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Cover: Wai‘ale‘ale, Kaua‘i summit forest showing abundance of epiphytic liverworts. Photo K. Faccenda (see p. 56)

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RECORDS OF THE HAWAII BIOLOGICAL SURVEY FOR 2025

Editor's Preface

I am pleased to present the annual compilation of *Records of the Hawaii Biological Survey*; this year for the year 2025. The Hawaii Biological Survey, established by the Hawaii State Legislature in 1992 as a program of Bishop Museum, is an ongoing natural history inventory of the Hawaiian Archipelago. It was created to locate, identify, and evaluate all native and nonnative species of flora and fauna within the state; and by State Law to maintain the reference collections of that flora and fauna for a wide range of uses. In coordination with related activities in other federal, state, and private agencies, the Hawaii Biological Survey gathers, analyzes, and disseminates biological information necessary for the wise stewardship of Hawai'i's biological resources.

An intensive and coordinated effort has been made by the Hawaii Biological Survey to make our products, including many of the databases supporting the papers published here, available to the widest user-community possible through our web server. Products currently available include taxonomic authority files (species checklists for terrestrial arthropods, flowering plants, nonmarine snails, marine invertebrates, fossil taxa, and vertebrates), bibliographic databases (vascular plants, nonmarine snails, and insects), specimen databases (fungi, fish, invertebrates, portions of the insect collection) and type specimens (entomology; botany—including algae and fungi; and vertebrates), collections data (lists of holdings for select groups of flies as well as Cicadellidae and Pentatomidae), detailed information and/or images on endangered, threatened, and extinct plants and animals; as well as our staff publication lists. Additional reference databases include: the list of insect and spider collections of the world (based on Arnett, Samuelson & Nishida, 1993, 'Insect and spider collections of the world') with links to institutional web sites; and an authority file with full names and vital dates of more than 7,200 authors who have described new taxa of flies (Diptera).

The Records for 2025 include descriptions of 3 new endemic species, 107 new state records of alien species, and 212 new island records of alien species.

Our Primary Web Products:
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Hawaii Biological Survey's "Good Guys/Bad Guys" website
http://hbs.bishopmuseum.org/good-bad/

World Diptera taxonomist list
http://hbs.bishopmuseum.org/dipterists/

Many of the new records reported here resulted from curatorial projects and field surveys funded by the National Science Foundation, the U.S. Department of Defense, the U.S. Geological Survey, the U.S. Fish & Wildlife Service, the U.S. National Park Service, and the Hawai‘i Department of Land and Natural Resources; they are thanked for their support and partnership of the Hawaii Biological Survey over the years.

We encourage authors with new information concerning flora or fauna occurring in the Hawaiian Islands to submit their data to the editor for consideration for publication in the Records. Submission and format of papers must follow format of recent papers. For information on submission of manuscripts and guidelines for contributors, please contact the editor ——*N.L. Evenhuis, editor* [neale@bishopmuseum.org]

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New records of introduced Lepidoptera in the Hawaiian Islands for the year 2024

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Four new state records, thirty new island records, and one new status are reported for introduced or presumed introduced Lepidoptera in Hawai'i. Information regarding the formerly published distributions in Hawai'i of species discussed herein is based on Nishida (2002), Starr *et al.* (2004), Howarth *et al.* (2012), Matsunaga *et al.* (2019), and Austin & Rubinoff (2022, 2023, 2024). All identifications were made by the first author. Label data were transcribed verbatim except for corrections to Hawaiian spelling and orthography. Any other corrections to data labels are provided in brackets following the verbatim label. Identifications were based on external morphology and genitalia dissections. Specimens were compared with illustrations and figures in the published literature as well as through comparisons with material deposited at the Bernice Pauahi Bishop Museum (BPBM) and the University of Hawai'i Insect Museum (UHIM). Voucher specimens and other examined material are deposited in these collections as noted.

Alucitidae

Alucita objurgatella (Walsingham) **New island record**

This questionably introduced species is known only from the Hawaiian Islands and is only to known to feed in the fruits of alahe'e (*Psydrax odorata*). Future studies may reveal it to be a native species, but historically it has been considered introduced. It has been reported from Kaua'i, O'ahu, Maui, and Hawai'i (Nishida 2002). We report it from Moloka'i for the first time.

Material examined. **Moloka'i**: 1♂, Moloka'i F[orest] R[eserve], Mākolelau, 21.0961, -156.9074, 945 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM).

Choreutidae

***Tebenna* sp. A** **New state record**

This genus is globally distributed and difficult to identify without detailed morphological examination. It includes several minor pest species, at least one of which has been spread well beyond its native range by human activity (i.e., *Tebenna micalis*). All species whose hosts are known are leaf-miners or -skeletonizers on Asteraceae. Species confirmation of the taxon in Hawai'i may require molecular data.

Material examined. **Kaua'i**: 1♂, Nā Pali Coast State Wilderness Park, Kalalau Beach, 22.1727, -159.6576, 10 m, 27–29 Mar 2024, K.A. Austin, UVLED light sheet (UHIM).

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Cosmopterigidae

Asymphorodes dimorpha (Busck) **New island record**

Zimmerman (1978) reported this introduced species from almost all of the Hawaiian Islands: Niʻihau, Oʻahu, Molokaʻi, Maui, Lānaʻi, Hawaiʻi, Nihoa, Necker, Pearl and Hermes, Midway, and Kure. Austin & Rubinoff (2022) reported it from Kauaʻi. We report it from French Frigate Shoals for the first time.

Material examined. **French Frigate Shoals**: 3♂, 1♀, Tern Island, 26 Sep 2000, G.M. Nishida, at sheet lit by 6-volt lamp (BPBM).

Asymphorodes triaula (Meyrick) **New island records**

This widespread introduced species was previously known from Oʻahu and Hawaiʻi (Nishida 2002). We report it from Kauaʻi, Molokaʻi, and Maui for the first time. It likely occurs on all the main Hawaiian Islands.

Material examined. **Kauaʻi**: 1♀, Nā Pali Coast State Wilderness Park, Kalalau Beach, 22.1727, -159.6576, 10 m, 27–29 Mar 2024, K.A. Austin, UVLED light sheet (UHIM). **Molokaʻi**: 1♂, Molokaʻi F[orest] R[eserve], Mākolelau, 21.0979, -156.9031, 1035 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM). **Maui**: 1♂, ʻĀhihi-Kīnaʻu N[atural] A[rea] R[eserve], 20.6158, -156.4365, 5 m, K.A. Austin, C. Doorenweerd, UVLED light sheet (UHIM).

Crambidae

***Herpetogramma* sp. A** **New island record**

This introduced species was previously known from Oʻahu and Hawaiʻi island (Austin & Rubinoff 2022). We report it from Maui for the first time. It remains unidentified to species, but adults have been reared from *Drymaria cordata* (Caryophyllaceae) in Mānoa on Oʻahu [link].

Material examined. **Maui**: 1♂, Kanaio N[atural] A[rea] R[eserve], 20.6291, -156.3484, 830 m, 20–21 Apr 2024; K.A. Austin, Z. Pezzillo; UVLED light sheet (UHIM).

Samea multiplicalis (Guenée) **New state record**

This species was found feeding and causing significant damage on water lettuce (*Pistia stratiotes*) in a small pond on the campus of the University of Hawaiʻi at Mānoa. It had been first photographed at Neal S. Blaisdell Park near Pearl Harbor in September 2023. It is native from the southern United States south to Argentina, where it is a generalist feeder on various aquatic plants, including *Lemna* spp. (Araceae), *Pistia stratiotes* (Araceae), *Salvinia auriculata* (Salviniaceae), *Azolla caroliniana* (Salviniaceae), and rarely *Pontederia crassipes* (Pontederiaceae) (Knopf & Habeck 1976). As several of its known hosts are noxious weeds, it has been deliberately introduced to Australia (Sands & Kassulke 1984), southern Africa (Julien & Griffiths 1998), and Fiji (Day & Winston 2016) as a biological control agent. We can find no records of its deliberate release in Hawaiʻi; it likely arrived with aquatic plants, perhaps as part of the aquarium trade.

Material examined. **Oʻahu**: 4♂, University of Hawaiʻi at Mānoa, pond behind Krauss Hall, 21.2969, -157.8176, 21 m, larvae/pupae collected 3 Jun 2024, adults eclosed 4–18 Jun 2024, K.A. Austin / HOST: *Pistia stratiotes* (Araceae) (UHIM).

***Terastia* sp. A.** **New island record**

Upon its discovery, this species was considered introduced in Hawaiʻi and has been collected on Oʻahu (Swezey 1923) and Maui (Austin & Rubinoff 2022). Austin & Rubinoff (2024) later considered it an endemic, undescribed species. Despite its current status as a native species, we list a new record here from Molokaʻi because of its historic status as an introduced species.

Material examined. **Moloka‘i**: 1♂, Kalaupapa, Kauhakō, 9 Mar 2000, 300 ft [91.4 m], S.L. Montgomery (UHIM).

Erebidae

Galtara extensa (Butler) **New island record**

This species was deliberately released on Maui and Hawai‘i island in 2013 to control Madagascan Fireweed (*Senecio madagascariensis*) and Cape Ivy (*Delairea odorata*) under the name *Secusio extensa*. Austin & Rubinoff (2022) pointed out that the taxon should be treated as *Galtara extensa*. Austin & Rubinoff (2024) reported it from O‘ahu and considered it tentatively established on that island. Anecdotal reports suggest it now occurs on Lāna‘i as well, but we have not examined any vouchers. We report it here from Moloka‘i for the first time, in the vicinity of a large population of *Senecio madagascariensis*, suggesting that it has successfully colonized another island.

Material examined. **Moloka‘i**: 1♀, Moloka‘i F[orest] R[eserve], Mākolelau, 21.0980, -156.9045, 1010 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM).

Oraesia excavata (Butler) **New island record**

This introduced species was previously known in the Hawaiian Islands from Kaua‘i, O‘ahu, Maui, and Hawai‘i island (Haines *et al.* 2011). We report it from Moloka‘i for the first time.

Material examined. **Moloka‘i**: 2♂, Moloka‘i F[orest] R[eserve], Mākolelau, 21.0961, -156.9074, 945 m, 25–26 vi 2024, K. A. Austin, S. L. Pote, K. Coelho, UV bucket trap (UHIM). 1♀, same as previous except 21.0980, -156.9045, 1010 m (UHIM).

Gelechiidae

Dichomeris acuminatus (Staudinger) **New island records**

This species was previously known from Kaua‘i, O‘ahu, and Maui (Nishida 2002, Howarth & Preston 2002). We report it from Midway Atoll, Necker, and Hawai‘i island for the first time. This pantropical species is known to feed on a broad range of Fabaceae (Zimmerman 1978).

Material examined. **Midway**: 1♂, Sand Isle, 10 May [20]08, J.J. Le Roux, D. Rubinoff (UHIM). **Necker**: 2♂, 1♀, Annexation Hill, 60 m, 4 Sep 2004, ex. *Sesbania* litter, S. L. Montgomery (UHIM). 1♂, 2♀, Summit Hill, 22 Sep 2000, G.M. Nishida, at sheet lit by 6-volt lamp (BPBM). **Hawai‘i:** 2♂, [Hawai‘i] Volcano[es] National Park, Thurston Lava Tube, 18 May 2006, W. Haines, blacklight sheet (UHIM). 1♂, [0].5 mi[les] [1km] W[est] of Kamuela, dry scrub, 22 Apr [20]03, Rubinoff & Nogues (UHIM).

Mesophleps adustipennis (Walsingham) **New island record**

This introduced species was previously known in Hawai‘i from O‘ahu and Hawai‘i island (Austin & Rubinoff 2022, 2024). We report it from Maui for the first time.

Material examined. **Maui**: 1♂, Kanaio N[atural] A[rea] R[eserve], 20.6291, -156.3484, 830 m, 20–21 Apr 2024; K.A. Austin, Z. Pezzillo; UVLED light sheet (UHIM).

Geometridae

***Scopula* sp. A** **New status**

This introduced species of was first reported in the Hawaiian Islands from Maui by Howarth *et al.* (2012), who identified it as *Scopula personata* (Prout). Austin & Rubinoff (2022) provisionally followed this identification and reported it from Kaua‘i, O‘ahu, and Lāna‘i. We have thus far been unable to confirm the identification of Howarth *et al.*

(2012), even with DNA sequence data, and consider it questionable, considering the enormous diversity of *Scopula* (>900 currently recognized species; Rajaei *et al.* 2022) and the lack of images, dissections, and keys for much of the world's *Scopula* fauna. Based on wing pattern, it comes closer to *Scopula emma* (Prout) than *S. personata*, but there are still distinct differences. For these reasons, we recommend treating previous records of *Scopula personata* from Hawai'i as *Scopula* sp. A for the present until a more reliable identification can be made.

Thyrinteina arnobia (Stoll) **New island record**

This recently introduced species was previously only known in Hawai'i from O'ahu (Austin & Rubinoff 2024). We report it from Kaua'i in a coastal area heavily dominated by invasive Java plum (*Syzygium cumini*), a possible host in Hawai'i.

Material examined. **Kaua'i**: 1♂, Nā Pali Coast State Wilderness Park, Kalalau Beach, 22.1727, -159.6576, 10 m, 27–29 Mar 2024, K.A. Austin, UVLED light sheet (UHIM).

Gracillariidae

Ketapangia leucochorda (Meyrick) **New island record**

This introduced species was previously only known in Hawai'i from O'ahu (Austin & Rubinoff 2024). We report it from Kaua'i, where we found it abundantly mining leaves of the introduced sea almond (*Terminalia catappa*) in a remote portion of the Nā Pali Coast, suggesting that it is widespread on Kaua'i.

Material examined. **Kaua'i**: 5♂, Nā Pali Coast State Wilderness Park, Kalalau Beach, 22.1724, -159.6583, 10 m, coll. 27 Mar 2024, ecl. 31 Mar – 8 Apr 2024, K.A. Austin, leaf mines on *Terminalia catappa* (UHIM).

Lycaenidae

Brephidium exilis (Boisduval) **New island record**

This introduced species is known from Kaua'i, O'ahu, Maui, Lāna'i, Kaho'olawe, and Hawai'i island (Howarth & Preston 2002, Nishida 2002, Starr *et al.* 2004, Austin & Rubinoff 2023, 2024). We report it from Moloka'i for the first time.

Material examined. **Moloka'i:** 1♂, Kaunakakai, Malama Cultural Park, 21.0880, -157.0240, 10 m, 26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, hand collecting adult (UHIM).

Noctuidae

Argyrogramma verruca (Fabricius) **New island record**

This introduced species was previously known in Hawai'i from O'ahu, Maui, and Hawai'i island (Austin & Rubinoff 2022, 2023). We report it from Kaua'i for the first time.

Material examined. **Kaua'i**: 1♂, Po'ipū, 20 ft [6.1 m], 27–29 Oct 2003, S.L. Montgomery (UHIM).

Feltia subterranea (Fabricius) **New island record**

Prestes (2014) reported this recently introduced polyphagous species from Hawai'i island, Lāna'i, and Maui. Austin & Rubinoff (2022) reported it from O'ahu and Moloka'i. We report it from Kaua'i for the first time.

Material examined. **Kaua'i**: 1♀, Nā Pali-Kona F[orest] R[eserve], Alaka'i Wilderness Preserve, Wai'alae Cabin, 22.0826, -159.5855, 1110 m, 21–23 Feb 2024, K.A. Austin, UVLED light sheet (UHIM).

Leucania striata Leech **New island record**

This introduced species is known from Kauaʻi, Oʻahu, Lānaʻi, Maui, and Hawaiʻi island (Nishida 2002, Austin & Rubinoff 2022). We report it from Molokaʻi for the first time.

Material examined. **Molokaʻi**: 1♂, Molokaʻi F[orest] R[eserve], Mākolelau, 21.0961, -156.9074, 945 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM).

Pyralidae

Achroia grisella (Fabricius) **New island record**

This introduced pest of honey bee hives was previously known in Hawaiʻi from Kauaʻi, Oʻahu, and Hawaiʻi island (Nishida 2002). We report it from Maui for the first time.

Material examined. **Maui**: 2♂, Kanaio N[atural] A[rea] R[eserve], 20.6247, -156.3492; 735 m, 20–21 Apr 2024; K.A. Austin, Z. Pezzillo; UV bucket trap (UHIM).

Elasmopalpus lignosellus (Zeller) **New island record**

This introduced species was previously known in Hawaiʻi from Kauaʻi, Oʻahu, Maui, and Hawaiʻi island (Nishida 2002). We report it from Molokaʻi for the first time.

Material examined. **Molokaʻi**: 2♂, 1♀, Kalaupapa, Kauhakō, 10 ft [3 m], 10 Mar 2000, S.L. Montgomery ["Kauhakō" and elevation crossed out on one male label] / NE sand + *Scaevola* (UHIM).

Loryma* cf. *recusata (Walker) **New island record**

This introduced species was previously known in Hawaiʻi from Maui and Hawaiʻi island (Howarth *et al.* 2012, Matsunaga *et al.* 2019). We report it from Oʻahu for the first time. Its life history is unknown.

Material examined. **Oʻahu**: 1♂, R[ou]t[e] 803, ditch n[ea]r Poamoho Exp[erimental] Farm, 800 ft [244 m], Oct 2001, S.L. Montgomery (UHIM).

Tineidae

Opogona sacchari (Bojer) **New island record**

Nishida (2002) included records from Oʻahu and Hawaiʻi island for this introduced polyphagous pest species; Austin & Rubinoff (2022) reported it from Kauaʻi and Maui. We report it from Molokaʻi for the first time.

Material examined. **Molokaʻi**: 2♂, 1♀, Mākolelau, 2,500 ft [762 m], 8 Feb 2000, S.L. Montgomery (UHIM). 1♂, Mākolelau, 2,000 ft [610 m], 1 May [20]00 / reared ex stem [of] *Pleomele* (UHIM).

Phereoeca allutella (Rebel) **New island record**

This synanthropic species has been recorded in Hawaiʻi from Kauaʻi, Oʻahu, Maui, Hawaiʻi, Laysan, and French Frigate Shoals (Zimmerman 1978, Nishida 2002). We report it from Molokaʻi for the first time. A photograph of a larval case on Lānaʻi [link], suggests that it is present on that island as well.

Material examined. **Molokaʻi**: 1♂, Molokaʻi F[orest] R[eserve], Mākolelau, 21.0961, -156.9074, 945 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM).

***Trachycentra* sp. A** **New state record**

This species was encountered while surveying for coqui frogs in Waimānalo, Oʻahu at night. They were commonly seen resting on the bottom of tī (*Cordyline fruticosa*) and kukui (*Aleurites moluccanus*) leaves. The earliest photographic record of this species is from Nuʻuanu in February 2024 [link]. It has also been photographed in Kāneʻohe and Maunawili. Members of this genus are minor pests of coconut, sugar cane, and screw pine

elsewhere in the Pacific (Veitch 1919, Lever 1945, Hinckley 1967), although it appears to feed primarily in dead or dying wood. Identification to species may require molecular data.

Material examined. **Oʻahu**: 2♂, Waimānalo, mauka of Kaulukanu St[reet]; 21.3286, -157.7289; 150 m; 31 Oct 2024; K.A. Austin, P. Kapu, C. Mayer; hand collecting adults at night (UHIM).

Trichophaga mormopis Meyrick **New island record**

Nishida (2002) included records from Oʻahu and Maui for this introduced species; Austin & Rubinoff (2022) reported it from Kauaʻi. We report it from Nihoa for the first time.

Material examined. **Nihoa**: 4 specimens (sex unknown), E[ast] Palm V[alley], Tanager Peak, 240 m, 2 Sep 2004, S.L. Montgomery, M. Richardson (UHIM).

Tortricidae

Bactra minima Meyrick **New state record**

This species was widely considered for use as a biological control agent of purple nutsedge (*Cyperus rotundus*) in the Pacific. It was introduced to Fiji and Tonga in 1971 and the Cook Islands in 1973 (Phatak *et al.* 1987). It failed to establish in the Cook Islands and Fiji; it became established in Tonga, but exerted poor control of the target weed. *Bactra minima* is a widespread species, but its native range is unclear. It is known from much of south and southeast Asia, throughout Micronesia and Melanesia, and the Canary Islands (Diakonoff 1956, 1959). We can find no records of its deliberate introduction to the Hawaiian Islands. A related species, *Bactra venosana* (Zeller), was first released in Hawaiʻi to control *Cyperus rotundus* in 1925 and was initially very effective before introduced *Trichogramma* (Trichogrammatidae) began parasitizing its eggs (Zimmerman 1978). Although still present in Hawaiʻi, *Bactra venosana* is now a very uncommon species.

Material examined. **Midway**: 2♂, 2♀, Sand Isle, 10 May [20]08, J.J. Le Roux, D. Rubinoff / KAA diss. #1219(♂), #1220 (♀) (UHIM).

Cryptophlebia ombrodelta (Lower) **New island records**

This polyphagous introduced pest species was previously known in Hawaiʻi from Kauaʻi, Oʻahu, Maui, and Hawaiʻi island (Nishida 2002). We report it from Molokaʻi and Kahoʻolawe for the first time.

Material examined. **Molokaʻi**: 1♂, Molokaʻi F[orest] R[eserve], Mākolelau, 21.0961, -156.9074, 945 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM). **Kahoʻolawe:** 1♂, Beck's Cove, 10 m, 11–14 Feb 1980, G.M. Nishida, at UV light (BPBM).

Lorita scarificata (Meyrick) **New island records**

This introduced species was previously known in Hawaiʻi from Midway Atoll, Kauaʻi, Oʻahu, Kahoʻolawe, and Maui (Beardsley 1979, Nishida 2002, Austin & Rubinoff 2022). We now report it from Molokaʻi and Hawaiʻi island for the first time.

Material examined. **Molokaʻi**: 1♀, Kalaupapa, Kauhakō, 9 Mar 2000, 300 ft [91.4 m], S.L. Montgomery (UHIM). 1♂, Molokaʻi F[orest] R[eserve], Mākolelau, 21.0961, -156.9074, 945 m, 25–26 Jun 2024, K.A. Austin, S.L. Pote, K. Coelho, UV bucket trap (UHIM). **Hawaiʻi**: 1♂, N[orth] Kona, Kaloko, 400–600 ft [122–183 m], 12–15 Sep 2008, S.L. Montgomery (UHIM).

Platynota stultana Walsingham **New island record**

This polyphagous introduced species was previously known in Hawaiʻi from Oʻahu, Lānaʻi, Kahoʻolawe, Maui, and Hawaiʻi island (Miller & Hodges 1995, Howarth *et al.* 2012, Austin & Rubinoff 2022). Austin & Rubinoff (2022) initially reported it from Kauaʻi, but later corrected the identification as *P. rostrana* (Walker) (Austin & Rubinoff 2023). We now report *P. stultana* from Kauaʻi once again.

Material examined. **Kaua'i**: 1♂, Po'ipū, 20 ft [6.1 m], 7 Nov 2003, S.L. Montgomery (UHIM). 1♂, 1♀, Kālepa, 90 ft [27.4 m], 28–29 Jul 2003, S.L. Montgomery (UHIM).

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New records of non-native insects (especially Hymenoptera) from the Hawaiian Islands

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Here I report new state and island records of alien species, along with several name and status corrections. These are a mix of recent discoveries and specimens that were previously partially or fully identified by John W. Beardsley and others, but had not been published. This paper includes 37 new state records, five of which are considered questionably established due to being based on single collections from areas near ports of entry; 14 species with new island records; and seven changes, updates, or corrections to species names (several of the last also include new island records).

Due to the difficulty in identifying specimens even to genus, a large number of long-established introduced Hymenoptera remain to be published, particularly in Chalcidoidea and Platygastroidea. Others are undescribed even in their native range and require more comprehensive treatment. I have included taxa currently identified only to genus where they are particularly common and/or distinctive. Additional Bethylidae, Cleonymidae, Eulophidae, Pteromalidae, and Scelionidae will be dealt with in separate papers.

Unless otherwise noted, specimens listed below are deposited at the Bishop Museum (BPBM). Other collections referenced are the University of Hawai'i at Mānoa Insect Museum (UHIM) and KNM personal collection (KNMC). Specimens were imaged at the Bishop Museum using a Leica imaging system system and LASX software (Leica Microsystems Inc.), and focus stacks produced using Helicon Focus 8. All images are of females unless noted, since they are more commonly collected and usually more distinctive for Hymenoptera.

COLEOPTERA

Elateridae

Anchastus swezeyi van Zwaluwenburg, 1931 **Revised status, New island record**

This beetle was described as "probably endemic" without explanation or justification in its description (Van Zwaluwenburg 1931). At the time it was known only from windward Haleakalā, which Van Zwaluwenburg described as an area "in which no entomological collecting had ever been done previous to the visit of Messrs. Swezey and Whitten." It has previously been reported from Hawai'i, where it is now one of the most common beetles found in montane forests. Here I additionally report it from Kaua'i, O'ahu, and Moloka'i, where it has been present for some time. Such a dramatic increase in abundance, both at low elevations and in areas such as the Ko'olau range where it had never been found despite intensive collecting through the 1930s, indicates that this species is undoubtedly adventive. A note from J.W. Beardsley on one of the identification labels also states "this species is listed as endemic to Hawai'i but I suspect it is an immigrant."

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Figure 1. *Lyprauta* sp. (Diptera: Keroplatidae).

Material examined. **KAUA‘I**: North Bog, on leaves, 22.1631°N 159.5999°W, 1 Aug 2023, K.N. Magnacca, K23080103-06. 1♀. **O‘AHU**: Pauoa Flats, 1600 ft [690 m], 11 Aug 1982, W.D. Perreira, 1♂. Mt. Tantalus, 2000 ft [610 m], flood light, 22 Sep 1984, W.D. Perreira, 1♀. Camp Pūpūkea, 1950 ft [595 m], yellow sticky board trap, 15–28 May 1996, W.D. Perreira, 2♂. Central Kaluaʻa Gulch, 630 m, Townes Malaise trap, 21.4611°N 158.0995°W, 31 Mar–8 Jun 2023, K.N. Magnacca, O23060801–01, 2♀. **MOLOKA‘I**: Nr. Honomuni Stream, ca. 10 ft [3 m], yellow sticky board trap, W.D. Perreira: 1♂ 2–16 Sep 1994, 1♀ 16–30 Sep 1994. Papiʻo Stream, 600 ft [180 m], yellow sticky board trap, W.D. Perreira: 1♀ 14–28 Oct 1994, 1♀ 20 Jan–3 Feb 1995.

DIPTERA

Culicidae

Aedes (Hulecoeteomyia) japonicus

(Theobald, 1901) **New island record**

Previously recorded from Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Larish & Savage 2005, Yang & Hasty 2013, Magnacca 2015). Like on the older islands, on Molokaʻi it was moderately abundant in a mesic gulch, but not found at higher, wetter sites.

Material examined. **MOLOKA‘I**: Kua Gulch 830 m, 2 Jul 2024, K.N. Magnacca, 1♀.

Keroplatidae

Apyrtula sastrei Matile, 1982 **New island record**

This predaceous fungus gnat was previously recorded from Oʻahu.

Material examined. **KAUA‘I**: PMRF oxidation pond, pan trap group 7, 21.9937°N 159.7649°W, 25 Mar 2021, K.N. Magnacca & J.H. Preble, PP032507-03, 1♀.

Figure 2. *Proceroplatus* sp. (Diptera: Keroplatidae).

***Lyprauta* sp.** **New state record**

This and the following species were recorded as single individuals from nearby coastal areas. The area receives direct military air traffic from other regions, so both are considered questionably established until further specimens are found. The genus can be separated from others in Hawai‘i by the wing venation (Fig. 1), but male genitalia is required for species identification, so at present its identity is unknown. Some species are pests in greenhouses (Chandler & Pijnakker 2009). Identification by Neal Evenhuis.

Material examined. **KAUA‘I**: Nohili dunes, pan trap group 6, 22.0637°N 159.7835°W, 24 Mar 2021, K.N. Magnacca & J.H. Preble, PP032406-12, 1♀.

***Proceroplatus* sp.** **New state record**

Easily distinguished from the other introduced keroplatids by the bright yellow thorax, marks on the wing, and pectinate antennae (Fig. 2). Identification by Neal Evenhuis.

Material examined. **KAUA‘I**: PMRF beach cottage, at porch light, 22.0091°N 159.7776°W, 23 Mar 2021, K.N. Magnacca, P032320-12, 1♀.

HEMIPTERA

Pentatomidae

Agonoscelis puberula Westwood, 1881 **New state record**

The African cluster bug was first recognized as invasive in the Americas in 2003 but apparently originally introduced to Cuba around 1978 (Thomas *et al.* 2003, Kment & Rider 2017). On July 1, 2019, a single adult landed on the shirt of a homeowner who lives in Wai‘anae Valley. He mailed it to the Hawai‘i Department of Agriculture (HDOA) Plant Quarantine Branch, where it was tentatively identified it as *A. puberula*. Digital photos

Figure 3. *Agonoscelis puberula* (Hemiptera: Pentatomidae).

were sent to Dr. Thomas J. Henry, Hemiptera specialist at United States Department of Agriculture (USDA)-Systematic Entomology Laboratory who confirmed the identification. Physical specimens were subsequently confirmed by Dr. James Zahniser at USDA-National Identification Services on July 9, 2019. PPC staff surveyed the Waiʻanae area where the first individual was found and discovered a large population of *A. puberula* infesting *Leonotis nepetifolia* (lion's ear). Additional surveys at Kealia Trail found *A. puberula* on *L. nepetifolia* there as well. In August 2019, Pūlama Lānaʻi staff discovered a single adult, again on *L. nepetifolia*. The earliest Oʻahu observation may have been on June 6, 2019 (https://www.inaturalist.org/observations/29411836). It was found on Kauaʻi in 2021 (specimen listed below) and on Hawaiʻi in 2022 [link]. The Molokaʻi collection is surprising as it was collected in near-pristine wet forest far from its typical weedy host plants, but such a collection in a Malaise trap may indicate either a larger population at lower elevations that is prone to wide dispersal, or feeding on native hosts. Given this distribution, it is likely that it is present on Maui as well. It has a wide host range, including crops such as coffee and cotton, but does not usually seem to be a significant pest. It may even be slightly beneficial as its preferred hosts are *L. nepetifolia* and *Marrubium vulgare* (common horehound) (Kment & Rider 2017), both of which are weeds in Hawaiʻi. The color pattern is superficially somewhat similar to *Brochymena quadripustulata* (Fab.), but it is easily distinguished from all other stink bugs in Hawaiʻi by the long hairs covering the entire body (Fig. 3).

Material examined. **KAUAʻI**: PMRF Barking Sands, Diver's Landing, sweeping coastal scrub, 24 Aug 2021, P082406-01, K.N. Magnacca, 1♂. **MOLOKAʻI**: Puʻu ʻAliʻi NAR 1,160 m, Malaise trap, 21.1412°N 156.9022°W, 14 May–17 Jun 2024, M24051418, 1♂.

HYMENOPTERA
Bethylidae

Cephalonomia peregrina Westwood, 1881 **Misidentification**

This species was first reported as having arrived in Hawai‘i in cardboard packaging from India infested with a ptinid beetle, with identification by Ferrière (Swezey 1933a). It was subsequently reared by Swezey and released at his home in Mānoa (Swezey 1933b). The reason for this identification is unclear, as the description of *C. peregrina* is very brief and largely useless. Although the description of *C. peregrina* is insufficient to establish its identity, it does describe the male as “Omnino pallide fulvus” [In general, pale tawny] and the female “Pallide picea...alis anticis stigmate oblongo-ovali” [Pale pitchy...wings beyond the stigma oblong-oval]. The relatively dark coloration and winged females are incompatible with the specimens at hand. Possibly Ferrière used Kieffer’s (1914) key, which uses minimal characters and lists only three species for the Afro-Indian region. All specimens at BPBM and UHIM identified as *C. peregrina* and matching Swezey’s descriptions of the records, including those that originally arrived in cardboard from India, are yellow or testaceous and (with the exception of some males) wingless. These exactly match *C. gallicola* Ashmead, a cosmopolitan species which was already established in Hawai‘i by that time. This resemblance was noted previously by Muesebeck (cited by Hardy 1950), who likewise said that *C. peregrina* could not be definitely identified due to the poor description but that the specimens clearly matched *C. gallicola*. Apparently this was not followed up on, and *C. peregrina* has remained on record in Hawai‘i. I have examined long series of both supposed taxa and conclude that they are the same, and *C. peregrina* should be removed from the Hawai‘i species list.

Material examined. **O‘AHU**: Identified as *C. gallicola*: Honolulu, U.H. Campus Library, in book, 3 Nov 1945, D.E. Hardy, 3♀ (UHIM). U.H. Campus library, in book, 5 Nov 1949, D.E. Hardy, 2♀. Honolulu, Kapahulu St, ex building, 15 Jun 1990, J. Strazanac, 1♀. Honolulu, ex tatami mat purchased at Marukai (Kalihi), stinging, 14 Jun 1993, R. Kunishi, 3♀. Identified as *C. peregrina*: Pusa, India, ex ptinid in cardboard [note: this undoubtedly refers to the origin of the shipment referenced above; no collector is listed but the handwriting matches Swezey’s], 29 May 1930, 2♀ (UHIM). Honolulu, reared ex *Catorama mexicana*, O.H. Swezey: 1♂ 1♀ 6 Aug 1930; 3♀ (BPBM), 2♀ (UHIM) 23 Aug 1930; 1♂ (BPBM), 1♂ (UHIM) 24 Aug 1930; 1♂ (BPBM), 2♀ (UHIM), 6 Sep 1930. Mānoa Valley, ex *Catorama*, 22 May 1932, O.H. Swezey, 2♂. **MAUI**: Kailua, ex barley from Calif[ornia], Aug 1918, J.C. Bridwell, 2♀.

Goniozus aethiops Bridwell, 1919 **New state record**

This is an African species imported to the western US for control of the pink bollworm, *Pectinophora gossypiella* (Saunders) (Lepidoptera: Gelechiidae; Gordh & Evans 1976). It is quite unusual among *Goniozus s.s.* in having a short, weakly carinate clypeus and the head smooth and strongly shining (Fig. 4), resembling only some other African species but also similar to many *Sierola*. These characters also make it easy to recognize among the Hawaiian bethylids.

Material examined. **O‘AHU**: Hickam AFB [Air Force Base], light trap, 7 Jun 1985, J.W. Beardsley, 2♂ (BPBM), 1♂ (HDOA). Waimānalo, reared ex cocoons on *Cryptophlebia* infested macadamia nuts, Sep 1989, V. Jones, 2♀. Hale‘iwa, ‘Uko‘a pond, Malaise trap, Jun 2015, 3♂. Makaleha Stream el. 3 ft [1 m], 27 May–5 Jun 2017, W.D. Perreira & D.A. Yee, 1♂. **HAWAI‘I**: Mauna Kea, North, DMP380, N19.92072° W155.44506°, Malaise, 13 Aug–15 Sep 2004, D.M. Pollock, 1♀.

Figure 4. *Goniozus aethiops* (Hymenoptera: Bethylidae). Left: dorsal view of head. Right: lateral habitus.

Figure 5. *Goniozus floridanus* (Hymenoptera: Bethylidae). Left: dorsal view of head. Right: lateral habitus.

Goniozus floridanus Ashmead, 1887 **New state record**

This Nearctic species is somewhat similar to *G. williamsi* (see below), but the fore femur is not as broad and it lacks the prominent vertex carina (Fig. 5).

Material examined. **KAUA'I**: Kokole, at night, on *Leucaena leucocephala*, 21.982°N 159.760°W, 23 Mar 2021, K.N. Magnacca, P032317-09, 1♀. **O'AHU**: Mānoa, *Acacia koa*, 24 Sep 1933, N.L.H. Krauss, 1♀. Barbers Point, 11 Aug 1966, C.M. Yoshimoto, 1♀. Uni. Hawai'i, light trap, Oct 1969, J.W. Beardsley, 2♂ (HDOA). 'Ewa, light trap, Jun 1978, J.W. Beardsley, 1♂ (HDOA). Hickam AFB, sweeping, 19 May 1988, J.W. Beardsley, 1♂ 1♀ (HDOA). Waimānalo at UH farm, 60–80 ft [18–25 m], sweeping weeds and crops, 18 Jul 1994, J.W. Beardsley & W.D. Perreira, 2♂ 2♀. Hale'iwa, 'Uko'a pond, Malaise trap, Jun 2015, 1♂ 1♀.

Goniozus foveolatus Ashmead, 1887 **New state record**

This is the species recorded as "*Goniozus* cf. *columbianus*" by Howarth *et al.* (2002, 2012). In his revision of the North American Bethylidae, Evans (1978) placed *G. foveolatus* as a junior synonym of *G. columbianus* Ashmead due to incorrectly citing them as having been described in the same publication; in fact *G. foveolatus* was described earlier and is thus the senior name, as noted elsewhere (Gordh & Móczár 1990). Examination of both types confirms the identification. Separated from *G. floridanus* and *G. williamsi* by

Figure 6. *Goniozus foveolatus* (Hymenoptera: Bethylidae). Top left: dorsal view of head. Top right: lateral view of head. Bottom left: lateral habitus. Bottom right: ventral view of head, showing palpi. habitus.

the black mandible, obtuse clypeal apex in lateral view, and absence of the transverse propodeal carina (Fig. 6). In addition, it belongs to a large group of Nearctic *Goniozus* that have only four maxillary and two labial palpomeres as in *Sierola*, whereas most species in the genus (including all the others known from Hawai‘i) have the palpal formula 5/3.

Material examined. **O‘AHU**: Barbers Point NAS [Naval Air Station], ex *Ficus retusa*, 31 Aug 1976, J.W. Beardsley, 1♀. Ka‘ala twin towers, 3,950 ft [1,200 m], 21.509°N 158.148°W, sweeping, 4 Nov 2012, K.N. Magnacca, 3♀. **MOLOKA‘I**: Kapukahehu Beach, 10 ft [3 m], yellow whitefly trap board, 24 Jun–8 Jul 1994, W.D. Perreira & M. Fukada, 4♀. **MAUI**: Kahului Malaise trap site #1, nr. Crash fire sta. 20°54′22″N, 156°25′56″W, 16 Nov 1999, F.G. Howarth *et al.*, 1♀. **HAWAI‘I**: Kohala Mt Rd nr. Koai‘a Preserve, ca. 3,400 ft [1,040 m], yellow sticky board trap, 20 Oct–3 Nov 1995, W.D. Perreira, 1♀. Pōhakuloa Training Area, Kīpuka Kalawamauna, 5,300 ft [1,620 m], 19.7460°N 155.6581°W, sweeping *Bidens*, 8 Aug 2012, K.N. Magnacca, 1♀.

Goniozus gracilicornis (Kieffer, 1906) **New state record**

Like the long-established *Goniozus emigratus* (Rohwer), and unlike the other members of the genus recorded in this paper, this species has cell 1M closed and was originally described in the genus *Parasierola*. It is easily recognized by the combination of the wing venation and the broad head, short behind the eyes, with the clypeus weakly carinate (Fig. 7). It is widespread across North America from southern Canada to northern Mexico (Evans 1978).

Figure 7. *Goniozus gracilicornis* (Hymenoptera: Bethylidae). Top left: dorsal view of head. Top right: lateral view of head. Bottom left: lateral habitus. Bottom right: left fore wing.

Material examined. **HAWAI‘I**: Waikōloa to ‘Anaeho‘omalu, on *Pennisetum setaceum*, 20 Nov 1982, W.C. Gagne, 1♀. Pōhakuloa Training Area, Old Saddle Rd, 6,500 ft [1,980 m], 19.7457°N 155.5271°W, on *Myoporum*, 17 Jun 2012, K.N. Magnacca, 1♀, KNMC. Pōhakuloa Training Area, Kīpuka Kalawamauna, 5,300 ft [1,620 m], 19.7460°N 155.6581°W, sweeping *Bidens*, 8 Aug 2012, K.N. Magnacca, 1♀. Pu‘u Wa‘awa‘a, West Kīleo, 4,300 ft [1,300 m], 19.7345°N 155.8359°W, beating *Santalum*, 14 Aug 2012, K.N. Magnacca, 1♂, KNMC.

Goniozus williamsi Bridwell, 1919 **New state record**

This species is native to the Philippines (Bridwell 1919) and appears to be widespread on Pacific islands; specimens have been seen from Tutuila and Palmyra. It may be native on some of them as well. It is part of a large complex of similar species found in southeast Asia, with carinate vertex crest, broad head and fore femur, and yellow mandibles, and most with glabrous basal wing cells. *Goniozus williamsi* is distinguished from the others by the presence of a transverse propodeal carina and a shallow emargination in the vertex carina between the ocelli (most clearly seen in a slightly frontal view due to the reflexed carina). Examination of the type showed that its placement in the key of Ram and Subba Rao (1967) is incorrect; in addition to the transverse carina being present, the femora are all dark (Fig. 8). Given how long it has been present on the other islands, it likely occurs on Hawai‘i island as well.

Figure 8. *Goniozus williamsi* (Hymenoptera: Bethylidae). Left: dorsal view of head. Right: lateral habitus.

Material examined. **KAUA‘I**: Moloa[‘a], ex corn control plot, Aug 1990, P. Britt, 1♀. **O‘AHU**: Waimānalo, sweeping, 2 Aug 1988, J.W. Beardsley, 1♀. UH farm at Waimānalo, el. ca. 60–80 ft [18–24 m], sweeping crops & weeds, 5 Jun 1995, 1♀. Tantalus Drive, el. 1,500 ft [460 m], yellow sticky board trap, 12–27 May 1997, W. D. Perreira, 1♀. Round Top Drive, el. 900 ft [275 m], yellow sticky board trap, W.D. Perreira: 1♀ 10–16 Jun 1997, 1♀ 2–16 Sep 1997. Tantalus Drive, el. 1,600 ft [490 m], yellow sticky board trap, 22 Jul–5 Aug 1997, W.D. Perreira, 2♂. Tantalus, Nāhuina Trail, el. 1,200 ft [366 m], 5–19 Aug 1997, yellow sticky board trap, W.D. Perreira, 1♀. Waialua Farmlands, Trap 035 baited with BioLure, L. Leblanc: 2♀ 26 Sep–7 Dec 2004, 1♀ 24 Dec 2004–7 Jan 2005, UHIM. Pahole crest, 2,200 ft [670 m], 21.5393°N 158.1924°W, on *Bidens torta*, 28 Jul 2012, K.N. Magnacca, 1♀. Wai‘anae–Ka‘ala Trail, 2,400 ft [732 m], 21.5014°N 158.1566°W, on *Alyxia stellata*, 2 Nov 2012, K.N. Magnacca, 1♀. Pahole crest, 2,150 ft [655 m], 21.5374°N 158.1924°W, on *Acacia koa*, 1 Feb 2017, K.N. Magnacca, 2♀. **MOLOKA‘I**: Nr. Honomuni stream, el. 10 ft [3 m], yellow sticky board trap, 9–22 Dec 1995, J.W. Beardsley & W.D. Perreira, 1♀. **MAUI**: Nr. Pa‘akea Gulch, el. ca. 1,250 ft [380 m], yellow sticky board trap, 18 Nov–2 Dec 1995, W.D. Perreira, 1♀. Hanawī Stream, el. 1,040 ft [320 m], yellow sticky board trap, 18 Nov–2 Dec 1995, W.D. Perreira, 1♀.

Braconidae

***Blacus* sp.** **New state record**

This species is widespread at least on Kaua‘i, Moloka‘i, and Maui, and is one of the most common and abundant species observed resting on leaves. In Beardsley’s (1961) key to Hawaiian Braconidae it runs to couplet 17, where it fails because the distal abscissa of the radius runs clearly to the wing apex but there is only one cubital cell (Fig. 9). In the revision of Blacinae (Achterberg 1988), the male and female run imperfectly to different species. The species listed as *Blacus cremastobombyciae* Fullaway in Nishida (2002) is very different (testaceous with the distal radius absent), and in fact does not belong to the genus or even subfamily; it has long been known as *Mirax cremastobombyciae* in the subfamily Miracinae (Achterberg 1976), but this name change was apparently never registered in the Hawai‘i insect checklist.

Material examined. **KAUA‘I**: Kōke‘e site E 1,130 m, on *Metrosideros polymorpha*, 22.125°N 159.665°W, 25 Aug 2021, K.N. Magnacca, K082501-05, 1♀. Kōke‘e site E 1130 m, Townes Malaise trap, 22.1253°N 159.6646°W, 25 Aug–17 Sep 2021, K.N. Magnacca, KM091701-35, 1♂. Kōke‘e site E 1,130 m, on *Psychotria mariniana*, 22.125°N 159.665°W, 17 Sep 2021 K.N. Magnacca, K091716-

Figure 9. *Blacus* sp. (Hymenoptera: Braconidae).

14, 1♀. **O‘AHU**: Kaukonahua Road 225 m, on *Corymbia citriodora*, 21.5364°N 158.0885°W, 28 Feb 2025, K.N. Magnacca, 1♀. **MOLOKA‘I**: Kumu‘eli gulch 1,030 m, on ground, 21.0971°N 156.8692°W, 3 Jul 2024, K.N. Magnacca, 2♂. Kumu‘eli gulch 1,030 m, Malaise trap, 21.0971°N 156.8692°W, 3 Jul–20 Aug 2024, K.N. Magnacca, M24070310-01, 1♂ 1♀. **MAUI**: Launiupoko 760 m, Townes Malaise trap, 20.8582°N 156.5957°W, 19 Oct 2022–17 Mar 2023, K.N. Magnacca & K. Bustamente, M23031701-64, 3♂ 4♀.

Cerocephalidae

***Laesthiola flavida* Bouček, 1993** **New state record**

This species has had a remarkably long history in Hawai‘i but has never been recorded, probably related to it being rarely collected and only recently described from Florida (Bouček 1993). It has not been recorded elsewhere and nothing is known about its life history, but it is easily recognizable among Cerocephalidae by the smooth lateral area of the propodeum (Fig. 10). The male has not been previously recorded; it is much darker but matches the female in the propodeal sculpture and in having a row of admarginal ventral setae on the fore wing.

Material examined. **KAUA‘I**: Moloa‘a Bay, arthropod survey, Habitat: Cultivated, Sector #14, yellow pan trap, Crop: banana, 2–21 Feb 1990, R. Messing & A. Asquith, 1♂. **O‘AHU**: H.S.P.A grounds [Honolulu], on cane, Apr 1908, R.C.L. Perkins, 1♀. Honolulu, on window, 11 Dec 1915, P.H. Timberlake, 1♀. Honolulu, 7 Mar 1916, O.H. Swezey, 1♀. Mānoa, in home, 17 Sep 1926, O.H. Swezey, 1♀. Ewa, light trap, 20 Nov 1976, J.W. Beardsley, 1♀. **MOLOKA‘I**: Kalaniana‘ole Colony, el. 3 ft [1 m], yellow sticky board trap, W.D. Perreira: 5–19 Jan 1996, 2♀; 12–26 Apr 1996, 1♀. Kalaniana‘ole Colony, el. 3 ft [1 m], yellow pan trap, 26 Apr–10 May 1996, W.D. Perreira, 1♀.

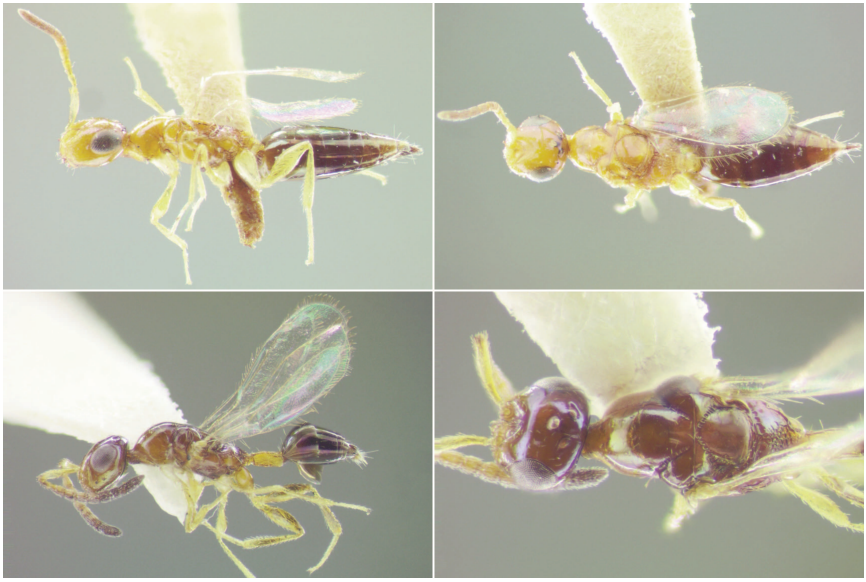

Figure 10. *Laesthiola flavida* (Hymenoptera: Cerocephalidae). Top left: Female, lateral. Top right: female, dorsal. Bottom left: male, lateral. Bottom right: male, dorsal.

Colletidae

Hylaeus anthracinus (F. Smith, 1853) **Range reduction**

This native bee had been recorded from Niʻihau (Beardsley & Tuthill 1959), which was regarded as suspicious given that its sister species *H. flavifrons* (Kirby) occurs on Kauaʻi and was found on Lehua islet just off of Niʻihau (Daly & Magnacca 2003). The specimen that was the basis of this record had been missing, but was recently found in the BPBM collection. It is a male, and clearly has the very broad scape of *H. flavifrons*, not the narrower one of *H. anthracinus*. The face marks are somewhat small, which presumably led to the misidentification as *H. anthracinus*, but this character is known to be variable in *H. flavifrons* (Daly & Magnacca 2003). Therefore, Niʻihau should be deleted from the range of *H. anthracinus*.

Material examined. **NIʻIHAU**: Niʻihau, around *Planchonella* sp., 13 Aug 1947, L.D. Tuthill, 1♂ [*H. flavifrons*].

Crabronidae

Bembecinus littoralis Vecht, 1949 **New state record**

This species has been found widely on sandy beaches on Oʻahu since its first discovery. It is the first member of the subfamily Bembicinae to become established in Hawaiʻi, and is strikingly different from other sphecoid wasps in Hawaiʻi, with yellow stripes similar to *Vespula* but much narrower (Fig. 11). In Vecht's (1949) key to Indonesian species, both males and females match *B. littoralis* in both structural and color characters, including the color variability of the female hind tarsus. Both in Hawaiʻi and its native range it appears to be found almost exclusively at the coast; it can sometimes be extremely abundant.

Figure 11. *Bembecinus littoralis* (Hymenoptera: Crabronidae). Top left: frontal view of head. Top right: dorsal view of apical metasoma. Bottom left: dorsal view of posterior mesosoma. Bottom right: lateral view showing propodeal flange.

The following life history notes were contributed by Paul Krushelnycky. On June 12–13 2024, about 15–20 *Bembecinus* puparia were collected from a patch of sand at James Campbell NWR, Kahuku, O‘ahu. These were obtained by sifting sand in an area with many nest burrow holes. Each nest consisted of a single cell containing an immature *Bembecinus* sealed in a capsule. This oblong capsule consisted of many small sand pebbles glued to a dark membrane. The capsule exterior was quite hard and rigid, protecting the developing wasp. Those that were opened contained white pupae with melanized eyes. Attached loosely around the capsule were often wings of cicadellid prey and other debris that was presumably inside the nest burrow prior to pupation. Five adults emerged between June 23 and July 22. Another five apparently entered dormancy and emerged as adults in January and February 2025. Two puparia were found to have small holes in their exterior or were damaged when collected, and when opened fly maggots were observed. These were reared and turned out to be an unidentified phorid.

Material examined. **O‘AHU**: Kaneohe Marine Corps Base, North Beach, flying over ground, 10 May 2017, 2♀. James Campbell NWR, at nest aggregation, 22 Apr 2024, P. Krushelnycky, 4♂ 3♀.

Figure 12. *Dicranorhina ritsemae luzonensis* (Hymenoptera: Crabronidae), male. Oblique fronto-dorsal view.

Dicranorhina ritsemae luzonensis Rohwer, 1919 **New island record**

This species was previously recorded from O‘ahu and Maui (Nishida 2002, Howarth & Preston 2007). There are only a handful of specimens, but some are recent so it is probably still present. It is distinct from other larrine crabronids in Hawai‘i in having the apical third of the wing tinged with brown (Fig. 12). The specimens on hand agree with the description of Williams (1928) in having the clypeus, mandible, and pronotal lobes reddish brown rather than black, in contrast to the key of Mawadda *et al.* (2019). Howarth & Preston (2007) said that the generic name is a homonym of a beetle genus and it should be listed as *Polemistus luzonensis* Rohwer, but this is incorrect; *P. luzonensis* is a different taxon, and the beetle genus is *Dicronorhina*.

Material examined. **KAUA‘I**: Mahaulepu, with crickets in sand dune root holes, 15 Sep 1976, S.L. Montgomery, 1♀. **O‘AHU**: Nu‘uanu Valley, 28 Oct 1949, 2♀ (HDOA). Honolulu, 14 Nov 1949, P.W. Weber, 2♀ (HDOA). Pālama, 3 Nov 1950, T. Iwami, 1♀. Honolulu, 5 Jan 1951, J. Beardsley, 1♀. Honolulu, on window ent. lab. HSPA, 30 Jan 1952, O.H. Swezey, 1♀ (HDOA). Honolulu, 19 Apr 1954, C.R. Joyce, 1♀. Nu‘uanu Valley, 22 Nov 1956, J.S. Rosa, 1♀ (HDOA). Kuli‘ou‘ou Valley Trail, el. 200 ft [60 m], 18 Jun 1998, W.D. Perreira, 1♂.

Nitela bicornis (Williams, 1928) **New state record**

This species is very distinct from the two following, with strongly angulate anterior corners on the pronotum, transverse ridges on the mesoscutum, and the frons dull with very tiny, almost indistinguishable punctures (Fig. 13). It was originally described from the Philippines, and the type is at BPBM. *Nitela* provision their nests with aphids and barklice (Williams 1928). Although so far recorded from only one specimen, it is likely established

Figure 13. *Nitela bicornis* (Hymenoptera: Crabronidae). Left: frontal view of head. Right: dorsal habitus.

since it was found in the mid elevation forest, and due to its life history probably spends most of its time in the canopy where it would be rarely encountered.

Material examined. **O'AHU**: Wa'ahila Ridge, 21 Jul 1999, N21°18.009′ W157°48.416′, Malaise trap, G.M. Nishida, 1♀.

Nitela domestica (Williams, 1928) **New state record**

This very small crabronid resembles a bethylid, with a prominent frontal carina, somewhat prognathous head, and quadrate pronotum, which unlike in Bethylidae does not extend close to the tegulae dorsally. It is readily recognized among *Nitela* by the pair of low, slightly curved carinae on the frons (Fig. 14). It is native to the Philippines, China, and Japan (Williams 1928, Li & Li 2010).

Material examined. **O'AHU**: Hawai'iloa Trail, on *Diospyros sandwicensis*, 22 Jul 2017, K.N. Magnacca, 1♀. UH Mānoa campus, sweeping *Eucalyptus deglupta*, 3 Feb 2025, K.N. Magnacca, 1♀.

Figure 14. *Nitela domestica* (Hymenoptera: Crabronidae). Left: frontal view of head. Right: lateral habitus.

Figure 15. *Nitela pendleburyi* (Hymenoptera: Crabronidae). Left: frontal view of head. Right: dorsal habitus.

Nitela pendleburyi Turner, 1926 **Identification, New island record**

This species was initially reported as "*Nitela* sp." by Beardsley & Perreira (2000) based on the 1994–1998 O'ahu and Moloka'i specimens, but they were unable to provide a name. It is also the taxon referred to as "*Nitela* sp. A" in Howarth & Preston (2002, 2007). It runs to *N. pendleburyi* in the key to Oriental species of Li & Li (2010) and matches the original description; it is native to Malaysia (Turner 1926). The eyes are strongly convergent above (interocular width at toruli/interocular width at median ocellus about 0.50, eyes nearly touching lateral ocelli), eyes bare, and frons and mesoscutum nearly smooth (frons very faintly longitudinally striate in the female) with moderately fine punctation (Fig. 15); this combination is unusual among *Nitela*. It is quite different from *N. domestica* or *N. bicornis*, lacking the strongly raised, laminate anterior carina of the former (weakly carinate in the male, only raised and angulate in the female), and without carinae or reticulate sculpture on the frons or mesoscutum.

Material examined. **O'AHU**: Wa'ahila Ridge, 40–190 m, 25 Apr 1999, G.M. Nishida, 1♂ 1♀. Pearl Harbor, West loch, el. 3 ft, Yellow sticky board trap, 11–25 Feb 1998, W.D. Perreira, 2♀. **MOLOKA'I**: Kamalō Bridge, el. 3 ft [1 m], Yellow sticky board trap, W.D. Perreira; 1♀ 2–16 Sep 1994, 1♀ 16–30 Sep 1994, 1♂ 5–19 Jan 1996. Kualapu'u in coffee field, Yellow sticky board trap, el. 750 ft [230 m], 27 Oct–10 Nov 1995, J.W. Beardsley and W.D. Perreira, 2♀. Mapulehu nr. 'Ili'ili'ōpae Heiau, el. 10–40 ft [3–12 m], Yellow sticky board trap, 26 Apr–10 May 1996, 1♀ (BPBM), 1♀ (HDOA). Mapulehu nr. 'Ili'ili'ōpae Heiau, el. 10–40 ft [3–12 m], Yellow sticky board trap, 10–24 May 1996, 1♀. **MAUI**: Olowalu, 10–11 Apr 1996, H. Nagase, 1♂. Kahului Airport drainage canal, 20°54.464′N, 156°26.124′W, 2 cup traps on, 8–10 Sep 1999, F.G. Howarth, D.J. Preston, & R.A. Englund, 1♀. West Maui, 20.798°N 156.5875°W, 3–4 May 2013, S.W. Droege 11506, USGS-DRO 374910, 1♀. South Maui, 20.7613°N 156.4504°W, 7–8 May 2013, S.W. Droege 11539, USGS-DRO 374177, 1♀.

Passaloecus borealis Saussure, 1892 **Corrected identification**

This species has had a rather confused taxonomic history. It was first recorded from Hawai'i as *P. ithacae* Krombein (Beardsley 1971), which was later synonymized with *P. insignis* van der Linden, under which name it has been listed in the Hawaiian arthropod checklist (Nishida 2002). The former name is now considered to be a synonym instead of the Nearctic *P. monilicornis* Dahlbom (Vincent 1978). However, the taxon found in Hawai'i is clearly none of these, but is instead *P. borealis*. It is distinguished by the form of the mesosoma, with the notauli and medial lines about equal length, scutal patches present and oval-shaped, lateral scutal margins reflexed, and omaulus broad (Vincent 1978). Among small crabronids in Hawai'i, it can be easily recognized by the white mandible (Fig. 16).

Figure 16. *Passaloecus borealis* (Hymenoptera: Crabronidae). Left: frontal view of head. Right: lateral habitus.

Material examined. **O'AHU**: P[earl] City, 12.14.68, F.S. Weadt, 1♀. U. of H[awai'i], 20 Apr 1969, Raso, 1♀ [identified as *P. ithacae* by C.M. Yoshimoto]. Mānoa, 11 May 1970, Kam, 1♂. Mānoa, 21 Apr 1977, S. Ishikawa, 1♀. UH Mānoa at Spalding Hall, el. ca. 80 ft [25 m], sweeping grasses & weeds, 27 Mar 1995, J.W. Beardsley, 1♀.

Polemistus pusillus Saussure, 1892 **New state record**

This species is native to central Mexico, and provisions its nests with aphids (Menke & Vincent 1983). It is easily recognized by the large depressed spots on the anterior mesonotum marking the posterior end of the notauli (especially distinct in the female; Fig. 17), and the toothed ventral antenna of the male (Menke & Vincent 1983). The mesoscutum is also dull and velvety at low magnification, and the very short notauli and lack of other dorsal lines separates it from *Passaloecus borealis*. The only other species of *Polemistus* known from Hawai'i, *Po. luzonensis* Rohwer, is very different with strongly foveate grooves extending the full length of the mesonotum.

Material examined. **O'AHU**: Wa'ahila Ridge, N21°18.009′ W157°48.416′, Malaise trap, 21 July 1999, G.M. Nishida & R. Englund, 1♂ 2♀.

Figure 17. *Polemistus pusillus* (Hymenoptera: Crabronidae). Left: frontal view of head. Right: lateral habitus.

Solierella peckhami (Ashmead, 1897) **New island record**

This species has been in the islands for many years and has been previously recorded from Niʻihau, Kauaʻi, Oʻahu, Molokaʻi, Maui (Nishida 2002). These records extend its range to all the main islands except Lānaʻi, and it is probably also present there.

Material examined. **KAHOʻOLAWE**: Beck's Cove, 200 m, 11–14 Feb 1980, G.M. Nishida, 1♀. **HAWAIʻI**: Kailua, 19°38.91′N 155°59.73′W, 108 m, 16 Oct 1992, G.M. Nishida, 1♀.

Trypoxylon buddha Cameron, 1889 **New state record**

A single female of this species was collected on Oʻahu. The locality is not far from a harbor, so it is not considered established until more specimens are found. It keys clearly to *T. buddha* in Tsuneki (1979) and matches a specimen at BPBM identified by Tsuneki. The apical foveae on T1–3 are very distinctive for this species. Among the *Trypoxylon* in Hawaiʻi, it can also be easily identified by lacking the strong facial carinae of the following species and the red coloration of the previously established species (Fig. 18). Its native range extends from India southeast to Malaysia (Tsuneki 1979).

Material examined. **Oʻahu**: Kalaeloa National Wildlife Refuge, site 2 pan trap 3, 16 Jun 2023, M. Ross & N. Chan, 1♀.

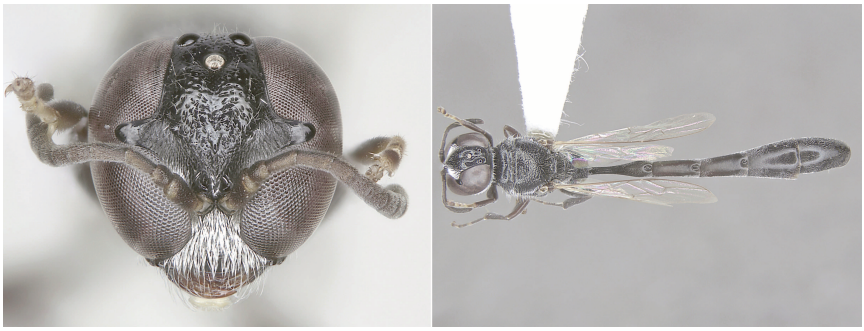

Figure 18. *Trypoxylon buddha* (Hymenoptera: Crabronidae). Left: frontal view of head. Right: dorsal habitus, showing metasomal foveae.

Trypoxylon melanurum Cameron, 1901 **Identification**

This species was reported as "*Trypoxylon* sp." by Beardsley & Perreira (2000) and Nishida (2002). Examination of their specimens shows that it is a member of the very distinctive *scutatum* species group, which have carinae marking off a shield-shaped area of the frons including the median ocellus (Fig. 19). This, along with the entirely black coloration, serves to separate it from the other *Trypoxylon* species found in Hawaiʻi. It clearly matches the concept of *T. melanurum* in Tsuneki (1978). Its native range includes almost all of India and Bangladesh (Tsuneki 1978).

Material examined. **Oʻahu**: Pearl Harbor, West Loch, 1–5 ft [0–2 m], yellow sticky board trap, W.D. Perreira: 30 Sep–11 Oct 1997 (1♂), 13–20 Dec 1997 (1♂), 3–14 Jan 1998 (2♂), 11–25 Feb 1998 (3♂).

Figure 19. *Trypoxylon melanurum* (Hymenoptera: Crabronidae). Left: frontodorsal view of head, showing frontal enclosure. Right: lateral habitus.

Diapriidae

***Basalys* sp.** **New state record**

This genus is distinguished by the combination of notauli absent, antenna with an abrupt 3-segmented club and the seven preceding flagellomeres small and nodiform, and the presence of a tubular, pigmented basal vein which is not connected to the submarginal vein as in Belytinae (Fig. 20). It superficially resembles *Doliopria* in the small size and strongly clubbed antenna, but in that genus the antenna is 11-segmented rather than 12 (only six nodiform segments between the pedicel and club), and the basal vein is absent. In addition to the specimens listed below, three specimens from O‘ahu and Moloka‘i have

Figure 20. *Basalys* sp. (Hymenoptera: Diapriidae). Arrow indicates the basal vein.

the antenna 11-segmented but otherwise like *Basalys*, and the basal vein present; it is unclear if these represent a different, aberrant species of *Basalys* or mutant individuals. Individuals of some other genera have been seen with apparently one fewer antennal segment than normal, but in those cases it is usually obvious with the segment being longer than normal and often partly divided, which is not the case here.

Material examined. **KAUA'I**: Moloa'a Bay, arthropod survey, Habitat: Cultivated, Sector #14, yellow pan trap, Crop: banana, 2–21 Feb 1990, R. Messing & A. Asquith, 4♀. **O'AHU**: Mt. Tantalus, 22 Sep 1968, E.F. Drake, 1♂ 1♀. Ulumawao, sweeping, 22 Oct 1968, W.C. Gagné, 1♂. Honolulu International Airport, light trap, May 1981, J.W. Beardsley, 1♀. UH farm at Waimānalo, el. 60–80 ft [18–24 m], 15–22 May 1996, yellow sticky board trap, W.D. Perreira, 2♀. **MOLOKA'I**: Nr. Honomuni stream, el. 10 ft [3 m], yellow sticky board trap, Nov 1994, W.D. Perreira, 1♀. Mapulehu nr. 'Ili'ili'ōpae Heiau, el. 10–40 ft [3–12 m], yellow sticky board trap, 18 Aug–1 Sep 1995, 1♂. **MAUI**: 'O'opuola Stream, el. 800 ft [245 m], yellow sticky board trap, 18 Nov–2 Dec 1995, W.D. Perreira, 1♀.

***Belyta* sp.** **New state record**

Based on the wing venation and reniform scutellar fovea (Fig. 21), this species is close to the Eurasian *B. depressa* Thomson and is clearly not any of the species known from the Oriental or Australian regions. However, the genus is very poorly studied outside of Europe, particularly in North America where the species have not been examined in over 100 years and many undescribed species probably exist.

Material examined. **KAUA'I**: Alaka'i Swamp Trail, pitfall, Jul–Aug 1991, A. Asquith, 2♀. 'Alaka'i Trail, pitfall, Sep–Oct 1991, 1♂ 1♀. Alaka'i Swamp Trail, non-target study, 920220, 31 Jan–20 Feb 1992, 1♂.

Figure 21. *Belyta* sp. nr. *depressa* (Hymenoptera: Diapriidae).

Figure 22. *Calogalesus* sp. (Hymenoptera: Diapriidae). Left: anteroventral view of head. Right: lateral habitus.

