

BISHOP MUSEUM BULLETINS IN ENTOMOLOGY

Review of *Sierola* Cameron
(Hymenoptera: Bethyilidae)
of the Hawaiian Islands. Part 1: O‘ahu

Karl N. Magnacca



Bishop Museum Bulletin in Entomology 14



Bishop Museum Press
Honolulu, 2020

Cover: *Sierola nitens* at Palikea, southern Wai'anāe range. Photo: Karl Magnacca.

Published by
Bishop Museum Press
1525 Bernice Street
Honolulu, Hawai'i 96817, USA

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eISSN 2376-3124 [published online 23 November 2020]
ZooBank Registration:
lsid:zoobank.org:pub:DCD2AF46-14F6-48E0-B2D9-DF30C8CBF020

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ABSTRACT

Sierola Cameron is one of the largest genera in Bethyilidae, but it has been taxonomically neglected and the overwhelming majority of species are undescribed. Hawai'i has an extraordinary radiation in the group, with probably more than 100 species on each major island. This revision covers the 158 species present on O'ahu, 71 of which are described as new: *S. akahikina*, n. sp., *S. alala*, n. sp., *S. alba*, n. sp., *S. alelo*, n. sp., *S. aniani*, n. sp., *S. arpactes*, n. sp., *S. auwae*, n. sp., *S. balteata*, n. sp., *S. beardslevi*, n. sp., *S. canuta*, n. sp., *S. centralis*, n. sp., *S. citripoda*, n. sp., *S. concava*, n. sp., *S. curvata*, n. sp., *S. danimalis*, n. sp., *S. discoides*, n. sp., *S. extensa*, n. sp., *S. femoralis*, n. sp., *S. granulosa*, n. sp., *S. halona*, n. sp., *S. hauwahine*, n. sp., *S. heterochroma*, n. sp., *S. hiiaka*, n. sp., *S. hookahi*, n. sp., *S. hualala*, n. sp., *S. huapoo*, n. sp., *S. huikau*, n. sp., *S. ihulena*, n. sp., *S. kahuku*, n. sp., *S. kamani*, n. sp., *S. kawala*, n. sp., *S. kepau*, n. sp., *S. kikiwi*, n. sp., *S. kilohana*, n. sp., *S. kolea*, n. sp., *S. koloa*, n. sp., *S. komohana*, n. sp., *S. kumene*, n. sp., *S. kumumu*, n. sp., *S. kunihi*, n. sp., *S. lapuu*, n. sp., *S. lateralis*, n. sp., *S. laupapa*, n. sp., *S. leiocephala*, n. sp., *S. mahiai*, n. sp., *S. mahoe*, n. sp., *S. makaha*, n. sp., *S. malino*, n. sp., *S. manono*, n. sp., *S. neoarmata*, n. sp., *S. nihopeku*, n. sp., *S. nuku*, n. sp., *S. olena*, n. sp., *S. pakela*, n. sp., *S. pano*, n. sp., *S. peleleu*, n. sp., *S. pipturi*, n. sp., *S. poepoe*, n. sp., *S. poohiwi*, n. sp., *S. psaliphora*, n. sp., *S. puiwa*, n. sp., *S. rostrata*, n. sp., *S. rugiventris*, n. sp., *S. uhiwai*, n. sp., *S. urerae*, n. sp., *S. vicina*, n. sp., *S. weaweae*, n. sp., *S. wehe*, n. sp., *S. welau*, n. sp., *S. xanthodera*, n. sp., and *S. yoshimotoi*, n. sp. Thirty-five previously published names are proposed as synonyms. Two species believed to be introduced to O'ahu are recorded for the first time, *S. larifuga* Evans, 1978 (established on multiple islands, described from California but probably not native there either), and *S. pilosa* Fullaway, 1920 (described from Moloka'i and possibly not established on O'ahu). The unique type of *S. nitida* Fullaway, 1920 has been lost, and based on its ambiguous description it is regarded as a *nomen dubium*.

INTRODUCTION

This is the first revision of the Hawaiian *Sierola* in 100 years. As the first of an anticipated four or more monographs that will treat the genus on an island-by-island basis, it covers the 158 species found on O‘ahu. A cursory examination of the collections from other islands indicates that a similar level of diversity is found on at least Kaua‘i, Maui, and Hawai‘i. Most if not all are island endemics—closely related species among the more distinctive taxa differ in at least minor characters between islands, and those that appear fully identical are likely cryptic species.

At first glance, it may appear that the species are over-split based on minor differences that amount to intraspecific variation. While there will inevitably be revisions to the species concepts used here, the overall pattern of a highly diversified group with multiple sympatric or parapatric species that have diverged based on host specialization and are separated only by small morphological characters has precedent in the Hawaiian radiations of *Drosophila* Fallén (Magnacca & O’Grady 2009) and *Hypsmocoma* Butler (Zimmerman 1978b). Moreover, the large number of strikingly distinct species known from only one or two individuals, and the many sites that have yet to be adequately sampled, suggest that more species remain to be discovered even on O‘ahu.

Taxonomic History

The genus *Sierola* was described by Peter Cameron based on a single specimen (*S. testaceipes* Cameron) collected by Rev. Thomas Blackburn on O‘ahu (Cameron 1881). The etymology of the genus is unknown; it is not stated in the paper, and I have been unable to determine its origin. It appears to be Greek, but no related words can be found in that or in Latin. It may be a mis-transliteration of *σειρά*, meaning chain or series, plus the diminutive *-ola*, possibly referring to the short, beaded antenna of *S. testaceipes*. It is also the name of an Italian olive variety (Bartolini & Cerreti 2007, Celletti 2011), apparently derived from a personal name, and may have some origin there. Curiously, the species described before and after *S. testaceipes* in the same paper (Cameron 1881) were from the Sierra Nevada in Spain, and it is possible that he mistakenly named it as an elided version of ‘Sierra’ plus the suffix *-cola* (dwelling).

Two additional species, *S. monticola* Blackburn & Cameron and *S. leuconeura* Blackburn & Cameron, were added in 1886 from Hawai‘i and Lāna‘i, respectively (Blackburn & Cameron 1886). In the monumental work *Fauna Hawaiiensis*, W.H. Ashmead described a further five species (Ashmead 1901a), and R.C.L. Perkins added one more in his supplement (Perkins 1910). In the early period of collecting, most specimens were grouped under *S. testaceipes* by Ashmead and others, with only a handful sorted under the new names, most of which also turned out to include multiple species in their type series. In his introduction to *Fauna Hawaiiensis*, Perkins described the general habits of *Sierola* and noted for the first time the potential diversity in the group in his typically understated way:

“*Sierola* differs greatly from *Scleroderma* [sic] in the fact that while individuals of the latter are not generally common, those of the first genus are quite the most plentiful of the parasitic Microhymenoptera. They are essentially forest insects, though one or two of them are occasionally found without the forest. Their habits are quite different from those of *Scleroderma*, for they are commonly seen running on the leaves of the ‘Ki’ (*Cordyline terminalis*), of *Pelea*, *Acacia koa* and many other trees and shrubs. They are parasitic on various caterpillars, but chiefly, I think, those of the Microlepidoptera (Tineina and Tortricina) from which I have occasionally bred specimens, but they also attack those of larger moths, for Swezey has bred *S. dichroma* from the caterpillar of *Omiodes asaphombra* [misidentification of *O. scotaea*; see Zimmerman, 1958].... The species of *Sierola* are apparently somewhat variable and not always easily distinguished, and I rather suspect that they were more numerously represented in my collections, than is shown by Ashmead’s discrimination of them. (Perkins 1913)”

The last sentence was decidedly correct—out of 79 specimens at the NHMUK collected by Perkins and determined by Ashmead as *S. testaceipes*, only one actually is that species. The remainder include nine species from O‘ahu in only ten specimens, and a large number of species from other islands, most still undescribed. Considering Perkins’ specimens at NHMUK and BPBM together, he obtained a total of 22 species from O‘ahu alone.

The first, and so far only, attempt at a comprehensive work on the group was published by David T. Fullaway (1920). At the time, he and a number of other prominent Hawai‘i entomologists such as Otto Swezey were working for the Hawaii Sugar Planters’ Association, which had a vigorous entomology program to deal with the ever-increasing number of sugarcane pests. Fullaway (1920) described 171 species from Hawai‘i (as well as one each from Fiji and China), but his geographic sampling was heavily biased. One hundred eighteen species were from O‘ahu, based on specimens collected by himself and fellow HSPA entomologists Otto H. Swezey, John C. Bridwell, William M. Giffard, and Philip H. Timberlake; the collecting localities span the entire island but are heavily concentrated in the southeast Ko‘olau range above Honolulu. Another 45 are from Hawai‘i, nearly all taken by Giffard and from only a few localities around the island. Only a single species each was described from Kaua‘i and Moloka‘i, and six from Maui. These latter islands are not less speciose—I have found about 60 species from Kaua‘i by my own minimal collecting efforts there, and at least an additional 40 species from Hawai‘i from those of others—but their faunas remain almost totally undescribed.

While it provides an important basis for the current study, Fullaway’s monograph was deeply flawed in several ways. First, there are almost no illustrations, which make it difficult to understand the meaning of the many (necessarily) ambiguous character descriptions. More significant is that the key and descriptions are often not merely ambiguous, but actually incorrect. For example, the first couplet is “Head extended in front of the eyes, anterior margin angulate, sometimes with a clypeal horn” vs. “Head not extended in front of the eyes, anterior margin transverse.” Yet many placed among the latter group have a distinctly projecting clypeus (see *S. hirticeps* Fullaway for an example), while others such as *S. pygmaea* Fullaway are under the former but have quite a short, obtuse clypeus. Consequently it is common to find the same species described under two names, one on each side of this character. As another, among the taxa falling under couplet 157-164 “Head longer than wide by half/Head only a little longer than wide,” all have a head length/width ratio of 1.12–1.27, with overlap between the two groups at around 1.20 (notably, only two known species in the entire genus, *S. armata* Fullaway and *S. levis* Fullaway, have the head fully half again as long as wide; in all others the ratio is 1.43 or less). One specimen placed in the second group, *S. swezeyi* Fullaway, actually has the head proportionally longer than any of those in the first. This, followed by several more dubious couplets based on minor characters of coloration and antennal length, results in the separation of several names under the *kilauea/olympiana* complex, many of which are synonyms.

As a result of this, as well as splitting on the basis of minor differences of coloration and surface sculpting, I recognize 35 new synonyms here (Table 1). In general, however, I have taken a relatively conservative approach. Fullaway’s species have been retained to the degree that they can be separated using reliable characters such as head dimensions and mandible structure, as with the *affinis/pygmaea* species complex. Ultimately, a few additional species may turn out to be synonyms of others, but it will take more resources and specimens than are currently available. Such problematic taxa are also primarily limited to a few difficult clusters, namely the *olympiana* and *striata* species groups.

There are probably more cryptic or semi-cryptic species found among collections. While Fullaway clearly over-split the group, placing fully identical specimens on opposite ends of the key based on differences that could not be found in this study, he nevertheless correctly noted some clear cases of close yet distinct species. For example, *S. bridwelli* Fullaway and *S. perottetiae* Fullaway are extremely similar, matching in nearly all characters on paper. However, the former consistently has more massive mandibles, narrower femora

Table 1. Summary of O‘ahu *Sierola* species and taxonomic changes.
(Indented names are synonyms of the one above)

<i>Sierola acuta</i> Fullaway, 1920	<i>Sierola hauwahine</i> Magnacca, n. sp.
<i>Sierola affinis</i> Fullaway, 1920	<i>Sierola heterochroma</i> Magnacca, n. sp.
<i>Sierola akahikina</i> Magnacca, n. sp.	<i>Sierola hiika</i> Magnacca, n. sp.
<i>Sierola alala</i> Magnacca, n. sp.	<i>Sierola hillebrandi</i> Fullaway, 1920
<i>Sierola alba</i> Magnacca, n. sp.	<i>Sierola hirsuta</i> Fullaway, 1920
<i>Sierola alelo</i> Magnacca, n. sp.	<i>Sierola hirticeps</i> Fullaway, 1920
<i>Sierola anemophila</i> Fullaway, 1920	<i>Sierola hookahi</i> Magnacca, n. sp.
<i>Sierola aniani</i> Magnacca, n. sp.	<i>Sierola hualala</i> Magnacca, n. sp.
<i>Sierola anthracina</i> Fullaway, 1920	<i>Sierola huapoo</i> Magnacca, n. sp.
<i>Sierola aristoteliae</i> Fullaway, 1920	<i>Sierola huikau</i> Magnacca, n. sp.
<i>Sierola seminigra</i> Fullaway, 1920 n. syn.	<i>Sierola ihulena</i> Magnacca, n. sp.
<i>Sierola armata</i> Fullaway, 1920	<i>Sierola incita</i> Fullaway, 1920
<i>Sierola arpactes</i> Magnacca, n. sp.	<i>Sierola kaala</i> Fullaway, 1920
<i>Sierola aspera</i> Fullaway, 1920	<i>Sierola kahuku</i> Magnacca, n. sp.
<i>Sierola auwae</i> Magnacca, n. sp.	<i>Sierola kamani</i> Magnacca, n. sp.
<i>Sierola balteata</i> Magnacca, n. sp.	<i>Sierola kaumuohona</i> Fullaway, 1920
<i>Sierola batrachedrae</i> Fullaway, 1920	<i>Sierola kawala</i> Magnacca, n. sp.
<i>Sierola beardsleyi</i> Magnacca, n. sp.	<i>Sierola kepau</i> Magnacca, n. sp.
<i>Sierola bella</i> Fullaway, 1920	<i>Sierola kikiwi</i> Magnacca, n. sp.
<i>Sierola bicolor</i> Fullaway, 1920	<i>Sierola kilohana</i> Magnacca, n. sp.
<i>Sierola brevicornis</i> Fullaway, 1920	<i>Sierola koa</i> Fullaway, 1920
<i>Sierola bridwelli</i> Fullaway, 1920	<i>Sierola koebelei</i> Fullaway, 1920
<i>Sierola callida</i> Fullaway, 1920 n. syn.	<i>Sierola kolea</i> Magnacca, n. sp.
<i>Sierola lata</i> Fullaway, 1920 n. syn.	<i>Sierola koloa</i> Magnacca, n. sp.
<i>Sierola brunnea</i> Fullaway, 1920	<i>Sierola komohana</i> Magnacca, n. sp.
<i>Sierola lugens</i> Fullaway, 1920 n. syn.	<i>Sierola koolauensis</i> Fullaway, 1920
<i>Sierola brunneipennis</i> Fullaway, 1920	<i>Sierola polita</i> Fullaway, 1920 n. syn.
<i>Sierola canuta</i> Magnacca, n. sp.	<i>Sierola kumene</i> Magnacca, n. sp.
<i>Sierola capuana</i> Fullaway, 1920	<i>Sierola kumumu</i> Magnacca, n. sp.
<i>Sierola celeris</i> Fullaway, 1920	<i>Sierola kunihi</i> Magnacca, n. sp.
<i>Sierola centralis</i> Magnacca, n. sp.	<i>Sierola langfordi</i> Fullaway, 1920
<i>Sierola citripoda</i> Magnacca, n. sp.	<i>Sierola curiosa</i> Fullaway, 1920 n. syn.
<i>Sierola concava</i> Magnacca, n. sp.	<i>Sierola lanihuliana</i> Fullaway, 1920
<i>Sierola cryptophlebiae</i> Fullaway, 1920	<i>Sierola lapuu</i> Magnacca, n. sp.
<i>Sierola brunneipes</i> Fullaway, 1920 n. syn.	<i>Sierola larifuga</i> Evans, 1978*
<i>Sierola flavicornis</i> Fullaway, 1920 n. syn.	<i>Sierola lateralis</i> Magnacca, n. sp.
<i>Sierola proxima</i> Fullaway, 1920 n. syn.	<i>Sierola laupapa</i> Magnacca, n. sp.
<i>Sierola curvata</i> Magnacca, n. sp.	<i>Sierola leiocephala</i> Magnacca, n. sp.
<i>Sierola danimalis</i> Magnacca, n. sp.	<i>Sierola levis</i> Fullaway, 1920
<i>Sierola depressa</i> Fullaway, 1920	<i>Sierola luteipes</i> Fullaway, 1920
<i>Sierola depressella</i> Fullaway, 1920	<i>Sierola mahiai</i> Magnacca, n. sp.
<i>Sierola dichroma</i> Perkins, 1910	<i>Sierola mahoe</i> Magnacca, n. sp.
<i>Sierola discoides</i> Magnacca, n. sp.	<i>Sierola makaha</i> Magnacca, n. sp.
<i>Sierola epagogeana</i> Fullaway, 1920	<i>Sierola malino</i> Magnacca, n. sp.
<i>Sierola extensa</i> Magnacca, n. sp.	<i>Sierola mandibularis</i> Fullaway, 1920
<i>Sierola femoralis</i> Magnacca, n. sp.	<i>Sierola mandibulata</i> Fullaway, 1920
<i>Sierola flavipes</i> Fullaway, 1920	<i>Sierola manoa</i> Fullaway, 1920
<i>Sierola fossulata</i> Fullaway, 1920	<i>Sierola abusa</i> Fullaway, 1920 n. syn.
<i>Sierola fuliginosa</i> Fullaway, 1920	<i>Sierola kaalensis</i> Fullaway, 1920 n. syn.
<i>Sierola fusca</i> Fullaway, 1920	<i>Sierola manono</i> Magnacca, n. sp.
<i>Sierola giffardi</i> Fullaway, 1920	<i>Sierola minuscula</i> Fullaway, 1920
<i>Sierola glabra</i> Fullaway, 1920	<i>Sierola montana</i> Fullaway, 1920
<i>Sierola opaeula</i> Fullaway, 1920 n. syn.	<i>Sierola neoarmata</i> Magnacca, n. sp.
<i>Sierola gracilariae</i> Fullaway, 1920	<i>Sierola nigra</i> Fullaway, 1920
<i>Sierola kaduana</i> Fullaway, 1920 n. syn.	<i>Sierola nigrita</i> Fullaway, 1920
<i>Sierola gracilis</i> Fullaway, 1920	<i>Sierola nihopeku</i> Magnacca, n. sp.
<i>Sierola gracillima</i> Fullaway, 1920	<i>Sierola nitens</i> Fullaway, 1920
<i>Sierola granulosa</i> Magnacca, n. sp.	<i>Sierola nuda</i> Fullaway, 1920
<i>Sierola halona</i> Magnacca, n. sp.	<i>Sierola williamsi</i> Fullaway, 1920 n. syn.

* introduced to the Hawaiian Islands.

Table 1. Summary of O‘ahu *Sierola* species and taxonomic changes (continued).
(Indented names are synonyms of the one above)

<i>Sierola nuku</i> Magnacca, n. sp.	<i>Sierola similis</i> Fullaway, 1920
<i>Sierola oahuensis</i> Ashmead, 1901	<i>Sierola amica</i> Fullaway, 1920 n. syn.
<i>Sierola distincta</i> Fullaway, 1920 n. syn.	<i>Sierola distinguenda</i> Fullaway, 1920 n. syn.
<i>Sierola obscura</i> Fullaway, 1920	<i>Sierola laccessita</i> Fullaway, 1920 n. syn.
<i>Sierola adumbrata</i> Fullaway, 1920 n. syn.	<i>Sierola megalops</i> Fullaway, 1920 n. syn.
<i>Sierola breviceps</i> Fullaway, 1920 n. syn.	<i>Sierola spicata</i> Fullaway, 1920
<i>Sierola kalihiensis</i> Fullaway, 1920 n. syn.	<i>Sierola striata</i> Fullaway, 1920
<i>Sierola localis</i> Fullaway, 1920 n. syn.	<i>Sierola agens</i> Fullaway, 1920 n. syn.
<i>Sierola olen</i> Magnacca, n. sp.	<i>Sierola subcrispa</i> Fullaway, 1920
<i>Sierola olympiana</i> Fullaway, 1920	<i>Sierola rufomandibulata</i> Fullaway, 1920 n. syn.
<i>Sierola brevicauda</i> Fullaway, 1920 n. syn.	<i>Sierola suttoniae</i> Fullaway, 1920
<i>Sierola pilifera</i> Fullaway, 1920 n. syn.	<i>Sierola arida</i> Fullaway, 1920 n. syn.
<i>Sierola opogonae</i> Fullaway, 1920	<i>Sierola swezeyi</i> Fullaway, 1920
<i>Sierola pakela</i> Magnacca, n. sp.	<i>Sierola tenebriosa</i> Fullaway, 1920
<i>Sierola pano</i> Magnacca, n. sp.	<i>Sierola willardi</i> Fullaway, 1920 n. syn.
<i>Sierola peleana</i> Fullaway, 1920	<i>Sierola tenuiceps</i> Fullaway, 1920
<i>Sierola peleleu</i> Magnacca, n. sp.	<i>Sierola tenuis</i> Fullaway, 1920
<i>Sierola pemberton</i> Fullaway, 1920	<i>Sierola testaceipes</i> Cameron, 1881
<i>Sierola perottetiae</i> Fullaway, 1920	<i>Sierola brunneiventris</i> Fullaway, 1920 n. syn.
<i>Sierola philodoriae</i> Fullaway, 1920	<i>Sierola pubescens</i> Fullaway, 1920 n. syn.
<i>Sierola picea</i> Fullaway, 1920	<i>Sierola tantalea</i> Fullaway, 1920 n. syn.
<i>Sierola pilosa</i> Fullaway, 1920	<i>Sierola timberlakei</i> Fullaway, 1920
<i>Sierola pipturi</i> Magnacca, n. sp.	<i>Sierola tuberculata</i> Fullaway, 1920
<i>Sierola planiceps</i> Fullaway, 1920	<i>Sierola tumidoventris</i> Fullaway, 1920
<i>Sierola flavipennis</i> Fullaway, 1920 n. syn.	<i>Sierola magna</i> Fullaway, 1920 n. syn.
<i>Sierola poepoe</i> Magnacca, n. sp.	<i>Sierola uhiwai</i> Magnacca, n. sp.
<i>Sierola poohiwi</i> Magnacca, n. sp.	<i>Sierola urerae</i> Magnacca, n. sp.
<i>Sierola psaliphora</i> Magnacca, n. sp.	<i>Sierola usitata</i> Fullaway, 1920
<i>Sierola puiwa</i> Magnacca, n. sp.	<i>Sierola vestita</i> Fullaway, 1920
<i>Sierola pulchra</i> Fullaway, 1920	<i>Sierola robusta</i> Fullaway, 1920 n. syn.
<i>Sierola punctata</i> Fullaway, 1920	<i>Sierola vicina</i> Magnacca, n. sp.
<i>Sierola pygmaea</i> Fullaway, 1920	<i>Sierola waianaeana</i> Fullaway, 1920
<i>Sierola rostrata</i> Magnacca, n. sp.	<i>Sierola weawe</i> Magnacca, n. sp.
<i>Sierola rufignatha</i> Fullaway, 1920	<i>Sierola wehe</i> Magnacca, n. sp.
<i>Sierola rugiventris</i> Magnacca, n. sp.	<i>Sierola welau</i> Magnacca, n. sp.
<i>Sierola rugulosa</i> Fullaway, 1920	<i>Sierola xanthodera</i> Magnacca, n. sp.
<i>Sierola setosa</i> Fullaway, 1920	<i>Sierola yoshimotoi</i> Magnacca, n. sp.
<i>Sierola similis</i> Fullaway, 1920	

(FL/FW ~2.2–2.3), and a slightly broader head (WH/LH 0.89–0.91); the latter has slightly narrower mandibles, broader femora (FL/FW ~1.8–1.9), and a slightly narrower head (WH/LH 0.86–0.88). They are significantly different in overall gestalt as well, a useful (albeit subjective) way of examining specimens. The femur width may be somewhat variable within some species, but reliably separates these two.

In determining species boundaries here, I use the phylogenetic species concept as defined by Nixon & Wheeler (1990) and Wheeler & Platnick (2000): the smallest aggregation of populations diagnosable by a unique combination of character states. This may lead to over-splitting due to assessing character states as diagnosable due to the small number of individuals (a common issue with many of the *Sierola* taxa), but I consider it a conservative approach since it retains the greatest amount of information about individuals and populations. Assuming greater variability in characters would still result in relatively few names being synonymized (Table 2). There are a few aberrant individuals in collections, differing mainly in morphometrics, that may represent either extended variation or additional species, but in the absence of a series of specimens or distinctive characters I have not separated them or given them a definitive determination.

Table 2. Potential synonyms if certain characters are shown to be more variable than expected.

Species	Character(s)
<i>S. capuana</i> , <i>S. manoa</i> , <i>S. similis</i>	mandible curvature, mandible color
<i>S. affinis</i> , <i>S. aspera</i> , <i>S. luteipes</i>	head width, leg color
<i>S. celeris</i> , <i>S. striata</i>	leg color, metasoma sculpture
<i>S. glabra</i> , <i>S. mandibularis</i>	frons punctuation
<i>S. discoides</i> , <i>S. setosa</i>	head depth
<i>S. heterochroma</i> , <i>S. hirsuta</i> , <i>S. olympiana</i>	mandible color, leg color
<i>S. femoralis</i> , <i>S. hirticeps</i> , <i>S. tenuis</i> , <i>S. usitata</i>	head width, mandible color, leg color
<i>S. opogonae</i> , <i>S. vestita</i>	head width

I have not formally defined species groups here, because most species do not fall clearly with a circumscribed group, but several clusters of clearly related taxa are informally mentioned. The *anthracina* group includes species with an acarinate, flat or slightly convex clypeus with the mandibles falcate; the *striata* group consists of species with broad mandibles, usually of robust form with the head relatively elongate behind the eyes and a sharply or occasionally weakly carinate clypeus; and the *olympiana* group is defined by the thin, highly arched clypeal carina, elongate, forward-directed vertex and genal setae, and usually dense frons punctuation. These groups are not strictly delimited, but generally include those species found under couplets 9, 82, and 159, respectively, in the key to species. Species referable to all three of these groups are found outside Hawai‘i, and it is likely that they are not phylogenetic units.

The pin and label of the unique holotype of *S. nitida* Fullaway are present, but the specimen is missing. Since the description could apply to multiple existing or new species (especially considering Fullaway’s poorly-defined character states) and there is no overriding need to define the species for the purpose of stability, no neotype is designated and *S. nitida* is here considered a *nomen dubium*. In addition, four specimens in the general collection at BPBM bear holotype labels with Fullaway manuscript names. None of these were ever described, nor are they able to be now in practical terms (i.e., those labeled as “alterna”, “unica”, and “inana” are males, and “communis” and “inana” are headless, thus lacking nearly all identification features).

Biogeography and Evolution

Sierola is one of the largest genera in Bethyridae and the largest in the subfamily Bethylinae, with 213 described species prior to this treatment. It is widely distributed throughout the Indo-Pacific region, from India and East Asia to Australia, New Guinea, New Zealand, and throughout Oceania. Two additional fossil species from Baltic and Rovno amber indicate it had a much wider distribution in the past (Ramos *et al.* 2014). The centers of diversity are Australia (where the genus probably originated) and Hawai‘i. The overwhelming majority of species are undescribed, particularly outside Hawai‘i. A cursory examination of the >1,000 specimens at the Australian National Insect Collection indicates that at least 200 species are present there (including Norfolk and Lord Howe Islands), but only four are described. Eleven and six are described from the Marquesas Islands and New Zealand, respectively, and one from Fiji (Fullaway 1934, Ward 2013, Magnacca 2019a). However, specimens are present in the Bishop Museum collection from Tahiti, Samoa, Fiji, Tonga, New Caledonia, Vanuatu, the Solomon Islands, the Bismarck Archipelago, New Guinea, and Borneo, representing at least 50 undescribed species in all. Most of these islands are poorly collected: in most cases there are only 5–10 specimens from a given island group where each individual represents a different species, and many more undoubtedly exist. Compared to other genera of Bethyridae, *Sierola* are rarely collected from mainland Asia, but the eight species described from that region are represented by only one to three spec-

imens each (Gorbatovsky 1998, Terayama 2004, 2006, Santhosh 2017), suggesting that many more exist. One species, *S. larifuga* Evans, is recorded from California (Evans 1978), and is here documented from Hawai'i as well, but it is likely an introduction to both places from elsewhere and currently cryptogenic.

There are no particular characters that separate the Hawaiian taxa from those elsewhere. On the contrary, similar morphological forms—particularly those resembling *S. olympiana* Fullaway and *S. striata* Fullaway, representing species with a high, laminate clypeal carina and those with broad, parallel-sided mandibles respectively—appear on many Pacific islands, suggesting either multiple introductions or repeated convergence. Since the *S. olympiana*-like form also occurs in *Goniozus* Förster, the latter is likely. Australia contains a far greater morphological diversity in its undescribed species than Hawai'i, as might be expected as a large continental region with diverse habitats that may be the center of origin for the genus. Many species there have a very short or slightly open cell 2R1, a distinct line of tessellate sculpture between the eye and vertex, biconvex fore femora, a distinct transverse propodeal carina, lack dense setae on the ventral mesosoma, and/or bear elongate setae on the eyes or metasoma, all characters absent or extremely rare in the Hawaiian and other Pacific island species. That said, a large proportion of the Hawaiian fauna consists of species that are morphologically distinct from those elsewhere. In particular, the ventral expansion of the head into a triangular shape, and the modification of the mandibles to be twisted or extremely enlarged compared to the head, appears to be almost unique to Hawai'i. Pale yellow-brown coloration also appears to be extremely rare elsewhere (though this too occurs in *Goniozus*), but is moderately common in Hawaiian species, and even occurs as intraspecific variation.

One significant consequence of the number of undescribed species is that it is virtually impossible to recognize any introduced species of *Sierola*. Unless it were one of the more extreme Australian or Asian species, or one of the few already described, it would be easily be assumed to be one of the many generalized natives. One definite alien, *S. larifuga* Evans, has been found in coffee fields on multiple islands as well as in native forest; it differs from the native *S. kaala* Fullaway only in details of microsculpture. At least one O'ahu species, *S. acuta* Fullaway, appears to be strongly associated with sugarcane and has not been collected since the end of sugar production on O'ahu; it may be a lowland native species that switched to attacking a cane-feeding caterpillar after its native host became extirpated along with most of the rest of the lowland insect fauna.

In Hawai'i, the broader picture of *Sierola* evolution is difficult to see because so many species are as yet undescribed and probably even uncollected, including nearly the entire faunas of Kaua'i and Maui Nui. A few trends appear evident, however. Species with pale coloration are much more common on the older islands, especially Kaua'i. This is true in terms of both species diversity and numbers of individuals. Species with more highly modified morphology also seem to be more frequent on the older islands, although this may be due more to a sampling effect. Still, as an example, *S. oahuensis* Ashmead has the head flatter and the clypeus larger than its undescribed relative on Hawai'i; and the former is relatively common while the latter appears to be quite rare. Why this should be is unknown.

The extent of island endemism is not entirely clear, as the faunas of the other islands have not yet been studied intensively. One would expect that such small, poor-flying insects would not disperse readily between or even within islands. However, they are clearly able to at least maintain distributions in both the Ko'olau and Wai'anae ranges of O'ahu. In many cases extremely similar species are found on different islands with only minor differences between them. In a few instances, these appear to be virtually identical. It would be helpful to ascertain the relationships among these populations with additional methods, such as genetics, that have not been available for the current study.

Curiously, one pair of sibling species, *S. oahuensis* and *S. rostrata*, n. sp., appear to be virtually allopatric, but are not separated by any obvious geographic barrier. The former is found throughout the Ko'olau range and in the northern Wai'anae to the summit of Ka'ala; the latter is found from the lower elevations of the east slopes of Ka'ala, through the re-

mainder of the southern Wai‘anae range (Map 25). One collection—labelled “Mt. Ka‘ala” but likely from upper Hale‘au‘au Valley on the old trail to the summit on the east slope (Swezey 1931)—contains one of each, but with no elevation information. It is possible they are segregated by elevation in this contact zone, since on other dates, *S. rostrata* is recorded from approximately 450–600 m and *S. oahuensis* from 950 m in Hale‘au‘au. Two other species pairs, *S. gracilis* Fullaway and *S. kikiwi*, n. sp., and *S. glabra* Fullaway and *S. extensa*, n. sp., appear to split along the same line (Maps 10, 13, 18), but in these cases all four are extremely rare and it is uncertain if the apparent distributions are real or an artefact of the few specimens available.

I expect the total number of Hawaiian species in the genus will exceed 400. Even if O‘ahu should prove to harbor the peak level of diversity among the islands, there are already more than 90 species known from Hawai‘i and 70 from Kaua‘i based on Fullaway’s work and minimal collections by myself, without even having examined Swezey’s and Beardsley’s extensive collections. Maui, Moloka‘i, and Lāna‘i are as yet almost totally unknown, and are generally the least collected, but are unlikely to be depauperate when the smaller, heavily altered island of O‘ahu has retained so much of its diversity. Given the number of O‘ahu species known from one or two individuals—the result of both sustained collecting at the same localities, and fortuitous visits to remote sites—it is more likely that the other islands have similar or perhaps higher diversity, even if it is not reflected in the number of species that have been collected.

The reason for the extraordinary proliferation of *Sierola* species in Hawai‘i is unknown. Sibling mating is the general rule in Bethylidae, with males often cutting open the pupae of their sisters and mating with them prior to eclosion (Bridwell 1920, Gordh & Evans 1976, Griffiths & Godfray 1988). Such close inbreeding may result in rapid development of host races and sympatric speciation (Bush & Butlin 2004). Compared to continental areas, Hawai‘i has relatively few lineages of native parasitoid wasps, and in particular lacks the high diversity of Braconidae and Ichneumonidae that are typically the most abundant parasitoids of Lepidoptera larvae in continental regions. The only native braconids are two species of *Ecphylopsis* Ashmead, an unusual micropterous genus that apparently attacks wood-boring beetle larvae (Beardsley 1961), and the only native ichneumonids are modest radiations of the genera *Enicospilus* Stephens which attack relatively large, exposed caterpillars (Bennett 2008) and *Spolas* Townes, whose biology is unknown. Thus, the combination of a diverse fauna of microlepidoptera in concealed situations, few parasitoid competitors for that niche, and a mating system that promotes rapid divergence, can easily result in a very high number of species in a relatively short time period.

Ecology and Behavior

Bethylidae are basal aculeate wasps, possessing a stinger that delivers an amine-based venom (Skinner *et al.* 1990). Once stung, the prey larva generally does not recover, though if stung by some bethylid species, prey may be able to regain some movement and even pupate (Gordh & Evans 1976, Howard *et al.* 1998). The hosts of the subfamily Bethylinae, including *Sierola*, are primarily microlepidopteran caterpillars, while the other subfamilies primarily attack Coleoptera grubs (Azevedo *et al.* 2018b).

Some bethylines apparently have unusual habits, such as attacking insects in galls. The Indian *Sierola nasseri* Santhosh was reared from thrips-induced galls on *Memecylon umbellatum* Brum. f. (Melastomataceae), which were inhabited by staphylinid beetles in the genus *Carpelimus* (Santhosh 2017). The Australian *Sierola antipoda* Ashmead was reportedly reared from galls in *Melaleuca* (Myrtaceae) caused by the cecidomyiid fly *Dasineura frauenfeldi* (Schiner, 1868) (Ashmead 1901b). In each case, the true host is uncertain and may have been a lepidopteran inquiline that was not evident, but it indicates a willingness to attack hosts in concealed locations that may or may not be the typical ones for the wasp.

Known hosts for *Sierola* in Hawai‘i are relatively few (Table 3). Many were originally published by Swezey (1907, 1909, 1915a, 1915b, 1932, 1933, 1943, 1954), but not always

Table 3. Recorded hosts of *Sierola* in Hawai'i.
Only the earliest reference found is noted; many are duplicated in Swezey (1954) and Zimmerman (1978a, 1978b). "Specs." indicates if the specimens in the reference have been found in collections and the identity verified

Species	Host Family	Host	Habit	Plant	Specs.	Reference	Notes
<i>S. acuta</i>	Tineidae	<i>Erechthias flavistriata</i> (Walsingham)		<i>Saccharum officinarum</i>	Y?	Swezey 1909, p. 26	The record of <i>S. molokaiensis</i> parasitizing <i>Erechthias</i> by Swezey (1909) is a misidentification of this species, as several <i>S. acuta</i> were reared by Swezey. The specimens cannot be definitively found, but one female missing its head and consistent with <i>S. acuta</i> is present in the HDOA collection with the label "reared from budworm of cane"
<i>S. aristoteliae</i>	Gelechiidae	<i>Merimnetria</i> prob. <i>elegantior</i> (Walsingham)	seed borer	<i>Kadua affinis</i>	Y	Fullaway 1920, p. 82	Only the host genus is specified on the label (as <i>Aristotelia</i>); the species is inferred from it feeding on the fruit, and this is cited in Zimmerman (1978). The record for <i>S. flavocollaris</i> as a parasite of this species in Swezey (1915) is a misidentification of <i>S. aristoteliae</i> , which had not yet been described.
<i>S. aristoteliae</i> ?	Gelechiidae	<i>Merimnetria homoxyla</i> (Meyrick)?	twig galler	<i>Kadua affinis</i>	Y	Swezey 1954, p. 95	Listed as <i>S. tantalea</i> due to misidentification. Melanic compared to typical <i>S. aristoteliae</i> associated with fruits, possibly a host race or cryptic species
<i>S. armata</i>	Cosmopterigidae	<i>Hyposiocoma kahanamoa</i> Schmitz & Rubinoff	algae feeder	on algae in stream	Y	This work	
<i>S. batrachedrae</i>	Batrachedridae	<i>Batrachedrodex</i> sp.		<i>Elaphoglossum</i> sp.	Y	Fullaway 1920, p. 125	
<i>S. bridwelli</i>	Cosmopterigidae	<i>Hyposiocoma</i> (<i>Euperissus</i>) sp.	twig borer	<i>Broussaisia arguta</i>	Y	This work	
<i>S. bridwelli</i>	Curculionidae	<i>Oodemas aenescens</i> ?			Y	This work	

Table 3. Recorded hosts of *Sierola* in Hawai‘i. (continued)

Species	Host Family	Host	Habit	Plant	Specs.	Reference	Notes
<i>S. capuana</i>	Tortricidae	<i>Pararrhaptica</i> cf. <i>longiplicata</i> (Walsingham)		<i>Myrsine</i> <i>lessertiana</i> ?	Y	Fullaway 1920, p. 113	According to Zimmerman (1978), populations of <i>P. longiplicata</i> from outside Maui are probably distinct species. Plant not specified on label, inferred from host of caterpillar.
<i>S. capuana</i>	Tortricidae	<i>Spheterista</i> <i>cassia</i> (Swezey)		<i>Senna</i> <i>gaudichaudii</i> ?	Y	Fullaway 1920, p. 113	Listed in Zimmerman as <i>Sierola</i> sp. Plant not specified on label, inferred from host of caterpillar.
<i>S. cryptophlebiae</i>	Olethreutidae	<i>Cryptophlebia</i> <i>illepida</i> (Butler)	seed borer	<i>Acacia</i> <i>koa</i>	Y	Fullaway 1920, p. 119	
<i>S. cryptophlebiae</i>		larva		<i>Aleurites</i> <i>moleucana</i>	Y	This work	
<i>S. dichroma</i>	Crambidae	<i>Omiodes</i> <i>scotaea</i> (Hampson)	leaf roller	<i>Astelia</i> sp.		Swezey 1907, p. 45	<i>Omiodes scotaea</i> was long misidentified as <i>O. asaphombra</i> , including in the reference; see Zimmerman (1958). The specimens cannot be found, and while some of those on hand were collected by Swezey, all date from after 1907.
<i>S. epagogsana</i>	Tortricidae	<i>Spheterista</i> <i>infaustana</i> (Walsingham)		<i>Pipturus</i> <i>albidus</i> ?	Y	Fullaway 1920, p. 135	Plant not specified on label, inferred from host of caterpillar.
<i>S. fuliginosa</i>	Crambidae	<i>Omiodes</i> <i>maia</i> Swezey	leaf roller	<i>Musa</i> × <i>paradisica</i>	Y	This work	Slightly different from definitive <i>S. fuliginosa</i> from Ka‘ala.
<i>S. gracilariae</i>	Gracillariidae	<i>Caloptilia</i> <i>mabaella</i> (Swezey)	leaf miner	<i>Diospyros</i> sp.?	Y	Fullaway 1920, p. 118	Plant not specified on label, inferred from host of caterpillar.
<i>S. kauniohona</i>			leaf miner	<i>Coprosma</i>	Y	This work	
<i>S. kauniohona</i>	Gelechiidae	<i>Merimnetria</i> prob. <i>thurifica</i> (Meyrick)		<i>Kadua</i>	Y	This work	

Table 3. Recorded hosts of *Sierola* in Hawai'i. (continued)

Species	Host Family	Host	Habit	Plant	Specs.	Reference	Notes
<i>S. koa</i>	Olethreutidae	<i>Cryptophlebia illepidia</i> (Butler)	seed borer	<i>Acacia koa</i>	Y	Swezey 1954, p. 4	
<i>S. koa</i>	Crambidae	<i>Omiodes blackburni</i> (Butler)	leaf roller	<i>Cocos nucifera</i>	Y	This work	
<i>S. kolea</i>	Gracillariidae	<i>Philodoria</i> sp. nr. <i>auromagnifica</i>	leaf miner	<i>Myrsine lessertiana</i> ?	Y	This work	Plant species not specified, but <i>M. lessertiana</i> is the only <i>Myrsine</i> known to host leaf miners.
<i>S. koalauiensis</i>	Carposinidae	<i>Carpocostina</i> sp. 4?		<i>Metrosideros polymorpha</i>	Y	This work	Labelled as "ex lehua bud moth", of which an undescribed species of <i>Carpocostina</i> (called "new species 4" in Zimmerman 1978) is the only known candidate.
<i>S. kunihi</i>	Cosmopterigidae	<i>Hypomocoma (Euperistis) caecitervis</i> Meyrick?		<i>Smilax melastomifolia</i>	Y	Bridwell 1920, p. 454	Host unidentified, but possibly this species based on the plant.
<i>S. kilohana</i>	Yponomeutidae	<i>Prays</i> sp.?		<i>Melicope</i>	Y	This work	Labelled as "ex <i>Ptelea</i> [= <i>Melicope</i>] fruits"; <i>Prays</i> is the only group of caterpillars known to feed on these.
<i>S. manoa</i>	Crambidae	<i>Udea dryadopa</i> (Meyrick)		<i>Scaevola glabra</i>	Y	This work	
<i>S. manono</i>	Gelechiidae	<i>Merimnetria xylospila</i> ?	stem galler	<i>Kadua affinis</i>	Y	This work	Labelled as "from Lepidopteran gall on twig terminals of <i>Gouardia terminalis</i> [= <i>Kadua affinis</i>]"; <i>M. xylospila</i> is the only moth known to have this habit, but there may be undescribed species in the genus.
<i>S. nuda</i> ?	Gracillariidae	<i>Caloptilia mabaella</i> (Swezey)	leaf miner	<i>Diospyros sandwicensis</i> ?	Y	Fullaway 1920, p. 118	Specimen included as part of the paratype series of <i>S. gracillariae</i> ; it is clearly not that species but does not exactly match <i>S. nuda</i> either. Plant not specified on label, inferred from host of caterpillar.

Table 3. Recorded hosts of *Sierola* in Hawai‘i. (continued)

Species	Host Family	Host	Habit	Plant	Specs.	Reference	Notes
<i>S. opogonae</i>	Tineidae	<i>Opogona aurisquamosa</i> (Butler)?	scavenger	<i>Clernontia kakeana</i>	Y	Bridwell 1919, p. 25	The label says the host was <i>Opogona</i> ; however, according to Bridwell (1919), only <i>Thyrocopa</i> and <i>Hypomoacoma (Euperissus)</i> emerged from the material, while <i>Opogona</i> had been taken in other collections of similar material. The <i>Sierola</i> larvae were found already fully-fed, indicating that the host caterpillar(s) may not have been identifiable. Since <i>Opogona</i> is introduced and the other two are endemic, it is likely that the host was misidentified.
<i>S. philodorae</i>	Gracillariidae	<i>Philodoria splendida</i> Walsingham	leaf miner	<i>Metrosideros polymorpha</i>	Y	Fullaway 1920, p. 146	
<i>S. planiceps</i>	Gracillariidae	<i>Philodoria dubautiella</i> (Swezey)	leaf miner	<i>Dubautia</i> spp.	Y	Zimmerman 1978a, p. 667	
<i>S. pulchra</i>	Gracillariidae	<i>Philodoria ureraella</i> (Swezey)	leaf miner	<i>Urera glabra</i>	Y	Swezey 1915a, p. 95	
<i>S. setosa</i>	Tortricidae	<i>Spheterista flavocincta</i> (Walsingham)?		<i>Santalum freycinetianum</i>	Y	This work	One collection labelled as from <i>Urera glabra</i> "ex blotch miner" while the other specifies <i>Philodoria ureraella</i> but does not state plant host (the moth is host-specific)
<i>S. timberlakei</i>	Batrachedridae	<i>Batrachedrodes sophroniella</i> (Walsingham)		<i>Christella cyathoides?</i>	Y	Fullaway 1920, p. 96	Labelled as "ex lep <i>Santalum</i> "; <i>S. flavocincta</i> is the only caterpillar known to feed on <i>Santalum</i>
<i>S. sp.</i>	Batrachedridae	<i>Batrachedrodes</i> sp.		<i>Diplazium arnotii</i>		Swezey 1954, p. 86	Plant not specified on label, inferred from host of caterpillar. From O‘ahu, specimens not found.

Table 3. Recorded hosts of *Sierola* in Hawai'i. (continued)

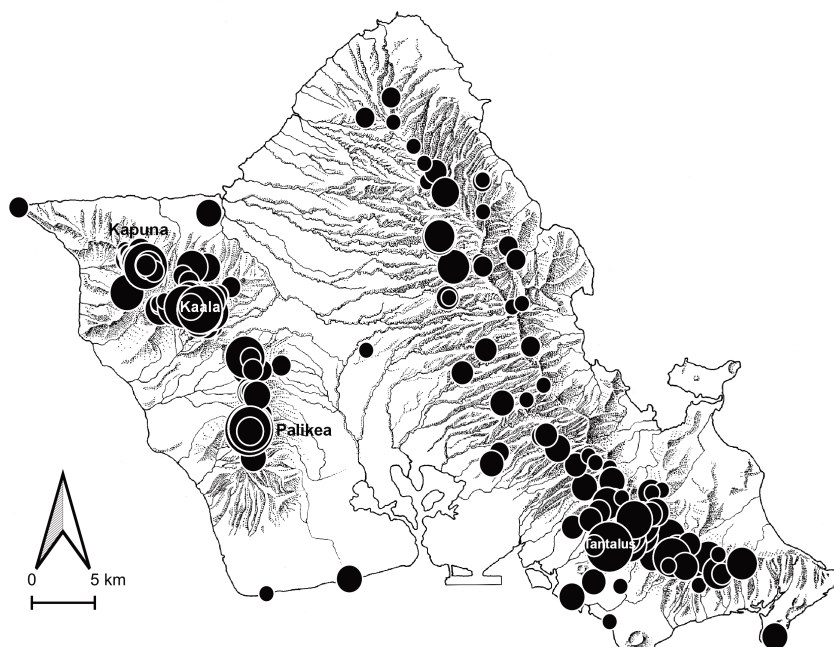
Species	Host Family	Host	Habit	Plant	Specs.	Reference	Notes
S. sp.	Curculionidae	<i>Heteramphus</i> <i>swezeyi</i> Perkins		<i>Elaphoglossum</i> spp.		Swezey 1954, p. 87	From O'ahu, specimens not found.
S. sp.	Carposinidae	<i>Carposina</i> <i>solutella</i> (Walsingham)		<i>Kadua affinis</i>		Swezey 1954, p. 96	From O'ahu and/or Hawai'i, specimens not found.
S. sp.	Crambidae	<i>Udea platyleuca</i> (Meyrick)		<i>Urera glabra</i>		Swezey 1933, p. 300	From O'ahu; larvae pupated but died before emerging.
S. sp.	Cosmopterigidae	<i>Hypomacoma</i> (<i>Euperissus</i>) <i>trivittella</i> Swezey		<i>Elaphoglossum</i> <i>crassicaule</i>		Kawahara <i>et al.</i> 2011	Undescribed species from Kaua'i. Specimens cannot be located.
S. sp.	Tortricidae	<i>Spheterista</i> <i>oheoheana</i> (Swezey)		<i>Polyscias</i> <i>kavaiensis</i>		Swezey 1943, p. 282	Undescribed species from Kaua'i.
S. sp.	Pyralidae	<i>Homocidoma</i> <i>alboparsum</i> (Butler)		<i>Wilkesia</i> <i>gymnoxiphium</i>		Swezey 1932, p. 200	Undescribed species from Kaua'i.
S. sp.	Cosmopterigidae	<i>Pyroderces</i> <i>rileyi</i> (Walsingham)		<i>Ananas comosus</i>		Sakimura 1947, p. 22	Reared from caterpillar attacking pineapple fruit on Moloka'i.
S. sp.	Cerambycidae	<i>Plagithmysus</i> <i>lookii</i> (Swezey)?	wood borer	<i>Chenopodium</i> <i>oahuense</i>		Swezey 1947, p. 102	Unknown species from Hawai'i. Unclear if <i>Sierola</i> were attacking the beetle larvae or possibly wood-boring Lepidoptera caterpillars in the same piece of wood.

with the correct name due to the incomplete knowledge of the fauna. Since nearly all specimens recorded from O‘ahu have been located except those of the very distinctive *S. dichroma* Perkins (those from other islands have not yet been searched for in the collections), the proper names can now be associated. The overwhelming majority of records are from O‘ahu thanks to the work of Swezey and others at the HSPA. Notably, the two non-native species attacked are *Pyroderces rileyi* (Walsingham) (Cosmopterigidae), a sometime pest of pineapple (Zimmerman 1978b), and *Erechthias flavistriata* (Walsingham) (Tineidae), the sugarcane bud moth, an economically important pest of sugarcane and pineapple (Zimmerman 1978a). Rather remarkably, one lot of *S. obscura* Fullaway was reared from caterpillars stored in a nest of the native eumenine wasp *Nesodynerus oahuensis* (Dalla Torre) (Vespidae). Perhaps most strikingly, only a small handful have been reared from the enormous radiation of *Hyposmocoma* moths, despite intensive rearing from this group (D. Rubinoff, pers. comm., 2015). One might expect that a radiation of hundreds of species of microlepidopterans and another of hundreds of species of bethyline parasitoids would be the result of co-evolution, but this is apparently not the case. While *Sierola* do attack *Hyposmocoma*, each makes up only a small fraction of the other’s hosts and parasites respectively.

The relative lack of rearing records means that little can be said about the degree of specialization in Hawaiian *Sierola*. Like the Hawaiian *Drosophila* (Magnacca *et al.* 2008), host specialization in Bethyridae in general is based on host finding ability more than biological compatibility between host and parasite. In experimenting with the related *Goniozus emigratus* (Rohwer), an alien species in Hawai‘i, Bridwell (1919) found that the wasps would attack and breed on almost any caterpillar of suitable size, and even beetle grubs. This flexibility may mean that like *Drosophila*, the native *Sierola* can survive on alternate hosts—and potentially use them as a bridge for host-switching and eventually speciation—but require their primary host(s) for long-term survival. The case of *S. aristoteliae* Fullaway and *S. manono*, n. sp. may be an example of specialization in closely-related species—both have been reared from *Merimnetria* Walsingham (Gelechiidae) feeding on *Kadua affinis* (DC) (Rubiaceae), the former from caterpillars in fruits (probably *M. elegantior* [Walsingham]) and the latter from stem galls (probably induced by *M. xylospila* [Meyrick] or an undescribed species). However, there is only one rearing record for each, so these associations may not hold up. Indeed, there is also one lot reared from galls in *Kadua affinis* twigs, consisting of wasps that are structurally identical to *S. aristoteliae* but nearly black like *S. manono*, perhaps indicating the existence of host races or host influence on morphology.

Collecting

Most flighted bethylids are collected by Malaise traps. *Sierola*, both in Hawai‘i and elsewhere, are generally taken by beating vegetation, and occasionally by rearing from caterpillars; they are relatively uncommon in Malaise traps, though those may be useful for finding them in low-density sites. Canopy fogging using pyrethrum vapor yields relatively few specimens as a proportion of the total since it knocks down all unattached arthropods (Gruner 2004), but has proven invaluable for obtaining new species. Some Hawaiian *Sierola* have been collected in pitfall and yellow pan traps, but only in a few localities; whether this is due to the distribution of ground-dwelling species or limited sampling that has been carried out is unclear. A few species undergo periodic outbreaks, presumably corresponding to outbreaks of their hosts, and can be found in very large numbers. Hundreds of individuals of two undescribed species from the island of Hawai‘i have been taken this way. Others, such as *S. uhiwai*, n. sp. on O‘ahu, are frequently found on the undersides of leaves and may be easily taken in high numbers with an aspirator or alcohol vial. However, those found this way tend to be disproportionately males, presumably because hunting females are more concealed. The overwhelming majority of species are taken as one or two specimens per collection. This is the case even for more abundant species such as *S. nitens* Fullaway and *S. alba*, n. sp., which generally reach high numbers in collections by being more reliably and widely found, rather than occurring in greater absolute numbers at any one time. Some-



Map 1. All collection localities of *Sierola* specimens used in this study, with high-diversity areas labelled. The size of circles is proportional to the number of collections (log scale). The proportion of collections from the highly-collected sites is actually underrepresented here because at many of the labelled sites there are several localities close together where the circles largely overlap.

times a wasp sitting stationary on a leaf will curl itself into a C-shape, then return to normal; the purpose of this behavior is unknown.

The history of *Sierola* collections on O‘ahu can be divided into four periods, each dominated by one collector. From 1892–1897, R.C.L. Perkins collected extensively throughout the islands, culminating in the publication of the *Fauna Hawaiiensis* volumes (Perkins 1913). Prior to this time, only Rev. Thomas Blackburn had collected *Sierola* in Hawai‘i, in the 1880s; he sent only three specimens back to London for description, the types of *S. testaceipes*, *S. leuconeura*, and *S. monticola*. However, while Perkins collected several hundred *Sierola* of probably over a hundred species, they were poorly described and shoe-horned into seven names, most lumped into *S. testaceipes* (Ashmead 1901a). A long period of sustained collecting from 1905–1936, extending sporadically to 1944, was the product of a number of entomologists working for the Hawaii Sugar Planters’ Association. As noted above, John C. Bridwell, David T. Fullaway, William M. Giffard, and Philip H. Timberlake all made substantial contributions early on, and Elwood C. Zimmerman later. But the overwhelming bulk of collections were made by Otto H. Swezey. I refer to this as the “early period” of collecting. Although the entire island was covered, sampling was heavily biased towards the southern Ko‘olau range, particularly around Mānoa (Tantalus) and Pālolo. In the Wai‘anae range, only Ka‘ala and the adjoining valley of Hale‘au‘au were visited more than one or two times. The last may have been where Blackburn collected *S. testaceipes* (Swezey 1931).

There is a gap with few specimens from 1939–1954. From 1955–1966 is another period of frequent collecting, mostly by John W. Beardsley. Although these consist of a relatively large number of specimens and species, they represent few collection days. This “middle

period” continues through 1989, but more sporadically and by a diversity of collectors. Another gap with almost no specimens occurs beginning in 1990, after which my collections begin from 2006 to the present. I refer to these dates as the “recent period”. In contrast to earlier collections, mine are biased towards the Wai‘anae range and to some extent the northern Ko‘olau, with few from the southern Ko‘olau range that earlier collectors focused on. Information on distribution and date of last collection should be taken with this in mind.

Sites for specimens used in this study are shown in Map 1, with markers proportional to the number of collections. Since multiple close sites will nearly overlap and appear as one, this map actually underrepresents how big a proportion the highly-sampled sites make up. A few have unusually high diversity. One of the primary early collecting sites was Tantalus (Pu‘u ‘Ōhi‘a and the Mānoa Cliff Trail, extending back to Pauoa Flat and Kaumuhonu, also known as Kaumuohona; see Magnacca 2013 for discussion of the last), a massif between Mānoa and Nu‘uanu valleys, where 60 species have been collected. Recently, the most productive site has been Palikea, the southernmost high peak of the Wai‘anae range. The site is small—it is currently protected by an 8 ha fence, and much of that is still alien-dominated—but 52 species of *Sierola* have been collected there, nearly all from within a 1 ha portion. In part this reflects sample site bias, as both Tantalus and Palikea are relatively easily-accessible, but they also both have strong rainfall gradients that produce a mixing of wet and mesic forests within a small area. This results in taxa from both communities being present, and significantly higher diversity than nearby sites that only contain a single forest type. Notably, while the mix of habitats is similar and few *Sierola* species are restricted to one mountain range, only 19 of the combined 93 species are shared between Tantalus and Palikea.

MATERIALS AND METHODS

Holotypes of all previously-described *Sierola* species were examined, except for seven species from East and South Asia. A total of 2,666 O‘ahu specimens were examined, in the collections of the Bernice Pauahi Bishop Museum, Honolulu (BPBM), including specimens originally in the Hawaii Sugar Planters’ Association collection (HSPA); Hawaii Department of Agriculture (HDOA); University of Hawai‘i at Mānoa (UHIM); and the Natural History Museum, London (NHMUK). Material from the *Fauna Hawaiiensis* collections at the Smithsonian National Museum of Natural History, Washington D.C. (NMNH), was also examined. Some vouchers from recent collections have been retained in my personal collection (KNMC) in anticipation of future genetic study. Label data for holotypes, and paratypes for new species, is included under species accounts; other non-type specimens examined are listed in the Appendix. Comments and clarifications (e.g. spelling corrections, updated taxonomy) are in square brackets; all other text is from the label. Specimen data in the Appendix is transcribed as-is, without Hawaiian diacritics.

Measurements were taken with an Olympus SZ61 dissecting microscope at 67.5× using an eyepiece micrometer with a tick length of 0.0146 mm. Morphometric measurements of holotypes are given for all species; for selected taxa where more precision was required, larger samples (or all available specimens) were measured for major characters, and these are presented as ranges. Morphological data for all species were entered in DELTA (Dallwitz 1980, Dallwitz *et al.* 2000), using the Open DELTA implementation (Atlas of Living Australia 2011).

Holotype specimens were imaged at BPBM using a Leica LAS montage system, and images combined into a focus stack using CombineZP (Hadley 2010), except for the types of *S. oahuensis* and *S. testaceipes* which were imaged at NHMUK. The head of each was photographed from the side, top, and an angle from the front to capture the mandibles. All of the images are of holotypes, unless noted, and the main images (Figs. 11–42) are all at the same scale.

Locality coordinates are accurate to within about 10–30 m for recent collections (since 2010). For older collections, sites on the maps are estimated based on the locations of trails

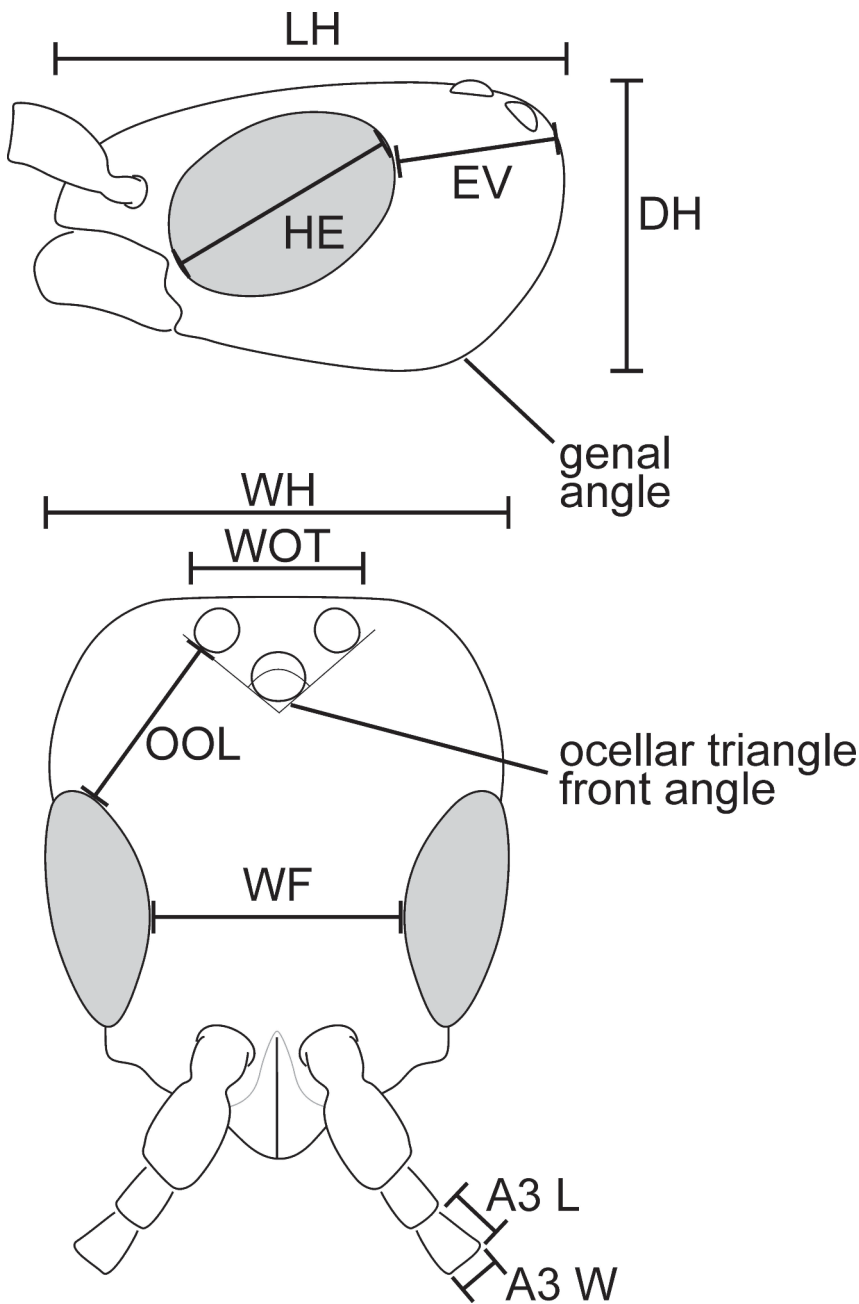


Figure 1. Head measurements, shown on a stylized generic *Sierola*. LH: length of head; DH: depth of head; WH: width of head; EV: eye-vertex distance; HE: height (= length) of eye; WF: width of frons; WOT: width of ocellar triangle; OOL: ocellar-ocular length; A3 L: length of third antennal segment (= first flagellar segment); A3 W: width of third antennal segment.

and known collecting areas. While these should be accurate to the ridge or valley, they may be significantly off in elevation and precise locality (up to 1–3 km), especially where elevation data is not on the label. Specimens with only very general information such as “S. Waianae Mts.” were not mapped unless there were other collections from the same date and collector with more specific information.

Several Fullaway dates are reported incorrectly by Fullaway himself in the 1920 monograph. Based on all labels where it is clear, he used Roman numerals consistently for the month, with the exception of two collections (8.11.1912 and 3.30.13) whose labels appear to be in the hand of Otto Swezey, who also collected those days and always wrote his dates with the month first. However, in recording the dates, several are given as if the month is an Arabic numeral indicating the day. For example, the type of *S. striata* and paratype of *S. seminigra* are recorded as Aug. 12, 1912 (written as 8.12.1912), when it is actually 8.IX.1912 on the label, i.e. Sept. 8, 1912. This date is correctly given for *S. breviceps* (all from Pālolo). These have been corrected here.

Morphology

All descriptions are based on females. Most diagnostic characters pertain primarily to females, and are primarily those related to prey capture. These include the size and shape of the mandibles, the shape of the clypeus and particularly its dorsal carina (or absence thereof), the shape of the head (which is related to the size and placement of the mandibular muscles), and the flattening of the head and/or body (a tradeoff between increased musculature and the ability to fit into tight spaces to attack concealed prey). Males tend to be rather monotonous; the clypeus is often similarly-shaped, but the mandibles are usually much thinner and are often yellow even when black in the female, and the head shape is different. As a result, one may often collect several species of males and several of females, and be unable to associate them with even the slightest certainty. In addition, it is not uncommon to take males that are clearly not the same species as any of the females taken at the same time. Males with distinct clypeal modifications can often be identified to species or at least narrowed to a handful of possibilities, but it is still impossible to separate even relatively distinct taxa, for example *S. fossulata* Fullaway and *S. peleana* Fullaway, that are readily distinguished by the female mandibles. Each of these may have more closely related species (*S. lapuu*, n. sp. and *S. puiua*, n. sp., respectively, in this case) that are even more difficult to separate in the males. Azevedo *et al.* (2016, 2018a) have associated highly dimorphic conspecific males and females in subfamily Pristocerinae when couples are taken in copulation, but such pairs have not been found in *Sierola*. Otherwise, without extensive DNA sequencing, it is unlikely that this situation will be resolved.

Many, perhaps most, character states are not clear-cut and grade into each other. Extreme examples can be easily distinguished, but at finer scales they are subject to interpretation and viewing conditions (e.g. the position of the specimen and type of lighting used). Furthermore, it is difficult to describe in words subtle differences that may be better understood when seen on specimens and consistent within a species. These include those regarding the size and shape of the clypeus and mandible, which are best for separating species, and the sculpturing of the head. I have attempted to limit the use of ambiguous or subjective characters as much as possible in the dichotomous key, and to key out difficult species in multiple places to ensure correct identification. In all cases, where difficulty is encountered in interpreting ambiguous character states, the reader is recommended to refer to the images over the written descriptions.

Use of a finely-graded eyepiece micrometer on a microscope of at least 50× magnification is a necessity for proper identification of *Sierola*. Many species can only reliably be separated based on head measurements, and it is essential that this be done accurately since species may be separated based on small differences. It may be possible to narrow it down to a few and compare images, but this does not always work. The head and femur proportions must be measured precisely, and attempting to judge even rough proportions by eye

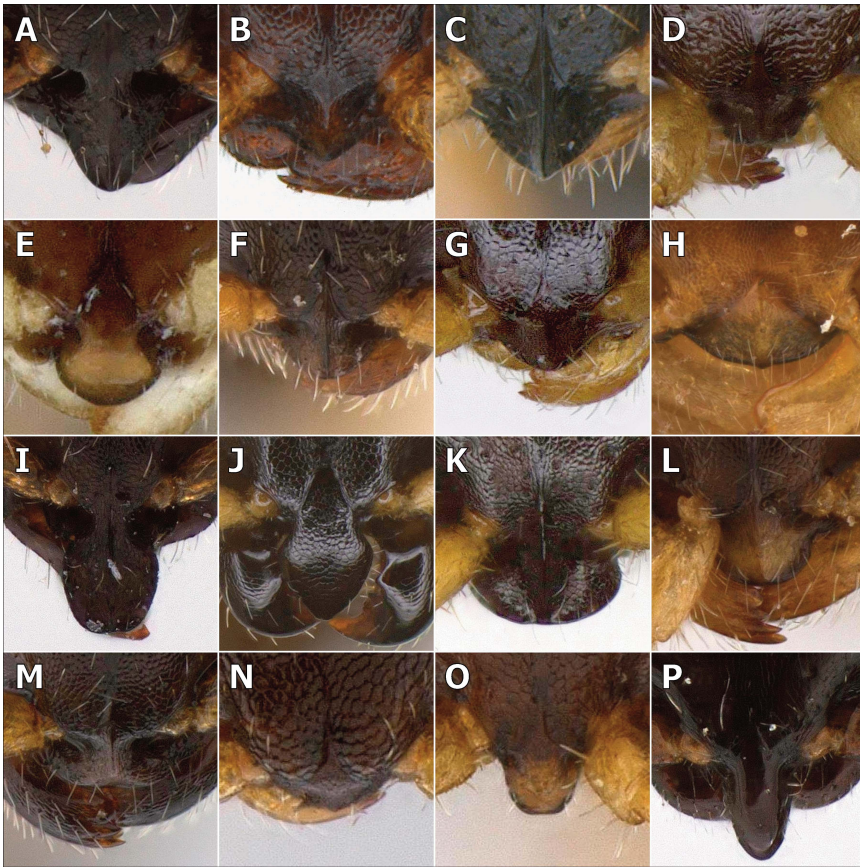


Figure 2. Clypeus shape, dorsal view. **A.** Triangular, apex rounded (*S. acuta*). **B.** Short-triangular, apex weakly pointed (*S. auwae*). **C.** Rounded triangular, apex pointed (*S. citripoda*). **D.** Trapezoidal, apex truncate (*S. kilohana*). **E.** Semicircular, apex broadly rounded (*S. alba*). **F.** Semicircular, apex rounded (*S. setosa*). **G.** Semi-elliptical, apex rounded (*S. uhiwai*). **H.** Semi-elliptical, apex broadly rounded (*S. dichroma*). **I.** Spathulate, apex broadly rounded (*S. armata*). **J.** Spathulate, apex narrowly transverse (*S. rostrata*). **K.** Quadrate, apex truncate (*S. koloa*). **L.** Quadrate, apex truncate to broadly rounded (*S. rufignatha*). **M.** Very short, transverse, apex truncate (*S. langfordi*). **N.** Very short, almost transverse, apex weakly pointed (*S. nitens*). **O.** Elongate, parallel-sided, apex truncate (*S. bella*). **P.** Narrow, rostrate (*S. spicata*).

can be extremely misleading. A bright LED ring light is best for observing cuticle microsculpture, which may not be accurately seen in specimens in alcohol. Besides having a less optimal angle, most halogen or tungsten gooseneck lights are not bright enough to show fine details on mostly-black wasps.

Head. Most of the useful characters are on the head. Indeed, aside from a few species pairs that are separated based on the wing setation and metasoma sculpture, it is possible to identify most based on a disembodied head alone. Directional descriptors refer to the position of the head as it is normally in a prognathous position, i.e. the frons is dorsal, gena/postgena ventral, occiput basal, and mouthparts apical. The characters may be broken down into three broad categories: those of head shape, the clypeus, and the mandibles.

Morphometric measures of the head are extremely important. Many species are best defined by these, and a few can only be reliably distinguished by them. Measurements are adapted from Evans (1964) with some modifications as described below (Figure 1). All must be taken at their maximum.

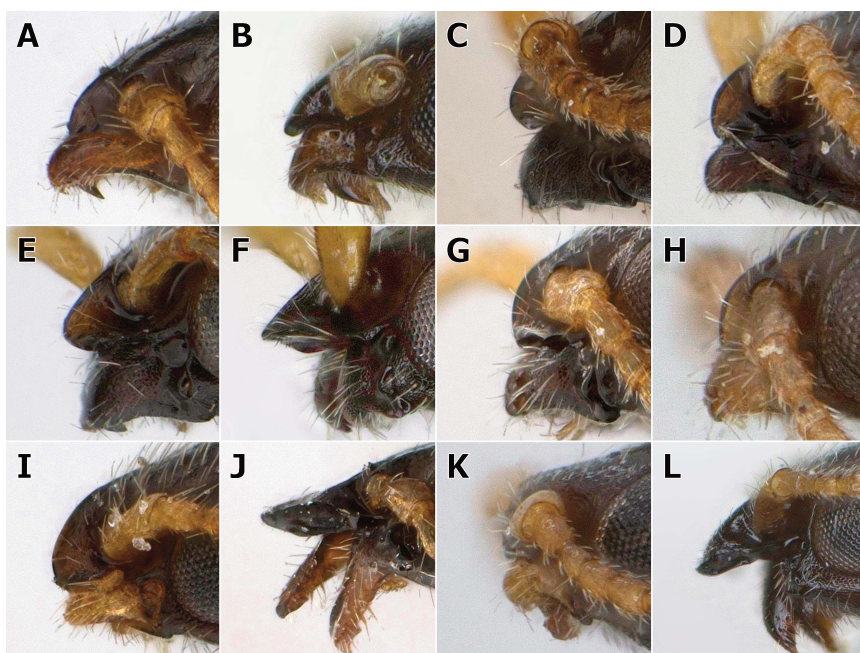


Figure 3. Clypeus shape, lateral view. **A.** Evenly curved to the apex (*S. fossulata*). **B.** Evenly curved to the apex (*S. laupapa*). **C.** Rounded and recurved at the apex (*S. bridwelli*). **D.** Rounded and recurved at the apex (*S. kaumuohona*). **E.** Evenly sloping, nearly straight (*S. celeris*). **F.** Evenly sloping, nearly straight (*S. koloa*). **G.** Steeply sloping, curved (*S. aspera*). **H.** Steeply sloping, curved (*S. philodoriae*). **I.** Strongly arched (*S. hirsuta*). **J.** Gently sloping at base, apical portion horizontal (*S. armata*). **K.** Brow high and rounded, nearly vertical distally (*S. nitens*). **L.** Elongate, evenly curved (*S. neoarmata*).

Head length (LH), *head depth* (DH), and *eye-vertex distance* (EV) are measured in lateral view. LH is from the apex of the clypeus to the vertex. EV is from the posterior margin of the eye to the vertex; it may be difficult to obtain accurately due to the different focus levels of the endpoints. In other works it is sometimes measured in dorsal view; here I use lateral view because a strongly convex dorsum of the head makes it difficult to ascertain when it is in the correct view to measure accurately.

Head width (WH), *frons width* (WF), and *width of the ocellar triangle* (WOT) are measured in dorsal view. WH is the greatest width, which is usually across the eyes, but may be above them in species where the head is broadened above. WF is the shortest line between the eyes. WOT is the distance across the outer edges of the lateral ocelli. The angle of the ocellar triangle is also a useful character, although it may be ambiguous in species where it is only slightly acute or slightly obtuse.

Eye height (HE) is measured in near-lateral view, but at a slight anterodorsal angle to ensure the full length of the eye is seen. Likewise, the *ocellar-ocular length* (OOL), between the lateral ocellus and eye top, is measured in dorsolateral view as necessary.

Antenna length is a useful character for a few species. The length/width ratio of the third segment (A3, first flagellomere) is a good proxy for overall length.

These measurements are expressed as ratios rather than absolute numbers. In descending order of usefulness, these are: DH/LH, WH/LH, EV/HE, EV/WF, OOL/WOT, WF/HE, and WH/WF. DH/LH tends to exhibit little variation within a species, generally ± 0.03 ; WH/LH slightly more, ± 0.05 . EV/HE and OOL/WOT are significantly more variable, due to both natural variation and the accuracy of measurement, estimated to be about ± 0.10 – 0.15 .

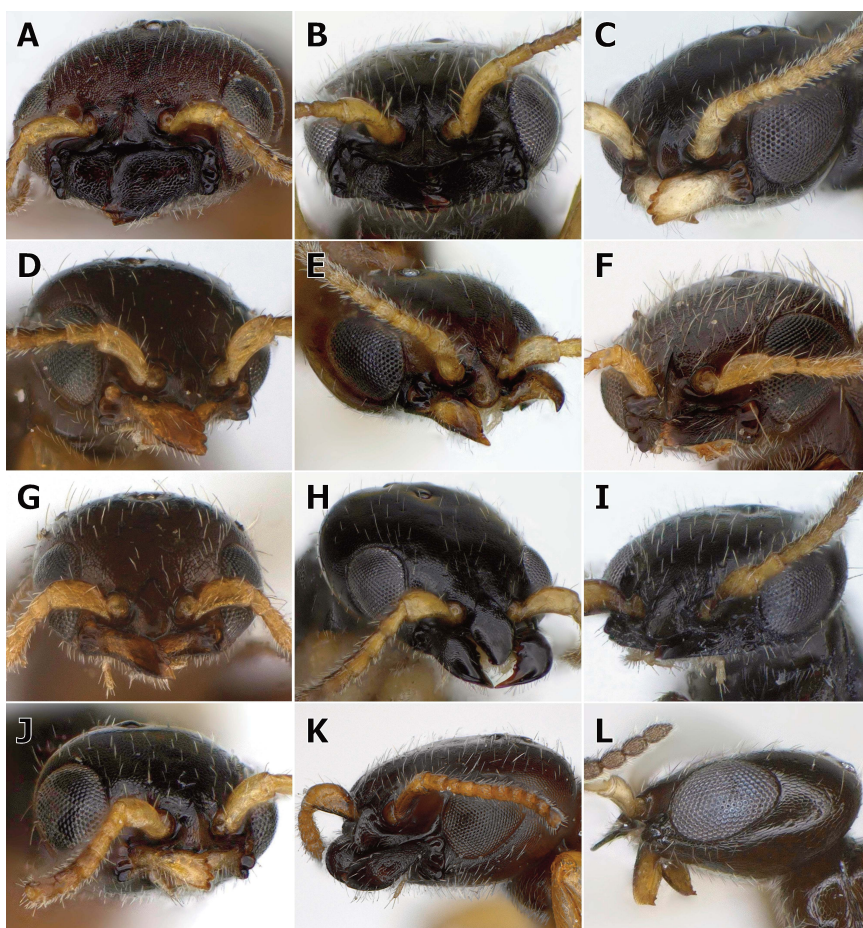


Figure 4. Mandible width and teeth. **A.** Strongly expanded, broadening from the base (*S. kumene*). **B.** Broad, not narrowed from base; second ventral tooth longest, ventral tooth partially concealed in frontal view (*S. kolaa*). **C.** Moderately broad, slightly concave ventrally (*S. lateralis*). **D.** Narrowed medially and strongly expanded apically, strongly concave ventrally (*S. peleana*). **E.** Moderately narrow, parallel-sided; falcate, with only a single large ventral tooth (*S. balteata*). **F.** Moderately narrow, slightly concave ventrally (*S. flavipes*). **G–H.** Moderately narrow, distinctly concave ventrally; with a single large ventral tooth and a few smaller teeth on the inner margin, apex of mandible strongly oblique (**G.** *S. gracilis*; **H.** *S. rostrata*). **I.** Narrow, parallel-sided (*S. leioccephala*). **J.** Narrow, distinctly concave ventrally (*S. uhiwai*). **K.** Strongly constricted near the base, expanded and club-like apically (*S. koa*). **L.** Thin and laminate, scissors-like; apically truncate, with only two ventral subapical teeth (*S. psaliphora*).

The *clypeus* provides the most obvious and basic characters for starting identification. It extends in a triangle basally between the antennal fossae, with three lobes on the apical margin that extend over the closed mandibles. The lateral lobes are small and inconspicuous, while the median lobe is usually large and well-developed, extending forward of the rest of the head. Without any qualifiers, “clypeus” refers to the median lobe process. It may range from very short and transverse, to large, projecting, and quadrate or spatulate (Figure 2). Typically in Bethylinae, the clypeus has a sharp dorsal carina extending between the antennal fossae. In *Sierola*, the clypeus is highly variable, ranging from a very thin, laminate carina, to angulate and weakly carinate, to nearly flat. Those lacking a distinct sharp carina

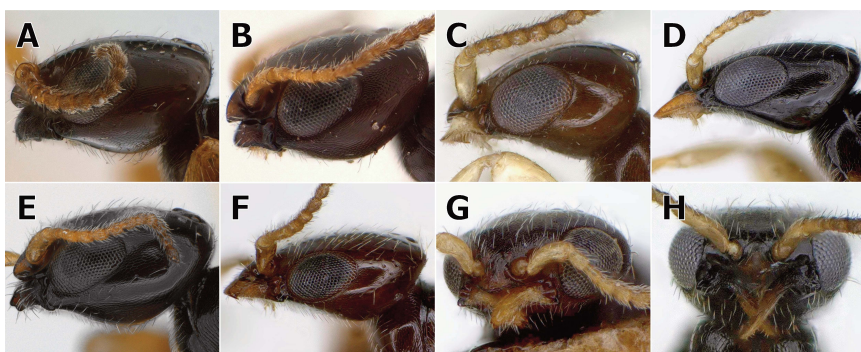


Figure 5. Mandible twist and shape. **A.** Not twisted, more or less flat outwardly (*S. bridwelli*). **B.** Slightly twisted (*S. suttoniae*). **C.** Strongly twisted (*S. alba*). **D.** Fully twisted, cutting plane nearly parallel to long axis of head (*S. arpactes*). **E.** Strongly convex outwardly, semicylindrical, ventral tooth behind second ventral (*S. nihopeku*). **F.** V-shaped in cross section, distinctly margined outwardly and reflexed ventrally, ventral tooth on ventral surface (*S. kamani*). **G–H.** Bent down near the base, crossing at an angle when closed (**G.** *S. kumumu*; **H.** *S. psaliphora*).

are nearly half of the species, and make up a disproportionate number of the newly-described species (an even greater range of variation can be observed in the Australian fauna, which is almost entirely undescribed). The shape in lateral view is also a useful character, ranging from high and arched to nearly straight, and from elongate to short and steep (Figure 3). The last is somewhat correlated to the length of the clypeal projection itself, but not entirely since the carina may extend back onto the head.

The *mandibles* are highly variable and are probably under intense selection as part of prey capture. The most obvious character is their width, which varies from extremely broad to quite narrow (Figure 4). The ventral (anatomically posterior) margin may be parallel-sided, or weakly to strongly concave. In all but those with very broad mandibles, the articulation is broader than the main body of the mandible; this initial narrowing is not considered in determining the mandible shape (unless the apical half is broadened again from the narrowest part). While important characters, the mandible width and curvature must be treated with caution as they are especially difficult to describe objectively; when the mandibles are fully closed and overlapping, they may appear different than when open. The mandibles may also be twisted, so that the cutting plane of the teeth is diagonal to, or in extreme cases parallel to, the long axis of the head, rather than perpendicular as normal (Figure 5). The bend of the mandible as seen in ventral view may be characterized, but interpretation tends to be somewhat variable depending on the position of the mandibles, and is often difficult to see due to the metasoma being curled under the head.

The mandible apex and teeth provide another set of characters (Figure 4). The apex may be vertical (as usual), or it may be angled so that the dorsal (upper) teeth do not touch when the lower ones do. Normally there are four teeth, the uppermost (fourth) being broad and blunt and the remainder pointed, often with the ventral or second ventral tooth slightly larger than the others. A number of species (all in the group with the clypeal carina reduced or absent) have the teeth reduced or absent. Typically the teeth lie more or less in a plane, with the outer surface of the mandibles slightly convex when examined closely, but all teeth visible in frontal view. In some species the outer surface of the mandible is strongly convex so that the lowermost tooth is somewhat concealed behind the second in direct frontal view, as in *S. gracilariae* Fullaway, *S. koloa*, n. sp., and *S. manono*, n. sp. A few species have the outer mandible angulate, concealing the ventral tooth entirely. One group, including *S. armata* Fullaway and *S. psaliphora*, n. sp., has the mandibles highly modified into thin, scissors-like structures.

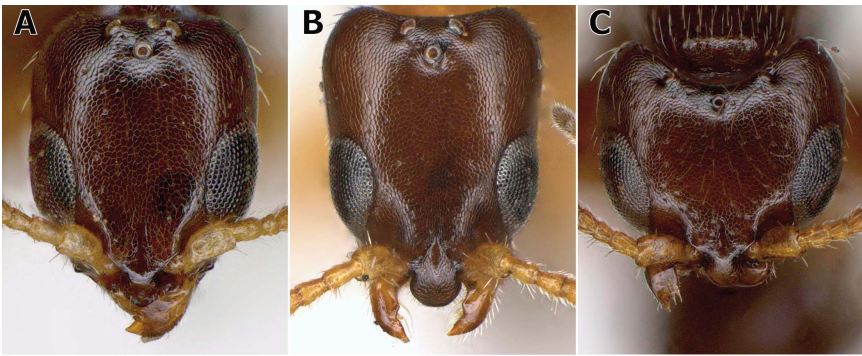


Figure 6. Vertex, dorsal view. **A.** Very slightly concave (*S. kikiwi*). **B.** Broadly, shallowly concave (*S. hauwahine*). **C.** Broadly, deeply concave (*S. concava*).

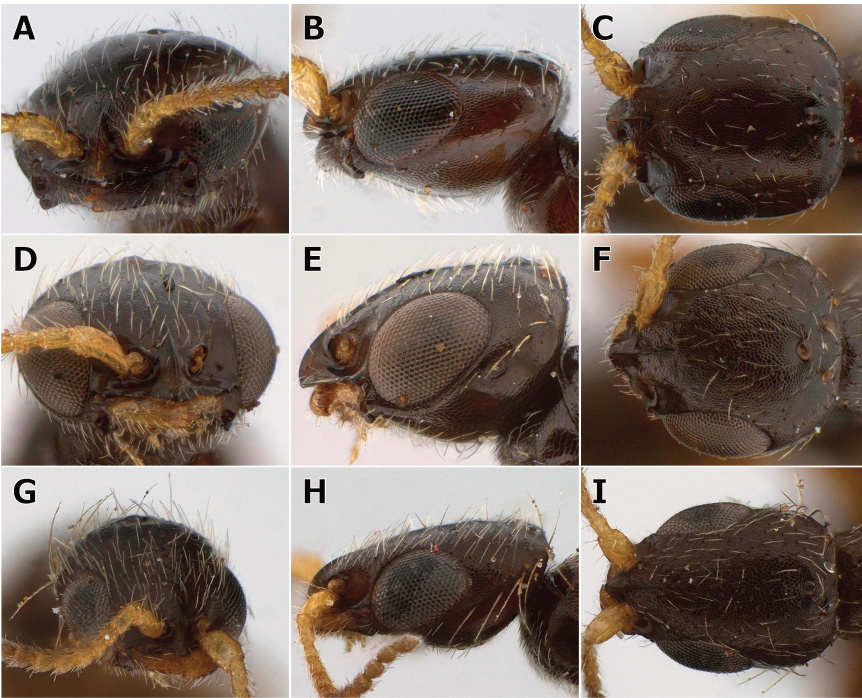


Figure 7. Vertex and genal setae. **A–C.** Similar to other frons setae (*S. perottetiae*). **D–F.** Longer than frons setae but not strongly differentiated (*S. manoa*). **G–I.** Conspicuous, twice as long as frons setae and thicker (*S. tenuis*).

The *occipital margin* behind the ocelli forms a rounded surface or slight angle that is usually difficult to discern objectively. However, a few species have it developed into a strong angle or carina. Likewise, the *vertex in dorsal view* is nearly straight in the great majority of species, but is sometimes concave, occasionally strikingly so as in *S. concava*, n. sp. (Figure 6). The vertex may also have a row of longer, erect, forward-curving setae that extend onto the gena and are up to twice as long as those on the frons (Figure 7). Be aware that the elongate setae are fragile and may be broken off in specimens that have been roughly handled or stored in ethanol.

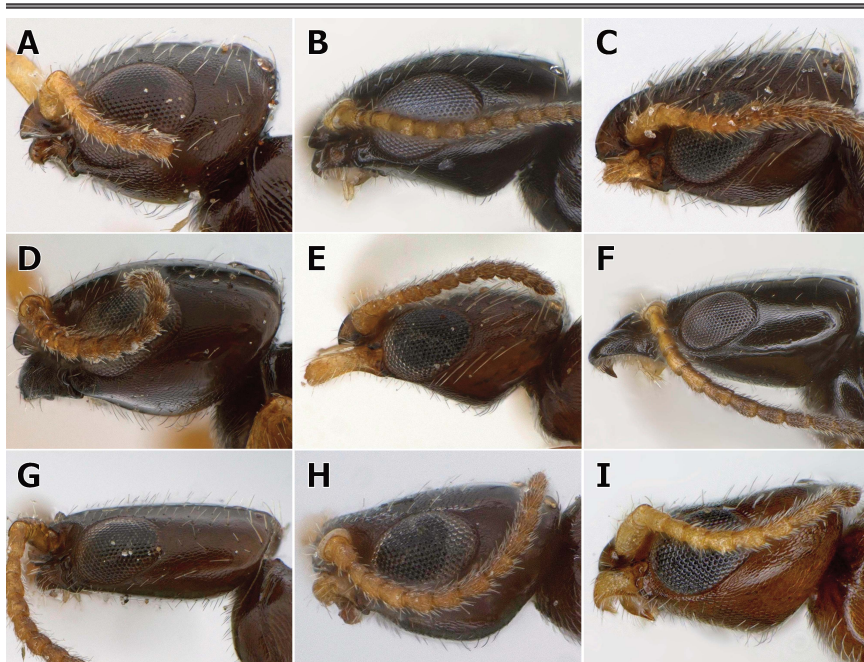


Figure 8. Head shape, lateral view. Dorsal margin: **A–B.** Strongly convex dorsally; **C–E.** Weakly convex dorsally; **F–H.** Flat dorsally; **I.** Slightly concave dorsally. Ventral margin and genal angle: **A, C, D.** Head evenly convex ventrally, genal angle absent; **B.** Genal angle prominent, head triangular; **E, H, I.** Genal angle broadly rounded; **F.** Genal angle present but not prominent, head relatively flat; **G.** Genal angle absent, head nearly flat below. Between mandibles and genal angle or greatest convexity: **A, C, D, H.** Convex behind the mandibles; **B, E.** Concave behind the mandibles; **F, G, I.** Flat behind the mandibles. **A.** *S. similis*; **B.** *S. lapuur*; **C.** *S. hirsuta*; **D.** *S. bridwelli*; **E.** *S. brunnea*; **F.** *S. rostrata*; **G.** *S. depressa*; **H.** *S. nitens*; **I.** *S. komohana*.

The *genal angle* is often a conspicuous feature of the head in lateral view (Figure 8). In species with flattened heads, lack of an obvious genal angle may take two forms which may not be clearly distinguishable. Either the angle may be very far back, so that the head is nearly rectangular rather than triangular; or it may be extremely broad and rounded so that it is not properly an “angle” at all. The states “broadly rounded” and “absent, evenly convex below” in particular intergrade and may be subjective. The former is used in taxa where the surfaces of the gena and occiput are more or less straight on either side of a rounded portion, thus making the head somewhat angulate, rather than evenly curved all along. The *postgenal depression* is a trough on the underside of the head found in some species. It is formed as increased size of the mandibular muscles makes the ventral side of the head produced on each side (typically with a strong genal angle), leaving the midline thinner.

The *ocellar triangle front angle* is often a notable character, although infrequently used in the keys (Figure 9). It is best measured in slightly oblique dorsal view, placing a line between one lateral ocellus and the median ocellus horizontal and checking the front angle to the other lateral ocellus. In the majority of species it is between weakly acute and weakly obtuse, which may be interpreted as a right angle depending on how it is viewed, and may vary slightly between individuals. A significant number of species have the angle strongly acute (at an angle of approximately 60 degrees or more) or strongly obtuse (approximately 120 degrees or more). The degree of separation of the ocelli from the vertex crest can also be a distinguishing feature.

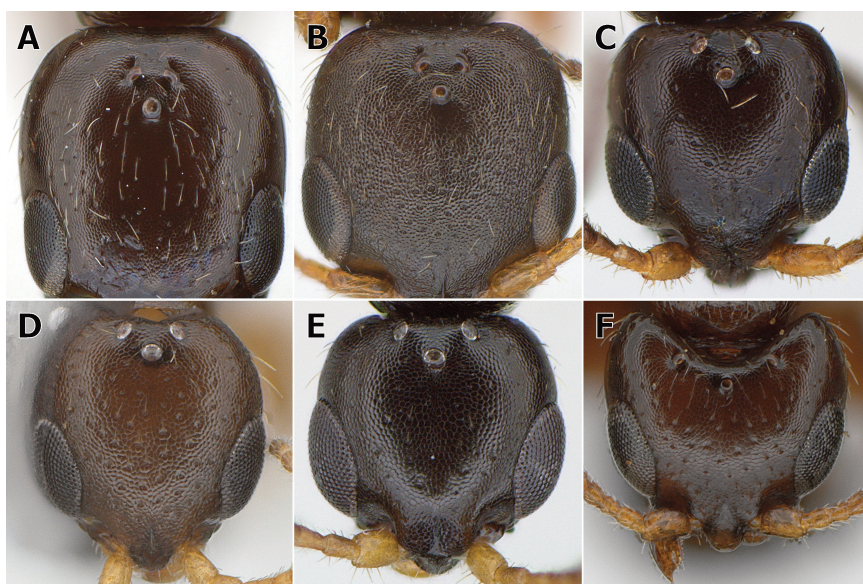


Figure 9. Ocellar triangle. **A.** Front angle very strongly acute, lateral ocelli separated from vertex by length of ocellar triangle (*S. hualala*). **B.** Strongly acute, lateral ocelli over an ocellus length from vertex (*S. granulosa*). **C.** Weakly acute, lateral ocelli separated from vertex by less than an ocellus length (*S. yoshimotoi*). **D.** Weakly obtuse (*S. mahoe*). **E.** Strongly obtuse (*S. uhiwai*). **F.** Very strongly obtuse (*S. concava*). **D–F.** Lateral ocelli nearly touching vertex.

Frons microsculpture forms grades that are difficult to describe unambiguously, but are useful for separating taxa with more extreme forms. Harris (1979) is the standard reference for surface sculpture terminology. However, it is somewhat inadequate for distinguishing the gradations of fine microsculpture necessary for identifying *Sierola*. These are largely of a single form varying only in the degree of relief, which affects reflectivity. Therefore, the following categories are used in describing the frons. *Evident but smooth microreticulation* is a pattern of distinctly visible, very slightly impressed reticulate lines that do not impart significant dullness to the surface, leaving it smooth and mostly shining (only a few species have the frons highly polished and strongly shining, with reticulation not or hardly visible). *Finely microreticulate* sculpture retains reflectivity within each cellule, and appears more or less smooth where flat surfaces directly face the light, but are slightly matte especially in areas where the cuticle curves away. *Coriaceous* is distinctly matte, with some shine in direct light but with obvious surface texture. *Granular* sculpture is extremely dull, without obvious shine. These clearly grade into each other, but to a great extent one can distinguish smooth/fine from coriaceous/granular, i.e., predominantly shining versus generally dull.

Frons punctation likewise can be sorted into broad categories, but with some ambiguous species. Nearly all species exhibit more widely spaced punctation towards the vertex and closure punctures towards the antennae. The primary area of concern is thus between the median ocellus and the clypeus. The majority of species have punctures irregularly spaced 1–3 pit widths apart, sometimes consistently around 1 pit width anterior of the middle of the eyes. Those that have punctures denser (one pit width apart or less across the entire area) or sparse (consistently three or more pit widths apart) stand out as distinct.

Mesosoma. Compared to the head, the mesosoma has relatively few useful characters. Structurally it is fairly monotonous, with sculpture and punctation typically following that of the head. Since the metapostnotum and anatomical first abdominal segment are not

clearly delimited by carinae or different sculpture, the entire metapectal-propodeal complex (Azevedo *et al.* 2018b) is here simply referred to as the propodeum. Dorsal propodeal carinae are generally absent; the median and/or transverse posterior carinae are occasionally faintly present, but this appears to vary intraspecifically (these carinae are often strong in Asian or west Pacific species).

Mesosoma length (LM) and *mesosoma depth* (DM) are measured in lateral view. LM is taken from the anterior margin of the pronotal declivity to the metasomal articulation. DM is measured between the dorsum of the metasoma and the venter between the mid and hind coxae. In some species that attack leaf-mining caterpillars, the mesosoma is strongly dorsoventral flattened. This may be defined as the $DM/LM < 0.33$, but is generally obvious in lateral view. *Length of the fore wing* (LFW) is measured from the apex of the tegula to the wing apex. LFW and DM are given in mm.

The fore femur of females is typically expanded dorsoventrally, and flattened and slightly arcuate in the anterior-posterior dimension, concave on the anterior face and convex on the posterior. In a few species it is relatively thick and also convex on the anterior face, as in most Australian *Sierola*. Species vary widely in the degree of expansion, with significant intraspecific variability as well. It is taken to its most extreme form in *S. obscura*, where the fore femur is only 1.58–1.71 times as long as wide; this is among the most dilated in the entire family (Azevedo & Lanes 2009). At the other extreme, the species with the femur over 2.4 times as long as wide are predominantly those with broad mandibles and large heads, including *S. dichroma*, *S. bridwelli*, and *S. kumene*, suggesting a potential divergence in attack strategies between grasping with the fore legs and crushing with the mandibles. The overwhelming majority of species, regardless of mandible and head shape, are in the middle with a length/width ratio of 1.85–2.20. *Fore femur length* (FL) and *fore femur width* (FW) are measured in posterior (outer) face view, where the maximum length is visible. Do not include the trochanter in FL, and do not measure on the anterior (inner) side, as the measured length will be different due to the angled basal margin. It may be difficult to measure accurately as the fore femur is sometimes naturally curved. Specimens pinned from alcohol may have the femur curl as the specimen dries. The *hind femur length* (HFL) to *hind femur width* (HFW) ratio is also useful in distinguishing species, particularly in the *olympiana* complex. It is important that the hind femur be measured at the base from where the dorsal margin meets the trochanter, rather than the greatest length; since the hind femur is often blocked from one side or the other, and the trochanteral-femoral joint is usually angled, this allows consistent measurement in anterior, posterior, or dorsal view.

Metasoma. The metasoma tends to be rather monotonous, and has few distinguishing features except in a handful of species. In general it is highly polished with little sign of microsculpture on the terga except at the lateral margins. Some species have a fine reticulate pattern visible over the entire metasoma, but still no obvious texture. This is consistent between species, allowing it to be used as an identifying character. Only a very few have the terga strongly sculpted or punctate (none on O‘ahu, so far as known), which makes them immediately recognizable. A few species have the 6th sternum evenly covered with short setae rather than the typical mix of long and short setae with a glabrous strip of varying width medially. Some Australian species have elongate setae on the sterna, but no Hawaiian species have been found with this. The internal characters of the sting apparatus have not yet been investigated for taxonomic significance. Because females have more distinguishing external characters and are generally more commonly collected, and most males cannot be associated with females, the male genitalia have also not been investigated. A cursory examination suggests that there are not many obvious differences between unrelated species. They are also quite small compared to the genitalia of *Goniozus*.

Coloration. The reliability of body color as a character is a difficult question to answer. The overwhelming majority of species are all black, and always are. A certain number of species, such as *S. timberlakei* Fullaway and the complex of species related to *S. pulchra* Fullaway, appear to have consistent color patterns. A third, smaller set contains species that

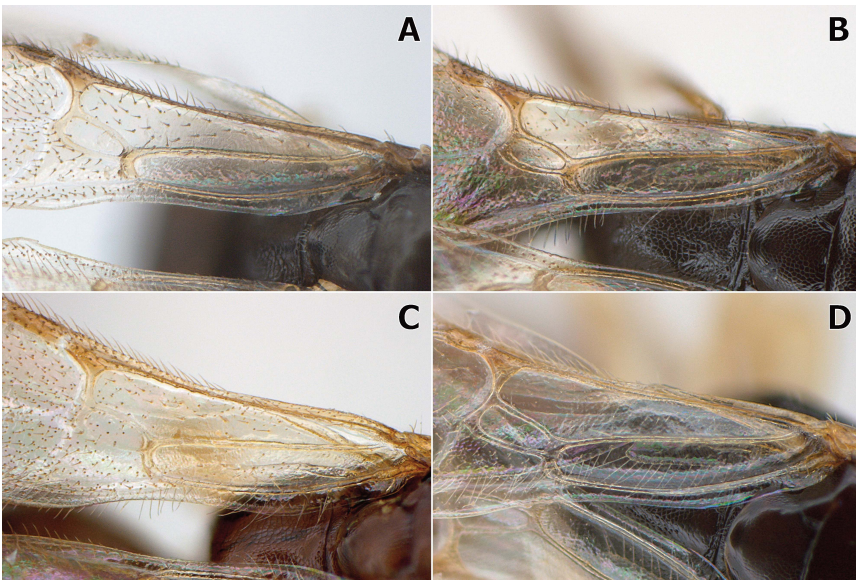


Figure 10. Basal wing cell setation. **A.** Densely setose, more than two rows of setae in cell R and at least two in 1Cu (*S. komohana*). **B.** Intermediate, with two rows in each cell, setae often irregular or variable (*S. uhiwai*). **C.** Sparsely setose, usually one row of setae in each cell with a few other scattered hairs (*S. kilohana*). **D.** Nearly glabrous, sometimes with a few random setae (*S. alba*).

clearly vary in coloration. In this category, there are occasional individuals of *S. alba*, n. sp. with yellow coloration, and several series of *S. brunnea* Fullaway ranging from all black to the entire head and prothorax yellow, with intermediates having only the prosternum or prothorax yellow. In the case of the sister taxa *S. aristoteliae* and *S. manono*, coloration is an obvious difference beneath which is a subtle morphological character in the mandible teeth, and is evidently related to the specialization of the former on a *Merimnetria* caterpillar that attacks the fruit of *Kadua affinis* and the latter on a congener that makes stem galls. Structurally, the two are otherwise virtually identical aside from a slight difference in head width which might be considered within the range of possible variation. However, there is one series of individuals that are clearly *S. aristoteliae*, but are more melanic like *S. manono*, with only the pronotum brown. These were also reared from the same host as *S. manono*, perhaps indicating that host environment may influence color.

Leg color can be clearly seen as variable in distinctive species with long series, but to what degree is even more uncertain. Historically it was considered a significant character by Ashmead, Fullaway, and others. A number of species, such as *S. cryptophlebiae* Fullaway, appear to consistently have the legs all yellow, yet a few stray individuals appear to be these species but with the coxae and femora black. These may be indicators of rare semi-cryptic species—which seem to be frequent in *Sierola*—or they may be simply uncommon variants. Mandible color appears to be more stable, but it is possible some species pairs with black and yellow mandibles (e.g. *S. similis* Fullaway and *S. manoa* Fullaway) may be found to be synonyms. In *S. tenebriosa* Fullaway, mandible and leg color are highly variable and correlated—most have yellow legs and orange to reddish brown mandibles, or black femora and black mandibles (the latter formerly described as *S. willardi* Fullaway)—but occasional specimens with dark legs and pale mandibles or vice versa indicates that they are all one species.

Wings. Cell and vein terminology is that of Azevedo *et al.* (2018b). The setation of cells R and 1Cu of the fore wing (median and submedian cells of Evans 1964, here referred to collectively as the “basal wing cells”) is an extremely useful character that divides the group nearly in half, with one group having the cells nearly glabrous to sparsely setose (one or two rows of setae in each cell), and the other densely setose (three or more rows of setae; Figure 10). A handful of species are variable or intermediate (typically with two rows in both cells, which may look dense in small specimens); these have been keyed under both sides of this couplet in the key. This character is only partially related to phylogeny—some groups of evidently closely related species may have both states—but it is notable that about 2/3 of the species lacking a sharp clypeal carina have the cells sparsely setose to glabrous, while a majority of those with a distinct carina have them densely setose.

Beyond this, the wings are relatively monotonous. None of the Hawaiian species seen so far have a distinctly modified cell 1M or 2R1 (areolet and radial cell respectively of Evans 1964), such as in *S. berryae* Ward of New Zealand (Ward 2013). Three, *S. weaweae*, n. sp., *S. wehe*, n. sp., and *S. welau*, n. sp., have cell 2R1 slightly open as commonly seen in Australian species; this will cause them to key out to *Goniozus* in prior works. These are only found in intact native forest and almost certainly endemic species; they appear to have developed this character not only independently of the Australian taxa but of each other. Only a very few species, such as *S. pano*, n. sp. and *S. suttoniae* Fullaway, have the wings distinctly infusate; this makes them easily recognizable.

SYSTEMATICS

Sierola Cameron

Type species: *Sierola testaceipes* Cameron, 1881, by monotypy

Diagnosis.

Small to medium sized bethylids, 1.7–6.2 mm long. Defined principally by wing venation, with cell 1M (areolet of earlier workers) present and cell 2R1 (radial cell) closed or nearly so, the distal portion of vein Rs bent toward the anterior wing margin at a right angle, and without a closed 1R1 (submarginal cell). All known species macropterous and flighted. Palpal formula 4:2. Clypeus variable: typically with median lobe moderately elongate, triangular to semicircular, and with a sharp dorsal carina; often highly modified in various shapes or shortened, sometimes nearly transverse and hardly longer than lateral lobes, and/or convex or flat dorsally. Mandible usually with four teeth, uppermost broad and blunt, others pointed; sometimes falcate or teeth otherwise reduced; mandible occasionally highly modified. Eye setae almost always present but usually short, sparse, and inconspicuous. Parapsidal lines present, notauli absent. Mesosoma lacking any protuberances or distinctive sculpting. Propodeum without pits, rarely with a trace of a median carina, never with submedian carinae; posterior transverse carina sometimes present in Asian and Australian species, usually absent in Oceanian species; metapleural carina variable but usually well developed. Fore and hind femora swollen and convex dorsally, 1.6–2.5 and 1.8–3.1 times as long as wide, respectively. Metasoma mostly lacking distinctive features; petiole ventrally with a complete median carina, tergites typically polished, sometimes with smooth microreticulation, only rarely with distinct microsculpture. Male genitalia not examined in detail, much smaller than in comparable-sized *Goniozus*. Sting apparatus also not examined.

Taxonomy is here based on females as males are often difficult to associate due to more generalized structure and a large number of similar sympatric species.

KEY TO SPECIES OF O‘AHU *SIEROLA*, BASED ON FEMALES

SHORTCUTS TO MAJOR GROUPS (A FEW SPECIES SKIPPED)

Clypeus without distinct, sharp carina	
Mandible distinctly bent down at base	3
Mandible normal, not bent down	
Mandible falcate or with reduced dorsal teeth	9
Mandible with four distinct teeth, more or less similar	22
Clypeus with a distinct, sharp carina	
Mandible broad, not at all narrowed from base	82
Mandible not extremely broad	
Basal wing cells sparsely setose to glabrous	102
Basal wing cells densely setose	143

MAIN KEY

1. Clypeus dorsally flat, rounded, angulate (weakly carinate), or faintly carinate at the base only 2
- . Clypeus dorsally with a distinct, sharp carina, sides slightly to strongly concave 80
- 2 (1). Mandible distinctly bent down at the base, crossing in an “X” when closed (Figs. 13C, 22L, 32C) 3
- . Mandible sometimes with the cutting plane twisted but not bent down at the base, overlapping broadly at the tips (Fig. 4A–K) 7
- 3 (2). Mandible thin, laminate, scissors-like, apically truncate and without obvious teeth (two very small preapical teeth visible on close examination; Fig. 32C) *S. psaliphora*, n. sp.
- . Mandible semicylindrical, teeth distinct (Figs. 13C, 22L) 4
- 4 (3). Clypeus spatulate, broadening anterior of antennae, at least as long from antennal bases to apex as wide; in profile concave (thickened portion not extending to the apex), dorsally flat with a trace of a low carina basally; apex of mandible obliquely truncate with a large ventrally-directed apical tooth and smaller preapical teeth; malar space distinct, 1/3–1/2 as long as width of mandible base; frons variable, often shining, with weak microsculpture *S. armata* Fullaway
- . Clypeus semicircular or quadrate, much wider than long; in profile convex (tapering to the apex), evenly curved, dorsally convex or with a low carina; apex of mandible with small, equally strong teeth, all inwardly-directed; malar space usually absent or nearly so (rarely up to 1/3 as long as width of mandible base); frons somewhat dull, coriaceous to granular 5
- 5 (4). Head relatively narrow and compressed, WH/LH 0.67–0.74, DH/LH 0.48–0.51; basal cells of forewing densely setose *S. neoarmata*, n. sp.
- . Head broader and deeper, WH/LH 0.80–0.86, DH/LH 0.52–0.57; basal cells of forewing sparsely setose 6
- 6 (5). Clypeus rounded dorsally, sometimes weakly carinate; mandible and usually at least fore femora yellow; ocellar triangle strongly obtuse *S. kumumu*, n. sp.
- . Clypeus flat dorsally, with a trace of a low carina basally; mandible, coxae, and femora dark brown to black; ocellar triangle right *S. alelo*, n. sp.
- 7 (2). Mandible fully twisted, cutting plane parallel to long axis of head; with two small teeth apically, otherwise obliquely truncate (Fig. 13) *S. arpactes*, n. sp.
- . Mandible not twisted to strongly twisted, but never with the plane parallel to long axis of head; with distinct teeth or with a single large ventral tooth 8

8 (7). Mandible falcate or with a single large ventral tooth and a few minute dorsal ones, mandible apex usually strongly oblique (Fig. 4E, G, H) 9

–. Mandible with four distinct teeth (very rarely three with the ventral tooth notched), more or less similar in size or with the ventral tooth slightly larger, rarely with all minute teeth but never falcate with a very strong ventral tooth; mandible apex usually vertical, rarely slightly oblique (Fig. 4A–D, F, I–K) 22

9 (8). Vertex in dorsal view distinctly concave (Fig. 6B–C) 10

–. Vertex in dorsal view straight or only very slightly concave (Fig. 6A) 14

10 (9). Clypeal projection distinctly convex dorsally or appearing as a rounded ridge 11

–. Clypeal projection generally flat dorsally, slightly sloping only at the lateral margins ... 12

11 (10). Clypeus elongate, parallel-sided, apically truncate; mandible narrow, parallel-sided; pronotum and prosternum entirely yellow; EV/HE < 0.82 *S. bella* Fullaway

–. Clypeus semicircular, apically rounded; pronotum almost always darker along the midline, sometimes mostly brown except for laterodorsal pale streaks; EV/HE > 0.82 *S. balteata*, n. sp.

12 (10). Mesosoma with extensive yellow to pale brown coloration; clypeus in profile evenly curved; dorsum of head flat in lateral view; basal cells of forewing nearly glabrous *S. hauwahine*, n. sp.

–. Body entirely dark brown to black; clypeus in profile evenly sloping, nearly straight; dorsum of head convex in lateral view; basal cells of forewing densely setose 13

13 (12). Vertex in dorsal view very deeply concave; head short and broad, WH/LH ~1.00, EV/HE < 0.90 *S. concava*, n. sp.