***Calogalesus* sp.** **New state record**

This genus is easily recognized by the ventrally projecting mandibles (almost parallel and beak-like, not overlapping when closed), distinct notauli, and arched, nearly glabrous petiole (Fig. 22). Only three species are described; in the key of Feng *et al.* (2016), the Hawai‘i males run to *C. malabaricus* Rajmohana & Narendran but the female does not match any, so it is likely undescribed. Undescribed species are reported from Africa, Asia, and Australia; at least two are found in the Caribbean and one of these may be cosmopolitan (Masner & Garcia 2002), which may be the one here. This taxon was reported as “Diapriidae gen. sp. A” in Howarth *et al.* (2012).

Material examined. **O‘AHU**: Honolulu International Airport, light trap, May 1981, J.W. Beardsley, 1♀. **MOLOKA‘I**: Mapulehu nr. ‘Ili‘ili‘ōpae Heiau, el. 10–40 ft [3–12 m], yellow sticky board trap, 29 Sep–13 Oct 1995, 1♂ 1♀. Mapulehu, el. 10–60 ft [3–18 m], sweeping, 10 Nov 1995, J.W. Beardsley, 1♂. Nr. Kamalō Bridge, el. 3 ft [1 m], yellow sticky board trap, Dec 1995, W.D. Perreira, 1♂. **LĀNA‘I**: Lāna‘ihale, ex trap baited with dead *Dacus* [= *Bactrocera*] *dorsalis*, 6 Jul 1978, P. Conant, 1♀. **MAUI**: Kahului Airport, 20°54′22″N 156°25′56″W, sample #B19 Malaise #1, 16 Nov 1999, F.G. Howarth & D.J. Preston, 3♀. Kahului Airport, AOA, 20°54′22″N 156°25′56″W, 16 Dec 1999, Malaise tr. #17, *Leucaena* shrubland, F.G. Howarth, D.J. Preston, F. Starr, K. Martz, 1♀.

***Doliopria* sp.** **New island record**

Previously recorded from O‘ahu (Early & Goff 1986).

Material examined. **MOLOKA‘I**: Pala‘au State Park, 1,500 ft [460 m], yellow sticky board trap, 20 Jan–3 Feb 1995, J.W. Beardsley & W.D. Perreira, 1♀. Nr. Honomuni stream, el. 10 ft [3 m], yellow sticky board trap, 26 May–9 Jun 1995, J.W. Beardsley & W.D. Perreira, 1♀.

Entomacis mellipetiola (Ashmead, 1887) **New state record**

This is now one of the most common diapriids in Hawai‘i. It probably occurs on all islands, and many more specimens have been seen than those listed below. *Entomacis* is easily recognized by the combination of 13-segmented antennae in both sexes and a nar-

Figure 23. *Entomacis mellipetiola* (Hymenoptera: Diapriidae). Female, showing the 13-segmented antenna and deep notch in the syntergite (circled).

row, deep incision in the anterior margin of the syntergite (Fig. 23). This species is widespread throughout North America. The Hawai‘i specimens clearly match the description and figures in Yoder (2004). On O‘ahu and Maui it has been taken in the same sample with the following species, but is easily distinguished by the shorter petiole, lacking the tubular costal vein, having female F1–3 cylindrical rather than slightly expanded apically, and being slightly smaller overall. There are numerous other minute differences.

Material examined. **KAUA‘I**: Kōke‘e site B 1100 m, on *Coprosma waimeae*, 22.117°N 159.670°W, 25 Aug 2021, K.N. Magnacca, K082511-09, 1♀. Kōke‘e site E 1130 m, Townes Malaise trap, 22.1253°N 159.6646°W, 25 Aug–17 Sep 2021, K.N. Magnacca, KM091701-46, 1♀. **O‘AHU**: Wai‘anae, Kūmaipō gulch 665 m, Townes Malaise trap, 21.4997°N 158.1543°W, 27 Jul–28 Sep 2023, K.N. Magnacca O23092801-98, 3♂ 5♀. **MOLOKA‘I**: Kumu‘eli gulch 1,030 m, Malaise trap, 21.0971°N 156.8692°W, 2 Jul–20 Aug 2024, K.N. Magnacca, M24070310-01, 2♀. **MAUI**: Launiupoko 760 m, Townes Malaise trap, 20.8582°N 156.5957°W, 19 Oct 2022–17 Mar 2023, K.N. Magnacca & K. Bustamente M23031701-179, 3♀. **HAWAI‘I**: Kīpāhoehoe mid kīpuka 1,410 m, Townes Malaise trap, 19.2480°N 155.8166°W, 11 May–27 Jun 2022, K.N. Magnacca, H22062701-17, 1♂. Pāpā mid road 1,230 m, Townes Malaise trap, 19.2118°N 155.8169°W, 1 Jul–4 Aug 2022, K.N. Magnacca, H22080401-49, 1♂ 2♀. Kukuiopa‘e upper 1,400 m, Townes Malaise trap, 19.3047°N 155.8196°W, 11 Aug–25 Oct 2022, K.N. Magnacca, H22102501-82, 3♀.

Entomacis* cf. *penelope Nixon, 1980 **New state record**

Among North American species (Yoder 2004) this species is closest to *E. eoraria* Yoder, 2004 but the male antenna does not match. Among East Asian species (Chemyreva 2015) it is closest to *E. penelope* Nixon, and may be that species; it is widespread in the Palearctic from Ireland to Japan. The costal vein is present and tubular (Fig. 24), which is

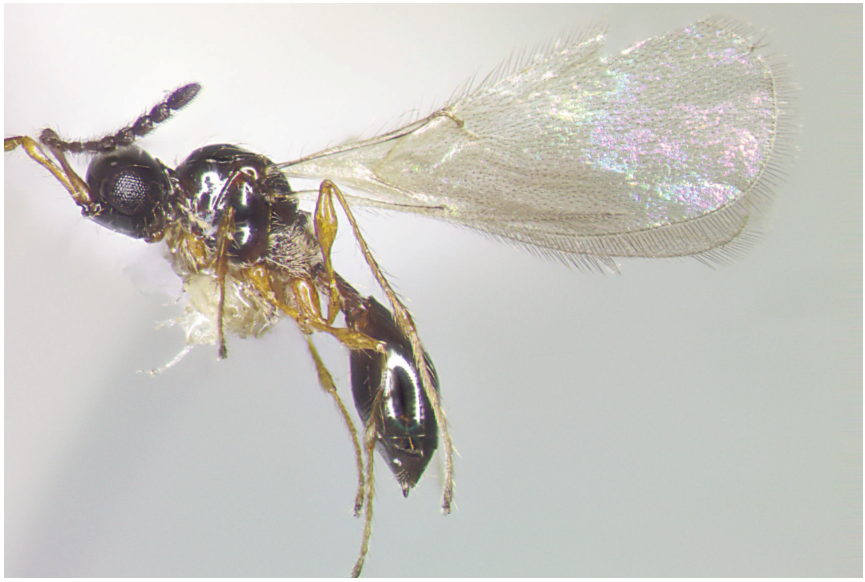

Figure 24. *Entomacis* cf. *penelope* (Hymenoptera: Diapriidae).

somewhat unusual in the genus. However, many undescribed species are known, and the Asian species are not as fully treated morphologically as those of the Nearctic.

Material examined. **O'AHU**: Pahole NAR, bioblitz pan trap 3, 25–27 Mar 2010, K.N. Magnacca, 2♀. **MAUI**: Helu gulch 3 1130 m, on *Cyanea scabra*, 20.8678°N 156.6133°W, 6 Jul 2022, K.N. Magnacca, M22070602-05, 1♂. Helu gulch 1 1,100 m, pan trap loop, 20.870°N 156.615°W, 8 Jul 2022, K.N. Magnacca, M22070811-40, 2♀. Launiupoko 760 m, Townes Malaise trap, 20.8582°N 156.5957°W, 19 Oct 2022–17 Mar 2023, K.N. Magnacca & K. Bustamente M23031701-80, 5♀.

***Paramesius* sp.** **New state record**

This is one of several diapriids that have become established in Hawai'i in recent decades, none of which have been identified by species name. Like many of those others, this one is widespread but rare in collections; it has only been taken in Malaise traps. Like *Entomacis* it is a member of the tribe Spilomicrini and has the antennae 13-segmented in both sexes, but the last antennal segment is much longer than the penultimate one, the antenna is distinctly broader at the apex, and the syntergite is not notched (Fig. 25). The petiole is also more robust than most other diapriids found here.

Material examined. **KAUA'I**: Kōke'e site B 1,100 m, Townes Malaise trap, 22.1173°N 159.6696°W, 22 Apr–25 Aug 2021, K.N. Magnacca, KM082502-80, 1♀. **O'AHU**: Wai'anae, Kūmaipō gulch 665 m, Townes Malaise trap, 21.4997°N 158.1543°W, 27 Jul–28 Sep 2023, K.N. Magnacca O23092801-99, 4♀. **MOLOKA'I**: Kumu'eli gulch 1,030 m, Malaise trap, 21.0971°N 156.8692°W, 2 Jul–20 Aug 2024, K.N. Magnacca, M24070310-02, 2♀. **HAWAI'I**: Pāpā mid road 1,230 m, Townes Malaise trap, 19.2118°N 155.8169°W, 1 Jul–4 Aug 2022, H22080401-50, K.N. Magnacca, 5♀. Kukuiopa'e upper 1,400 m, Townes Malaise trap, 19.3047°N 155.8196°W, 11 Aug–25 Oct 2022, K.N. Magnacca, H22102501-83, 2♀.

Figure 25. *Paramesius* sp. (Hymenoptera: Diapriidae).

***Spilomicrus* sp.** **New island record**

Previously recorded only from Oʻahu (Nishida 2002).

Material examined. **MAUI**: Kahului Malaise trap site #2, nr. Crash fire sta. 20°54′18″N 156°25′42″W, Malaise trap #1, 30 Nov 1999, F.G. Howarth, D.J. Preston, J.E. Dockall, K. Martz, & F. Starr, 1♀.

***Stylaclista* sp.** **New island record**

Previously recorded only from Oʻahu (Nishida 2002). Very distinctive, with the female apical metasoma segments prolonged. Many more specimens have been taken from Kauaʻi than are listed below; most have not been mounted since it is so common.

Material examined. **KAUAʻI**: Kōkeʻe, 29 Aug 1962, J.W. Beardsley, 1♂. Kōkeʻe, *Drosophila* mushroom bait, 19 May 1982, J. Takara, 1♀. Kōkeʻe site B 1100 m, Townes Malaise trap, 22.1173°N 159.6696°W, 22 Apr–25 Aug 2021, K.N. Magnacca, KM082502-81, 1♀. **MOLOKAʻI**: Kalanianaʻole Colony, el. 3 ft [1 m], yellow sticky board trap, 1–15 Mar 1996, W.D. Perreira, 12♀. **MAUI**: Kula, ex suction traps in vegetable field, Mar–Apr 1989, A. Moore, 2♂ 3♀. Launiupoko 760 m, Townes Malaise trap, 20.8582°N 156.5957°W, 17 Mar 2023, K.N. Magnacca & K. Bustamente, M23031701-78, 3♀. **HAWAIʻI**: Kīlauea Iki, 3,800 ft [1,160 m], 23 Jun 1966, J.W. Beardsley, 1♀. Kohala Mts, *Acacia koa*, 14 May 1973, J.W. Beardsley, 2♂. Pāpā mid road 1,230 m, Townes Malaise trap, 19.2118°N 155.8169°W, 1 Jul–4 Aug 2022, H22080401-4 K.N. Magnacca, 2♀.

Dryinidae

Haplogonatopus vitiensis Perkins, 1906 **Correction**

This species has been incorrectly recorded in the Hawaiian arthropod checklist (Nishida 2002) as *Acrodontochelys vitiensis* (Perkins). The checklist index gives that name as a

senior synonym of both *H. vitiensis* and *Neogonatopus vitiensis* Perkins. The latter is correct (Olmi 1984), but *H. vitiensis* is a different nominal taxon. *Haplogonatopus vitiensis* attacks delphacids, and is one of the dryinids released and established for control of the sugarcane leafhopper (Swezey 1923); *Acrodontochelys* (= *Neogonatopus*) *vitiensis* attacks cicadellids (Perkins 1906), and has never been released in or recorded from Hawai‘i. The confusion no doubt arises in part because they were described in the same publication (Perkins 1906).

Encyrtidae

Cryptanusia comperei (Timberlake, 1929) **New state record**

This species fails in the key to Hawaiian Encyrtidae (Beardsley 1976), but is immediately recognizable by the broad, flat antennae and coloration (Fig. 26). Some of the endemic *Coelopencyrtus* have the flagellar segments somewhat expanded, but not to the extent of this species. It is a mealybug parasitoid, native to Australia (Timberlake 1929). It is supposed to be distinguished from *C. aureiscutellum* (Girault), which is recorded from New Zealand, by having the pleura all black and the body overall lacking violet reflections, as well as the leg coloration (Timberlake 1929). However, according to Noyes and Hayat (1984), specimens taken in the native range in Australia exhibit wide variation in coloration, so these two names and others may be synonyms.

Material examined. **O‘AHU**: Pahole NAR, bioblitz pan trap 18, 25–27 Mar 2010, 1♀. Palikea, Honouliuli Forest Reserve, beating *Cheirodendron trigynum*, 19 Oct 2017, K.N. Magnacca, 1♀. Pu‘u Hāpapa 815 m, on *Psychotria hathewayi*, 21.467°N 158.103°W, 17 Jul 2017, O23071708-01, K.N. Magnacca, 1♀.

\Figure 26. *Cryptanusia comperei* (Hymenoptera: Encyrtidae).

Figure 27. *Meselatus bicolor* (Hymenoptera: Epichrysomallidae).

Epichrysomallidae

***Meselatus bicolor* Chen, 1999** **New state record**

A single specimen of this non-pollinating fig wasp were collected in montane forest in Kaʻū, Hawaiʻi. It is easily distinguished from the only other epichrysomallids present in Hawaiʻi, *Odontofroggatia* spp. and the *Josephiella* stem and leaf gall wasps, by the 5-segmented tarsi and longer antennae (funicle with 7 segments in the female, 6 in male) of the head and mesosoma (Fig. 27). It is a fruit galler in banyan, *Ficus microcarpa* (Chen *et al.* 1999). No figs were noted in the immediate area so it likely was blown up from the lower elevations where alien trees were more common. Although only one specimen was collected, it is almost certainly well established based on it being collected deep in native forest, some distance from its host plant and far from ports of entry. It runs to *Sycophilodes* rather than *Meselatus* in the key of Pramanik & Dey (2014) due to the single scutellar setae, and apparently belongs to a new genus (J.-Y. Rasplus, pers. comm.). Identification by Jean-Yves Rasplus.

Material examined. **HAWAIʻI**: Kapāpala CMA 1,440 m, sweeping ferns, 19.349°N 155.473°W, 12 Apr 2023, H23041201-19, K.N. Magnacca, 1♀.

Eulophidae

***Elasmus* sp. 3** **New state record**

This species is rather unusual in its color and setal pattern: the bristles of the hind tibia are in nearly straight lines, coxae and femora entirely black except the apex of the fore femur, and T2 and adjoining parts of T1 and T3 are orange-yellow with the rest of the metasoma black (Fig. 28). Both the setal pattern and coloration separate it from the two previously

Figure 28. *Elasmus* sp. 3 (Hymenoptera: Eulophidae).

known *Elasmus*, *E. atratus* and *E. polistis*. Those recorded as "sp. A" and "sp. B" or "sp. 1" and "sp. 2" by Howarth *et al.* (2012) were reexamined and found to be male and female respectively of *E. polistis*; however, the present species is assigned a different number in order to avoid confusion. It is closest to *E. mandibularis* Girault of Australia, but that species has the metasoma all dark. It is not any of the species described from North America, the Palearctic, or Australia (Burks 1965, Riek 1967, Graham 1995, Yefremova & Strakhova 2009, 2010, 2011, Gunawardene & Taylor 2012). It is probably an undescribed Australian species.

Material examined. **KAUA'I**: WWVH road, on *Leucaena leucocephala*, 21.988°N 159.762°W, 26 Aug 2021, K.N. Magnacca, P082604-02, 2♀.

Eupelmidae

***Eusandalum* sp.** **New state record**

This is the first Hawai'i record of the subfamily Calosotinae *sensu lato* (recently recircumscribed with *Eusandalum* now placed in Eusandalinae; Burks *et al.* 2022). Although it has the typical eupelmid habitus (Fig. 29) it is quite distinctive, lacking pegs on the mid tibia and tarsus and with the antennae elongate and filiform, lacking a compact clava. The genus is very large and has not been recently revised.

Material examined. **O'AHU**: Wai'anae Mts., Ka'ala, 4,000 ft [1,220 m], 7 May 1969, E.F. Drake, 1♂. Waialua, el. 20 ft [6 m], 16 Nov 1995, sweeping of sugarcane and weeds, J.W. Beardsley & W.D. Perreira, 1♀.

Figure 29. *Eusandalum* sp. (Hymenoptera: Eupelmidae). Top left: lateral habitus. Top right: oblique dorsal. Bottom left: frontal view of head. Bottom right: dorsal metasoma.

Eurytomidae

Chryseida bennetti Burks, 1956 **New state record**

This wasp has the typical eurytomid habitus of a high, robust mesosoma with large punctures and a laterally compressed, shining metasoma. It can be immediately distinguished from all other eurytomid genera by the dull metallic green coloration of the mesosoma (Fig. 30). The range of variation in size and leg color (from entirely testaceous to having prominent brown bands medially on the femora) in Hawai‘i specimens matches that in the original description. It is a parasitoid of bruchid beetle larvae in legume seeds (Burks 1956), and has evidently been present in the islands for some time. It is known from specimens from four islands going back nearly 30 years, and likely occurs on Maui and Lāna‘i as well.

Material examined. **KAUA‘I**: PMRF Barking Sands, Diver’s Landing, sweeping coastal scrub, 24 Aug 2021, P082406-08, K.N. Magnacca, 1♀. **O‘AHU**: Barbers Pt., el. 5–10 ft [2–3 m], 14 Nov 1995, general sweeping, J.W. Beardsley & W.D. Perreira, 1♀. UH farm at Waimānalo, el. 60–80 ft [18–24 m], 15–22 May 1996, yellow sticky board trap, W.D. Perreira, 1♀. Dillingham Field, el. 10 ft [3 m], 15–28 May 1996, yellow sticky board trap, W.D. Perreira, 1♀. **MOLOKA‘I**: Mapulehu nr. ‘Ili‘ili‘ōpae Heiau, el. 10–40 ft [3–12 m], 29 Sep–13 Oct 1995, yellow sticky board trap, W.D. Perreira, 1♀. Pālā‘au State Park, el. 1,500 ft [460 m], general sweeping, 20 Jan 1995, general sweeping, J.W. Beardsley & W.D. Perreira, 5♀. **HAWAI‘I**: Whittington Beach Park at Honu‘apo Bay, el. 3 ft [1 m], 20 Oct–3 Nov 1995, yellow sticky board trap, W.D. Perreira, 7♀.

Figure 30. *Chryseida bennetti* (Hymenoptera: Eurytomidae).

Figitidae

Trybliographa stigmata (Say, 1836) **New state record**

A single specimen of this very distinctive eucoiline was taken at Kōkeʻe State Park; a second was later found in similar habitat on Oʻahu. It is immediately recognizable from all others in Hawaiʻi because cell R is completely filled in with pigment, giving the appearance of a large stigma (Fig. 31). Identification confirmed by Matt Buffington, USDA/SEL.

Material examined. **KAUAʻI**: Kōkeʻe State Park, 1,110 m, on cabin lanai, 22.1277°N 159.6625°W, 21 Apr 2021, K.N. Magnacca, K042101-01, 1♀. **OʻAHU**: Puʻu Hāpapa, 815m, on *Pisonia umbellifera*, 21.467°N 158.103°W, 17 Jul 2023, K.N. Magnacca, O23071705, 1♀.

Formicidae

***Lioponera* sp.** **New state record**

A series of unusual alate male ants was collected on Lehua islet off of Niʻihau. Subsequently an older series of males was discovered at BPBM, misidentified as *Ooceraea* (= *Cerapachys*) *biroi* Forel, the only other doryline present in Hawaiʻi. Although *O. biroi* was first recorded from Hawaiʻi in 1908 (Swezey 1917) and reported to have been widely collected around Oʻahu and other islands (Huddleston & Fluker 1968), only a handful of actual specimens could be found in the BPBM and HDOA collections. So far, only workers of *O. biroi* and males of *Lioponera* have been seen. The two are easily separated in both castes: workers of *Lioponera* have large eyes and the alates lack notauli (Fig. 32), while the workers of *Ooceraea* are blind and alates have complete Y-shaped notauli. A specimen from Hawaiʻi was sequenced for COI; it is close to and possibly conspecific with a sequence on the Barcode of

Figure 31. *Trybliographa stigmata* (Hymenoptera: Figitidae).

Figure 32. *Lioponera* sp. (Hymenoptera: Formicidae). Top left: dorsal view of mesosoma. Top right: lateral habitus. Bottom left: lateral view of mesosoma. Bottom right: petiole and anterior gaster.

Life Database (BOLD) from Sumatra, and more distant from one from Pakistan (2.9% and 7.2% sequence divergence respectively in the standard barcode region; BOLD process ID numbers GMIAK678-17 and GMPBS103-18). Images of these specimens cannot be distinguished from the Hawai‘i taxon, but they are of low quality and important characters are not visible. One species, *L. longitarsus* Mayr, is reported as widespread from North Africa to Taiwan and Australia (Barech *et al.* 2017), but the sequence results suggest that there may be cryptic species involved.

Material examined. **NI‘IHAU**: Lehua shelter, at light at night, 22.0154°N 160.0975°W, 31 May 2023, K.N. Magnacca, K23053107-18, 4♂. Same data, 1 Jun 2023, K23060108-03, 2♂. **O‘AHU**: ‘Ewa, Apr 1975–Jul 1976, J.W. Beardsley, 6♂. Hickam AFB, 10 Oct 1977–17 Nov 1978, C.W. Mills III, 9♂.

Megachilidae

Megachile lanata (Fabricius, 1775) **New island record**

This species has previously been recorded from O‘ahu, Moloka‘i, Maui, and Hawai‘i (Magnacca *et al.* 2013, Magnacca 2015, Matsunaga *et al.* 2019).

Material examined. **KAUA‘I**: PMRF Barking Sands, oxidation pond, 21.993°N 159.766°W, 24 Mar 2021, K.N. Magnacca, P032412-02, 1♂.

Megachile policaris **New island record**

This species was first detected in ‘Ewa, O‘ahu, and has previously been recorded from Maui and Hawai‘i (Koch *et al.* 2021). This is the first record from Kaua‘i. It is easily recognized by the expanded white tarsi of the males, used for covering the eyes of females during mating.

Material examined. **KAUA‘I**: PMRF Barking Sands, Nohili ditch, pan trap group 12, 22.0537°N 159.7764°W, PP032412-01, 24 Mar 2021, K.N. Magnacca & J.H. Preble, 1♀. PMRF, oxidation pond, on *Verbesina encelioides*, 21.993°N 159.766°W, 24 Aug 2021, K.N. Magnacca, P082413-01, 1♀. **O‘AHU**: Barbers Point, el. 0–5 ft [0–2 m], *Verbesina*, D.A. Yee & W.D. Perreira, 4 Sep 2015, 1♀. Barbers Point, el. 0–5 ft [0–2 m], W.D. Perreira: 13 Sep 2015, 1♂ 1♀; 6 Oct 2015, 1♂.

Mymaridae

Palaeomymar markhoddlei Triapitsyn, 2018 **New island record**

This species was described from California and Maui, and is presumed to be an egg parasitoid of the two-spotted leafhopper *Sophonia orientalis* (Matsumura) (Triapitsyn 2018). It is recorded here from Kaua‘i and O‘ahu, and likely occurs on the other islands as well.

Material examined. **KAUA‘I**: Kōke‘e site A, 1,115 m, pan trap, 22.113°N 159.669°W, 23 Apr 2021, J.H. Preble, 2♀. **O‘AHU**: Pia Gulch, 440 m, Townes Malaise trap, 21.3151°N 157.7425°W, 30 Aug–17 Oct 2023, K.N. Magnacca, 4♂.

Perilampidae

Perilampus chrysopae Crawford, 1914 **New state record**

This is a new state record for the family, which are quite distinct from any other wasps found in Hawai‘i (Fig. 33). It is a hyperparasitoid in lacewing cocoons, and found widely across the US (Smulyan 1936). Due to its life history it would be infrequently collected, so it is probably established despite the single record.

Material examined. **MAUI**: East Maui, Pulehu, ex cucumber, 2,150 ft [655 m], 27 Sep 1994, G.K. Uchida & C. McGrath, 1♀.

Figure 33. *Perilampus chrysopae* (Hymenoptera: Perilampidae).

Platygastridae

Platygaster acciculosis Drake, 1970 **New island record**

This species was described from Hawai‘i island, but there are earlier specimens from elsewhere. It is probably found on all islands.

Material examined. **KAUA‘I**: Kōke‘e, 17 Sep 1965, J.W. Beardsley, 1♀. Alaka‘i Swamp, 17 Sep 1965, J.W. Beardsley, 1♀. Honopū Trail, 1,245 m, 22.1468°N 159.6501°W, Townes Malaise trap, 18 May–27 Jul 2023, K.N. Magnacca, K23051804-115, 1♀. **O‘AHU**: Palolo Valley, reared ex *Diarthronomyia chrysanthemi*, 24–30 Nov 1949, M. Goto, 3♀. Mt. Ka‘ala, 4,000 ft [1,220 m], 28 Sep 1985, J.W. Beardsley, 1♀.

Synopeas* nr. *curvicauda (Förster, 1856) **New state record**

This minute parasitoid of cecidomyiid gall midges is very distinctive, with the ovipositor carried coiled in a ventral projection of the second metasomal sternum (Fig. 34). A large number of undescribed species in this group are known; the taxon found here appears similar to one found in Colombia (Hernandez-Mahecha *et al.* 2018), clearly differing from *S. curvicauda* in having the scutellum strongly convex dorsally.

Material examined. **KAUA‘I**: PMRF Barking Sands, WWVH road, on *Leucaena leucocephala*, 26 Aug 2021, K.N. Magnacca, P082604-04, 1♀. **MOLOKA‘I**: Mapulehu nr. ‘Ili‘ili‘ōpae Heiau, el. 10–40 ft [3–12 m], general sweeping, 20 Jan 1995, 2♀. Kapukahehu Beach, 5 ft [2 m], yellow sticky board trap, Apr–May 1995, W.D. Perreira, 1♀. Kualapu‘u, 1,750 ft [530 m], in coffee field, yellow sticky board trap, 12 May 1995, W.D. Perreira, 1♀.

Figure 34. *Synopeas* nr. *curvicauda* (Hymenoptera: Platygastridae).

Scelionidae

***Aradophagus* sp.** **New state record**

This peculiar genus is easily recognized by the very flat, foliose metasoma (Fig. 35). It is also mostly pale, whereas most other scelionids in Hawai‘i are dark. It does not fit any described species. A note by Beardsley accompanying the specimens says “Runs to *Aradophagus pulchricornis* Masner in Masner’s 1979 key, but antennae are not multicolored, coxae [and] trochanters not whitish. Prob. an undescribed sp.” Since all specimens were collected together near the port of Honolulu, it may not be established. However, members of the genus are rarely collected in general, and their true hosts are unknown (García & Masner 1994).

Material examined. **O‘AHU**: Honolulu, Pier 52, light trap, Aug 1985, J.W. Beardsley, 4♂.

Cremastobaeus* cf. *boolei Veenakumari, 2017 **New state record**

This species differs from the following by the all-dark body and shorter metasoma (about 1.5 times as long as the mesosoma, compared to 2 times; Fig. 36). In the key to Indian species (Veenakumari & Prashanth 2017) it runs to *C. boolei*, based primarily on the completely striate frontal depression. However, the scape is mostly brown rather than clear yellow, and with the undoubtedly large number of undescribed species (species in other regions have not been revised), it cannot be identified with confidence.

Material examined. **KAUA‘I**: Kipu Ranch, sweeping, 22 Sep 1993, C. Campbell, 1♀ (HDOA). **O‘AHU**: ‘Ewa, 18 Nov 1959, J.W. Beardsley, 2♀. ‘Ewa, J.W. Beardsley: 4 Aug 1965, 9♂ 14♀; 23 Sep 1965, 25♂ 7♀. Barbers Point, Apr 1966, J.W. Beardsley, 18♂ 30♀. Waimānalo sweeping, 6 Sep 1988, J.W. Beardsley, 4♂ 2♀. Waimānalo, sweeping, 2 Aug 1988, J.W. Beardsley, 1♂ 1♀.

Figure 35. *Aradophagus* sp. (Hymenoptera: Scelionidae).

Figure 36. *Cremastobaeus* cf. *boolei* (Hymenoptera: Scelionidae).

Figure 37. *Cremastobaeus* sp. (Hymenoptera: Scelionidae).

***Cremastobaeus* sp.** **New state record**

This species is easily recognized by the yellow body with a strongly contrasting dark brown to black head (Fig. 37). Of the 26 Oriental species (Veenakumari & Prashanth 2017), the only ones with similar coloration are *C. nigrocephalus* Veenakumari 2017, which differs in having a hump on T1, and *C. suvarnadeha* Veenakumari 2017, which has the metascutellum and posterior tergal margins smooth.

Material examined. **O'AHU**: Kului Gulch 450 m, on *Freycinetia arborea*, 21.314°N 157.745°W, 17 Apr 2024, K.N. Magnacca, O24041703-02, 1♀. **MAUI**: Launiupoko 760 m, Townes Malaise trap, 20.8582°N 156.5957°W, 19 Oct 2022–17 Mar 2023, K.N. Magnacca, M23031701-44, 1♀.

Encyrtoscelio mirissimus Dodd, 1914 **Identification, New island record**

This bizarre genus is immediately recognizable by the large, carinate frontal ledge and ventrally protruding mandibles, similar to *Calogalesus* (Fig. 38). It was previously recorded as *Encyrtoscelio* sp. (Beardsley 1989, Nishida 2002). In the revision of the genus (Caleca & Bin 1995), the Hawai'i taxon can be identified as *E. mirissimus* based on the large eye, mandible teeth, and head shape. The most similar species, *E. apterus* (Szelényi) and *E. miroides* Caleca, are also from Europe and Africa respectively and less likely to arrive in Hawai'i than the Australian *E. mirissimus*. Most individuals are micropterous, but a few macropterous females are present. They are evidently parasites of the eggs of burrowing bugs (Hemiptera: Cydnidae; Caleca & Bin 1995).

Material examined. **KAUA'I**: 13–17 Sep 1965, Kōke'e, J.W. Beardsley, 1♀. **O'AHU**: Honolulu, J.W. Beardsley, Jul 1965, 4♂ 2♀. Waipi'o Peninsula, 29 Dec 1965, J.W. Beardsley, 1♀. Ewa, Sep 1974, pit trap, J.W. Beardsley, 2♂ 1♀. Kailua, pitfall trap, 4 Oct 1976, J.W. Beardsley, 3♀.

Figure 38. *Encyrtoscelio mirissimus* (Hymenoptera: Scelionidae). Left: dorsal view. Right: lateral view.

Figure 39. *Paridris gorn* (Hymenoptera: Scelionidae). Top left: dorsal habitus. Top right: lateral habitus. Bottom left: oblique frontal view of head. Bottom right: T3–6 and partially extruded ovipositor.

Kailua, coconut grove, el. 10 ft [3 m], yellow sticky board trap, 17 Dec 1994–2 Jan 1995, W.D. Perreira, 2♂. Kalaeloa NWR, site 3 Malaise trap, 22 Jun 2023, M. Ross & N. Chan, 1♂. **LĀNA‘I**: Lāna‘i, ex pitfall trap, Dec 1985, J.W. Beardsley, 1♂ 3♀.

Paridris gorn Talamas & Masner, 2012 **New state record**

Easily recognized among the Hawaiian scelionids by the pair of short spines on the metanotum, in contrast to the median triangular projection found in the native *Opisthacantha* and other similar genera. It exactly matches the description and images of *P. gorn* in

Talamas *et al.* (2012), including the smooth T4–5 and constricted, finely punctate-rugulose T6 (Fig. 39). It is widespread in the southeastern US from Ohio through Georgia, and probably an egg parasitoid of crickets (Talamas *et al.* 2012). It is also very similar to *P. subplana* (Dodd) (= *P. coorgensis* Sharma) of southeast Asia (Talamas & Pham 2017, Talamas *et al.* 2024), and it is possible that it is an introduced species in the US, either synonymous with or closely related to *P. subplana* (E.J. Talamas, pers. comm.). Identification confirmed by E.J. Talamas.

Material examined. **O'AHU**: 'Ewa, light trap, Jun 1955, 1♀. **HAWAI'I**: Kona, H.T. Osborn, 4♀. Chain of Craters Road nr. 'Ālo'i crater, 3,000 ft [915 m], 23 Jun 1966, J.W. Beardsley, 2♀.

Figure 40. *Probaryconus cauverycus* (Hymenoptera: Scelionidae). Left: dorsal habitus. Right: oblique frontal view of head.

Probaryconus cauverycus Saraswat, 1978 **New state record**

Unlike all the other elongate scelionines present in Hawai'i, this genus has projections on the propodeum rather than the metanotum (Fig. 40). The female also has an anterior bulge on T1 as in *Paridris*. The antennae are all dark, but this appears to be a variable character; the holotype of *P. cauverycus* has the scape and clava dark and funicle pale, while the holotype of the synonym *P. karnatakensis* (Sharma) also has the scape pale (Talamas *et al*. 2017). Identification confirmed by E.J. Talamas.

Material examined. **O'AHU**: 'Ewa, alfalfa field, 14 Mar 1961, 1♂. Waimānalo, sweeping, 6 Sep 1988, J.W. Beardsley, 2♂ 2♀.

Trimorus lepidus Fouts, 1948 **New state record**

This is the first species of the subfamily Teleasinae recorded from Hawai'i. It runs to *T. lepidus* in the key of Fouts (1948), and exactly matches high-quality images of the holotype (Fig. 41). This species is unusual in having fully winged females and micropterous males; the male of *T. lepidus* has apparently not been previously recorded. Two additional species appear to be represented by single specimens collected around the same time from East Maui – one is also black with T1 deeply grooved but has the upper frons fully polished with few setae; the second is brownish with the grooves of T1 short, only covering the middle third, and almost the entire face smoothly polished except just above the mandibles. Both are smaller than *T. lepidus*, about 0.9 mm versus 1.2–1.4 mm. One *Trimorus* specimen was previously recorded from Hawai'i (Gruner 2004), but it could not be located and the description of it being faintly metallic green does not match any of

Figure 41. *Trimorus lepidus* (Hymenoptera: Scelionidae). Top left: female, lateral. Top right: female, oblique dorsal. Bottom left: female, face. Bottom right: male, lateral.

those here, so it may represent a fourth species. At least some species of *Trimorus* are known to be parasites of eggs of Carabidae (Fouts 1948), and these species may be having an impact on native *Blackburnia*, *Mecyclothorax*, or other native beetles.

Material examined. **MOLOKA'I**: Kamakou Preserve, 1,200–1,300 m, 7 Oct 1987, N. Reimer & J. Strazanac, 1♂ 1♀. **MAUI**: Waikamoi, J.W. Beardsley: 19 Jul 1965, 2♂ 4♀; 21 Jul 1965, 1♂; 24 Jul 1965, 1♂ 1♀. Maui I. (W[est]), 27 Oct 1966, T. Saigusa, 10♂. **HAWAI'I**: Ahumoa Crater, 6,500 ft [1,980 m], 21 Jun 1966, J.W. Beardsley, 1♂. Kīpuka Kī, 7 Apr 1972, 1♂.

Vespidae

Delta latreillei petiolare (Schulz, 1904) **Possibly extirpated**

This species has been erroneously listed as endemic in the Hawaiian checklist (Nishida 2002), despite having been described from New Guinea and originally recorded as an adventive species (Townes 1947); Carpenter (2008) noted that the genus *Delta* is adventive in Hawai'i. No specimens more recent than 1966 are present in collections or observed on citizen science websites – unusual for such a large, conspicuous wasp, and where the similar *D. pyriforme philippinense* and *D. curvatum* are commonly seen – suggesting it may now be extirpated from Hawai'i.

Eumenes punctatus de Saussure, 1852 **New state record**

Several of the *Delta* species in Hawai'i were first recorded as *Eumenes*, but this is the first member of *Eumenes s.s.* to be found here. It is mostly black with some small yellow markings. Among vespids present in Hawaii, it superficially resembles a small *Delta pyriforme*

Figure 42. *Eumenes punctatus* (Hymenoptera: Vespidae).

philippinense. It is easily separated from all the *Delta* and *Phimenes* species by the coloration and the strong, close punctation of the body, including the metasoma (Fig. 42). It is distinctly different from *E. mediterraneus*, introduced to Tahiti, which has the petiole broader and more abruptly expanded, and with much more extensive yellow marks. Although so far known from only a single specimen, it is likely established since it was found well into native forest.

Material examined. **O'AHU**: Pahole Gulch, 585 m, on *Pipturus albidus*, 21.5415°N 158.1928°W, 6 Jan 2023, W. Haines, 1♀.

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Liverworts (Marchantiophyta) of the Kaua‘i summits, Hawai‘i, with two new state records and five new island records[1]

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Abstract. A 2024 survey by the second author of the liverworts (Marchantiophyta) of Wai‘ale‘ale on the “Kaua‘i Summits”, high elevation (1,450–1,598 m) very wet bogs and bog forests, revealed 65 species. When historical records are included, 73 species have now been documented from Wai‘ale‘ale and Kawaikini. Rare species documented in the present survey include state records for the Asian disjunct species *Marsupella* cf. *stoloniformis* and *Plagiochila* cf. *recurvata*; new island records for *Chiloscyphus lambertonii, Cryptolophocolea bartlettii, Drepanolejeunea pentadactyla, Plagiochila caduciloba,* and *Southbya organensis*; and a probable new holostipous species of *Cheilolejeunea* related to *C. stenoschiza*. A recently invasive exotic, *Telaranea nematodes,* is present.

INTRODUCTION

> “…The summit of Wai‘ale‘ale is cool and windswept as well as being one of the wettest spots in the world. The presence of a Himalayan species [the disjunct leafy liverwort *Calypogeia aeruginosa*] in this situation suggests that the high, cool, and fog-shrouded bogs of Hawai‘i may reveal similar disjunct distributions when they are carefully explored bryologically…” (Miller 1963: 500).

> “…The summit bogs of Wai‘ale‘ale and Kawaikini are amazing and still harbor extraordinary diversity waiting to be discovered and studied….” (Kenneth R. Wood, pers. comm., 23 Sep 2024).

Bryologist Harvey A. Miller’s (1928–2020) prophetic description of the summit bogs (Wai‘ale‘ale and Kawaikini) of Kaua‘i, echoed by Ken Wood, still resonates today. High-elevation Hawaiian bogs continue to reveal new and overlooked bryophytes, such as the recently described *Kahakuloa operculispora* A.V. Freire, Judz., Cargill, L.L. Forrest & Gradst. (Freire *et al.* 2023) from Maui, which represents a new genus and family, as well.

On Kaua‘i, Wagner *et al.* (1990:103) described the summit of Wai‘ale‘ale as a *Metrosideros/Dubautia/Oreobolus* bog dominated by sedges (*Oreobolus furcatus* H. Mann*, Rhynchospora rugosa* Gaudich. subsp. *lavarum* (Gaudich.) T. Koyama), the grass *Deschampsia nubigena* Hillebr., bryophytes (Fig. 1) grading into a forest dominated by *Metrosideros* (Fig. 2). These habitats are ideal for a diverse suite of hepatics. The present study encompasses all liverwort collections made in the summit bogs and adjacent forests from 1,450 m elevation to the summits of Wai‘ale‘ale (1,569 m) and Kawaikini (1,598 m).

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Figure 1. Waiʻaleʻale, Kauaʻi summit forest, photo by K. Faccenda, 24 Feb 2024. Note abundance of epiphytic liverworts, often reddish in color and principally of the genera *Bazzania*, *Cuspidatula*, *Herbertus*, and *Pleurozia*.

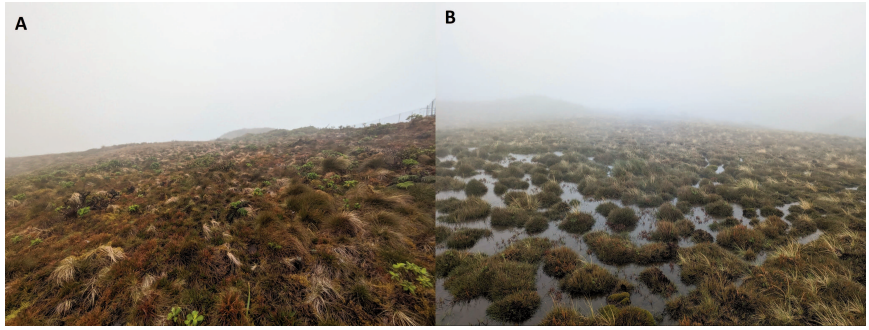

Figure 2. Wai‘ale‘ale, Kaua‘i summit bog. **A**, Dominated by the grass *Deschampsia nubigena*, 24 Feb 2024. **B**, Dominated by the sedge *Rhynchospora chinensis*, 18 Jun 2024. Photos by K. Faccenda.

HISTORY OF HEPATOLOGICAL EXPLORATION

The Swedish-led Hawaiian Bog Survey of 1938 led by Carl Skottsberg, Lucy M. Cranwell, Olof H. Selling, and Folke Fagerlind, were the first to collect on the Summits; on 23 August 1938 they collected on Wai‘ale‘ale summit and documented eleven species of liverworts, including the uncommon and rare species *Acromastigum integrifolium, Anastrepta orcadensis* (the first Hawaiian collection) and *Calypogeia aeruginosa* (the first and, so far, only Hawaiian collection); these collections are housed in the Stockholm Herbarium (acronym S) and were not examined in the present study, and no records of these specimen are available to study online. All of them, however, were studied and cited by Miller (1963). A duplicate of at least one of these Stockholm collections (*Calypogeia aeruginosa*) was available for study by us at Miami University (MU), Miller’s base of operations for many years.

The next series of collections were made nearly 70 years later, by National Tropical Botanical Garden personnel Timothy W. Flynn, Kenneth R. Wood, and collaborators; they are deposited at the National Tropical Botanical Garden (PTBG), with a subset of duplicates distributed to Bernice P. Bishop Museum (BISH) and other herbaria, including the California Academy of Sciences (CAS), the Royal Botanic Garden Edinburgh (E), and The Field Museum of Natural History (F). A few were made in 2007, but the majority were made from 2015–2022, mostly on Kawaikini. They collected a total of 28 species.

Finally, the second author (Faccenda) made two forays to Wai‘ale‘ale summit on 24 February 2024 (collection numbers 3307–3376) and 18 June 2024 (collection numbers 3490–3540) and collected 121 numbers, including 65 species of liverworts; 32 of these species were new to the summits. Sets of these collections are deposited at both BISH and PTBG. It should be emphasized that the letters which follow the collection numbers (for example, 3313b versus 3313f) refer to the same specimen packet.

THE PRESENT SURVEY

While visiting the Kauaʻi summits for two days, Faccenda observed that the habitat is almost entirely dominated by native vascular plant species. In efforts to protect this habitat, part of the summit is fenced and almost entirely ungulate-free, but part is unfenced, and ungulate tracks were observed there. As is the case for most habitats in Hawaiʻi, some weeds are beginning to invade; the exotic grass *Andropogon bicornis* L. was rarely observed along disturbed areas along fence lines where its seed likely blew in, but its growth is stunted. Similarly, the exotic grass *Microlaena stipoides* (Labill.) R. Br. is found along fence lines and is uncommon but beginning to form stands several meters long. Some *Axonopus fissifolius* (Raddi) Kuhlm. (Poaceae, exotic) was seen in disturbed areas but is uncommon. The most aggressive weed is the rush *Juncus planifolius* R. Br., which is abundant along fence lines and has begun spreading into the summit bog. *Juncus planifolius* has a very weak, fibrous root system that does a poor job stabilizing soil and needs disturbed soil to expand; hence, it is common in ungulate-influenced areas. It forms a near monoculture in some areas; however, it is likely that removal of ungulate disturbance would allow for the recolonization of native species.

The quantity of liverworts in the summit forest is astounding; they cover almost all surfaces, from skirts on lower tree trunks up to almost 5 cm thick, to small populations on higher parts of trees which stay appressed so as to not blow away. Nearly every plant stem is covered in liverworts, as are all surfaces of dead wood, rocks, and bare soil; the abundant moisture allows liverworts to grow in nearly any condition. At the heiau at Lake Waiʻaleʻale, all surfaces were overgrown with liverworts, with the exception of a small patch of coral that was still free of plant growth. Mosses are also common, but greatly exceeded by the liverworts in terms of biomass. The summit forest is dominated by *Bazzania* species. This genus must constitute over 90% of the biomass of liverworts in the forest and covers the lower surfaces of ʻōhiʻa trees in mats several cm thick (Fig. 1). The liverwort *Anastrophyllum fissum* also forms large turfs on tree trunks but is uncommon. *Frullania apiculata* is abundant in the midcanopy, as is *Pleurozia subinflata*. On some trees, *Pleurozia subinflata* is more common than *Bazzania*, often in more wind-exposed habitats. Many other species are found in lower quantities on smaller branches. On surfaces of open bogs, *Pleurozia conchifolia* is common and very distinctive due to its size and unique blackish-purplish growth (Fig. 28). *Odontoschisma denudatum* subsp. *denudatum* is common, growing on exposed soil in open bogs where it is not outcompeted by other liverworts.

Due to logistics and rigorous conditions, Faccenda spent about ten hours in the field, and less than half of that time actively searching for liverworts. We expect there is still much undocumented diversity on the Summits; the lack of relocation of several species should not be taken to imply that they are absent.

Acrobolbaceae

Acrobolbus integrifolius (A. Evans) Briscoe

(Fig. 3)

An uncommon endemic species known from Kauaʻi, Molokaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 4–5).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, light green, lithophytic on stream bank walls, common, 22.062529°N, 159.498224°W, 1,573 m, 21 Jan 2015, *K.R. Wood, S. Perlman & M. Query 16249* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-

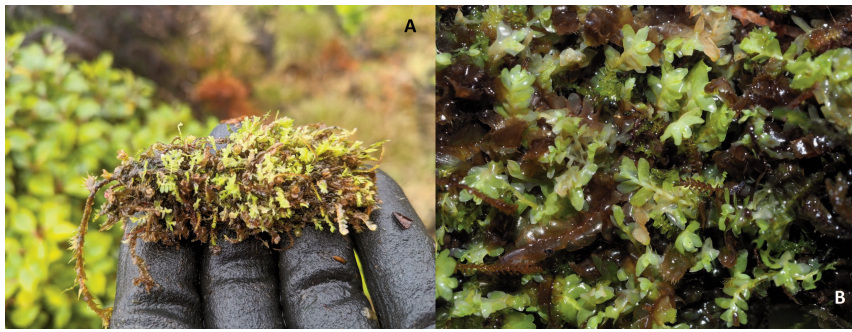

Figure 3. *Acrobolbus integrifolius*. Waiʻaleʻale summit. *Faccenda 3522a* (BISH, PTBG). Photos by K. Faccenda.

statured wet forest with open bog habitat dissected by headwater drainages, thinly matting, leaves yellow-green, common, 22.056746°N, 159.495587°W, 1,585 m, 28 Jan 2022, *K.R. Wood & B. Nyberg 18901* (PTBG); Waiʻaleʻale, extremely wet area at summit rim, terrestrial, 1,552 m, 18 Jun 2024, *K. Faccenda 3522a* (BISH, PTBG).

Adelanthaceae

Cuspidatula labrifolia (H.A. Mill.) A.V. Freire & Judz.

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 4–5).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet area at summit rim, 1,466 m, 18 Jun 2024, *K. Faccenda 3519b* (BISH, PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3307c, 3314f, 3315e, 3317d, 3320a, 3329c* (BISH, PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, open bog, terrestrial on bog floor, 1,463 m, 26 Feb 2024, *K. Faccenda 3329c* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3364e, 3369c, 3371b, 3372g, 3374a* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, exposed area, epiphyte, common, 1,552 m, 18 Jun 2024, *K. Faccenda 3519a, 3524* (BISH, PTBG).

Cuspidatula robusta (Austin) Váňa & L. Söderstr.

A common indigenous endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 11). First documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 510), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5232* (S, not examined), as *Jamesoniella macrophylla*.

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, purple-red, matting trunks, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18554* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3308b, 3310, 3313b, 3314c, 3316b, 3322e* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3339c, 3340b, 3341d, 3348c, 3349a, 3352, 3353c, 3354c, 3355c, 3356d, 3367d, 3369d* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3491a* (BISH, PTBG).

Aneuraceae

Riccardia hawaica (Steph.) H.A. Mill.

First documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 528), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5076* (S, not examined). T. Furuki's 8 Feb 2000 annotation of the Geneva type [link] indicates that *Riccardia hawaica* Steph. is a synonym of the tropical Asian, Australasian, and Oceania species *Riccardia graeffei* (Steph.) Hewson. Accordingly, the species could be considered as either endemic or indigenous. Among our undetermined species of *Riccardia*, we were unable to confirm the presence or absence of this species.

Riccardia sp.

Riccardia is a difficult genus in Hawaiʻi and we are unable to provide specific determinations of the specimens below. It is uncertain how many species occur on the Summits.

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9138* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3318a, 3320b, 3325b* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3336* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, on rotting ʻuki (*Machaerina angustifolia*) leaf base, 1,524 m, 26 Feb 2024, *K. Faccenda 3354a, 3359h, 3360, 3366a, 3376a* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, open, exposed area in bog, terrestrial on soil, south-facing aspect, 1,546 m, 18 Jun 2024, *K. Faccenda 3490c, 3492d, 3493i, 3495i, 3500b, 3508a, 3511b* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia, Rhynchospora* as dominant vascular plants and *Pleurozia conchifolia* very common, 1,551 m, 18 Jun 2024, *K. Faccenda 3536c* (BISH, PTBG).

Calypogeiaceae

Asperifolia arguta (Nees & Mont.) A.V. Troitsky, Bakalin & Maltseva

A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Judziewicz & Freire 2023: 160).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, with *Symphyogyna*, 1,465 m, 18 Jun 2024, *K. Faccenda 3495c* (BISH, PTBG).

Calypogeia aeruginosa Mitt.

(Figs. 4–5)

A rare indigenous species known in Hawaiʻi only from Kauaʻi, where documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 498), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5100* (S, not examined), *L. Cranwell, O. Selling & C. Skottsberg 5237* (isotype, MU!; holotype, S, not examined). This is an eastern Asian species (Sun *et al.* 2018: 160) known from India (Sikkim), China, Vietnam, and Taiwan, and is disjunct on Kauaʻi. It has not been seen again after the 1938 collections. These striking plants have very broad holostipous underleaves and are blackish in color. Bakalin *et al.* (2020: 116) question whether Hawaiian material is conspecific with Asian populations but present no evidence for this conclusion. If it is recognized as a distinct species, the correct name would be *Calypogeia waialealeensis* (H. A. Mill. & Kuwah.) H.A. Mill. (Miller 1967).

Figure 4. *Calypogeia aeruginosa*. Wai‘ale‘ale summit, *Cranwell et al. 5237* (MU). **A**, Dorsal view showing imbricate and concave leaves. **B**, Underleaves are large, broader than long and imbricate. **C**, Leaves are rounded, do not spread, are cupped towards the plant ventral side, and have inrolled margins. **D–E**, Rounded leaves. Photos by A.V. Freire

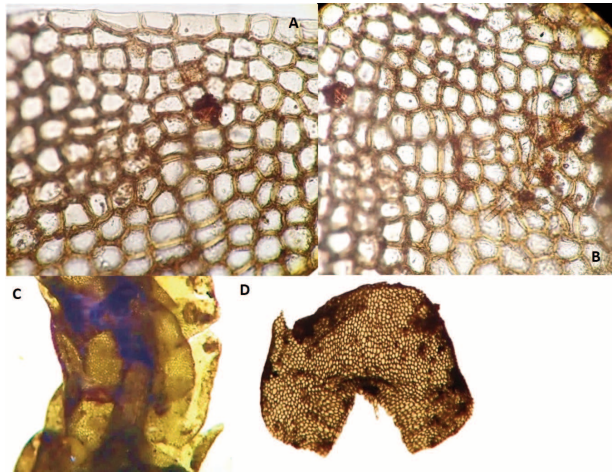

Figure 5. *Calypogeia aeruginosa*. *Cranwell et al. 5237* (MU). **A**, Detail of leaf border formed by horizontally elongated marginal cells with thin outer walls (above). This border is not always well defined. **B**, Median leaf cells appear thick walled. **C–D**, Underleaves are auriculate, nearly 1 mm wide, and with a very arched insertion. Scale = 1 mm. Photos by A.V. Freire.

Calypogeia cuspidata (Steph.) Steph.
A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3491i, 3493f, 3495d, 3496d, 3498g* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, extremely wet area, with moss, 1,549 m, 18 Jun 2024, *K. Faccenda 3517f* (BISH, PTBG).

Calypogeia tosana (Steph.) Steph.
A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 12).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet area near summit rim, deeply shaded area dominated by native vegetation, very wet with flowing water, 1,544 m, 18 Jun 2024, *K. Faccenda 3501b* (BISH, PTBG).

Mnioloma fuscum (Lehm.) R.M. Schust.
An uncommon indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 5).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, 1,465 m, 18 Jun 2024, *K. Faccenda 3496f, 3498a* (BISH, PTBG).

Cephaloziaceae
Cephalozia sp.
An uncommon indigenous genus known from Kauaʻi, Oʻahu, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 5). We are uncertain whether this specimen should be assigned to *C. lucens* (A. Evans) Steph. or *C. maxima* Steph. Both species are endemic to Hawaiʻi.

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim. Deeply shaded area dominated by native vegetation, 1,465 m, 18 Jun 2024, *K. Faccenda 3496a, 3496b* (BISH, PTBG).

Cephalozia sp. (?)
(Fig. 6)
We tentatively identified this as a species of *Cephaloziella*; however, it has larger leaves than any other collection of Hawaiian *Cephaloziella* we have examined—the leaf lobes are 10–11 cells high and 7–8 cells wide. Moreover, the cell walls are thin-walled, as in *Cephalozia*, rather than thick-walled, as in *Cephaloziella*. The smaller, lower (postical) leaf lobe has a slightly hooked apex. We have seen no other Hawaiian material resembling this collection. We did not have the opportunity to examine this specimen for the presence or absence of a hyalodermis.

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, mixed with *Herbertus gracilis*, 22.056746°N, 159.495587°W, 1,585 m, 22 Jan 2022, *K.R. Wood & B. Nyberg 18891b* (PTBG).

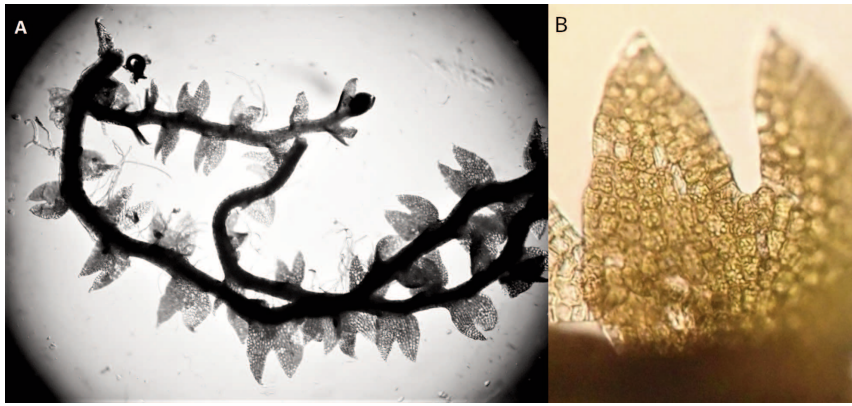

Figure 6. *Cephalozia species* (?). Kawaikini summit, *K.R. Wood & B. Nyberg 18891b* (PTBG). **A–B**, We tentatively identify this as a species of *Cephaloziella*, but it has larger leaves than any other collection of Hawaiian *Cephaloziella* we have examined; the lobes are 10–11 cells high and 7–8 cells wide, moreover, the cell walls are thin-walled rather than thick-walled. The smaller, lower (postical) leaf lobe has a slightly hooked apex. We have seen no other Hawaiian material resembling this collection.

Fuscocephaloziopsis baldwinii (C.M. Cooke) Váňa & L. Söderstr.

An uncommon endemic species known from Kauaʻi, Molokaʻi, Maui, and Hawaiʻi (Judziewicz & Freire 2023: 160).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, with *Mnioloma fuscum*, 1,465 m, 18 Jun 2024, *K. Faccenda 3495o, 3498b* (BISH, PTBG).

Fuscocephaloziopsis connivens (Dicks.) Váňa &
L. Söderstr. subsp. ***sandwicensis*** (Mont.) Váňa & L. Söderstr.

A common indigenous subspecies known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 14).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, with *Riccardia*, 1,524 m, 26 Feb 2024, *K. Faccenda 3366b* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1,200 m W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3491h, 3493b* (BISH, PTBG).

Odontoschisma denudatum (Mart.) Dumort. subsp. ***denudatum***

A common indigenous subspecies known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz & Freire 2023: 161).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, leaves short-matting with red-purple tinge, uncommon, 22.060976°N, 159.498005°W, 1,573 m, 21 Jan 2015, *K.R. Wood, S. Perlman & M. Query 16265* (in part) (PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 500 m W of summit rim, bog surface on soil, forming a uniform carpet on the soil in this bog, very dark black and uniform in texture, with water lichen (*Siphula subulata*), *Rhynchospora, Dicranopteris,* and *Metrosideros*, 1,523 m, 18 Jun 2024, *K. Faccenda 3499* (BISH, PTBG);

Waiʻaleʻale, extremely wet area near summit rim, open, exposed area in bog, terrestrial on soil, south-facing aspect, extremely wet area, 1,546 m, 18 Jun 2024, *K. Faccenda 3505.5* (BISH, PTBG).

Odontoschisma denudatum (Mart.) Dumort. subsp. ***sandvicense*** (Ångstr.) Gradst., S.C. Aranda & Vanderp.
A common endemic subspecies known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz & Freire 2023: 161).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, bog floor, 1,524 m, 26 Feb 2024, *K. Faccenda 3376g* (BISH, PTBG).

Frullaniaceae
Frullania apiculata (Reinw., Blume & Nees) Nees
An abundant indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 15). First documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 518), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5222* (S, not examined).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18530, 18559* (PTBG); same locality, *T. Flynn, K.R. Wood & B. Nyberg 9140* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3309d, 3311a, 3315b, 3319c, 3321b* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3362e, 3363a, 3364b, 3365d, 3369j* (BISH, PTBG).

Frullania hypoleuca Nees
An abundant indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 16).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3307e, 3309b, 3314g* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,552 m, 18 Jun 2024, *K. Faccenda 3532d* (BISH, PTBG); also *K. Faccenda 3347c, 3375e.*

Frullania meyeniana Lindenb.
An abundant indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 16).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17796* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, with *Riccardia*, 1,463 m, 26 Feb 2024, *K. Faccenda 3317b, 3318b*, *3320d* (BISH, PTBG).

Gymnomitriaceae
Marsupella cf. ***stoloniformis*** N. Kitag. **New state record**
(Figs. 7–10)
This tiny, rare, indigenous plant represents a new state record for Hawaiʻi and is also the first record of *Marsupella* sect. *Stolonicaulon* (N. Kitag.) Váňa (Kitagawa 1967; Schuster 1996: 68–72; Bakalin *et al.* 2022) for the state. It may be most closely related if not identical to *M.*

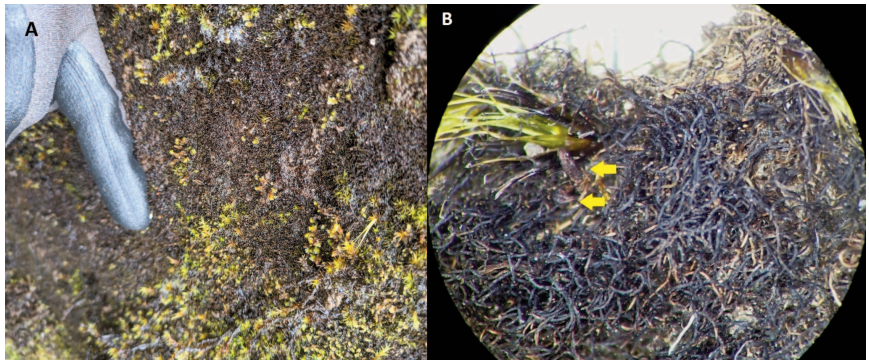

Figure 7. *Marsupella* cf. *stoloniformis*. Wai‘ale‘ale summit, Kaua‘i, *K. Faccenda 3505a* (BISH, PTBG). Plants are minute, forming a blackish mat on bog floor; stems and leaves are ca. 100 µm wide. **A**, K. Faccenda photo. **B**, Perianths are 0.7–0.8 mm long. Photo by E.J. Judziewicz.

Figure 8. *Marsupella* cf. *stoloniformis*. Wai‘ale‘ale summit, Kaua‘i, *K. Faccenda 3505a* (BISH, PTBG). **A**, Perianth subtended by larger bifid leaves. Photo by A.V. Freire. **B**, Androecial branch (arrow) ca. 0.5 mm long. Photo by E.J. Judziewicz.

stoloniformis, a species known from montane China (Yunnan and Taiwan), Nepal, Bhutan, Vietnam, Malaysia (Mt. Kinabalu), and Papua New Guinea (Mt. Wilhelm). It is a tiny, blackish plant with stems and leaves only 100 µm wide and forms wiry, tangled mats on the bog floor. The stems have thin-walled cells and the leaves are entire, ovate-triangular, subacute to rounded, and have thin-walled cells 20–25 µm wide; each cell has several large (6–8 µm in diameter) smooth oil bodies. The perigynia/perianths are 0.7–1 mm long and are subtended by several larger leaves that are slightly (10–15%) bifid rather than entire. Androecial branches are 0.4–0.5 mm long and have 4–5 pairs of androecia.

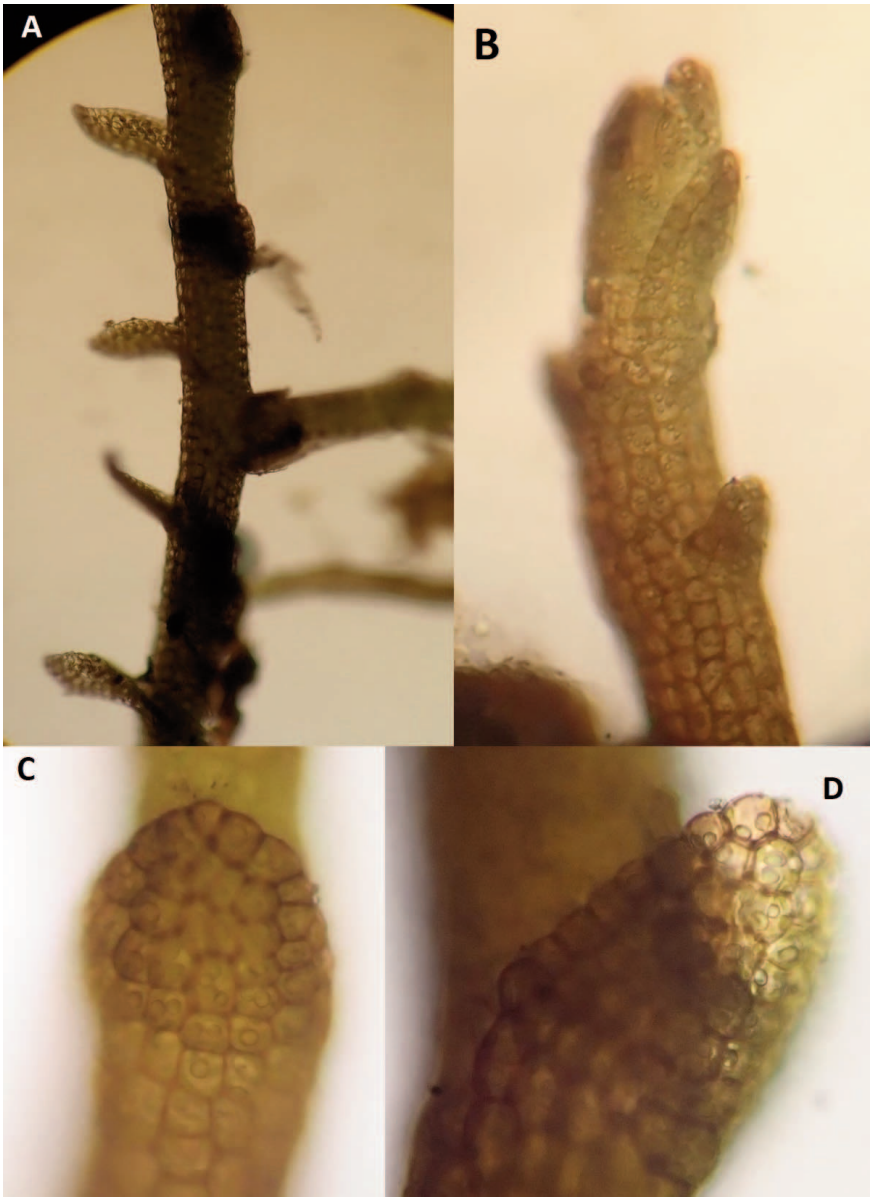

Figure 9. *Marsupella* cf. *stoloniformis.* Waiʻaleʻale summit, Kauaʻi, **A**, Branching pattern. **B**, Apex of shoot. **C–D**, Leaves and stems. The leaves (ca. 100 µm long) are entire and about as wide as the stem; leaf cells thin walled. Note large, smooth, spherical oil bodies. *K. Faccenda 3505a* (BISH, PTBG). Photos: A.V. Freire & E.J. Judziewicz.

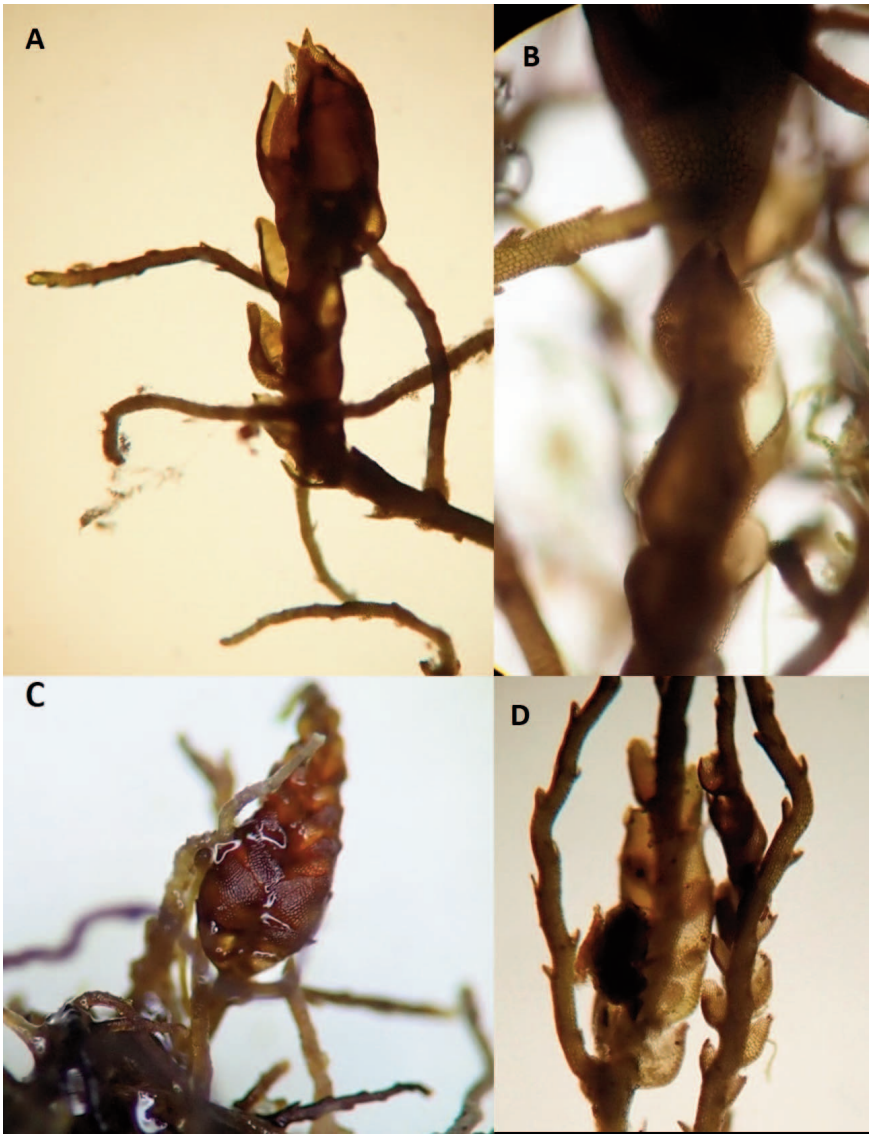

Figure 10. *Marsupella* cf. *stoloniformis*. Wai‘ale‘ale summit, Kaua‘i, *K. Faccenda 3505a* (BISH, PTBG). **A–B**, Gynoecial branches; note larger, bifid leaves below perianth. **C–D**, Androecial branches. Photos by A.V. Freire.

Material examined. **KAUA‘I**: Wai‘ale‘ale, extremely wet area near summit rim, open, exposed area in bog, terrestrial on soil, south-facing aspect, extremely wet area, forming a blackish mat on bog floor, 1,546 m, 18 Jun 2024, *K. Faccenda 3505a* (BISH, PTBG).

Herbertaceae

Herbertus aduncus (Dicks.) Gray

An abundant indigenous species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Judziewicz & Freire 2023: 162). First documented from the Kaua‘i Summits by the Hawaiian Bog Survey (Miller 1963: 490), Wai‘ale‘ale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5232* (S, not examined), as *H. sanguineus*.

Material examined. **KAUA‘I**: Wai‘ale‘ale summit bogs, dissected with riparian vegetation of *Metrosideros-Cheirodendron* forest, epiphytic on *Metrosideros*, red-purple leaves, along rim, common, 1,524 m, 8 Mar 2007, *K.R. Wood & M. DeMotta 12311* (PTBG); Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, with *Cuspidatula robusta, Bazzania emarginata, Frullania, Plagiochila, Drepanolejeunea anderssonii* and *Radula cavifolia*, 1,463 m, 26 Feb 2024, *K. Faccenda 3313a* (BISH, PTBG); Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, open bog, terrestrial on bog floor, 1,463 m, 26 Feb 2024, *K. Faccenda 3321c, 3328b, 3329a* (BISH, PTBG); Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale 1,524 m, 26 Feb 2024, *K. Faccenda 3337c, 3343a, 3348d, 3356c, 3357c, 3367a, 3375c* (BISH, PTBG).

Herbertus gracilis (Mont.) Steph.

A common indigenous species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Judziewicz, Freire & Bogner 2023: 17). First documented from the Kaua‘i Summits by the Hawaiian Bog Survey (Miller 1963: 490), Wai‘ale‘ale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5111, 5236* (S, not examined).

Material examined. **KAUA‘I**: Kawaikini summit region, small, protected gully of open, canopied trees shrubby trees and ferns with *Metrosideros, Sadleria, Gahnia, Vaccinium, Dubautia*, epiphytic on ‘ōhi‘a, 22.05811°N, 159.4969°W, 1,576 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9139* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17775* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, 22.056746°N, 159.495587°W, 1,585 m, 22 Jan 2022, *K.R. Wood & B. Nyberg 18891a* (PTBG); Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3314d, 3315c* (BISH, PTBG); Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3363d, 3371e* (BISH, PTBG); Wai‘ale‘ale, extremely wet native-dominated forest about 1.2 km W of summit rim, on ground in low shrubby area, 1,454 m, 18 Jun 2024, *K. Faccenda 3492c, 3493g, 3494f, 3495g, 3497b* (BISH, PTBG); Wai‘ale‘ale, extremely wet area at summit rim, 1,466 m, 18 Jun 2024, *K. Faccenda 3519c* (BISH, PTBG); Wai‘ale‘ale, extremely wet area at summit rim, 1,486 m, 18 Jun 2024, *K. Faccenda 3525b* (BISH, PTBG); Wai‘ale‘ale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia*, *Rhynchospora* as dominant vascular plants, and *Pleurozia conchifolia* very common, 1,551 m, 18 Jun 2024, *K. Faccenda 3535a, 3537b, 3539.1c* (BISH, PTBG).

Herbertus sp.

Herbertus is a problematic genus in Hawai‘i and we are unable to provide specific determinations to the specimens below.

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, with *Riccardia*, 1,463 m, 26 Feb 2024, *K. Faccenda 3317c* (BISH, PTBG); Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3339d, 3340a, 3351c, 3361, 3364h, 3365b, 3369a, 3372a, 3373b* (BISH, PTBG); Wai‘ale‘ale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia, Rhynchospora* as dominant vascular plants and *Pleurozia conchifolia* very common, 1,551 m, 18 Jun 2024, *K. Faccenda 3537a, 3539.4c* (BISH, PTBG); Wai‘ale‘ale, extremely wet area near summit rim, deeply shaded area dominated by native vegetation, very wet with flowing water, 1,544 m, 18 Jun 2024, *K. Faccenda 3504b* (BISH, PTBG).

Figure 11. *Cheilolejeunea* species. Kawaikini summit, *K.R. Wood, T. Flynn, B. Nyberg 18546* (PTBG). **A–B**, Field photos by Kenneth R. Wood, who reported it as common and with a “tan to yellow-green” color. **C–D**, Photos by E.J. Judziewicz.

Lejeuneaceae

Cheilolejeunea sp.

(Figs. 11–13)

This probable new species is known from both the Kawaikini and Wai‘ale‘ale summits. Among Hawaiian species it appears to most closely resemble the Hawaiian endemic *C. stenoschiza* (Ångstr.) A. Evans, but our species, unlike all other Hawaiian congeners, has entire (holostipous) rather than bifid (schizostipous) underleaves; the ventral merophyte appears to be 4 cells wide. The leaves have somewhat inflexed lobes and evident trigones; the lobules are large, wide, and rectangular with a single short tooth or occasionally a hint of a second, more proximal tooth. We could not find slime papillae. The oil bodies are

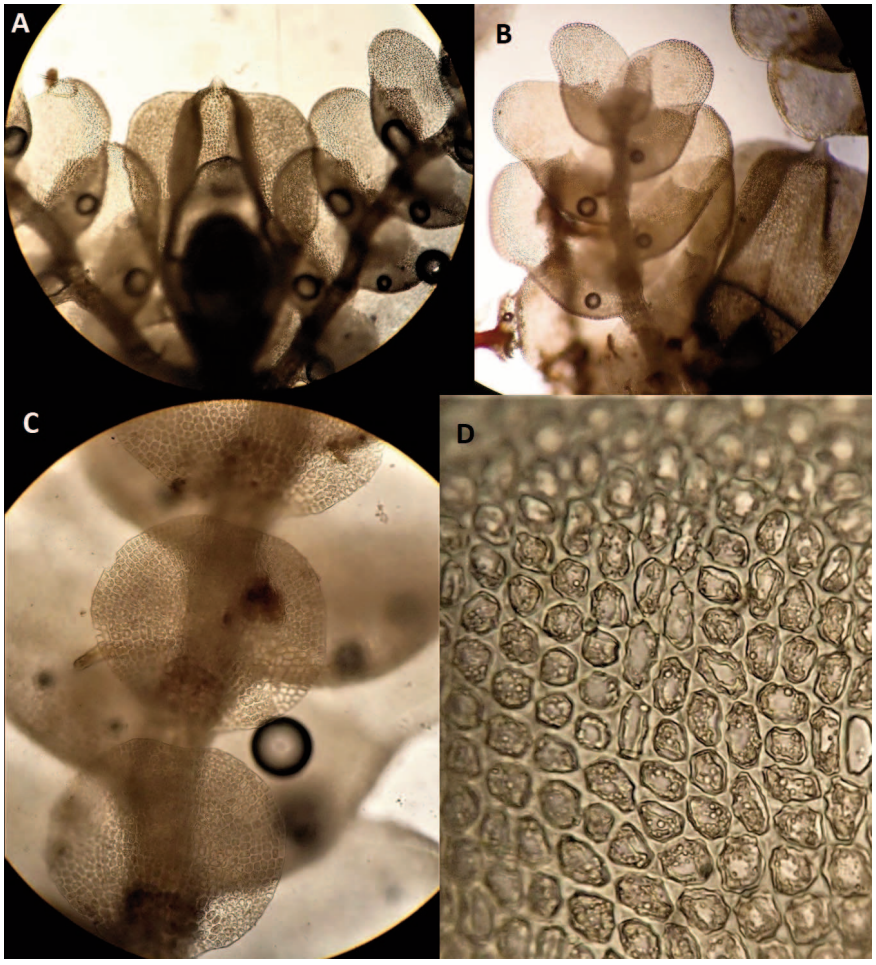

Figure 12. *Cheilolejeunea* species. Kawaikini summit, *K.R. Wood, T. Flynn, B. Nyberg 18546* (PTBG). **A–B**, Note keeled perianths. **C**, Underleaves are holostipous, about five times wider than the stem, and slightly wider than long. The ventral merophyte appears to be four cells wide. **D**, Leaf lobe cells have evident trigones. Photos by E.J. Judziewicz.

degraded and difficult to interpret but may be large and few in number (2–3), as is typical for species of *Cheilolejeunea*. There are abundant ribbed perianths.

Material examined. **KAUA'I**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, tan to yellow-green, epiphytic on twigs of *Metrosideros*, common, with *Melicope, Myrsine, Dubautia, Cheirodendron, Metrosideros, Coprosma, Labordia, Psychotria, Vaccinium,* and *Kadua,* fern genera include *Asplenium, Adenophorus, Dryopteris, Sadleria, Elaphoglossum, Polypodium, Lycopodium,* and *Cibotium,* terrestrial and epiphytic bryophytes and lichen are abundant, bogs are dominated by *Rhynchospora, Dichanthelium, Carex, Gahnia, Deschampsia, Machaerina, Oreobolus, Vaccinium,*

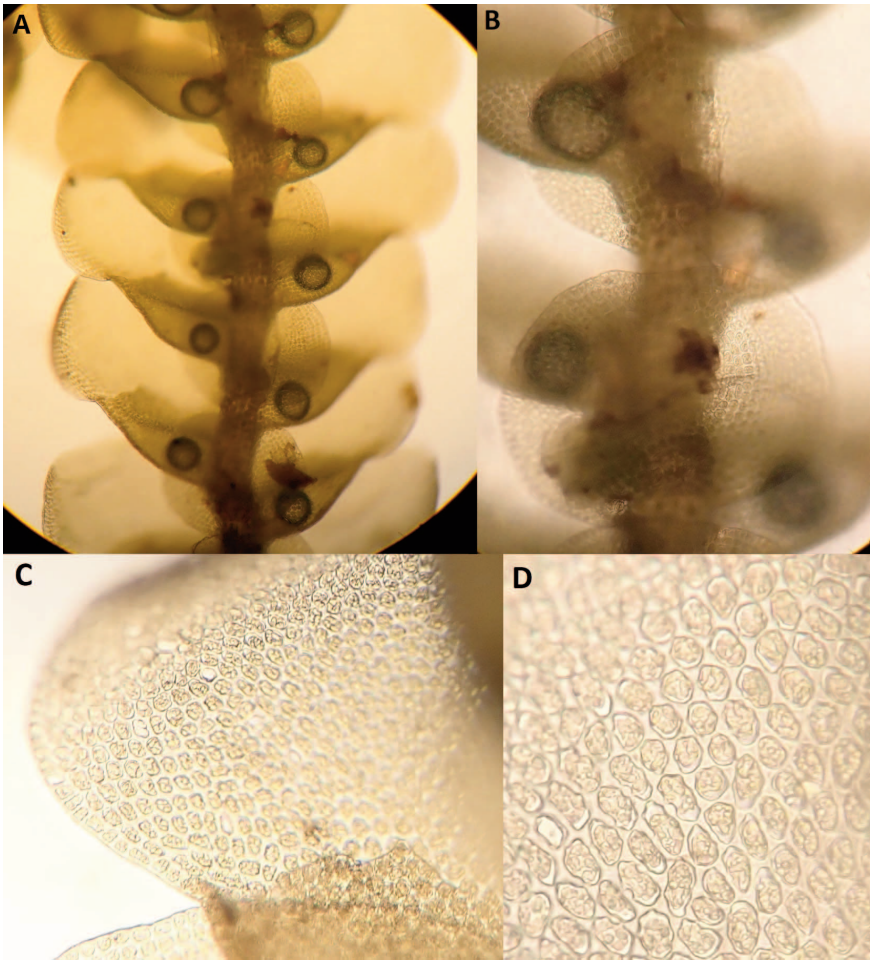

Figure 13. *Cheilolejeunea* species. Wai‘ale‘ale summit, *K. Faccenda 3346* (BISH). **A–D**, Note broad, one-toothed lobules and lobes with evident trigones. Photos by E.J. Judziewicz.

Keysseria, Plantago, Peperomia, Viola, and *Nertera*, with hard stony substrate and scattered rock outcrops, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18546* (PTBG); Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale, open, windswept summit bog, epiphyte, with *Frullania meyeniana*, plants 1 mm wide, holostipous, 1,524 m, 26 Feb 2024, *K. Faccenda 3346a* (BISH, PTBG).

Colura tenuicornis (A. Evans) Steph.

A common indigenous species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Judziewicz, Freire & Bogner 2023: 17).

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, with *Frullania apiculata*, 1,463 m, 26 Feb 2024, *K. Faccenda 3311b* (BISH, PTBG).

Drepanolejeunea anderssonii (Ångstr.) A. Evans
A common endemic species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Judziewicz, Freire & Bogner 2023: 19).

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, with *Herbertus aduncus, Cuspidatula robusta, Bazzania emarginata, Frullania, Plagiochila, Drepanolejeunea anderssonii* and *Radula cavifolia*, 1,463 m, 26 Feb 2024, *K. Faccenda 3313g* (BISH, PTBG); Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, 1,463 m, 26 Feb 2024, *K. Faccenda 3321d* (BISH, PTBG); Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3364d* (BISH, PTBG).

Drepanolejeunea pentadactyla (Mont.) Steph. **New island record**
A rare indigenous species previously known from O‘ahu (Judziewicz & Freire 2023: 163).

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, with *Herbertus aduncus, Cuspidatula robusta, Bazzania emarginata, Frullania, Plagiochila, Drepanolejeunea anderssonii* and *Radula cavifolia*, 1,463 m, 26 Feb 2024, *K. Faccenda 3313f* (BISH, PTBG).

Drepanolejeunea ungulata (Steph.) Grolle
A common endemic species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Judziewicz, Freire & Bogner 2023: 17).

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, open bog, terrestrial on bog floor, 1,463 m, 26 Feb 2024, *K. Faccenda 3329e* (BISH, PTBG).

Drepanolejeunea sp.
We have been unable to identify these collections to species.

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3309c* (BISH, PTBG); Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale, open, windswept summit bog, dominant epiphyte, 1,524 m, 26 Feb 2024, *K. Faccenda 3368d* (BISH, PTBG); also *K. Faccenda 3307f, 3308c, 3314e, 3317e, 3334c, 3335e, 3344d, 3345d, 3349d, 3353e, 3362c, 3365c, 3367f, 3369e, 3371d.*

Metalejeunea cucullata (Reinw., Blume & Nees) Grolle
A minute but abundant indigenous species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Judziewicz, Freire & Bogner 2023: 21). First documented from the Kaua‘i Summits by the Hawaiian Bog Survey (Miller 1963: 523), Wai‘ale‘ale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5232* (S, not examined), as *Microlejeunea albicans*.

Material examined. **KAUA‘I**: Kaua‘i summit, approximately 400 m W of Wai‘ale‘ale, open, windswept summit bog, terrestrial on bog floor, 1,524 m, 26 Feb 2024, *K. Faccenda 3337a, 3344e* (BISH, PTBG).

Lepidoziaceae
Acromastigum integrifolium (Austin) A. Evans
(Fig. 14)
An uncommon endemic species known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, and Maui (Judziewicz, Freire & Bogner 2023: 22). First documented from the Kaua‘i Summits by

Figure 14. *Acromastigum integrifolium*. Waiʻaleʻale summit, 18 Jun 2024, *K. Faccenda 3500a* (BISH, PTBG). Note pale yellowish color; mixed with *Riccardia* species. Photo by K. Faccenda.

the Hawaiian Bog Survey (Miller 1963: 498), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5067* (S, not examined).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3369i* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,534 m, 18 Jun 2024, *K. Faccenda 3364c* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 500 m W of summit rim, deeply shaded area dominated by native vegetation, very wet with flowing water, 1,515 m, 18 Jun 2024, *K. Faccenda 3550a* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, open, exposed area in bog, terrestrial on soil, south-facing aspect, 1,546 m, 18 Jun 2024, *K. Faccenda 3508b* (BISH, PTBG).

Bazzania baldwinii A. Evans

An uncommon endemic species known from Kauaʻi, Oʻahu, Molokaʻi, and Maui (Judziewicz, Freire & Thomas 2024: 11).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, mixed with *Herbertus*, thickly matting tree trunks and occasionally terrestrial, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17780* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, with *Melicope, Myrsine, Dubautia, Cheirodendron, Metrosideros, Coprosma, Labordia, Psychotria, Vaccinium,* and *Kadua,* fern genera include *Asplenium, Adenophorus, Dryopteris, Sadleria, Elaphoglossum, Polypodium, Lycopodium,* and *Cibotium,* terrestrial and epiphytic

bryophytes and lichen are abundant, bogs are dominated by *Rhynchospora, Dichanthelium, Carex, Gahnia, Deschampsia, Machaerina, Oreobolus, Vaccinium, Keysseria, Plantago, Peperomia, Viola, and Nertera*, with hard stony substrate and scattered rock outcrops, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18547* (in part) (PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3494e* (BISH, PTBG).

Bazzania cordistipula (Mont.) Trevis.

An abundant indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9142, 9143* (in part) (PTBG); Waiʻaleʻale summit, open montane bogs dissected with riparian vegetation of *Metrosideros-Cheirodendron* forest, matting, leaves yellow-orange, terrestrial in bog, common, 1,585 m, 8 Oct 2008, *K.R. Wood & B. Baldwin 13355* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17773* (in part), *17781* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, green-brown, thickly matting, common, 22.056746°N, 159.495587°W, 1,585 m, 28 Jan 2022, *K.R. Wood & B. Nyberg 18890* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3307d, 3308a, 3314a, 3317a, 3325c, 3328a* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3335a, 3341e, 3345a, 3347b, 3348a, 3351a, 3356b, 3357a, 3362a, 3363b, 3364f, 3366c, 3367b, 3368b, 3370b, 3375a, 3376d* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, partially shaded area on south-facing wall under some ʻōhiʻa trees, 1,545 m, 18 Jun 2024, *K. Faccenda 3511a* (BISH, PTBG).

Bazzania didericiana (Gottsche ex Steph.) Steph.

An uncommon indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 23).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18547* (in part) (PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 26 Feb 2024, *K. Faccenda 3493e* (BISH, PTBG).

Bazzania emarginata (Steph.) C.M. Cooke

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 23).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial and epiphytic, light green to tinging brown, matting, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17773* (in part), *17776* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3307b, 3313c, 3314b, 3315a, 3316c, 3321a* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3337b, 3347b, 3353a, 3354b, 3355a, 3356a, 3357b, 3363e, 3364a, 3365a, 3366d, 3367c, 3368c, 3369b, 3370c, 3371c, 3372c, 3372h,*

3374b, 3375b, 3376h (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, mixed with *Cuspidatula, Plagiochila,* and *Riccardia,* 1,454 m elevation, 18 Jun 2024, *K. Faccenda 3490b, 3490b, 3491e, 3492e, 3493p, 3495e, 3495p* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, shaded area under ʻōhiʻa trees, 1,546 m, 18 Jun 2024, *K. Faccenda 3509, 3512* (BISH, PTBG).

Bazzania minuta (Austin) A. Evans

An uncommon endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 23).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, open bog, terrestrial on bog floor, 1,463 m, 26 Feb 2024, *K. Faccenda 3329f* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3335b, 3341f, 3343b, 3348b, 3349e, 3350, 3353b* (BISH, PTBG).

Bazzania sandvicensis (Steph.) Steph.

An uncommon indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 24). First documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 492), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5232* (S, not examined). We did not find any other material of this species.

Kurzia hawaica (C.M. Cooke) Grolle

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 24).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3491g* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, 1,465 m, 18 Jun 2024, *K. Faccenda 3496c* (BISH, PTBG).

Kurzia sp.

A series of collections tend towards the Maui endemic *K. mauiensis* (H.A. Mill.) H.A. Mill. in their more straight, appressed, ascending leaf lobes that tend to be biseriate for at least half of their length (Miller 1963; Staples & Imada 2006). We hesitate to identify them as such and suspect that *K. hawaica* and *K. mauiensis* may be conspecific.

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, mixed with *Odontoschisma denudata* subsp. *denudata*, 22.060976°N, 159.498005°W, 1,573 m, 21 Jan 2015, *K.R. Wood, S. Perlman & M. Query 16265* (in part) (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, open bog, terrestrial on bog floor, entwined at base of *Oreobolus furcatus*, plants 0.125 mm wide, 1,463 m, 26 Feb 2024, *K. Faccenda 3323* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, entwined at base of *Oreobolus furcatus,* 1,524 m, 26 Feb 2024, *K. Faccenda 3358b* (BISH, PTBG).

Lepidozia sandvicensis Lindenb. ex Gottsche, Lindenb. & Nees

A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi.

Material examined. **KAUAʻI**: Alakaʻi, just west of Waiʻaleʻale, *Metrosideros-Rhynchospora* montane bogs margined by *Metrosideros-Cheirodendron* mixed wet forest with matting ferns and riparian vegetation, terrestrial, light green, occasional, 22.07°N, 159.5°W, 1,463 m, 8 Feb 2012, *K.R. Wood 14874* (PTBG).

Telaranea nematodes (Gottsche ex Austin) M. Howe
A common exotic species now known from Kauaʻi, Oʻahu, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 24). First collected on Kauaʻi in 2014 and now apparently spreading, even to remote areas.

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3491j, 3493c* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, 1,465 m, 18 Jun 2024, *K. Faccenda 3498d* (BISH, PTBG).

Lophocoleaceae

Chiloscyphus greenwelliae (H.A. Mill.) H.A. Mill.
A common endemic species known from Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Staples & Imada 2006; Thomas 2022).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet area at summit rim, 1,466 m, 18 Jun 2024, *K. Faccenda 3519d* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,552 m, 18 Jun 2024, *K. Faccenda 3531, 3533a* (BISH, PTBG).

Chiloscyphus lambertonii H.A. Mill. **New island record**
An uncommon endemic species previously known from Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 12).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, 1,554 m, 18 Jun 2024, *K. Faccenda 3516c* (BISH, PTBG).

Cryptolophocolea bartlettii (H.A. Mill.)
Judz. & A.V. Freire **New island record**
An uncommon endemic species previously known from Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 12).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,200 m W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3493o* (BISH, PTBG).

Leptoscyphus baldwinii (Steph.) Judz. & A.V. Freire
A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 25).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3339e, 3341a, 3362b, 3367e, 3369k, 3370a, 3373c, 3374d* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, on ground in low shrubby area, 1,454 m, 26 Feb 2024, *K. Faccenda 3491f, 3492a, 3493d, 3495k, 3498f* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, partially shaded area on south-facing wall under some ʻōhiʻa trees, 1,545 m, 18 Jun 2024, *K. Faccenda 3511d, 3616e* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,486 m, 18 Jun 2024, *K. Faccenda 3522b, 3525a, 3528b* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,552 m, 18 Jun 2024, *K. Faccenda 3532c* (BISH, PTBG).

Leptoscyphus aff. ***baldwinii*** (Steph.) Judz. & A.V. Freire
(Figs. 15–17)
Typical *Leptoscyphus baldwinii* has 8–12 ciliate leaf teeth and is frequent on the Kauaʻi Summits. But some populations apparently referable to this or closely related species have

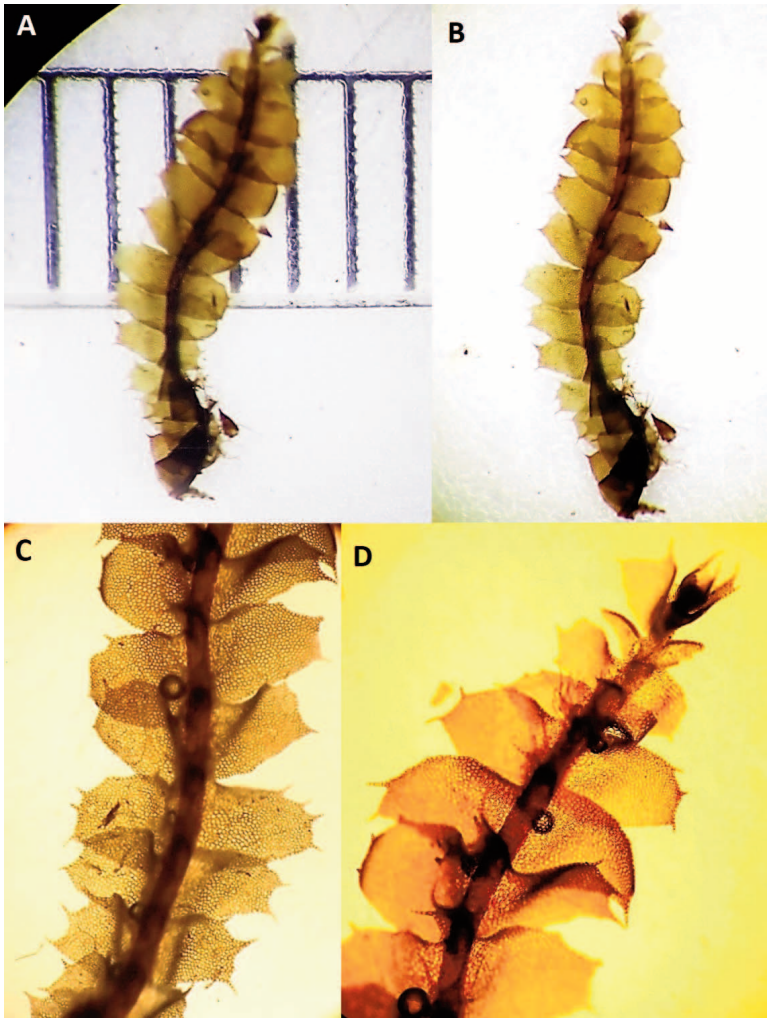

Figure 15. *Leptoscyphus* aff. *baldwinii*. Kawaikini summit. *Wood et al. 18563* (PTBG). **A–B**, row: Plants are brown, large, flattened, with elongated rectangular leaves. **C–D**, Leaves somewhat elongated, with (2)3–4 cilia. Underleaves bifid with long cilia. Photos by A.V. Freire (top row) and E.J. Judziewicz (bottom row).

fewer or even no teeth. *Wood et al. 18563* has (0–1) 2–4 cilia on leaf margins and rectangular rather than isodiametric leaves. The trigones are very large. Because of its large size, color, marginal cilia and underleaf morphology, we believe this specimen represents an extreme morphotype of *L. baldwinii*. The leaves of *K.R. Wood et al. 18547*, as well as *Faccenda 3516d, 3521b, 3522d, 3532c*, are usually entire, and have just a single, small, oblique leaf tooth, or rarely two teeth. Such edentate or nearly edentate populations of *L.*

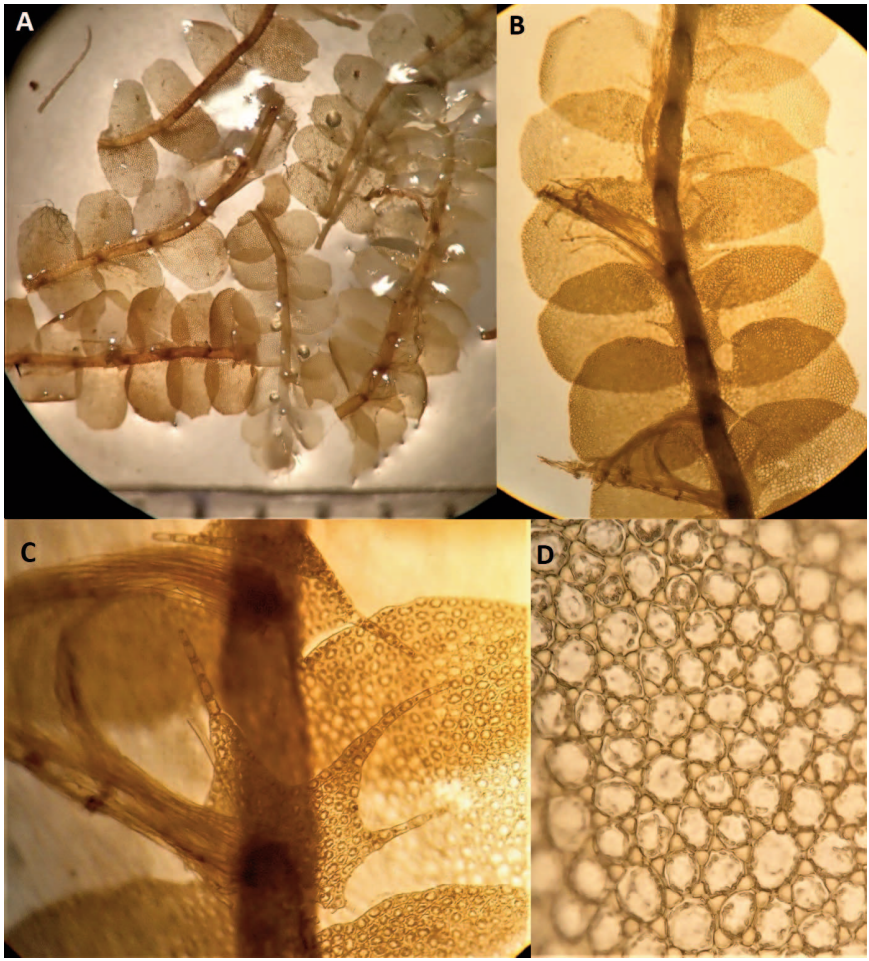

Figure 16. *Leptoscyphus* species. Kawaikini summit, *K.R. Wood 18547* (PTBG). **A–B**, Note the mainly entire leaves with an occasional tooth (upper right part of B); **C**, Quadrifid underleaves; **D**, large nodulose leaf trigones. Photos by E.J. Judziewicz.

baldwinii are also occasionally found on Maui and Hawai‘i Island as well and we tentatively refer them to this species.

Material examined. **KAUA‘I**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, green to green-brown or brown-red, epiphytic matting branches of *Metrosideros*, common, with *Melicope, Myrsine, Dubautia, Cheirodendron, Metrosideros, Coprosma, Labordia, Psychotria, Vaccinium,* and *Kadua,* fern genera include *Asplenium, Adenophorus, Dryopteris, Sadleria, Elaphoglossum, Polypodium, Lycopodium,* and *Cibotium,* terrestrial and epiphytic bryophytes and lichen are abundant, bogs are dominated by *Rhynchospora, Dichanthelium, Carex, Gahnia, Deschampsia, Machaerina,*

Figure 17. *Leptoscyphus* species. Waiʻaleʻale summit. **A–B** and **D**: *K. Faccenda 3521.5* (BISH); **C**, *K. Faccenda 3532c* (BISH). Note broad perianth (**A**), mainly entire leaves with occasional teeth (**A** and **C**), and large nodulose leaf trigones (**D**). Photos by E.J. Judziewicz.

Oreobolus, Vaccinium, Keysseria, Plantago, Peperomia, Viola, and Nertera, with hard stony substrate and scattered rock outcrops, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18547* (in part) (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, mixed with *Bazzania*, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18563* (PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, 1,554 m, 18 Jun 2024, *K. Faccenda 3516d* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, terrestrial, with *Plagiochila deflexa*, 1,548 m, 18 Jun 2024, *K. Faccenda 3521b* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, terrestrial, 1,552 m, 18 Jun 2024, *K. Faccenda 3522d, 3532c* (BISH, PTBG).

Marchantiaceae

Marchantia crenata Austin

An uncommon endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 14). This is the only complex thalloid liverwort documented so far from the Summits.

Material examined. **KAUAʻI**: Kawaikini, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, liverwort, matting lithophyte, fertile, uncommon, 22.056746°N, 159.495587°W, 1,585 m, 28 Jan 2022, *K.R. Wood & B. Nyberg 18893* (PTBG).

Metzgeriaceae

Metzgeria lindbergii Schiffn.

(Fig. 18)

An uncommon indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, with *Mnioloma fuscum*, 1,465 m, 18 Jun 2024, *K. Faccenda 3498c* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, common, 1,554 m, 18 Jun 2024, *K. Faccenda 3514a* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, 1,554 m, 18 Jun 2024, *K. Faccenda 3516b* (BISH, PTBG).

Symphyogyna semi-involucrata Austin

A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 28).

Material examined. **KAUAʻI**: Kawaikini summit region, on bryophyte bank in small, protected

Figure 18. *Metzgeria lindbergii*. **A–B**, Waiʻaleʻale summit. *K. Faccenda 3514* (BISH, PTBG). Photos by K. Faccenda.

gully area of open-canopied, shrubby trees and ferns, 22.05802°N, 159.49677°W, 1,572 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9144* (PTBG); Kaua‘i summit, approximately 1.2 km W of Wai‘ale‘ale, rainforest, terrestrial, on trail from bare soil, 1,463 m, 26 Feb 2024, *K. Faccenda 3326a* (BISH, PTBG); Wai‘ale‘ale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, 1,465 m, 18 Jun 2024, *K. Faccenda 3495a* (BISH, PTBG); Wai‘ale‘ale, extremely wet area near summit rim, open, exposed area in bog, terrestrial on soil, south-facing aspect, extremely wet area, 1,546 m, 18 Jun 2024, *K. Faccenda 3506* (BISH, PTBG); Wai‘ale‘ale, extremely wet area near summit rim, partially shaded area on south-facing wall under some ‘ōhi‘a trees, 1,545 m, 18 Jun 2024, *K. Faccenda 3510* (BISH, PTBG); Wai‘ale‘ale, extremely wet area at summit rim, 1,486 m, 18 Jun 2024, *K. Faccenda 3527a* (BISH, PTBG).

Figure 19. *Symphyogyna species.* Wai‘ale‘ale summit, *K. Faccenda 3536a* (BISH). **A–B**, Dense population on soil; note the reddish coloration of most plants. Photos *in situ* by K. Faccenda.

Symphyogyna sp.
(Figs. 19–24)

This collection differs from all other Hawaiian species in having erect thallus wings; these are multistratose at their lower half. These indigenous, dioicous plants are 1–4(–5) centimeters long, 1.5–3.5(–4) mm broad, often dichotomously branched but also with lateral-ventral branches. The thalli are light green when young, turning reddish with age; the margin is sometimes hyaline. A prominent midrib is present; it has a central vascular strand and is surrounded by pigmented medullar cells; the thallus wings are erect and multistratose to about 1/2 their length. The cells have thin walls and no trigones; oil bodies number only 1–3 per cell and are elliptical, gray, and granular. The rhizoids are hyaline. Female plants are more robust and greener than the males, with archegonia clustered and protected by a large, fringed gynoecial scale; a shoot calyptra is present. Male plants have abundant and clustered antheridia protected by large, fringed, and often pigmented scales. No sporophytes were observed.

Material examined. **KAUA‘I**: Wai‘ale‘ale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia, Rhynchospora* as dominant vascular plants and *Pleurozia conchifolia*, very common, forming densely entangled mats and associated with a rich algal microflora, 1,551 m, 18 Jun 2024, *K. Faccenda 3536a* (BISH, PTBG).

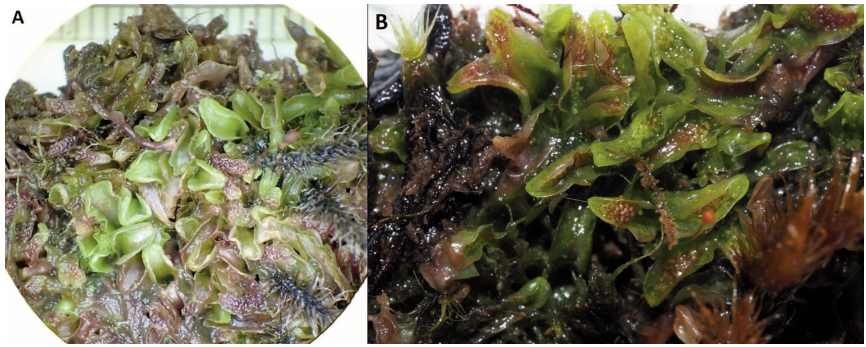

Figure 20 *Symphyogyna* species. Wai‘ale‘ale Summit, *K. Faccenda 3536a* (BISH). **A**, Photo *ex situ* A.V. Freire; population of thickly interwoven plants; note the more robust green females and the smaller reddish males; scale in mm. **B**, Photo *ex situ* K. Faccenda. Note the reddish color due to clustered antheridial scales.

Figure 21. *Symphyogyna* species. Wai‘ale‘ale Summit, *K. Faccenda 3536a* (BISH). **A**, Plant showing an intricate pattern of latero-ventral branching; scale = 1 mm. **B**, Ventral surface of thallus with branch initials (arrows). Photos by A.V. Freire.

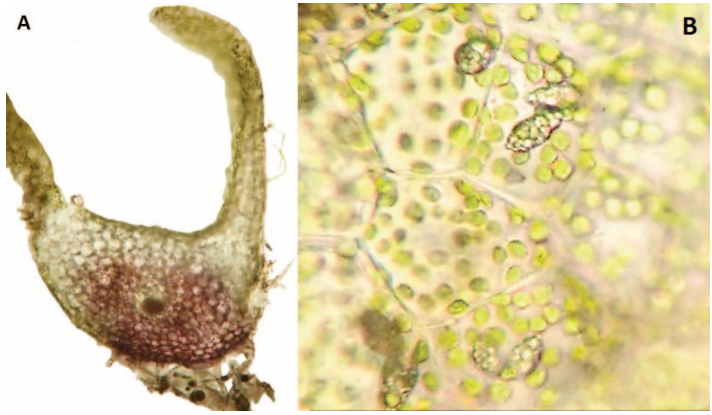

Figure 22. *Symphyogyna* species. Wai‘ale‘ale Summit, *K. Faccenda 3536a* (BISH). **A**, Section of thallus showing the prominent midrib with a central vascular strand and pigmented surrounding cells; wings are erect and multistratose for about 1/2 of their length. **B**, Oil bodies are elongated and granular, 1–3 per cell; cells are thin-walled, without trigones. Photos by A.V. Freire.

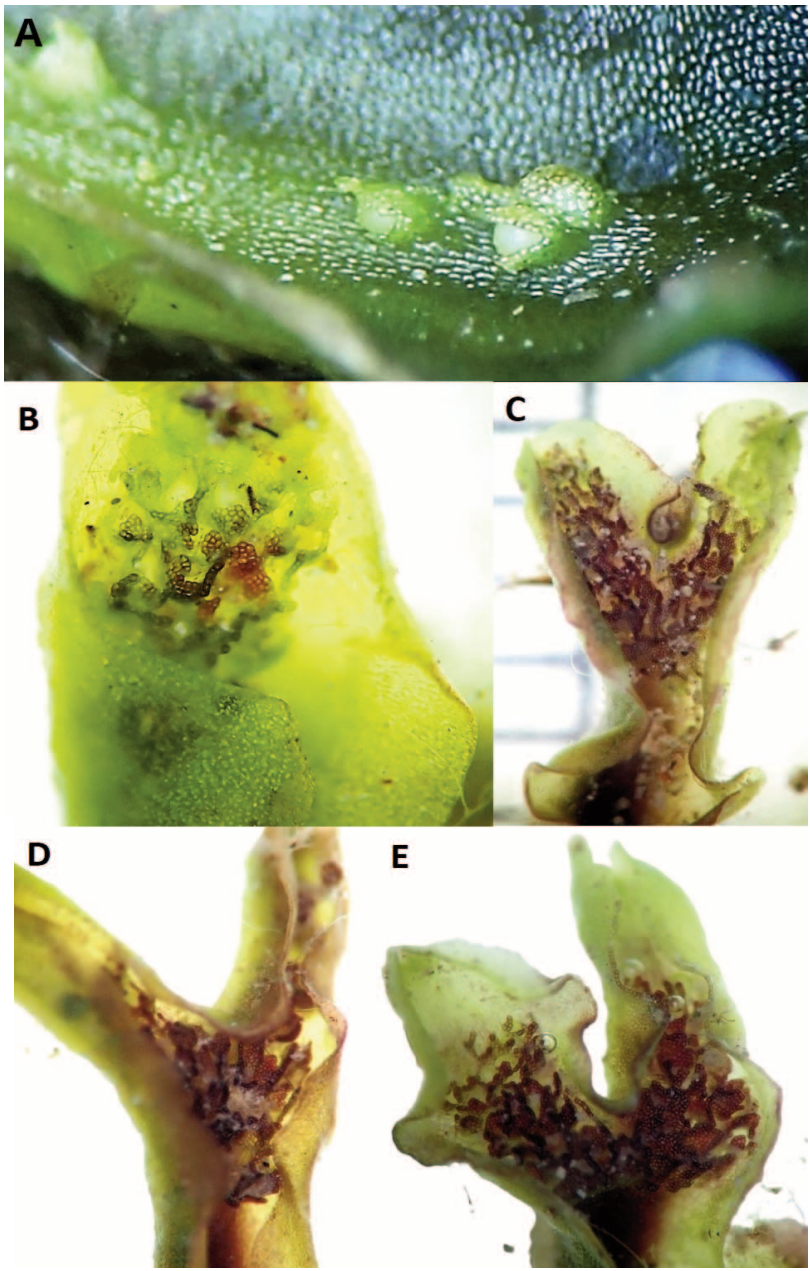

Figure 23. *Symphyogyna* species. Wai‘ale‘ale Summit, *K. Faccenda 3536a* (BISH). **A**, Young antheridia with scales still green or just beginning to develop pigments; **B**, A more advanced stage of maturity can be seen in the picture to the right; note the scales’ pigmentation. **C–E**, Examples of mature antheridia, protected by large and pigmented scales. Scale in mm. Photos by A.V. Freire.

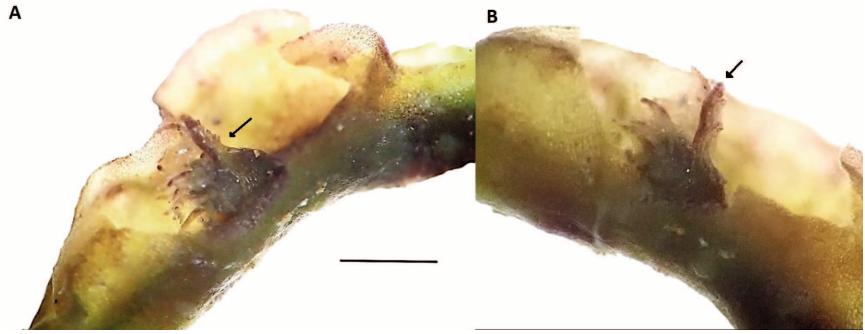

Figure 24 *Symphyogyna* species. Waiʻaleʻale Summit, *K. Faccenda 3536a* (BISH). **A**, Gynoecial scale (arrow), protecting a cluster of archegonia; scale = 1 mm. **B**, Gynoecial scale (arrow) is fringed and can be pigmented. Photos by A.V. Freire.

Plagiochilaceae

Chiastocaulon combinatum (Mitt.)
S.D.F. Patzak, M.A.M. Renner, Schäf.-Verw. & Heinrichs

A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 28).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3372d, 3374c, 3376e, 3373a* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, abundant, 1,554 m, 18 Jun 2024, *K. Faccenda 3514d, 3515a* (BISH, PTBG).

Plagiochila caduciloba Steph. **New island record**

An uncommon indigenous species previously known from Hawaiʻi Island (Judziewicz & Freire 2023: 169).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, epiphytic on *Metrosideros*, filmy green, rachis yellow-green, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood, T. Flynn & B. Nyberg 18529* (PTBG).

Plagiochila conduplicata Steph.

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 15).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, 1,465 m, 18 Jun 2024, *K. Faccenda 3497a* (BISH, PTBG).

Plagiochila convoluta Steph.

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 15).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3322b* (BISH, PTBG).

Plagiochila deflexa Mont. & Gottsche

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **KAUAʻI**: Kawaikini summit bog, 22.05663°N, 159.49654°W, 1,591 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9126* (PTBG); Waiʻaleʻale summit, montane bogs dissected with riparian vegetation of *Metrosideros-Cheirodendron* forest, terrestrial with light green leaves, common, 1,463 m, 7 Mar 2007, *K.R. Wood 12295* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, 22.062529°N, 159.498224°W, 1,573 m, 21 Jan 2015, *K.R. Wood, S. Perlman & M. Query 16248* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, matting epiphyte, leaves yellow-green, common, 22.056746°N, 159.495587°W, 1,585 m, 22 Jan 2022, *K.R. Wood & B. Nyberg 18896, 18898* (PTBG); Waiʻaleʻale, extremely wet area near summit rim, deeply shaded area dominated by native vegetation, very wet with flowing water, 1,547 m, 18 Jun 2024, *K. Faccenda 3502a* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, terrestrial, 1,548 m, 18 Jun 2024, *K. Faccenda 3521a* (BISH, PTBG).

Plagiochila gaudichaudii Mont. & Gottsche

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet area near summit rim, deeply shaded area dominated by native vegetation, very wet with flowing water, 1,547 m, 18 Jun 2024, *K. Faccenda 3502c* (BISH, PTBG).

Plagiochila gracillima Austin ex A. Evans

A common endemic species known from Kauaʻi, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 15).

Material examined. **KAUAʻI**: Ridge and slopes running south of Kawaikini, liverwort, matting boulders and under *Diplazium, Dubautia-Sadleria* shrubland-fernland, common, 1,550 m, 10 Jan 2023, *K.R. Wood & S. Deans 19262* (PTBG).

Plagiochila maunakeana Steph.

An uncommon endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 16).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3364i* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, on ground in low shrubby area, 1,454 m, 18 Jun 2024, *K. Faccenda 3492f* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, 1,554 m, 18 Jun 2024, *K. Faccenda 3516d* (BISH, PTBG).

Figure 25. *Plagiochila* cf. *recurvata*. Waiʻaleʻale summit, *K. Faccenda 3529a* (BISH, PTBG).

Plagiochila cf. ***recurvata*** (W.E. Nicholson) Grolle **New state record**

(Figs. 25–27)

This species is notable among Hawaiian congeners in the paucity of leaf teeth; leaves are usually entire, with an occasional short lateral tooth (or 2) present; if present, the tooth is never terminal to the leaf. The leaves are dorsally long-decurrent and have large nodular trigones. The plants are small (1–1.5 mm wide), with elongate, unbranched stems. Summit material closely resembles illustrations and descriptions of *P. recurvata* (W.E. Nicholson) Grolle, an Asian species of sect. Poeltiae Inoue (So 2001: 116, 124–125) previously known from China, Nepal, India (Sikkim), and Bhutan. This is tentatively the first report of this taxon from Hawaiʻi.

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3339b, 3340e, 3342*, *3376b* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, shaded area under ʻōhiʻa trees, 1,554 m, 18 Jun 2024, *K. Faccenda 3516h* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,552 m, 18 Jun 2024, *K. Faccenda 3529a* (BISH, PTBG).

Figure 26. *Plagiochila* cf. *recurvata.* Waiʻaleʻale summit. **A**, Dorsal view of plant showing long-decurrent leaf insertion. **B**, Ventral view showing J-shaped leaf insertion. **C**, Leaf cells showing oil bodies and large nodulose trigones. **D**, Ventral view of plant. *K. Faccenda 3342* (BISH, PTBG). Photos by E.J. Judziewicz

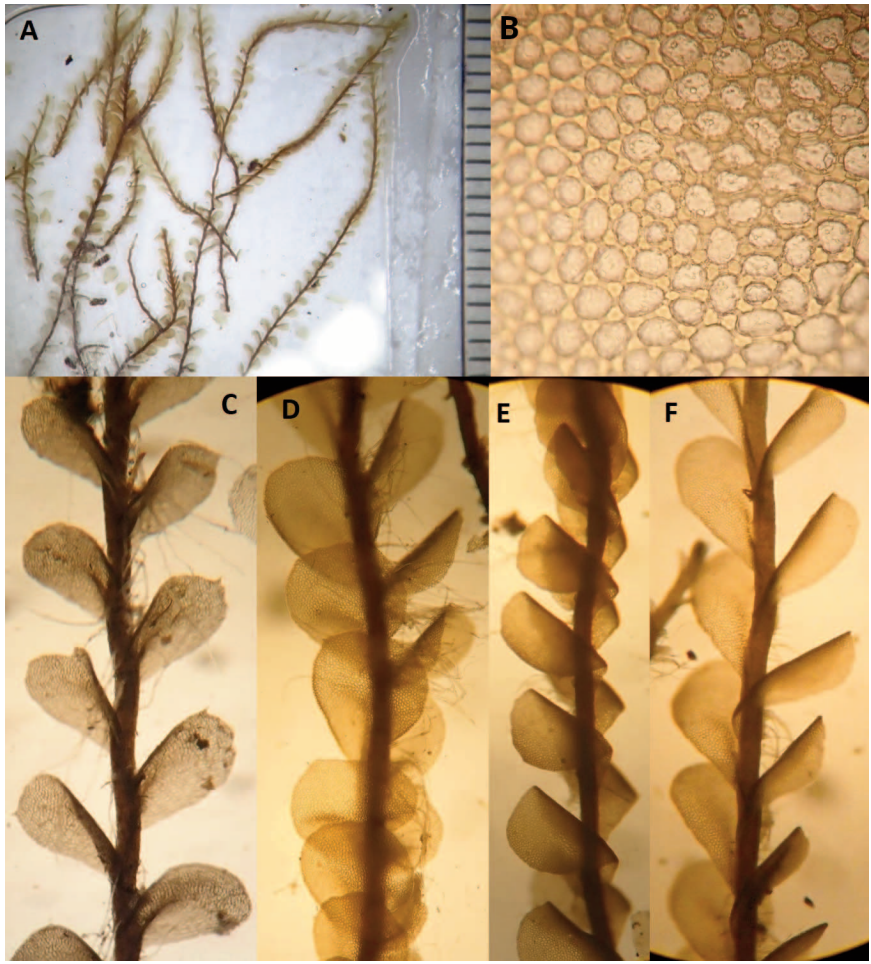

Figure 27. *Plagiochila* cf. *recurvata.* Waiʻaleʻale summit, *K. Faccenda 3529a* (BISH, PTBG). **A**, Habit; **B**, Large nodular leaf trigones. **C–F**, Aspects of stem and leaves; note slightly folded, conduplicate aspect of leaves; leaf margins mostly entire but occasionally tipped by 1–2 teeth, each tooth 2–4-celled. Photos by E.J. Judziewicz.

Pleuroziaceae

Pleurozia conchifolia (Hook. & Arn.) Austin

(Fig. 28)

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, and Maui (Staples & Imada 2006). First documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 518), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5107, 5232, 5233* (S, not examined).

Figure 28 A–B, *Pleurozia conchifolia*. Waiʻaleʻale summit. Photos by K. Faccenda.

Material examined. **KAUAʻI**: Kawaikini summit bog, terrestrial, leaves deep reddish brown, 22.05663°N, 159.49654°W, 1,591 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9114* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, terrestrial, erect, thickly matting, purple-red, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17782* (PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, terrestrial on bog floor, common, not seen as an epiphyte, dark purple, 1,524 m, 26 Feb 2024, *K. Faccenda 3334a, 3363c* (BISH, PTBG).

Pleurozia subinflata (Austin) Austin

A common endemic species known from Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 16).

(Fig. 29)

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, liverwort, green or brown-red, matting or pendent on trunks and in branches, common, 22.056627°N, 159.496052°W, 1,590 m, 2 Oct 2020, *K.R. Wood & B. Nyberg 18555* (PTBG); Kawaikini summit bog, 22.05663°N, 159.49654°W, 1,591 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9125, 9129, 9141* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, epiphytic on *Metrosideros*, light green, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *J.R. Shevock, K.R. Wood & W.-Z. Ma 51154* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, abundant epiphyte with *Bazzania*, colors ranging from red, purple, and yellow all on one plant, becoming dominant on upper tree branches towards summit, 1,463 m, 26 Feb 2024, *K. Faccenda 3307a, 3319a* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, dominant epiphyte, 1,524 m, 26 Feb 2024, *K. Faccenda 3344a, 3368a* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3493a* (BISH, PTBG).

Radulaceae

Radula cavifolia Gottsche, Lindenb. & Nees

An uncommon or overlooked indigenous species known from Kauaʻi, Oʻahu, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 17).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3308d* (BISH, PTBG); Kauaʻi summit, approximately 1.2 km W of

Figure 29. *Pleurozia subinflata.* Wai‘ale‘ale summit, *K. Faccenda 3529a* (BISH, PTBG). Dominant trunk epiphyte. Photo by K. Faccenda.

Waiʻaleʻale, rainforest, with *Herbertus aduncus, Cuspidatula robusta, Bazzania emarginata, Frullania, Plagiochila, Drepanolejeunea anderssonii* and *Radula cavifolia*, 1,463 m, 26 Feb 2024, *K. Faccenda 3313h* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3344c, 3345c* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1,200 m W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3493h* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1,000 m W of summit rim, deeply shaded area dominated by native vegetation, with *Symphyogyna*, 1,465 m, 18 Jun 2024, *K. Faccenda 3495h* (BISH, PTBG).

Radula gracilis Mitt. ex Steph.

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Bogner 2023: 30).

Material examined. **KAUAʻI**: Kauaʻi, Waiʻaleʻale summit rim, 1,465 m, 18 Jun 2024, *K. Faccenda 3494g* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,552 m, 18 Jun 2024, *K. Faccenda 3532b* (BISH, PTBG).

Radula mauiensis M.L. So

(Fig. 30)

A rare endemic species known from Kauaʻi, Oʻahu, and Maui (Judziewicz, Freire & Thomas 2024: 18).

Material examined. **KAUAʻI**: Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, epiphytic on *Metrosideros*, light green, common, 22.056627°N, 159.496052°W, 1,590 m, 29 Jan 2018, *K.R. Wood, J. Shevock & D. Ma 17774, 17779* (PTBG); Kawaikini summit region, *Metrosideros-Cheirodendron* short-statured wet forest with open bog habitat dissected by headwater drainages, thinly matting, epiphytic on *Metrosideros*, light green, 22.056746°N, 159.495587°W, 1,585 m, 28 Jan 2022, *K.R. Wood & B. Nyberg 18903* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, 1,463 m, 26 Feb 2024, *K. Faccenda 3307g, 3311c, 3312b, 3315f, 3319e, 3320c, 3329d* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3343c, 3362d, 3369l, 3371a* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,552 m, 18 Jun 2024, *K. Faccenda 3532a* (BISH, PTBG).

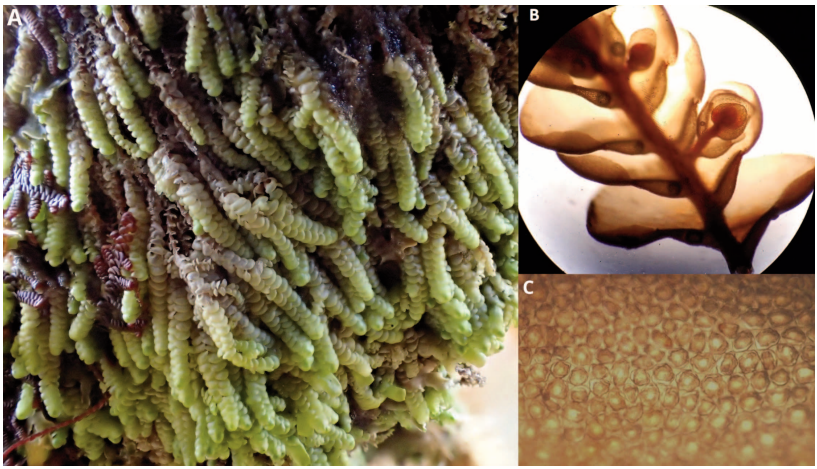

Figure 30. *Radula mauiensis*. Kawaikini summit, *K.R. Wood 17774* (PTBG). **A**, Kenneth R. Wood photo. **B–C**, Note elongate, inrolled lobules and large leaf trigones, photos by E.J. Judziewicz.

Scapaniaceae

Anastrepta orcadensis (Hook.) Schiffn.

A rare indigenous species known from Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 18). First documented from the Kauaʻi Summits by the Hawaiian Bog Survey (Miller 1963: 510), Waiʻaleʻale summit bog, 23 Aug 1938, *Hawaiian Bog Survey 5232* (S, not examined). It has not been re-collected on the Kauaʻi Summits since then.

Anastrophyllum esenbeckii (Mont.) Steph.

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 18).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3320e* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, terrestrial on bog floor, common, not seen as an epiphyte, dark purple, 1,524 m, 26 Feb 2024, *K. Faccenda 3334b, 3340f, 3341c* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3348e, 3353d, 3354d, 3358a, 3362f* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, rainforest, 1,463 m, 26 Feb 2024, *K. Faccenda 3369g* (BISH, PTBG); Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, 1,454 m, 18 Jun 2024, *K. Faccenda 3491c* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia*, *Rhynchospora* as dominant vascular plants, and *Pleurozia conchifolia* very common, 1,551 m, 18 Jun 2024, *K. Faccenda 3535b, 3539.4a* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, with *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia, Rhynchospora* as dominant vascular plants and *Pleurozia conchifolia* very common, 1,551 m, 18 Jun 2024, *K. Faccenda 3536d, 3539.3*.

Anastrophyllum fissum Steph.

An uncommon indigenous species known from Kauaʻi, Oʻahu, and Maui (Judziewicz, Freire & Thomas 2024: 19).

Material examined. **KAUAʻI**: Kawaikini summit region, on bryophyte bank in small, protected gully area of open-canopied, shrubby trees and ferns, terrestrial, 22.0581°N, 159.4969°W, 1,576 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9143* (in part) (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, rainforest, dark purple/black, 1,463 m, 26 Feb 2024, *K. Faccenda 3316a, 3322a* (BISH, PTBG); Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3339a, 3341b, 3364j, 3376f* (BISH, PTBG).

Scapania ciliata Sande Lac.

subsp. ***hawaiica*** (Müll. Frib.) Potemkin

A common endemic subspecies known from Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 19).

Material examined. **KAUAʻI**: Kauaʻi summit, approximately 400 m W of Waiʻaleʻale, open, windswept summit bog, 1,524 m, 26 Feb 2024, *K. Faccenda 3375d* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, shaded area under ʻōhiʻa trees, 1,546 m, 18 Jun 2024, *K. Faccenda 3509.5* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, 1,486 m, 18 Jun 2024, *K. Faccenda 3527b, 3528a* (BISH), PTBG).

Scapania javanica Gottsche

A common indigenous species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 19).

Material examined. **KAUAʻI**: Kawaikini summit region, on bryophyte bank in small, protected gully area of open-canopied, shrubby trees and ferns, terrestrial on shaded bank, 22.05825°N,

159.49713°W, 1,584 m, 2 Oct 2020, *T. Flynn, K.R. Wood & B. Nyberg 9131* (PTBG); Kauaʻi summit, approximately 1.2 km W of Waiʻaleʻale, open bog, terrestrial, on trail from bare soil, 1,463 m, 26 Feb 2024, *K. Faccenda 3325a, 3326b, 3330* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, deeply shaded area dominated by native vegetation, very wet with flowing water, 1,544 m, 18 Jun 2024, *K. Faccenda 3502b, 3503a, 3505b*, *3507a* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, south-facing wall, exposed, growing terrestrially, 1,545 m, 18 Jun 2024, *K. Faccenda 3513* (BISH, PTBG); Waiʻaleʻale, extremely wet area at summit rim, north-facing, very exposed mound, terrestrial, with *Metrosideros, Machaerina, Dubautia, Sadleria, Deschampsia, Rhynchospora* as dominant vascular plants and *Pleurozia conchifolia,* very common, 1,551 m, 18 Jun 2024, *K. Faccenda 3539.1a* (BISH, PTBG).

Solenostomataceae

Solenostoma exsertum (A. Evans) Steph.

A common endemic species known from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Judziewicz & Freire 2023: 172).

Material examined. **KAUAʻI**: Waiʻaleʻale summit rim, 1,465 m, 18 Jun 2024, *K. Faccenda 3494b* (BISH, PTBG); Waiʻaleʻale, extremely wet area near summit rim, open, exposed area in bog, terrestrial on soil, south-facing aspect, 1,546 m, 18 Jun 2024, *K. Faccenda 3503.5* (BISH, PTBG).

Southbyaceae

Southbya organensis Herzog **New island record**

(Fig. 31)

A rare indigenous species previously documented from Maui (Staples & Imada 2006; Judziewicz & Freire 2023: 173); H.A. Miller (unpublished) also reports it from Kauaʻi, Oʻahu, and Molokaʻi but without citing vouchers. We can confirm it from Kauaʻi. Gradstein (2018) maps it as occurring in Brazil, Peru, Sri Lanka, Hawaiʻi, Southeast Asia, and New Guinea.

Material examined. **KAUAʻI**: Waiʻaleʻale, extremely wet native-dominated forest about 1.2 km W of summit rim, deeply shaded area dominated by native vegetation, mixed with *Bazzania emarginata, Cuspidatula, Plagiochila,* and *Riccardia,* 1,454 m elevation, 18 Jun 2024, *K. Faccenda 3490a* (BISH, PTBG).

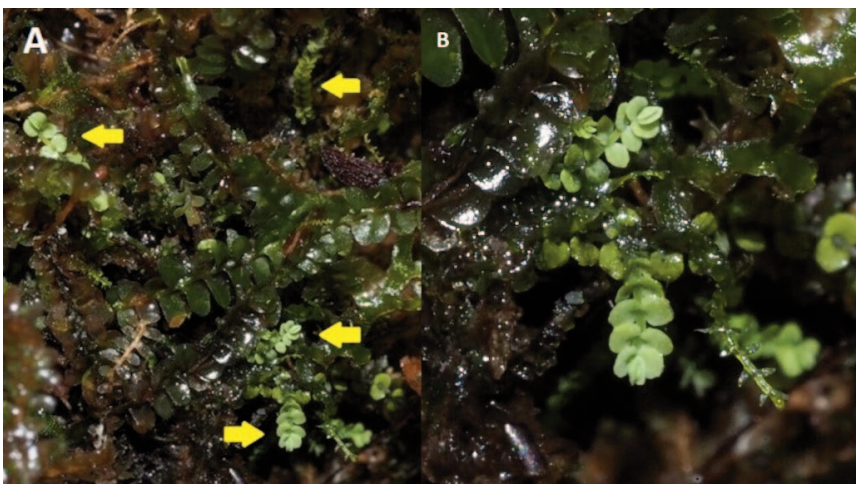

Figure 31, A–B. *Southbya organensis*. Waiʻaleʻale summit, 24 Feb 2024; plants are 0.4–0.7 mm wide. *K. Faccenda 3490a* (BISH, PTBG). Photos by K. Faccenda.

DISCUSSION

A total of 73 species of liverworts are now known from the Summits. The area is poor in thalloid liverworts (perhaps as few as six species; five simple thalloids, one complex thalloid) and Lejeuneaceae (only six species); no hornworts (Anthocerotophyta) have been documented. New island records of *Chiloscyphus lambertonii, Cryptolophocolea bartlettii, Drepanolejeunea pentadactyla, Plagiochila caduciloba,* and *Southbya organensis* were documented. *Calypogeia aeruginosa*, an Asian disjunct previously known in Hawai‘i only from two 1938 collections made in the Summit zone, was not relocated. New state records for the montane Asian and Australasian species *Marsupella* cf. *stoloniformis* and *Plagiochila* cf. *recurvata* were made.

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Palmer's chickens on Kaua'i, Hawaiian Islands

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When Lionel Walter Rothschild (1868–1937) sent Henry Charles Palmer (1866–1920) out to the Hawaiian archipelago to collect specimens for his ever-growing bird collection, approximately 2,000 bird specimens were collected by Palmer and his assistants George Campbell Munro (1866–1963) and Edward (Ted) Basil Wolstenholme (1864–1926) during December 1890 and August 1893. Several bird species proved to be new to science while others were more familiar (Rothschild 1893–1900). Perhaps the most familiar species was Red Junglefowl ('chicken') *Gallus gallus,* of which five specimens were collected by Palmer and Munro on Kaua'i during January and February 1891. Both men kept notes in their diaries but, unfortunately, only those of Munro still exist (stored in the Archives collection at the Bernice P. Bishop Museum, Honolulu; BPBM). Being unfamiliar with the avifauna of the Hawaiian archipelago, Munro's notes about the fowl are those of admiration and fascination. As part of our research into discovery, description and distribution of Hawaiian endemic songbirds, we examined Munro's notes describing peculiarities of landscape, wildlife and people, but also describing each and every fowl. From previous studies (e.g. Paterson & Brisbin 2005), we deduced that the specimens still existed and, furthermore, might differ in plumage colouration and other characteristics. We therefore wondered if their plumage could be matched to the descriptions in Munro's diaries. Furthermore, we wondered if this matching process could yield or correct information that is currently attached to the existing specimens which in turn can assist further studies into the avifauna of the Hawaiian Islands in general and of the Kaua'i avifauna in particular of that time period.