–. Vertex in dorsal view shallowly concave; head longer and narrower, WH/LH ~0.83, EV/HE > 1.00 *S. giffardi* Fullaway

14 (9). Basal cells of forewing densely setose 15

–. Basal cells of forewing nearly glabrous 16

15 (14). Mandible only slightly twisted; clypeus semicircular; ocellar triangle front angle nearly right (Fig. 20G–I) *S. gracilis* Fullaway

–. Mandible strongly twisted; clypeus rounded triangular; ocellar triangle strongly obtuse (Fig. 24M–O) *S. kikiwi*, n. sp.

16 (14). Clypeus spatulate, broadest just past the antennal bases; mandible stout, with small subapical teeth; genal angle present but inconspicuous, head flat below (Figs. 2J, 32D–F, 37A–C) 17

–. Clypeus semicircular or rounded triangular, narrowing anterior of the antennal bases (Fig. 2B, F, G); mandible not particularly stout, falcate, without subapical or dorsal teeth; genal angle distinct, or absent and head evenly convex below 18

17 (16). Clypeus in profile porrect, evenly sloping (Fig. 37E); central and southern windward Wai‘anae range from Ka‘ala (Līhu‘e) to Palehua *S. rostrata*, n. sp.

–. Clypeus in profile evenly curved (Fig. 32E); Ko‘olau range and Wai‘anae range from Ka‘ala north *S. oahuensis* Ashmead

18 (16). Genal angle prominent, head distinctly triangular in lateral view (Fig. 14K); postgenal depression deep, distinct *S. bicolor* Fullaway

–. Genal angle weak or absent, head convex or broadly rounded below (Fig. 8A, C–E, H–I; postgenal depression very shallow or absent 19

- 19 (18). Head relatively deep, DH/LH ~0.58, deepest near posterior margin of eye; dorsum of head in lateral view strongly convex; apex of clypeus weakly acute in lateral view; EV/HE usually ~0.90 (0.80–1.00) *S. curvata*, n. sp.
- . Head more compressed, DH/LH 0.50–0.54, deepest well behind eye; dorsum of head in lateral view weakly convex or nearly flat; apex of clypeus strongly acute in lateral view; EV/HE usually >1.00 20
- 20 (19). Anterior margin of pronotum in lateral view weakly angulate, pronotal disc slightly convex; mandible black; clypeus semicircular; occurring around Mt. Ka‘ala *S. beardsleyi*, n. sp.
- . Anterior margin of pronotum in lateral view strongly angulate, pronotal disc flat or slightly concave; mandible brown; clypeus rounded triangular 21
- 21 (21). Clypeal projection distinctly convex dorsally or appearing as a rounded ridge; known from montane areas of the Ko‘olau range *S. anthracina* Fullaway
- . Clypeal projection generally flat dorsally, slightly sloping only at the lateral margins; known from coastal and lowland sites in the Wai‘anae range *S. laupapa*, n. sp.
- 22 (8). Clypeus very short, almost transverse, nearly vertical in profile, brow high and rounded *S. nitens* Fullaway
- . Clypeal process of varying shape, sometimes short, but always distinctly curved or sloping in profile, never vertical with a high rounded brow 23
- 23 (22). Head nearly flat below, genal angle absent; head strongly compressed, DH/LH 0.36–0.52 24
- . Head convex or angulate below; head variable but often deeper 26
- 24 (23). Clypeus narrow, spicate; vertex broadly, deeply concave in dorsal view; malar space about 1/3 as long as base of mandible; mandible moderately broad; large species (Fig. 38G–I) *S. spicata* Fullaway
- . Clypeus semicircular to semi-elliptical in dorsal view, usually with a trace of a carina; vertex straight or only very slightly concave in dorsal view; malar space nearly absent; mandible narrow; small species 25
- 25 (24). Body normal, not strongly depressed, DH/LH 0.50–0.52, DT/LT ~0.34; clypeus in lateral view relatively small but rather strongly arched in lateral view; mandible, clypeus, coxae, and femora yellow; ocellar triangle strongly obtuse *S. ihulena*, n. sp.
- . Body strongly depressed, DH/LH ~0.38, DT/LT ~0.27; clypeus in lateral view strongly rounded distally and slightly recurved; mandible, clypeus, coxae, and femora black; ocellar triangle strongly acute *S. depressa* Fullaway
- 26 (23). Genal angle prominent, head triangular in lateral view; postgenal depression deep, distinct 27
- . Genal angle weak or absent, head convex or with a broadly rounded angle below; postgenal depression almost always very shallow or absent 30
- 27 (26). Mandible nearly straight in ventral view, with small, indistinct teeth; malar space 1/3 as long as width of mandible base; dorsum of head slightly convex in lateral view; head very narrow, WH/LH < 0.75 (Fig. 28G–I) *S. levis* Fullaway
- . Mandible curved or elbowed in ventral view, with prominent teeth; malar space nearly absent; dorsum of head strongly convex in lateral view; head broader, WH/LH > 0.83 28
- 28 (27). Basal cells of fore wing densely setose; dorsum of head in lateral view slightly convex; mandible distinctly concave ventrally *S. tuberculata* Fullaway
- . Basal cells of fore wing sparsely setose to glabrous; dorsum of head in lateral view strongly convex; mandible parallel-sided or only slightly concave ventrally 29

- 29 (28). Head broad and deep, DH/LH ~0.67, WH/LH ~0.95; frons sparsely punctate, mostly 3 or more pit widths apart; basal cells of fore wing nearly glabrous *S. montana* Fullaway
- . Head narrower and shorter, DH/LH ~0.55, WH/LH ~0.87; frons moderately punctate, 1–3 pit widths apart; basal cells of fore wing mostly glabrous, apex of cell R with moderately dense setae *S. lapuu*, n. sp., in part
- 30 (26). Clypeal projection flat dorsally, slightly sloping only at the lateral margins; mandible strongly twisted; frons smooth and shining 31
- . Clypeal projection distinctly convex to weakly carinate dorsally; mandible not or only slightly twisted (except in *S. kahuku*, n. sp. and *S. rugiventris*, n. sp.); frons microsculpture variable, often coriaceous 34
- 31 (30). Mandible very pale yellow-white, thinner in ventral view than breadth; frons with sparse punctures, mostly 3 or more pit widths apart, and highly polished microsculpture nearly absent; legs entirely yellowish white (Fig. 11M–O) *S. alba*, n. sp.
- . Mandible orange to black, about as thick at the midpoint in ventral view as wide in lateral view; frons moderately punctate, 1–3 pit widths apart, microsculpture variable; at least coxae and femora brown 32
- 32 (31). Basal cells of fore wing densely setose; head flat behind the eyes *S. leioccephala*, n. sp.
- . Basal cells of fore wing nearly glabrous; head slightly convex 33
- 33 (32). Mandible orange or reddish brown, V-shaped in cross section, appearing strongly twisted, distinctly margined outwardly and reflexed ventrally so that the bottom tooth is on the ventral surface; frons highly polished, microsculpture barely visible; head elongate behind the eyes, EV/HE ~0.85–1.10 (Fig. 24A–C) *S. kamani*, n. sp.
- . Mandible black, strongly twisted, without the ventral margin reflexed; frons smooth and shining but with microsculpture distinctly visible; head shorter behind the eyes, EV/HE ~0.60–0.85 (Fig. 11G–I) *S. akahikina*, n. sp.
- 34 (30). Wings distinctly infusate; basal cells densely setose; mandible slightly twisted *S. suttoniae* Fullaway, in part
- . Wings hyaline or very faintly tinged with yellow; other characters variable 35
- 35 (34). Bicolored, at least the pronotum orange-brown to yellow 36
- . Body entirely black 48
- 36 (35). Head wider than long (WH/LH ~1.06); frons very broad and eyes strongly lateral (OOL/WOT ~2.05–2.25, WH/WF ~1.50); fore femur very narrow (FL/FW ~2.50); large species (Fig. 18A–C) *S. dichroma* Perkins
- . Head at least slightly longer than wide, WH/LH at most 0.99; frons not particularly broad and eyes extending medially, OOL/WOT <2.00 (usually <1.80), WH/WF >1.55; fore femur usually not narrow (FL/FW <2.30; except in *S. kilohana*, n. sp.); moderate to small species 37
- 37 (36). Head and body predominantly yellow, only propodeum dark ... *S. vicina*, n. sp., in part
- . At least the head brown to black, often only the prothorax yellow 38
- 38 (37). Basal cells of fore wing densely setose 39
- . Basal cells of fore wing sparsely setose to glabrous 42
- 39 (38). Frons densely punctate, pits one pit width apart or less, the setae short and even, shorter than flagellum width; clypeus trapezoidal, truncate or very broadly rounded, in lateral view steep, short, and slightly recurved ventrally; mandible moderately broad (Fig. 12M–O) *S. aristoteliae* Fullaway, in part

- . Frons less densely punctate, pits irregularly 1–3 pit widths apart or dense only between the eyes, the setae about as long as flagellum width or longer; clypeus semicircular to semi-elliptical, rounded, in lateral view evenly curved or strongly arched; mandible narrow **40**
- 40** (39). Clypeus in profile strongly arched or recurved at apex, bulbous and strongly convex dorsoapically; postgenal depression present, narrow but distinct; frons microsculpture fine to smooth, somewhat shining (Fig. 42A–C) *S. xanthodera*, n. sp.
- . Clypeus in profile evenly curved, not strongly arched or recurved, weakly carinate, not strongly convex dorsoapically; postgenal depression absent; frons microsculpture coriaceous, dull (Figs. 16G–I, 38A–C) **41**
- 41** (40). Head very broad, WH/LH ~0.98, nearly circular in dorsal view; gena very evenly convex; mandible reddish brown *S. centralis*, n. sp.
- . Head less broad, WH/LH ~0.92, in dorsal view parallel-sided behind the eyes for a short distance; gena not evenly convex, with an indistinct angle; mandible yellow *S. similis* Fullaway
- 42** (38). Clypeus prominent, rounded triangular, weakly angulate; head deep, DH/LH ~0.62; mandible strongly concave ventrally; wing cells nearly glabrous *S. hiaka*, n. sp., in part
- . Clypeus relatively short, semicircular or semi-elliptical, apically truncate or broadly rounded; head more compressed, DH/LH < 0.58; mandible and wing cells variable, but if mandible strongly concave then wing cells sparsely setose **43**
- 43** (42). Clypeus in profile evenly curved, moderately elongate, sharply carinate but sometimes appearing weak, rounded apically; mandible more or less straight *S. batrachedrae* Fullaway, in part
- . Clypeus in profile short and steep, sometimes recurved, with a rounded carina dorsally, short and often truncate apically; mandible curved outwardly, semicylindrical in cross section **44**
- 44** (43). Basal cells of fore wing nearly glabrous; clypeus semi-elliptical, broadly rounded apically, weakly carinate to the apex; ocellar triangle right to weakly acute; at least the entire prothorax orange-yellow, or with more extensive pale coloration **45**
- . Basal cells of fore wing sparsely setose; clypeus truncate apically and blunt, carina effaced apically; ocellar triangle strongly acute or weakly to strongly obtuse; all known specimens with only the pronotum orange-yellow **46**
- 45** (44). Frons punctuation sparse, 3 or more pit widths apart; frons shining, microsculpture visible but smooth; mesosoma all yellow except metanotum and propodeum; apical segments of metasoma yellow, mostly shining, without microsculpture except narrowly at the sides *S. pulchra* Fullaway
- . Frons punctuation moderate, 1–3 pit widths apart, denser between eyes; frons somewhat dull, microsculpture fine to coriaceous; metasoma with faint but distinct microreticulation over entire surface; all known specimens with only the prothorax orange-yellow *S. makaha*, n. sp., in part
- 46** (44). Head large, ocellar triangle acute, lateral ocelli distinctly separated from vertex crest; mandible moderately broad, distinctly concave ventrally (Fig. 25A–C) *S. kilohana*, n. sp.
- . Head not particularly large, ocellar triangle obtuse, lateral ocelli nearly touching vertex crest; mandible narrow, weakly concave ventrally (Fig. 29A–C) **47**

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- 47** (46). Distal portion of Rs not quite reaching the wing margin, cell 2R1 partially open; OOL/WOT 1.55–1.75 *S. weaweae*, n. sp.
 –. Rs reaching anterior wing margin, cell 2R1 fully closed; OOL/WOT ~1.45
 *S. mahoe*, n. sp. in part
- 48** (35). Mandible distinctly concave ventrally **49**
 –. Mandible not or only weakly concave ventrally **61**
- 49** (48). Mandible strongly twisted, black; malar space 1/4 as long as base of mandible; venter of head with moderately dense pubescence (Fig. 23M–O) *S. kahuku* Fullaway
 –. Mandible not twisted, color variable, often reddish brown to yellow; malar space very small, almost absent; venter of head with sparse setae **50**
- 50** (49). Ocellar triangle front angle strongly acute, lateral ocelli distinctly separated from vertex crest (Fig. 9A–B); head large, narrower and longer behind the eyes, WH/LH 0.75–0.90, EV/HE >0.90; usually large species **51**
 –. Ocellar triangle front angle right to strongly obtuse, lateral ocelli nearly touching vertex crest (Fig. 9D–E); head small, broad and shorter behind the eyes, WH/LH (0.87–)0.90–0.99, EV/HE <0.90; moderate to small species **53**
- 51** (50). Mandible strongly constricted near the base, extremely broad in ventral view, expanded apically and strongly elbowed *S. koa* Fullaway
 –. Mandible distinctly concave ventrally but never with an abrupt constriction near the base, not broadened in ventral view **52**
- 52** (51). Frons closely punctate, about 1 pit width apart, with dull, granular microsculpture; mandible orange; head behind eyes shorter, EV/HE ~0.88–1.18
 *S. granulosa*, n. sp., in part
 –. Frons with open punctures, 1–3 pit widths apart, and fine microsculpture, weakly shining; mandible black; head behind eyes longer, EV/HE ~1.17–1.47 *S. hualala*, n. sp.
- 53** (50). Mandible bent at a right angle externally (as seen in ventral view), outer face of apical half strongly convex with the ventral tooth partially concealed behind the second
 *S. auwae*, n. sp.
 –. Mandible evenly curved in ventral view or only obliquely bent, outer face nearly straight or only slightly convex, all teeth facing forward **54**
- 54** (53). Dorsum of head entirely flat or slightly concave; head compressed, DH/LH ~0.55; basal cells of fore wing always densely setose (Fig. 26A–C) *S. komohana*, n. sp.
 –. Dorsum of head slightly convex, sometimes nearly flat behind eyes; head usually deeper, DH/LH 0.57–0.69; basal cells of fore wing variable, often sparsely setose to nearly glabrous **55**
- 55** (54). Frons sparsely punctate, over two pit widths apart; clypeus prominent, rounded triangular, pointed apically (short in *S. pakela*, n. sp.); mandible usually reddish brown, sometimes yellow; ocellar triangle right to strongly obtuse; basal wing cells with only a few setae, nearly glabrous **56**
 –. Frons moderately punctate, 1–3 pit widths apart; clypeus short, semi-elliptical, rounded or weakly pointed apically; mandible always yellow; ocellar triangle always strongly obtuse; basal wing cells variable, sometimes moderately setose **59**
- 56** (55). Outer surface of mandible strongly shining and polished apically; mandible distinctly bicolored, yellowish dorsally, brown ventrally and on outer face; metasoma with faint but distinct microreticulation over all terga; S6 evenly covered with very dense pilose setae *S. peleana* Fullaway

- . Outer surface of mandible distinctly microreticulate, somewhat dull; mandible entirely yellow or dark; metasoma variable, often with faint microreticulation only laterally; S6 broadly glabrous medially 57
- 57** (56). Clypeus flat basally, convex only laterally and near the apex; metasoma highly polished, without microsculpture; pronotum and mandible yellow
S. hiiaka, n. sp., in part
- . Clypeus strongly convex, usually angulate or faintly carinate; metasoma with faint microreticulation at least laterally; body black, mandible variable 58
- 58** (57). Mandible reddish brown; fore femur weakly expanded, less than twice as long as wide, FL/FW ~2.1; metasoma polished with faint microsculpture laterally .. *S. pakela*, n. sp.
- . Mandible yellow; fore femur strongly expanded, FL/FW ~1.8; metasoma with faint but distinct microsculpture covering all terga *S. puiwa*, n. sp.
- 59** (55). Clypeus in profile steep and nearly straight; at least hind femur brown; occurring in wet cloud forest around the summits of Ka‘ala and Kōnāhuanui *S. uhiwai*, n. sp.
- . Clypeus somewhat elongate, evenly curved; legs entirely yellow; occurring in mesic forest 60
- 60** (59). Basal cells of fore wing nearly glabrous; setae of frons and pronotum shorter than flagellum width *S. aniani*, n. sp., in part
- . Basal cells of fore wing sparsely setose; setae of frons and pronotum as long or slightly longer than flagellum width *S. halona*, n. sp.
- 61** (48). Clypeus large and projecting, triangular or quadrate (Fig. 2A, L); mandible moderately broad 62
- . Clypeus typical, semicircular to rounded triangular or smaller, not particularly large (Fig. 2B–H); mandible variable 64
- 62** (61). Clypeus quadrate, apex broadly rounded or truncate, dorsally with a rounded carina or weakly carinate; mandible moderately broad, reddish-brown to orange; head strongly convex in lateral view (Fig. 37D–F) *S. rufignatha* Fullaway
- . Clypeus triangular, apex rounded; mandible moderately narrow, black; head slightly convex in lateral view (Figs. 11A–C, 37G–I) 63
- 63** (62). Mandible not twisted; clypeus dorsally with a narrow, short carina raised above the flat surface; lateral ocelli distinctly separate from vertex crest
S. acuta Fullaway, in part
- . Mandible strongly twisted; clypeus angulate dorsally, weakly carinate; lateral ocelli nearly touching vertex crest *S. rugiventris*, n. sp., in part
- 64** (61). Mandible very broad, parallel-sided; clypeus relatively short, semi-elliptical, in profile usually steep and evenly curved (Fig. 3G) 65
- . Mandible not so broad, or if somewhat so then the clypeus is very large and projecting .69
- 65** (64). Frons narrow, subequal to eye height (WF/HE 0.95–1.05); OOL/WOT 1.40–1.60; head short behind the eyes, EV/HE 0.70–0.85; clypeus with a sharp carina 66
- . Frons broader, distinctly wider than eye height, WF/HE >1.10; OOL/WOT 1.60–2.00; head usually longer behind the eyes, EV/HE usually >0.85 (rarely less); clypeal carina weak 67
- 66** (65). Basal cells of fore wing sparsely setose; clypeus in lateral view short and steeply curved, nearly vertical apically; coxae and femora predominantly dark or at least with dorsal margins brown *S. aspera* Fullaway, in part
- . Basal cells of fore wing nearly glabrous; clypeus in lateral view more elongate, evenly curved; legs entirely bright yellow *S. luteipes* Fullaway, in part

- 67** (65). Frons extremely broad, WF/HE 1.3, and with microsculpture smooth to fine, punctation 1–3 pit widths apart across entire frons; coxae and at least hind femur dark; metasoma with smooth but distinct microreticulation all over terga *S. malino*, n. sp., in part
- . Frons not so broad, WF/HE 1.10–1.22, microsculpture coriaceous to granular, punctation variable; legs entirely yellow; metasoma mostly polished, without visible microreticulation except laterally **68**
- 68** (67). Clypeus somewhat truncate apically, trapezoidal, short and steep in lateral view; frons punctation dense between the eyes (Fig. 36M–O) *S. pygmaea* Fullaway, in part
- . Clypeus semi-elliptical but slightly elongate in lateral view and rounded medially; punctation 1–3 pit widths apart across entire frons (Fig. 11D–F) *S. affinis* Fullaway, in part
- 69** (64). Clypeus short and steep in profile; frons appearing impunctate, microreticulate and dull between the eyes, distinctly smoother above; head shape distinctive, like a parallelogram in lateral view, only slightly shorter at the antennae and clypeus than at the vertex (Fig. 39J–L) *S. tenuiceps* Fullaway
- . Clypeus evenly curved or sloping in profile; frons with distinct punctures, microsculpture present but smooth and shining, more or less even all over; head slightly but distinctly convex above and below, deepest below the eye or hind margin of eye **70**
- 70** (69). Mandible strongly twisted; clypeus large and projecting, trapezoidal; head narrower, WH/LH ~0.72; frons moderately, unevenly punctate, 1–3 pit widths apart; metasoma smooth and shining, without microsculpture; basal cells of fore wing densely setose (Fig. 37G–I) *S. rugiventris*, n. sp., in part
- . Mandible not twisted; clypeus not strongly projecting, at most semicircular; head rather broad, WH/LH ~0.85–0.93; other characters variable **71**
- 71** (70). Head dorsally with distinctly dull, granular microsculpture, with dense, fine punctation, about 1 pit width apart or less, setae short and even, shorter than flagellum width; dorsum of head strongly convex in lateral view (Fig. 12M–O) **72**
- . Head dorsally with coriaceous to shining microsculpture, with moderately dense punctation, 1–3 pit widths apart, setae about as long as flagellum width or slightly longer; dorsum of head usually slightly convex in lateral view **73**
- 72** (71). Mandible outwardly convex, with four teeth; pronotum usually at least slightly pale; head narrower and more compressed, WH/LH ~0.86, DH/LH ~0.61 *S. aristoteliae* Fullaway, in part
- . Mandible outwardly nearly straight, with three teeth, the ventral one notched apically; entirely black; head broader and deeper, WH/LH ~0.92, DH/LH ~0.64 *S. manono*, n. sp.
- 73** (71). Clypeus prominent, rounded triangular to semicircular; genal angle present, broadly rounded; lateral ocelli nearly touching vertex crest **74**
- . Clypeus short in dorsal view, truncate, semi-elliptical, or short-triangular; genal angle absent, head evenly convex below; lateral ocelli distinctly separate from vertex crest (except in *S. lateralis*, n. sp.) **77**
- 74** (73). Clypeus of unique form dorsally, with a broadly rounded ridge; head rather flat, DH/LH ~0.50; fore femur only moderately broad, FL/FW ~2.0; basal cells of fore wing sparsely setose; metasoma with smooth but distinct microreticulation over all terga *S. brevicornis* Fullaway
- . Clypeus dorsally strongly convex, sometimes faintly angulate; head deeper, DH/LH 0.55–0.60; fore femur broad, FL/FW ~1.8; basal cells of fore wing nearly glabrous; metasoma polished, at most with smooth microsculpture narrowly at sides of terga **75**
- 75** (74). Clypeus in profile blunt, recurved apically (Fig. 32B); frons sparsely punctate, mostly 3 or more pit widths apart; ocellar triangle strongly obtuse *S. nuku*, n. sp.

- . Clypeus in profile evenly curving, apex acute (Figs. 19E, 27H); frons moderately punctate, 1–3 pit widths apart; ocellar triangle front angle right to slightly acute **76**
- 76 (75).** Head broader and deeper, WH/LH ~0.94, DH/LH ~0.60; pronotal setae prominent, about as long as flagellar width; basal cells of fore wing nearly glabrous *S. fossulata* Fullaway
- . Head narrower and more compressed, WH/LH ~0.87, DH/LH ~0.55; pronotal setae very short and inconspicuous, shorter than flagellar width; basal cells of fore wing mostly glabrous, apex of cell R with moderately dense setae *S. lapuu*, **n. sp.** in part
- 77 (73).** Clypeus broadly truncate apically (Fig. 27C); mandible moderately narrow; metasoma polished, with smooth microsculpture narrowly at sides of terga; basal cells of fore wing sparsely setose *S. langfordi* Fullaway
- . Clypeus semicircular to short-triangular, apically broadly rounded or weakly pointed; mandible moderately broad; metasoma with smooth but distinct microreticulation over all terga; wing cells variable **78**
- 78 (77).** Head dorsally with coriaceous, weakly shining microsculpture, and moderately dense punctation, 1–3 pit widths apart; lateral ocelli distinctly separate from vertex crest, ocellar triangle weakly acute; basal cells of fore wing densely setose; mandible black *S. mahiai*, **n. sp.**
- . Head dorsally shining with distinct but smooth microsculpture, and sparse punctation, 3 or more pit widths apart at least above the middle of the eyes; lateral ocelli nearly touching vertex crest, ocellar triangle strongly obtuse; basal wing cells sparsely setose; mandible orange-brown to pale yellow-white **79**
- 79 (78).** Head very broad, wider than long, WH/LH ~1.04, and deep, DH/LH ~0.63; mandible pale yellow-white; distal portion of Rs meeting wing margin, cell 2R1 fully closed ... *S. lateralis*, **n. sp.**
- . Head longer than wide, WH/LH ~0.88, and more compressed, DH/LH ~0.55; mandible orange-brown to testaceous; distal portion of Rs ending short of anterior wing margin, cell 2R1 partially open *S. wehe*, **n. sp.**, in part
- 80 (1).** Occipital margin sharply carinate and slightly reflexed upward; vertex in dorsal view slightly sinuate around the ocelli (Fig. 26N–O) *S. kunihi*, **n. sp.**
- . Occipital margin sometimes forming a blunt ridge but not sharply carinate and reflexed; vertex not sinuate around ocelli **81**
- 81 (80).** Mandible broad, not narrowed from the articulation, parallel-sided or only slightly concave ventrally, rarely broadening towards the apex (Fig. 4A–B); head evenly convex ventrally **82**
- . Mandible moderately broad to narrow, always at least slightly narrowed from the articulation, often distinctly concave ventrally (Fig. 4C–K); head below variable, often genal angle present **101**
- 82 (81).** Mandible extremely broad, becoming wider from the base, flat frontally, bent near the base and nearly straight; head very large, about as wide as long, WH/LH ~1.00 (Fig. 26G–I) *S. kumene*, **n. sp.**
- . Mandible not as above, generally moderately curved or elbowed, parallel-sided or concave below; head usually longer than wide (e.g. Figs. 25M–O, 31D–F) **83**
- 83 (82).** Basal cells of fore wing nearly glabrous; head ventrally densely downy pubescent; clypeus steeply curved and short in lateral view *S. testaceipes* Cameron
- . Never with this combination of characters: basal cells of fore wing usually sparsely to densely setose; head usually sparsely pubescent ventrally (rarely moderately so); never both characters in combination; clypeus variable **84**

- 84** (83). Clypeus in profile evenly sloping, nearly straight or only slightly curved, relatively elongate; head behind the eyes long, $EV/HE > 0.95$, usually > 1.00 (Figs. 16D–F, 25M–O, 38J–L) **85**
 –. Clypeus distinctly curved, or if somewhat straight then short and nearly vertical; head behind the eyes variable (Figs. 15A–C, 28J–L, 31D–F) **88**
- 85** (84). Clypeus very large, parallel-sided, quadrate, truncate apically; mandible slightly convex externally, with ventral tooth shorter than second (Fig. 25M–O) *S. koloa*, n. sp.
 –. Clypeus semicircular to slightly elongate, rounded apically; mandible vertical, ventral tooth largest (Fig. 38J–L) **86**
- 86** (85). Coxa and femora entirely dark brown, tibiae often also brown; head more compressed, $DH/LH \sim 0.50$; hind femur expanded, $HFL/HFW 2.20\text{--}2.40$; A3 short, as wide or wider than long *S. tumidoventris* Fullaway
 –. Legs predominantly yellow, sometimes dorsal margins of femora dark, hind femur brown, or all femora tinged with brown; head deeper, $DH/LH 0.53\text{--}0.57$; hind femur narrow, $HFL/HFW 2.50\text{--}2.90$; A3 at least 1.1 times longer than wide **87**
- 87** (86). Metasoma with smooth microreticulation all over (sometimes faint); head broader and shorter behind the eyes, $WH/LH 0.80\text{--}0.83$, $EV/HE 0.95\text{--}1.10$; legs usually entirely yellow (rarely hind femur brownish); primarily found in the Ko‘olau range *S. striata* Fullaway
 –. Metasomal terga highly polished except lateral portions; head narrower and longer behind the eyes, $WH/LH 0.75\text{--}0.80$, $EV/HE 1.05\text{--}1.30$; legs always at least partially dark, dorsal margins of femora and/or hind femur broadly brown; primarily found in the Wai‘anae range *S. celeris* Fullaway
- 88** (84). Head very narrow, $0.73\text{--}0.76$, moderately setose ventrally; legs mostly brown; clypeus semi-elliptical, evenly curved and slightly crenulate in lateral view (Fig. 15M–O)..... *S. canuta*, n. sp.
 –. Head broader, > 0.80 , usually > 0.83 , sparsely setose ventrally; other characters variable, but usually not occurring in combination, clypeus sometimes short and truncate and/or legs all yellow **89**
- 89** (88). Clypeus in profile weakly sloping at base, strongly rounded and distinctly recurved at the apex (Figs. 15B, 34H); head broad, $WH/LH 0.88\text{--}0.93$ **90**
 –. Clypeus in profile evenly curved to the apex or steep and short, not distinctly recurved (Figs. 11E, 31E); head not so broad, WH/LH variable but usually < 0.88 **91**
- 90** (89). Femur distinctly more than twice as long as wide, $FL/FW \sim 2.2\text{--}2.3$; basal cells of fore wing somewhat variable, usually sparsely setose but sometimes densely setose *S. bridwelli* Fullaway
 –. Femur distinctly less than twice as long as wide, $FL/FW \sim 1.8\text{--}1.9$; basal cells of fore wing always sparsely setose *S. perottetiae* Fullaway, in part
- 91** (89). Clypeus prominent, rounded triangular to semicircular; at least coxae and femora always dark brown **92**
 –. Clypeus short, semi-elliptical or trapezoidal; legs variable, often all yellow **96**
- 92** (91). Head broad, $WH/LH \sim 0.90$, and short, $EV/HE \sim 0.60\text{--}0.80$; frons microsculpture coriaceous; lateral ocelli nearly touching vertex crest; metasoma with smooth but evident microsculpture over all terga *S. pambertoni* Fullaway, in part
 –. Head narrower, $WH/LH \sim 0.83\text{--}0.87$, and/or longer, $EV/HE \sim 0.75\text{--}1.10$; frons microsculpture smooth to fine; lateral ocelli distinctly separate from vertex crest; metasoma mostly polished, without sculpturing except narrowly at the sides **93**

- 93 (92). Basal cells of fore wing nearly glabrous; head strongly convex below and relatively deep, DH/LH ~0.60; posterior corners of head indistinct, strongly rounded off (Fig. 22M–O) *S. huapoo*, n. sp.
- . Basal cells of fore wing sparsely to densely setose; head weakly convex below, depth variable, DH/LH 0.56–0.59; posterior corners of head rounded but distinct, somewhat squared 94
- 94 (93). Clypeus in profile strongly curved, somewhat recurved, apical angle obtuse; fore femur distinctly less than twice as long as wide, FL/FW ~1.8–1.9; mandible in ventral view evenly curved, teeth similar; WH/LH usually ~0.87 ... *S. perottetae* Fullaway, in part
- . Clypeus in profile gently curved, apical angle acute; fore femur about twice as long as wide or more, FL/FW ~2.0–2.2; mandible in ventral view obtusely elbowed, ventral tooth largest; WH/LH usually ~0.83 95
- 95 (94). Head shorter behind the eyes, EV/HE 0.75–0.95; fore femur robust, about twice as long as wide *S. nigrita* Fullaway
- . Head longer behind the eyes, EV/HE 0.95–1.25; fore femur more than twice as long as wide, FL/FW ~2.2 *S. malino*, n. sp. in part
- 96 (91). Frons narrow, subequal to eye height (WF/HE 0.95–1.05); OOL/WOT 1.40–1.60; head short behind the eyes, EV/HE 0.70–0.85; clypeus clearly with a sharp carina 97
- . Frons broader, distinctly wider than eye height, WF/HE >1.10; OOL/WOT 1.60–2.00; head usually longer behind the eyes, EV/HE usually >0.85 (rarely less); clypeal carina often appearing weak 99
- 97 (96). Basal cells of fore wing very densely setose, cell R with four rows of setae, cell 1Cu with three; ocellar triangle front angle right to weakly acute .. *S. hillebrandi* Fullaway
- . Basal cells of fore wing moderately setose to glabrous, cell 1Cu with at most two rows of setae; ocellar triangle front angle strongly acute 98
- 98 (97). Basal cells of fore wing sparsely setose; clypeus in lateral view short and steeply curved, nearly vertical apically (Fig. 13H); coxae and femora predominantly dark or at least with dorsal margins brown *S. aspera* Fullaway, in part
- . Basal cells of fore wing nearly glabrous; clypeus in lateral view more elongate, evenly curved (Fig. 28K); legs entirely bright yellow *S. luteipes* Fullaway, in part
- 99 (96). Frons extremely broad, WF/HE 1.3, and with microsculpture smooth to fine, punctation 1–3 pit widths apart across entire frons (Fig. 29G–I); coxae and at least hind femur dark; metasoma with smooth but distinct microreticulation all over terga *S. malino*, n. sp., in part
- . Frons not so broad, WF/HE 1.10–1.22, microsculpture coriaceous to granular, punctation variable (Figs. 11D–F, 36M–O); legs entirely yellow; metasoma mostly polished, without visible microreticulation except laterally 100
- 100 (99). Clypeus somewhat truncate apically, trapezoidal, short and steep in lateral view; frons punctation dense between the eyes *S. pygmaea* Fullaway, in part
- . Clypeus semi-elliptical but slightly elongate in lateral view and rounded medially; punctation 1–3 pit widths apart across entire frons *S. affinis* Fullaway, in part
- 101 (81). Basal cells of fore wing sparsely setose to glabrous (Fig. 10B–D; rarely sparsely setose over most of the cell R but with a patch of dense setae at the apex) 102
- . Basal cells of fore wing densely and conspicuously setose (Fig. 10A) 143
- 102 (101). Head strongly flattened, nearly flat below, DH/LH ~0.46–0.50 (Figs. 17H, 25K, 35H) 103
- . Head normal, convex or slightly angulate below, DH/LH >0.53 105

- 103** (102). Mandible black; frons with moderate punctures, 1–3 pit widths apart; mandible moderately broad; head narrow, WH/LH ~ 0.74 – 0.77 ; basal cells of fore wing moderately setose *S. danimalis*, n. sp. in part
- . Mandible yellow; frons with sparse punctures, 3 or more pit widths apart; mandible moderately narrow; head broad, WH/LH > 0.84 ; basal cells of fore wing nearly glabrous **104**
- 104** (103). Clypeus in profile steep, often slightly recurved at apex; ocellar triangle narrow, OOL/WOT 1.80–2.00 *S. planiceps* Fullaway
- . Clypeus in profile evenly curved to the apex; ocellar triangle relatively broad, OOL/WOT 1.40–1.65 *S. kolea*, n. sp.
- 105** (102). Head as wide or wider than long, WH/LH 0.99–1.06; fore femur very strongly expanded, FL/FW 1.55–1.80, and biconvex; femora dark brown to black; mandible moderately broad, distinctly concave ventrally *S. obscura* Fullaway
- . Head not wider than long, WH/LH ≤ 0.98 and usually much less; fore femur variable but FL/FW almost never < 1.75 , often about twice as long as wide or more, always laterally compressed and slightly arcuate in dorsal view; mandible and femora color variable ... **106**
- 106** (105). At least pronotum yellow-brown, often with more extensive pale coloration . **107**
- . Body entirely black, at most mandible and clypeus yellow **110**
- 107** (106). Entire body predominantly yellow including head, only propodeum consistently dark; metasoma with distinct microreticulation all over terga *S. vicina*, n. sp., in part
- . At least head dark brown to black, often only prothorax pale; metasoma variable, tergites often polished except laterally **108**
- 108** (107). Clypeus in profile evenly curved, moderately elongate, sharply carinate but sometimes appearing weak, rounded apically; mandible distinctly concave ventrally, more or less straight outwardly *S. batrachedrae* Fullaway, in part
- . Clypeus in profile short and steep, sometimes recurved, with a rounded carina dorsally, short and often truncate apically; mandible curved outwardly, semicylindrical in cross section **109**
- 109** (108). Basal cells of fore wing sparsely setose; clypeus truncate apically and blunt, carina effaced apically; ocellar triangle strongly acute or weakly to strongly obtuse; metasoma polished, without evident microsculpture; all known specimens with only the pronotum orange-yellow *S. mahoe*, n. sp., in part
- . Basal cells of fore wing nearly glabrous; clypeus semi-elliptical, broadly rounded apically, weakly carinate to the apex; ocellar triangle right to weakly acute; metasoma with faint but distinct microreticulation over entire surface; all known specimens with the entire prothorax orange-yellow *S. makaha*, n. sp., in part
- 110** (106). Frons shining, microsculpture evident but smooth or occasionally weakly matte; mandible usually distinctly concave ventrally **111**
- . Frons microsculpture coriaceous to granular, matte; mandible variable but usually parallel-sided or only weakly concave ventrally, if strongly concave then frons densely punctate at least between the eyes **123**
- 111** (110). Frons punctuation sparse, mostly 3 or more pit widths apart, sometimes closer between the eyes; mandible usually slightly twisted or distinctly convex externally, ventral tooth partly concealed behind second tooth, sometimes subapical **112**
- . Frons moderately punctate, with irregular pits about 1–3 pit width apart; mandible not twisted, more or less flat outwardly or only slightly convex, all teeth visible on frontal surface **116**

- 112** (111). Ocellar triangle strongly obtuse; distal portion of Rs ending short of anterior wing margin, cell 2R1 partially open *S. wehe*, n. sp., in part
 -. Ocellar triangle right to strongly acute; distal portion of Rs meeting wing margin, cell 2R1 fully closed **113**
- 113** (112). Mandible narrow, strongly concave ventrally **114**
 -. Mandible moderately narrow to moderately broad, parallel-sided or only slightly concave ventrally **115**
- 114** (113). Head narrower and more compressed (WH/LH 0.77–0.80, DH/LH ~0.54); antennae short, just reaching the anterior pronotum, distal flagellomeres as long as wide
 *S. glabra* Fullaway
 -. Head broader and deeper (WH/LH 0.85, and DH/LH 0.58); antennae moderately long, extending to the posterior margin of the pronotum, distal flagellomeres distinctly longer than wide *S. extensa*, n. sp.
- 115** (113). Clypeus in profile evenly curved, apex acute; mandible slightly twisted, ventral tooth very small and subapical; cell R of fore wing mostly glabrous with a patch of dense setae apically; head narrower, WH/LH ~0.78; legs yellow, mandible orange-brown *S. picea* Fullaway
 -. Clypeus in profile distinctly recurved ventrally; mandible convex externally, ventral tooth slightly curved under but nearly as long as the second; cell R of fore wing sparsely setose all over; head broader, WH/LH ~0.86; legs and mandible dark brown
 *S. kawala*, n. sp.
- 116** (111). Mandible reddish brown to yellow, always narrow **117**
 -. Mandible black, width variable **119**
- 117** (116). Clypeus somewhat weakly carinate; head nearly flat dorsally, strongly convex ventrally; head broad and deep, WH/LH ~0.98, DH/LH ~0.63 ... *S. aniani*, n. sp., in part
 -. Clypeal carina distinct; head moderately convex both dorsally and ventrally; head narrower and more compressed, WH/LH 0.80–0.93, DH/LH 0.52–0.60 **118**
- 118** (117). Hind femur narrow, HFL/HFW ~2.75; mandible more or less parallel-sided; OOL/WOT ratio 1.10–1.40; lateral ocelli nearly touching vertex crest; apical half of antennae usually brown (yellowish in partially teneral individuals)
 *S. minuscula* Fullaway
 -. Hind femur very broad, HFL/HFW 1.90–2.10 (rarely to 2.30); mandible distinctly concave ventrally (sometimes appearing parallel-sided when folded beneath the clypeus); OOL/WOT ratio 1.55–1.75; lateral ocelli distinctly separate from vertex crest; antennae almost entirely yellow, only tinged with brown on the apical 3–4 segments
 *S. pipturi*, n. sp.
- 119** (116). Head very broad and deep, WH/LH 0.94–0.98, DH/LH 0.63–0.66; legs distinctively colored, in all known specimens yellow with a brown band across the middle third of the hind femur and brown on the dorsal margin of the fore femur
 *S. huikau*, n. sp. in part
 -. Head narrower and more compressed, WH/LH <0.92, DH/LH <0.61; coxae and femora brown, or legs all yellow **120**
- 120** (119). Mandible moderately broad; clypeus in profile weakly sloping at base, strongly rounded and distinctly recurved at the apex; genal angle absent, head evenly convex below; lateral ocelli distinctly separate from vertex crest (Figs. 17A–C, 34G–I) .. **121**
 -. Mandible narrow; clypeus in profile evenly curved; genal angle distinct; lateral ocelli nearly touching vertex crest (Figs. 15J–L, 29J–L) **122**

- 121** (120). Head narrow and elongate behind the eyes, WH/LH 0.78–0.83, EV/HE usually ~0.95–1.0, EV/WF usually ~0.85–0.95; antennae short, scarcely extending past the head (A3 as wide as long or wider), and entirely yellow to yellow-brown, occasionally darker on the terminal segments; legs usually all yellow (rarely femora brown) *S. cryptophlebiae* Fullaway, in part
- . Head wider and shorter behind the eyes, WH/LH ~0.87, EV/HE 0.80–0.90, EV/WF ~0.63–0.73; antennae at least reaching pronotum (A3 at least slightly longer than wide), always brown on at least the apical half; coxae and femora always brown *S. perottetiae* Fullaway, in part
- 122** (120). Head narrow, WH/LH ~0.82; basal cells of fore wing nearly glabrous; front angle of ocellar triangle obtuse *S. mandibularis* Fullaway
- . Head broader, WH/LH ~0.87; basal cells of fore wing with one or two rows of setae; front angle of ocellar triangle right *S. brunneipennis* Fullaway
- 123** (110). Clypeus in profile steeply sloping, vertical or strongly rounded and slightly recurved at the apex; mandible black, broad to moderately broad; metasoma always predominantly polished, at most with faint microsculpture laterally; OOL/WOT 1.40–2.00 **124**
- . Clypeus in profile evenly curved, arcing, apically acute, or rather strongly arched; mandible usually moderately narrow to narrow, sometimes yellow; OOL/WOT 1.00–1.40, or if higher (to 1.55) then with distinct microreticulation over the entire metasoma ... **127**
- 124** (123). Frons narrow, subequal to eye height (WF/HE 0.95–1.05); OOL/WOT 1.40–1.60; head short behind the eyes, EV/HE 0.70–0.85; clypeus clearly with a sharp carina **125**
- . Frons broader, distinctly wider than eye height, WF/HE >1.10; OOL/WOT 1.60–2.00; head usually longer behind the eyes, EV/HE usually >0.85 (rarely less); clypeal carina often appearing weak **126**
- 125** (124). Basal cells of fore wing sparsely setose; clypeus in lateral view short and steeply curved, nearly vertical apically; coxae and femora predominantly dark or at least with dorsal margins brown *S. aspera* Fullaway, in part
- . Basal cells of fore wing nearly glabrous; clypeus in lateral view more elongate, evenly curved; legs entirely bright yellow *S. luteipes* Fullaway, in part
- 126** (124). Clypeus somewhat truncate apically, trapezoidal, short and steep in lateral view; frons punctuation dense between the eyes *S. pygmaea* Fullaway, in part
- . Clypeus semi-elliptical but slightly elongate in lateral view and rounded medially; punctuation 1–3 pit widths apart across entire frons *S. affinis* Fullaway, in part
- 127** (123). Head behind the eyes long, EV/HE ~0.90–1.15, OOL/WOT 1.9–2.5; ocellar triangle strongly acute, separated from vertex crest by more than an ocellus width; frons densely punctate, with distinct pits mostly about 1 pit width apart, extremely dull microsculpture obscuring the punctuation; mandible yellow (Fig. 20M–O) *S. granulosa*, n. sp., in part
- . Head behind the eyes usually shorter, EV/HE usually <0.90, OOL/WOT <1.8, if longer then frons only weakly coriaceous; frons not densely punctate, with irregular pits about 1–3 pit width apart, sometimes denser between the eyes; mandible variable, often black **128**
- 128** (127). Mandible distinctly concave ventrally **129**
- . Mandible not or only weakly concave ventrally **132**
- 129** (128). Head elongate behind the eyes, narrow and compressed, EV/HE 0.95–1.00, WH/LH 0.78–0.83, DH/LH 0.55–0.58; mandible moderately broad; ocellar triangle strongly acute, lateral ocelli distinctly separate from vertex crest ... *S. cryptophlebiae* Fullaway, in part

- . Head short behind the eyes, broader and deeper, EV/HE 0.55–0.75, WH/LH 0.85–0.96, DH/LH 0.59–0.64; mandible moderately narrow to narrow; ocellar triangle right to weakly acute, lateral ocelli nearly touching vertex crest **130**
- 130** (129). Frons densely punctate between the eyes, 1–3 pit widths apart above; OOL/WOT 1.30–1.50; mandible orange to yellow *S. capuana* Fullaway
- . Frons densely punctate all over; OOL/WOT 1.00–1.25; mandible variable **131**
- 131** (130). Wing cells clearly sparsely setose; mandible black; fore femora moderately broad, FL/FW ~1.90–2.10 *S. epagogeana* Fullaway
- . Wing cells intermediate, moderately setose; mandible yellow; fore femora narrow, FL/FW ~2.15–2.35 *S. hookahi*, n. sp., in part
- 132** (128). Head deep, DH/LH 0.59–0.66 **133**
- . Head somewhat compressed, DH/LH ~0.56 (rarely to 0.58) **138**
- 133** (132). Mandible black **134**
- . Mandible yellow **136**
- 134** (133). Coxae and femora brown; head dorsally and ventrally moderately convex in lateral view (Fig. 24K); OOL/WOT 1.35–1.50; metasoma with smooth but distinct microreticulation all over at least posterior terga (sometimes very faint on anterior terga) *S. kepau*, n. sp.
- . Legs predominantly yellow, at most dorsal margins of femora yellow; head dorsally and ventrally strongly convex in lateral view (Figs. 23B, 38E); OOL/WOT 1.15–1.30; all metasomal terga polished medially, faintly microreticulate only laterally **135**
- 135** (134). Basal cells of fore wing sparsely setose to nearly glabrous throughout; frons setae distinctly longer than flagellum width; legs all yellow or with only dorsal margins of femora brown; head not so broad and deep, WH/LH 0.88–0.93, DH/LH 0.59–0.61 ... *S. similis* Fullaway
- . Cell R of fore wing sparsely setose on basal 2/3 with a patch of relatively dense setae at the apex; frons setae only about as long as flagellum width or scarcely longer; hind femur with a brown band across the middle third; head very broad and deep, WH/LH 0.94–0.98, DH/LH 0.63–0.66 *S. huikau*, n. sp., in part
- 136** (133). Frons densely punctate all over, punctures about one pit width apart; fore femora strongly expanded, FL/FW 1.85–2.00; lateral ocelli nearly touching vertex crest; wing cells with at least two complete rows of setae *S. citripoda*, n. sp., in part
- . Frons at most densely punctate between the eyes, up to 2 pit widths apart above; fore femora only moderately expanded, FL/FW >2.10; lateral ocelli distinctly separated from vertex crest; wing cells with few setae **137**
- 137** (136). Head conspicuously setose in lateral view, setae distinctly longer than flagellar width, vertex setae elongate and curving forward; clypeus somewhat strongly arched, evenly curved to the apex, basally extending slightly above the antennal sockets; fore femora moderately narrow, FL/FW ~2.20; head generally more compressed and shorter behind the eyes, DH/LH 0.60–0.62, EV/HE 0.55–0.65 (Fig. 30A–C) *S. manoa* Fullaway
- . Head setae inconspicuous in lateral view, setae shorter than flagellar width, vertex setae not distinct; clypeus somewhat steeply curved to the apex, basally not extending above the antennal sockets; fore femora extremely narrow, FL/FW ~2.40; head generally deeper and longer behind the eyes, DH/LH 0.62–0.65, EV/HE 0.65–0.75 (Fig. 41A–C) *S. urerae*, n. sp.
- 138** (132). Mandible yellow to reddish brown; legs predominantly yellow; head often narrower, WH/LH 0.78–0.86; basal cells of fore wing always sparsely setose **139**

- . Mandible black; at least femora dark brown to black; head often broader, WH/LH 0.86–0.90; basal cells of fore wing intermediate, sometimes appearing somewhat densely setose **141**
- 139** (138). Head narrower, WH/LH ~0.79; vertex and genal setae elongate, conspicuous *S. rugulosa* Fullaway
- . Head broader, WH/LH 0.81–0.86; vertex and genal setae not distinct from frons setae .. **140**
- 140** (139). Head deeper, DH/LH ~0.56 (Fig. 37N); femora moderately broad, FL/FW ~1.95, HFL/HFW ~2.35 *S. setosa* Fullaway
- . Head more compressed, DH/LH ~0.52 (Fig. 18E); femora narrow, FL/FW ~2.15, HFL/HFW ~2.85 *S. discoides*, n. sp.
- 141** (138). Mandible distinctly convex externally, semicylindrical in cross-section, ventral tooth partially concealed behind others; clypeus rather short, semi-elliptical or nearly transverse; ocellar triangle front angle strongly acute *S. waianaeana* Fullaway
- . Mandible more or less flat externally or only slightly convex, all teeth visible; clypeus prominent in dorsal view, semicircular to rounded triangular; ocellar triangle front angle weakly acute to weakly obtuse **142**
- 142** (141). Mandible broad; clypeus evenly curved in profile (Fig. 34D–F) *S. pembertoni* Fullaway, in part
- . Mandible moderately narrow; clypeus somewhat strongly arched in profile (Fig. 19G–I) ... *S. fuliginosa* Fullaway, in part
- 143** (101). Clypeus large and projecting, triangular, rounded at the apex, with a short carina raised above the convex surface; in profile almost straight, evenly sloping (Fig. 11A–C) *S. acuta* Fullaway, in part
- . Clypeus rounded triangular, semicircular, or semi-elliptical, not large and projecting; carina sharp, distinctly raised; in profile curved, or if straight then steep and short **144**
- 144** (143). Head deep and wider than long, WH/LH ~1.06, DH/LH ~0.66, strongly convex dorsally; mandible pale yellow-white, apical half distinctly convex externally (Fig. 34A–C) *S. peleleu*, n. sp.
- . Head at least slightly longer than wide, WH/LH at most 0.95, and more compressed, DH/LH <0.63; mandible lemon yellow to black, never white; other characters variable ... **145**
- 145** (144). Head compressed, DH/LH <0.51, flat or weakly convex ventrally (Figs. 17G–O, 34J–L) **146**
- . Head not strongly compressed, DH/LH >0.53, rarely to 0.51 but then always distinctly convex below and with the clypeus rather elongate and strongly arched **149**
- 146** (145). Frons with sparse punctures, 3 or more pit widths apart; head and mesosoma very strongly flattened and very narrow, DH/LH ~0.45, WH/LH ~0.71; clypeus evenly curved in profile (Fig. 17M–O) *S. depressella* Fullaway
- . Frons with more dense punctures, 1–3 pit widths apart; head and mesosoma not so flattened and broader, DH/LH 0.48–0.51, WH/LH >0.74; clypeus in profile steeply curved or recurved ventrally **147**
- 147** (146). Clypeus in lateral view rounded and recurved ventrally; mandible moderately broad, distinctly concave ventrally; head narrower and longer behind the eyes, WH/LH ~0.77, EV/HE 1.00–1.20 (Fig. 17G–I) *S. danimalis*, n. sp., in part
- . Clypeus in lateral view evenly curved or short and steeply curved; mandible narrow to moderately narrow, more or less parallel-sided; head broader and shorter behind the eyes, WH/LH 0.80–0.85, EV/HE 0.75–0.95 **148**

- 148** (147). Mandible reddish brown to yellow; clypeus in lateral view short and steeply curved, nearly vertical apically; ocellar triangle large, OOL/WOT 1.20–1.50; legs all yellow *S. philodoriae* Fullaway
- . Mandible black; clypeus in lateral view evenly curved; ocellar triangle small, OOL/WOT 1.60–1.75; at least coxae and femora brown *S. gracillima* Fullaway, in part
- 149** (145). Head slightly concave between genal angle and mandible, compressed but relatively broad, DH/LH 0.51–0.53, WH/LH 0.82–0.88; mandible always yellow, body variable, from all black to predominantly yellow (Fig. 15D–I) *S. brunnea* Fullaway
- . Head ventrally always evenly convex up to the mandible, rarely both compressed and broad, if DH/LH 0.51–0.53 then WH/LH 0.74–0.77 or frons sparsely punctate; mandible often black, body usually all black, never highly variable **150**
- 150** (149). Head and body predominantly yellow to testaceous or at least with pale markings all over, propodeum always dark, metasoma entirely pale or banded with brown; head sometimes with irregular dark marks or smoky, but never entirely dark brown to black (Figs. 32M–O, 40D–F) **151**
- . Usually entirely dark brown to black, if extensive yellow coloration present then the head is always dark **152**
- 151** (150). Ocellar triangle obtuse; head strongly convex below, occiput and genal margins forming nearly a right angle in lateral view; mandible entirely yellow; femora predominantly brown in Wai'anāe specimens, legs all yellow in Ko'olau specimens (Fig. 40D–F) *S. timberlakei* Fullaway
- . Ocellar triangle strongly acute; head moderately convex below, occiput and genal margins forming an obtuse angle in lateral view; mandible yellow basally, apical third dark; legs entirely yellow, so far only known from the Wai'anāe range (Fig. 32M–O) *S. olena*, n. sp.
- 152** (150). Mandible distinctly concave ventrally, expanded on the apical half, usually moderately broad **153**
- . Mandible more or less parallel-sided beyond the base, sometimes weakly concave ventrally, width variable **158**
- 153** (149). Antennae short, scarcely extending past the head, most segments about as long as wide; head long, EV/HE ~0.90–1.10 **154**
- . Antennae longer, extending at least to the middle of the pronotum, most segments longer than wide; head shorter, EV/HE ~0.60–0.90 **155**
- 154** (153). Frons microsculpture coriaceous; clypeus in lateral view rounded and slightly recurved ventrally; mandible black; head narrower, WH/LH ~0.80 (Fig. 26D–F) *S. koolauensis* Fullaway
- . Frons microsculpture strongly granular, without reflections; clypeus in lateral view strongly sloping, almost straight, apex distinctly acute; mandible orange-brown; head broader, WH/LH ~0.85 (Fig. 20M–O) *S. granulosa*, n. sp., in part
- 155** (153). Clypeus prominent, subquadrate, apex broadly rounded and somewhat truncate; head strongly convex above and below, DH/LH ~0.59; mandible black; frons punctures sparser, 1–3 pit widths apart, microsculpture fine, slightly shining; lateral ocelli distinctly separate from vertex crest (Fig. 42M–O) *S. yoshimotoi*, n. sp.
- . Clypeus semicircular to semi-elliptical, not particularly prominent, rounded; head moderately to weakly convex above and below, either deeper or higher; mandible reddish-brown to yellow; frons punctures mostly dense, about 1 pit width apart at least between eyes, microsculpture dull and granular; lateral ocelli nearly touching vertex crest **156**

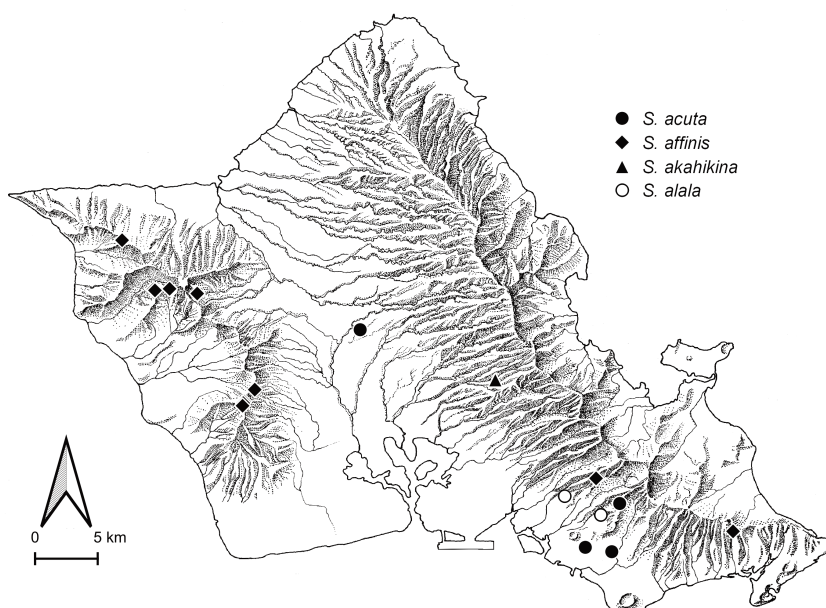
- 156** (155). Head deep, DH/LH ~ 0.63 , and moderately strongly convex dorsally; vertex setae only slightly longer than frons setae; OOL ~ 1.00 – 1.20 *S. hookahi*, n. sp., in part
 –. Head more compressed, DH/LH ~ 0.54 – 0.58 , weakly convex dorsally; vertex setae elongate, conspicuous; OOL ~ 1.25 – 1.45 or more **157**
- 157** (156). Mandible reddish brown; metasoma polished, without a trace of microsculpture medially; head more compressed, DH/LH 0.54 – 0.55 *S. subcrispa* Fullaway
 –. Mandible black; metasoma shining but with distinct microreticulation all over; head deeper, DH/LH 0.56 – 0.58 *S. kaala* Fullaway, in part
- 158** (152). Vertex and genal setae strong and elongate, nearly twice as long as frons setae, very conspicuous (Fig. 7G–I); clypeus strongly arched in profile, carina thin and laminate (Fig. 3I); frons usually densely punctate; head variable but usually moderately narrow, WH/LH 0.72 – 0.85 ; lateral ocelli nearly touching vertex crest (except in *S. fuliginosa*, *S. kaala*, and *S. pilosa*) **159**
 –. Vertex and genal setae sometimes longer than frons setae but not thicker, not particularly conspicuous (Fig. 7A–F); clypeus more or less evenly curved in profile, carina sharp but not thin and laminate (Fig. 3A, B, D, H); if frons densely punctate then head always broader, WH/LH 0.84 – 0.96 ; ocelli variable, often distinctly separated from vertex crest **187**
- 159** (158). Head distinctly triangular in lateral view, genal angle prominent, gena strongly concave in frontal view (Fig. 35A–C); occipital margin carinate; metasoma with distinct microreticulation all over, tergites punctate apically (possibly not resident on O'ahu) *S. pilosa* Fullaway
 –. Head not triangular in lateral view, genal angle broadly rounded or absent, gena flat or convex in frontal view (Figs. 19A–C, 33A–C, 41F–I); occipital margin rounded, not carinate; metasoma usually mostly polished, with microsculpture only laterally if at all ... **160**
- 160** (159). Frons moderately punctate, irregular, 1–3 pit widths apart (sometimes dense between the eyes) **161**
 –. Frons densely punctate, 1 pit width apart or less all over **164**
- 161** (160). Head narrow, WH/LH 0.77 – 0.82 ; frons densely punctate between the eyes; mandible narrow, slightly concave below *S. swezeyi* Fullaway
 –. Head broader, WH/LH > 0.85 ; mandible more or less parallel-sided except at the base, or if slightly concave then broader **162**
- 162** (161). Metasoma with faint but distinct microreticulation all over; femora strongly expanded, less than twice as long as wide, FL/FW 1.80 – 2.05 , HFL/HFW 2.00 – 2.15 ; OOL/WOT 1.25 – 1.45 ; head usually narrower, WH/LH 0.85 – 0.89
 *S. kaala* Fullaway, in part
 –. Metasoma mostly polished, microreticulate only laterally; fore and hind femora much narrower, FL/FW 2.15 – 2.45 , HFL/HFW 2.30 – 3.15 ; OOL/WOT 1.10 – 1.25 ; head generally broader, WH/LH 0.86 – 0.94 **163**
- 163** (162). Hind femur extremely narrow, HFL/HFW 2.90 – 3.15 ... *S. fusca* Fullaway in part
 –. Hind femur moderately narrow, HFL/HFW 2.30 – 2.55 *S. fuliginosa* Fullaway, in part
- 164** (160). Head quite broad, WH/LH ≥ 0.85 , usually > 0.88 ; hind femur always broad, HFL/HFW < 2.40 , usually < 2.20 ; mandible usually moderately narrow **165**
 –. Head narrower, WH/LH 0.77 – 0.84 (rare individuals to 0.86 , if so then HFL/HFW > 2.50); mandible narrow **169**
- 165** (164). Legs all yellow, at most femora tinged with brown dorsally **166**
 –. At least coxae and fore and/or hind femur dark brown to black **168**

- 166** (165). Mandible yellow; head compact, OOL/WOT 1.05–1.25, and moderately broad and deep, WH/LH 0.88–0.89, DH/LH ~0.60; fore femur moderately expanded, FW/FL 1.85–2.00 *S. citripoda*, n. sp., in part
 –. Mandible black; OOL/WOT 1.20–1.40, other characters variable **167**
- 167** (166). Head extremely broad and rather deep, WH/LH 0.95–0.97, DH/LH 0.61–0.63; fore femur strongly expanded, FW/FL 1.72–1.81 *S. poepoe*, n. sp.
 –. Head not as broad or deep, WH/LH 0.86–0.91, DH/LH 0.58–0.59; fore femur moderately expanded, FW/FL 1.85–1.95 *S. flavipes* Fullaway
- 168** (165). Clypeus in profile high and evenly arched; head typical, deepest posterior of the middle and broadly rounded posteriorly to vertex, dimensions somewhat variable but narrower and deeper, WH/LH 0.85–0.88, DH/LH 0.56–0.61 (Fig. 33D–F); metasoma highly polished, without microsculpture or punctation *S. opogonae* Fullaway
 –. Clypeus in profile elongate and not as strongly arched; head distinctively shaped in lateral view, deepest around middle and evenly narrowed to vertex posteriorly, consistently broader and shallower, WH/LH 0.89–0.90, DH/LH 0.55–0.56 (Fig. 11J–L); apical tergites of metasoma punctate laterally *S. alala*, n. sp., in part
- 169** (164). Wings distinctly infusate; third antennal segment long, 1.4–1.6 times as long as wide; mandible black; femora predominantly dark but usually distinctly marked with yellow apically; femora moderately expanded, FW/FL 1.72–2.05, HFL/HFW 2.20–2.70 *S. pano*, n. sp.
 –. Wings hyaline; other characters not in combination **170**
- 170** (169). Distal portion of Rs not quite reaching the wing margin, cell 2R1 partially open; mandible orange-testaceous, legs predominantly yellow but hind femur usually tinged with brown *S. welau*, n. sp.
 –. Rs reaching anterior wing margin, cell 2R1 fully closed; mandible and legs variable, if legs mostly yellow then usually not with only the hind femur brown **171**
- 171** (170). Hind femur narrow, HFL/HFW >2.50, usually >2.60; fore femur moderately expanded, FL/FW 1.90–2.20, usually 1.95–2.15; antennae relatively long, A3 1.2–1.5 times as long as wide; coxae and femora usually entirely dark brown or entirely yellow, if the latter then at most with narrow dorsal margins of the femora brown **172**
 –. Hind femur broad, HFL/HFW <2.45; fore femur strongly expanded, FL/FW 1.75–1.95; antennae relatively short, A3 0.9–1.2 times as long as wide; legs predominantly either dark brown or yellow but almost always with distinct marks of the other color ... **174**
- 172** (171). Mandible black; coxae and femora entirely dark brown to black; WH/LH always ≥0.80; metasoma usually with smooth but distinct microreticulation, sometimes faint *S. olympiana* Fullaway
 –. Mandible yellow; legs variable; WH/LH variable but often ≤0.80; metasoma polished dorsally or with only very faint microreticulation **173**
- 173** (172). Legs entirely yellow *S. hirsuta* Fullaway
 –. Coxae and femora predominantly or entirely dark brown *S. heterochroma*, n. sp.
- 174** (171). OOL/WOT usually <1.33, rarely to 1.40; mandible always black; hind femur moderately expanded, HFL/HFW 2.20–2.40; head moderately broad, WH/LH 0.80–0.84; femora with characteristic color pattern, dark brown with broadly yellow apices, pale color sometimes extending medially on the fore femur for much of its length *S. vestita* Fullaway

- . Without the above combination of characters: OOL/WOT >1.33, usually >1.40; hind femur variable but often very strongly expanded, HFL/HFW 1.80–2.40; head width and color of mandible and legs variable, sometimes with the same pattern on the femora, often predominantly pale, if WH/LH >0.78 then mandible always pale brown to yellow **175**
- 175** (174). Head distinctly narrow, WH/LH 0.72–0.76 (rarely to 0.77), appearing elongate in frontodorsal view, and flattened, DH/LH 0.50–0.52; OOL/WOT >1.38 (Figs. 22D–F, 39M–O) **176**
- . Head broader, WH/LH >0.76, appearing rounded in frontodorsal view, and deeper, DH/LH 0.53–0.56 or more; OOL/WOT usually <1.38 (Figs. 18M–O, 41D–F) **177**
- 176** (175). Mandible pale brown to yellow; coxae and femora predominantly yellow with brown markings, up to about half brown *S. tenuis* Fullaway
- . Mandible dark brown to black; coxae and femora entirely dark brown to black *S. hirticeps* Fullaway
- 177** (175). Mandible dark brown to black; head usually narrower, WH/LH 0.76–0.77; third antennal segment at least slightly longer than wide *S. usitata* Fullaway
- . Mandible yellow to testaceous; head broader, WH/LH 0.78–0.83; third antennal segment as wide as long or slightly wider *S. femoralis*, n. sp.
- 178** (158). Mandible slightly twisted or distinctly convex externally (Figs. 12N, 20E, 31H, 39B) **179**
- . Mandible not twisted or distinctly convex externally, more or less flat or only weakly convex (Figs. 23K, 39H) **187**
- 179** (178). Mandible and prothorax yellow, sometimes metasoma also brownish to yellow **180**
- . Body entirely black, clypeus and mandible sometimes brown **181**
- 180** (179). Frons densely punctate, about 1 pit width apart or less, with granular microsculpture; mandible moderately broad; metasoma dark brown to black, with smooth but distinct microreticulation over all terga *S. aristoteliae* Fullaway, in part
- . Frons moderately punctate, 1–3 pit widths apart, slightly shining with fine microsculpture; mandible moderately narrow; metasoma yellowish, highly polished, without distinct microreticulation *S. mandibulata* Fullaway
- 181** (179). Mandible distinctly convex externally, semicylindrical in cross-section; legs all yellow; clypeal carina sharp (Figs. 20E, 31H) **182**
- . Mandible flat but slightly twisted; at least femora often brown; clypeus sometimes weakly carinate (Fig. 39B) **185**
- 182** (181). Clypeus in profile nearly straight, evenly sloping or only slightly curved; mandible moderately broad, ventral tooth partially concealed behind second in front view *S. nihopeku*, n. sp.
- . Clypeus in profile distinctly curved, often slightly recurved ventrally; mandible moderately narrow, ventral tooth not concealed behind second in front view **183**
- 183** (182). Head extremely broad and deep, WH/LH 0.94–0.98, DH/LH 0.63–0.66; femora predominantly yellow, fore femora usually dark on dorsal and sometimes ventral margin, hind femur with a broad brown band medially *S. huikau*, n. sp. in part
- . Head narrower and more compressed, WH/LH 0.84–0.90, DH/LH 0.56–0.60; legs entirely yellow or with only dorsal margins of femora brown **184**

- 184** (183). Frons punctures dense between the eyes, about 1 pit width apart, sparser above; mandible slightly angulate outwardly at second ventral tooth which is distinctly longer than others *S. gracilariae* Fullaway
 –. Frons punctures sparser, 1–3 pit widths apart or less across entire frons; mandible not angulate or strongly convex outwardly, second ventral tooth about as long as ventral tooth *S. kaumuohona* Fullaway
- 185** (181). Frons sparsely punctate, mostly 3 or more pit widths apart, punctuation partly obscured by coarse microsculpture *S. nuda* Fullaway
 –. Frons with denser punctures, about 1–3 pit widths apart, distinct **186**
- 186** (185). Wings distinctly infusate *S. suttoniae* Fullaway, in part
 –. Wings hyaline or faintly tinged with yellow *S. lanihuliana* Fullaway
- 187** (178). Metasoma shining but with distinct microreticulation over entire surface **188**
 –. Metasoma polished, with faint microsculpture at most on lateral margins of terga **193**
- 188** (187). Clypeus in profile high and somewhat strongly arched, slightly recurved ventrally (Fig. 23K); ocellar triangle front angle right to weakly obtuse; fore femur broad, less than twice as long as wide, FL/FW 1.80–2.05; head moderately narrow, WH/LH 0.84–0.89; coxae and femora dark brown to black *S. kaala* Fullaway, in part
 –. Clypeus in profile evenly curved (Figs. 39G, 25H); ocellar triangle right to acute; fore femur somewhat narrow, twice as long as wide or more, FL/FW ~2.0–2.5; head width variable but often wide, WH/LH >0.90; legs variable **189**
- 189** (188). Lateral ocelli nearly touching vertex crest; head strongly convex below and round in dorsal view, OOL/WOT 1.10–1.30 (Fig. 39G–I) *S. tenebriosa* Fullaway
 –. Lateral ocelli distinctly separate from vertex crest; head weakly convex below and elongate in dorsal view, OOL/WOT 1.35–1.65 (Fig. 25G–I) **190**
- 190** (189). Frons punctuation 1–3 pit widths apart all over, microsculpture smooth to fine; head elongate behind the eyes, EV/HE >0.85; frons distinctly broader than eye height, WF/HE 1.10–1.15 **191**
 –. Frons punctuation dense between the eyes, 1–3 pit widths above, microsculpture coriaceous to granular; head short behind the eyes, EV/HE <0.85; frons subequal to eye height, WF/HE 1.00–1.05 **192**
- 191** (190). Mandible narrow, more or less parallel-sided; mandible color variable, from black to yellow; OOL/WOT 1.60–1.75 *S. gracillima* Fullaway, in part
 –. Mandible moderately broad, slightly concave ventrally; mandible always black; OOL/WOT 1.35–1.60 *S. koebelei* Fullaway
- 192** (190). Mandible moderately broad; head more compressed, DH/LH ~0.55; antennae relatively short, A3 about 1.0–1.2 times as long as wide ... *S. pambertoni* Fullaway, in part
 –. Mandible moderately narrow; head deeper, DH/LH ~0.60; antennae relatively long, A3 about 1.3–1.4 times as long as wide *S. punctata* Fullaway
- 193** (187). Head extremely narrow, WH/LH 0.70, WF/HE ~0.95, widest at the anterior portion of the eyes, appearing elongate-quadrate in dorsal view (Fig. 35M–O) *S. poohiwi*, n. sp.
 –. Head broader, WH/LH 0.80–0.98, WF/HE >1.00, eyes more rounded anteriorly, appearing ovate in dorsal view **194**

- 194** (193). Mandible broad, hardly narrowed from the base; head moderately narrow, WH/LH 0.80–0.84; lateral ocelli distinctly separate from vertex crest *S. aspera* Fullaway
 –. Mandible narrow to moderately narrow; head broader (except in *S. larifuga*, which has the lateral ocelli nearly touching vertex crest) **195**
- 195** (194). Frons densely punctate at least between the eyes, often all over, usually with coriaceous to dull granular microsculpture; head somewhat more compressed, DH/LH ~0.55–0.58; mandible moderately narrow **196**
 –. Frons moderately punctate all over, 1–3 pit widths apart, usually with smooth to fine microsculpture; head deeper, DH/LH 0.59–0.66; mandible narrow **199**
- 196** (195). Mandible and legs all yellow; ocellar triangle strongly acute and narrow, OOL/WOT 1.60–1.75 *S. incita* Fullaway
 –. Mandible black, coxae and femora at least mostly dark brown; ocellar triangle right to obtuse and broader, OOL/WOT 1.10–1.45 **197**
- 197** (196). Fore femora narrow, more than twice as long as wide, FL/FW 2.10–2.30; frons microsculpture coriaceous to fine, weakly shining in direct light; ocellar triangle obtuse; wing cell setation intermediate, with two complete rows of setae and a few additional ones *S. fuliginosa* Fullaway, in part
 –. Fore femora less than twice as long as wide, FL/FW 1.75–1.95; frons microsculpture very dull granular; ocellar triangle right; basal wing cells densely setose **198**
- 198** (197). Clypeus in profile evenly curved, slightly recurved apically; frons not particularly broad in dorsal view, WF/HE ~1.0; head narrower, WH/LH ~0.82–0.88; occipital margin broadly rounded; metasoma highly polished, without punctation; A3 short, only about as long as wide (Fig. 27J–L) *S. larifuga* Evans
 –. Clypeus in profile elongate; head broader, WH/LH 0.89–0.90; frons distinctly broad in dorsal view, WF/HE ~1.2; occipital margin carinate; apical tergites of metasoma punctate laterally; A3 elongate, about 1.5 times as long as wide (Fig. 11J–L)
 *S. alala*, n. sp., in part
- 199** (195). Head extremely broad and deep, WH/LH 0.94–0.98, DH/LH 0.63–0.66; femora predominantly yellow, fore femora usually dark on dorsal and sometimes ventral margin, hind femur with a broad brown band medially ... *S. huikau*, n. sp., in part
 –. Head narrower and more compressed, WH/LH 0.89–0.95, DH/LH 0.59–0.62; femora entirely brown or nearly so **200**
- 200** (199). Fore femur moderately broad, hind femur narrow, FL/FW ~2.00, HFL/HFW ~2.80–2.90; mandible yellowish; frons punctation obscure, visible only at a strongly oblique angle; A3 elongate, about 1.7–2.0 times as long as wide *S. nigra* Fullaway
 –. Both fore and hind femora either broad or narrow; mandible black; frons punctation distinct; A3 variable **201**
- 201** (200). Fore femur robust, FL/FW 1.8–2.1, hind femur moderately broad, HFL/HFW 2.10–2.50; A3 short, only about 1.2 times as long as wide *S. anemophila* Fullaway
 –. Fore and hind femora narrow, FL/FW 2.3–2.6, HFL/HFW 2.80–3.10; A3 elongate, about 1.7–2.0 times as long as wide *S. fusca* Fullaway, in part



Map 2. Collection localities of *Sierola acuta*, *S. affinis*, *S. akahikina*, and *S. alala*.

Species Accounts

Sierola acuta Fullaway, 1920

Figure 11A–C, Map 2

Sierola acuta Fullaway, 1920: 74.

Island. O‘ahu.

Diagnosis. The large, protruding, triangular clypeus separates this species from all others except *S. rugiventris*, from which it can be distinguished by the mandible being vertical rather than twisted.

Description. Female. Head. Clypeal process triangular, apex rounded; dorsally with a distinct but narrow, sharp ridge raised slightly above the otherwise flat surface; in profile evenly sloping, nearly straight. Mandible moderately broad, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest well behind eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; transverse carina distinct, complete; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

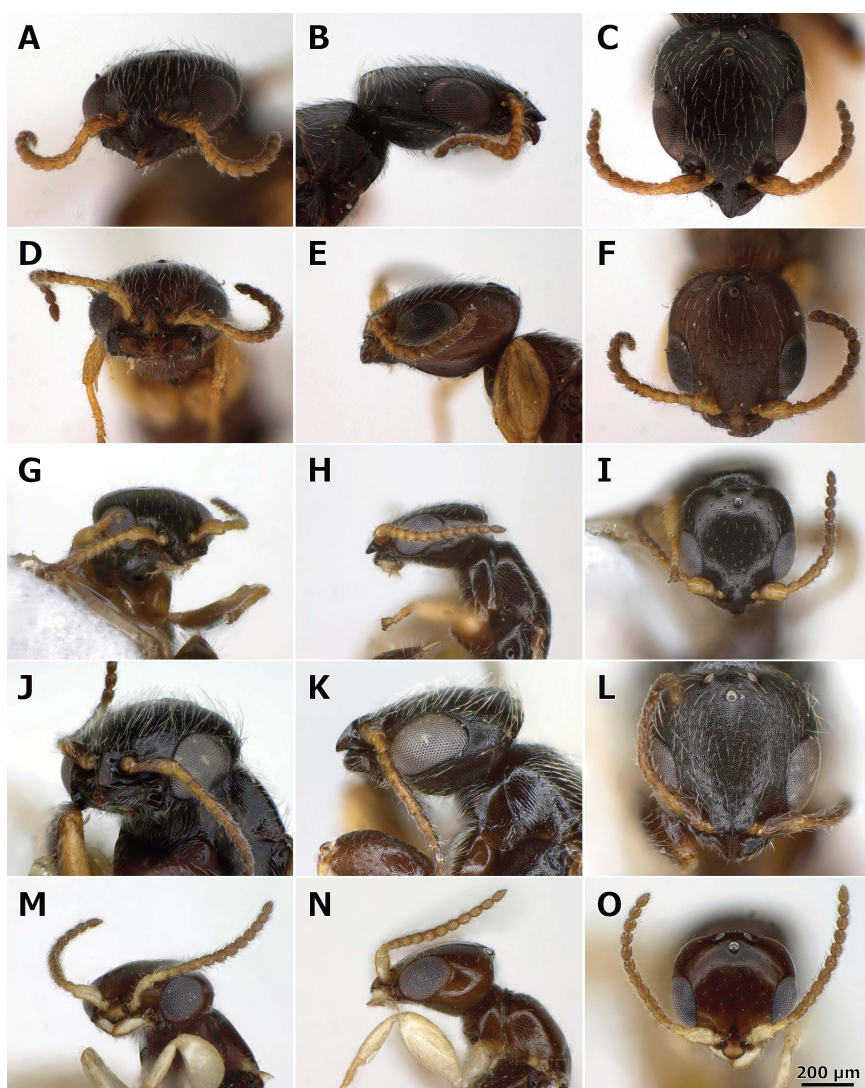


Figure 11. A–C: *Sierola acuta*. D–F: *Sierola affinis*. G–I: *Sierola akahikina*. J–L: *Sierola alala*. M–O: *Sierola alba*.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.14 mm; LT 1.01 mm; WH/LH 0.79; DH/LH 0.43; EV/HE 0.83; EV/WF 0.74; WF/HE 1.13; WH/WF 1.78; OOL/WOT 1.75; DT/LT 0.34; FL/FW 2.07; HFL/HFW 2.32; A3 L/W 1.00.

Type Material. Holotype ♀. O‘ahu: HSPA Exp. Sta., 18 Jul 1916, collected on window, P.H. Timberlake, BPBM Type 5.

Distribution. Found in the lowlands up to about 800 ft. (240 m) elevation. Known from

a handful of specimens, most collected on or in the vicinity of sugarcane, and several taken at light traps; the most recent was 1966.

Ecology. Reared from the sugarcane bud worm, *Erechthias flavistriata* (Walsingham) (Tineidae) by Swezey (1909), who misidentified it as *S. molokaiensis* prior to Fullaway's work. The one specimen I have been able to find labelled as being reared is now missing its head, but the association with sugarcane and other grasses is extremely strong.

Discussion. This is the only Hawaiian species with a strong, distinct transverse propodeal carina, a feature commonly found in Australian and Asian *Sierola* but nearly absent from insular Pacific species. The association with sugarcane suggests that its original host was a native grass-feeding caterpillar, possibly *Omiodes accepta* (Butler), the endemic sugarcane leafroller with a broad host range among native and introduced grasses. The battery of alien parasites purposely introduced to control *O. accepta* and the decline of both sugarcane cultivation and native grasses may be responsible for the absence of this species. The known host, the sugarcane budworm, also feeds on palms, bananas, and *Pandanus*. However, these hosts are rarely searched for *Sierola* in the lowlands, so it may still persist. The closely related *S. rugiventris* is also a lowland species.

Sierola affinis Fullaway, 1920

Figure 11D–F, Map 2

Sierola affinis Fullaway, 1920: 121.

Island. O'ahu.

Diagnosis. Part of a complex of species with broad, nearly parallel-sided mandibles, a short, steeply curved clypeus, frons microsculpture coriaceous, and sparsely setose basal wing cells. Together with *S. pygmaea*, separated from related species by the broad frons, distinctly greater than the eye height and shorter behind the eyes (WF/HE 1.15–1.25, EV/HE 0.85–1.00, OOL/WOT 1.75–1.95). Distinguished from *S. pygmaea* by the rounded, elliptical clypeus and moderate frons punctation. The clypeus also usually appears weakly carinate, unlike *S. aspera* and *S. luteipes* which clearly have a sharp carina. The clypeus is consistently tinged orange to yellow in all specimens, which distinguishes it from all three.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute, or steep and short, evenly curved. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape

and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.93 mm; LT 0.92 mm; WH/LH 0.86 (0.83–0.87); DH/LH 0.58 (0.56–0.60); EV/HE 0.89 (0.87–0.97); EV/WF 0.75 (0.75–0.82); WF/HE 1.18 (1.15–1.22); WH/WF 1.69 (1.69–1.74); OOL/WOT 1.91 (1.75–1.92); DT/LT 0.39; FL/FW 2.07 (2.07–2.29); HFL/HFW 2.55 (2.28–2.82); A3 L/W 1.33 (1.11–1.33). N = 8.

Type Material. Holotype ♀. O'ahu: Kuli'ou'ou, 22 Dec 1918, P.H. Timberlake, BPBM Type 99.

Distribution. Uncommon, found in wet to wet-mesic forest across the island but primarily in the Wai'ananae range.

Discussion. The setation of the basal wing cells is intermediate, cell 1Cu having only one row of setae while cell R is densely setose. The collection date of the holotype was incorrectly recorded by Fullaway as Dec. 12 (the first 2 is narrow, but 1 written by Timberlake is always an unadorned line, without serifs).

Sierola akahikina, n. sp.

Figure 11G–I, Map 2

Island. O'ahu.

Diagnosis. Clypeus flat dorsally, mandible strongly twisted and with distinct teeth, and wing cells nearly glabrous. Closely resembling *S. alba*, but lacking the pale coloration of that species, with the head not as broad or deep, and with smooth but distinct microsculpture on the frons.

Description. Female. Head. Clypeal process nearly semicircular, slightly constricted at base, apex broadly rounded or truncate; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible narrow, more or less parallel-sided except at base; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.61 mm; LT 0.81 mm; WH/LH 0.90; DH/LH 0.52; EV/HE 0.73; EV/WF 0.59; WF/HE 1.23; WH/WF 1.68; OOL/WOT 1.32; DT/LT 0.36; FL/FW 1.75; HFL/HFW 1.67; A3 L/W 0.68.

Type Material. Holotype ♀. O'ahu: Waimano Trail 1100' [335 m], 21.4324°N 157.9061°W, 4 Sep

2012, sweeping *Freyrcinetia arborea*, K.N. Magnacca, BPBMENT 0000017878.

Etymology. From the Hawaiian *aka*, shadow, and *hikina*, eastern, referring to its similarity to a black *S. alba* and its presence in the Ko‘olau range. It is a noun in apposition.

Distribution. Known only from the type, taken in the central Ko‘olau range.

Sierola alala, n. sp.

Figure 11J–L, Map 2

Island. O‘ahu.

Diagnosis. Fitting among species with a sharp clypeus, closely punctate frons, and densely setose basal wing cells. Close to *S. vestita*, distinguished from it and others in the *olympiana* complex by the finer frons punctation, distinctly triangular clypeus with a less strongly arched carina, broad head (WH/LH ~0.90), laterally punctate metasomal tergites, and much larger overall size.

Description. Female. Head. Clypeal process triangular or rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave, or with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or elongate, evenly curved, apex acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin carinate. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena below eye flat. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, apical tergites punctate laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Areolet distinctly convex posteriorly, corner medioapical.

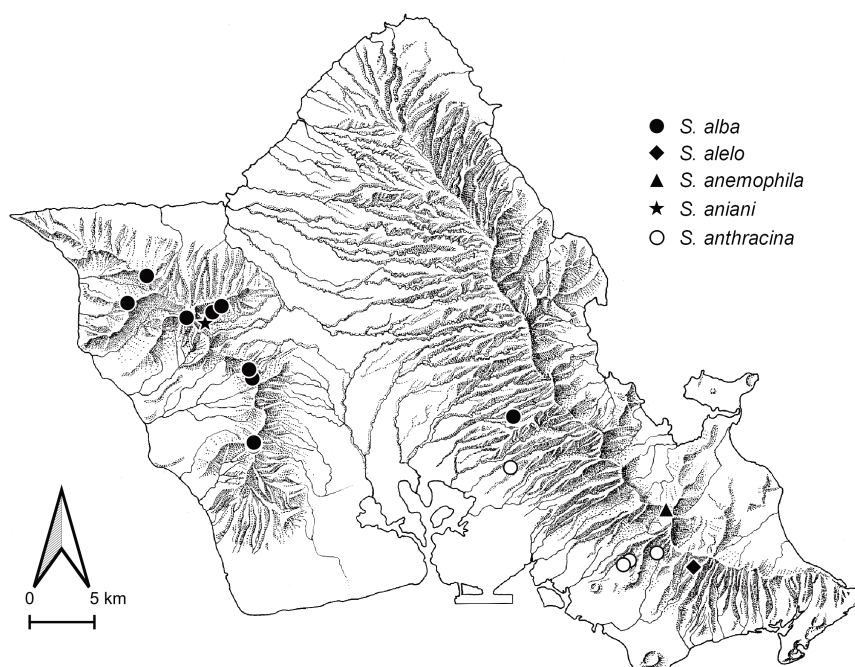
Measurements. LFW 2.30 mm; LT 1.13 mm; WH/LH 0.90; DH/LH 0.54; EV/HE 0.60; EV/WF 0.49; WF/HE 1.21; WH/WF 1.61; OOL/WOT 1.29; DT/LT 0.47; FL/FW 1.84; HFL/HFW 2.00; A3 L/W 1.50.

Type Material. Holotype ♀. O‘ahu: Mt. Tantalus, 24 Aug 1963, J.L. Gressitt, BPBMENT 0000017879.

Paratypes: 1 ♀, Tantalus, 6 Jan 1923, on bark of tree, O.H. Swezey, BPBM. 1 ♀, Mt. Tantalus, 4 Jul 1956, J.W. Beardsley, BPBM. 1 ♀, Kapālama Trail 800' [240 m], 1 Nov 1968, *Ilex anomala*, W.C. Gagné, BPBM.

Etymology. Named for the *‘alalā*, the Hawaiian native crow, for the resemblance of the prolonged clypeus to a beak and the entirely black color. It is a noun in apposition.

Distribution. Known from four specimens, all from the vicinity of Nu‘uanu Valley.



Map 3. Collection localities of *Sierola alba*, *S. alelo*, *S. anemophila*, *S. aniani*, and *S. anthracina*.

Sierola alba, n. sp.

Figure 11M–O, Map 3

Island. O‘ahu.

Diagnosis. The strongly twisted, cream-colored mandible, elongate but strongly convex head, highly polished frons, and flat clypeus make this species unmistakable.

Description. Female. Head. Clypeal process rounded triangular or semicircular, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; strongly twisted, outwardly polished, smooth, shining; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture nearly absent, polished. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible very pale yellow-white. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae. Areolet distinctly convex posteriorly, corner medioapical.

Measurements. LFW 1.67 mm; LT 0.83 mm; WH/LH 0.99; DH/LH 0.57; EV/HE 0.71; EV/WF 0.55; WF/HE 1.29; WH/WF 1.70; OOL/WOT 1.37; DT/LT 0.46; FL/FW 2.10; HFL/HFW 2.50; A3 L/W 1.00.

Type Material. Holotype ♀ and allotype ♂. O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Apr 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 0000017880.

Paratypes: 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Apr 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♂, North Hale'au'au Gulch 2350' [720 m], 21.5066°N 158.1297°W, 24 Feb 2012, on *Diospyros*, K.N. Magnacca, BPBM. 1 ♀ 1 ♂, Waimano Trail 1100' [335 m], 21.4324°N 157.9061°W, 4 Sep 2012, sweeping *Freyinetia arborea*, K.N. Magnacca, BPBM. 1 ♀, 'Ōhikilolo 2900' [885 m], 21.5133°N 158.1930°W, 6 Jun 2013, on *Metrosideros polymorpha*, K.N. Magnacca, BPBM. 1 ♂, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 21 May 2014, on *Psychotria mariniana*, K.N. Magnacca, BPBM. 1 ♀ 2 ♂, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 6 Jul 2014, on *Pisonia sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 6 Jul 2014, on *Xylosma hawaiiense*, K.N. Magnacca, BPBM. 1 ♀, Pūle'e, Coffee Gulch 1900' [580 m], 21.5108°N 158.1230°W, 24 Mar 2015, on *Labordia kaalae*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Dec 2015, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♂, 'Ōhikilolo 2900' [885 m], 21.5133°N 158.1930°W, 8 Jun 2016, sweeping, K.N. Magnacca, BPBM. 1 ♂, Central Kalua'a Gulch 2200' [670 m], 21.4603°N 158.1004°W, 30 Jun 2016, on *Pisonia*, K.N. Magnacca, BPBM. 1 ♀ 1 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 2 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♀ 2 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Oct 2016, on *Coprosma longifolia*, K.N. Magnacca, NMNH. 1 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Oct 2016, on *Perrottetia sandwicensis*, K.N. Magnacca, NMNH. 1 ♀ 1 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Oct 2016, on *Kadua affinis*, K.N. Magnacca, NMNH. 2 ♀, Palikea 3000' [915 m], 21.4155°N 158.0995°W, 23 Nov 2016, on *Coprosma longifolia*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4155°N 158.0995°W, 21 Dec 2016, on *Cheirodendron trigynum*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 21 Dec 2016, on *Perrottetia sandwicensis*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 23 Jan 2017, on *Coprosma longifolia*, K.N. Magnacca, UHIM. 1 ♀, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 22 Feb 2017, on *Kadua affinis*, K.N. Magnacca, UHIM. 1 ♀ 1 ♂, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 22 Feb 2017, on *Coprosma longifolia*, K.N. Magnacca, UHIM. 2 ♀, Palikea 3000' [915 m], 21.4155°N 158.0995°W, 22 Jun 2017, on *Coprosma longifolia*, K.N. Magnacca, BPBM.

Etymology. From the Latin *alba*, white, referring to the striking cream coloration of the legs and mandible. It is an adjective in the nominative singular.

Distribution. Found in both mountain ranges, abundantly in the Wai'anāe and rarely in the Ko'olau, in mesic to wet forest.

Ecology. Collected on a very wide array of plants.

Discussion. This is now one of the most common species of *Sierola* on O'ahu, despite there being no specimens of it from before 2012. It does appear to occur predominantly in the Wai'anāe range and be rare in the Ko'olau, where most earlier collecting was done, but there are significant earlier collections from the Wai'anāe. There is some possibility it could be introduced, but nothing like it has been seen among undescribed specimens from elsewhere. Indeed, while somewhat unique in the details, it more closely resembles the unusual innovations of Hawaiian species such as *S. montana* and *S. kamani* than those of the Australian fauna. Perhaps some change in host abundance has resulted in it becoming much more common than previously.

Sierola alelo, n. sp.
Figure 12A–C, Map 3

Island. O'ahu.

Diagnosis. A distinctive species, with the mandible bent down at the base and the clypeus prominent, large relative to the head, and semicircular, flat dorsally with a faint carina basally. The sparsely setose basal wing cells also distinguish it from others with bent mandible except for *S. kumumu*, n. sp., which has the clypeus convex dorsally, mandible and at least front femora yellow, and ocellar triangle strongly obtuse.

Description. Female. Head. Clypeal process semicircular or quadrate, apex broadly rounded; dorsally flat, with a trace of a low carina basally; in profile elongate, evenly curved, apex acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; distinctly bent down near base, crossing when closed, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.52 mm; LT 0.73 mm; WH/LH 0.82; DH/LH 0.53; EV/HE 0.66; EV/WF 0.66; WF/HE 1.00; WH/WF 1.86; OOL/WOT 1.24; DT/LT 0.42; FL/FW 1.95; HFL/HFW 2.75; A3 L/W 1.25.

Type Material. Holotype ♀. O'ahu: Pālolo Cr. [Creek?], 28 Feb 1920, E.H. Bryan, BPBMNT 0000017881.

Etymology. From the Hawaiian *alelo*, tongue, referring to the broad, flat clypeus. It is a noun in apposition.

Distribution. Known only from the type, collected at Pālolo in 1920.

Discussion. The holotype has had the metasoma broken off and glued back (association not lost).

Sierola anemophila Fullaway, 1920

Figure 12D–F, Map 3

Sierola anemophila Fullaway, 1920: 129.

Island. O'ahu.

Diagnosis. Belonging to the large group of species with the basal wing cells densely setose, clypeus carinate and evenly curved, and mandible narrow and parallel-sided to slightly

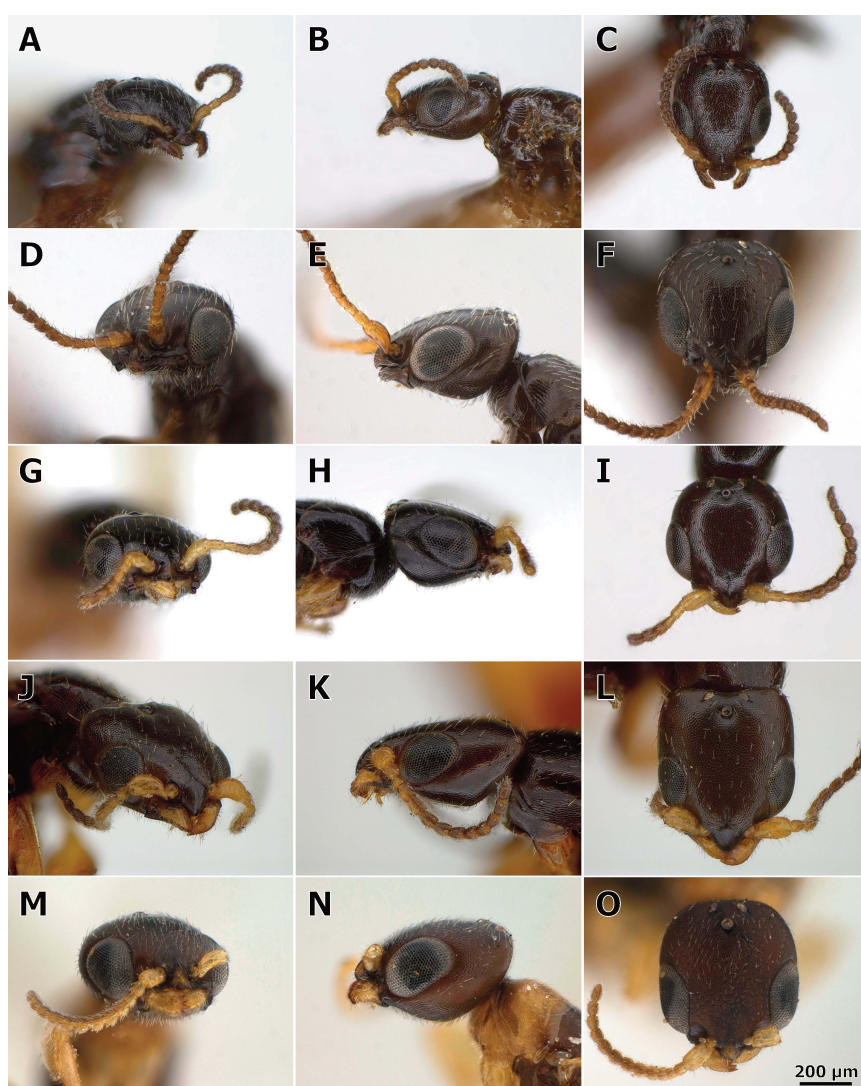


Figure 12. A–C: *Sierola alelo*. D–F: *Sierola anemophila*. G–I: *Sierola aniani*. J–L: *Sierola anthracina*. M–O: *Sierola aristoteliae*.

concave ventrally without any modifications. Forming a closely related complex with *S. nigra* and *S. tenebriosa*, denoted by the broad, deep head (WH/LH 0.89–0.95, DH/LH 0.59–0.64). Separated from those species by the polished metasoma, weak, fine frons microsculpture and black mandible. Also similar to *S. fusca*, distinguished by the broader femur and much shorter A3 (1.2–1.3 times as long as wide compared to 1.7–1.9 in *S. fusca*).

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and

genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.00 mm; LT 0.97 mm; WH/LH 0.92; DH/LH 0.59; EV/HE 0.61; EV/WF 0.58; WF/HE 1.04; WH/WF 1.81; OOL/WOT 1.07; DT/LT 0.41; FL/FW 1.94; HFL/HFW 2.42; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Nu'uuanu Pali, 1 Apr 1917, D.T. Fullaway, BPBM Type 113.

Distribution. Found in wet areas, around the peaks of Ka'ala and Kalena in the Wai'anāe range, and lower down in the Ko'olau range. Last collected in 1944.

Discussion. This species is very similar to *S. nigra* and *S. fusca*, and they could eventually prove to be synonyms as they all occur sympatrically. The three differ primarily in the microsculpture of the frons and abdomen and shape of the femora, both of which are generally reliable characters. They strongly resemble the *S. similis*/*S. manoa* complex, but have the basal wing cells setose.

Sierola aniani, n. sp.

Figure 12G–I, Map 3

Island. O'ahu.

Diagnosis. Closely related to *S. uhiwai*, which it groups with by the weakly carinate clypeus and yellow, strongly concave mandible. Separated from that species by the somewhat elongate clypeus which is curved in lateral view, all yellow legs, and nearly glabrous basal wing cells. The last also distinguishes it from *S. halona*.

Description. Female. Head. Clypeal process semi-elliptical, apex weakly pointed or rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart, or with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte, or evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Side of head behind eye with a line of smooth tessellate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting above and below. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.92 mm; LT 0.97 mm; WH/LH 0.98; DH/LH 0.63; EV/HE 0.62; EV/WF 0.53; WF/HE 1.18; WH/WF 1.72; OOL/WOT 1.04; DT/LT 0.42; FL/FW 2.04; HFL/HFW 2.70; A3 L/W 1.48.

Type Material. Holotype ♀. O'ahu: Hale'au'au, 28 Apr 1935, *Antidesma*, O.H. Swezey, BPBMENT 0000017882.

Paratype: 1 ♀, Hale'au'au, 28 Apr 1935, *Antidesma*, O.H. Swezey, BPBM.

Etymology. From the Hawaiian *aniani*, mirror, referring to the close similarity of this species to *S. halona* and *S. uhiwai*, and its occurrence in Hale'au'au close to where most specimens of the latter have been found. It is a noun in apposition.

Distribution. Known only from three specimens taken in mesic forest below Ka'ala, two from Hale'au'au on the southeast slope and one from the northern slope.

Discussion. See comments under *S. uhiwai*.

Sierola anthracina Fullaway, 1920

Figure 12J–L, Map 3

Sierola anthracina Fullaway, 1920: 83.

Island. O'ahu.

Diagnosis. Part of a complex of species lacking a clypeal carina, with the mandible falcate and basal wing cells nearly glabrous. Distinguished from all related species by having the clypeus distinctly convex dorsally and pointed apically rather than flat dorsally and rounded apically, mandible reddish brown to orange, and head flat behind the eyes in lateral view, not convex. It shares with *S. laupapa* the strongly expanded fore femur (less than twice as long as wide) and flattened pronotum which is strongly angulate anteriorly.

Description. Female. Head. Clypeal process triangular, apex pointed; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; slightly twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/3 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view broadly, shallowly concave, corners somewhat squared; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle present posteriorly, not prominent, head relatively flat. Postgenal depression deep, distinct, broad. Antenna extending to pronotum.

Mesosoma. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to orange. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.10 mm; LT 1.16 mm; WH/LH 0.81; DH/LH 0.52; EV/HE 1.10; EV/WF 0.85; WF/HE 1.30; WH/WF 1.69; OOL/WOT 1.38; DT/LT 0.40; FL/FW 1.70; A3 L/W 0.89.

Type Material. Holotype ♀. O'ahu: Tantalus 1500' [460 m], 22 Dec 1918, W.M. Giffard, BPBM Type 23.

Distribution. Restricted to the central and southern Ko'olau range. Last collected in 1962.

Discussion. This species is closely related to three others on O'ahu (*S. beardsleyi*, *S. curvata*, and *S. laupapa*), as well as undescribed species from all the other islands. With its strongly rounded clypeus, *S. anthracina* is the most easily distinguished. The species appear to be allopatric except for *S. anthracina* and *S. curvata*, which are very distinct in the depth and curvature of the head.

Sierola aristoteliae Fullaway, 1920

Figure 12M–O, Map 4

Sierola aristoteliae Fullaway, 1920: 82.

Sierola seminigra Fullaway, 1920: 98, **n. syn.**

Island. O'ahu.

Diagnosis. The dense, fine punctation of the head combined with very short, even setae (shorter than the width of the antennal flagellum) makes this species easily recognizable. The usually bicolored body, weakly carinate, trapezoidal clypeus and rounded shape of the head are also distinctive. The only similar species is *S. manono*, which is nearly identical but is all black, has the mandible with only three strong teeth, and has the head slightly wider.

Description. Female. Head. Clypeal process semicircular or semi-elliptical, apex broadly rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and re-curved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with shallow, close punctures, mostly less than 1 pit width apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Prothorax yellow, body otherwise dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible yellow. Legs all yellow.

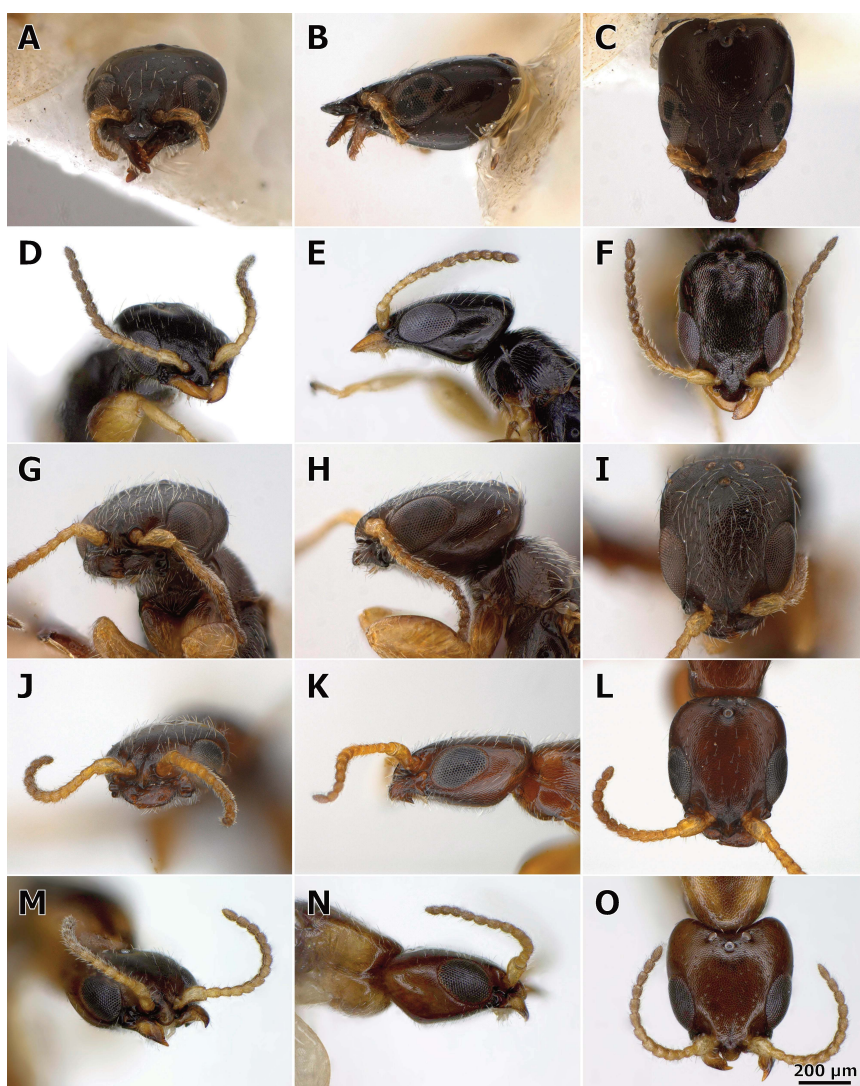


Figure 13. A–C: *Sierola armata*. D–F: *Sierola arpactes*. G–I: *Sierola aspera*. J–L: *Sierola auwae*. M–O: *Sierola balteata*.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.00 mm; LT 0.99 mm; WH/LH 0.86; DH/LH 0.61; EV/HE 0.75; EV/WF 0.72; WF/HE 1.04; WH/WF 1.76; OOL/WOT 1.46; DT/LT 0.39; FL/FW 2.13; HFL/HFW 2.50; A3 L/W 1.00.

Type Material. Holotype ♀ of *Sierola aristoteliae*. O‘ahu: Pālolo, 11 Jan 1914, reared from larva of *Aristotelia* [= *Merimnetria*] infesting *Gouldia* [= *Kadua*] fruit [date is collection date], O.H. Swezey, BPBM Type 22.

Holotype ♀ of *Sierola seminigra*. O‘ahu: Cooke’s trail, Nu‘uanu, 14 Jan 1917, D.T. Fullaway, BPBM Type 52.

Distribution. Widespread in the central and southern Ko‘olau range; in the Wai‘anae range, known only from Kapuna Gulch, despite the wide range of its host plant.

Ecology. Reared from *Merimnetria* (*Aristotelioides*) *elegantior* in fruits of *Kadua affinis*;

melanic individuals reared from *M. homoxyla*, presumably in stem galls. The latter were originally identified as *S. tantalea* (= *S. testaceipes*) and are listed as such by Swezey (1954) and Zimmerman (1978b). Closely associated with *K. affinis* and only rarely collected on other plants.

Discussion. Fullaway separated *S. aristoteliae* and *S. seminigra* based on the clypeus being carinate in the latter but not the former. It is weakly carinate (angulate) in the type of *S. aristoteliae*, and as in many species with a weakly carinate clypeus, clearly varies depending on the individual and the angle at which it is viewed. See also notes under *S. manono*. Four nearly all black specimens (originally identified by Swezey as *S. tantalea*), with only the pronotum and base of the metasoma tinged brown, were reared from *Merimnetria homoxyla*, the presumed host of *S. manono*, but have the mandible and head dimensions of *S. aristoteliae*. These may represent hybrids or possibly indicate that the two are incompletely separated host races.

***Sierola armata* Fullaway, 1920**

Figure 13A–C, Map 4

Sierola armata Fullaway, 1920: 72.

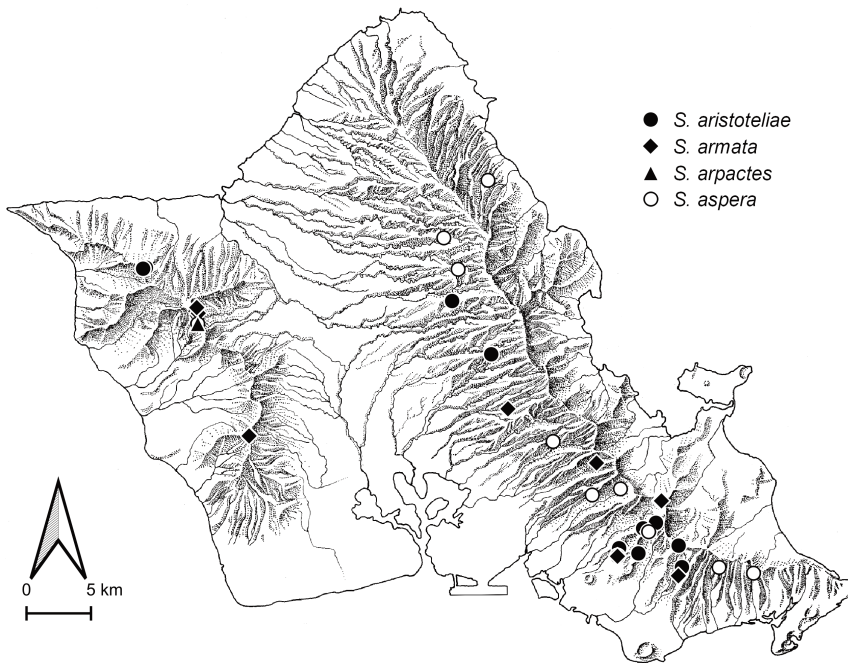
Island. O'ahu.

Diagnosis. Immediately recognizable by the flat, elongate, spatulate clypeus and bent-down mandible with distinct teeth. Other species with a similar mandible have the clypeus convex to the apex in lateral view and shorter, and the frons microsculpture coriaceous to granular; in *S. armata* the flattened apical portion of the clypeus is parallel to the long axis of the head in lateral view, rather than sloping in line with the basal part. Additionally distinguished from the very similar *S. neoarmata* by the enlarged ventral tooth of the mandible, longer malar space ($1/3$ – $1/2$ as long as basal mandible width), more compressed head, extremely narrow frons, and longer behind the eyes (DH/LH 0.42–0.46, WF/WH 1.94–2.12, OOL/WOT 1.59–1.75 compared to 0.48–0.51, 1.73–1.91, and 1.40–1.60 respectively in *S. neoarmata*).

Description. Female. Head. Clypeal process spatulate, expanded beyond anterior margin of head, apex broadly rounded; dorsally flat, with a trace of a low carina basally; in profile slightly sloping at base, apical portion horizontal. Mandible narrow, more or less parallel-sided except at base; distinctly bent down near base, crossing when closed, outwardly polished, smooth, shining; in ventral view abruptly bent near base, distally straight. Apex of mandible strongly oblique, with teeth distinctly stronger ventrally. Malar space $1/2$ as long as width of base of mandible. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart, or with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture, or finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.



Map 4. Collection localities of *Sierola aristoteliae*, *S. armata*, *S. arpactes*, and *S. aspera*.

Color. Body entirely dark brown to black. Mandible black, reddish at apex before teeth. Coxae and femora dark brown to black, front tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.93 mm; LT 0.98 mm; WH/LH 0.67 (0.63–0.71); DH/LH 0.44 (0.42–0.46); EV/HE 0.97 (0.88–1.02); EV/WF 1.03 (0.91–1.07); WF/HE 0.95 (0.90–1.03); WH/WF 2.03 (1.94–2.12); OOL/WOT 1.62 (1.59–1.74); DT/LT 0.40; FL/FW 2.11 (2.04–2.36); HFL/HFW 2.67 (2.39–2.88); A3 L/W 0.91. $N = 10$.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 7 Sep 1913, O.H. Swezey, BPBM Type 2.