The American Museum of Natural History, New York, USA (AMNH) contains many specimens of the Rothschild's collection (Anonymous 1935), including the majority of the existing Palmer specimens. These include five specimens of fowl from Kaua'i, for which the original labels that Palmer and Munro attached to in the field still exist (Figure 1). On 26 September 2024, all five were photographed by Said Robles Bello, including the labels, and were matched by us to the descriptions of fowl in Munro's diary. Furthermore, other diary notes by Munro about fowl on Kaua'i were extracted by us.

RESULTS

Munro mentioned at least 14 fowl that were shot during their stay on Kaua'i of which he gave descriptions of (parts of) their plumage of at least 11 in his diary (Table 1). We presume that only a few fowl were prepared as specimens and instead many formed parts of their dinner (as mentioned for two specimens shot on 21 January 1891). Four of the 14 specimens

Table 1. Match of descriptions of 14 specimens of fowl (from Munro's diaries) with plumage of five specimens collected by Palmer and Munro in AMNH*

spm	collection date	sex	general	neck/hackles	back	wing coverts	secondaries	underparts	(under?) tail	primaries	spurs	Palmer-number
1	13-jan	m	?	golden tipped with white & black	?	?	light rusty	spotted shining steel blue & white	?	?	inch	587
2	16-jan	m	more white than #1	?	?	?	?	?	?	?	?	616
3	21-jan	f	rusty with white spots	?	?	?	?	?	?	?	?	655
4	21-jan	m	?	?	?	?	?	?	?	?	?	–
5	22-jan	f	?	golden	?	?	?	?	?	?	?	–
6	22-jan	f	?	slatey bluish grey	?	?	?	?	?	?	?	–
7	27-jan	m	?	silver	golden	golden	?	slate blue	?	?	inch	705
8	27-jan	m	?	blood-red	?	?	?	blue-black	blue-black	?	not grown	–
9	27-jan	m	?	?	?	?	?	?	?	?	?	–
10	5-feb	m	?	silver	brick red&gold	?	?	?	?	?	1,5 inch	–
11	6-feb	f	?	light gold	brown with light line down centre of most feathers	?	?	rusty	?	?	?	–
12	7-feb	m	?	gold	red band	red band	steel gray with rusty patch	steel gray	black & white	mostly white	1,8 inch	749
13	26-mar	m	spotted white	?	?	?	?	?	?	?	?	–
14	1-apr	m	?	?	?	?	?	?	?	?	?	–

* A question mark (?) means that no information was available for that body part.

described by Munro are females, and the remainder were males (Table 1). Of the five specimens still in existence, one is a female, and the four others are males (Table 2).

Comparison of the descriptions of the 14 specimens with the plumage of the five specimens in AMNH resulted in five matches (Table 2). Based on these matches, we established that the collection date as currently associated with the five specimens was correct in two specimens. In another two specimens the collection date differed by one day. For the fifth specimen, we now know that the collection date was 11 days earlier than the date currently associated with it (Table 2).

Table 2. **Summary of details of five specimen of fowl collected by Palmer and Munro on Kauai in Jan-Feb 1891.**

AMNH-label	sex	Palmer-number	Registration AMNH date	True collection date
skin-543358	m	587	13 Jan. 1891	13 Jan. 1891
skin-543360	m	616	16 Jan. 1891	16 Jan. 1891
skin-543362	f	655	22 Jan. 1891	21 Jan. 1891
skin-543359	m	705	28 Jan. 1891	27 Jan. 1891
skin-543361	m	749	18 Feb. 1891	7 Feb. 1891

DISCUSSION

After Palmer and Munro had arrived on Kauaʻi, they were told by Francis Gay (1852–1928), a sugar planter on Kauaʻi with his own small collection of Hawaiian birds, that the fowl were native and that members of the third circumnavigation (1776–1780) captained by James Cook (1728–1779) had found them already when arriving in the archipelago in 1779 (BPBM Archives, MS SC Munro Box 1.1; entry 10 January 1891). Another inhabitant, judge Christopher Blom Hofgaard (1859–1931) told a similar story about the fowl: "*the chickens were native right enough, as the natives had legends of historical events where the chiefs were supposed* to *have had these birds at their feasts, hundreds of years before white men saw the islands*" (BPBM Archives, MS SC Munro Box 1.1; entry 30 January 1891). This is true of course: the first colonisers of the remote archipelagos and islands in the Pacific, including Kauaʻi, brought with them many animals including fowl (Kirch 1982, Pyle 1995, Moulton *et al*. 2001a, Gering *et al*. 2015). On Kauaʻi, some probably escaped and, in the eyes of Munro, formed a wild population. Munro (1944) stated: "*During the course of their migrations they undoubtedly changed from wild to at least semi-domestic, finally reverting here in Hawaii to their original wild state*". Whether the fowl on Kauaʻi can be considered self-sustaining is still debated, with opponents and proponents of such status. Munro (1944) was not certain that junglefowl were established in the Hawaiian archipelago outside of Kauaʻi, although Moulton *et al*. (2001b) later stated that populations considered wild are present on both Oʻahu and Kauaʻi.

The five fowl collected by Palmer and Munro constitute the first collection of fowl from the Hawaiian archipelago. They were overlooked by Ball (1933) in his study of Pacific fowl specimens. Others however included them in their studies into ancestry of and phenotypic variation in Pacific fowl, leading to the conclusion that the Kauaʻi birds of Palmer and Munro were genetically mixed with domestic fowl (Paterson & Brisbin 2005). As we

Figure 1. Ventral views of five fowl specimens collected by Palmer and Munro on Kaua‘i in Jan-Feb 1891. From left to right: AMNH-skin 543362, 543359, 543360, 543361 and 543358 (Said Robles Bello © American Museum of Natural History, New York).

also demonstrate, the four males collected by Palmer and Munro considerably differed in colour. The colour variability in fowl occurring in the Pacific region is thus confirmed (Ball 1933, Paterson & Brisbin 2005). As is clear from our study and those of others (e.g. Paterson & Brisbin 2005), the birds of Kaua‘i do not however confirm to a separate colour variety for many Pacific islands (contra Ball 1933). Note that genomic research on the current Kaua‘i populations may result in different results because of admixture due to for instance (deliberate and accidental) releases since the 1930s (Martin Cerezo *et al*. 2023, Gering *et al*. 2024).

It is not often that individual variation within a bird species allows for an attempt to link diary descriptions of collected individuals to the very same existing specimens. The domesticated fowl is one of these species. In our research, we were lucky to have access to Munro’s diary with his descriptions but also that he had a more than average interest in these fowl. His annotations in his diary are testimony to this. For several dates in his diary, Munro expressed his almost admiration about the Kaua‘i fowl, as exemplified by the entry for 20 January 1891: “*The male chickens vary a good deal in color, in full plumage they are usually beautiful birds, the hackles are generally golden varied more or less, combs & wattles large, spurs very sharp, & with fine syckle feathers in their tails, Mr. Kirk had one that died when we were there, it was taken when a chick, he said it was a demon to fight...*” (BPBM Archives, MS SC Munro Box 1.1).

Attempts to reconstruct expedition results such as those of Palmer and Munro on Kaua‘i rely heavily on specimen information available from income books and the specimen itself. Our ability to match the five fowl specimens with original Palmer label num-

bers to Munro's diary descriptions of fowl should help us to reconstruct the expedition with more certainty. Furthermore, by matching described plumage in Munro's diary with the plumage of specimens, we were able to correct information currently attached to the specimens with respect to exact collection date. Especially, AMNH-skin-543361, which was not collected on 18 February 1891 as formally registered, but on 7 February. Such corrections will enable us to reconstruct the timeline of the expedition of Palmer and Munro much better.

Specimen collections often place much value on the originally occurring species. Palmer's collection illustrates the value of collecting obvious introduced species. Not only is the Hawaiian archipelago known for its many extinct endemic species, but it is also known for its many species that were introduced since the 1930s. Thanks to the efforts of Palmer, we also have information of several species that were introduced before this period. Apart from the fowl, he for instance also collected several specimens of Northern Bobwhite *Colinus virginianus*, Scaly-breasted Munia *Lonchura punctulata* and House Finch *Haemorhous mexicanus*. He also caught two swamp-hens *Porphyrio* on O'ahu, which were either identified as *melanotus* (Rothschild 1893–1900, Henshaw 1902, Pyle & Pyle 2017) or *poliocephalus* (data AMNH). Interestingly, both the bobwhite and the swamp-hen are now not considered to be established in the Hawaiian archipelago, unlike the fowl and both songbird species (Pyle & Pyle 2017). Finally, Gering *et al*. (2015) showed that Kaua'i fowl contain an ancient haplogroup (D) that "*either persisted on Kauai into the present day or was subsequently repopulated from a closely related source population*." Ancient specimens of introduced species may thus provide information on history and evolution of species and may represent reservoirs of ancient lineages.

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First record of *Mieniplotia scabra* (Gastropoda: Thiaridae) in Hawai‘i: Another non-native introduction to Hawai‘i’s already imperiled freshwater systems[1]

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We report the establishment of yet another globally invasive freshwater snail belonging to the family Thiaridae Gill, 1871 (1823) in the Hawaiian Islands.

Thiaridae Gill, 1871 (1823)
***Mieniplotia scabra* (Müller, 1774)** **New state record**
(Figs. 1, 2)

Cowie (1997) listed seven species of thiarids in the Hawaiian Islands: *Melanoides tuberculata* (Müller, 1774), *Tarebia granifera* (Lamarck, 1816), *Tarebia lateritia* (I. Lea & H.C. Lea, 1851), *Thiara baldwini* (Ancey, 1899), *Thiara indefinita* (I. Lea & H.C. Lea, 1851), *Thiara kauaiensis* (Pease, 1870), and *Thiara verreauiana* (I. Lea, 1857). *Melanoides tuberculata* and *Tarebia granifera* are known from archaeological sites, and considered “canoe snails”, brought with the Polynesian voyagers (Athens *et al.* 2014; Christensen *et al*. 2021). These are now among the most widely distributed freshwater invasives in the islands and are known to carry several zoonotic disease agents that impact birds, fish, and even humans (Hayes *et al.* 2007; Pinto & de Melo 2011). The origins and identities of other thiarids in Hawai‘i, *Tarebia lateritia*, *Thiara baldwini*, *T. indefinita*, *T. kauaiensis*, and *T. verreauiana*, are unresolved, but appear to be modern introductions (Cowie 1997; Cowie *et al*. 2008; Christensen *et al*. 2018). Here we report the first record in Hawai‘i of another introduced thiarid, *Mieniplotia scabra*, the pagoda tiara. A total of 462 specimens were collected live from streams (Fig. 1 A–B) and in local pet stores.

Originally described as *Buccinum scabrum* Müller, 1774, and until recently it was widely recognized as *Thiara scabra*. Low & Tan (2014) established the genus *Mieniplotia* and placed this species in it as the only representative. *Mieniplotia scabra* is generally considered to have origins in the Indo-Pacific, and it is reported from South and Southeast (SE) Asia, through the Western Pacific Islands (Thompson *et al*. 2009). Pliocene fossil records attributed to this species indicate that it is native to Indonesia (Oostingh 1935; O’Connor *et al.* 2005), while archaeological records place it in the Philippines historically (Kress 2000;

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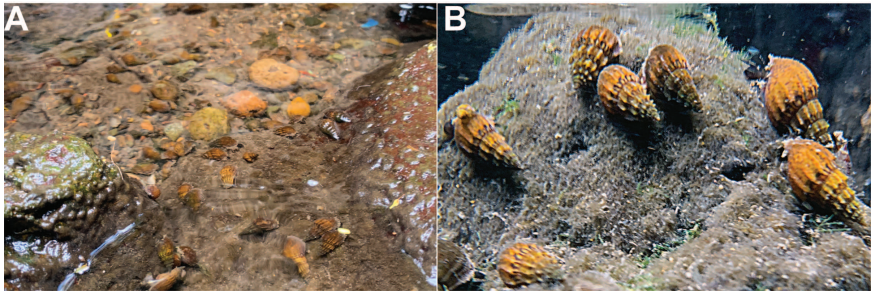

Figure 1. **A**) Live specimens of *Mieniplotia scabra* in Makiki Stream, O‘ahu. **B**) Specimens under water feeding on algae growing on the rocks in the stream. Photo: C. Atta

Pawlik & Piper 2019). However, given how widely it has been introduced and the taxonomic uncertainty, the full extent of its original native range may never be known. It is frequently found in the aquarium trade and is one of the most often encountered freshwater snails in SE Asia (Thompson *et al.* 2009; Cianfanelli *et al.* 2016).

Most specimens collected on O‘ahu, which included a range of size classes (Fig. 2), were consistent with the current concept of *M. scabra*, and were brown in color, some with irregular spiral rows of spots that sometimes fuse into axial maculations. The elevated spire with angled shoulders, which may bear spines, gives the shell a pagoda-like appearance. The specimens collected from Mānoa Stream were the exception, with nearly all the shells appearing black with no spines and less-angled shoulders (Fig. 2 D–F). Specimens collected in Hawai‘i match the syntype material in the Mollusc collection at the Natural History Museum of Denmark (NHMD-90997; Fig. 2 A–C).

One hundred three specimens from across all collections sites on O‘ahu were sequenced for a portion of the mitochondrial cytochrome *c* oxidase subunit I (COI) gene. A subset of these were sequenced for a fragment of the mitochondrial large ribosomal subunit 16S, and the nuclear ribosomal 28S gene. All sequences were 100% identical within each locus for all O‘ahu specimens. An NCBI BLASTn (https://blast.ncbi.nlm.nih.gov) search using the COI sequences returned matches of 97.8 and 100% (accession numbers MK879275 and PQ327780, respectively) with sequences identified as *M. scabra* on GenBank. Similarly, BLASTn results for 16S matched at similar levels (98.6-100%) for the same species. As part of another ongoing study (Hayes *et al.* unpubl.), all sequences were aligned with other thiarids from Hawai‘i and available sequences on GenBank to produce a concatenated alignment of 1,762 bp, which was used for Maximum Likelihood (ML) phylogenetic estimation implemented using IQ-TREE (Nguyen *et al.* 2015) with 40,000 ultrafast bootstrap (UFB) replicates (Hoang *et al.* 2018). The ML analysis of a reduced dataset with COI only (Fig. 3) and the full dataset recovered (not shown) all Hawaiian *M. scabra* specimens in a strongly supported clade (99%) with multiple *M. scabra* sequences on GenBank from specimens collected in the Philippines (MH319875-6; Stelbrink *et al.* 2019), Thailand (MK879275-8, MK879282; Boonmekam *et al.* 2019), and one sequence identified as *Thiara* cf. *granum* (AY958759; Genner *et al.* 2007), from an aquarium store in Germany. The latter name is an unaccepted combination for *Melania granum* von dem Busch, 1842, which itself is a junior synonym of *M. scabra*

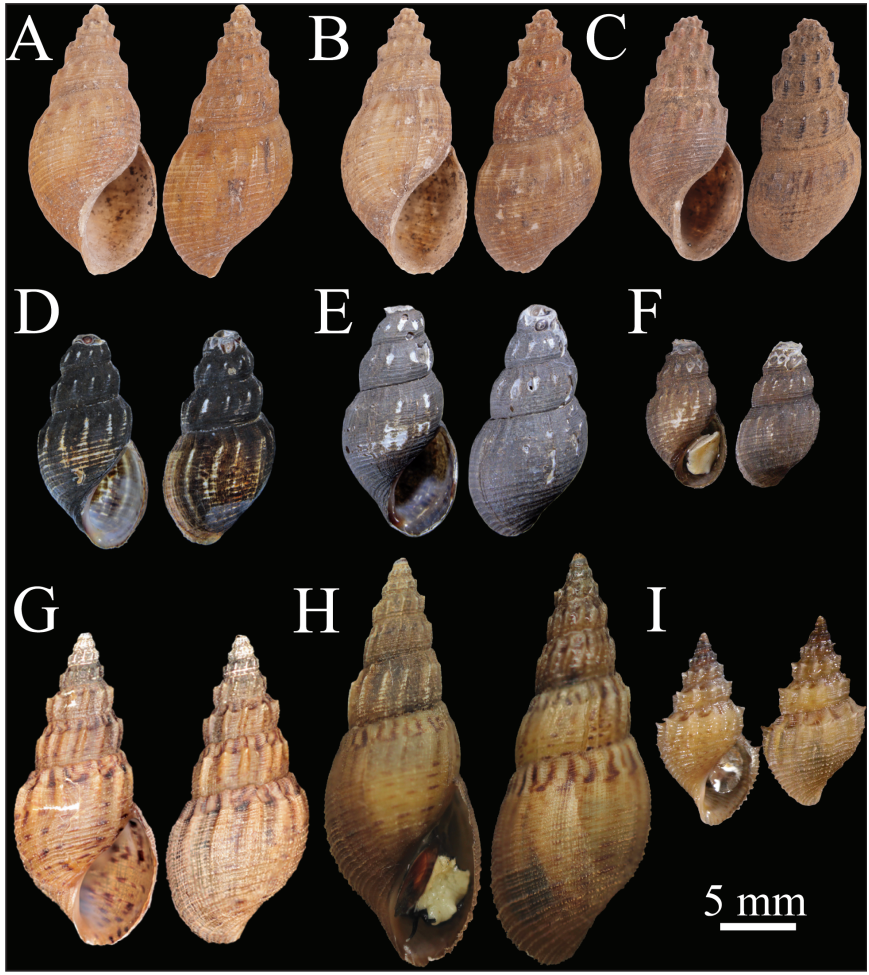

Figure 2. Representative shell images of *Mieniplotia scabra*. **A–C**) Probable syntypes from the Natural History Museum of Denmark (NHMD-90997). **D–H**) Shells of specimens collected from three sites on Oʻahu representing multiple size classes. **D–F**) Mānoa Stream, BPBM 288131; **G–H**) Makiki Stream, BPBM 293901; **I**) Makiki Stream, BPBM 293905.

(Starmühlner 1984). Several other *M. scabra* sequences from GenBank, collected from Thailand, Indonesia, Australia, and Papua New Guinea were recovered in a close relationship to the Hawaiian clade of *M. scabra* (Fig. 3). These initial phylogenetic results along with species delimitation analysis indicate that *M. scabra* represents a species complex that will require more extensive geographic sampling and taxonomic revision to resolve (Hayes *et al.* unpubl.).

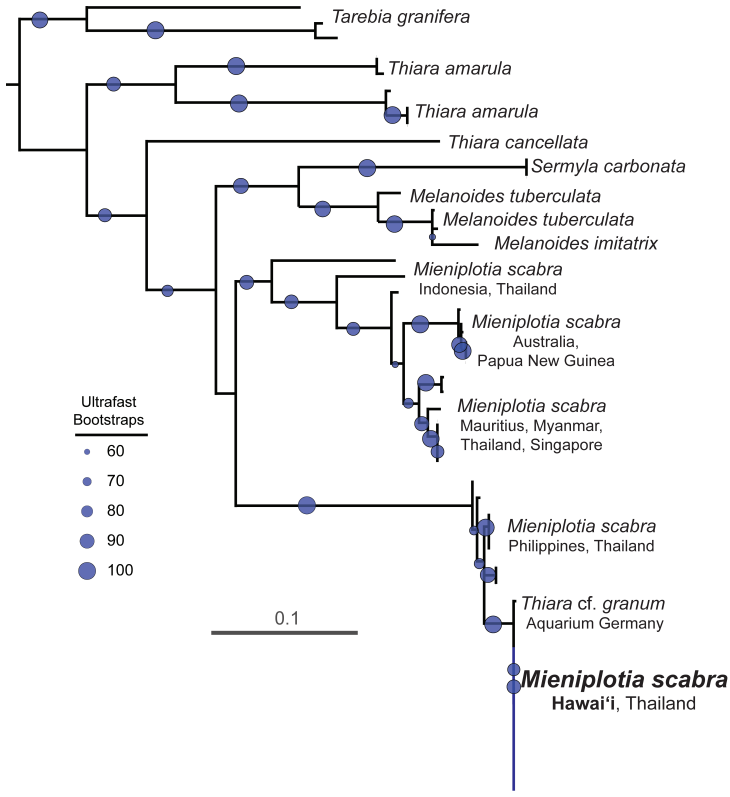

Figure 3. Maximum likelihood reconstruction of COI sequences from all *Mieniplotia scabra* specimens collected from Oʻahu and thiarid sequences from GenBank. Node symbols are for 40,000 ultrafast bootstrap replicates.

All collected material is deposited in the Bishop Museum (BPBM) Malacology Collection and tissue and genomic resources from each in the Pacific Center for Molecular Biodiversity (PCMB). Numbers are for those respective collections.

Material examined. Oʻahu: 213, Mānoa Stream, 21.308527, -157.809162, coll. 8 Jan 2022, K. A. Hayes, Y. Channel, B. Derne, hand collected (BPBM 288131; PCMB60815; PCMB60818-24; PCMB6867-8); 5, Makiki Stream, 21.309886, -157.830536, coll. 22 May 2022, C. Atta, E. D'Amelio, hand collected (BPBM 293901; PCMB56414; PCMB61274); 1, same data except 21.310097, -157.830444 (BPBM 293904; PCMB56413); 8, same data except 21.30097, -157.830444 (BPBM 293904; PCMB56413); 8, same data except 21.309736, -157.830581 (BPBM 293905; PCMB56415-6); 16, pet store, coll. 12 Jan 2024, T. P. Kinzler, hand collected (BPBM 297000; PCMB68851-2; PCMB68854-5); 1, pet store, coll. 12 Jan 2024, T. P. Kinzler, hand collected (BPBM 297004; PCMB68851-2; PCMB68854-5); 78, Mānoa Stream, 21.3076265, -157.80899, coll. 6 Feb 2024, T. P. Kinzler, hand collected (BPBM 297326; PCMB68895-9; PCMB68901; PCMB68903); 87, same data except Nuʻuanu Stream, 21.3200035, -157.85481 (BPBM 297328; PCMB68914-9; PCMB68921); 32, Makiki Stream, 21.3096253, -157.8306158, coll. 8 Mar 2024, T. P. Kinzler, hand collected (BPBM 297068; PCMB68969-77); 21, Waimānalo Stream, 21.35027, -157.72815, 13 m, coll. 29 Aug 2024; C. Yap, hand collected (BPBM 298011).

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A reevaluation of the nomenclature of Hawaiian *Acacia*[1]

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The close relationship between Hawaiian *Acacia koa* A. Gray and Réunionese *Acacia heterophylla* Willd. has long been noted (Bentham 1875), but due to their disjunct geography and morphological differences they have been recognized as distinct species (St. John 1975; Wagner *et al*. 1999). Their relationship was investigated using genetic techniques by Le Roux *et al*. (2014) and revealed that *A. heterophylla* evolved from *A. koa*, rendering *A. koa* paraphyletic. The most parsimonious explanation for these genetic results is an extreme long-distance dispersal event from Hawai'i to Réunion. Based on this relationship, these species should be treated at the infraspecific level to best represent their evolutionary history and maintain monophyly.

In Hawai'i both western scientific and indigenous taxonomic systems have recognized two types of *Acacia*, both *A. koa* (Hawaiian name koa) and *A. koaia* (koai'a or koai'e). Koa is traditionally recognized by its large habit (up to 35 m), transversely arranged seeds, generally straight trunks, and wider phyllodes whereas koai'a has a shorter habit (up to 5 m), longitudinally arranged seeds, denser wood, often twisted and furrowed trunks, narrower phyllodes, and occurs in drier habitats (Hillebrand 1888; St. John 1979; Adamski *et al*. 2012). The current taxonomy of Wagner *et al*. (1999: 1875) and Rico-Arce (2007) recognizes these at the species rank, but given that they intergrade both morphologically and genetically (Adamski *et al*. 2012), we propose to recognize them instead at subspecific rank.

As such, we do not accept the names *Acacia kauaiensis* Hillebr., *Acacia koa* var. *latifolia* (Benth.) H.St.John, or other segregates outside of koai'a and treat these as synonyms within *A. koa*. *Acacia kauaiensis* was noted as more-or-less distinguishable by Wagner *et al*. (1999) based on its terminal inflorescence, accepted by Lourdes Rico-Acre (2007), and Fredua-Agyeman *et al*. (2008) found that Kaua'i populations of *A. koa sensu latu* are rather distinct genetically. However, the genetic work by Adamski *et al*. (2012) and Le Roux *et al*. (2014) found the koa from Kaua'i to be indistinct within the variation

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of Hawaiian koa. Furthermore, there is no known ecological differentiation between *A. kauaiensis* and *A. koa,* unlike koaiʻa. Examination of koa specimens at BISH found intermediates with respect to the position of the inflorescence, including Oʻahu specimens with terminal inflorescences, suggesting that floral arrangement has nearly continuous variation within koa and should not form the basis of any taxonomy.

Acacia heterophylla subsp. ***koa*** (A. Gray) Morden & Faccenda, **comb. et stat. nov.**
Basionym: *Acacia koa* A. Gray, U.S. Expl. Exped., Phan. 1: 480 (1854).
Lectotype: (designated by St. John [1979]): Sandwich Islands, Oʻahu, on the mountains behind Honolulu, U.S. Exploring Expedition, Capt. Wilkes (K).

Acacia heterophylla subsp. ***koaia*** (Hillebr.) Morden & Faccenda, **comb. et stat. nov.**
Basionym: *Acacia koaia* Hillebr., Fl. Hawaiian Isl.: 113 (1888).
Lectotype: (designated by St. John [1979]): Hawaiian Islands, Molokaʻi, Kalae, Jul 1870, W. Hillebrand (B) [now destroyed, photograph reproduced in St. John (1979)].

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Updates to the Hawaiian grass flora: Part 4[1]

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This paper finalizes the work of Faccenda (2022, 2023) and Faccenda *et al.* (2024) in revising the grass flora of Hawai'i by making some nomenclatural changes and publishing a few new naturalizations and reidentifications. I discovered some of these records through work on an atlas of grasses in Hawai'i (http://mauu.net/atlas) as I began to focus more on the native species. During this project I compared herbarium data to the checklist of native grasses on each island (Imada *et al*. in prep.), finding several new island records. Unfortunately, the majority of these records were historic collections from the nineteenth or twentieth centuries that have not been collected again. It is assumed that the majority of these are extirpated. The endemic *Deschampsia nubigena* is also changed to a subspecies of *Deschampsia cespitosa* and neotypified. All specimens examined are stored at BISH unless otherwise noted.

Several grain species have been listed as naturalized in Hawai'i by previous authors (e.g., sorghum, wheat, etc.). However, recent fieldwork and a critical examination of herbarium material has shown that these species are not forming self-sustaining populations, and are rather ephemeral populations continuously being resupplied from spilled seed. In other regions of the world, these species would be defined as casual, waifs, or spontaneous (Brock *et al.* 2019). Brock *et al.* (2019) provides guidance on the publication of naturalizations in Hawai'i, but does not specifically address how these species should be treated. As Brock defines *naturalized* as species that form populations outside of cultivation, these species must be excluded from both the naturalized and questionably naturalized checklists since there is currently no evidence that they are either naturalized or in the process of naturalizing.

Agrostis gigantea Roth **New state record**

Recent fieldwork stumbled upon *Agrostis gigantea* naturalized along the Mauna Kea access road at about 2170 m. The population observed was purely rhizomatous and occupied several hundred feet of roadside, but the area was not rigorously surveyed. This species is native to Eurasia but is widely naturalized across the world (POWO 2025). It is likely that some specimens currently identified as *Agrostis stolonifera* are actually this species, as rhizomes or stolons are needed to diagnose the two species (Barkworth *et al.* 1993) and many specimens exclude the rootstock. *Agrostis stolonifera* has only stolons but no rhizomes, whereas *A. gigantea* has only rhizomes but no stolons (Barkworth *et al.* 1993).

Material examined. **HAWAI'I:** Mauna Kea, about 3 km up the access road on right side, past the grove of trees, dry pasture type habitat dominated by invasive grass, common on roadbank, 2177 m, 19.716314, -155.445596, 10 Jul 2024, *K. Faccenda 3598*.

1. Contribution No. 2025-005 to the Hawaii Biological Survey.

Agrostis sandwicensis Hillebr. **New island records**

When *Agrostis sandwicensis* was published, Hillebrand cited material from both Oʻahu and East Maui. O'Connor (1990) reported *A. sandwicensis* as questionable for Oʻahu, as Hillebrand's specimen was not seen at that time, but the MEL specimen confirms its presence on this island. Another specimen from a foreign herbarium also adds Molokaʻi to this species' distribution. It is therefore considered extirpated from both Oʻahu and Molokaʻi, as it has not been observed in 100 years. It has also not been collected on Kauaʻi since 1916 (*Hitchcock 15507*) but likely persists at the Waiʻaleʻale summit bog (Ken Wood, pers. comm.)

Material examined. **Oʻahu**: n.d., *W. Hillebrand s.n.* (MEL 1520483). **Molokaʻi**: Kamalō, Jun 1909, *A. Faurie 1369* (P).

Alopecurus pratensis L. **Extirpation**

Alopecurus pratensis, published as a new state record by Judziewicz (2017) based on a single collection, should no longer be considered naturalized. The collection site was visited in January 2024 and no plants were seen, nor were any seen on nearby roadsides. This grass likely appeared from imported hay or was perhaps deliberately planted. This species may appear again in high elevation areas of Hawaiʻi or Maui.

Anthephora hermaphrodita (L.) Kuntze **Retraction of naturalization**

Anthephora hermaphrodita was reported as naturalized by Herbst & Clayton (1998) based on one specimen from 1981 at Makapuʻu and has not been recollected since. The Kaʻiwi and Makapuʻu area was searched for this species in the winter of 2023 and it was not found, nor was it found in less exhaustive surveys in 2022. *Anthephora hermaphrodita* should therefore be considered a questionable naturalization in Hawaiʻi until it is relocated.

Arrhenatherum elatius (L.) P.Beauv.
ex J.Presl & C.Presl subsp. ***elatius*** **Nomenclatural note**

The naturalized *Arrhenatherum elatius* in Hawaiʻi is best referred to as the nominate subspecies on the basis of its basal nodes, which are glabrous and not swollen (Barkworth *et al.* 1993).

Avena barbata Pott ex Link **New island record**

Examination of the *Avena* collection at BISH found that all specimens filed as *Avena fatua* from Lānaʻi are actually *A. barbata*.

Material examined. **Lānaʻi**: Kānepuʻu, 04 Mar 1928, *G.C. Munro 308*; Koʻele, 2.5 mi [4.0 km] from junction of Keōmoku and Lānaʻihale road, along Keōmoku Rd, in disturbed dry pasture, 500 ft [150 m], 30 Apr 1975, *D. Herbst 5291a*; mauka of Kanaele, 1500 ft [455 m], 23 Mar 1961, *K. Yoshido 12.*

Avena fatua L. **Correction**

All specimens of *Avena fatua* from Lānaʻi have been reidentified as *A. barbata*. See note above.

Bothriochloa laguroides (DC.) Herter
subsp. ***laguroides*** **Nomenclatural note**

Bothriochloa laguroides is questionably naturalized on Maui and Hawaiʻi (Faccenda 2022). All specimens from Hawaiʻi belong to *B. laguroides* subsp. *laguroides*, following Barkworth *et al.* (2003).

Calamagrostis hillebrandii (Munro ex Hillebr.) Hitchc. **New island record**

O'Connor (1990) notes this species as perhaps occurring on Moloka'i based on *Hitchcock 15286* (US), but did not examine the specimen. A photograph was examined and the identification is now confirmed. The generic placement of this grass is uncertain; it may need to be transferred to *Greeneochloa* just as *Calamagrostis expansa* was moved to *Greeneochloa* based on molecular evidence (Peterson *et al.* 2022b). However, this genus is described as having hairy ovaries, yet *C. expansa* apparently lacks hairy ovaries. Future work should sequence DNA from *C. hillebrandii* to see if it should also be moved to *Greeneochloa*, as it appears the morphological evidence is inconclusive.

Cenchrus agrimonioides Trin. var. ***agrimonioides*** **New island record**

This species was reported from Ni'ihau from 1826 (Hooker & Arnott 1841) and is surely extirpated. Unfortunately, no specimens could be found at this time, although one may yet exist undigitized in a European herbarium.

Cenchrus americanus (L.) Morrone **Correction**

Cenchrus americanus was published as naturalized on Maui by Oppenheimer (2007), who cited material from an agricultural area, where it is likely that the plants were volunteers from spilled seed or potentially planted as a forage crop. As this species is a cultigen, it tends not to form persistent populations, and as such this species should be excluded from the Hawaiian flora.

Cenchrus × ***cupreus*** (Thorpe) Govaerts **Extirpation**

Previously published as naturalized on Maui by Faccenda (2022), a revisit of the Lāhainā site by Danielle Frohlich in 2022 found no persistent plants. As such, this species should no longer be considered naturalized in Hawai'i.

Chloris divaricata R.Br. **Confirmation of naturalization**

Chloris divaricata was previously published as a questionable naturalization on Hawai'i Island by Faccenda (2023). Recent fieldwork has found a population at Pololū, confirming its naturalization.

Material examined. **HAWAI'I:** Kohala, Pololū lookout, roadside near lookout, dry, sunny area, rare, only about 3 plants seen, 145 m, 20.205987, -155.735609, 02 Jan 2024, *K. Faccenda & E. Judziewicz 3252*.

Coix lacryma-jobi L. var. ***lacryma-jobi*** **Nomenclatural note**

Following the treatment of *Coix* in Wu *et al.* (2006), all individuals of *Coix lacryma-jobi* in Hawai'i should be treated as the typical variety.

Deschampsia cespitosa subsp. ***beringensis*** (Hultén) W.E.Lawr. **Correction**

This species was reported as naturalized in Hawai'i based on a misidentification of the native *Deschampsia*. See below.

Deschampsia cespitosa subsp. ***nubigena***
(Hillebr.) Faccenda, **comb. et stat. nov.** **New island record; note**
[Basionym: *Deschampsia nubigena* Hillebr., Fl. Hawaiian Isl. 521 (1888)]
Neotype (designated here): Puʻu Kukui, near summit, open bog, 1850 m, 24 Sep 1916, *A.S. Hitchcock 14728* (BISH 118559!; isoneotypes: US 00449074 photo!, US 00430392 photo!).

To clarify and stabilize the usage of *Deschampsia nubigena*, this name is first neotypified. None of Hillebrand's original material for *Deschampisa nubigena* could be found, as it was deposited at B (Berlin) and was likely destroyed in WWII. Original material could only be found for the heterotypic synonyms *D. australis* Nees ex Steud. (MEL, US, BISH) and *D. pallens* Hillebr. (BISH). *Hitchcock 14728* was chosen as a neotype, as it comes from the type locality, bears good resemblance to the protologue, and has duplicates.

Deschampsia cespitosa (L.) P.Beauv. is widely distributed in temperate areas of both hemispheres and is traditionally interpreted as a polymorphic species with many subspecies distinguished by geographic and weak morphological separation (Chiapella 2000; Wu *et al.* 2006; Chiapella & Zuloaga 2010). Many North American specimens of *D. cespitosa* were compared to the Hawaiian plants at BISH to understand the differences between *D. nubigena* and *D. cespitosa*.

Measurements claimed to distinguish between *D. nubigena* and *D. cespitosa* are provided by Snow & Davidse (2011), but the measurements provided for *D. cespitosa* are much narrower than the values reported by other authors (e.g. Barkworth *et al.* 1993; Wu *et al.* 2006). When *D. nubigena* is compared against the global variation of *D. cespitosa*, the two species almost entirely overlap in their morphologies. One character commonly found in Hawaiian plants is that the ribs on the upper leaf surface are strongly papillose on most specimens, but some plants are purely scabrous, making this character inconsistent.

Further study is needed into this polymorphic grass, both in Hawaiʻi and worldwide. There is great variation within plants in Hawaiʻi, which may represent cryptic species or ecotypes. The morphological variation appears to be quite correlated with habitat, with similar morphological forms existing on both Maui and Hawaiʻi. Maui appears to have the most morphological diversity, and several ecotypes are briefly described below to illustrate some of the variation on the island. These do not encompass the full range of ecological or morphological diversity, and intermediates are found.

- Plants with elongated internodes and soft leaves, the uppermost leaf often sheathing the inflorescence. This ecotype has the largest florets. Found in bogs and other wet areas at middle elevations on East Maui.
- Plants with leaves that are short (3–10 cm) and needlelike from a basal rosette, with 1–2 reduced cauline leaves produced on flowering culms. Found from bogs on West Maui to the Haleakalā summit, 5000–10000 ft [1500–3000 m] elevation. The type specimen is of this form.
- Similar to form 2 and intergrading with it, but dramatically larger, up to 60 cm tall, with leaves ca. 20 cm long and only found at the dry Haleakalā crater and summit region, >6000 ft [1800 m] elevation.
- A form with soft leaves but with basal internodes contracted. The leaves are ribless or with only minute ribs on their adaxial surface. This form generally has the smallest florets and the panicle branches are more capillary and smooth. It is found in stream beds and waterfalls from ~3000–6000 ft [900–1800 m] elevation.

As both *D. nubigena* & *D. cespitosa* are exceedingly variable species and overlap in their morphology, no justification could be found for maintaining *D. nubigena* as distinct from *D. cespitosa* at the species level. This close relationship has been observed previously, as Hillebrand (1888:520) notes that Hawaiian *Deschampsia* "approaches closely" *D. cespitosa*. Chiapella (2007) also found *D. nubigena* to be closely related to *D. cespitosa* but achieved low resolution in their phylogeny. The population genetically most similar to, and likely the ancestor of, the Hawaiian *Deschampsia* is *D. cespitosa* from North America (Baldwin & Wagner 2010). In the spirit of describing subspecies of *Deschampsia nubigena* based primarily on geography (Clarke 1978; Chiapella 2000; Wu *et al*. 2006), the Hawaiian plants are hereby moved to *D. cespitosa* subsp. *nubigena* **comb**. **nov**.

Deschampsia nubigena has previously been reported from Kauaʻi, Molokaʻi, Maui, and Hawaiʻi (O'Connor 1990). However, Hillebrand (1888) reported this species on Lānaʻi (cited as *D. pallens*), and Skottsberg (1926) also cited a specimen of *Deschampsia* from Hillebrand's herbarium collected on Lānaʻi, confirming this record. Unfortunately, this specimen, as with much of Hillebrand's material, was destroyed in WWII. Given that there have been no collections since, *D. cespitosa* subsp. *nubigena* is assumed to be extirpated from Lānaʻi.

Deschampsia nubigena was also published as occurring in French Polynesia on Mt. ʻOrohena, Tahiti (Welsh 2009; Clayton & Snow 2010). Of the five specimens at BISH, only one (*B.H. Gagné 1561*) has complete spikelets, with the others at various stages of decay. Based on this limited quantity of material, it is unclear at this time whether this population should also be placed in *D. cespitosa* subsp. *nubigena* or a different subspecies.

Deschampsia cespitosa was imported to Hawaiʻi for use as forage in 1913 (HAES n.d.). I could locate no mentions of this grass beyond the initial importation, making it unclear if this grass was distributed or even germinated, thus the subspecies is unknown. Comparison of the specimens identified as *D. cespitosa* subsp. *beringensis* by Snow & Davidse (2011) found them near the edge, but within the range of variation, of the indigenous Hawaiian *Deschampsia* populations. These plants are unusual in that they have long internodes and relatively wide leaves, but are similar to *Forbes 1872.M*, which was collected in 1920, also on East Maui. While this was after *D. cespitosa* was imported, Forbes' notes indicate that this collection was from native-dominated habitat. Based on morphological analysis, the specimens cited by Snow & Davidse (2011) are reidentified as the native *Deschampsia*. The possibility cannot be eliminated that some contemporary Hawaiian populations descend from forage importations or contaminated hay, but molecular techniques would be needed to identify these.

The following description was prepared based on examination of much of the Hawaiian *Deschampsia* collection at BISH:

> Plant perennial, caespitose, (15)30–100 cm tall, nodes glabrous. Leaves clustered in basal rosette, or with elongated internodes, 3–30(40) cm long, up to 1.2–3 mm wide when flattened, appearing cylindrical due to strong inrolling, adaxial surface ribbed, densely papillose with or without scabrites, abaxial surface smooth or with minute scabrites, margins antrorsely scabrous. Sheaths smooth, margins hyaline, sometimes a thickened, knobby, coriaceous auricle observed at collar. Ligules acute, (2)4–8(11) mm long, often splitting longitudinally into 2 lobes. Inflorescence an open panicle, 5–30 cm long, lower branches spreading to partly erect, panicle branches antrorsely scabrous to smooth, pedicel clavate. Spikelets 2-flowered [rarely 3-flowered, only one of this found from

Waiʻānapanapa Lake, *P. Welton et al. s.n.*, BISH 780226], 3–7 mm long, rachilla hairy, prolonged 2 mm beyond uppermost floret, sometimes with an aborted lemma at apex, often with purple pigmentation. Glumes subequal, 3–7 mm long, usually surpassing lemmas, keeled, keel smooth to antrorsely scabrous apically, lower glume 1-veined, upper glume 3-veined, persistent after lemmas fall. Lemmas thin, not keeled, 3–5 mm long, callus hairs to 1.5 mm long, 4-fid at apex (often appearing lacerate) with lobes from 0.2–0.6 mm deep, the lobes variable, ranging from approximately subequal to larger outer lobes double the length of inner lobes. Awn 6–9 mm long, arising at length of lemma, geniculate to nearly straight. Palea strongly 2-keeled, keels glabrous at base and scabrous at apex. Anthers 3, 1.6–1.8 mm long, yellow or purple. Caryopsis ovoid to fusiform, cylindrical, ca. 1.6 mm long, slightly rugose.

Dichanthium sericeum (R.Br.) A.Camus subsp. ***sericeum*** **Nomenclatural note**

The naturalized Hawaiian populations of *Dichanthium sericeum* are the nominate subspecies, as all specimens are perennial (Barkworth *et al.* 2003; Simon & Alfonso 2011).

Digitaria didactyla Willd. **New island record**

Digitaria didactyla is now naturalized on Oʻahu, where it was found growing at Hoʻomaluhia Botanical Garden in an area where it does not appear to be planted. One large colony was found about 15 m wide in a mowed, turfgrass area. *Digitaria didactyla* is now known to be naturalized on Kauaʻi, Oʻahu, and Hawaiʻi (Faccenda 2023).

Material examined. **OʻAHU**: Ho'omaluhia Botanical Garden, large grassy area between visitor center and lake, mowed, unirrigated grass area otherwise dominated by *Axonopus compressus*, 68 m, 21.387287, -157.807482, 27 Aug 2023, *K. Faccenda & S. Vanapruks 3227.*

Digitaria longiflora (Retz.) Pers. **Correction**

Digitaria longiflora was published as a new state record by Faccenda (2023); however, further examination of the specimen suggests that it is an aberrant *Digitaria violascens* with unusually pale fertile lemmas and a "stolon" that was actually a culm laying sideways and subsequently developing branches from the axillary nodes. Seed was taken from the original specimen and cultivated by the author, and despite having consistently brown fertile lemmas, the cultivated plant failed to produce stolons and grew inflorescences with up to 5 branches that were dramatically longer than the original specimen and out of the recorded range of *D. longiflora*. As this was the only specimen known, this species should be deleted from the naturalized flora.

Digitaria setigera Roth. var. ***setigera*** **Nomenclatural note**

All *Digitaria setigera* in Hawaiʻi are of the nominate variety, as they lack glassy bristles (Boonsuk *et al*. 2016).

Digitaria stricta Roth var. ***stricta*** **New island record**

Digitaria stricta is now known to be naturalized on Kauaʻi, where approximately 50 plants were found at the parking lot overlooking Wailua Falls. *Digitaria stricta* was previously known only from Oʻahu (Faccenda 2022).

Material examined. **KAUAʻI**: Wailua Falls lookout, sunny, moist area, found along roadside with other weeds, common, at least 50 plants seen, plants close to 1 m tall, culm bases purple, 71 m, 22.033559, -159.379141, 11 Sep 2023, *K. Faccenda & C. Statler 3229*.

Dissochondrus biflorus (Hillebr.)
Kuntze ex Hack. **Extirpation**

Dissochondrus biflorus is extirpated from Kauaʻi, Lānaʻi, and Hawaiʻi. On Kauaʻi it has not been seen since 1973 (*Herbst 2986*), despite concerted efforts made to relocate it (Ken Wood, pers. comm.). On Lānaʻi it has not been seen since Hillebrand's time. On Hawaiʻi it has not been seen since 1911 at Puʻu Waʻawaʻa, and PEPP knows of no populations (Josh VanDeMark, pers. comm.). Populations remain on Oʻahu, Molokaʻi, and Maui. Molecular evidence supports *Dissochondrus* being maintained as a valid monotypic genus whose closest known relative is *Pseudoraphis,* an Asian genus (Arthan *et al.* 2024).

Eragrostis variabilis (Gaudich.) Hook. & Arn. **Note**
[= *Eragrostis fosbergii* Whitney]

Eragrostis fosbergii, known only from the Waiʻanae Mountains, has been diagnosed by its ciliate glumes, but is otherwise indistinguishable from *E. variabilis* (O'Connor 1990). Maintaining this as a distinct species, amongst the many other names that have been synonymized into *E. variabilis* (O'Connor 1990), is not justified given the wide morphological variation in *E. variabilis.*

Hemarthria altissima (Poir.) Stapf & C.E.Hubb. **New island record**

Hemarthria altissima is now naturalized on roadsides on Hawaiʻi Island, where it has spread from pastures in Mountain View and Glenwood. It has previously only been reported as naturalized on Maui (Imada 2019).

Material examined. **HAWAIʻI:** Mountain View, N Peck Rd, near highway, weedy roadside, sunny, wet, edge of pasture, 2 patches seen along road, each about 5 m wide, sprawling grass to 1.5 m tall, 554 m, 19.540191, -155.128320, 06 Jan 2024, *K. Faccenda & E. Judziewicz 3278*; Puna Distr, N Glenwood Rd, roadside, wet, sunny area, decumbent grass, rare, only one colony seen along this road, about 5 m long along road, spreading from pasture but area not extensively surveyed, 822 m, 19.500946, -155.175656, 05 Jan 2024, *K. Faccenda & E. Judziewicz 3266*.

Hyparrhenia rufa (Nees) Stapf var. ***rufa*** **Nomenclatural note**

Following the treatment of *Hyparrhenia* in the monograph by Clayton (1969), the *Hyparrhenia rufa* populations naturalized in Hawaiʻi are recognized as the nominate variety, *H. rufa* var. *rufa*.

Koeleria glomerata Kunth **Nomenclatural note**

This endemic species, called *Trisetum glomeratum* (Kunth) Trin. ex Steud. in the *Manual* (O'Connor 1990), should now be recognized in the genus *Koeleria*, based on molecular evidence (Barberá *et al.* 2019; Barberá *et al.* 2025).

Koeleria inaequalis (Whitney) Barberá,
Quintanar, Soreng & P.M.Peterson **Nomenclatural note**

This endemic species, referred to as *Trisetum inaequale* Whitney in the *Manual* (O'Connor 1990), should now be recognized in the genus *Koeleria*, based on molecular evidence (Barberá *et al.* 2019; Barberá *et al.* 2025).

Koeleria macrantha (Ledeb.) Schult. **Correction**

Koeleria macrantha was first published as naturalized in Hawai‘i by O’Connor (1990; as *K. nitida*), based on about a dozen collections from Mauna Kea. In the generic key in O’Connor (1990), it is distinguished from the native *K. glomerata* [as *Trisetum glomeratum*] by its lack of awns, whereas *K. glomerata* is awned. However, this is the only trait in which the “*K. macrantha*” specimens differ from *K. glomerata*. Examination of all *K. glomerata* specimens found that material from Maui consistently has awns, but plants on Hawai‘i are variable and generally have smaller awns than plants from Maui. Some specimens annotated as *K. macrantha* were also found to have minute awns up to 4 mm long. The protologue of *K. glomerata* also describes the lemma as “sub apice breviter aristata, … arista recta, hispido-scabra, inflore secundo interdum, in tertio semper abortiens,” or “shortly awned below the apex, … awn straight, bristly-scaly, sometimes in the second flower, always abortive in the third,” and examination of photographs of original material of *K. glomerata* stored at K showed short awns on some lemmas and other lemmas lacking, or with minute, awns. The type locality is also from Mauna Kea.

The World Collection at BISH also has numerous vouchers of *K. macrantha* from its native range, which were compared to the Hawaiian material. These collections differ from Hawaiian “*K. macrantha*” in their softer, thinner leaves and glabrous to scabrous lemmas and glumes. The Hawaiian “*K. macrantha*” are identical to *K. glomerata* in all non-awn characters examined, including their stiffer, often in-rolled, wider leaves; longer pubescence on the inflorescence peduncle; and variably pubescent glumes and lemmas. Therefore, it is concluded that *Koeleria glomerata* is variable as to whether it has awns and that all identifications of *K. macrantha* in Hawai‘i derive from misidentifications of *K. glomerata*.

Melinis repens (Willd.) Zizka subsp. ***repens*** **Nomenclatural note**

All *Melinis repens* in Hawai‘i should be referred to as the nominate subspecies, following the taxonomy of Launert & Pope (1989) and examination of all specimens at BISH.

Microlaena stipoides (Labill.) R.Br.
var. ***stipoides*** **Nomenclatural note**

All Hawaiian plants of *Microlaena stipoides* are the nominate variety, following the taxonomy of Edgar & Connor (2000) and examination of all BISH specimens.

Oryza sativa L. **Correction**

Oryza sativa was published as questionably naturalized (Faccenda 2022) but should be excluded from the naturalized flora, as there is no evidence of natural reproduction.

Panicum beecheyi Hook. & Arn. **New island record**

Label data on three sheets of possible original material of *Panicum beecheyi* at E, K, and US all give the locality as “Oneehow,” expanding the historical range of this grass to Ni‘ihau, although it is now likely extirpated on that island.

Material examined. **NI‘IHAU:** n.d., *Beechey s.n. (*K 000674382*).*

Panicum miliaceum L. **Correction**

Previously reported on Kauaʻi, Oʻahu, Maui, and Hawaiʻi (O'Connor 1990; Oppenheimer 2003), all prior reports are associated with gardens or areas where bird seed was likely cast. No specimens document persistent populations. As such, these records should be considered adventive populations and excluded from the naturalized flora unless new evidence arrives to the contrary.

Paspalum plicatulum Michx. **New island record**

Paspalum plicatulum is now naturalized at Kualoa Ranch on Oʻahu. This new naturalization was located and identified through the citizen science platform iNaturalist (https://www.inaturalist.org/observations/206526634). Over 100 individuals were observed in 4 populations located within about 1 km of each other. These plants were found on ridge tops, fencelines, and the edge of a pasture.

Material examined. **Oʻahu:** Kaʻaʻawa Valley, NW side, grazing pasture slopes, 275 ft [85 m], 12 May 2025, *A. Evans KR9.*

Pentapogon micranthus (Cav.) P.M.Peterson, Romasch. & Soreng **Nomenclatural note, new island records**

Dichelachne micrantha should now be referred to as *Pentapogon micranthus* based on molecular evidence (Peterson *et al.* 2022a). *Pentapogon micranthus* is a non-native species that has been reported as naturalized on Kauaʻi, Lānaʻi, and Maui (Imada 2019). Collections made of this species in Kaunakakai and Hāmākua document its naturalization on Molokaʻi and Hawaiʻi. It should be considered extirpated on both islands until recollected.

Material examined. **Molokaʻi**: Kaunakakai, 02 May 1952, *E.Y. Hosaka 3659.* **Hawaiʻi:** Hāmākua, Honokaʻa, Pauhau, 04 Jul 1956, *E.Y. Hosaka 4011*.

Poa annua L. **Note**

At the Kaʻala summit along the road an unusual grass was located, covering hundreds of square meters along about 500 m of roadside, and was most common at the area surrounding the composting toilet. The species was quite delicate, stoloniferous, rooting at the nodes and forming thick mats and successfully competing with kikuyu (*Cenchrus clandestinus*). Notably, no flowers could be found despite extensive searching. Some of this grass was cultivated in a greenhouse. Over the two years the plant has been in cultivation, it produced one inflorescence (Mike Ross, pers. comm.).

Photos from this inflorescence were shared with Rob Soreng (US), who identified the plant as *Poa annua* and noted that *P. annua* may perennate in alpine conditions in tropical places. These perennial types of *P. annua* have been called *P. annua* var. *reptans* Hausskn. (Carson *et al.* 2007), although varieties of *P. annua* are not accepted in Soreng (1993). *Poa annua* is an allopolyploid derived from an annual caespitose species (*Poa infirma* Kunth) and a perennial, stoloniferous species (*Poa supina* Schrader; Mao & Huff 2012). It is the opinion of Soreng that stoloniferous forms of *P. annua* have evolved repeatedly, likely aided by its *P. supina* ancestry. Evolution *in situ* at Kaʻala is unlikely given the roadside habitat, and it seems more likely that this grass was introduced as an erosion control species, as cultivars resembling this plant are available commercially (Soreng 1993). Within *P. annua*, there are various flowering responses in different populations, with some requiring short days and others long days (Heide 2001), perhaps explaining why no flowers could be found in May 2021.

Material examined. **O‘AHU:** Pu‘u Ka‘ala summit, roadside, 1216 m, 21.507922, -158.143839, 06 May 2023, *K. Faccenda & T. Chambers 3100*; Kapi‘olani Community College greenhouse, cultivated material from *Faccenda 3100*, 01 Mar 2024, *M.C. Ross 1984.*

Rytidosperma biannulare (Zotov) Connor & Edgar **Note**

The identification of *Rytidosperma* in Hawai‘i has been immensely complicated by the great number of misapplied names used locally and their shifting application over time (Table 1). Unfortunately, names must now shift again after a much more careful review of Hawaiian specimens by Graeme Lorimer (MEL), which began with a conversation on iNaturalist.org. The taxonomy used here follows the treatment of *Rytidosperma* by Edgar & Connor (2000). There were 12 accessions of *Rytidosperma* imported by the Hawaii Agricultural Experiment Station (HAES) from 1913–1937, which were received as *Danthonia pilosa* or *D. semiannularis*, identifications that cannot be trusted. It is also possible that further seeds of *Rytidosperma* were imported accidentally with hay.

Rytidosperma biannulare has previously been published as occurring on Moloka‘i and Maui (Imada 2019) and this island-level distribution remains unchanged. However, within Maui both this species and *R. gracile* have been identified from BISH specimens formerly identified as *R. biannulare*. *Rytidosperma biannulare* is currently the only *Rytidosperma* known from West Maui. However, on East Maui it overlaps with *R. gracile*. See the key below for identification. How these species differ ecologically in Hawai‘i is not yet known.

Rytidosperma gracile (Hook.f.) Connor & Edgar **New state record**

Rytidosperma gracile, an Aotearoan and Australian species (POWO 2025), is naturalized on Haleakalā from 3000–8000 ft [900–2440 m]. It has been present on Maui since 1937 but has been referred to as *R. biannulare*, *R. caespitosum,* and *Danthonia semiannularis* throughout time (Table 1). See further discussion about misapplied names under *R. biannulare.* See the key below for identification. Only representative specimens are cited below.

Material examined: **MAUI:** Haleakalā, Pu‘u Nianiau, common in open pasture, 6000 ft [1830 m], 28 Jan 1937, *E.Y. Hosaka 1767*; Haleakalā, Makawao, in grassy slopes among *Styphelia*, 5000 ft [1520 m], 12 Apr 1947, *E.Y. Hosaka 2472*; Haleakalā National Park, Hosmer grove, 6800 ft [2070 m], 10 Nov 1993, *P. Welton 1786.*

Rytidosperma penicillatum (Labill.) Connor & Edgar **Note**

This species was formerly treated as the only *Rytidosperma* naturalized in Hawai‘i with upper lemma hairs in tufts (Imada 2019). This has now been split into three species (Table 1). *Rytidosperma penicillatum* in its revised sense is widespread above 4000 ft [1220 m] on East Maui and western and northern Mauna Kea. The oldest specimen of *R. penicillatum* from Maui is a volunteer in a grass garden (BISH 448988) from 1938, although it is possible that this species was also accidentally introduced as a hay contaminant earlier, as it was “common in [a] pasture” in 1944 (*Hosaka 2675*).

Material examined. **MAUI:** East Maui, Kahikinui, Pāhihi drainage, 4800 ft [1460 m], 27 Sep 2006, *H. Oppenheimer H90623*; Makawao, ‘Ōma‘opio, 5000 ft [1520 m], 11 May 1944, *E.Y. Hosaka 2675*; East Maui, Crater Rd, pasture, 5500 ft [1680 m], 13 Sep 2000, *F. Starr & K. Martz 000913-3*; East Maui, Haleakalā National Park, old switchbacks [near modern Halemau‘u trail], 7850 ft [2390 m], 13 Aug 2004, *F. Starr & K. Starr 040813-2*; Hosmer Grove LZ, 6800 ft [2070 m], 13 Jun 2002, *P. Welton & B. Haus 2157*. **HAWAI‘I:** Mauna Kea, Hāmākua, Ka‘ohe, occasional in dry open pasture, 6500 ft [1980 m], 12 Sep 1936, *E.Y. Hosaka 1596*; Hāmākua, Kalōpā, Hanipoe, semi-dry pasture, rare, 5500 ft [1680 m], 03 Jul 1952, *E.Y. Hosaka 3667*; Mauna Kea, Pu‘u Lā‘au hunter’s cabin, 7500 ft [2290 m], 18 Jan 1975, *D.R. Herbst 2554*.

Table 1. Usage of different *Rytidosperma* names in Hawai‘i by different authors and the islands they were reported from Moloka‘i, Maui, and Hawai‘i Each row corresponds to one species, cells spanning multiple rows indicate one name was used for what is now recognized as multiple species. (Mo = Moloka‘i, M = Maui, H = Hawai‘i).

This paper	Faccenda (2022, 2025)	Darbyshire *et al.* (2010); Imada (2019)	O’Connor (1990); Whitney *et al.* (1939)
Rytidosperma penicillatum (M, H)	*Rytidosperma penicillatum* (M, H)	*Rytidosperma penicillatum* (M, H)	*Danthonia pilosa* (H)
Rytidosperma racemosum var. *racemosum* (M, H)			
Rytidosperma pilosum (H)			
Rytidosperma biannulare (Mo, M)	*Rytidosperma biannulare* (Mo, M)	*Rytidosperma biannulare* (Mo, M)	*Danthonia semiannularis* (M)
Rytidosperma gracile (M)		*Rytidosperma caespitosum* (M)	

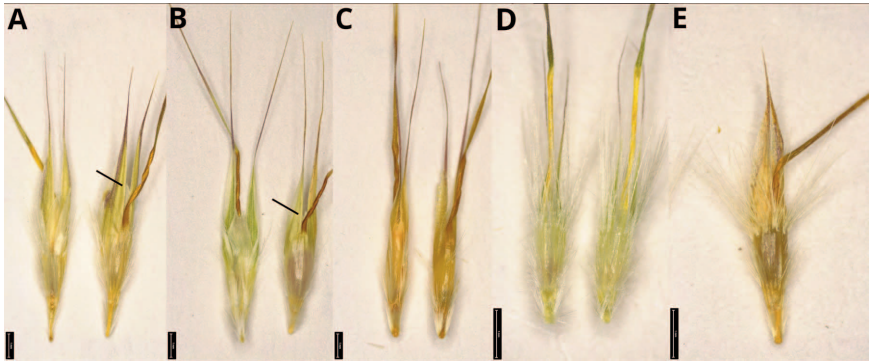

Figure 1. Lemmas of *Rytidosperma* spp. **A,** *R. racemosum* var. *racemosum* (*Herbst 5937*), line indicates tip of palea. **B,** *R. penicillatum* (*Welton 2157*), line indicates tip of palea. **C,** *R. pilosum* (*Hosaka 2316*). **D,** *R. biannulare* (*Oppenheimer H50725*). **E,** *R. gracile*, (*Hosaka 1767*).

Rytidosperma pilosum (R.Br.) Connor & Edgar **New state record**

This species was formerly treated as the only *Rytidosperma* naturalized in Hawai‘i with upper lemma hairs in tufts before the work by Darbyshire *et al*. (2010) changed it to *R. penicillatum* (Table 1). A re-evaluation of Hawaiian specimens found *R. pilosum* does occur here and appears to be largely confined to the Humu‘ula area, where it co-occurs with *R. racemosum* var. *racemosum*.

Material examined. **HAWAI‘I:** Humu‘ula, near Pu‘u ‘Ō‘ō, 7000 ft [2130 m], 02 May 1932, *G.R. Ewart III 250*; Saddle Rd, 26 miles from Hilo, 6000 ft [1830 m], 29 Mar 1967, *D.R. Herbst 404*; Saddle area, common along road to Mauna Loa observatory, 7000 ft [2130 m], 15 Jun 1981, *J. Davis 523*; Ahumoa, 6900 ft [2100 m], 21 May 1975, *D.R. Herbst 5341*.

Rytidosperma racemosum (R.Br.)
Connor & Edgar var. ***racemosum*** **New state record**

Most of the specimens previously called *Rytidosperma penicillatum* have now been reidentified as *R. racemosum* var. *racemosum*. Photos of these plants on iNaturalist were reviewed by Graeme Lorimer (MEL), who identified them by their lemmas being widest above the uppermost hairs, the length of the callus hairs, and the relatively longer callus. Examination of specimens at BISH confirms this determination on the basis of the key in Edgar & Connor (2000) and Darbyshire *et al.* (2010). This species is naturalized on Maui and Hawai‘i and is known from western Haleakalā, widespread on Mauna Kea, and currently the only *Rytidosperma* known from Mauna Loa. In its native range of Australia, this species is tolerant of disturbance and compacted soil. Lorimer (pers. comm.) reports that it is found in lawn, pastures, and paths, in addition to less disturbed sites.

Material examined: **MAUI:** East Maui, Kama‘ole, Kula Forest Reserve, 6300 ft [1920 m], 15 Jul 2002, *H. Oppenheimer H70208*; Haleakalā Crater, Halemau‘u Trail, 7000 ft [2130 m], 28 Jun 1992, *P. Welton 1658*. **HAWAI‘I:** Hawai‘i Volcanoes National Park, Mauna Loa Strip Rd, 1878 m, 19.483598, -155.377854, 15 Aug 2022, *K. Faccenda & J. Gross 2653*; Halepōhaku, 9200 ft [2800 m], 06 Oct 1981, *L.W. Cuddihy 895*; Pōhakuloa Military Camp, Mauna Kea, 1979 burn, 8000 ft [2440 m], n.d. [1980s], *K. Adee s.n.* (BISH 580767); N slope of Mauna Kea, makai of Pu‘u Kole near Hanaipoe Gulch, widespread and common, 2650 m, 23 Jun 2004, *F. Starr & K. Starr 040723-9*.

KEY TO *RYTIDOSPERMA* NATURALIZED IN HAWAIʻI

Examining lemmas under magnification is necessary for identification. The awn column is the strongly coiled, basal portion of the awn and is usually browner and shinier than the upper portion of the awn. The column is best examined on mature lemmas, as its length will contract as it coils with age. The awn sinus is cleft in the lemma at the base of the awn. To determine branching, examine the base of the plant where new culms arise at the base of the old culms (tillering). Extravaginal branching occurs when the new culm pierces through the old, often at a wide angle. Intravaginal branching occurs when a new culm arises within the sheath of an old culm at a narrow angle, pushing the old sheath out of the way without piercing through it.

1. Lemma with 2 continuous rows of hairs; lemma surface sparsely short-hairy between rows; inflorescence paniculate
    2. Awn column equalling upper lemma hairs, surpassing palea; branching intravaginal; leaves mostly basal, often forming a dense tuft ..... *R. biannulare*
    2′. Awn column shorter than upper lemma hairs, equalling or less than palea; branching extravaginal; leaves mostly cauline, usually not forming a dense tuft .....*R. gracile*

1′. Lemma with 1 lower continuous row of hairs, upper hairs concentrated in 2 lateral tufts, sometimes with scattered hairs between upper tufts; lemma glabrous between rows; inflorescence racemose or paniculate
    3. Palea barely reaching or equalling the awn sinus; branching intravaginal .... *R. pilosum*
    3′. Palea surpassing the base of the awn sinus (Figure 1A, B); branching extravaginal
        4. Lemma widest above uppermost tuft of hairs; callus hairs shorter than or barely reaching lower lemma hairs ..... *R. racemosum* var. *racemosum*
        4′. Lemma widest at uppermost tuft of hairs; callus hairs reaching or surpassing lower lemma hairs ..... *R. penicillatum*

Saccharum spontaneum L. subsp. ***spontaneum*** **Correction; nomenclatural note**
There is no longer any evidence that this species is naturalized on Molokaʻi, as the only evidence of naturalization was a misidentified specimen of *Saccharum officinale* L. (*St. John 19960*) published by O'Connor (1990). Furthermore, all *S. spontaneum* in Hawaiʻi should be referred to as the nominate subspecies on the basis of the leaf blade narrowing to nearly just the midvein at the base, and the triangular ligules (Cope 2002).

Sorghum bicolor (L.) Moench subsp. ***bicolor*** **Correction; nomenclatural note**
Plants previously referred to as *Sorghum bicolor* (L.) Moench in Hawaiʻi should now be referred to as *S. bicolor* subsp. *bicolor*, following the species concept proposed by De Wet (1978). This species concept better represents the biology of these plants, as *S. bicolo*r subsp. *bicolor* is a cultigen derived from wild *S. bicolor* subsp. *verticilliflorum* (Steud.) de Wet and the two subspecies freely hybridize to form *S. bicolor* nothosubsp. *drummondii*. Previously published as naturalized on Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Imada 2019), *S. bicolor* subsp. *bicolor* should now be recognized as a casual in Hawaiʻi, as there is no evidence self-sustaining populations exist here. Bird seed appears to be the main source of the plants found here, as most plants are found in urban areas where seed is often scattered.

Sorghum bicolor nothosubsp. ***drummondii***
(Nees ex Steud.) de Wet ex Davidse **Nomenclatural note**
Plants previously known as *Sorghum drummondii* (Nees ex Steud.) Millsp. & Chase in Hawai‘i should now be called *S. bicolor* nothosubsp. *drummondii* per De Wet (1978). See additional comments above.

Figure 2. *Stolonochloa pygmea* forming a dense ground cover outside the ‘Ōla‘a small tract.

Stolonochloa pygmaea (R.Br.) E.J.Thomps. **Nomenclatural note; note**
Panicum pygmaeum R. Br. was published as occurring in Hawai‘i by Faccenda (2023) but has now been moved to the genus *Stolonochloa* as *S. pygmaea* (R.Br.) E.J.Thomps. (Thompson 2022) as a part of an ongoing effort to make the genus *Panicum* monophyletic. The author visited the population initially found by Linda Pratt and found it to have persisted. Only this one population is known in Hawai‘i, despite rather extensive bike surveys of Volcano in both subdivisions on either side of the highway.

It is very curious how this grass native to eastern Australia arrived in Hawai‘i. It is endemic to Queensland and New South Wales, where it occurs in tropical heaths, tropical and subtropical sclerophyll forests, and tropical and subtropical subhumid woodlands (Simon & Alfonso 2011). The population in Volcano is growing along a fenceline surrounding the ‘Ōla‘a Small Tract of the Hawai‘i Volcanoes National Park, where it was found in the wet understory of a closed canopy rainforest along 180 m of fence. It is spreading stoloniferously into the native-dominated ‘ōhi‘a forest, forming mats on the ground (Figure 2). However, it is more common outside the fence, where it is benefited

by pig disturbances. It was not seen along the sunnier part of the fence that borders a pasture, nor was it seen inside the fully sunny, kikuyu-dominated pasture. This may be due to its reliance on shade, or because the area had been sprayed with herbicide before the site was visited. Perhaps this population arrived with fence materials or via a potted plant and has since spread to the fenceline from a residence in Volcano.

Material examined. **HAWAIʻI:** Volcano, ʻŌlaʻa Small Tract (end of Haunani Rd), along fenceline, 1168 m, 19.452751, -155.245333, 05 Jan 2024, *K. Faccenda & E. Judziewicz 3267*.

Triraphis mollis R.Br. **New naturalization**

An unusual grass was posted on the citizen science website iNaturalist by Michael Sthreshley (https://www.inaturalist.org/observations/222182319), and a specimen was requested and identified as *Triraphis mollis*. A single plant was found in leeward Kohala in an area consisting predominantly of buffelgrass and struggling kiawe trees. The plant appeared after irrigation was enabled in the area. It is likely that more plants exist upslope from where this was found, as leeward Kohala has been poorly studied botanically, and this is very likely naturalized despite only one plant being seen.

Triraphis mollis was imported as a forage species in the mid-twentieth century (Faccenda 2025) and has likely been naturalized ever since. *Triraphis mollis* is native to Australia, where it is widespread across inland arid areas, often found in clayey sand soils or red earth soils (Simon & Alfonso 2011). It has since been reported as naturalized in Belgium, Germany, Great Britain, New Guinea, and Texas (POWO 2025). This species is grazed, but is generally not well regarded as a forage grass as it contains cyanide, but poisoning is rarely reported in Australia due to the species' low density (Simon & Alfonso 2011).

This species can be identified by its tussocky perennial habit, feathery purple flower heads at maturity, and many awns. Look-alike species may be *Aristida adscensionis* L. or *Festuca myuros* L., but these are smaller annuals.

Material examined. **HAWAIʻI:** Kohala, site of former ornamental nursery, single individual in irrigated plot that was formerly a small nursery site, 95 m, 20.129563, -155.882375, 13 Jun 2024, *M. Sthreshley 2*.

Triticum aestivum L. **Correction**

Previously published as naturalized on Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi by Wagner & Herbst (2003), who called it "clearly naturalized," the same conclusion has been unable to be reached by the author. No naturalized populations were found during extensive fieldwork (see Faccenda 2023), and the majority of herbarium material is from areas where seed was likely spilled or dumped. Furthermore, no specimens from Hawaiʻi are explicitly described as naturalized by their collectors. As such, *Triticum aestivum* should be considered a casual species in Hawaiʻi and excluded from the naturalized flora.

Urochloa maxima (Jacq.) R.D.Webster **Nomenclatural note**

Guinea grass, formerly placed in both the genera *Panicum* and *Megathyrsus*, is most accurately referred to as *Urochloa maxima*, as molecular evidence has consistently shown the genus *Megathyrsus* is entirely nested within *Urochloa* (González & Morton 2005; Tomaszewska *et al*. 2023; Masters *et al.* 2024).

Urochloa mollis (Sw.) Morrone & Zuloaga **Retraction of naturalization**
Initially reported from one specimen from Makapu‘u collected in 1997 (Staples *et al.* 2002), *Urochloa mollis* has not been seen since. The Ka‘iwi and Makapu‘u areas were specifically searched for this species in the winter of 2023 and was not found. *Urochloa mollis* should therefore be considered a questionable naturalization in Hawai‘i unless it is relocated.

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More Hawaiian bryophyte records from Herbarium Pacificum for 2025: 30 new island records including seven new state records for Hawaiian liverworts and hornworts[1]

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Abstract. We report 30 new island records of liverworts and hornworts and seven state records: the hornwort *Notothylas orbicularis* and the liverworts *Cololejeunea raduliloba, Lejeunea cocoes, Lepidozia holorhiza, Plagiochasma cordatum, Riccardia* aff. *digitiloba,* and *Schistochila aligera.* We also report the first documentation of a liverwort (*Frullania sandvicensis*) from Kahoʻolawe, and the first report of the endemic liverwort genus *Kahakuloa* from Haleakalā (East Maui).

INTRODUCTION

Further fieldwork, research, and visits to the Bernice P. Pauahi Bishop Museum (BISH) and the Willard Turrell Sherman Herbarium (MU) at Miami University in Oxford, Ohio in March 2024 (by Judziewicz and Freire) have led to the discovery of more bryophyte records for the Hawaiian Islands. This is the fifth in a series of papers updating and further documenting the liverwort and hornwort flora of Hawaiʻi: a survey of Lānaʻi (Judziewicz, Freire & Bogner 2023); new state records and name changes for all islands (Judziewicz & Freire 2023); 106 new island records (Judziewicz, Freire & Thomas 2024); and the flora of the Kauaʻi summits (Judziewicz, Faccenda & Freire 2025). All are part of a projected five-volume identification guide to Hawaiian liverworts and hornworts (Freire & Judziewicz 2025).

ANTHOCEROTOPHYTA

Anthocerotaceae

Anthoceros punctatus L. **New island record**

This cosmopolitan naturalized species was previously known in Hawaiʻi from Hawaiʻi Island (Judziewicz & Freire 2023: 158).

Material examined. **MAUI:** Coastal Haleakalā, Lower Kanaio, Old Army National Guard Exclosure, on state lands west of windmills, a single patch of plants coming up on hardpan soil with buffel grass (*Cenchrus ciliaris*), ca 150 m, 2 Feb 2024, *Z. Pezzillo, H. Oppenheimer & R. Henderson 578* (BISH).

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Dendrocerotaceae

Megaceros flagellaris (Mitt.) Steph. **New island record**

This indigenous species (also known from Asia, other places in Oceania, and Madagascar) has been previously documented from Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Staples & Imada 2006; Judziewicz, Freire & Bogner 2023: 4).

Material examined. **MOLOKAʻI:** Upper Waikolu Valley, pipeline trail, 4,000 ft [1,219 m], 2 Jun 1953, *H.A. Miller & A.R.H. Lamberton 3847* (MU).

Notothyladaceae

Notothylas orbicularis (Schwein.) Sull. **New state record**

This is a weedy subcosmopolitan species with many records from Japan, eastern North America, and central Europe. In Hawaiʻi it is represented by two mid-twentieth century collections. It differs from the similarly weedy *N. breutelii* (Gottsche) Gottsche (known in Hawaiʻi only from Oʻahu) in its yellowish orange rather than black spores.

Material examined. **KAUAʻI:** Hanalei, Tasa path, 2 Jan 1948, *M.L. Lohman L-K-55* (MU). **MAUI:** Hanakalua [sic, locality and its spelling uncertain] Valley trail to Puʻu ʻEke, on soil, 1,500–1,600 ft [457–488 m], 6 Jun 1953, *H.A. Miller & A.R.H. Lamberton 3926* (MU).

MARCHANTIOPHYTA

Aneuraceae

Riccardia aff. ***digitiloba*** (Spruce) Pagán **New state record**

(Figs. 1–2)

This *Riccardia* species is noteworthy for its very small size, with filamentous thalli only 0.2–0.8 mm wide (mostly 0.3 mm wide) and clusters of abundant bicellular gemmae (30 × 20 µm) produced at the (often curved) apices of the thalli. From our search of the literature, it appears that it could be close to *R. digitiloba*, a widespread tropical American species (Gradstein & Reeb 2018: 525), or perhaps a group of filamentous New Zealand species (Glenny 2025).

Material examined. **MAUI:** West Maui, Hanaʻula, wet mesic forest above windmills, 1,100 m, 15 Mar 2024, *Z. Pezzillo, H. Oppenheimer & R. Henderson 788* (BISH).

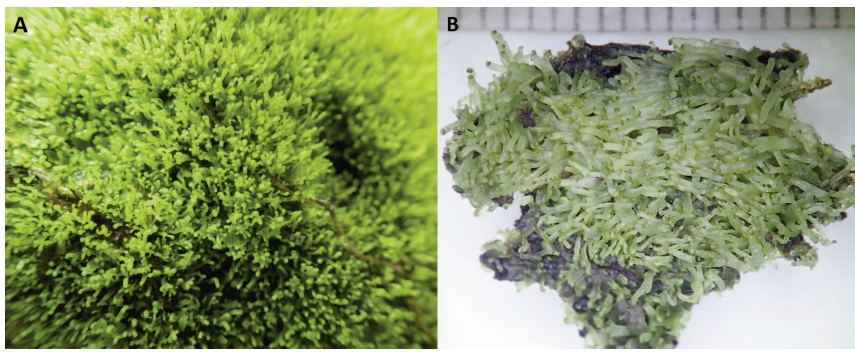

Figure 1. *Riccardia* aff. *digitiloba*. Hanaʻula, West Maui, note the small size of plants, *Z. Pezzillo et al.* 788 (BISH). **A**, Z. Pezzillo photo: https://www.inaturalist.org/observations/202835859. **B**, Scale in mm. Photo by A.V. Freire.

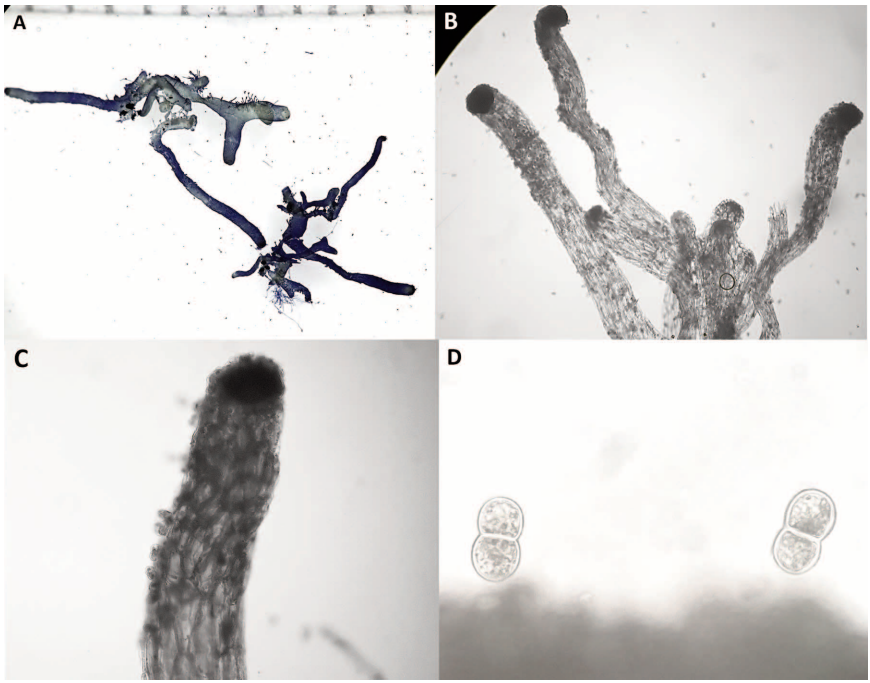

Figure 2. *Riccardia* aff. *digitiloba*. Hanaʻula, West Maui, Z. Pezzillo et al. 788 (BISH). **A–B**, Tiny plants with abundant gemmae clustered at the ends of thalli filaments with curved apices (scale in mm). **C**, Detail of gemmiferous branch. **D**, Bicellular gemmae (30 × 20 µm). Photos by A.V. Freire.

Aytoniaceae

Plagiochasma cordatum Lehm. & Lindenb. **New state record**

(Figs. 3–4)

This indigenous species (also found in eastern Asia) is a new record for Hawaiʻi. A previous report from Oʻahu (Miller 1963: 529), apparently the basis of the report by Staples & Imada (2006), was later re-identified by Miller as *P. japonicum*. Miller (1959 annotation of BISH specimen) initially identified *Olsen 81* (BISH) from Maui as *P. cordatum* but later changed this determination to *P. japonicum* (we agree with his latter determination). Bischler-Causse (1979: 45) cites the occurrence of *P. japonicum* in Hawaiʻi (based on Skottsberg 1192 (S), from Oʻahu), as well as the possible occurrence of *P. cordatum* there (Austin 1874), but without citing any specimens. Finally, Long and Grolle (1990) cite the occurrence in Hawaiʻi of *P. japonicum*, without citing specimens. Staples & Imada (2006) recognize the presence of *P. japonicum* but do not list *P. cordatum*. Therefore, the following is the only verified Hawaiian collection of the latter species.

Material examined. **Oʻahu:** Koʻolau Range, Tantalus area, Nā Ala Hele Moleka Trail, terrestrial, 1 sq m trailside patch, 21.322749°N, 157.817816°W, 375 m, 28 Apr 2024, *K. Faccenda 3383* (BISH). https://www.inaturalist.org/observations/254927808, https://www.inaturalist.org/observations/211450908, https://www.inaturalist.org/observations/200984279.

Figure 3. *Plagiochasma cordatum.* Koʻolau Range, Oʻahu, K. Faccenda 3383 (BISH). **A**, Growing on rocks, forming dense mats. Photo by K. Faccenda, https://www. inaturalist.org/observations/211450908. **B,** Serial female receptacles along the dorsal midline of the thallus; note the purple margins of thalli. Photo by A.V. Freire. **C**, Ventral scales will occasionally project and bend onto the dorsal surface of the thallus apex, forming a "mustache" (above); antheridia are produced in heart-shaped receptacles. Photo by A.V. Freire.

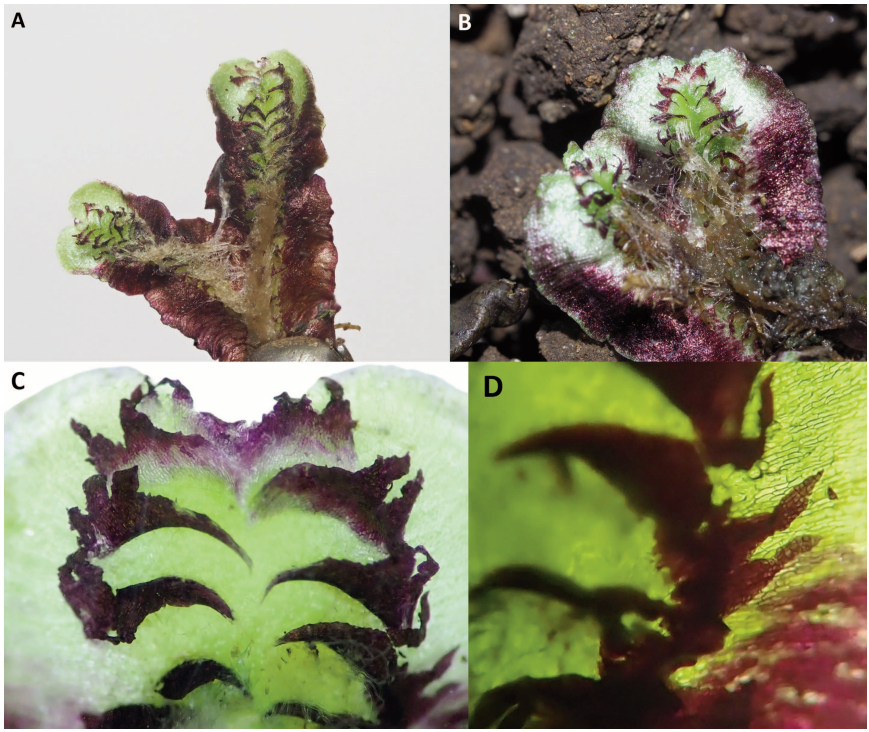

Figure 4. *Plagiochasma cordatum*. Koʻolau Range, Oʻahu. *K. Faccenda 3383* (BISH), ventral surface of thallus. **A–B**, Showing purple color of older portions of thallus, and the two rows of purple ventral scales; note the long and narrow scale appendages. Photos by K. Faccenda, https://www.inaturalist.org/observations/211450908. **C**, Lunate, purple ventral scales with 2–3 appendages. Photo by A.V. Freire. **D**, Detail of long, narrow, triangular scale appendages. Photo by A.V. Freire.Freire.

Plagiochasma japonicum (Steph.) C.Massal. **New island records**

This indigenous species (also found in eastern Asia) was previously known only from Oʻahu (see discussion under *P. cordatum*).

Material examined. **KAUAʻI:** Koaiʻe Canyon, 1–2 miles above Lonomea Camp, on either side of Koaiʻe Stream, in soil pockets on dripping wet rock face, locally common, 1,700–1,900 ft [518–579 m], 16 Apr 1991, *T. Flynn et al. 4544* (PTBG); headwaters of N fork of Wailua River, on wet shaded rock face, thallus long creeping, glossy medium green, 2,000–2,300 ft [600–700 m], 11 Mar 1993, *T. Flynn 5286* (PTBG). **MAUI:** Haleakalā, Kaupō Trail, in very wet cave on dirt and rocks, associated with *Hillebrandia sandvicensis*, 25 Aug 1937, *G.E. Olsen 81* (BISH).

Calypogeiaceae

Metacalypogeia alternifolia (Nees) Grolle **Corrections; confirmation of island record; new island record**

Metacalypogeia is an indigenous temperate Asian and North American genus (Lee & Gradstein 2021: 55) related to *Calypogeia*. *Metacalypogeia alternifolia* supposedly occurs on all major islands except Lānaʻi (Miller *et al.* 1983, later cited by Staples & Imada 2006). We had not collected or examined any Hawaiian material prior to the collections from Maui cited below, and it appears (based on his unpublished drawings housed at BISH) that Miller confounded this species with *Mnioloma fuscum* and that his reports (Miller 1963: 499–500) of *Calypogeia alternifolia* (= *Metacalypogeia alternifolia*) from many islands should be referred to *Mnioloma fuscum*. Therefore, the island records for Kauaʻi, Oʻahu, and Molokaʻi, cited by Miller *et al.* (1983) without citing vouchers, must be rejected; new records for Maui were confirmed (below), and the Hawaiʻi Island records tentatively accepted.

However, there are two previous possible authentic Hawaiian records of this species from Kohala, Hawaiʻi Island, reported by Miller (1963: 500–501) as *Metacalypogeia montana* (Horik.) Inoue var. *verruculosa* (Hatt.) H.A.Mill.: "Upper Hāmākua Ditch Trail between Koiawe and Waima Valleys, *O. Selling 5405*; above Waima, in cave, *O. Selling 5371*" (both collections in Stockholm Herbarium (S), and not examined by us). Miller cites Yukinobu Kuwahara as the determiner of these specimens, and presumably Kuwahara would have been familiar with this species, which is common in Japan (Yamada & Iwatsuki 2006).

Metacalypogeia alternifolia resembles the related *Mnioloma fuscum* but is greenish (not brownish) in color and has pointed leaves. The underleaves of *Metacalypogeia* are perfectly rounded at the apex, whereas in *Mnioloma* the apex is often very slightly and irregularly retuse. *Metacalypogeia* is also easily confused with some of the smaller species of *Bazzania*, such as *B. baldwinii* A.Evans or *B. minuta* (Austin) A.Evans, but it lacks the ventral microphyllous branches of the latter genus.

Material examined. **MAUI:** Waikamoi Preserve, above end of Waikamoi Flume on TNC side of fence, forested ridges and riparian zones, wet forest, *Metrosideros, Cheirodendron, Vaccinium, Leptecophylla, Melicope, Myrsine, Rubus, Coprosma, Dryopteris wallichiana, Pteris, Athyrium, Elaphoglossum, Sadleria, Carex,* and *Astelia,* 4,600 ft [1,400 m], 17 Sep 2024, *Z. Pezzillo & R. Henderson 995* (BISH); West Maui, summit of Puʻu Kukui, bogs, wet, riparian, with *Trichocolea gracillima*, 5,500 ft [1,676 m], 9 Dec 2024, *Z. Pezzillo 1074* (BISH).

Cephaloziaceae

Cephalozia lucens (A.Evans) Steph. **New island record**

An endemic species previously documented on Kauaʻi, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Judziewicz, Freire & Thomas 2024: 6–7).

Material examined. **MOLOKAʻI:** Molokaʻi Swamp below Kaunuohua, 4,200 ft [1,280 m], 30 May 1953, *H.A. Miller & A.R.H. Lamberton 3593* (MU).

Frullaniaceae

Frullania sandvicensis Ångstr. **New island record**

(Fig. 5)

This indigenous species has been previously documented from Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Staples & Imada (2006), as *F. ericoides* and *F. neurota*); see Judziewicz and Freire (2023). The Kahoʻolawe record below is the first documentation of a liverwort from that island.

Material examined. **KAHOʻOLAWE:** Island summit near Puʻuomoaʻula Iki, 450 m, Mar 2022, noted by D.W. Beilman, W.C. Bleecker, and P. Higashino; photo by W.C. Bleecker.

Figures 5–6. **5**, *Frullania sandvicensis*. Summit of Kahoʻolawe, 2022; note inflated, helmet-shaped lobules. Photo by W. Cuyler Bleecker. **6**, *Geocalyx graveolens*. Kula Forest Reserve, Haleakalā, Maui, *Z. Pezzillo 589* (BISH). Photo by E.J. Judziewicz.

Geocalycaceae

Geocalyx graveolens (Schrad.) Nees **New island record**

This widespread Holarctic species is either indigenous or more likely naturalized. It had been previously documented from Hawaiʻi Island in 1953 from an "exposed gulch" at 6,500 ft [2,000 m] on the Mauna Kea Truck Trail (*H.A. Miller & A.R.H. Lamberton 5162*, MU).

Material examined. **MAUI:** Haleakalā, Kula Forest Reserve, between Plum Trail and lower boundary, 0, Aspect: W, very remnant mesic forest mostly filled in by introduced forestry plantings and introduced understory species, with *Frullania sandvicensis* and *Lophocolea bicuspidata*, N2287872, E779949, [ca. 2,000 m], 6 Mar 2024, *Z. Pezzillo & R. Henderson 589, 592* (BISH).

Kahakuloaceae

Kahakuloa aff. ***operculispora*** A.V.Freire, Judz., Cargill, L.L.Forrest & Gradst. **New island record**

An endemic species, genus, and family, previously known only from West Maui (Freire *et al.* 2023). We can report its occurrence from East Maui (Haleakalā), about 35 km east of the type locality, based on the following collection, for which no habitat or elevation information is given. Incidental bryophytes occurring with it include the mosses "*Campylopus purpuroflavescens*" (=*Campylopus hawaiicus* (Müll.Hal.) A.Jaeger) and *Leucobryum* species, and the liverworts *Asperifolia arguta, Bazzania cordistipula, Calypogeia cuspidata, Cephalozia lucens, Cephaloziella* species*, Fuscocephaloziopsis connivens, Kurzia hawaica, Mnioloma fuscum*, and *Marchantia* species.

Material examined. **MAUI:** Olinda Ditch Trail [the Olinda flume runs from ca 20°48′13–32″N, 156°13′14–47″W, 4,265–4,315 ft [1,300–1,315 m], between Waikamoi and Ha'ipua'ena Streams, presumably near where Miller and Lamberton collected it], 12 Jun 1953, *H.A. Miller & A.R.H. Lamberton 4478* (BISH, MU).

Lejeuneaceae

Cololejeunea hillebrandii (Austin) Steph. **Nomenclatural note; new island record**

This endemic species has been previously documented from Kaua'i, O'ahu, Moloka'i, and Maui (Staples & Imada 2006). Sass-Gyarmati *et al*. (2023: 349) note that correcting Austin's original spelling "*hildebrandii*" (as was done by Staples & Imada 2006) is allowable under the International Code of Nomenclature since he intended to honor botanist William Hillebrand (1821–1886). Some specimens cited below vary somewhat from typical material and may represent a separate taxon.

Material examined. **HAWAI'I:** *Cibotium-Metrosideros* rainforest above Thurston Lava Tube, on flaking bark of *Metrosideros*, 3,900 ft [1,189 m], 1 Aug 1966, *W.J. Hoe 1073.0* (MU); Niaulani rainforest, Volcano, on dead *Cibotium* stipe, 19°25′35″N, 155°14′23″W, 1,158 m, 4 Oct 2020, *A.V. Freire & E.J. Judziewicz 20-771* (BISH); Small 'Ōla'a Tract, Hawai'i Volcanoes National Park, 19°27′42″N, 155°14′54″W, 1,170 m, 24 May 2021, *A.V. Freire & E.J. Judziewicz 21-583a* (HAVO); Upper Kāhuku Unit, CCC/TNA cabin forest, Hawai'i Volcanoes National Park, 19°14′46–52″N, 155°36′02–22″W, 1,852–1,885 m, 10 Aug 2022, *A.V. Freire & E.J. Judziewicz 22-701* (HAVO); Hakalau Forest National Wildlife Refuge, Pua 'Ākala road makai, paralleling 'Āwehi Gulch, 19°47′12–21″N, 155°18′56″–19′32″N, 1,753–1,905 m, 26 Mar 2023, *A.V. Freire & E.J. Judziewicz 23-252f* (BISH); Kohala, Pu'u O 'Umi Natural Area Reserve, 'Eke gate NE to 'Eke Summit and then down steep slope to sedge bog, 20°04′55″–05′00″N, 155°43′30–50″W, 1,524–1,615 m, 5 Sep 2023, *A.V. Freire & E.J. Judziewicz 23-359d* (BISH); Laupāhoehoe Natural Area Reserve, along Blair Road on perimeter of "Scowcroft Exclosure"; *Acacia koa* (dominant)- *Metrosideros polymorpha-Cibotium glaucum* forest, 19°54′50–55″N, 155°18′25–30″W, 1,402–1,433 m, 4 Jan 2024, *E.J. Judziewicz & K. Faccenda 17,211* (BISH).

Cololejeunea raduliloba Steph. **New state record**

This indigenous or possibly naturalized species is mainly tropical Asian in distribution, ranging east to New Caledonia (Thouvenot *et al.* 2011: 313), Fiji (Söderström *et al*. 2011:

412), and Tonga (Söderström *et al*. 2012: 131). It is characterized by its small, narrow, erect lobules with two asymmetrical teeth; the lobes lack a hyaline margin (Tixier 1985). Plants are 0.8–0.9 mm wide, and perianths and discoid gemmae are abundantly produced. Although maintained as a member of subgenus *Pedinolejeunea* Benedix ex Mizut. by Söderström *et al*. (2016: 336), these authors also note (2016: 320) that molecular evidence presented by Yu *et al.* (2013) instead support its placement in subgenus *Chlorolejeunea* Benedix.

Material examined. **HAWAIʻI:** South Kona Distr, Amy B.H. Greenwell Ethnobotanical Garden, Kaʻawaloa (Captain Cook), bark epiphyte on cultivated indigenous trees, 450 m, 9 Oct 2021, *A.V. Freire & E.J. Judziewicz 21-912, 21-916* (BISH). **KAUAʻI:** Waimea Distr, Puʻu ka Pele Forest Reserve, along Kawaiʻiki Stream, with large boulders above Koaiʻe Canyon Trail, below Lonomea Campsite, about 2.75 mi above junction with Waimea Canyon Trail, 22°05′18.1″N, 159°37′26.2″W, 1,500 ft. [457 m], fused to surface of volcanic boulder in filtered light, dry, mixed non-native forest, 22 Feb 2016, *J.R. Shevock, T. Flynn, J. Game & W. Ma 48203* (CAS).

Drepanolejeunea pentadactyla (Mont.) Steph. **New island record**

This indigenous species is found in tropical Asia, Australasia, New Caledonia, and Oʻahu (Judziewicz & Freire 2023: 163).

Material examined. **KAUAʻI:** Līhuʻe Distr, summit area of Hāʻupu, degraded mesic shrubland, on branches of *Syzygium*, growing mixed with *Acroporium* in bryophyte mat, 21.924°N, 159.401°W, 681–685 m, 19 Sep. 2023, *T. Flynn, K.R. Wood & B.G. Baldwin 9847b*, *9855c* (PTBG).

Lejeunea cocoes Mitt. **New state record**

(Fig. 7)

A tropical Asian species ranging east to Fiji and French Polynesia; presumably naturalized in Hawaiʻi.

Material examined. **HAWAIʻI:** Hilo Nursery Arboretum, on bark of cultivated *Brownea macrophylla* and several other cultivated exotic tree species, growing in dense mats with occasional plants of *Lejeunea flava*, 19°42′22″N, 155°04′24″W, 11 m, 25 Aug 2023, *A.V. Freire & E.J. Judziewicz 23-500* (BISH).

Lopholejeunea proxima Steph., **syn. nov.** **Taxonomic note**

Basionym: *Lopholejeunea proxima* Steph., Sp. Hepat. (Steph.) 5: 89. 1912.

[= *Lopholejeunea nigricans* (Lindenb.) Steph. ex Schiffn., Consp. Hepat. Arch. Ind. 293. 1898.]

Apparently known only from the type collection made by Urbain Faurie in 1909 from the vicinity of Hanalei, Kauaʻi. We believe that this species is synonymous with *Lopholejeunea nigricans* (Lindenb.) Schiffn. (found on all major Hawaiian Islands), based on our examination of the following isotype; the holotype is reportedly in the Geneva Herbarium (G):

https://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=137371&base=img&lang=en

https://www.ville-ge.ch/musinfo/bd/cjb/chg/adetail.php?id=162929&base=img&lang=en

Material examined. **KAUAʻI:** Hanalei, 1910, *U. Faurie s.n.* (MU-B-52274).

Vitalianthus pseudoneurus (A.Evans) Judz. & A.V.Freire **New island record**

This endemic species has been previously documented from Oʻahu, Maui, and Hawaiʻi (Judziewicz & Freire 2023: 165–166).

Material examined. **KAUAʻI:** Nā Pali-Kona Forest Reserve, Kalua Puhi Trail, tropical hardwood forest with guava and planted stand of *Cryptomeria japonica*, on hardwood trunk in filtered

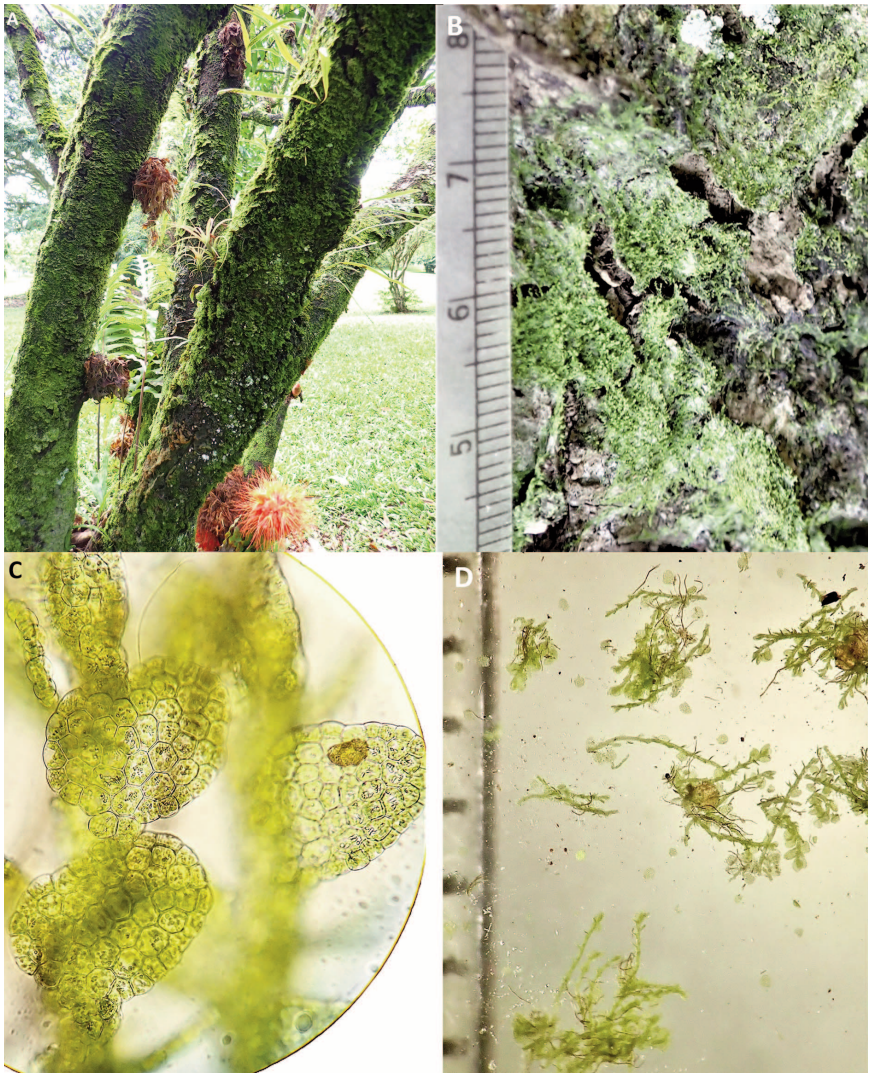

Figure 7. *Lejeunea cocoes*. **A–D**, Hilo Arboretum Nursery, Hawai'i Island, *A.V. Freire & E.J. Judziewicz 23-500* (BISH), tiny, mat-forming bark epiphyte on exotic tree *Brownea macrophylla*. Associates include *Lejeunea flava* and the ferns *Crepidomanes parvulum* and *Lepisorus thunbergianus*. Photos by E.J. Judziewiczz.

light, 20°08′30.7″N, 159°38′16.6″W, 4,220 ft [1,286 m], 18 Sep 2024, *J.R. Shevock & T. Flynn 63972* (CAS, PTBG, UWSP).

Lepidoziaceae

Bazzania patens (Mont.) Trevis. **New island record**

This endemic species has been previously documented from Kauaʻi, Oʻahu, and Maui (Staples & Imada 2006).

Material examined. **HAWAIʻI:** 12 miles below Kulani Prison [ca 500 m], 24 Jun 1953, *H.A. Miller & A.R.H. Lamberton 5219, 5221* (MU).

Lepidozia australis (Lehm. & Lindenb.) Mitt. **New island record**

This endemic species has been previously documented from Kauaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **MOLOKAʻI:** NW of Puʻu Kolekole, 3,800 ft [1,159 m], 29 May 1953, *H.A. Miller & A.R.H. Lamberton 3419* (MU).

Lepidozia holorhiza (Reinw., Blume & Nees) Nees **New state record**

Miller *et al.* (1983) include this tropical Asian species, based on a Baldwin specimen, as "probably from Maui." Staples & Imada (2006) list it as a dubious record, but we found a specimen at the Miami University herbarium (MU).

Material examined. **MAUI:** without locality, "ex hb. Stephani ex hb. Farlow," *Baldwin s.n.* (MU-B-043377).

Lophocoleaceae

Chiloscyphus greenwelliae H.A.Mill. **New island record**

(Fig. 8)

This endemic species has been previously documented from Kauaʻi, Oʻahu, Maui, Lānaʻi, and Hawaiʻi (Staples & Imada 2006).

Material examined. **MOLOKAʻI:** NW of Puʻu Kolekole, 3,800 ft [1,158 m], 29 May 1953, *H.A. Miller & A.R.H. Lamberton 3410* (MU); Upper Waikolu Valley, pipeline trail, 4,000 ft [1,219 m], 2 Jun 1953, *H.A. Miller & A.R.H. Lamberton 3798, 3827* (MU).

Chiloscyphus laceratus (Steph.) J.J.Engel & R.M.Schust. **New island record**

This endemic species has previously been documented from Oʻahu (Thomas 2022), Molokaʻi, Lānaʻi (Judziewicz, Freire & Bogner 2023), Maui, and Kohala, Hawaiʻi (Miller 1963: 506). It may be misplaced in this genus; it appears to be close to *Heteroscyphus splendens* (Lehm & Lindenb.) Grolle, a widespread species that ranges from tropical East Africa, Madagascar, and tropical Asia to New Guinea, New Caledonia, Aotearoa-New Zealand, and Sāmoa (Pócs 1976; Piippo 1985; Thouvenot 2023). Both taxa share opposite entire leaves with large trigones, and broad, many-toothed underleaves. Unlike *Heteroscyphus splendens*, however, Hawaiian plants produce abundant leaf marginal gemmae; these are spherical, unicellular, and 20–25 µm in diameter.

Material examined. **KAUAʻI:** Hanalei Distr, Upper Limahuli Preserve, on tree bark in a sheltered valley in diverse wet forest, 1,095 m, Nov 2024, Susan Fawcett photo: (https://www.inaturalist.org/observations/253460930); ʻIole, northern headwaters, *Metrosideros-Cheirodendron* mixed forest, epiphytic on *Melicope degeneri*, medium green, occasional, 22.042327°N, 159.498744°W, 900 m, 16 Jan 2025, *K.R. Wood 19703* (PTBG).

Figure 8. *Chiloscyphus laceratus.* Kauaʻi, Note the abundant leaf marginal gemmae. Photo by Susan Fawcett: https://www.inaturalist.org/observations/253460930.

Lophocolea bicuspidata Steph. **New island record**

This endemic species has been previously documented from Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Staples & Imada 2006).

Material examined. **LĀNAʻI:** Lānaʻihale, 2,600 ft [792 m], May 2024, Z. Pezzillo photo (https://www.inaturalist.org/observations/235045949).

Plagiochilaceae

Plagiochila caduciloba H.L.Blomq. **New island record**

This indigenous species, disjunct from the southern Appalachian, U.S., was previously documented from Kauaʻi (Judziewicz, Faccenda & Freire 2025) and Hawaiʻi (Judziewicz & Freire 2023: 169).

Material examined. **OʻAHU:** ʻŌpaeʻula, northern Koʻolau Range, 2 Oct 2024, *M.K. Thomas 786* (BISH).

Pleuroziaceae

Pleurozia conchifolia (Hook. & Arn.) Austin **New island record**

(Fig. 9)

This indigenous species has been previously documented from Kauaʻi, Oʻahu, Molokaʻi, Maui, and, purportedly, Hawaiʻi (Staples & Imada 2006: 34). The latter island record is based on Miller *et al*. (1983), who does not cite any vouchers; Thiers (1993) does not cite any specimens from Hawaiʻi Island, and we did not examine any Hawaiʻi Island material

Figure 9. *Pleurozia conchifolia.* Near Mauga Cabin, Kohala Mountain, Hawai‘i Island, 8 Jan 2024, photo by Pono Christianson.

of this species from either BISH, MU, or PTBG. Therefore, the following is the first documentation of the species there.

Material examined. **HAWAI‘I:** Kohala, Pu‘u O ‘Umi Natural Area Reserve, near “Mauga Cabin,” near Waipo‘o fence line, 20.098°N, 155.695°W, 1,400 m, 24 Jan 2024, P. Christianson photograph (Fig. 9); 20.100532°N, 155.694187°W, 4,500 ft [1,372 m], 25 Feb 2025, *A. Cullison s.n.* (BISH); ‘Eke fence line east, 20.08006°N, 155.72332° W, 5,280 ft [1,609 m], 25 Feb 2025, *P. Christianson s.n.* (BISH).

Pleurozia inflata (Austin) Austin **New island record**

This indigenous species has been previously documented from Kaua‘i, O‘ahu, Maui, and Hawai‘i (Staples & Imada 2006).

Material examined. **MOLOKA‘I:** Kamakou Preserve boardwalk, 4,160 ft [1,268 m], 18 Oct 2024, *Z. Pezzillo* photo (https://www.inaturalist.org/observations/248417003).

Radulaceae

Radula gracilis Mitt. ex Steph. **Taxonomic note**

[= *Radula javanica* Gottsche]

Radula gracilis was recognized by So (2005) and Staples & Imada (2006) but relegated to synonymy under *R. javanica* by Gradstein (2021: 630); the latter is a species that occurs on all main Hawaiian Islands (Judziewicz, Freire & Thomas 2024: 17).

Scapaniaceae

Anastrophyllum fissum Steph. **New island record**

This indigenous species has been previously documented from Kauaʻi, Oʻahu, and Maui (Staples & Imada 2006).

Material examined. **HAWAIʻI:** Kohala Mountains Forest Reserve, 19 Jun 1953, 4,000 ft [1,219 m], *H.A. Miller & A.R.H. Lamberton 4881* (MU); Kohala, near "Mauga Cabin," near Waipoʻo fenceline, 20.098°N, 155.695°W, 1,400 m, 24 Jan 2024, *P. Christianson s.n.* (BISH-797581, 797776).

Schistochilaceae

Schistochila aligera (Nees et Blume) J.B.Jack & Steph. **New state record**

(Fig. 10)

Schistochila aligera is a widespread species of tropical Asia and Oceania, but only the following record is known from Hawaiʻi. We were unable to learn anything about the collector or their itinerary. One other species of this genus is known from Hawaiʻi, the Molokaʻi endemic *Schistochila cookei* (H.A.Mill.) R.M.Schust. (Judziewicz & Freire 2023: 172); based on our examination of the Cooke isotype at MU, the latter species has leaf trigones and lamellae and is quite distinct from *S. aligera.*

Material examined. "Hawaiian Islands," without further location, 1876, *J. Barly s.n.* (MU 42352).

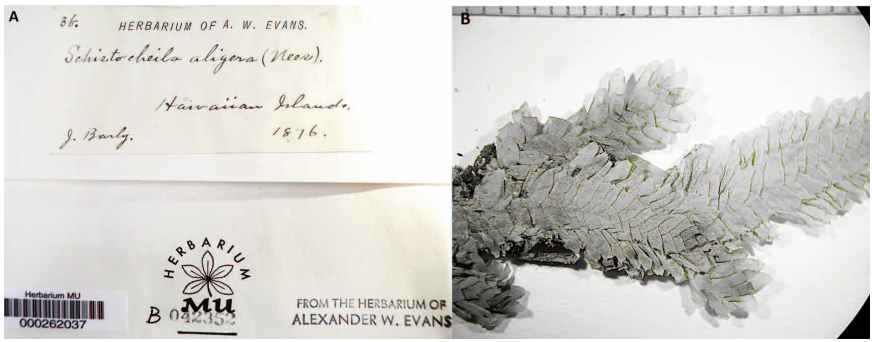

Figure 10. *Schistochila aligera.* ***A–B****, From unknown Hawaiian locality, J. Barly s.n., 1876 (MU). Photos by E.J. Judziewicz.*

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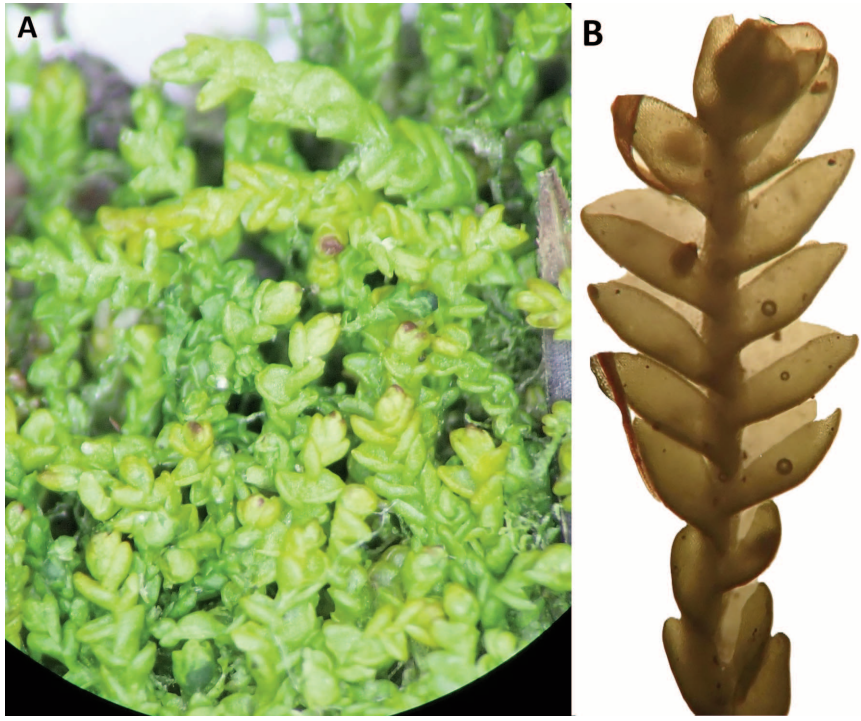

Figure 11. *Solenostoma hawaiicum.* **A–B**, Pu‘u Kukui, West Maui, *Z. Pezzillo 1051* (BISH), Maui. Photos by E.J. Judziewicz.

Solenostomaceae

Solenostoma hawaiicum H.A.Mill. **Taxonomic note**

(Fig. 11)

Solenostoma hawaiicum was reduced to a synonym of *S. exsertum* (A. Evans) Steph. (an endemic species found on all major islands; Judziewicz & Freire 2023: 172). However, upon examination of recent West Maui collections, we agree with Miller (1963: 513–514) that it is easily distinguished from *S. exsertum* by its smaller size, concave rather than plane leaves, and evident leaf trigones. Treated as *Jungermannia hawaiica* (H.A.Mill.) Váňa by Váňa (1975: 362–364) and Staples & Imada (2006). Söderström *et al.* (2016: 131) cite *S. exsertum* as an accepted species, but neglects to account for *S. hawaiicum*. The type of *Solenostoma hawaiicum,* from O‘ahu (Ko‘olau Range, south ridge of Kīpapa Gulch, 1,800–2,500 ft [549–762 m], 23 Nov. 1952, *H.A. Miller 2701*, MU), was not examined. Miller (1963) also cites three collections (paratypes) from the summit of Pu‘u Kukui, West Maui (*O. Selling 5027, 5033.5*, and *5255*, all from S (Stockholm Herbarium), also not examined by us. However, two 2024 Pezzillo collections from the latter locality match Miller’s drawing and description of this species.

Material examined. **MAUI:** West Maui, summit of Pu‘u Kukui, high elevation bog, 5,600 ft [1,707 m], 9 Dec 2024, *Z. Pezzillo 1048, 1051* (BISH).

Southbyaceae

Southbya organensis Herzog **New island record**

This indigenous species has been previously documented from Maui (Staples & Imada 2006) and Kauaʻi (Judziewicz, Faccenda & Freire 2025).

Material examined. **MOLOKAʻI:** West rim of Waikolu Canyon, 4,000 ft [1,219 m], 1 Jun 1953, *H.A. Miller & A.R.H. Lamberton 3708* (MU).

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Notes, Nuances, and Novelties in the Hawaiian Flora from Herbarium Pacificum[1]

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In preparation for an updated checklist of all Hawaiian vascular plants, we found many novelties and corrections in the Hawaiian flora. We report 122 new island records, 137 corrections, 26 new naturalized species, 22 new state records, 12 questionable naturalizations, two range extensions, and one notable rediscovery of an endemic species.

Following in the tradition of Imada (2012) and Imada (2019), we first assembled an initial draft checklist entirely from literature sources. However, as part of this checklist update, we wished to ensure that a specimen exists for every species on every island in our draft checklist. This process is considered best practice for an evidence-based checklist. To do this, we subsequently assembled a large joint database from the individual databases of herbaria (BISH, PTBG, US; acronyms following Thiers (2024), continually updated) and iNaturalist, which we then cross-referenced with our draft checklist. Many island records noted in previously published floras have no corroborating specimen or iNaturalist record and are thus corrected here.

1. Contribution No. 2025-007 to the Hawaii Biological Survey.

Some of these corrections derive from specimen reidentifications without a correction being subsequently published. However, most apparently derive from assumptions about certain species occurring on all the high islands, or all the main islands, but lacking photographic or vouchered evidence. It is likely that some of the records corrected herein are legitimate (for example, perhaps these species do occur on all main islands) but lack an herbarium voucher. In that case, we eagerly invite communication from fieldworkers who can provide specimens or photos to set the record straight. The corrections presented in this manuscript also provide motivation and specific guidance on gaps in herbarium records and motivate continued fieldwork, specimen preparation, and careful curation of herbarium specimens.

We also dredged the novel combined database for any specimens that represent new naturalizations not included in our draft checklist. Most of the records reported herein were located in this manner. In addition to the many specimens we found filed away in the main herbarium collection, a small number of records were also found during recent fieldwork, principally from Oʻahu and Maui. All voucher specimens cited are deposited at Herbarium Pacificum (BISH) unless otherwise indicated.

We identified the following names, which have been misapplied in Hawaiʻi or refer to multiple species: *Ambrosia artemisiifolia, Anemone hupehensis* var. *japonica, Arctotheca prostrata, Azolla caroliniana, Boerhavia coccinea, Buddleja paniculata, Cissus rhombifolia, Ctenodon falcatus, Cyperus cyperinus, Myosotis azorica, Neomarica gracilis, Plantago rugelii, Potamogeton nodosus, Pueraria lobata* var. *lobata, Ruta graveolens, Sambucus canadensis, Schinus molle, Schoenoplectiella mucronata, Solanum americanum, Solanum nigrescens,* and *Solidago canadensis.*

In the process of dredging our database for new records, we located some holotypes, largely those named by Harold St. John between 1987 and 1989, which had not yet been synonymized. We synonymize these names for the first time or provide novel synonymy: *Cyrtandra basirotundata, C. bishopii, C. kamooaliiensis, C. kremnes, C. ovalifolia, C. ovalis, C. piaensis, C. porsiflora, C. pukeleensis, C. rotundata, C. scapiflora, C. tantalusensis, C. triados, C. triens, C. wailupeensis, Lipochaeta nesophila, Huperzia* × *medeirosii, Peperomia epihippii, P. hanaensis, P. muscorum, P. woolfordii, Pittosporum molokaiense, Solanum angustior, S. hillebrandii, S. nesophilum, S. pubinervosum,* and *Viola vanroyenii.*

Acanthaceae

Barleria lupulina Lindl. **Confirmation of naturalization**

Barleria lupulina is currently listed as questionably naturalized on Oʻahu (Imada 2019). Collections of this species made from the Mauʻumae Nature Park confirm the naturalization of this species, as 20–30 mature plants were found in an area spanning about a quarter acre.

Material examined. **Oʻahu**: Honolulu, Mauʻumae Nature Park, near 16th Ave and Claudine St, 30 Jul 2017, *A. Lau 2017073001.*

Strobilanthes alternata (Burm.f.) Moylan ex J.R.I.Wood **Correction**

This species was published as naturalized in Hawaiʻi by Wagner *et al.* (1990, as *Hemigraphis alternata*), noting that it sometimes spreads in lawns in Honolulu. It should not be considered naturalized as there is no evidence that it has formed self-sustaining populations.

Aizoaceae

Tetragonia echinata Aiton **New island record**

This species was previously documented as naturalized on Oʻahu (Faccenda 2024a). Collections made from a former nursery plot in Kohala and roadsides in Puakō document its naturalization on Hawaiʻi.

Material examined. **HAWAIʻI**: Kohala, about 100 individuals found in irrigated plot of former nursery, 100 m, 20.129797, -155.88228, 13 Jun 2024, *M. Sthreshley 3*; Puakō, found growing alongside road to electric substation across from Puakō entrance, 50 m, 11 Apr 2008, *W.A. Whistler s.n.* (BISH 732169).

Alismataceae

Limnocharis flava (L.) Buchenau **New naturalization**

Limnocharis flava is an obligate aquatic herb native to the Americas and naturalized in much of Southeast Asia (POWO 2025). Collections of this species made in a fallow pond in the Hulēʻia National Wildlife Refuge on Kauaʻi as well as ʻUkoʻa Pond and Waimea Arboretum on Oʻahu show that this species is beginning to naturalize. The Oʻahu voucher notes only one individual and should thus be considered a questionable naturalization; however, the Kauaʻi specimen describes a population of undescribed size and appears fully naturalized. This species is sometimes cultivated as an aquatic plant in Hawaiʻi (Staples & Herbst 2005). The first documentation of this species in Hawaiʻi was from Waimea Botanical Garden, where it was cultivated (*J. Lau 2804*).

Material examined. **KAUAʻI**: Hulēʻia National Wildlife Refuge, Management Unit #H1N, fallow pond, 4Q: 460136E, 2426974N, 17 Dec 2014, *K. Uyehara & M. Milinichik s.n.* (BISH 764376). **Oʻ AHU**: ʻUkoʻa Pond, 25 Feb 1995, *E. Funk s.n.* (BISH 767426); Waimea Arboretum, edge of pond, 09 Sep 1986, *J. Lau 2804.*

Amaranthaceae

Achyranthes aspera L. var. ***aspera*** **New island record**

Achyranthes aspera was previously known to be naturalized on Laysan, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Imada 2019). Collections of this species made at Māhāʻulepū document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Māhāʻulepū, Kipu Kai, 8 m, 24 May 2006, *N. Tangalin 761* (PTBG).

Achyranthes sandwicensis (A.Gray) Di Vincenzo, Berends., Wondafr. & Borsch **Correction**

Achyranthes sandwicensis (as *Nototrichium sandwicense*) was reported as occurring on "all the main islands" by Wagner *et al.* (1990: 194). There is no evidence it ever occurred on Kahoʻolawe, as no specimens nor literature reports outside of the *Manual* exist (Warren *et al.* 1994).

Alternanthera ficoidea (L.) P.Beauv. **Correction**

Alternanthera ficoidea was published as naturalized in Hawaiʻi by Wagner *et al.* (1990: 185; as *A. tenella*), where it was noted to be "commonly cultivated and often found persisting, presumably vegetatively, around old homesites on Oʻahu." It should not be considered naturalized as no specimens or citizen science records could be found of plants definitely reproducing outside of cultivation.

Amaranthus blitum L. subsp. ***emarginatus*** (Salzm. ex Uline & Bray) Carretero, Muñoz Garm. & Pedrol **Note**

Wagner *et al.* (1990, as *Amaranthus lividus* subsp. *polygonoides*) noted that this taxon was collected once historically on Maui in the 1800s. It has still not been collected on this island, but citizen science records show that it has persisted. https://www.inaturalist.org/observations/17336502 https://www.inaturalist.org/observations/273120959

Amaranthus palmeri S.Watson **New island record**

In March 2024, one of us (JS) uploaded pictures of an unknown *Amaranthus* to iNaturalist (https://www.inaturalist.org/observations/203483364), where it was noticed by KF as unusual due to its long bracts. A specimen was obtained, which was a positive match for *Amaranthus palmeri*. The plants were found in an area where feral chickens are fed, making an introduction via birdseed quite likely. *Amaranthus palmeri* was previously reported on Oʻahu by Faccenda & Ross (2024), and one of the collection sites was also in an area where birdseed is cast. Given these two independent naturalizations of *A. palmeri* associated with birdseed, it is quite clear that imported birdseed is a mechanism of introduction of this weedy species to the Hawaiian Islands. After this collection was made, further material of *A. palmeri* was found in the BISH backlog dating from 2008, suggesting that the recent collection is not the first introduction of the species onto Maui. *Amaranthus palmeri* is a common contaminant of birdseed (Oseland *et al.* 2020), as it is an aggressive weed in row crop agriculture and found in the same fields as the grains comprising the seed. The birdseed introduction pathway is a rather direct mechanism for aggressive weeds of agriculture on the mainland to be packaged up with the crops they are infecting and then literally tossed out on the ground to sprout in Hawaiʻi.

Material examined. **MAUI**: Kīhei, E Lipoa St & Piʻilani Hwy, between Kīhei Aquatic Center and Kīhei DMV, on shaded and tended/mowed weedy lawn, only 2 plants found, 20.749571, -156.447525, 21 Mar 2024, *J. Starmer s.n.* (BISH 800606); Kamaʻole, along Piʻilani Hwy, plants to 1 m tall, 35 m, 06 Jun 2008, *R.W. Hobdy s.n.* (BISH 796738); Kaoholu, Kīhei, along Piʻilani Hwy, 3 plants found along hwy in soil recently disturbed by trenching machine that may have come from mainland, 36 m, 08 Jun 2008, *R.W. Hobdy 4295*.

Amaranthus polygonoides L. **New island record**

Amaranthus polygonoides has previously been reported as naturalized on Kauaʻi and Oʻahu (Frohlich & Lau 2020; Faccenda & Ross 2024). It has now been found on Maui at Kīhei, where it was first identified by citizen science observations from iNaturalist (https://www.inaturalist.org/observations/220038891).

Material examined. **MAUI**: East Maui, Kīhei, South Maui Community Park, Liloa Dr, 20.74544, -156.44638, 09 Jun 2024, *J. Starmer s.n.* (BISH 800609, 800610).

Charpentiera ovata Gaudich. var. ***ovata*** **New island record**

Charpentiera ovata var. *ovata* was previously reported from Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Wagner *et al.* 1990). Numerous specimens have been collected from Kauaʻi under various names (mostly *C. elliptica*) and have been redetermined by one of us (MKT) to be *Charpentiera ovata* var. *ovata*, documenting the existence of this species on Kauaʻi. Further study is needed on *Charpentiera* in the Hawaiian Islands, especially *C. elliptica* and *C. obovata*.

Material examined. **KAUA‘I**: Nā Pali coast, Hanakāpī‘ai Falls Trail, 182 m, 11 Apr 1980, *G. Clarke & C. Corn 344*; Kōke‘e State Park, Nu‘alolo Trail, 1 mile from beginning near Kōke‘e Lodge, 16 Jul 1970, *S.H. Sohmer 6497*; Hanalei, Alealau, 1109 m, 22.173979, -159.624051, 03 Sep 2020, *S. Walsh et al. SKW762*; Ho‘olulu, Kalalau Trail, 3¾ mile post, 19 Jul 1970, *S.H. Sohmer 6535*; Koai‘e Canyon, along stream, 835 m, 22.618, -159.3518, 13 Mar 2008, *C. Trauernicht & N. Tangalin 424*; Waimea, Awa‘awapuhi, 2.25 miles down trail, north-facing slope, 905 m, 22.150794, -159.671680, 28 Apr 2016, *K.R. Wood & M. Query 16819.*

Charpentiera tomentosa Sohmer var. ***tomentosa*** **New island record**

Previously only reported from O‘ahu, Moloka‘i, Maui, and Hawai‘i (Wagner *et al.* 1990), a single specimen of *Charpentiera tomentosa* var. *tomentosa* expands the range of this species to Kaua‘i. This specimen was compared to abundant material of both *C. tomentosa* and *C. obovata,* as well as descriptions in Wagner *et al.* (1990). The thick, large leaves separate this species from *C. obovata*, which has smaller, chartaceous leaves.

Material examined. **KAUA‘I**: Waimea Distr, Pōhakuao, hanging valley above falls, 588 m, 22.177875, -159.629470, 10 Aug 2016, *K.R. Wood et al. 17098.*

Amaryllidaceae

Crinum asiaticum L. **New island record**

Crinum asiaticum was previously reported as naturalized on O‘ahu (Faccenda 2024a). Collections of this species made from Niumalu Bay now document its naturalization on Kaua‘i. Despite the specimen being nearly 100 years old, it clearly shows that the species is naturalized. Furthermore, numerous observations from iNaturalist (https://www.inaturalist.org/observations/261930375 https://www.inaturalist.org/observations/205362897 https://www.inaturalist.org/observations/152910373) show that this is still naturalized in coastal situations, especially on the north shore, despite the lack of recent collections.

Material examined. **KAUA‘I**: Niumalu Bay, 14 Jun 1926, *O. Degener & H. Wiebke 2113*.

Zephyranthes minuta (Kunth) O.Dietr. **New island record**

Zephyranthes minuta was previously known to be naturalized on Lāna‘i and Maui (Imada 2019; as *Z. grandiflora*). Collections made at Kīpū Ranch document the naturalization of this species on Kaua‘i, where plants were found naturalized in a weedy, fallow area.

Material examined. **KAUA‘I**: Līhu‘e, Kīpū Ranch, weedy fallow area, 98 m, 21.93945, -159.416946, 14 Jul 2021, *N. Tangalin NT5193.*

Anacardiaceae

Mangifera indica L. **Corrections**

Mangifera indica was reported as naturalized on “all the main islands” by Wagner *et al.* (1990: 197); however, no specimens have been found to substantiate this species ever occurring on Kaho‘olawe. Furthermore, Warren *et al.* (1994) noted that any mangoes that may have occurred on the island are no longer present. Similarly, Wichman & St. John (1990) state that it only occurs in cultivation on Ni‘ihau.

Schinus areira L. **Nomenclatural note**

Following the taxonomy of Zapater *et al.* (2018) and Martínez-Crovetto (1963), the naturalized and cultivated plants formerly referred to as *Schinus molle* should now be referred to as *S. areira.* These species differ by the number of leaflets per leaf (10–15 vs 4–7), leaflet arrangement (alternate to opposite vs strictly opposite), and the presence of a rachis

wing (narrowly winged vs unwinged) for *S. areira* and *S. molle* respectively. We have seen no specimens referable to true *S. molle* in Hawai‘i using this classification.

Annonaceae

Artabotrys hexapetalus (L.f.) Bhandari **New island record**

Artabotrys hexapetalus was previously recorded as naturalized on O‘ahu, Maui, and Hawai‘i (Imada 2019). Collections made of this species in the Hulē‘ia River valley document its naturalization on Kaua‘i.

Material examined. **KAUA‘I**: Hulē‘ia River valley, Kīpū Ranch land, 41 m, 12.5640, -159.2358, 12 Apr 2008, *M. Merello & E. Bess 3251* (PTBG).

Apiaceae

Ammi majus L. **New naturalization**

A population of approximately a dozen individuals of *Ammi majus* was recently located on a roadside where they may have arrived with dumped greenwaste. *Ammi majus* was previously known in Hawai‘i from a single 1948 collection from a garden in Honolulu, where it was cultivated as an ornamental (*H. St. John 23364*). This species is native to the Mediterranean but has since naturalized at scattered localities around the world (POWO 2025). It is a ruderal weed that is expected to spread along roadsides and disturbed areas.

Material examined. **MAUI**: Kula, disturbed roadside at pullout and dumping spot, 952 m, 20.783584, -156.306738, 02 Jun 2024, *F. Starr & K. Starr 240603-01*.

Eryngium foetidum L. **New island record**

Eryngium foetidum was reported as questionably naturalized on O‘ahu (Imada 2019). Collections made of this species in Mapulehu document its naturalization on Moloka‘i and confirm its naturalization in the state.

Material examined. **MOLOKA‘I**: Mapulehu, mauka of hwy near ‘Ili‘ili‘ōpae Heiau, 76 m, 21.415, -156.4745, 10 Aug 2024, *H.L. Oppenheimer H82402*.

Petroselinum crispum (Mill.) A.W.Hill **Corrections**

Petroselinum crispum was published as naturalized on O‘ahu and Kaua‘i by Wagner *et al.* (1990). However, no specimens have been found to substantiate its naturalization on these islands.

Apocynaceae

Alstonia macrophylla Wall. ex G.Don **New island record**

Alstonia macrophylla was reported as naturalized on O‘ahu and Hawai‘i (Imada 2019). Collections made of this species in Waihe‘e document its naturalization on Maui where it likely spread from old plantings.

Material examined. **MAUI**: West Maui, Wailuku, Waihe‘e, 624 m, 20.5838, -156.3954, 28 Oct 2024, *H. Oppenheimer H102401*.

Calotropis gigantea (L.) W.T.Aiton **Confirmation of naturalization**

Calotropis gigantea was reported as naturalized on Moloka‘i and Maui, with questionable status on O‘ahu, Kaho‘olawe, and Hawai‘i (Imada 2019). Collections made of this species in Lua Makika confirm its naturalization on Kaho‘olawe.

Material examined. **KAHO‘OLAWE**: Northeast inner slope of Lua Makika, 426 m, 25 Apr 1980, *G. Clarke & W.P. Char 427*; gulch E of Lua Makika, 300 m, 19 Jun 1982, *P.K. Higashino et al. 9811*; NE part of island, Wa‘aiki Gulch, 274 m, 24 Apr 1980, *L.W. Cuddihy & G. Clarke 407*.

Catharanthus roseus (L.) G.Don **Correction**

Wagner *et al*. (1990: 216) reported *Catharanthus roseus* as "naturalized on probably all of the main islands and Midway Atoll, but we have not seen specimens from Kauaʻi or Lanaʻi." We clarify upon this and note that there is also no evidence of naturalization on Kahoʻolawe. Warren *et al*. (1994) noted that the only source for reporting this species on the island was the *Manual*; thus, the species was treated as questionable by Imada (2019), as there were no supporting specimens from Kahoʻolawe at BISH.

Hoya australis R.Br. ex J.Traill **New island record**

Hoya australis was previously recorded as naturalized on Maui (Imada 2019). Collections made in 2011 on Kumukahi Lighthouse Road document its naturalization on Hawaiʻi. iNaturalist observations show that the population survived the 2018 Kīlauea eruption that flowed through the Kapoho area (https://www.inaturalist.org/observations/298764346; https://www.inaturalist.org/observations/29589185)

Material examined. **HAWAIʻI**: Puna, Kapoho, Kumukahi Lighthouse Rd, 2158113N 307832E, 20 Jun 2011, *J. Parker & R. Parsons BIED156.*

Rauvolfia sandwicensis A.DC. **Correction**

Rauvolfia sandwicensis was reported as occurring on "all of the main islands except Kahoʻolawe" (Wagner *et al.* 1990: 220); however, no specimens exist from Niʻihau, nor is this species mentioned in Wichman & St. John (1990).

Araceae

Alocasia cucullata (Lour.) G.Don **New island record**

Alocasia cucullata was recorded as naturalized on Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Imada 2019). Collections made in Kawaihau near the Wailua Homesteads document its naturalization on Kauaʻi, where several plants were found.

Material examined. **KAUAʻI**: Kawaihau, Wailua, Nounou Trail, Kuamoʻo entrance, raised bed in ʻŌpaekaʻa Stream, 85 m, 22.05266, -159.365473, 16 Apr 2021, *N. Tangalin NT5168.*

Anthurium scandens (Aubl.) Engl. subsp. ***scandens*** **New naturalization**

The native range of *Anthurium scandens* subsp. *scandens* spans from Mexico to tropical America (POWO 2025). Collections made from a forested area at the margin of Ocean View Garden at Hawaiian Memorial Park Cemetery document this species' naturalization on Oʻahu, where a single, 1.3 m diameter colony was found growing epiphytically on *Schinus*. This flowering and fruiting specimen was the only individual in the area at the time of collection. It is formerly known only from cultivation (Staples & Herbst 2005).