Distribution. Found widely in both the Ko'olau and Wai'anae ranges, typically in wetter locations and often in or adjacent to streams.

Ecology. Observed attacking semi-aquatic case-bearing *Hypsimocoma kahanoo* caterpillars on rocks in streams.

Discussion. The head of the holotype is detached from the body and glued onto the point. The peculiar clypeus and mandible may be an adaptation for opening the closed cases of *Hypsimocoma* caterpillars, which this species has been observed to attack by entering head-first and then bringing the abdomen in underneath to sting the caterpillar. Typically the frons is sparsely punctate with weak microsculpture, but it is unusually variable in these characters, as well as the shape of the ocellar triangle. Larger specimens tend to be more punctate and more coarsely sculpted, but some large specimens are smooth and sparsely punctate.

Sierola arpactes, n. sp.

Figure 13D–F, Map 4

Island. O'ahu.

Diagnosis. This striking species cannot be confused with any other. The mandible is fully twisted so that the cutting plane is parallel to the long axis of the head, with a sharp outer margin and the ventral surface reflexed; and the venter of the head is concave and strongly tapered anteriorly. The form of the mandible is similar to *S. kamani* and *S. leioccephala*, but the dorsal surface is even more rotated horizontally and the teeth are reduced, with only one tooth visible in dorsal view and a second subapical tooth visible ventrally. The head is also strongly compressed, less than half as deep as long.

Description. Female. Head. Clypeal process semicircular or spatulate, expanded beyond anterior margin of head or trapezoidal, apex truncate; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; V-shaped in cross section, appearing fully twisted with dorsal plane parallel to long axis of head, distinctly margined outwardly and reflexed ventrally, outwardly polished, smooth, shining; in ventral view weakly curved. Apex of mandible slightly oblique, with two small teeth ventrally, otherwise truncate. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest just posterior of eye. Venter of head behind mandibles concave in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Postgenal depression shallow, rounded. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.86 mm; LT 0.87 mm; WH/LH 0.73; DH/LH 0.46; EV/HE 0.97; EV/WF 1.00; WF/HE 0.97; WH/WF 1.88; OOL/WOT 1.88; DT/LT 0.39; FL/FW 1.93; HFL/HFW 2.00; A3 L/W 1.09.

Type Material. Holotype ♀. O'ahu: Ka'ala-Kalena crestline 3100' [950 m], 21.4933°N 158.1379°W, 22 Apr 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBMENT 0000017883.

Etymology. From the Greek *arpaktes*, robber or raptor, referring to the grasping form of the mandible. It is a noun in apposition.

Distribution. Known only from the type, collected on the Wai'anae crestline between Ka'ala and Kalena along with that of *S. nuku*.

Sierola aspera Fullaway, 1920

Figure 13G–I, Map 4

Sierola aspera Fullaway, 1920: 153.**Island.** O‘ahu.

Diagnosis. Part of a complex of species with broad, nearly parallel-sided mandibles, a short, steeply curved clypeus, frons microsculpture coriaceous, and sparsely setose basal wing cells. Together with *S. luteipes*, separated from related species by the more compact head, with a narrow frons subequal to the eye height and shorter behind the eyes (WF/HE 0.95–1.05, EV/HE 0.70–0.85, OOL/WOT 1.40–1.60). Distinguished from *S. luteipes* by the brown-marked femora and very short clypeus in lateral view. The clypeus is also always distinctly carinate, unlike *S. affinis* and *S. pygmaea* which usually appear weakly carinate.

Description. Female. Head. Clypeal process semi-elliptical or very short, almost transverse, extending only slightly beyond lateral portion of clypeus, apex rounded; dorsally with a sharp carina; in profile steep and short, evenly curved. Mandible broad to moderately broad, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black to reddish brown. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.91 mm; LT 0.97 mm; WH/LH 0.80 (0.80–0.84); DH/LH 0.57 (0.57–0.61); EV/HE 0.83 (0.72–0.83); EV/WF 0.83 (0.73–0.83); WF/HE 1.00 (0.99–1.00); WH/WF 1.79 (1.79–1.83); OOL/WOT 1.43 (1.43–1.59); DT/LT 0.38; FL/FW 1.94 (1.94–2.12); HFL/HFW 2.43 (2.17–2.43); A3 L/W 1.14. N = 4.

Type Material. Holotype ♀. O‘ahu: Kaumuohona, 5 Dec 1907, O.H. Swezey, BPBM Type 162.

Distribution. Known from wet to mesic forest in both the Ko‘olau and Wai‘anae ranges.

Discussion. The setae of the basal wing cells is usually intermediate, with two rows of setae in both cells. Overall the specimens grouped under this name are rather variable in the form of the clypeus, and possibly more than one species is involved, but there are no clear characters to separate them.

Sierola auwae, n. sp.

Figure 13J–L, Map 5

Island. O'ahu.

Diagnosis. Among species with a weakly carinate clypeus and distinctly concave mandible, readily separated by the mandible being strongly angled and convex outwardly, with the ventral tooth partially concealed behind the second. The only similar species on O'ahu is *S. koa*, which has the mandible very strongly constricted at the base and the ocellar triangle front angle strongly acute rather than right. Closest to *S. megalognatha* of Hawai'i, which has the mandible broader and parallel-sided and differs in a number of other respects.

Description. Female. Head. Clypeal process short, triangular, apex pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view strongly elbowed. Apex of mandible slightly oblique, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart, or with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna yellow, tinged with brown dorsally. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae to mostly glabrous, cell R densely setose apically.

Measurements. LFW 1.71 mm; LT 0.88 mm; WH/LH 0.84; DH/LH 0.51; EV/HE 0.79; EV/WF 0.67; WF/HE 1.18; WH/WF 1.64; OOL/WOT 1.40; DT/LT 0.37; FL/FW 2.09; HFL/HFW 2.20; A3 L/W 0.83.

Type Material. Holotype ♀. O'ahu: Wai'anae ab. 24[00]–2800' [730–850 m], 1 Jan 1919, P.H. Timberlake, BPBMENT 0000017884.

Etymology. From the Hawaiian '*auwae*, chin, referring to the appearance of the squared mandible in lateral view. It is a noun in apposition.

Distribution. Known only from the type, collected at Wai'anae (Valley?) in 1919.

Sierola balteata, n. sp.

Figure 13M–O, Map 5

Island. O'ahu.

Diagnosis. Fitting in the group with the clypeus rounded dorsally and mandible with reduced teeth. Together with *S. bella*, distinguished by having the vertex distinctly concave and being bicolored; separated from that species by the semicircular, apically rounded clypeus,

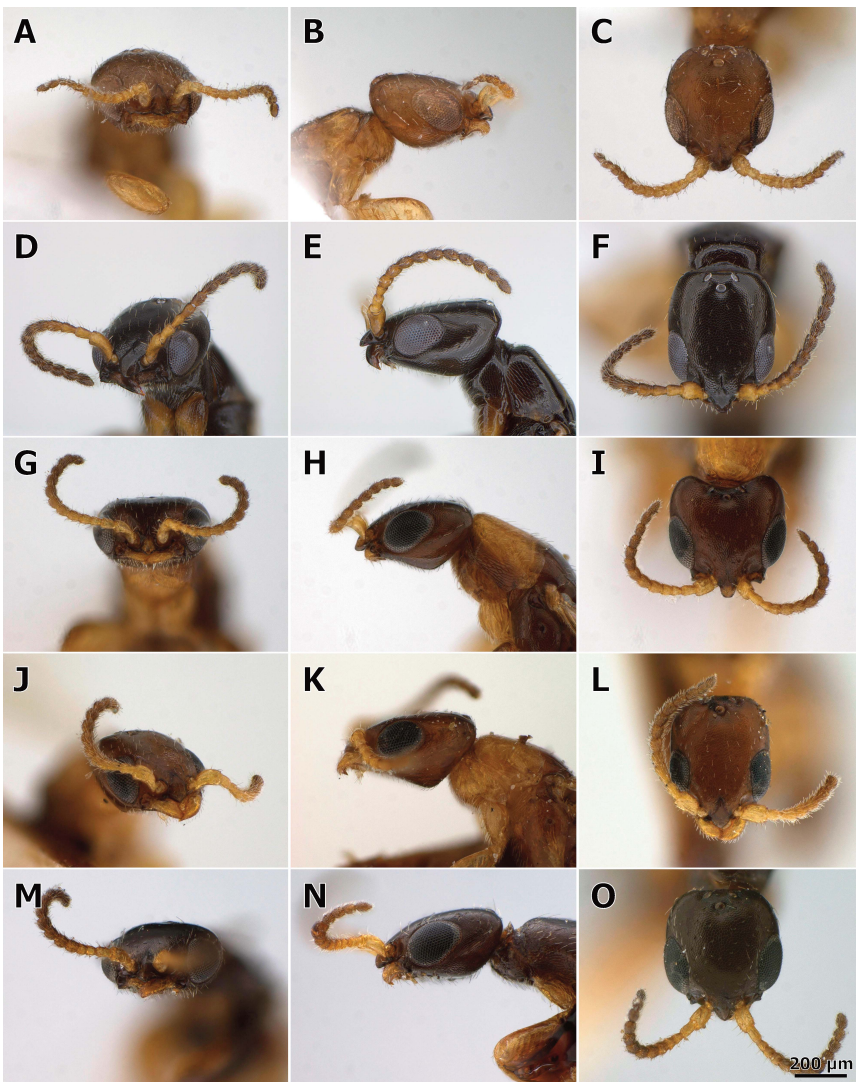


Figure 14. A–C: *Sierola batrachedrae*. D–F: *Sierola beardsleyi*. G–I: *Sierola bella*. J–L: *Sierola bicolor*. M–O: *Sierola brevicornis*.

short malar space, longer head behind the eyes, and thin mandible without any distinct preapical teeth.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space $1/4$ as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart, or with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, deeply concave; occipital margin narrowly rounded. Lateral ocelli nearly

touching vertex. Ocellar triangle front angle strongly obtuse. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest just posterior of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate; anterior face of pronotum strongly concave to receive the head, dorsum slightly concave, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Head black, prothorax yellow (at least laterally), basal metasomal segments often pale. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible largely yellow, basal 1/5 black, apex reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.92 mm; LT 1.02 mm; WH/LH 0.88; DH/LH 0.54; EV/HE 0.97; EV/WF 0.82; WF/HE 1.19; WH/WF 1.82; OOL/WOT 0.96; DT/LT 0.37; FL/FW 2.08; HFL/HFW 2.26; A3 L/W 1.00.

Type Material. Holotype ♀, O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Dec 2015, on *Coprosma longifolia*, K.N. Magnacca, BPBM 0000017885.

Paratypes: 1 ♀ 1 ♂, Palikea 2950' [900 m], 21.4150°N 158.0993°W, 24 Apr 2014, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Apr 2015, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 23 Jun 2015, on *Coprosma longifolia*, K.N. Magnacca, NMNH. 1 ♂, 'Ōhikilolo 2900' [885 m], 21.5133°N 158.1930°W, 8 Jun 2016, sweeping, K.N. Magnacca, BPBM. 1 ♂, Palikea 3000' [915 m], 21.4155°N 158.0995°W, 23 Nov 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM.

Etymology. From the Latin *balteat*, girdled, referring to the lateral yellow markings of the pronotum. It is an adjective in the nominative singular.

Distribution. Known from only a handful of recent specimens, all from the Wai'anae range and all but one from Palikea.

Ecology. Associated with *Coprosma longifolia* and *Cheirodendron trigynum*.

Discussion. Very similar to *S. bella*, with which it was initially confused. The coloration is unusual: in the few specimens available, the pronotum ranges from nearly all yellow to nearly all black, but the most xanthic individual still has a dark median stripe, while the most melanic has faint brown patches laterally.

Sierola batrachedrae Fullaway, 1920

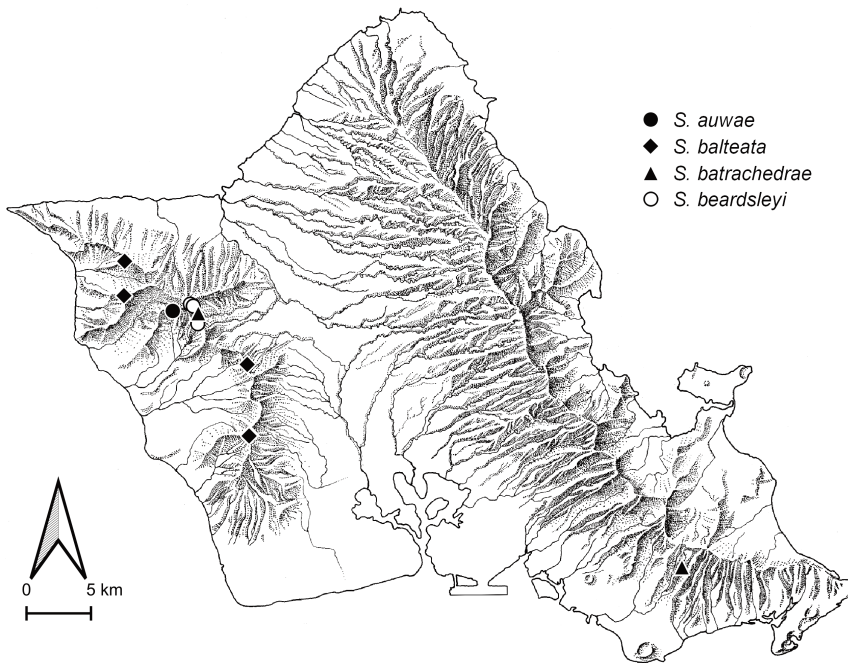
Figure 14A–C, Map 5

Sierola batrachedrae Fullaway, 1920: 125.

Island. O'ahu.

Diagnosis. This is the only species with a sharp carina and sparsely setose basal wing cells which has the pronotum yellow. Also distinguished by the head moderately elongate behind the eyes (EV/HE ~0.85), mandible narrow and distinctly concave ventrally, and clypeus evenly curved in lateral view. Very similar to *S. timberlakei*, but more pigmented and with basal wing cells sparsely setose. The clypeal carina is sharp but somewhat short, so it may appear weakly carinate.

Description. Female. *Head.* Clypeal process semi-elliptical, apex broadly rounded or truncate; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral mar-



Map 5. Collection localities of *Sierola auwae*, *S. balteata*, *S. batrachedrae*, and *S. beardsleyi*.

gin distinctly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Prothorax and basal metasoma yellow, head and posterior mesosoma and metasoma brown. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.61 mm; LT 0.82 mm; WH/LH 0.86; DH/LH 0.58; EV/HE 0.85; EV/WF 0.74; WF/HE 1.15; WH/WF 1.77; OOL/WOT 1.25; DT/LT 0.38; FL/FW 1.93; HFL/HFW 2.20; A3 L/W 0.83.

Type Material. Holotype ♀. O'ahu: Pālolo Ridge, 4 Sep 1911, reared from larva of *Batrachedra* [= *Batrachedrodes*] infesting *Acrostichum* [= *Elaphoglossum*] fern, O.H. Swezey, BPBM Type 106.

Distribution. Known from only a few records, in both the Ko'olau and Wai'anae ranges.

Ecology. Reared from *Batrachedrodes* sp. (Batrachedridae) feeding on spores of *Elaphoglossum* ferns.

***Sierola beardsleyi*, n. sp.**

Figure 14D–F, Map 5

Island. O'ahu.

Diagnosis. Part of a complex of species lacking a clypeal carina, with the mandible falcate and basal wing cells nearly glabrous. Separated by the combination of a dorsally flat clypeus, compressed head, narrow fore femur (more than twice as long as wide), and convex pronotum which is weakly angulate anteriorly.

Description. Female. Head. Clypeal process semicircular or elongate, parallel-sided, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate, pronotal disc distinctly flattened. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely rugulose; median carina faintly present; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs yellowish brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.84 mm; LT 0.92 mm; WH/LH 0.76; DH/LH 0.54; EV/HE 1.10; EV/WF 0.94; WF/HE 1.17; WH/WF 1.71; OOL/WOT 1.58; DT/LT 0.40; FL/FW 2.04; HFL/HFW 2.63; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Ka'ala-Kalena crestline 3100' [950 m], 21.4933°N 158.1379°W, 22 Apr 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM 0000017886.

Paratypes: 1♀, Mt. Ka'ala, 14 Apr 1966, J.W. Beardsley, BPBM. 1♂, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 10 Feb 2014, on *Melicope*, K.N. Magnacca, BPBM. 1♀, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 3 Mar 2015, under leaves, K.N. Magnacca, BPBM. 1♀, Ka'ala-Kalena crestline 3100' [950 m], 21.4933°N 158.1379°W, 22 Apr 2015, on *Cheirodendron trigynum*, K.N. Magnacca, NMNH.

Etymology. Named for John W. Beardsley, the leading researcher of parasitic Hymenoptera in Hawai'i in the 20th century and collector of the earliest specimen.

Distribution. Found only around the summit of Ka'ala in the Wai'anae range.

Discussion. Closely related to *S. curvata* and *S. laupapa*; the characters given in the key and diagnosis will easily distinguish them.

Sierola bella Fullaway, 1920

Figure 14G–I, Map 6

Sierola bella Fullaway, 1920: 78.**Island.** O‘ahu.

Diagnosis. Fitting in the group with the clypeus rounded dorsally and mandible with reduced teeth. Together with *S. balteata*, distinguished by having the vertex distinctly concave and being bicolored; separated from that species by the narrow, elongate clypeus which is truncate apically, long malar space, shorter head behind the eyes, and thick mandible with a distinct preapical ventral tooth (the teeth may be concealed by the other mandible when closed).

Description. Female. Head. Clypeal process elongate, parallel-sided, apex truncate; dorsally with a rounded carina dorsally, effaced towards apex; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly polished, smooth, shining; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible slightly oblique, with a single large ventral tooth and a few small teeth on the inner margin, and a single preapical tooth on the ventral surface. Malar space 1/2 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view broadly, deeply concave; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate; anterior face of pronotum strongly concave to receive the head, dorsum slightly concave, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Head black, prothorax yellow-brown, remainder of mesosoma dark brown to black, metasoma brown. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Coxae brown, femora brown dorsally, legs otherwise yellow.

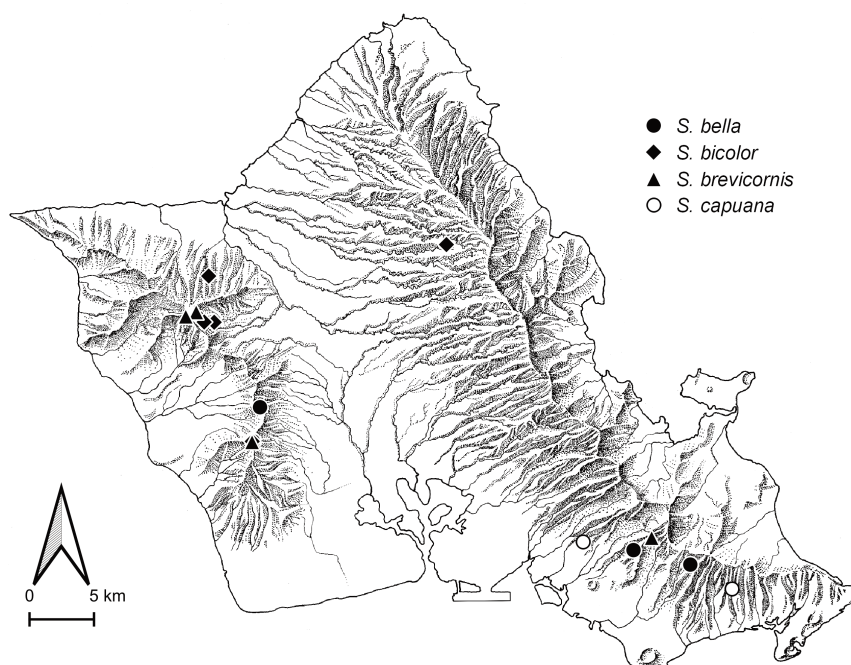
Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.68 mm; LT 0.94 mm; WH/LH 0.95; DH/LH 0.56; EV/HE 0.67; EV/WF 0.57; WF/HE 1.17; WH/WF 1.76; OOL/WOT 1.04; DT/LT 0.37; FL/FW 1.81; HFL/HFW 2.29; A3 L/W 1.20.

Type Material. Holotype ♀. O‘ahu: Pālolo Crater, 8 Sep 1918, P.H. Timberlake, BPBM Type 13.

Distribution. Rare, only about six specimens known, from both the southern Ko‘olau and southern Wai‘anae ranges.

Discussion. Very similar to *S. balteata*, with which it shares similar coloration and the unusual concave anterior pronotum.



Map 6. Collection localities of *Sierola bella*, *S. bicolor*, *S. brevicornis*, and *S. capuana*.

***Sierola bicolor* Fullaway, 1920**

Figure 14J–L, Map 6

Sierola bicolor Fullaway, 1920: 81.

Island. O‘ahu.

Diagnosis. Clypeus flat dorsally, mandible falcate, prothorax yellow. Separated from similar species by the very prominent genal angle and the relatively deep postgenal depression. Unusually, the frons is distinctly concave medially, although in lateral view the head is convexly curved.

Description. Female. Head. Clypeal process triangular, apex pointed; dorsally flat, not carinate, slightly convex only on the sides; in profile steep and short, evenly curved. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; strongly twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right to weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest just posterior of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Postgenal depression deep, distinct, broad. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded, pronotal disc distinctly flattened. Pronotal pubescence short, inconspicuous. Propodeal disc laterally

coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Prothorax yellow, head and propodeum dark brown, mesothorax and metasoma medium to dark brown. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.78 mm; LT 0.85 mm; WH/LH 0.75; DH/LH 0.55; EV/HE 1.00; EV/WF 0.89; WF/HE 1.12; WH/WF 1.66; OOL/WOT 1.45; DT/LT 0.41; FL/FW 2.15; HFL/HFW 2.45; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: 'Ōpae'ula, 30 Mar 1913, D.T. Fullaway, BPBM Type 21.

Distribution. Known from a handful of specimens from the Wai'anae and northern Ko'olau ranges. Last collected in 1938.

Ecology. One specimen each apparently reared from *Kadua affinis* and *Melicope* sp., but plant part and insect host not recorded for either.

Discussion. The original description says the species is black aside from the pronotum, but the type is now faded to brown.

Sierola brevicornis Fullaway, 1920

Figure 14M–O, Map 6

Sierola brevicornis Fullaway, 1920: 85.

Island. O'ahu.

Diagnosis. Generally nondescript (black, mandible moderately narrow and only weakly concave ventrally, basal wing cells sparsely setose), but easily recognized by the unique form of the clypeus which has a distinctive rounded ridge or carina, neither sharp nor evenly convex. The clypeus in lateral view is also unusual, distinctly curved but short in lateral view compared to most other species. It most closely resembles *S. ihulena*, but that species has the clypeus even more strongly arched, broadly convex, and pale, and the head is flat ventrally.

Description. Female. Head. Clypeal process rounded triangular, apex broadly rounded; dorsally with a rounded carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.71 mm; LT 0.92 mm; WH/LH 0.89; DH/LH 0.50; EV/HE 0.74; EV/WF 0.64; WF/HE 1.16; WH/WF 1.70; OOL/WOT 1.39; DT/LT 0.30; FL/FW 2.00; HFL/HFW 2.14; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Kaumuohona, 4 Jun 1916, P.H. Timberlake, BPBM Type 27.

Distribution. Found in both the Ko'olau and Wai'anae range but rare, known only from five specimens. All except the holotype were collected recently in the Wai'anae range. Apparently restricted to wet forest.

Sierola bridwelli Fullaway, 1920

Figure 15A–C, Map 7

Sierola bridwelli Fullaway, 1920: 145.

Sierola callida Fullaway, 1920: 100, **n. syn.**

Sierola lata Fullaway, 1920: 132, **n. syn.**

Island. O'ahu.

Diagnosis. Easily recognizable among species with broad, parallel-sided mandible by the blunt clypeus, recurved apicoventrally. The only similar species is *S. perottetiae*, which has the fore femur broad rather than narrow as in *S. bridwelli* (FL/FW 1.8–1.9 vs. 2.2–2.3 respectively) and the mandible not quite so wide.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.50 mm; LT 1.19 mm; WH/LH 0.89; DH/LH 0.57; EV/HE 0.86; EV/WF 0.66; WF/HE 1.31; WH/WF 1.63; OOL/WOT 1.96; DT/LT 0.39; FL/FW 2.35; HFL/HFW 2.43; A3 L/W 1.13.

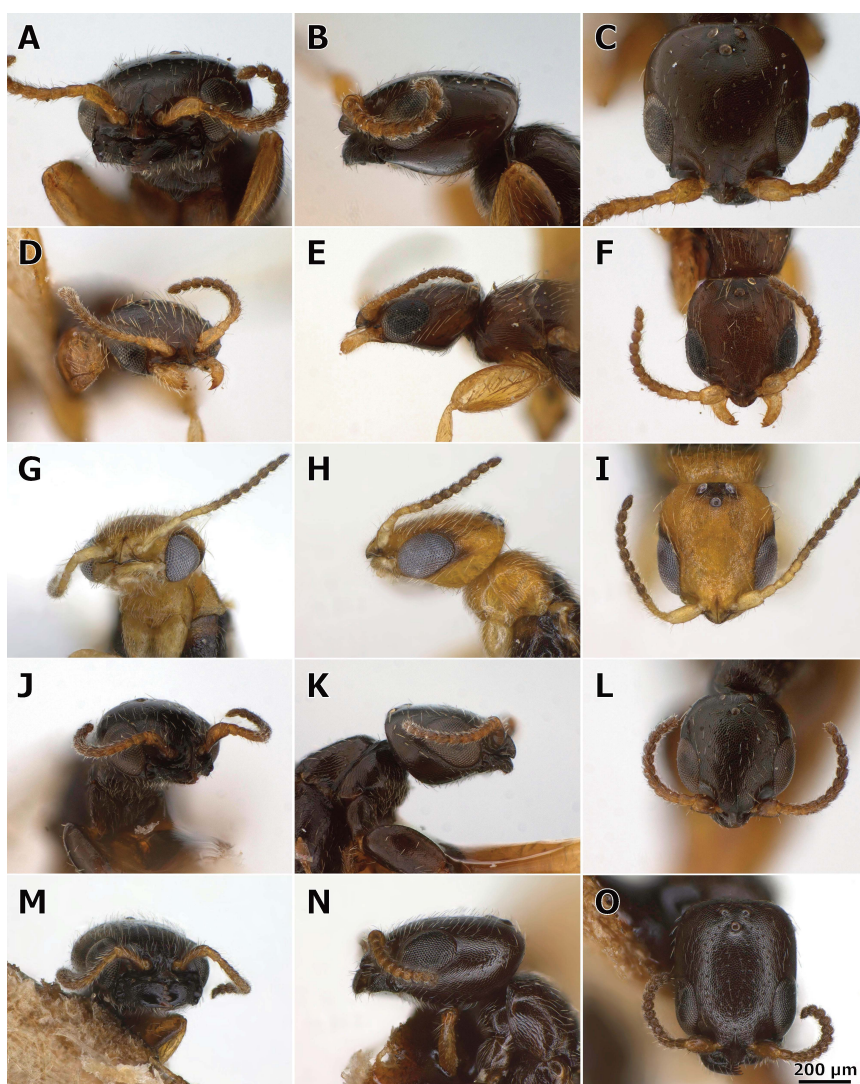


Figure 15. A–C: *Sierola bridwelli*. D–F: *Sierola brunnea*. G–I: *Sierola brunnea* (variant, with both elongate clypeus and pale coloration). J–L: *Sierola brunneipennis*. M–O: *Sierola canuta*.

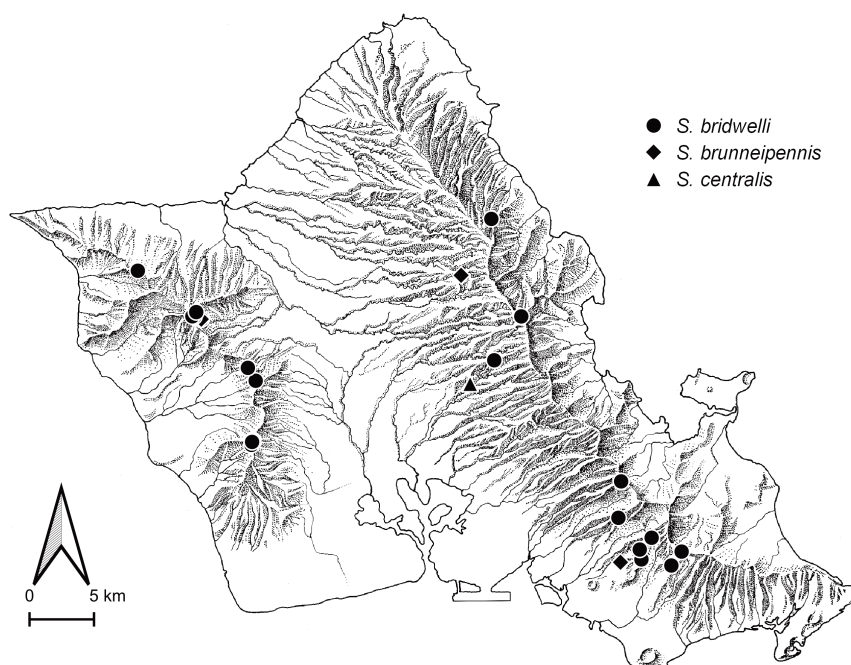
Type Material. Holotype ♀ of *Sierola bridwelli*. O‘ahu: SE Ko‘olau Mts., 1916, J.C. Bridwell, BPBM Type 145.

Holotype ♀ of *Sierola callida*. O‘ahu: Mt. Ka‘ala, 4 Jul 1916, P.H. Timberlake, BPBM Type 56.

Holotype ♀ of *Sierola lata*. O‘ahu: Mt. Olympus, 21 Jan 1912, O.H. Swezey, BPBM Type 119.

Distribution. Found widely in both the Ko‘olau and Wai‘anae ranges, primarily in wet forest but extending into mesic forest.

Ecology. Collected on a wide variety of plants. One specimen reared from a *Hyposmocoma* (*Euperissus*) sp. (Cosmopterigidae) caterpillar boring in a stem of *Broussaisia arguta*. Another is labelled “ex *Oodemas aenescens kahanae*” (Coleoptera: Curculionidae), one of three purported records of *Sierola* attacking beetle grubs. This should be confirmed as wood-boring caterpillars, including *Hyposmocoma* (*Euperissus*), are also common. However, it would not be out of the question for a wasp with the caterpillar as its primary host to attack beetle grubs opportunistically, since they will do so in the lab.



Map 7. Collection localities of *Sierola bridwelli*, *S. brunneipennis*, and *S. centralis*.

Discussion. *Sierola bridwelli* and *S. lata* are a clear example of species separated by Fullaway based on his first couplet (head extended in front of the eyes, anterior margin angulate, vs. head not extended in front of the eyes, anterior margin transverse), despite the clypeus being identical in both taxa. The latter was further separated from *S. callida* based on supposedly having the head as wide as long, rather than longer than wide; the WH/LH ratio in the types are 0.87 for *S. callida*, 0.89 for *S. bridwelli*, and 0.91 for *S. lata*, representing a typical range of intraspecific variation.

Sierola brunnea Fullaway, 1920

Figure 15D–I, Map 8

Sierola brunnea Fullaway, 1920: 103.

Sierola lugens Fullaway, 1920: 116, **n. syn.**

Island. O‘ahu.

Diagnosis. A variable but very distinctive taxon, immediately recognizable among species with a carinate clypeus and setose wing cells by the strongly flattened head with a distinct genal angle, the gena concave between the angle and mandible. The head being both flattened and broad (DH/LH 0.51–0.53, WH/LH 0.82–0.88) is extremely unusual.

Description. Female. Head. Clypeal process semicircular or semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or elongate, evenly curved, apex acute. Mandible narrow, somewhat expanded at base and apex, ventral margin weakly to distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart, or with close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous,

nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena below eye flat. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.71 mm; LT 0.80 mm; WH/LH 0.85; DH/LH 0.51; EV/HE 0.83; EV/WF 0.71; WF/HE 1.17; WH/WF 1.69; OOL/WOT 1.50; DT/LT 0.40; FL/FW 1.87; HFL/HFW 2.58; A3 L/W 1.00.

Type Material. Holotype ♀ of *Sierola brunnea*. O'ahu: Tantalus 1300' [400 m], 29 Jan 1905, W.M. Giffard, BPBM Type 63.

Holotype ♀ of *Sierola lugens*. O'ahu: 'Ōpae'ula, 30 Mar 1913, D.T. Fullaway, BPBM Type 87.

Distribution. Found in wet to mesic forest throughout both the Ko'olau and Wai'anae ranges.

Ecology. Collected on a wide variety of plants, with no clear preference.

Discussion. This is an oddly polymorphic species. There appear to be two general forms, one with moderately open punctation, the clypeus evenly curved with the apex broadly acute, and WH/LH ~0.88, and the other with close punctation, the clypeus elongate with the apex sharply acute in profile, and WH/LH ~0.82. In addition, one series of specimens has the head and mesosoma predominantly yellow, and several others have only the prosternum or small spots on the prothorax yellow. It would be tempting to separate these as distinct species, but they occur sympatrically, and the characters do not always segregate together; individuals with both dense punctation and broad heads can be found. Fullaway's *S. lugens* is a synonym of this species, but it exactly matches the type of *S. brunnea* rather than representing the other form (both are the first type, with open punctures and a broad head). Further study is needed to elucidate the nature of variation in this species. One of the paratypes of *S. lugens* is actually *S. hirsuta*; another (Tantalus, 4 Aug 1912) is a specimen of *S. weaweae*, n. sp.

Sierola brunneipennis Fullaway, 1920

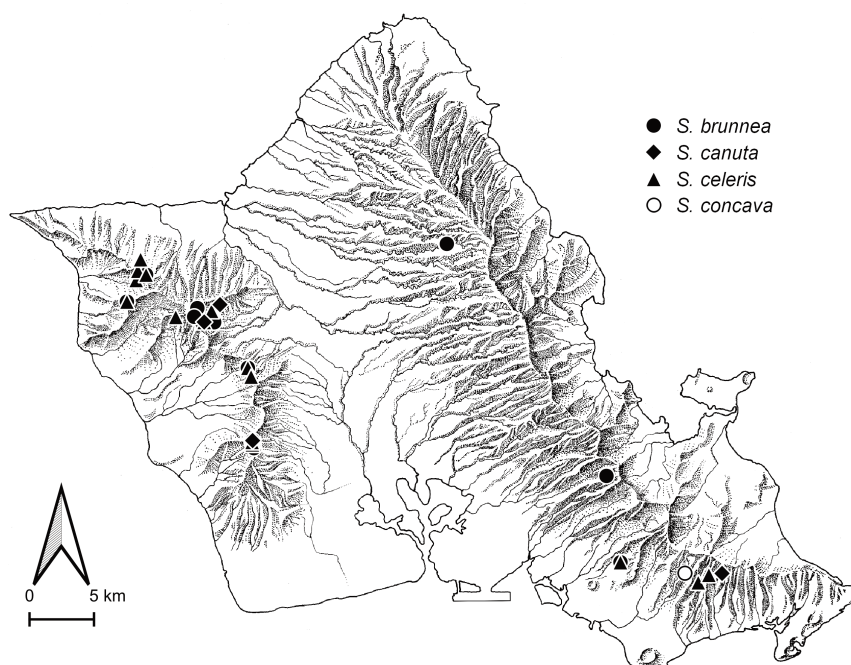
Figure 15J–L, Map 7

Sierola brunneipennis Fullaway, 1920: 129.

Island. O'ahu.

Diagnosis. One of only a few species with a carinate clypeus and sparsely setose to glabrous basal wing cells to also have a distinct genal angle and smooth frons microsculpture. Separated from *S. glabra* by the moderately punctate frons, and from *S. mandibularis* by the broader head and sparsely setose basal wing cells. It also lacks the unusual form of the head and pronotum of the latter species.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly to distinctly broader on apical half, ventral margin



Map 8. Collection localities of *Sierola brunnea*, *S. canuta*, *S. celeris*, and *S. concava*.

weakly to distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.73 mm; LT 0.84 mm; WH/LH 0.87; DH/LH 0.58; EV/HE 0.67; EV/WF 0.58; WF/HE 1.15; WH/WF 1.67; OOL/WOT 1.30; DT/LT 0.37; FL/FW 1.93; HFL/HFW 2.38; A3 L/W 0.83.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 7 Sep 1913, O.H. Swezey, BPBM Type 114.

Distribution. Found in wet to mesic forest in both the Ko'olau and Wai'anae ranges. Rare, known from only a handful of specimens.

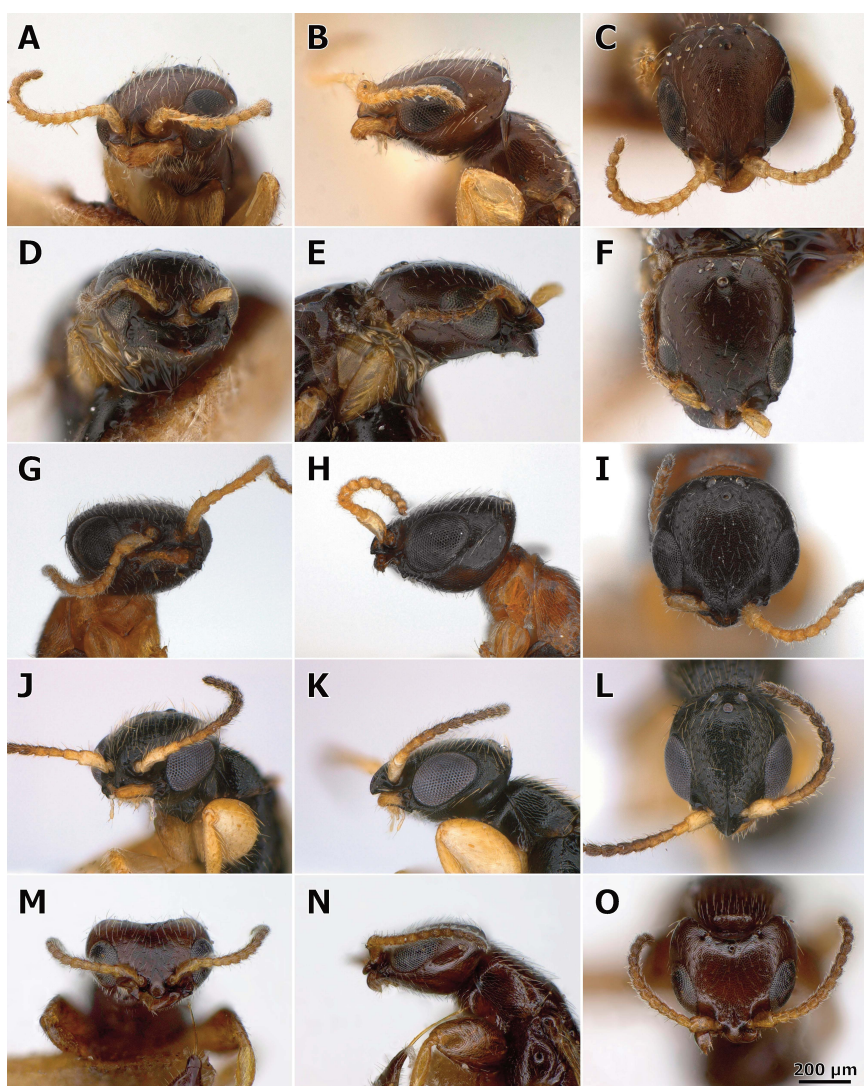


Figure 16. A–C: *Sierola capuana*. D–F: *Sierola celeris*. G–I: *Sierola centralis*. J–L: *Sierola citripoda*. M–O: *Sierola concava*.

Sierola canuta, n. sp.

Figure 15M–O, Map 8

Island. O‘ahu.

Diagnosis. This species is readily separated from others with broad, parallel-sided mandible by the extremely narrow head, WH/LH 0.73–0.76. The combination of a somewhat short clypeus, curved in lateral view, and dark brown femora also usually distinguishes it. Closest to *S. pygmaea*, but in addition to the narrower head and dark legs, the clypeus is more rounded with a more distinct carina, rather than being truncate and often appearing weakly carinate. The type also has the head moderately setose ventrally, although this seems to be variable among the few specimens.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dor-

sally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.87 mm; LT 0.89 mm; WH/LH 0.74; DH/LH 0.54; EV/HE 1.18; EV/WF 1.05; WF/HE 1.12; WH/WF 1.74; OOL/WOT 1.95; DT/LT 0.40; FL/FW 2.08; HFL/HFW 2.22; A3 L/W 1.08.

Type Material. Holotype ♀. O'ahu: Wailupe, 30 May 1919, O.H. Swezey, BPBM. 0000017887.

Paratypes: 1 ♀, Hale'au'au, 14 Sep 1930, *Eleocarpus* [sic: *Elaeocarpus*], O.H. Swezey, BPBM. 1 ♀, Pūle'e, Coffee Gulch 1900' [580 m], 21.5109°N 158.1234°W, 24 Mar 2015, on *Diospyros hillebrandii*, K.N. Magnacca, BPBM.

Distribution. Known from four specimens, one from the Ko'olau range taken in 1919, and one older and two recent ones from the Wai'anae range.

Sierola capuana Fullaway, 1920

Figure 16A–C, Map 6

Sierola capuana Fullaway, 1920: 113.

Island. O'ahu.

Diagnosis. Belonging to the group of species with a sharp, somewhat strongly arched clypeal carina, the basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs nearly all yellow. Distinguished from similar species by the yellow mandible which is distinctly concave ventrally, frons densely punctate between the eyes, OOL/WOT 1.30–1.50, and head short behind the eyes (EV/HE 0.50–0.70).

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central

frons. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna yellow, apical segments tinged with brown. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.93 mm; LT 0.99 mm; WH/LH 0.88; DH/LH 0.61; EV/HE 0.64; EV/WF 0.60; WF/HE 1.06; WH/WF 1.72; OOL/WOT 1.31; DT/LT 0.43; FL/FW 2.00; HFL/HFW 2.36; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Niu, 16 May 1909, reared from larva of *Capua* [= *Spheterista*] *cassia*, O.H. Swezey, BPBM Type 82.

Distribution. Rare, known only from five specimens taken in the southeastern Ko'olau range. Last collected in 1968.

Ecology. Reared from two species of native tortricids, *Pararrhaptica* cf. *longiplicata* (Walsingham, 1907) and *Spheterista cassia* (Swezey, 1912), which are recorded from *Myrsine lessertiana* and *Senna gaudichaudiana* respectively (the plant hosts in the *Sierola* rearings were not recorded).

Discussion. See comments under *S. similis*.

Sierola celeris Fullaway, 1920

Figure 16D–F, Map 8

Sierola celeris Fullaway, 1920: 150.

Island. O'ahu.

Diagnosis. Among species with broad, nearly parallel-sided mandibles, separated by the densely setose basal wing cells, moderately elongate clypeus which is evenly sloping or very slightly curved in lateral view, and mandible apex straight and nearly flat, with the ventral tooth long. Distinguished from the sibling species *S. striata* by the medially polished metasomal terga, legs marked with brown at least on the hind femur and/or dorsal margins of femora, and generally narrower, longer head (WH/LH 0.75–0.80 vs. 0.80–0.83, EV/HE 1.05–1.30 vs. 0.92–1.10, OOL/WOT 2.04–2.40 vs. 1.75–2.16). Also close to *S. tumidoventris*, from which it is separated by the predominantly yellow legs, deeper head, and narrow hind femora (DH/LH 0.53–0.57 vs. 0.50, HFL/HFW 2.55–2.90 vs. 2.20–2.35).

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, ventral margin slightly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but

smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.18 mm; LT 1.05 mm; WH/LH 0.78 (0.75–0.80); DH/LH 0.54 (0.53–0.57); EV/HE 1.20 (1.06–1.29); EV/WF 0.89 (0.83–0.98); WF/HE 1.35 (1.23–1.39); WH/WF 1.61 (1.59–1.68); OOL/WOT 2.04 (2.04–2.39); DT/LT 0.39; FL/FW 2.25 (2.15–2.45); HFL/HFW 2.76 (2.57–2.90); A3 L/W 1.13 (1.13–1.23). N = 18.

Type Material. Holotype ♀. O'ahu: Tantalus, 16 Mar 1915, O.H. Swezey, BPBM Type 156.

Distribution. Widespread and moderately common in mesic and wet forest in the Wai'anae range, with three specimens taken from the Ko'olau range.

Discussion. I am tentatively maintaining *S. celeris* and *S. striata* as separate species, since they can be distinguished on the basis of color, morphometrics and to some extent geography, although there is slight overlap in each. All recent specimens of *S. striata* clearly have the legs all yellow; some of the very earliest appear to have the hind femora brownish, but it is unclear if they may have become discolored over time. Otherwise this and the metasoma sculpture are the clearest characters to diagnose them. Head width and EV/HE overlap only narrowly, while OOL/WOT is less reliable. That both species are nearly but not quite confined to one mountain range is curious, but is seen in other species such as *S. cryptophlebiae*.

Sierola centralis, n. sp.

Figure 16G–I, Map 7

Island. O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, evenly curved in lateral view, and basal wing cells densely setose. Very similar to *S. similis*, distinguished by the broader head (WH/LH ~0.98) and evenly convex gena.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right to weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly

convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Head black, prothorax yellow-brown, remainder of mesosoma dark brown to black, metasoma brown. Antenna yellow, apical segments tinged with brown. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.18 mm; LT 1.07 mm; WH/LH 0.98; DH/LH 0.61; EV/HE 0.65; EV/WF 0.57; WF/HE 1.15; WH/WF 1.74; OOL/WOT 1.33; DT/LT 0.41; FL/FW 1.97; HFL/HFW 2.33; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Waiawa, 8 Jun 1921, O.H. Swezey, BPBMNT 0000017888.

Etymology. Named because the type locality, Waiawa, is centrally located on the island of Oahu. It is treated as a noun in apposition.

Distribution. Known only from the type, taken in the central Ko'olau range.

Discussion. This may prove to be a variant of *S. similaris*, but they look distinctly different in gestalt.

Sierola citripoda, n. sp.

Figure 16J–L, Map 9

Island. O'ahu.

Diagnosis. Among species with a highly arched and thin clypeal carina, densely punctate frons, and strong and elongate vertex and genal setae, this species is united with *S. flavipes* and *S. poepoe* by the broad head and all-yellow legs. It is readily distinguished from those two by the yellow mandible and generally shorter OOL/WOT (1.05–1.25 vs. 1.20–1.40 in the other two). Also resembles *S. tenebriosa*, which may appear to have the clypeus strongly arched, but that species has the vertex and genal setae relatively weak, frons densely punctate only anteriorly, mandible dull orange to black, and fore femora much narrower (FL/FW 2.10–2.30 vs. 1.87–1.93 in *S. citripoda*).

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.81 mm; LT 0.91 mm; WH/LH 0.88 (0.88–0.89); DH/LH 0.60; EV/HE 0.61; EV/WF 0.61; WF/HE 1.00; WH/WF 1.81; OOL/WOT 1.24 (1.09–1.24); DT/LT 0.45; FL/FW 1.92 (1.90–1.97); HFL/HFW 2.33 (2.22–2.39); A3 L/W 1.48 (1.33–1.48). N = 3.

Type Material. Holotype ♀. O'ahu: Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 20 Apr 2015, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM 0000017889.

Paratypes: 1♀, Wai'anae, Kūmaipō gulch 4 2200' [670 m], 21.4990°N 158.1533°W, 12 Jan 2015, stinging neck, K.N. Magnacca, BPBM. 1♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 19 May 2015, on *Coprosma longifolia*, K.N. Magnacca, NMNH.

Etymology. Named for the bright lemon-yellow color of the legs. It is a noun in apposition.

Distribution. Known only from three specimens, all taken from separate localities in mesic forest in the Wai'anae range.

Sierola concava, n. sp.

Figure 16M–O, Map 8

Island. O'ahu.

Diagnosis. Clypeus flat dorsally, mandible falcate, and vertex concave. Close to *S. giffardi*, separated by the broader and deeper head, and very deep emargination of the vertex. In general appearance it is most similar to *S. emarginata* of Hawai'i, from which it differs in the broad head and even shorter OOL/WOT ratio.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; strongly twisted, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/3 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, deeply concave; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression absent. Antenna extending to pronotum.

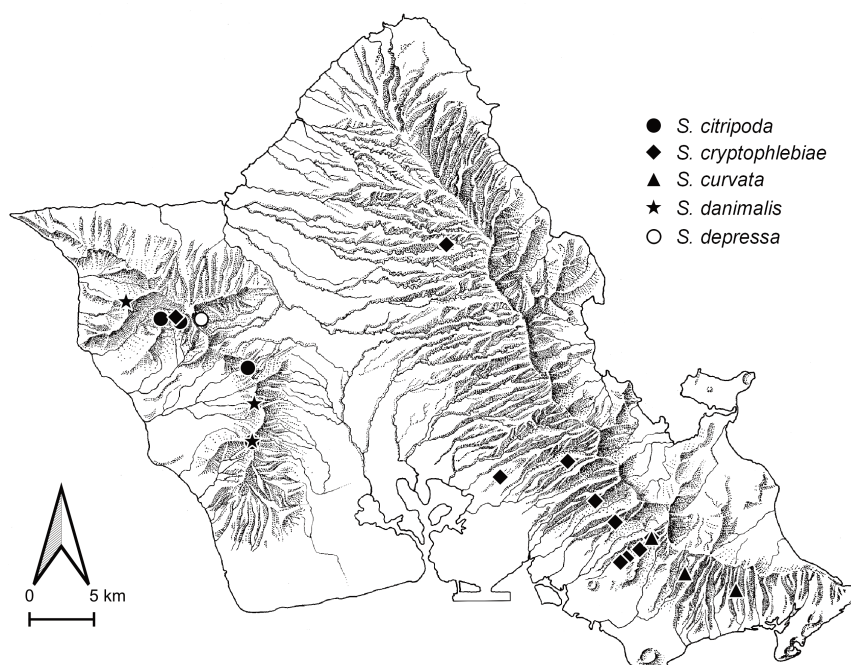
Mesosoma. In lateral view anterior margin of pronotum strongly angulate, pronotal disc distinctly flattened. Pronotal pubescence longer than flagellar width. Metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.67 mm; LT 0.91 mm; WH/LH 1.00; DH/LH 0.57; EV/HE 0.77; EV/WF 0.63; WF/HE 1.23; WH/WF 1.82; OOL/WOT 0.51; DT/LT 0.41; FL/FW 1.79; HFL/HFW 2.09; A3 L/W 1.20.



Map 9. Collection localities of *Sierola citripoda*, *S. cryptophlebiae*, *S. curvata*, *S. danimalis*, and *S. depressa*.

Type Material. Holotype ♀. O'ahu: Pālolo, 24 Jun 1917, J.C. Bridwell, BPBM 000017890. Paratype: 1 ♀, Pālolo, 3 Sep 1906, O.H. Swezey, BPBM.

Etymology. Named for the deeply emarginate head. It is an adjective in the nominative singular.

Distribution. Known from only two individuals, both taken from Pālolo in the south-eastern Ko'olau range. A male collected at Palikea in the Wai'anāe range may also be this species, but is not designated as a paratype.

Discussion. Due to the concave vertex pushing the lateral ocelli towards the eyes, the OOL/WOT of this species is the smallest of any known *Sierola*. The closely related *S. emarginata*, found on Hawai'i, is the only other species in which it is distinctly less than 1. One of the two specimens was originally designated a paratype of *S. emarginata*; it bears an upside-down holotype label with the name "*Sierola inerma*," apparently an unpublished Fullaway manuscript name.

Sierola cryptophlebiae Fullaway, 1920

Figure 17A–C, Map 9

Sierola cryptophlebiae Fullaway, 1920: 119.

Sierola brunneipes Fullaway, 1920: 102, **n. syn.**

Sierola flavicornis Fullaway, 1920: 96, **n. syn.**

Sierola proxima Fullaway, 1920: 152, **n. syn.**

Island. O'ahu.

Diagnosis. A distinctive species, recognizable among taxa with a sharp clypeal carina and sparsely setose to glabrous basal wing cells by the combination of the clypeus rounded and recurved in profile, and mandible moderately broad and distinctly concave ventrally. The antenna is also short and yellow, and the legs are usually all yellow. Similar to *S. koolauensis*, but immediately separated by the wing setation.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture, or finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna short, scarcely extending beyond head.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Legs all yellow or coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.73 mm; LT 0.93 mm; WH/LH 0.81; DH/LH 0.55; EV/HE 1.00; EV/WF 0.91; WF/HE 1.10; WH/WF 1.80; OOL/WOT 1.73; DT/LT 0.32; FL/FW 2.00; HFL/HFW 2.22; A3 L/W 1.00.

Type Material. Holotype ♀ of *Sierola cryptophlebiae*. O'ahu: Tantalus, 10 Jun 1910, reared from larva of *Cryptophlebia illepida*, D.T. Fullaway, BPBM Type 94.

Holotype ♀ of *Sierola brunneipes*. O'ahu: Tantalus, 16 Feb 1916, W.M. Giffard, BPBM Type 60.

Holotype ♀ of *Sierola flavicornis*. O'ahu: Tantalus 1300' [400 m], 1 Jan 1905, W.M. Giffard, BPBM Type 48.

Holotype ♀ of *Sierola proxima*. O'ahu: Tantalus 1300' [400 m], [no date], W.M. Giffard, BPBM Type 160.

Distribution. Widespread in the Ko'olau range with one collection from the Wai'anae range. Formerly rather common, especially around Tantalus, but only one recent collection, from Lanihuli. These latter specimens have the femora and antenna dark and may represent a sibling species.

Ecology. Reared from pods of *Acacia koa* A. Gray (koa, Fabaceae), at least once definitively from caterpillars of *Cryptophlebia illepida* (Butler) (Tortricidae) infesting the seeds. Nearly all collections where the plant is noted come from koa.

Discussion. Fullaway described this species under four names based on minor differences and ambiguous descriptions. This name was chosen because the type is in good condition and represents approximately the middle of the range of variation. Several of Fullaway's paratypes of other species are actually *S. cryptophlebiae* as well. The legs are entirely yellow in nearly all of the older specimens, but in one of those and the only two recent specimens, the legs are predominantly brown. All other characters are identical.

Sierola curvata, n. sp.

Figure 17D–F, Map 9

Island. O'ahu.

Diagnosis. Part of a complex of species lacking a clypeal carina, with the mandible falcate and basal wing cells nearly glabrous. Separated from similar species by the relatively deep head which is strongly convex dorsally, with the genal angle quite distinct but not strongly protruding.

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs yellowish brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.74 mm; LT 0.91 mm; WH/LH 0.85; DH/LH 0.58; EV/HE 0.90; EV/WF 0.68; WF/HE 1.31; WH/WF 1.61; OOL/WOT 1.24; DT/LT 0.44; FL/FW 2.19; HFL/HFW 3.01; A3 L/W 2.00.

Type Material. Holotype ♀. O'ahu: Pālolo, 13 May 1917, J.C. Bridwell, BPBM. 0000017891.

Paratypes: 1♀, SE Ko'olau Mts., Jul 1916, J.C. Bridwell, BPBM. 1♀, Pālolo, 24 Jun 1917, J.C. Bridwell, BPBM.

Etymology. Named for the strongly convex head. It is an adjective in the nominative singular.

Distribution. Found in the southeastern Ko'olau range. Known from only four specimens; last collected in 1918.

Discussion. Similar to *S. anthracina*, *S. beardsleyi*, *S. laupapa*, and *S. bicolor*, differing in the deeper head (much more curved dorsally in the holotype) and somewhat bulbous clypeus. The two paratypes, including one specimen collected from the same locality as the type a month later, have the head less convex above but agree with all other characters, including the flattened pronotum and the clypeus only gently convex dorsally and abruptly dropping away at the sides. One specimen originally included as a paratype of *S. peleana* (Niu Ridge, 10 Feb 1918) appears to be this species but the clypeus is strongly convex dorsally; it is clearly not *S. peleana* based on the very different mandible, but is not included as a paratype of *S. curvata*.

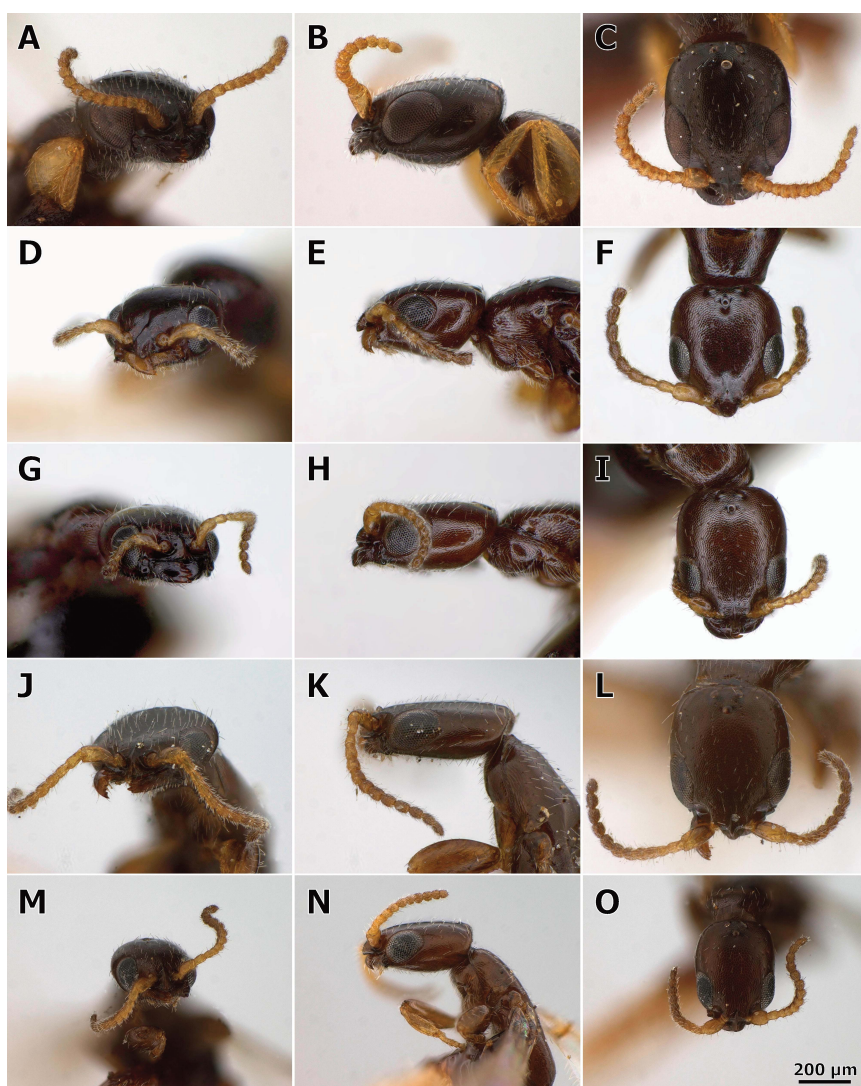


Figure 17. A–C: *Sierola cryptophlebiae*. D–F: *Sierola curvata*. G–I: *Sierola danimalis*. J–L: *Sierola depressa*. M–O: *Sierola depressella*.

***Sierola danimalis*, n. sp.**

Figure 17G–I, Map 9

Island. O‘ahu.

Diagnosis. Part of a small cluster of small, flattened species with the head flat above and below, less than half as deep as long, and the mesosoma also compressed. Separated from related species by having the basal wing cells densely setose, clypeus rounded and recurved in lateral view, frons moderately punctate, and mandible moderately broad and distinctly concave.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately

broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna short, scarcely extending beyond head.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum evenly rounded, pronotal disc distinctly flattened. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.64 mm; LT 0.85 mm; WH/LH 0.77; DH/LH 0.49; EV/HE 1.10; EV/WF 0.94; WF/HE 1.17; WH/WF 1.76; OOL/WOT 2.06; DT/LT 0.32; FL/FW 2.10; HFL/HFW 2.21; A3 L/W 0.83.

Type Material. Holotype ♀. O'ahu: S. Wai'anae Mts., 9 Nov 1919, O.H. Swezey, BPBM 0000017892.

Paratypes: 1 ♀, S. Wai'anae Mts., 9 Nov 1919, E.H. Bryan, BPBM. 1 ♀, S. Wai'anae Mts., 9 Nov 1919, O.H. Swezey, BPBM. 1 ♀, Pu'u Kaua, 22 Jun 1924, O.H. Swezey, BPBM. 1 ♀ 1 ♂, Pu'u Kaua, 6 Nov 1932, *Eragrostis*, O.H. Swezey, BPBM. 2 ♀, Palikea, 11 Nov 1936, Beating, E.C. Zimmerman, BPBM.

Etymology. Named for my late colleague Daniel Keone Sailer—affectionately known as Danimal for his endurance and ability to navigate the steep mountains of the Wai'anae range—a conservationist and naturalist who worked tirelessly to protect the Honouliuli area, from which all known specimens of this species have been taken. It is a noun in apposition.

Distribution. Occurring throughout the Wai'anae range.

Discussion. Very similar to *S. depressella*, differing in the broader mandible, slightly shorter and broader head, and denser punctuation; also much larger, closer in size to *S. philodoriae*. The one recent specimen (not included as a paratype), which is also the only one from the northern Wai'anae range, is somewhat intermediate with the clypeus and punctuation of typical *S. danimalis* but the head dimensions and mandible of *S. depressella*; it could represent a third species or possibly show that they all represent variants with a larger series.

Sierola depressa Fullaway, 1920

Figure 17J–L, Map 9

Sierola depressa Fullaway, 1920: 145.

Island. O'ahu.

Diagnosis. Part of a small cluster of small, flattened species with the head flat above and below, less than half as deep as long, and the mesosoma also compressed. Separated from related species by having the basal wing cells nearly glabrous, fore femora less than twice as long as wide, mandible narrow and parallel-sided, and head extremely flattened (DH/LH 0.38).

Most similar to *S. antipoda* Ashmead of Australia, which has broader, distinctly concave mandible and a short, truncate clypeus.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a rounded carina dorsally, effaced towards apex; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum almost evenly sloping, weakly curved, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.08 mm; LT 1.06 mm; WH/LH 0.79; DH/LH 0.38; EV/HE 1.05; EV/WF 0.87; WF/HE 1.22; WH/WF 1.69; OOL/WOT 1.25; DT/LT 0.27; FL/FW 1.85; HFL/HFW 2.17; A3 L/W 1.50.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 1 Sep 1913, O.H. Swezey, BPBM Type 146.

Distribution. Known only from the unique type, collected on the middle slopes of Ka'ala in 1913.

Discussion. The metasoma of the type is missing, and the wings largely obscured by glue. This is the most flattened Hawaiian *Sierola* known (in both the head and mesosoma), equaled only by *S. antipoda* of Australia and several undescribed species from there. This body form appears to be associated with attacking leaf miners in other Hawaiian species such as *S. philodoriae* and *S. planiceps*, so if this and the related *S. depressella* are still extant, it may be there that they could be found. However, *S. antipoda* appears to attack caterpillars infesting cone-shaped leaf bud galls, an unusual habitat in Hawai'i but one observed in *Merimnetria* attacking *Kadua affinis* (Zimmerman, 1978b). Fullaway (1934) described a taxon from the Marquesas as subspecies *S. depressa marquisensis*, but it is actually a sclerodermine, apparently *Thlastepyrus* or a related genus, as evidenced by its highly reduced wing venation.

Sierola depressella Fullaway, 1920

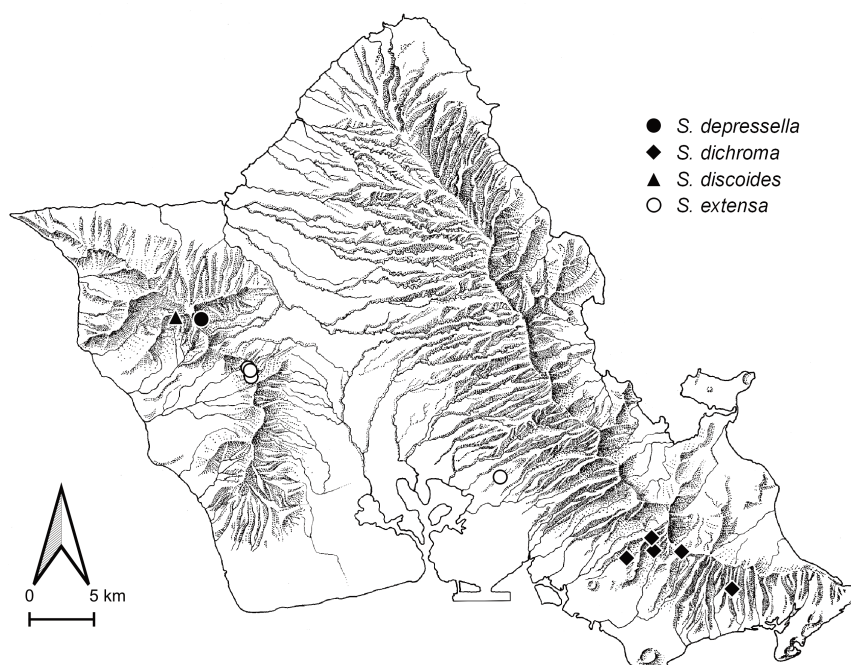
Figure 17M–O, Map 10

Sierola depressella Fullaway, 1920: 95.

Island. O'ahu.

Diagnosis. Part of a small cluster of small, flattened species with the head flat above and below, less than half as deep as long, and the mesosoma also compressed. Separated from related species by the densely setose basal wing cells, relatively elongate, evenly curved clypeus, and narrow head, elongate behind the eye.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly



Map 10. Collection localities of *Sierola depressella*, *S. dichroma*, *S. discoides*, and *S. extensa*.

acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat, head deepest well behind eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna short, scarcely extending beyond head.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.29 mm; LT 0.64 mm; WH/LH 0.71; DH/LH 0.46; EV/HE 1.23; EV/WF 1.07; WF/HE 1.15; WH/WF 1.67; OOL/WOT 2.00; DT/LT 0.29; FL/FW 2.11; HFL/HFW 2.20; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 2500–3000' [915 m] [760–915 m], 22 Jul 1917, P.H. Timberlake, BPBM Type 46.

Distribution. Known only from four specimens taken on the middle slopes of Ka'ala in the Wai'anae range. Last collected in 1920.

Sierola dichroma Perkins, 1910

Figure 18A–C, Map 10

Sierola dichroma Perkins, 1910: 614.

Island. O'ahu.

Diagnosis. A very large and striking species, immediately recognizable by the predominantly yellow testaceous coloration of the mesosoma and large head which is broader than long. The mandible is both broad and long, and the clypeus is only weakly carinate. Other species with large heads and similarly elongate, broad mandible (e.g. *S. granulosa* and *S. hualala*) are all black and have the head distinctly longer than wide.

Description. Female. *Head.* Clypeal process semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrowed medially and strongly expanded at apex, hourglass-shaped, ventral margin strongly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli separated from vertex by greater than their length. Ocellar triangle front angle strongly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Head brown, yellow anterior of eyes and on posterior corners of vertex, pronotum and mesonotum yellow dorsally, metasoma orange-brown. Antenna dark brown dorsally, yellowish brown ventrally. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.50 mm; LT 1.26 mm; WH/LH 1.06; DH/LH 0.58; EV/HE 0.93; EV/WF 0.51; WF/HE 1.81; WH/WF 1.49; OOL/WOT 2.15; DT/LT 0.39; FL/FW 2.53; HFL/HFW 2.92; A3 L/W 2.00.

Type Material. Holotype ♀. O'ahu: Pālolo 1500' [460 m], 1902, R.C.L. Perkins, BPBM Type 1503.

Distribution. Rare, known from 8 specimens taken in the southeastern Ko'olau range. Last collected in 1917.

Ecology. Reared from *Omiodes scotaea* (Hampson) (Crambidae; misidentified in Swezey [1909] as *O. asaphombra*), which feeds on *Astelia*.

Discussion. Males are almost entirely yellow. *Astelia* is now rare on O'ahu, particularly in the Ko'olau range, and *O. scotaea* has not been collected on Oahu recently. However, potential refuges such as the summit area of Ka'ala have not been extensively searched for either the moth or the wasp.

Sierola discoides, n. sp.

Figure 18D–F, Map 10

Island. O'ahu.

Diagnosis. Belonging to a group of species with a sharp, somewhat strongly arched clypeal carina, the basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs nearly all yellow. Distinguished from similar species in the *S. similis* complex by the reddish brown mandible and more flattened, moderately narrow head (DH/LH 0.55–0.57, WH/LH 0.81–0.86). Nearly identical to *S. setosa*, but with the head much flatter and the femora narrow (DH/LH 0.52, FL/FW 2.15, HFL/HFW 2.86 vs. DH/LH 0.55–0.57, FL/FW 1.85–2.00, HFL/HFW 2.30–2.45 in *S. setosa*).

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence elongate, twice as long as flagellar width or more. Metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.93 mm; LT 0.97 mm; WH/LH 0.86; DH/LH 0.52; EV/HE 0.58; EV/WF 0.55; WF/HE 1.05; WH/WF 1.75; OOL/WOT 1.24; DT/LT 0.42; FL/FW 2.15; HFL/HFW 2.86; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, W. side, 1 Jun 1919, O.H. Swezey, BPBMENT 0000017893.

Etymology. Named for the flattened, round head.

Distribution. Known only from the holotype, collected on the west side of Ka'ala in the Wai'anae range in 1919.

Sierola epagogeana Fullaway, 1920

Figure 18G–I, Map 11

Sierola epagogeana Fullaway, 1920: 135.**Island.** O'ahu.

Diagnosis. Belonging to the group of species with a sharp, somewhat strongly arched clypeal carina, the basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs predominantly yellow. Distinguished from similar species by

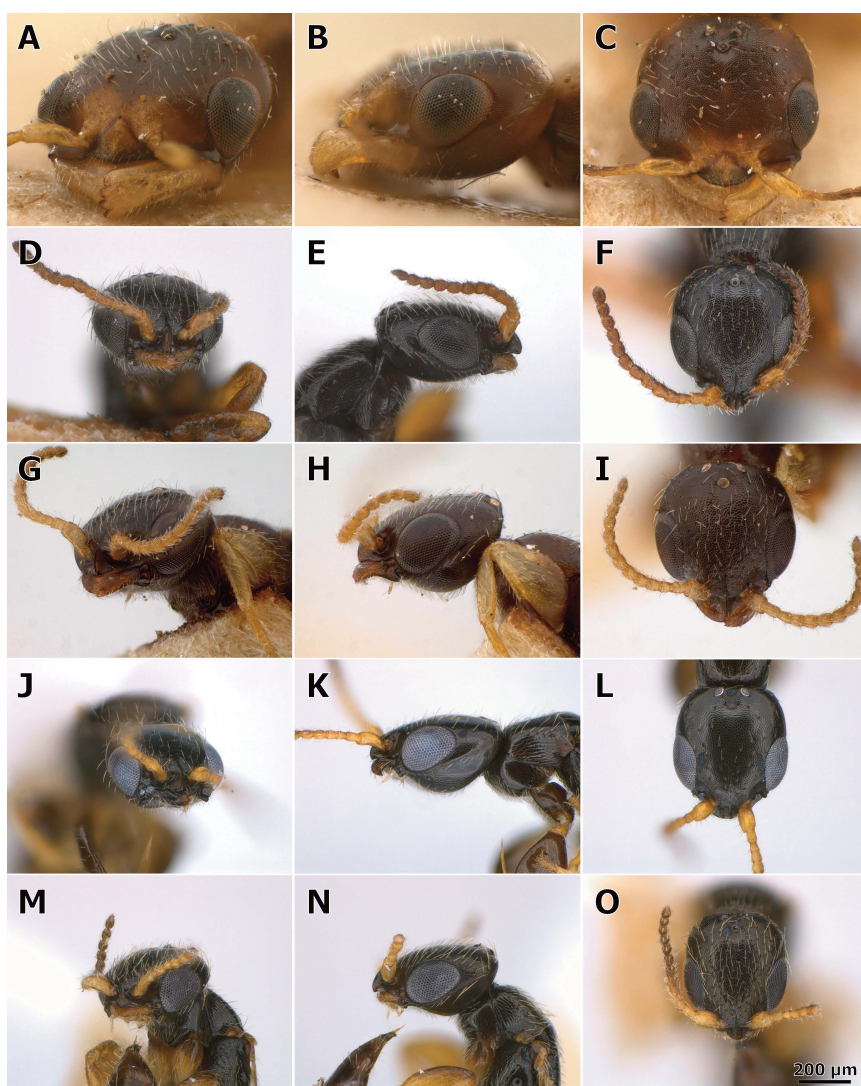


Figure 18. A–C: *Sierola dichroma*. D–F: *Sierola discoides*. G–I: *Sierola epagogeana*. J–L: *Sierola extensa*. M–O: *Sierola femoralis*.

the black mandible which is distinctly concave ventrally, frons densely punctate between the eyes, head short behind the eyes (EV/HE 0.50–0.70), and moderately broad fore femora (FL/FW 1.90–2.15).

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin not carinate

but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Areolet distinctly convex posteriorly, corner medioapical.

Measurements. LFW 1.93 mm; LT 1.00 mm; WH/LH 0.91; DH/LH 0.60; EV/HE 0.61; EV/WF 0.56; WF/HE 1.09; WH/WF 1.76; OOL/WOT 1.14; DT/LT 0.40; FL/FW 2.00; HFL/HFW 2.50; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Kaumuohona Trail, 18 Dec 1910, reared from larva of *Epagoge* [= *Spheterista*] *infaustana*, O.H. Swezey, BPBM Type 126.

Distribution. Rare, known from about half a dozen specimens from the southern Wai'anae and southeastern Ko'olau ranges.

Ecology. The holotype was reared from *Spheterista infaustana* (Walsingham) (Tortricidae), presumably on *Pipturus albidus* (mamaki, Urticaceae).

Discussion. See comments under *S. similis*.

Sierola extensa, n. sp.

Figure 18J–L, Map 10

Island. O'ahu.

Diagnosis. The combination of a strongly concave mandible and smooth, sparsely punctate frons separates this species from nearly all others with a carinate clypeus and sparsely setose to glabrous basal wing cells. Very similar to *S. glabra*, which has the head narrower and more compressed (WH/LH 0.77–0.80 vs. 0.85, and DH/LH 0.54 vs. 0.58) and the antenna shorter (just reaching the anterior pronotum and distal flagellomeres as long as wide, rather than reaching the posterior margin of the pronotum and distal flagellomeres distinctly longer than wide in *S. extensa*). Also similar to *S. mandibularis* and *S. brunneipennis*, which have the frons more closely punctate and a distinct genal angle. The deepest part of the head is more forward in *S. extensa*, making it appear more evenly curved below than all three of the others.

Description. Female. Head. Clypeal process semicircular or semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart, or with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest

beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.77 mm; LT 0.83 mm; WH/LH 0.85; DH/LH 0.58; EV/HE 0.75; EV/WF 0.67; WF/HE 1.13; WH/WF 1.72; OOL/WOT 1.35; DT/LT 0.37; FL/FW 1.79; HFL/HFW 2.05; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: North Kalua'ā Gulch 2200' [670 m], 21.4647°N 158.1010°W, 28 Jun 2016, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM 0000017894.

Paratypes: 1♀, 'Aiea 5–600' [150–180 m], 18 Jun 1922, *Acacia koa*, O.H. Swezey, BPBM. 1♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 30 Jun 2016, on *Planchonella sandwicensis*, K.N. Magnacca. 1♀, Pu'u Hāpapa 2200' [670 m], 21.4665°N 158.1028°W, 27 Dec 2016, on *Freycinetia arborea*, K.N. Magnacca, BPBM.

Etymology. From the Latin *extensus*, stretched or spread out, referring to this species differing from *S. glabra* by having the head dimensions greater in all directions. It is an adjective in the nominative singular.

Distribution. Known only from two recent collections in the southern Wai'anae range and one older specimen from the Ko'olau range.

Discussion. This may form an allopatric species pair with *S. glabra* (see notes under *S. rostrata*), but very few of either have been collected.

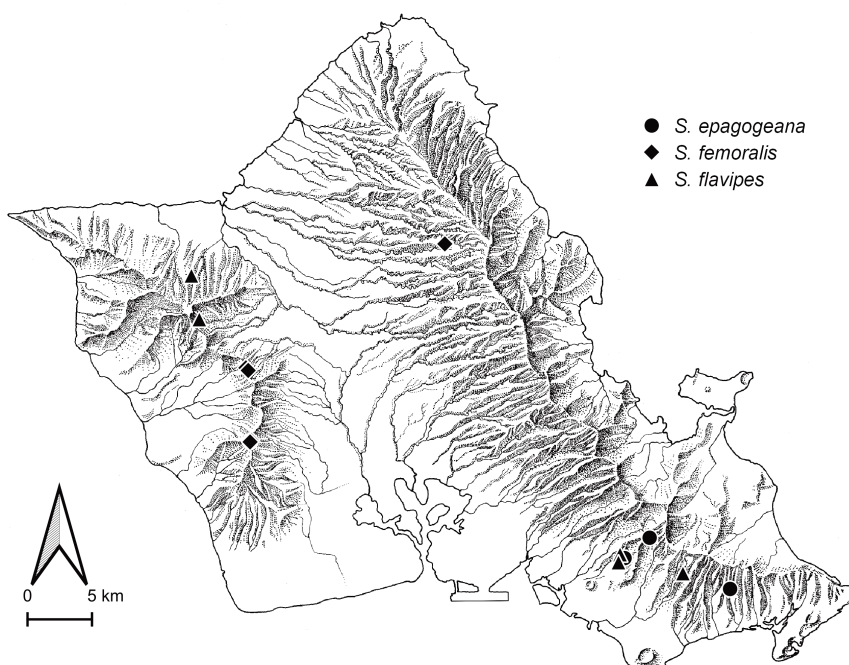
Sierola femoralis, n. sp.

Figure 18M–O, Map 11

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Forming a species complex with *S. hirticeps*, *S. tenuis*, and *S. usitata* based on having a broad hind femur (HFL/HFW 1.80–2.40) and the head narrow and elongate behind the eyes, OOL/WOT 1.33–1.55. Separated from those by the combination of the broader and deeper head (WH/LH 0.78–0.83, DH/LH 0.55–0.56), orange to yellow mandible, and A3 as wide or slightly wider than long. The head dimensions overlap slightly with *S. vestita*, which is distinguished by the black mandible and triangular clypeus.

Description. Female. Head. Clypeal process semicircular or semi-elliptical, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave, or with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets, or evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal



Map 11. Collection localities of *Sierola epagogeana*, *S. femoralis*, and *S. flavipes*.

view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally, or shining, with very faint microreticulation over posterior terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to yellow. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.67 mm; LT 0.85 mm; WH/LH 0.80 (0.78–0.83); DH/LH 0.55 (0.55–0.56); EV/HE 0.75; EV/WF 0.71; WF/HE 1.05; WH/WF 1.70; OOL/WOT 1.33 (1.33–1.41); DT/LT 0.40; FL/FW 1.81 (1.77–1.81); HFL/HFW 2.15 (2.10–2.32); A3 L/W 1.00 (0.87–1.00). N = 5.

Type Material. Holotype ♀. O'ahu: Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 17 May 2012, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM 0000017895.

Paratypes: 1 ♀, Palikea 2900' [885 m], 21.4158°N 158.0993°W, 16 Feb 2012, beating vegetation, K.N. Magnacca, BPBM. 1 ♀, Pe'ahināi'a Tr. 2100' [640 m], 21.5525°N 157.9532°W, 9 Apr 2015, on *Antidesma platyphyllum*, K.N. Magnacca, BPBM. 1 ♀, North Kalua'ā Gulch 2200' [670 m], 21.4647°N 158.1010°W, 27 May 2015, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W,

15 Jun 2016, on *Wikstroemia oahuensis*, K.N. Magnacca, BPBM. 1♀ 1♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Coprosma longifolia*, K.N. Magnacca, NMNH.

Etymology. Named for the expanded hind femur, and for the habit of the fore femur curling up in specimens removed from alcohol, a trait not typically seen in other species aside from the related *S. tenuis*.

Distribution. Uncommon, known from six recent specimens, all collected in the southern Wai'anae range aside from one taken in the central Ko'olau.

Discussion. The elongate setae of the vertex clearly place this species in the *olympiana* group, where it closely resembles *S. usitata*, but the clypeus is much shorter and less strongly arched than most members of that group. This taxon could perhaps be merged with *S. usitata*, and possibly also *S. hirticeps* and *S. tenuis*, into a single highly variable species, but since all four are diagnosable with distinct differences in the head shape, mandible color, and antenna, I prefer to maintain them as separate.

Sierola flavipes Fullaway, 1920

Figure 19A–C, Map 11

Sierola flavipes Fullaway, 1920: 137.

Island. O'ahu.

Diagnosis. Among species with a highly arched and thin clypeal carina, densely punctate frons, and strong and elongate vertex and genal setae, this species is united with *S. citripoda* and *S. poepoe* by the broad head and all-yellow legs. It is readily distinguished from the former by having the mandible black and usually longer OOL/WOT (1.20–1.40 vs. 1.05–1.25), and from the latter by the narrower and more compressed head and less expanded fore femora (WH/LH 0.86–0.93, DH/LH 0.58–0.60, and FW/FL 1.79–1.95 vs. 0.95–0.97, 0.61–0.63, and 1.72–1.81 respectively).

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles flat in lateral view, with moderately dense pubescence, not extending past the genal angle. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

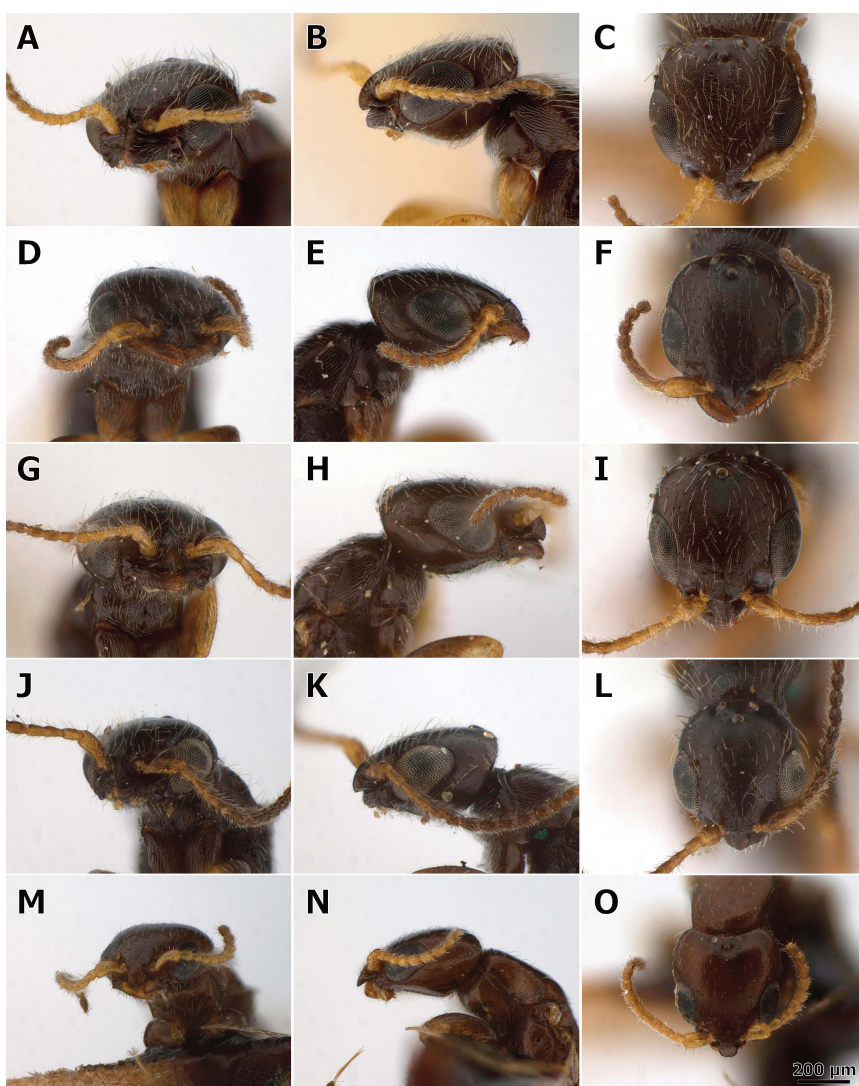


Figure 19. A–C: *Sierola flavipes*. D–F: *Sierola fossulata*. G–I: *Sierola fuliginosa*. J–L: *Sierola fusca*. M–O: *Sierola giffardi*.

Measurements. LFW 2.11 mm; LT 1.01 mm; WH/LH 0.93 (0.86–0.93); DH/LH 0.60 (0.57–0.60); EV/HE 0.61; EV/WF 0.55; WF/HE 1.11; WH/WF 1.69; OOL/WOT 1.22 (1.22–1.37); DT/LT 0.45; FL/FW 1.79 (1.79–1.94); HFL/HFW 2.10 (2.09–2.25); A3 L/W 1.08 (0.93–1.14). N = 4.

Type Material. Holotype ♀. O'ahu: Tantalus 1300' [400 m], 2 Apr 1905, W.M. Giffard, BPBM Type 129.

Distribution. Rare, known from only two specimens in each mountain range. Last collected in 1957.

Discussion. The holotype collection date is listed by Fullaway as April 4, but the day is clearly a 2 on the label (written 2.IV.'05).

Sierola fossulata Fullaway, 1920

Figure 19D–F, Map 12

Sierola fossulata Fullaway, 1920: 126.**Island.** O‘ahu.

Diagnosis. Very similar to *S. peleana* in having the clypeus strongly convex dorsally (sometimes slightly angled but without a distinct carina), basal wing cells sparsely setose to glabrous, and a distinct genal angle; separated by the distinctly different mandible, narrow, parallel-sided, and black rather than moderately broad, strongly concave ventrally, and reddish brown in *S. peleana*. Also close to *S. nuku*, which has the clypeus smaller but somewhat bulbous and recurved in profile, and the frons more sparsely punctate.

Description. Female. Head. Clypeal process rounded triangular or semicircular, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.00 mm; LT 1.06 mm; WH/LH 0.94; DH/LH 0.60; EV/HE 0.70; EV/WF 0.54; WF/HE 1.30; WH/WF 1.68; OOL/WOT 1.10; DT/LT 0.40; FL/FW 1.78; HFL/HFW 2.07; A3 L/W 1.14.

Type Material. Holotype ♀. O‘ahu: Kaumuohona Trail, 9 Sep 1917, P.H. Timberlake, BPBM Type 108.

Distribution. Relatively common in mesic to wet forest in the Wai‘anae range (though never more than a few individuals found at once), but only one specimen (the holotype) taken from the Ko‘olau range.

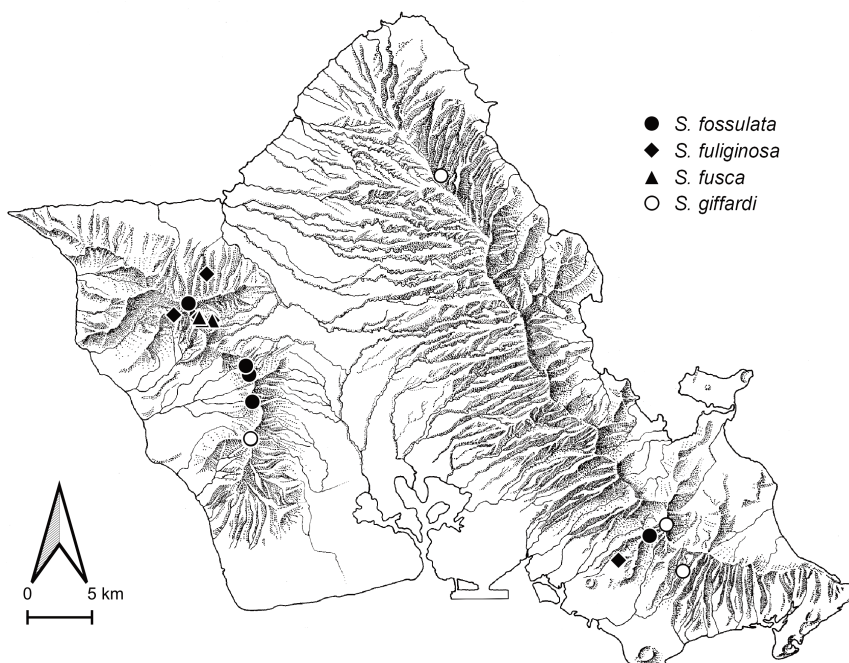
Ecology. Taken on a wide variety of understory trees.

Sierola fuliginosa Fullaway, 1920

Figure 19G–I, Map 12

Sierola fuliginosa Fullaway, 1920: 132.**Island.** O‘ahu.

Diagnosis. This species is fairly distinctive but difficult to key out. The most obvious distinguishing characters are the clypeus strongly arched but with only a sharp carina, not thin



Map 12. Collection localities of *Sierola fossulata*, *S. fuliginosa*, *S. fusca*, and *S. giffardi*.

and laminate as in the *S. olympiana* complex, frons punctation not dense, lateral ocelli separate from the vertex, fore femora less than twice as long as broad, and head broader and deeper than most of those species, WH/LH 0.89–0.92, DH/LH 0.57–0.60. The basal wing cell setation is intermediate, with two complete rows in each cell. Very similar to *S. kaala*, differing in the wing setation, having the metasoma predominantly polished, mandible narrower and parallel-sided, head broader, antenna longer, and fore femora narrow, much more than twice as long as wide. The last also separates it from *S. larifuga*, which can be found in similar habitat and also has a narrower head (WH/LH 0.81–0.88). A3 is conspicuously elongate in *S. fuliginosa*, whereas it is only as long as wide in both *S. kaala* and *S. larifuga*.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture, or finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum almost evenly sloping, weakly

curved. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.13 mm; LT 1.10 mm; WH/LH 0.91 (0.89–0.92); DH/LH 0.57 (0.57–0.60); EV/HE 0.67 (0.63–0.77); EV/WF 0.55 (0.53–0.65); WF/HE 1.21 (1.17–1.25); WH/WF 1.69 (1.65–1.72); OOL/WOT 1.14 (1.14–1.33); DT/LT 0.37; FL/FW 2.39 (2.13–2.48); HFL/HFW 2.46 (2.29–2.78); A3 L/W 1.77 (1.43–1.77). N = 9.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 4 Jul 1916, P.H. Timberlake, BPBM Type 120.

Distribution. Most specimens from near the summit of Ka'ala, except from one from Tantalus in the Ko'olau range. Rare, known from nine definitive specimens, last collected in 1949.

Ecology. A series of three specimens was reared from *Omiodes maia* (Crambidae) at Kamokuiki, a gulch on the northern slope of Ka'ala. They are probably this species but are smaller with smoother microsculpture.

Sierola fusca Fullaway, 1920

Figure 19J–L, Map 12

Sierola fusca Fullaway, 1920: 127.

Island. O'ahu.

Diagnosis. Aberrant within the group of species with the clypeal carina thin, laminate, and highly arched, by having the frons moderately punctate rather than very dense all over. Separated from the similar *S. swezeyi* by the broader head (WH/LH 0.86–0.89), frons moderately punctate all over, and mandible parallel-sided. Also similar to *S. anemophila*, but with the fore and hind femora much narrower (FL/FW 2.30–2.50, HFL/HFW 2.80–3.15), and A3 elongate, 1.7–1.9 times as long as wide.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral

side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.96 mm; LT 0.99 mm; WH/LH 0.88; DH/LH 0.59; EV/HE 0.62; EV/WF 0.57; WF/HE 1.09; WH/WF 1.71; OOL/WOT 1.11; DT/LT 0.41; FL/FW 2.50; HFL/HFW 3.01; A3 L/W 1.71.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 1500–2500' [760 m] [460–760 m], 9 Jul 1916, P.H. Timberlake, BPBM Type 109.

Distribution. Known only from three specimens, all taken in the Wai'anāe range on the lower slopes of Ka'ala. Last collected in 1944.

Sierola giffardi Fullaway, 1920

Figure 19M–O, Map 12

Sierola giffardi Fullaway, 1920: 79.

Island. O'ahu.

Diagnosis. Clypeus flat dorsally, mandible strongly oblique apically with reduced dorsal teeth, and vertex concave. Very similar to *S. concava*, separated by the longer and narrower head, and shallow emargination of the vertex.

Description. Female. Head. Clypeal process spatulate, expanded beyond anterior margin of head or elongate, parallel-sided, apex broadly rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; slightly twisted, outwardly polished, smooth, shining; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible strongly oblique, with a single large ventral tooth and a few small teeth on the inner margin. Malar space 1/3 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, deeply concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Coxae and femora dark brown to black, tibiae and tarsi yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.63 mm; LT 0.87 mm; WH/LH 0.83; DH/LH 0.52; EV/HE 1.10; EV/WF 0.83; WF/HE 1.33; WH/WF 1.70; OOL/WOT 1.43; DT/LT 0.37; FL/FW 2.08; HFL/HFW 2.14; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Kōnāhuanui, 22 Feb 1914, O.H. Swezey, BPBM Type 17.

Distribution. Uncommon but widespread in both the Ko'olau and Wai'anāe ranges.

Sierola glabra Fullaway, 1920

Figure 20A–C, Map 13

Sierola glabra Fullaway, 1920: 95.*Sierola opaeula* Fullaway, 1920: 105, **n. syn.****Island.** O'ahu.

Diagnosis. The combination of strongly concave mandible and smooth, sparsely punctate frons separates this species from nearly all others with a carinate clypeus and sparsely setose to glabrous basal wing cells. Closest to *S. extensa*, which has the head broader and deeper (WH/LH 0.85 vs. 0.77–0.80, and DH/LH 0.58 vs. 0.54) and the antenna longer (reaching the posterior margin of the pronotum and distal flagellomeres distinctly longer than wide, rather than just reaching the anterior pronotum and distal flagellomeres as long as wide in *S. glabra*). The narrow head (WH/LH less than 0.80) also separates it from *S. mandibularis* and *S. brunneipennis*; one unusually small specimen has the head slightly broader. The genal angle is variable even among the few specimens and often ambiguous.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle broadly rounded, or absent, head evenly convex ventrally. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.56 mm; LT 0.79 mm; WH/LH 0.78; DH/LH 0.54; EV/HE 0.91; EV/WF 0.83; WF/HE 1.09; WH/WF 1.69; OOL/WOT 1.68; DT/LT 0.34; FL/FW 1.78; HFL/HFW 2.06; A3 L/W 1.00.

Type Material. Holotype ♀ of *Sierola glabra*. O'ahu: Tantalus 1300' [400 m], 7 May 1911, W.M. Giffard, BPBM Type 47.

Holotype ♀ of *Sierola opaeula*. O'ahu: 'Ōpae'ula, 30 Mar 1913, D.T. Fullaway, BPBM Type 66.

Distribution. Known from a handful of specimens from the Ko'olau range, all except the holotype of *S. opaeula* collected from around Tantalus, and one from Ka'ala in the Wai'anae range. Last taken in 1920.

Discussion. Synonym of *S. opaeula*; the two types are identical in all characters. This name is chosen as the type is in better condition.

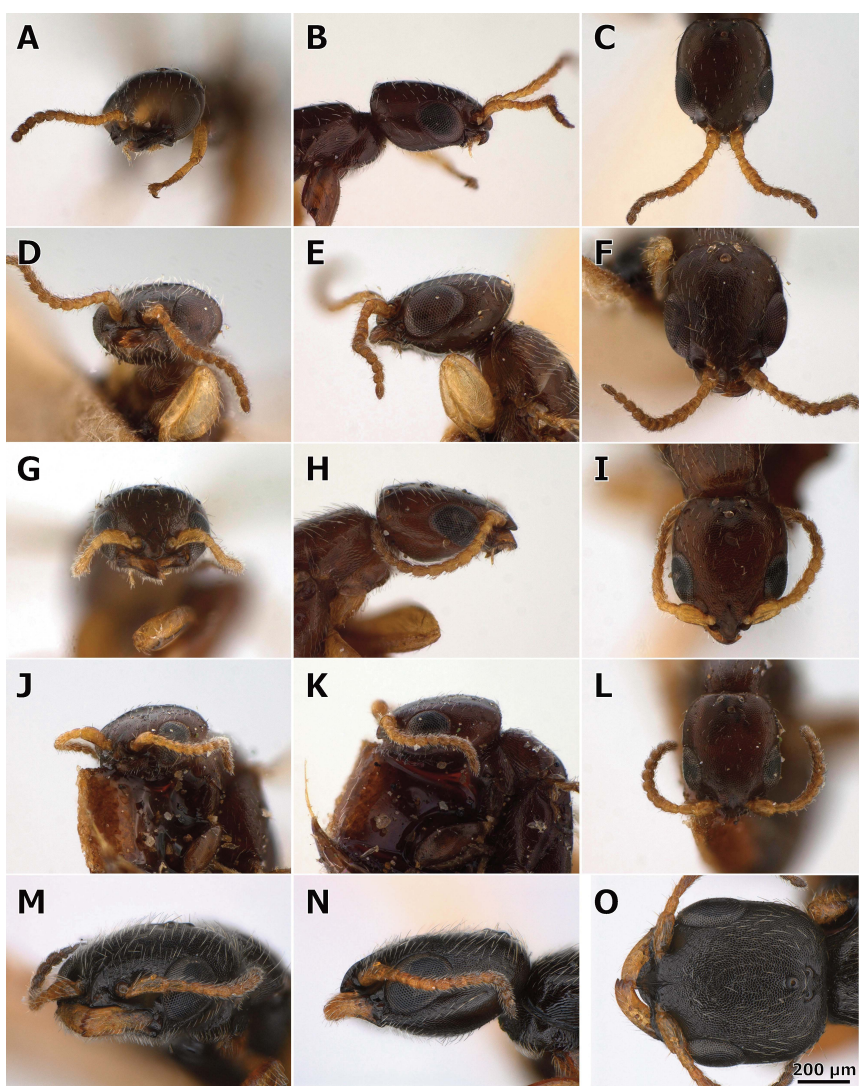


Figure 20. A–C: *Sierola glabra*. D–F: *Sierola gracilariae*. G–I: *Sierola gracilis*. J–L: *Sierola gracilima*. M–O: *Sierola granulosa*.

***Sierola gracilariae* Fullaway, 1920**

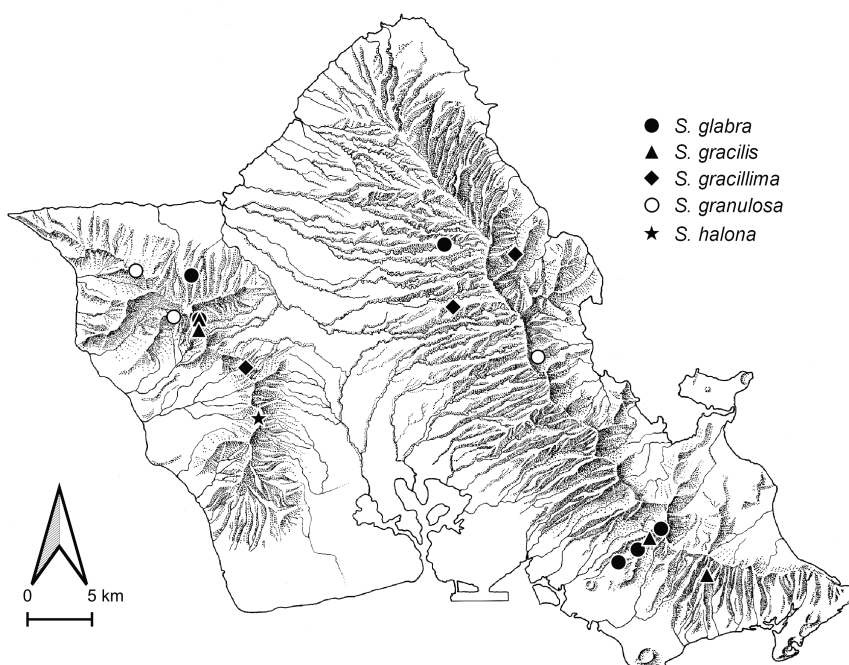
Figure 20D–F, Map 14

Sierola gracilariae Fullaway, 1920: 118.

Sierola kaduana Fullaway, 1920: 118, **n. syn.**

Island. O‘ahu.

Diagnosis. Distinguished from most other species with a sharp clypeal carina and densely setose basal wing cells by having the mandible strongly convex externally, semicylindrical in cross section. Separated from the closely related *S. kaumuohona* primarily by the more punctate frons and distinctly elongate second ventral tooth, and from the more distant *S. nihopeku* by having the mandible narrow and the clypeus curved in profile.



Map 13. Collection localities of *Sierola glabra*, *S. gracilis*, *S. gracillima*, *S. granulosa*, and *S. halona*.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with second ventral tooth largest. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.66 mm; LT 0.83 mm; WH/LH 0.87; DH/LH 0.56; EV/HE 0.70; EV/WF 0.68; WF/HE 1.02; WH/WF 1.77; OOL/WOT 1.35; DT/LT 0.39; FL/FW 2.23; HFL/HFW 2.40; A3 L/W 0.86.

Type Material. Holotype ♀ of *Sierola gracilariae*. O'ahu: Niu, 11 Dec 1910, reared from larva of *Gracilaria mabaella* [= *Caloptilia mabaella*], O.H. Swezey, BPBM Type 92.

Holotype ♀ of *Sierola kaduana*. O'ahu: Mālamalama, 28 Jul 1918, on *Kadua acuminata*, P.H. Timberlake, BPBM Type 91.

Distribution. Found in mesic forest in the northern Wai'anae range and southeastern Ko'olau range. Most specimens collected October–December.

Ecology. All specimens where the plant was recorded have come from *Diospyros hillebrandii* (lama, Ebenaceae), except for the type of *S. kaduana* (see comments). Reared from *Caloptilia mabaella* (Swezey) (Gracillariidae), a leaf miner in *Diospyros* spp. This moth was considered to be an alien by Zimmerman (1978b), but is not known from outside Hawai'i and the evident close association between it and *S. gracilariae* implies it is native.

Discussion. Fullaway lists a number of characters of the punctuation, coloration and mandible to separate this species from *S. kaduana*, but none are evident on examination of the types: both have the wings hyaline, the mandible width and frons punctuation are identical, and the head setation of *S. gracilariae* is less conspicuous only because the type specimen is more abraded. *Sierola kaumuohona* may also be a synonym; it is retained as distinct because the punctuation difference appears to be consistent and to largely correlate with different hosts and habitat (*Merimnetria* on *Kadua* in wet forest for *S. kaumuohona*, *Caloptilia* on *Diospyros* in mesic forest for *S. gracilariae*). However, the type of *S. kaduana* was collected on *Kadua* but is clearly of the same form as *S. gracilariae*, suggesting that they may not be fully separated.

Sierola gracilis Fullaway, 1920

Figure 20G–I, Map 13

Sierola gracilis Fullaway, 1920: 78.

Island. O'ahu.

Diagnosis. In the species with the clypeus flat dorsally, mandible strongly oblique apically with reduced dorsal teeth, and vertex straight. United with *S. kikiwi* in having the basal wing cells densely setose; distinguished by the mandible being only slightly twisted, ocellar triangle front angle right (OOL/WOT ~1.45), and the head convex dorsally. The frons width is also distinctly greater than the eye height, WF/HE ~1.19.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; slightly twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible slightly oblique, with a single large ventral tooth and a few small teeth on the inner margin. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely,

weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.93 mm; LT 0.95 mm; WH/LH 0.79; DH/LH 0.51; EV/HE 0.88; EV/WF 0.74; WF/HE 1.19; WH/WF 1.63; OOL/WOT 1.45; DT/LT 0.38; FL/FW 1.96; HFL/HFW 2.38; A3 L/W 1.10.

Type Material. Holotype ♀. O'ahu: Kaumuohona Ridge, 7 Jan 1917, P.H. Timberlake, BPBM Type 14.

Distribution. Only known from four specimens, from both the Ko'olau and Wai'anae ranges. The latter occurrences are all from Ka'ala and to the north.

Discussion. This species and its very similar sibling *S. kikiwi* appear to have the same allopatric distribution as *S. oahuensis* and *S. rostrata*, although there are too few specimens of both to be certain. See comments under the latter species.

Sierola gracillima Fullaway, 1920

Figure 20J–L, Map 13

Sierola gracillima Fullaway, 1920: 102.

Island. O'ahu.

Diagnosis. A rather nondescript species, with the basal wing cells densely setose, clypeus carinate and evenly curved, and mandible narrow and parallel-sided without any modifications. Distinguished from similar species by the rather narrow head (WH/LH 0.80), with weak microsculpture and moderately sparse punctation on the frons.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart, or with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.58 mm; LT 0.75 mm; WH/LH 0.80; DH/LH 0.53; EV/HE 1.00; EV/WF 0.89; WF/HE 1.12; WH/WF 1.66; OOL/WOT 1.68; DT/LT 0.34; FL/FW 2.27; HFL/HFW 2.47; A3 L/W 0.86.

Type Material. Holotype ♀. O'ahu: Punalu'u, 11 Jun 1911, O.H. Swezey, BPBM Type 59.

Distribution. Known only from two specimens taken in the central Ko'olau range and one from the Wai'anāe.

Discussion. Each of the three specimens are slightly different. The second Ko'olau specimen has the head more compressed and shorter behind the eyes compared to the type and with the mandible yellow rather than brown to black. The Wai'anāe specimen has the head similarly flattened and also wider than the others; the mandible is reddish brown. They are the same in other respects, and just within the range of expected variation, so are tentatively maintained as one species.

Sierola granulosa, n. sp.

Figure 20M–O, Map 13

Island. O'ahu.

Diagnosis. Separated from most species in the group with a sharp or weakly carinate clypeal carina and densely to sparsely setose basal wing cells by the moderately broad, distinctly concave, orange-yellow mandible, lack of a genal angle, and head elongate behind the eyes (EV/HE greater than 0.90). Most similar to *S. hualala*; distinguished from that species by the shorter head behind the eyes (EV/HE 0.90–1.10) and close punctation, and from *S. koolauensis* by the broad, flattened head and small ocellar triangle (OOL/WOT 2.2–2.3 vs. ~1.6 in *S. koolauensis*). Differs from both in the orange mandible and very strongly granular sculpture of the frons.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina, or with a distinct but narrow, sharp ridge raised slightly above the otherwise flat surface; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin absent, back of head evenly rounded in lateral view. Lateral ocelli separated from vertex by greater than their length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible orange. Fore coxa and femur black, legs otherwise brown, paler towards tarsi.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.89 mm; LT 0.98 mm; WH/LH 0.85; DH/LH 0.55; EV/HE 1.03; EV/WF 0.70; WF/HE 1.48; WH/WF 1.50; OOL/WOT 2.21; DT/LT 0.42; FL/FW 2.31; HFL/HFW 2.61; A3 L/W 1.50.

Type Material. Holotype ♀ and allotype ♂. O'ahu: Mt. Ka'ala, W. side, 1 Jun 1919, O.H. Swezey, BPBM 0000017896.

Paratypes: 1♀, Waiāhole, 12 May 1919, *Euphorbia*, O.H. Swezey, BPBM. 1♀ 1♂, Kukuiala Val., 9 Feb 1936, *Euphorbia*, O.H. Swezey, BPBM.

Etymology. From the extremely dull sculpture of the head. It is an adjective in the nominative singular.

Distribution. Known from five specimens from three collections in wet to mesic forest, two from the Wai'anae range and one from the Ko'olau. Last taken in 1936.

Ecology. Probably associated with *Euphorbia* (= *Chamaesyce*; 'akoko, Euphorbiaceae), as two of the three records are from it and there are only a handful of other *Sierola* collections from it (all common species). The *Euphorbia* species occurring in wetter habitats where it was collected, *E. herbstii* in the Wai'anae range and *E. rockii* in the Ko'olau, are now endangered, which may be why this species is so rare.

Discussion. The setation of the basal wing cells is somewhat intermediate, with two full conspicuous rows of setae in each cell. The Ko'olau specimen has the clypeus less curved and carina lower, but is otherwise identical.

Sierola halona, n. sp.

Figure 21A–C, Map 13

Island. O'ahu.

Diagnosis. Closely related to *S. uhiwai*, which it groups with by the weakly carinate clypeus and yellow, strongly concave mandible. Separated from that species by the somewhat elongate clypeus which is curved in lateral view, and all yellow legs; distinguished from *S. aniani* by the sparsely setose basal wing cells.

Description. Female. Head. Clypeal process semicircular, apex weakly pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Side of head behind eye with a line of smooth tessellate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting above and below. Post-genal depression very shallow, nearly absent. Antenna extending to mesonotum.

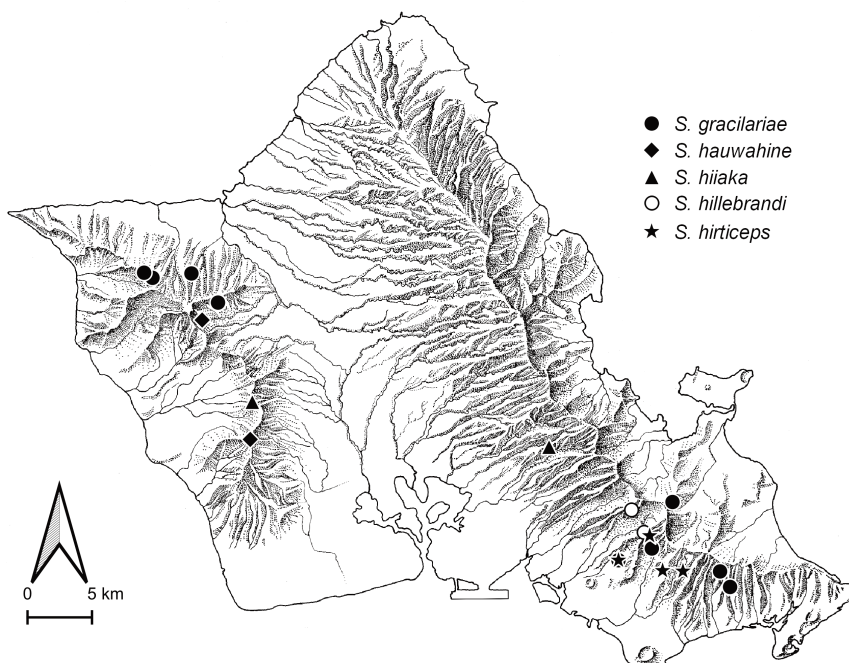
Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture, or shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.77 mm; LT 0.89 mm; WH/LH 0.92; DH/LH 0.60; EV/HE 0.64; EV/WF 0.56; WF/HE 1.13; WH/WF 1.73; OOL/WOT 1.00; DT/LT 0.43; FL/FW 2.00; HFL/HFW 2.89; A3 L/W 1.40.