Material examined. **OʻAHU**: Kāneʻohe, Hawaiian Memorial Park, Ocean View Garden, forested margin, 84 m, 21.394416, -157.788981, 12 Sep 2017, *S. Montgomery & M. LeGrande s.n.* (BISH 775087).

Colocasia esculenta (L.) Schott **Correction**

Colocasia esculenta (kalo) was listed as "persisting outside of cultivation on all of the main islands except Kahoʻolawe" by Wagner *et al.* (1990: 1357); however, Wichman & St. John (1990) noted only cultivated plants occurring on Niʻihau. Furthermore, testimony of Niʻihau residents confirm that there is insufficient surface water for kalo to grow (Kapahulehua 1970).

Monstera adansonii Schott **New naturalization**

Monstera adansonii is native to the tropical wet forests of the Americas (POWO 2025) and has been in cultivation in Hawai‘i since at least 1985. It was observed in a wet, shady, invasive-dominated secondary forest where about a dozen plants, including seedlings, were found climbing into the canopy at the end of Kānealole Trail in Makiki. This area was at one point planted with several ornamentals, including other aroids that appear to have not yet naturalized; pots were also observed. It appears that this species was also planted at the site and has since naturalized.

Material examined. **O‘AHU**: Makiki Loop, Kānealole Trail, near intersection with Makiki Valley Trail, 306 m, 21.325875, -157.821696, 04 Feb 2024, *K. Faccenda 3304.*

Philodendron erubescens K.Koch & Augustin **Range extension**

Philodendron erubescens was previously published as naturalized on East Maui by Oppenheimer (2007) and has now been found on West Maui. *Philodendron erubescens* is also naturalized on Kaua‘i (Imada 2019).

Material examined. **MAUI**: West Maui, Lāhainā Distr, Honokahua, locally naturalized sprawling and climbing in secondary alien forest, apparently spreading from discarded landscaping waste, 91 m, 16 Apr 2023, *H. Oppenheimer et al. H42335*; West Maui, ca 7 km NW of Waihe‘e along hwy, edge of road, climbing up cliff ca 10 m, dominant on this hillside, only seen in this one location on road, 300 m, 20.969875, -156.539621, 22 Oct 2022, *K Faccenda 2740.5*.

Araliaceae

Hedera helix L. **Correction**

Hedera helix was published as “sparingly naturalized on Kaua‘i, O‘ahu, and Hawai‘i” by Wagner *et al.* (1990: 228). However, no specimens or citizen science records have been found to substantiate its naturalization on O‘ahu.

Araucariaceae

Araucaria columnaris (G.Forst.) Hook. **New island record**

Araucaria columnaris was recorded as naturalized on O‘ahu, Moloka‘i, Lāna‘i, and Maui (Imada 2019). Collections of this species made in the Nounou Forest Reserve now document its naturalization on Kaua‘i.

Material examined. **KAUA‘I**: Kawaihau, Nounou Forest Reserve, crest of Sleeping Giant Mountain, 335 m, 13 Sep 1987, *D.H. Lorence et al. 5551* (PTBG).

Araucaria cunninghamii Aiton ex D.Don **New naturalization**

Araucaria cunninghamii is a species native to portions of New Guinea and Australia (POWO 2025). Collections made in Waimano behind the Department of Health building document its naturalization on O‘ahu. It is spreading from nearby forestry plantings, with over 100 seedlings observed at all stages of development.

Material examined. **O‘AHU**: Waimano, forest reserve behind Dept. of Health building, 259 m, 21.42548, -157.932463, 24 Oct 2024, *M.K. Thomas et al. 882.*

Aspleniaceae

Asplenium aethiopicum (Burm.f.) Bech. **Correction**

Asplenium aethiopicum was reported as occurring on all the main islands by Palmer (2003). However, no specimens or literature could be found to substantiate its occurrence on Lāna‘i.

Asplenium hobdyi W.H.Wagner **New island record**

In Palmer (2003), *Asplenium hobdyi* was not listed as occurring on the island of Oʻahu. However, upon inspection of unresolved specimens of *Asplenium* at BISH, a 1931 collection from Kaʻala (*Christophersen 1777*) was found, tentatively labeled as *A. hobdyi* by the late Dan Palmer. Communication by MKT with Dan in 2020 revealed that he had not been confident of the identification and thus set it aside to be verified by other fern experts, and for this reason excluded the Oʻahu record from his 2003 book. Comparison to the holotype at MICH and other island material at BISH by MKT, this plant was found to perfectly match *A. hobdyi*. Additionally, in July 2023, a survey of the Kaʻala summit by the Oʻahu Plant Extinction Prevention Program came across a single population of roughly 20 individuals.

Material examined. **Oʻahu**: Top of Kaʻala in wet forest, 1200 m, 10–15 May 1931, *Christophersen 1777*; northern Waiʻanae Mts, Kaʻala, 1200 m, 21.507269, -158.14631, 22 Jun 2023, *M.K. Thomas et al. 586.*

Asplenium kaulfussii Schltdl. f. ***gemmiparum*** (Hillebr.) D.D.Palmer
Correction

Asplenium kaulfussii f. *gemmiparum* was reported as occurring on Lānaʻi by Palmer (2003). However, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Asplenium kaulfussii Schltdl. f. ***kaulfussii*** **Correction**

Asplenium kaulfussii f. *kaulfussii* was reported as occurring on all the main islands by Palmer (2003). However, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Asplenium × ***kokeense*** W.H.Wagner **New island records**

Asplenium × *kokeense* was reported only from Kauaʻi in Palmer (2003). Now collections from Puʻu Kaʻala and leeward Haleakalā document the existence of this species on Oʻahu and Maui.

Material examined. **Oʻahu**: Puʻu Kaʻala above Waialua on the DuPont ridge trail, 2000 ft [610 m], 20 Dec 1959, *B.C. Stone 3171*. **Maui**: East Maui, leeward Haleakalā, Nākula Natural Area Reserve, west of Camp Release, 1550 m, 20.67273, -156.2340924, 19 Jul 2022, *Z. Pezzillo 20.*

Asplenium normale D.Don **Correction**

Asplenium normale was reported as occurring on all the main islands by Palmer (2003). However, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Asplenium sphenotomum Hillebr. **Correction**

Asplenium sphenotomum was reported as occurring on all the main islands by Palmer (2003). However, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Figure 1. *Asplenium trichomanes* observed by J. Lau in 2004.

Asplenium trichomanes L. subsp. ***densum*** (Brack.) W.H.Wagner **New island record**
Asplenium trichomanes has been recorded as naturally occurring on Maui and Hawai‘i (Palmer 2003). A discovery by Joel Lau in the Wai‘anae Range at Pu‘ukūmakali‘i in Lualualei in 2004 documents this species as naturally occurring on O‘ahu (Figure 1). Only a few plants were found growing in a shady gulch bottom on a soil bank; unfortunately, no voucher was collected.

Asteliaceae
Astelia argyrocoma A.Heller ex Skottsb. **New island record**
Astelia argyrocoma was described as naturally occurring only on Kaua‘i (Wagner *et al.* 1990). A collection made in 1956 on the ridge to the east of central Makaleha in the Wai‘anae Range documents the occurrence of this species on O‘ahu. The identification was made using the key in the *Manual* (Wagner *et al*. 1999) and by comparison with *A. argyrocoma* specimens from Kaua‘i.

Material examined. **O‘AHU**: Wai‘anae Mts, ridge E of central Makaleha Valley, 15 Apr 1956, *E.T. Ozaki 1562.*

Asteraceae

Acanthospermum australe (Loefl.) Kuntze **Correction**

Acanthospermum australe was published as occurring on "all of the main islands" by Wagner *et al.* (1990: 252). However, no specimens could be found to substantiate its presence on Niʻihau.

Ambrosia artemisiifolia L. **Corrections**

All specimens of *Ambrosia artemisiifolia* from Oʻahu, Molokaʻi, and Maui have been redetermined as *A. confertiflora* (see below). Hawaiʻi is the only island where true *A. artemisiifolia* is present; the earliest specimen is cited below.

Material examined. **HAWAIʻI**: Byron Camp, Hawaiʻi Volcanoes National Park, waste grounds, 01 Oct 1929, *O. Degener 5595.*

Ambrosia confertiflora DC. **New state record**

Ambrosia artemisiifolia, as treated by Wagner *et al*. (1990), is a mixture of two species, *A. artemisiifolia* and *A. confertiflora*. Wagner *et al.* (1990) noted that much of the Hawaiian material was formerly identified as *A. confertiflora* and considered these misidentifications. We are following the treatment of *Ambrosia* by Strother (2006) and disagree with the treatment of Wagner *et al.* (1990). *Ambrosia confertiflora* is native to western North America from Texas to California, where it grows in waste places and disturbed sites (Strother 2006). See the key below for characteristics separating the species. All specimens from Oʻahu, Molokaʻi, and Maui are *A. confertiflora.* Hawaiʻi Island has both species present. Only the first record on each island is reported below.

Key to *Ambrosia* (based on Strother 2006)

1. Burs with straight spines or spines reduced to tubercles; plants annual .... *A. artemisiifolia*
1′. Burs with hooked spines; plants perennial ..... *A. confertiflora*

Material examined. **Oʻahu**: Honolulu, no date [approximately 1864], *H. Mann & W.T. Brigham 684*. **Molokaʻi**: Kaulawai, 06 May 1916, *G.C. Munro 375*. **Maui**: Paukūkalo near Halekiʻi Heiau State Park, 17 Jun 1986, *R. Hobdy 2566*. **HAWAIʻI**: Kealakekua, naturalized along small stretch of road, 23 Aug 1926, *O. Degener & H. Wiebke 2127.*

Arctotheca prostrata (Salisb.) Britten **Nomenclatural note**

Arctotheca calendula was published as naturalized on Maui by Starr & Starr (2011). The specimen has since been redetermined as *A. prostrata* based on the presence of stolons on *A. prostrata* and their absence on *A. calendula* (Hinojosa-Espinosa & Villaseñor 2015). *Arctotheca prostrata* is native to South Africa (POWO 2025). This species is naturalized in lawns in Makawao and near the grounds of Enchanting Floral Gardens of Kula.

Material examined. **Maui**: Enchanting Floral Gardens of Kula, growing with wide variety of ornamentals in upcountry Maui Botanical Garden, 716 m, 20.792976, -156.3260971, 19 Feb 2008, *F. Starr & K. Starr 080219-01*; East Maui, Makawao, Kēōkea, 908 m, 20.701870, -156.357070, 02 Apr 2016, *H. Oppenheimer H41601.*

Bellis perennis L. **Corrections**

This species was published as naturalized in Hawaiʻi by Wagner *et al.* (1990: 267), where it was considered "sparingly naturalized in high elevation, mesic areas on Kauaʻi and perhaps Hawaiʻi." However, as no herbarium or citizen science records exist to substantiate this naturalization, it should not be considered naturalized in the state.

Bidens alba (L.) DC. var. ***radiata*** (Sch.Bip.) Ballard ex Melchert **Correction**

Bidens alba var. *radiata* was reported as naturalized on Kure Atoll by Wagner *et al*. (1990). However, no specimens could be found to substantiate its occurrence, nor was it found during extensive surveys in 2001 (Starr *et al*. 2001), thus it should not be considered naturalized there.

Bidens micrantha Gaudich. subsp. ***micrantha*** **New island record**

Bidens micrantha subsp. *micrantha* was reported as naturally occurring on Maui (Wagner *et al.* 1990). We expand its range with collections from Puʻulehua in North Kona, Hawaiʻi.

Material examined. **HAWAIʻI**: North Kona, Puʻulehua, 1,524 m, 18 Jul 1987, *S.L. Montgomery s.n.* (BISH 514001).

Bidens pilosa L. **New island record**

This species is described as naturalized on Kuaihelani (Midway Atoll), Niʻihau, Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, Kahoʻolawe, and Hawaiʻi (Imada 2019). Collections made in 2006 on the south side of Lehua document its naturalization on the islet.

Material examined. **LEHUA**: Outer crescent on S side of islet, 30 m, 29 Apr 2006, *K.R. Wood 11862.*

Dubautia laxa Hook. & Arn. subsp. ***laxa*** **Correction**

Dubautia laxa subsp. *laxa* was published as present on Kauaʻi by Wood (2006). The specimen (*Wood 11425*) has since been redetermined as *D. haupuensis* B.G.Baldwin & K.R.Wood. As such, *D. laxa* subsp. *laxa* is no longer known from Kauaʻi.

Galinsoga quadriradiata Ruiz & Pav. **Correction**

Galinsoga quadriradiata was published as naturalized on "Oʻahu, Molokaʻi, Maui, and Hawaiʻi" by Wagner *et al.* (1990: 320). However, no specimens could be found to validate the Molokaʻi record. It appears this report was erroneous and that *G. parviflora* is the only member of this genus on Molokaʻi (Oppenheimer 2011).

Hypochaeris radicata L. **Correction**

Hypochaeris radicata was published as naturalized on Lehua by Wood & LeGrande (2006). However, the specimen (*Flynn 4859*) has been redetermined as *H. glabra*, making *H. radicata* no longer known from Lehua.

Lipochaeta connata (Gaudich.) DC. subsp. ***acris*** (Sherff) W.L.Wagner & H.Rob. **New island record**

Lipochaeta connata subsp. *acris* was previously known from Niʻihau and Kauaʻi (Imada 2012). Dozens of collections made from ʻĪao Valley in Wailuku and a single collection from Olowalu document its occurrence on Maui. These specimens were annotated by the *Manual* team in 1983 & 1984 but evidently their inclusion in the manuscript was forgotten.

Material examined. **MAUI**: Wailuku, ʻĪao Valley, Black Gorge, stream bed, 290 m, 18 Feb 1975, *R. Gardner 376*; Olowalu Valley, 19 May 1920, *C.N. Forbes 2431M*.

Lipochaeta integrifolia (Nutt.) A.Gray **Correction**

Lipochaeta integrifolia was reported as occurring on "all of the main islands" by Wagner *et al.* (1990: 336). Although abundant habitat is available, there is no evidence it ever occurred on Kahoʻolawe, as no specimens nor literature reports outside of the *Manual* exist (Warren *et al.* 1994).

Lipochaeta lobata (Gaudich.) DC. subsp. ***lobata*** **New synonym**

[= *Lipochaeta nesophila* H.St.John]

Lipochaeta nesophila was historically considered a synonym of *Lipochaeta rockii* Sherff by Wagner *et al.* 1990. However, examination in this study of the holotype of *L. nesophila* by MKT shows it is actually *L. lobata* (Gaudich.) DC. subsp. *lobata*.

Lipochaeta succulenta (Hook. & Arn.) DC. **Correction**

Lipochaeta succulenta was reported as occurring on "all of the main islands except Lanaʻi" by Wagner *et al.* (1990). There is no evidence it ever occurred on Kahoʻolawe, as no specimens nor literature reports outside of the *Manual* exist (Warren *et al.* 1994), thus it should not be listed as occurring there.

Picris hieracioides L. **New island record**

Picris hieracioides was previously recorded as naturalized on Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Imada 2019). Collections made of this species from various parts of Waimea now document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Waimea, Hikimoe Ridge, 21 individuals, 918 m, 22.097141, -159.689069, 02 Jan 2020, *S. Kashiwa 077* (PTBG); NW Kauaʻi, Waimea, Kōkeʻe, Trail One just off Hwy 550 north of radio tower at mile marker 9, 914 m, 22.060736, -159.666805, 27 Jul 2009, *E. Manini s.n.* (PTBG 055659).

Porophyllum ruderale (Jacq.) Cass. **New island records**

Porophyllum ruderale was previously reported as naturalized on Hawaiʻi Island by Parker & Parsons (2016). It has now additionally been found on Kauaʻi, Oʻahu, and East Maui. On Kauaʻi it is naturalized in Wailua; on Oʻahu, in Mauʻumae Nature Park, where more than 500 plants were observed forming a colony about 20 m wide, with one smaller patch seen outside of the main colony. On East Maui, hundreds of plants were found densely scattered over at least a couple of acres at Waiʻōpae, during a transect from 1,554 m to sea level, and it was only seen in this one area; it is unclear how it arrived at the site.

Material examined. **KAUAʻI**: Wailua, intersection of Puapiloa and Olohena Rds, along road-cut, locally naturalized, 183 m, 22 Nov 2000, *Nesbek s.n.* (BISH 769991). **OʻAHU**: Mauʻumae Nature Park, dry, open area from shallow soil, 91 m, 21.286592, -157.789633, 28 Dec 2023, *K. Faccenda 3249.* **MAUI**: East Maui, Waiʻōpae, ridge on W edge of Pāhihi Gulch, open, grazed dry-land scrub/pasture, rocky with lots of bare soil, in association with *Lantana camara*, *Erythrina sandwicensis*, and *Bidens pilosa*, 440 m, 20.65016, -156.206464, *F. Starr & K. Starr 240322-01.*

Silybum marianum (L.) Gaertn. **New state record**; **eradication**

Silybum marianum was found naturalized in pastures in Makawao by Bob Hobdy in 2009, and subsequently became a Maui Invasive Species Committee eradication target. Between 2009 and 2014, 2,208 plants were killed, of which 289 were mature. The last plant was killed in 2014 and annual surveys over the past 10 years have not found any further indi-

viduals (Mike Ade, pers. comm.). This species is native to portions of the Mediterranean and is naturalized on most continents (POWO 2025). It is unclear how it arrived in Hawai‘i although it may have been for medicinal usage.

Material examined. **MAUI**: East Maui, Makawao Ave, 488 m, 13 Mar 2009, *R.W. Hobdy 4308.*

Solidago altissima L. subsp. ***altissima*** **Taxonomic note**; **Corrections**

[syn. *Solidago canadensis* var. *scabra* (Muhlenberg ex Willdenow) Torrey & A. Gray]

Solidago canadensis var. *scabra* was noted as very sparingly naturalized on Kaua‘i, O‘ahu, Maui, and Hawai‘i by Wagner *et al.* (1990). Following the latest taxonomic concepts of *Solidago* by Semple & Cook (2006) where *scabra* is treated as a junior synonym of *S. altissima* subsp. *altissima*, all Hawaiian specimens have been redetermined as such (Wagner *et al.* 2023–). Furthermore, examination of the specimens and lack of observation of any truly wild populations persisting to the present, leads us to conclude that this taxon is not naturalized in Hawai‘i.

Sonchus wightianus DC. **Questionable naturalization**

Sonchus wightianus is native to Asia from Iraq through Malaysia, and is naturalized in Costa Rica (POWO 2025). It is adventive in Hawai‘i, as it was collected once along a driveway in ‘Āhuimanu. More specimens are needed to confirm whether it has fully naturalized. *Sonchus wightianus* differs from the common *S. oleraceus* in its perennial habit.

Material examined. **O‘AHU**: ‘Āhuimanu, 47-722 ‘Āhuimanu Rd, 73 m, 20 Mar 2009, *J. Beachy et al. USARMY 146.*

Sphagneticola trilobata (L.) Pruski **New island record**; **correction**

Sphagneticola trilobata was reported as naturalized on Kuaihelani (Midway Atoll), Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, and Hawai‘i (Imada 2019). It is now also naturalized on Kaho‘olawe. Furthermore, although treated as naturalized on Kuaihelani by Wagner *et al*. (1990), the only specimen at BISH from the island was labeled as cultivated. This species was not found during a full survey of the island in 2008 (Starr & Starr 2008).

Material examined. **KAHO‘OLAWE**: LZ 1, 427 m, 20.33°N 156.34°W, 11 May 2004, *F. Starr et al. 040511-2.*

Tagetes minuta L. **Correction**

Tagetes minuta was published as naturalized on O‘ahu by Wagner *et al.* (1990) on the basis of a single collection in 1956 (*Uehara s.n* BISH 121535) that was “perhaps cultivated.” It has not been seen again and is not naturalized on O‘ahu.

Thymophylla pentachaeta (DC.) Small **New state record**

Collections made at Barbers Point and Campbell Industrial Park document the naturalization of *Thymophylla pentachaeta* on O‘ahu. Native to the Americas (POWO 2025), this species was found growing in a coral substrate, with ~500 plants observed. *Thymophylla pentachaeta* can be distinguished from the naturalized *T. tenuiloba* by its woodier habit and stiff, principally opposite leaves, compared to the purely herbaceous habit of *T. tenuiloba* with softer, principally alternately arranged leaves.

Material examined. **O‘AHU**: Leeward O‘ahu, Barbers Point, drainage canal that runs between Campbell Industrial Park and Barbers Point Station, 06 Aug 2003, *W. Char s.n.* (BISH 697625); ‘Ewa, Campbell Industrial Park, coral plain, 28 Nov 2005, *G. Mansker s.n.* (BISH 718803); Kapolei, empty lot E of Kamokila Blvd and Kapolei Pkwy, in shallow drainage, sprouting prolifically after abundant winter rains, 21 m, 07 Mar 2011, *R.W. Hobdy 4330, 4334, 4335.*

Thymophylla tenuiloba (DC.) B.L.Rob. **New island record**

Thymophylla tenuiloba was reported as naturalized on Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Kahoʻolawe (Imada 2019). A collection of a single flowering plant mauka of the highway in Puakō documents its naturalization on Hawaiʻi Island.

Material examined. **HAWAIʻI**: South Kohala, Puakō, mauka of highway, 121 m, 10 Apr 2014, *R.W. Hobdy 4352*.

Xanthium strumarium L. **New island record**

Xanthium strumarium is now known from Lehua Islet. It is now known from all the main islands from Niʻihau to Hawaiʻi as well as Kuaihelani (Wagner et al. 1990).

Material examined. **LEHUA**: Above weatherport on ridge, coastal dry shrubland, 20 m, 27 Apr 2011, *N. Tangalin 2622* (PTBG).

Athyriaceae

Diplazium arnottii Brack. **Correction**

Diplazium arnottii was reported as occurring on all the main islands by Palmer (2003). However, no specimens or literature could be found to substantiate its occurrence on Kauaʻi.

Diplazium esculentum (Retz.) Sw. **Correction**

Diplazium esculentum was reported as occurring on Lānaʻi by Palmer (2003). However, no specimens or literature could be found to substantiate its naturalization on Lānaʻi, although it is cultivated (HO, pers. observ).

Balsaminaceae

Impatiens walleriana Hook.f. **Correction**

Impatiens walleriana was reported as "documented on all of the main islands except Niʻihau and Kahoʻolawe" by Wagner *et al.* (1990: 380). However, no specimens or citizen science records substantiate its occurrence on Lānaʻi.

Begoniaceae

Begonia cucullata Willd. **New island record**

Begonia cucullata was previously reported as naturalized on Kauaʻi, Oʻahu, Molokaʻi, and Hawaiʻi (Imada 2019). It has now been found naturalized on Maui at ʻĪao Valley. iNaturalist observations also suggest that it is naturalizing in Hāna, East Maui. (https://www.inaturalist.org/observations/173368417).

Material examined. **MAUI**: West Maui, Wailuku Distr, ʻĪao Valley, Nākalaloa Stream, lowland wet forest, naturalized, all size classes on mossy bounder along perennial stream, 570 m, 08 Apr 2021, *H. Oppenheimer H42101*.

Bignoniaceae

Tabebuia heterophylla (DC.) Britton **New island record**

Tabebuia heterophylla was reported as naturalized on Oʻahu, Maui, and Hawaiʻi (Imada 2019). Collections made of this species in Hanalei and Kōloa document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Hanalei, beginning of Princeville, private land, 195 m, 22.181111, -159.45865, 12 Dec 2022, *A.M. Williams AMW774* (PTBG); Kōloa, Kalāheo, SW side of Papalina Rd between Maka Rd and Pālama St, between golf course and road, 249 m, 21.918925, -159.525422, 16 Oct 2019, *T. Flynn 9008* (PTBG).

Bixaceae

Bixa orellana L. **Extirpation**

Bixa orellana was published as naturalized on Kauaʻi, Oʻahu, Molokaʻi, and Maui (Wagner *et al.* 1990), but it appears that none of these populations (if they ever were naturalized) have persisted to the present. Although extirpated in the wild, it remains in cultivation.

Boraginaceae

Lappula occidentalis (S.Watson) Greene
var. ***occidentalis*** **Questionable naturalization**

Lappula occidentalis var. *occidentalis* is a temperate annual or biennial species native to North and South America. In North America it grows primarily from the Midwest to the West Coast and has been found naturalized in parts of the East Coast (POWO 2025). A collection made in Haleakalā National Park near the visitor center shows that the species is adventive in Hawaiʻi, as only a single individual was observed.

Material examined. **MAUI**: Haleakalā National Park, visitor's center, near parking lot, 2965 m, 2293018N, 786368E, 24 May 2014, *F. Starr & K. Starr 140502-01*.

Myosotis latifolia Poir. **Nomenclatural note**

Myosotis azorica H.C.Watson was published as naturalized on Maui by Starr *et al.* (2008). In 2024, the single naturalized specimen (*Starr et al. 060509-01*) documenting this naturalization was redetermined as *M. latifolia* by H. Schaefer (TUM). In addition, all cultivated specimens of *M. azorica* were similarly redetermined. Therefore, *M. azorica* is no longer known from Hawaiʻi.

Brassicaceae

Brassica juncea (L.) Czern. **New island record**

Brassica juncea was reported as naturalized on Hawaiʻi (Imada 2019). Collections of this species made in Wailua and Kalāheo document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Wailua, roadside at Wailua Golf Course, E side of hwy, 1 mile south of KCCC, 07 Mar 1990, *L. Hume 493* (PTBG 3369, 3370); Kalāheo, near intersection of Waha and Niho Rds, growing at edge of cane field, 19 Mar 1984, *T. Flynn 808* (PTBG).

Cardamine hirsuta L. **New island record**

Previously documented as naturalized on Kauaʻi and Hawaiʻi (Wagner *et al.* 1990), collections of *Cardamine hirsuta* from Palikea Trail document its naturalization on Oʻahu. Thousands of plants were seen forming dense colonies in the shady, moist understory.

Material examined. **Oʻahu**: Palikea Trail, 1.5 km N of trailhead, mixed native–invasive forest, locally abundant in moist, shady understory, 876 m, 21.414340, -158.099838, 01 Jul 2023, *K. Faccenda 3226.*

Rorippa sarmentosa (G.Forst. ex DC.)
J.F.Macbr. **Correction**

Rorippa sarmentosa was published as occurring "on Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi" by Wagner *et al.* (1990: 412; as *Nasturtium sarmentosum*); however, no specimens have been found to substantiate its occurrence on the island of Molokaʻi.

Bromeliaceae

Tillandsia juncea (Ruiz & Pav.) Poir. **New island record**

Tillandsia juncea was reported as possibly naturalized on Oʻahu (Imada 2019). Collections from Kōloa now document its naturalization on Kauaʻi, where it escaped from cultivation and spread onto nearby trees.

Material examined. **KAUAʻI**: Kōloa, Lāwaʻi, National Tropical Botanical Garden, McBryde Garden, near Bamboo Bridge shed, 40 m, 21.5414, -159.3027, 19 May 2010, *D.H. Lorence 10195.*

Tillandsia polystachia (L.) L. **New island record**

Tillandsia polystachia was previously recorded as naturalized on Oʻahu (Imada 2019). Collections from Lāwaʻi now document its naturalization on Kauaʻi, where it is forming substantial colonies in canopies of *Ficus* and *Dracena*.

Material examined. **KAUAʻI**: Kōloa Distr, Lāwaʻi Valley, Allerton Estate, NE side of Diana Fountain, cultivated plant spreading locally, 26 Jul 2007, *T. Flynn & A.L. Vernon 7350*; Lāwaʻi, west of old Japanese cemetery off of Haʻilima Rd, below Marjorie's Kauaʻi Inn Bed and Breakfast, 159 m, 21.915000, -159.502964, 28 Apr 2014, *D.H. Lorence & G. Lorence 10452.*

Cactaceae

Selenicereus costaricensis (F.A.C.Weber) S.Arias & N.Korotkova ex Hammel **Correction**; **taxonomic note**

Selenicereus costaricensis was published as naturalized by Lorence *et al.* (1995), but presents two issues. First, the specimen's label notes that the plant is cultivated. Second, the specimen (*Flynn 3571*) has been annotated as *S. trigonus* (Haw.) Stafford by B. Leuenberger in the year 2000. This species should be removed from the naturalized flora, as there is no evidence of naturalization and no further observation or collections of it have been made.

Selenicereus undatus (Haw.) D.R.Hunt **Corrections**

Selenicereus undatus (as *Hylocereus undatus*) was reported as cultivated on "all the main islands" by Wagner *et al.* (1990: 419). There is no evidence it ever occurred on Kahoʻolawe, as no specimens or literature reports outside of the *Manual* exist (Warren *et al.* 1994). In addition, no specimens or citizen science records substantiate its naturalization on Molokaʻi, and Wichman & St. John (1990) mention that it is found on Niʻihau only in cultivation.

Campanulaceae

Cyanea elliptica (Rock) Lammers **New island record**

[Syn. *Delissea molokaiensis* H.St.John]

Cyanea elliptica was previously reported from Lānaʻi and Maui (Wagner *et al.* 1990). It is now also known from Molokaʻi, based on type specimens of *Delissea molokaiensis* H.St.John from Pīpīwai Gulch, which were later re-annotated as *Cyanea elliptica* by T.G. Lammers in 1991 (Lammers 2005).

Material examined. **MOLOKAʻI**: Pīpīwai Gulch to Lelemākō Gulch, near ridgetop on cliff face, 490 m, 27 Oct 1979, *S. Perlman 502* [3 sheets]; no locality, *C.N. Forbes s.n.* (BISH 444267).

Hippobroma longiflora (L.) G.Don **Correction**

Hippobroma longiflora was reported as naturalized on Maui by Wagner *et al.* (1990), but no specimens or citizen science records could be found to substantiate its occurrence on the island.

Wahlenbergia gracilis (G.Forst.) A.DC. **New island record**

Wahlenbergia gracilis was previously reported as naturalized on Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Imada 2019). Collections of this species from an isolated group of three plants next to the training buildings at Schofield Barracks document its naturalization on Oʻahu.

Material examined. **Oʻahu**: Schofield Barracks, West Range, Kolekole Range, next to training building, 1500 m, UTM 592067, 2376145, 19 Jun 2019, *J. Beachy & K. Kong USARMY 516.*

Cannabaceae

Trema orientale (L.) Blume **Correction**

Wagner *et al.* (1990: 1296; as *Trema orientalis*) noted that *Trema orientale* was "cultivated on many of the main islands and naturalized in dry disturbed areas, 30–190 m, at least on Kauaʻi and Molokaʻi," which Imada (2019) interpreted as Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi. However, no planting records (Skolmen 1980), specimens, or citizen science records could be found to substantiate its naturalization on Lānaʻi.

Caryophyllaceae

Atocion armeria (L.) Raf. **Eradication**

Atocion armeria was found by Starr & Starr (2012; as *Silene armeria*) naturalizing as a roadside weed in Olinda, East Maui in 2011, but the population has since disappeared (Forest Starr, pers. obs.). It should no longer be considered naturalized.

Cerastium fontanum Baumg.

subsp. ***vulgare*** (Hartm.) Greuter & Burdet **Taxonomic note**, **correction**

Cerastium fontanum subsp. *triviale* was reported as naturalized by Wagner *et al.* (1990), but this name is now considered a synonym of *C. fontanum* subsp. v*ulgare* (Weakley & Southeastern Flora Team 2025). This taxon is no longer known from Oʻahu, as all material at BISH has been reidentified as *C. glomeratum.*

Cerastium glomeratum Thullier **New island records**

Cerastium glomeratum was reported as naturalized on Kuaihelani (Midway Atoll), Oʻahu, and Maui (Imada 2019; Faccenda 2024b). Collections made at Kalaupapa and Kalaʻe document its naturalization on Molokaʻi, and collections in Hāmākua and Puʻuwaʻawaʻa document its naturalization on Hawaiʻi.

Material examined. **Molokaʻi**: Kalaupapa, top of trail restoration site, near cultural signage, 550 m, 03 Feb 2006, *M.L. Wysong 873*; Kalaʻe, golf course fairway, 22 Apr 1985, *R. Hobdy 2365*. **Hawaiʻi**: Hāmākua Distr, Kalaniai Rd, 1 km from Hwy 19, 359 m, 20.054118, -155.421904, 06 Mar 2022, *K. Faccenda 2345*; North Kona, Puʻuwaʻawaʻa, 1,219 m, 17 Sep 1936, *E.Y. Hosaka 1619.*

Sagina procumbens L. **New island record**

Sagina procumbens was reported as naturalized on Kuaihelani (Midway Atoll), Lānaʻi, and Maui (Imada 2019). Collections made along the driveway of the Volcano Golf and Country Club subdivision document its naturalization on Hawaiʻi.

Material examined. **HAWAIʻI**: Volcano Golf and Country Club subdivision, 99-1884 Pukeawe Circle, driveway, 30 May 2023, *F.R. Warshauer 7050.*

Schiedea diffusa A. Gray subsp. ***diffusa*** **New island record**

The endemic *Schiedea diffusa* subsp. *diffusa* was reported as naturally occurring on Molokaʻi and Maui (Imada 2012). Collections of this species made in Kohala now document its presence on Hawaiʻi.

Material examined. **HAWAIʻI**: Kohala Mts, Waimea, Sep 1911, *C.N. Forbes 484.H*; North Kohala, Kahuā, Puʻu Pili, 1400 m, 01 Oct 2021, *J. VanDeMark 53.*

Cleomaceae

Cleome houtteana Schltdl. **Questionable naturalization**

Native to South America (POWO 2025), *Cleome houtteana* is an annual cultivated on Oʻahu since at least 1939 (*M.C. Neal 1179*). A collection of this species made along the shore of Lake Wilson where water had receded document its presence on Oʻahu. This should be considered a questionable naturalization, as the population size is not provided on the specimen label.

Material examined: **Oʻahu**: Shores of Lake Wilson, 12 Jul 1992, *E. Funk s.n.* (BISH 767438).

Cleome rutidosperma DC. **New island record**

Cleome rutidosperma was previously reported as naturalized on Oʻahu (Faccenda 2024a), but is now also known from Maui, where a single plant was found along a roadside in Kīpahulu. An iNaturalist observation from Hāna shows a population in that area. (https://www.inaturalist.org/observations/266030062).

Material examined. **MAUI**: Haleakalā National Park, Kīpahulu section, roadside outside visitor center, sunny, wet area, 1 plant seen, flower purple, 44 m, 20.661294, -156.046406, 19 Sep 2023, *K. Faccenda & K. Akamine 3236.*

Convolvulaceae

Calystegia soldanella (L.) R.Br. ex Roem. & Schult. **New state record**

Calystegia soldanella is native to many coastal ecosystems across the globe (POWO 2025). Collections made from Turtle Beach on Sand Island document the first record of this species on Kuaihelani (Midway Atoll). It likely floated to the island naturally.

Material examined. **Kuaihelani** (**Midway Atoll**): Sand Island, Turtle Beach, 3 m, 28.215514, -177.3678, 25 Jun 2022, *F. Starr et al. Starr-220625-22.*

Camonea umbellata (L.) A.R.Simões & Staples **New island record**

Camonea umbellata was previously reported as naturalized on Oʻahu (Imada 2019). Collections made in Keaʻau document this species on Hawaiʻi, where it was found on the edges of macadamia nut fields.

Material examined. **HAWAIʻI**: Puna, Keaʻau, Puna Sugar Co. [probably cultivated], 04 Mar 1964, *R. Kami s.n.* (BISH 47739, 776049); Keaʻau, borders of macadamia nut fields, 05 Feb 1996, *D.M. Westcott s.n.* (BISH 777974).

Cuscuta sandwichiana Choisy **New island record**

The published native range of *Cuscuta sandwichiana* spans seven of the eight main Hawaiian Islands (Imada 2012). Collections made of this species at ʻAleʻale now extend its native range to include Kahoʻolawe.

Material examined. **KAHOʻOLAWE**: ʻAleʻale, 30 m, 11 Mar 1996, *K.R. Wood et al. 5046* (PTBG).

Ipomoea littoralis Blume **Correction**

Ipomoea littoralis was noted as occurring "on Oʻahu, Molokaʻi, Maui and also reported by Hillebrand (1888) from Hilo Hawaiʻi" by Wagner *et al.* (1990: 557), but no specimens could be found to substantiate its occurrence on Molokaʻi.

Ipomoea tuboides O.Deg. & Ooststr. **Correction**

Ipomoea tuboides is listed as occurring on "all of the main islands" by Wagner *et al.* (1990: 560), but no specimens are known from Niʻihau, nor is it reported from there by Wichman & St. John (1990).

Poranopsis paniculata (Sweet) Roxb. **New island record**

Poranopsis paniculata was reported as naturalized on Kauaʻi, Maui, and Hawaiʻi (Imada 2019; Brock *et al.* 2023). Collections made in Nuʻuanu, Heʻeia, and Haleʻiwa document the naturalization of this species across Oʻahu.

Material examined. **Oʻahu**: North Shore, Leftover's, parking lot, 21.6283763, -158.0737973, 29 Nov 2020, *S. Ching Harbin 20201129-01*; lower Nuʻuanu, Nuʻuanu Stream, 21.1932, -157.5044, 20 Dec 2014, *G. Staples 1615*; Heʻeia State Park, 27 Jan 2007, *A. Lau s.n.* (BISH 725988).

Cucurbitaceae

Momordica charantia L. **Correction**

Momordica charantia was reported as naturalized on "all of the main islands" by Wagner *et al.* (1990: 572). However, there is no evidence that it ever occurred on Kahoʻolawe, as no specimens or literature reports outside of the *Manual* exist (Warren *et al.* 1994).

Sicyos erostratus H.St.John **Correction**

This species was reported as occurring on Oʻahu by Wagner *et al*. (1990); however, the specimen (*Gagne 671*) has now been redetermined as *S. pachycarpus* by MKT, making *S. erostratus* only known from Molokaʻi.

Sicyos herbstii (H.St.John) I.Telford **Correction**

Wagner *et al.* (1990: 577) recorded *Sicyos herbstii* from leeward Kauaʻi, but also noted that "a single collection from Molokaʻi may also represent this species." This Molokaʻi specimen could not be located, and has presumably been reidentified; therefore, its possible presence on Molokaʻi should be removed.

Sicyos pachycarpus Hook. & Arnott **Correction**

Sicyos pachycarpus was reported from "all of the main islands" by Wagner *et al.* (1990: 579), but no specimens from Niʻihau exist, nor is it mentioned by Wichman & St. John (1990).

Sicyos waimanaloensis H.St.John **New island record**

Sicyos waimanaloensis was reported as naturally occurring on Kauaʻi, Oʻahu, and Molokaʻi (Wagner *et al.* 1990). The holotype of *Sicyocarya protusa* H.St.John was determined to be *Sicyos waimanaloensis* by W.L. Wagner in 1995, expanding the range of this species to Lānaʻi.

Material examined. **LĀNAʻI**: Maunalei Gulch, on dry basalt, 152 m, 12 Apr 1938, *H. St. John et al. 18818.*

Cyperaceae

Carex meyenii Nees **Corrections**

Carex meyenii was reported as occurring on "all of the main islands, but no longer found on Kahoʻolawe" by Wagner *et al.* (1990: 1390). However, there is no evidence that it had ever occurred on Kahoʻolawe, as no specimens nor literature reports outside of the *Manual* exist (Warren *et al.* 1994). Similarly, there are no specimens from Niʻihau, nor is it mentioned from there by Wichman & St. John (1990).

Carex montis-eeka Hillebr. **New island record**

Carex montis-eeka was reported as occurring on Kauaʻi, Molokaʻi, and Maui by Wagner *et al.* (1990). Collections of this species made in South Hilo document its presence on Hawaiʻi.

Material examined. **HAWAIʻI**: South Hilo Distr, Upper Waiākea Forest Reserve, Power Line Rd, pole 27, transect 26, 2 miles S of junction with Saddle Rd, 1615 m, 21 Jul 1981, *R. Gustafson 2387*; Upper Waiākea Forest Reserve, 1,600 m, 23 Jun 1981, *J. Davis 537.*

Cyperus compressus L. **Correction**

Cyperus compressus was published as naturalized on Molokaʻi by Oppenheimer (2006) and Wood (2006), but all specimens (*Wood 9832; Oppenheimer H40402*) have since been reidentified as *C. polystachyos*.

Cyperus cyperinus (Retz.) Suringar **Corrections**

Cyperus cyperinus was first reported in Hawaiʻi by Wagner *et al.* (1990; as *Mariscus cyperinus*), where it was considered an indigenous species present on Kauaʻi, Oʻahu, and Molokaʻi. Critical examination of the specimens held at BISH found that this "species" (in the sense of Hawaiian botanists) is actually a hodge-podge of several different species, including *C. phleoides* and *C. fauriei.* No authentic *C. cyperinus* could be found in the BISH Hawaiian collection; as such, it should be removed from the Hawaiian flora.

Cyperus cyperoides (L.) Kuntze **Correction**

Cyperus cyperoides was reported from Hawaiʻi Island by Herbarium Pacificum Staff (1996), but the sole specimen (*Hosaka 1558*) has now been redetermined as *C. phleoides.* It is still known from Lānaʻi.

Cyperus esculentus L. **Correction**

The specimen of *Cyperus esculentus* (*Clarke et al. ESP 321*) cited by Wagner *et al.* (1990) for Kauaʻi was misidentified and actually represents *C. polystachyos*. *Cyperus esculentus* is now known only from Hawaiʻi Island.

Cyperus fauriei Kük. **New island record**

The range of the endemic *Cyperus fauriei* is now expanded to Maui, based on material formerly identified as *C. cyperinus*.

Material examined. **MAUI**: Kanaio Natural Area Reserve, soil pockets in ʻaʻā lava, above road, in remnant dry shrubland, uncommon, 549 m, 24 Dec 2002, *H. Oppenheimer & F. Duvall H20207*; Kanaio National Guard lower exclosure, 122 m, 31 Mar 2004, *F. Starr & K. Starr 040331-1*; Līhau Natural Area Reserve, dry ridge top, 460 m, 19 Mar 2025, *Z. Pezzillo & K. Faccenda 1119.*

Figure 2. *Cyperus iria* spikes from *Faccenda 3576.5*.

Cyperus iria L. **New state record**

Cyperus iria is now naturalized on Hawaiʻi Island, where it is scattered around Hilo. It was first discovered by Kyle Kashner on iNaturalist (https://www.inaturalist.org/observations/197767947). Hundreds of individuals were seen along road margins and at disturbed sites. This species is native to much of Africa, Asia, Australia, and the western Pacific, and has also naturalized across much of North and South America (POWO 2025). In China, its habitat is described as "forest margins, under shrubs or forests, grasslands by water, mountain slopes, along trails in valleys, river margins, wet places, paddy fields" (Dai *et al.* 2010). It is an especially serious weed in rice crops (Awan *et al.* 2022). This sedge is readily recognizable by its round, scarcely overlapping pistillate scales (Figure 2).

Material examined. **HAWAIʻI**: Pepeʻekeo, Old Māmalahoa Hwy & Kulaʻimano Homestead Rd, uncommon, 122 m, 19.829544, -155.096419, 07 Jul 2024, *K. Faccenda 3576.5*; University of Hawaiʻi at Hilo, greenwaste dumping area off Nowelo St, wet, sunny, disturbed site, 100 m, 19.70181, -155.084989, 27 Jan 2024, *K. Kashner s.n.* (BISH 797026).

Cyperus laevis R.Br. **New state record**

Cyperus laevis, an eastern Australian endemic, is now naturalized on Lānaʻi, where it is assumed to have been imported with hay from Australia, like many other Australian weeds unique to Lānaʻi. This is the first report of this species outside of its native range. This species was initially identified using the *Flora of New South Wales* (2025), after which photos were shared with Karen Wilson (NSW), who confirmed the identification. In New South Wales, *C. laevis* grows in forests, mostly in shady, moist situations (Flora of New South Wales 2025). This species differs from the closely related *C. gracilis* by not producing plantlets and having scales without conspicuous lateral veins, whereas *C. gracilis* is often proliferous, forming plantlets in the inflorescence, and having scales with conspicuous raised lateral veins.

Material examined. **LĀNAʻI**: Lopa Gulch, middle tributary, a few plants on rocky ledge along an intermittent stream, mixed with a clump of *Cymbopogon refractus*, 750 m, 20.809048, -156.859215, 26 Jun 2018, *H. Oppenheimer* & *K. Bogner H618009*; cultivated material from *H. Oppenheimer H618009*, 14 Dec 2018, *H. Oppenheimer* & *A. Palomino H121802*.

Cyperus melanospermus (Nees) Valck.Sur. **New state record**

Identified by Mark Strong (US), *Cyperus melanospermus* is now naturalized on Maui, where it was found at Puakea. It is native across Africa, Asia, Malesia, and Australia and has become naturalized in Fiji and Vanuatu (POWO 2025). It is most like *Cyperus brevifolius* but differs by having black achenes and culms 30–120 cm tall, whereas *C. brevifolius* has brown achenes and rarely surpasses 40 cm in height.

Material examined. **MAUI**: Hāna Distr, Puakea, near Hāna Hwy, in wet ground, 384 m, N 20° 48′, W 156° 07′, 22 Jun 2003, *H. Oppenheimer H603220*.

Cyperus pennatiformis Kük. var. ***pennatiformis*** **Correction**

Cyperus pennatiformis var. *pennatiformis* was noted as occurring "on Laysan, Kauaʻi, Oʻahu, Maui, and Hawaiʻi" by Wagner *et al.* (1990: 1421; *as Mariscus pennatiformis* subsp. *pennatiformis*); however, no evidence could be found to substantiate its occurrence on Hawaiʻi Island.

Cyperus pilosus Vahl **New island record**

Previously reported from Kauaʻi (Imada 2019), *Cyperus pilosus* is now known from Hawaiʻi, based on the collection of a single individual at the University of Hawaiʻi at Hilo campus. Given the weediness of this species, it is unlikely that this is the only individual present on the island and it is therefore considered naturalized, with more localities expected to be found with further fieldwork.

Material examined. **HAWAIʻI**: Hilo, University of Hawaiʻi at Hilo campus, green waste dump area off of Nowelo St across from Haleʻōhelo, disturbed, wet, sunny area, 1 plant seen, annual, 51 m, 19.701919, -155.085096, 09 Jul 2024, *K. Faccenda et al. 3589.*

Cyperus sesquiflorus (Torr.) Mattf. & Kük. subsp. ***sesquiflorus*** **New state record**

Cyperus sesquiflorus has been present in Hawaiʻi since at least 1987, but has historically been misidentified as *C. mindorensis* until recent fieldwork and iNaturalist observations showed that this species is widespread on Hawaiʻi Island around Hilo, with a population also in Volcano, where it is a weed of lawns, roadsides, and gardens. A voucher from Molokaʻi, where it is common in pastures, was identified by Mark Strong (US).

Figure 3. Inflorescence of *Cyperus sesquiflorus* subsp. s*esquiflorus* with secondary head visible on left.

Cyperus sesquiflorus is very similar to *C. mindorensis* in that they both have white heads, but *C. sesquiflorus* has pistillate scales with smooth keels and often produces smaller secondary heads below the main head, whereas *C. mindorensis* has small spines on its keels and rarely produces secondary heads (Figure 3). *Cyperus sesquiflorus* has a pantropical distribution, with POWO considering it native across its entire current range (POWO 2025). In China it is found in wet places along trails, river margins, and ditch margins from near sea level to 2000 m (Dai *et al.* 2010). Much of the literature regarding this species uses the synonyms *Kyllinga odorata* Vahl or *K. cylindrica* Nees.

Material examined. **MOLOKA‘I**: Lūpehu, naturalized and common in pastures, 330 m, 07 Nov 2007, *H.L. Oppenheimer H220719*. **HAWAI‘I**: Hilo, Hilo Veterans Cemetery, occasional in lawn, 53 m, 23 Jul 1996, *K.M. Nagata 4430*; University of Hawai‘i-Hilo, occasionally naturalized in Hilo and Puna lawns and roadsides, 06 Jul 1987, *L. Stemmermann 7175*; Hilo, University of Hawai‘i at Hilo campus, edge of volleyball court, mowed lawns, moist, sunny areas, common, 49 m, 19.701323, -155.082358, 09 Jul 2024, *K. Faccenda et al. 3587*; Hilo, Lahi St near Waiānuenue St, weed in lawn, common, 245 m, 19.711536, -155.130564, 07 Jul 2024, *K. Faccenda et al. 3575*.

Cyperus virens Michx. **New island record**

Cyperus virens was previously reported on Hawai‘i Island (Wagner *et al.* 1990). It has now also been found on Maui at Honokahua, where it was locally naturalized in a waste area and emerging in asphalt cracks, associated with *C. polystachyos* and weeds.

Material examined. **MAUI**: West Maui, Lāhainā Distr, Honokahua, 61 m, 19 Mar 2023, *H. Oppenheimer H32365*.

Figure 4. Inflorescence of *Fimbristylis complanata.*

Fimbristylis complanata (Retz.) Link **New state record**

Fimbristylis complanata is now naturalized along Kaūmana Drive near its intersection with Saddle Road, where thousands of plants were seen on sunny, wet roadsides in mowed and infrequently mowed areas. This species has a pantropical distribution, and POWO considers it to be native across most of the planet except for Fiji, where it was introduced (POWO 2025). In China it grows from wet places in valleys, grasslands, stream sides, open fields, slopes, ditches, swampy places, and along ravines from 100–3000 m (Dai *et al*. 2010). *Fimbristylis complanata* can be identified by being much larger than other *Fimbristylis* found in Hawai‘i, in addition to its trigonous (3 stigmas), white, tuberculate achenes (Figure 4).

Material examined. **HAWAI‘I**: Hilo, Kaūmana Dr & Nolemana St, annual, leaves flattened, central branch of most inflorescences bent, possibly due to wind, 571 m, 19.682886, -155.178572, 09 Jul 2024, *K. Faccenda et al. 3585.*

Schoenoplectiella triangulata (Roxb.) J.Jung & H.K.Choi **Nomenclatural note**

Schoenoplectiella mucronata was reported as naturalized on Maui and Hawai‘i (Strong & Wagner 1997; Oppenheimer & Pezzillo 2024). However, specimens from a recently returned loan were annotated by Eisuke Hayasaka (FUK) as *S. triangulata*. Using the key in Ohwi (1984), all Hawaiian holdings formerly identified as *S. mucronata* were found to match *S. triangulata*.

Schoenoplectus californicus (C.A.Mey.) Palla **Correction**

Schoenoplectus californicus was noted by Wagner *et al.* (1990: 1431) as occurring on "all of the main islands except Kahoʻolawe," yet no records could be found to substantiate its occurrence on Lānaʻi.

Schoenoplectus tabernaemontani (C.C.Gmel.) Palla **New island record**

Schoenoplectus tabernaemontani was recorded as indigenous on Niʻihau, Kauaʻi, Oʻahu, Molokaʻi, and Hawaiʻi (Imada 2012). Collections made in ʻĪao Valley now document its presence on Maui.

Material examined. **MAUI**: West Maui, Wailuku, ʻĪao Valley, in open, swampy, muddy ground, 542 m, 02 Apr 2014, *H.L. Oppenheimer et al. H41402.*

Dennstaedtiaceae

Hypolepis dicksonioides (Endl.) Hook. **New state record**

Hypolepis dicksonioides is now naturalized at Palikea, Oʻahu; Haleakalā, Maui; and is widespread on Hawaiʻi above 1000 m. This species is native to Norfolk Island, Kermadec Islands, New Zealand, Samoa, Tahiti, and the Marquesas Islands, and is apparently adventive in southwestern Australia (Flora of Australia 2024). It is unclear how it first arrived in Hawaiʻi. *Hypolepis dicksonioides* has a high weed risk assessment in Hawaiʻi and has been observed to colonize areas infested with gorse (*Ulex europaeus*) above 1,500 m on Mauna Kea, as well as forest openings in the Hakalau Forest National Wildlife Refuge and at Kīlauea Iki in Hawaiʻi Volcanoes National Park. This species is easily differentiated from the endemic *H. hawaiiensis* by its large size (often over 2 m tall; see Figure 5), thick fiddleheads, and abundantly hairy stipes, rachises, and costae (see key).

1. Plants often 2 m or more tall (shorter in exposed, rocky areas); stipes and costae covered with abundant sticky hairs up to 5 mm long, young fronds densely hairy and sticky, mature fronds hairy, stipe base 1.5–2 cm diam.; sori often covered by a well-developed marginal flap (most apparent on young sori) ..... *H. dicksonioides*
1′. Plants typically 1 m tall (much shorter in var. *mauiensis*); stipes and costae with sparse short hairs up to 2 mm long (usually 1 mm long), young fronds sparsely to moderately hairy, mature fronds glabrous or glabrate (hairs may be present on rachis grooves), stipe base 0.4–0.8 cm diam.; marginal flap not as above ..... *H. hawaiiensis*

Material examined. **Oʻahu**: Palikea, on slope facing Honouliuli, southern Waiʻanae Mts, along fence line on border of thicket of *Psidium cattleianum,* 883 m, 21.41629, -158.099, *M.K. Thomas et al. 698*. **MAUI**: East Maui, Makawao Distr, Haʻikū Uka, Koʻolau Forest Reserve, Waiohiwi, several mature plants and numerous immature sporophytes observed, 902 m, 30 Jan 2024, *H. Oppenheimer & R. Henderson H12418*; *loc. cit.,* remote, overgrown location precludes any possibility this occurrence is or has been under cultivation, 840 m, 29 Jan 2024, *H. Oppenheimer et al. H12415.* **HAWAIʻI**: Puna, Kahaualeʻa, Nalehua Rd, 19.443892, -155.177377, 1,000 m, 20 Apr 2022, *K. Lynch s.n.* (BISH 783666, 783667); Puna, Keauhou, forest belonging to Jeff McCall, Haunani Road, 1,230 m, 19.44526, -155.246, 13 Apr 2022, *K. Lynch s.n.* (BISH 783665, 783668, 783669); Puna, Hawaiʻi Volcanoes National Park, 1,250 m, 19.429125, -155.260232, 19 Apr 2022, *H. Quintana & K. Lynch s.n.* (BISH 783673, 783674); cultivated at Kay Lynch's nursery, wild sporeling collected from forest land of Jeff McCall's flower farm, 1,219 m, 20 Apr 2021, *K. Lynch s.n.* (BISH 782295).

Figure 5. *Hypolepis dicksonioides* habit in the Kahuku unit of Hawai‘i Volcanoes National Park. These plants are over 3 m tall.

Hypolepis hawaiiensis Brownsey

var. ***hawaiiensis*** **Correction**

Hypolepis hawaiiensis var. *hawaiiensis* was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lāna‘i.

Microlepia setosa (Sm.) Alston

var. ***mauiensis*** (W.H.Wagner) M.K.Thomas **New island record**

Microlepia setosa var. *mauiensis* was previously only reported from Hawai‘i, Maui, and O‘ahu (Palmer 2003; Imada & Kennedy 2020). Though there is a continuum of hairiness in *Microlepia setosa*, a Kaua‘i specimen from Wai‘oli matches the variation found on Hawai‘i and Maui and is indistinguishable from the O‘ahu population. In his protologue of the taxon, W. H. Wagner stressed the importance of a zig-zag rachis, but this feature has been found to be variable and sometimes appears on typical *M. setosa*.

Material examined. **KAUA‘I**: Wai‘oli Valley, hanging gulch above main waterfall, N-facing slope of Nāmolokama, growing in patches on low slopes between drainages, exceptionally hairy, 833 m, 22.151149, -159.498941, 09 May 2022, *S. Deans & S. Heintzman KP05092202*.

Figure 6. *Drosera burmanni* habitat.

Droseraceae

Drosera burmanni Vahl **New naturalization**

Drosera burmanni is native to tropical and subtropical Asia, Australia, and the West Pacific (POWO 2025). Collections from the junction of Stainback Hwy and Kūlani Road on Hawaii Island document the second naturalization of this species outside of its native range, besides Florida (https://www.inaturalist.org/observations/106696665). Over 100 plants were growing from a sunny, boggy, frequently mowed roadside (Figure 6) during a brief visit to the site in 2024, although the area was not surveyed thoroughly. The plants were feeding on *Wasmannia auropunctata* (little fire ants). This species was surely imported as a horticultural plant, although there are no specimens at BISH, nor is this mentioned in Staples & Herbst (2005).

Material examined. **HAWAI‘I**: Intersection of Stainback Hwy and Kūlani Rd on open roadside, 515 m, 19.3557, -155.0812, 08 Dec 2022, *A.V. Freire & E.J. Judziewicz 2022-975*; Mountain View, intersection of Stainback Hwy and Kūlani Rd, 516 m, 19.599114, -155.136573, 06 Jan 2024, *K. Faccenda & E. Judziewicz 3280.*

Dryopteridaceae

Dryopteris crinalis (Hook. & Arn.) C.Chr. var. ***crinalis*** **Correction**

Dryopteris crinalis var. *crinalis* was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lāna‘i.

Dryopteris mauiensis C.Chr. **Correction**

Dryopteris mauiensis was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Euphorbiaceae

Codiaeum variegatum (L.) Blume **New naturalization**

Codiaeum variegatum is native from the Philippines to Malesia to Queensland and Melanesia, and has naturalized in scattered location across the tropics (POWO 2025). Collections of this species made in the southern Koʻolau Range document its naturalization on Oʻahu, where scattered plants are found in moist to wet, shady understories in invasive-dominated forests. How it is dispersing to these locations, many hundreds of meters away from houses, is unclear. Seedlings are found in association with the mature naturalized individuals. *Codiaeum variegatum* has been cultivated in Hawaiʻi since at least 1926 (*Ball 26*) and is still widely found in modern gardens.

Material examined. **Oʻahu**: Southeast Koʻolau Mts, Kuluʻī Gulch, 2 trees, 200 m, 21.297658, -157.748762, 15 Dec 2021, *M.K. Thomas et al. 208*; Kailua, 209 Oneawa Kai Pl, seedlings appearing next to cultivated plants, 21.24 N 157.44 W, 10 Oct 1999, *G. Staples 1188*; Waimānalo, Maunawili Contour Trail, 132 m, 21.345406, -157.747505, 21 Feb 2025, *K. Arthur et al. 69*; Pālolo Valley, 290 m, 21.311956, -157.776922, 13 Jan 2025, *K. Arthur & K. Faccenda 9.*

Croton glandulosus L. var. ***lindheimeri*** Müll.Arg. **New state record**

Croton glandulosus var. *lindheimeri* is native from Kansas to northern Mexico (POWO 2025). Collections of this species made at Puʻu o Hoku Ranch document its naturalization on Molokaʻi. The population size or extent of this naturalization is unclear. This appears to be the first report of this variety outside of its native range, although other varieties have naturalized in Australia and Indonesia (POWO 2025).

Material examined: **Molokaʻi**: Puʻu o Hoku Ranch, 17 May 2005, *F. Starr & K. Starr 050517-12.*

Euphorbia celastroides Boiss. var. ***amplectens*** Sherff **Correction**

Wagner *et al*. (1990: 606) reported *Euphorbia celastroides* var. *amplectens* (as *Chamaesyce celastroides* subsp. *amplectens*) as present on "all of the main islands," but there are no specimens nor evidence in the literature that it occurred on Niʻihau (Wichman & St. John 1990).

Euphorbia heterophylla L. **Correction**

Euphorbia heterophylla was reported as naturalized on "all of the main islands except Molokaʻi" by Wagner *et al.* (1990: 619). There is no evidence it ever occurred on Kahoʻolawe, as no specimens or literature reports outside of the *Manual* exist (Warren *et al.* 1994).

Euphorbia hypericifolia L. **New island record**

Euphorbia hypericifolia is now known from Kahoʻolawe. It has previously been reported from Kure, Kuaihelani (Midway Atoll), French Frigate Shoals, and all the main islands except Niʻihau and Kahoʻolawe (Wagner et al. 1990; Oppenheimer 2003).

Material examined. **Kahoʻolawe**: Upper Hakioawa, near outplantings, lowland scrub with *Dodonaea viscosa*, 290 m, 754,155 e, 2,277,356 N, 12 Dec 2015, *F. Starr & K. Starr 151212-01.*

Euphorbia hyssopifolia L. **Correction**

Euphorbia hyssopifolia was reported as naturalized on Kahoʻolawe by Starr & Starr (2017), but was based on a misidentification of *E. hypericifolia* (see above).

Euphorbia maculata L. **Correction**

Euphorbia maculata was reported as naturalized on Kure by Wagner *et al.* (1990); however, all specimens have been redetermined as *E. serpens* (see below).

Euphorbia serpens Kunth **New island record**

Euphorbia serpens was previously documented as naturalized on Kuaihelani (Midway Atoll), Kauaʻi, Oʻahu, and Maui (Imada 2019; Ross & Faccenda 2023). Collections from Green Island around the LORAN buildings document its naturalization on Kure Atoll.

Material examined. **KURE**: Around LORAN buildings, common prostrate herb, 04 Jan 1979, *D.R. Herbst 6286;* [no locality], Aug 1993, *DLNR staff s.n*. (BISH777908)*;* Around houses, 03 Jan 1979, *C. Corn s.n.* (BISH667495).

Fabaceae

Acacia cincinnata F.Muell. **New naturalization**

Acacia cincinnata is now naturalized in Hawaiʻi, as a sizable patch of over 100 mature trees intermixed with *Acacia koa* was discovered in May 2024 by Bishop Museum botanists. Plants of all life stages were found, with mature trees producing seedlings and abundant root suckers along an eroded section of ridgeline west of the Mānana Trail. It was later discovered that in 1991 an experimental planting of 12 *Acacia* species was done in Waiʻawa, Oʻahu (Cole *et al.* 1996), which is the next major valley over from the recorded naturalization site. It is hypothesized that these trees originated from the 1991 planting, as this species is not mentioned in the planting lists of Skolmen (1980). The young trees may resemble *Acacia mangium*, but can be differentiated by following key.

1. Branch tips weakly angular/winged; phyllode tips acuminate; fruit 5–6 mm wide and tightly spiraled, resembling radiatori pasta ..... *A. cincinnata*
1′. Branch tips conspicuously angled/winged; phyllode tips broadly acute; fruit less than 3–6 mm wide and loosely coiled, resembling angel hair pasta ..... *A. mangium*

Material examined: **OʻAHU**: Ridge west of Mānana Trail, central Koʻolau Mts, growing in open scrubland on border of forest with *Acacia koa*, etc., 340 m, 21.437821, -157.936791, 20 May 2024, *M.K. Thomas 661.*

Albizia lebbeck (L.) Benth. **Corrections**

Wagner *et al.* (1990) reported *Albizia lebbeck* as naturalized on Hawaiʻi Island, but no specimens or citizen science records could be found to substantiate its naturalization on the island. Furthermore, this species was reported as naturalized on Kuaihelani (Midway Atoll) by Wagner *et al*. (1990), but both specimens at BISH are clearly labeled as cultivated and no naturalized plants were found during recent surveys (Starr & Starr 2008). *Albizia lebbeck* is now known as naturalized on Niʻihau, Kauaʻi, Oʻahu, Molokaʻi and Maui (Imada 2019).

Alysicarpus ovalifolius (Schumach.) J.Léonard **New state record**

While botanizing along Hanauma ridge near ʻIhiʻihilauākea, about 25 individuals of *Alysicarpus ovalifolius* were observed growing in dry rocky tuff. The native range for this

species is Africa and the Indian subcontinent, but it has been introduced to the southeastern U.S., Australia, and Taiwan (POWO 2025). It is known to grow in open pinelands and margins, roadsides, urban waste areas, and lawns (Ohashi 2023a). *Alysicarpus ovalifolius* can be most readily distinguished from the more common *A. vaginalis* by having loments that are non-septate and ridged at the joints, while those of *A. vaginalis* are septate and furrowed at the joints. Additionally, *A. ovalifolius* is an erect or ascending annual herb (Figure 7), while *A. vaginalis* is a sprawling or ascending perennial.

The following description is from the Flora of North America (Ohashi 2023a):

> "Herbs annual. Stems erect or ascending, usually much branched, sometimes woody at base, 20–100 cm, puberulent or pubescent, glabrescent. Leaves unifoliolate; stipules 5–20 mm; petiole 2–8 mm; leaflet blades: proximals usually orbiculate, elliptic, or oblong, distals often lanceolate, 1–10 × 0.6–3 cm, base subcordate, apex acute to emarginate and mucronulate, abaxial surface finely puberulent, with some hairs on veins. Inflorescences 6–20-flowered, terminal or leaf-opposed, usually racemes, sometimes panicles, usually 5–15 cm. Pedicels 1–2 mm. Flowers: calyx 5–6 mm, tube 1.5–2 mm, lobes valvate at base, narrowly triangular, 3–4 mm, acuminate; corolla orange-buff to reddish violet or pink, 5–6 mm. Infructescences lax, internodes longer than 1/2 loment length. Loments subterete, oblong or linear, 10–25 × 2 mm, much longer than calyx, margins straight, not constricted between segments, uncinulate-puberulent; segments (2–)4–6(–8), broadly oblong or quadrate, 2.5–4 mm, lateral surfaces coarsely reticulate, obscurely sculpted, ridged between segments, puberulent; septa without internal cross partitions, except sometimes present at distal joints. Seeds brown, oblong, 2 × 1 mm. 2n = 16."

Figure 7. *Alysicarpus ovalifolius* showing the erect to ascending habit. Inset showing non-septate loment.

KEY TO *ALYSICARPUS* IN HAWAIʻI (ADAPTED FROM OHASHI 2023a)

1. Loments ridged, without internal cross-partition between segments, sometimes with partitions distally; inflorescences laxly flowered; infructescences lax, internodes longer than 1/2 loment length; plants annual; stems much branched, erect or ascending .... *A. ovalifolius*

1′. Loments furrowed, with internal cross-partition between segments; inflorescences densely flowered; infructescences much crowded, internodes much shorter than loments; plants perennial; stems diffuse, ascending or sprawling ..... *A. vaginalis*

Material examined. **OʻAHU**: Honolulu, Hanauma Ridge, growing in dry rocky tuff with *Cynanchum gerrardii* and *Cenchrus ciliaris,* ca 25 plants seen, 80 m, 21.154696, -157.415830, 08 April 2024, *M.C. Ross 1988*.

Biancaea decapetela (Roth) O.Deg. **New island record**; **correction**

Biancaea decapetela was reported as naturalized on Niʻihau, Kauaʻi, Oʻahu, Lānaʻi, Maui, and Hawaiʻi (Imada 2019). Collections of this species made in a dry ʻauwai near old Hawaiian house sites in Kalamaʻula document its naturalization on Molokaʻi. No evidence in either the herbarium or Wichman & St. John (1990) substantiate its occurrence on Niʻihau.

Material examined. **MOLOKAʻI**: Kalamaʻula, dry ʻauwai near old Hawaiian house site, 244 m, 23 Jun 1927, *G.C. Munro 128.*

Calliandra haematocephala Hassk. **New naturalization**

Calliandra haematocephala is native to Bolivia (POWO 2025), but has been widely cultivated in Hawaiʻi since the 1800s (Staples & Herbst 2005). It is now escaping cultivation on Oʻahu near Schofield Barracks and Waimea Valley.

Material examined. **OʻAHU**: Schofield Barracks, East Range, near OISC's coqui site, ~10 plants observed, 304 m, 24 Feb 2005, *Oʻahu Invasive Species Committee OISC 001*; upper Waimea Valley, Drum Road, mixed disturbed wetland forest, Dec 2004, *K. Kawelo USARMY 7*.

Crotalaria juncea L. **Corrections**

Crotalaria juncea was published as naturalized on Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Imada 2019), but only the Kauaʻi record appears to be truly naturalized. The Maui and Hawaiʻi reports appear to be adventive populations, based on examination of herbarium specimens, while the record from Oʻahu (*Sasakawa s.n*. BISH 457141) was likely cultivated.

Crotalaria longirostrata Hook. & Arn. **Correction**

Crotalaria longirostrata was reported on Hawaiʻi Island by Wagner *et al.* (1990), but no specimens or citizen science records could be found to substantiate its naturalization on that island.

Crotalaria trichotoma Bojer **New island record**

Crotalaria trichotoma was previously documented as naturalized on Maui (Imada 2019). A specimen collected from a large population at the Poamoho Research Station in Waialua, where over 500 plants were seen, documents its naturalization on Oʻahu.

Material examined. **OʻAHU**: Waialua, Poamoho Research Station, growing along dirt road leading to farm plots, 186 m, 21.322411, -158.530221, 29 Mar 2023, *M.C. Ross & K. Faccenda 1923*.

Ctenodon elegans (Schltdl. & Cham.)
D.B.O.S.Cardoso & A.Delgado **Taxonomic note**

Aeschynomene falcata (Poir.) DC. (syn. *Ctenodon falcatus* (Poir.) D.B.O.S.Cardoso, P.L.R.Moraes & H.C.Lima) was published as naturalized on Molokaʻi by Oppenheimer & Pezzillo (2024). However, examination of the specimens using the key in Rudd (1955), as well as the photographed types of both *C. falcatus* and *C. elegans*, revealed that all Hawaiian material is misidentified and corresponds to *C. elegans*, based on fruit size and shape.

Ctenodon paniculatus (Willd. ex Vogel)
D.B.O.S.Cardoso, P.L.R.Moraes & H.C.Lima **New island record**

Ctenodon paniculatus was previously documented as naturalized on Molokaʻi (Hughes 1995; as *Aeschynomene paniculata*). It has since been moved to the genus *Ctenodon* based on molecular evidence (Cardoso *et al.* 2020). Collections made from disturbed pastureland on Pōhākea Ranch in Kunia document its naturalization on Oʻahu.

Material examined. **Oʻahu**: Kunia, Pōhākea Ranch, disturbed pastures, 357 m, 21.27, -158.4, 25 Nov 2003, *S. Ching-Harbin et al. 027.*

Desmodium psilocarpum A.Gray **New state record**

The native range of *Desmodium psilocarpum* is Arizona, New Mexico, and northern Mexico, and it has also been reported as naturalized in Zimbabwe and Zambia (POWO 2025). This species is now also naturalized in North Kona on Hawaiʻi Island, and on Lānaʻi. On Lānaʻi it was found naturalized in a fenced area inaccessible to deer or sheep, where it had been mowed and resprouted. This species may have been accidentally imported with hay, as we could find no records of intentional introduction. This species is quite similar to *D. tortuosum* and would key to it in Wagner *et al.* (1990); as such, the following key is provided here to distinguish the two (adapted from Ohashi 2023b).

1. Loments 6–10 × 5–7 mm, sparsely pubescent ..... *D. psilocarpum*
1′. Loments 3.0–4.5 × 3.0–3.5 mm, densely uncinate pubescent ..... *D. tortuosum*

Material examined. **Lānaʻi**: SW end of Hiʻi Flats, near Kapohaku Gulch, 550 m, 3 Oct 2023, *H. Oppenheimer et al. H102301*. **Hawaiʻi**: Kona, Kamoa State Historical Park, 03 Sep 1985, *C. Corn* (BISH 668256); North Kona, Kailua-Kona, roadside, 6 m, 15 Jul 1984, *K.M. Nagata 2991.*

Grona heterophylla (Willd.) H.Ohashi
& K.Ohashi **New island record**

Grona heterophylla (syn. *Desmodium heterophyllum* (Willd.) DC.) was previously documented as naturalized on Maui, Hawaiʻi, and questionably on Molokaʻi (Imada 2019). Collections from the Kuilau Moalepe Trail document its naturalization on Kauaʻi, where it formed mats along the shaded portion of the trail.

Material examined. **Kauaʻi**: Kuilau Moalepe Trail, secondary vegetation in a mixed native-invasive forest, 220 m, 19 Apr 1997, *T. Flynn et al. 6124.*

Lathyrus oleraceus Lam. **New naturalization**

Lathyrus oleraceus, the domestic pea, has been found naturalized on the west slope of Mauna Kea, Hawaiʻi Island. This species was formerly called *Pisum sativum* L., but molecular evidence now places it in the genus *Lathyrus* (Rix *et al.* 2023). *Lathyrus oleraceus* is native to the Mediterranean and widely introduced across most of the world (POWO 2025).

Material examined. **HAWAI‘I**: W slope of Mauna Kea, outside of sandalwood enclosure, downslope of Pu‘u Lā‘au state cabin, 2255 m, 248964 E, 2192173 N, UTM zone 5Q, 1998, *S. Dougill s.n.* (BISH 778207); W slope of Mauna Kea, cinder mining area, Pu‘u Lā‘au, 2,258 m, 19.49 N, 155.35 W, 18 Dec 2000, *S. Dougill s.n.* (BISH 667716).

Leucaena leucocephala (Lam.) de Wit **New island record**

Leucaena leucocephala was documented as naturalized on Kuaihelani (Midway Atoll), Ka‘ula Rock, Ni‘ihau, Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, Maui, Kaho‘olawe, and Hawai‘i (Imada 2019). Collections made in 2007 now document its naturalization on Lehua. There were a few plants found on the outer crescent; the specimen plant was 1.75 m tall, with flowers and fruit.

Material examined. **LEHUA**: Outer crescent, 50 m, 04 Apr 2007, *K.R. Wood & J.F. Butaud 12325.*

Macrotyloma axillare (E.Mey.) Verdc. **New island record**

Macrotyloma axillare has previously been reported as naturalized on O‘ahu (Imada 2019). Collections made of this species made in Hāmākua now document its naturalization on Hawai‘i Island.

Material examined. **HAWAI‘I**: Hāmākua, Pōhakuloa, Ke‘āmuku, old pasture land, UTM 5 N215344 E2195122, 26 Jun 2021, *C. Morrison & P. Martin s.n.* (BISH 786323).

Mezoneuron kauaiense (H.Mann) Hillebr. **New island record**

Mezoneuron kauaiense was not reported from Lāna‘i in Wagner *et al*. (1990), but was later added in Wagner, Herbst, *et al*. (1999). We elaborate on this addition as follows: a single *Mezoneuron kauaiense* tree was discovered by botanist Joel Lau from Puhi‘elelū on Lāna‘i in October 1990 and had one living branch where a seed pod was collected before the tree died (Joel Lau, pers. comm). No herbarium specimen was made of this, however. The seeds were then planted at his residence in Mānoa, O‘ahu where the tree produced hundreds of seeds, some of which are now seed-banked at Lyon Arboretum.

Neltuma pallida (Humb. & Bonpl. ex Willd.) C.E.Hughes & G.P.Lewis **Correction**

Kiawe, formerly *Prosopis pallida*, was reported as occurring on Kuaihelani (Midway Atoll) by Wagner *et al*. (1990). However, this species had never naturalized there (Starr & Starr 2008) and there are no specimens documenting its naturalization.

Peltophorum pterocarpum (DC.) Backer ex K.Heyne **New island record**

Peltophorum pterocarpum was previously reported as naturalized on Kaua‘i (Imada 2019). A population of around 50 young trees 4–6 m tall at the Kahuku Training Area now document its naturalization on O‘ahu.

Material examined. **O‘AHU**: Ko‘olau Mts, Kahuku Training Area, 15 m, 21.69092, -157.97536, 30 Jun 2020, *K. Kawelo et al. USARMY 536.*

Pterocarpus indicus Willd. **Questionable naturalization**

Pterocarpus indicus has been cultivated in Hawai‘i since at least 1916 (*J.F. Rock s.n.*, BISH 55869) and is now showing signs of naturalization, as many seedlings were found

under a mature tree (unclear if the mature tree was planted or wild) around Schofield West Range. This species is often planted as a shade tree in Hawai‘i and was also used as a forestry planting (Staples & Herbst 2005). *Pterocarpus indicus* is native to Southeast Asia and the western Pacific and has been reported as naturalized in areas of Africa, Australia, and India (POWO 2025).

Material examined. **O‘AHU**: Schofield West, Trimble Road, 21.488852, -158.090113, 28 Nov 2011, *J. Beachy & K. Kawelo USARMY 242.*

Pueraria montana (Lour.) Merr. var. ***thomsonii*** (Benth.) M.R.Almeida **Taxonomic note**

In Wagner *et al*. (1990) two varieties of *Pueraria montana* (treated as *P. lobata* vars. *lobata* and var. *thomsoni*) were considered present in Hawai‘i, with *P. m.* var. *thomsonii* limited to Kaua‘i and *P. m.* var. *montana* as present on O‘ahu, Maui, and Hawai‘i. The identification of the Kaua‘i specimen was confirmed by van der Maesen (1985). Comparison to the Kaua‘i specimens of several fertile specimens collected after publication of the *Manual* suggests that *P. montana* var. *thomsonii* is the only variety currently present in Hawai‘i. However, as the majority of Hawaiian specimens are sterile and cannot be positively identified to variety, further collections may yet find *P. montana* var. *lobata* to be present in Hawai‘i. Only fertile material which can be confidently identified is cited below.

Material examined. **O‘AHU**: Pauoa Valley, roadside along cultivated field, 26 Sep 1925, *D. Topping* s.n. (BISH55880); **MAUI** Hana Distr., lower Nāhiku, Honoulunui, disturbed secondary wet forest, 19 Sep 2012, *H. Oppenheimer H91209*; Honomanu, Hana Hwy, side of road, lowland wet jungle, vine forming dense mats on steep wet valley wall, 10 Oct 2002, *F. Starr et al. 021012-1.*

Senna occidentalis (L.) Link **New island record**

Senna occidentalis was previously documented as naturalized on Ni‘ihau, Kaua‘i, O‘ahu, Moloka‘i, Maui, and Hawai‘i (Imada 2019). Collections made from a single colony in a gulch on the outer crescent of Lehua now document its naturalization on the island.

Material examined. **LEHUA**: Outer crescent, gulch E of camp, 70 m, 02 May 2009, *K.R. Wood & M. Query 13712.*

Senna surattensis (Burm.f.) H.S.Irwin & Barneby **New island record**

Senna surattensis was documented as naturalized on Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, and Maui (Imada 2019). Collections made on a road to the lighthouse at Kauhola Point now document its naturalization on Hawai‘i, where there is a well-established population.

Material examined. **HAWAI‘I**: Kohala, Hala‘ula, E of Kapa‘au, along road to lighthouse at Kauhola Pl, 26 Apr 2006, *C. Murray s.n.* (BISH 726209).

Stylosanthes guianensis (Aubl.) Sw. var. ***guianensis*** **New island record**

Stylosanthes guianensis var. *guianensis* was reported as naturalized on Kaua‘i and Moloka‘i (Imada 2019; Oppenheimer & Pezzillo 2024). Collections made in the Pāhole Natural Area Reserve along the Mokulē‘ia Trail now document its naturalization in the mesic forest. A population is also found in Makua-Ke‘eau Valley in dry, disturbed shrubland and pastureland near sea level, where its population is likely in the thousands (https://www.inaturalist.org/observations/82810727). Similarly, this species was also observed growing abundantly on the Ka‘ala road suggesting it is widely distributed in the northern Wai‘anae mountains.

Material examined. **O‘AHU**: Pāhole Natural Area Reserve, Mokulē‘ia Trail, 21.535749, -158.180141, 29 Feb 2024, *M.K. Thomas et al. 634.*

Vigna unguiculata (L.) Walp.
subsp. ***unguiculata*** **New naturalization**

Vigna unguiculata, commonly known as cow pea, is native to much of Africa and reported as naturalized in many parts of the world with a seasonally dry tropical biome (POWO 2025). Collections of this species made in Po‘ipū now document its naturalization on Kaua‘i, where it was rather common along roadsides. It has formerly been cultivated as a forage legume in Hawai‘i.

Material examined. **KAUA‘I**: Po‘ipū, 1 mile E of Makawehi Point, roadside at edge of cane field, 25 May 1988, *L. Hume et al. 346.*

Vigna vexillata (L.) A.Rich **Correction**

Vigna vexillata was published as naturalized on Kaua‘i by Wagner *et al.* (2012). The specimen (*Lorence 9071*) has since been redetermined as *Sigmoidotropis speciosa* based on its glabrous habit.

Geraniaceae

Erodium cicutarium (L.) L’Hér. **Note**

A recent collection of *Erodium cicutarium* in Kapolei marks the first documented occurrence of this species on O‘ahu in over a century. The last known collection was made by Charles Forbes in Kalihi Valley in 1909.

Material examined. **O‘AHU**: Kapolei, growing adjacent to abandoned railroad tracks in *Pithecellobium dulce–Cenchrus cilaris*-dominated scrub, dry, ca 15 m NW of FDR Ave, near intersection with Coral Sea Rd, ca 10 plants seen, 16 m, 21.194172, -158.328481, 11 Mar 2024, *M.C. Ross 1985.*

Erodium moschatum (L.) L’Hér. **New state record**

Erodium moschatum is native to the Mediterranean and has widely naturalized across the globe (POWO 2025). It is now naturalized both on Moloka‘i (where it was “rare”) and Maui, where plants were locally abundant (approximately dozens of plants were seen) on a disturbed roadside but not seen elsewhere in the neighborhood. Furthermore, the specimen referred to by Wagner *et al.* (1990) as “*Erodium* sp.” from Moloka‘i has been identified as *E. moschatum*. In California, this species is found in open, disturbed sites (Jepson Flora Project 2025). It differs from *E. cicutarium* by having glands on pits of the mericarp and less dissected leaves, while *E. cicutarium* lacks glands on pits of the mericarp and has more dissected leaves (Jepson Flora Project 2025).

Material examined. **MOLOKA‘I**: Kalama‘ulu Game Management Area, rare, 11 May 1992, *G.D. Hughes 40*. **MAUI**: Kula, corner of Ikea Dr and Old Kula Hwy, dry, disturbed weedy corner, roadside, 755 m, 20.790425, -156.325097, 11 Jun 2023, *F. Starr & K. Starr 230111-01.*

Gesneriaceae

Cyrtandra calpidicarpa (Rock) H.St.John & Storey × ***C. hawaiiensis*** C.B.Clarke. **New synonymy**

[= *Cyrtandra triens* H.St.John & Takeuchi]

Examination of the holotype of *Cyrtandra triens* by MKT suggests that it is a hybrid between *C. calpidicarpa* and *C. hawaiiensis.*

Cyrtandra calpidicarpa (Rock) H.St.John & Storey × ***C. propinqua*** C.N.Forbes. **New synonymy**

[= *Cyrtandra bishopii* H.St.John & Takeuchi]

[= *Cyrtandra triados* H.St.John & Takeuchi]

Examination of the holotypes of *Cyrtandra bishopii* and *C. triados* by MKT suggests that these are hybrids between *C. calpidicarpa* and *C. propinqua*.

Cyrtandra cordifolia Gaudich. × ***C. garnotiana*** Gaudich. **New synonymy**

[= *Cyrtandra pukeleensis* H.St.John & Takeuchi]

Examination of the holotype of *Cyrtandra pukeleensis* by MKT suggests that it is a hybrid between *C. cordifolia* and *C. garnotiana* Gaudich. It is also possible that the second parent is *C. grandiflora* instead of *C. garnotiana*.

Cyrtandra cordifolia Gaudich × ***C. grandiflora*** Gaudich. **New synonymy**

[= *Cyrtandra basirotundata* H.St.John & Takeuchi]

[= *Cyrtandra ovalis* H.St.John & Takeuchi]

[= *Cyrtandra rotundata* H.St.John & Takeuchi]

Examination of the holotype of *C. basirotundata, C. ovalis,* and *C. rotundata* by MKT suggests that these are hybrids between *C. cordifolia* and *C. grandiflora.* In the case of *C. ovalis,* it is also possible that the first parent is instead *C. macraei* instead of *C. cordifolia.* In the case of *C. rotundata*, it is also possible that the second parent is *C. garnotiana instead of C. grandiflora.*

Cyrtandra cordifolia Gaudich. × ***C. macraei*** A.Gray. **New synonymy**

[= *Cyrtandra wailupeensis* H.St.John & Takeuchi]

Examination of the holotype of *Cyrtandra wailupeensis* by MKT suggests that it is a hybrid between *C. cordifolia* and *C. macraei*. It is also possible that the second parent is *C. garnotiana* instead of *C. macraei*.

Cyrtandra garnotiana Gaudich. × ***C. propinqua*** C.N.Forbes. **New synonymy**

[= *Cyrtandra ovalifolia* H.St.John & Takeuchi]

Examination of the holotype of *Cyrtandra ovalifolia* by MKT suggests that it is a hybrid between *C. garnotiana and C. propinqua.*

Cyrtandra gracilis Hillebr. ex C.B.Clarke. × ***Cyrtandra paludosa*** Gaudich. **New synonymy**

[= *Cyrtandra piaensis* H.St.John & Takeuchi]

Examination of the holotype of *Cyrtandra piaensis* suggests that it is a hybrid between *C. gracilis* and *C. paludosa.* It is also possible that the first parent is *C. grandifolia* instead of *C. gracilis*.

Cyrtandra grandiflora Gaudich.
× ***C. laxiflora*** H.Mann. **New synonymy**
[= *Cyrtandra kamooaliiensis* H.St.John & Takeuchi]
[= *Cyrtandra kremnes* H.St.John & Takeuchi]
[= *Cyrtandra porosiflora* H.St.John & Takeuchi]
[= *Cyrtandra scapiflora* H.St.John & Takeuchi]
Examination of the holotypes of *Cyrtandra kamooaliiensis*, *C. porosiflora* and *C. scapiflora* by MKT suggests that these are hybrids between *C. grandiflora* and *C. laxiflora.* In the case of *C. kremnes*, it is also possible that the second parent is instead *C. garnotiana* instead of *C. laxiflora*.

Cyrtandra grandiflora Gaudich.
× ***C. sandwicensis*** (H.Lév.) H.St.John & Storey. **New synonymy**
[= *Cyrtandra tantalusensis* H.St.John & Takeuchi]
Examination of the holotype of *Cyrtandra tantalusensis* by MKT suggests that it is a hybrid between *Cyrtandra grandiflora* and *C. sandwicensis.*

Cyrtandra kalichii Wawra **New island record**; **extirpation**
Treated as an O‘ahu endemic by Wagner *et al*. (1990), two specimens of *Cyrtandra kalichii* were found in the BISH collection labeled as being from Moloka‘i. The Lydgate specimen is strange in that the locality is written on a scrap of lined paper rather than on the label, which is blank. It reads [in pencil] “Molokai, 1st exc. June 18 [no year] *Cyrtandra triflora* [and, in pen, different hand] *Cyrtandra kalichii* Wawra.” There are no other Lydgate specimens in the BISH database from Moloka‘i, which strongly suggests that Lydgate did not collect it. The Forbes specimen also bears an annotation by W.L. Wagner: “Island locality surely incorrect,” apparently based on the assumption that *C. kalichii* was an O‘ahu endemic. During the course of dredging the BISH database for new island records, no other cases of swapped Forbes labels were observed. Furthermore, there are 41 instances of species for which Forbes was the only observer on a particular island. While there has been doubt cast upon these records in the past, it seems most parsimonious to assume that this species was once on Moloka‘i but is now extirpated from there, as the odds of two separate collectors switching labels seems unlikely.

Material examined. **MOLOKA‘I**: 1st exc. Jun 18, *J.M. Lydgate s.n.* (BISH 702461); Mapulehu Valley, Jun 1912, *C.N. Forbes 308.Mo.*

Hydrangeaceae
Philadelphus karwinskyanus (Willd.) A.Gray **New island record**
Philadelphus karwinskyanus has previously been reported as naturalized on Kaua‘i and Maui (Imada 2019). It now also appears to be naturalizing at Waikoloa Stream on Hawai‘i, but it is unclear whether it is reproducing vegetatively or via seed.

Material examined. **HAWAI‘I**: Kamuela Town, Waikoloa Stream next to Waimea-Kawaihae Rd bridge, sparingly naturalized, 655 m, 20.01, -155.40, 23 Jul 2000, *D.R. Herbst 9876.*

Hydrocharitaceae
Elodea densa (Planch.) Casp. **Correction**
Elodea densa was published as naturalized on Moloka‘i by Wagner *et al.* (1990); however, no specimen has been found to substantiate its occurrence on the island.

Hymenophyllaceae

Crepidomanes draytonianum (Brack.) Ebihara & K.Iwats. **Correction**

Crepidomanes draytonianum was reported as occurring on all the main islands by Palmer (2003; as *Vandenboschia draytoniana*). However, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Hymenophyllum obtusum Hook. & Arn. **Correction**

Hymenophyllum obtusum was reported as occurring on Lānaʻi by Palmer (2003; as *Sphaerocionium obtusum*); however, no specimens or literature could be found to substantiate its occurrence on the island.

Hypoxidaceae

Curculigo capitulata (Lour.) Kuntze **New island record**

Curculigo capitulata was previously reported as naturalized on Kauaʻi (Imada 2019). A large population along ʻĀhuimanu Stream found during restoration work at the old Kahaluʻu loʻi complex now documents its naturalization on Oʻahu. Hundreds of plants were pulled out, but naturalized pockets along the stream bank and near houses remain extant. Hundreds of seedlings were seen germinating on concrete slabs, between buttress roots, and along stream banks. Evidently, some colonies of *C. capitulata* are more fertile or better pollinated than others, as another colony along the Judd Trail in Nuʻuanu was examined thoroughly and found to be entirely clonal, with no seedlings observed.

Material examined: **Oʻahu**: ʻĀhuimanu, within old loʻi complex near bridge along Hui Kelu St, 61 m, 21.431700, -157.838262, 27 Apr 2025, *M.K. Thomas 1047.*

Iridaceae **Nomenclatural note**; **new island record**

Neomarica candida (Hassl.) Sprague

Neomarica gracilis was published as an adventive on West Maui by Oppenheimer & Pezzillo (2024), and was also treated as occurring in cultivation in Hawaiʻi by Staples & Herbst (2005). This name, however, has been misapplied both in Hawaiʻi and worldwide to plants that are truly *N. candida* (Capallari 2000; Gil 2012). Keying out the Hawaiian plants places them all as *N. candida*; this species is further noted as cultivated in Hawaiʻi by Capallari (2000). The naturalized range of this species is also now expanded to Oʻahu. Besides the locality cited below, additional populations on Oʻahu have been observed by the authors on Tantalus.

Material examined. **Oʻahu**: Poamoho Stream, in limited locations along stream trail, 320 m, 18 Dec 2018, *T. Takahama s.n.* (BISH 775066).

Juncaceae

Juncus acuminatus Michx. **Corrections**

Juncus acuminatus was previously noted as naturalized on Oʻahu, Maui, and Hawaiʻi (Wagner *et al.* 1990; Frohlich & Lau 2020). All specimens from Oʻahu and Maui have now been redetermined as *J. prismatocarpus. Juncus acuminatus* now only occurs on Hawaiʻi Island.

Juncus ensifolius Wikstr. **Correction**

Juncus ensifolius was previously published as naturalized on Molokaʻi by Faccenda & Daehler (2024). The sole specimen has now been redetermined as *J. prismatocarpus.*

Juncus prismatocarpus R.Br.

subsp. ***prismatocarpus*** **New state record**

Juncus prismatocarpus is native to portions of East Asia through Australia, and naturalized in Great Britain and Mauritius (POWO 2025). This species was first noted as naturalized in Hawai‘i by Kirschner (2002). It is currently known from O‘ahu, Moloka‘i, Maui, and Hawai‘i, and is also apparently present on Kaua‘i, based on citizen science reports (https://www.inaturalist.org/observations/239841230). As this species is quite similar to *Juncus acuminatus* (and may grow side-by-side with it), a revised key to *Juncus* was prepared to aid in identification of this species.

Material examined. **O‘AHU**: Waimea Valley, Kamananui Stream, 21.629306, -158.041757, 03 Jun 2013, *A. Lau & D. Frohlich 2013060301*. **MOLOKA‘I**: Kamakou Preserve, 1,120 m, 21.117153, -156.912707, 28 Dec 2022, *K. Faccenda 2936*. **MAUI**: West Maui, Hana‘ula, S slope, along trail margin between pasture and forest, 1,220 m, 08 Mar 1988, *W.L. Wagner et al. 5859*; West Maui, Hana‘ula, 1,219 m, 24 May 1985, *R. Hobdy 2398*. **HAWAI‘I**: Hāmākua, Waimanu Valley, W side of valley, 45 m, 24 Sep 1988, *K.M. Nagata 3893*; North Kohala Distr, Hāwī, Parker Ranch, stock ponds near Kehena Reservoir, 731 m, 20.10 N, 155. 48 W, 08 Jun 1992, *A. Engilis Jr. & F.A. Reid 92-03*; Hawai‘i Volcanoes National Park, Hwy 11, 19.461981, -155.247976, 13 Aug 2022, *K. Faccenda 2663*.

KEY TO *JUNCUS* IN HAWAI‘I (ADAPTED FROM WAGNER *ET AL.* 1990)

1. Leaves bladeless; inflorescence appearing lateral on cylindrical stem
   2. Stems and leaf bases reddish brown to purple; pith solid; perianth equaling or longer than capsule ..... *J. effusus*
   2′. Stems and leaf bases dark brown; pith interrupted; perianth distinctly shorter than capsule ..... *J. polyanthemos*
1′. Leaves with well defined blades; inflorescence appearing terminal
   3. Flowers solitary or nearly so
      4. Annual; stems branched from base ..... *J. bufonius*
      4′. Perennial; stems unbranched from base ..... *J. tenuis*
   3′. Flowers clustered in glomules of >10
      5. Leaves only from basal rosette, red or purple-colored at base .... *J. planifolius*
      5′. At least some leaves cauline
         6. Branching equitant (leaves all in one plane), heads densely spherical, usually having >30 flowers; blades flattened ..... *J. ensifolius*
         6′. Branching not equitant, heads hemispheric, usually 10–20-flowered; blades flattened to round
            7. Septae of leaves complete, spanning entire width of leaf approximately every centimeter; leaves round or approximately so ..... *J. acuminatus*
            7′. Septae of leaves incomplete, uniformly distributed along length of leaf and not spanning entire leaf width; leaves flattened ..... *J. prismatocarpus*

Luzula hawaiiensis Buchenau

var. ***hawaiiensis*** **Correction**

Luzula hawaiiensis was noted as occurring on Lāna‘i by Wagner *et al.* (1990), but no specimens or citizen science records could be found to substantiate its occurrence on the island.

Lamiaceae

Coleus cylindraceus (Hochst. ex Benth.)
A.J.Paton **New island records**

Coleus cylindraceus was previously reported as naturalized on Hawai‘i Island (Imada 2019; as *C. montanus*). Now recent collections document the apparent naturalization of this species on O‘ahu and Maui. At Palehua, O‘ahu, *C. cylindraceus* was found in a fenced area a reasonable distance from the nearest garden, while at Pu‘u Māhoe, Maui, sprouting plants were collected possibly from discarded lawn trimmings.

Material examined. **O‘AHU**: Wai‘anae Mts, Palehua, 731 m, 21.23568, -158.61518, 14 Feb 2020, *M. Walker & L.S. Reynolds s.n.* (BISH 779152). **MAUI**: East Maui, Makawao, Pu‘u Māhoe, 725 m, 20.632722, -156.386359, 06 Mar 2015, *H. Oppenheimer H31503*.

Lamium amplexicaule L. **Correction**

Lamium amplexicaule was reported from Moloka‘i by Wysong *et al.* (2007), but the sole specimen (*Wood 10599 PTBG*) has since been reidentified as *Stachys arvensis*. It is no longer known from Moloka‘i.

Mesosphaerum suaveolens (L.) Kuntze **Correction**

Mesosphaerum suaveolens was published as naturalized on Lāna‘i by Oppenheimer & Pezzillo (2024); however, the specimen (*Oppenheimer et al. H112216*) was misidentified and is actually *M. pectinatum*. No other records of *M. suaveolens* are known from Lāna‘i.

Stenogyne angustifolia A.Gray **Correction**

Wagner *et al.* (1990) followed Hillebrand (1888) in reporting the presence of *Stenogyne angustifolia* on Moloka‘i. This record seems dubious, as Hillebrand described these as the “γ” variety, noting several differences from other islands and stating that it was found at Kalaupapa. As Wagner *et al.* (1990) noted that *S. angustifolia* occurs in subalpine habitats, a record from such a lowland area is highly suspicious. Hillebrand’s γ variety likely represents an extinct, undescribed species or a case of switched labels.

Lauraceae

Cinnamomum camphora (L.) J.Presl **Correction**

Cinnamomum camphora (camphor) was noted as occurring on Lāna‘i by Wagner *et al.* (1990), but no specimens or citizen science records have been found to substantiate its naturalization on the island.

Cinnamomum verum J.Presl **Corrections**

Cinnamomum verum was published as “cultivated and naturalized on Kaua‘i, O‘ahu, and Maui” by Wagner *et al.* (1990: 846), but no specimens or citizen science records could be found to substantiate its naturalization on the last two islands so it is best treated as only naturalized on Kaua‘i.

Figure 8. *Micranthemum glomeratum.* **A**, habit with dumped aquarium. **B**, closeup of plant.

Linderniaceae

Micranthemum glomeratum (Chapm.) Shinners **New naturalization**

Micranthemum glomeratum is endemic to Florida and has now become naturalized on Oʻahu in Nuʻuanu, at a dam at the Judd Trail trailhead, where a colony consisting of many unconnected colonies covered over 4 m^2. The majority of plants were found growing on the dam surface or spillway, where a thin film of water overflows down the dam. The DLNR Division of Aquatic Resources surveyed and found more unconnected populations downstream. The upstream section has not yet been surveyed. It is unclear whether this species is principally reproducing via fragmentation or by seed. This population was first detected by iNaturalist user Jon Ehrenberg (https://www.inaturalist.org/observations/164572314) and is further testament to the use of iNaturalist for early detection of new naturalizations.

This is the first report of *Micranthemum glomeratum* being naturalized anywhere in the world. While this species has not formally been recorded in cultivation in Hawaiʻi, we assume that this species was imported for use as an aquarium plant, as the related species *M. umbrosum* (J.F.Gmel.) S.F.Blake was observed for sale at PetCo in Honolulu in 2023. Furthermore, at the site of the naturalized *M. glomeratum*, both a dumped aquarium and hamster cage were observed submerged off of the dam. This species is similar to *Pilea microphylla* in habit and habitat, but differs in having opposite leaves, whereas *Pilea microphylla* has alternate leaves (Figure 8).

Material examined. **OʻAHU**: Nuʻuanu, in thin layer of running water at top of spillway near Judd Trail, colony covers approximately 2 m^2 as several unconnected colonies, 221 m, 21.347076, -157.821199, 08 Jun 2023, *K. Faccenda & M. Ross 3114.*

Torenia crustacea (L.) Cham. & Schltdl. **Correction**

Torenia crustacea was published as naturalized on Oʻahu by Wagner *et al.* (1990), citing *Hosaka 1321*, but that specimen is actually *Stellaria media*. No other specimens of *T. crustacea* from Oʻahu are known.

Lindsaeaceae

Lindsaea repens var. ***macraeana*** Hook. & Arn.) C.Chr. **Correction**

Lindsaea repens var. *macraeana* was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Lycopodiaceae

Huperzia erosa Beitel & W.H.Wagner **Correction**

Huperzia erosa was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Huperzia erubescens (Brack.) Holub **Taxonomic note**

Huperzia erubescens (Brack.) Holub and *H. somae* (Hayata) Ching are currently listed as separate taxa, according to Plants of the World Online (POWO 2025). No obvious differences could be found to separate the two when comparing descriptions and specimens; thus, they are viewed here as conspecific. Since *Huperzia erubescens* [as *Lycopodium erubescens* Brack. in U.S. Expl. Exped., Filic. 16: 320. 1854] has priority, *H. somae* [as *Lycopodium somae* Hayata, Icon. Pl. Formosan. 5: 255 (f.91). 1915] is treated here as a heterotypic synonym.

*"**Huperzia** × **erubescens*** W.H.Wagner" **Taxonomic note**

In 1854, *Lycopodium erubescens* Brack. was described from a collection made on Haleakalā, Maui during the U.S. Exploring Expedition of 1838–1842. Holub (1985) transferred the species to *Huperzia*, making the combination *Huperzia erubescens* (Brack.) Holub. Subsequently, W.H. Wagner *et al.* (1999) interpreted the type of *H. erubescens* as a hybrid between *H. haleakalae* (Brack.) Holub and *H. somae* (= *H. erubescens* (Brack.) Holub, sensu Palmer 2003). This taxonomic treatment by W. H. Wagner *et al.* (1999) was erroneously interpreted as publishing the name "*Huperzia* × *erubescens* W.H.Wagner" by Palmer (2003), who then included the name in his flora. This name is not validly published (Turland *et al*. 2018: Art 50.1) and must be abandoned from any future floras. Furthermore, the isotype of *Lycopodium erubescens* Brack. at BISH was examined by the late pteridologist Daniel Palmer in 1991, who had reviewed the spores and concluded that the plant was not a hybrid, making the hybrid combination "*Huperzia* × *erubescens*" doubly unnecessary.

Huperzia haleakalae (Brack.) Holub **Correction**

Huperzia haleakalae was collected during the U.S. Exploring Expedition, under the command of Captain James Wilkes, in the 1840s. William Brackenridge and other botanists were sent to collect specimens on Maui, where they climbed Haleakalā. Immediately afterward, they returned to Honolulu on a smaller vessel to meet up with the main ship, which continued on to the island of Hawaiʻi for collecting on Mauna Kea and Mauna Loa. After leaving Hawaiʻi, Wilkes and his crew set off immediately for British Columbia. The problem is that *H. haleakalae* has only been attributed to the Hawaiian Islands by one specimen—the type specimen—and has never since been collected there. This sole col-

lection was distributed to two herbaria: the holotype at the U.S. National Herbarium (US) and the cotype at the Bishop Museum in Honolulu (BISH). In British Columbia, *H. haleakalae* had been abundantly collected and is still found there today. In Hawai‘i, though, despite the efforts of many competent field botanists, the species has evaded recollection. It is likely that a mixup of the Hawaiian and West Coast (British Columbia, Washington, etc.) collections occurred somewhere along the line. The preponderance of evidence suggests that *H. haleakalae* has never been collected in Hawai‘i and does not belong in any future Hawaiian flora.

Huperzia* × *carlquistii Beitel & W.H.Wagner **New synonymy**
[= *Huperzia* × *medeirosii* Beitel & W.H.Wagner]
Formerly considered a hybrid between *Huperzia haleakalae* and *H. subintegra* (Palmer 2003), after careful review of literature and specimens, *H.* × *medeirosii* is now considered to be conspecific with *H.* × *carlquistii* (*H. erubescens* × *H. subintegra* (Hillebr.) Beitel & W.H.Wagner).

Huperzia serrata (Thunb. ex Murray) Trevis. **New island record**
Huperzia serrata was previously known from Kaua‘i, O‘ahu, Moloka‘i, Lāna‘i, and Hawai‘i (Palmer 2003). Collections made of this species on Pu‘u Kukui now document its presence on Maui.

Material examined. **MAUI**: West Maui, Pu‘u Kukui, 24–25 Jul 1938, *L.M. Cranwell et al. 2649.*

Phlegmariurus filiformis (Sw.) W.H.Wagner **Correction**
Phlegmariurus filiformis was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lāna‘i.

Malvaceae
Abutilon incanum (Link) Sweet **New island record**
Abutilon incanum was previously known from all of the main islands except Hawai‘i (Wagner *et al.* 1990). It has now been recorded from Hawai‘i Island.

Material examined. **HAWAI‘I**: Waimea, Kawaihae Rd corridor, segment 1, 31 Dec 1980, *P.H. McEldowney s.n.* (BISH 794028); Ka‘awaloa, 19.28, -155.56, 04 October 1984, *W. Souza s.n.* (BISH 770316).

Abutilon menziesii Seem. **Note**
Abutilon menziesii (ko‘oloa ‘ula) was recorded as present on Lāna‘i, Moloka‘i, and Hawai‘i (Wagner *et al.* 1999). Its status on O‘ahu has been uncertain, as when it was first discovered on O‘ahu, the populations were considered to represent escapes from cultivation (Herbarium Pacificum Staff 1999). They are now accepted as naturally occurring wild populations and managed as a federally listed endangered species (USFWS 2011). Since it was first observed on O‘ahu, ko‘oloa ‘ula has been documented from several sites on the ‘Ewa Plain and Lualualei. The remaining wild populations on O‘ahu include a total of 65 mature individual plants, so are smaller than those on Lāna‘i, where there are estimated to be 500, and Maui with fewer than 200 individual mature plants. On O‘ahu, conservation efforts by the Hawai‘i Division of Forestry and Wildlife are underway to protect wild populations from threats and secure propagules *ex situ*.

Material examined. **O‘AHU**: ‘Ewa, mauka of Varona Village, east of Kalo‘i Gulch, 23 m, 27 Sep 1996, *K.M. Nagata 4433*; Lualualei, Hālona, Navy facility, 61 m, 27 Jul 2023, *S. Ching et al. 20230727-01*.

Gossypium tomentosum Nutt **New island record**; **extirpations**

Gossypium tomentosum (ma‘o) was listed as occurring “on all the main islands except Hawai‘i” by Wagner *et al*. (1990: 867). It was last seen on Kaua‘i in 1870 (Wawra 1873) and is now extirpated. Furthermore, a specimen collected by David Nelson on Cook’s 3rd voyage suggests this species was formerly found on Hawai’i island and that it was last seen on Hawai‘i in 1779 (St. John 1978) and is also considered extirpated.

Hibiscus brackenridgei A.Gray
subsp. ***brackenridgei*** **New island record**; **extirpation**

Hibiscus brackenridgei subsp. *brackenridgei* was historically known from Kaho‘olawe but has not been seen since the 1850s, and is now surely extirpated.

Material examined. **KAHO‘OLAWE**: 1851–1855, *M.J. Remy 559* (P 06587810). https://mediaphoto.mnhn.fr/media/1441389813906mRCPm8hYTzoE9cud

Hibiscus tiliaceus L. **Correction**

Wagner *et al*. (1990) reported hau as naturalized on French Frigate Shoals. However, this plant was intentionally planted on the island, with no evidence of naturalization, and all plants were furthermore destroyed by 1942 (Amerson 1971).

Hibiscus trionum L. **Questionable naturalization**

Commonly known as the flower-of-an-hour or bladder hibiscus, *Hibiscus trionum* was observed growing on O‘ahu in an overgrown lot along Kalākaua Avenue in Waikīkī, just north of Fort DeRussy and across from the David Kalākaua statue. Only a single plant was noted. Given that *H. trionum* is a highly invasive weed (Swearingen 2005), and considering the location in a busy tourist area, it seems plausible that a seed may have adhered to a tourist’s shoe and been dislodged while visiting. This species is an annual or biennial herb native to regions spanning from central and eastern Europe to the Mediterranean and western Himalayas (POWO 2025). However, it has been introduced into many parts of the world, including the U.S., Canada, New Zealand, China, Taiwan, Chile, Uruguay, and southern Europe, where it has become a widespread weed (POWO 2025).

Material examined. **O‘AHU**: Waikīkī, Kalākaua Ave, growing near sidewalk in weedy, unkempt lot adjacent to Fort DeRussy Park, only 1 plant observed, 3 m, 21.170101, -157.495415, 03 Feb 2024, *M.C. Ross 1971*.

Malachra alceifolia Jacq. **Correction**

Wagner *et al*. (1990: 891) reported *Malachra alceifolia* as “naturalized in disturbed places at low elevations on Kaua‘i, O‘ahu, and Maui.” However, no evidence could be found to substantiate the occurrence of this species on Maui.

Sida planicaulis Cav. **Correction**

Sida planicaulis was formerly treated as the synonym *S. acuta* subsp. *carpinifolia* in Hawai‘i (Fryxell & Hill 2015). Wagner *et al*. (1990: 897; as *Sida acuta* subsp. *carpinifolia*) reported this species as “naturalized in open and shaded sites, from near sea level up

to ca. 790 m, on Kauaʻi, Oʻahu, Maui, and Hawaiʻi." However, we could find no specimens or citizen science records to support its naturalization on Maui.

Sida spinosa L. **New island record**

Sida spinosa was previously recorded as naturalized on Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Imada 2019). Collections made of this species below Lua Makika now document its naturalization on Kahoʻolawe.

Material examined. **KAHOʻOLAWE**: Below Lua Makika, 21 Feb 1988, *W.L. Wagner et al. 5776* (PTBG).

Sidastrum paniculatum (L.) Fryxell **Correction**

Sidastrum paniculatum was reported as naturalized on Lānaʻi by Oppenheimer (2011). This determination was erroneous, as the specimen (*Oppenheimer H30917*) actually represents *Sidastrum micranthum*.

Molluginaceae

Mollugo verticillata L. **New island record**

Mollugo verticillata has previously been reported as naturalized on Oʻahu, Molokaʻi, Lānaʻi, and Hawaiʻi (Imada 2019; Faccenda & Strong 2024). It is now known from East Maui, where a few scattered plants were observed. Given the behavior of this species on other islands, it is expected that larger populations exist but were unobserved, or they will soon form larger populations.

Material examined. **MAUI**: Kīhei, Kūlanihākoʻi Gulch, dry pasture, wash area, 61 m, 20.769223, -156.434362, 25 Apr 2024, *F. Starr & K. Starr 250424-01*.

Moraceae

Ficus obliqua G.Forst. **New naturalization**

Ficus obliqua is native from Maluku to the southwestern Pacific (POWO 2025), has been cultivated in Hawaiʻi since at least 1938 (*Judd s.n*., BISH 464471), and planted as a forestry tree. Collections made of this species in a gully off the ʻAiea Loop Trail document the naturalization of this species on Oʻahu. The plant was found on a steep cliff and this habit and was of smaller size than would be expected for a forestry planting. Another plant was found as an epiphyte on a dead ʻŌhiʻa lehua in Nuʻuanu. This is apparently the first reported naturalization of *F. obliqua* in the world (POWO 2025).

Material examined. **OʻAHU**: Central Koʻolau Mts, ʻAiea Loop Trail, 365 m, 21.403046, -157.890824, 15 Aug 2023, *M.K. Thomas & R. Chang 597*. Side ridge in Nuʻuanu valley off Judd trail. ~465 m from trail head, full sun wet uluhe forest on slope, epiphytic on dead ʻŌhiʻa, 21.344931, -157.8172, 04 Mar 2025, *K. Arthur 91*.

Ficus religiosa L. **New island record**

Ficus religiosa was reported as naturalized on Oʻahu, Maui, and Hawaiʻi (Imada 2019; Frohlich & Lau 2020). Collections made of this species on Wailapa Road now document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Kawaihau, Kīlauea, Wailapa Rd to Kāhili Beach, 65 m, 22.212118, -159.384312, 03 Jun 2016, *K. Brock 846* (PTBG).

Ficus rubiginosa Desf. ex Vent. **New island record**

Ficus rubiginosa is now naturalized on Oʻahu, where it has escaped from forestry plantings. In addition to the 1977 collection below, many plants have been observed naturalizing during recent surveys but were not collected, as we had never realized that this was a not documented as naturalized.

Material examined. **OʻAHU**: Hālawa Trail, 1/3 mile E of quarry, 18 Dec 1977, *F.G. Howarth & O. Bussen s.n.* (BISH 420033).

Myrtaceae

Eucalyptus paniculata Sm. **New island record**

Eucalyptus paniculata was previously recorded as naturalized on Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Imada 2019). Collections made of this species east of Mānele Road now document its naturalization on Lānaʻi.

Material examined. **LĀNAʻI**: Southern Lānaʻi, E of Mānele Rd, along former plantation road, 521 m, 20.778910, -156.874431, 23 Jun 2023, *K. Faccenda & J. Sprague 3208.*

Metrosideros polymorpha Gaudich.
var. ***incana*** (H.Lév.) H.St.John **New island record**

Metrosideros polymorpha var. *incana* was treated as native to Oʻahu, Molokaʻi, Lānaʻi, Maui, and Hawaiʻi (Wagner *et al.* 1990). Numerous collections were made from across Kauaʻi and determined to be var. *incana* by the authors of the *Manual,* but the Kauaʻi specimens were apparently inadvertently excluded in their publication.

Material examined. **KAUAʻI**: Halemanu, 14–26 Feb 1909, *J.F. Rock s.n.* (BISH 443940); Kahōluamanu, Oct 1916, *J.F. Rock s.n.* (BISH 449932); Waimea, Nā Pali-Kona Forest Reserve, Kumuwela Rd, near gate 5, 1,127 m, 23 Aug 1953, *A.K. Chock 1016*; Waimea, Nā Pali–Kona Forest Reserve, Kumuwela Rd, 1,127 m, 10 Aug 1953, *A.K. Chock 893.*

Metrosideros polymorpha Gaudich.
var. ***pumila*** (A.Heller) J.Wyndham Dawson
& Stemmermann **New island record**

Metrosideros polymorpha var. *pumila* was treated as native to Kauaʻi, Oʻahu, Molokaʻi, and Maui (Wagner *et al.* 1990). Collections made of this species in the Puʻu o ʻUmi Natural Area Reserve now extend its native range to include Hawaiʻi Island.

Material examined. **HAWAIʻI**: Kohala, Puʻu o ʻUmi Natural Area Reserve, 1,335 m, 20.052066, -155.41332, 28 Jun 2005, *M.E. Wright & T.A. Ranker s.n.* (BISH 718062).

Nephrolepidaceae

Nephrolepis falcata (Cav.) C.Chr. ‘**Furcans**’ **Corrections**

Nephrolepis falcata was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its naturalization on Lānaʻi or Hawaiʻi.

Nyctaginaceae

Boerhavia acutifolia (Choisy) J.W.Moore **Correction**

Boerhavia acutifolia was reported on Pearl & Hermes Atoll by Staples *et al*. (2003; as *B. glabrata*); however, the specimen at BISH (*Conant 142*) has since been redetermined as *B. repens.*

Boerhavia diffusa L. **Nomenclatural note**; **new island record**

The name *Boerhavia coccinea* has long been misapplied to plants in Hawai‘i belonging to the species *B. diffusa.* The key in Wagner *et al.* (1990) mistakenly lists *B. coccinea* as having leaves restricted to the basal half of the plant; however, in true *B. coccinea* the leaves are well distributed throughout the plant, and the inflorescences are both axillary and terminal (Spellenberg 2004). In *B. diffusa* the leaves are restricted to the basal half of the plant and the inflorescences are almost always terminal, as seen in the Hawaiian material. *Boerhavia coccinea* should therefore no longer be considered present in Hawai‘i. *Boerhavia diffusa* is now also known to be naturalized on Lisianski.

Material examined. **LISIANSKI**: West coast, central, 2 m, 08 Aug 1983, *S. Conant 189.*

Boerhavia herbstii Fosberg **New island record**; **corrections**

Boerhavia herbstii was reported in Wagner *et al*. (1990) from Pearl & Hermes, Lisianski, O‘ahu, Lāna‘i, Maui, Kaho‘olawe, and Hawai‘i. It is now known from Moloka‘i, where it was last seen in 1916. However, no specimens have been found to substantiate any record from Pearl & Hermes, and the voucher from Lisianski (*Conant 189*) appears to more closely match *B. diffusa*, making *B. herbstii* no longer known from any of the Northwestern Hawaiian Islands.

Material examined. **MOLOKA‘I**: Central Moloka‘i, stony gulch near ranch house, 13 Oct 1916, *A.S. Hitchcock 15147* (US).

Nymphaeaceae

Nymphaea nouchali Burm.f.

var. ***caerulea*** (Savigny) Verdc. **New island record**

Nymphaea nouchali var. *caerulea* has been reported as naturalized on Hawai‘i Island (Imada 2019; as *N. caerulea*). Collection made of this species in Olowalu now document its naturalization on Maui. It was found growing in a drainage channel where the population extends over 100 m. A resident reported that the infestation started as just a couple of plants.

Material examined. **MAUI**: West Maui, Lāhainā, Olowalu, stagnant drainage S of Luawai St, 6 m, 20.5829, -156.4041, 22 Jun 2024, *H.L. Oppenheimer H62401.*

Ochnaceae

Ochna serrulata (Hochst.) Walp. **New island record**

Ochna serrulata was previously recorded as naturalized on O‘ahu and Hawai‘i (Imada 2019). Collection made from the Kula Agricultural Station further document its naturalization on Maui. The area has a few cultivated plants as well as a few naturalized plants that are beginning to escape from the site.

Material examined. **MAUI**: Kula Agricultural Station, 945 m, 20.45 N 156.19 W, 15 Aug 2002, *F. Starr & K. Starr 020815-4.*

Ochna thomasiana Engl. & Gilg **New island record**

Ochna thomasiana was previously recorded as naturalized on Kaua‘i, O‘ahu, Lāna‘i, and Maui (Imada 2019). Collection made of this species east of the Kainalu Stream now document its naturalization on Moloka‘i.

Material examined. **MOLOKA‘I**: Kainalu Stream, E side of stream, near archeological site, 25 m, 21.091737, -156.776110, 05 Jun 2009, *H. Oppenheimer et al. H60912.*

Oleaceae

Noronhia emarginata (Lam.) Poir. **Confirmation of naturalization**

Daehler & Baker (2006) previously noted *Noronhia emarginata* as adventive on O‘ahu at Lyon Arboretum. We have now found further populations and confirm the naturalization of this species on O‘ahu. In addition to the population at Pūpūkea below, another was observed but uncollected at Kahana Valley, where many seedlings were observed.

Material examined. **O‘AHU**: Gated road above Pūpūkea, not far from trailhead, naturalizing in moist, invasive-dominated forest, forming a rather small but dense stand with hundreds of individuals seen, patch ca 15 m wide, 265 m, 21.640827, -158.023248, 02 Sep 2023, *K. Faccenda & K. Austin 3228.*

Onagraceae

Epilobium billardiereanum Ser.
subsp. ***cinereum*** (A.Rich.) P.H.Raven
& Engelhorn **New island record**; **correction**

Epilobium billardiereanum subsp. *cinereum* was previously recorded as naturalized on Kaua‘i, O‘ahu, Moloka‘i, Maui, and Hawai‘i (Imada 2019). Collection of this species made from the summit ridge along the Munro Trail document its naturalization on Lāna‘i. The Moloka‘i record published by Oppenheimer (2016) has since been redetermined as *Epilobium ciliatum* subsp. *ciliatum* and is no longer known from the island.

Material examined. **LĀNA‘I**: Summit ridge along Munro Trail, between Ha‘alelepa‘akai and summit of Lāna‘ihale, 1,000 m, 20.809971, -156.870919, 01 Dec 2022, *H. Oppenheimer et al. H122201.*

Epilobium ciliatum Raf. subsp. ***ciliatum*** **New island record**

Epilobium ciliatum subsp. *ciliatum* was previously recorded as naturalized on Maui and Hawai‘i (Imada 2019), and has now been found on Moloka‘i at scattered locations, where it was clearly naturalized.

Material examined. **MOLOKA‘I**: Pua‘ahala ahupua‘a, upper drainage of Kua Gulch, west of Kalapamoa Ridge, *Metrosideros* montane forest, single mature plant with many seedlings, all pulled, 1180 m, 19 May 2015, *H. Oppenheimer & R. Kallstrom H51516*; Wailau Valley, tributary of Pūlena Stream on S side, along perennial stream, 380 m, 14 Jul 2015, *H. Oppenheimer H71515.*

Ophioglossaceae

Ophioderma pendula (L.) C.Presl
subsp. ***falcata*** (C.Presl) R.T.Clausen **Correction**

Ophioderma pendula subsp. *falcata* was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lāna‘i.

Orchidaceae

Cymbidium dayanum Rchb.f **New island record**

Cymbidium dayanum was previously recorded as naturalized on Hawai‘i Island (Imada 2019). A Collection made near the Peacock Flats campsite along the Mokulē‘ia Trail now document its naturalization on O‘ahu.

Material examined. **O‘AHU**: Mokulē‘ia Trail, along road ca 2 km from Peacock Flats campsite, epiphyte on a ~2 inch diam. stick which had fallen from the canopy, only 1 plant seen but area not thoroughly searched, 698 m, 21.538297, -158.183917, 21 Apr 2024, *K. Faccenda 3382.*

Dendrobium discolor Lindl. **New naturalization**

Although not mentioned in Staples & Herbst (2005) nor in the BISH database as occurring in cultivation, *Dendrobium discolor* has most likely escaped from cultivation. The collection of this species, growing on a ridge crest dominated by native species on Mau‘umae Trail, is evidence of it naturalization on O‘ahu. The native range of *D. discolor* is Sulawesi to Queensland (POWO 2025).

Material examined. **O‘AHU**: Ko‘olau Mts, Mau‘umae Ridge, 0.5 miles from trailhead on native-dominated ridge crest, 121 m, 21.304275, -157.779395, 29 Jan 2017, *D. Polhemus & H. Polhemus s.n.* (BISH 76711, 76712); Mau’umae ridge, open, wind and sun exposed east side of ridge, from soil, at least three flowering individuals observed, many more sterile plants found which may represent a mixed population, 321m, 21.29977, -157.783449, 04 Jun 2025, *K. Arthur & K. Faccenda 114*.

Dendrobium lineale Rolfe **Questionable naturalization**

Although not mentioned in Staples & Herbst (2005) nor in the BISH database as occurring in cultivation, *Dendrobium lineale* has also surely escaped from cultivation. A collection made in the Ko‘olau Mountains on the ridge between North and South Hālawa Valleys gives evidence of its possible naturalization on O‘ahu. More collections will be needed to confirm. *Dendrobium lineale* is native to New Guinea (POWO 2025),

Material examined. **O‘AHU**: Ko‘olau Mts, ridge between North and South Hālawa Valleys, 122 m, 05 Jun 2016, *K. Kawelo s.n.* (BISH 767708, 767709).

Epidendrum* × *obrienianum Rolfe **Correction**

Epidendrum × *obrienianum* was noted as naturalized on Kaua‘i, O‘ahu, Lāna‘i, Maui, and Hawai‘i by Wagner *et al.* (1990); however, no specimens or citizen science records could be found to substantiate its naturalization on the Lānai.

Epidendrum radicans Pav. ex Lindl. **New naturalization**

Epidendrum radicans was introduced into Hawai‘i for ornamental usage (Staples & Herbst 2005). A collection made in Kanaele Bog document its naturalization on Kaua‘i. This species has a creeping habit and covered 10 m^2 in a sunny open area on the south edge of the bog growing amongst native species. *Epidendrum radicans* differs from the much more commonly naturalized *E.* × *obrienianum* by having resupinate flowers (labellum pointing downwards), as opposed to the non-resupinate flowers (labellum pointing upwards) of *E.* × *obrienianum.* The native range of *Epidendrum radicans* spans from Mexico to Colombia, and it is also reported as naturalized in Cuba and Puerto Rico (POWO 2025). In its native range it is a common species growing in habitats ranging from dry hillsides to floating debris on ponds (Williams 1951).

Material examined. **KAUA‘I**: Kanaele Bog (Wahiawa Swamp), growing in sunny open bog with ‘ōhi‘a, pūkiawe, and uluhe, 645 m, 12 Sep 2023, *K. Faccenda et al. 3230*; Wahiawa Bog, 640 m, 22 Dec 1983, *W.L. Wagner et al. 5203.*

Vanda merrillii Ames & Quisumb. **Questionable naturalization**

Vanda merrillii is an epiphytic orchid native to the Philippines (POWO 2025). A collection of this horticultural escape made on the east flank of Honolua peak give evidence of its potential naturalization on Maui. Further collection will be needed to confirm its naturalization. It can be distinguished from *Vanda tricolor*, the other naturalized member of this genus, by its more uniformly reddish flower color and the presence of 4 dark red-purple stripes at the base of the labellum.

Material examined. **MAUI**: West Maui, Lāhainā Distr, E flank of Honolua peak, 616 m, 20.5748, -156.365, 30 Nov 2004 [material collected 27 Oct 2004], *H. Oppenheimer & G. Hansen H110413.*

Zeuxine strateumatica (L.) Schltr. **New island record**

Zeuxine strateumatica was previously documented as being naturalized on Maui (Imada 2019). The collection of this species on Oʻahu as a volunteer in a residential lawn on Kawaihae Street in Maunalua and at the University of Hawaiʻi campus in Mānoa document this orchid's naturalization on the island. The plant found at the University of Hawaiʻi was initially posted on iNaturalist (https://www.inaturalist.org/observations/154891189).

Material examined. **OʻAHU**: Maunalua, Kawaihae St, in a resident's grass lawn, 21.1728, -157.4254, 14 Mar 2021, *M. LeGrande 2021.01*; University of Hawaiʻi at Mānoa, near Varney Circle, weed in flower bed, 1 plant seen, 25 m, 21.299944, -157.817948, 01 Apr 2023, *Jacob White s.n.* (BISH 788024).

Zygopetalum maculatum (Kunth) Garay
subsp. ***maculatum*** **Questionable naturalization**

Zygopetalum maculatum subsp. *maculatum* is native to South America and not known to be naturalized in other parts of the world (POWO 2025). Collection made of this species on Kaʻala Road give evidence of its potential naturalization on Oʻahu. Further collection will be needed to confirm. This species was surely imported for horticultural purposes, but it is not recorded in the Museum's database, nor in Staples & Herbst (2005).

Material examined. **OʻAHU**: Waiʻanae Mts, Kaʻala Rd, 670 m, 25 Oct 2021, *W.T. Russell III et al. USARMY 561.*

Oxalidaceae

Oxalis dehradunensis Raizada **Questionable new naturalization**

Oxalis dehradunensis, native to the Caribbean, has been previously documented as naturalized across many southern states of the U.S. and parts of Mexico (POWO 2025). It is now spreading on Maui along a roadside. The colony was observed in 2008 as a single plant, but over the course of three years it has spread to a 2 m^2 patch, likely via rhizomes. Nesom (2016) notes that this species rarely makes seed in the continental U.S., but it is unclear if this would also be the case in Hawaiʻi, which is much more tropical and climatically similar to its native range. It is likely that this is a horticultural escape, as several tropical *Oxalis* are sold in the foliage trade as "shamrock" (Staples & Herbst 2005), although there are no prior records of this species in Hawaiʻi.

This species is similar to *Oxalis debilis* Kunth var. *corymbosa* (DC.) Lourteig but differs by its much more widely triangular leaflets with acute lobes, compared to the more cordate leaflets with round lobes of *O. debilis* var. *corymbosa*. Nearly all literature referring to this species uses the name *O. intermedia* A.Rich., an illegitimate name (POWO 2025).

Material examined. **MAUI**: Makawao, Hoene St, herb growing along roadside, slowly growing vegetatively, 20.845838, -156.327238, 23 Dec 2011, *H. Oppenheimer & F. Duvall H121101.*

Passifloraceae

Passiflora caerulea L. **New state record**

Passiflora caerulea is native to Bolivia, North Argentina, and Brazil. It has been previously documented as naturalized across parts of North America, Europe, Africa, and Asia (POWO 2025). A collection made in Olinda documents its naturalization on Maui. On Piʻiholo Road this species climbed a few hundred meters along the road into *Eucalyptus*, as it made its way into the forest. While *P. caerulea* has been used as a misapplied name in the past in Hawaiʻi (Staples & Herbst 2005), these specimens from Maui match the pure species rather than the hybrid.

Material examined. **MAUI**: East Maui, Olinda, Piʻiholo Rd, 914 m, 14 Jun 2009, *R.W. Hobdy 4312*; Piʻiholo, Aloha o ka ʻĀina, vine climbing on *Eucalyptus*, 06 Jun 1998, *F. Starr & K. Martz FSKM980406-24.*

Passiflora* × *violacea Loiseleur-Deslongchamps **Correction**

Passiflora × *violacea* is no longer known from Maui, as the specimens have been redetermined as *P. caerulea*.

Piperaceae

Peperomia cookiana C.DC. **New synonymy**

[= *Peperomia epihippii* H.St.John]

Examination of the holotype of *Peperomia epihippii* by MKT suggests that this name is best treated as a synonym of *P. cookiana*.

Peperomia eekana C.DC. **New synonymy**

[= *Peperomia woolfordii* H.St.John]

Examination of the holotype of *Peperomia woolfordii* by MKT suggests that this name is best treated as a synonym of *P. eekana.*

Peperomia kipahuluensis H.St.John & Lamoureux. **New synonymy**

[= *Peperomia hanaensis* H.St.John]

[= *Peperomia muscorum* H.St.John]

Examination of the holotype of *Peperomia hanaensis and P. muscorum* by MKT suggests that these names are best treated as synonyms of *P. kipahuluensis.*

Peperomia ligustrina Hillebr. **New island record**

Peperomia ligustrina was previously known from Molokaʻi, Maui, and Hawaiʻi (Wagner *et al.* 1990). It has now been found on Oʻahu growing as an epiphyte at Poamoho.

Material examined: **Oʻahu**: Poamoho Stream bed, 25 Jan 2021, *T. Chambers USARMY 558.*

Peperomia sandwicensis Miq. **New island record**

Peperomia sandwicensis had previously been reported on Maui by Yuncker (1933), who cited two Hillebrand specimens (Kaʻanapali and West Maui), both of which are presumably destroyed. Their assumed destruction is possibly why Wagner *et al*. (1990) recorded

it as occurring on only Kauaʻi, Oʻahu, and Molokaʻi. However, a recent collection made after publication of the *Manual* suggests that this species is still present on West Maui.

Material examined. **MAUI**: Kahakuloa, Waikalai Ridge Rd, on large boulders in gulch bottom, 366 m, 02 Dec 1993, *R.W. Hobdy 3627.*

Pittosporaceae

Pittosporum glabrum Hook. & Arn. **New island record**; **new synonym**

[= *Pittosporum molokaiense* H.St.John]

Pittosporum glabrum was recorded as naturally occurring on Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, and Maui (Wagner *et al.* 1990). Collections made in North Kohala now document that this species also naturally occurs on Hawaiʻi. Furthermore, the holotype of *P. molokaiense* H.St.John was examined by MKT and it falls within the variation of *P. glabrum.*

Material examined. **HAWAIʻI**: North Kohala, Kehena Ditch Trail, stream bank, 1,158 m, NAD 83 Zone 5, 22 Nov 2022, *J. VanDeMark et al. 58*; North Kohala, Puʻukapu, ʻŌpaeloa Stream, 1341 m, NAD 83 Zone 5: X: 215877 Y: 2225142, 29 Jan 2020, *J. VanDeMark & Z. Judd 36.*

Plantaginaceae

Plantago asiatica L. var. ***asiatica*** **New state record**

Plantago asiatica var. *asiatica* has previously been reported as naturalized in Hawaiʻi (Shipunov *et al.* 2021), but this publication eluded the staff of Herbarium Pacificum until recently. A subsequent critical examination of the herbarium holdings found *P. asiatica* on Kauaʻi, Oʻahu, Lānaʻi, Maui, and Hawaiʻi. It also appears to be more common across the modern landscape than *P. major*, and the ratio of *P. asiatica* to *P. major* has been increasing over time in the herbarium records. *Plantago asiatica* differs from *P. major* by having pedicellate flowers (short pedicel above the bract) and ellipsoid fruits that dehisce below the middle, whereas *P. major* has sessile flowers and approximately spheroid fruits that dehisce at approximately the middle. As there are many specimens of this species and it is common across the modern landscape, only the first record from each island is cited below.

Material examined. **KAUAʻI**: Hanalei, Wainiha Valley, Power House Rd, 30 m, 13 May 1995, *T. Flynn & D.H. Lorence 5796.* **Oʻ AHU**: Lāʻie, 1 m, 26 Jan 1986, *S. Sanders 5505.* **LĀNAʻI**: Lānaʻi City, ʻIlima Ave, 496 m, 20.826104, -156.919697, 22 Jun 2023, *K. Faccenda 3181.* **MAUI**: West Maui, Lāhainā Distr, Lāhainā town, 6 m, 20.52, -156.40, 17 Jan 2002, *H. Oppenheimer H10209.* **HAWAIʻI**: Puna, ʻŌlaʻa Forest Reserve, 6.4 km from junction of Stainback Hwy and Hwy 17, 870 m, 06 Jul 1974, *T. Herat et al. 954.*

Plantago rugelii Decne. **Corrections**

Plantago rugelii was previously reported as naturalized on Oʻahu and Hawaiʻi (Faccenda 2024a). The identification of this species in Hawaiʻi was hasty, as the specimens have now been redetermined as *P. asiatica* (see above). *Plantago rugelii* should be removed from the Hawaiian flora.

Plantago virginica L. **New naturalization**

Plantago virginica is now naturalized on Kauaʻi, where a single collection was made on Mākaha Ridge Road containing three plants, as this is an annual species, it is surely naturalized. It is native across much of North America and is naturalized in China, Japan,

Korea, and Taiwan (POWO 2025). It is similar to *P. australis* subsp. *hirtella* but is easily separated, as *P. virginica* is a taprooted annual, whereas *P. australis* is a fibrous-rooted perennial.

Material examined. **KAUA‘I**: Pu‘u Ka Pele Forest Reserve, Mākaha Ridge Rd, roadside, 600 m, 29 April 1997, *T. Flynn 6138.*

Veronica peregrina L. subsp. ***peregrina*** **New state record**

Veronica peregrina subsp. *peregrina* is native to the Americas and is naturalized across Europe and Asia (POWO 2025). Three separate collections made across urban Honolulu document its naturalization on O‘ahu, where it seems to prefer irrigated flower beds and is clearly spreading with potted plants. The specimens formerly published as *V. peregrina* subsp. *xalapensis* from East and West Maui (Starr *et al.* 2002; Oppenheimer & Pezzillo 2024) have also been redetermined as the nominate variety, and *V. p.* subsp. *xalapensis* is no longer known from Maui. A single specimen, found in a potted plant for sale at a commercial nursery, also documents that this species is present on Kaua‘i, where it is also expected to naturalize, if it has not done so already.