Map 14. Collection localities of *Sierola gracilariae*, *S. hauwahine*, *S. hiiaka*, *S. hillebrandi*, and *S. hirticeps*.

Type Material. Holotype ♀. O'ahu: Halona Val., Wai'anae Mts., 12 Mar 1933, *Osmanthus* [= *Nestegis*] O.H. Swezey, BPBMENT 0000017897.

Etymology. Named for the type locality, Hālonā Valley in the Wai'anae range. It is a noun in apposition.

Distribution. Known only from one specimen from the southern Wai'anae range, in mesic forest at Hālonā Gulch.

Discussion. See comments under *S. uhiwai*.

***Sierola hauwahine*, n. sp.**

Figure 21D–F, Map 14

Island. O'ahu.

Diagnosis. Clypeus flat dorsally, mandible falcate, and vertex slightly concave. Immediately distinguishable from similar species by the predominantly yellow mesosoma, as well as the flat dorsum of the head.

Description. Female. Head. Clypeal process semicircular or elongate, parallel-sided, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; strongly twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space $1/3$ as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, shallowly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly



Figure 21. A–C: *Sierola halona*. D–F: *Sierola hauwahine*. G–I: *Sierola heterochroma*. J–L: *Sierola hiiaka*. M–O: *Sierola hillebrandi*.

acute to right. Head broadening behind eyes. Dorsum of head in lateral view nearly flat, head deepest just posterior of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Gena below eye flat. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate, pronotal disc distinctly flattened. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Head black, pronotum, mesonotum, and scutellum yellow-brown, metanotum, propodeum, and metasoma dark brown to black, pleura variable. Antenna yellow-brown. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.12 mm; LT 1.10 mm; WH/LH 0.72; DH/LH 0.48; EV/HE 1.16; EV/WF 1.06; WF/HE 1.10; WH/WF 1.85; OOL/WOT 1.55; DT/LT 0.36; FL/FW 1.87; HFL/HFW 2.52; A3 L/W 1.33.

Type Material. Holotype ♀, O'ahu: Hale'au'au, 13 Mar 1932, *Alyxia*, O.H. Swezey, BPBMNT 0000017898.

Paratype: 1 ♀, Palikea, Jun 1957, J.W. Beardsley, BPBM.

Etymology. Named for Hauwahine, the supernatural *mo'ō* (lizard) guardian of Kawainui. It is a noun in apposition.

Distribution. Known only from two specimens collected in the southern Wai'anae range.

***Sierola heterochroma*, n. sp.**

Figure 21G–I, Map 15

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Forms a closely related complex with *S. hirsuta* and *S. olympiana* based on the hyaline wings, moderately wide head (WH/LH 0.77–0.84), elongate third antennal segment (about 1.2–1.5 times as long as wide), and narrow femora (FL/FW 1.90–2.20, HFL/HFW 2.50–3.00) that are usually solid colored. Separated from those species by having the mandible yellow but the coxae and femora brown.

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular, or coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Coxae and basal 2/3 of femora brownish, legs otherwise yellow or coxae brown above and yellow below, basodorsal 2/3 of fore femur and all of mid and hind femora dark brown, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.87 mm; LT 0.87 mm; WH/LH 0.80 (0.76–0.84); DH/LH 0.55 (0.53–0.57); EV/HE 0.78; EV/WF 0.69; WF/HE 1.13; WH/WF 1.69; OOL/WOT 1.25 (1.15–1.40); DT/LT 0.44; FL/FW 2.00 (1.90–2.12); HFL/HFW 2.70 (2.52–2.84); A3 L/W 1.40 (1.20–1.40). N = 22.

Type Material. Holotype ♀. O'ahu: Palikea 2900' [885 m], 21.4158°N 158.0993°W, 16 Feb 2012, beating vegetation, K.N. Magnacca, BPBM. 0000017899.

Paratypes: 1 ♀, Pālehua, Wai'anae, 7 May 1922, Gouldia, O.H. Swezey, BPBM. 1 ♀, Mt. Ka'ala, 18 Feb 1923, *Metrosideros*, O.H. Swezey, BPBM. 1 ♀, Pe'ahināi'a Rdg., 13 Apr 1930, 'Ōhi'a hā [*Syzygium sandwicense*], O.H. Swezey, BPBM. 1 ♀, Kukuiala Val., 16 Sep 1933, *Maba* [= *Diospyros*], O.H. Swezey, BPBM. 1 ♀, Mt. Ka'ala 1200–1500' [460 m] [370–460 m], 29 Oct 1944, Beating Shrubbery, E.C. Zimmerman, BPBM. 1 ♀, Mt. Ka'ala, Apr 1949, G.B. Mainland, BPBM. 2 ♀, Mākaha, Camp Ridge 2300' [700 m], 21.5019°N 158.1690°W, 14 Feb 2012, beating vegetation, K.N. Magnacca, BPBM. 2 ♀, North Hale'au'au Gulch 2350' [720 m], 21.5066°N 158.1297°W, 24 Feb 2012, on *Antidesma platyphyllum*, K.N. Magnacca, BPBM. 2 ♀ 1 ♂, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 16 May 2012, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, Pu'u Kaua summit 3050' [930 m], 21.4411°N 158.0989°W, 30 Aug 2012, on *Metrosideros polymorpha*, K.N. Magnacca, HDOA. 1 ♀ 1 ♂, 'Ōhikilolo 2900' [885 m], 21.5133°N 158.1930°W, 5 Jun 2013, sweeping ferns, K.N. Magnacca, BPBM. 1 ♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 6 Jul 2014, on *Antidesma platyphyllum*, K.N. Magnacca, HDOA. 1 ♀ 1 ♂, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 19 Nov 2014, on *Psychotria*, K.N. Magnacca, NMNH. 1 ♀, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 3 Mar 2015, under leaves, K.N. Magnacca, NMNH. 1 ♀, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 2 Jun 2015, on *Broussaisia arguta*, K.N. Magnacca, BPBM. 2 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Kadua affinis*, K.N. Magnacca, BPBM. 1 ♀, West Makaleha Gulch 1900' [580 m], 21.5285°N 158.1723°W, 14 Nov 2016, on *Diospyros hillebrandii*, K.N. Magnacca, UHIM. 1 ♀ 1 ♂, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 22 Feb 2017, on *Perrottetia sandwicensis*, K.N. Magnacca, UHIM.

Etymology. Named for the differing colors of the mandible and legs. It is an adjective in the nominative singular.

Distribution. Found in both wet and mesic forest, primarily in the northern Wai'anae range, and at Palikea in the southern Wai'anae. No records from the Ko'olau range.

Discussion. I am establishing this species somewhat reluctantly, because it would otherwise be difficult to maintain *S. hirsuta* and *S. olympiana* as distinct. All three are similar structurally, united by the narrow fore and hind femora, moderately long antenna, and identical range of head dimensions. They differ in coloration, mandible and femora being yellow in *S. hirsuta*, both dark brown to black in *S. olympiana*, and mandible yellow but femora dark in *S. heterochroma*. Unlike other species known to be polymorphic in coloration, such as *S. tenuis* or *S. vestita*, there are no intermediate forms seen. The ranges overlap significantly, and they may be taken in company, but also show some segregation – *S. heterochroma* is found mainly in the northern Wai'anae range, in both mesic and wet forest (only one record from the Ko'olau range); *S. hirsuta* is found mostly in wet forest, mainly in the Wai'anae range and occasionally in the Ko'olau; and *S. olympiana* is found widely in both ranges, again primarily in wet forest. The metasoma is distinctly microreticulate only in *S. olympiana*, leading to the possibility that it is distinct but *S. hirsuta* and *S. heterochroma* are one species. Notably, *S. hirsuta* appears to have declined significantly in recent collections compared to earlier periods, while *S. heterochroma* has increased.

Sierola hiika, n. sp.

Figure 21J–L, Map 14

Island. O'ahu.

Diagnosis. Readily separated from most species by the prominent clypeus which is strongly convex or weakly carinate dorsally, moderately broad mandible that are strongly concave ventrally and expanded apically, and sparsely setose basal wing cells. Close to *S. peleana*, but with a flatter clypeus, broader and deeper head, reduced microsculpture of the metasoma, and pronotum and mandible yellow.

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrowed medially and strongly expanded at apex, hourglass-shaped, ventral margin strongly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible slightly oblique,

with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Prothorax yellow, body otherwise dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.09 mm; LT 1.07 mm; WH/LH 0.93; DH/LH 0.64; EV/HE 0.62; EV/WF 0.50; WF/HE 1.24; WH/WF 1.63; OOL/WOT 1.04; DT/LT 0.40; FL/FW 2.07; HFL/HFW 2.73; A3 L/W 1.67.

Type Material. Holotype ♀. O'ahu: 'Aiea Ridge Trail 1600' [490 m], 3 Nov 1968, *Ilex anomala*, W.C. Gagné, BPBM 0000017900.

Paratype: 1 ♀, Pu'u Kaua, 22 Jun 1924, O.H. Swezey, BPBM.

Etymology. Named for Hi'iaka, the Hawaiian goddess of hula and medicine and sister of the volcano goddess Pele, referring to the similarity of this species to *S. peleana*. It is a noun in apposition.

Distribution. Known from two specimens, one each from the Wai'anae and Ko'olau ranges.

Discussion. Very similar to *S. peleana*, and initially thought to be a color variety of that species. The differences in head dimensions, S6 setation, and coloration, along with the subtle but recognizable difference in the form of the clypeus, show it to be distinct.

Sierola hillebrandi Fullaway, 1920

Figure 21M–O, Map 14

Sierola hillebrandi Fullaway, 1920: 121.

Island. O'ahu.

Diagnosis. Part of a complex of species with a broad, nearly parallel-sided mandible and a short, steep clypeus. Separated from related species by the very densely setose basal wing cells (four rows of setae in cell R and three in 1Cu) and distinctly carinate clypeus which is nearly straight in profile. The head dimensions are closest to *S. aspera*, but *S. hillebrandi* is distinctly different in the shape of the clypeus and wing cell setation.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, ventral margin slightly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by

less than ocellus length. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.93 mm; LT 0.97 mm; WH/LH 0.86; DH/LH 0.58; EV/HE 0.82; EV/WF 0.78; WF/HE 1.05; WH/WF 1.83; OOL/WOT 1.42; DT/LT 0.36; FL/FW 2.07; HFL/HFW 2.70; A3 L/W 1.17.

Type Material. Holotype ♀, O'ahu: Hillebrand's Glen, 17 Nov 1912, O.H. Swezey, BPBM Type 98.

Distribution. Known only from two specimens taken on opposite sides of Nu'uanu Valley in the southeastern Ko'olau range. Last collected in 1916.

Sierola hirsuta Fullaway, 1920

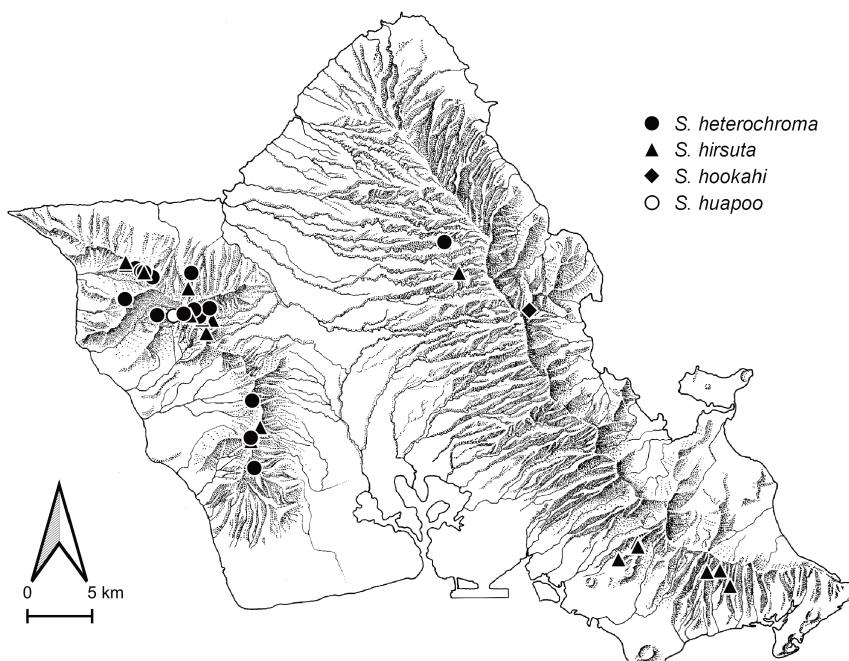
Figure 22A–C, Map 15

Sierola hirsuta Fullaway, 1920: 106.

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Forms a closely related complex with *S. heterochroma* and *S. olympiana* based on the hyaline wings, moderately wide head (WH/LH 0.77–0.84), elongate third antennal segment (about 1.2–1.5 times as long as wide), and narrow femora (FL/FW 1.90–2.20, HFL/HFW 2.50–3.00) that are usually solid colored. Separated from those species by having both the mandible and legs entirely yellow. Distinguished from the very similar *S. welau* but having cell 2R1 completely closed, slightly smaller OOL/WOT (1.10–1.40 vs. 1.40–1.55), and usually narrower hind femora (2.53–2.86 vs. 2.15–2.57, typical specimens much different).

Description. Female. Head. Clypeal process triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about twice as long as flagellar width or more. Frons with shallow, close punctures, mostly less than 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular, or coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin carinate. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.



Map 15. Collection localities of *Sierola heterochroma*, *S. hirsuta*, *S. hookahi*, and *S. huapoo*.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture, or shining, with very faint microreticulation over posterior terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.88 mm; LT 1.01 mm; WH/LH 0.80 (0.77–0.84); DH/LH 0.55 (0.53–0.58); EV/HE 0.71; EV/WF 0.64; WF/HE 1.12; WH/WF 1.66; OOL/WOT 1.32 (1.11–1.39); DT/LT 0.37; FL/FW 2.13 (1.93–2.21); HFL/HFW 2.73 (2.53–2.86); A3 L/W 1.23 (1.23–1.48). N = 16.

Type Material. Holotype ♀. O‘ahu: Niu, 10 Feb 1918, P.H. Timberlake, BPBM Type 69.

Distribution. Found in wet forest, taken in the southeastern Ko‘olau range and at Palikea and on the windward slopes of Ka‘ala in the Wai‘anae range. Formerly abundant, but uncommon in recent collections and found only at Palikea.

Discussion. The male allotype is almost certainly a different species; the head punctuation is much sparser. Some individuals have the frons more shiny and/or the wings less densely setose, but the two characters seem to vary independently and cannot be used to reliably separate them into distinct taxa. Curiously, there are no recent collections from Ka‘ala where it was formerly abundant, despite extensive collecting there, but the nearly identical *S. welau* n. sp. is now taken frequently there. See also comments under *S. heterochroma*.

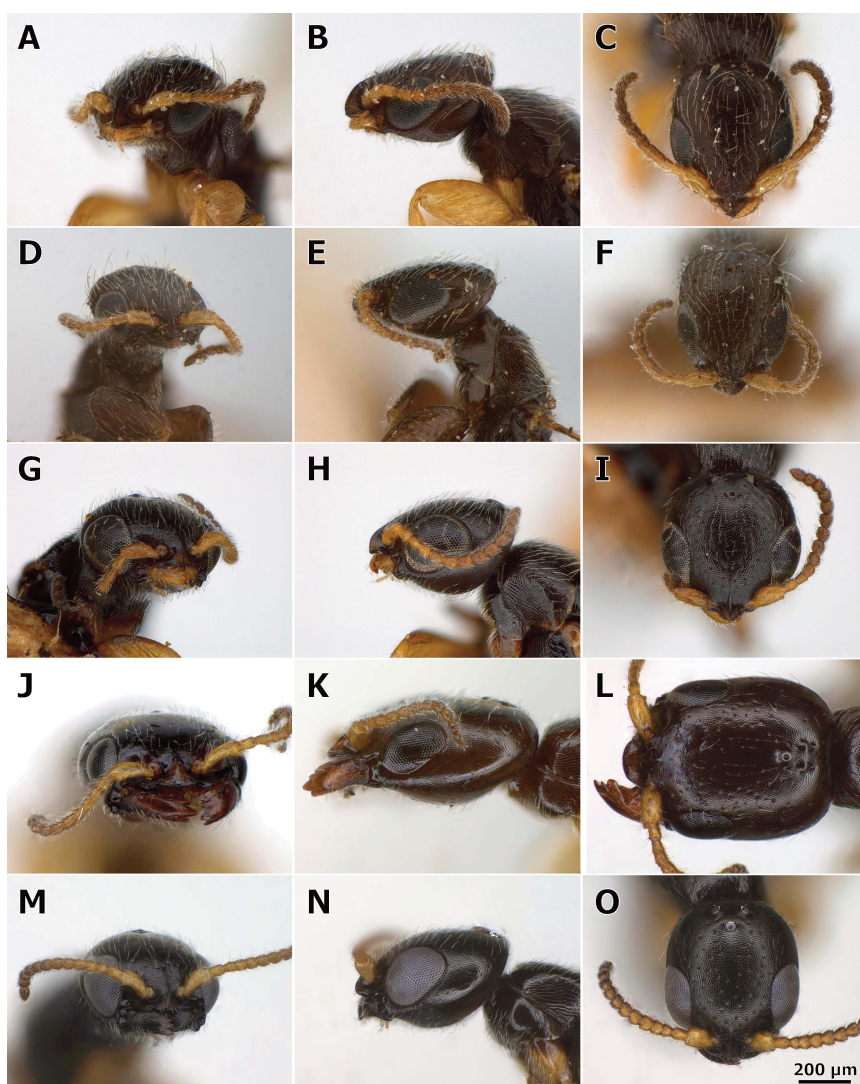


Figure 22. A–C: *Sierola hirsuta*. D–F: *Sierola hirticeps*. G–I: *Sierola hookahi*. J–L: *Sierola hualala*. M–O: *Sierola huapoo*.

***Sierola hirticeps* Fullaway, 1920**

Figure 22D–F, Map 14

Sierola hirticeps Fullaway, 1920: 147.

Island. O‘ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Separated from nearly all others by the very narrow, compressed head (WH/LH 0.72–0.76, DH/LH 0.50–0.52) and the swollen hind femur (HFL/HFW 1.80–2.40). Distinguished from *S. tenuis*, which has a similarly narrow head, by having the femora and mandible entirely dark brown to black.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with

a thin, laminar carina, the sides strongly concave, or with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets, or evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena below eye flat. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.73 mm; LT 0.88 mm; WH/LH 0.76; DH/LH 0.52; EV/HE 0.73; EV/WF 0.75; WF/HE 0.98; WH/WF 1.75; OOL/WOT 1.41; DT/LT 0.38; FL/FW 1.80; HFL/HFW 2.00; A3 L/W 1.20.

Type Material. Holotype ♀. O'ahu: Tantalus, 3 Jan 1910, D.T. Fullaway, BPBM Type 150.

Distribution. Very rare, only definitively known from the holotype and two other specimens. Last collected in 1917.

Discussion. This species is very similar to the moderately common *S. tenuis*, and may prove to be an aberrant color morph of it. The paratype from Kunia is *S. usitata*, and the one from Kaumua'hona collected by Timberlake listed by Fullaway (1920) cannot be located.

Sierola hookahi, n. sp.

Figure 22G–I, Map 15

Island. O'ahu.

Diagnosis. Fitting among a cluster of species with a sharp clypeal carina and mandible distinctly concave ventrally; distinguished from most of those with similar characteristics by the deep, moderately broad head (DH/LH ~0.63, WH/LH ~0.94) and yellow mandible. The basal wing cells are intermediate, with two complete rows present in each cell and cell R dense apically. Strikingly similar to *S. capuana* and *S. epagogeana*, with the mandible yellow like the former and densely punctate frons like the latter, and with more setose wing cells than either.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae distinctly longer

than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Coxae brown, femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.87 mm; LT 0.94 mm; WH/LH 0.94; DH/LH 0.63; EV/HE 0.63; EV/WF 0.58; WF/HE 1.08; WH/WF 1.77; OOL/WOT 1.12; DT/LT 0.44; FL/FW 2.26; HFL/HFW 2.62; A3 L/W 1.48.

Type Material. Holotype ♀. O'ahu: Waikāne, 13 Apr 1924, on Sandalwood tree, O.H. Swezey, BPBMNT 0000017901.

Etymology. From the Hawaiian *ho'okahi*, one or solitude, referring to the unique type specimen, which is also the only *Sierola* specimen so far taken from Waikāne Valley. It is a noun in apposition.

Distribution. Known only from the holotype, collected in the Ko'olau range in 1924.

Ecology. The sole specimen was collected on *Santalum freycinetianum* ('iliahī, Santalaceae), the only record from this genus from O'ahu.

Sierola hualala, n. sp.

Figure 22J–L, Map 16

Island. O'ahu.

Diagnosis. A very distinctive species, with a large head that is very elongate behind the eyes and compressed (EV/HE 1.3, DH/LH 0.51); the clypeus weakly carinate, broad, and rather short but appearing elongate in lateral view due to the long slope; and the mandible distinctly concave ventrally and convex externally with the ventral tooth subapical. The closest species is *S. granulosa*, which has the frons closely punctate and strongly granular rather than more sparsely punctate and with weak microsculpture, and mandible orange and more nearly vertical outwardly with more or less equal teeth, rather than black and strongly convex with the second tooth much stronger and the ventral one preapical and partially concealed.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded or truncate; dorsally weakly carinate; in profile evenly sloping, nearly straight. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin absent, back of head evenly rounded in lateral view. Lateral ocelli separated from vertex by greater than their length. Ocellar triangle front angle very strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest just posterior

of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.31 mm; LT 1.07 mm; WH/LH 0.77; DH/LH 0.51; EV/HE 1.32; EV/WF 0.89; WF/HE 1.47; WH/WF 1.57; OOL/WOT 2.44; DT/LT 0.40; FL/FW 2.30; HFL/HFW 2.38; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Pu'u Kaua, 5 Apr 1958, *Metrosideros*, J.L. Gressitt, BPBMNT 0000017902.

Etymology. From the Hawaiian *hualala*, curved or oval, referring to the shape of the head. It is a genderless adjective in the nominative singular.

Distribution. Known only from the type, collected from mesic forest in the Wai'anae range in 1958.

Discussion. The combination of a long head and narrow ocellar triangle gives this species one of the highest OOL/WOT ratios of any known in the genus, at 2.44, second only to *S. gilbertae* of New Zealand.

Sierola huapoo, n. sp.

Figure 22M–O, Map 15

Island. O'ahu.

Diagnosis. Belonging to the group of species with broad, parallel-sided mandibles. Easily distinguished from all related species except *S. testaceipes* by the glabrous basal wing cells, and from the latter by the shorter head behind the eyes and lack of ventral pubescence. The head is strongly convex above and below, which further separates it from all others in the group, including the similar *S. nigrita*. In general appearance close to *S. pygmaea*, further differing from that and related species by the relatively elongate, semicircular to rounded triangular clypeus, and dark brown to black femora.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely,

weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae brown, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.03 mm; LT 0.98 mm; WH/LH 0.84; DH/LH 0.60; EV/HE 0.82; EV/WF 0.74; WF/HE 1.11; WH/WF 1.71; OOL/WOT 1.52; DT/LT 0.37; FL/FW 1.93; HFL/HFW 2.21; A3 L/W 0.91.

Type Material. Holotype ♀. O'ahu: Wai'anae-Ka'ala Tr. 2400' [730 m], 21.5014°N 158.1566°W, 2 Nov 2012, on *Alyxia stellata*, K.N. Magnacca, BPBMENT 0000017903.

Etymology. From the Hawaiian *huapo* 'o, the rounded bones of the side of the head, referring to the strongly rounded posterior corners of the head. It is a noun in apposition.

Distribution. Known only from the type, collected from mesic forest in the Wai'anae range in 2012.

***Sierola huikau*, n. sp.**

Figure 23A–C, Map 16

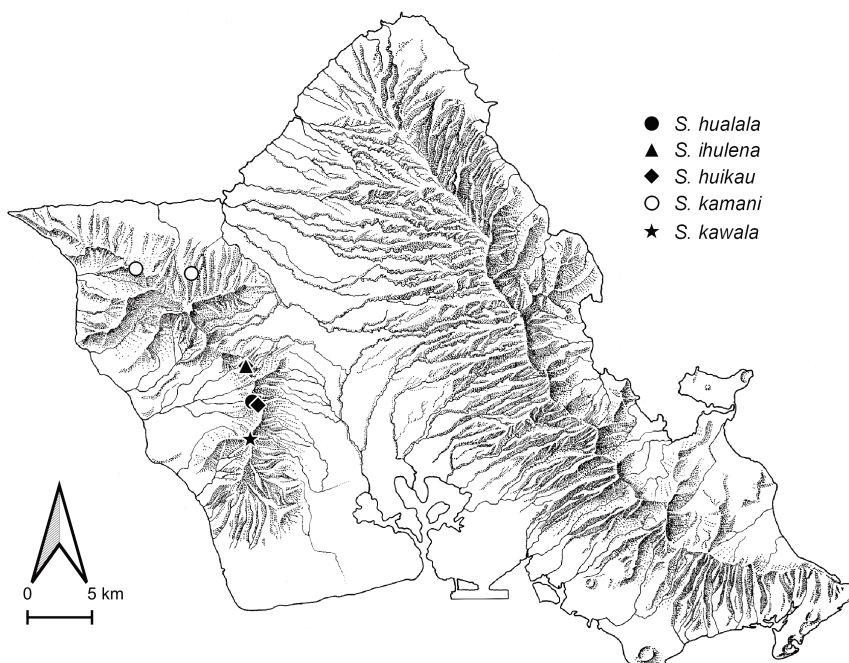
Island. O'ahu.

Diagnosis. A rather distinct species, though the intermediate wing setation, mandible curvature, and frons sculpture cause it to fall out in several places in the key. Among species with a sharp clypeal carina and black mandible, the broad, deep head (WH/LH 0.94–0.98, DH/LH 0.63–0.66) separates it from *S. anemophila* and *S. similis*, the most similar species. It somewhat resembles *S. poepoe* but that species has the vertex and genal setae strong and elongate, and the femora entirely yellow with the fore femur strongly expanded, much less than twice as long as wide; *S. huikau* has the hind femur characteristically with a broad median band and the fore femur dark along the dorsal margin, and twice as long as wide or more. The wing setation is also distinctive, with cell R mostly sparsely setose but becoming densely setose near the apex.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture, or finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.



Map 16. Collection localities of *Sierola hualala*, *S. huikau*, *S. ihulena*, *S. kamani*, and *S. kawala*.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, cell R somewhat densely setose apically.

Measurements. LFW 2.40 mm; LT 1.19 mm; WH/LH 0.98; DH/LH 0.66; EV/HE 0.59; EV/WF 0.52; WF/HE 1.14; WH/WF 1.75; OOL/WOT 1.31; DT/LT 0.42; FL/FW 2.00; HFL/HFW 2.19; A3 L/W 1.43.

Type Material. Holotype ♀. O'ahu: 'Ēkahanui, gulch 2D 2200' [670 m], 21.4389°N 158.0938°W, 5 Aug 2014, on *Neraudia melastomifolia*, K.N. Magnacca, BPBMENT 0000017904.

Etymology. From the Hawaiian *huikau*, confused or mixed-up, referring to the mix of characters that caused this species to remain unrecognized until near the end of this project. It is a genderless adjective in the nominative singular.

Distribution. Known only from two recent specimens, both taken from mesic forest in the southern Wai'anae range.

***Sierola ihulena*, n. sp.**

Figure 23D–F, Map 16

Island. O'ahu.

Diagnosis. A distinctive species, immediately recognizable by the flattened head and pale, short but highly arched clypeus which is rounded or weakly carinate dorsally. Most closely resembles *S. brevicornis*, but the head is flat ventrally rather than convex and the clypeus is broadly convex dorsally rather than with a rounded ridge, and more strongly arched in lateral view.

Description. Female. Head. Clypeal process semi-elliptical, apex weakly pointed; dor-

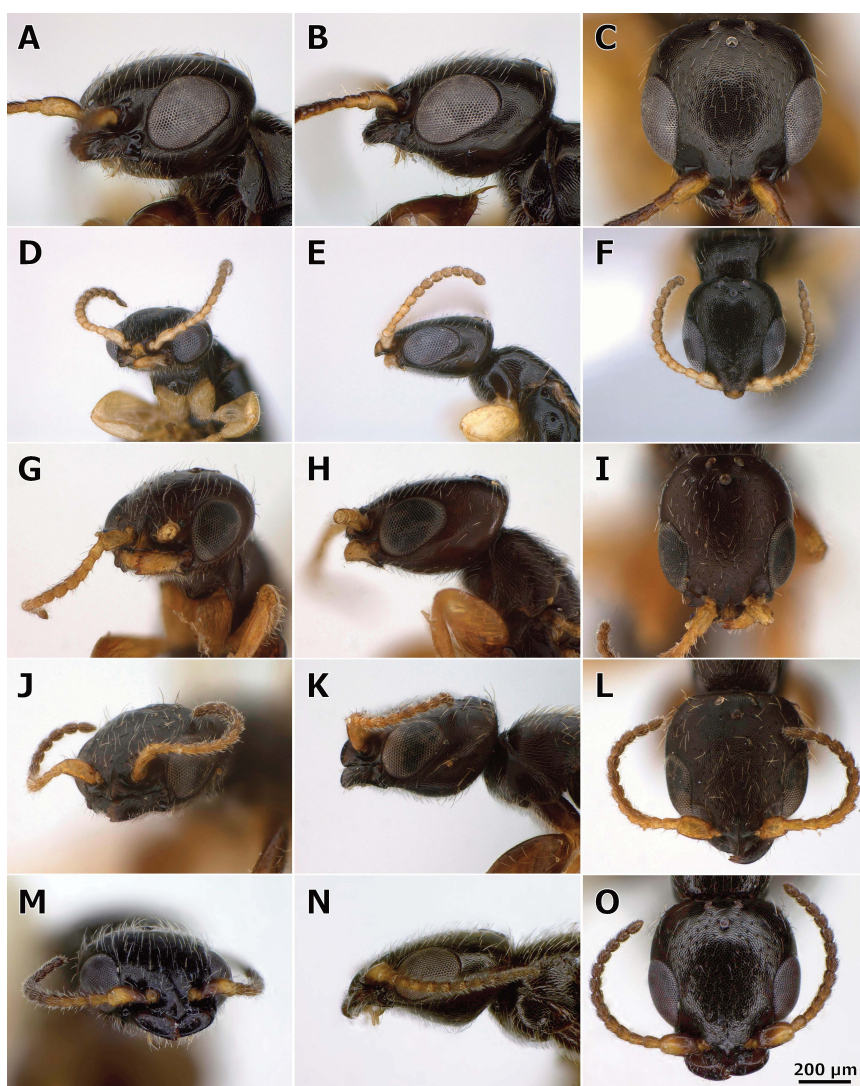


Figure 23. A–C: *Sierola huikau*. D–F: *Sierola ihulena*. G–I: *Sierola incita*. J–L: *Sierola kaala*. M–O: *Sierola kahuku*.

sally weakly carinate, or rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head nearly flat ven-

trally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.54 mm; LT 0.75 mm; WH/LH 0.85; DH/LH 0.52; EV/HE 0.48; EV/WF 0.55; WF/HE 0.88; WH/WF 1.93; OOL/WOT 1.06; DT/LT 0.35; FL/FW 1.86; HFL/HFW 2.28; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 30 Aug 2018, on *Urera kaalae*, K.N. Magnacca, BPBMENT 0000017905.

Paratype: 1 ♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 15 Jul 2014, on *Pipturus albidus*, K.N. Magnacca.

Etymology. From the Hawaiian *ihu lena*, yellow nose, referring to the pale clypeus.

Distribution. Known only from two specimens, both collected at Pu'u Hāpapa in the southern Wai'anae range.

Ecology. Both of the specimens were collected on Urticaceae, *Pipturus albidus* and *Urera kaalae*, which are relatively uncommon plants for *Sierola* to be found on.

Sierola incita Fullaway, 1920

Figure 23G–I, Map 17

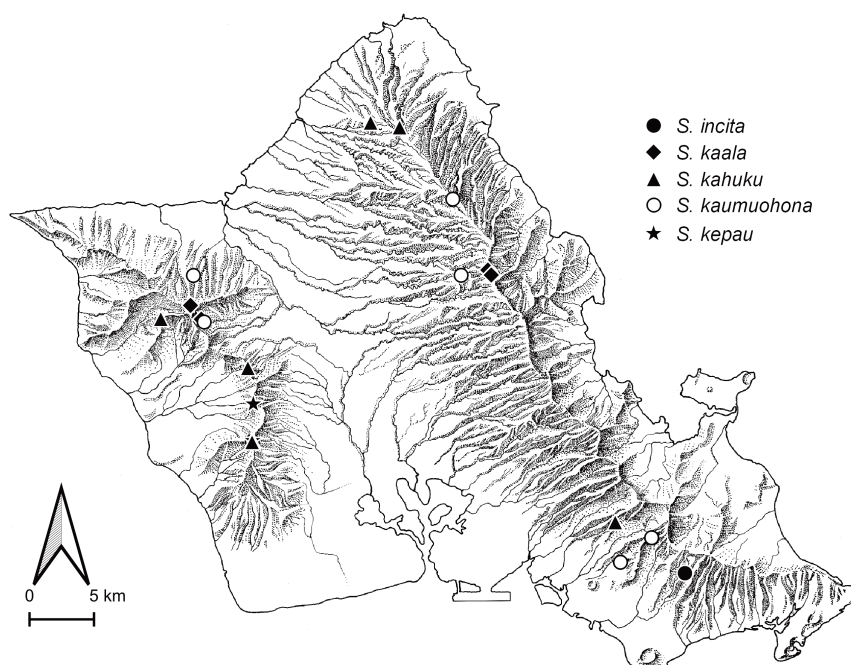
Sierola incita Fullaway, 1920: 119.

Island. O'ahu.

Diagnosis. A rather nondescript species, distinguished chiefly by the yellow mandible and lack of any other unusual characters. Among other species with a sharp clypeal carina and densely setose basal wing cells, it most closely resembles *S. punctata* and *S. gracilariae*, both of which have black mandibles. The only similar species with yellow mandibles (*S. nigra* and *S. tenebriosa*) differ in having the head distinctly broader and deeper.

Description. Female. Head. Clypeal process semicircular or semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.



Map 17. Collection localities of *Sierola incita*, *S. kaala*, *S. kahuku*, *S. kaumuohona*, and *S. kepau*.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna yellow, apical segments tinged with brown. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.91 mm; LT 1.00 mm; WH/LH 0.85; DH/LH 0.57; EV/HE 0.85; EV/WF 0.83; WF/HE 1.02; WH/WF 1.83; OOL/WOT 1.67; DT/LT 0.37; FL/FW 2.06; HFL/HFW 2.55; A3 L/W 1.00.

Type Material. Holotype ♀. O‘ahu: Pālolo Hill trail, 4 Apr 1916, P.H. Timberlake, BPBM Type 93.

Distribution. Known only from the holotype, collected in the southeast Ko‘olau range in 1916.

Sierola kaala Fullaway, 1920

Figure 23J–L, Map 17

Sierola kaala Fullaway, 1920: 86.

Island. O‘ahu.

Diagnosis. Forms a distinctive species pair with *S. fuliginosa* based on the clypeus strongly arched but with only a sharp carina, not thin and laminate as in the *S. olympiana* complex; it also differs from that group in having the frons punctation less dense and the lateral ocelli distinctly separate from the vertex. Differing from *S. fuliginosa* in having the metasomal terga distinctly microreticulate dorsally, basal wing cells clearly densely setose, mandible broader and slightly concave ventrally, head usually narrower (WH/LH 0.84–0.89

vs. 0.89–0.92), antenna shorter (A3 about as long as wide), and fore femora less than twice as long as broad. The reticulate metasoma also separates it from *S. larifuga*, which is extremely similar in the head width, fore femur, and A3. The latter species also differs in other measures of the head, with the frons narrower (WF/HE 0.99–1.07 and OOL/WOT 1.10–1.25 compared to WF/HE 1.15–1.25 and OOL/WOT 1.25–1.46 in *S. kaala*).

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.20 mm; LT 1.10 mm; WH/LH 0.86 (0.85–0.89); DH/LH 0.59 (0.56–0.60); EV/HE 0.78 (0.68–0.78); EV/WF 0.64 (0.58–0.65); WF/HE 1.22 (1.18–1.27); WH/WF 1.61 (1.60–1.67); OOL/WOT 1.46 (1.25–1.46); DT/LT 0.37; FL/FW 1.89 (1.89–2.04); HFL/HFW 2.14 (2.00–2.14); A3 L/W 1.00 (0.91–1.07). N = 6.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 2500–3000' [915 m] [760–915 m], 22 Jul 1917, P.H. Timberlake, BPBM Type 30.

Distribution. Known from four specimens collected in wet forest, one from Ka'ala in the Wai'anae range and three from Poamoho in the Ko'olau range.

Sierola kahuku, n. sp.

Figure 23M–O, Map 17

Island. O'ahu.

Diagnosis. The combination of a convex clypeus (lacking a carina) and strongly twisted mandible separate this species from all others. The distinct, broadly rounded genal angle distinguishes it further.

Description. Female. Head. Clypeal process semicircular, apex pointed; dorsally weakly carinate, or rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view strongly elbowed. Apex of mandible vertical, with equally strong teeth. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head about

as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna brown, scape yellowish on median face. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.03 mm; LT 1.00 mm; WH/LH 0.89; DH/LH 0.56; EV/HE 0.73; EV/WF 0.59; WF/HE 1.23; WH/WF 1.69; OOL/WOT 1.55; DT/LT 0.40; FL/FW 1.93; HFL/HFW 2.07; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Kahuku, Ko'olau Summit Tr 1650' [500 m], 21.6344°N 157.9880°W, 21 May 2013, sweeping *Freycinetia arborea*, K.N. Magnacca, BPBM 0000017906.

Paratypes: 1♀, Pūpūkea, 17 Dec 1933, O.H. Swezey, BPBM. 1♀, Lanihuli Trail 1800' [240 m] [550 m], 21.3567°N 157.8286°W, 30 Oct 2012, on *Acacia koa*, K.N. Magnacca, BPBM. 1♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 15 Jul 2014, on *Pisonia umbellifera*, K.N. Magnacca, BPBM.

Etymology. From the type locality in the northern Ko'olau range; also from the Hawaiian *ka huku*, the protuberance, referring to the projecting genal angle. It is a noun in apposition.

Distribution. Rare but widespread in both the Ko'olau and Wai'anae ranges. Two of the six specimens come from the Kahuku region of the northern Ko'olau range.

Sierola kamani, n. sp.

Figure 24A–C, Map 16

Island. O'ahu.

Diagnosis. Belonging to a group of species with the clypeus flat dorsally, frons smooth and shining, and the mandible twisted, with four teeth. Separated from similar species by the strongly polished head (microreticulation very faint), posterior corners of the head effaced and vertex short in dorsal view, and basal wing cells nearly glabrous. The mandible is also of a unique structure, sharply reflexed at the level of the second tooth and forming a sharp outward margin, V-shaped in cross-section, with the ventral tooth largely concealed in frontal view. Only *S. leioccephala* has a similar mandible, but it has the basal wing cells densely setose and more conspicuous microsculpture on the frons.

Description. Female. Head. Clypeal process rounded triangular or semicircular, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible narrow, more or less parallel-sided except at base; V-shaped in cross section, appearing strongly twisted, distinctly margined outwardly and reflexed ventrally, outwardly polished, smooth, shining; in ventral view weakly curved. Apex of mandible vertical, with three subequal apical teeth and one inwardly-directed ventral tooth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than

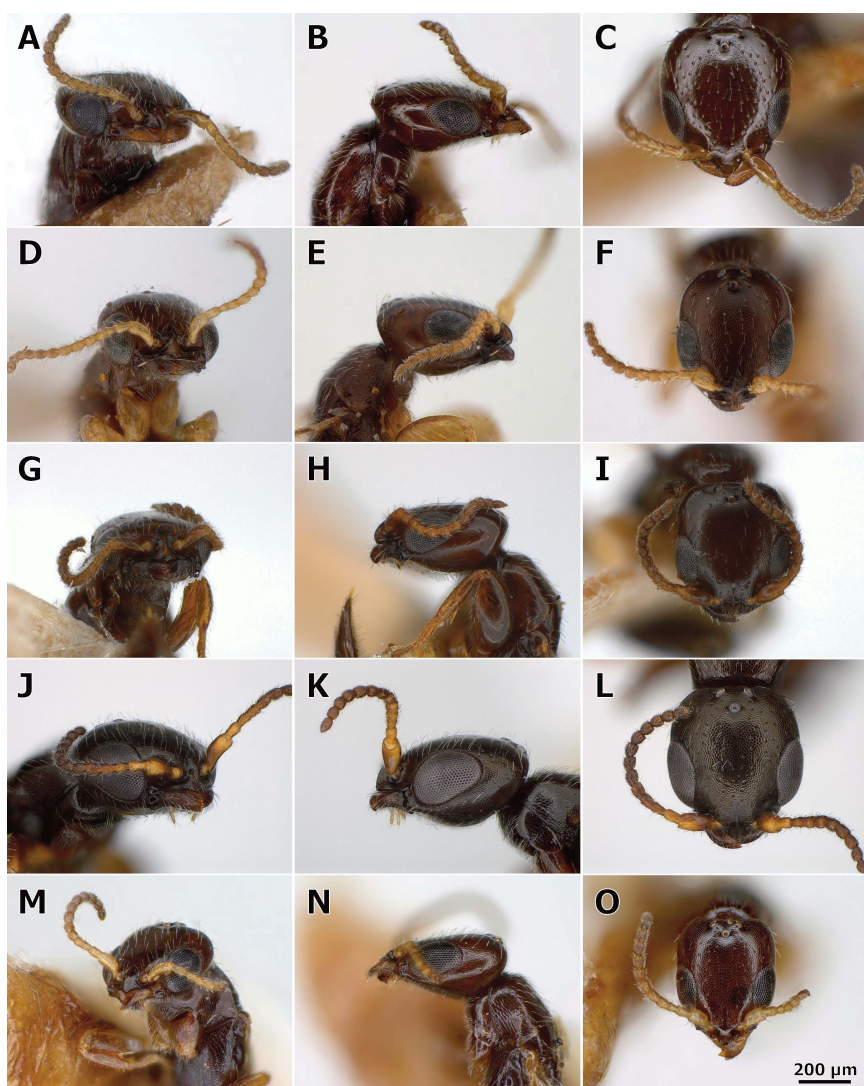


Figure 24. A–C: *Sierola kamani*. D–F: *Sierola kaumuohona*. G–I: *Sierola kawala*. J–L: *Sierola kepau*. M–O: *Sierola kikiwi*.

frons setae but only about as thick, not particularly conspicuous. Frons microsculpture nearly absent, polished. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible orange. Legs all dark brown to black.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.92 mm; LT 0.95 mm; WH/LH 0.88; DH/LH 0.48; EV/HE 0.97; EV/WF 0.68; WF/HE 1.42; WH/WF 1.59; OOL/WOT 1.83; DT/LT 0.35; FL/FW 1.92; HFL/HFW 1.63; A3 L/W 0.92.

Type Material. Holotype ♀. O'ahu: Kukuiala Val., 16 Sep 1933, *Alectryon*, O.H. Swezey, BPBM. 0000017907.

Paratypes: 1 ♀, Mt. Ka'ala 1200–1500' [460 m] [370–460 m], 29 Oct 1944, Beating Shrubbery, E.C. Zimmerman, BPBM. 1 ♀, Wai'anae, Jul 1953, E.J. Ford, BPBM.

Etymology. From the Hawaiian *kamani*, smooth, shiny, or polished, referring to the extremely smooth cuticle of the head. It is a genderless adjective in the nominative singular.

Distribution. Rare, known from four specimens, all from the northern Wai'anae range.

Discussion. The unusual mandible, shared with *S. arpactes* and *S. leiocephala*, is so far unique in the genus and perhaps the subfamily.

Sierola kaumuohona Fullaway, 1920

Figure 24D–F, Map 17

Sierola kaumuohona Fullaway, 1920: 149.

Island. O'ahu.

Diagnosis. Distinguished from most other species with a sharp clypeal carina and densely setose basal wing cells by having the mandible distinctly convex externally, semicylindrical in cross section. Separated from the closely related *S. gracilariae* primarily by the less punctate frons and less convex mandible with the teeth more or less equal in length, and from the more distant *S. nihopeku* by having the mandible narrow and the clypeus curved in profile.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane weakly infusate. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.71 mm; LT 0.80 mm; WH/LH 0.86; DH/LH 0.56; EV/HE 0.79; EV/WF 0.74; WF/HE 1.08; WH/WF 1.79; OOL/WOT 1.45; DT/LT 0.40; FL/FW 2.07; HFL/HFW 2.35; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Kaumuohona, 9 Sep 1917, P.H. Timberlake, BPBM Type 153.

Distribution. Typically found in the wet summit areas of both mountain ranges, but occasionally found in mesic forest.

Ecology. Reared from *Merimnetria* sp. (Gelechiidae) in leaves of *Kadua* sp. (Rubiaceae). Since the larger shrubby species of *Kadua* were under the genus name *Gouldia* at the time of the collection, the host plant was probably *K. acuminata* Cham. & Schldl. and the host caterpillar *M. thurifica* (Meyrick). Another specimen was reared from an unspecified leaf miner in *Coprosma* sp. (Rubiaceae), possibly an undescribed *Merimnetria*.

Discussion. See comments under *S. gracilariae*.

Sierola kawala, n. sp.

Figure 24G–I, Map 16

Island. O'ahu.

Diagnosis. In general habitus this species is similar to *S. gracilariae*, but the basal wing cells are sparsely setose, the mandible is slightly broader and not so convex externally, and the frons is smooth with sparse punctation. It keys closest to *S. picea*, from which it differs by having the mandible dark brown with the ventral tooth similar to the others (mandible orange-brown and ventral tooth short and subapical in *S. picea*), and head broader.

Description. Female. Head. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Legs all brown.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.77 mm; LT 0.84 mm; WH/LH 0.86; DH/LH 0.52; EV/HE 0.87;

EV/WF 0.68; WF/HE 1.27; WH/WF 1.66; OOL/WOT 1.53; DT/LT 0.33; FL/FW 2.09; HFL/HFW 2.30; A3 L/W 1.00.

Type Material. Holotype ♀. O‘ahu: Palikea, 11 Nov 1936, Beating, E.C. Zimmerman, BPBMENT 0000017908.

Etymology. From the Hawaiian *kāwala*, sparse or scattered, referring to the sparse punctation and setae of the frons. It is a genderless adjective in the nominative singular.

Distribution. Known only from a single specimen taken in the southern Wai‘anae range in 1936.

Sierola kepau, n. sp.

Figure 24J–L, Map 17

Island. O‘ahu.

Diagnosis. Among species with a sharp clypeal carina, coriaceous to granular frons microsculpture, and nearly glabrous basal wing cells, fitting close to *S. similis* based on the black mandible and moderately deep head. Readily separated from that species by the dark brown to black femora, along with the microreticulate metasoma, less convex dorsum of the head, and greater OOL/WOT (1.35–1.50 vs. 1.15–1.30 in *S. similis*).

Description. Female. *Head.* Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Side of head behind eye with a line of distinct tessellate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting above and below. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally with granulate sculpture; median carina faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and pedicel yellow, flagellum brown. Mandible black. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.92 mm; LT 0.98 mm; WH/LH 0.88; DH/LH 0.60; EV/HE 0.62; EV/WF 0.58; WF/HE 1.06; WH/WF 1.72; OOL/WOT 1.43; DT/LT 0.40; FL/FW 2.30; HFL/HFW 2.62; A3 L/W 1.33.

Type Material. Holotype ♀. O‘ahu: Palikea snail jail 3000' [915 m], 21.4155°N 158.0995°W, 9 Apr 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBMENT 0000017909.

Paratype: 1 ♀, Pu‘u Kaua summit 3050' [930 m], 21.4411°N 158.0989°W, 30 Aug 2012, on *Metrosideros polymorpha*, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *kēpau*, pitch or resin, referring to the piceous color of the legs. It is a genderless adjective in the nominative singular.

Distribution. Rare, known only from three specimens taken from the southern Wai'anāe range.

Discussion. Remarkably, although Fullaway described *S. similis* under several names, he did not have any specimens of this taxon. Furthermore, *S. similis* was formerly common but has not been found in recent collecting, while two of the three specimens of *S. kepau* are from recent collections. Nevertheless, the differences between them are clear, perhaps indicating a shift in available host species.

Sierola kikiwi, n. sp.

Figure 24M–O, Map 18

Island. O'ahu.

Diagnosis. In the species with the clypeus flat dorsally, mandible strongly oblique apically with reduced dorsal teeth, and vertex straight. United with *S. gracilis* in having the basal wing cells densely setose; distinguished by the mandible being strongly twisted, ocellar triangle obtuse (OOL/WOT ~1.25), and the head flatter. The frons width is also about equal to the eye height, WF/HE 0.95–1.05.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; strongly twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible slightly oblique, with a single large ventral tooth and a few small teeth on the inner margin. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse to strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

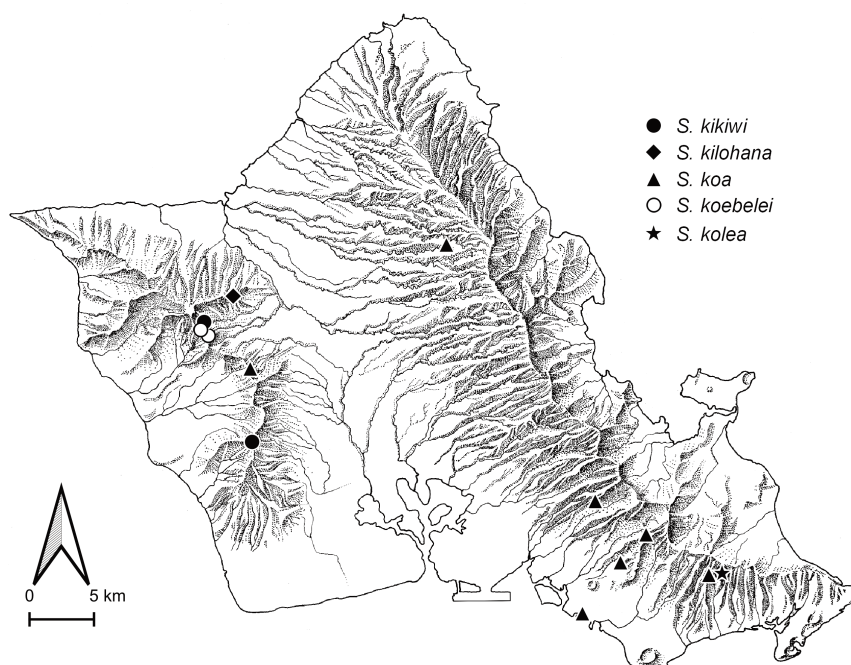
Measurements. LFW 1.70 mm; LT 0.81 mm; WH/LH 0.76; DH/LH 0.49; EV/HE 0.77; EV/WF 0.83; WF/HE 0.94; WH/WF 1.83; OOL/WOT 1.24; DT/LT 0.36; FL/FW 2.00; HFL/HFW 2.20; A3 L/W 1.09.

Type Material. Holotype ♀. O'ahu: S. Wai'anāe Mts., 9 Nov 1919, E.H. Bryan, BPBM 0000017910.

Paratype: 1 ♀, Hale'au'au, 3 Jan 1932, O.H. Swezey, BPBM.

Etymology. From the Hawaiian *kikiwi*, bent, referring to the twisted mandible. It is a genderless adjective in the nominative singular.

Distribution. So far known only from three specimens taken in the windward Wai'anāe range south of Ka'ala.



Map 18. Collection localities of *Sierola kikiwi*, *S. kilohana*, *S. koa*, *S. koebelei*, and *S. kolea*.

***Sierola kilohana*, n. sp.**

Figure 25A–C, Map 18

Island. O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, short and steep in lateral view, and basal wing cells sparsely setose; very close to *S. mahoe*, distinguished by the large, thick head with the ocellar triangle strongly acute and the lateral ocelli distant from the vertex.

Description. Female. Head. Clypeal process semi-elliptical or trapezoidal, apex truncate; dorsally with a rounded carina dorsally, effaced towards apex; in profile steep and short, evenly curved. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture, or finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head narrowed behind eyes. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal

declivity. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Pronotum yellow, body otherwise dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.09 mm; LT 1.01 mm; WH/LH 0.87; DH/LH 0.56; EV/HE 0.88; EV/WF 0.80; WF/HE 1.10; WH/WF 1.71; OOL/WOT 1.88; DT/LT 0.37; FL/FW 2.58; HFL/HFW 2.45; A3 L/W 1.21.

Type Material. Holotype ♀. O'ahu: Pu'u Pane, 18 Mar 1973, ex *Pelea* [= *Melicope*] fruits (R92), D. Fujii(?), BPBM ENT 0000017911.

Paratype: 1 ♀, same data as holotype, BPBM.

Etymology. From the Hawaiian *kilohana*, lookout place, referring to the type locality at Pu'u Pane which commands a broad view of north and central Oahu. It is a noun in apposition.

Distribution. Known only from one collection at Pu'u Pane, east of Ka'ala in the Wai'anae range.

Ecology. Reared from fruits of *Melicope* sp. (alani, Rutaceae). The host was not specifically recorded but is almost certainly an undescribed species of *Prays* (Yponomeutidae), which is the only moth known to attack seeds of the native Rutaceae (Zimmerman, 1978a).

Sierola koa Fullaway, 1920

Figure 25D–F, Map 18

Sierola koa Fullaway, 1920: 88.

Island. O'ahu.

Diagnosis. The broad club-like mandible narrowing to a deep notch near the base are unique among the O'ahu fauna.

Description. Female. Head. Clypeal process rounded triangular, apex broadly rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible strongly constricted near base, apical half expanded and club-like; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view strongly elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

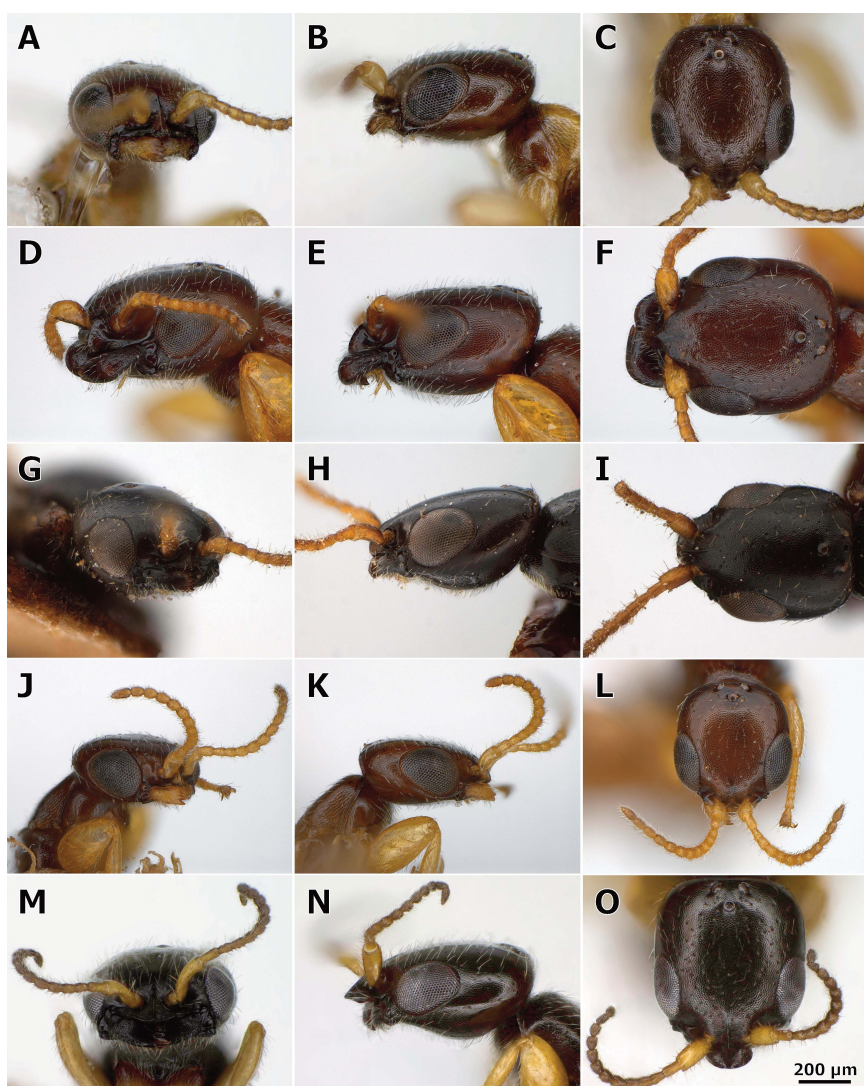


Figure 25. A–C: *Sierola kilohana*. D–F: *Sierola koa* (paratype). G–I: *Sierola koebelei*. J–L: *Sierola kolea*. M–O: *Sierola koloa*.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.23 mm; LT 1.10 mm; WH/LH 0.81; DH/LH 0.54; EV/HE 1.06; EV/WF 0.81; WF/HE 1.32; WH/WF 1.65; OOL/WOT 1.81; DT/LT 0.42; FL/FW 2.17; HFL/HFW 2.29; A3 L/W 1.13.

Type Material. Holotype ♀. O‘ahu: Mt. Tantalus, Jun 1918, swept from *Acacia koa*, J.C. Bridwell, BPBM Type 33.

Distribution. Found in mid-elevation mesic forest, mostly known from the Ko‘olau range but also recently recorded from the Wai‘anae range.

Ecology. Closely associated with *Acacia koa* (koa); adults found on green pods with developing seeds. Reared from koa pods with *Cryptophlebia illepida* (Tortricidae); possibly also

attacking bruchid beetle larvae infesting the same seeds. One record of rearing from coconut leafroller, *Omiodes blackburni*.

Discussion. The head of the holotype, which contains most of the characters, is missing. However, the paratypes from same collection are extant, and the distinctiveness of this species means it cannot be confused with any other. Therefore, no neotype is designated.

***Sierola koebelei* Fullaway, 1920**

Figure 25G–I, Map 18

Sierola koebelei Fullaway, 1920: 109.

Island. O'ahu.

Diagnosis. Similar to *S. koolauensis*, but separated from that and most other species in the group with a sharp clypeal carina and densely setose basal wing cells by the smooth sculpture of the frons and presence of distinct microsculpture on the metasoma. The former character is shared only with *S. poohiwi*, which has a very narrow head. The mandible is moderately broad but usually not strongly concave ventrally as in *S. koolauensis*, but this may not be clear.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.15 mm; LT 1.10 mm; WH/LH 0.79; DH/LH 0.55; EV/HE 0.91; EV/WF 0.81; WF/HE 1.13; WH/WF 1.69; OOL/WOT 1.50; DT/LT 0.36; FL/FW 2.06; HFL/HFW 2.60; A3 L/W 1.50.

Type Material. Holotype ♀. O'ahu: O'ahu, [no date], A. Koebele, BPBM Type 75.

Distribution. Widespread in both mountain ranges in wet to mesic forest, but known only from a handful of specimens.

Sierola kolea, n. sp.
Figure 25J–L, Map 18

Island. O'ahu.

Diagnosis. Part of a small cluster of small, flattened species with the head flat above and below, less than half as deep as long, and the mesosoma also compressed. Separated from most related species by having the basal wing cells nearly glabrous and the mandible yellow. Distinguished from the sibling species *S. planiceps* by having the clypeus evenly curved in lateral view and the ocellar triangle broad, OOL/WOT 1.40–1.65.

Description. Female. Head. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna bright yellow. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.81 mm; LT 0.85 mm; WH/LH 0.91; DH/LH 0.51; EV/HE 0.70; EV/WF 0.68; WF/HE 1.03; WH/WF 1.88; OOL/WOT 1.44; DT/LT 0.36; FL/FW 2.12; HFL/HFW 2.53; A3 L/W 1.20.

Type Material. Holotype ♀, O'ahu: Wailupe, 11 Jan 1925, ex *Philodoria* in *Suttonia* [= *Myrsine*], O.H. Swezey, BPBM 0000017912.

Paratype: 1 ♀, on same point as holotype, BPBM.

Etymology. Named for *kōlea* (*Myrsine* spp., Primulaceae), host plant of the host caterpillar. It is a noun in apposition.

Distribution. Known only from one collection of two specimens taken in the southeastern Ko'olau range in 1923.

Ecology. Reared from a mine of *Philodoria* sp. (Gracillariidae) in *Myrsine* sp. (*kōlea*; Primulaceae). *Philodoria* mines are common in *Myrsine lessertiana* on Oahu but the species is apparently undescribed. The only *Philodoria* recorded from *Myrsine* is *P. auromagnifica* Walsingham, known only from Maui and Hawai'i.

Discussion. This taxon may prove to be a host race of *S. planiceps*, but it appears to be distinctive enough to warrant describing under its own name. Its rarity is puzzling given the abundance of *Philodoria* leaf mines in *Myrsine* throughout O'ahu. Notably, nearly all of the flattened *Sierola* attacking leaf miners, including *S. depressa*, *S. depressella*, *S. philodoriae*, and the closely related *S. planiceps*, also have not been seen in over 90 years.

Sierola koloa, n. sp.
Figure 25M–O, Map 19

Island. O‘ahu.

Diagnosis. Among species with broad, nearly parallel-sided mandibles, separated by the large, elongate clypeus which is evenly sloping in lateral view, and mandible convex outwardly, with the ventral tooth short and partially concealed behind the second tooth.

Description. Female. Head. Clypeal process quadrate, apex truncate; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, ventral margin slightly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible slightly oblique, with second ventral tooth largest, ventral tooth partially concealed behind in frontal view. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.31 mm; LT 1.02 mm; WH/LH 0.80; DH/LH 0.50; EV/HE 1.05; EV/WF 0.80; WF/HE 1.32; WH/WF 1.64; OOL/WOT 2.00; DT/LT 0.39; FL/FW 2.23; HFL/HFW 2.42; A3 L/W 1.30.

Type Material. Holotype ♀. O‘ahu: Mākaha, Camp Ridge 2300' [700 m], 21.5019°N 158.1690°W, 14 Feb 2012, beating vegetation, K.N. Magnacca, BPBMENT 0000017913.

Paratypes: 1 ♀, North Hale‘au‘au Gulch 2350' [720 m], 21.5066°N 158.1297°W, 24 Feb 2012, on *Diospyros*, K.N. Magnacca, BPBM. 1 ♀, Pālāwai Gulch 2300' [700 m], 21.4189°N 158.0955°W, 14 Jan 2015, on *Planchonella sandwicensis*, K.N. Magnacca, NMNH. 1 ♀ 1 ♂, ‘Ōhikilolo 2900' [885 m], 21.5133°N 158.1937°W, 2 Aug 2017, on *Metrosideros polymorpha*, K.N. Magnacca, BPBM.

Etymology. Named for the *koloa* (*Anas wyvilliana*), the native duck, for the duckbill-like clypeus. It is a noun in apposition.

Distribution. Known only from six specimens (two of them males), all from wet-mesic forest in the Wai‘anae range.

Discussion. This species was initially confused with *S. tumidoventris* due to the enlarged clypeus, but the strongly convex mandible with a short ventral tooth are distinct from any other related species. The wing cell setation is intermediate.

Sierola komohana, n. sp.

Figure 26A–C, Map 19

Island. O'ahu.

Diagnosis. A distinctive species, immediately recognizable among those with a weakly carinate or rounded clypeus by the dorsally flat head, often slightly concave in lateral view. The mandible is also distinctly concave ventrally and the basal wing cells densely setose.

Description. Female. Head. Clypeal process short, triangular or semi-elliptical, apex weakly pointed or rounded; dorsally rounded, convex, lacking a carina, or with a rounded carina dorsally, effaced towards apex; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat or slightly concave between the eyes and ocelli, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

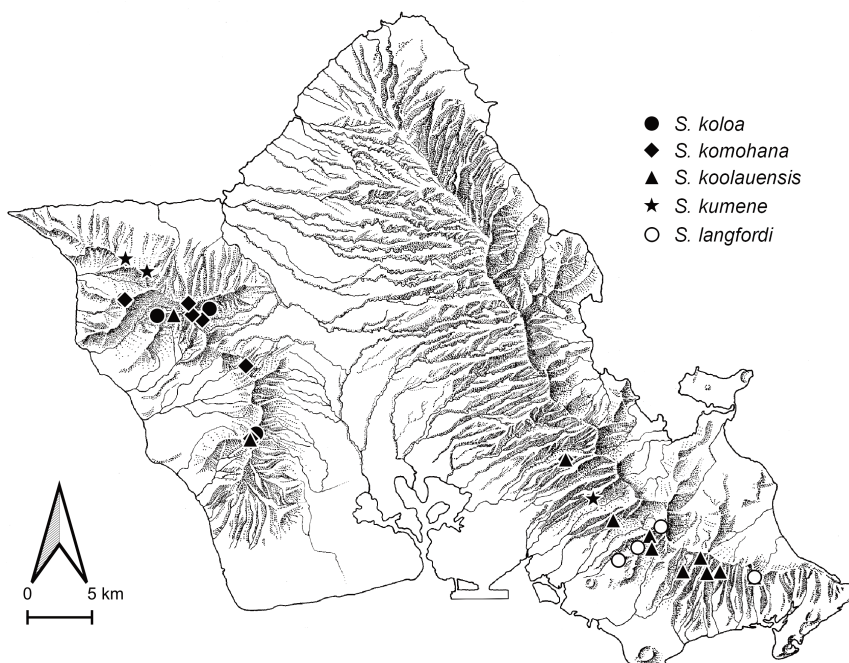
Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Areolet distinctly convex posteriorly, corner medioapical.

Measurements. LFW 1.92 mm; LT 0.91 mm; WH/LH 0.91; DH/LH 0.55; EV/HE 0.75; EV/WF 0.69; WF/HE 1.09; WH/WF 1.80; OOL/WOT 1.18; DT/LT 0.39; FL/FW 2.08; HFL/HFW 2.32; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Hale'au'au, 28 Apr 1935, *Antidesma*, O.H. Swezey, BPBM 0000017914.

Paratypes: 1 ♀, Hale'au'au, 1 Dec 1929, *Suttonia* [= *Myrsine*], O.H. Swezey, BPBM. 1 ♀, Hale'au'au, 9 Feb 1930, *Pteralyxia*, O.H. Swezey, BPBM. 1 ♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 17 May 2012, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, 'Ōhikilolo 2900' [885 m], 21.5133°N 158.1930°W, 5 Jun 2013, on *Wikstroemia oahuensis*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 May 2014, on *Perrottetia sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 21 Aug 2014, on *Psychotria*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Apr 2015, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Apr 2016, sweeping ferns, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Jun 2016, on *Kadua affinis*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on *Perrottetia sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on *Kadua affinis*, K.N. Magnacca, BPBM. 2 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Perrottetia sandwicensis*, K.N. Magnacca, UHIM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Oct 2016, on *Antidesma platyphyllum*, K.N. Magnacca, UHIM. 1 ♀, Palikea 3000' [915 m], 21.4155°N 158.0995°W, 22 Jun 2017, on *Coprosma longifolia*, K.N. Magnacca,



Map 19. Collection localities of *Sierola koloa*, *S. komohana*, *S. koolauensis*, *S. kumene*, and *S. langfordi*.

HDOA. 1♀, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 24 Jul 2017, on *Melicope*, K.N. Magnacca, HDOA. 1♀, Palikea 3000' [915 m], 21.4128°N 158.0997°W, 13 Sep 2017, on *Coprosma foliosa*, K.N. Magnacca, NMNH. 2♀, Palikea 3000' [915 m], 21.4128°N 158.0997°W, 13 Sep 2017, on *Coprosma longifolia*, K.N. Magnacca, NMNH.

Etymology. From the Hawaiian *komohana*, west, referring to the species being known predominantly from the western Wai'anae range. It is a noun in apposition.

Distribution. Widespread in the Wai'anae range, in both mesic and wet forest; one older specimen is from the Ko'olau range.

Ecology. Taken on a wide variety of plants.

Discussion. The Ko'olau specimen has the clypeus slightly longer; it is considered conspecific but is not included as a paratype.

Sierola koolauensis Fullaway, 1920

Figure 26D–F, Map 19

Sierola koolauensis Fullaway, 1920: 109.

Sierola polita Fullaway, 1920: 120, **n. syn.**

Island. O'ahu.

Diagnosis. Separated from most species in the group with a sharp clypeal carina and densely setose basal wing cells by the moderately broad, distinctly concave mandible and lack of a genal angle. Most similar to *S. subcrispa*; distinguished from that species and *S. yoshimotoi* by the longer head behind the eyes (EV/HE 0.90–1.10) and short antenna, and from *S. granulosa* by the coriaceous rather than strongly granular sculpture of the frons and by the distinctly curved clypeal carina.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly

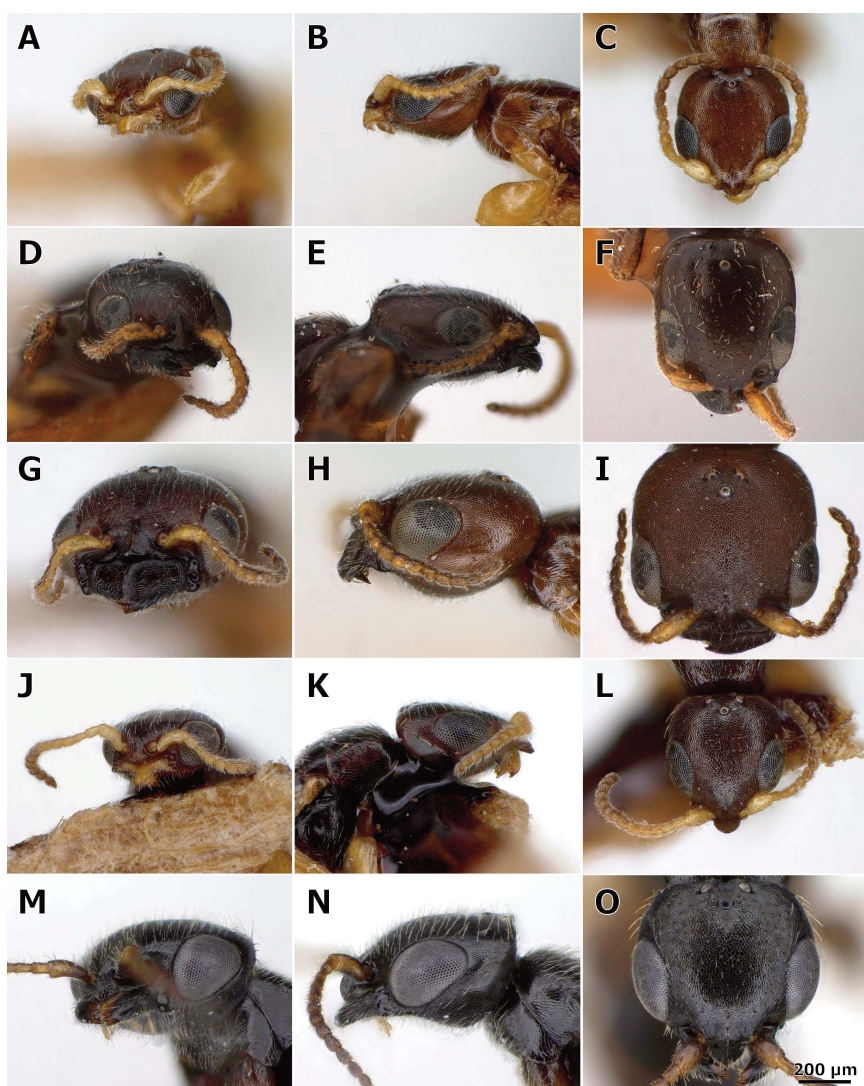


Figure 26. A–C: *Sierola komohana*. D–F: *Sierola koolauensis*. G–I: *Sierola kumene*. J–L: *Sierola kumumu*. M–O: *Sierola kunihi*.

acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex

in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.88 mm; LT 0.99 mm; WH/LH 0.80; DH/LH 0.54; EV/HE 1.00; EV/WF 0.85; WF/HE 1.18; WH/WF 1.65; OOL/WOT 1.62; DT/LT 0.35; FL/FW 2.06; HFL/HFW 2.17; A3 L/W 1.00.

Type Material. Holotype ♀ of *Sierola koolauensis*. O'ahu: SE Ko'olau Mts., 1916, J.C. Bridwell, BPBM Type 74.

Holotype ♀ of *Sierola polita*. O'ahu: Kuli'ou'ou, 25 Jun 1916, P.H. Timberlake, BPBM Type 95.

Distribution. Widespread in both the Ko'olau and Wai'anae ranges, but much more abundant in the former. Moderately common before 1930, but only one specimen collected recently.

Ecology. One specimen, taken in 1924 from Lanipō by O.H. Swezey, is labelled ex lehua [= *Metrosideros polymorpha*, Myrtaceae] bud moth. This is probably *Carposina* new species 4 (Carposinidae) of Zimmerman (1978a), which he describes as being reared from terminal buds of *Metrosideros* by Swezey in 1925 from the neighboring peak of Olympus. No other groups of moths are known to feed on *Metrosideros* buds.

Discussion. Separated from *S. polita* by Fullaway based on being more shiny, but examination of the types shows that they are essentially the same, and if anything *S. koolauensis* is more dull.

Sierola kumene, n. sp.

Figure 26G–I, Map 19

Island. O'ahu.

Diagnosis. This unique species cannot be confused with any other, with its flat, extremely broad mandible, expanded from the base, and massive head with a short, usually truncate clypeus.

Description. Female. Head. Clypeal process semi-elliptical or trapezoidal, apex truncate; dorsally with a sharp carina; in profile evenly sloping, nearly straight, or steep and short, evenly curved. Mandible extremely broad, broadening toward apex, ventral margin straight; not twisted, outwardly coriaceous, somewhat dull; in ventral view abruptly bent near base, distally straight. Apex of mandible vertical, with two small teeth ventrally, otherwise truncate. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin absent, back of head evenly rounded in lateral view. Lateral ocelli separated from vertex by greater than their length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Side of head behind eye with a line of tessellate microsculpture extending from posteroventral margin of eye halfway

to vertex crest, distinctly different from smoother sculpting above and below. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.05 mm; LT 0.91 mm; WH/LH 0.99; DH/LH 0.64; EV/HE 1.12; EV/WF 0.68; WF/HE 1.64; WH/WF 1.48; OOL/WOT 1.83; DT/LT 0.42; FL/FW 2.42; HFL/HFW 2.55; A3 L/W 1.09.

Type Material. Holotype ♀. O‘ahu: Kahauiki, 7 Nov 1926, O.H. Swezey, BPBM. 0000017915.

Paratypes: 2♀ 3♂, Kapuna, Mokulē‘ia Tr. 2100' [640 m], 21.5334°N 158.1764°W, 21 Feb 2010, sweeping, K.N. Magnacca, BPBM. 1♀, Kapuna, Mokulē‘ia Tr. 2100' [640 m], 21.5328°N 158.1765°W, 4 Jun 2015, on *Kadua affinis*, K.N. Magnacca, NMNH.

Etymology. From the Hawaiian *kūmene*, flat-nosed, referring to the extremely unusual shape of the mandible. It is a genderless adjective in the nominative singular.

Distribution. One older specimen from the south-central Ko‘olau range, otherwise known only from Kapuna and Pahole gulches in the northern Wai‘anae range.

Ecology. Unknown, but two of the four collections are from February, presumably relating to its host’s activity period.

Sierola kumumu, n. sp.

Figure 26J–L, Map 20

Island. O‘ahu.

Diagnosis. Part of the complex of unusual species with the mandible bent down at the base and the clypeus prominent, large relative to the head, and semicircular, rounded dorsally and sometimes weakly carinate. The sparsely setose basal wing cells also distinguish it from others with bent mandible except for *S. alelo*, which has the clypeus flat dorsally, mandible and all femora black, and ocellar triangle right.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally rounded, convex, lacking a carina; in profile evenly sloping, nearly straight, or elongate, evenly curved, apex acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; distinctly bent down near base, crossing when closed, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view abruptly bent near base, distally straight. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture microreticulate and dull between the eyes and antenna, distinctly smoother between eyes and ocelli. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur robust, about

twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna yellow, tinged with brown dorsally. Mandible yellow except black near the articulation. Legs all yellow or coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.65 mm; LT 0.88 mm; WH/LH 0.84; DH/LH 0.55; EV/HE 0.57; EV/WF 0.59; WF/HE 0.97; WH/WF 1.88; OOL/WOT 1.05; DT/LT 0.42; FL/FW 2.08; HFL/HFW 2.60; A3 L/W 1.40.

Type Material. Holotype ♀. O'ahu: Mt. Tantalus, 7 Nov 1920, O.H. Swezey, BPBM 0000017916.

Paratypes: 1 ♀, Palikea trail 2700' [820 m], 21.4102°N 158.0986°W, 9 Apr 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 10 Jan 2017, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♀, 'Ōhikilolo 2900' [885 m], 21.5133°N 158.1937°W, 2 Aug 2017, on *Metrosideros polymorpha*, K.N. Magnacca, NMNH.

Etymology. From the Hawaiian *kūmūmū*, blunt or obtuse, referring to the projecting, rounded clypeus. It is a genderless adjective in the nominative singular.

Distribution. Known only from six specimens, the type from Tantalus in the Ko'olau range and the rest from across the Wai'anāe range.

Discussion. The specimens vary more than usual in size, but do not appear to exhibit any structural differences. However, the type has the legs all yellow, while the five recent specimens have the hind femur dark brown but the fore femur yellow except along the dorsal margin.

Sierola kunihi, n. sp.

Figure 26M–O, Map 20

Island. O'ahu.

Diagnosis. This species does not appear to be closely related to any others and is somewhat intermediate between other species groups, but is instantly recognizable by the carinate vertex, which is slightly sinuate around the ocelli in dorsal view. The head is also unusual in being strongly convex dorsally but slightly concave ventrally between the deepest part of the gena and the mandible in lateral view.

Description. Female. Head. Clypeal process rounded triangular, apex pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, more or less parallel-sided except at base; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view slightly sinuate around the ocellar triangle; occipital margin sharply carinate, margin slightly reflexed upward. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles concave in lateral view, with dense, downy pubescence, conspicuous in lateral view and extending past the genal angle. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.50 mm; LT 1.21 mm; WH/LH 0.99; DH/LH 0.59; EV/HE 0.60; EV/WF 0.45; WF/HE 1.32; WH/WF 1.63; OOL/WOT 1.29; DT/LT 0.43; FL/FW 1.94; HFL/HFW 2.19; A3 L/W 1.23.

Type Material. Holotype ♀. O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Oct 2014, on *Labordia kaalae*, K.N. Magnacca, BPBMENT 0000017917.

Paratype: 1 ♀, Mt. Ka'ala, 28 Dec 1919, in *Smilax* twig, F.X. Williams, HDOA.

Etymology. From the Hawaiian *kūnihi*, ridge of a precipice, referring to the sharply carinate vertex and vertical occiput. It is a noun in apposition.

Distribution. Known from only three specimens collected in wet forest in the Wai'anae range.

Discussion. The strongly carinate, sinuate vertex is so far unique in the genus. Remarkably, a nearly identical feature is found in an apparently undescribed alien *Goniozus* discovered in Hawai'i.

Sierola langfordi Fullaway, 1920

Figure 27A–C, Map 19

Sierola langfordi Fullaway, 1920: 153.

Sierola curiosa Fullaway, 1920: 156, **n. syn.**

Island. O'ahu.

Diagnosis. Belonging to the large cluster of species with a convex to weakly carinate clypeus and narrow to moderately broad mandible which is parallel-sided to slightly concave ventrally. Readily distinguished from all other taxa by the short, broad, truncate clypeus. Further separated from the *S. aristoteliae* complex by the smoother frons microsculpture, sparsely setose basal wing cells, and broader fore femur.

Description. Female. *Head*. Clypeal process very short, almost transverse, extending only slightly beyond lateral portion of clypeus, apex truncate; dorsally with a rounded carina dorsally, effaced towards apex; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

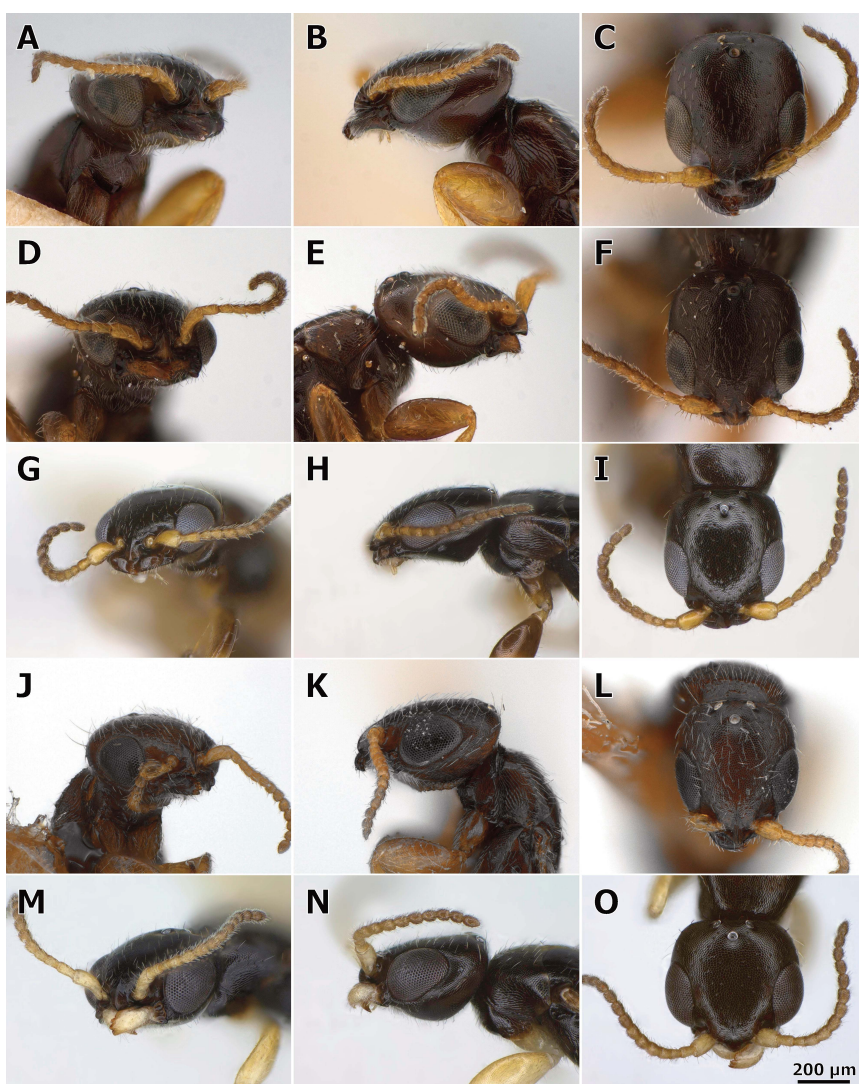


Figure 27. A–C: *Sierola langfordi*. D–F: *Sierola lanihuliana*. G–I: *Sierola lapuu*. J–L: *Sierola larifuga* (specimen from Ka‘ala). M–O: *Sierola lateralis*.

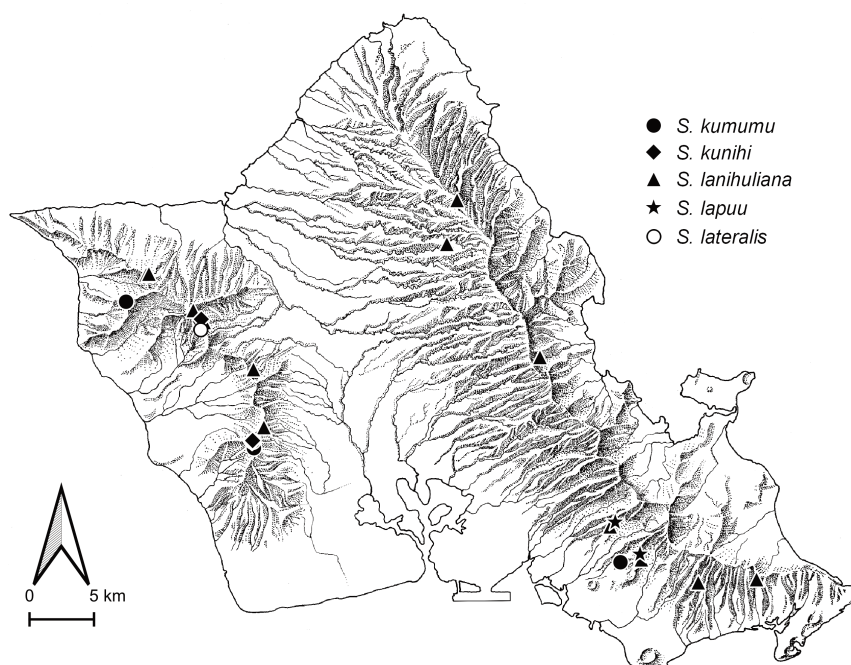
Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.05 mm; LT 1.08 mm; WH/LH 0.86; DH/LH 0.58; EV/HE 0.80; EV/WF 0.71; WF/HE 1.13; WH/WF 1.71; OOL/WOT 1.67; DT/LT 0.37; FL/FW 2.00; HFL/HFW 2.15; A3 L/W 1.00.

Type Material. Holotype ♀. O‘ahu: Tantalus 1300' [400 m], 1–2 Nov 1905, W.M. Giffard, BPBM Type 161.



Map 20. Collection localities of *Sierola kumumu*, *S. kunihi*, *S. lanihuliana*, *S. lapuu*, and *S. lateralis*.

Holotype ♀ of *Sierola curiosa*. O‘ahu: Kuli‘ou‘ou, 25 Jun 1916, P.H. Timberlake, BPBM Type 168.

Distribution. Very rare, known from six specimens taken in the southeastern Ko‘olau range. Last collected in 1916.

Discussion. Fullaway (1920) separated *S. langfordi* from *S. curiosa* based on the mandible of the latter supposedly being narrower, but they are virtually identical. Both share the unique transverse clypeus, not seen in any other Hawaiian species.

Sierola lanihuliana Fullaway, 1920

Figure 27D–F, Map 20

Sierola lanihuliana Fullaway, 1920: 120.

Island. O‘ahu.

Diagnosis. Among species with a sharp clypeal carina and densely setose basal wing cells, readily recognized by the slightly twisted mandible, easily seen in lateral view. Distinguished from the related *S. suttoniae* by the hyaline wings and usually brownish mandible, and the clypeal carina always distinctly sharp.

Description. Female. *Head.* Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture

coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.88 mm; LT 0.92 mm; WH/LH 0.88; DH/LH 0.59; EV/HE 0.83; EV/WF 0.73; WF/HE 1.14; WH/WF 1.81; OOL/WOT 1.38; DT/LT 0.43; FL/FW 2.30; HFL/HFW 2.80; A3 L/W 1.14.

Type Material. Holotype ♀. O'ahu: Lanihuli, 3 Sep 1916, P.H. Timberlake, BPBM Type 96.

Distribution. Uncommon but widespread in both the Wai'anāe and Ko'olau ranges, primarily in wet forest but extending into the mesic zone.

Discussion. The holotype was incorrectly recorded by Fullaway (1920) as being from 1913; the label clearly shows 1916, the types of *S. spicata* and *S. laccessita* were also collected on 3 Sep 1916 from Lanihuli, and there are no other Timberlake collections from 1913 (he was apparently not in the islands then). Two unusually small specimens at HDOA are tentatively assigned to this species; both are on the margins of the expected morphometric variation, which may be due to their size or because they represent a distinct taxon.

Sierola lapuu, n. sp.

Figure 27G–I, Map 20

Island. O'ahu.

Diagnosis. One of a handful of species with a strong, prominent genal angle and deep, distinct postgenal depression. Separated from others with this character by the relatively narrow, compressed head (WH/LH 0.87, DH/LH 0.55) and unusual setation of cell R of the fore wing, which is mostly glabrous but with a dense patch of setae near the apex. These characters also serve to separate it from *S. fossulata*, to which it is most similar in general appearance.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally weakly carinate, or rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute, or evenly sloping, nearly straight. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly polished, smooth, shining; in ventral view obtusely elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head dis-

tinctly triangular in lateral view. Postgenal depression deep, distinct, broad. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate. Pronotal pubescence short, inconspicuous. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing mostly glabrous, cell R densely setose apically.

Measurements. LFW 1.76 mm; LT 0.89 mm; WH/LH 0.87; DH/LH 0.55; EV/HE 0.71; EV/WF 0.65; WF/HE 1.09; WH/WF 1.76; OOL/WOT 1.04; DT/LT 0.41; FL/FW 1.72; HFL/HFW 2.00; A3 L/W 1.00.

Type Material. Holotype ♀, O'ahu: Mānoa Cliffs Trail 1700' [520 m], 21.3341°N 157.8103°W, 21 Jan 2013, sweeping *Freycinetia arborea*, K.N. Magnacca, BPBM 0000017918.

Paratype: 1 ♀, Lanihuli Trail 1800' [240 m] [550 m], 21.3567°N 157.8286°W, 30 Oct 2012, on *Aca-cia koa*, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *lāpu'u*, arched or hunched over, referring to the strongly convex head. It is a genderless adjective in the nominative singular.

Distribution. Known only from two specimens collected in the southeastern Ko'olau range.

Sierola larifuga Evans, 1978

Figure 27J–L, Map 21

Sierola larifuga Evans, 1978: 223.

Island. Hawai'i, Maui, O'ahu, Northwest Hawaiian Islands (Midway). Also found in California.

Diagnosis. Fitting among the large group of species with a sharp, evenly curved clypeal carina and densely setose basal wing cells. Not particularly distinctive but easily recognized by the combination of the frons narrow (WF/HE 0.99–1.07), dull and granular with dense punctation between the eyes, A3 short (as wide or wider than long), fore femora expanded (FL/FW 1.75–2.00), and metasoma smooth and polished except at the lateral margins of terga. Closest to *S. kaala*, which differs in the microreticulate metasoma and broader frons (WF/HE 1.15–1.25 and OOL/WOT 1.25–1.45); and *S. fuliginosa*, which has the head and frons wider (WH/LH 0.89–0.92, WF/HE 1.15–1.25) and A3 elongate, 1.4–1.8 times as long as wide.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons, or with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head evenly convex ventrally, genal angle absent. Side of head with a line of tessellate microsculpture extending from

posteroventral margin of eye to vertex crest, distinctly different from the smoother sculpting above and below. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; transverse carina absent, brow of declivity broadly rounded, or faintly present, curving on each side; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna yellow, tinged with brown dorsally. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.67 mm; LT 0.88 mm; WH/LH 0.84 (0.81–0.87); DH/LH 0.56 (0.54–0.57); EV/HE 0.63 (0.58–0.71); EV/WF 0.63 (0.56–0.69); WF/HE 1.00 (0.99–1.06); WH/WF 1.74 (1.69–1.80); OOL/WOT 1.19 (1.11–1.23); DT/LT 0.38; FL/FW 1.96 (1.75–2.00); HFL/HFW 2.19 (1.84–2.20); A3 L/W 1.00 (0.77–1.00). N = 20.

Type Material. Holotype ♀. USA, California: Anaheim, Orange Co, Cal., 6 Oct 1965, McPhail trap - Orange, C. Johnson collector, CAS Type No. 13370.

Distribution. Taken infrequently but widely in agricultural fields on at least O'ahu, Maui, and Hawai'i. In addition, one individual was collected in a light trap near the coast at 'Ewa, and one each at the summits of Ka'ala and Pu'u Kaua in the Wai'anae range. A series of three individuals was collected at Midway Atoll.

Ecology. Found on coffee farms as well as in native forest and disturbed coastal and low-land areas.

Discussion. This species was originally described from California, but I have been unable to determine if it has been collected there recently. It is unclear whether it was introduced from California to Hawai'i or vice versa; it may originally be from Australia, as it is very similar to *S. ellingtoni* Gordh. They appear to differ only in the slightly narrower fore femur and broader head of *S. ellingtoni*; however, I have only examined one specimen of that species, and more comparison may show them to be conspecific. A tremendous number of undescribed Australian *Sierola* species are present in collections, probably at least 300. The possibility that it is a Hawaiian species cannot yet be eliminated, as it is also extremely similar to the native *S. kaala*. At least one Hawaiian endemic, *S. acuta*, appears to have adapted to introduced agricultural pests, and it is not inconceivable that having done so, they would spread to other areas with that pest. However, the line of tessellate, brick-like microsculpture extending from the eye to the vertex is characteristic of the Australian species. It is found in nearly all taxa from that region that I have seen, but is only rarely present among Polynesian species and in reduced form (as in *S. uhiwai*). The population on Midway is unquestionably introduced. The Hawaiian specimens exhibit a similar range of variation in head width (WH/LH 0.81–0.87) to that described by Evans (1978) among seven specimens collected in California (WH/LH 0.82–0.88), but are most frequently on the narrower end; nearly all are 0.82–0.85.

***Sierola lateralis*, n. sp.**

Figure 27M–O, Map 20

Island. O'ahu.

Diagnosis. Belonging to the broader *S. uhiwai* complex based on the head being very broad, weakly convex dorsally and strongly convex ventrally, with a short clypeus. Readily separated from others in the group by the moderately broad mandible which is only weakly concave ventrally. The head is distinctly wider than long and the mandible is pale yellow-white, traits found in only a few species. Overall most similar to *S. peleleu*, which has a more prominent clypeus with a sharp dorsal carina, distinctly concave mandible, and coriaceous frons microsculpture.

Description. Female. Head. Clypeal process short, triangular, apex pointed; dorsally rounded, convex, lacking a carina; in profile steep and short, evenly curved. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Post-genal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible very pale yellow-white. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.86 mm; LT 0.94 mm; WH/LH 1.04; DH/LH 0.63; EV/HE 0.57; EV/WF 0.50; WF/HE 1.14; WH/WF 1.79; OOL/WOT 1.09; DT/LT 0.42; FL/FW 2.00; HFL/HFW 2.36; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Kalena east ridge 3100' [950 m], 21.4933°N 158.1379°W, 22 Jun 2016, on *Cheirodendron trigynum*, K.N. Magnacca, BPBMENT 0000017919.

Etymology. Named for the extremely broad head. It is a noun in apposition.

Distribution. Known only from the holotype, collected near the wet summit of Pu'u Kalena in the Wai'anae range.

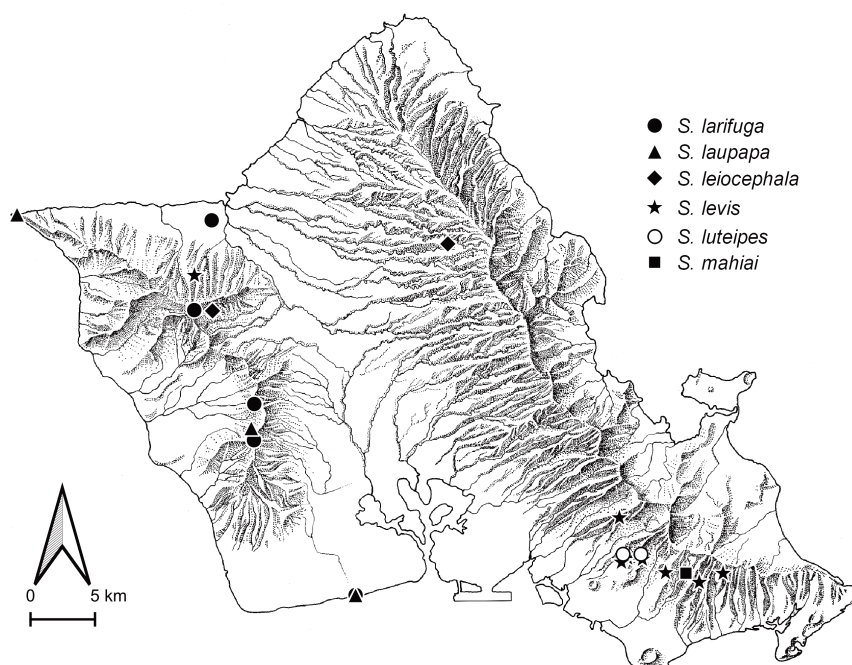
Sierola laupapa, n. sp.

Figure 28A–C, Map 21

Island. O'ahu.

Diagnosis. Part of a complex of species lacking a clypeal carina, with the mandible falcate and basal wing cells nearly glabrous. Closely related to *S. beardleyi* and *S. curvata*, with a flat clypeus (not tapered and rounded at the sides as in *S. anthracina*), evenly curved in profile, and the genal angle not particularly prominent. Distinguished by the combination of a long, compressed head, broad fore femur (less than twice as long as wide), and flattened pronotum which is strongly angulate anteriorly. It is also found at the coast and lowlands, in contrast to the other species which are found in montane forests.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; slightly twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, falcate, lacking subapical teeth. Malar space 1/3 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front



Map 21. Collection localities of *Sierola larifuga* Kaala, *S. laupapa*, *S. leioccephala*, *S. levis*, *S. luteipes*, and *S. mahiai*.

angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest just posterior of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle present posteriorly, not prominent, head relatively flat. Postgenal depression deep, distinct, broad. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; transverse carina faintly present; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna yellow, apical segments tinged with brown. Mandible reddish brown. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.51 mm; LT 0.85 mm; WH/LH 0.79; DH/LH 0.50; EV/HE 1.00; EV/WF 0.83; WF/HE 1.20; WH/WF 1.72; OOL/WOT 1.43; DT/LT 0.40; FL/FW 1.69; HFL/HFW 2.20; A3 L/W 0.83.

Type Material. Holotype ♀, O'ahu: 'Ewa, Dec 1961, J.W. Beardsley, BPBM 0000017920.

Paratypes: 1 ♀ 1 ♂, 'Ewa, 8 Mar 1961, J.C. Bridwell, BPBM. 1 ♀, 'Ewa, 24 Jun 1964, J.C. Bridwell, BPBM. 1 ♀, Ka'ena Point 15' [5 m], 21.5748°N 158.2758°W, 13–15 Apr 2016, pitfall trap, P. Krushelnicky, UHIM. 1 ♀, Ka'ena Point 15' [5 m], 21.5748°N 158.2758°W, 13 Apr 2015, vegetation sweeping, P. Krushelnicky, UHIM. 2 ♀, Lualualei, Halona Valley 1470' [450 m], 21.4243°N 158.1012°W, 10–13 Dec 2018, N.L. Evenhuis, yellow pan trap, BPBM. 1 ♀ 3 ♂, Lualualei, Halona Valley 1280' [390 m], 21.4261°N

158.1030°W, 21–23 Aug 2019, N.L. Evenhuis, yellow pan trap, BPBM. 7♀ 4♂, Lualualei, Halona Valley 1280' [390 m], 21.4261°N 158.1030°W, 24–27 Sep 2019, N.L. Evenhuis, yellow pan trap, BPBM. 1♂, Lualualei, Halona Valley 1280' [390 m], 21.4261°N 158.1030°W, 27 Sep 2019, N.L. Evenhuis, on *Sapindus oahuensis*, BPBM.

Etymology. From the Hawaiian *laupapa*, a broad flat expanse of land, referring to the type locality of the 'Ewa coral plain, and to the flat clypeus. It is a noun in apposition.

Distribution. Known from coastal areas of the Wai'anae range, at 'Ewa and Ka'ena Point, and in lowland dry-mesic forest in Lualualei Valley.

Sierola leiocephala, n. sp.

Figure 28D–F, Map 21

Island. O'ahu.

Diagnosis. Belonging to a group of species with the clypeus flat dorsally, frons smooth and shining, and the mandible apparently twisted. The mandible is actually V-shaped in cross-section, reflexed ventrally with a distinct ventral tooth as in *S. kamani*. Separated from that and other similar species by the more conspicuous microreticulation of the frons, head flat behind the eyes, posterior corners of the head effaced and vertex short in dorsal view, and basal wing cells densely setose.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly sloping, nearly straight. Mandible narrow, more or less parallel-sided except at base; V-shaped in cross section, appearing strongly twisted, distinctly margined outwardly and reflexed ventrally, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view weakly curved. Apex of mandible vertical, with three subequal apical teeth and one inwardly-directed ventral tooth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head narrowed behind eyes. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape yellow with a contrasting brown basal spot, flagellum brown dorsally and yellow ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.79 mm; LT 0.83 mm; WH/LH 0.83; DH/LH 0.48; EV/HE 0.78; EV/WF 0.66; WF/HE 1.19; WH/WF 1.68; OOL/WOT 1.44; DT/LT 0.36; FL/FW 1.88; HFL/HFW 1.76; A3 L/W 0.85.

Type Material. Holotype ♀. O'ahu: North Hale'au'au Gulch 2350' [720 m], 21.5066°N 158.1297°W, 24 Feb 2012, on *Psychotria*, K.N. Magnacca, BPBM ENT 0000017921.

Paratype: 1♀, Pe'ahināi'a Tr. 2100' [640 m], 21.5525°N 157.9532°W, 8 Apr 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM.

Etymology. From the Greek *leio*, smooth, and *kephalon*, head, referring to the polished frons. It is a noun in apposition.

Distribution. Known from two recent specimens, one from each mountain range.

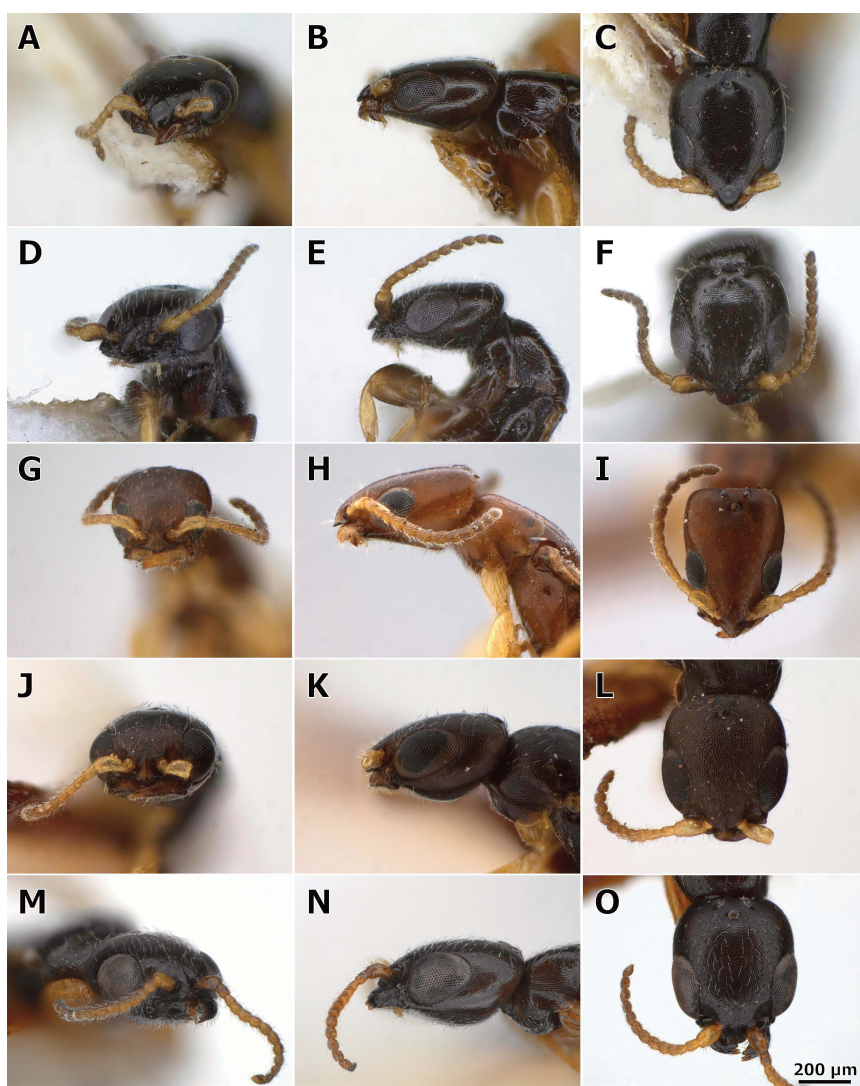


Figure 28. A–C: *Sierola laupapa*. D–F: *Sierola leioccephala*. G–I: *Sierola levis*. J–L: *Sierola luteipes*. M–O: *Sierola mahiai*.

***Sierola levis* Fullaway, 1920**

Figure 28G–I, Map 21

Sierola levis Fullaway, 1920: 84.

Island. O'ahu.

Diagnosis. A very distinctive species with a narrow head, prominent and rather sharp genal angle, no clypeal carina, and narrow mandible, almost straight in ventral view, with minute indistinct teeth.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, out-

wardly shining but with distinct, fine microsculpture; in ventral view straight or nearly so. Apex of mandible vertical, obliquely truncate subapically, with small, indistinct teeth. Malar space 1/3 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight, corners somewhat squared; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Postgenal depression deep, distinct, V-shaped. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.71 mm; LT 0.94 mm; WH/LH 0.68; DH/LH 0.55; EV/HE 1.12; EV/WF 1.12; WF/HE 1.00; WH/WF 1.88; OOL/WOT 1.85; DT/LT 0.37; FL/FW 2.17; HFL/HFW 3.00; A3 L/W 1.67.

Type Material. Holotype ♀. O'ahu: Tantalus 1500' [460 m], 22 Dec 1918, W.M. Giffard, BPBM Type 26.

Distribution. Known exclusively from the southeastern Ko'olau range east of Lanihuli, mainly the Tantalus area. By numbers it is one of the more abundant species in collections (in part because males are easily identifiable), but was last taken in 1959.

Discussion. The type has faded to brown, but other specimens show clearly that the body color is black as indicated in the original description.

Sierola luteipes Fullaway, 1920

Figure 28J–L, Map 21

Sierola luteipes Fullaway, 1920: 123.

Island. O'ahu.

Diagnosis. Part of a complex of species with broad, nearly parallel-sided mandibles, a short, steeply curved clypeus, frons microsculpture coriaceous, and sparsely setose basal wing cells. Together with *S. aspera*, separated from related species by the more compact head, with a narrow frons subequal to the eye height and shorter behind the eyes (WF/HE 0.95–1.05, EV/HE 0.70–0.85, OOL/WOT 1.40–1.60). Distinguished from *S. aspera* by the entirely yellow legs and more elongate, curved clypeus in lateral view. The clypeus is also distinctly carinate, unlike *S. affinis* and *S. pygmaea* which usually appear weakly carinate.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or steep and short, evenly curved. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than

setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.68 mm; LT 0.84 mm; WH/LH 0.87; DH/LH 0.59; EV/HE 0.73; EV/WF 0.74; WF/HE 0.98; WH/WF 1.86; OOL/WOT 1.55; DT/LT 0.40; FL/FW 2.00; HFL/HFW 2.40; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Pāloalo Valley, 3 Sep 1906, O.H. Swezey, BPBM Type 101.

Distribution. Known from only two specimens, both taken in the southeastern Ko'olau range.

***Sierola mahiai*, n. sp.**

Figure 28M–O, Map 21

Island. O'ahu.

Diagnosis. Close to *S. aristoteliae* and *S. manono* in having the clypeus weakly carinate, basal wing cells densely setose, and mandible convex outwardly. Readily separated from those species by the less dense frons punctation, and head more quadrate. Superficially similar to *S. pembedoni*, but that species has a sharp clypeal carina and the mandible nearly flat.

Description. Female. Head. Clypeal process semicircular or semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, more or less parallel-sided except at base; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart, or with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.79 mm; LT 0.85 mm; WH/LH 0.85; DH/LH 0.58; EV/HE 0.76; EV/WF 0.74; WF/HE 1.03; WH/WF 1.76; OOL/WOT 1.50; DT/LT 0.34; FL/FW 2.17; HFL/HFW 2.50; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Pālolo, 8 Sep 1912, D.T. Fullaway, BPBMNT 0000017922.

Etymology. From the Hawaiian *mahi 'ai*, agriculture, referring to the discovery of this species in the Hawaii Department of Agriculture collection. It is a noun in apposition.

Distribution. Known only from the type, collected in the southeastern Ko'olau range in 1912.

Sierola mahoe, n. sp.

Figure 29A–C, Map 22

Island. O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, short and steep in lateral view, and basal wing cells sparsely setose; close to *S. kilohana*, but readily distinguished by the small head, narrowed anteriorly, with the ocellar triangle distinctly obtuse and lateral ocelli close to the vertex. Very similar to *S. weawe*, separated only by the fully closed cell 2R1 and OOL/WOT slightly smaller (~1.45 vs. 1.55–1.75).

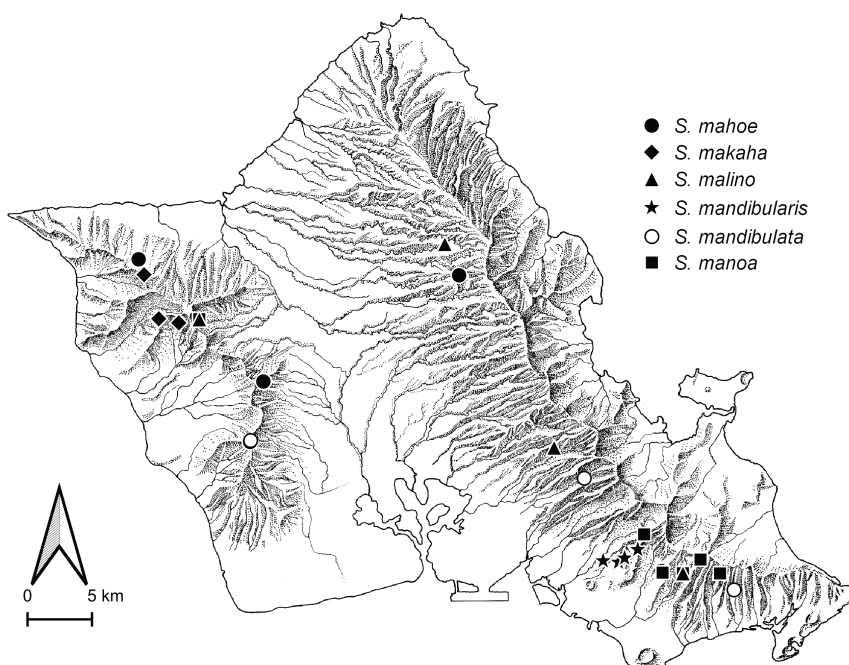
Description. Female. Head. Clypeal process semi-elliptical or trapezoidal, apex truncate; dorsally with a rounded carina dorsally, effaced towards apex; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse to strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Side of head behind eye with a line of tessellate microsculpture extending from posteroventral margin of eye halfway to vertex crest, distinctly different from smoother sculpting above and below. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Pronotum yellow, body otherwise dark brown to black. Antenna entirely dull yellow. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.



Map 22. Collection localities of *Sierola mahoe*, *S. makaha*, *S. malino*, *S. mandibularis*, *S. mandibulata*, and *S. manoa*.

Measurements. LFW 1.65 mm; LT 0.76 mm; WH/LH 0.89; DH/LH 0.58; EV/HE 0.90; EV/WF 0.76; WF/HE 1.17; WH/WF 1.71; OOL/WOT 1.44; DT/LT 0.33; FL/FW 2.00; HFL/HFW 2.22; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Peacock Flats 1800' [240 m] [550 m], 18 Aug 1988, J. Strazanac & C.J. Fritzler, BPBM 0000017923.

Paratype: 1 ♀, Poamoho Trail, 6 Oct 1965, J.W. Beardsley, BPBM.

Etymology. From the Hawaiian *māhoe*, twin, referring to the close similarity of this species to *S. kilohana* and *S. weawe*, and to the occurrence of the two definitive specimens from opposite mountain ranges. It is a noun in apposition.

Distribution. Known only from two specimens, one in the northern Ko'olau range and one in the northern Wai'anae. A third specimen from the southern Wai'anae may also be this species, but is damaged.

***Sierola makaha*, n. sp.**

Figure 29D–F, Map 22

Island. O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, short and steep in lateral view, and basal wing cells nearly glabrous; separated from *S. pulchra* by the more distinct sculpture of the head and metasoma, and overall darker coloration.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina, or weakly carinate; in profile steep and short, evenly curved. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost

absent. Dorsal hairs of head shorter than flagellar width. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Prothorax yellow, body otherwise dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.87 mm; LT 0.89 mm; WH/LH 0.88; DH/LH 0.55; EV/HE 0.77; EV/WF 0.75; WF/HE 1.03; WH/WF 1.83; OOL/WOT 1.31; DT/LT 0.36; FL/FW 2.22; HFL/HFW 2.60; A3 L/W 1.60.

Type Material. Holotype ♀. O'ahu: Mākaha, unit 1 2300' [700 m], 21.5012°N 158.1678°W, 7 Nov 2013, on *Planchonella sandwicensis*, K.N. Magnacca, BPBMENT 0000017924.

Paratypes: 1 ♀, Mākaha, unit 1 2300' [700 m], 21.5012°N 158.1678°W, 7 Nov 2013, on *Alyxia stellata*, K.N. Magnacca, BPBM. 1 ♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 19 Nov 2014, on *Nestegis sandwicensis*, K.N. Magnacca, BPBM.

Etymology. Named for the type locality, Mākaha Valley in the leeward Wai'anae range. It is a noun in apposition.

Distribution. Known only from four specimens, all from Mākaha and Wai'anae valleys in the leeward Wai'anae range.

Discussion. This appears to be the Wai'anae sister taxon of *S. pulchra*. See notes under that species.

Sierola malino, n. sp.

Figure 29G–I, Map 22

Island. O'ahu.

Diagnosis. Part of a complex of species with a broad, nearly parallel-sided mandible and a short, steeply curved clypeus. Separated from related species by the broad frons, distinctly greater than the eye height and shorter behind the eyes (WF/HE 1.25–1.35, EV/HE 1.00–1.15, OOL/WOT 1.60–1.85). Very similar to *S. affinis* and *S. pygmaea*, distinguished by the smooth to fine microsculpture of the frons with punctuation not dense between the eyes, clypeus more elongate and rounded in dorsal view, and metasoma covered with distinct microsculpture, at least apically.

Description. Female. Head. Clypeal process semi-elliptical, apex rounded; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, ventral margin slightly concave; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–

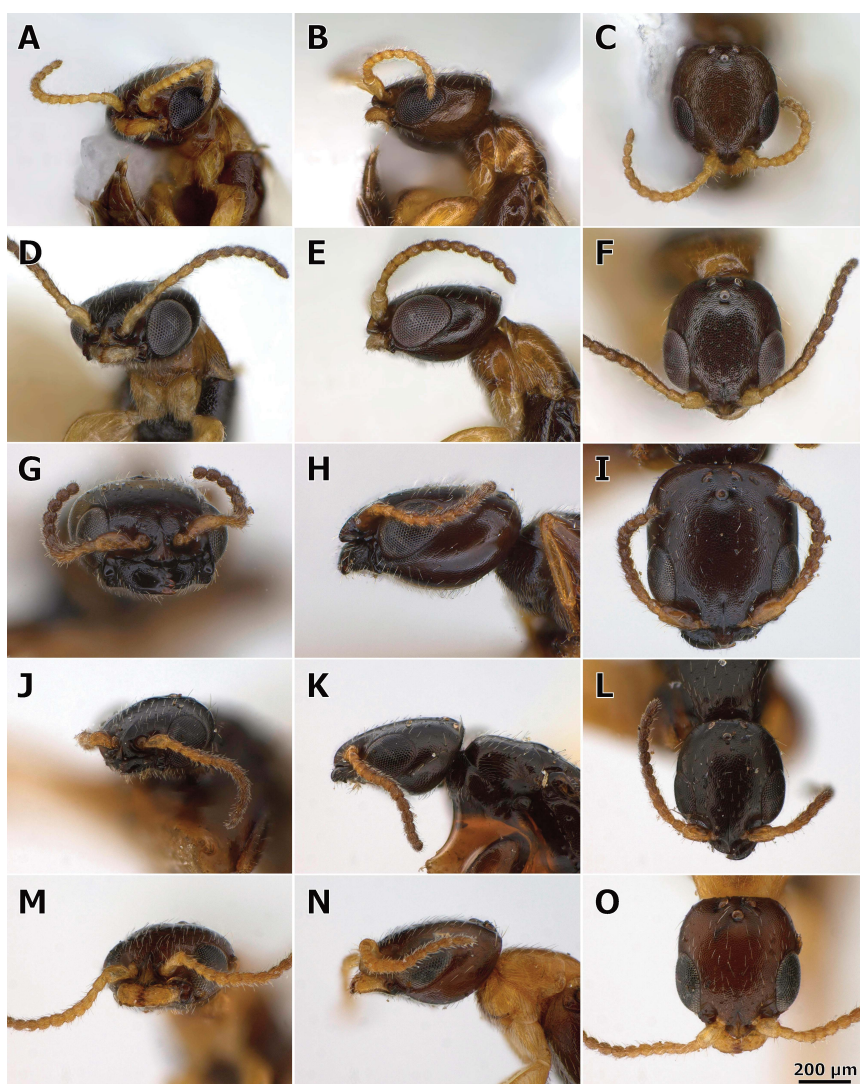


Figure 29. A–C: *Sierola mahoe*. D–F: *Sierola makaha*. G–I: *Sierola malino*. J–L: *Sierola mandibularis*. M–O: *Sierola mandibulata*.

3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black or coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Areolet distinctly convex posteriorly, corner medioapical.

Measurements. LFW 2.37 mm; LT 1.10 mm; WH/LH 0.84; DH/LH 0.59; EV/HE 1.11; EV/WF 0.84; WF/HE 1.32; WH/WF 1.62; OOL/WOT 1.77; DT/LT 0.40; FL/FW 2.26; HFL/HFW 2.35; A3 L/W 1.33.

Type Material. Holotype ♀. O‘ahu: Mt. Ka‘ala, 18 May 1920, O.H. Swezey, BPBM 0000017925.

Other Specimens. 1♀, Pālolo, 24 Jun 1917, J.C. Bridwell, BPBM. 1♀, Pe‘ahināi‘a Tr. 2100' [640 m], 21.5525°N 157.9532°W, 2 Nov 2016, on *Melicope*, K.N. Magnacca, BPBM.

Etyymology. From the Hawaiian *malino*, smooth and unwrinkled, referring to the reduced microsculpture of the head compared to *S. pygmaea*. It is a genderless adjective in the nominative singular.

Distribution. Rare, known from three specimens across the Ko‘olau range and one from the Wai‘anae.

Discussion. The two non-type specimens key to the same place as the type but differ slightly: in both the metasoma lacks microsculpture except at the sides, the ventral head is sparsely setose, and the clypeus is strongly rounded and recurved apically in profile. The Palolo specimen also has the mandible straight ventrally rather than slightly concave. While these are normally consistent characters, I am reluctant to describe either or both as separate species when so few specimens are available.

Sierola mandibularis Fullaway, 1920

Figure 29J–L, Map 22

Sierola mandibularis Fullaway, 1920: 105.

Island. O‘ahu.

Diagnosis. One of only a few species with a carinate clypeus and sparsely setose to glabrous basal wing cells to also have a distinct genal angle and smooth frons microsculpture. Separated from *S. glabra* and *S. extensa* by the moderately punctate frons, and from *S. brunneipennis* by the narrower head and almost completely glabrous basal wing cells. The strongly rounded posterior corners of the head and slightly concave pronotum (as seen in lateral view) are also very distinctive and distinguish it from nearly all other species.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate, pronotal disc slightly concave. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae, trochanters, and femora black, all tibiae and tarsi yellow-brown.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.73 mm; LT 0.89 mm; WH/LH 0.82; DH/LH 0.56; EV/HE 0.79; EV/WF 0.75; WF/HE 1.05; WH/WF 1.75; OOL/WOT 1.20; DT/LT 0.38; FL/FW 1.87; HFL/HFW 2.14; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Tantalus, 15 Jul 1916, collected on Pauoa side of Tantalus, J.C. Bridwell, BPBM Type 67.

Distribution. Found in wet-mesic forest in both the Ko'olau and Wai'anae ranges. Rare, known from only five specimens; last collected in 1918.

Discussion. Possibly a synonym of *S. glabra*, differing primarily in the frons punctuation.

Sierola mandibulata Fullaway, 1920

Figure 29M–O, Map 22

Sierola mandibulata Fullaway, 1920: 130.

Island. O'ahu.

Diagnosis. Among species with a sharp clypeal carina and densely setose basal wing cells, distinguished from most others by the convex or slightly twisted mandible (the distinction is blurred in this species) and largely yellow to yellow-brown coloration. Superficially similar to *S. aristoteliae*, from which it can be distinguished by the less dense frons punctuation and smoother microsculpture. Structurally closest to *S. olena*, but differing in having the head entirely brown to black, outwardly convex mandible, and ocellar triangle right rather than strongly acute.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Head black except clypeus yellow, prothorax, mesonotum, and metasoma yellow-brown, remainder of mesosoma dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.86 mm; LT 0.93 mm; WH/LH 0.88; DH/LH 0.59; EV/HE 0.74; EV/WF 0.66; WF/HE 1.12; WH/WF 1.68; OOL/WOT 1.32; DT/LT 0.35; FL/FW 2.00; HFL/HFW 2.63; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Niu Ridge, 10 Feb 1918, P.H. Timberlake, BPBM Type 115.

Distribution. Rare, known from only five specimens, mostly from wetter locations in both the Ko'olau and Wai'anae ranges.

Discussion. This species is structurally very similar to *S. olenae*, but the color difference between them appears to correlate with the subtle differences in the mandible and the ocellar triangle (strongly acute in *S. olenae*, right in *S. mandibulata*), so they are maintained as distinct. One specimen at BPBM (11 Nov 1926) appears to be this species, but is entirely black.

Sierola manoa Fullaway, 1920

Figure 30A–C, Map 22

Sierola manoa Fullaway, 1920: 131.

Sierola abusa Fullaway, 1920: 136, **n. syn.**

Sierola kaalensis Fullaway, 1920: 139, **n. syn.**

Island. O'ahu.

Diagnosis. Belonging to the group of species with a sharp, somewhat strongly arched clypeal carina, basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs predominantly yellow. Separated from most similar species by the yellow mandible, which is parallel-sided or only weakly concave ventrally, frons densely punctate between the eyes, and head deep. Very similar to *S. urerae*, distinguished by having the frons setae elongate, vertex and genal setae somewhat differentiated, clypeus strongly arched in lateral view, head slightly less deep (DH/LH 0.60–0.62 vs. 0.62–0.65), and fore femora broader (FL/FW ~2.20 vs. ~2.40). Also similar to *S. tenebriosa*, separated by the sparse setation of the wing cells and broader hind femora (HFL/HFW 2.55–2.90 vs. 2.20–2.45 in *S. tenebriosa*).

Description. Female. Head. Clypeal process semicircular, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

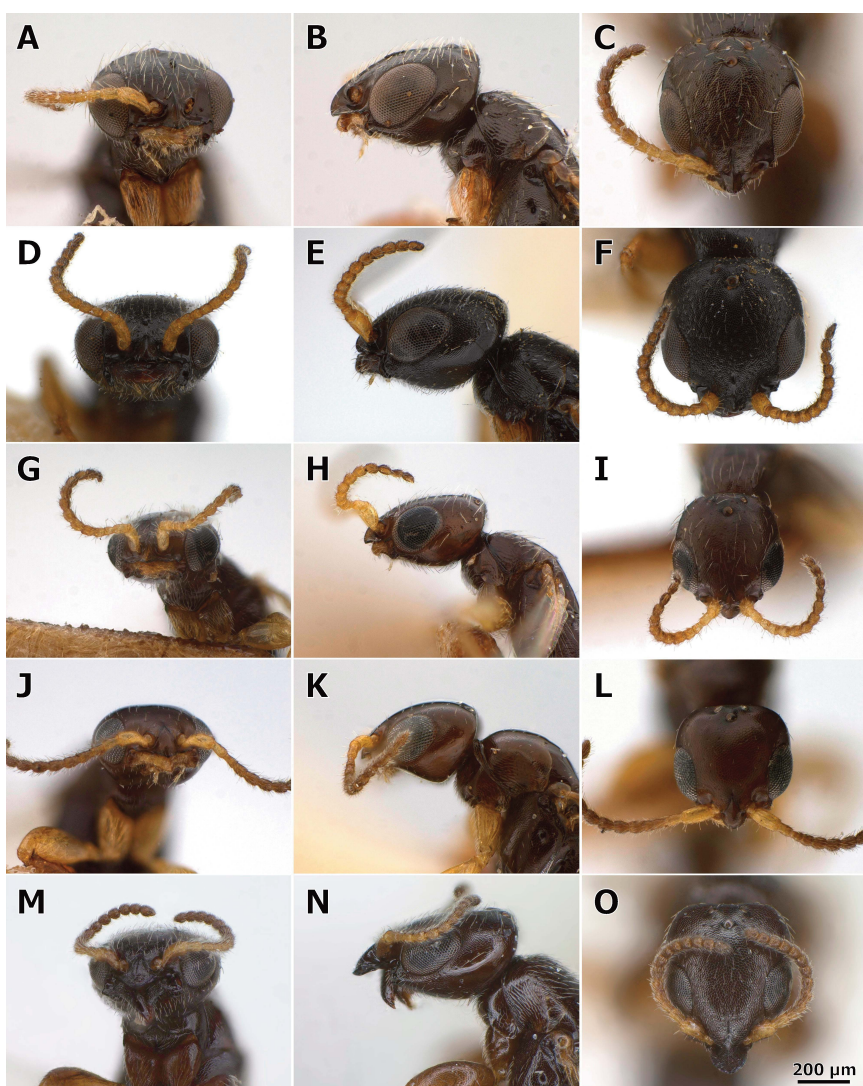


Figure 30. A–C: *Sierola manoa*. D–F: *Sierola manono*. G–I: *Sierola minuscula*. J–L: *Sierola montana*. M–O: *Sierola neoarmata*.

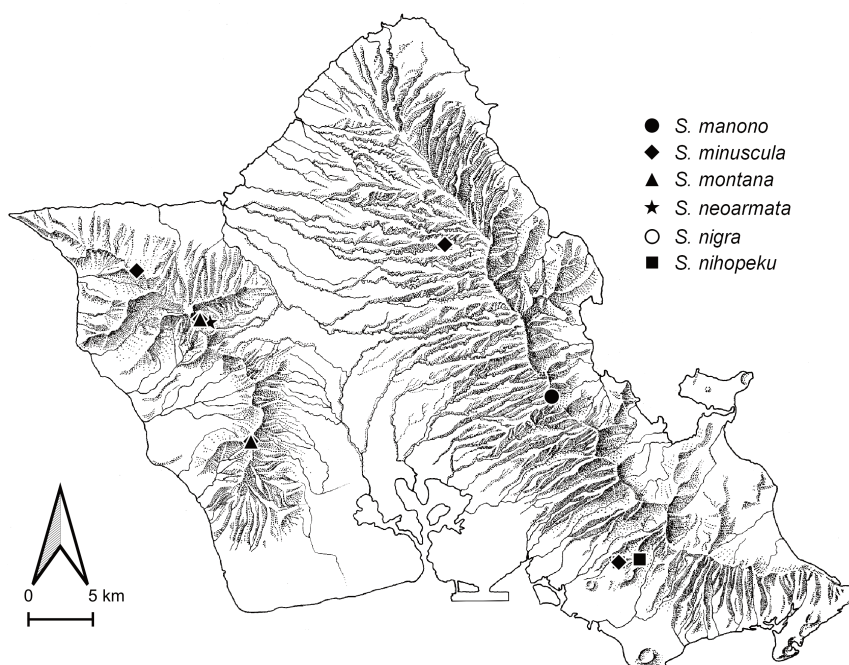
Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow except black near the articulation. Legs yellowish brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.05 mm; LT 1.04 mm; WH/LH 0.90; DH/LH 0.61; EV/HE 0.58; EV/WF 0.56; WF/HE 1.04; WH/WF 1.80; OOL/WOT 1.14; DT/LT 0.42; FL/FW 2.19; HFL/HFW 2.71; A3 L/W 1.29.

Type Material. Holotype ♀ of *Sierola manoa*. O'ahu: Mānoa Ridge, 13 Feb 1917, D.T. Fullaway, BPBM Type 118.



Map 23. Collection localities of *Sierola manono*, *S. minuscula*, *S. montana*, *S. neoarmata*, *S. nigra*, and *S. nihopeku*.

Holotype ♀ of *Sierola abusa*. O‘ahu: Pālolo Hill trail, 9 Apr 1916, P.H. Timberlake, BPBM Type 127.

Holotype ♀ of *Sierola kaalensis*. O‘ahu: Mt. Ka‘ala, 22 Jul 1917, P.H. Timberlake, BPBM Type 133.

Distribution. Rare, known only from a handful of specimens from the southeastern Ko‘olau range and two from Ka‘ala. Last collected in 1924.

Ecology. Two specimens were reared from *Udea dryadopa* (Meyrick) (Crambidae) on *Scaevola glabra* (‘ohe naupaka, Goodeniaceae). However, it is unlikely this is the typical host, since *Sc. glabra* is uncommon on Oahu and does not occur in most of the places where *S. manoa* has been collected.

Discussion. Synonym of *S. abusa* and *S. kaalensis*, which were separated by Fullaway based on the frons microsculpture and mandible width; the types are nearly identical in these characters and all others. See comments under *S. similis*.

***Sierola manono*, n. sp.**

Figure 30D–F, Map 23

Island. O‘ahu.

Diagnosis. Nearly identical to *S. aristoteliae* aside from color, with the frons densely punctate, head setae very short, mandible moderately broad, and basal wing cells densely setose. Differing in being all black, the head slightly wider, and the mandible with only three teeth, the ventral one notched.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally weakly carinate; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with only three teeth, ventral

tooth minutely notched apically. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black to reddish brown. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.87 mm; LT 0.95 mm; WH/LH 0.92; DH/LH 0.64; EV/HE 0.74; EV/WF 0.63; WF/HE 1.18; WH/WF 1.70; OOL/WOT 1.50; DT/LT 0.43; FL/FW 2.15; HFL/HFW 2.45; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Waimano Trail, Ko'olau Mts. 725 m [2380'], 23 Sep 1972, Emerged 3 Oct 1972 from Lepidopteran gall on twig terminals of *Gouldia terminalis* [= *Kadua affinis*], W.C. Gagné, BPBM 0000017926.

Paratypes: 10 ♀ 2 ♂, same data as holotype, BPBM.

Etyymology. Named for the endemic shrub *manono* (*Kadua affinis*, Rubiaceae), from which the type series was reared. It is a noun in apposition.

Distribution. Known only from one series taken in the central Ko'olau range.

Ecology. Reared from unknown lepidopteran galls in *Kadua affinis*, probably *Merimnetria* sp.

Discussion. The presence of only three distinct teeth on the otherwise-unmodified mandible is extremely unusual. The notched ventral tooth has not been observed in any other species. It is obviously very closely related to *S. aristoteliae*, and probably the result of specialization on related moths that both attack *Kadua affinis*. *Merimnetria elegantior* attacks the fruits, from which *S. aristoteliae* has been reared; *M. homoxyla* in the Ko'olau range and *M. xylospila* in the Wai'anae range make stem galls, from which *S. manono* was reared. The difference in the mandible is presumably related to how they enter the caterpillar's refuge. However, unusually dark specimens of *S. aristoteliae* have been reared from *M. homoxyla* stem galls.

Sierola minuscula Fullaway, 1920

Figure 30G–I, Map 23

Sierola minuscula Fullaway, 1920: 128.

Island. O'ahu.

Diagnosis. Distinguished from most other species with a sharp clypeal carina, sparsely setose to glabrous basal wing cells, and rounded gena by the shining frons with smooth microsculpture and typical punctuation 1–2 pit widths apart. Separated from the closely related *S. pipturi* by the narrow hind femur (HFL/HFW ~2.75 vs. 1.90–2.10), shorter head (OOL/WOT 1.10–1.40 vs. 1.55–1.75), lateral ocelli nearly touching the vertex, and mandible nearly parallel-sided or only slightly concave ventrally.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with

a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow except dorsal margins of femora tinged with brown or coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.61 mm; LT 0.79 mm; WH/LH 0.88; DH/LH 0.55; EV/HE 0.76; EV/WF 0.72; WF/HE 1.05; WH/WF 1.79; OOL/WOT 1.12; DT/LT 0.38; FL/FW 2.08; HFL/HFW 2.76; A3 L/W 1.20.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 11 Aug 1912, D.T. Fullaway, BPBM Type 112.

Distribution. Widespread but rare in both the Wai'anae and Ko'olau ranges. Known only from 10 specimens, last collected in 1936.

Ecology. Possibly associated with *Pisonia* (pāpala kēpau, Nyctaginaceae); one rearing record "ex cocoons on *Pisonia* leaf" but no host given.

Discussion. See comments under *S. pipturi*.

Sierola montana Fullaway, 1920

Figure 30J–L, Map 23

Sierola montana Fullaway, 1920: 85.

Island. O'ahu.

Diagnosis. Clypeus convex dorsally, basal wing cells nearly glabrous, mandible with normal teeth; distinctive among the O'ahu species by the very deep head, triangular in lateral view and dorsally strongly convex. Nearly identical to *S. rocki* of Hawai'i, differing only in the slightly narrower mandible, deeper postgenal depression, and shorter pubescence of the head and pronotum.

Description. Female. *Head.* Clypeal process semicircular, apex broadly rounded; dorsally rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli

nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles flat in lateral view, nearly glabrous. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena below eye flat. Postgenal depression deep, distinct, broad. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded, pronotal disc distinctly convex. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.83 mm; LT 0.85 mm; WH/LH 0.96; DH/LH 0.67; EV/HE 0.65; EV/WF 0.52; WF/HE 1.24; WH/WF 1.63; OOL/WOT 1.27; DT/LT 0.48; FL/FW 2.32; HFL/HFW 2.55; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 2500–3000' [915 m] [760–915 m], 22 Jul 1917, P.H. Timberlake, BPBM Type 28.

Distribution. Known only from two specimens taken in the Wai'anae range in wet to wet-mesic forest. Last collected in 1938.

Sierola neoarmata, n. sp.

Figure 30M–O, Map 23

Island. O'ahu.

Diagnosis. Belonging to the group of species with a prominent flattened clypeus and the mandible bent down at the base. Separated from *S. alelo* and *S. kumumu* by the narrow head. Very similar to *S. armata*, differing in having all mandible teeth similar, the malar space short ($1/4$ – $1/3$ as long as basal mandible width), and the head deeper with a broader frons and shorter behind the eyes (DH/LH 0.48–0.51, WH/WF 1.73–1.91, OOL/WOT 1.40–1.60 compared to 0.42–0.46, 1.94–2.12, and 1.59–1.75 respectively in *S. armata*).

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a broad, rounded ridge; in profile elongate, evenly curved, apex acute. Mandible narrow, more or less parallel-sided except at base; distinctly bent down near base, crossing when closed, outwardly shining but with distinct, fine microsculpture; in ventral view abruptly bent near base, distally straight. Apex of mandible slightly oblique, with equally strong teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.76 mm; LT 0.91 mm; WH/LH 0.73 (0.67–0.74); DH/LH 0.49 (0.48–0.51); EV/HE 0.83 (0.82–0.89); EV/WF 0.79 (0.79–0.89); WF/HE 1.00 (1.00–1.06); WH/WF 1.84 (1.79–1.91); OOL/WOT 1.40 (1.40–1.60); DT/LT 0.44; FL/FW 2.00 (2.00–2.17); HFL/HFW 2.45 (2.36–2.93); A3 L/W 1.00. N = 3.

Type Material. Holotype ♀. O‘ahu: Hale‘au‘au, 1 Dec 1929, *Suttonia* [= *Myrsine*], O.H. Swezey, BPBM ENT 0000017927.

Paratypes: 1♀, S. Wai‘anae Mts., 9 Nov 1919, O.H. Swezey, BPBM. 1♀, S. Hale‘au‘au, Breeder Flats 2100' [640 m], 21.4983°N 158.1301°W, 22 Apr 2015, on *Perrottetia sandwicensis*, K.N. Magnacca, BPBM.

Etymology. Named for the close similarity to *S. armata*.

Distribution. Known only from three specimens, two from Hale‘au‘au Gulch in the central Wai‘anae range.

Discussion. Apparently a narrow geographic segregate, restricted to a part of the southern Wai‘anae range. Its similar sister species, *S. armata*, is uncommon but widespread in both the Ko‘olau and Wai‘anae ranges. See *S. rostrata* for another example.

Sierola nigra Fullaway, 1920

Figure 31A–C, Map 23

Sierola nigra Fullaway, 1920: 131.

Island. O‘ahu.

Diagnosis. Belonging to the large group of species with the basal wing cells densely setose, clypeus carinate and evenly curved, and mandible narrow and parallel-sided to slightly concave ventrally without any modifications. Forming a closely related complex with *S. anemophila* and *S. tenebriosa*, denoted by the broad, deep head (WH/LH 0.87–0.94, DH/LH 0.59–0.66) which is strongly convex ventrally. Separated from those species by the polished metasoma, relatively weak frons microsculpture, and combination of moderately broad fore femora and narrow hind femora.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

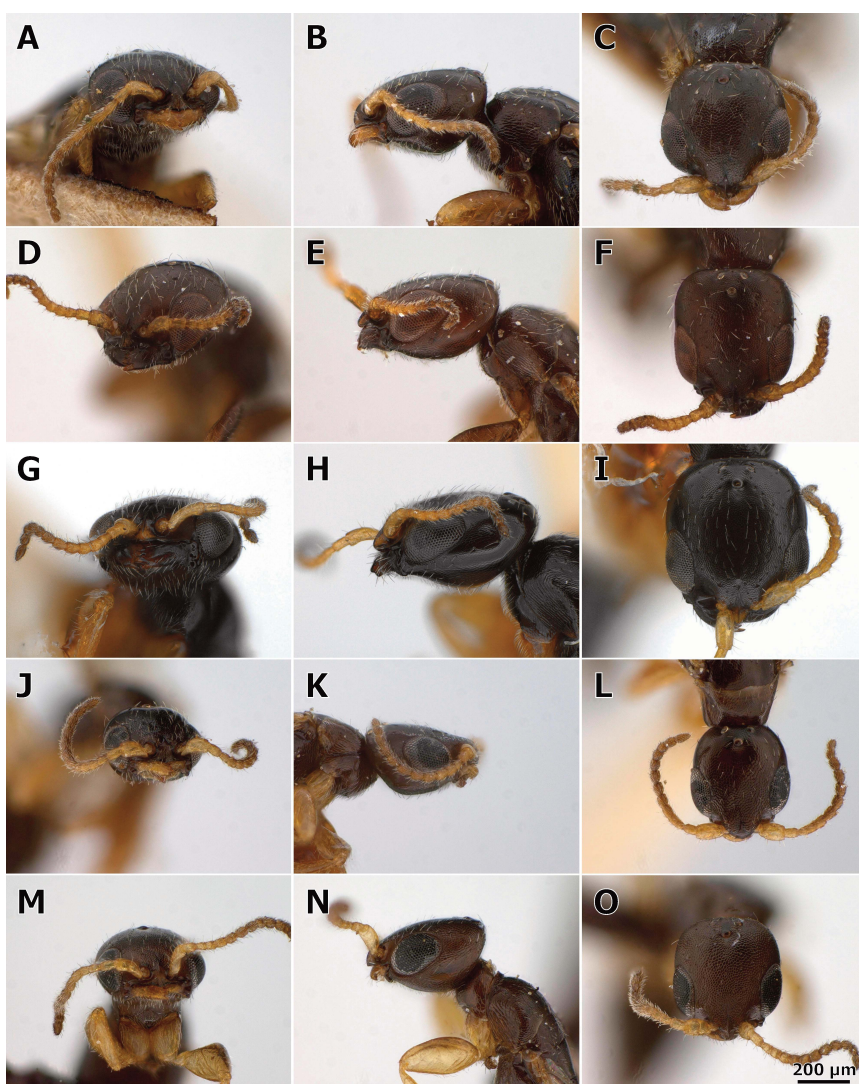


Figure 31. A–C: *Sierola nigra*. D–F: *Sierola nigrita*. G–I: *Sierola nihopeku*. J–L: *Sierola nitens*. M–O: *Sierola nuda*.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Coxae and femora brown, tibiae, tarsi, and trochanters yellow.

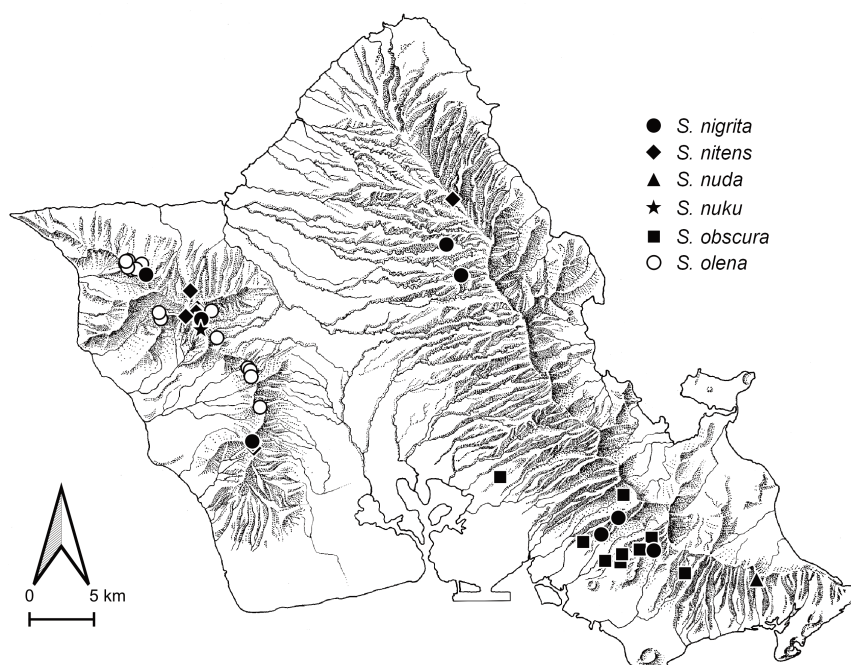
Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.76 mm; LT 0.92 mm; WH/LH 0.93; DH/LH 0.60; EV/HE 0.67; EV/WF 0.60; WF/HE 1.12; WH/WF 1.70; OOL/WOT 1.07; DT/LT 0.39; FL/FW 2.03; HFL/HFW 2.89; A3 L/W 2.00.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 11 Aug 1912, O.H. Swezey, BPBM Type 117.

Distribution. Known only from the holotype, taken at Ka'ala.

Discussion. See comments under *S. anemophila*.



Map 24. Collection localities of *Sierola nigrita*, *S. nitens*, *S. nuda*, *S. nuku*, *S. obscura*, and *S. olena*.

***Sierola nigrita* Fullaway, 1920**

Figure 31D–F, Map 24

Sierola nigrita Fullaway, 1920: 120.

Island. O‘ahu.

Diagnosis. Separated from most species with broad, parallel-sided mandible by having the clypeus evenly curved in lateral view and the head relatively short behind the eyes (EV/HE 0.80–0.93). The latter character readily separates it from *S. striata*, with which it may be confused by the gentle curve of the clypeus. The basal wing cells are also sparsely setose, though the setae are more widely scattered than usual which may confuse the observer. It keys closest to *S. perottetiae*, which is distinctly different in appearance with a strongly curved, usually recurved clypeus, and broader fore femora.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or evenly sloping, nearly straight. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse

setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, front tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.63 mm; LT 0.83 mm; WH/LH 0.84 (0.79–0.84); DH/LH 0.57 (0.55–0.58); EV/HE 0.83 (0.80–0.93); EV/WF 0.77 (0.72–0.83); WF/HE 1.07 (1.07–1.14); WH/WF 1.73 (1.69–1.77); OOL/WOT 1.80 (1.72–1.88); DT/LT 0.37; FL/FW 2.00 (2.00–2.10); HFL/HFW 2.30 (2.23–2.35); A3 L/W 0.86 (0.77–1.00). N = 9.

Type Material. Holotype ♀. O'ahu: 'Ōpae'ula, 30 Mar 1913, D.T. Fullaway, BPBM Type 97.

Distribution. Relatively common in early collections from the southeastern Ko'olau range, but only two specimens known from the Wai'anāe range (one recent).

Ecology. There is one collection of four individuals from *Acacia koa*, in ripe pods, suggesting it is associated with caterpillars feeding on the seeds.

Sierola nihopeku, n. sp.

Figure 31G–I, Map 23

Island. O'ahu.

Diagnosis. Distinguished from most other species with a sharp clypeal carina and densely setose basal wing cells by having the mandible strongly convex externally, with the second tooth prominent and the ventral one subapical and partly concealed by the curvature. Separated from the species pair *S. gracilariae* and *S. kaumuohona* by having the mandible broader and the reduced ventral tooth, and the clypeus nearly straight in profile.

Description. Female. Head. Clypeal process rounded triangular or semicircular, apex weakly pointed; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible slightly oblique, with second ventral tooth largest, ventral tooth partially concealed behind in frontal view. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; transverse carina faintly present, curving on each side; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black, reddish at apex before teeth. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.15 mm; LT 1.02 mm; WH/LH 0.86; DH/LH 0.57; EV/HE 0.97; EV/WF 0.77; WF/HE 1.27; WH/WF 1.66; OOL/WOT 1.90; DT/LT 0.40; FL/FW 2.31; HFL/HFW 2.42; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Mt. Tantalus, 6 Nov 1957, J.W. Beardsley, BPBMNT 0000017928.

Paratype: 1 ♀, Mānoa Cliffs Trail, 26 Oct 1919, W.M. Giffard, HDOA.

Etymology. From the Hawaiian *niho peku*, a new tooth coming up through the gums, referring to the small ventral tooth that is partially behind the second tooth. It is a noun in apposition.

Distribution. Known only from the holotype and one other specimen, both taken at Tantalus in the southeastern Ko'olau range.

Discussion. The mandible of this species is quite distinctive and it should be easily recognizable.

Sierola nitens Fullaway, 1920

Figure 31J–L, Map 24

Sierola nitens Fullaway, 1920: 148.

Island. O'ahu.

Diagnosis. Immediately recognizable by the very short clypeus, vertical in profile with a high, rounded brow. This character is so far unique among *Sierola*.

Description. Female. Head. Clypeal process very short, almost transverse, extending only slightly beyond lateral portion of clypeus, apex weakly pointed; dorsally flat, not carinate, slightly convex only on the sides; in profile nearly vertical distally, brow high and rounded. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture microreticulate and dull between the eyes and antenna, distinctly smoother between eyes and ocelli. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow except black near the articulation. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.71 mm; LT 0.73 mm; WH/LH 0.88; DH/LH 0.61; EV/HE 0.76; EV/WF 0.72; WF/HE 1.06; WH/WF 1.75; OOL/WOT 1.08; DT/LT 0.41; FL/FW 2.40; HFL/HFW 3.15; A3 L/W 1.40.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 2500' [760 m], 4 Mar 1917, on *Pelea clusiaefolia* [= *Melicope clusiifolia*], P.H. Timberlake, BPBM Type 152.

Distribution. Common in wet forest around the summits of Ka'ala and Palikea in the Wai'anae range, and close to the Ko'olau crestline.

Ecology. Taken on a wide variety of plants, but most abundantly on *Cheirodendron trigynum*, *Kadua affinis*, and *Melicope* sp.

Sierola nuda Fullaway, 1920

Figure 31M–O, Map 24

Sierola nuda Fullaway, 1920: 157.

Sierola williamsi Fullaway, 1920: 138, **n. syn.**

Island. O'ahu.

Diagnosis. Among species with a sharp clypeal carina and densely setose basal wing cells, this species is readily distinguished by the sparse punctation of the frons and round head in dorsal view. The mandible is also slightly twisted.

Description. Female. Head. Clypeal process semi-elliptical, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided or slightly expanded at base and apex, ventral margin weakly concave; slightly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Side of head behind eye with a faint line of smooth tessellate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting above and below. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black to reddish brown. Legs all yellow or coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.58 mm; LT 0.78 mm; WH/LH 0.87; DH/LH 0.59; EV/HE 0.77; EV/WF 0.68; WF/HE 1.14; WH/WF 1.70; OOL/WOT 1.36; DT/LT 0.38; FL/FW 2.17; HFL/HFW 2.37; A3 L/W 1.20.

Type Material. Holotype ♀ of *Sierola nuda*. O'ahu: Kuli'ou'ou, 12 Jul 1918, D.T. Fullaway, BPBM Type 170.

Holotype ♀ of *Sierola williamsi*. O'ahu: 'Ālewa Heights, 26 Mar 1916, P.H. Timberlake, BPBM Type 132.

Distribution. Known only from three definitive specimens, the holotypes of *S. nuda* and *S. williamsi* from the Ko'olau range and one additional specimen from Ka'ala. Last collected in 1920.

Ecology. One male reared from *Caloptilia mabaella* and included as a paratype of *S. gracilariae* may be this species. However, while it is clearly not *S. gracilariae*, its identity cannot be definitively established.

Discussion. Senior synonym of *S. williamsi*. The only other specimen in collections is significantly more melanic than either type specimen, with the legs and mandible dark brown to black. One additional specimen at BPBM matches the type in all respects except that the head has smooth rather than granular sculpture; it probably represents a distinct species, since it seems to be a reliable character within the bounds of interpretation and they represent the two extremes of microsculpture, but I am reluctant to describe it based on a single character.

***Sierola nuku*, n. sp.**

Figure 32A–C, Map 24

Island. O'ahu.

Diagnosis. Belonging to the group of species with the clypeus convex dorsally and basal wing cells nearly glabrous. Separated from most others by the narrow, parallel-sided mandible, and from the related *S. fossulata* by the slightly recurved clypeal apex and sparse frons punctation. Overall most similar to *S. brevicornis*, differing in the clypeus shape (slightly recurved in profile, lacking a ridge dorsally) and shape of the head in profile (angle further forward in *S. brevicornis*).

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally rounded, convex, lacking a carina; in profile weakly sloping dorsally but strongly rounded and recurved at apex, or evenly sloping, nearly straight. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space 1/4 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression shallow, rounded. Antenna extending to pronotum.

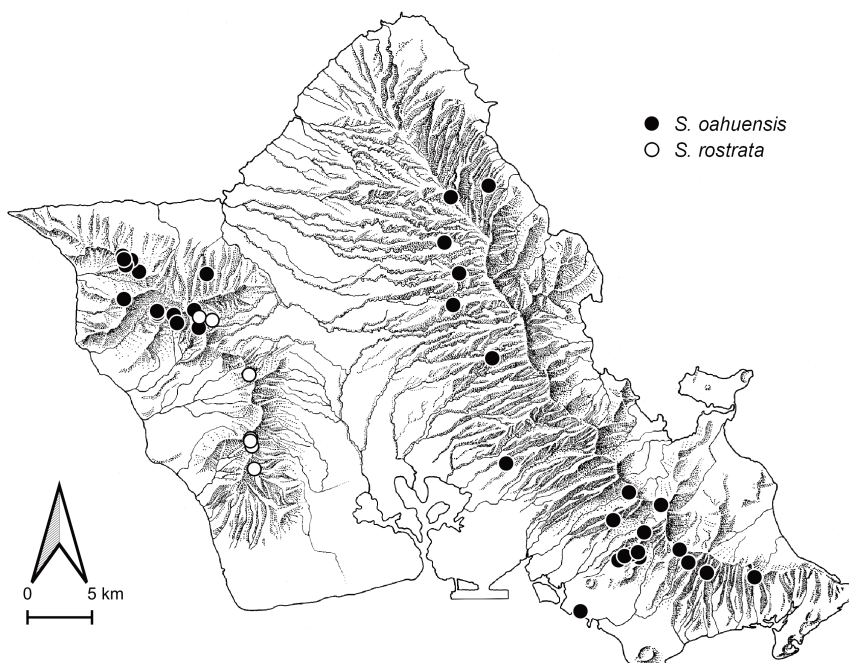
Mesosoma. In lateral view anterior margin of pronotum strongly angulate, pronotal disc distinctly flattened. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.71 mm; LT 0.83 mm; WH/LH 0.91; DH/LH 0.54; EV/HE 0.72; EV/WF 0.58; WF/HE 1.24; WH/WF 1.72; OOL/WOT 1.05; DT/LT 0.37; FL/FW 1.74; HFL/HFW 1.75; A3 L/W 0.93.



Map 25. Collection localities of *Sierola oahuensis* and *S. rostrata*.

Type Material. Holotype ♀. O'ahu: Ka'ala-Kalena crestline 3100' [950 m], 21.4933°N 158.1379°W, 22 Apr 2015, under leaves, K.N. Magnacca, BPBMENT 0000017929.

Etymology. From the Hawaiian *nuku*, beak, referring to the prominent nose-like clypeus. It is a noun in apposition.

Distribution. Known only from the type, collected on the Wai'anae crestline between Ka'ala and Kalena along with that of *S. arpactes*.

***Sierola oahuensis* Ashmead, 1901**

Figure 32D–I, Map 25

Sierola oahuensis Ashmead, 1901: 290.

Sierola distincta Fullaway, 1920: 72, **n. syn.**

Island. O'ahu.

Diagnosis. The large spatulate, flat clypeus and unusual mandible, with the dorsal three teeth present but reduced compared to the very large ventral tooth, separate this species from nearly all others on O'ahu. Distinguished from the allopatric *S. rostrata* by the clypeus distinctly curved down from the bases of the antenna in lateral view, rather than nearly horizontal basally. Related species occur on the other islands.

Description. Female. Head. Clypeal process spatulate, expanded beyond anterior margin of head, apex broadly rounded; dorsally flat, not carinate, slightly convex only on the sides; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view strongly elbowed. Apex of mandible strongly oblique, with a single large ventral tooth and a few small teeth on the inner margin. Malar space 1/2 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with

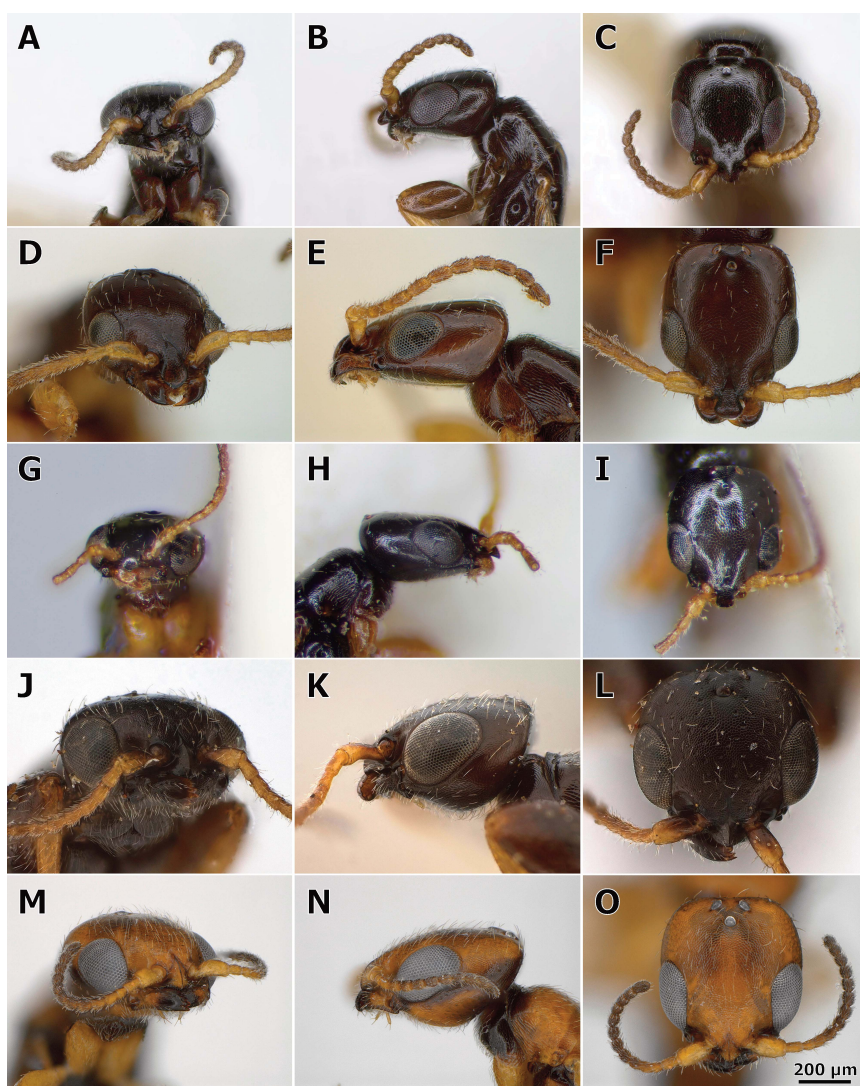


Figure 32. A–C: *Sierola nuku*. D–F: *Sierola oahuensis* (female holotype of *S. distincta*). G–I: *Sierola oahuensis* (male holotype). J–L: *Sierola obscura*. M–O: *Sierola olenae*.

shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle present posteriorly, not prominent, head relatively flat. Postgenal depression deep, distinct, V-shaped. Antenna extending to mesonotum.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; median carina faintly present; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, with both anterior

and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view. *Metasoma*. Shining, with faint microsculpture laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.43 mm; LT 1.08 mm; WH/LH 0.77; DH/LH 0.47; EV/HE 1.05; EV/WF 0.81; WF/HE 1.30; WH/WF 1.65; OOL/WOT 1.83; DT/LT 0.29; FL/FW 1.59; A3 L/W 1.75.

Type Material. Lectotype ♂ of *Sierola oahuensis* (designated by Magnacca 2019b). O'ahu: Wai'anae Mts., 2000 ft. [610 m], Apr 1892, R.C.L. Perkins, NHMUK Type 13.192.

Holotype ♀ of *Sierola distincta*. O'ahu: 'Ōpae'ula, 30 Mar 1913, O.H. Swezey, BPBM Type 1.

Distribution. Found throughout the Ko'olau range, and in the Wai'anae range north and west of Ka'ala, in wet to wet-mesic forest.

Ecology. Taken on a wide variety of plants.

Discussion. The description is based on the type of *S. distincta*, as the only extant type of *S. oahuensis* (designated as the lectotype) is a male. Ashmead (1901) described the female, presumably based on a second specimen from Hawai'i, but the specimen is missing; it may have been the undescribed Hawai'i relative of *S. oahuensis*, which has been found in collections, or a different species entirely, such as *S. sima*. Due to the distinctive characters of the clypeus, mandible, and the rest of the head, the sexes can be associated, unlike in most species. The clypeus of the male is parallel-sided rather than spatulate and the mandible are narrower, but it is otherwise similar to the female. One of Fullaway's male *S. distincta* paratypes is a specimen of *S. anthracina*. The type of *S. distincta* is a somewhat unusual specimen with the head wider and deeper than normal for this species. It forms an allopatric species pair with *S. rostrata*; see comments under that species.

Sierola obscura Fullaway, 1920

Figure 32J–L, Map 24

Sierola obscura Fullaway, 1920: 93.

Sierola adumbrata Fullaway, 1920: 141, **n. syn.**

Sierola breviceps Fullaway, 1920: 144, **n. syn.**

Sierola kalihienensis Fullaway, 1920: 143, **n. syn.**

Sierola localis Fullaway, 1920: 93, **n. syn.**

Island. O'ahu.

Diagnosis. A large and robust species, easily recognized by the very broad, biconvex fore femora, and head very short behind the eyes and as wide or wider than long.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pu-

bescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; meta-pleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly covered with short, anteriorly-directed setae.

Color. Body entirely dark brown to black. Antenna dark brown dorsally, yellowish brown ventrally. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.72 mm; LT 1.35 mm; WH/LH 1.02; DH/LH 0.61; EV/HE 0.53; EV/WF 0.44; WF/HE 1.19; WH/WF 1.71; OOL/WOT 1.21; DT/LT 0.39; FL/FW 1.68; HFL/HFW 1.88; A3 L/W 1.20.

Type Material. Holotype ♀ of *Sierola obscura*. O'ahu: Pālolo, 3 Jan 1915, O.H. Swezey, BPBM Type 43.

Holotype ♀ of *Sierola adumbrata*. O'ahu: Ka'ala Mts., 11 Aug 1912, O.H. Swezey, BPBM Type 138.

Holotype ♀ of *Sierola breviceps*. O'ahu: Pālolo, 8 Sep 1912, D.T. Fullaway, BPBM Type 144.

Holotype ♀ of *Sierola kalihiensis*. O'ahu: Kalihi, 11 Mar 1917, on *Suttonia* [= *Myrsine*] *lessertiana*, P.H. Timberlake, BPBM Type 142.

Holotype ♀ of *Sierola localis*. O'ahu: Tantalus 1300' [400 m], 15 Jan 1905, W.M. Giffard, BPBM Type 42.

Distribution. Almost restricted to the southern Ko'olau range, except for one specimen from Ka'ala. Not uncommon during the early collecting period, but last taken in 1929.

Discussion. Senior synonym of *S. localis*, *S. breviceps*, *S. kalihiensis*, and *S. adumbrata*. The first three are based on specimens from the southeastern Ko'olau mountains between Kalihi and Pālolo valleys; the type of the last is the only specimen known from the Wai'anae range and has the head slightly less convex, but is otherwise identical. They were separated based on incorrect statements about the head dimensions, punctuation, and clypeus; all are identical in these characters. *Sierola obscura* is chosen to be retained because the type is in the best condition. One of the paratypes of *S. adumbrata* is actually a specimen of *S. fuliginosa*. The unusual head shape makes this species near *S. kauensis* of Hawai'i, but it differs in the shape of the clypeus, underside of the head, and various smaller features. The wide head, short eye-vertex distance, and broad fore femora are all near the extremes of the genus, and in combination are found only in *S. kauensis* Fullaway of Hawai'i and *S. thorpei* Magnacca of New Zealand and Australia. The fore femora are also rather thick, and straight or slightly convex on the anterior margin as seen in dorsal view, which is a common state in *Goniozus* and Australian *Sierola* but rare in Hawaiian species.

Sierola olena, n. sp.

Figure 32M–O, Map 24

Island. O'ahu.

Diagnosis. Superficially very similar to *S. timberlakei* and *S. vicina* due to the predominantly yellow coloration. Closer to *S. timberlakei*, with the basal wing cells densely setose, relatively long frons setae, A3 short (1.05–1.30 times as long as wide), and the metasoma mostly polished, but distinctly different in the gestalt of the head. *Sierola olena* has the head less strongly convex ventrally in lateral view, posterior corners more squared in dorsal view, and ocellar triangle strongly acute rather than weakly obtuse. Several morphometric measures differ on average, but OOL/WOT and FL/FW separate them consistently (1.20–1.45 and 1.90–2.04 respectively in *S. timberlakei*, and 1.50–1.80 and 2.04–2.30 in *S. olena*). The body coloration is similarly variable in both species but the mandible is always dark apically in *S. olena*, and all yellow in *S. timberlakei*. Specimens of *S. timberlakei* from the Wai'anae range consistently have the femora brownish, which also distinguishes them from *S. olena* which

has the legs all yellow (Ko'olau *S. timberlakei* also have the legs all yellow, but *S. olena* has not been found there).

Description. Female. *Head.* Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad to moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Predominantly yellow to testaceous, propodeum always dark and metasomal terga banded with brown apically, head and mesosoma often mottled with brown, especially laterally. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow basally, apical third brown to black. Legs all yellow.

Wings. Membrane tinged with yellow, or weakly infusate. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.99 mm; LT 0.94 mm; WH/LH 0.86 (0.85–0.88); DH/LH 0.59 (0.58–0.60); EV/HE 0.76 (0.71–0.84); EV/WF 0.71 (0.63–0.79); WF/HE 1.07 (1.05–1.14); WH/WF 1.73 (1.67–1.75); OOL/WOT 1.67 (1.50–1.78); DT/LT 0.41; FL/FW 2.21 (2.04–2.29); HFL/HFW 2.62 (2.50–2.78); A3 L/W 1.20 (1.17–1.30). $N = 11$.

Type Material. Holotype ♀. O'ahu: Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 19 Nov 2014, on *Nestegis sandwicensis*, K.N. Magnacca, BPBM 0000017930.

Paratypes: 1♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 19 Nov 2014, on *Nestegis sandwicensis*, K.N. Magnacca, BPBM. 3♀ 1♂, North Hale'au'au Gulch 2350' [720 m], 21.5066°N 158.1297°W, 24 Feb 2012, on *Antidesma platyphyllum*, K.N. Magnacca, BPBM. 1♂, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 16 May 2012, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM. 1♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 17 May 2012, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM. 1♀, Kahanahaiki 2000' [610 m], 21.5399°N 158.1939°W, 15 May 2013, under leaves, K.N. Magnacca, BPBM. 1♂, Mohiākea Gulch 2500' [760 m], 21.4877°N 158.1258°W, 20 May 2013, on *Pisonia*, K.N. Magnacca, BPBM. 1♀, Pahole Gulch, gulch 1 1800' [240 m] [550 m], 21.5421°N 158.1918°W, 12 May 2014, on *Sapindus oahuensis*, K.N. Magnacca, BPBM. 1♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 6 Jul 2014, on *Myrsine lessertiana*, K.N. Magnacca, NMNH. 1♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5396°N 158.1818°W, 6 Jul 2014, on *Sapindus oahuensis*, K.N. Magnacca, NMNH. 1♀, Pahole Gulch, gulch 2 2100' [640 m], 21.5357°N 158.1896°W, 20 Oct 2014, on *Planchonella sandwicensis*, K.N. Magnacca, NMNH. 1♂, Pahole Gulch, gulch 3 2050' [625 m], 21.5362°N 158.1862°W, 20 Oct 2014, on *Planchonella sandwicensis*, K.N. Magnacca, UHIM. 1♀, Kahanahaiki ridge 2200' [670 m], 21.5374°N 158.1924°W, 17 Jul 2015, on *Kadua affinis*, K.N. Magnacca, UHIM. 2♀ 1♂, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 29 Jul 2016, on *Kadua affinis*, K.N. Magnacca, HDOA. 1♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Apr 2017, on *Pisonia umbellifera*, K.N. Magnacca, HDOA.

Etymology. From the Hawaiian 'ōlena, yellow, referring to the color. It is a noun in apposition.

Distribution. Known only from the Wai'anae range, with most specimens from Pahole and Kapuna in the northwest.

Discussion. This species was initially thought to be a variant of *S. timberlakei*, but it exhibits a number of consistent differences in morphometrics, coloration, and head shape with no intergradation. It may be more closely related to *S. mandibulata*, which also has predominantly yellow color.

Sierola olympiana Fullaway, 1920

Figure 33A–C, Map 26

Sierola olympiana Fullaway, 1920: 112.

Sierola brevicauda Fullaway, 1920: 111, **n. syn.**

Sierola pilifera Fullaway, 1920: 123, **n. syn.**

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Forms a closely related complex with *S. heterochroma* and *S. hirsuta* based on the hyaline wings, moderately wide head (WH/LH 0.77–0.84, rarely to 0.86), elongate third antennal segment (usually about 1.2–1.5 times as long as wide), and narrow femora (FL/FW 1.90–2.20, HFL/HFW 2.50–3.00) that are usually solid colored. Separated from those species by having the mandible, coxae, and femora entirely dark brown to black, and the metasoma usually smoothly microreticulate all over the terga.

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly less than 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular, or coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right to weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

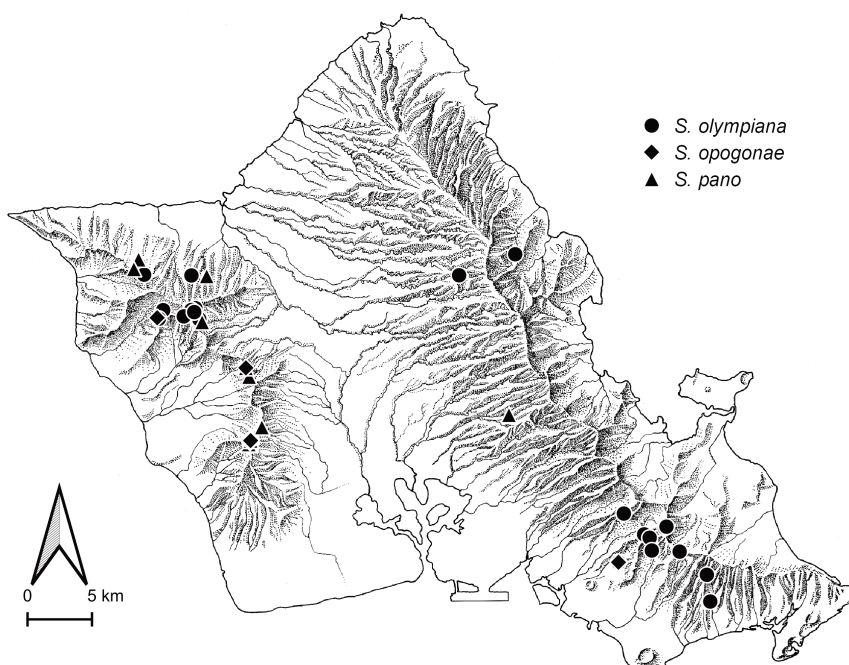
Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely rugulose; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga, or shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.83 mm; LT 0.92 mm; WH/LH 0.82 (0.80–0.86); DH/LH 0.56 (0.54–0.59); EV/HE 0.68; EV/WF 0.64; WF/HE 1.07; WH/WF 1.68; OOL/WOT 1.28 (1.13–1.42); DT/LT 0.36; FL/FW 2.00 (1.85–2.21); HFL/HFW 2.69 (2.55–3.01); A3 L/W 1.33 (1.08–1.74). N = 42.



Map 26. Collection localities of *Sierola olympiana*, *S. opogonae*, and *S. pano*.

Type Material. Holotype ♀ of *Sierola olympiana*. O'ahu: Mt. Olympus, 18 Jun 1916, P.H. Timberlake, BPBM Type 80.

Holotype ♀ of *Sierola brevicauda*. O'ahu: Nu'uuanu Valley, 4 Mar 1912, D.T. Fullaway, BPBM Type 78.

Holotype ♀ of *Sierola pilifera*. O'ahu: Mākaha, 5 Nov 1905, W.M. Giffard, BPBM Type 102.

Distribution. Primarily found in wet forest, rarely in mesic areas. Taken widely in both the Ko'olau and Wai'anae ranges.

Discussion. Two of Fullaway's names are included here as junior synonyms, *S. brevicauda* and *S. pilifera*. Both fall well within the morphometric range exhibited by *S. olympiana* and have identical coloration. As in *S. hirsuta* and other members of this species group, the sculpture of the frons varies from moderately coriaceous to dull granular, but this does not appear to correlate with any other feature. See comments under *S. heterochroma*.

Sierola opogonae Fullaway, 1920

Figure 33D–F, Map 26

Sierola opogonae Fullaway, 1920: 122.

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Separated from most similar species by the combination of a relatively broad, deep head (WH/LH 0.84–0.88, DH/LH 0.56–0.61), dark brown to black, broad fore femora (FL/FW 1.79–2.00), and lateral ocelli nearly touching the vertex. The most similar species is *S. vestita*, which has the head narrower and more compressed (WH/LH 0.80–0.84, DH/LH 0.54–0.56), and the clypeus triangular in dorsal view. The wide head causes it to key close to *S. alala*, which has the head more compressed (DH/LH 0.54–0.56) and appearing conspicuously broad in dorsal view due



Figure 33. A–C: *Sierola olympiana*. D–F: *Sierola opogonae*. G–I: *Sierola pakela*. J–L: *Sierola pano*. M–O: *Sierola peleana*.

to the narrow eyes, and the clypeus also usually more elongate and beak-like in lateral view.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about twice as long as flagellar width or more. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head

rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head strongly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.53 mm; LT 0.87 mm; WH/LH 0.87 (0.84–0.88); DH/LH 0.59 (0.56–0.61); EV/HE 0.59; EV/WF 0.59; WF/HE 1.00 (0.95–1.11); WH/WF 1.79 (1.64–1.79); OOL/WOT 1.23 (1.00–1.34); DT/LT 0.39; FL/FW 1.79 (1.79–2.00); HFL/HFW 2.08 (1.92–2.36); A3 L/W 1.00 (0.92–1.11). N = 8.

Type Material. Holotype ♀. O'ahu: Tantalus, 26 May 1918, reared from larva of *Opogona* on *Clermontia*; formed cocoons on May 27, emerged June 5, J.C. Bridwell, BPBM Type 100.

Distribution. Rare, known only from the type series taken in the southeastern Ko'olau range and a handful of specimens collected throughout the Wai'anae range.

Ecology. Reared from caterpillars feeding on decaying wood of *Clermontia kakeana*. The host is recorded as an introduced species, *Opogona aurisquamosa* (Butler) (Tineidae), but the true host may have been one of the endemic caterpillars that were reared from the same material, *Thyrocopa* (Xylorictidae) or *Hyposmocoma* (*Euperissus*) (Cosmopterigidae; Bridwell, 1919).

Discussion. This species is not well separated from *S. vestita* aside from the head width and depth. The majority of specimens fall into the extremes of the distribution, but a small number of intermediates on the margins of the expected variation could potentially be placed with either species. More investigation of this complex is needed.

Sierola pakela, n. sp.

Figure 33G–I, Map 27

Island. O'ahu.

Diagnosis. Part of a complex related to *S. peleana*, with a strongly convex and weakly carinate clypeus, mandible distinctly concave ventrally, sparsely punctate frons, and sparsely setose to glabrous basal wing cells. Separated from related species by the reddish brown mandible with distinct microsculpture outwardly, weakly expanded fore femora, and mostly polished metasoma.

Description. Female. Head. Clypeal process triangular or rounded triangular, apex pointed; dorsally weakly carinate, or rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae.

Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna yellow, apical segments tinged with brown. Mandible reddish brown. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.70 mm; LT 0.79 mm; WH/LH 0.89; DH/LH 0.58; EV/HE 0.70; EV/WF 0.68; WF/HE 1.03; WH/WF 1.84; OOL/WOT 1.17; DT/LT 0.37; FL/FW 2.10; HFL/HFW 2.16; A3 L/W 0.85.

Type Material. Holotype ♀. O'ahu: North Kalua'ā Gulch 2200' [670 m], 21.4647°N 158.1010°W, 27 Jul 2016, on *Psychotria mariniana*, K.N. Magnacca, BPBM 0000017931.

Paratypes: 1 ♀, Kūmaipō Gulch 2400' [730 m], 21.4983°N 158.1528°W, 16 Jun 2016, on *Cordyline fruticosa*, K.N. Magnacca, BPBM. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 30 Jun 2016, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on *Perrottetia sandwicensis*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 22 Jun 2017, on *Psychotria mariniana*, K.N. Magnacca, NMNH.

Etymology. From the Hawaiian *pākela*, excessive, referring to the extraordinary number of species found at Palikea where the unique holotype was found. It is a genderless adjective in the nominative singular.

Distribution. Known from about half a dozen specimens, all taken in the southern Wai'anae range, except one from Wai'anae Valley.

Sierola pano, n. sp.

Figure 33J–L, Map 26

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Similar to *S. olympiana*, *S. vestita*, and related species based on the black mandible and moderately wide head (WH/LH 0.79–0.82), but immediately separated from all other species in the complex by the infusate wings. The third antennal segment is elongate as in *S. olympiana* (about 1.2–1.7 times as long as wide), but the femora are bicolored and expanded (FL/FW 1.72–2.10, HFL/HFW usually 2.40–2.55) as in *S. vestita*.

Description. Female. Head. Clypeal process rounded triangular, apex pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Gena below eye flat. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum almost evenly sloping, weakly curved. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane infusate. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.05 mm; LT 0.92 mm; WH/LH 0.81 (0.79–0.82); DH/LH 0.56 (0.54–0.57); EV/HE 0.81; EV/WF 0.74; WF/HE 1.08; WH/WF 1.71; OOL/WOT 1.24 (1.23–1.44); DT/LT 0.41; FL/FW 1.81 (1.72–2.10); HFL/HFW 2.44 (2.1–2.67); A3 L/W 1.67 (1.2–1.67). N = 13.

Type Material. Holotype ♀. O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 May 2014, sweeping low veg, K.N. Magnacca, BPBM 0000017932.

Paratypes: 1 ♀, Hale'au'au, 13 Mar 1932, *Eleocarpus* [sic: *Elaeocarpus*], O.H. Swezey, BPBM. 1 ♀, Kamokuiki Val, 8 Apr 1934, O.H. Swezey, BPBM. 1 ♀, Peacock Flats 1800' [240 m] [550 m], 18 Aug 1988, J. Strazanac & C.J. Fritzler, BPBM. 1 ♀, Waimano Trail 1100' [335 m], 21.4324°N 157.9061°W, 4 Sep 2012, sweeping *Freyinetia arborea*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 May 2014, on *Perrottetia sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 21 May 2014, on *Psychotria mariniana*, K.N. Magnacca, BPBM. 1 ♂, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 21 May 2014, on *Planchonella sandwicensis*, K.N. Magnacca, BPBM. 1 ♀, North Puali'i Gulch 2100' [640 m], 21.4249°N 158.0910°W, 2 Jul 2014, K.N. Magnacca, UHIM. 1 ♀, Pahole Gulch, gulch 3 2050' [625 m], 21.5362°N 158.1862°W, 20 Oct 2014, on *Urera glabra*, K.N. Magnacca, UHIM. 1 ♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 28 Jan 2015, on *Labordia kaalae*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Dec 2015, on *Perrottetia sandwicensis*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Jun 2016, on *Psychotria*, K.N. Magnacca, NMNH. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Apr 2017, on *Pisonia umbellifera*, K.N. Magnacca, NMNH.

Etymology. From the Hawaiian *pano*, dark like clouds, referring to the infusate wings. Figuratively it also means mysterious or unknown, which is also applicable as it was long confused with *S. olympiana*.

Distribution. Found in the Wai'anae range, primarily in mesic forest south of Ka'ala. Rare in older collections but common recently.

Sierola peleana Fullaway, 1920

Figure 33M–O, Map 27

Sierola peleana Fullaway, 1920: 86.

Island. O'ahu.

Diagnosis. A very distinctive species once recognized, with a prominent clypeus, strongly convex or weakly carinate dorsally, moderately broad, distinctly toothed mandible that is strongly concave ventrally and expanded apically, and sparsely setose basal wing cells. Forms a species complex with *S. hiiaka*, *S. pakela*, and *S. puiwa*, and distinguished from them by the polished, strongly shining mandible, very broad apically; sparsely setose basal wing cells; and distinctly microreticulate metasoma.

Description. Female. Head. Clypeal process rounded triangular or semicircular, apex pointed; dorsally weakly carinate, or rounded, convex, lacking a carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrowed medially and strongly expanded at apex, hourglass-shaped, ventral margin strongly concave; not twisted, outwardly polished, smooth, shining; in ventral view strongly elbowed. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons.

Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.91 mm; LT 0.99 mm; WH/LH 0.87; DH/LH 0.60; EV/HE 0.84; EV/WF 0.67; WF/HE 1.26; WH/WF 1.67; OOL/WOT 1.31; DT/LT 0.35; FL/FW 2.00; HFL/HFW 2.82; A3 L/W 1.43.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 2000' [610 m], 4 Mar 1917, on *Pelea clusiaefolia* [= *Melicope clusiifolia*], P.H. Timberlake, BPBM Type 29.

Distribution. Widespread and relatively common in the Wai'anae range, mostly in wet to wet-mesic forest, but apparently absent from the Ko'olau range.

Ecology. Taken on a wide variety of plants.

Discussion. One of Fullaway's paratypes belongs to the new species *S. curvata*; there is supposed to be another from the same collection but it cannot be located to verify its identity.

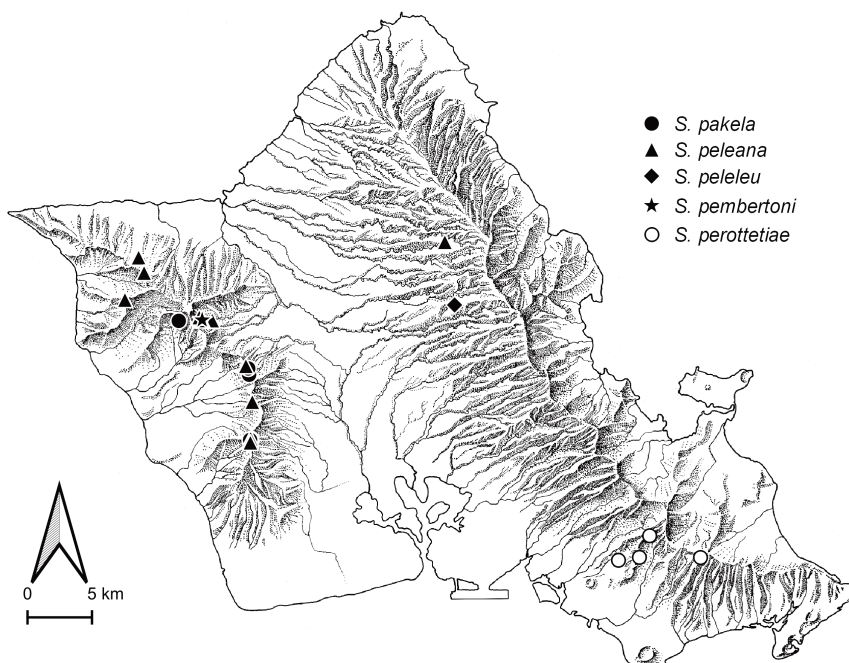
Sierola peleleu, n. sp.

Figure 34A–C, Map 27

Island. O'ahu.

Diagnosis. Distinguished from all other species on O'ahu by the combination of the head wider than long, basal wing cells densely setose, and clypeus with a sharp carina. The mandible is also pale yellow-white, an unusual character. The only similar species is *S. obscura*, which has the basal wing cells glabrous, the mandible broader and black, the clypeus weakly carinate, and the femora even more strongly expanded. Closely resembling *S. illingworthi* and *S. kauensis* of Hawai'i, separated by the mandible color, wider head (WH/LH 1.06 vs. 0.98), and less prominent genal angle.

Description. Female. Head. Clypeal process semicircular, apex weakly pointed; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head narrowed behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression shallow, rounded. Antenna extending to pronotum.



Map 27. Collection localities of *Sierola pakela*, *S. peleana*, *S. peleleu*, *S. pembertoni*, and *S. perottetiae*.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, with both anterior and posterior surfaces convex, not strongly compressed, more or less straight in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible very pale yellow-white. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.17 mm; LT 1.02 mm; WH/LH 1.06; DH/LH 0.66; EV/HE 0.55; EV/WF 0.46; WF/HE 1.19; WH/WF 1.74; OOL/WOT 0.93; DT/LT 0.46; FL/FW 1.87; HFL/HFW 2.14; A3 L/W 1.30.

Type Material. Holotype ♀. O'ahu: Schofield-Waikāne Tr. 1600' [490 m], 21.5082°N 157.9462°W, 5 Apr 2012, on *Acacia koa*, K.N. Magnacca, BPBMENT 0000017933.

Etymology. From the Hawaiian *peleleu*, broad or spread out, referring to the very wide head. It is a genderless adjective in the nominative singular.

Distribution. Known only from the holotype, collected in the central Ko'olau range.

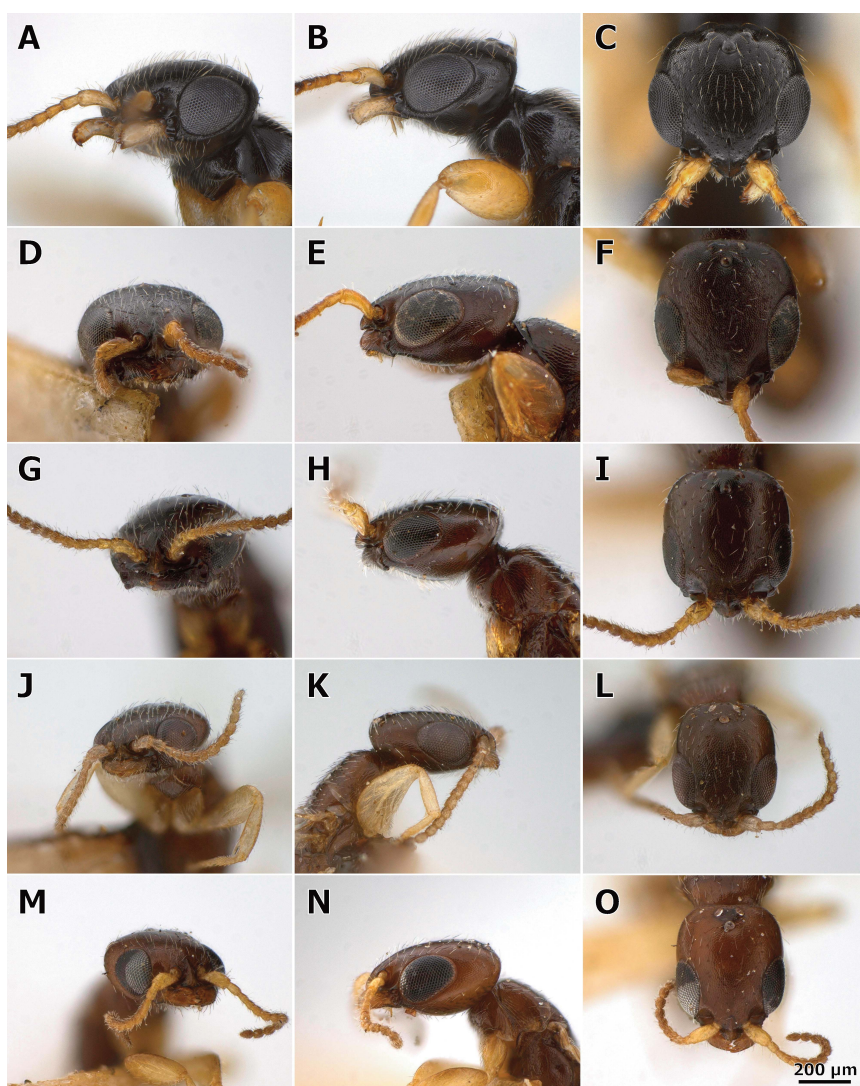


Figure 34. A–C: *Sierola peleleu*. D–F: *Sierola pembertoni*. G–I: *Sierola perottetiae*. J–L: *Sierola philodoriae*. M–O: *Sierola picea*.

Sierola pembertoni Fullaway, 1920

Figure 34D–F, Map 27

Sierola pembertoni Fullaway, 1920: 140.

Island. O‘ahu.

Diagnosis. A somewhat nondescript species, but the combination of the clypeus prominent with a sharp carina which is evenly curved in profile, broad to moderately broad mandible, a broad but not deep head (WH/LH 0.90, DH/LH 0.55), and somewhat dull coriaceous microsculpture on the frons separates it from all others.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute.

Mandible broad to moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black to reddish brown. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.96 mm; LT 0.99 mm; WH/LH 0.90; DH/LH 0.55; EV/HE 0.69; EV/WF 0.68; WF/HE 1.02; WH/WF 1.84; OOL/WOT 1.48; DT/LT 0.40; FL/FW 2.13; HFL/HFW 2.52; A3 L/W 1.14.

Type Material. Holotype ♀. O'ahu: Tantalus 1300' [400 m], 12 Feb 1905, W.M. Giffard, BPBM Type 135.

Distribution. Known from only three specimens, one from the Ko'olau and two from the Wai'anae range. Last collected in 1933.

Discussion. The wing setation is uncertain, as the type appears to be missing many setae. One specimen has the mandible brown, but is otherwise nearly identical.

Sierola perottetiae Fullaway, 1920

Figure 34G–I, Map 27

Sierola perottetiae Fullaway, 1920: 151.

Island. O'ahu.

Diagnosis. This species is somewhat difficult to characterize, but the combination of mandible broad to moderately broad, front and hind femora strongly broadened (FL/FW 1.8–1.9, HFL/HFW 1.80–2.00), frons shining and smoothly microreticulate, and lack of ventral setation on the head separates it from all others. It resembles *S. bridwelli* but the femora are distinctly different, and also keys close to *S. cryptophlebiae* but the mandible is not strongly concave ventrally.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible broad to moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of

frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.98 mm; LT 0.95 mm; WH/LH 0.87; DH/LH 0.57; EV/HE 0.85; EV/WF 0.68; WF/HE 1.25; WH/WF 1.64; OOL/WOT 1.57; DT/LT 0.34; FL/FW 1.88; HFL/HFW 1.85; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Mānoa Cliff Trail, Jul 1918, reared from decaying wood of *Perrottetia* [sic] *sandwicensis*, J.C. Bridwell, BPBM Type 158.

Distribution. Rare, known only from six specimens collected in the southeastern Ko'olau range. Last taken in 1959.

Discussion. Very few specimens are known, which is particularly striking compared to the relative abundance of the similar *S. bridwelli*. One of the paratypes is listed by Fullaway as being from the same collection as the holotype and other paratype, but is from September rather than July and labelled simply as "ex rotten wood" with no species specified; it is actually *S. bridwelli*. This species is named for the plant on which the type series was collected, *Perrottetia sandwicensis*. The genus name was misspelled by Fullaway both in naming the wasp and referring to the plant.

Sierola philodoriae Fullaway, 1920

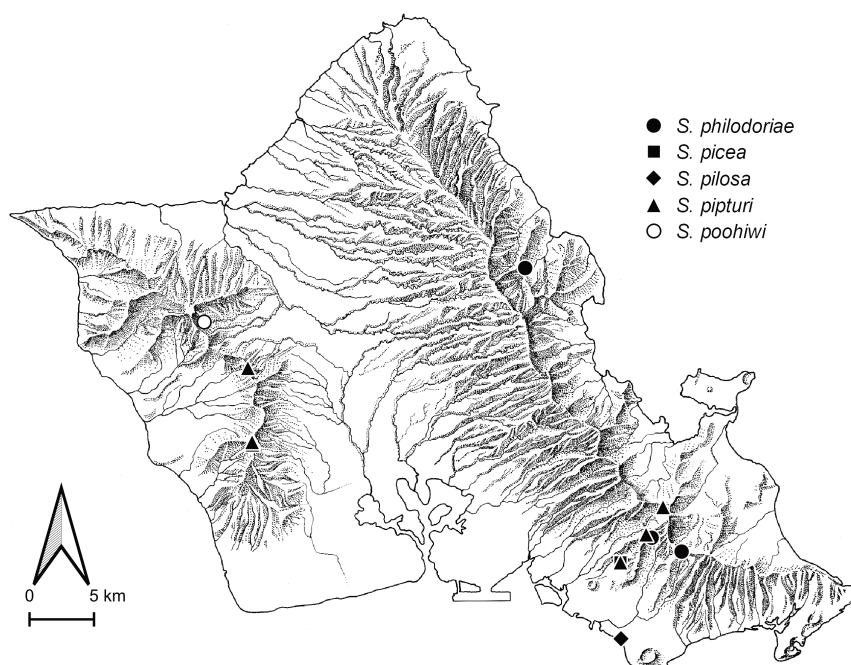
Figure 34J–L, Map 28

Sierola philodoriae Fullaway, 1920: 146.

Island. O'ahu.

Diagnosis. Part of a small cluster of small, flattened species with the head flat above and below, less than half as deep as long, and the mesosoma also compressed. Separated from related species by having the basal wing cells densely setose, clypeus steep and short in lateral view, mandible reddish brown to yellow, and the head relatively short behind the eyes (EV/HE less than 1.0).

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile steep and short, evenly curved. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or



Map 28. Collection localities of *Sierola philodoriae*, *S. picea*, *S. pilosa*, *S. pipturi*, and *S. poohiwi*.

less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest just posterior of eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. Strongly dorsoventrally compressed. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible reddish brown to yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.66 mm; LT 0.80 mm; WH/LH 0.83; DH/LH 0.49; EV/HE 0.86; EV/WF 0.94; WF/HE 0.92; WH/WF 1.94; OOL/WOT 1.36; DT/LT 0.32; FL/FW 2.16; HFL/HFW 2.56; A3 L/W 1.40.

Type Material. Holotype ♀. O'ahu: Mt. Olympus, 30 Jan 1913, reared from larva of *Philodoria splendida*, O.H. Swezey, BPBM Type 147.

Distribution. Known from five specimens from both the northern and southern Ko'olau range. Last taken in 1928.

Ecology. Reared from leaf mines of *Philodoria splendida* in *Metrosideros polymorpha* ('ōhi'a lehua).

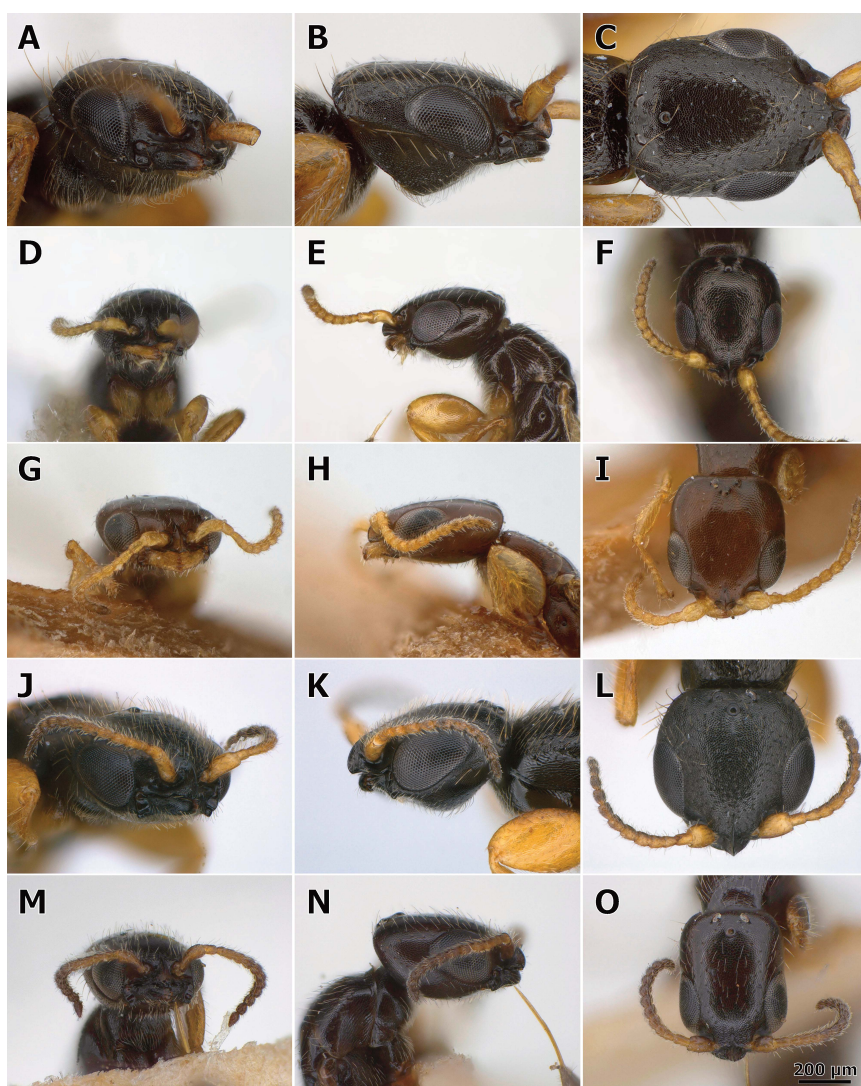


Figure 35. A–C: *Sierola pilosa* (O‘ahu specimen). D–F: *Sierola pipturi*. G–I: *Sierola planiceps*. J–L: *Sierola poepoe*. M–O: *Sierola poohiwi*.

Discussion. The holotype label says “type marked with red” as if another was present on the same pin, but only one is there now. The third specimen described by Fullaway as being from this collection is at the HDOA collection.

***Sierola picea* Fullaway, 1920**

Figure 34M–O, Map 28

Sierola picea Fullaway, 1920: 104.

Island. O‘ahu.

Diagnosis. Easily recognized among species with a carinate clypeus and mostly sparsely setose basal wing cells by the smooth, sparsely punctate frons and especially the unusual mandible, with the ventral tooth subapical and concealed behind the second in frontal view.

Similar to *S. kawala*, from which it is distinguished by the shorter ventral tooth, narrower head, and dense patch of setae in cell R.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, more or less parallel-sided or slightly narrowed medially and expanded at apex, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with second ventral tooth largest, ventral tooth partially concealed behind in frontal view. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view very slightly concave; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing mostly glabrous, cell R densely setose apically.

Measurements. LFW 1.68 mm; LT 0.80 mm; WH/LH 0.78; DH/LH 0.52; EV/HE 0.82; EV/WF 0.82; WF/HE 1.00; WH/WF 1.77; OOL/WOT 1.50; DT/LT 0.37; FL/FW 2.13; HFL/HFW 2.37; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Tantalus 1300' [400 m], 15 Jan 1905, W.M. Giffard, BPBM Type 64.

Distribution. Known only from the holotype, collected at Tantalus in 1905.

Discussion. The mandible structure is very unusual: it is primarily twisted with the dorsal teeth all on the dorsal surface, but the short ventral tooth is subapical, and located on the ventral side. Only *S. koloa*, *S. nihopeku*, and the related *S. kawala* are similar. The basal wing cell setation pattern, mostly glabrous with a patch of dense setae apically in cell R, is also only found in a handful of unrelated species.

Sierola pilosa Fullaway, 1920

Figure 35A–C, Map 28

Sierola pilosa Fullaway, 1920: 89.

Island. Moloka'i, O'ahu.

Diagnosis. A distinctive species, resembling the *olympiana* complex in having a highly arched, very thin clypeal carina and strong, elongate setae along the vertex, but with the head strongly expanded ventrally. The only similar species is *S. laticeps* of Hawai'i, which has the head much broader (WH/LH 0.89 vs. 0.76–0.78).

Description. Female. Head. Clypeal process triangular, apex pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less

parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about twice as long as flagellar width or more. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin carinate. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles concave in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena below eye concave. Postgenal depression narrow but distinct, V-shaped. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga, apical tergites punctate laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black, reddish at apex before teeth. Fore coxa and basoventral 2/3 of fore femur dark brown, legs otherwise yellow-brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.44 mm; LT 1.35 mm; WH/LH 0.78; DH/LH 0.58; EV/HE 0.78; EV/WF 0.67; WF/HE 1.18; WH/WF 1.55; OOL/WOT 1.57; DT/LT 0.38; FL/FW 1.78; HFL/HFW 2.29; A3 L/W 1.42.

Type Material. Holotype ♀. Moloka'i: Kualapu'u, 15 Jul 1910, D.T. Fullaway, BPBM Type 34.

Distribution. Described from five specimens from Moloka'i; on O'ahu, known only from two specimens taken at Waikiki.

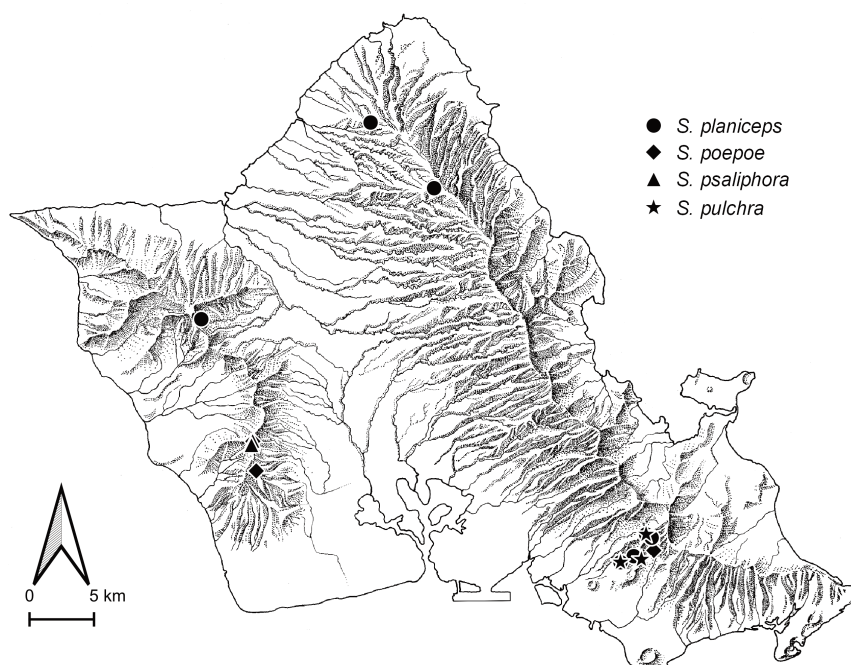
Discussion. The discovery of this species on O'ahu is puzzling. The two O'ahu specimens appear to be conspecific with the Moloka'i type; the only notable difference is the DH/LH ratios, which are 0.55 and 0.58 in the O'ahu specimens compared to 0.61 in the type. This is slightly beyond the range of ± 0.02 observed in other species, but the unusually protuberant gena may result in greater variation. The labels read "Waikiki, stinging tourist", suggesting it may have been transported interisland; possibly they emerged from plant material that was carried between islands. It has never been found elsewhere on O'ahu, despite extensive surveys in native habitats, nor have similar species been found in other regions of the world. Specimens collected abundantly in the Mauna Loa–Mauna Kea saddle region of Hawai'i appear to match *S. pilosa* rather than the similar *S. laticeps* described from Kilauea, but have not been compared in detail. It has not been collected on Moloka'i since the type series, but nearly all Moloka'i *Sierola* at BPBM come from a single collecting trip in 1966. It does appear to occur on Maui, where it has been found in both native forest and agricultural areas, but the latter are more variable and some appear to match *S. laticeps*.

Sierola pipturi, n. sp.

Figure 35D–F, Map 28

Island. O'ahu.

Diagnosis. Distinguished from most other species with a sharp clypeal carina, sparsely setose to glabrous basal wing cells, and rounded gena by the shining frons with smooth microsculpture and typical punctation 1–2 pit widths apart. Separated from the closely related *S. minuscula* by the broad hind femur (HFL/HFW 1.90–2.10 vs. ~2.75) longer head



Map 29. Collection localities of *Sierola planiceps*, *S. poepoe*, *S. psaliphora*, and *S. pulchra*.

(OOL/WOT 1.55–1.75 vs. 1.10–1.40), lateral ocelli distinctly separate from the vertex, and mandible strongly concave ventrally. Also similar to *S. capuana*, from which it is separated by the sparser punctation and smoother microsculpture of the frons, and the higher OOL/WOT.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly polished, smooth, shining; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna yellow, apical segments tinged with brown. Mandible yellow. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.54 mm; LT 0.72 mm; WH/LH 0.85; DH/LH 0.57; EV/HE 0.79; EV/WF 0.68; WF/HE 1.17; WH/WF 1.71; OOL/WOT 1.69; DT/LT 0.43; FL/FW 1.91; HFL/HFW 1.90; A3 L/W 1.00.

Type Material. Holotype ♀, O'ahu: Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 15 Jul 2014, on *Pipturus albidus*, K.N. Magnacca, BPBM 0000017934.

Paratypes: 2♀, Nu'uauu Pali, Dec [no year], on *Pipturus*, R.C.L. Perkins, BPBM. 3♀, Tantalus, Sep 1906, R.C.L. Perkins, BPBM. 1♀, Cooke Trail, 7 Jan 1917, P.H. Timberlake, HDOA. 1♀, Wai'anae ab. 16–1900' [580 m] [490–580 m], 1 Jan 1919, P.H. Timberlake, HDOA. 1♀, Mt. Tantalus, 23 Jan 1966, D.M. Tsuda, BPBM. 1♀, Palikea 2950' [900 m], 21.4150°N 158.0993°W, 25 Mar 2015, on *Perrottetia sandwicensis*, K.N. Magnacca, BPBM. 1♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Apr 2015, on *Pipturus albidus*, K.N. Magnacca, UHIM. 1♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 20 Apr 2015, on *Pisonia umbellifera*, K.N. Magnacca, NMNH.

Etymology. Named for the apparent association with the native tree *Pipturus albidus* (mamaki, Urticaceae), which rarely hosts *Sierola* but on which five of the 13 specimens were collected.

Distribution. Known from about a dozen specimens from both ranges, five of them recently collected at Pu'u Hāpapa and Palikea.

Ecology. Appears to be associated with *Pipturus albidus*, but only rarely found in areas where the leaf miners *Philodoria pipturiella* and *P. pipturicola* (Gracillariidae) are abundant.

Discussion. Very similar to *S. minuscula*, but the differences listed above are consistent enough to describe it as distinct.

Sierola planiceps Fullaway, 1920

Figure 35G–I, Map 29

Sierola planiceps Fullaway, 1920: 146.

Sierola flavipennis Fullaway, 1920: 99, n. syn.

Island. O'ahu.

Diagnosis. Part of a small cluster of small, flattened species with the head flat above and below, less than half as deep as long, and the mesosoma also compressed. Separated from most related species by having the basal wing cells nearly glabrous and the mandible yellow. Distinguished from the sibling species *S. kolea* by having the clypeus short and steeply curving in lateral view and the ocellar triangle narrow, OOL/WOT 1.80–2.00.

Description. Female. *Head.* Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or steep and short, evenly curved. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely yellow except the two terminal segments brown. Mandible yellow. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae. Areolet distinctly convex posteriorly, corner medioapical.

Measurements. LFW 1.74 mm; LT 0.86 mm; WH/LH 0.86 (0.85–0.92); DH/LH 0.47 (0.47–0.52); EV/HE 0.88 (0.81–0.88); EV/WF 0.80 (0.75–0.81); WF/HE 1.09 (1.07–1.14); WH/WF 1.80 (1.76–1.81); OOL/WOT 1.82 (1.82–2.00); DT/LT 0.34; FL/FW 1.92 (1.81–2.10); HFL/HFW 2.53 (2.15–2.53); A3 L/W 1.40. N = 5.

Type Material. Holotype ♀ of *Sierola planiceps*. O'ahu: Nu'uanu Valley, 4 Mar 1912, D.T. Fullaway, BPBM Type 148.

Holotype ♀ of *Sierola flavipennis*. O'ahu: Kaumuohona, 23 Apr 1916, P.H. Timberlake, BPBM Type 54.

Distribution. Found throughout the Ko'olau range, probably mostly in wet forest based on its apparent host. Last collected in 1937.

Ecology. Reared from leaf mines of *Philodoria dubautiella* in *Dubautia laxa* and *D. plantaginea* (na'ena'e; Asteraceae).

Discussion. *Sierola flavipennis* was separated by Fullaway based on the size of the clypeus, but it is fully identical. This species appears to be a specialist on *Philodoria* leaf miners in *Dubautia*, while those in *Myrsine* are attacked by the closely related *S. kolea*.

Sierola poepoe, n. sp.

Figure 35J–L, Map 29

Island. O'ahu.

Diagnosis. Among species with a highly arched and thin clypeal carina, densely punctate frons, and strong and elongate vertex and genal setae, this species is united with *S. flavipes* and *S. citripoda* by the broad head and all-yellow legs. It can be separated from the latter by having a black mandible and greater OOL/WOT (1.25–1.40 vs. 1.05–1.25), and from the former by the broader, deeper head and more expanded fore femora (WH/LH 0.95–0.97, DH/LH 0.61–0.64, and FW/FL 1.72–1.81 vs. 0.86–0.93, 0.58–0.60, and 1.79–1.95 respectively).

Description. Female. Head. Clypeal process rounded triangular, apex pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle broadly rounded, or absent, head strongly convex ventrally. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum almost evenly sloping, weakly curved. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.44 mm; LT 1.05 mm; WH/LH 0.95 (0.95–0.97); DH/LH 0.64 (0.61–0.64); EV/HE 0.58; EV/WF 0.51; WF/HE 1.14; WH/WF 1.68; OOL/WOT 1.28 (1.26–1.32); DT/LT 0.44; FL/FW 1.78 (1.72–1.81); HFL/HFW 2.06 (2.06–2.12); A3 L/W 1.17. N = 3.

Type Material. Holotype ♀. O'ahu: Palikea 2950' [900 m], 21.4150°N 158.0993°W, 24 Apr 2014, on *Antidesma platyphyllum*, K.N. Magnacca, BPBM ENT 0000017935.

Paratypes: 1♀, Pālehua, Wai'anāe, 7 May 1922, *Metrosideros*, O.H. Swezey, BPBM. 1♀, Mānoa, 24 Sep 1933, *Acacia koa*, N.L.H. Krauss, BPBM. 1♀, Palikea 2950' [900 m], 21.4150°N 158.0993°W, 24 Apr 2014, on *Antidesma platyphyllum*, K.N. Magnacca, NMNH.

Etymology. From the Hawaiian *poepoe*, round or circular, referring to the nearly circular head. It is a genderless adjective in the nominative singular.

Distribution. Known from four specimens, three from Palikea in the southern Wai'anāe range and one from Mānoa in the southeastern Ko'olau range.

Sierola poohiwi, n. sp.

Figure 35M–O, Map 28

Island. O'ahu.

Diagnosis. The parallel-sided, very narrow but not strongly flattened head (WH/LH 0.70, DH/LH 0.54) will alone separate this species from nearly all others, including *S. gracillima* which is closest in general aspect. *Sierola canuta* also has the head narrow, but the mandibles are broad.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown except ventral side of basal segments yellowish. Mandible black. Coxae and femora dark brown to black, tibiae dark brown, trochanters, tarsi, and bands at bases and apices of tibiae orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.



Figure 36. A–C: *Sierola psaliphora*. D–F: *Sierola puiwa*. G–I: *Sierola pulchra*. J–L: *Sierola punctata*. M–O: *Sierola pygmaea*.

Measurements. LFW 1.90 mm; LT 0.90 mm; WH/LH 0.70; DH/LH 0.54; EV/HE 0.89; EV/WF 0.94; WF/HE 0.94; WH/WF 1.71; OOL/WOT 1.48; DT/LT 0.36; FL/FW 2.25; HFL/HFW 2.32; A3 L/W 0.90.

Type Material. Holotype ♀. O'ahu: Hale'au'au, 13 Mar 1932, *Sideroxylon* [= *Planchonella*], O.H. Swezey, BPBMNT 0000017936.

Etymology. From the Hawaiian *po'ohiwi*, thin head, referring to the very narrow head, made more striking by the parallel-sided shape. It is a noun in apposition. The single word *po'ohiwi* also means shoulder, applicable to the squared corners and parallel sides of the head.

Distribution. Known only from the type, collected in 1932 at Hale'au'au (Schofield Barracks) in the Wai'anāe range.

Sierola psaliphora, n. sp.

Figure 36A–C, Map 29

Island. O'ahu.

Diagnosis. Among species with a flat, spatulate clypeus, the bizarre flattened, scissors-like mandible immediately separate this species from any others. Nearly identical to *S. nigrescens* of Hawai'i, differing only in the narrower head (WH/LH ~0.72 vs. ~0.78) and having the frons sculpture smooth to fine rather than coriaceous to granular.

Description. Female. *Head.* Clypeal process spatulate, expanded beyond anterior margin of head, apex truncate; dorsally flat, with a trace of a low carina basally; in profile slightly sloping at base, apical portion horizontal. Mandible very thin, laminate, scissors-like; distinctly bent down near base, crossing when closed, outwardly polished, smooth, shining; in ventral view abruptly bent near base, distally straight. Apex of mandible vertical, truncate, lacking teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum strongly angulate, pronotal disc distinctly flattened. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Coxae and femora dark brown to black, front tibia and tarsi yellow, mid and hind tibiae brown with yellow bands at bases and apices.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.46 mm; LT 0.64 mm; WH/LH 0.72; DH/LH 0.46; EV/HE 0.72; EV/WF 0.78; WF/HE 0.93; WH/WF 1.85; OOL/WOT 1.38; DT/LT 0.37; FL/FW 2.22; HFL/HFW 2.44; A3 L/W 1.25.

Type Material. Holotype ♀. O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Oct 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM 0000017937.

Paratypes: 1 ♀, Palikea 2950' [900 m], 21.4150°N 158.0993°W, 24 Apr 2014, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 1 ♀, Wailupe middle ridge 2250' [685 m], 21.3241°N 157.7484°W, 27 Oct 2019, on *Metrosideros polymorpha*, K.N. Magnacca, BPBM.

Etymology. From the Greek *psalis*, scissors, + *-phor*, bearing, referring to the peculiar shear-like mandible. It is an adjective in the nominative singular.

Distribution. Known from six specimens, one from the southeast Ko'olau range and the rest taken at Palikea in the Wai'anae range.

Discussion. Similar undescribed species have been collected on Kaua'i and Maui. The function of the strange mandible is unknown, but presumably is related to entering the host refuge.

Sierola puiwa, n. sp.
Figure 36D–F, Map 30

Island. O‘ahu.

Diagnosis. Part of a complex related to *S. peleana*, with a strongly convex and weakly carinate clypeus, mandible distinctly concave ventrally, sparsely punctate frons, and sparsely setose to glabrous basal wing cells. Separated from related species by the yellow mandible with distinct microsculpture outwardly, shorter clypeus, strongly expanded fore femora, and metasoma with distinct microreticulation.

Description. Female. Head. Clypeal process short, triangular, apex weakly pointed; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Coxae brown above and yellow below, basodorsal 2/3 of fore femur and all of mid and hind femora dark brown, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.77 mm; LT 0.85 mm; WH/LH 0.94; DH/LH 0.57; EV/HE 0.74; EV/WF 0.62; WF/HE 1.20; WH/WF 1.69; OOL/WOT 1.31; DT/LT 0.40; FL/FW 1.77; HFL/HFW 2.42; A3 L/W 1.00.

Type Material. Holotype ♀. O‘ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM 0000017938.

Paratypes: 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 29 Aug 2016, on *Coprosma longifolia*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4128°N 158.0997°W, 13 Sep 2017, on *Coprosma longifolia*, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *pū‘iwa*, surprising, referring to the late discovery of this species among a series identified as *S. peleana*. It is a genderless adjective in the nominative singular.

Distribution. Known only from five specimens, all taken at Palikea in the southern Wai‘anae range.

Ecology. Four of the five specimens were collected on *Coprosma* spp. (pilo, Rubiaceae).

Sierola pulchra Fullaway, 1920

Figure 36G–I, Map 29

Sierola pulchra Fullaway, 1920: 97.**Island.** O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, short and steep in lateral view, and basal wing cells nearly glabrous, forming a complex of related species with *S. kilohana*, *S. mahoe*, and *S. makaha*. The former two are united by having the clypeus truncate apically and the wing cells sparsely setose. Separated from the very similar *S. makaha* by the smooth sculpture of the head and metasoma, sparse frons punctation, and more extensive pale coloration on the mesosoma. All three are darker than *S. pulchra*, which has the mesosoma and sometimes the metasoma almost entirely yellow; the others have only the prothorax or pronotum orange.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally weakly carinate; in profile steep and short, evenly curved. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Head black except clypeus yellow, body all yellow except metanotum, propodeum, and base of metasoma. Antenna entirely yellow except the two terminal segments brown. Mandible yellow except black near the articulation. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.63 mm; LT 0.84 mm; WH/LH 0.90; DH/LH 0.51; EV/HE 0.74; EV/WF 0.70; WF/HE 1.05; WH/WF 1.75; OOL/WOT 1.48; DT/LT 0.38; FL/FW 2.15; HFL/HFW 2.69; A3 L/W 1.17.

Type Material. Holotype ♀. O'ahu: Tantalus, 15 Mar 1914, ex leaf miner in *Urera*, O.H. Swezey, BPBM Type 50.

Distribution. The few collections all come from the southeastern Ko'olau range.

Ecology. Reared from *Philodoria ureraella* (Swezey) (Gracillariidae), and found on its host plant *Urera glabra* (Urticaceae). Two batches of specimens are said to be reared from serpentine mines, indicating that they probably came from the sympatric *P. urerana* (Swezey).

Discussion. This species is known only from several series collected at Tantalus between 1914–18 in association with *Philodoria ureraella* and probably *P. urerana*, but I have not searched in the Ko'olau range for them and have not found them in the Wai'anae range. All these specimens are morphologically uniform aside from slight variations in color.

Sierola punctata Fullaway, 1920

Figure 36J–L, Map 30

Sierola punctata Fullaway, 1920: 103.**Island.** O'ahu.

Diagnosis. Part of the group of species with the basal wing cells densely setose, clypeus carinate and evenly curved, and mandible moderately narrow and parallel-sided without any modifications. Distinguished by the granular microsculpture of the frons, strongly acute ocellar triangle front angle, and rather narrow femur. Most similar to *S. pambertoni*, from which it is separated only by the head dimensions (WH/LH 0.85 and DH/LH 0.60, vs. 0.90 and 0.55 in *S. pambertoni*).

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons, or with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute to weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.25 mm; LT 1.07 mm; WH/LH 0.85; DH/LH 0.60; EV/HE 0.76; EV/WF 0.73; WF/HE 1.05; WH/WF 1.77; OOL/WOT 1.62; DT/LT 0.38; FL/FW 2.38; HFL/HFW 2.82; A3 L/W 1.43.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala 2000' [610 m], 4 Mar 1917, sweeping *Kadua*, P.H. Timberlake, BPBM Type 62.

Distribution. Known only from three specimens taken in the central Wai'anae range and one in the Ko'olau range. Last collected in 1920.

Ecology. Reared from a caterpillar in stem of *Kadua* sp.

Discussion. This species is somewhat nondescript, but can be distinguished fairly easily when found.

Sierola pygmaea Fullaway, 1920

Figure 36M–O, Map 30

Sierola pygmaea Fullaway, 1920: 108.**Island.** O'ahu.

Diagnosis. Part of a complex of species with broad, nearly parallel-sided mandibles, a short, steeply curved clypeus, frons microsculpture coriaceous, and sparsely setose basal wing cells. Together with *S. affinis*, separated from related species by the broad frons, distinctly greater than the eye height and shorter behind the eyes (WF/HE 1.09–1.15, EV/HE 0.75–1.05, OOL/WOT 1.60–1.85). Distinguished from *S. affinis* by the truncate, trapezoidal clypeus and frons densely punctate between the eyes. The clypeus usually appears weakly carinate, unlike *S. aspera* and *S. luteipes* which clearly have a sharp carina. Also similar to *S. malino*, distinguished by the coriaceous microsculpture of the frons, polished metasoma, and all yellow legs.

Description. Female. Head. Clypeal process semi-elliptical or trapezoidal, apex truncate; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible broad, not narrowed from base, ventral margin nearly straight; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.58 mm; LT 0.74 mm; WH/LH 0.80 (0.80–0.85); DH/LH 0.57 (0.57–0.60); EV/HE 1.03 (0.77–1.03); EV/WF 0.90 (0.70–0.90); WF/HE 1.14 (1.09–1.14); WH/WF 1.74 (1.74–1.78); OOL/WOT 1.81 (1.62–1.81); DT/LT 0.42; FL/FW 2.25 (2.17–2.25); HFL/HFW 2.44 (2.44–2.70); A3 L/W 1.33 (1.17–1.33). N = 4.

Type Material. Holotype ♀. O'ahu: Cooke's trail, Nu'uuanu Valley, 20 Aug 1916, D.T. Fullaway, BPBM Type 72.

Distribution. Rare, known only from five specimens, one recently collected at Pu'u Hāpapa in the Wai'ānae range and the rest from Tantalus in the southeastern Ko'olau range before 1934.

Discussion. The clearly truncate clypeus separates this species from similar taxa.

Sierola rostrata, n. sp.

Figure 37A–C, Map 25

Island. O'ahu.

Diagnosis. The large spatulate, flat clypeus and unusual mandible, with the dorsal three teeth present but reduced compared to the very large ventral tooth, separate this species from nearly all others on O'ahu. Distinguished from the allopatric *S. oahuensis* by having the clypeus porrect and nearly horizontal, rather than distinctly curved down in lateral view.

Description. Female. Head. Clypeal process spatulate, expanded beyond anterior margin of head, apex narrowly transverse; dorsally flat, not carinate, slightly convex only on the sides; in profile elongate, evenly curved, apex acute. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; strongly twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view evenly, moderately curved. Apex of mandible strongly oblique, with a single large ventral tooth and a few small teeth on the inner margin. Malar space 2/3 as long as width of base of mandible. Dorsal hairs of head shorter than flagellar width. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture nearly absent, polished. Vertex in dorsal view very slightly concave; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view nearly flat, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Genal angle present posteriorly, not prominent, head relatively flat. Postgenal depression deep, distinct, V-shaped. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely rugulose; median carina faintly present; metapleural carinae complete. Fore femur strongly expanded, less than twice as long as wide, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 2.33 mm; LT 1.13 mm; WH/LH 0.71; DH/LH 0.42; EV/HE 1.26; EV/WF 0.96; WF/HE 1.31; WH/WF 1.74; OOL/WOT 2.00; DT/LT 0.40; FL/FW 1.80; HFL/HFW 2.52; A3 L/W 1.29.

Type Material. Holotype ♀. O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Apr 2015, on *Kadua affinis*, K.N. Magnacca, BPBM. 0000017939.

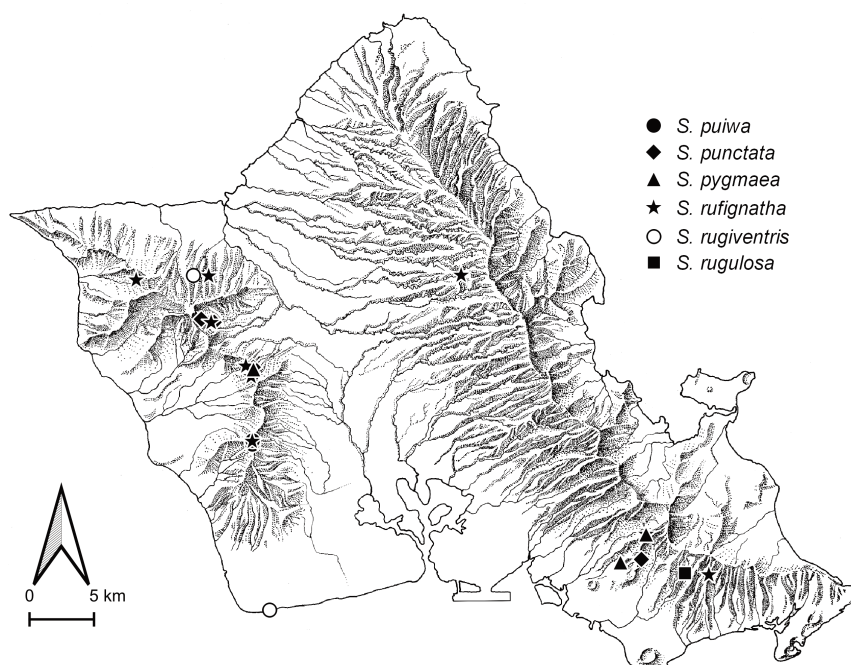
Paratypes: 1 ♀, S. Wai'anāe Mts., 9 Nov 1919, O.H. Swezey, BPBM. 1 ♂, Mt. Ka'ala, 11 Jan 1920, E.H. Bryan, BPBM. 1 ♂, E. slope Mt. Ka'ala 1500–2000' [610 m] [460–610 m], 14 Sep 1930, E.H. Bryan, BPBM. 1 ♀, Pālehua, 6 May 1934, Kuku'i, O.H. Swezey, BPBM. 2 ♀, Wai'anāe Mts., 18 Apr 1968, ex de vac machine, D. Ashdown & J. Tenorio, BPBM. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Jun 2014, on *Antidesma platyphyllum*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Apr 2015, on *Urera glabra*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 19 May 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 1 ♀, Palikea trail 2700' [820 m], 21.4102°N 158.0986°W, 9 Apr 2016, on *Myrsine lessertiana*, K.N. Magnacca, UHIM. 1 ♀ 1 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Apr 2016, on *Coprosma longifolia*, K.N. Magnacca, NMNH. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Apr 2017, on *Pisonia brunoniana*, K.N. Magnacca, HDOA.

Etymology. From the Latin *rostratus*, beaked, referring to the prominent porrect clypeus.

Distribution. Restricted to the windward southern Wai'anāe range south of Mt. Ka'ala. Most specimens collected April–June.

Ecology. Taken on a wide variety of plants.

Discussion. Replacing the very similar *S. oahuensis* in the southern Wai'anāe range, dif-



Map 30. Collection localities of *Sierola puiwa*, *S. punctata*, *S. pygmaea*, *S. rufignatha*, *S. rugiventris*, and *S. rugulosa*.

fering in the correct clypeus and flattened head. The two overlap narrowly around Mt. Ka‘ala; one collection from 1920 contains one specimen of each. However, the label location Mt. Ka‘ala from that time referred not only to the summit but to the lower valleys of Hale‘au‘au and Wai‘anae, and it is uncertain where these specimens came from. Most likely it is from around Hale‘au‘au. The reason for this particular geographic split are unknown; there is no physical barrier between them (as opposed to between the Ko‘olau and Wai‘anae ranges, or at Kolekole Pass between the northern and southern portions of the Wai‘anae range), and both species occur in the same various forest types in their respective ranges. Another species pair, *S. gracilis* and *S. kikiwi*, appear to share the same distribution.

***Sierola rufignatha* Fullaway, 1920**

Figure 37D–F, Map 30

Sierola rufignatha Fullaway, 1920: 115.

Island. O‘ahu.

Diagnosis. A very distinct species, with a large, quadrate, weakly carinate clypeus that is curved in profile, broad, slightly twisted, orange-yellow mandible, and rather strongly convex head. Most similar to *S. sima* of Hawai‘i, which has the clypeus much broader and straight-sloping in profile. Also somewhat similar to *S. koloa* and *S. magna*, both of which have the head only slightly convex dorsally and the mandible black and not twisted.

Description. Female. Head. Clypeal process quadrate, apex broadly rounded or truncate; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, slightly narrowed medially and expanded at apex, ventral margin weakly concave; slightly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved. Apex of mandible slightly oblique, with teeth distinctly

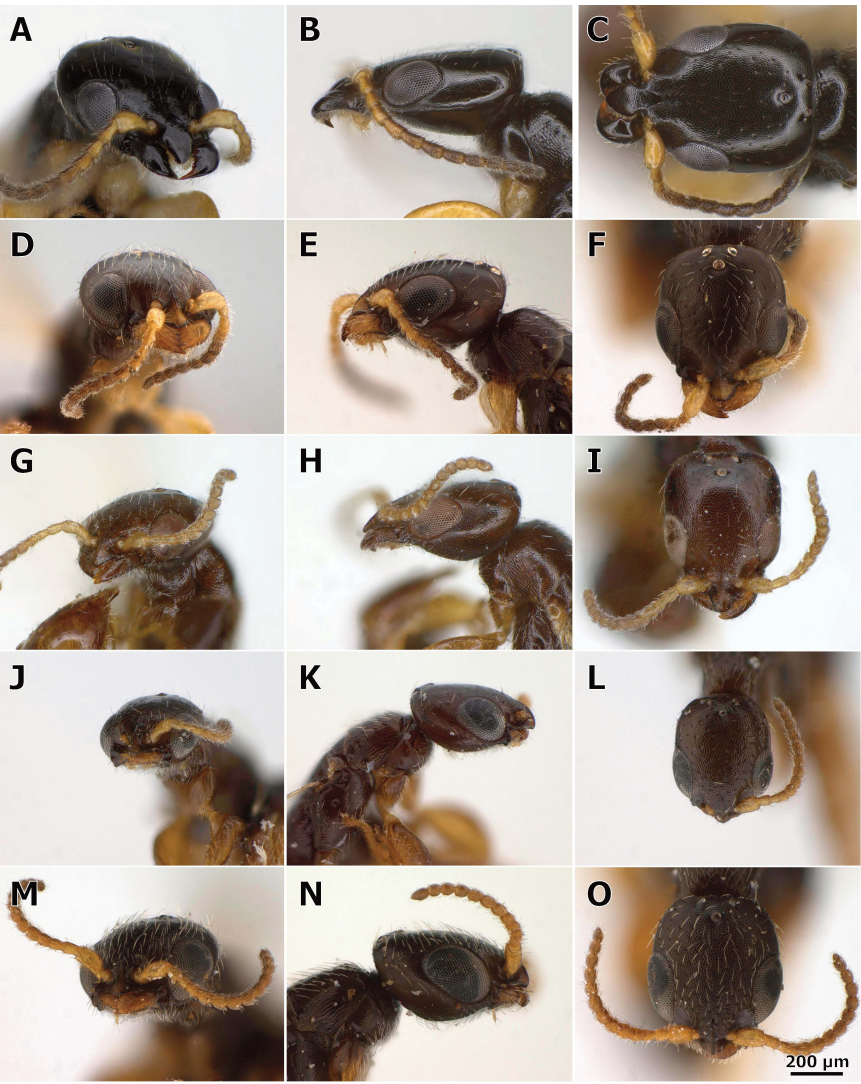


Figure 37. A–C: *Sierola rostrata*. D–F: *Sierola rufignatha*. G–I: *Sierola rugiventris*. J–L: *Sierola rugulosa*. M–O: *Sierola setosa*.

stronger ventrally. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle strongly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; median carina

faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.78 mm; LT 0.92 mm; WH/LH 0.86; DH/LH 0.59; EV/HE 0.79; EV/WF 0.74; WF/HE 1.07; WH/WF 1.83; OOL/WOT 1.42; DT/LT 0.42; FL/FW 2.38; HFL/HFW 2.95; A3 L/W 1.67.

Type Material. Holotype ♀. O'ahu: Nu'uuanu Valley, 20 Aug 1916, D.T. Fullaway, BPBM Type 86.

Distribution. Widespread in mesic forest in both the Wai'anae and Ko'olau ranges, but predominantly found in the former.

Sierola rugiventris, n. sp.

Figure 37G–I, Map 30

Island. O'ahu.

Diagnosis. The large, protruding, trapezoidal or bluntly triangular clypeus and flat head separates this species from all others except *S. acuta*, from which it can be distinguished by the strongly twisted mandible.

Description. Female. Head. Clypeal process rounded triangular, apex broadly rounded; dorsally weakly carinate; in profile evenly sloping, nearly straight. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; strongly twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved, or obtusely elbowed. Apex of mandible vertical, with second ventral tooth largest. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena sculpture coarse, minutely areolate. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely rugulose; median carina faintly present; transverse carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Coxae brown, femora brown dorsally, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.51 mm; LT 0.83 mm; WH/LH 0.72; DH/LH 0.48; EV/HE 1.00; EV/WF 0.86; WF/HE 1.16; WH/WF 1.70; OOL/WOT 1.68; DT/LT 0.39; FL/FW 2.13; HFL/HFW 2.50; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Barbers Pt., Apr 1966, J.W. Beardsley, BPBMNT 0000017940.

Etymology. Named for the coarse microsculpture of the underside of the head compared to the smooth frons. It is treated as a noun in apposition.

Distribution. Known only from the holotype, collected at Barbers Point near the coast. One male from Waialua also appears to be this species but is not designated as an allotype or paratype.

Discussion. The basal wing cell setation is uncertain, as the type may have lost setae.

Sierola rugulosa Fullaway, 1920

Figure 37J–L, Map 30

Sierola rugulosa Fullaway, 1920: 110.

Island. O'ahu.

Diagnosis. Belonging to the group of species with a sharp, somewhat strongly arched clypeal carina, the basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs nearly all yellow. Distinguished from similar species by the yellow mandible and more flattened, narrower head (DH/LH ~0.53, WH/LH ~0.79).

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right to weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum evenly pilose, with dense short erect setae.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible yellow except black near the articulation. Coxae brown, femora brown dorsally, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.46 mm; LT 0.78 mm; WH/LH 0.79; DH/LH 0.53; EV/HE 0.83; EV/WF 0.81; WF/HE 1.03; WH/WF 1.70; OOL/WOT 1.48; DT/LT 0.37; FL/FW 2.04; HFL/HFW 2.47; A3 L/W 1.20.

Type Material. Holotype ♀. O'ahu: Pālolo Hill trail, 7 Apr 1916, numbered 16, P.H. Timberlake, BPBM Type 77.

Distribution. Rare, known from only the type, collected in the southeastern Ko'olau range in 1916.

Discussion. This species may be a morphometrically extreme form of *S. setosa*, but it does have the setae around the vertex and gena elongate like other members of the olympiana group and unlike *S. setosa*.

Sierola setosa Fullaway, 1920

Figure 37M–O, Map 31

Sierola setosa Fullaway, 1920: 125.**Island.** O‘ahu.

Diagnosis. Belonging to a group of species with a sharp, somewhat strongly arched clypeal carina, the basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs nearly all yellow. Distinguished from similar species in the *S. similis* complex by the reddish brown mandible and more flattened, moderately narrow head (DH/LH 0.55–0.57, WH/LH 0.81–0.86). Very similar to *S. minuscula*, but readily separated by the head microsculpture and broad hind femora.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a thin, laminar carina, the sides strongly concave, or with a sharp carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets, or evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart, or with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible reddish brown. Coxae brown, femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

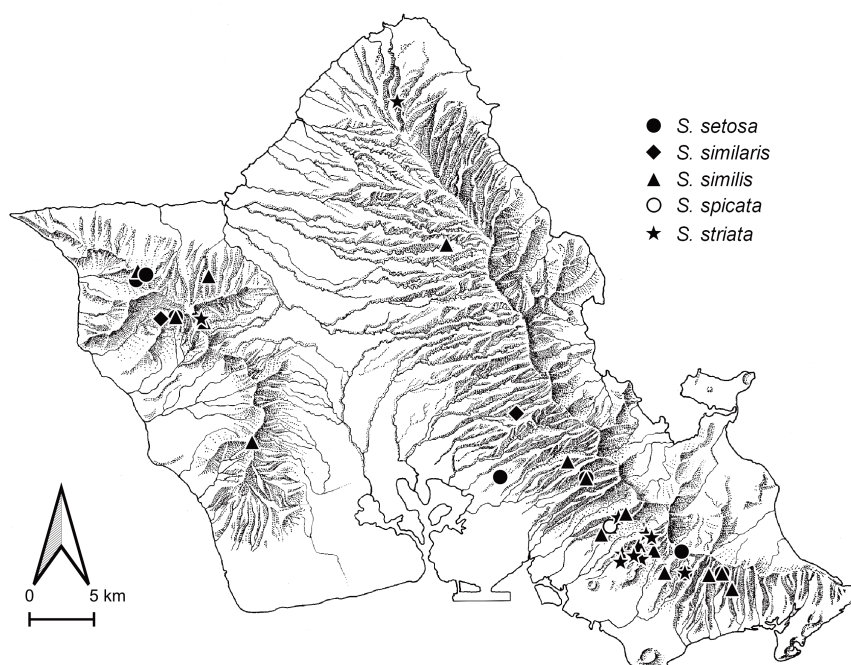
Measurements. LFW 1.96 mm; LT 1.04 mm; WH/LH 0.86 (0.81–0.86); DH/LH 0.56 (0.55–0.57); EV/HE 0.74; EV/WF 0.71; WF/HE 1.04; WH/WF 1.79; OOL/WOT 1.29 (1.27–1.39); DT/LT 0.37; FL/FW 1.95 (1.85–2.00); HFL/HFW 2.35 (2.30–2.42); A3 L/W 1.14. N = 7.

Type Material. Holotype ♀. O‘ahu: Pālolo Hill trail, 9 Apr 1916, P.H. Timberlake, BPBM Type 105.

Distribution. Known from a handful of specimens from mesic forest in both the Ko‘olau and Wai‘anae ranges.

Ecology. One specimen reared “ex lep Santalum”. This is probably *Spheterista flavocincta* (Walsingham) (Tortricidae), which is the only moth on O‘ahu known to feed on *Santalum*.

Discussion. The head of the holotype is on the wide end of the expected range; the average WH/LH for the specimens on hand is 0.83. The few specimens available are rather variable and it is unclear if perhaps more than one taxon is involved, or if the definition should be expanded to include *S. rugulosa*.



Map 31. Collection localities of *Sierola setosa*, *S. similaris*, *S. similis*, *S. spicata*, and *S. striata*.

***Sierola similaris* Fullaway, 1920**

Figure 38A–C, Map 31

Sierola similaris Fullaway, 1920: 126.

Island. O‘ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, evenly curved in lateral view, and basal wing cells densely setose. Very similar to *S. centralis*, distinguished by the narrower head (WH/LH ~0.92) and presence of a slight genal angle.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded or truncate; dorsally weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded, or absent, head strongly convex ventrally. Postgenal depression absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

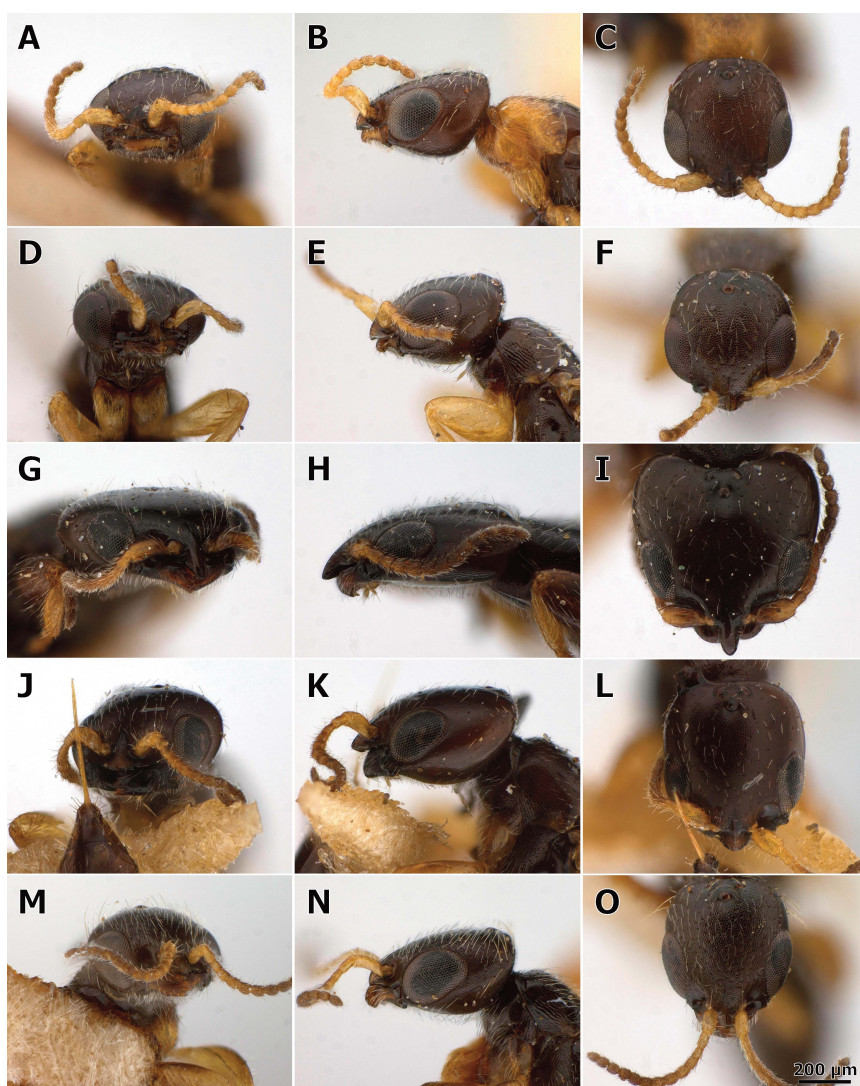


Figure 38. A–C: *Sierola similaris*. D–F: *Sierola similis*. G–I: *Sierola spicata*. J–L: *Sierola striata*. M–O: *Sierola subcrispa*.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Head black or prothorax yellow, body otherwise dark brown to black, pronotum and mesonotum yellow dorsally, metasoma orange-brown. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.91 mm; LT 1.01 mm; WH/LH 0.92; DH/LH 0.59; EV/HE 0.67; EV/WF 0.56; WF/HE 1.19; WH/WF 1.62; OOL/WOT 1.23; DT/LT 0.37; FL/FW 1.94; HFL/HFW 2.62; A3 L/W 1.00.

Type Material. Holotype ♀. O‘ahu: Waimano, 5 Jan 1913, O.H. Swezey, BPBM Type 107.

Distribution. Known only from three specimens: the holotype, taken in 1913 in the central Ko‘olau range, and two recent specimens from the leeward Wai‘anae range.

Discussion. The recent specimens are slightly different, with more extensive pale coloration and the clypeus blunt apically. These may represent a distinct species, but for now are retained under *S. similis* as there are no other clear characters to distinguish them and coloration clearly can vary within species.

***Sierola similis* Fullaway, 1920**

Figure 38D–F, Map 31

Sierola similis Fullaway, 1920: 136.

Sierola amica Fullaway, 1920: 137, **n. syn.**

Sierola distinguenda Fullaway, 1920: 155, **n. syn.**

Sierola lacessita Fullaway, 1920: 140, **n. syn.**

Sierola megalops Fullaway, 1920: 114, **n. syn.**

Island. O'ahu.

Diagnosis. Belonging to the group of species with a sharp, somewhat strongly arched clypeal carina, the basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs predominantly yellow. Distinguished from similar species by the black mandible, which is parallel-sided or only weakly concave ventrally, frons densely punctate between the eyes, and head moderately broad and deep (WH/LH 0.89–0.93, DH/LH 0.59–0.63).

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow or coxae brown, femora brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell to nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.83 mm; LT 0.93 mm; WH/LH 0.92 (0.89–0.94); DH/LH 0.62 (0.59–0.62); EV/HE 0.58 (0.56–0.67); EV/WF 0.55 (0.55–0.64); WF/HE 1.04 (0.99–1.11); WH/WF 1.79 (1.73–1.88); OOL/WOT 1.11 (1.11–1.30); DT/LT 0.41; FL/FW 2.28 (2.07–2.46); HFL/HFW 2.43 (2.32–2.73); A3 L/W 1.50 (1.48–1.67). N = 10.

Type Material. Holotype ♀ of *Sierola similis*. O'ahu: Mt. Ka'ala, 11 Aug 1912, O.H. Swezey, BPBM Type 128.

Holotype ♀ of *Sierola amica*. O'ahu: Ka'ala Mts., 7 Sep 1913, O.H. Swezey, BPBM Type 130.

Holotype ♀ of *Sierola distinguenda*. O'ahu: Mt. Ka'ala, 11 Aug 1912, D.T. Fullaway, BPBM Type 166.

Holotype ♀ of *Sierola lacesita*. O'ahu: Lanihuli, 3 Sep 1916, P.H. Timberlake, BPBM Type 136.

Holotype ♀ of *Sierola megalops*. O'ahu: Mānoa, 29 Jul 1917, D.T. Fullaway, BPBM Type 83.

Distribution. Widespread in mesic to wet forest in both mountain ranges. Most abundant July–November. Formerly relatively common (though never taken in numbers), but not collected since 1966.

Ecology. Taken on a variety of trees and shrubs, without any clear preference.

Discussion. Fullaway described this species under several names based on minor differences in leg color or nonexistent differences in mandible width; these are synonymized here, along with *S. abusa* and *S. kaalensis* under *S. manoa*. The types of *S. similis*, *S. amica*, and *S. distinguenda* all came from Ka'ala, while those of *S. lacesita* and *S. megalops* are from the Ko'olau range. The distinctions between this species and three others (*S. capuana*, *S. epagogeana*, and *S. manoa*) are somewhat tenuous, but it seems that they can be reliably distinguished based on mandible shape and color, and therefore are retained at present. Two specimens initially determined as *S. epagogeana* (a Fullaway specimen from Niu Valley, 28 Jun 1909, and an undated specimen from Tantalus collected by Perkins) key to that species or *S. hookahi* but do not match either of those or any other in the complex. However, I do not feel they present enough distinct characters to warrant describing them.

Sierola spicata Fullaway, 1920

Figure 38G–I, Map 31

Sierola spicata Fullaway, 1920: 76.

Island. O'ahu.

Diagnosis. The broad, extremely flat head and spicate clypeus are unique among O'ahu species.

Description. Female. *Head.* Clypeal process narrow, rostrate, apex rounded; dorsally with a broad, rounded ridge; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, more or less parallel-sided except at base; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view distinctly elbowed externally, internal margin nearly straight. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space 1/3 as long as width of base of mandible. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with sparse, scattered punctures, mostly 3 pit widths apart or more. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view broadly, deeply concave; occipital margin carinate. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest well behind eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head nearly flat ventrally, genal angle absent. Postgenal depression absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae, trochanters, and femora black, all tibiae and tarsi yellow-brown.

Wings. Membrane tinged with yellow. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.10 mm; LT 1.29 mm; WH/LH 0.91; DH/LH 0.42; EV/HE 1.23; EV/WF 0.84; WF/HE 1.45; WH/WF 1.84; OOL/WOT 2.23; DT/LT 0.34; FL/FW 2.06; HFL/HFW 2.36; A3 L/W 1.13.

Type Material. Holotype ♀. O'ahu: Lanihuli Ridge 1500' [460 m], 3 Sep 1916, P.H. Timberlake, BPBM Type 10.

Distribution. Extremely rare, known only from the holotype and allotype collected in the southern Ko'olau range in 1916.

Discussion. This species is endemic to O'ahu; the related taxon on Hawai'i, described as subspecies *S. spicata hawaiiensis* Fullaway, is clearly a distinct species based on a number of characters.

***Sierola striata* Fullaway, 1920**

Figure 38J–L, Map 31

Sierola striata Fullaway, 1920: 107.

Sierola agens Fullaway, 1920: 108, **n. syn.**

Island. O'ahu.

Diagnosis. Among species with broad, nearly parallel-sided mandibles, separated by the densely setose basal wing cells, moderately elongate clypeus which is evenly sloping or very slightly curved in lateral view, and mandible apex straight and nearly flat, with the ventral tooth long. Distinguished from the sibling species *S. celeris* by the microreticulate metasomal terga, usually all-yellow legs, and generally broader, shorter head (WH/LH 0.80–0.83 vs. 0.75–0.80, EV/HE 0.92–1.10 vs. 1.05–1.30, OOL/WOT 1.75–2.16 vs. 2.04–2.40) Also close to *S. tumidiventris*, from which it is separated by the yellow legs, deeper head, and narrow hind femora (DH/LH 0.55–0.58 vs. 0.50, HFL/HFW 2.45–2.80 vs. 2.20–2.35).

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, outwardly shining but with distinct, fine microsculpture. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest just posterior of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; median carina faintly present; transverse carina faintly present; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna yellow-brown. Mandible black. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.13 mm; LT 1.01 mm; WH/LH 0.82 (0.80–0.83); DH/LH 0.55 (0.55–0.58); EV/HE 1.05 (0.92–1.10); EV/WF 0.81 (0.70–0.81); WF/HE 1.29 (1.24–1.37); WH/WF 1.65 (1.57–1.69); OOL/WOT 2.00 (1.75–2.16); DT/LT 0.40; FL/FW 2.33 (2.07–2.43); HFL/HFW 2.73 (2.48–2.80); A3 L/W 1.43 (1.14–1.43). N = 15.

Type Material. Holotype ♀ of *Sierola striata*. O'ahu: Pālolo Valley, 8 Sep 1912, D.T. Fullaway, BPBM Type 70.

Holotype ♀ of *Sierola agens*. O'ahu: Nu'uuanu, 20 Aug 1916, D.T. Fullaway, BPBM Type 71.

Distribution. Widely distributed in mesic to wet forest in the Wai'anae range, but not in the summit cloud forests; one specimen, the holotype, from the Ko'olau.

Ecology. Collected on a wide variety of trees and shrubs.

Discussion. *Sierola agens* was separated from *S. striata* by Fullaway based on the length of the antenna, but they are identical in this character. See notes under *S. celeris*.

***Sierola subcrispa* Fullaway, 1920**

Figure 38M–O, Map 32

Sierola subcrispa Fullaway, 1920: 157.

Sierola rufomandibulata Fullaway, 1920: 156, **n. syn.**

Island. O'ahu.

Diagnosis. Separated from most species in the group with a sharp clypeal carina and densely setose basal wing cells by the moderately broad, distinctly concave mandible and lack of a genal angle. Most similar to *S. koolauensis*; distinguished from that species and *S. granulosa* by the shorter head behind the eyes (EV/HE 0.70–0.90) and longer antenna, and from *S. yoshimotoi* by the head only slightly convex above, not as deep (DH/LH ~0.54), with dense punctures between the eyes.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons, or with distinct, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with moderately dense pubescence, not extending past the genal angle. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown. Legs all yellow except dorsal margins of femora tinged with brown.

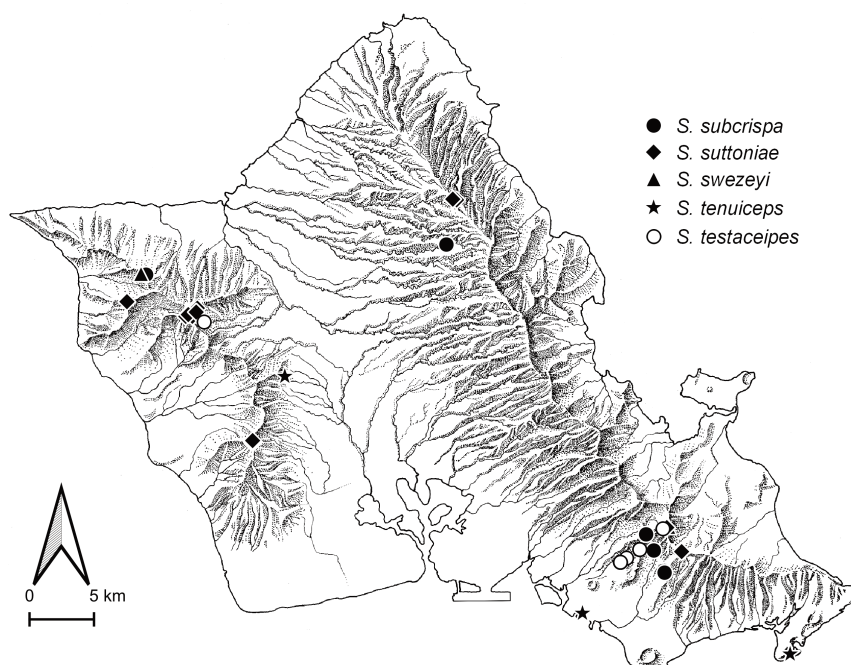
Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.78 mm; LT 0.89 mm; WH/LH 0.85; DH/LH 0.54; EV/HE 0.71; EV/WF 0.67; WF/HE 1.07; WH/WF 1.71; OOL/WOT 1.36; DT/LT 0.39; FL/FW 2.15; HFL/HFW 2.55; A3 L/W 1.17.

Type Material. Holotype ♀ of *Sierola subcrispa*. O'ahu: Mānoa Ridge, 13 Feb 1917, D.T. Fullaway, BPBM Type 169.

Holotype ♀ of *Sierola rufomandibulata*. O'ahu: Mānoa, 27 Jul 1913, O.H. Swezey, BPBM Type 167.

Distribution. Known from about six specimens from wet to mesic forest, primarily in the Ko'olau range, with one recent specimen from the Wai'anae range.



Map 32. Collection localities of *Sierola subcrispa*, *S. suttoniae*, *S. swezeyi*, *S. tenuiceps*, and *S. testaceipes*.

Discussion. Fullaway separated *S. rufomandibulata* from this species based on the coriaceous but slightly shining microsculpture, but that character clearly varies within species to some degree as demonstrated in *S. olympiana* and others. All other characters, including the unusual reddish, moderately broad, ventrally distinctly concave mandible, match. I have chosen *S. subcrispa* because the type is in better condition.

***Sierola suttoniae* Fullaway, 1920**

Figure 39A–C, Map 32

Sierola suttoniae Fullaway, 1920: 80.

Sierola arida Fullaway, 1920: 102, n. syn.

Island. O‘ahu.

Diagnosis. Among species with a sharp to weak clypeal carina and densely setose basal wing cells, readily recognized by the dark infusate wings and slightly twisted mandible, easily seen in lateral view. Very similar to *S. lanthuliana* which has the wings hyaline and the mandible usually brownish.

Description. Female. Head. Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, more or less parallel-sided except at base; slightly twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible slightly oblique, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head shorter than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate from vertex by less than



Figure 39. A–C: *Sierola suttoniae*. D–F: *Sierola swezeyi*. G–I: *Sierola tenebriosa*. J–L: *Sierola tenuiceps*. M–O: *Sierola tenuis*.

ocellus length. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black, clypeus orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black to reddish brown. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane infusate. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.91 mm; LT 0.93 mm; WH/LH 0.92; DH/LH 0.60; EV/HE 0.90; EV/WF 0.76; WF/HE 1.19; WH/WF 1.76; OOL/WOT 1.44; DT/LT 0.45; FL/FW 2.28; HFL/HFW 2.77; A3 L/W 1.50.

Type Material. Holotype ♀ of *Sierola suttoniae*. O'ahu: Mt. Ka'ala 2500' [760 m], 4 Mar 1917, on *Suttonia* [= *Myrsine*] *lessertiana*, P.H. Timberlake, BPBM Type 18.

Holotype ♀ of *Sierola arida*. O'ahu: Ka'ala Mts., 7 Sep 1913, O.H. Swezey, BPBM Type 61.

Distribution. Found in wet forest around the summits of Ka'ala and Palikea in the Wai'anae range, and close to the Ko'olau crestline. Most abundant April–August.

Ecology. Taken on a variety of plants, but predominantly *Cheirodendron trigynum* and *Broussaisia arguta*, and restricted to areas where those occur.

Discussion. The dark wings are very unusual among *Sierola*, making it easily recognizable. Among other O'ahu species, only *S. pano* has the wings distinctly infusate. Fullaway separated *S. arida* from *S. suttoniae* early in his key based on the clypeus, but they are identical in that as well as the twisted mandible, infusate wings, and all other characters.

Sierola swezeyi Fullaway, 1920

Figure 39D–F, Map 32

Sierola swezeyi Fullaway, 1920: 116.

Island. O'ahu.

Diagnosis. Aberrant within the group of species with the clypeal carina thin, laminate, and highly arched, by having the frons moderately punctate above rather than very dense all over. Separated from the similar *S. fusca* by the narrow head (WH/LH ~0.78), frons densely punctate between the eyes, and mandible slightly concave ventrally.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Gena below eye flat. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely rugulose; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.86 mm; LT 0.92 mm; WH/LH 0.78; DH/LH 0.56; EV/HE 0.79; EV/WF 0.73; WF/HE 1.08; WH/WF 1.71; OOL/WOT 1.25; DT/LT 0.39; FL/FW 2.29; HFL/HFW 2.80; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Kōnāhuanui, 23 Feb 1914, O.H. Swezey, BPBM Type 88.

Distribution. Rare, known from a handful of specimens from the summit ridges of both the Wai'anae and Ko'olau ranges.

Sierola tenebriosa Fullaway, 1920

Figure 39G–I, Map 33

Sierola tenebriosa Fullaway, 1920: 112.

Sierola willardi Fullaway, 1920: 158, **n. syn.**

Island. O'ahu.

Diagnosis. Belonging to the large group of species with the basal wing cells densely setose, clypeus carinate and evenly curved, and mandible narrow and parallel-sided to slightly concave ventrally without any modifications. Forming a closely related complex with *S. anemophila* and *S. nigra*, denoted by the broad, deep head (WH/LH 0.87–0.94, DH/LH 0.60–0.64). Separated from those species by the coarse, granular frons microsculpture and microreticulate metasoma; the mandible is also often orange-brown to yellow.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view weakly curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart, or with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; median carina faintly present; transverse carina faintly present; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black, clypeus sometimes orange to yellow. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black to orange. Legs all yellow or coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.93 mm; LT 0.97 mm; WH/LH 0.89 (0.89–0.95); DH/LH 0.60 (0.60–0.64); EV/HE 0.61 (0.53–0.72); EV/WF 0.56 (0.45–0.62); WF/HE 1.09 (1.02–1.17); WH/WF 1.68 (1.61–1.81); OOL/WOT 1.15 (1.10–1.35); DT/LT 0.38; FL/FW 2.22 (1.89–2.5); HFL/HFW 2.35 (2.35–2.67); A3 L/W 1.33 (1.20–1.68). N = 21.

Type Material. Holotype ♀ of *Sierola tenebriosa*. O'ahu: Mt. Olympus, 31 Jul 1917, P.H. Timberlake, BPBM Type 81.

Holotype ♀ of *Sierola willardi*. O'ahu: Mt. Ka'ala, 4 Jul 1916, J.C. Bridwell, BPBM Type 171.

Distribution. Found in wet areas, around the peaks of Ka'ala, Kalena, and Palikea in the Wai'anae range and lower down in the Ko'olau range.

Discussion. One paratype is a specimen of *S. manoa*. *Sierola willardi* was distinguished by having the mandible and femora all dark brown to black. In most species these seem to be good characters, but an examination of the full series of specimens otherwise falling under these taxa shows they cannot reliably separate them into two groups. Specimens with the legs completely yellow usually have the mandible yellow to reddish brown, but a few have black mandibles, and some with black mandibles have the legs dark only basally. Given the restricted, overlapping distribution of both and lack of any other distinguishing characters, I regard them as synonyms. Also see comments under *S. anemophila*.

***Sierola tenuiceps* Fullaway, 1920**

Figure 39J–L, Map 32

Sierola tenuiceps Fullaway, 1920: 148.

Island. O'ahu.

Diagnosis. A very distinctive species, immediately recognizable by the head which is narrow in dorsal view and rhomboid in lateral view, little tapered from the occiput to the clypeus. The clypeus is quite high, raised well above the antennal sockets, and steep and short in profile.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally flat, with a trace of a low carina basally; in profile steep and short, evenly curved. Mandible moderately narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons appearing impunctate (setae arising from shallow pits that are only visible at low angles). Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture microreticulate and dull between the eyes and antenna, distinctly smoother between eyes and ocelli. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin not carinate but forming a pronounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest just posterior of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dull yellow. Mandible black. Legs all yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.26 mm; LT 0.74 mm; WH/LH 0.72; DH/LH 0.56; EV/HE 1.07; EV/WF 0.94; WF/HE 1.13; WH/WF 1.65; OOL/WOT 1.60; DT/LT 0.38; FL/FW 2.00; HFL/HFW 3.14; A3 L/W 1.40.

Type Material. Holotype ♀. O'ahu: Honolulu, Apr 1916, J.C. Bridwell, BPBM Type 151.

Distribution. Found primarily in lowland and coastal sites, highest record at 2000 ft. (610 m) elevation. Now rare, most recent collection 1959.

Ecology. At least two specimens were taken from wood, both from introduced trees.

Discussion. This unique species is one of a handful from lowland habitats. These sites are now highly disturbed and few native insects inhabit them, but they are often not surveyed for native insects, and it may persist in areas such as those where the coastal *Hylaeus* bees live. All specimens have minute dots in the basal wing cells as if setae were broken off, but not even the most intact have any present.

***Sierola tenuis* Fullaway, 1920**

Figure 39M–O, Map 33

Sierola tenuis Fullaway, 1920: 94.

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Separated from nearly all others by the very narrow, compressed head (WH/LH 0.72–0.77, DH/LH 0.50–0.53) and the swollen hind femur (HFL/HFW 1.80–2.40). Distinguished from *S. hirticeps*, which has a similarly narrow head, by the generally pale coloration of the legs and mandible. Specimens of this species and *S. usitata* on the extreme ranges of head width and depth may overlap, but *S. tenuis* always has a distinctive gestalt in frontodorsal view, appearing long and narrow even when the measurements are identical.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted; in ventral view evenly, moderately curved. Apex of mandible vertical, with small, indistinct teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly less than 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena below eye flat. Postgenal depression absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae nearly absent, visible only beyond propodeal declivity. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

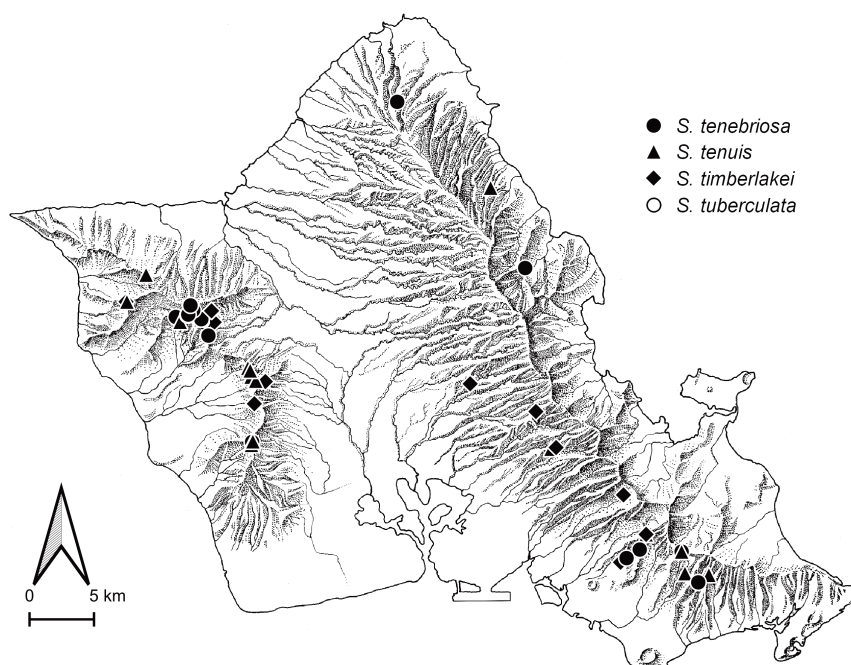
Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to yellow. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.63 mm; LT 0.87 mm; WH/LH 0.73 (0.72–0.77); DH/LH 0.51 (0.50–0.53); EV/HE 0.81; EV/WF 0.79; WF/HE 1.03; WH/WF 1.66; OOL/WOT 1.60 (1.40–1.60); DT/LT 0.34; FL/FW 1.87 (1.76–1.97); HFL/HFW 2.00 (1.81–2.38); A3 L/W 1.00 (1.00–1.20). N = 15.

Type Material. Holotype ♀. O'ahu: Pālolo, 3 Jan 1915, O.H. Swezey, BPBM Type 45.

Distribution. Widespread in both the Ko'olau and Wai'anae ranges, primarily in mesic forest.



Map 33. Collection localities of *Sierola tenebriosa*, *S. tenuis*, *S. timberlakei*, and *S. tuberculata*.

Discussion. The coloration of the mandible and legs appears to be more variable in this species than others of the *olympiana* group, but does not divide into any clearly separable groups. The legs are almost always at least tinged with brown on the hind femora, and the mandible range on a continuum from dark brown to nearly yellow. The narrow appearance of the head in frontodorsal view is distinctive, due to the somewhat protruding eyes and narrow head behind them, making it recognizable even from very similar species such as *S. usitata*. See notes under *S. femoralis*.

***Sierola testaceipes* Cameron, 1881**

Figure 40A–C, Map 32

Sierola testaceipes Cameron, 1881: 556.

Sierola brunneiventris Fullaway, 1920: 149, **n. syn.**

Sierola pubescens Fullaway, 1920: 97, **n. syn.**

Sierola tantalea Fullaway, 1920: 90, **n. syn.**

Island. O‘ahu.

Diagnosis. Among the broad mandible species, almost unique in having the basal wing cells nearly glabrous. The only similar species is *S. huapoo*, which has the head much shorter and more convex dorsally. The densely pubescent venter of the head is also almost unique in the Hawaiian species, with only the very different *S. kunihi* approaching it. The head is also generally deeper than most similar species, DH/LH 0.58–0.60.

Description. Female. Head. Clypeal process rounded triangular, apex rounded; dorsally with a sharp carina; in profile steep and short, evenly curved. Mandible broad, not narrowed from base, ventral margin nearly straight; not twisted, outwardly coriaceous, somewhat dull. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent.

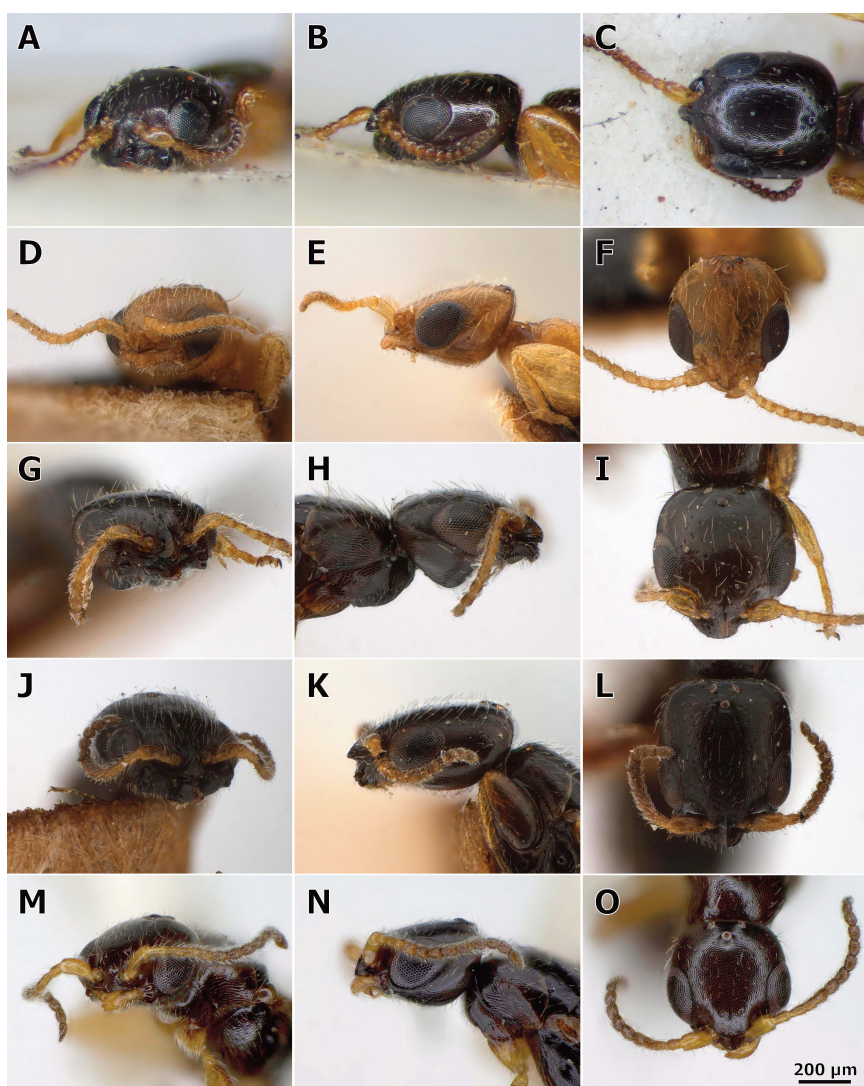


Figure 40. A–C: *Sierola testaceipes*. D–F: *Sierola timberlakei*. G–I: *Sierola tuberculata*. J–L: *Sierola tumidoventris*. M–O: *Sierola uhiwai*.

Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with dense, downy pubescence, conspicuous in lateral view and extending past the genal angle. Head evenly convex ventrally, genal angle absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally shining,

with weak microsculpture; median carina absent, but median portion of propodeum broadly elevated; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Legs all yellow except dorsal margins of femora tinged with brown.

Wings. Membrane hyaline. Basal cells of fore wing nearly glabrous, with only a few scattered setae.

Measurements. LFW 1.78 mm; LT 0.94 mm; WH/LH 0.79; DH/LH 0.58; EV/HE 1.08; EV/WF 0.90; WF/HE 1.20; WH/WF 1.73; OOL/WOT 1.87; DT/LT 0.39; FL/FW 1.86; HFL/HFW 2.21; A3 L/W 0.87.

Type Material. Holotype ♀ of *Sierola testaceipes*. [card with specimen with Blackburn code for O'ahu and "94"], "Sandwich Islands, ?Oahu, Blackburn, Rare. 2 sp only taken", NHMUK Type 13.193.

Holotype ♀ of *Sierola brunneiventris*. O'ahu: Tantalus 1300' [400 m], 15 Oct 1905, numbered 10, W.M. Giffard, BPBM Type 154.

Holotype ♀ of *Sierola pubescens*. O'ahu: Tantalus 1300' [400 m], 15 Oct 1905, W.M. Giffard, BPBM Type 51.

Holotype ♀ of *Sierola tantalea*. O'ahu: Tantalus 1800' [240 m] [550 m], 9 Sep 1908, numbered 284, W.M. Giffard, BPBM Type 36.

Distribution. Primarily taken from the vicinity of Tantalus in the Ko'olau range, with one record from Hale'au'au in the Wai'anae range. Moderately common through 1908, but only a few specimens taken after that; last collected in 1930.

Ecology. Apparently associated with *Acacia koa*, but the exact host is unknown. The record of *S. tantalea* reared from *Merimnetria homoxyla* (Walsingham) (Gelechiidae) in Swezey (1954, p. 95) is based on dark specimens of *S. aristoteliae*. One specimen is recorded as "ex koa leaves where had been a batch of *Rhyncogonus* eggs," but it is extremely unlikely that these were a larval host.

Discussion. The type is glued onto a card so that the distinctive dense ventral pubescence of the head is not clearly visible, but some can be seen at the posterior margin and all other characters match *S. brunneiventris*, *S. pubescens*, and *S. tantalea*, which cannot be separated from each other. All other specimens with broad mandible and glabrous basal wing cells collected by Perkins and others where the ventral head is visible have this dense setation. The shape of the clypeal carina in lateral view varies slightly among the specimens, but not significantly. Other species have been widely misidentified as *S. testaceipes*, particularly by Ashmead who assigned the majority of Perkins's specimens to it; only one of the 79 specimens at NHMUK identified as "*S. testaceipes*" actually is it. In addition, three of Fullaway's *S. pubescens* paratypes and three *S. tantalea* paratypes are *S. cryptophlebiae* (the latter are not mentioned as paratypes by Fullaway but bear paratype labels), and one *S. tantalea* paratype is *S. striata*.

Sierola timberlakei Fullaway, 1920

Figure 40D–F, Map 33

Sierola timberlakei Fullaway, 1920: 96.

Island. O'ahu.

Diagnosis. Together with *S. olena* and *S. vicina*, immediately recognizable as the only Oahu species that are predominantly testaceous to yellow, including the head. Closer to *S. olena*, with the basal wing cells densely setose, relatively long frons setae, A3 short (1.05–1.25 times as long as wide), and the metasoma mostly polished. Distinct from that species in

the shape of the head, which is more strongly convex ventrally in lateral view, posterior corners more rounded in dorsal view, and ocellar triangle weakly to strongly obtuse rather than strongly acute. Several morphometric measures differ on average, but OOL/WOT and FL/FW separate them consistently (1.20–1.45 and 1.90–2.04 respectively in *S. timberlakei*, and 1.50–1.80 and 2.04–2.30 in *S. olena*). The body coloration is similarly variable in both species but the mandible is always dark apically in *S. olena*, and all yellow in *S. timberlakei*. Specimens of *S. timberlakei* from the Wai'anāe range consistently have the femora brownish, which also distinguishes them from *S. olena* which has the legs all yellow (Ko'olau *S. timberlakei* also have the legs all yellow, but *S. olena* has not been found there).

Description. Female. *Head.* Clypeal process semicircular, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely rugulose; transverse carina absent, brow of declivity broadly rounded, or faintly present, curving on each side; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum evenly covered with short, anteriorly-directed setae.

Color. Yellow, propodeum slightly darkened. Antenna entirely dull yellow. Mandible yellow. Legs all yellow or coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.93 mm; LT 0.97 mm; WH/LH 0.88 (0.87–0.91); DH/LH 0.58 (0.57–0.62); EV/HE 0.70 (0.69–0.79); EV/WF 0.64 (0.61–0.68); WF/HE 1.10 (1.06–1.18); WH/WF 1.73 (1.68–1.76); OOL/WOT 1.28 (1.21–1.43); DT/LT 0.41; FL/FW 1.93 (1.88–2.04); HFL/HFW 2.33 (2.29–2.67); A3 L/W 1.17 (1.07–1.23). N = 12.

Type Material. Holotype ♀, O'ahu: Tantalus, 13 Aug 1911, reared from larva of *Batrachedra* [= *Batrachedrodes*] *sophroniella*, O.H. Swezey, BPBM Type 49.

Distribution. Found widely in mesic forest in the Ko'olau and southern Wai'anāe ranges, with one specimen from the far northwest Wai'anāe.

Ecology. The holotype was reared from *Batrachedrodes sophroniella* (Walsingham) (Batrachedridae), which feeds on sporangia of the endemic fern *Cyclosorus cyatheoides*.

Discussion. The Ko'olau and Wai'anāe populations may represent separate species or incipient species. This is the only taxon seen where leg color varies geographically, and while the overall morphometrics represent the expected variation seen in others, the Ko'olau specimens are all on the low end of DH/LH, OOL/WOT, and HFL/HFW while the Wai'anāe specimens are all on the high end. Unfortunately only three Ko'olau specimens are available for comparison, including the type; several more are in collections but are missing their heads.

Sierola tuberculata Fullaway, 1920

Figure 40G–I, Map 33

Sierola tuberculata Fullaway, 1920: 130.**Island.** O‘ahu.

Diagnosis. Belonging to a complex of species with the head strongly produced ventrally, appearing triangular in lateral view, and clypeus lacking a sharp carina. Separated from similar species by the densely setose basal wing cells, mandible not twisted or bent at the base, and distinct, broad postgenal depression.

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a rounded carina dorsally, effaced towards apex; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly polished, smooth, shining; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle right. Head rounded shortly behind eyes. Dorsum of head in lateral view strongly convex, head deepest beneath eye. Venter of head behind mandibles concave in lateral view, with relatively sparse setae. Genal angle prominent, apex rounded, head distinctly triangular in lateral view. Gena below eye concave. Postgenal depression deep, distinct, V-shaped. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely rugulose; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters brownish orange.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.13 mm; LT 1.09 mm; WH/LH 0.94; DH/LH 0.65; EV/HE 0.62; EV/WF 0.52; WF/HE 1.20; WH/WF 1.67; OOL/WOT 1.42; DT/LT 0.36; FL/FW 1.95; HFL/HFW 2.31; A3 L/W 1.14.

Type Material. Holotype ♀. O‘ahu: Wai‘anae mountains, 5 Mar 1911, D.T. Fullaway, BPBM Type 116.

Distribution. Known only from two specimens, both taken in the Wai‘anae range. Last seen in 1930.

Ecology. Possibly associated with grasses, one specimen collected from *Eragrostis*.

Discussion. This species is very rare but distinctive. Few recent collections have been made on native grasses, so it may persist in some areas.

Sierola tumidoventris Fullaway, 1920

Figure 40J–L, Map 34

Sierola tumidoventris Fullaway, 1920: 109.*Sierola magna* Fullaway, 1920: 75, n. syn.**Island.** O‘ahu.

Diagnosis. Among species with broad, nearly parallel-sided mandibles, separated by the moderately setose basal wing cells, and elongate, sharply carinate clypeus which is more or

less evenly sloping in lateral view. Closest to *S. koloa*, distinguished by having the mandible apex straight, with the ventral tooth long. Also similar to the much more common *S. celeris* and *S. striata*, from which it is separated by the dark legs, flatter head, and strongly expanded hind femur (DH/LH ~0.50 vs. 0.55, HFL/HFW 2.20–2.40 vs. 2.50–2.90). A3 is short, as wide or wider than long, compared to 1.15–1.35 times as long as wide in the other three species.

Description. Female. Head. Clypeal process semicircular or quadrate, apex broadly rounded; dorsally with a sharp carina; in profile evenly sloping, nearly straight. Mandible broad, ventral margin slightly concave; not twisted, outwardly polished and shining distad of the bend, coriaceous and dull basad; in ventral view obtusely elbowed. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli separated from vertex by about their own length. Ocellar triangle front angle strongly acute. Head broadening behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna short, scarcely extending beyond head.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Coxae and femora dark brown to black, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.88 mm; LT 0.87 mm; WH/LH 0.79; DH/LH 0.50; EV/HE 1.18; EV/WF 0.90; WF/HE 1.31; WH/WF 1.65; OOL/WOT 2.25; DT/LT 0.43; FL/FW 2.21; HFL/HFW 2.21; A3 L/W 0.88.

Type Material. Holotype ♀ of *Sierola tumidoventris*. O'ahu: Cooke's trail, Nu'uuanu Valley, 20 Aug 1916, D.T. Fullaway, BPBM Type 73.

Holotype ♀ of *Sierola magna*. O'ahu: Niu, 11 Dec 1910, O.H. Swezey, BPBM Type 6.

Distribution. Known from only three female specimens, two from the southeastern Ko'olau range and one recent collection from the northern Wai'anae range.

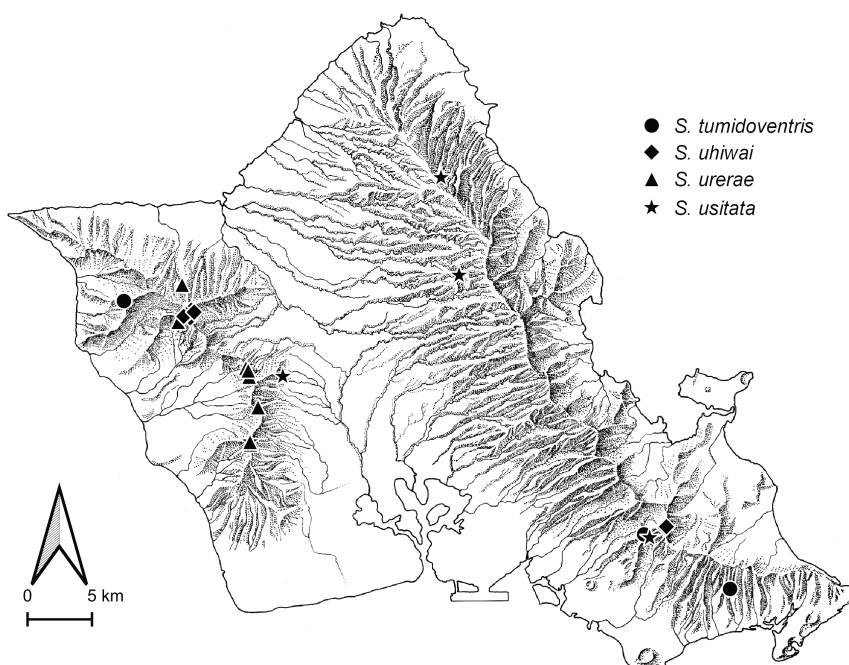
Discussion. This species is very similar to *S. celeris* and *S. striata*; it is maintained as distinct based on the consistent leg color, hind femur, and deeper head in those species. The clypeus is also larger in dorsal view, parallel-sided for some distance at the base before rounding to the apex. The type of *S. magna* is virtually identical, differing from that of *S. tumidoventris* only in having the clypeus straighter in lateral view and the basal wing cells slightly less setose. The former character is similarly variable in the related *S. celeris* and *S. striata*, and the wing cells of the *S. magna* specimen appear to be abraded. The wing cells are somewhat intermediate in both, as well as in some specimens of *S. celeris* and *S. striata*.

Sierola uhiwai, n. sp.

Figure 40M–O, Map 34

Island. O'ahu.

Diagnosis. Although somewhat difficult to key out due to the intermediate state of some characters, this species is easily recognizable once seen. The weakly carinate clypeus and yellow, strongly concave mandible set it apart from all except the closely related *S. aniani* and



Map 34. Collection localities of *Sierola tumidiventris*, *S. uhiwai*, *S. urerae*, and *S. usitata*.

S. halona, from which it is distinguished by the clypeus being steeply sloping and nearly straight in lateral view rather than strongly curved, legs at least partly brown, and basal wing cells usually intermediate between densely and sparsely setose.

Description. Female. Head. Clypeal process semi-elliptical, apex rounded; dorsally weakly carinate; in profile evenly sloping, nearly straight. Mandible narrowed medially and strongly expanded at apex, hourglass-shaped, ventral margin strongly concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head narrowed behind eyes. Dorsum of head in lateral view nearly flat behind middle of eyes, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded. Side of head behind eye with a line of smooth tessellate microsculpture extending from posteroventral margin of eye to vertex crest, distinctly different from smoother sculpting above and below. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence about as long as flagellar width or scarcely longer. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum

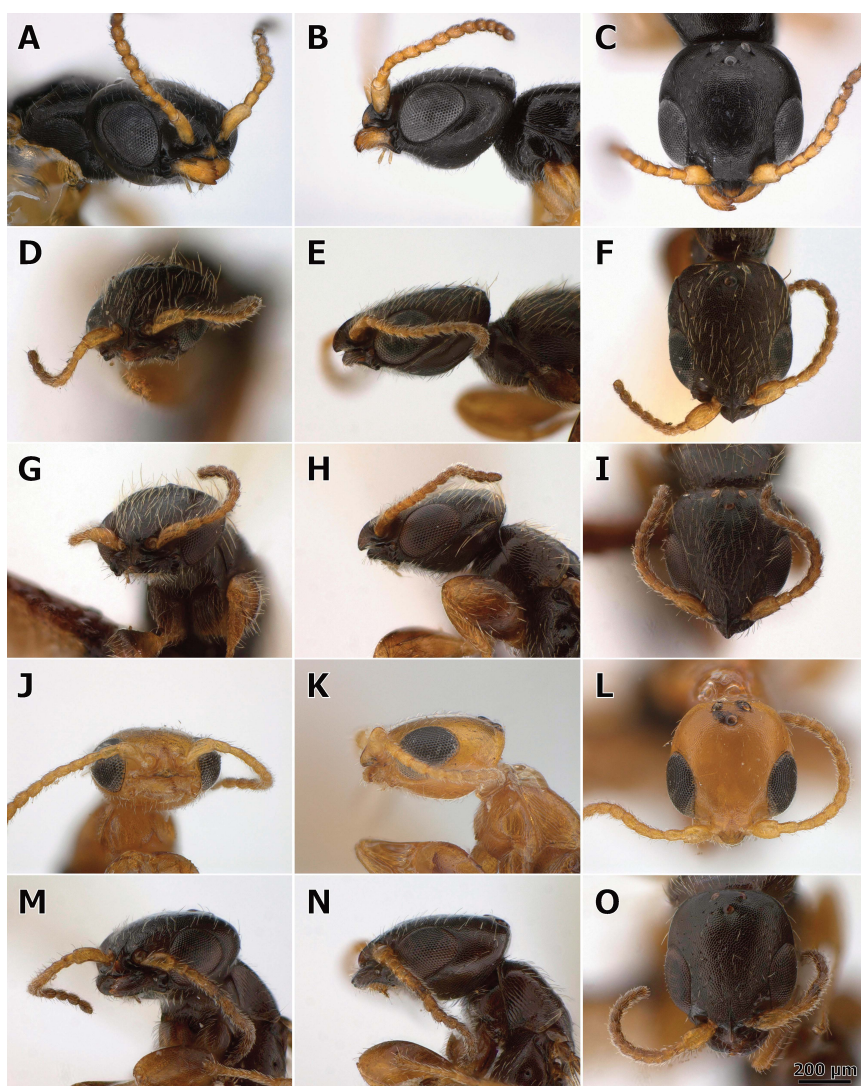


Figure 41. A–C: *Sierola urerae*. D–F: *Sierola usitata*. G–I: *Sierola vestita*. J–L: *Sierola vicina*. M–O: *Sierola waianaeana*.

pale, becoming darker over apical half. Mandible yellow except black near the articulation. Coxae and hind femur brown, other femora brown dorsally, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose to sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.00 mm; LT 1.00 mm; WH/LH 0.97; DH/LH 0.64; EV/HE 0.70; EV/WF 0.58; WF/HE 1.21; WH/WF 1.70; OOL/WOT 1.09; DT/LT 0.43; FL/FW 2.17; HFL/HFW 2.70; A3 L/W 1.80.

Type Material. Holotype ♀. O‘ahu: Mt. Ka‘ala, 14 Apr 1966, C.M. Yoshimoto, BPBM. 0000017941.

Paratypes: 1♀, Mt. Ka‘ala, 14 Apr 1966, J.W. Beardsley, BPBM. 1♀, near Pu‘u Kōnāhuanui 2800' [240 m] [850 m], 24 Mar 1982, W.D. Pereira, BPBM. 1♀, Kōnāhuanui 3100' [950 m], 27 Aug 1983, W.D. Pereira, BPBM. 2♂, Mt Ka‘ala summit, 4 Jul 1994, ex *Syzygium sandwicense*, A. Asquith, BPBM. 1♀, Mt Ka‘ala summit, 4 Jul 1994, A. Asquith, BPBM. 1♀ 1♂, Wai‘anae-Ka‘ala Tr. 3850' [1170 m],

21.5025°N 158.1492°W, 1 Aug 2013, under leaves, K.N. Magnacca, BPBM. 3♀ 2♂, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 10 Feb 2014, on *Melicope*, K.N. Magnacca, BPBM. 4♀ 1♂, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 14 May 2015, on *Broussaisia arguta*, K.N. Magnacca, NMNH. 1♀ 3♂, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 14 May 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 3♀ 1♂, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 14 May 2015, on *Melicope*, K.N. Magnacca, BPBM. 6♀, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 2 Jun 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 4♀ 2♂, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 28 Apr 2016, on *Broussaisia arguta*, K.N. Magnacca, BPBM. 7♀, Ka'ala summit, SE face 3850' [1170 m], 21.5017°N 158.1442°W, 4 May 2016, on *Melicope*, K.N. Magnacca, BPBM. 2♀, Ka'ala transect, 665 m 3850' [1170 m], 21.5028°N 158.1441°W, 11 Aug 2016, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 2♀ 3♂, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 9 Feb 2017, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 2♀, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 9 Feb 2017, on *Melicope*, K.N. Magnacca, BPBM. 7♀, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 9 Feb 2017, on *Broussaisia arguta*, K.N. Magnacca, HDOA. 4♀, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 16 May 2017, on *Melicope*, K.N. Magnacca, UHIM.

Etymology. From the Hawaiian *uhiwai*, heavy mist, referring to the usually foggy and rainy summit of Ka'ala where this species is abundantly found. It is a noun in apposition.

Distribution. Occurring only in cloud forests at the summits of Ka'ala and Kōnāhuanui. Large numbers have been collected recently, though only eight were taken before 2014 and none before 1966. Most specimens collected April–July.

Ecology. Found on a variety of plants, but most abundantly on *Cheirodendron trigynum* and *Melicope* sp. Males are found abundantly on the former but rarely on the latter. One female was observed chewing into a leaf mine in *Melicope*.

Discussion. The basal wing cell setation is somewhat variable, and often intermediate. This species forms a complex with the extremely similar *S. aniani* and *S. halona*. These may represent ecomorphs in the process of speciation. Those from the wet summits of Ka'ala and Kōnāhuanui consistently have the clypeal carina short and straight and the basal wing cells intermediate between sparsely and densely setose (*S. uhiwai*); those from lower elevation mesic forest have the clypeal carina curved and more elongate, and the wing cells sparsely setose (*S. halona*) or fully glabrous (*S. aniani*). The latter two share a distinctly more elongate and curved clypeus than the first. They are otherwise virtually identical in morphometrics and other characters.

Sierola urerae, n. sp.

Figure 41A–C, Map 34

Island. O'ahu.

Diagnosis. Belonging to the group of species with a sharp, somewhat strongly arched clypeal carina, basal wing cells sparsely setose, genal angle absent, frons microsculpture coriaceous to granular, and legs predominantly yellow. Separated from most similar species by the yellow mandible, which is parallel-sided or only weakly concave ventrally, frons densely punctate between the eyes, and head deep. Very similar to *S. manoa*, distinguished by having the frons setae short, vertex and genal setae not differentiated, clypeus rather short and steeply curved, head deeper (DH/LH 0.62–0.65 vs. 0.60–0.62), and fore femora extremely narrow (FL/FW ~2.40 vs. ~2.20).

Description. Female. *Head.* Clypeal process semicircular, apex rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart, or with shallow punctures, dense near the antennae, 2–3 pit widths apart above midpoint of eyes. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view

more or less straight; occipital margin narrowly rounded. Lateral ocelli distinctly separate from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence short, inconspicuous. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Body entirely dark brown to black, apex of clypeus and posterior corners of pronotum with orange to yellow spots. Antenna yellow, apical segments tinged with brown. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 2.06 mm; LT 1.00 mm; WH/LH 0.92; DH/LH 0.64; EV/HE 0.70; EV/WF 0.62; WF/HE 1.13; WH/WF 1.76; OOL/WOT 1.39; DT/LT 0.43; FL/FW 2.39; HFL/HFW 2.76; A3 L/W 1.50.

Type Material. Holotype ♀, O'ahu: Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Dec 2015, on *Urera glabra*, K.N. Magnacca, BPBM 0000017942.

Paratypes: 1 ♀, Makaleha, Mt. Ka'ala, 8 Jan 1922, O.H. Swezey, BPBM. 2 ♀, Makaleha, Mt. Ka'ala, 8 Jan 1922, O.H. Swezey, BPBM. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Jun 2014, on *Antidesma platyphyllum*, K.N. Magnacca, BPBM. 1 ♀, Wai'anāe, Kūmaipō gulch 4 2200' [670 m], 21.4990°N 158.1533°W, 12 Feb 2015, on *Urera glabra*, K.N. Magnacca, BPBM. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 15 Apr 2015, on *Pipturus albidus*, K.N. Magnacca, BPBM. 1 ♀, 'Ēkahanui, gulch 2D 2400' [730 m], 21.4389°N 158.0938°W, 5 May 2016, on *Passiflora*, K.N. Magnacca, BPBM. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 30 Jun 2016, on *Planchonella sandwicensis*, K.N. Magnacca, HDOA. 1 ♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 20 Jul 2016, on self, K.N. Magnacca, BPBM. 1 ♀, Central Kalua'ā Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Apr 2017, on *Pisonia sandwicensis*, K.N. Magnacca, NMNH. 1 ♀, Palikea 3000' [915 m], 21.4128°N 158.0997°W, 13 Sep 2017, on *Coprosma longifolia*, K.N. Magnacca, UHIM. 1 ♀ 2 ♂, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 26 Sep 2017, on *Urera glabra*, K.N. Magnacca, BPBM.

Etymology. Named for plant it is most commonly found on, *Urera glabra* (ōpuhe, Urticaceae).

Distribution. Known only from the Wai'anāe range, but the Ko'olau range has not been adequately searched for *Urera*.

Ecology. Apparently associated with *Urera glabra* (Urticaceae); nearly half the specimens were taken on it, while other species are found on it relatively infrequently. Swezey (1954) mentions a species of *Sierola* being reared from *Udea platyleuca* (Meyrick) (Crambidae), which feeds on *U. glabra*. However, those specimens could not be located to confirm the identity of the wasp. The only other *Sierola* reared from *Udea* is *S. manoa*, which is very similar to *S. urerae*.

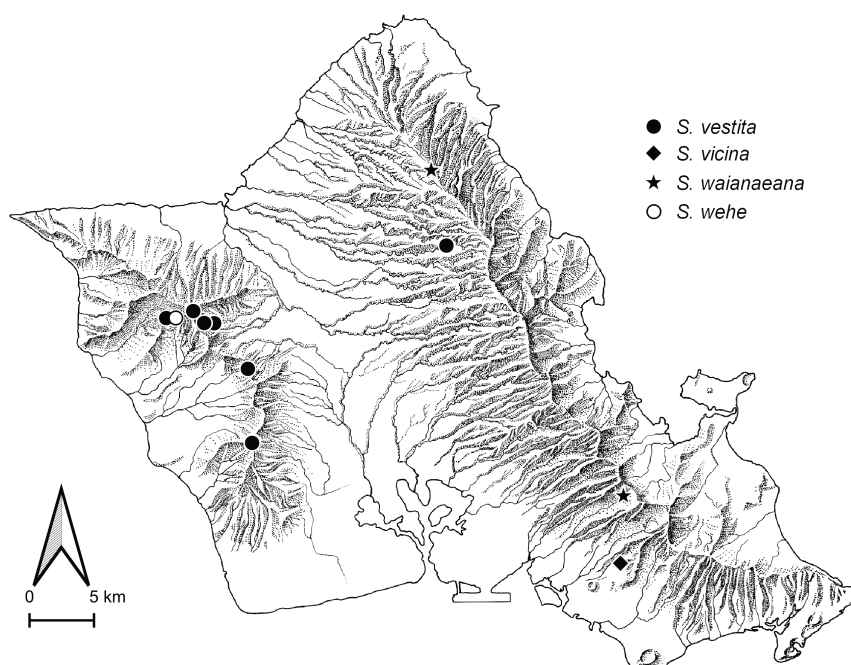
Sierola usitata Fullaway, 1920

Figure 41D–F, Map 34

Sierola usitata Fullaway, 1920: 87.

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Forming a species complex with *S. femoralis*, *S. hirticeps*, and *S. tenuis* based on having a broad hind femur (HFL/HFW 1.80–2.40) and the head narrow and elongate behind the eyes, OOL/WOT 1.33–



Map 35. Collection localities of *Sierola vestita*, *S. vicina*, *S. waianaeana*, and *S. wehe*.

1.55. Separated from those by the combination of a slightly deeper and broader head (WH/LH 0.76–0.82, DH/LH 0.53–0.54), dark brown to black mandible, and A3 at least slightly longer than wide.

Description. Female. Head. Clypeal process rounded triangular, apex weakly pointed; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, slightly expanded at base and apex, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena below eye concave. Postgenal depression very shallow, nearly absent. Antenna extending to anterior margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally finely, weakly striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 2.03 mm; LT 1.02 mm; WH/LH 0.77 (0.76–0.82); DH/LH 0.54 (0.53–0.54); EV/HE 0.83; EV/WF 0.75; WF/HE 1.11; WH/WF 1.68; OOL/WOT 1.37 (1.35–1.51); DT/LT 0.46; FL/FW 1.89 (1.88–2.00); HFL/HFW 2.27 (2.00–2.40); A3 L/W 1.17 (1.00–1.30). N = 5.

Type Material. Holotype ♀. O'ahu: Kaumuohona, 9 Sep 1917, P.H. Timberlake, BPBM Type 31.

Distribution. Rare, known only from five specimens, but from both the Ko'olau and Wai'anae ranges.

Discussion. Compared to *S. tenuis*, with which it overlaps in head width, the head behind the eyes is not so narrowed so it does not have the same distinctive appearance in dorsal or frontodorsal view. One paratype is a specimen of *S. olympiana*. See notes under *S. femoralis*.

Sierola vestita Fullaway, 1920

Figure 41G–I, Map 35

Sierola vestita Fullaway, 1920: 114.

Sierola robusta Fullaway, 1920: 124, n. syn.

Island. O'ahu.

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Similar to *S. olympiana*, *S. pano*, and related species based on the black mandible and moderately wide head (WH/LH 0.77–0.84). Distinguished by the combination of hyaline wings, moderately broad femora (FL/FW 1.80–1.95, HFL/HFW 2.20–2.45), and the third antennal segment short, 1.0–1.2 times as long as wide. These characters are shared with *S. opogonae*, but that species has the head broader and deeper (WH/LH 0.84–0.88, DH/LH 0.56–0.61). The color pattern of the legs is distinctive, with the femora predominantly dark but broadly yellow apically and usually with a conspicuous apicomedial yellow mark of varying size on the fore femur (also found in *S. pano*, which has infuscate wings and long antenna).

Description. Female. *Head.* Clypeal process triangular or rounded triangular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture dull, granular. Vertex in dorsal view more or less straight; occipital margin carinate. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute to right. Head narrowed behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles flat in lateral view, with moderately dense pubescence, not extending past the genal angle. Genal angle broadly rounded. Gena below eye flat. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence elongate, twice as long as flagellar width or more. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna brown, scape yellowish on median face. Mandible black. Coxae and basal 2/3 of femora brownish, legs otherwise yellow.

Wings. Membrane tinged with yellow. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.76 mm; LT 0.92 mm; WH/LH 0.83 (0.80–0.84); DH/LH 0.54 (0.54–0.56); EV/HE 0.64; EV/WF 0.60; WF/HE 1.07 (1.05–1.11); WH/WF 1.70 (1.65–1.75); OOL/WOT 1.40 (1.20–1.40); DT/LT 0.41; FL/FW 1.88 (1.80–1.94); HFL/HFW 2.26 (2.23–2.44); A3 L/W 1.10 (1.00–1.29). N = 13.

Type Material. Holotype ♀ of *Sierola vestita*. O'ahu: Wai'anae mountains, 5 Mar 1911, D.T. Fullaway, BPBM Type 84.

Holotype ♀ of *Sierola robusta*. O'ahu: 'Ōpae'ula, 30 Mar 1913, O.H. Swezey, BPBM Type 104.

Distribution. Found only in the Wai'anae range, taken mainly around Ka'ala and Palikea.

Discussion. The unique type of *S. robusta* matches *S. vestita* in all characters, including the distinctive triangular clypeus. See comments under *S. opogonae*.

Sierola vicina, n. sp.

Figure 41J–L, Map 35

Island. O'ahu.

Diagnosis. Superficially very similar to *S. olena* and *S. timberlakei*, as the three species on Oahu with the body predominantly yellow-testaceous. Distinctly different from both of those species by the rather weakly carinate clypeus, microreticulate metasoma, short frons setae, apparently sparsely setose basal wing cells, and distinctly elongate A3 (about 1.5–1.8 times as long as wide compared to 1.05–1.25 for the others). Other characters are a mix of the two: matching *S. timberlakei* in the all yellow mandible, rounded posterior corners of the head, WH/LH, and OOL/WOT, and like *S. olena* in the acute ocellar triangle front angle and HFL/HFW. FL/FW is on the boundary between the two.

Description. Female. Head. Clypeal process semi-elliptical, apex broadly rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space very small. Dorsal hairs of head shorter than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight, corners strongly rounded off; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression absent. Antenna extending to hind margin of pronotum.

Mesosoma. Pronotal pubescence short, inconspicuous. Metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Yellow, propodeum slightly darkened. Antenna entirely dull yellow. Mandible yellow. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.96 mm; LT 1.02 mm; WH/LH 0.90; DH/LH 0.58; EV/HE 0.70; EV/WF 0.67; WF/HE 1.05; WH/WF 1.82; OOL/WOT 1.37; DT/LT 0.36; FL/FW 2.00; HFL/HFW 2.80; A3 L/W 1.67.

Type Material. Holotype ♀ and allotype ♂. O'ahu: Mt. Tantalus, 10 Mar 1935, O.H. Swezey, BPB-MENT 0000017943.

Etymology. From the Latin *vicina*, neighbor, referring to both the similarity of this species to *S. timberlakei* and that the types of both were collected at Tantalus. It is a noun in apposition.

Distribution. Very rare, known only from the type collection from Tantalus in the southeastern Ko'olau range.

Discussion. At first glance this species appears nearly identical to *S. timberlakei*, and was previously included under it, but close inspection shows it differs in a number of key characters as listed in the diagnosis. The female holotype is not in good condition and the head has been reglued to the body, but all characters are visible.

Sierola waianaeana Fullaway, 1920

Figure 41M–O, Map 35

Sierola waianaeana Fullaway, 1920: 155.

Island. O'ahu.

Diagnosis. Very closely related and similar to *S. gracilariae*, including the distinct outwardly convex mandible. Differentiated by the sparsely setose basal wing cells (only one row of setae in cell 1Cu, but up to three in R) and less punctate frons. Among other species with sparsely setose wing cells, it can be separated by the very short, almost transverse clypeus, broad fore femur (FL/FW ~1.8) and coriaceous frons microsculpture.

Description. Female. Head. Clypeal process semi-elliptical or very short, almost transverse, extending only slightly beyond lateral portion of clypeus, apex broadly rounded; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow, slightly narrowed medially compared to base, ventral margin weakly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct punctures, dense near the antennae and eyes, 2–3 pit widths apart or more in central frons. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly acute to weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head weakly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Propodeal disc laterally shining, with weak microsculpture; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with smooth but distinct microreticulation over all terga. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna entirely dark brown to black. Mandible black. Legs all dark brown to black.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell.

Measurements. LFW 1.86 mm; LT 0.92 mm; WH/LH 0.86; DH/LH 0.55; EV/HE 0.77; EV/WF 0.71; WF/HE 1.09; WH/WF 1.75; OOL/WOT 1.50; DT/LT 0.34; FL/FW 1.82; HFL/HFW 2.00; A3 L/W 1.00.

Type Material. Holotype ♀. O'ahu: Wai'anae mountains, 5 Mar 1911, D.T. Fullaway, BPBM Type 165.

Distribution. Rare, known from only three specimens, but found in both the Wai'anae and Ko'olau ranges and as recently as 2014.

Discussion. The host associations are not known, but this species is apparently found in wetter sites than the similar *S. gracilariae*, and not in association with *Diospyros*.

Sierola weaweae, n. sp.

Figure 42A–C, Map 36

Island. O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate, short and steep in lateral view, and basal wing cells sparsely setose; close to *S. kilohana*, but readily distinguished by the small head, narrowed anteriorly, with the ocellar triangle distinctly obtuse and lateral ocelli close to the vertex. Very similar to *S. mahoe*, separated only by the open cell 2R1 and OOL/WOT slightly greater (1.55–1.75 vs. ~1.45).

Description. Female. *Head.* Clypeal process semi-elliptical to trapezoidal, apex broadly rounded to truncate; dorsally weakly carinate; in profile weakly sloping dorsally but strongly rounded and recurved at apex. Mandible moderately narrow at base, distinctly broader on apical half, ventral margin distinctly concave; apical half of mandible semicylindrical, teeth arrayed on frontal and dorsal surfaces, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view very slightly concave, corners strongly rounded off; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression absent. Antennae extending to mesonotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded, pronotal disc distinctly flattened. Pronotal pubescence longer than flagellar width. Ventral mesosoma moderately setose. Prosternum about 1.2–1.5 times as wide as long. Pit elongate. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with very faint microreticulation over posterior terga. Sixth sternum glabrous medially, with a mix of long and short setae laterally.

Color. Pronotum orange-brown, body otherwise dark brown to black (coloration variable, sometimes nearly all black with small pale areas). Antenna yellow, apical segments tinged with brown. Mandible yellow (brownish at the base). Legs yellowish brown.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Distal portion of vein Rs nearly straight but not quite meeting anterior wing margin, cell 2R1 partially open.

Measurements. LFW 1.77 mm; LM 0.83 mm; WH/LH 0.88 (0.83–0.88); DH/LH 0.58 (0.56–0.59); EV/HE 0.83 (0.83–0.94); EV/WF 0.69 (0.69–0.76); WF/HE 1.20 (1.17–1.23); WF/WH 1.64 (1.64–1.70); OOL/WOT 1.59 (1.57–1.73); DM/LM 0.39; FL/FW 2.00 (1.91–2.00); HFL/HFW 2.32 (2.11–2.32); A3 L/W 1.08 (1.08–1.30). N = 8.

Type Material. Holotype ♀. O'ahu: Ka'ala summit, NE face 3500' [1070 m], 21.5085°N 158.1403°W, 12 Sep 2013, on *Touchardia latifolia*, K.N. Magnacca, BPBM 2008013411.

Paratypes: 1♀, Tantalus 1300' [400 m], 4 Aug 1912, O.H. Swezey, BPBM. 4♀, Hale'au'au, 14 Sep 1930, O.H. Swezey, BPBM. 4♀, Hale'au'au, 14 Sep 1930, on *Myrsine*, O.H. Swezey, BPBM. 2♀,

Hale'au'au, 14 Sep 1930, on *Elaeocarpus bifidus*, O.H. Swezey, BPBM. 1♀, Hale'au'au, 14 Sep 1930, on *Melicope*, O.H. Swezey, BPBM. 1♀ 1♂, Hale'au'au, 14 Sep 1930, on *Acacia koa*, O.H. Swezey, BPBM. 1♀, Kukuiala Val., 16 Sep 1933, on *Elaeocarpus bifidus*, O.H. Swezey, BPBM. 1♂, Waiawa, 8 Jun 1921, O.H. Swezey, BPBM. 1♀, Hale'au'au, 13 Mar 1932, on *Elaeocarpus bifidus*, O.H. Swezey, BPBM. 1♀, Hale'au'au, 15 Oct 1933, on *Antidesma platyphyllum*, O.H. Swezey, BPBM. 3♀ 1♂, Hale'au'au, 28 Apr 1935, on ex *Diplazium arnottii*, O.H. Swezey, BPBM. 1♀, Kukuiala Val., 9 Feb 1936, on *Euphorbia*, O.H. Swezey, BPBM. 1♀, Central 'Ēkahanui Gulch: E of Pu'u Kaua 670 m [2200'], 10 Oct 1971, on *Urera glabra*, W.C. Gagné, BPBM. 1♀, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5025°N 158.1492°W, 1 Aug 2013, K.N. Magnacca, NMNH. 3♀ 1♂, Ka'ala summit, NE face 3500' [1070 m], 21.5085°N 158.1403°W, 12 Sep 2013, on *Touchardia latifolia*, K.N. Magnacca, NMNH. 1♀, Central Kalua'a Gulch 2200' [670 m], 21.4603°N 158.1004°W, 26 Jun 2014, on *Antidesma platyphyllum*, K.N. Magnacca, KNMC. 2♀, East Makaleha, culvert 69 3400' [1040 m], 21.5112°N 158.1484°W, 8 Sep 2014, on *Kadua centranthoides*, K.N. Magnacca, KNMC. 2♀, Pāhole Gulch, gulch 3 2050' [625 m], 21.5362°N 158.1862°W, 20 Oct 2014, on *Urera glabra*, K.N. Magnacca, BPBM. 1♀, Pāhole Gulch, gulch 3 2050' [625 m], 21.5362°N 158.1862°W, 20 Oct 2014, on *Euphorbia herbstii*, K.N. Magnacca, KNMC. 1♀, Palikea 3000' [915 m], 21.4145°N 158.0988°W, 9 Mar 2015, on *Pisonia brunoniana*, K.N. Magnacca, HDOA. 1♂, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 21 Dec 2016, on *Perrottetia sandwicensis*, K.N. Magnacca, HDOA. 1♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 24 Jan 2018, on *Perrottetia sandwicensis*, K.N. Magnacca, BPBM. 1♂, Palikea 3000' [915 m], 21.4150°N 158.0993°W, 21 Feb 2019, on *Kadua affinis*, K.N. Magnacca, KNMC.

Etymology. From the Hawaiian *we'awe'a*, streaked, spotted, or faded, referring to the variable coloration.

Distribution. Widespread in wet and mesic forest in the Wai'anae range, rare in the Ko'olau range.

Sierola wehe, n. sp.

Figure 42D–F, Map 35

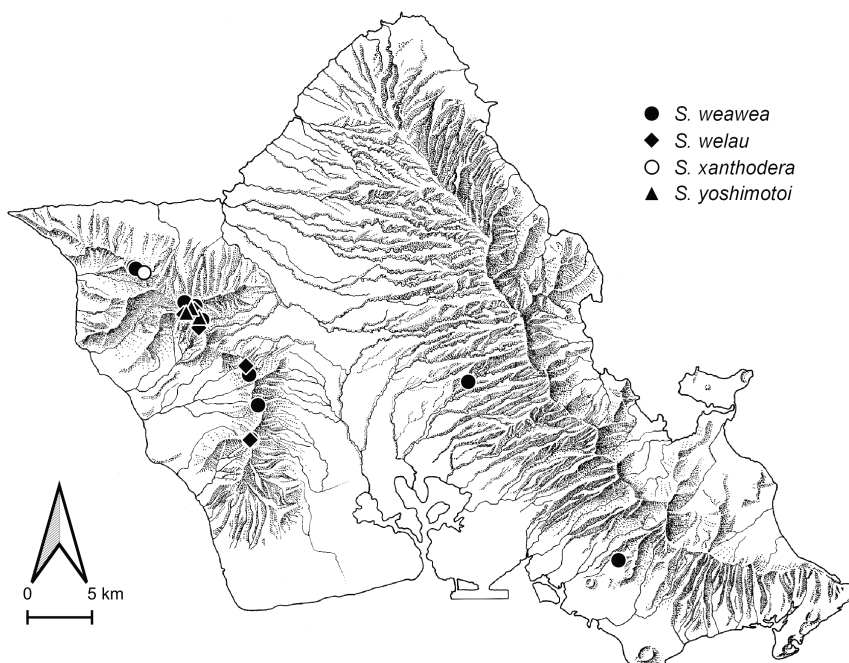
Island. O'ahu.

Diagnosis. The combination of smooth, sparsely punctate frons, weakly to sharply carinate clypeus, sparsely setose basal wing cells, and strongly obtuse ocellar triangle separates this species from most others. Distinguished from the remainder by having cell 2R1 partially open, a character otherwise found only in *S. weaweae* and *S. welau* which are very different.

Description. Female. Head. Clypeal process semi-elliptical, apex rounded; dorsally with a sharp carina, or weakly carinate; in profile evenly curved from the base to the apex, apical angle slightly acute. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with moderately close punctures between antennae and midpoint of eyes, 1–3 pit widths apart, sparse above. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture evident but smooth, shining. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle strongly obtuse. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antennae extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence about as long as flagellar width or scarcely longer. Ventral mesosoma moderately setose. Prosternum about 1.2–1.5 times as wide as long. Pit large and triangular, very shallow. Propodeal disc laterally finely, weakly striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum glabrous medially, with a mix of long and short setae laterally.



Map 36. Collection localities of *Sierola weaweae*, *S. welau*, *S. xanthodera*, and *S. yoshimotoi*.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible reddish brown to orange. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing sparsely setose, with one or two rows of setae in each cell. Distal portion of vein Rs nearly straight but not quite meeting anterior wing margin, cell 2R1 partially open.

Measurements. LFW 1.58 mm; LM 0.76 mm; WH/LH 0.88; DH/LH 0.55; EV/HE 0.68; EV/WF 0.64; WF/HE 1.06; WF/WH 1.76; OOL/WOT 1.33; DM/LM 0.35; FL/FW 1.87; HFL/HFW 2.20; A3 L/W 1.09.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, W. side, 1 Jun 1919, O.H. Swezey, BPBMENT 2008013412.

Etymology. From the Hawaiian *wehe*, to go away, referring to the lack of recent collections of this species.

Distribution. Known only from the type collection in 1919, at Ka'ala.

Discussion. A second specimen collected on the same day may also be this species; it is distinctly larger, the mandibles are broader and concave ventrally, and the clypeus is less prolonged anteriorly in profile, but there are no clear characters for separating them. It is not considered a paratype.

***Sierola welau*, n. sp.**

Figure 41G–I, Map 36

Diagnosis. Belonging in the group of species with a highly arched, thin clypeal carina, strong, conspicuous vertex and genal setae, and densely punctate frons. Nearly identical to *S. hirsuta* in having moderately narrow head (WH/LH 0.77–0.80) and yellow to orange mandibles and legs. Distinguished by having cell 2R1 open (Rs vein not quite meeting anterior wing margin), slightly larger OOL/WOT (1.40–1.55 vs. 1.10–1.40), and usually broader hind

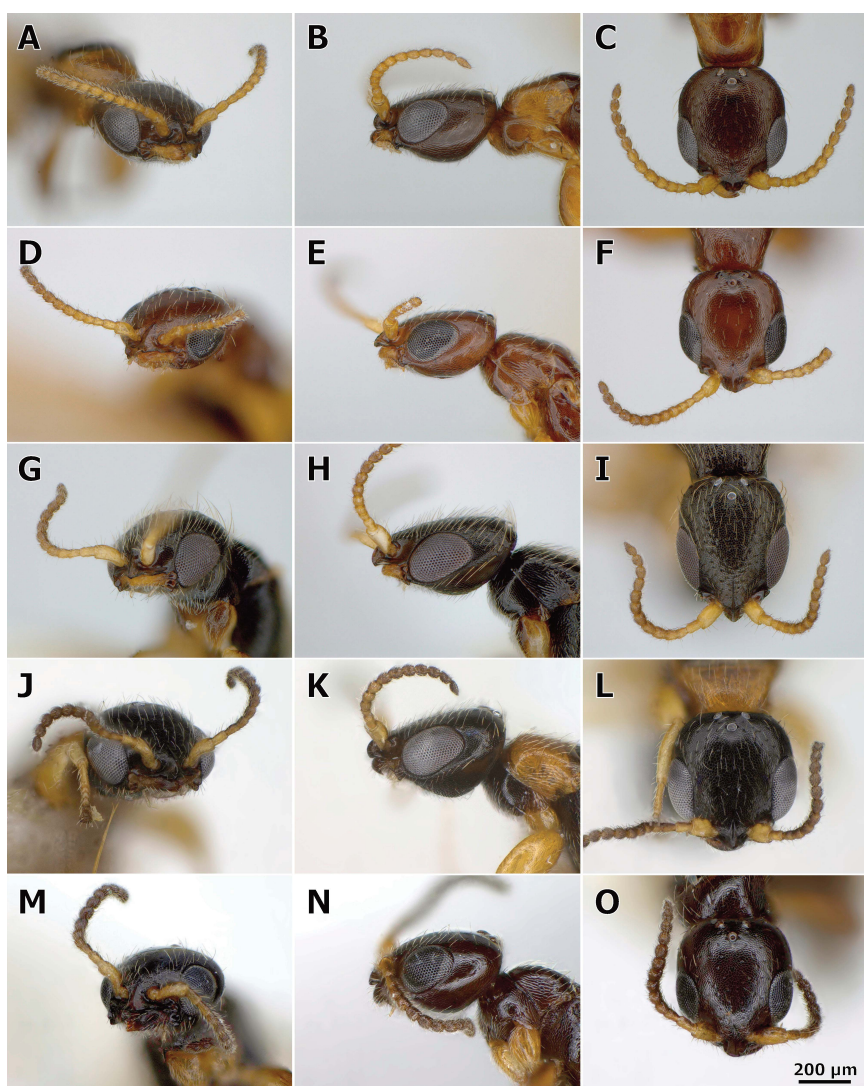


Figure 42. A–C: *Sierola weawea*. D–F: *Sierola wehe*. G–I: *Sierola welau*. J–L: *Sierola xanthodera*. M–O: *Sierola yoshimotoi*.

femora (2.15–2.57 vs. 2.53–2.86, typical specimens much different) which are usually distinctly brownish rather than all yellow.

Description. Female. Head. Clypeal process rounded triangular to semicircular, apex rounded; dorsally with a thin, laminar carina, the sides strongly concave; in profile strongly arched, vertical or slightly recurved at the apex, carina extending above antennal sockets. Mandible narrow, more or less parallel-sided except at base; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with equally strong teeth. Malar space almost absent. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, close punctures, mostly about 1 pit width apart. Vertex and genal setae conspicuous, nearly twice as long as setae of frons and stronger, erect and directed forward. Frons microsculpture coriaceous, matte but without strong surface texture. Vertex in dorsal view more or less straight; occipital margin not carinate but forming a pro-

nounced ridge. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view slightly convex, head deepest beneath eye. Venter of head behind mandibles flat in lateral view, with relatively sparse setae. Head evenly convex ventrally, genal angle absent. Gena below eye flat. Postgenal depression absent. Antennae extending to hind margin of pronotum.

Mesosoma. In lateral view anterior margin of pronotum evenly rounded. Pronotal pubescence longer than flagellar width. Ventral mesosoma moderately setose. Prosternum about 1.2–1.5 times as wide as long. Pit circular. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible orange to yellow. Hind coxa and femur brown except at apices, fore and mid femora tinged with brown dorsally, legs otherwise yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose. Distal portion of vein Rs nearly straight but not quite meeting anterior wing margin, cell 2R1 partially open.

Measurements. LFW 1.77 mm; LM 0.88 mm; WH/LH 0.77 (0.77–0.80); DH/LH 0.53 (0.52–0.55); EV/HE 0.71 (0.63–0.79); EV/WF 0.72 (0.65–0.79); WF/HE 0.98 (0.98–1.01); WF/WH 1.69 (1.69–1.74); OOL/WOT 1.44 (1.40–1.53); DM/LM 0.40; FL/FW 1.96 (1.87–2.00); HFL/HFW 2.41 (2.15–2.57); A3 L/W 1.20 (1.20–1.23). N = 9.

Type Material. Holotype ♀, O'ahu: Palikea 3000' [915 m], 21.4150°N 158.0993°W, 24 Jul 2017, on *Melicope*, K.N. Magnacca, BPBM 2008013413.

Paratypes: 1♀, Pu'u Hāpapa 2650' [810 m], 21.4665°N 158.1028°W, 15 Jul 2014, on *Pisonia umbellifera*, K.N. Magnacca, BPBM. 1♀, Ka'ala-Kalena crestline 3100' [950 m], 21.4933°N 158.1379°W, 22 Apr 2015, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM. 1♀, Ka'ala-Kalena crestline 3100' [950 m], 21.4933°N 158.1379°W, 22 Apr 2015, on *Ilex anomala*, K.N. Magnacca, NMNH. 1♀, Ka'ala summit, E face 3950' [1200 m], 21.5057°N 158.1412°W, 2 Jun 2015, on *Labordia*, K.N. Magnacca, NMNH. 1♀, Palikea 3000' [915 m], 21.4146°N 158.0999°W, 9 Apr 2016, on *Antidesma platyphyllum*, K.N. Magnacca, HDOA. 1♀, Wai'anae-Ka'ala Tr. 3850' [1170 m], 21.5028°N 158.1491°W, 28 Apr 2016, on *Broussaisia arguta*, K.N. Magnacca, HDOA. 2♀, Ka'ala transect, 665 m 3850' [1170 m], 21.5028°N 158.1441°W, 11 Aug 2016, on *Cheirodendron trigynum*, K.N. Magnacca, BPBM.

Etymology. From the Hawaiian *wēlau*, tip or extremity, referring to the collections of this species all coming from the higher peaks of the Wai'anae range.

Distribution. Found in the Wai'anae range on the higher peaks of Ka'ala, Palikea, and Pu'u Hāpapa.

Sierola xanthodera, n. sp.

Figure 42J–L, Map 36

Island. O'ahu.

Diagnosis. Bicolored, with the clypeus weakly carinate and basal wing cells densely setose. Readily distinguished from similar species (*S. similis* and *S. centralis*) by the peculiar bulbous clypeus and presence of a slight genal angle. In all known specimens only the pronotum is yellow whereas the entire prothorax is yellow in the other species, but this may be variable.

Description. Female. Head. Clypeal process semicircular, apex rounded; dorsally weakly carinate, or with a rounded carina; in profile strongly arched, vertical or slightly recurved at apex, carina extending above antennal sockets, or weakly sloping dorsally but strongly rounded and recurved at apex. Mandible narrow, expanded at base and apex, ventral margin distinctly concave; not twisted, outwardly coriaceous, somewhat dull; in ventral view evenly, moderately curved. Apex of mandible vertical, with second ventral tooth largest. Malar

space very small. Dorsal hairs of head distinctly longer than flagellar width. Frons with shallow, uneven punctures, 1–3 pit widths apart. Vertex and genal setae distinctly longer than frons setae but only about as thick, not particularly conspicuous. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin narrowly rounded. Lateral ocelli nearly touching vertex. Ocellar triangle front angle weakly acute. Head rounded shortly behind eyes. Dorsum of head in lateral view slightly convex or nearly flat, head deepest beneath eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Genal angle broadly rounded, or absent, head strongly convex ventrally. Postgenal depression narrow but distinct, V-shaped. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae present posteriorly, fading anteriorly. Fore femur robust, about twice as long as high and strongly convex dorsally, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Shining, with faint microsculpture laterally. Sixth sternum broadly glabrous medially, with sparse setae laterally.

Color. Pronotum yellow, body otherwise dark brown to black. Antenna with scape and pedicel yellow, flagellum brown. Mandible reddish brown. Legs all yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.74 mm; LT 0.86 mm; WH/LH 0.91; DH/LH 0.57; EV/HE 0.66; EV/WF 0.60; WF/HE 1.09; WH/WF 1.75; OOL/WOT 1.30; DT/LT 0.42; FL/FW 1.92; HFL/HFW 2.38; A3 L/W 1.40.

Type Material. Holotype ♀. O'ahu: Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 31 Mar 2016, on *Elaeocarpus bifidus*, K.N. Magnacca, BPBMNT 0000017944.

Paratypes: 1 ♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 6 Jul 2014, on *Myrsine lessertiana*, K.N. Magnacca, BPBM. 1 ♀, Kapuna, Mokulē'ia Tr. 2100' [640 m], 21.5321°N 158.1786°W, 18 Oct 2017, on *Elaeocarpus bifidus*, K.N. Magnacca, NMNH.

Etymology. From the Greek *xantho*, yellow, and *dero*, neck, for the striking orange-yellow pronotum. It is an adjective in the nominative singular.

Distribution. Known from four specimens, all taken in Kapuna Gulch in the Wai'anae range.

Discussion. The frons punctation is extremely shallow and difficult to see. This species shares with *S. rugiventris* the unusually coarse sculpting of the underside of the head.

Sierola yoshimotoi, n. sp.

Figure 42M–O, Map 36

Island. O'ahu.

Diagnosis. Separated from most species in the group with a sharp clypeal carina and densely setose basal wing cells by the moderately broad, distinctly concave mandible and lack of a genal angle. Most similar to *S. subcrispa*; distinguished from that species by having the head strongly convex above and deeper (DH/LH ~0.59), without dense punctures between the eyes, and from *S. koolauensis* and *S. granulosa* by the shorter head behind the eyes (EV/HE 0.70–0.90) and longer antenna.

Description. Female. Head. Clypeal process semicircular or quadrate, apex broadly rounded or truncate; dorsally with a sharp carina; in profile evenly curved from base to apex, apical angle slightly acute. Mandible moderately broad, distinctly narrowed medially and expanded at apex, ventral margin concave; not twisted, outwardly shining but with distinct, fine microsculpture; in ventral view weakly curved, or obtusely elbowed. Apex of mandible vertical, with teeth distinctly stronger ventrally. Malar space almost absent. Dorsal hairs of head about as long as flagellar width or scarcely longer. Frons with distinct, uneven punctures, 1–3 pit widths apart. Vertex and genal setae similar to and only slightly longer than setae of frons. Frons microsculpture finely microreticulate, surface weakly matte. Vertex in dorsal view more or less straight; occipital margin broadly rounded. Lateral ocelli distinctly separate

from vertex by less than ocellus length. Ocellar triangle front angle weakly acute. Head more or less parallel-sided for some distance before posterior corners. Dorsum of head in lateral view strongly convex, head deepest beneath hind margin of eye. Venter of head behind mandibles convex in lateral view, with relatively sparse setae. Head strongly convex ventrally, genal angle absent. Postgenal depression very shallow, nearly absent. Antenna extending to pronotum.

Mesosoma. In lateral view anterior margin of pronotum weakly angulate. Pronotal pubescence longer than flagellar width. Propodeal disc laterally coarsely striate; metapleural carinae complete. Fore femur only moderately expanded, more than twice as long as high, strongly laterally compressed, slightly arcuate in dorsal view.

Metasoma. Highly polished, without a trace of microsculpture. Sixth sternum narrowly glabrous medially, laterally with dense pilose setae.

Color. Body entirely dark brown to black. Antenna with scape and base of flagellum pale, becoming darker over apical half. Mandible black. Fore coxa and femur yellow except dorsal margin of femur, mid and hind femora brown, tibiae, tarsi, and trochanters yellow.

Wings. Membrane hyaline. Basal cells of fore wing densely and conspicuously setose.

Measurements. LFW 1.81 mm; LT 0.89 mm; WH/LH 0.84; DH/LH 0.59; EV/HE 0.81; EV/WF 0.70; WF/HE 1.16; WH/WF 1.70; OOL/WOT 1.30; DT/LT 0.41; FL/FW 2.53; HFL/HFW 2.59; A3 L/W 1.33.

Type Material. Holotype ♀. O'ahu: Mt. Ka'ala, 14 Apr 1966, C.M. Yoshimoto, BPBM 0000017945.

Paratypes: 1♀, Mt. Ka'ala, 22 Jul 1917, J.C. Bridwell, BPBM. 1♀, Mt. Ka'ala 4000' [1220 m], 10 Nov 1965, J.W. Beardsley, BPBM.

Etymology. Named for the collector, Carl Yoshimoto, who made many contributions to the study of parasitoid wasps in Hawai'i.

Distribution. Known from four specimens from the summit region of Ka'ala.

Nomen dubium in *Sierola* Cameron

Sierola nitida Fullaway, 1920

Sierola nitida Fullaway, 1920: 77, *nomen dubium*.

Island. O'ahu.

Diagnosis. The holotype is missing, and not distinguishable based on the description. See discussion below.

Description. Female. "Brilliant black, antenna, tibiae, and tarsi brown to fuscous. Head and thorax with a delicate surface sculpture, uniformly closely and distinctly punctate and hairy. Head almost as wide as long, widest directly behind the eyes, narrowing behind and in front, width between the eyes a little more than the distance from the eye to the vertical margin; flat above, somewhat tumid beneath, deepest behind the eyes but without great depth; vertical margin slightly concave, temples rounded, eyes flat; antenna scarcely longer than the head, all the segments beyond the pedicel as wide as or wider than long, the pedicel a little longer than wide, antennal fossae fairly deep; clypeal process short and stout, bluntly spicate, convex above, extending little beyond the anterior margin of the head; mandibles long, slender, curved and toothed apically, base not quite reaching the eye; cheeks very narrow; gula and sides of the head flat, the former foreshortened, as wide as long; propodeum finely rugulose; abdomen elongate ovate, smooth and polished; wings hyaline; length 3 mms." (Fullaway 1920)

Type Material. Holotype ♀. O'ahu: Tantalus 1500' [460 m], 27 Aug 1918, W.M. Giffard, BPBM Type 12.

Discussion. The pin and label of the unique holotype are present, but the specimen is missing. Since the description could apply to multiple existing or new species (especially considering Fullaway's poorly-defined character states), but do not clearly match any, and there is no overriding need to define the species for the purpose of stability, no neotype is designated and *S. nitida* is considered a *nomen dubium*.

ACKNOWLEDGEMENTS

Many people helped make this work possible. For assistance with visiting collections, I thank David Notton at the Natural History Museum, London; Seán Brady and Brian Harris at the Smithsonian National Museum of Natural History; Federica Turco, Juanita Rodriguez, Nicole Fisher, and Laurence Mound at the Australian National Insect Collection; Christopher Grinter at the California Academy of Sciences; Darren Ward at the New Zealand Arthropod Collection; Janis Matsunaga at the Hawai‘i Department of Agriculture; and Daniel Rubinoff at the University of Hawai‘i Insect Museum. Thanks to Neal Evenhuis of the Bishop Museum, Paul Krushelnicky of the University of Hawai‘i, and Luc Leblanc of the University of Idaho for specimens, and thanks to the late Otto Swezey for his collections and enormous contributions to the knowledge of Hawaiian insects. Collecting permits were obtained thanks to Cynthia King, Betsy Gagné, Ryan Peralta, Marigold Zoll, and Charmian Dang of the Hawai‘i Division of Forestry and Wildlife. Mahalo nui to Makanani Akiona and Kaia Kong for assistance with Hawaiian names. Finally, I especially thank the entomology staff of the Bishop Museum, Neal Evenhuis, James Boone, Keith Arakaki, Tracie Mackenzie, and Shepherd Myers, for facilitating my work there over the six years it took to produce this monograph; the security staff of the Bishop Museum, who graciously put up with my late hours working there; and Kapua Kawelo and Jobriath Rohrer of the O‘ahu Army Natural Resources Program for giving me the opportunity to visit so many remote sites in the Wai‘anae mountains, without which many of the species here would remain undiscovered.

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Appendix. Specimens Examined in this Study

Localities and taxa are written as on the label, without italics or diacritics. The letter before coordinates indicates whether the location source is a GPS waypoint (W, accuracy 10–30 m) or estimated based on the locality name (E, potential error of 1–3 km). Collectors' names are abbreviated as follows: AA = Adam Asquith; AK = Albert Koebele; CMY = Carl M. Yoshimoto; DA = Donald Ashdown; DF = D. Fujii; DTF = David T. Fullaway; DEH = D. Elmo Hardy; DMT = Dick M. Tsuda; EHB = Edwin H. Bryan; EFD = E. F. Drake; ED = E. Desner; EIJF = Ernest J. Ford; ET = E. Tagawa; ECZ = Elwood C. Zimmerman; FXW = Francis X. Williams; GBM = Gordon B. Mainland; GKU = Grant K. Uchida; JWB = John W. Beardsley; JCB = John C. Birdwell; JLG = J. Linsley Gressitt; JK = Jacob Kotinsky; JS = John Straznec; JT = J. Tenorio; KNM = Karl N. Magnacca; LL = Luc Leblanc; LWQ = Larry W. Quate; NLE = Neal L. Evenhuis; NLHK = Noel L.H. Krauss; NS = N. Seto; OHS = Otto H. Swezey; OW = O. Whittaker; PDK = Paul D. Krushelnysky; PHT = Philip H. Timberlake; REL = Robin E. Leech; RCLP = Robert C.L. Perkins; SLM = Steven L. Montgomery; SN = Setsuo Nakata; TB = Thomas Blackburn; TCM = Tsing-chao Maa; WCG = Wayne C. Gagné; WMG = William M. Giffard; WPH = William P. Haines; WDP = William D. Perreira.

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
RCLP	Oahu	[no date]	Honolulu Mts.				acuta	1		BPBM	E 21.3374	-157.8105	
OHS	Oahu	22 May 1906	Honolulu, HSPA station			bred from budworm of cane?	acuta	1		HDOA	E 21.3037	-157.8369	head missing; no collector, writing appears to be Swezey's
OHS	Oahu	27 Mar 1908	HSPES			behind cane leaf-sheath	acuta	2		HDOA	E 21.3037	-157.8369	
OHS	Oahu	27 Mar 1908	HSPA Exp. Sta.			collected behind leaf-sheath of cane on station grounds	acuta	2		BPBM	E 21.3037	-157.8369	paratype; has ID label for <i>S. molokaiensis</i>
PHT	Oahu	18 Jul 1916	HSPA Exp. Sta.			collected on window	acuta	1		BPBM	E 21.3037	-157.8369	holotype
JWB	Oahu	20 Jun 1961	Waipio			light trap	acuta	1		BPBM	E 21.4710	-158.0100	
JCB	Oahu	10 Jul 1966	U. of H. grounds			light trap	acuta		1	BPBM	E 21.3003	-157.8166	
PHT	Oahu	22 Dec 1918	Kuliouou				a finis	1		BPBM	E 21.3160	-157.7233	holotype
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				a finis	1		BPBM	E 21.5024	-158.1565	
OHS	Oahu	14 Sep 1930	Haleaiau			Eleocharpus	a finis	1		BPBM	E 21.4988	-158.1353	
KNM	Oahu	14 Feb 2012	Makaha, Camp Ridge	2300	700	beating vegetation	a finis	1		BPBM	W 21.5019	-158.1690	
KNM	Oahu	16 Feb 2012	Palikea	2900	885	beating vegetation	a finis	1		BPBM	W 21.4158	-158.0993	
KNM	Oahu	30 Oct 2012	Lanihuli Trail	1800	550	on Scaevola gaudie haudiana	a finis	1		BPBM	W 21.3567	-157.8286	
KNM	Oahu	28 May 2014	North Puuli Guk'h	2100	640	on Claoxylon sandwicense	a finis	1		BPBM	W 21.4249	-158.0910	
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Psychotria hahewayi	a finis	1		NNNH	W 21.4146	-158.0999	
KNM	Oahu	21 Dec 2017	Palikea	3000	915	on Kadua affinis	a finis	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	7 Feb 2018	Makaha, unit 1	2300	700	on Nestegis sandwicensis	a finis	1		KNMC	W 21.5012	-158.1678	
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on Coprosma longifolia	a finis	1		KNMC	W 21.4125	-158.1004	
KNM	Oahu	15 Jan 2019	Pahoale-Kahana haiki ridge	2150	655	on Acacia koa	a finis	1		BPBM	W 21.5398	-158.1930	
KNM	Oahu	4 Sep 2012	Waimano Trail	1100	335	sweeping Freycinetia arborea	akahikina	1		BPBM	W 21.4324	-157.9061	holotype
OHS	Oahu	6 Jan 1923	Tantalus			on bark of tree	ahala	1		BPBM	E 21.3286	-157.8250	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
JNB	Oahu	4 Jul 1956	Mt. Tantalus				alaba	1		BPBM	E 21.3286	-157.8250	paratype
JLG	Oahu	24 Aug 1963	Mt. Tantalus				alaba	1		BPBM	E 21.3286	-157.8250	holotype
WCG	Oahu	1 Nov 1968	Kapalama Trail	800	240	Ilex anomala	alaba	1		BPBM	E 21.3430	-157.8527	paratype
KNM	Oahu	24 Feb 2012	North Haleauau Gulch	2350	720	on Disopyros	alba	1	1	BPBM	W 21.5066	-158.1297	paratype
KNM	Oahu	4 Sep 2012	Waimano Trail	1100	335	sweeping Freycinetia arborea	alba	1	1	BPBM	W 21.4324	-157.9061	paratype
KNM	Oahu	6 Jun 2013	Ohikilolo	2900	885	on Metrosideros polymorpha	alba	1		BPBM	W 21.5133	-158.1930	paratype
KNM	Oahu	21 May 2014	Puu Hapapa	2650	810	on Psychotria maritima	alba	1	1	BPBM	W 21.4665	-158.1028	paratype
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Psionia sandwicensis	alba	1	2	BPBM	W 21.5321	-158.1786	paratype
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Xylosma hawaiiense	alba	1		BPBM	W 21.5321	-158.1786	paratype
KNM	Oahu	24 Mar 2015	Pulee, Coffee Gulch	1900	580	on Labordia kaalae	alba	1		BPBM	W 21.5108	-158.1230	paratype
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on Coprosma longifolia	alba	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on Xylosma hawaiiense	alba	1		KNMC	W 21.5321	-158.1786	holotype and allotype
KNM	Oahu	9 Apr 2016	Palikea	3000	915	on Coprosma longifolia	alba	1	1	BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	9 Apr 2016	Palikea	3000	915	on Coprosma longifolia	alba	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	8 Jun 2016	Ohikilolo	2900	885	sweeping	alba	1	1	BPBM	W 21.5133	-158.1930	paratype
KNM	Oahu	30 Jun 2016	Central Kaluaa Gulch	2200	670	on Psionia	alba	1		BPBM	W 21.4603	-158.1004	paratype
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on Cheirodendron trigynum	alba	1	1	BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on Coprosma longifolia	alba	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	21 Jul 2016	Puu Hapapa	2650	810	on Labordia kaalae	alba	1		KNMC	W 21.4665	-158.1028	paratype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Coprosma longifolia	alba	2		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Cheirodendron trigynum	alba	1	2	BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Coprosma longifolia	alba	1		NMNH	W 21.4146	-158.0999	paratype
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Perrottetia sandwicensis	alba	1	1	NMNH	W 21.4146	-158.0999	paratype
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Kaula affinis	alba	1	1	NMNH	W 21.4146	-158.0999	paratype
KNM	Oahu	23 Nov 2016	Palikea	3000	915	on Coprosma longifolia	alba	2		HDOA	W 21.4155	-158.0995	paratype
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on Perrottetia sandwicensis	alba	1		HDOA	W 21.4150	-158.0993	paratype
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on Cheirodendron trigynum	alba	1		HDOA	W 21.4155	-158.0995	paratype
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on Coprosma longifolia	alba	5	2	KNMC	W 21.4155	-158.0995	paratype
KNM	Oahu	10 Jan 2017	Palikea	3000	915	on Coprosma longifolia	alba	1		UHM	W 21.4150	-158.0993	paratype
KNM	Oahu	23 Jan 2017	Palikea	3000	915	on Coprosma longifolia	alba	1		UHM	W 21.4150	-158.0993	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	22 Feb 2017	Palikea	3000	915	on <i>Kadua</i> affinis	alba	1		UHM	W	21.4150	-158.0993
KNM	Oahu	22 Feb 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba	1	1	UHM	W	21.4150	-158.0993
KNM	Oahu	16 May 2017	Waianae-Kaala Tr.	3850	1170	on <i>Brusselsia arguta</i>	alba		1	KNMC	W	21.5028	-158.1491
KNM	Oahu	22 Jun 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba	2		BPBM	W	21.4155	-158.0995
KNM	Oahu	24 Jul 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba	8	1	KNMC	W	21.4155	-158.0995
KNM	Oahu	13 Sep 2017	Palikea	3000	915	on <i>Coprosma foliosa</i>	alba		1	KNMC	W	21.4128	-158.0997
KNM	Oahu	26 Sep 2017	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	alba		4	KNMC	W	21.4146	-158.0999
KNM	Oahu	26 Sep 2017	Palikea	3000	915	on <i>Ureia glabra</i>	alba		3	KNMC	W	21.4146	-158.0999
KNM	Oahu	12 Oct 2017	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	alba		1	KNMC	W	21.4146	-158.0999
KNM	Oahu	19 Oct 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba	3		KNMC	W	21.4146	-158.0999
KNM	Oahu	26 Oct 2017	Puu Hapapa	2650	810	on <i>Psychotria hawaiiensis</i>	alba		10	KNMC	W	21.4665	-158.1028
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	alba	2		BPBM	W	21.4150	-158.0993
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	alba		4	KNMC	W	21.4155	-158.0995
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba		2	KNMC	W	21.4155	-158.0995
KNM	Oahu	21 Dec 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba		1	KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Ureia glabra</i>	alba	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Cheiriodendron trigynum</i>	alba	2		KNMC	W	21.4155	-158.0995
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Coprosma longifolia</i>	alba		1	KNMC	W	21.4155	-158.0995
KNM	Oahu	17 Jan 2019	Palikea	3000	915	on <i>Kadua</i> affinis	alba	2		BPBM	W	21.4150	-158.0993
KNM	Oahu	23 Apr 2019	Palikea	3000	915	on <i>Cheiriodendron trigynum</i>	alba	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	19 Jun 2019	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	alba	1		KNMC	W	21.4155	-158.0995
EHB	Oahu	28 Feb 1920	Pakolo Cr.			alelo	alelo	1		BPBM	E	21.3266	-157.7728
DTF	Oahu	1 Apr 1917	Nuuanu Pali			anemophila	anemophila	1		BPBM	E	21.3671	-157.7928
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on <i>Psychotria hawaiiensis</i>	anemophila	1		BPBM	W	21.4665	-158.1028
RCLP	Oahu	Apr 1892	Waianae Mts. [above Waialua]	2000-3000	610-915	aniani	aniani	1		NHMLUK	E	21.5206	-158.1455
OHS	Oahu	28 Apr 1935	Halea'u			Antidesma	aniani	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	28 Apr 1935	Halea'u			Antidesma	aniani	1		BPBM	E	21.4988	-158.1353
WAG	Oahu	22 Dec 1918	Tanahou	1500	460	anthracina	anthracina	1	1	HDOA	E	21.3366	-157.8000
NLHC	Oahu	20 Feb 1944	Manoa			anthracina	anthracina	2	1	BPBM	E	21.3366	-157.8000

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
JWVB	Oahu	4 Jul 1956	Mt. Tantalus				anthracina	1	2	BPBM	E 21.3286	-157.8250	
SN	Oahu	11 Dec 1962	Aiea Hts.				anthracina	1		BPBM	E 21.3970	-157.9085	allotype and paratype of <i>S. seminigra</i>
OHS	Oahu	23 Jan 1909	Pauoa Valley				aristote liae	1	1	BPBM	E 21.3342	-157.8237	paratype of <i>S. seminigra</i>
DTF	Oahu	14 Jan 1912	Mt. Olympus				aristote liae	1		HDOA	E 21.3357	-157.7792	paratype of <i>S. seminigra</i>
DTF	Oahu	8 Sep 1912	Paloalo Valley				aristote liae	1		HDOA	E 21.3342	-157.8237	paratype of <i>S. seminigra</i>
OHS	Oahu	11 Jan 1914	Paloalo			reared from larva of <i>Aristotelia</i> infesting <i>Gouardia</i> fruit (date is collection date)	aristote liae	4		BPBM	E 21.3206	-157.7768	holotype and paratypes
DTF	Oahu	14 Jan 1917	Cooke's trail, Nuuanu Valley				aristote liae	1		BPBM	E 21.3480	-157.8056	holotype of <i>S. seminigra</i>
DTF	Oahu	14 Jan 1917	Cooke's trail, Nuuanu Valley				aristote liae	1		HDOA	E 21.3480	-157.8056	paratype
JCB	Oahu	9 Sep 1917	SE Koolau Mts.				aristote liae	1		BPBM	E 21.3456	-157.8015	paratype
PHT	Oahu	29 Mar 1918	Manoa Cliffs				aristote liae	1		missing	E 21.3305	-157.8093	paratype
WMG	Oahu	26 Oct 1919	Manoa Cliffs Trail				aristote liae	1		BPBM	E 21.3305	-157.8093	
EHB	Oahu	23 Nov 1919	Kaunimuhona				aristote liae	1		BPBM	E 21.3456	-157.8015	
OHS	Oahu	31 Oct 1920	Wahiawa				aristote liae	1		BPBM	E 21.5082	-157.9473	
OHS	Oahu	10 Jan 1923	Tantalus				aristote liae	1		BPBM	E 21.3286	-157.8250	
OW	Oahu	27 Jan 1929	Oahu				aristote liae	1		NHUK			
OHS	Oahu	11 Aug 1929	Waipio Rdg.				aristote liae	1		BPBM	E 21.4707	-157.9183	
OHS	Oahu	14 Jun 1938	Lulumahu			ex <i>Aristotelia</i> homoxyla	aristote liae	2		HDOA	E 21.3518	-157.7960	
OHS	Oahu	14 Jun 1938	Lulumahu			ex <i>Aristotelia</i> homoxyla	aristote liae	2		UHIM	E 21.3518	-157.7960	
JWVB	Oahu	4 Jul 1956	Mt. Tantalus				aristote liae	1		BPBM	E 21.3286	-157.8250	
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	3		BPBM	W 21.5321	-158.1786	
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	1		BPBM	W 21.5321	-158.1786	
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	1		BPBM	W 21.5328	-158.1765	
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	2	2	KNMC	W 21.5328	-158.1765	
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	3		KNMC	W 21.5321	-158.1786	
KNM	Oahu	29 Jul 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Psychotria</i>	aristote liae	1		BPBM	W 21.5321	-158.1786	
KNM	Oahu	29 Jul 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	1		NMNH	W 21.5321	-158.1786	
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua</i> affinis	aristote liae	2		BPBM	W 21.5321	-158.1786	
OHS	Oahu	7 Sep 1913	Mt. Kaala				armata	1		BPBM	E 21.5008	-158.1374	holotype
DTF	Oahu	1 Apr 1917	Nuuanu Pali				armata	1		BPBM	E 21.3671	-157.7928	allotype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
DTF	Oahu	1 Apr 1917	Nuuanu Pali				armata	1	1	HDOA	E 21.3671	-157.7928	paratypes
JCB	Oahu	17 Jun 1917	Kaunuaehona				armata	1		BPBM	E 21.3456	-157.8015	
PHT	Oahu	9 Sep 1917	Kaunuaehona				armata	1	1	BPBM	E 21.3456	-157.8015	paratypes
PHT	Oahu	9 Sep 1917	Kaunuaehona				armata	3		missing	E 21.3456	-157.8015	paratypes
WMG	Oahu	27 Aug 1918	Tantalus				armata	1		BPBM	E 21.3286	-157.8250	paratype
WMG	Oahu	22 Dec 1918	Tantalus				armata	1	1	BPBM	E 21.3286	-157.8250	paratype
TCM	Oahu	5 Oct 1960	Palikea Pl.	2500	760	Metrosideros	armata	1		BPBM	E 21.4149	-158.0998	
	Oahu	12 Jul	Nuuanu Pali: Kamooalii Stream	1000-1200	300-370	moss of waterfall	armata	1		BPBM	E 21.3671	-157.7918	no year, from middle collecting period
KNM	Oahu	4 Sep 2012	Waimano Trail	1100	335	sweeping Freycinetia arborea	armata		4	BPBM	W 21.4324	-157.9061	
WPH	Oahu	16 Sep 2013	Waionao Stream	650	200	ex Hyposmocoma kahamanoa	armata	1		BPBM	W 21.3146	-157.7795	
KNM	Oahu	29 Apr 2014	S Haleanua, Trimerve Gulch	3000	915	on Perrottetia sandwicensis	armata	1		BPBM	W 21.5047	-158.1386	
KNM	Oahu	4 Apr 2015	Kulanuahane Tr.	950	290	at Hyposmocoma in stream	armata	1		BPBM	W 21.3940	-157.8401	
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Coprosma longifolia	armata	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Coprosma longifolia	armata	1		BPBM	W 21.4146	-158.0999	
OHS	Oahu	26 Oct 1924	Waiannae Mts.			on leaf Ipomoea bona-nox [=alba]	armata?		1	BPBM			
CMY	Oahu	18 Jan 1966	Wiliwilinui Ridge				armata?		1	BPBM	E 21.3193	-157.7590	
KNM	Oahu	17 Jan 2019	Palikea	3000	915	on Kadua affinis	armata?		1	KNMC	W 21.4150	-158.0993	
KNM	Oahu	22 Apr 2015	Kaah-Kalema crestline	3100	950	on Cheirodendron trigynum	arpactes	1		BPBM	W 21.4933	-158.1379	holotype
OHS	Oahu	5 Dec 1907	Kaunuaehona				aspera	1		BPBM	E 21.3456	-157.8015	holotype
OHS	Oahu	17 May 1914	Kailhi				aspera	1		BPBM	E 21.3757	-157.8223	
OHS	Oahu	22 Dec 1918	Kulouou			Metrosideros	aspera	1		BPBM	E 21.3160	-157.7233	
OHS	Oahu	16 May 1920	Waiupe				aspera	1		BPBM	E 21.3202	-157.7491	
OHS	Oahu	7 Nov 1926	Kahauiiki				aspera	1		BPBM	E 21.3716	-157.8435	
JWB	Oahu	6 Oct 1965	Poamoho Trail				aspera	1		BPBM	E 21.5304	-157.9427	
KNM	Oahu	30 Apr 2012	Maakua Ridge	1100	335	sweeping	aspera	1		KNMC	W 21.5926	-157.9198	
KNM	Oahu	30 Jul 2012	Aiea Ridge Trail	1700	520	on Freycinetia arborea	aspera	1		BPBM	W 21.4093	-157.8725	
KNM	Oahu	8 Apr 2015	Peahinaia Tr.	2100	640	on Psychotria maritima	aspera	1		BPBM	W 21.5525	-157.9532	
KNM	Oahu	22 Apr 2015	Kaah-Kalema crestline	3100	950	on Cheirodendron trigynum	aspera	1		BPBM	W 21.4933	-158.1379	holotype; originally from HDOA collection
PHT	Oahu	1 Jan 1919	Waiannae	c. 2400-2800	730-850		auwae	1		BPBM			

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	24 Apr 2014	Palikeya	2950	900	on Cheirodendron trigynum	bailecta	1	1	BPBM	W 21.4150	-158.0993	paratype
KNM	Oahu	15 Apr 2015	Palikeya	3000	915	on Coprosma longifolia	bailecta	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	23 Jun 2015	Palikeya	3000	915	on Coprosma longifolia	bailecta	1		NMNH	W 21.4146	-158.0999	paratype
KNM	Oahu	17 Jul 2015	Kahanahiki ridge	2200	670	on Coprosma longifolia	bailecta	1		KNMC	W 21.5374	-158.1924	
KNM	Oahu	9 Dec 2015	Palikeya	3000	915	on Coprosma longifolia	bailecta	1		BPBM	W 21.4146	-158.0999	holotype
KNM	Oahu	8 Jun 2016	Ohikilolo	2900	885	sweeping	bailecta		1	BPBM	W 21.5133	-158.1930	paratype
KNM	Oahu	28 Sep 2016	Palikeya	3000	915	on Cheirodendron trigynum	bailecta	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	23 Nov 2016	Palikeya	3000	915	on Coprosma longifolia	bailecta		1	BPBM	W 21.4155	-158.0995	paratype
KNM	Oahu	28 Mar 2019	North Kahaia Gulch	2200	670		bailecta	1		BPBM	W 21.4647	-158.1010	
OHS	Oahu	4 Sep 1911	Paliolo Ridge			reared from larva of Batrachoda infesting Acrostichum fern	batrachodae	1	1	BPBM	E 21.3206	-157.7768	holotype and allotype
OHS	Oahu	4 Sep 1911	Paliolo Ridge			reared from larva of Batrachoda infesting Acrostichum fern	batrachodae	1	1	BPBM	E 21.3206	-157.7768	paratypes
OHS	Oahu	4 Sep 1911	Paliolo Ridge			reared from larva of Batrachoda infesting Acrostichum fern	batrachodae	1		BPBM	E 21.3206	-157.7768	paratypes
OHS	Oahu	4 Sep 1911	Paliolo Ridge			reared from larva of Batrachoda infesting Acrostichum fern	batrachodae	2	1	BPBM	E 21.3206	-157.7768	
OHS	Oahu	4 Sep 1911	Paliolo Ridge			reared from larva of Batrachoda infesting Acrostichum fern	batrachodae	1		HDOA	E 21.3206	-157.7768	paratypes
OHS	Oahu	14 Oct 1928	Mt. Kaaia [Haleaiau]			ex larva on spores of Elaphoglossum	batrachodae	9	6	BPBM	E 21.5008	-158.1374	site identified as Haleaiau in Swezey (1954)
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	on Cheirodendron trigynum	batrachodae?		5	KNMC	W 21.4933	-158.1379	
JWB	Oahu	14 Apr 1966	Mt. Kaaia				beardsleyi	1		BPBM	E 21.5072	-158.1434	paratype
KNM	Oahu	10 Feb 2014	Kaala summit, E face	3950	1200	on Melicope	beardsleyi		1	BPBM	W 21.5057	-158.1412	paratype
KNM	Oahu	3 Mar 2015	Kaala summit, E face	3950	1200	under leaves	beardsleyi	1		BPBM	W 21.5057	-158.1412	paratype
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	on Cheirodendron trigynum	beardsleyi	1		BPBM	W 21.4933	-158.1379	holotype
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	on Cheirodendron trigynum	beardsleyi	1		NMNH	W 21.4933	-158.1379	paratype
KNM	Oahu	18 Apr 2019	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	beardsleyi?		1	BPBM	W 21.5028	-158.1491	
PHT	Oahu	8 Sep 1918	Paliolo Crater				bella	1		BPBM	E 21.3266	-157.7728	holotype
WDP	Oahu	10 Nov 1989	Manoa Cliff's Trail Paliolo Side	1400	430	on Touchardia	bella		1	BPBM	E 21.3370	-157.8152	
KNM	Oahu	5 Aug 2014	Ekahani, gulch 2D	2200	670	on Planchonella sandwicensis	bella	1		BPBM	W 21.4389	-158.0938	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
KNM	Oahu	22 Nov 2017	Pāikea	3000	915	on <i>Perrotetia sandwicensis</i>	bella		1	KNMC	W	21.4150	-158.0993
KNM	Oahu	22 Nov 2017	Pāikea	3000	915	on <i>Anidesma platyphyllum</i>	bella		1	BPBM	W	21.4155	-158.0995
KNM	Oahu	22 Nov 2017	Pāikea	3000	915	on <i>Coprosma longifolia</i>	bella		1	BPBM	W	21.4155	-158.0995
KNM	Oahu	21 Feb 2019	Pāikea	3000	915	on <i>Kadua affinis</i>	bella		1	BPBM	W	21.4150	-158.0993
DIF	Oahu	30 Mar 1913	Opaeula				bicolor	1		BPBM	E	21.5520	-157.9535 holotype
PHT	Oahu	22 Jul 1917	Mt. Kaala				bicolor	1		BPBM	E	21.5008	-158.1374 paratype
PHT	Oahu	18 May 1920	Mt. Kaala	1800-2000	550-610	on palapalai	bicolor	1		HDOA	E	21.4986	-158.1278
PHT	Oahu	18 May 1920	Mt. Kaala	2000-2500	610-760	on <i>Euphorbia hillebrandii</i>	bicolor	1	1	HDOA	E	21.5008	-158.1374
OHS	Oahu	18 Feb 1923	Mt. Kaala				bicolor	1		BPBM	E	21.5008	-158.1374
OW	Oahu	27 Jan 1929	Oahu				bicolor	1	1	NHMK			
OHS	Oahu	28 Apr 1929	Pahinia Rdg.				bicolor	1		BPBM	E	21.5520	-157.9535
OHS	Oahu	2 Apr 1933	Kamokuiki Val			<i>Anidesma</i>	bicolor	1		BPBM	E	21.5310	-158.1317
OHS	Oahu	18 Jun 1938	Pāikea			ex <i>Pelea</i>	bicolor	1		HDOA	E	21.4149	-158.0998
OHS	Oahu	4 Jul 1938	Haleaiau			ex <i>Gouldia</i> [Kadua]	bicolor	1		BPBM	E	21.4988	-158.1353
PHT	Oahu	4 Jun 1916	Kaunaothona				brevicornis	1		BPBM	E	21.3456	-157.8015 holotype
KNM	Oahu	4 Jul 2014	Kaala summit, E face	4000	1220	on <i>Melicope</i>	brevicornis	1	1	BPBM	W	21.5057	-158.1412
KNM	Oahu	20 Jul 2016	Pāikea	3000	915	on <i>Kadua affinis</i>	brevicornis	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	9 Feb 2017	Waianae-Kaala Tr.	3850	1170	on <i>Broussaisia arguta</i>	brevicornis	1		KNMC	W	21.5028	-158.1491
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on <i>Cheirodendron trigynum</i>	brevicornis	1		BPBM	W	21.5057	-158.1412
WMG	Oahu	24 Mar 1911	Konahuaiui	2100	640		bridwelli	1		BPBM	E	21.3456	-157.8015
OHS	Oahu	21 Jan 1912	Mt. Olympus				bridwelli	1		BPBM	E	21.3357	-157.7792 holotype of <i>S. lata</i>
JCB	Oahu	1916	SE Koolau Mts.				bridwelli	2		BPBM	E	21.3456	-157.8015 holotype and paratype
PHT	Oahu	4 Jul 1916	Mt. Kaala				bridwelli	1		BPBM	E	21.5008	-158.1374 holotype of <i>S. callida</i>
JCB	Oahu	Sep 1918	Manoa Cliff Trail			ex rotten wood	bridwelli	1		BPBM	E	21.3305	-157.8093 paratype of <i>S. perrotetiae</i> ; listed in Fullaway (1920) as being from same collection as holotype and other paratype
OHS	Oahu	8 Sep 1918	Olympus				bridwelli	1		BPBM	E	21.3357	-157.7792
PHT	Oahu	20 Oct 1918	Mt. Olympus				bridwelli	1		BPBM	E	21.3357	-157.7792
OHS	Oahu	24 Nov 1918	Lanihuli			<i>Euphorbia</i>	bridwelli	1		BPBM	E	21.3597	-157.8263
OHS	Oahu	11 Jan 1920	Mt. Kaala				bridwelli	1		BPBM	E	21.5008	-158.1374

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	28 Mar 1926	Kahuuli			ex cocoon in Broussaisia	bridwelli	3		BPBM	E 21.3852	-157.8240	
OHS	Oahu	3 Mar 1928	Waipio Rdg.			Pelea	bridwelli	1		BPBM	E 21.4707	-157.9183	
OHS	Oahu	21 Jul 1929	Mt. Kaala				bridwelli	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	22 Feb 1931	Kahanui Val.			ex <i>Semnoprepia</i> larva in pit of <i>Broussaisia</i>	bridwelli	1		BPBM	E 21.5697	-157.9198	
OHS	Oahu	16 Sep 1933	Kukuila Val.				bridwelli	1		BPBM	E 21.5349	-158.1848	
ECZ	Oahu	11 Nov 1936	Palikey			Beating	bridwelli	2		BPBM	E 21.4149	-158.0998	
NLHK	Oahu	21 Nov 1936	Manoa-Palolo Rdge				bridwelli	1		BPBM	E 21.3260	-157.7869	
OHS	Oahu	28 Apr 1938	Puu Kaaumakua			ex <i>Oodemas aeneus</i> kahanae	bridwelli	2		BPBM	E 21.5013	-157.8978	
EJF	Oahu	Apr 1953	Waianae Mts.				bridwelli	1		BPBM			
WDP	Oahu	18 Apr 1985	Manoa Cliffs Trail Manoa Sde	1800	550		bridwelli	1		BPBM	E 21.3374	-157.8105	
KNM	Oahu	16 Feb 2012	Palikey	2900	885	beating vegetation	bridwelli	1		BPBM	W 21.4158	-158.0993	
KNM	Oahu	24 Apr 2014	Palikey	2950	900	on <i>Coprosma longifolia</i>	bridwelli	1		BPBM	W 21.4150	-158.0993	
KNM	Oahu	3 Jun 2014	Kaala below cliffs, SE face	3350	1020	on <i>Perrottetia sandwicensis</i>	bridwelli	1		BPBM	W 21.5025	-158.1428	
KNM	Oahu	4 Jul 2014	Kaala summit, E face	4000	1220	on <i>Metrosideros polymorpha</i>	bridwelli	1		KNMC	W 21.5057	-158.1412	
KNM	Oahu	5 Jul 2014	South Kaiaa Gulch	2250	690	on <i>Cryptocarya oahuensis</i>	bridwelli	1		BPBM	W 21.4574	-158.0970	
KNM	Oahu	15 Jul 2014	Puu Hapupu	2650	810	on <i>Pipturus albidus</i>	bridwelli	1		BPBM	W 21.4665	-158.1028	
KNM	Oahu	28 Jan 2015	Puu Hapupu	2650	810	on <i>Myrsine lesertiana</i>	bridwelli	1		BPBM	W 21.4665	-158.1028	
KNM	Oahu	15 Apr 2015	Palikey	3000	915	on <i>Choromelia oblongifolia</i>	bridwelli	2		BPBM	W 21.4146	-158.0999	
KNM	Oahu	15 Apr 2015	Palikey	3000	915	on <i>Urena glabra</i>	bridwelli	1	4	KNMC	W 21.4146	-158.0999	
KNM	Oahu	19 May 2015	Palikey	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		BPBM	W 21.4146	-158.0999	
KNM	Oahu	9 Dec 2015	Palikey	3000	915	on <i>Cheirodendron trigynum</i>	bridwelli	1		HDOA	W 21.4146	-158.0999	
KNM	Oahu	9 Dec 2015	Palikey	3000	915	on <i>Coprosma longifolia</i>	bridwelli	2		HDOA	W 21.4146	-158.0999	
KNM	Oahu	15 Jun 2016	Palikey	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	11 Aug 2016	Kaala transect, 665 m	3850	1170	on <i>Broussaisia arguta</i>	bridwelli	1		KNMC	W 21.5028	-158.1441	
KNM	Oahu	20 Oct 2016	Palikey	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		NMNH	W 21.4146	-158.0999	
KNM	Oahu	23 Nov 2016	Palikey	3000	915	on <i>Perrottetia sandwicensis</i>	bridwelli	1		NMNH	W 21.4150	-158.0993	
KNM	Oahu	23 Nov 2016	Palikey	3000	915	on <i>Cheirodendron trigynum</i>	bridwelli	2		KNMC	W 21.4155	-158.0995	
KNM	Oahu	23 Nov 2016	Palikey	3000	915	on <i>Kadua affinis</i>	bridwelli	1		NMNH	W 21.4155	-158.0995	
KNM	Oahu	23 Nov 2016	Palikey	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		NMNH	W 21.4155	-158.0995	

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KNM	Oahu	10 Jan 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	19 Oct 2017	Palikea	3000	915	on <i>Kadua affinis</i>	bridwelli	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	19 Oct 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	bridwelli	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Coprosma longifolia</i>	bridwelli	3		KNMC	W	21.4155	-158.0995
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Dianella sandwicensis</i>	bridwelli	1		BPBM	W	21.4125	-158.1004
KNM	Oahu	17 May 2018	Palikea	3000	915	on <i>Pipturus albidus</i>	bridwelli	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	12 Jul 2018	Palikea	3000	915	on <i>Psychotria hahewayi</i>	bridwelli	1		KNMC	W	21.4150	-158.0993
KNM	Oahu	23 Apr 2019	Palikea	3000	915	on <i>Coprosma longifolia</i>	bridwelli	1		BPBM	W	21.4146	-158.0999
WNG	Oahu	29 Jan 1905	Tantalus	1300	400		bruncea	1		BPBM	E	21.3286	-157.8250 holotype
DIT	Oahu	30 Mar 1913	Opaiea				bruncea	1	1	BPBM	E	21.5520	-157.9535 holotype and allotype of <i>S. lugens</i>
PHI	Oahu	4 Mar 1917	Mt. Kaala	1500-1800	460-550		bruncea	1		BPBM	E	21.4986	-158.1278
JCB	Oahu	10 Jun 1917	Mt. Tantalus				bruncea	1		BPBM	E	21.3286	-157.8250
JCB	Oahu	24 Jun 1917	Paioa				bruncea	1		BPBM	E	21.3206	-157.7768
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				bruncea	1		BPBM			
KNM	Oahu	12 Sep 2013	Kaala summit, NE face	3500	1070	on <i>Touchardia latifolia</i>	bruncea	1	1	BPBM	W	21.5085	-158.1403
KNM	Oahu	26 May 2014	Moanalua, South Fork	1150	350	on <i>Diospyros halebrandii</i>	bruncea	1		BPBM	W	21.3891	-157.8349
KNM	Oahu	3 Jun 2014	Kaala below cliffs, SE face	3350	1020	on <i>Perrottetia sandwicensis</i>	bruncea	1		NMNH	W	21.5025	-158.1428
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on <i>Planchonella sandwicensis</i>	bruncea	2		KNMC	W	21.4665	-158.1028
KNM	Oahu	25 Mar 2015	Palikea	2950	900	on <i>Kadua affinis</i>	bruncea	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	8 Apr 2015	Peshinaia Tr.	2100	640	on <i>Psychotria maritima</i>	bruncea	1	3	BPBM	W	21.5525	-157.9532
KNM	Oahu	9 Apr 2015	Peshinaia Tr.	2100	640	on <i>Anidesma platyphyllum</i>	bruncea	1	2	BPBM	W	21.5525	-157.9532
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on <i>Kadua affinis</i>	bruncea	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	9 Apr 2016	Palikea trail	2700	820	on <i>Kadua affinis</i>	bruncea	1		BPBM	W	21.4102	-158.0986
KNM	Oahu	8 Jun 2016	Ohikilolo	2900	885	sweet ping	bruncea	1		BPBM	W	21.5133	-158.1930
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on <i>Psychotria</i>	bruncea	1		NMNH	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Cheirondetron trigynum</i>	bruncea	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Kadua affinis</i>	bruncea	1	4	KNMC	W	21.4146	-158.0999
KNM	Oahu	10 Jan 2017	Palikea	3000	915	on <i>Clermontia oblongifolia</i>	bruncea	1		KNMC	W	21.4150	-158.0993

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KNM	Oahu	23 Jan 2017	Palikea	3000	915	on Kadua affinis	bruncea	1		KNMC	W	21.4150	-158.0993
KNM	Oahu	8 Mar 2017	Peahināia Tr.	2100	640	on Psychotria maritima	bruncea	1		BPBM	W	21.5525	-157.9532
KNM	Oahu	26 Sep 2017	Palikea	3000	915	on Urera glabra	bruncea	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	18 Oct 2017	Kapūma, Mokuleia Tr.	2100	640	on Antidesma platyphyllum	bruncea	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	18 Oct 2017	Kapūma, Mokuleia Tr.	2100	640	on Nestegis sandwicensis	bruncea	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	26 Oct 2017	Puu Hapapa	2650	810	on Planchonella sandwicensis	bruncea	1		BPBM	W	21.4665	-158.1028
KNM	Oahu	31 Jul 2018	Palikea	3000	915	on Cheirodendron trigynum	bruncea	1		BPBM	W	21.4155	-158.0995
OHS	Oahu	7 Sep 1913	Mt. Kaala				bruncepennis	1		BPBM	E	21.5008	-158.1374 holotype
JWB	Oahu	4 Jul 1956	Mt. Tantalus				bruncepennis	1		BPBM	E	21.3286	-157.8250
JWB	Oahu	6 Oct 1965	Poamoho Trail				bruncepennis	1		BPBM	E	21.5304	-157.9427
OHS	Oahu	30 May 1919	Waiaupe				canuta	1		BPBM	E	21.3202	-157.7491 holotype
OHS	Oahu	14 Sep 1930	Haleaunuu			Elaeocarpus	canuta	1		BPBM	E	21.4988	-158.1353 paratype
KNM	Oahu	24 Mar 2015	Pulee, Coffee Gulch	1900	580	on Diospyros hillebrandii	canuta	1		BPBM	W	21.5109	-158.1234 paratype
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on Cheirodendron trigynum	canuta	1		KNMC	W	21.4155	-158.0995
OHS	Oahu	16 May 1909	Niu			reared from larva of Cupua casia	capuana	1		BPBM	E	21.3093	-157.7417 holotype
OHS	Oahu	27 Jun 1909	Niu			reared from larva of Archips longipileatus (Tortricidae)	capuana	2	1	BPBM	E	21.3093	-157.7417 allotype and paratypes
WCG	Oahu	1 Nov 1968	Kapalama Trail	800	240	Cheirodendron trigynum var. haleaunuu	capuana	1		BPBM	E	21.3430	-157.8527
OHS	Oahu	16 Mar 1915	Tantalus				celeris	1		BPBM	E	21.3286	-157.8250 holotype
OHS	Oahu	16 Feb 1919	Waialeae Nui				celeris	1		BPBM	E	21.3141	-157.7669
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				celeris	1		BPBM	E	21.5024	-158.1565
EHB	Oahu	9 Nov 1919	S. Waiaanae Mts.				celeris	1		BPBM			
OHS	Oahu	9 Nov 1919	S. Waiaanae Mts.				celeris	2		BPBM			
OHS	Oahu	9 Feb 1930	Haleaunuu			Eragrostis	celeris	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	27 Sep 1932	Makua			Neowawraea	celeris	1		BPBM	E	21.5284	-158.1860
OHS	Oahu	9 Feb 1936	Kukuiāla Vail			Coprosma	celeris	1		BPBM	E	21.5349	-158.1848
REL	Oahu	11 Oct 1959	Waiaanae Mts.	2000	610		celeris	1		BPBM	E	21.5259	-158.1464
CMY	Oahu	18 Jan 1966	Wiliwili Ridge				celeris	1		BPBM	E	21.3193	-157.7590
JS	Oahu	18 Aug 1988	Peacock Flats	1800	550		celeris	1		BPBM	E	21.5429	-158.1826

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KNM	Oahu	24 Feb 2012	North Haleanau Gulch	2350	720	on Psychotria	celeris	1		BPBM	W	21.5066	-158.1297
KNM	Oahu	5 Jun 2013	Ohikilolo	2900	885	sweeping ferns	celeris	1		BPBM	W	21.5133	-158.1930
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Anidesma platyphyllum	celeris	2		KNMC	W	21.5321	-158.1786
WPH	Oahu	22 Jan 2015	Palikea	3000	915	on Pipturus a bidus	celeris	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	28 Jan 2015	Puu Hapapa	2650	810	on Myrsine lessertiana	celeris	1		BPBM	W	21.4665	-158.1028
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on Cheirodendron trigynum	celeris	1		NMNH	W	21.4146	-158.0999
KNM	Oahu	24 Jul 2017	Palikea	3000	915	on Cheirodendron longifolia	celeris	1		NMNH	W	21.4155	-158.0995
KNM	Oahu	13 Sep 2017	Palikea	3000	915	on Coprosma longifolia	celeris	1		KNMC	W	21.4128	-158.0997
KNM	Oahu	19 Oct 2017	Palikea	3000	915	on Urena glabra	celeris	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	21 Dec 2017	Palikea	3000	915	on Coprosma longifolia	celeris	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2018	Central Kaluaa Gulch	2200	670	on Urena glabra	celeris	1	1	KNMC	W	21.4603	-158.1004
OHS	Oahu	8 Jun 1921	Waianae				centralis	1		BPBM	E	21.4543	-157.9364 holotype
KNM	Oahu	12 Jan 2015	Waianae, Kunaipae gulch 4	2200	670	stinging neck	cirripoda	1		BPBM	W	21.4990	-158.1533 paratype
KNM	Oahu	20 Apr 2015	Puu Hapapa	2650	810	on Planchonella sandwicensis	cirripoda	1		BPBM	W	21.4665	-158.1028 holotype
KNM	Oahu	19 May 2015	Palikea	3000	915	on Coprosma longifolia	cirripoda	1		NMNH	W	21.4146	-158.0999 paratype
KNM	Oahu	16 Jan 2019	Makaha, unit 1	2300	700	on Pisonia brunoiana	cirripoda	1		KNMC	W	21.5012	-158.1678 paratype; originally a paratype of <i>S. emarginata</i> ; has upside-down holotype label for " <i>Sierola inerma</i> "
OHS	Oahu	3 Sep 1906	Palolo				conca va	1		BPBM	E	21.3206	-157.7768 holotype
JCB	Oahu	24 Jun 1917	Palolo				conca va	1		BPBM	E	21.3206	-157.7768 holotype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Cheirodendron trigynum	conca va ?	1	1	BPBM	W	21.4146	-158.0999
WVG	Oahu	[no date]	Tantalus	1300	400		cryptophlebiae	1		BPBM	E	21.3286	-157.8250 holotype of <i>S. proxima</i>
RCLP	Oahu	Sept	Tantalus	1800	550		cryptophlebiae	1		BPBM	E	21.3374	-157.8105 on same card as 2 <i>S. testaceipes</i>
WVG	Oahu	1 Jan 1905	Tantalus	1300	400		cryptophlebiae	1		BPBM	E	21.3286	-157.8250 holotype of <i>S. flavicornis</i>
WVG	Oahu	11 Mar 1905	Tantalus	1300	400		cryptophlebiae	1		BPBM	E	21.3286	-157.8250 paratype of <i>S. pubescens</i>
WVG	Oahu	16 Apr 1905	Tantalus	1300	400		cryptophlebiae	1		HDOA	E	21.3286	-157.8250 paratype of <i>S. pubescens</i>
WVG	Oahu	2 Dec 1905	Tantalus	1300	400		cryptophlebiae	1		BPBM	E	21.3286	-157.8250 paratype of <i>S. pubescens</i>

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
RCLP	Oahu	1966	Honolulu Mts.	1800	550		cryptophlebiae	1		BPBM	E 21.3374	-157.8105	
OHS	Oahu	Nov 1908	Tantalus	1300	400	bred from twigs and larvae of leps in kukui	cryptophlebiae	3		BPBM	E 21.3286	-157.8250	
DTF	Oahu	10 Jun 1910	Tantalus			reared from larva of Cryptophlebia illepidia	cryptophlebiae	3		HDOA	E 21.3286	-157.8250	paratypes
DTF	Oahu	10 Jun 1910	Tantalus			reared from larva of Cryptophlebia illepidia	cryptophlebiae	2		BPBM	E 21.3286	-157.8250	holotype and paratypes
JCB	Oahu	1913	SE Koolau Mts.				cryptophlebiae	1		BPBM	E 21.3456	-157.8015	paratype
JCB	Oahu	5 Jul 1915	Tantalus, Pauoa side			swept from Acacia koa	cryptophlebiae	1		BPBM	E 21.3286	-157.8250	paratype of <i>S. brumeipes</i>
WMG	Oahu	16 Feb 1916	Tantalus				cryptophlebiae	1		BPBM	E 21.3286	-157.8250	holotype of <i>S. brumeipes</i>
JCB	Oahu	10 Jun 1917	Mt. Tantalus				cryptophlebiae	1		BPBM	E 21.3286	-157.8250	
JCB	Oahu	Jun 1918	Tantalus				cryptophlebiae	3		BPBM	E 21.3286	-157.8250	paratype of <i>S. tanaka</i>
JCB	Oahu	Jun 1918	Tantalus			on Acacia koa	cryptophlebiae	1		BPBM	E 21.3286	-157.8250	paratype of <i>S. brumeipes</i>
JCB	Oahu	Jun 1918	Tantalus			on Acacia koa	cryptophlebiae	1		HDOA	E 21.3286	-157.8250	paratype of <i>S. brumeipes</i>
JCB	Oahu	Jun 1918	Mt. Tantalus				cryptophlebiae	6		BPBM	E 21.3286	-157.8250	
WMG	Oahu	22 Dec 1918	Tantalus	1500	460		cryptophlebiae	1		BPBM	E 21.3315	-157.8204	
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side			ex koa pods	cryptophlebiae	1		BPBM	E 21.5024	-158.1565	
OHS	Oahu	18 Jun 1922	Aiea	500-600	150-180	Metrosideros	cryptophlebiae	1		BPBM	E 21.3889	-157.9145	
OHS	Oahu	17 Dec 1922	Halewa				cryptophlebiae	1		BPBM	E 21.3995	-157.8639	
OHS	Oahu	10 Jan 1923	Tantalus				cryptophlebiae	6		BPBM	E 21.3286	-157.8250	
OHS	Oahu	28 Sep 1924	Kahaiki			ex koa pods	cryptophlebiae	1		BPBM	E 21.3716	-157.8435	
OHS	Oahu	28 Mar 1926	Kahaiki				cryptophlebiae	1		BPBM	E 21.3716	-157.8435	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
	Oahu	6 Aug 1926	Honolulu, T.H.				cryptophlebiae	1		BPEM	E 21.3315	-157.8204	
EFB	Oahu	24 Apr 1927	Tantalus			Acacia koa	cryptophlebiae	1		BPEM	E 21.3286	-157.8250	
OHS	Oahu	13 Apr 1930	Peahiaia Rdg.				cryptophlebiae	1		BPEM	E 21.5520	-157.9535	
OHS	Oahu	13 Apr 1930	Peahiaia Rdg.				cryptophlebiae	1		BPEM	E 21.5520	-157.9535	
KNM	Oahu	30 Oct 2012	Lanihuli Trail	1800	550	on Acacia koa	cryptophlebiae	2		BPEM	W 21.3567	-157.8286	
JCB	Oahu	Jul 1916	SE Koolau Mts.				curvata	1		BPEM	E 21.3456	-157.8015	paratype
JCB	Oahu	13 May 1917	Pakolo				curvata	1		BPEM	E 21.3206	-157.7768	holotype
JCB	Oahu	24 Jun 1917	Pakolo				curvata	1		BPEM	E 21.3206	-157.7768	paratype
PHT	Oahu	10 Feb 1918	Niu Ridge				curvata	1		BPEM	E 21.3086	-157.7387	paratype of <i>S. peleana</i> ; slightly different from other <i>S. curvata</i>
PHT	Oahu	10 Feb 1918	Niu Ridge				curvata?	1		missing	E 21.3086	-157.7387	paratype of <i>S. peleana</i> ; missing, from same <i>S. peleana</i> paratype collection as <i>S. curvata</i> specimen
EHB	Oahu	9 Nov 1919	S. Waianae Mts.				danimalis	1		BPEM			paratype
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				danimalis	1		BPEM			holotype
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				danimalis	1		BPEM			paratype
OHS	Oahu	22 Jun 1924	Puu Kuaa				danimalis	1		BPEM	E 21.4413	-158.0981	paratype
OHS	Oahu	6 Nov 1932	Puu Kuaa			Eragrostis	danimalis	1	1	BPEM	E 21.4413	-158.0981	paratype
ECZ	Oahu	11 Nov 1936	Palikea			Beating	danimalis	2		BPEM	E 21.4149	-158.0998	paratype
KNM	Oahu	2 Aug 2017	Ohikilolo	2900	885	on Metrosideros polymorpha	danimalis	1		KNMC	W 21.5133	-158.1937	
OHS	Oahu	1 Sep 1913	Mt. Kaaia				depressa	1		BPEM	E 21.5008	-158.1374	holotype
PHT	Oahu	22 Jul 1917	Mt. Kuaia	2500-3000	760-915		depressa	1		BPEM	E 21.5008	-158.1374	holotype
OHS	Oahu	11 Jan 1920	Mt. Kuaia				depressa	2		BPEM	E 21.5008	-158.1374	
PHT	Oahu	18 May 1920	Mt. Kaaia	c. 2500-3000	760-915		depressa	1		HDOA	E 21.5008	-158.1374	
RCLP	Oahu	1902	Pakolo	1500	460		dichroma	1	1	BPEM	E 21.3315	-157.8204	holotype and allotype
RCLP	Oahu	1903	Hon. Mts.	2000	610		dichroma	1		BPEM	E 21.3456	-157.8015	
OHS	Oahu	14 Feb 1909	Kaunaoehona				dichroma	1		BPEM	E 21.3456	-157.8015	
OHS	Oahu	20 Nov 1909	Olympus				dichroma	2		BPEM	E 21.3357	-157.7792	
OHS	Oahu	11 Dec 1910	Niu				dichroma	1		BPEM	E 21.3093	-157.7417	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
DTF	Oahu	29 Jul 1917	Manoa				dichroma		1	HDOA	E 21.3366	-157.8000	
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				discoides	1		BPBM	E 21.5024	-158.1565	holotype
OHS	Oahu	18 Dec 1910	Kaunaoehona Trail			reared from larva of Epagoge infuastana	epagogaena	1		BPBM	E 21.3456	-157.8015	holotype
OHS	Oahu	18 Jun 1922	Aiea	500-600	150-180	Acacia koa	extensa	1		BPBM	E 21.3889	-157.9145	paratype
KNM	Oahu	28 Jun 2016	North Kahaia Gulch	2200	670	on Planchonella sandwicensis	extensa	1		BPBM	W 21.4647	-158.1010	holotype
KNM	Oahu	28 Jun 2016	North Kahaia Gulch	2200	670	on Planchonella sandwicensis	extensa	1		KNMC	W 21.4647	-158.1010	
KNM	Oahu	30 Jun 2016	Central Kahaia Gulch	2200	670	on Planchonella sandwicensis	extensa	1		BPBM	W 21.4603	-158.1004	paratype
KNM	Oahu	27 Dec 2016	Puu Hapapa	2200	670	on Freycinetia arborea	extensa	1		BPBM	W 21.4665	-158.1028	paratype
KNM	Oahu	16 Feb 2012	Palikea	2900	885	beating vegetation	femorilis	1		BPBM	W 21.4158	-158.0993	paratype
KNM	Oahu	17 May 2012	Puu Hapapa	2650	810	on Planchonella sandwicensis	femorilis	1		BPBM	W 21.4665	-158.1028	holotype
KNM	Oahu	9 Apr 2015	Peshimata Tr.	2100	640	on Anikde sma platyphyllum	femorilis	1		BPBM	W 21.5525	-157.9532	paratype
KNM	Oahu	27 May 2015	North Kahaia Gulch	2200	670		femorilis	1		HDOA	W 21.4647	-158.1010	paratype
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on Wikstroemia oahuensis	femorilis	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Coprosma longifolia	femorilis	1		NMNH	W 21.4146	-158.0999	paratype
RCLP	Oahu	1905	Tantalus				flavipes	1		BPBM	E 21.3286	-157.8250	
WVG	Oahu	2 Apr 1905	Tantalus	1300	400		flavipes	1		BPBM	E 21.3286	-157.8250	holotype
OHS	Oahu	23 Jan 1909	Puuoa				flavipes	1		BPBM	E 21.3342	-157.8237	has upside-down holotype label for "Sterola obliqua"
JCB	Oahu	13 May 1917	Palo				flavipes	1		BPBM	E 21.3206	-157.7768	
ECZ	Oahu	29 Oct 1944	Mt. Kaala	1200-1500	370-460	Beating Shrubbery	flavipes	1		BPBM	E 21.5314	-158.1432	
JWB	Oahu	Jul 1957	Mt. Kaala				flavipes	1		BPBM	E 21.5008	-158.1374	
PHT	Oahu	9 Sep 1917	Kaunaoehona Trail				fossulata	1		BPBM	E 21.3456	-157.8015	holotype
JLG	Oahu	5 Apr 1958	Puu Kaa			Metrosideros	fossulata	1		BPBM	E 21.4413	-158.0981	
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on Cheirodendron trigynum	fossulata	2		BPBM	W 21.4150	-158.0993	
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on Perrottetia sandwicensis	fossulata	1		BPBM	W 21.4150	-158.0993	
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on Psychotria hawaiiensis	fossulata	1		BPBM	W 21.4665	-158.1028	
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on Pisonia umbellifera	fossulata	2		KNMC	W 21.4665	-158.1028	
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on Planchonella sandwicensis	fossulata	1		KNMC	W 21.4665	-158.1028	
KNM	Oahu	24 Feb 2015	Central Kahaia Gulch	2200	670		fossulata	1		BPBM	W 21.4603	-158.1004	
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on Cheirodendron trigynum	fossulata	1		BPBM	W 21.4146	-158.0999	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on <i>Coprosma longifolia</i>	fossulata	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	9 Apr 2016	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	fossulata	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	9 Apr 2016	Palikea	3000	915	on <i>Coprosma longifolia</i>	fossulata	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	9 Apr 2016	Palikea snail jail	3000	915	on <i>Coprosma longifolia</i>	fossulata	3		KNMC	W	21.4155	-158.0995
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	fossulata	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	fossulata	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Psychotria</i>	fossulata	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Kadua affinis</i>	fossulata	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	fossulata	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	fossulata	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	23 Nov 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	fossulata	1		NMNH	W	21.4150	-158.0993
KNM	Oahu	23 Nov 2016	Palikea	3000	915	on <i>Psychotria hahuewayi</i>	fossulata	1		NMNH	W	21.4150	-158.0993
KNM	Oahu	23 Nov 2016	Palikea	3000	915	on <i>Kadua affinis</i>	fossulata	1		NMNH	W	21.4155	-158.0995
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on <i>Cheirodendron trigynum</i>	fossulata	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	19 Oct 2017	Palikea	3000	915	on <i>Coprosma longifolia</i>	fossulata	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	fossulata	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	18 May 2018	Kaala, Dupont Trail	3800	1160	on <i>Cheirodendron trigynum</i>	fossulata	1		BPBM	W	21.5105	-158.1455
KNM	Oahu	14 May 2015	Waianae-Kaala Tr.	3850	1170	on <i>Metrosideros polymorpha</i>	fossulata?		1	BPBM	W	21.5028	-158.1491
OHS	Oahu	15 Oct 1911	Tantalus				fuliginosa	1		BPBM	E	21.3286	-157.8250
OHS	Oahu	11 Aug 1912	Mt. Kaala				fuliginosa	1		BPBM	E	21.5008	-158.1374
PHT	Oahu	4 Jul 1916	Mt. Kaala				fuliginosa	1		BPBM	E	21.5008	-158.1374
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				fuliginosa	2		BPBM	E	21.5024	-158.1565
PHT	Oahu	18 May 1920	Mt. Kaala	2000	610	on <i>Eragrostis gracilis</i>	fuliginosa	1		HDOA	E	21.4986	-158.1278
OHS	Oahu	8 Apr 1934	Kamokuiki Val			ex <i>Omiodes maia</i>	fuliginosa	3		BPBM	E	21.5310	-158.1317
GBM	Oahu	Apr 1949	Mt. Kaala				fuliginosa	1		BPBM	E	21.5008	-158.1374
PHT	Oahu	9 Jul 1916	Mt. Kaala	1500-2500	460-760		fuliginosa	1		BPBM	E	21.4986	-158.1278
OHS	Oahu	14 Sep 1930	Haleuauu				fusca	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	8 Dec 1944	Mt. Kaala			Dubautia	fusca	1		BPBM	E	21.5008	-158.1374
OHS	Oahu	22 Feb 1914	Koahuuani				giffardi	2		BPBM	E	21.3533	-157.7889
EHB	Oahu	25 Feb 1922	Paloa				giffardi	1		BPBM	E	21.3206	-157.7768

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
JS	Oahu	27 Aug 1988	Laie Trail	1900-2300	580-700		giffardi	1		BPBM	E 21.5989	-157.9558	
JS	Oahu	27 Aug 1988	Laie Trail	1900-2300	580-700		giffardi	1		BPBM	E 21.5989	-157.9558	
KNM	Oahu	9 Apr 2016	Paliaka snail jail	3000	915	on <i>Coprosma longifolia</i>	giffardi	1		KNMC	W 21.4155	-158.0995	
RCLP	Oahu	Dec	Tantalus	1800	550		glabra	4		BPBM	E 21.3374	-157.8105	
RCLP	Oahu	189-	Mis nr Honolulu	2000-3000	610-915		glabra	1		BPBM	E 21.3518	-157.7930	
WMMG	Oahu	9 Apr 1905	Tantalus	1300	400		glabra?	1		BPBM	E 21.3286	-157.8250	
WMMG	Oahu	7 May 1911	Tantalus	1300	400		glabra	1		HDOA	E 21.3286	-157.8250	
WMMG	Oahu	7 May 1911	Tantalus	1300	400		glabra	1		BPBM	E 21.3286	-157.8250	holotype
WMMG	Oahu	7 May 1911	Tantalus	1300	400		glabra	1		BPBM	E 21.3286	-157.8250	
DTF	Oahu	30 Mar 1913	Opaeula				glabra	1		BPBM	E 21.5520	-157.9535	holotype of <i>S. opaeula</i>
PHT	Oahu	18 May 1920	Mt. Kaala	c. 2000-2500	610-760	on <i>Dubautia plantaginea</i>	glabra	1		HDOA	E 21.5008	-158.1374	
PHT	Oahu	18 May 1920	Mt. Kaala	c. 1500	460	on <i>Acacia koa</i>	glabra	1		HDOA	E 21.5314	-158.1432	
OHS	Oahu	27 Jun 1909	Niu			ex <i>Gracilaria mabaella</i>	gracilariae	1	1	BPBM	E 21.3093	-157.7417	paratype; date incorrectly given in Fullaway as same as holotype
OHS	Oahu	11 Dec 1910	Niu			reared from larva of <i>Gracilaria mabaella</i> [= <i>Caloptilia mabaella</i>]	gracilariae	1	1	BPBM	E 21.3093	-157.7417	holotype and allotype
PHT	Oahu	28 Jul 1918	Malamalama			on <i>Kadua acuminata</i>	gracilariae	2		BPBM	E 21.3691	-157.7842	holotype and paratype of <i>S. kadiana</i>
OHS	Oahu	18 Nov 1923	Waiupe				gracilariae	1		BPBM	E 21.3202	-157.7491	
NLHK	Oahu	20 Feb 1944	Munou				gracilariae	1		BPBM	E 21.3366	-157.8000	
ECZ	Oahu	29 Oct 1944	Mt. Kaala	1200-1500	370-460	Beating Shrubbery	gracilariae	1		BPBM	E 21.5314	-158.1432	
JWB	Oahu	6 Nov 1957	Mt. Tantalus				gracilariae	1		BPBM	E 21.3286	-157.8250	
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Diopsvyros hillebrandii</i>	gracilariae	2	1	BPBM	W 21.5321	-158.1786	
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Diopsvyros hillebrandii</i>	gracilariae	4	1	KNMC	W 21.5321	-158.1786	
KNM	Oahu	18 Nov 2014	Pulee, Coffee Gulch	1900	580	on <i>Diopsvyros hillebrandii</i>	gracilariae	1		BPBM	W 21.5108	-158.1230	
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Diopsvyros hillebrandii</i>	gracilariae	4		BPBM	W 21.5321	-158.1786	
KNM	Oahu	19 Oct 2016	Pulee, Coffee Gulch	1900	580	on <i>Diopsvyros hillebrandii</i>	gracilariae	1		NMNH	W 21.5109	-158.1234	
KNM	Oahu	14 Nov 2016	West Makaleha Gulch	1900	580	on <i>Diopsvyros hillebrandii</i>	gracilariae	2		BPBM	W 21.5285	-158.1723	
KNM	Oahu	14 Nov 2016	West Makaleha Gulch	1900	580	on <i>Diopsvyros hillebrandii</i>	gracilariae	2		NMNH	W 21.5285	-158.1723	
KNM	Oahu	14 Nov 2016	West Makaleha Gulch	1900	580	on <i>Diopsvyros hillebrandii</i>	gracilariae	6		KNMC	W 21.5285	-158.1723	
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on <i>Diopsvyros hillebrandii</i>	gracilariae	3		KNMC	W 21.5321	-158.1786	
PHT	Oahu	7 Jan 1917	Kaunaohe Ridge				gracilis	1		BPBM	E 21.3456	-157.8015	holotype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
PHT	Oahu	18 May 1920	Mt. Kaala	c. 2000-2500	610-760	on Dubautia plantaginea	gracilis	1		HDOA	E 21.5008	-158.1374	
JWB	Oahu	26 Nov 1961	Wiliwilini Ridge				gracilis	1		BPBM	E 21.3193	-157.7590	
KNM	Oahu	22 Apr 2015	Kaala-Kalema crestline	3100	950	on Metrosideros polymorpha	gracilis	1		BPBM	W 21.4933	-158.1379	
OHS	Oahu	11 Jun 1911	Punahoa				gracillima	1		BPBM	E 21.5449	-157.9006	holotype
OHS	Oahu	3 Jun 1921	Waiaawa				gracillima	1		BPBM	E 21.5082	-157.9473	
KNM	Oahu	1 May 2014	Puu Hapapa	2650	810	at Drosophila bait	gracillima	1		BPBM	W 21.4666	-158.1029	
OHS	Oahu	12 May 1919	Waiahole			Euphorbia	granulosa	1		BPBM	E 21.4728	-157.8841	paratype
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side			Euphorbia	granulosa	1	1	BPBM	E 21.5024	-158.1565	holotype and allotype
OHS	Oahu	9 Feb 1936	Kukuiaia Val.			Euphorbia	granulosa	1	1	BPBM	E 21.5349	-158.1848	paratype
OHS	Oahu	12 Mar 1933	Halona Val., Waianae Mts.			Osmorhiza	halona	1		BPBM	E 21.4308	-158.0935	holotype
OHS	Oahu	13 Mar 1932	Haleuanu			Alyxia	hauwahine	1		BPBM	E 21.4988	-158.1353	holotype
JWB	Oahu	Jun 1957	Palikea				hauwahine	1		BPBM	E 21.4149	-158.0998	paratype
OHS	Oahu	7 May 1922	Palehua, Waianae			Gouardia	heterochroma	1		BPBM	E 21.3943	-158.0969	paratype
OHS	Oahu	18 Feb 1923	Mt. Kaala			Metrosideros	heterochroma	1		BPBM	E 21.5008	-158.1374	paratype
OHS	Oahu	13 Apr 1930	Pehiniia Ridge			Ohia la	heterochroma	1		BPBM	E 21.5520	-157.9535	paratype
OHS	Oahu	16 Sep 1933	Kukuiaia Val.			Maba	heterochroma	1		BPBM	E 21.5349	-158.1848	paratype
ECZ	Oahu	29 Oct 1944	Mt. Kaala	1200-1500	370-460	Beating Shrubbery	heterochroma	1		BPBM	E 21.5314	-158.1432	paratype
KNM	Oahu	14 Feb 2012	Makaha, Camp Ridge	2300	700	beating vegetation	heterochroma	2		BPBM	W 21.5019	-158.1690	paratype
KNM	Oahu	16 Feb 2012	Palikea	2900	885	beating vegetation	heterochroma	1		BPBM	W 21.4158	-158.0993	holotype
KNM	Oahu	24 Feb 2012	North Haleuanu Gulch	2350	720	on Antidesma platyphyllum	heterochroma	2		BPBM	W 21.5066	-158.1297	paratype
KNM	Oahu	16 May 2012	Kapuna, Mokuleia Tr.	2100	640	on Planchonella sandwicensis	heterochroma	2	1	BPBM	W 21.5321	-158.1786	paratype
KNM	Oahu	30 Aug 2012	Puu Kaua summit	3050	930	on Metrosideros polymorpha	heterochroma	1		HDOA	W 21.4411	-158.0989	paratype
KNM	Oahu	30 Aug 2012	Puu Kaua trail	2900	885	on Coprosma longifolia	heterochroma	1	5	KNMC	W 21.4415	-158.0983	
KNM	Oahu	5 Jun 2013	Ohikilolo	2900	885	sweeping ferns	heterochroma	1	1	BPBM	W 21.5133	-158.1930	paratype
KNM	Oahu	5 Jun 2013	Ohikilolo	2900	885	on Wikstroemia oahuensis	heterochroma	2		KNMC	W 21.5133	-158.1930	
KNM	Oahu	5 Jun 2013	Ohikilolo	2900	885	on Elaeocarpus bifidus	heterochroma	2	7	KNMC	W 21.5133	-158.1930	
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Antidesma platyphyllum	heterochroma	1		HDOA	W 21.5321	-158.1786	paratype
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on Psychotria	heterochroma	1	1	NMNH	W 21.5321	-158.1786	paratype
KNM	Oahu	3 Mar 2015	Kaala summit, E face	3950	1200	under leaves	heterochroma	1		NMNH	W 21.5057	-158.1412	paratype
KNM	Oahu	2 Jun 2015	Kaala summit, E face	3950	1200	on Broussaisia arguta	heterochroma	1		BPBM	W 21.5057	-158.1412	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Xylosma hawaiiense</i>	heterochroma	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on <i>Kadua affinis</i>	heterochroma	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	heterochroma	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Kadua affinis</i>	heterochroma	2		BPBM	W	21.4146	-158.0999 paratype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Cheiriodendron trigynum</i>	heterochroma	1	1	KNMC	W	21.4146	-158.0999
KNM	Oahu	14 Nov 2016	West Makaleha Gulch	1900	580	on <i>Disopyros hillebrandii</i>	heterochroma	1		UHIM	W	21.5285	-158.1723 paratype
KNM	Oahu	22 Feb 2017	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	heterochroma	1		UHIM	W	21.4150	-158.0993 paratype
KNM	Oahu	10 Aug 2017	Waianae-Kaala Tr.	3850	1170	on <i>Melastoma</i>	heterochroma	1		KNMC	W	21.5028	-158.1491
KNM	Oahu	19 Oct 2017	Palikea	3000	915	on <i>Kadua affinis</i>	heterochroma	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	26 Feb 2018	Palikea	3000	915	on <i>Cheiriodendron trigynum</i>	heterochroma	4	4	BPBM	W	21.4155	-158.0995
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Psychotria muriniana</i>	heterochroma	1		BPBM	W	21.4128	-158.0997
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Melastoma</i>	heterochroma	3		KNMC	W	21.4133	-158.0993
KNM	Oahu	9 May 2018	Ohikilolo	2900	885	on <i>Metrosideros polymorpha</i>	heterochroma	1	2	KNMC	W	21.5133	-158.1930
KNM	Oahu	9 May 2018	Ohikilolo	2900	885	on <i>Prichardia kaalae</i>	heterochroma	3	3	KNMC	W	21.5137	-158.1938
KNM	Oahu	31 Jul 2018	Palikea	3000	915	on <i>Coprosma longifolia</i>	heterochroma	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2100	640	on <i>Elaeocarpus bifidus</i>	heterochroma	5		BPBM	W	21.5321	-158.1786
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2200	670	on <i>Citrus</i>	heterochroma	1		BPBM	W	21.5326	-158.1808
KNM	Oahu	19 Jun 2019	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	heterochroma	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on <i>Antidesma platyphyllum</i>	heterochroma	2		KNMC	W	21.5137	-158.1938
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on <i>Psychotria muriniana</i>	heterochroma	1	3	KNMC	W	21.5137	-158.1938
GBM	Oahu	Apr 1949	Mt. Kaala				heterochroma?	1		BPBM	E	21.5008	-158.1374
OHS	Oahu	22 Jun 1924	Puu Kaua				hiaka	1	1	BPBM	E	21.4413	-158.0981 paratype
WCG	Oahu	3 Nov 1968	Aiea Ridge Trail	1600	490	<i>Ilex anomala</i>	hiaka	1		BPBM	E	21.4084	-157.8763 holotype
PHH	Oahu	17 Nov 1912	Hillebrand's Glen				hillebrandi	1		BPBM	E	21.3638	-157.8149 holotype
PHH	Oahu	27 Aug 1916	Cooke Trail [Nuuanu]				hillebrandi	1		BPBM	E	21.3480	-157.8056
RCLP	Oahu	[no date]	Honolulu Mts.				hirsuta	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	[no date]	Tantalus	1800	550		hirsuta	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	Sep 1906	Tantalus				hirsuta	1	1	BPBM	E	21.3286	-157.8250
DTF	Oahu	30 Mar 1913	Opeula				hirsuta	1		BPBM	E	21.5520	-157.9535 paratype of <i>S. lugens</i>

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	7 Sep 1913	Kaala Mis				hirsuta	2		BPBM	E 21.5207	-158.1455	
PHT	Oahu	9 Jul 1916	Mt. Kaala	1500-2500	460-760		hirsuta	1		BPBM	E 21.4986	-158.1278	
PHT	Oahu	9 Jul 1916	Mt. Kaala				hirsuta	1		missing	E 21.5008	-158.1374	paratype; missing, may be the specimen with the same date labelled as "olympiana?"
PHT	Oahu	4 Mar 1917	Mt. Kaala	1500-1800	460-550		hirsuta	4	1	BPBM	E 21.4986	-158.1278	allotype and paratypes
PHT	Oahu	22 Jul 1917	Mt. Kaala				hirsuta		1	BPBM	E 21.5008	-158.1374	paratype
PHT	Oahu	10 Feb 1918	Niu				hirsuta	1		BPBM	E 21.3093	-157.7417	holotype
W/MG	Oahu	27 Aug 1918	Tanahus				hirsuta	1		BPBM	E 21.3286	-157.8250	paratype
W/MG	Oahu	22 Dec 1918	Tanahus				hirsuta	1		BPBM	E 21.3286	-157.8250	paratype
EHB	Oahu	11 Jan 1920	Mt. Kaala				hirsuta	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	11 Jan 1920	Mt. Kaala				hirsuta	1		BPBM	E 21.5008	-158.1374	
PHT	Oahu	18 May 1920	Mt. Kaala	c. 1500	460	on ohia lehua	hirsuta	1		HDOA	E 21.5314	-158.1432	
OHS	Oahu	7 May 1922	Palehua, Waianae				hirsuta	1		BPBM	E 21.3943	-158.0969	
OHS	Oahu	7 May 1922	Palehua, Waianae			Acacia koa	hirsuta	1		BPBM	E 21.3943	-158.0969	
OHS	Oahu	10 Jan 1923	Tanahus				hirsuta	1		BPBM	E 21.3286	-157.8250	
OHS	Oahu	18 Feb 1923	Mt. Kaala			Pelea	hirsuta	4		BPBM	E 21.5008	-158.1374	
OHS	Oahu	18 Feb 1923	Mt. Kaala			Metrosideros	hirsuta	3		BPBM	E 21.5008	-158.1374	
OHS	Oahu	18 Feb 1923	Mt. Kaala			Euphorbia	hirsuta	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	18 Nov 1923	Wailupe				hirsuta	2		BPBM	E 21.3202	-157.7491	
OHS	Oahu	13 Jan 1924	Niu				hirsuta	1		BPBM	E 21.3093	-157.7417	
OHS	Oahu	22 Jun 1924	Puu Kaua				hirsuta	2	1	BPBM	E 21.4413	-158.0981	
OHS	Oahu	6 Feb 1927	Mt. Kaala				hirsuta	1		BPBM	E 21.5008	-158.1374	
EHB	Oahu	22 Jul 1928	Mt. Kaala	2000-3000	610-915		hirsuta	1	1	BPBM	E 21.4986	-158.1278	
OW	Oahu	22 Jan 1929	Oahu				hirsuta	1		NHMOUK			
OW	Oahu	22 Jan 1929	Oahu				hirsuta	1		NHMOUK			
OHS	Oahu	21 Jul 1929	Mt. Kaala				hirsuta	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	11 Jan 1931	Haleanuu			Ohia Lehua	hirsuta	1	1	BPBM	E 21.4988	-158.1353	
OHS	Oahu	19 Apr 1931	Puu Kalena			Pelea	hirsuta	1		BPBM	E 21.4892	-158.1322	
OHS	Oahu	13 Mar 1932	Haleanuu			Alyxia	hirsuta	1		BPBM	E 21.4988	-158.1353	
OHS	Oahu	15 Oct 1933	Haleanuu			Pelea	hirsuta	1		BPBM	E 21.4988	-158.1353	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
ECZ	Oahu	11 Nov 1936	Palikea			Beating	hirsuta	2		BPBM	E 21.4149	-158.0998	
ECZ	Oahu	29 Oct 1944	Mt. Kaala	1200-1500	370-460	Beating Shrubbery	hirsuta	2		BPBM	E 21.5314	-158.1432	
EJF	Oahu	Jan 1955	Puu Palikea				hirsuta	1		BPBM	E 21.4149	-158.0998	
DEH	Oahu	Apr 1956	Pauoa Flats				hirsuta	2		BPBM	E 21.3405	-157.8110	
JWB	Oahu	4 Jul 1956	Mt. Tantalus				hirsuta	2		BPBM	E 21.3286	-157.8250	
JWB	Oahu	Jul 1957	Mt. Kaala				hirsuta	1		BPBM	E 21.5008	-158.1374	
TCM	Oahu	5 Oct 1960	Palikea Pk.	2500	760	Metrosideros	hirsuta	1	1	BPBM	E 21.4149	-158.0998	
JWB	Oahu	6 Oct 1965	Pomoho Trail				hirsuta	2		BPBM	E 21.5304	-157.9427	
CMT	Oahu	18 Jan 1966	Wiiliiliui Ridge				hirsuta	2		BPBM	E 21.3193	-157.7590	
JWB	Oahu	18 Jan 1966	Wiiliiliui Ridge				hirsuta	1	1	BPBM	E 21.3193	-157.7590	
KNM	Oahu	28 Jul 2012	Pahoehoe, Waianae crest	2200	670	sweeping Bidens torta	hirsuta	1	2	BPBM	W 21.5393	-158.1924	
KNM	Oahu	28 Jul 2012	Pahoehoe, Waianae crest	2200	670	sweeping Bidens torta	hirsuta	1	1	KNMC	W 21.5393	-158.1924	
KNM	Oahu	30 Aug 2012	Puu Kauna trail	2900	885	on Coprosma longifolia	hirsuta	1	1	KNMC	W 21.4415	-158.0983	
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on Perrottetia sandwicensis	hirsuta	1		KNMC	W 21.4150	-158.0993	
KNM	Oahu	20 May 2014	Palikea	3000	915	on Ilex anomala	hirsuta	1		BPBM	W 21.4146	-158.0999	
KNM	Oahu	21 Aug 2014	Palikea	3000	915	on Psychotria	hirsuta	1		BPBM	E 21.4146	-158.0999	
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on Xylosma hawaiiense	hirsuta	1		NMNH	W 21.5321	-158.1786	
KNM	Oahu	17 Jul 2015	Kahanahaki ridge	2200	670	on Nestegis sandwicensis	hirsuta	1		KNMC	W 21.5374	-158.1924	
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on Perrottetia sandwicensis	hirsuta	1		NMNH	W 21.4146	-158.0999	
KNM	Oahu	4 May 2016	Kaala summit, SE face	3850	1170	on Syzygium sandwicensis	hirsuta	1		KNMC	W 21.5017	-158.1442	
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on Coprosma longifolia	hirsuta	1		BPBM	W 21.4146	-158.0999	
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on Disopyros hillebrandii	hirsuta	2	1	BPBM	W 21.5321	-158.1786	
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on Xylosma hawaiiense	hirsuta	2	15	KNMC	W 21.5321	-158.1786	
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on Myrsine oahuensis	hirsuta	1		KNMC	W 21.5321	-158.1786	
KNM	Oahu	9 May 2018	Ohikilolo	2900	885	on Metrosideros polymorpha	hirsuta	2	1	KNMC	W 21.5133	-158.1930	
KNM	Oahu	12 Jul 2018	Palikea	3000	915	on Melicope	hirsuta	1		BPBM	W 21.4133	-158.0993	
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2100	640	on Elaeocarpus bifidus	hirsuta	1	4	BPBM	W 21.5321	-158.1786	
KNM	Oahu	13 Jun 2019	Pualii	2600	790	on Antidesma platyphyllum	hirsuta	3	3	KNMC	W 21.4230	-158.0924	
DTF	Oahu	3 Jan 1910	Tantalus				hirticeps	1		BPBM	E 21.3286	-157.8250	holotype
OHS	Oahu	17 Jan 1915	Pahalo				hirticeps	1		BPBM	E 21.3206	-157.7768	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
DTF	Oahu	13 Feb 1917	Manoa Ridge				hirticeps	1		HDOA	E 21.3211	-157.7920	paratype
JCB	Oahu	9 Sep 1917	SE Koolau Mts.				hirticeps	1		BPBM	E 21.3456	-157.8015	paratype
PHT	Oahu	9 Sep 1917	Kaunaochona				hirticeps	1		missing	E 21.3456	-157.8015	paratype
OHS	Oahu	13 Apr 1924	Waikane			on Sandalwood tree	hookahi	1		BPBM	E 21.5037	-157.8904	holotype
JLG	Oahu	5 Apr 1958	Puu Kaa			Metrosideros	huakala	1		BPBM	E 21.4413	-158.0981	holotype
KNM	Oahu	2 Nov 2012	Waianae-Kaala Tr.	2400	730	on Alyxia stellata	huapoo	1		BPBM	W 21.5014	-158.1566	holotype
KNM	Oahu	5 Aug 2014	Ekahaniui, gulch 2D	2200	670	on Nerudia melastomifolia	huaku	1		BPBM	W 21.4389	-158.0938	holotype
KNM	Oahu	26 Oct 2017	Puu Hapapa	2650	810	on Psychotria hillebrandii	huaku	1		KNMC	W 21.4665	-158.1028	holotype
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on Pipturus albidus	ihulena	1		BPBM	W 21.4665	-158.1028	paratype
KNM	Oahu	30 Aug 2018	Puu Hapapa	2650	810	on Urena kaala	ihulena	1		KNMC	W 21.4665	-158.1028	holotype
KNM	Oahu	28 Aug 2019	Puu Hapapa	2650	810	sweeping	ihulena	1		KNMC	W 21.4665	-158.1028	holotype
PHT	Oahu	4 Apr 1916	Palolo Hill trail				incita	1		BPBM	E 21.3206	-157.7768	holotype
PHT	Oahu	22 Jul 1917	Mt. Kaala	2500-3000	760-915		kaala	1		BPBM	E 21.5008	-158.1374	holotype
JWB	Oahu	6 Oct 1965	Poomoho Trail				kaala	1		BPBM	E 21.5304	-157.9427	
JWB	Oahu	11 Apr 1966	Mt. Kaala				kaala	1		BPBM	E 21.5072	-158.1434	
JWB	Oahu	14 Apr 1966	Mt. Kaala				kaala	1		BPBM	E 21.5072	-158.1434	
KNM	Oahu	3 Apr 2012	Poomoho Trail	2400	730	on Dubautia plantaginea	kaala	2		BPBM	W 21.5340	-157.9226	
KNM	Oahu	6 Oct 2012	KST nr. Poomoho cabin	2500	760	sweeping	kaala	1		BPBM	W 21.5304	-157.9201	
KNM	Oahu	18 May 2018	Kaala, Dupont Trail	3800	1160	on Cheirodendron trigynum	kaala	1		KNMC	W 21.5105	-158.1455	
OHS	Oahu	17 Dec 1933	Pupukea				kahuku	1		BPBM	E 21.6378	-158.0097	paratype
KNM	Oahu	30 Oct 2012	Lanihuli Trail	1800	550	on Acacia koa	kahuku	1		BPBM	W 21.3567	-157.8286	paratype
KNM	Oahu	21 May 2013	Kahuku, Koolau Summit Tr	1650	500	sweeping Freycinetia arborea	kahuku	1		BPBM	W 21.6344	-157.9880	holotype
KNM	Oahu	20 May 2014	Palikea	3000	915	sweeping	kahuku	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on Pisonia umbellifera	kahuku	1		BPBM	W 21.4665	-158.1028	paratype
KNM	Oahu	10 Jan 2017	Palikea	3000	915	on Coprosma longifolia	kahuku	1		KNMC	W 21.4150	-158.0993	
KNM	Oahu	16 Jan 2019	Makaha, unit 1	2300	700	on Cyanea superba	kahuku	1		KNMC	W 21.5012	-158.1678	
RCLP	Oahu	Dec 1892	Kaala Mts.	3000	915		kamani	1		NHMUK	E 21.5172	-158.1455	
OHS	Oahu	16 Sep 1933	Kukuihala Val.			Alectryon	kamani	1		BPBM	E 21.5349	-158.1848	holotype
ECZ	Oahu	29 Oct 1944	Mt. Kaala	1200-1500	370-460	Beating Shrubbery	kamani	1		BPBM	E 21.5314	-158.1432	paratype
EJF	Oahu	Jul 1953	Waianae				kamani	1		BPBM			paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	5 Dec 1915	Tartarus			ex Kadua minor	kaumuohona	1	1	BPBM	E 21.3286	-157.8250	
PHT	Oahu	9 Sep 1917	Kaumuohona				kaumuohona	1		BPBM	E 21.3456	-157.8015	holotype
OHS	Oahu	12 Jan 1919	Kaumuohona			ex Aristotelia in Kadua	kaumuohona	2	1	BPBM	E 21.3456	-157.8015	
PHT	Oahu	18 May 1920	Mt. Kaala	c. 1500	460	on ohia lehua	kaumuohona	1		HDOA	E 21.5314	-158.1432	
OHS	Oahu	22 Feb 1924	Tartarus			ex Aristotelia on Kadua leaf	kaumuohona	1	1	BPBM	E 21.3286	-157.8250	
OHS	Oahu	28 Apr 1935	Haleuanu			ex leafminer in Coprosma	kaumuohona	2		BPBM	E 21.4988	-158.1353	
OHS	Oahu	30 Jun 1935	Palikea			ex Suttonia	kaumuohona	1		BPBM	E 21.4149	-158.0998	
JWB	Oahu	6 Oct 1965	Pamoho Trail				kaumuohona	1		BPBM	E 21.5304	-157.9427	
KNM	Oahu	17 Mar 2015	Koloa, Koolau Summit Tr	2400	730	on Melicope	kaumuohona	1		KNMC	W 21.5838	-157.9485	
ECZ	Oahu	11 Nov 1936	Palikea			Beating	kawala	1		BPBM	E 21.4149	-158.0998	holotype
OHS	Oahu	18 Jun 1938	Palikea			Euphorbia	kepau	1		BPBM	E 21.4149	-158.0998	
KNM	Oahu	30 Aug 2012	Puu Kaua summit	3050	930	on Metrosideros polymorpha	kepau	1		BPBM	W 21.4411	-158.0989	paratype
KNM	Oahu	9 Apr 2016	Palikea snail jail	3000	915	on Coprosma longifolia	kepau	1		BPBM	W 21.4155	-158.0995	holotype
EHB	Oahu	9 Nov 1919	S. Waianae Mts.				kikawi	1		BPBM			holotype
OHS	Oahu	3 Jan 1932	Haleuanu				kikawi	1		BPBM	E 21.4988	-158.1353	paratype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Coprosma longifolia	kikawi	1		KNMC	W 21.4146	-158.0999	
DF	Oahu	18 Mar 1973	Puu Puae			ex Peka fruits (R92)	kilohana	1		BPBM	E 21.5168	-158.1134	holotype
DF	Oahu	18 Mar 1973	Puu Puae			ex Peka fruits (R92)	kilohana	1		BPBM	E 21.5168	-158.1134	paratype
JCB	Oahu	Jun 1918	Mt. Tantalus			swept from Acacia koa	koa	3		BPBM	E 21.3286	-157.8250	holotype and paratypes
	Oahu	28 Jun 1919	Niuanu			ex C. illepidia	koa	1		HDOA	E 21.3480	-157.8056	
OHS	Oahu	7 Nov 1926	Kahaiki				koa	1		BPBM	E 21.3716	-157.8435	
OHS	Oahu	13 Apr 1930	Peahinaia Rdg.				koa	1		BPBM	E 21.5520	-157.9535	
OHS	Oahu	20 May 1934	Mt. Tantalus			Acacia koa	koa	1		BPBM	E 21.3286	-157.8250	
	Oahu	May 1939	Honolulu			ex cocoon leafroller	koa	2	1	BPBM	E 21.2930	-157.8537	
OHS	Oahu	27 Jun 1939	Tartarus			ex Argroploe e illepidia	koa	4	1	HDOA	E 21.3286	-157.8250	
CNY	Oahu	18 Jan 1966	Wilivilini Ridge				koa	1		BPBM	E 21.3193	-157.7590	
KNM	Oahu	27 Jun 2017	Hapapa trail	2300	700	on Acacia koa pods	koa	1		BPBM	W 21.4660	-158.1010	
KNM	Oahu	27 Jun 2017	Hapapa trail ex koa pods	2300	700	w Cryptophl. illepidia em 12 Jul	koa	1		BPBM	W 21.4660	-158.1010	
KNM	Oahu	27 Jun 2017	Hapapa trail ex koa pods	2300	700	w Cryptophl. illepidia em 13 Jul	koa	1	2	BPBM	W 21.4660	-158.1010	
KNM	Oahu	27 Jun 2017	Hapapa trail	2300	700	on Acacia koa pods	koa	2		KNMC	W 21.4660	-158.1010	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	27 Jun 2017	Hapupu trail ex koa pods	2300	700	w <i>Cryptophl. illepidia</i> em 16 Jul	koa	1	1	KNMC	W	21.4660	-158.1010
KNM	Oahu	27 Jun 2017	Hapapa trail ex koa pods	2300	700	w <i>Cryptophl. illepidia</i> em 16 Jul	koa	1		NMNH	W	21.4660	-158.1010
KNM	Oahu	27 Oct 2019	Waihupe middle ridge	2250	685	on <i>Acacia</i> koa	koa	1		BPBM	W	21.3421	-157.7484
AK	Oahu	[no date]	Oahu				koche lei	1		BPBM			holotype
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				koche lei	1		BPBM			
OHS	Oahu	11 Jan 1925	Waihupe				koche lei	1		BPBM	E	21.3202	-157.7491
OHS	Oahu	29 Dec 1929	Puu Kalena				koche lei	1		BPBM	E	21.4892	-158.1322
KNM	Oahu	19 Jun 2018	Kaaha-Kalena crestline	3100	950	on <i>Metrosideros polymorpha</i>	koche lei	1		KNMC	W	21.4933	-158.1379
OHS	Oahu	11 Jan 1925	Waihupe			ex <i>Philodoria</i> in <i>Suttonia</i>	koa	2		BPBM	E	21.3202	-157.7491
KNM	Oahu	14 Feb 2012	Makahu, Camp Ridge	2300	700	beating vegetation	koa	1		BPBM	W	21.5019	-158.1090
KNM	Oahu	24 Feb 2012	North Haleanuu Gulch	2350	720	on <i>Diospyros</i>	koa	1		BPBM	W	21.5066	-158.1297
KNM	Oahu	14 Jan 2015	Palawai Gukh	2300	700	on <i>Planchonella sandwicensis</i>	koa	1		NMNH	W	21.4189	-158.0955
KNM	Oahu	2 Aug 2017	Ohikilolo	2900	885	on <i>Metrosideros polymorpha</i>	koa	1	1	BPBM	W	21.5133	-158.1937
KNM	Oahu	2 Aug 2017	Ohikilolo	2900	885	on <i>Metrosideros polymorpha</i>	koa		1	KNMC	W	21.5133	-158.1937
OHS	Oahu	1 Dec 1929	Haleanuu			<i>Suttonia</i>	komohana	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	9 Feb 1930	Haleanuu			<i>Pteralyxia</i>	komohana	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	28 Apr 1935	Haleanuu			<i>Anitidesma</i>	komohana	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	26 May 1935	Haleana				komohana	1		BPBM	E	21.3995	-157.8639
KNM	Oahu	17 May 2012	Puu Hapapa	2650	810	on <i>Planchonella sandwicensis</i>	komohana	1		BPBM	W	21.4665	-158.1028
KNM	Oahu	5 Jun 2013	Ohikilolo	2900	885	on <i>Wikstroemia oahuensis</i>	komohana	1		BPBM	W	21.5133	-158.1930
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on <i>Perrottetia sandwicensis</i>	komohana	1		KNMC	W	21.4150	-158.0993
KNM	Oahu	20 May 2014	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	komohana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	20 May 2014	Palikea	3000	915	on <i>Cherodendron trigynum</i>	komohana	2	7	KNMC	W	21.4146	-158.0999
KNM	Oahu	3 Jun 2014	Kaaha below cliffs, SE face	3350	1020	on <i>Coprosma longifolia</i>	komohana	2	1	KNMC	W	21.5025	-158.1428
KNM	Oahu	21 Aug 2014	Palikea	3000	915	on <i>Psychotria</i>	komohana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on <i>Coprosma longifolia</i>	komohana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	9 Apr 2016	Palikea	3000	915	sweeping ferns	komohana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on <i>Kadua affinis</i>	komohana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	komohana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Kadua affinis</i>	komohana	1		BPBM	W	21.4146	-158.0999

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KNM	Oahu	20 Jul 2016	Paliaka	3000	915	on Psychotria	komohana	2		KNMC	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2016	Paliaka	3000	915	on Perottetia sandwicensis	komohana	2		UHIM	W	21.4146	-158.0999 paratype
KNM	Oahu	20 Oct 2016	Paliaka	3000	915	on Anidesma platyphylum	komohana	1		UHIM	W	21.4146	-158.0999 paratype
KNM	Oahu	10 Jan 2017	Paliaka	3000	915	on Coprosma longifolia	komohana	1		KNMC	W	21.4150	-158.0993
KNM	Oahu	22 Jun 2017	Paliaka	3000	915	on Coprosma longifolia	komohana	1		HDOA	W	21.4155	-158.0995 paratype
KNM	Oahu	24 Jul 2017	Paliaka	3000	915	on Melicope	komohana	1		HDOA	W	21.4150	-158.0993 paratype
KNM	Oahu	13 Sep 2017	Paliaka	3000	915	on Coprosma foliosa	komohana	1		NMNH	W	21.4128	-158.0997 paratype
KNM	Oahu	13 Sep 2017	Paliaka	3000	915	on Coprosma longifolia	komohana	2		NMNH	W	21.4128	-158.0997 paratype
KNM	Oahu	19 Oct 2017	Paliaka	3000	915	on Coprosma longifolia	komohana	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on Coprosma longifolia	komohana	1	2	KNMC	W	21.4155	-158.0995
KNM	Oahu	26 Mar 2018	Paliaka	3000	915	on Melicope	komohana	1		KNMC	W	21.4133	-158.0993
KNM	Oahu	10 May 2018	Ohikilo	2900	885	on Planchonella sandwicensis	komohana		4	KNMC	W	21.5133	-158.1930
KNM	Oahu	18 May 2018	Kaala, Dupont Trail	3800	1160	on Cheirodendron trigynum	komohana	2		BPBM	W	21.5105	-158.1455
KNM	Oahu	21 Jun 2018	Paliaka	3000	915	on Kadua affinis	komohana	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	23 Jul 2019	Ohikilo	2900	885	on Freycinetia arborea	komohana	2		KNMC	W	21.5137	-158.1938
KNM	Oahu	23 Jul 2019	Ohikilo	2900	885	on Metrosideros polymorpha	komohana	1		KNMC	W	21.5137	-158.1938
JCB	Oahu	1916	SE Koolau Mts.				koalaensis	1		BPBM	E	21.3456	-157.8015 holotype
PHT	Oahu	25 Jun 1916	Kuliouou				koalaensis	2		BPBM	E	21.3160	-157.7233 holotype and paratype of S. polia
PHT	Oahu	25 Jun 1916	Kuliouou			pencil label: "sp. no. 20"	koalaensis	1		BPBM	E	21.3160	-157.7233 paratype
JCB	Oahu	24 Jun 1917	Pikolo				koalaensis	2		BPBM	E	21.3206	-157.7768
OHS	Oahu	22 Dec 1918	Kuliouou				koalaensis	1		BPBM	E	21.3160	-157.7233
OHS	Oahu	30 May 1919	Waiaupe				koalaensis	1		BPBM	E	21.3202	-157.7491
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				koalaensis	1		BPBM			
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				koalaensis	1		BPBM	E	21.3456	-157.8015
EBH	Oahu	23 Nov 1919	Kuumahona				koalaensis	1		BPBM	E	21.3366	-157.8000
FXW	Oahu	1 Jan 1920	Manoa				koalaensis	1		BPBM	E	21.3193	-157.7590
OHS	Oahu	21 Mar 1920	Waialeale Iki				koalaensis	1		BPBM	E	21.3995	-157.8639
OHS	Oahu	17 Dec 1922	Halawa				koalaensis	1		BPBM	E	21.3300	-157.7636
OHS	Oahu	11 Jun 1924	Lanipo			ex lehua bud moth	koalaensis	1		BPBM	E	21.3300	-157.7636
OHS	Oahu	12 Sep 1926	Kaala, Waianae				koalaensis	1		BPBM	E	21.5024	-158.1565

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ECZ	Oahu	11 Nov 1936	Palikea			Beating	koolauensis	1		BPBM	E	21.4149	-158.0998
KNM	Oahu	30 Oct 2012	Lanihuli Trail	1800	550	on Acacia koa	koolauensis	1		BPBM	W	21.3567	-157.8286
OHS	Oahu	7 Nov 1926	Kahaiki				kumene	1		BPBM	E	21.3716	-157.8435
KNM	Oahu	21 Feb 2010	Mokuleia Trail	2050	625	sweeping	kumene	2	3	BPBM	W	21.5334	-158.1764
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on Kadua affinis	kumene	2		KNMC	W	21.5328	-158.1765
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on Kadua affinis	kumene	2		NMNH	W	21.5328	-158.1765
KNM	Oahu	1 Feb 2017	Pihole Gulch, gulch 1	1900	580	on Psonia brunoiana	kumene	1		KNMC	W	21.5418	-158.1925
OHS	Oahu	7 Nov 1920	Mt. Tantalus				kumumu	1		BPBM	E	21.3286	-157.8250
KNM	Oahu	9 Apr 2016	Palikea trail	2700	820	on Coprosma longifolia	kumumu	1		BPBM	W	21.4102	-158.0986
KNM	Oahu	10 Jan 2017	Palikea	3000	915	on Coprosma longifolia	kumumu	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	2 Aug 2017	Ohikilolo	2900	885	on Metrosideros polymorpha	kumumu	2		KNMC	W	21.5133	-158.1937
KNM	Oahu	2 Aug 2017	Ohikilolo	2900	885	on Metrosideros polymorpha	kumumu	1		NMNH	W	21.5133	-158.1937
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on Urena glabra	kumumu?	1		KNMC	W	21.4146	-158.0999
FXW	Oahu	28 Dec 1919	Mt. Kaala			in Smilax twig	kunhihi	1		HDOA	E	21.5008	-158.1374
KNM	Oahu	29 Oct 2014	Palikea	3000	915	on Labordia kaalae	kunhihi	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on Coprosma longifolia	kunhihi	1		KNMC	W	21.4155	-158.0995
RCLP	Oahu	[no date]	Tantalus	1800	550		langfordi	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	189-	Mts nr Honolulu	2000-3000	610-915		langfordi	1		BPBM	E	21.3518	-157.7930
RCLP	Oahu	189-	Honolulu Mts.	2000-3000	610-915		langfordi	1	1	NHMUK	E	21.3518	-157.7930
WVG	Oahu	1-2 Nov 1905	Tantalus	1300	400		langfordi	1		BPBM	E	21.3286	-157.8250
RCLP	Oahu	Sep 1906	Tantalus				langfordi	1		BPBM	E	21.3286	-157.8250
PHT	Oahu	25 Jun 1916	Kuliouou				langfordi	1		BPBM	E	21.3160	-157.7233
PHT	Oahu	25 Jul 1916	Kuliouou				lanhuliana	1		HDOA	E	21.3160	-157.7233
OHS	Oahu	Aug 1916	Waiahole				lanhuliana	1		BPBM	E	21.4728	-157.8841
PHT	Oahu	3 Sep 1916	Lanihuli				lanhuliana	1		BPBM	E	21.3537	-157.8325
OHS	Oahu	22 Apr 1917	Waiahole Ridge				lanhuliana	1		HDOA	E	21.3141	-157.7669
WVG	Oahu	26 Oct 1919	Maaoa Cliffs Trail				lanhuliana	1		HDOA	E	21.3305	-157.8093
OHS	Oahu	28 Apr 1935	Haleuauu			ex Gouldia [Kadua]	lanhuliana	1		BPBM	E	21.4988	-158.1353
ECZ	Oahu	11 Nov 1936	Palikea			Beating	lanhuliana	1		BPBM	E	21.4149	-158.0998
JWB	Oahu	4 Jul 1956	Mt. Tantalus				lanhuliana	1		BPBM	E	21.3286	-157.8250

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WDP	Oahu	28 Sep 1985	Mt. Kaala	4000	1220		lanihulana	1		BPBM	E 21.5072	-158.1434	
KNM	Oahu	28 May 2014	North Puu Ii Gulch	2100	640	on Planchonella sandwicensis	lanihulana	1		BPBM	W 21.4249	-158.0910	
KNM	Oahu	6 Jul 2014	Kapuna, Mokuiaia Tr.	2100	640	on Phaeosporium	lanihulana	1		BPBM	W 21.5321	-158.1786	
KNM	Oahu	8 Apr 2015	Peehiniaia Tr.	2100	640	on Psychotria maritima	lanihulana	1		BPBM	W 21.5525	-157.9532	
KNM	Oahu	9 Apr 2015	Peehiniaia Tr.	2100	640	on Antidesma platyphyllum	lanihulana	1		KNMC	W 21.5525	-157.9532	
KNM	Oahu	4 Jun 2015	Kapuna, Mokuiaia Tr.	2100	640	on Elaeocharpus bifidus	lanihulana	1		KNMC	W 21.5328	-158.1765	
KNM	Oahu	27 Dec 2016	Puu Hapapa	2200	670	on Psychotria maritima	lanihulana	1		NMNH	W 21.4655	-158.0986	
KNM	Oahu	30 Oct 2012	Lanahu Trail	1800	550	on Acacia koa	lapuu	1		BPBM	W 21.3567	-157.8286	paratype
KNM	Oahu	21 Jan 2013	Manoa Cliffs Trail	1700	520	sweeping Freycinetia arborea	lapuu	1		BPBM	W 21.3341	-157.8103	holotype
JWB	Oahu	10 Feb 1963	Ewa				larifuga	1		BPBM	E 21.3069	-158.0240	
EFD	Oahu	7 May 1969	Kaala, Waianae Mts.		1220		larifuga	1		BPBM	E 21.5072	-158.1434	
NS	Midway	6 Mar 1997	Sund I: Henderson @ Halsey Aves				larifuga	3		BPBM	E 28.2126	-177.3756	
LL	Oahu	7 Dec 2004	Waialua Farmlands			Trap 040 (methyl eugenol)	larifuga	1		UHIM	E 21.5700	-158.1300	
LL	Oahu	24 Dec 2004	Waialua Farmlands			Trap 037 (Solutys)	larifuga	1		UHIM	E 21.5700	-158.1300	
LL	Oahu	7 Jan 2005	Waialua Farmlands			Trap 081 (Solutys)	larifuga	1		UHIM	E 21.5700	-158.1300	
LL	Oahu	7 Jan 2005	Waialua Farmlands			Trap 064 (dead flies)	larifuga	1		UHIM	E 21.5700	-158.1300	
LL	Oahu	17 Mar 2005	Waialua Farmlands			Trap 111 (Cue-lure)	larifuga	1		UHIM	E 21.5700	-158.1300	
LL	Hawaii	29 Jun 2005	Waimea, Howard Halls lime orchard	2440	740	Trap 361 (Solutys)	larifuga	1		UHIM	W 20.0112	-155.6936	
LL	Hawaii	5 Jul 2005	Waimea, USDA-ARS Citrus Orchard	550	170	Trap 223 (Methyl Eugenol)	larifuga	1		UHIM	W 19.6481	-155.0798	
LL	Hawaii	9 Jul 2005	Saddle Road Mile 9, open bog	2200	670	Trap 397 (Dead Flies)	larifuga	1		UHIM	W 19.6891	-155.1955	
LL	Hawaii	20 Jul 2005	Waimea, Howard Halls lime orchard	2440	740	Trap 356 (Solutys)	larifuga	1		UHIM	W 20.0112	-155.6936	
LL	Maui	14 Jul 2006	Kula, Flora Umemo coffee	3000	915	Trap 914 (BioLure)	larifuga	1		UHIM	W 20.7570	-156.3244	
LL	Maui	4 Aug 2006	Kula, Clark Hashimoto invas. forest	3400	1040	Trap 618 (2-comp Biolure)	larifuga	1		UHIM	W 20.7630	-156.3097	
LL	Maui	15 Aug 2006	Kula, Flora Umemo coffee	3000	915	Trap 914 (BioLure)	larifuga	1		UHIM	W 20.7570	-156.3244	
LL	Maui	16 Aug 2006	Kula, Flora Umemo coffee	3000	915	Trap 681 (2-comp Biolure)	larifuga	1		UHIM	W 20.7570	-156.3244	
LL	Maui	26 Sep 2006	Kula, Flora Umemo coffee	3000	915	Trap 681 (2-comp Biolure)	larifuga	1		UHIM	W 20.7570	-156.3244	
LL	Maui	26 Oct 2006	Kula, Howard Harada coffee	3700	1130	Trap 653 (2-comp Biolure)	larifuga	1		UHIM	W 20.7390	-156.3166	

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KNM	Oahu	16 Feb 2012	Palikea	2900	885	beating vegetation	larifuga	1		BPBM	W	21.4158	-158.0993
KNM	Oahu	30 Aug 2012	Puu Kaa summit	3050	930	on <i>Metrosideros</i> polymorpha	larifuga	1		BPBM	W	21.4411	-158.0989
KNM	Oahu	22 Jun 2016	Kalena east ridge	3100	950	on <i>Cheirodendron trigynum</i>	lateralis	1		BPBM	W	21.4933	-158.1379
JCB	Oahu	8 Mar 1961	Ewa				laupapa	1	1	BPBM	E	21.3069	-158.0240
JWB	Oahu	Dec 1961	Ewa				laupapa	1		BPBM	E	21.3069	-158.0240
JCB	Oahu	24 Jun 1964	Ewa				laupapa	1		BPBM	E	21.3069	-158.0240
PDK	Oahu	13 Apr 2015	Kaena Point	15	5	pifall trap	laupapa	1		UHM	W	21.5748	-158.2758
PDK	Oahu	13 Apr 2015	Kaena Point	15	5	vegetation sweeping	laupapa	1		UHM	W	21.5748	-158.2758
NLE	Oahu	10-13 Dec 2018	Luu‘ualei, Hakona Val.	1470	450	malaise trap	laupapa	2		BPBM	W	21.4243	-158.1012
NLE	Oahu	21-23 Aug 2019	Luu‘ualei, Hakona Val.	1280	390	yellow pan trap	laupapa	1	3	BPBM	W	21.4261	-158.1030
NLE	Oahu	10-13 Sep 2019	Luu‘ualei, Hakona Val.	1280	390	yellow pan trap	laupapa	6	3	BPBM	W	21.4261	-158.1030
NLE	Oahu	27 Sep 2019	Luu‘ualei, Hakona Val.	1280	390	yellow pan trap	laupapa	7	4	BPBM	W	21.4261	-158.1030
NLE	Oahu	27 Sep 2019	Luu‘ualei, Hakona Val.	1280	390	on <i>Supindus oahuensis</i>	laupapa	1		BPBM	W	21.4261	-158.1030
KNM	Oahu	24 Feb 2012	North Hakaauu Guleh	2350	720	on <i>Psychotria</i>	leiocephala	1		BPBM	W	21.5066	-158.1297
KNM	Oahu	8 Apr 2015	Pehimaa Tr.	2100	640	on <i>Cheirodendron trigynum</i>	leiocephala	1		BPBM	W	21.5525	-157.9532
DTF	Oahu	13 Feb 1917	Manoa Ridge				levis	1	2	HDAA	E	21.3211	-157.7920
OHS	Oahu	22 Apr 1917	Waialae Ridge				levis	1		BPBM	E	21.3141	-157.7669
PHT	Oahu	29 Mar 1918	Manoa Cliff’s				levis	1		missing	E	21.3305	-157.8093
WMG	Oahu	27 Aug 1918	Tantalus	1500	460		levis	1		BPBM	E	21.3315	-157.8204
PHT	Oahu	1 Sep 1918	Manoa Cliff’s				levis	1		missing	E	21.3305	-157.8093
OHS	Oahu	24 Nov 1918	Lanihuli				levis	1		BPBM	E	21.3597	-157.8263
WMG	Oahu	22 Dec 1918	Tantalus	1500	460		levis	1	1	BPBM	E	21.3315	-157.8204
OHS	Oahu	30 May 1919	Waiaupe				levis	1	1	BPBM	E	21.3202	-157.7491
WMG	Oahu	26 Oct 1919	Manoa Cliff’s Trail				levis	1		BPBM	E	21.3305	-157.8093
OW	Oahu	27 Jan 1929	Oahu				levis	1		NHMMUK			
OHS	Oahu	27 Aug 1933	Mt. Tantalus			Hibiscus	levis	1		BPBM	E	21.3286	-157.8250
OHS	Oahu	20 May 1934	Mt. Tantalus			Acacia koa	levis	1		BPBM	E	21.3286	-157.8250
ECZ	Oahu	29 Oct 1944	Mt. Kaa‘ala	1200-1500	370-460	Beating Shrubbery	levis	2	1	BPBM	E	21.5314	-158.1432
JWB	Oahu	Jun 1955	Mt. Tantalus				levis	1		BPBM	E	21.3286	-157.8250
JWB	Oahu	4 Jul 1956	Mt. Tantalus				levis	1	4	BPBM	E	21.3286	-157.8250

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
JWB	Oahu	6 Nov 1957	Mt. Tantalus				levis		2	BPBM	E 21.3286	-157.8250	
LWQ	Oahu	8 Jul 1959	Mt. Tantalus				levis		2	BPBM	E 21.3286	-157.8250	
OHS	Oahu	3 Sep 1906	Puulo Valley				lucipes	1		BPBM	E 21.3342	-157.8237	holotype
KNM	Oahu	21 Jan 1913	Manoa Cliffs Trail	1700	520	sweeping Freycinetia arborea	lucipes	1		BPBM	W 21.3341	-157.8103	
DTF	Oahu	8 Sep 1912	Puulo				mahai	1		BPBM	E 21.3206	-157.7768	holotype; originally from HDOA collection, locality spelled "Puulo" on label
JWB	Oahu	6 Oct 1965	Poomoho Trail				mahoe	1		BPBM	E 21.5304	-157.9427	paratype
SLM	Oahu	22 May 1975	Puu Kanehoa				mahoe	1		BPBM	E 21.4568	-158.0898	head damaged, identification uncertain; not included as paratype
JS	Oahu	18 Aug 1988	Peacock Flats	1800	550		mahoe	1		BPBM	E 21.5429	-158.1826	holotype
KNM	Oahu	12 Oct 2017	Puileka	3000	915	on Antidesma platyphyllum	mahoe	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	7 Nov 2013	Makaha, unit 1	2300	700	on Planchonella sandwicensis	makaha	1		BPBM	W 21.5012	-158.1678	holotype
KNM	Oahu	7 Nov 2013	Makaha, unit 1	2300	700	on Alyxia stellata	makaha	1		BPBM	W 21.5012	-158.1678	paratype
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on Nestegis sandwicensis	makaha	1		BPBM	W 21.5321	-158.1786	paratype
KNM	Oahu	9 Aug 2017	Waianae Valley	2400	730	on Hibiscus arnotianus	makaha	2		KNMC	W 21.4983	-158.1528	
KNM	Oahu	16 Jan 2019	Makaha, unit 1	2300	700	on Cyanea superba	makaha	1		KNMC	W 21.5012	-158.1678	
KNM	Oahu	22 Aug 2019	Waianae, Kumaipo Gulch 4	2200	670	on Urena glabra	makaha		1	KNMC	W 21.4990	-158.1533	
JCB	Oahu	24 Jun 1917	Puulo				malino	1		BPBM	E 21.3206	-157.7768	paratype
OHS	Oahu	18 May 1920	Mt. Kaala				malino	1		BPBM	E 21.5008	-158.1374	holotype
KNM	Oahu	2 Nov 2016	Pehihiaia Tr.	2100	640	on Melicope	malino	1		BPBM	W 21.5525	-157.9532	paratype
KNM	Oahu	20 Oct 2018	Aiea Ridge Trail	1700	520	on Syzygium sandwicense	malino	1		KNMC	W 21.4093	-157.8725	
RCLP	Oahu	[no date]	Honolulu Mts.	1800	550	march. [?]	mandibularis	1		BPBM	E 21.3374	-157.8105	word on label uncertain, underside of card says "Hon. July 18" in pencil
WMG	Oahu	1909	Tantalus	1500	460		mandibularis	1		BPBM	E 21.3315	-157.8204	
JCB	Oahu	15 Jul 1916	Tantalus			collected on Pauoa side of Tantalus	mandibularis	1		BPBM	E 21.3286	-157.8250	holotype
JCB	Oahu	Jun 1918	Mt. Tantalus				mandibularis	1		BPBM	E 21.3286	-157.8250	last digit of year is somewhat obscure, appears to be 1915 but presumed to be 1918 based on other collections with same label
OHS	Oahu	17 Nov 1918	Pacific Hts.				mandibularis	1		BPBM	E 21.3297	-157.8364	
PHT	Oahu	10 Feb 1918	Nia Ridge				mandibulata	1		BPBM	E 21.3086	-157.7387	holotype
OHS	Oahu	10 Feb 1918	Nia Ridge				mandibulata	1		HDOA	E 21.3086	-157.7387	identified by Swezey as <i>S. dichroma</i>

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
EHB	Oahu	9 Apr 1922	Moanahua				mandibulata	1		BPBM	E 21.3876	-157.8501	
JWB	Oahu	6 Oct 1965	Poanoho Trail				mandibulata	1		BPBM	E 21.5304	-157.9427	
KNM	Oahu	24 Jan 2018	Palikeya	3000	915	on Cherodendron trigynum	mandibulata	1		KNMC	W 21.4155	-158.0995	
PHT	Oahu	9 Apr 1916	Paliolo Hill trail			pencil label: "sp. no. 8"	manoa	1		BPBM	E 21.3206	-157.7768	holotype of <i>S. abiosa</i>
PHT	Oahu	9 Apr 1916	Paliolo Hill trail				manoa	2		BPBM	E 21.3206	-157.7768	
DTF	Oahu	20 Aug 1916	Cooke's trail, Nuuanu Valley				manoa	1		HDOA	E 21.3480	-157.8056	paratype of <i>S. tenebriosa</i>
DTF	Oahu	13 Feb 1917	Manoa Ridge				manoa	1		BPBM	E 21.3211	-157.7920	holotype
PHT	Oahu	22 Jul 1917	Mt. Kaala				manoa	1		BPBM	E 21.5008	-158.1374	holotype of <i>S. kadensis</i>
OHS	Oahu	18 May 1920	Mt. Kaala				manoa	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	18 Nov 1923	Waipupe				manoa	1		BPBM	E 21.3202	-157.7491	
OHS	Oahu	27 Jan 1924	Waianae Mts.				manoa	1		BPBM			
OHS	Oahu	11 Jun 1924	Lanipo			ex <i>Pyrausta dryadopa</i>	manoa	2		BPBM	E 21.3300	-157.7636	
OW	Oahu	22 Jan 1929	Oahu				manoa	1		NHMUK			
WCG	Oahu	23 Sep 1972	Waimano Trail, Koolau Mts.	2380	725	Emerged 3.X.1972 from Lepidopteran gall on twig terminals of <i>Goukdia terminalis</i>	manono	1		BPBM	E 21.4450	-157.8742	holotype
WCG	Oahu	23 Sep 1972	Waimano Trail, Koolau Mts.	2380	725	Emerged 3.X.1972 from Lepidopteran gall on twig terminals of <i>Goukdia terminalis</i>	manono	10	2	BPBM	E 21.4450	-157.8742	paratype
DTF	Oahu	11 Aug 1912	Mt. Kaala				minuscule	1		BPBM	E 21.5008	-158.1374	holotype
DTF	Oahu	30 Mar 1913	Opaeula				minuscule	1		HDOA	E 21.5520	-157.9535	
DTF	Oahu	26 Jan 1916	Tanahulu				minuscule	1		BPBM	E 21.3286	-157.8250	
OHS	Oahu	21 Jul 1929	Mt. Kaala			<i>Metrosideros</i>	minuscule	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	16 Sep 1933	Kukuiaia Val.			<i>Pisonia</i>	minuscule	1		BPBM	E 21.5349	-158.1848	
OHS	Oahu	16 Sep 1933	Kukuiaia Val.			ex cocoons on <i>Pisonia</i> leaf	minuscule	4		BPBM	E 21.5349	-158.1848	
ECZ	Oahu	11 Nov 1936	Palikeya			Beating	minuscule	1		BPBM	E 21.4149	-158.0998	
PHT	Oahu	22 Jul 1917	Mt. Kaala	2500-3000	760-915		montana	1		BPBM	E 21.5008	-158.1374	holotype
OHS	Oahu	15 Jan 1938	Palikeya			<i>Euphorbia</i>	montana	1		BPBM	E 21.4149	-158.0998	
OHS	Oahu	9 Nov 1919	S. Wainae Mts.				neoarmata	1		BPBM			paratype
OHS	Oahu	1 Dec 1929	Haleaunuu			<i>Suttonia</i>	neoarmata	1		BPBM	E 21.4988	-158.1353	holotype
KNM	Oahu	22 Apr 2015	S. Haleaunuu, Breeder Flats	2100	640	on <i>Perettia sandwicensis</i>	neoarmata	1		BPBM	W 21.4983	-158.1301	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	11 Aug 1912	Mt. Kaala				nigra	1		BPM	E 21.5008	-158.1374	holotype
DTF	Oahu	30 Mar 1913	Opaeula				nigrita	1		BPM	E 21.5520	-157.9535	holotype
PHT	Oahu	26 Mar 1916	Alewa Heights				nigrita	1		BPM	E 21.3482	-157.8392	
OHS	Oahu	24 Nov 1918	Lanihuli				nigrita	1		BPM	E 21.3597	-157.8263	
OHS	Oahu	24 Nov 1918	Lanihuli				nigrita	3		BPM	E 21.3597	-157.8263	
OHS	Oahu	25 May 1919	Lanihuli				nigrita	1		BPM	E 21.3597	-157.8263	
EHB	Oahu	18 Jul 1920	Lanihuli				nigrita	1		BPM	E 21.3597	-157.8263	
OHS	Oahu	18 Feb 1923	Mt. Kaala				nigrita	1		BPM	E 21.5008	-158.1374	
NLHK	Oahu	30 Jun 1929	Manoa				nigrita	1		BPM	E 21.3366	-157.8000	
OHS	Oahu	11 Nov 1933	Poamoho			Acacia koa, in ripe pods	nigrita	4		BPM	E 21.5304	-157.9427	
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Antidesma platyphyllum	nigrita	1		BPM	W 21.5321	-158.1786	
WMG	Oahu	26 Oct 1919	Manoa Cliffs Trail				nihopeku	1		HDOA borrowed	E 21.3305	-157.8093	paratype
JWB	Oahu	6 Nov 1957	Mt. Tantalus				nihopeku	1		BPM	E 21.3286	-157.8250	holotype
OHS	Oahu	7 Sep 1913	Kaala Mts				nitens	1		BPM	E 21.5207	-158.1455	paratype; has holotype label for "Sterola acris"
PHT	Oahu	4 Mar 1917	Mt. Kaala	2500	760	on Pelea clusiifolia	nitens	1		BPM	E 21.5008	-158.1374	holotype
OHS	Oahu	30 Jun 1935	Palikea			ex Suttonia	nitens	1		BPM	E 21.4149	-158.0998	
KNM	Oahu	7 Aug 2013	Kolou, Koolau Summit Tr	2400	730	on Melicope	nitens	2		BPM	W 21.5838	-157.9485	
KNM	Oahu	12 Sep 2013	Kaala summit, NE face	3500	1070	on Touchardia latifolia	nitens	2		BPM	W 21.5085	-158.1403	
KNM	Oahu	29 Apr 2014	S Haleuanau, Trnerve Gulch	3000	915	on Boehmeria grandis	nitens	2		BPM	W 21.5047	-158.1386	
KNM	Oahu	20 May 2014	Palikea	3000	915	sweeping low veg	nitens	1		BPM	W 21.4146	-158.0999	
KNM	Oahu	5 Jul 2014	Palikea	3000	915	on Coprosma longifolia	nitens	1		BPM	W 21.4146	-158.0999	
KNM	Oahu	18 Aug 2014	Kolou, Koolau Summit Tr	2400	730	on Melicope	nitens	20	1	KNMC	W 21.5838	-157.9485	
KNM	Oahu	17 Mar 2015	Kolou, Koolau Summit Tr	2400	730	on Melicope	nitens	1		BPM	W 21.5838	-157.9485	
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on Clermontia oblongifolia	nitens	2		BPM	W 21.4146	-158.0999	
KNM	Oahu	14 May 2015	Waianae-Kaala Tr.	3850	1170	on Melicope	nitens	1		BPM	W 21.5028	-158.1491	
KNM	Oahu	19 May 2015	Palikea	3000	915	on Perrottetia sandwicensis	nitens	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	2 Jun 2015	Kaala summit, E face	3950	1200	on Melicope	nitens	1		BPM	W 21.5057	-158.1412	
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on Urera glabra	nitens	1		BPM	W 21.4146	-158.0999	
KNM	Oahu	9 Apr 2016	Palikea trail	2700	820	on Kadua affinis	nitens	1		BPM	W 21.4102	-158.0986	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	9 Apr 2016	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	nitens	2		BPBM	W	21.4146	-158.0999
KNM	Oahu	28 Apr 2016	Waiaiae-Kaala Tr.	3850	1170	on <i>Cherodendron trigynum</i>	nitens	1		BPBM	W	21.5028	-158.1491
KNM	Oahu	28 Apr 2016	Waiaiae-Kaala Tr.	3850	1170	on <i>Broussaisia arguta</i>	nitens	3	1	BPBM	W	21.5028	-158.1491
KNM	Oahu	2 Jun 2016	Kaala summit, E face	3950	1200	on <i>Cherodendron trigynum</i>	nitens		1	BPBM	W	21.5057	-158.1412
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	4	1	BPBM	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	nitens	3		BPBM	W	21.4146	-158.0999
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	2		UHIM	W	21.4146	-158.0999
KNM	Oahu	28 Sep 2016	Palikea	3000	915	on <i>Elaeocarpus bifidus</i>	nitens	1		UHIM	W	21.4146	-158.0999
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on <i>Psychotria huthewayi</i>	nitens	1		UHIM	W	21.4146	-158.0999
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	nitens	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on <i>Cherodendron trigynum</i>	nitens		2	BPBM	W	21.4155	-158.0995
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on <i>Coprosma longifolia</i>	nitens	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	23 Jan 2017	Palikea	3000	915	on <i>Psychotria huthewayi</i>	nitens		1	BPBM	W	21.4150	-158.0993
KNM	Oahu	23 Jan 2017	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	5		KNMC	W	21.4150	-158.0993
KNM	Oahu	9 Feb 2017	Waiaiae-Kaala Tr.	3850	1170	on <i>Melicope</i>	nitens	1		BPBM	W	21.5028	-158.1491
KNM	Oahu	22 Feb 2017	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	nitens	2		HDOA	W	21.4150	-158.0993
KNM	Oahu	22 Feb 2017	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	1		HDOA	W	21.4150	-158.0993
KNM	Oahu	22 Feb 2017	Palikea	3000	915	on <i>Psychotria maritima</i>	nitens	2		HDOA	W	21.4150	-158.0993
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on <i>Ilex anomala</i>	nitens	2		KNMC	W	21.5057	-158.1412
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on <i>Cherodendron trigynum</i>	nitens	1		NMNH	W	21.5057	-158.1412
KNM	Oahu	16 May 2017	Waiaiae-Kaala Tr.	3850	1170	on <i>Cherodendron trigynum</i>	nitens	8		KNMC	W	21.5028	-158.1491
KNM	Oahu	16 May 2017	Waiaiae-Kaala Tr.	3850	1170	on <i>Broussaisia arguta</i>	nitens		3	KNMC	W	21.5028	-158.1491
KNM	Oahu	22 Jun 2017	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	5		KNMC	W	21.4150	-158.0993
KNM	Oahu	22 Jun 2017	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	3		NMNH	W	21.4150	-158.0993
KNM	Oahu	22 Jun 2017	Palikea	3000	915	on <i>Psidium cuttleianum</i>	nitens	1		NMNH	W	21.4155	-158.0995
KNM	Oahu	24 Jul 2017	Palikea	3000	915	on <i>Kadua affinis</i>	nitens	10		KNMC	W	21.4150	-158.0993
KNM	Oahu	10 Aug 2017	Waiaiae-Kaala Tr.	3850	1170	on <i>Melicope</i>	nitens	5		KNMC	W	21.5028	-158.1491
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Urena glabra</i>	nitens	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	nitens	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Melicope</i>	nitens	3	4	KNMC	W	21.4133	-158.0993

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	21 Jun 1918	Palikeya	3000	915	on Kadua affinis	niensis	6		KNMC	W	21.4155	-158.0995
WMG	Oahu	27 Aug 1918	Tantalus	1500	460		nitida	1		BPBM	E	21.3315	-157.8204
PHT	Oahu	26 Mar 1916	Alewa Heights Trail				nuda	1		BPBM	E	21.3482	-157.8392
DTF	Oahu	12 Jul 1918	Kuliouou				nuda	1		BPBM	E	21.3160	-157.7233
OHS	Oahu	11 Jun 1920	Mt. Kaala				nuda	1		BPBM	E	21.5008	-158.1374
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	under leaves	nuku	1		BPBM	W	21.4933	-158.1379
RCLP	Oahu	[no date]	Tantalus	1500	460		oahuensis	1		BPBM	E	21.3315	-157.8204
JK	Oahu	[no date]	Tantalus	2000	610		oahuensis	1		BPBM	E	21.3328	-157.8150
RCLP	Oahu	October	Tantalus				oahuensis	1		BPBM	E	21.3286	-157.8250
RCLP	Oahu	Apr 1892	Waianae Mts.	2000	610		oahuensis		1	NHMLUK			lectotype
WMG	Oahu	15 Oct 1905	Tantalus	1300	400		oahuensis	1		BPBM	E	21.3286	-157.8250
DTF	Oahu	20 Mar 1910	Tantalus				oahuensis	1		BPBM	E	21.3286	paratype of <i>S. distincta</i> ; year incorrectly written in Fullaway as 1900; label has a 1 in ink over printed 0
OHS	Oahu	30 Mar 1913	Opaetula				oahuensis	2	1	BPBM	E	21.5520	holotype, allotype, and paratype of <i>S. distincta</i>
OHS	Oahu	15 Aug 1914	Hauula				oahuensis	1		BPBM	E	21.5916	paratype of <i>S. distincta</i>
WMG	Oahu	22 Dec 1915	Tantalus	1500	460		oahuensis		1	missing	E	21.3315	paratype of <i>S. distincta</i>
PHT	Oahu	25 Jun 1916	Kuliouou				oahuensis	1		BPBM	E	21.3160	paratype of <i>S. distincta</i>
DTF	Oahu	20 Aug 1916	Nuuanu, Cooke's Trail				oahuensis		1	HDOA	E	21.3480	paratype of <i>S. distincta</i>
DTF	Oahu	4 Sep 1916	Nuuanu				oahuensis	1		HDOA	E	21.3480	paratype of <i>S. distincta</i>
JCB	Oahu	1917	Honolulu				oahuensis	1		BPBM	E	21.2930	paratype of <i>S. distincta</i>
DTF	Oahu	1 Apr 1917	Nuuanu Pali				oahuensis		1	HDOA	E	21.3671	paratype of <i>S. distincta</i>
JCB	Oahu	Jun 1918	SE Koolau Mts.			swept from Acacia koa	oahuensis	1		BPBM	E	21.3286	paratype of <i>S. distincta</i>
WMG	Oahu	27 Aug 1918	Tantalus	1500	460		oahuensis	2		BPBM	E	21.3315	paratype of <i>S. distincta</i>
PHT	Oahu	1 Sep 1918	Manoa Cliffs			on Campylothea	oahuensis	1		missing	E	21.3305	paratype of <i>S. distincta</i>
PHT	Oahu	8 Sep 1918	Palolo Crater				oahuensis	1		missing	E	21.3266	paratype of <i>S. distincta</i>
PHT	Oahu	8 Sep 1918	Mt. Olynopus				oahuensis		2	BPBM	E	21.3357	paratypes of <i>S. distincta</i> ; one missing
PHT	Oahu	29 Sep 1918	Palolo Crater			on <i>Sraussea ka duana</i>	oahuensis		4	BPBM	E	21.3266	paratypes of <i>S. distincta</i> ; Fullaway lists only 3

Coll.	Island	Date	Locality	Elev. (ft)	Elev. (m)	Notes	Species	F	M	repository	Lat	Long	Notes
PHT	Oahu	29 Sep 1918	Palolo Crater			on <i>Pelea ciliataefolia</i>	oahuensis		1	BPM	E 21.3266	-157.7728	paratype of <i>S. dsihiacta</i> ; Fullaway gives date as 28th
WMG	Oahu	22 Dec 1918	Tantalus	1500	460		oahuensis	3	1	BPM	E 21.3315	-157.8204	paratype of <i>S. dsihiacta</i> ; male not mentioned by Fullaway
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				oahuensis		1	BPM	E 21.5024	-158.1565	
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				oahuensis	1		BPM	E 21.5024	-158.1565	
WMG	Oahu	26 Oct 1919	Manoa Cliffs Trail				oahuensis		1	BPM	E 21.3305	-157.8093	
EHB	Oahu	11 Jan 1920	Mt. Kaala				oahuensis		1	BPM	E 21.5008	-158.1374	
OHS	Oahu	5 Mar 1920	Kuliouou				oahuensis		1	BPM	E 21.3160	-157.7233	
OHS	Oahu	4 Jul 1920	Wahiawa				oahuensis		1	BPM	E 21.5082	-157.9473	
OHS	Oahu	10 Apr 1921	Opaeula				oahuensis	1		BPM	E 21.5520	-157.9535	
OHS	Oahu	28 Aug 1927	Waipio Rdg.				oahuensis	1		BPM	E 21.4707	-157.9183	
OHS	Oahu	28 Apr 1929	Peahinaia Rdg.				oahuensis	2		BPM	E 21.5520	-157.9535	
OHS	Oahu	30 Dec 1933	Piko Trail, Waianae Mts.			Pelea	oahuensis	1		BPM	E 21.5328	-158.1824	
OHS	Oahu	8 Apr 1934	Kamokuiki Val			Neowawraea	oahuensis		1	BPM	E 21.5310	-158.1317	
OHS	Oahu	10 Mar 1935	Mt. Tantalus			ex <i>Acacia</i> koa	oahuensis	1		BPM	E 21.3286	-157.8250	
JWB	Oahu	31 Mar 1950	Wihwilimui Ridge				oahuensis	1		BPM	E 21.3193	-157.7590	
JWB	Oahu	14 Jan 1956	Mt. Tantalus				oahuensis	1		BPM	E 21.3286	-157.8250	
JWB	Oahu	4 Jul 1956	Mt. Tantalus				oahuensis		1	BPM	E 21.3286	-157.8250	
LWQ	Oahu	8 Jul 1959	Mt. Tantalus				oahuensis	2		BPM	E 21.3286	-157.8250	
LWQ	Oahu	10 Nov 1960	Kalihi Val	1000	300		oahuensis	1	2	BPM	E 21.3761	-157.8168	
JWB	Oahu	11 Dec 1962	Aiea Hts.				oahuensis	1	1	BPM	E 21.3970	-157.9085	
CMY	Oahu	6 Oct 1965	Poamoho Trail				oahuensis	1		BPM	E 21.5304	-157.9427	
JWB	Oahu	6 Oct 1965	Poamoho Trail				oahuensis	2		BPM	E 21.5304	-157.9427	
KNM	Oahu	27 Mar 2010	Pahole Gulch	1700	520	sweeping	oahuensis	1		BPM	W 21.5410	-158.1882	
KNM	Oahu	14 Feb 2012	Makahu, Camp Ridge	2300	700	beating vegetation	oahuensis		1	BPM	W 21.5019	-158.1690	
KNM	Oahu	30 Oct 2012	Lanihuli Trail	1800	550	on <i>Acacia</i> koa	oahuensis		1	BPM	W 21.3567	-157.8286	
KNM	Oahu	30 Oct 2012	Lanihuli Trail	1800	550	on <i>Scacvola gaudichaudiana</i>	oahuensis	2	1	BPM	W 21.3567	-157.8286	
KNM	Oahu	12 Jan 2015	Waianae, Kumaipo gulch 1	2200	670	on <i>Bidens</i> forta	oahuensis		1	NMNH	W 21.4967	-158.1541	
KNM	Oahu	17 Mar 2015	Koala, Koolau Summit Tr	2400	730	on <i>Melicope</i>	oahuensis		1	NMNH	W 21.5838	-157.9485	
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	on <i>Cherodendron trigynum</i>	oahuensis		1	BPM	W 21.4933	-158.1379	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	22 Apr 2015	Kaala-Kaala crestline	3100	950	on Metrosideros polymorpha	oahuensis	1		NMNH	W	21.4933	-158.1379
KNM	Oahu	17 Jul 2015	Kahanaiki ridge	2100	640	on Acacia koa	oahuensis	1		KNMC	W	21.5441	-158.1945
KNM	Oahu	30 Jul 2016	Manoa Cliffs Trail	1700	520	beating vegetation	oahuensis	1		KNMC	W	21.3341	-157.8103
KNM	Oahu	1 Feb 2017	Pahoehoe crest	2150	655	on Kadua affinis	oahuensis	1	1	KNMC	W	21.5374	-158.1924
KNM	Oahu	22 Jan 2018	Pihole gulch rim	1970	600	on Bidens torta	oahuensis		2	KNMC	W	21.5416	-158.1936
KNM	Oahu	9 May 2018	Ohikilolo	2900	885	on Prichardia kaala	oahuensis	1		KNMC	W	21.5137	-158.1938
KNM	Oahu	2 Apr 2019	Makaha, unit 1	2150	655	on Metrosideros polymorpha	oahuensis	1		BPBM	W	21.5034	-158.1686
KNM	Oahu	7 May 2019	Kaala summit, E face	3950	1200	on Cheirodendron trigynum	oahuensis	1		BPBM	W	21.5057	-158.1412
KNM	Oahu	14 May 2019	Makaha, Camp Ridge	1850	560	on Rauvolfia sandwicensis	oahuensis	1		BPBM	W	21.5052	-158.1690
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on Psychotria maritima	oahuensis	2		KNMC	W	21.5137	-158.1938
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on Metrosideros polymorpha	oahuensis	2		KNMC	W	21.5137	-158.1938
TB	Oahu	[no date]	135			obscura	obscura	1		BPBM			
RCLP	Oahu	[no date]	Honolulu Mts.	1800	550		obscura	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	[no date]	Honolulu Mts.	1800	550		obscura	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	[no date]	Honolulu Mts.				obscura	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	[no date]	Honolulu Mts.	1800	550		obscura	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	Dec	Honolulu Mts.	1800	550		obscura	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	1893	Kaala Mts.	2500	760		obscura	1		NHMUK	E	21.5206	-158.1455
WAG	Oahu	15 Jan 1905	Tantalus	1300	400		obscura	1		BPBM	E	21.3286	-157.8250
OHS	Oahu	30 May 1905	Pacific Hts.				obscura	1		BPBM	E	21.3297	-157.8364
OHS	Oahu	3 Sep 1906	Pahalo Valley			ex caterpillar in nest of Odynerus oahuensis	obscura	2	2	HDOA	E	21.3342	-157.8237
OHS	Oahu	8 Dec 1907	Kaunuaohona				obscura	1		BPBM	E	21.3456	-157.8015
OHS	Oahu	11 Aug 1912	Mt. Kaala				obscura	1		BPBM	E	21.5008	-158.1374
DTF	Oahu	8 Sep 1912	Pahalo Valley				obscura	1		BPBM	E	21.3342	-157.8237
OHS	Oahu	3 Jan 1915	Pahalo				obscura	1		BPBM	E	21.3206	-157.7768
PHT	Oahu	11 Mar 1917	Kahili Valley			on Suttonia lessertiana	obscura	1		BPBM	E	21.3757	-157.8223
FXW	Oahu	1 Jan 1920	Manoa				obscura	1		HDOA	E	21.3366	-157.8000
OHS	Oahu	18 Jun 1922	Aiea	500-600	150-180	Metrosideros	obscura	1		BPBM	E	21.3889	-157.9145
ETH	Oahu	17 Aug 1929	Kupahuna, Nuuanu				obscura	1		BPBM	E	21.3430	-157.8527

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
NLHK	Oahu	Oct 1932	Manoa Val.				obscura	1		BPM	E	21.3366	-157.8000
KNM	Oahu	24 Feb 2012	North Haleaunui Gulch	2350	720	on <i>Antilema phytopyllum</i>	olea	3	1	BPM	W	21.5066	-158.1297
KNM	Oahu	16 May 2012	Kapuna, Mokuia Tr.	2100	640	on <i>Planchonella sandwicensis</i>	olea		1	BPM	W	21.5321	-158.1786
KNM	Oahu	17 May 2012	Puu Hapapa	2650	810	on <i>Planchonella sandwicensis</i>	olea	1		BPM	W	21.4665	-158.1028
KNM	Oahu	15 May 2013	Kahanaiki	2000	610	under leaves	olea	1		BPM	W	21.5399	-158.1939
KNM	Oahu	20 May 2013	Mohiaka Gulch	2500	760	on <i>Pisonia</i>	olea		1	BPM	W	21.4877	-158.1258
KNM	Oahu	12 May 2014	Pihole Gulch, gulch 1	1800	550	on <i>Sapindus oahuensis</i>	olea	1		BPM	W	21.5421	-158.1918
KNM	Oahu	6 Jul 2014	Kapuna, Mokuia Tr.	2100	640	on <i>Myrsine lessertiana</i>	olea	1		NMNH	W	21.5321	-158.1786
KNM	Oahu	6 Jul 2014	Kapuna, Mokuia Tr.	2100	640	on <i>Sapindus oahuensis</i>	olea	1		NMNH	W	21.5396	-158.1818
KNM	Oahu	20 Oct 2014	Pihole Gulch, gulch 2	2100	640	on <i>Planchonella sandwicensis</i>	olea	1		NMNH	W	21.5357	-158.1896
KNM	Oahu	20 Oct 2014	Pihole Gulch, gulch 3	2050	625	on <i>Planchonella sandwicensis</i>	olea		1	UHIM	W	21.5362	-158.1862
KNM	Oahu	19 Nov 2014	Kapuna, Mokuia Tr.	2100	640	on <i>Nestegis sandwicensis</i>	olea	1		BPM	W	21.5321	-158.1786
KNM	Oahu	19 Nov 2014	Kapuna, Mokuia Tr.	2100	640	on <i>Nestegis sandwicensis</i>	olea	1		BPM	W	21.5321	-158.1786
KNM	Oahu	17 Jul 2015	Kahanaiki ridge	2200	670	on <i>Kadua affinis</i>	olea	1		UHIM	W	21.5374	-158.1924
KNM	Oahu	31 Mar 2016	Kapuna, Mokuia Tr.	2100	640	on <i>Diospyros hillebrandii</i>	olea	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	12 Apr 2016	North Kaluaa Gulch	2200	670	on <i>Pisonia umbellifera</i>	olea	1		KNMC	W	21.4647	-158.1010
KNM	Oahu	29 Jul 2016	Kapuna, Mokuia Tr.	2100	640	on <i>Kadua affinis</i>	olea	2	1	HDOA	W	21.5321	-158.1786
KNM	Oahu	29 Jul 2016	Kapuna, Mokuia Tr.	2100	640	on <i>Psychotria</i>	olea	2		KNMC	W	21.5321	-158.1786
KNM	Oahu	26 Apr 2017	Central Kaluaa Gulch	2200	670	on <i>Pisonia umbellifera</i>	olea	1		HDOA	W	21.4603	-158.1004
KNM	Oahu	18 Oct 2017	Kapuna, Mokuia Tr.	2100	640	on <i>Nestegis sandwicensis</i>	olea	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	18 Oct 2017	Kapuna, Mokuia Tr.	2100	640	on <i>Diospyros hillebrandii</i>	olea	4		KNMC	W	21.5321	-158.1786
KNM	Oahu	18 Oct 2017	Kapuna, Mokuia Tr.	2100	640	on <i>Myrsine oahuensis</i>	olea	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	24 Oct 2017	Central Kaluaa Gulch	2200	670	on <i>Planchonella sandwicensis</i>	olea	1		KNMC	W	21.4603	-158.1004
KNM	Oahu	22 Jan 2018	Pihole gulch rim	1970	600	on <i>Planchonella sandwicensis</i>	olea	1		missing	W	21.5416	-158.1936
KNM	Oahu	7 Feb 2018	Makaha, unit 1	2300	700	on <i>Urena glabra</i>	olea	1	1	BPM	W	21.5012	-158.1678
KNM	Oahu	7 Feb 2019	Ekahuni, gulch 2D	2400	730	on <i>Psychotria maritima</i>	olea	1		BPM	W	21.4389	-158.0938
KNM	Oahu	2 Apr 2019	Makaha, unit 1	1800	550	on <i>Psychotria odorata</i>	olea	1		BPM	W	21.5056	-158.1691
WMC	Oahu	5 Nov 1905	Makaha				olympiana	1		BPM	E	21.5072	-158.1644
RCLP	Oahu	Sep 1906	Tantalus				olympiana	1		BPM	E	21.3286	-157.8250
RCLP	Oahu	Apr 1907	Tantalus				olympiana	1		BPM	E	21.3286	-157.8250
													holotype of <i>S. pilifera</i>

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	11 Nov 1909	Punaluu				olympiana	1		BPM	E 21.5449	-157.9066	
DHF	Oahu	4 Mar 1912	Nuuanu Valley				olympiana	1		BPM	E 21.3480	-157.8056	holotype of <i>S. brevicanda</i>
OHS	Oahu	4 Aug 1912	Tantalus				olympiana	1		BPM	E 21.3286	-157.8250	
DTF	Oahu	11 Aug 1912	Waianae Mts.				olympiana	1		HDOA	E 21.5008	-158.1374	others from this day all labelled 'Mt. Kaala'
PHT	Oahu	18 Jun 1916	Mt. Olympus				olympiana	1		BPM	E 21.3357	-157.7792	holotype
PHT	Oahu	4 Jul 1916	Mt. Kaala				olympiana	1		BPM	E 21.5008	-158.1374	
PHT	Oahu	7 Jan 1917	Cooke's trail, Nuuanu Valley				olympiana	1		missing	E 21.3480	-157.8056	paratype
PHT	Oahu	9 Sep 1917	Kaunohoua				olympiana	1		BPM	E 21.3456	-157.8015	paratype of <i>S. olympiana</i>
PHT	Oahu	18 May 1920	Mt. Kaala	c. 2000-2500	610-760	on Dubautia plumbaginea	olympiana	1		HDOA	E 21.5008	-158.1374	
EHB	Oahu	21 Apr 1929	Mt. Kaala	2900-3000	885-915		olympiana	1		BPM	E 21.5008	-158.1374	
OHS	Oahu	30 Jun 1935	Paliaka			ex Kadua	olympiana	1		BPM	E 21.4149	-158.0998	
ECZ	Oahu	11 Nov 1936	Paliaka			Beating	olympiana	1		BPM	E 21.4149	-158.0998	
ECZ	Oahu	9 May 1943	Koahuuui	2600-3000	790-915	Beating Shrubbery	olympiana	4		BPM	E 21.3526	-157.7901	
ECZ	Oahu	Oct 1944	Manoa Val.				olympiana	1		BPM	E 21.3366	-157.8000	
ECZ	Oahu	29 Oct 1944	Mt. Kaala	1200-1500	370-460	Beating Shrubbery	olympiana	1		BPM	E 21.5314	-158.1432	
ED	Oahu	Mar 1952	Koolau Mts.				olympiana	1		BPM			
JWB	Oahu	4 Jul 1956	Mt. Tantalus				olympiana	2		BPM	E 21.3286	-157.8250	
JWB	Oahu	26 Dec 1956	Aiea Haina				olympiana	1		BPM	E 21.3006	-157.7566	
JWB	Oahu	17 Jul 1964	Wilililui Ridge			Metrosideros polymorpha	olympiana	1		BPM	E 21.3193	-157.7590	
JWB	Oahu	6 Oct 1965	Poomoho Trail				olympiana	1		BPM	E 21.5304	-157.9427	
JWB	Oahu	10 Nov 1965	Mt. Kaala	4000	1220		olympiana	3		BPM	E 21.5072	-158.1434	
JWB	Oahu	11 Apr 1966	Mt. Kaala				olympiana	9	12	BPM	E 21.5072	-158.1434	
CMY	Oahu	14 Apr 1966	Mt. Kaala				olympiana	11		BPM	E 21.5072	-158.1434	
JWB	Oahu	14 Apr 1966	Mt. Kaala				olympiana	11	24	BPM	E 21.5072	-158.1434	
DMT	Oahu	15 Jul 1967	Mt. Kaala			Malaise trap	olympiana	1		BPM	E 21.5072	-158.1434	
WDP	Oahu	27 Aug 1983	Koahuuui	3100	950		olympiana	1		BPM	E 21.3533	-157.7889	
JWB	Oahu	28 Sep 1985	Mt. Kaala				olympiana	1		BPM	E 21.5072	-158.1434	
WDP	Oahu	3 Apr 1989	Koahuuui	3103	950		olympiana	1		BPM	E 21.3533	-157.7889	
KNM	Oahu	3 Nov 2012	Lanihuli Trail	2100	640	on Syzygium sardwienensis	olympiana	2		BPM	W 21.3627	-157.8207	
KNM	Oahu	12 Sep 2013	Kaala summit, NE face	3500	1070	on Touchardia latifolia	olympiana	1		BPM	W 21.5085	-158.1403	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	10 Feb 2014	Kaala summit, E face	3950	1200	on Melicope	olympiana	1		BPBM	W	21.5057	-158.1412
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on <i>Perrottetia sandwicensis</i>	olympiana	1		KNMC	W	21.4150	-158.0993
KNM	Oahu	3 Jun 2014	Kaala below cliffs, SE face	3350	1020	on <i>Cheiroderon trigynum</i>	olympiana	1		BPBM	W	21.5072	-158.1433
KNM	Oahu	4 Jul 2014	Kaala summit, E face	4000	1220	on Melicope	olympiana	1		BPBM	W	21.5057	-158.1412
KNM	Oahu	14 May 2015	Waiaanae-Kaala Tr.	3850	1170	on <i>Cheiroderon trigynum</i>	olympiana	3		BPBM	W	21.5028	-158.1491
KNM	Oahu	2 Jun 2015	Kaala summit, E face	3950	1200	on <i>Syzgium sandwicensis</i>	olympiana	1		KNMC	W	21.5057	-158.1412
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Antidesma platyphyllum</i>	olympiana	1	1	KNMC	W	21.5321	-158.1786
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on <i>Kadua affinis</i>	olympiana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Eleocharis bifida</i>	olympiana	3		BPBM	W	21.5321	-158.1786
KNM	Oahu	28 Apr 2016	Waiaanae-Kaala Tr.	3850	1170	on <i>Cheiroderon trigynum</i>	olympiana	1		HDOA	W	21.5028	-158.1491
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Seaevola gaudichaudiana</i>	olympiana	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	23 Nov 2016	Palikea	3000	915	on <i>Coprosma longifolia</i>	olympiana	1		NMNH	W	21.4155	-158.0995
KNM	Oahu	9 Feb 2017	Waiaanae-Kaala Tr.	3850	1170	on <i>Broussaisia arguta</i>	olympiana	2		NMNH	W	21.5028	-158.1491
KNM	Oahu	12 Oct 2017	Palikea	3000	915	on <i>Pipturus albidus</i>	olympiana	2		KNMC	W	21.4146	-158.0999
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	olympiana	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Urera glabra</i>	olympiana	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on <i>Antidesma platyphyllum</i>	olympiana	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	7 Feb 2018	Makaha, unit 1	2300	700	on <i>Nestegis sandwicensis</i>	olympiana	1		KNMC	W	21.5012	-158.1678
KNM	Oahu	21 Jun 2018	Palikea	3000	915	on <i>Kadua affinis</i>	olympiana	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	31 Jul 2018	Palikea	3000	915	on <i>Urera glabra</i>	olympiana	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	19 Mar 2019	Palikea	3000	915	on <i>Kadua affinis</i>	olympiana	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	7 May 2019	Kaala summit, E face	3950	1200	on Melicope	olympiana	1		BPBM	W	21.5057	-158.1412
KNM	Oahu	22 May 2019	Palikea	3000	915	on <i>Kadua affinis</i>	olympiana	1		BPBM	W	21.4150	-158.0993
RCLP	Oahu	Mar-Apr 1893	Kawailoa Gulch				olympiana	1		NHMLUK	E	21.5796	-158.0060
JCB	Oahu	26 May 1918	Tantalus			reared from larva of <i>Opogona</i> on <i>Clermontia</i> ; formed cocoons on May 27, emerged June 5	opogonae	2	1	BPBM	E	21.3286	-157.8250 holotype, and paratype
OHS	Oahu	9 Nov 1919	S. Waiaanae Mts.				opogonae	1		BPBM			
KNM	Oahu	14 Feb 2012	Makaha, Camp Ridge	2300	700	beating vegetation	opogonae	2		BPBM	W	21.5019	-158.1690
KNM	Oahu	21 Aug 2014	Palikea	3000	915	on <i>Psychotria</i>	opogonae	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	1 Oct 2014	Puu Hapapa	2650	810		opogonae	1		BPBM	W	21.4665	-158.1028

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KNM	Oahu	9 Apr 2016	Palikea snail jail	3000	915	on <i>Coprosma longifolia</i>	opogonae	1		NMNH	W	21.4155	-158.0995
KNM	Oahu	16 Jun 2016	Kunaiipo Gulch	2400	730	on <i>Cordyline fruticosa</i>	pakela	1		BPBM	W	21.4983	-158.1528
KNM	Oahu	30 Jun 2016	Central Ka laua Gulch	2200	670	on <i>Planchonella sandwicensis</i>	pakela	1		BPBM	W	21.4603	-158.1004
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	pakela	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	27 Jul 2016	North Ka laua Gulch	2200	670	on <i>Psychotria maritima</i>	pakela	1		BPBM	W	21.4647	-158.1010
KNM	Oahu	22 Jun 2017	Palikea	3000	915	on <i>Psychotria maritima</i>	pakela	1		NMNH	W	21.4150	-158.0993
KNM	Oahu	12 Oct 2017	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	pakela	1		KNMC	W	21.4146	-158.0999
OHS	Oahu	13 Mar 1932	Haleuau				pano	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	8 Apr 1934	Kamokiki Val			<i>Eleocharis</i> [sic]	pano	1		BPBM	E	21.5310	-158.1317
JS	Oahu	18 Aug 1988	Petcock Flats	1800	550		pano	1		BPBM	E	21.5429	-158.1826
KNM	Oahu	4 Sep 2012	Waimano Trail	1100	335	sweeping <i>Freycinetia arborea</i>	pano	1		BPBM	W	21.4324	-157.9061
KNM	Oahu	20 May 2014	Palikea	3000	915	sweeping low veg	pano	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	20 May 2014	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	pano	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	21 May 2014	Puu Hapapa	2650	810	on <i>Psychotria maritima</i>	pano	1		BPBM	W	21.4665	-158.1028
KNM	Oahu	21 May 2014	Puu Hapapa	2650	810	on <i>Planchonella sandwicensis</i>	pano	1	1	BPBM	W	21.4665	-158.1028
KNM	Oahu	2 Jul 2014	North Puuili Gulch	2100	640		pano	1		UHM	W	21.4249	-158.0910
KNM	Oahu	26 Aug 2014	Central Ka laua Gulch	2200	670	on <i>Claoxylon sandwicense</i>	pano	2		KNMC	W	21.4603	-158.1004
KNM	Oahu	20 Oct 2014	Pihole Gulch, gulch 3	2050	625	on <i>Urena glabra</i>	pano	1		UHM	W	21.5362	-158.1862
KNM	Oahu	28 Jun 2015	Puu Hapapa	2650	810	on <i>Labordia kaala</i>	pano	1		HDOA	W	21.4665	-158.1028
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on <i>Perrottetia sandwicensis</i>	pano	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	15 Jun 2016	Palikea	3000	915	on <i>Psychotria</i>	pano	1		NMNH	W	21.4146	-158.0999
KNM	Oahu	26 Apr 2017	Central Ka laua Gulch	2200	670	on <i>Pisonia umbellifera</i>	pano	1		NMNH	W	21.4603	-158.1004
KNM	Oahu	12 Oct 2017	Palikea	3000	915	on <i>Pipturus albidus</i>	pano	1	1	KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Oct 2017	Central Ka laua Gulch	2200	670	on <i>Planchonella sandwicensis</i>	pano	1	1	KNMC	W	21.4603	-158.1004
KNM	Oahu	26 Oct 2017	Puu Hapapa	2650	810	on <i>Psychotria hawaiiensis</i>	pano	4		KNMC	W	21.4665	-158.1028
KNM	Oahu	26 Oct 2017	Puu Hapapa	2650	810	on <i>Planchonella sandwicensis</i>	pano	1	2	KNMC	W	21.4665	-158.1028
KNM	Oahu	22 Nov 2017	Palikea	3000	915	on <i>Anidesma platyphyllum</i>	pano	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Daniella sandwicensis</i>	pano	1		BPBM	W	21.4125	-158.1004
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Psychotria hawaiiensis</i>	pano	2	1	KNMC	W	21.4128	-158.0997
KNM	Oahu	17 May 2018	Palikea	3000	915	on <i>Cheirodendron trigynum</i>	pano	1		BPBM	W	21.4155	-158.0995

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	25 Oct 2018	Paliaka	3000	915	on <i>Psychotria maritima</i> na	pano	2		KNMC	W	21.4150	-158.0993
KNM	Oahu	17 Jan 2019	Paliaka	3000	915	on <i>Perrottetia sandwicensis</i>	pano	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	11 Apr 2019	Paliaka	3000	915	on <i>Clermontia oblongifolia</i>	pano	1		BPBM	W	21.4131	-158.1009
KNM	Oahu	19 Jun 2019	Paliaka	3000	915	on <i>Anide-sma platyphyllum</i>	pano		1	KNMC	W	21.4155	-158.0995
PHT	Oahu	4 Mar 1917	Mt. Kaala	2000	610	on <i>Pelea clusiaeifolia</i>	peleana	1		BPBM	E	21.4986	-158.1278 holotype
OHS	Oahu	18 Feb 1923	Mt. Kaala			Pelea	peleana	1		BPBM	E	21.5008	-158.1374
OHS	Oahu	28 Jun 1924	Puu Kaua				peleana	1		BPBM	E	21.4413	-158.0981
OHS	Oahu	28 Apr 1935	Haleaunuu			<i>Anidesma</i>	peleana	1		BPBM	E	21.4988	-158.1353
ECZ	Oahu	6 Mar 1938	Mt. Kaala			Beating	peleana	1		BPBM	E	21.5008	-158.1374
JWB	Oahu	Jul 1957	Mt. Kaala				peleana	1		BPBM	E	21.5008	-158.1374
DEH	Oahu	23 May 1968	Peacock Flats, Waianae Mts.	1800	550	ex stream	peleana	1		BPBM	E	21.5429	-158.1826
KNM	Oahu	5 Jun 2013	Ohikilolo	2900	885	on <i>Nestegis sandwicensis</i>	peleana	1	1	BPBM	W	21.5133	-158.1930
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Xylosma hawaiiense</i>	peleana	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	11 Feb 2015	Kapuna, Mokuleia Tr.	2100	640	beating branches	peleana	6	5	KNMC	W	21.5321	-158.1786
KNM	Oahu	9 Apr 2015	Peshinaia Tr.	2100	640	on <i>Elaeocarpus bifidus</i>	peleana	1		BPBM	W	21.5525	-157.9532
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Planchonella sandwicensis</i>	peleana	3		BPBM	W	21.5321	-158.1786
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Phomia sandwicensis</i>	peleana	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Syzygium sandwicensis</i>	peleana	1		HDOA	W	21.5321	-158.1786
KNM	Oahu	4 Jun 2015	Kapuna, Mokuleia Tr.	2100	640	on <i>Diospyros hillebrandii</i>	peleana	2		NMNH	W	21.5321	-158.1786
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Elaeocarpus bifidus</i>	peleana	3	3	KNMC	W	21.5321	-158.1786
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Planchonella sandwicensis</i>	peleana	2	2	KNMC	W	21.5321	-158.1786
KNM	Oahu	23 Nov 2016	Paliaka	3000	915	on <i>Psychotria hadawayi</i>	peleana	2		KNMC	W	21.4150	-158.0993
KNM	Oahu	23 Nov 2016	Paliaka	3000	915	on <i>Kadua affinis</i>	peleana	1		HDOA	W	21.4155	-158.0995
KNM	Oahu	23 Nov 2016	Paliaka	3000	915	on <i>Coprosma longifolia</i>	peleana	1		NMNH	W	21.4155	-158.0995
KNM	Oahu	26 Oct 2017	Puu Hapapa	2650	810	on <i>Planchonella sandwicensis</i>	peleana	1	1	BPBM	W	21.4665	-158.1028
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on <i>Urena glabra</i>	peleana	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on <i>Anide-sma platyphyllum</i>	peleana	1		BPBM	W	21.4155	-158.0995
KNM	Oahu	26 Mar 2018	Paliaka	3000	915	on <i>Psychotria hadawayi</i>	peleana	1		KNMC	W	21.4128	-158.0997
OW	Oahu	27 Jan 1929	Oahu				peleana?	1		NHMMUK			
KNM	Oahu	26 Mar 2018	Paliaka	3000	915	on <i>Melicope</i>	peleana?	1		KNMC	W	21.4133	-158.0993

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
DTF	Oahu	4 Mar 1912	Nuanu Valley				planiceps	1		BPBM	E 21.3480	-157.8056	holotype
JCB	Oahu	1913	SE Koolau Mts.				planiceps	2		BPBM	E 21.3456	-157.8015	para type
PHT	Oahu	23 Apr 1916	Kaunuaehona				planiceps	1		BPBM	E 21.3456	-157.8015	holotype of <i>S. flavipennis</i>
PHI	Oahu	4 Jun 1916	Kaunuaehona				planiceps	1		missing	E 21.3456	-157.8015	para type
OHS	Oahu	12 Jan 1919	Kaunuaehona			ex Gracilaria dubautiella	planiceps	1		BPBM	E 21.3456	-157.8015	
WMG	Oahu	12 Oct 1919	Tantalus	2000	610		planiceps	10		HDOA	E 21.3328	-157.8150	
PHT	Oahu	18 May 1920	Mt. Kaala	c. 2000-2500	610-760	on Dubautia plantaginea	planiceps	1		HDOA	E 21.5008	-158.1374	
OHS	Oahu	17 Dec 1933	Pupukea			ex leafminer in Dubautia laxa	planiceps	1		BPBM	E 21.6578	-158.0097	
OHS	Oahu	2 Oct 1934	Kawaihoa Ridge			ex leaf-miner Dubautia	planiceps	3	1	HDOA	E 21.5915	-157.9625	
ECZ	Oahu	27 Feb 1937	Mt. Tantalus			Dubautia	planiceps	1		BPBM	E 21.3286	-157.8250	
OHS	Oahu	7 May 1922	Palehua, Waianae			Metrosideros	poepoe	1		BPBM	E 21.3943	-158.0969	para type
NLHK	Oahu	24 Sep 1933	Munua			Acacia koa	poepoe	1		BPBM	E 21.3366	-157.8000	para type
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on Antide smia platyphyllum	poepoe	1		BPBM	W 21.4150	-158.0993	holotype
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on Antide smia platyphyllum	poepoe	1		NMNH	W 21.4150	-158.0993	para type
OHS	Oahu	13 Mar 1932	Haleanuu			Sideroxylon	poohiwi	1		BPBM	E 21.4988	-158.1353	holotype
KNM	Oahu	24 Apr 2014	Palikea	2950	900	on Coprosma longifolia	psiliphora	1		BPBM	W 21.4150	-158.0993	para type
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Cherodendron trigynum	psiliphora	1		BPBM	W 21.4146	-158.0999	para type
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Coprosma longifolia	psiliphora	1		BPBM	W 21.4146	-158.0999	holotype
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on Cherodendron trigynum	psiliphora	1		KNMC	W 21.4155	-158.0995	
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on Metrosideros polymorpha	psiliphora	1		KNMC	W 21.4125	-158.1004	
KNM	Oahu	27 Oct 2019	Waihupe middle ridge	2250	685	on Metrosideros polymorpha	psiliphora	1		BPBM	W 21.3421	-157.7484	para type
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on Coprosma longifolia	puia	1		BPBM	W 21.4146	-158.0999	holotype
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on Coprosma longifolia	puia	1		BPBM	W 21.4146	-158.0999	para type
KNM	Oahu	13 Sep 2017	Palikea	3000	915	on Coprosma foliosa	puia	1		BPBM	W 21.4128	-158.0997	para type
KNM	Oahu	13 Sep 2017	Palikea	3000	915	on Coprosma foliosa	puia	1		KNMC	W 21.4128	-158.0997	
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on Cherodendron trigynum	puia	1		KNMC	W 21.4155	-158.0995	
DTF	Oahu	4 Mar 1912	Nuanu				pulchra	1		HDOA	E 21.3480	-157.8056	para type
OHS	Oahu	15 Mar 1914	Tantalus			ex leaf miner in Urena	pulchra	10	4	BPBM	E 21.3286	-157.8250	holotype, allotype, and paratypes not listed among paratypes in Fullaway, but has a paratype label
OHS	Oahu	5 Apr 1914	Tantalus				pulchra	3	1	BPBM	E 21.3286	-157.8250	
OHS	Oahu	16 Mar 1915	Tantalus				pulchra	1		BPBM	E 21.3286	-157.8250	para type

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
DTF	Oahu	4 Mar 1912	Nuanu Valley				planiceps	1		BPBM	E 21.3480	-157.8056	holotype
JCB	Oahu	1913	SE Koolau Mts.				planiceps	2		BPBM	E 21.3456	-157.8015	paratype
PHT	Oahu	23 Apr 1916	Kaunuaohona				planiceps	1		BPBM	E 21.3456	-157.8015	holotype of <i>S. flavipennis</i>
PHT	Oahu	4 Jun 1916	Kaunuaohona				planiceps	1		missing	E 21.3456	-157.8015	paratype
OHS	Oahu	12 Jan 1919	Kaunuaohona			ex <i>Gracilaria dubautiella</i>	planiceps	1		BPBM	E 21.3456	-157.8015	
WVG	Oahu	12 Oct 1919	Tanaius	2000	610		planiceps	10		HDOA	E 21.3328	-157.8150	
PHT	Oahu	18 May 1920	Mt. Kaala	c. 2000-2500	610-760	on <i>Dubautia plantaginacea</i>	planiceps	1		HDOA	E 21.5008	-158.1374	
OHS	Oahu	17 Dec 1933	Pupukea			ex leaf-miner in <i>Dubautia laxa</i>	planiceps	1		BPBM	E 21.6378	-158.0097	
OHS	Oahu	2 Oct 1934	Kawailoa Ridge			ex leaf-miner <i>Dubautia</i>	planiceps	3	1	HDOA	E 21.5915	-157.9625	
ECZ	Oahu	27 Feb 1937	Mt. Tantalus			<i>Dubautia</i>	planiceps	1		BPBM	E 21.3286	-157.8250	
OHS	Oahu	7 May 1922	Pulehuan, Waianae			<i>Metrosideros</i>	poepoe	1		BPBM	E 21.3943	-158.0969	paratype
NLHK	Oahu	24 Sep 1933	Munoa			<i>Acacia koa</i>	poepoe	1		BPBM	E 21.3366	-157.8000	paratype
KNM	Oahu	24 Apr 2014	Paliaka	2950	900	on <i>Antidesma platyphyllum</i>	poepoe	1		BPBM	W 21.4150	-158.0993	holotype
KNM	Oahu	24 Apr 2014	Paliaka	2950	900	on <i>Antidesma platyphyllum</i>	poepoe	1		NMNH	W 21.4150	-158.0993	paratype
OHS	Oahu	13 Mar 1932	Haleauau			<i>Sideroxylon</i>	poohiwi	1		BPBM	E 21.4988	-158.1353	holotype
KNM	Oahu	24 Apr 2014	Paliaka	2950	900	on <i>Coprosma longifolia</i>	psiliphora	1		BPBM	W 21.4150	-158.0993	paratype
KNM	Oahu	29 Aug 2016	Paliaka	3000	915	on <i>Cheirodendron trigynum</i>	psiliphora	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	20 Oct 2016	Paliaka	3000	915	on <i>Coprosma longifolia</i>	psiliphora	1		BPBM	W 21.4146	-158.0999	holotype
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on <i>Cheirodendron trigynum</i>	psiliphora	1		KNMC	W 21.4155	-158.0995	
KNM	Oahu	26 Mar 2018	Paliaka	3000	915	on <i>Metrosideros polymorpha</i>	psiliphora	1		KNMC	W 21.4125	-158.1004	
KNM	Oahu	27 Oct 2019	Waipue middle ridge	2250	685	on <i>Metrosideros polymorpha</i>	psiliphora	1		BPBM	W 21.3421	-157.7484	paratype
KNM	Oahu	20 Jul 2016	Paliaka	3000	915	on <i>Coprosma longifolia</i>	puuwa	1		BPBM	W 21.4146	-158.0999	holotype
KNM	Oahu	29 Aug 2016	Paliaka	3000	915	on <i>Coprosma longifolia</i>	puuwa	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	13 Sep 2017	Paliaka	3000	915	on <i>Coprosma foliosa</i>	puuwa	1		BPBM	W 21.4128	-158.0997	paratype
KNM	Oahu	13 Sep 2017	Paliaka	3000	915	on <i>Coprosma foliosa</i>	puuwa	1		KNMC	W 21.4155	-158.0995	
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on <i>Cheirodendron trigynum</i>	puuwa	1		KNMC	W 21.4155	-158.0995	
DTF	Oahu	4 Mar 1912	Nuanu				pulchra	1		HDOA	E 21.3480	-157.8056	paratype
OHS	Oahu	15 Mar 1914	Tanaius			ex leaf-miner in <i>Urena</i>	pulchra	10	4	BPBM	E 21.3286	-157.8250	holotype, allotype, and paratypes
OHS	Oahu	5 Apr 1914	Tanaius				pulchra	3	1	BPBM	E 21.3286	-157.8250	not listed among paratypes in Fulla way, but has a paratype label
OHS	Oahu	16 Mar 1915	Tanaius				pulchra	1		BPBM	E 21.3286	-157.8250	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	30 May 1915	Tantalus			ex Gracillaria uvernella	pulchra	2		BPBM	E 21.3286	-157.8250	
OHS	Oahu	29 Aug 1915	Tantalus			ex serpentine mine in Urena	pulchra	1	1	HDOA	E 21.3286	-157.8250	
OHS	Oahu	29 Aug 1915	Tantalus			reared from blotch miner in Urena	pulchra	1		BPBM	E 21.3286	-157.8250	paratype
OHS	Oahu	5 Dec 1915	Tantalus			ex Urena serpentine mines	pulchra	3	1	HDOA	E 21.3286	-157.8250	
OHS	Oahu	5 Dec 1915	Tantalus			ex Urena blotch mine	pulchra	2		HDOA	E 21.3286	-157.8250	
PHT	Oahu	29 Mar 1918	Manoa Cliffs			on Urena sandwicensis	pulchra	4		missing	E 21.3305	-157.8093	paratype
PHT	Oahu	15 Apr 1918	Manoa Cliffs			ex Urena leaf miner	pulchra	4	1	BPBM/ missing	E 21.3305	-157.8093	paratype; females missing
OHS	Oahu	15 Mar 1910	Popouwela			ex Lep. larva in stem of Kadua	punctata	1		BPBM	E 21.4669	-158.0987	
PHT	Oahu	4 Mar 1917	Mt. Kaala	2000	610	sweeping Kadua	punctata	1		BPBM	E 21.4986	-158.1278	holotype
WMG	Oahu	26 Oct 1919	Manoa Cliffs Trail				punctata	1		HDOA	E 21.3305	-157.8093	
OHS	Oahu	11 Jan 1920	Mt. Kaala				punctata	1		BPBM	E 21.5008	-158.1374	
RCLP	Oahu	[no date]	Tantalus				pygmaea	1		BPBM	E 21.3286	-157.8250	
DTF	Oahu	20 Aug 1916	Cooke's trail, Nuuanu Valley				pygmaea	1		BPBM	E 21.3480	-157.8056	holotype
JCB	Oahu	10 Jun 1917	Mt. Tantalus				pygmaea	1		BPBM	E 21.3286	-157.8250	
OHS	Oahu	20 May 1934	Mt. Tantalus			Acacia koa	pygmaea	1		BPBM	E 21.3286	-157.8250	
KNM	Oahu	27 Dec 2016	Puu Hapapa	2200	670	on Acacia koa	pygmaea	1		KNMC	W 21.4655	-158.0986	
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				rostrata	1		BPBM			paratype
EHB	Oahu	11 Jan 1920	Mt. Kaala				rostrata	1		BPBM	E 21.5008	-158.1374	paratype
EHB	Oahu	14 Sep 1930	E. slope Mt. Kaala	1500-2000	460-610		rostrata	1		BPBM	E 21.4986	-158.1278	paratype
OHS	Oahu	6 May 1934	Palehua			Kukui	rostrata	1		BPBM	E 21.3943	-158.0969	paratype
DA/JT	Oahu	18 Apr 1968	Waianae Mts.			ex de vac machine	rostrata	2		BPBM			paratype
KNM	Oahu	26 Jun 2014	Central Kahua Gulch	2200	670	on Anideuma platyphyllum	rostrata	1		BPBM	W 21.4603	-158.1004	paratype
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on Kadua affinis	rostrata	2		BPBM	W 21.4146	-158.0999	holotype
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on Urena glabra	rostrata	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	19 May 2015	Palikea	3000	915	on Cherodendron fragnum	rostrata	1		BPBM	W 21.4146	-158.0999	paratype
KNM	Oahu	19 May 2015	Palikea	3000	915	on Kadua affinis	rostrata	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	19 May 2015	Palikea	3000	915		rostrata	2		KNMC	W 21.4146	-158.0999	
KNM	Oahu	9 Apr 2016	Palikea trail	2700	820	on Coprosma longifolia	rostrata	3	1	KNMC	W 21.4102	-158.0986	
KNM	Oahu	9 Apr 2016	Palikea trail	2700	820	on Myrsine lessertiana	rostrata	1		UHIM	W 21.4102	-158.0986	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	9 Apr 2016	Paliaka	3000	915	on <i>Coprosma longifolia</i>	rostrata	1	1	NMNH	W	21.4146	-158.0999 paratype
KNM	Oahu	15 Jun 2017	Paliaka	3000	915	on <i>Coprosma longifolia</i>	rostrata	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	26 Apr 2017	Central Kahuaa Gulch	2200	670	on <i>Pisonia brunoniana</i>	rostrata	1		HDOA	W	21.4603	-158.1004 paratype
KNM	Oahu	22 Jun 2017	Paliaka	3000	915	on <i>Coprosma longifolia</i>	rostrata	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on <i>Cheirodendron trigynum</i>	rostrata	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	11 Apr 2019	Paliaka	3000	915	on <i>Melicope</i>	rostrata	1		BPBM	W	21.4138	-158.0997
KNM	Oahu	11 Apr 2019	Paliaka	3000	915	on <i>Cheirodendron trigynum</i>	rostrata	2		BPBM	W	21.4155	-158.0995
DTF	Oahu	20 Aug 1916	Nuuanu Valley				rufignatha	1		BPBM	E	21.3480	-157.8056 holotype
OHS	Oahu	21 Mar 1920	Waialeale Iki				rufignatha	1	1	BPBM	E	21.3193	-157.7590
OHS	Oahu	2 May 1920	Waialeale Iki				rufignatha	1		BPBM	E	21.3193	-157.7590
OHS	Oahu	27 Sep 1932	Makua				rufignatha	1		BPBM	E	21.5284	-158.1860
OHS	Oahu	27 Sep 1932	Makua			Neowawraea	rufignatha	1		BPBM	E	21.5284	-158.1860
OHS	Oahu	8 Apr 1934	Kamokuiiki Val				rufignatha	1		BPBM	E	21.5310	-158.1317
ECZ	Oahu	11 Nov 1936	Paliaka			Beating	rufignatha	1		BPBM	E	21.4149	-158.0998
OHS	Oahu	8 Oct 1939	Waianae Mts., Hapapa (rear)				rufignatha	1		BPBM	E	21.4677	-158.1043
JWB	Oahu	6 Oct 1965	Poomoho Trail				rufignatha	3		BPBM	E	21.5304	-157.9427
KNM	Oahu	22 Apr 2015	S Haleuanu, Breeder Flats	2100	640	on <i>Psychotria maritima</i>	rufignatha	1		BPBM	W	21.4983	-158.1301
KNM	Oahu	28 May 2015	Central Kahuaa Gulch	2200	670		rufignatha	1		KNMC	W	21.4603	-158.1004
NLHK	Oahu	21 Nov 1936	Monoa-Palolo Ridge				rufignatha?	2		BPBM	E	21.3260	-157.7869
OHS	Oahu	11 May 1924	Waialua side of Kaala	1500	460	in bunchgrass	rugiventris	1		BPBM	E	21.5314	-158.1432
JWB	Oahu	Apr 1966	Barbers Pt.				rugiventris	1		BPBM	E	21.2967	-158.0875 holotype
PHT	Oahu	7 Apr 1916	Palolo Hill trail			numbered 16	rugulosa	1		BPBM	E	21.3206	-157.7768 holotype
DTF	Oahu	14 Jan 1912	Olympus			ex lep. <i>Santalum</i>	setosa	1		BPBM	E	21.3357	-157.7792
PHT	Oahu	9 Apr 1916	Palolo Hill trail				setosa	1		BPBM	E	21.3206	-157.7768 holotype
PHT	Oahu	31 Jul 1917	Palolo Ridge				setosa	1		BPBM	E	21.3206	-157.7768
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				setosa	1		BPBM	E	21.5024	-158.1565
OHS	Oahu	16 May 1920	Waialeale			<i>Acacia koa</i>	setosa	1		BPBM	E	21.3202	-157.7491
OHS	Oahu	9 Apr 1922	Moanalua				setosa	1		BPBM	E	21.3876	-157.8501
OHS	Oahu	18 Jun 1922	Aiea	500-600	150-180	<i>Acacia koa</i>	setosa	1		BPBM	E	21.3889	-157.9145
OHS	Oahu	27 Sep 1932	Makua			Neowawraea	setosa	1		BPBM	E	21.5284	-158.1860

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Antidesma platyphyllum	setosa	2		KNMC	W	21.5321	-158.1786
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on Nestegis sandwicensis	setosa	1		BPM	W	21.5321	-158.1786
OHS	Oahu	5 Jan 1913	Waimano				similaris	1		BPM	E	21.4334	-157.9021 holotype
KNM	Oahu	7 Nov 2013	Makaha, unit 1	2300	700	on Nestegis sandwicensis	similaris	2		BPM	W	21.5012	-158.1678
DTF	Oahu	11 Aug 1912	Mt. Kaala				similaris	1		BPM	E	21.5008	-158.1374 holotype of <i>S. distinguenda</i>
OHS	Oahu	11 Aug 1912	Mt. Kaala				similaris	1		BPM	E	21.5008	-158.1374 holotype
OHS	Oahu	11 Aug 1912	Mt. Kaala				similaris	1		BPM	E	21.5008	-158.1374 paratype of <i>S. amika</i>
OHS	Oahu	7 Sep 1913	Mt. Kaala				similaris	1		BPM	E	21.5008	-158.1374 holotype of <i>S. amika</i>
PHT	Oahu	3 Sep 1916	Lanihuli				similaris	1		BPM	E	21.3537	-157.8325 holotype of <i>S. laevisita</i>
DTF	Oahu	13 Feb 1917	Manoa R.				similaris	1		BPM	E	21.3211	-157.7920
PHT	Oahu	26 Mar 1917	Alewa Heights				similaris	1		BPM	E	21.3482	-157.8392
DTF	Oahu	29 Jul 1917	Manoa Valley				similaris	1		BPM	E	21.3366	-157.8000 holotype of <i>S. megalops</i>
JCB	Oahu	9 Sep 1917	SE Koolau Mts.				similaris	2	1	BPM	E	21.3456	-157.8015
OHS	Oahu	24 Nov 1918	Lanihuli				similaris	1		BPM	E	21.3597	-157.8263
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				similaris	2		BPM	E	21.5024	-158.1565
EHB	Oahu	5 Oct 1919	Puaoa F.				similaris	1		BPM	E	21.3405	-157.8110
OHS	Oahu	8 Feb 1920	Moanalu				similaris	1		BPM	E	21.3876	-157.8501
EHB	Oahu	18 Jul 1920	Lanihuli				similaris	1		BPM	E	21.3597	-157.8263
OHS	Oahu	17 Dec 1922	Halawa				similaris	2		BPM	E	21.3995	-157.8639
OHS	Oahu	17 Dec 1922	Halawa			Metrosideros	similaris	1		BPM	E	21.3995	-157.8639
OHS	Oahu	18 Nov 1923	Waihupe				similaris	2		BPM	E	21.3202	-157.7491
OHS	Oahu	13 Jan 1924	Niu				similaris	1		BPM	E	21.3093	-157.7417
OHS	Oahu	27 Jan 1924	Waiannae Mts.				similaris	1		BPM			
OHS	Oahu	27 Jan 1924	Waiannae Mts.				similaris	1		BPM			
OHS	Oahu	11 Nov 1926	Mt. Kaala				similaris	1		BPM	E	21.5008	-158.1374
OW	Oahu	22 Jan 1929	Oahu				similaris	1		NHMUK			
OHS	Oahu	21 Jul 1929	Mt. Kaala				similaris	1		BPM	E	21.5008	-158.1374
OHS	Oahu	13 Apr 1930	Peahinaia Rdg.			koa	similaris	2		BPM	E	21.5520	-157.9535
OHS	Oahu	14 Sep 1930	Haleuanu				similaris	2		BPM	E	21.4988	-158.1353
OHS	Oahu	14 Sep 1930	Haleuanu			koa	similaris	1		BPM	E	21.4988	-158.1353

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
OHS	Oahu	16 Sep 1933	Kukuia la Val.			Psonia	similis	1		BPBM	E 21.5349	-158.1848	
OHS	Oahu	16 Sep 1933	Kukuia la Val.			Alectryon	similis	1		BPBM	E 21.5349	-158.1848	
OHS	Oahu	8 Apr 1934	Kamokuki Val				similis	1		BPBM	E 21.5310	-158.1317	
JWB	Oahu	Jul 1957	Mt. Kaala, Waianae side				similis	1		BPBM	E 21.5024	-158.1565	
CMY	Oahu	18 Jan 1966	Wiliwilinui Ridge				similis	1		BPBM	E 21.3193	-157.7590	
KNM	Oahu	20 Jul 2016	Puileka	3000	915	on Cheirodendron trigynum	similis	1		KNMC	W 21.4146	-158.0999	
RCLP	Oahu	Apr 1893	Kawailoa				similis	1		NHMLJ	E 21.5796	-158.0060	
PHT	Oahu	3 Sep 1916	Lanihuli Ridge	1500	460		spicata	1	1	BPBM	E 21.3537	-157.8325	holotype and allotype
AK	Oahu	[no date]	Oahu				striata	1		HDOA borrowed			
RCLP	Oahu	Apr 1892	Waianae Mts.	3000	915		striata	2		NHMLJ	E 21.5172	-158.1455	
OHS	Oahu	4 Feb 1906	Konahuanui				striata	1		BPBM	E 21.3456	-157.8015	
OHS	Oahu	8 Aug 1909	Kaunaochona				striata	1		BPBM	E 21.3456	-157.8015	
DTF	Oahu	8 Sep 1912	Pulolo				striata	1		HDOA	E 21.3206	-157.7768	label says "Palalo"
DTF	Oahu	8 Sep 1912	Palolo Valley				striata	1		BPBM	E 21.3342	-157.8237	holotype
DTF	Oahu	20 Aug 1916	Nuamu, Cooke's Trail				striata	1		HDOA	E 21.3480	-157.8056	
DTF	Oahu	20 Aug 1916	Nuamu Valley				striata	1		BPBM	E 21.3480	-157.8056	holotype of <i>S. aggers</i>
JCB	Oahu	17 Jun 1917	Kaunaochona				striata	1		BPBM	E 21.3456	-157.8015	
JCB	Oahu	22 Jul 1917	Mt. Kaala				striata	1		BPBM	E 21.5008	-158.1374	
JCB	Oahu	Jun 1918	Manoa Cliffs				striata	1		BPBM	E 21.3305	-157.8093	
OHS	Oahu	25 May 1919	Lanihuli				striata	1		BPBM	E 21.3597	-157.8263	
WNG	Oahu	12 Oct 1919	Tantalus	2000	610		striata	1		HDOA	E 21.3328	-157.8150	
OHS	Oahu	23 Nov 1924	Kahuku				striata	1		BPBM	E 21.6522	-157.9897	
OW	Oahu	22 Jan 1929	Oahu				striata	1		NHMLJ			
JWB	Oahu	4 Jul 1956	Mt. Tantalus				striata	3		BPBM	E 21.3286	-157.8250	
CMY	Oahu	8 Jul 1959	Mt. Tantalus				striata	1		BPBM	E 21.3286	-157.8250	
OHS	Oahu	27 Jul 1913	Manoa Valley				subcrispa	1		BPBM	E 21.3366	-157.8000	holotype of <i>S. rafomandibulata</i>
DTF	Oahu	13 Feb 1917	Manoa Ridge				subcrispa	1		BPBM	E 21.3211	-157.7920	holotype
PHT	Oahu	9 Sep 1917	Cooke Trail				subcrispa	1		BPBM	E 21.3480	-157.8056	
OHS	Oahu	10 Apr 1921	Opa'ula				subcrispa	1		BPBM	E 21.5520	-157.9535	
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on <i>Nestegis sandwicensis</i>	subcrispa	1		KNMC	W 21.5321	-158.1786	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	7 Sep 1913	Mt. Kaala				suttoniae	2		BPBM	E	21.5008	-158.1374 holotype and paratype of <i>S. arida</i>
PHT	Oahu	4 Mar 1917	Mt. Kaala	2500	760	on Suttonia lessertiana	suttoniae	1		BPBM	E	21.5008	-158.1374 holotype
OHS	Oahu	6 Feb 1927	Mt. Kaala				suttoniae	1		BPBM	E	21.5008	-158.1374
OHS	Oahu	29 Mar 1936	Mt. Olympus tr.			ex Broussaia	suttoniae	1		UHIM	E	21.3357	-157.7792
OHS	Oahu	9 Jan 1938	Mt. Olympus			Euphorbia	suttoniae	1		UHIM	E	21.3357	-157.7792
ECZ	Oahu	9 May 1943	Kona huanui	2600-3000	790-915	Beating Shrubbery	suttoniae	1		BPBM	E	21.3526	-157.7901
ECZ	Oahu	9 May 1943	Kona huanui	2600-3000	790-915	Beating Shrubbery	suttoniae	1		BPBM	E	21.3526	-157.7901
JWB	Oahu	11 Apr 1966	Mt. Kaala				suttoniae	1		BPBM	E	21.5072	-158.1434
CMY	Oahu	14 Apr 1966	Mt. Kaala				suttoniae	4		BPBM	E	21.5072	-158.1434
WCG	Oahu	29 Dec 1968	Mt. Kaala	4000	1220		suttoniae	1		BPBM	E	21.5072	-158.1434
JWB	Oahu	28 Sep 1985	Mt. Kaala	4000	1220		suttoniae	1		BPBM	E	21.5072	-158.1434
KNM	Oahu	3 Jun 2013	Kolaa, Koolau Summit Tr	2400	730	on Cyanea	suttoniae	1		BPBM	W	21.5831	-157.9453
KNM	Oahu	7 Aug 2013	Kolaa, Koolau Summit Tr	2400	730	on Melicope	suttoniae	1		missing	W	21.5838	-157.9485
KNM	Oahu	12 Sep 2013	Kaala summit, NE face	3500	1070	on Touchardia latifolia	suttoniae	1		BPBM	W	21.5085	-158.1403
KNM	Oahu	17 Dec 2013	Kolaa, nr. Koolau summit	2350	720	on Bobea elatior	suttoniae	1		BPBM	W	21.5832	-157.9457
KNM	Oahu	10 Feb 2014	Kaala summit, E face	3950	1200	on Melicope	suttoniae	1		BPBM	W	21.5057	-158.1412
KNM	Oahu	4 Jul 2014	Kaala summit, E face	4000	1220	on Metrosideros polymorpha	suttoniae	2	1	BPBM	W	21.5057	-158.1412
KNM	Oahu	18 Aug 2014	Kolaa, Koolau Summit Tr	2400	730	on Anide sma platyphyllum	suttoniae	2		BPBM	W	21.5838	-157.9485
KNM	Oahu	9 Mar 2015	Palikey	3000	915	on Cheirodendron trigynum	suttoniae	1		BPBM	W	21.4145	-158.0988
KNM	Oahu	14 May 2015	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	suttoniae	2		BPBM	W	21.5028	-158.1491
KNM	Oahu	2 Jun 2015	Kaala summit, E face	3950	1200	on Broussaia arguta	suttoniae	2		BPBM	W	21.5057	-158.1412
KNM	Oahu	9 Apr 2016	Palikey	3000	915	on Anide sma platyphyllum	suttoniae	1	1	BPBM	W	21.4146	-158.0999
KNM	Oahu	28 Apr 2016	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	suttoniae	2		BPBM	W	21.5028	-158.1491
KNM	Oahu	28 Apr 2016	Waianae-Kaala Tr.	3850	1170	on Broussaia arguta	suttoniae	1		UHIM	W	21.5028	-158.1491
KNM	Oahu	2 Jun 2016	Kaala summit, E face	3950	1200	on Cheirodendron trigynum	suttoniae	1		UHIM	W	21.5057	-158.1412
KNM	Oahu	20 Jul 2016	Palikey	3000	915	on Perrottetia sandwicensis	suttoniae	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	20 Jul 2016	Palikey	3000	915	on Psychotria	suttoniae	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	11 Aug 2016	Kaala transect, 665 m	3850	1170	on Cheirodendron trigynum	suttoniae	1		KNMC	W	21.5028	-158.1441
KNM	Oahu	29 Aug 2016	Palikey	3000	915	on Anide sma platyphyllum	suttoniae	1		HDOA	W	21.4146	-158.0999
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on Ilex anomala	suttoniae	3		KNMC	W	21.5057	-158.1412

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on Cheirodendron trigynum	suttoniae	2		NMNH	W	21.5057	-158.1412
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on Ilex anomala	suttoniae	1	2	NMNH	W	21.5057	-158.1412
KNM	Oahu	16 May 2017	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	suttoniae	5	1	KNMC	W	21.5028	-158.1491
KNM	Oahu	16 May 2017	Waianae-Kaala Tr.	3850	1170	on Broussaisia arguta	suttoniae	1		KNMC	W	21.5028	-158.1491
KNM	Oahu	10 Aug 2017	Waianae-Kaala Tr.	3850	1170	on Melicope	suttoniae	2		KNMC	W	21.5028	-158.1491
KNM	Oahu	24 Jan 2018	Paliaka	3000	915	on Coprosma longifolia	suttoniae	1		KNMC	W	21.4155	-158.0995
KNM	Oahu	16 Apr 2018	Kaala summit	3900	1190	on Broussaisia arguta	suttoniae	1		KNMC	W	21.5040	-158.1472
KNM	Oahu	9 May 2018	Ohikilolo	2900	885	on Psychotria maritima	suttoniae	1		BPBM	W	21.5133	-158.1930
KNM	Oahu	7 May 2019	Kaala summit, E face	3950	1200	on Melicope	suttoniae	1		BPBM	W	21.5057	-158.1412
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on Psychotria maritima	suttoniae	1		KNMC	W	21.5137	-158.1938
OHS	Oahu	23 Feb 1914	Kona huanui				swezeyi	1		BPBM	E	21.3533	-157.7889 holotype
OHS	Oahu	30 Dec 1933	Piko Trail, Waianae Mts.			Pelea	swezeyi	1		BPBM	E	21.5328	-158.1824
RCLP	Oahu	[no date]	Honolulu Mts.	1500	460		tenebriosa	1		BPBM	E	21.3315	-157.8204
RCLP	Oahu	[no date]	Honolulu Mts.	1800	550		tenebriosa	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	[no date]	Tantalus	1800	550		tenebriosa	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	189-	Honolulu Mts.	2000-3000	610-915		tenebriosa	1		NHMUK	E	21.3518	-157.7930
JCB	Oahu	4 Jul 1916	Mt. Kaala				tenebriosa	2		BPBM	E	21.5008	-158.1374
JCB	Oahu	4 Jul 1916	Mt. Kaala				tenebriosa	1		BPBM	E	21.5008	-158.1374 holotype of S. willardi
JCB	Oahu	22 Jul 1917	Mt. Kaala				tenebriosa	1		BPBM	E	21.5008	-158.1374
PHT	Oahu	31 Jul 1917	Mt. Olympus				tenebriosa	1		BPBM	E	21.3357	-157.7792 holotype
OHS	Oahu	16 Feb 1919	Waialeale Nui				tenebriosa	1		BPBM	E	21.3141	-157.7669
OHS	Oahu	16 Feb 1919	Waialeale Nui				tenebriosa	1		BPBM	E	21.3141	-157.7669
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				tenebriosa	1		BPBM	E	21.5024	-158.1565
OHS	Oahu	4 Jul 1920	Kahana				tenebriosa	1		BPBM	E	21.5352	-157.8947
OHS	Oahu	23 Nov 1924	Kahuku				tenebriosa	1		BPBM	E	21.6522	-157.9897
OHS	Oahu	11 Nov 1926	Mt. Kaala				tenebriosa	1		BPBM	E	21.5008	-158.1374
OW	Oahu	22 Jan 1929	Oahu				tenebriosa	1		NHMUK			
OHS	Oahu	21 Jul 1929	Mt. Kaala				tenebriosa	1		BPBM	E	21.5008	-158.1374
OHS	Oahu	19 Apr 1931	Puu Kalena			Gunnera	tenebriosa	1		BPBM	E	21.4892	-158.1322
OHS	Oahu	19 Apr 1931	Puu Kalena			Cibotium chamissoi	tenebriosa	1		BPBM	E	21.4892	-158.1322

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
ECZ	Oahu	2 Apr 1938	Mt. Kaala			Gouldia	tenebriosa	1		BPBM	E 21.5008	-158.1374	
JWB	Oahu	14 Apr 1966	Mt. Kaala				tenebriosa	4		BPBM	E 21.5072	-158.1434	
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on Pipturus abidus	tenebriosa	1	1	BPBM	W 21.4146	-158.0999	
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on Kadua affinis	tenebriosa	1		BPBM	W 21.4146	-158.0999	
KNM	Oahu	16 Apr 2018	Kaala summit	3900	1190	on Broussaisia arguta	tenebriosa	2		KNMC	W 21.5040	-158.1472	
KNM	Oahu	18 May 2018	Kaala, Dupont Trail	3800	1160	on Syzygium sandwicense	tenebriosa	1		BPBM	W 21.5105	-158.1455	
KNM	Oahu	18 May 2018	Kaala, Dupont Trail	3800	1160	on Cherodendron trigynum	tenebriosa	2		KNMC	W 21.5105	-158.1455	
KNM	Oahu	18 May 2018	Kaala, Dupont Trail	3800	1160	on Ilex anomala	tenebriosa	1		KNMC	W 21.5105	-158.1455	
RCLP	Oahu	[no date]	Honolulu			in mlo [kor? word uncertain] to Kewalo St.	tenukeps	1		BPBM	E 21.2930	-157.8537	
DTF	Oahu	9 Mar 1910	Kunia				tenukeps	1		HDOA	E 21.4603	-158.0752	paratype; specimen gone from point
JCB	Oahu	Apr 1916	Honolulu				tenukeps	1		BPBM	E 21.2930	-157.8537	holotype
OHS	Oahu	9 Nov 1919	S. Waianae Mts.				tenukeps	1		BPBM	E 21.2633	-157.6987	
OHS	Oahu	22 Feb 1927	Koko Hd.				tenukeps	1		BPBM	E 21.2633	-157.6987	
OHS	Oahu	17 Feb 1934	Koko Head				tenukeps	2	2	BPBM	E 21.2633	-157.6987	
OHS	Oahu	20 Feb 1934	Koko Head				tenukeps	1	1	BPBM	E 21.2633	-157.6987	
OHS	Oahu	15 Mar 1934	Koko Head				tenukeps	1		BPBM	E 21.2633	-157.6987	
OHS	Oahu	10 Nov 1934	Koko Head				tenukeps	1		BPBM	E 21.2633	-157.6987	
ECZ	Oahu	Mar 1942	Honolulu			Under dead bark, Pithocolobium [Pithocolobium]	tenukeps	1		BPBM	E 21.2930	-157.8537	
REL	Oahu	11 Oct 1959	Waianae Mts.	2000	610		tenukeps	1		BPBM	E 21.5259	-158.1464	
OHS	Oahu	3 Jan 1915	Palolo				tenuis	1		BPBM	E 21.3206	-157.7768	holotype
PHT	Oahu	9 Sep 1917	Cooke Trail				tenuis	1		BPBM	E 21.3480	-157.8056	mentioned in Fullaway as part of paratype series (as being from Kaunaohe) but without a paratype label
EHB	Oahu	11 Jan 1920	Mt. Kaala				tenuis	1		BPBM	E 21.5008	-158.1374	
OHS	Oahu	25 Feb 1922	Mt. Olympus				tenuis	1		BPBM	E 21.3357	-157.7792	
OHS	Oahu	6 Jan 1934	Hauula			olia ha	tenuis	1		BPBM	E 21.5916	-157.9201	
ECZ	Oahu	11 Nov 1936	Palikea			Beating	tenuis	1		BPBM	E 21.4149	-158.0998	
JWB	Oahu	17 Jul 1964	Wiliwiliui Ridge			Metrosideros polymorpha	tenuis	1		BPBM	E 21.3193	-157.7590	

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
WCG	Oahu	3 Nov 1968	Aiea Ridge Trail	1600	490	<i>Ilex anomala</i>	tenuis	1		BPBM	E	21.4084	-157.8763
KNM	Oahu	26 Jun 2014	Central Kaliaa Gulch	2200	670	on <i>Pisonia</i>	tenuis	1		BPBM	W	21.4603	-158.1004
KNM	Oahu	5 Jul 2014	South Kaliaa Gulch	2250	690	on <i>Cryptocarya oahuensis</i>	tenuis	1		BPBM	W	21.4574	-158.0970
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on <i>Planchonea sandwicensis</i>	tenuis	1		KNMC	W	21.4665	-158.1028
KNM	Oahu	21 Aug 2014	Palikea	3000	915	on <i>Psychotria</i>	tenuis	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	19 Nov 2014	Kapuna, Mokuleia Tr.	2100	640	on <i>Nestegis sandwicensis</i>	tenuis	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	12 Feb 2015	Waianae, Kunaipo gulch 4	2200	670	on <i>Urena glabra</i>	tenuis	1		BPBM	W	21.4990	-158.1533
KNM	Oahu	20 Apr 2015	Puu Hapapa	2650	810	on <i>Pisonia umbellifera</i>	tenuis	1		BPBM	W	21.4665	-158.1028
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on <i>Xylosma hawaianse</i>	tenuis	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	12 Apr 2016	North Kaliaa Gulch	2200	670	on <i>Planchonea sandwicensis</i>	tenuis	1		BPBM	W	21.4647	-158.1010
KNM	Oahu	29 Aug 2016	Palikea	3000	915	on <i>Coprosma longifolia</i>	tenuis	1		KNMC	W	21.4146	-158.0999
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on <i>Xylosma hawaianse</i>	tenuis	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	26 Mar 2018	Palikea	3000	915	on <i>Coprosma longifolia</i>	tenuis	3	3	KNMC	W	21.4125	-158.1004
KNM	Oahu	9 May 2018	Ohikilolo	2900	885	on <i>Myrsine kessertiana</i>	tenuis	1	7	KNMC	W	21.5133	-158.1930
KNM	Oahu	21 Jun 2018	Palikea	3000	915	on <i>Coprosma longifolia</i>	tenuis	1	1	KNMC	W	21.4155	-158.0995
KNM	Oahu	2 Aug 2018	North Kaliaa Gulch	2200	670	on <i>Pisonia umbellifera</i>	tenuis	1		BPBM	W	21.4647	-158.1010
KNM	Oahu	21 Feb 2019	Palikea	3000	915	on <i>Kadua affinis</i>	tenuis	1		BPBM	W	21.4150	-158.0993
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2100	640	on <i>Kadua affinis</i>	tenuis	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2100	640	on <i>Nestegis sandwicensis</i>	tenuis	1		BPBM	W	21.5321	-158.1786
KNM	Oahu	21 May 2019	Kapuna, Mokuleia Tr.	2100	640	on <i>Xylosma hawaianse</i>	tenuis	3	2	BPBM	W	21.5321	-158.1786
RCLP	Oahu	July	Honolulu Mts.	1500	460		testaceipes	1		BPBM	E	21.3315	-157.8204
RCLP	Oahu	July	Honolulu Mts.			804	testaceipes	1		BPBM	E	21.3374	-157.8105
RCLP	Oahu	Sept	Tanaitus	1800	550		testaceipes	2		BPBM	E	21.3374	-157.8105
RCLP	Oahu	189-	Honolulu Mts.	2000-3000	610-915		testaceipes	1		NHMUK	E	21.3518	-157.7930
RCLP	Oahu	1906	Honolulu Mts.	1800	550		testaceipes	1		BPBM	E	21.3374	-157.8105
WMG	Oahu	16 Apr 1905	Tanaitus	1300	400		testaceipes	1		BPBM	E	21.3286	-157.8250
WMG	Oahu	15 Oct 1905	Tanaitus	1300	400	numbered 10	testaceipes	1		BPBM	E	21.3286	-157.8250
WMG	Oahu	15 Oct 1905	Tanaitus	1300	400		testaceipes	2		BPBM	E	21.3286	-157.8250
RCLP	Oahu	Sep 1906	Tanaitus				testaceipes	1		BPBM	E	21.3286	-157.8250

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
OHS	Oahu	12 Jan 1907	Tantalus			ex koa leaves where had been a batch of Rhyncogonus eggs	te staceipes	1		HDOA	E 21.3286	-157 8250	
WMG	Oahu	14 Sep 1907	Tantalus			numbered 545	te staceipes	1		BPBM	E 21.3286	-157 8250	paratype of <i>S. tanialea</i>
WMG	Oahu	14 Nov 1907	Tantalus	1300	400	no 545	te staceipes	3		BPBM	E 21.3286	-157 8250	paratype of <i>S. pubescens</i>
WMG	Oahu	9 Sep 1908	Tantalus			numbered 284	te staceipes	1		BPBM	E 21.3286	-157 8250	holotype of <i>S. tanialea</i>
JCB	Oahu	10 Jun 1917	Mt. Tantalus				te staceipes	1		BPBM	E 21.3286	-157 8250	
JCB	Oahu	Jun 1918	Tantalus			swept from Acacia koa	te staceipes	1		BPBM	E 21.3286	-157 8250	paratype of <i>S. brunnipes</i>
JCB	Oahu	Jun 1918	SE Koolau Mts.			swept from Acacia koa	te staceipes	1		BPBM	E 21.3286	-157 8250	
OHS	Oahu	14 Sep 1930	Haleuanu			koa	te staceipes	1		BPBM	E 21.4988	-158.1353	
RCLP	Oahu	[no date]	Tantalus				te staceipes	1		BPBM	E 21.3286	-157 8250	
RCLP	Oahu	[no date]	Tantalus				te staceipes	1		BPBM	E 21.3286	-157 8250	
RCLP	Oahu	[no date]	Honolulu Mts.				te staceipes	1		BPBM	E 21.3374	-157 8105	
RCLP	Oahu	[no date]	Mts nr Honolulu	2000-3000	610-915		te staceipes	1		BPBM	E 21.3518	-157 7930	
TB	Oahu	[no date]	Oahu		94		te staceipes	1		BPBM			"specimen retained by BL [Blackburn] as being = estaceipes Cam. Oahu. coll Blackburn. R.C.L.P."
TB	Oahu	[no date]	Oahu				te staceipes	1		NHMUK			holotype
RCLP	Oahu	Nov 1906	Tantalus				te staceipes?	1		BPBM	E 21.3286	-157 8250	
OHS	Oahu	13 Aug 1911	Tantalus			reared from larva of Batrachodra sophroniella	timberlakei	1		BPBM	E 21.3286	-157 8250	holotype
OHS	Oahu	13 Aug 1911	Tantalus			reared from larva of Batrachodra sophroniella	timberlakei	1		missing	E 21.3286	-157 8250	paratype
OHS	Oahu	4 Aug 1912	Tantalus				timberlakei	1		BPBM	E 21.3286	-157 8250	paratype
OHS	Oahu	4 May 1913	Waiaua				timberlakei	1		BPBM	E 21.4543	-157 9364	allotype
OHS	Oahu	7 May 1914	Kalihi				timberlakei	1		BPBM	E 21.3757	-157 8223	paratype
OHS	Oahu	17 May 1914	Kalihi				timberlakei	1		BPBM	E 21.3757	-157 8223	paratype: head missing. listed in Fullaway as being from 7 May like other specimen
OHS	Oahu	6 Dec 1915	Tantalus				timberlakei	1		HDOA	E 21.3286	-157 8250	
PHT	Oahu	19 Mar 1916	Cooke's trail, Nuanuu Valley				timberlakei	1		missing	E 21.3480	-157 8056	paratype
DTF	Oahu	20 Aug 1916	Nuanuu			on Cyrtandra grandiflora	timberlakei	1		HDOA	E 21.3480	-157 8056	paratype: head missing
PHT	Oahu	4 Mar 1917	Mt. Kaala	2000	610		timberlakei	1		missing	E 21.4986	-158.1278	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	Repository	Lat	Long	Notes
OHS	Oahu	28 Mar 1920	Waiau				timberlakei		1	BPBM	E	21.4346	-157.8874
OHS	Oahu	22 Jun 1924	Puu Kaau				timberlakei	1		BPBM	E	21.4413	-158.0981
EJF	Oahu	Dec 1953	Mt. Kaala				timberlakei	1		BPBM	E	21.4986	-158.1278
SLM	Oahu	10 Oct 1976	Puu Kanehoa	2200	670		timberlakei	1		BPBM	E	21.4568	-158.0898
KNM	Oahu	24 Feb 2012	North Haleaunuu Gulch	2350	720	on <i>Antidesma platyphyllum</i>	timberlakei	4		BPBM	W	21.5066	-158.1297
KNM	Oahu	24 Feb 2012	North Haleaunuu Gulch	2350	720	on <i>Antidesma platyphyllum</i>	timberlakei	4		KNMC	W	21.5066	-158.1297
KNM	Oahu	24 Feb 2012	North Haleaunuu Gulch	2350	720	on <i>Psychotria</i>	timberlakei	1		NMNH	W	21.5066	-158.1297
KNM	Oahu	30 Jul 2012	Aiea Ridge Trail	1700	520	on <i>Freycinetia arborea</i>	timberlakei	1		BPBM	W	21.4093	-157.8725
KNM	Oahu	2 Aug 2017	Ohikilolo	2900	885	on <i>Myrsine kessertiana</i>	timberlakei	1		NMNH	W	21.5133	-158.1937
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on <i>Athyrium microphyllum</i>	timberlakei	1		KNMC	W	21.5137	-158.1938
DTF	Oahu	5 Mar 1911	Waianae mountains				tuberculata	1		BPBM			holotype
OHS	Oahu	9 Feb 1930	Haleaunuu			<i>Eragrostis</i>	tuberculata	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	11 Dec 1910	Nia Valley				tunidoventris	1		BPBM	E	21.3093	-157.7417
DTF	Oahu	20 Aug 1916	Cooke's trail, Nuuanu Valley				tunidoventris	1		BPBM	E	21.3480	-157.8056
KNM	Oahu	23 Jul 2019	Ohikilolo	2900	885	on <i>Metrosideros polymorpha</i>	tunidoventris	1	5	KNMC	W	21.5137	-158.1938
CMY	Oahu	14 Apr 1966	Mt. Kaala				uhiwai	2		BPBM	E	21.5072	-158.1434
JWB	Oahu	14 Apr 1966	Mt. Kaala				uhiwai	1		BPBM	E	21.5072	-158.1434
WDP	Oahu	24 Mar 1982	near Puu Kouhuanui	2800	850		uhiwai	1		BPBM	E	21.3526	-157.7901
WDP	Oahu	27 Aug 1983	Kouhuanui	3100	950		uhiwai	1		BPBM	E	21.3533	-157.7889
AA	Oahu	4 Jul 1994	Mt Kaala summit			<i>ex Syzygium sandwicense</i>	uhiwai	2		BPBM	E	21.5072	-158.1434
AA	Oahu	4 Jul 1994	Mt Kaala summit				uhiwai	1		BPBM	E	21.5072	-158.1434
KNM	Oahu	1 Aug 2013	Waianae-Kaala Tr.	3850	1170	under leaves	uhiwai	1	1	BPBM	W	21.5025	-158.1492
KNM	Oahu	10 Feb 2014	Kaala summit, E face	3950	1200	on <i>Melicope</i>	uhiwai	3	2	BPBM	W	21.5057	-158.1412
KNM	Oahu	4 Jul 2014	Kaala summit, E face	4000	1220	on <i>Cheirodendron trigynum</i>	uhiwai	1		KNMC	W	21.5057	-158.1412
KNM	Oahu	3 Mar 2015	Kaala summit, E face	3950	1200	under leaves	uhiwai	10		KNMC	W	21.5057	-158.1412
KNM	Oahu	14 May 2015	Waianae-Kaala Tr.	3850	1170	on <i>Broussaisia arguta</i>	uhiwai	4	1	NMNH	W	21.5028	-158.1491
KNM	Oahu	14 May 2015	Waianae-Kaala Tr.	3850	1170	on <i>Cheirodendron trigynum</i>	uhiwai	1	3	BPBM	W	21.5028	-158.1491
KNM	Oahu	14 May 2015	Waianae-Kaala Tr.	3850	1170	on <i>Melicope</i>	uhiwai	3	1	BPBM	W	21.5028	-158.1491
KNM	Oahu	2 Jun 2015	Kaala summit, E face	3950	1200	on <i>Cheirodendron trigynum</i>	uhiwai	6		BPBM	W	21.5057	-158.1412
KNM	Oahu	28 Apr 2016	Waianae-Kaala Tr.	3850	1170	on <i>Broussaisia arguta</i>	uhiwai	4	2	BPBM	W	21.5028	-158.1491

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	28 Apr 2016	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	uhiwai	1	19	KNMC	W	21.5028	-158.1491
KNM	Oahu	28 Apr 2016	Waianae-Kaala Tr.	3850	1170	on Melicope	uhiwai	18	3	KNMC	W	21.5028	-158.1491
KNM	Oahu	4 May 2016	Kaala summit, SE face	3850	1170	on Melicope	uhiwai	7		BPBM	W	21.5017	-158.1442 paratype
KNM	Oahu	4 May 2016	Kaala summit, SE face	3850	1170	on Syzygium sandwicensis	uhiwai	1		KNMC	W	21.5017	-158.1442
KNM	Oahu	2 Jun 2016	Kaala summit, E face	3950	1200	on Cheirodendron trigynum	uhiwai	14	7	KNMC	W	21.5057	-158.1412
KNM	Oahu	11 Aug 2016	Kaala transect, 665 m	3850	1170	on Cheirodendron trigynum	uhiwai	2		BPBM	W	21.5028	-158.1441 paratype
KNM	Oahu	9 Feb 2017	Waianae-Kaala Tr.	3850	1170	on Broussaia arguta	uhiwai	7		HDOA	W	21.5028	-158.1491 paratype
KNM	Oahu	9 Feb 2017	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	uhiwai	2	3	BPBM	W	21.5028	-158.1491 paratype
KNM	Oahu	9 Feb 2017	Waianae-Kaala Tr.	3850	1170	on Melicope	uhiwai	2		BPBM	W	21.5028	-158.1491 paratype
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on Cheirodendron trigynum	uhiwai	3	9	KNMC	W	21.5057	-158.1412
KNM	Oahu	4 May 2017	Kaala summit, E face	3950	1200	on Ilex anomala	uhiwai	2		KNMC	W	21.5057	-158.1412
KNM	Oahu	16 May 2017	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	uhiwai	2		KNMC	W	21.5028	-158.1491
KNM	Oahu	16 May 2017	Waianae-Kaala Tr.	3850	1170	on Melicope	uhiwai	4		UHIM	W	21.5028	-158.1491 paratype
KNM	Oahu	10 Aug 2017	Waianae-Kaala Tr.	3850	1170	on Melicope	uhiwai	1		KNMC	W	21.5028	-158.1491
KNM	Oahu	16 Apr 2018	Kaala summit	3900	1190	entering leaf mine in Melicope	uhiwai	1		BPBM	W	21.5040	-158.1472
KNM	Oahu	16 Apr 2018	Kaala summit	3900	1190	on Broussaia arguta	uhiwai	1	1	KNMC	W	21.5040	-158.1472
KNM	Oahu	16 Apr 2018	Kaala summit	3900	1190	on Melicope	uhiwai	5		KNMC	W	21.5040	-158.1472
KNM	Oahu	15 Aug 2018	Waianae-Kaala Tr.	3850	1170	on Melicope	uhiwai	3		BPBM	W	21.5028	-158.1491
KNM	Oahu	18 Apr 2019	Waianae-Kaala Tr.	3850	1170	on Cheirodendron trigynum	uhiwai	1		BPBM	W	21.5028	-158.1491
KNM	Oahu	18 Apr 2019	Waianae-Kaala Tr.	3850	1170	on Broussaia arguta	uhiwai	1		BPBM	W	21.5028	-158.1491
KNM	Oahu	18 Apr 2019	Waianae-Kaala Tr.	3850	1170	on Melicope	uhiwai	1		BPBM	W	21.5028	-158.1491
KNM	Oahu	7 May 2019	Kaala summit, E face	3950	1200	on Melicope	uhiwai	7	3	BPBM	W	21.5057	-158.1412
OHS	Oahu	8 Jan 1922	Makalehu, Mt. Kaala			ureuae	ureuae	1		BPBM	E	21.5250	-158.1501 paratype
OHS	Oahu	8 Jan 1922	Makalehu, Mt. Kaala			ureuae	ureuae	2		BPBM	E	21.5250	-158.1501 paratype
KNM	Oahu	26 Jun 2014	Central Kaluaa Gulch	2200	670	on Anideana platyphyllum	ureuae	1		BPBM	W	21.4603	-158.1004 paratype
KNM	Oahu	29 Oct 2014	Palikea	3000	915	on Ureua glabra	ureuae	3	1	KNMC	W	21.4146	-158.0999 paratype
KNM	Oahu	12 Feb 2015	Waianae, Kumaipo gulch 4	2200	670	on Ureua glabra	ureuae	1		BPBM	W	21.4990	-158.1533 paratype
KNM	Oahu	14 Apr 2015	Central Kaluaa Gulch	2200	670	on Cheilyxton sandwicense	ureuae	2		KNMC	W	21.4603	-158.1004
KNM	Oahu	15 Apr 2015	Palikea	3000	915	on Pipturus abidus	ureuae	1		BPBM	W	21.4146	-158.0999 paratype
KNM	Oahu	9 Dec 2015	Palikea	3000	915	on Ureua glabra	ureuae	1		BPBM	W	21.4146	-158.0999 holotype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	5 May 2016	Ekahanui, gulch 2D	2400	730	on Passiflora	uraeae	1		BPBM	W	21.4389	-158.0938 paratype
KNM	Oahu	30 Jun 2016	Central Kalauea Gulch	2200	670	on Planchonella sandwicensis	uraeae	1		HDOA	W	21.4603	-158.1004 paratype
KNM	Oahu	30 Jun 2016	Central Kalauea Gulch	2200	670	on Ureua glabra	uraeae	1		KNMC	W	21.4603	-158.1004
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on self	uraeae	1		BPBM	W	21.4146	-158.0999 paratype
KNM	Oahu	21 Jul 2016	Puu Hapaapa	2650	810	on Labordia kaala e	uraeae	1		KNMC	W	21.4665	-158.1028
KNM	Oahu	26 Apr 2017	Central Kalauea Gulch	2200	670	on Psionia sandwicensis	uraeae	1		NNNH	W	21.4603	-158.1004 paratype
KNM	Oahu	13 Sep 2017	Palikea	3000	915	on Coprosma longifolia	uraeae	1		UHIM	W	21.4128	-158.0997 paratype
KNM	Oahu	26 Sep 2017	Palikea	3000	915	on Ureua glabra	uraeae	1	2	BPBM	W	21.4146	-158.0999 paratype
KNM	Oahu	26 Sep 2017	Palikea	3000	915	on Ureua glabra	uraeae	2	7	KNMC	W	21.4146	-158.0999
KNM	Oahu	31 May 2018	Central Kalauea Gulch	2200	670	on Pipurus albidus	uraeae	1		BPBM	W	21.4603	-158.1004
KNM	Oahu	31 Jul 2018	Palikea	3000	915	on Ureua glabra	uraeae	1		BPBM	W	21.4146	-158.0999
KNM	Oahu	5 Sep 2018	North Kalauea Gulch	2200	670	on Phlebotomum aureum	uraeae	1		BPBM	W	21.4647	-158.1010
KNM	Oahu	22 Jul 2019	Palikea	3000	915	on Ureua glabra	uraeae	2		KNMC	W	21.4146	-158.0999
DTF	Oahu	24 Mar 1910	Kunia				usitata	1		BPBM	E	21.4603	-158.0752 paratype of <i>S. usitata</i>
JCB	Oahu	17 Jun 1917	Kaunahoua				usitata	1		BPBM	E	21.3456	-157.8015
PHT	Oahu	9 Sep 1917	Kaunahoua				usitata	3	1	BPBM	E	21.3456	-157.8015 holotype, allotype, and paratypes
JWB	Oahu	6 Oct 1965	Poamoho Trail				usitata	1		BPBM	E	21.5304	-157.9427
JS	Oahu	27 Aug 1988	Laie Trail	1900-2300	580-700		usitata	1		BPBM	E	21.5989	-157.9558
KNM	Oahu	21 Jun 2018	Palikea	3000	915	on Pipurus albidus	usitata	1		KNMC	W	21.4146	-158.0999
DTF	Oahu	5 Mar 1911	Waianae mountains				vestita	1		BPBM			holotype
OHS	Oahu	30 Mar 1913	Opaenua				vestita	1		BPBM	E	21.5520	-157.9535 holotype of <i>S. robusta</i>
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				vestita	1		BPBM	E	21.5024	-158.1565
OHS	Oahu	18 May 1920	Mt. Kaala				vestita	1		BPBM	E	21.5008	-158.1374
EBB	Oahu	14 Sep 1930	E. slope Mt. Kaala	1500-2000	460-610		vestita	1		BPBM	E	21.4986	-158.1278
OHS	Oahu	14 Sep 1930	Haleaunuu				vestita	1		BPBM	E	21.4988	-158.1353
OHS	Oahu	13 Mar 1932	Haleaunuu			Suttonia	vestita	1		BPBM	E	21.4988	-158.1353
GPU	Oahu	21 Sep 1985	Waianae Mts., Mt. Kaala	4000	1220	[on] ex Eugenia in flower	vestita	1		BPBM	E	21.5072	-158.1434
JWB	Oahu	28 Sep 1985	Mt. Kaala				vestita	2		BPBM	E	21.5072	-158.1434
KNM	Oahu	22 Jan 2013	Kumuipo Tr. top	2500	760	on Metrosideros polymorpha	vestita	2	14	KNMC	W	21.5024	-158.1637
KNM	Oahu	21 Aug 2014	Palikea	3000	915	on Psychotria	vestita	1		BPBM	W	21.4146	-158.0999

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	25 Aug 2014	Puu Hapapa	2650	810	sweeping Freycinetia arborea	vestia	1		BPBM	W 21.4665	-158.1028	
KNM	Oahu	20 Jul 2016	Palikea	3000	915	on Antidesma platyphyllum	vestia	1		BPBM	W 21.4146	-158.0999	
KNM	Oahu	20 Oct 2016	Palikea	3000	915	on Coprosma longifolia	vestia	1		KNMC	W 21.4146	-158.0999	
KNM	Oahu	23 Nov 2016	Palikea	3000	915	on Coprosma longifolia	vestia	1		NMNH	W 21.4155	-158.0995	
OHS	Oahu	10 Mar 1935	Mt. Tantalus				vicia	1	1	BPBM	E 21.3286	-157.8250	holotype and allotype
DTF	Oahu	5 Mar 1911	Waianae mountains				waianaeana	1		BPBM			holotype
OHS	Oahu	11 May 1919	Kalihi				waianaeana	1		BPBM	E 21.3757	-157.8223	
KNM	Oahu	1 Jul 2014	Kahuku, Koolau Summit Tr	2000	610	on Metrosideros polymorpha	waianaeana	1		BPBM	W 21.6048	-157.9645	
OHS	Oahu	4 Aug 1912	Tantalus	1300	400		weawe	1		BPBM	E 21.3286	-157.8250	paratype of S. brumica
OHS	Oahu	8 Jun 1921	Waiaua				weawe	1	1	BPBM	E 21.4543	-157.9364	paratype
OHS	Oahu	14 Sep 1930	Haleanuu			Suttonia	weawe	4		BPBM	E 21.4988	-158.1353	paratypes
OHS	Oahu	14 Sep 1930	Haleanuu			Eleocharpus	weawe	4		BPBM	E 21.4988	-158.1353	paratypes
OHS	Oahu	14 Sep 1930	Haleanuu			Pelea	weawe	2		BPBM	E 21.4988	-158.1353	paratypes
OHS	Oahu	14 Sep 1930	Haleanuu			koa	weawe	1		BPBM	E 21.4988	-158.1353	paratype
OHS	Oahu	14 Sep 1930	Haleanuu				weawe	1	1	BPBM	E 21.4988	-158.1353	paratypes
OHS	Oahu	13 Mar 1932	Haleanuu			Eleocharpus	weawe	1		BPBM	E 21.4988	-158.1353	paratype
OHS	Oahu	16 Sep 1933	Kukuiaia Val.			Eleocharpus	weawe	1		BPBM	E 21.5349	-158.1848	paratype
OHS	Oahu	15 Oct 1933	Haleanuu			Antidesma	weawe	1		BPBM	E 21.4988	-158.1353	paratype
OHS	Oahu	28 Apr 1935	Haleanuu			ex larva on Asplenium arnotii	weawe	3	1	BPBM	E 21.4988	-158.1353	paratypes
OHS	Oahu	9 Feb 1936	Kukuiaia Val.			Euphorbia	weawe	1		BPBM	E 21.5349	-158.1848	paratype, on point with an unidentified male
WCG	Oahu	10 Oct 1971	Central Ekahamui Gulch; E of Puu Kaa	2200	670	Urera sandwicensis	weawe	1		BPBM	E 21.4389	-158.0938	paratype
KNM	Oahu	1 Aug 2013	Waianae-Kaala Tr.	3850	1170	under leaves	weawe	1		NMNH	W 21.5025	-158.1492	paratype
KNM	Oahu	12 Sep 2013	Kaala summit, NE face	3500	1070	on Touchardia	weawe	1		NMNH	W 21.5085	-158.1403	holotype
KNM	Oahu	12 Sep 2013	Kaala summit, NE face	3500	1070	on Touchardia	weawe	3	1	BPBM	W 21.5085	-158.1403	paratypes, one nearly all dark brown
KNM	Oahu	26 Jun 2014	Central Kaluaa Gulch	2200	670	beating Antidesma	weawe	1		KNMC	W 21.4603	-158.1004	paratype
KNM	Oahu	8 Sep 2014	East Makaleha, culvert 69	3400	1040	on Kadua cent.	weawe	2		KNMC	W 21.5112	-158.1484	paratypes
KNM	Oahu	20 Oct 2014	Pahole Gulch, gulch 3	2050	625	on Urera	weawe	2		KNMC	W 21.5362	-158.1862	paratypes
KNM	Oahu	20 Oct 2014	Pahole Gulch, gulch 3	2050	625	on Euphorbia herbstii	weawe	1		KNMC	W 21.5362	-158.1862	paratype
KNM	Oahu	9 Mar 2015	Palikea	3000	915	on Pisonia brun.	weawe	1		HDOA	W 21.4145	-158.0988	paratype

Coll.	Island	Date	Locality	Elev (ft)	Elev (m)	Notes	Species	F	M	repository	Lat	Long	Notes
KNM	Oahu	21 Dec 2016	Palikea	3000	915	on Perrottetia	wea wea	1		HDOA	W	21.4150	-158.0993 paratype
KNM	Oahu	24 Jan 2018	Palikea	3000	915	on Perrottetia	wea wea	1		BPBM	W	21.4146	-158.0999 paratype
KNM	Oahu	21 Feb 2019	Palikea	3000	915	on Kadua affinis	wea wea	1		KNMC	W	21.4150	-158.0993 paratype
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side				wehe	1		BPBM	E	21.5024	-158.1565 holotype
OHS	Oahu	1 Jun 1919	Mt. Kaala, W. side			ex E. ekaha	wehe?	1		BPBM	E	21.5024	-158.1565 slightly different, not designated as a paratype
KNM	Oahu	15 Jul 2014	Puu Hapapa	2650	810	on Pisonia umb.	welau	1		BPBM	W	21.4665	-158.1028 paratype
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	on Cherodendron	welau	1		BPBM	W	21.4933	-158.1379 paratype
KNM	Oahu	22 Apr 2015	Kaala-Kalena crestline	3100	950	on Ilex	welau	1		NNNH	W	21.4933	-158.1379 paratype
KNM	Oahu	2 Jun 2015	Kaala summit, E face	3950	1200	on Labordia	welau	1		BPBM	W	21.5057	-158.1412 paratype
KNM	Oahu	9 Apr 2016	Palikea	3000	915	on Anidesma	welau	1		HDOA	W	21.4146	-158.0999 paratype
KNM	Oahu	28 Apr 2016	Waianae-Kaala Tr.	3850	1170	on Broussaisia	welau	1		HDOA	W	21.5028	-158.1491 paratype
KNM	Oahu	11 Aug 2016	Kaala transect, 665 m	3850	1170	on Cherodendron	welau	2		BPBM	W	21.5028	-158.1441 paratypes
KNM	Oahu	24 Jul 2017	Palikea	3000	915	on Melicope	welau	1		BPBM	W	21.4150	-158.0993 holotype
KNM	Oahu	6 Jul 2014	Kapuna, Mokuleia Tr.	2100	640	on Myrsine lessertiana	xanthodera	1		BPBM	W	21.5321	-158.1786 paratype
KNM	Oahu	31 Mar 2016	Kapuna, Mokuleia Tr.	2100	640	on Elaeoacarpus bifidus	xanthodera	1		BPBM	W	21.5321	-158.1786 holotype
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on Xylosma hawaiiense	xanthodera	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on Kadua affinis	xanthodera	1		KNMC	W	21.5321	-158.1786
KNM	Oahu	18 Oct 2017	Kapuna, Mokuleia Tr.	2100	640	on Elaeoacarpus bifidus	xanthodera	1		NNNH	W	21.5321	-158.1786 paratype
JCB	Oahu	22 Jul 1917	Mt. Kaala				yoshimotoi	1		BPBM	E	21.5008	-158.1374 paratype
JWB	Oahu	10 Nov 1965	Mt. Kaala	4000	1220		yoshimotoi	1		BPBM	E	21.5072	-158.1434 paratype
CMY	Oahu	14 Apr 1966	Mt. Kaala				yoshimotoi	1		BPBM	E	21.5072	-158.1434 holotype
KNM	Oahu	16 Apr 2018	Kaala summit	3900	1190	on Melicope	yoshimotoi	1		KNMC	W	21.5040	-158.1472
PHT	Oahu	4 Mar 1917	Mt. Kaala	1500-2500	460-760	one on Bohea elatior	sp.	3		BPBM	E	21.4986	-158.1278 allotype and paratypes of <i>S. callida</i> ; not that species, small with narrow mandibles