Material examined. **KAUA‘I**: Kauai Nursery and Landscaping, seen growing only in pots of plants for sale, only 1 plant seen, 99 m, 21.963019, -159.404331, 08 Jul 2022, *K. Faccenda & S. Vanapruks 2521*. **O‘AHU**: N side of Frear Hall, UH Mānoa campus along Dole St, partly shaded flower beds, only 1 individual seen, 21.295899, -157.813936, 19 May 2021, *K. Faccenda 1830*; Honolulu, Richards St and Queen St, outside Post Office Bldg, weed in irrigated flower bed, shady, only seen in 2 flower beds, no flowers present, 3 m, 21.306390, -157.861081, 14 Mar 2022, *K. Faccenda 2354*; Kaimukī, intersection of Wai‘alae Ave and Hunakai St, weed in irrigated flower bed in shade under shrubs, common in this flower bed, 14 m, 21.278980, -157.786782, 14 May 2022, *K. Faccenda 2372*. **MAUI**: East Maui, Makawao, coming up as weed in lawn on corner of ‘Ūkiu and Baldwin Ave, 1640 ft [500 m], 31 Mar 2000, *F. Starr & K. Martz 000331-1*; Honokahua, between Kahauiki and Honolua, cultivated area, 300 ft [90 m], 29 Feb 2020*, H. Oppenheimer H22005.*

Veronica plebeia R.Br. **Correction**

Wagner *et al*. (1990: 1250) reported *Veronica plebeia* as “naturalized in dry to wet areas ... on Maui and Hawai‘i”; however, no specimens or citizen science records could be found to substantiate its presence on Maui.

Poaceae

Chloris virgata Sw. **Correction**

Chloris virgata was published as occurring on Lehua Islet by Wood & LeGrande (2006), but the specimen cited (*Wood 9222*) has since been redetermined as *C. barbata*. Therefore, *C. virgata* is no longer known from Lehua.

Echinochloa crus-galli (L.) P.Beauv.
subsp. ***crus-galli*** **Correction**

Echinochloa crus-galli subsp. *crus-galli* was published as naturalized on Kuaihelani (Midway Atoll) by Starr *et al*. (2002), but the specimen (*Starr 990620-1*) has since been redetermined as *Eriochloa procera*, making *Echinochloa crus-galli* no longer known from Kuaihelani.

Polygonaceae

Persicaria capitata (Buch.-Ham, ex D.Don) Masam. **New island record**

Persicaria capitata was previously reported as naturalized on Oʻahu, Maui, and Hawaiʻi (Imada 2019). A collection made along Waimea River now document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Waimea, Waimea River, before second stream crossing on Kukui Trail, 215 m, 22.065967, -159.645013, 21 Sep 2021, *S. Deans & S. Heintzman KPEPP KP09212101*.

Polypodiaceae

Campyloneurum phyllitidis (L.) C.Presl **New naturalization**

Campyloneurum phyllitidis has been in cultivation on Oʻahu since at least 1986 (*J. Lau 2285*). Collections of this species from various locations in the Koʻolau Mountain Range document its naturalization on Oʻahu, where it seems to favor growing in very shallow soil on rocks in shaded areas (Figure 9). This species has been seen in cultivation at various home gardens in the Kāneʻohe region (M.K. Thomas, pers. observ.) and can be purchased readily online as "long strap fern." It is most likely being cultivated in other parts of the state and is probably naturalized outside of Oʻahu.

Material examined. **Oʻahu**: Moanalua Valley, 99 m, 21.373367, -157.878801, 28 Feb 2025, *K. Arthur et al. 75*; northern Koʻolau Mts, Kualoa, 122 m, 21.522275, -157.844203, 01 Aug 2024, *A. Evans et al. KR5.*

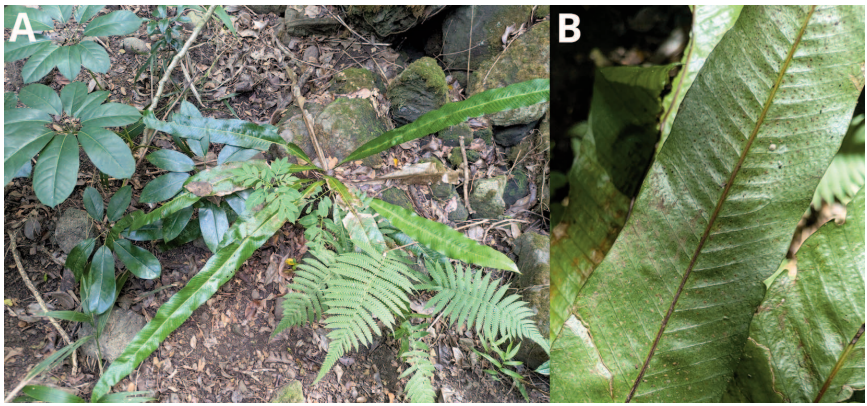

Figure 9. *Campyloneurum phyllitidis.* **A**, habit. **B**, sori.

Drynaria meyeniana (Schott) Christenh. **New naturalization**

Drynaria meyeniana grows primarily as an epiphyte in the wet tropical biome from the Philippines to Taiwan (POWO 2025). Collections of this species made in Kahaluʻu Valley near residences document its naturalization on Oʻahu. This species is known to be cultivated at Lyon Arboretum in Honolulu, where at least one plant was seen naturalizing on *Falcataria falcata* (M.K. Thomas, pers. observ.).

Material examined. **Oʻahu**: Kahaluʻu Valley, ʻĀhuimanu Rd, near bridge where ʻĀhuimanu Rd crosses Kahaluʻu Stream, other plants found growing on Malumalu Pl, 61 m, 27 Dec 2021, *K. Kawelo USARMY 568*; *loc. cit.,* 08 Apr 2018, *K. Kawelo USARMY 493.*

Polypodium pellucidum Kaulf.
var. ***vulcanicum*** Skottsb. **New island record**

Polypodium pellucidum var. *vulcanicum* has been recorded as naturally occurring on Molokaʻi, Maui, and Hawaiʻi (Palmer 2003). A collection of this species at Waiakeakua now document its presence on Lānaʻi, where it is likely now extirpated.

Material examined. **LĀNAʻI**: Waiakeakua, 884 m, 14 Jun 1927, *G.C. Munro 88.*

Portulacaeae

Portulaca molokiniensis Hobdy **New island record**

Portulaca molokiniensis has been recorded as naturally occurring on Maui and Kahoʻolawe (Wagner *et al.* 1990). A collection of this species on the west rim of Maunalei Gulch documents its presence on Lānaʻi, where four plants were found in 1991. This population is now extinct.

Material examined. **LĀNAʻI**: W rim of Maunalei Gulch, 228 m, 04 Feb 1991, *R.W. Hobdy 3280.*

Portulaca umbraticola Kunth **New island record**

Portulaca umbraticola has been recorded as naturalized on Oʻahu (Ross & Faccenda 2023). A collection in undeveloped pastureland in Kōloa now documents its naturalization on Kauaʻi, where dozens of plants were observed.

Material examined. **KAUAʻI**: Kōloa, former grazing land, 45 m, 21.889196, -159457664, 23 Oct 2021, *T. Agostini & L. Reynolds s.n.* (BISH 784450).

Potamogetonaceae

Potamogeton tricarinatus A.Benn. **Nomenclatural note**

The plants (*Hillebrand s.n. BISH147343, Forbes 2502.m, Forbes 260.m*) published as *Potamogeton nodosus* by Wagner *et al.* (1990) have since been reidentified as *P.* cf. *tricarinatus* by Robert R. Haynes. As such, *P. nodosus* should be considered a misapplied name in Hawaiʻi.

Primulaceae

Lysimachia remyi Hillebr. **New island records**

The endemic *Lysimachia remyi* was recorded as being on Molokaʻi and Maui by Wagner *et al.* (1990). A variety of collections from Lānaʻi made by G.C. Munro and C.N. Forbes were determined as *L. remyi* by the *Manual* authors, but evidently omitted from the *Manual*. Also, multiple collections from Oʻahu have recently been determined MKT as *L. remyi.*

Material examined. **Oʻahu**: Mākaha, 914 m, 27 Oct 2004, *J. Rohrer USARMY 4*; Koʻolau Mts, Kalauao-Waimalu Ridge, 518 m, 29 Mar 1933, *H. St. John 13004*; no locality, *J.M. Lydgate s.n.* (BISH 64013). **LĀNAʻI**: Ridge at head of Maunalei, 14 Nov 1916, *G.C. Munro 431*; no locality, *G.C. Munro s.n.* (BISH 836); Kaiholena, Sep 1917, *C.N. Forbes 387.L*; no locality, Jun 1913, *C.N. Forbes 221.L*; ridge above Maunalei, 14 Oct 1916, *G.C. Munro 627.*

Proteaceae

Stenocarpus sinuatus Endl. **New naturalization**

Stenocarpus sinuatus is native to southeastern New Guinea and eastern Australia (POWO 2025). It has now naturalized at Manukā State Park, Hawaiʻi, where two cultivated specimen trees have produced hundreds of seedlings and root suckers in the nearby area that are spreading into the adjacent natural areas.

Material examined. **HAWAI‘I**: Ka‘ū, Manukā State Park, spreading into Natural Area Reserve from 2 cultivated plants, 2115334N 202780E, *J. Parker & N. Friday BIED215* (BISH 782384, 782385, 782386).

Pteridaceae

Actiniopteris australis (L.f.) Link **New naturalization**

Actiniopteris australis is commonly sold as “eyelash fern” on the internet and has been found growing in Mau‘umae Nature Park in eastern Honolulu between boulders in dry shrubland (Figure 10). While there are no prior herbarium specimens of *A. australis* collected in Hawai‘i, it is assumed that that species is a horticultural escape, as *Actiniopteris* can be found for sale at local nurseries (K. Faccenda, pers. observ.). *Actiniopteris australis* is native to Mauritius and Réunion (POWO 2025). However, this species is not easily separated from other members of the genus, especially *A. radiata* (Sw.) Link. Vaganov & Shmakov (2016) provided a key to the species of the genus, but the couplets provided are somewhat vague and do not always work with herbarium specimens.

Material examined. **O‘AHU**: Mau‘umae Nature Park, growing from base of NW-facing boulder with *Coleus prostratus, Phyllanthus debilis*, and *Emilia fosbergii*, only 1 colony seen, ca 60 cm long × 25 cm wide, 98 m, 21.171216, -157.472085, 12 Jan 2024, *M.C. Ross 1968*.

Figure 10. *Actiniopteris australis* habit.

Adiantum diaphanum Blume **Questionable naturalization**

Adiantum diaphanum is a widespread species native to Malesia, Southeast Asia, Australia, New Zealand, and various Pacific islands (Flora of Australia 2024). A collection on Oʻahu behind Koʻolau Golf Course gives evidence of its potential naturalization. More collections will be needed to confirm. This species is extensively cultivated and can be purchased on the internet. It superficially resembles *A. hispidulum* but can be separated by the key below:

1. Blades palmate, pinnae often with extra orders of dichotomous branching; stipes and lamina covered in abundant short, pale hairs ..... *A. hispidulum*
1′. Blades pinnate, sometimes appearing palmate, pinnae without dichotomous branching; stipes essentially glabrous, lamina with sparse brown hairs ..... *A. diaphanum*

Material examined. **Oʻahu**: Kalāheo, Kailua, behind Koʻolau Golf Course, 200 m, 21.372351, -157.800513, 14 Jan 2025, *M.K. Thomas et al. 947.*

Doryopteris decora Brack. **Correction**

Doryopteris decora was reported as occurring on Kahoʻolawe by Palmer (2003); however, no specimens have been found to substantiate its occurrence on the island. Warren *et al.* (1994) reported its presence on the island as questionable. Several specimens at BISH which were formerly identified as *D. decora* (*Cuddihy 333; Higashino 8030*) but have been recently reidentified as the hybrid *Doryopteris* × *subdecipiens* (*Doryopteris decipiens* × *D. decora*) by MKT. Preliminary phylogeographic work on the Hawaiian *Doryopteris* by one of us (CMT) suggests that the current taxonomy is not supported by genomic data, and ongoing work into this group might synonymize Hawaiian species or suggest a revised classification. Thus, future updates to the flora will be necessary to accommodate these revisions.

Haplopteris elongata (Sw.) E.H.Crane **Correction**

Haplopteris elongata was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Pteris tripartita Sw. **New naturalization**

Pteris tripartita is a vigorous wetland species known from northeastern Australia, tropical Africa, Madagascar, Southeast Asia, Christmas Island, Malesia, and South Pacific islands (Flora of Australia 2024). Two small populations at Hoʻomaluhia Botanical Garden in Kāneʻohe, Oʻahu, were discovered by Talia Portner in 2023, one in a small shade house/nursery, the other in the visitor center courtyard (Figure 11). This species is known to be a noxious weed in Florida and should be eradicated wherever present in the Hawaiian Islands. One other specimen at BISH shows that it was cultivated at Foster Botanical Gardens in 1959 (*T. Potter s.n.*, BISH 9093).

Material examined. **Oʻahu**: Hoʻomaluhia Botanical Garden, shadehouse area, also popping up in and around visitor center, 90 m, 21.387243, -157.809722, 2 June 2023, *M.K. Thomas & T. Portner 585.*

Figure 11. *Pteris tripartita* leaf.

Ranunculaceae

Anemone hupehensis (É.Lemoine) É.Lemoine **Taxonomic note**

Anemone hupehensis var. *japonica* was noted as naturalized by Wagner *et al.* (1990); however, the naturalized Hawaiian populations are best referred to as *A. hupehensis*, following the taxonomy of Bowles & Stearn (1947). This taxonomy recognizes the Japanese anemone (var. *japonica*) as a semi-double form, whereas the wild-type plants with only 5 petals are *A. hupehensis*. While there is one specimen of *Anemone hupehensis* var. *japonica* from Hawai‘i, it appears to be cultivated (*M.C. Neal 219*). All wild plants in Hawai‘i have 5 petals. We are further following the taxonomy of Wang *et al.* (2001), who do not recognize *Atragene japonica* Thunb. or any synonyms derived from it as a valid species, but as cultivars of *Anemone hupehensis.*

Rhamnaceae

Ziziphus mauritiana Lam. **Questionable island record**

Ziziphus mauritiana is currently treated as questionably naturalized on O‘ahu (Imada 2019). Collections made in pastureland in Kapoho suggest its naturalization on Hawai‘i Island, but should be considered questionable until its population size is ascertained. It is also possible that these plants were destroyed in the 2018 east rift zone eruption.

Material examined. **HAWAIʻI**: Kapoho, Green Lake, pasture area, 04 Feb 1984, *L. Stemmermann 6881*.

Rosaceae

Prunus cerasifera Ehrh. × ***P. salicina*** Lindl. **Questionable naturalization**

Prunus cerasifera × *P. salicina,* the Methley plum, is a hybrid between two plums native to parts of Europe and Asia, *P. cerasifera* (cherry plum) and *P. salicina* (Japanese plum) (POWO 2025). This hybrid plum is often cultivated in Hawaiʻi (Staples & Herbst 2005). A collection made on Hawaiʻi Island off of Stainback Highway in Hilo gives evidence of its potential naturalization.

Material examined. **HAWAIʻI**: South Hilo, Stainback Hwy, 2164293N 261261E, 25 Apr 2011, *J. Parker & R. Parsons BIED154.*

Rubiaceae

Cinchona calisaya Wedd. **New naturalization**

Cinchona calisaya is native to central Peru and Bolivia (POWO 2025) and has now been found naturalized on Maui, where it has presumably spread from forestry plantings. These specimens were identified by L. Andersson (GB) as part of the *A Tropical Garden Flora* project.

Material examined. **MAUI**: West Maui, Lāhainā Distr, Kuhua ahupuaʻa, between Kealiʻi Gulch and Kahoma Stream, growing in disturbed area, naturalized, 640 m, 20.905407, -156.637139,30 Mar 2011, *L. Kia s.n.* (BISH 762241, 763796); East Maui, Makawao Forest Reserve, E of Treatment Center, 852 m, 20.49, -156.16, 15 Jun 2002, *F. Starr & K. Starr 020515-1, 020515-2*.

Coffea arabica L. **Correction**

Coffea arabica was reported as naturalized on "all the main islands except Niʻihau" by Wagner *et al.* (1990: 1120); however, no specimens have been found to substantiate this species ever having naturalized on Kahoʻolawe. The record is hereby removed.

Coprosma rhynchocarpa A.Gray **Correction**

Coprosma rhynchocarpa was published as occurring on Maui by Herbarium Pacificum Staff (1996), but the specimen (*Medeiros 191*) has since been redetermined to *Coprosma cordicarpa.* Thus, *C. rhynchocarpa* is no longer known on Maui.

Pentas lanceolata (Forssk.) Deflers **New island record**

Pentas lanceolata was reported as naturalized on Oʻahu, Maui, and Hawaiʻi (Imada 2019; Faccenda 2024b). Collections of this species in Wainiha now document its naturalization on Kauaʻi.

Material examined. **KAUAʻI**: Hanalei, Wainiha, 1 km up Powerhouse Rd, 53 m, 22.200001, -159.550003, 17 Mar 2011, *K.R. Wood & N. McMahon 14556* (PTBG).

Psychotria kaduana (Cham. & Schltdl.) Fosberg **Correction**

It was stated by Wagner *et al.* (1990: 1168) that *Psychotria kaduana* is found "on Kauaʻi, Oʻahu, Molokaʻi, Lānaʻi, and Maui". However, despite diligent efforts, no specimen has been found to substantiate it being found on Lānaʻi. One cannot help but be reminded of the lament expressed by Sohmer (1977), who remarked with some perplexity, "*Why it is also not on Lanai is inexplicable*." Such an absence, so contrary to expectation, invites further inquiry into the precise nature of this species' distribution and the forces that may govern it.

Spermacoce ocymifolia Willd. **New island record**

Spermacoce ocymifolia was reported as naturalized on Kauaʻi (Lorence & Faccenda 2024). Collections made off Drum Road in Kawailoa Training Area now document its naturalization on Oʻahu.

Material examined. **Oʻahu**: Waialua, Kawailoa Training Area, Drum Road, 360 m, 10 Mar 2020, *P. Maosi et al. USARMY 534.*

Rutaceae

Bergera koenigii L. **New naturalization**

Bergera koenigii, commonly known as curry leaf, is widespread through the Indian subcontinent, China, and Southeast Asia (POWO 2025). Originally known as *Bergera koenigii*, the species was transferred to the genus *Murraya* in the 1800s by Sprengel; however, morphological and molecular evidence have returned it to *Bergera* (Mou *et al.* 2023). The curry leaf is listed as uncommonly cultivated in Hawaiian gardens by Staples & Herbst (2005). This tree was found spreading from a planted individual along Anolani Street in Niu Valley into the forest reserve behind the residences. Many seedlings in various stages were seen under the parent and up to 10 m from the tree. Seedlings have also been observed further back in the valley along the Pia Valley Trail, nearly a kilometer from the housing development. This species has also been observed escaping cultivation from the Cactus and Succulent Garden at Kapiʻolani Community College, with ca. 10 wild individuals, mostly seedlings, scattered up to 100 m from the planted parent tree. The following is a description from Zhang *et al.* (2008):

> "Shrubs or trees, to 4 m tall. Leaves 17–31-foliolate; leaflet blades ovate, 2–5 × 0.5–2 cm, base obtuse to rounded and oblique, margin entire or crenulate. Inflorescences terminal, paniculate, many flowered. Flowers 5–merous, ellipsoid in bud. Sepals ovate, less than 1 mm. Petals white, oblanceolate to oblong, 5–7 mm. Stamens 10. Stigma capitate. Fruit bluish black, ovoid to oblong, 1–1.5 cm, 1– or 2–seeded. Seed coat membranous."

Material examined. **Oʻahu**: Niu Valley, on slope above Anolani St behind residential area, many seedlings under tree and on side of road in washed out area, 45 m, 21.288838, -157.740212, 24 Jan 2024, *M.K. Thomas 978*; Kapiʻolani Community College, Cactus and Succulent Garden, escaping cultivation, found scattered throughout the garden and campus, ca 10 wild plants seen, 56m, 21.161277, -157.483425, 04 May 2023, *M.C. Ross 1933*.

Flindersia brayleyana F.Muell. **New island record**

Flindersia brayleyana has previously been reported as naturalized on Kauaʻi, Maui, and Hawaiʻi (Imada 2019; Brock *et al.* 2023). Collections made of this species in Makiki now document its naturalization on Oʻahu, as thousands of seedlings are present underneath the mature forestry trees. Seedlings of this species are also abundantly present along the beginning of the Mānoa Cliffs Trail, which is adjacent to the end of the Moleka Trail.

Material examined. **Oʻahu**: Honolulu Watershed Forest Reserve, Moleka Trail, grove of 25 trees, much natural reproduction, 457 m, 03 Jun 1958, *M.F. Landgraf s.n.* (BISH 580971, 580972, 580973); Makiki, vicinity of Moleka Trail, east of trail, mesic, invasive-dominated forest, shady understory, thousands of seedlings recruiting from planted forestry trees which are now mature canopy trees, 368 m, 21.320483, -157.818900, 02 Dec 2024, *K. Faccenda & K. Arthur 3950.*

Melicope sessilis (H.Lév.) T.G.Hartley & B.C.Stone **New island record**

Melicope sessilis was reported as occurring on Molokaʻi and Maui (Imada 2012), but its range should also include Hawaiʻi Island, as Stone (1969) treated *Pelea parvifolia* Hillebr. var. *apoda* (H.St.John) B.C.Stone as an accepted taxon from the Volcano region, but var. *apoda* (and its basionym, *Pelea apoda* H.St.John) is now considered a synonym of *Melicope sessilis* (Hartley 2001).

Material examined. **HAWAIʻI**: Volcano region, Jul 1918, *J.C. Rock s.n.* (BISH 579676).

Ruta chalepensis L. **Taxonomic note**

Ruta graveolens L. was published as naturalized on Maui by Starr *et al.* (2004); however, it was a misidentification of *Ruta chalepensis*, based on its fringed petals (Tutin *et al.* 1968). All specimens from Maui have proven to be *Ruta chalepensis*. The name *R. graveolens* can be removed from the Hawaiian naturalized flora.

Zanthoxylum dipetalum H.Mann var. ***dipetalum*** **New island record**

Zanthoxylum dipetalum was published as occurring on Maui by Oppenheimer & Bustamente (2014) with a note that says "var. nov." Examination by one of us (MKT) places these specimens within the immense range of variation of the nominate subspecies, but the consistently smaller leaves with very short petioles and more contracted panicles could indicate a unique taxon. A more in-depth study using DNA analysis is needed for this species.

Material examined. **MAUI**: West Maui, Lāhainā, Kauaʻula Valley, S slope, population of 7, 1 large 8 m mother tree, 6 smaller but mature trees downslope, 945 m, 13 Apr 2016, *H. Oppenheimer et al. H41608*; *loc. cit.*, 24 Apr 2013, *H.L. Oppenheimer et al. H41338*; *loc. cit.*, 13 Feb 2014, *H.L. Oppenheimer et al. H23854.*

Salviniaceae

Azolla caroliniana Willd. **Corrections**

Azolla caroliniana was published as naturalized on Oʻahu and Molokaʻi by Imada & Kennedy (2020), but the specimens (*Lau 1616; Wilson 2447*) have since been reidentified as *A. filiculoides.* The name *A. caroliniana* can be removed from the Hawaiian naturalized flora.

Santalaceae

Exocarpos gaudichaudii A.DC. **Corrections**

Exocarpos gaudichaudii was reported as occurring on "all of the main islands except Kauaʻi" by Wagner *et al.* (1990: 1218); however, there is no evidence that it ever occurred on Kahoʻolawe, as no specimens or literature reports outside of the *Manual* exist (Warren *et al.* 1994). Similarly, there is no mention of the species by Wichman & St. John (1990) as being on Niʻihau, and no specimen documentation exists.

Sapindaceae

Cardiospermum halicacabum L. **Correction**

Cardiospermum halicacabum was reported from "all of the main islands except Lanaʻi and Kahoʻolawe" by Wagner *et al.* (1990: 1226), but no specimens or citizen science records could be found to substantiate its occurrence on Molokaʻi.

Filicium decipiens (Wight & Arn.) Thwaites **New island record**

Previously reported as naturalized on Kauaʻi, Oʻahu, Maui, and Hawaiʻi (Imada 2019), *Filicium decipiens* is now also found on Molokaʻi.

Material examined. **MOLOKAʻI**: Mapulehu, mauka of hwy along unpaved road leading to ʻIliʻiliʻōpae Heiau, growing in dense shade of *Psidium cattleianum*, *Syzygium cumini* and *Mangifera indica,* 61 m, 10 Aug 2024, *H. Oppenheimer H82401*.

Schizaeaceae

Microschizaea robusta (Baker) C.F.Reed **Correction**

Schizaea robusta, now accepted as *Microschizaea robusta* based on molecular evidence (Ke *et al.* 2022), was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lānaʻi.

Scrophulariaceae

Bontia daphnoides L. **New naturalization**

Bontia daphnoides is native to the Americas, where it grows in a primarily wet tropical biome (POWO 2025). Collections made at D.T. Fleming Beach Park document its naturalization on Maui, where many seedlings were observed spreading downslope.

Material examined. **MAUI**: West Maui, Lāhainā, Honokahua, between bathrooms at D.T. Fleming Beach Park and Ritz-Carlton Hotel, 10 m, 21.08, -156.394, 18 May 2024, *H.L. Oppenheimer H52401*.

Buddleja madagascariensis Lam. **New island record**

Buddleja madagascariensis has previously been reported as naturalized on Kauaʻi, Maui, and Hawaiʻi (Imada 2019). Collections made in Wahiawā, Mānoa, and Tantalus now document its naturalization on Oʻahu. This species is an eradication target of the Oʻahu Invasive Species Committee and any plants seen should be reported to them.

Material examined. **Oʻahu**: Wahiawā, Schofield Barracks, East Range, across Leilehua Rd, 21 Sep 2004, *S. Cato & OISC USARMY 2*; Schofield Barracks, East Range, near Army Natural Resources Center, 265 m, 28 Feb 2005, *K. Kawelo USARMY 12*; Honolulu, Mānoa Valley, Woodlawn, dry stream bed, 10 Mar 1931, *M.C. Neal s.n.* (BISH 56340).

Buddleja paniculata Wall. **Correction**

Buddleja paniculata was published as naturalized on Kauaʻi (Brock *et al.* 2023); however, this was a misidentification of *Buddleja madagascariensis* based on the reidentification of all specimens (*Lorence 8402; Brock 923*). As such, *Buddleja paniculata* should be deleted from the naturalized Hawaiian flora.

Kickxia elatine (L.) Dumort. **New state record**

Kickxia elatine is an annual species whose native range includes Europe, West Asia, and North Africa, and it is also a widespread weed across much of temperate North America and, to a lesser extent, South America (POWO 2025). In North America it grows from gravelly or sandy disturbed sites, roadsides, stream banks, gravel bars, and glades from 0–900 m (Elisens 2019). *Kickxia* can be recognized by its decumbent habit; hastate leaves; and solitary, bilabiate flowers on pedicels 10–22 mm long, the lower lip yellow, the upper purple, the spur long. Collections of *Kickxia elatine* on a disturbed area near a dumpsite on Oʻahu at Barbers Point Naval Air Station, and on a steep hydro-mulched road bank on Maui off of Honoapiʻilani Highway document this new naturalization in the state.

Material examined. **O‘AHU**: Barbers Point Naval Air Station, 15 Sep 1994, *A. Whistler 9677*. **MAUI**: Honolua, Mokulē‘ia, steep bank on Honoapi‘ilani Hwy, 45 m, 09 May 2006, *R.W. Hobdy 4263*.

Myoporum sandwicense A.Gray
subsp. ***sandwicense*** **New island record**

Myoporum sandwicense subsp. *sandwicense* (naio) was previously known from all of the main Hawaiian Islands except Kaho‘olawe (Imada 2012). Collections made from ‘Ale‘ale now document its presence on Kaho‘olawe, expanding the native range of this species to include all eight main Hawaiian Islands.

Material examined. **KAHO‘OLAWE**: Pu‘u Koa‘e, Kamōhio Bay, ‘Ale‘ale, 45 m, 18 May 1992, *S. Perlman & K. Wood 12775.*

Smilacaceae

Smilax glauca Walter **Questionable naturalization**

Smilax glauca is native to eastern North America from New York south to the Yucatan and west to Texas (POWO 2025). It is also now questionably naturalized at Schofield Barracks East Range on O‘ahu, apparently the first time this species has been reported outside of its native range (POWO 2025). The population covers a 12 m × 12 m area with extensive underground rhizomes. The specimen labels noted that no flowers had been observed and that they had been sprayed several times with 1% glyphosate, yet continued to persist to the present despite repeated herbicide applications. It is unclear how this species arrived in Hawai‘i. Importation through the horticultural trade seems unlikely, due to its inedible berries and prickles; perhaps a seed arrived attached to a vehicle. This species is easily distinguished from the endemic *S. melastomifolia* by its prickles and glaucous underleaves.

Material examined. **O‘AHU**: Schofield Barracks, East Range, 287 m, 26 Jul 2005, *K. Wong & S. Cato USARMY 33a;* Schofield Barracks, East Range 2, dry mesic area on slope, 14 Nov 2006, *S. Mosher USARMY 35b.*

Solanaceae

Cestrum aurantiacum Lindl. **Corrections**

Cestrum aurantiacum was noted as “persisting and perhaps naturalized at least on O‘ahu, Maui, and Hawai‘i” by Wagner *et al.* (1990: 1254), but we have not seen convincing evidence of naturalization, as all specimens date from before the 1950s and none make mention of naturalization. Furthermore, there are no citizen science observations of this growing wild, nor have the authors seen it. This species should be considered to be found only in cultivation.

Datura metel L. **New island record**; **corrections**

Datura metel was previously documented as naturalized on O‘ahu, Maui, Moloka‘i, and Hawai‘i (Wagner *et al.* 1990; Imada 2019). However, the O‘ahu records are all cultivated, nor is there any evidence to substantiate its naturalization on Hawai‘i Island. However, the collection of a mature individual near office trailers at Airport Nursery in Lāna‘i City, as well as reports of observations near Mānele Four Seasons Resort and construction sites across town, document its naturalization on Lāna‘i.

Material examined. **LĀNA‘I**: Lāna‘i City, mature individual near office trailers at Airport Nursery, 417 m, UTM 04 0713686 2301158, 15 Feb 2022, *K. Bogner KKB103*.

Datura stramonium L. **New island record**

Datura stramonium was previously reported as naturalized on Kauaʻi, Oʻahu, Molokaʻi, Maui, and Hawaiʻi (Imada 2019). A collection made behind the shade houses at the Pūlama Lānaʻi Quarantine Unit near the Lānaʻi Airport now document its naturalization on Lānaʻi. In June of 2019 a separate individual was observed growing along Challenge Drive in Mānele, Lānaʻi.

Material examined. **LĀNAʻI**: Lānaʻi Airport, Pūlama Lānaʻi Quarantine Unit, behind shade houses, 378 m, 05 Jul 2019, *K. Bogner s.n.* (BISH 777507).

Nicotiana tabacum L. **Correction**

Nicotiana tabacum was reported as naturalized on "Laysan and all of the main islands" by Wagner *et al.* (1990: 1262). It appears to have been historically cultivated on Kahoʻolawe, but it has not persisted (Warren *et al.* 1994) and Kahoʻolawe should be removed from its distribution.

Nothocestrum A.Gray **Note**

There appears to be some confusion between *Nothocestrum latifolium* and *N. longifolium.* The key in the *Manual* relies heavily on features of the flower clusters, but after reviewing all of the specimens at the Bishop Museum herbarium, there seems to be much overlap.

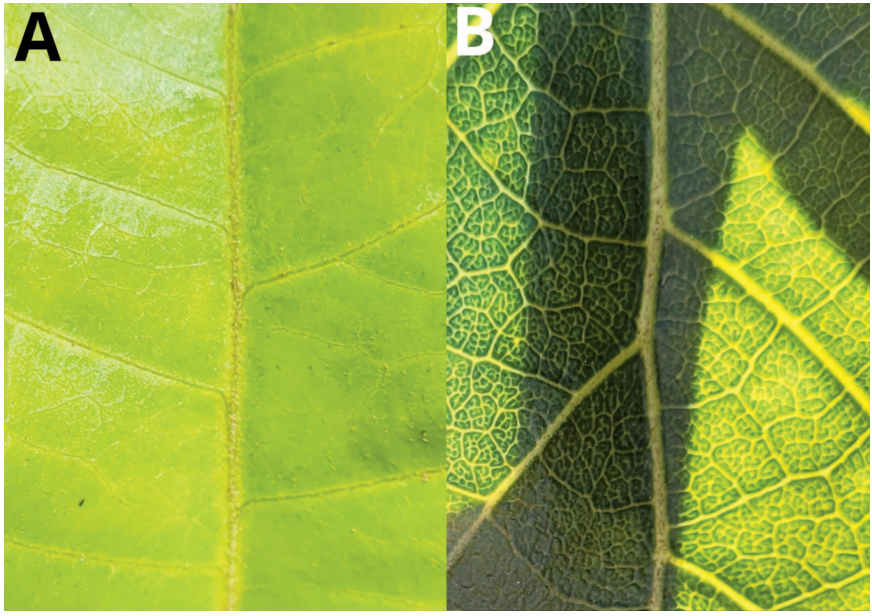

Figure 12: Detail of upper leaf venation of *Nothocestrum*. **A**, *N. longifolium.* **B**, *N. latifolium.*

The leaf shape, texture, and veins appear to be diagnostic and are here included in a modified key to this genus:

1. At least some of the leaves peltate or hemipeltate; pedicels ca 3–18 mm long .... *N. peltatum*
1′. None of the leaves peltate; pedicels 4–30 mm long
   2. Corolla tube barely exserted from calyx; fruit enclosed by calyx .... *N. breviflorum*
   2′. Corolla tube up to 2× longer than calyx; fruit not enclosed by calyx
      3. Leaves often thick, coriaceous, the margins usually irregularly lobed, mostly broadly ovate with some narrowly elliptic, veins conspicuous and pale green/yellow with very small gaps between the reticulations (Figure 12); fruit mostly globose; dry forests (occasionally in mesic forests) ..... *N. latifolium*
      3′. Leaves chartaceous, relatively thin, lanceolate to elliptic-oblong, margins entire, tertiary and quaternary veins mostly obscure with only primary and secondary veins conspicuous; fruit elongate or fusiform: mesic to wet forests ..... *N. longifolium*

Solanum americanum Mill. **Correction**

Solanum americanum is no longer known from Pearl and Hermes, Nihoa, Kaʻula, Lehua, Niʻihau, or Kahoʻolawe as all specimens have been reidentified as *S. opacum*; see below.

Solanum capsicoides All. **Range extension**

Solanum capsicoides was previously reported as naturalized on West Maui (Oppenheimer & Bartlett 2000). It is now known from East Maui, where a single individual was observed in a pasture.

Material examined. **MAUI**: Kapaʻalalaea, Haʻikū, mesic pasture, 26 Dec 2022, *F. Starr & K. Starr 221226-01*.

Solanum incompletum Dunal **Corrections**; **new synonyms**

[= *Solanum hillebrandii* H.St.John]
[= *Solanum nesophilum* H.St.John]
[= *Solanum pubinervosum* H.St.John]

Solanum incompletum was reported as occurring on Molokaʻi by Wagner *et al.* (1990), but no specimens could be found to document its occurrence on that island. Hillebrand (1888) does not mention Molokaʻi, the Degeners never treated the species, St. John (1988) lists *S. nelsonii* as the only endemic *Solanum* on Molokaʻi, and searches on the Biodiversity Heritage Library website found no primary literature sources. It appears that the reference to *S. incompletum* for Molokaʻi came from a specimen that has now been redetermined as *Solanum capsicoides* (*Hobdy 1834*). By similar logic as above, no records of this species from Kauaʻi could be located and it should no longer be considered as occurring on that island.

Examination by KF & MKT of types stored at BISH also expands the synonymy of this species. *Solanum hillebrandii* is currently accepted on the Solanaceae Source website (https://solanaceaesource.myspecies.info/solanaceae/solanum-hillebrandii) and on POWO (2025), which cites Solanaceae Source. Examination of the holotype of this species suggests that this name is best treated as a synonym of *S. incompletum* Dunal. *Solanum incompletum* is variable in the degree of spininess in the BISH collection, with some specimens densely spiny and others having 1–3 minute spines. Recognition of a

glabrous form of *S. incompletum* as *S. hillebrandii* does not seem warranted, given this continuous variation in spininess among these plants. Furthermore, St. John (1969) noted that the spines on *S. incompletum* varied with ontology, as mature branches may lack spines entirely. By the same logic, examination of the holotype of *Solanum nesophilum* also suggests this name is best treated as a synonym of *S. incompletum*. While the type of *Solanum pubinervosum* was formerly annotated as *S. sandwicense,* the presence of several scattered spines indicates that it is also a synonym of *S. incompletum*.

Solanum nigrescens Mart. & Galeotti **Correction**

Solanum nigrescens was published as naturalized on Hawai‘i Island in Wagner *et al.* (1990), who noted that the identification was tentative. This identification was noted as "certainly in error" by Knapp *et al.* (2019). While there were no specimens annotated with the name *S. nigrescens* in the BISH collection, many specimens from high-elevation Hawai‘i Island appear to match "*S. nigrescens*" as treated in the *Manual*. These plants appear similar to *Solanum opacum* but have consistently persistent pedicels and a minutely racemose inflorescence. It may be that this population represents an upland form of *Solanum opacum,* but future study is needed to place these populations taxonomically. These plants should be treated as *Solanum* sp. for the time being.

Solanum opacum A.Braun & C.D.Bouché **New island records**

The identity of the plants referred to in Wagner *et al.* (1990) as *Solanum americanum* has been challenged by a recent monograph of the *S. nigrum* complex (Särkinen *et al.* 2018). This revision noted that *Solanum americanum* is a post-European introduction, and *Solanum opacum* is an indigenous species that has long been called pōpolo in ‘ōlelo Hawai‘i. Examination of the holdings of BISH corroborate this, as most collections from before 1920 are *S. opacum*, after which *S. americanum* becomes dominant. We further note that *S. opacum* is quite often found in coastal or nearly coastal ecosystems, whereas *S. americanum* is more often a weed of disturbed areas. The taxonomy of these species in Hawai‘i warrants further study, as some modern populations have characters intermediate between *S. opacum* and *S. americanum*, with persistent pedicels but matte berries. Given that *S. americanum* is diploid and *S. opacum* is hexaploid (Särkinen *et al.* 2018), hybridization seems unlikely.

Solanum opacum was previously cited as occurring on Pearl and Hermes, Nihoa, Ka‘ula, Kaua‘i, O‘ahu, Maui, and Hawai‘i (Särkinen *et al.* 2018), based on examination of limited Hawaiian specimens. Examination of BISH holdings expands its range, adding Kure, Papa‘āpoho (Lisianski), Lehua, Ni‘ihau, Moloka‘i, and Lāna‘i. Only the first record on each island is cited.

Key to *Solanum nigrum* complex in Hawai‘i (adapted from Särkinen *et al.* 2018)

1. Berries matte, green, purple, or blackish; calyx lobes appressed to fruit; pedicles deciduous with fruit ..... *S. opacum*

1′. Berries glossy black; calyx lobes reflexed in fruit; pedicles persistent ... *S. americanum*

Material examined. **KURE**: Central open plain, 03 Oct 1959, *H.F. Clay s.n.* (BISH 70103). **LISIANSKI**: 150 yards from E shore, 17 Jun 1966, *P.C. Shelton 407.* **KA‘ULA**: 18 Aug 1932, *E.L. Caum 15*. **LEHUA**: N slopes, 10 Jan 1992, *D.H. Lorence 7142.* **NI‘IHAU**: Koali, Jan 1912, *J.F.G Stokes s.n.* (BISH 70124). **MOLOKA‘I**: Waialua Valley, near shore, 05 Aug 1928, *O. Degener 7377.* **LĀNA‘I**: Mahana, Oct 1913, *G.C. Munro 298.* **KAHO‘OLAWE**: vicinity of Moa‘ula, 22 Nov 1978, *W.P. Char 78.018.*

Solanum sandwicense Hook. & Arn. **New synonymy**

[= *Solanum angustior* H.St.John]

Examination of the holotype of *Solanum angustior* by MKT & KF suggests that this name is best treated as a synonym of *S. sandwicense.*

Tetrachondraceae

Polypremum procumbens L. **Confirmation of naturalization**

Wagner *et al.* (1990) reported *Polypremum procumbens* as questionably naturalized on Hawai‘i Island, as no vouchers were observed. Specimens have since been located at the Smithsonian, and citizen science observations from iNaturalist.org document its persistence around the Kīlauea summit caldera.

Material examined. **HAWAI‘I**: Kīlauea Military Camp, 1230 m, 03 Jan 1958, *F.R. Fosberg 39279* (US); Hawai‘i National Park, Kīlauea Military Camp and Volcano Observatory, Crater Rim Trail, 1200 m, 27 Mar 1961, *F.R. Fosberg 41781* (US); Volcanoes National Park, Crater Rim Trail, near observatory, 10 Aug 1975, *S.P. Darwin 1199* (US).

Thelypteridaceae

Cyclosorus interruptus (Willd.) H.Itô **Correction**

Cyclosorus interruptus was reported as occurring on all the main islands by Palmer (2003); however, no specimens or literature could be found to substantiate its occurrence on Lāna‘i.

Typhaceae

Typha domingensis Pers. **New island record**

Typha domingensis was previously reported as naturalized on O‘ahu (Wagner *et al.* 1990) and has now also been found at Ka‘anapali. According to two landscape workers, it was not planted by the adjacent resort and appeared on its own. The population is forming a dense stand 200 m^2, with culms up to 2 m tall.

Material examined. **MAUI**: West Maui, Lāhainā Distr, Ka‘anapali, naturalized in seasonal wetland, makai of coastal walking path, behind dune restoration project, 3 m, 13 Jan 2024, *H. Oppenheimer H12405*.

Verbenaceae

Aloysia gratissima (Gillies & Hook.) Tronc. **Questionable naturalization**

The native range of *Aloysia gratissima* covers dry forests and abandoned fields of North and South America (POWO 2025). This species was collected once on O‘ahu in a closed *Prosopis* forest mauka of the quarry in Campbell Industrial Park, where it was exceedingly unlikely to have been planted. As the population size is unclear and it has not been recollected, this should be considered a questionable naturalization.

Material examined. **O‘AHU**: ‘Ewa, Campbell Industrial Park, Dec 1978, *W. Char 78.093.*

Duranta erecta L. **New island record**

Duranta erecta has previously been recorded as naturalized on Kaua‘i and O‘ahu (Imada 2019). Collections made near the top of the plateau of Pakanaloiki now document its naturalization on Ni‘ihau.

Material examined. **NI‘IHAU**: Pakanaloiki, near top of plateau, 300 m, 15 Jan 1977, *C. Christensen 114.*

Lantana velutina M.Martens & Galeotti **New state record**

The native range of *Lantana velutina* spans the seasonally dry tropical areas of the Americas (POWO 2025). Approximately 200 individuals of this species were seen on Oʻahu in partially exposed dry areas of Mauʻumae Nature Park, where it is well naturalized and associated with *Leucaena leucocephala*, *Urochloa maxima*, and *Lantana camara*. It was not formerly known from cultivation, nor could it be located for sale on the internet. It is unclear how the species arrived in Hawaiʻi. *Lantana velutina* can be distinguished easily from other *Lantana* in Hawaiʻi by its white flowers and fruit, soft hairs, and lack of prickles (Figure 13).

Material examined. **OʻAHU**: Mauʻumae Nature Park, 97 m, 21.286986, -157.789368, 28 Dec 2023, *K. Faccenda 3248.*

Figure 13. *Lantana velutina* flowers and fruit from the Mauʻumae locality.

Phyla nodiflora (L.) E.Green **New island record**

Phyla nodiflora was previously documented as naturalized on Kuaihelani (Midway Atoll), Oʻahu, Molokaʻi, and Maui (Imada 2019). Collected as a weed growing in the lawn around the Big Valley lily pond at the National Tropical Botanical Garden, its naturalization on Kauaʻi is now documented.

Material examined. **KAUAʻI**: Kōloa, Lāwaʻi, National Tropical Botanical Garden, edge of lily pond in Big Valley, 37 m, 22 Sep 1999, *T. Flynn 6635*.

Stachytarpheta* × *trimenii Rech. **New state record**

Stachytarpheta × *trimenii* is a hybrid between *S. mutabilis* and *S. cayennensis*, which appears to be forming spontaneously in the vicinity of the *S. mutabilis* population at Hanalei on Kauaʻi. It is similar to *S. mutabilis* in its woody habit, but it has purple flowers instead of the pink of *S. mutabilis*. Observations on iNaturalist confirm that hybrids are still present, despite no recent collections.

Material examined. **KAUAʻI**: Hanalei Valley, growing along roadside, 29 Dec 1951, *O. Degener 21485*; Hanalei Valley, north wall, near sea, 91 m, 06 Aug 1928, *E.H. Bryan Jr. 629*.

Verbena bonariensis L. **New island record**

Verbena bonariensis was previously documented as naturalized on Kauaʻi, Oʻahu, Lānaʻi, Maui, and questionably on Molokaʻi (Imada 2019; Faccenda 2024b). Collections made in North Kona near Kīpuka Lupea in the ahupuaʻa of Keauhou 2 now document its naturalization on Hawaiʻi Island.

Material examined. **HAWAIʻI**: North Kona, Keauhou 2, Kīpuka Lupea, 1,645 m, X: 0209640, Y: 2164196, 27 Jan 2015, *J. VanDeMark s.n.* (BISH 778234).

Viburnaceae

Sambucus canadensis L. **Taxonomic note**

Sambucus cerulea Raf. was reported as naturalized in Hawaiʻi by Wagner *et al.* (1990). However, this was a misidentification, as all Hawaiian *Sambucus* at US was subsequently redetermined as *S. canadensis* by A.T. Whittemore after lectotypification of *S. cerulea* (Whittemore 2018). Further examination of BISH material supports a redetermination of all naturalized Hawaiian *Sambucus* to *S. canadensis*, as no specimens have a waxy bloom on the fruit that is characteristic of *S. cerulea* (Cronquist *et al.* 1984).

Violaceae

Isodendrion pyrifolium A.Gray **Rediscovery**

Isodendrion pyrifolium was first described from an Oʻahu collection made during the U.S. Exploring Expedition of 1838–1842 (also known as the Wilkes Expedition). It was subsequently collected on Niʻihau, Molokaʻi, Lānaʻi, and Hawaiʻi, and reported by Hillebrand from Maui between 1838 and 1870 (St. John 1952, 1985; Wagner *et al.* 1990). It was then presumed extinct until a small population was rediscovered on Hawaiʻi Island in 1991 (Herbarium Pacificum Staff 1996).

We now report that in 2016 a population was discovered on Oʻahu while conducting rope access work on large cliffs in the leeward Waiʻanae Mountains. This is the first collection of *Isodendrion pyrifolium* on Oʻahu since its original 1838 collection. Subsequent surveys have determined this population to include at least 60 individuals, by far the largest known population of this species. *Isodendrion pyrifolium* was also rediscovered on Kauaʻi in 2022 via drone survey (Nyberg *et al.* 2023).

Material examined. **Oʻahu**: No locality, 1838, *Wilkes Expedition s.n.* (GH 67059, US 7693); Waiʻanae Kai, 660 m, 11 Jul 2016, *A. Loomis et al. OA-WAI-A-0001*.

Viola kauaensis A.Gray var. ***kauaensis*** **New synonymy**
[= *Viola vanroyenii* H.St.John]
Viola vanroyenii was published by St. John (1989). Examination of the holotype (and sole collection) suggests that it is merely a small form of *Viola kauaensis* var. *kauaensis,* perhaps due to the extreme conditions of the Wai‘ale‘ale summit bogs, where it was collected. This follows the conclusion of Havran *et al.* (2014) that the species significantly overlap.

Vitaceae
Rhoicissus rhomboidea (E.Mey. ex Harv.)
Planch. **Taxonomic note**
Cissus rhombifolia Vahl was published as naturalized on Maui by Starr *et al.* (2004). However, this specimen (*Starr 010222-2*) proved to be a misidentification of *Rhoicissus rhomboidea* (syn. *Cissus rhomboidea* E.Mey. ex Harv.), which appears to have originated from a misidentification in Staples & Herbst (2005). Comparison of digitized herbarium specimens of both species from their native ranges shows that all Hawaiian specimens named *Cissus rhombifolia* are actually *Rhoicissus rhomboidea*.

Xyridaceae
Xyris jupicai Rich. **New state record**
Xyris jupicai has been naturalized on Kaua‘i since at least 1999 but has been confused with *X. complanata*. These species are similar and can co-occur in the same bog, such as at Lehua Makanoe, but they can be separated by the following characters: *X. complanata* has twisted leaves and is a perennial, whereas *X. jupicai* leaves are not twisted and is typically annual (or a short-lived perennial). Tens of thousands of plants exist on the Alaka‘i plateau and the Wahiawa Bog.

Xyris jupicai has a broad native range spanning North, Central, and South America (POWO 2025). Within the southeastern U.S., this species appears to have spread rapidly out of Florida via human dispersal and disturbance (Kral 1966). This Kaua‘i sighting appears to be the first disjunct report of *X. jupicai* outside of its native range. Within its native range, it is also a weedy species. Kral (1966) reports that it is commonly found in borrow pits, around farm ponds, and especially in roadside ditches.

It is possible that this species was first introduced via seeds on hiking boots, as the first specimen was found on the Alaka‘i Swamp Trail, the most trafficked trail on the Alaka‘i plateau. On Kaua‘i, *Xyris jupicai* is spreading along pig trails or fencelines running through bogs, but is well-dispersed into the bogs on the Alaka‘i Swamp Trail. We believe that ungulates and humans are now dispersing seeds while traveling along fencelines. Under ideal conditions, *X. jupicai* can go from seed to fruit in four months (Kral 1988). To prevent its spread, bogs should be fenced with the fenceline not cutting through any of the bog. *Xyris* spp. and *Juncus planifolius* all pose a significant threat to Hawaiian bogs, as they can out-compete native species and will aggressively colonize disturbed areas. Furthermore, the weaker roots of these species do a poorer job stabilizing soil, compared to natives (KF, pers. observ.).

The following account of the life history of *Xyris* spp. in the Alakaʻi plateau is provided by Keeley Hassett (pers. comm.): *Xyris jupicai* was first observed with post-flowering seed capsules in August 2023. It turned an amber brown in November and died off by March. In August 2023, most *X. complanata* were observed to have seed heads, with about 15% having flowers. In November most plants were seeding, and by March no flowers were observed and seed stocks were brown, with viable seeds within capsules.

KEY TO *XYRIS* IN HAWAIʻI

[Note: *Xyris platylepis* is currently known only from the Puna District of Hawaiʻi, while *X. complanata* is known from the Puna District of Hawaiʻi and the Alakaʻi plateau of Kauaʻi]

1. Perennial; flowering spikes 7–15 mm diam.; plants with a conspicuous swollen base ... . *X. platylepis*

1′. Annual or perennial; flowering spikes 4–8 mm diam.; plants without a conspicuously swollen base

2. Perennial; lateral sepals coriaceous; leaves 1–3.5 mm wide, conspicuously twisted, fans only prominent on young plants, margins thickened, hyaline ..... *X. complanata*

2′. Annual to short-lived perennial; lateral sepals thin and papery; leaves 2–5 mm wide, flat or weakly twisted, arranged in flattened fans, margins thin, hyaline at base but not thickened ..... *X. jupicai*

Material examined. **KAUAʻI**: Waimea, Kōkeʻe, Pihea Trail, Alakaʻi Bog, 1,221 m, 22.147283, -159.607808, 02 Aug 2023, *J. Jablonski 37*; Kanaele, Wahiawa Bog, W fence around bog, 640 m, 21.975760, -159.507700, 11 Oct 2023, *K. Hassett 1*; Waimea, Nā Pali-Kona Forest Reserve, Alakaʻi Wilderness area, Alakaʻi Swamp Trail, between Kawaikōī Stream valley and Kilohana, mile marker 2.0, 1,200 m, 22.0800, -159.3700, 11 Nov 1999, *D.H. Lorence et al. 8437*; Waimea, Alakaʻi Swamp Trail, near Kilohana, 1,219 m, 22.085790, -159.353561, 19 Nov 2012, *S. Perlman & W. Kishida 23150.*

Zingiberaceae

Hedychium coronarium J.Koenig **Correction**

Hedychium coronarium was noted as naturalized on Lānaʻi by Wagner *et al.* (1990). However, only one specimen from 1913 (*Munro 150*, BISH) from Waiapaʻa exists, and there are no recent citizen science records from the island. Because is unclear that the specimen represented a naturalized occurrence, this species should not be considered naturalized on Lānaʻi.

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Three new species of *Campsicnemus* from Kaua‘i, Hawaiian Islands (Diptera: Dolichopodidae)[1]

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Abstract. Three new species of *Campsicnemus* found on the Hawaiian Island of Kaua‘i, *C. alakai*, **n**. **sp**., *C. arakakii*, **n**. **sp**., and *C. brunnifemur*, **n**. **sp**., are described and illustrated. To date, 32 species of *Campsicnemus* are now known from the island and 193 are now known overall from the Hawaiian Islands, which harbors an incredible 63% of the world fauna of 304 species.

INTRODUCTION

The *Campsicnemus* from Kaua‘i were last reviewed in Evenhuis (2003), who tabulated some 26 species from the island. Since then, an additional three species have been described from Kaua‘i (Evenhuis, 2007, 2019). Additional material has been examined in this study and reveals yet another three new species: *C. alakai*, **n**. **sp**., *C. arakakii*, **n**. **sp**., and *C. brunnifemur*, **n**. **sp**., which are here described and illustrated. To date, 32 species of *Campsicnemus* are now known from the island and 193 are now known overall from the Hawaiian Islands, which harbors an incredible 63% of the world fauna of 304 species.

MATERIAL AND METHODS

Material derives from collections made by Robert Peck and Karl Magnacca and are deposited in the Bishop Museum, Honolulu, Hawai‘i, USA (BPBM). Morphological terminology and abbreviations follow Evenhuis (2016). Confocal images were accomplished by using a Leica M165C stereo dissecting scope via the Leica Microsystems LAS Multifocus software (v. 5.0.2) and using Zerene Stacker® software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image.

Abbreviations used:

I, II, III =	fore, mid, and hind leg
C =	coxa
F =	femur
T =	tibia
MSSC =	male secondary sexual characters
ac =	acrostichal setae
dc =	dorsocentral setae
hm =	postpronotal setae
np =	notopleural setae
oc =	ocellar setae
pa =	post alar setae
ph =	posthumeral setae
sa =	supra-alar setae
sc =	scutellar setae
t =	tarsus
t1–5 =	tarsomeres 1 to 5
vt =	vertical setae

Contribution No. 2025-008 to the Hawaii Biological Survey.

TAXONOMY

Campsicnemus Haliday

Campsicnemus Haliday *in* Walker, 1851: 187. Type species: *Dolichopus scambus* Fallén, 1823, by validation of I.C.Z.N. (1958: 351). *Nomen protectum* (see Evenhuis, 2003: 3).

Campsicnemus alakai Evenhuis, **new species**
(Figs. 1–2)

Types. *Holotype* ♂ (BPBMENT 0000081276) from HAWAIIAN ISLANDS: **Kaua'i**: Alaka'i Swamp, Puaiohi Field Camp, 22.07999°N, 159.546896°W, 6 Feb–27 Mar 2006, R. Peck, Malaise trap #1. Holotype (in fluid) in BPBM.

Diagnosis. Using the key in Evenhuis (2003) this species runs to the Kaua'i species *Campsicnemus kuku* Evenhuis based on both species having a small barb-like process at the base of the midtibia, but can be easily separated from it by the antennal flagellomere length being 1.5× its greatest width (flagellomere length subequal to width in *C. kuku*).

Description. **Male**. Body length: 3.5 mm. Wing length: 4.0 mm.

Head. Shining black; oc and vt black, about one-half length of antennal arista; face black, gray tomentose, constricted at middle, eyes not holoptic, separated below antennae for width of 4 ommatidia; palp small, dark brown; proboscis brown, slightly extending below eye in lateral view; antennae dark brown; postpedicel conical with blunt apex, length about 1.5× greatest width; arista slightly longer than head height.

Thorax. Dorsum of mesoscutum and scutellum black; pleura dark brown; thoracic setae long, strong, black: 3 dc; 2 np; 1 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellowish brown.

Legs (Figs 1–2). CI yellowish, with 4 short curved setae and white hair apically, numerous; CII and CIII yellowish brown; femora and TiI yellowish brown, unmodified, without MSSC; TiII and TiIII yellowish brown with dark brown apex; FII (Fig. 1) with small patch of long strong black setae subapically (MSSC); TiII (Fig. 2) with small barb basomesally (Fig 2) bearing thick short setae, remainder of TiII with hairs along mesal surface becoming longer toward apex (MSSC); IIt_1 and remainder of tarsi without MSSC.

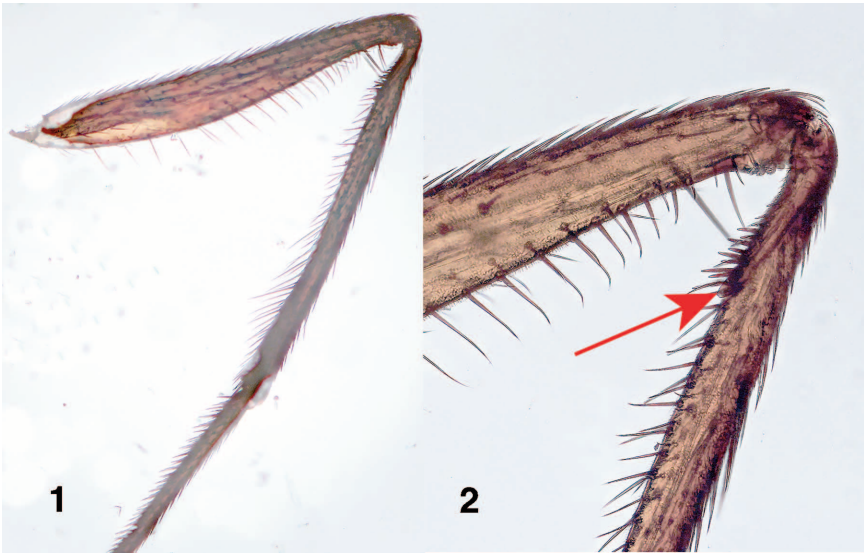
Wing. Smoky brown hyaline, with typical venation for *Campsicnemus*.

Abdomen. Tergites dark brown, each tergite with short stiff curved black hairs dorsally; sternites brown. Hypopygium yellowish brown, not dissected.

Female. Unknown.

Etymology. The specific name derives from the type locality.

Remarks. The photo of the barb (Fig. 2) seems to show a blunt apex from the angle photographed, but it is distinctly a barb or thorn-like process, much the same as *C. kuku* and related species.



Figures 1-2. *Campsicnemus alakai*, n. sp. **1**. mid femur, tibia, and basitarsus; **2**. detail of base of mid tibia showing tiny barb (arrow).

Campsicnemus arakakii Evenhuis, **new species**
(Fig. 3)

Types. *Holotype* ♂ (BPBMENT 0000081277) and 7♂, 3♀ paratypes from HAWAIIAN ISLANDS: **Kaua'i**: Alaka'i Swamp, Puaiohi Field Camp, 22.07999°N, 159.546896°W, 6 Feb–27 Mar 2006, R. Peck, Malaise trap #1. Holotype and paratypes (in fluid) in BPBM.

Diagnosis. Using the key in Evenhuis (2003) this species runs to the Kaua'i species *Campsicnemus spuh* Evenhuis based on having a predominantly yellow mesonotum with vittae and non-flattened tarsomeres, but can be separated from it by the mid basitarsus lacking an apical spur (spur present in *C. spuh*) and the mid tibiae being slightly flared (not so in *C. spuh*).

Description. **Male**. Body length: 1.9–2.2 mm. Wing length: 1.8–2.0 mm.

Head. Shining black; oc and vt black, about one-half length of antennal arista; face constricted at middle, eyes holoptic, contiguous below antennae for length of 3 ommatidia; palp small, dark brown; proboscis yellowish white, slightly extending below eye in lateral view; antennae yellowish; postpedicel yellowish, conical with blunt brown apex, length about 3× greatest width; arista length two-thirds head height.

Thorax. Dorsum of mesoscutum and scutellum yellowish to yellowish brown, paler laterally, with pair of thin admedian brown vittae extending posterior to just above prescutellar area, these vittae in association with dc, additionally a thin medial stripe dorsally not quite reaching prescutellar area; prescutellar area contrastingly brown; upper pleura concolorous with mesoscutum except lower pleura white, katatergite dark brown; thoracic setae long, strong, black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; 5 ac; halter stem and knob yellowish.

Figure 3. *Campsicnemus arakakii*, n. sp., mid tibia and basitarsus (mesal surface on right).

Legs. CI, CIII white, CI with 4 strong white setae apically, numerous smaller curved stiff setae; CII brownish yellow; remainder of legs white; foreleg and hindleg unmodified, without MSSC; FII with 12 stiff hairs along ventral surface (MSSC), other femora unmodified with no MSSC; TiII (Fig. 3), thin, slightly flared apically, with row of stiff pointed setae mesally on basal half, remainder of mesal hairs long and decumbent to apex (MSSC); one strong setae subapically on lateral surface (MSSC); IIt_1 and remainder of tarsi without MSSC.

Wing. Subhyaline, with typical venation for *Campsicnemus*.

Abdomen. Tergites brown, each tergite with short stiff curved black hairs dorsally; sternites white. Hypopygium yellowish, not dissected.

Female. As in male except legs normally shaped; oviscapt with pair of darkly sclerotized bifid spatulate spines and white hairs.

Etymology. The specific name honors my good friend and long-time colleague, Keith Arakaki in honor of his 50 years of service to the Bishop Museum.

Campsicnemus brunnifemur Evenhuis, **new species**
(Fig. 4)

Types. *Holotype* ♂ (BPBMENT 0000081278) and 2♀ *paratypes* from HAWAIIAN ISLANDS: **Kaua'i**: Koke'e Site B, 1,000 m, 22.117°N, 159.670°W, 22 Apr 2021, K. Magnacca, K042204-01, on ground. Holotype (in fluid) in BPBM.

Diagnosis. Using the key in Evenhuis (2003) this species runs to the Kaua'i species *Campsicnemus manaka* Evenhuis in both having the mid tibiae brown and without short, erect, truncate setae mesally and the mid basitarsus without long hairs, but can be separated from it by the mid tibiae having long downcurved or decumbent hairs mesally along the entire surface (mid tibiae with five strong erect setae on apicomesal two-thirds, but otherwise without long decumbent hairs mesally in *C. manaka*), mid femur with three stiff setae at apex (these setae lacking in *C. manaka*) and the fore coxa being white (brown in *C. manaka*).

Description. **Male**. Body length: 1.8 mm. Wing length: 2.0 mm.

Head. Shining black; oc and vt black, about one-half length of antennal arista; face constricted at middle, eyes holoptic, contiguous below antennae for length of 2 ommatidia; palp small, dark brown; proboscis dark brown, slightly extending below eye in lateral view; antennae dark brown; postpedicel conical with pointed apex, length about 3.5× greatest width; arista length subequal to head height.

Thorax. Dorsum of mesoscutum, scutellum, and pleura dark brown; thoracic setae long, strong, black: 3 dc; 2 np; 1 ph; 1 pa; 1 sc; ac absent; halter stem and knob white.

Legs. CI white, with 4 strong white setae apically, numerous smaller curved stiff setae; CII and CIII dark brown; FIII brown, yellow at extreme apex; remainder of legs pale yellow; foreleg and hindleg unmodified, without MSSC; midleg (Fig. 4) with FII with three minute setae ventromedially, small patch of three strong curved setae at extreme apex and three long curved hairs basally (MSSC); TiII (Fig. 4) with row of setae along mesal surface, setae becoming longer and more decumbent toward apex (MSSC), lateral surface with 2 very strong, long black setae medially (MSSC) mixed with rows of much short finer decumbent hairs;. IIt_1 and remainder of tarsi without MSSC.

Figure 4. *Campsicnemus brunnifemur*, n. sp., mid femur, tibia, and basitarsus.

Wing. Subhyaline, with typical venation for *Campsicnemus*.

Abdomen. Tergites dark brown, each tergite with short stiff curved black hairs dorsally; sternites dark brown. Hypopygium dark brown, not dissected.

Female. As in male except for lack of MSSC.

Etymology. The specific name derives from the Latin *brunni-* [= brown] + *femur*; referring to the brown hind femur.

Remarks. Both *Campsicnemus manaka* and *C. brunnifemur* were collected at Koke‘e and are similar to each other in some characters, but differ considerably in other characters that I am confident in treating it as a separate species.

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Additions and amendments to the Hawaiian flora 2025[1]

Miles Thomas[2,4], Karl Magnacca[3,5], Scott Heintzman[4], Susan Deans[4], Kevin Faccenda[2]

A comprehensive analysis of the native Hawaiian flora has revealed several taxonomic questions that are addressed here. Among these are distributional corrections for *Acacia heterophylla* subsp. *koaia*, *Canavalia pubescens*, *Carex wahuensis* subsp. *herbstii*, and *Clermontia lindseyana*. New combinations are provided for *Dracaena hawaiiensis*, *Hibiscus hannerae*, and *Touchardia sandwicensis*, along with new hybrid combinations in *Cibotium* and *Adenophorus*. These changes are to be reflected in an upcoming checklist of the Hawaiian flora (Imada *et al.* in prep.) and for the book *Ferns and lycophytes of the Hawaiian Islands* (Palmer & Thomas in press). All specimens are stored at the Bernice Pauahi Bishop Museum (BISH) unless otherwise noted.

Asparagaceae

Dracaena hawaiiensis (O.Deg. & I. Deg.) Magnacca, **comb**. **nov**.

Basionym: *Pleomele hawaiiensis* O.Deg. & I. Deg., Fl. Haw., fam. 68. 1980.

≡ *Chrysodracon hawaiiensis* (O.Deg. & I.Deg.) P.L.Lu & Morden, Syst. Bot. 39: 101. 2014.

= *Dracaena hawaiiensis* Fosberg, Occas. Pap. Bernice P. Bishop Mus. 23: 32. 1962, nom. inval.

= *Pleomele hawaiiensis* O.Deg., Fl. Haw., fam. 68. [sub] *Pleomele aurea.* 1932, nom. nud.

= *Pleomele konaensis* H.St.John, Pacific Sci. 39: 185 (1985).

≡ *Dracaena konaensis* (H.St.John) Jankalski, Sansevieria 18: 21. 2008, nom. superfl.

= *Pleomele kaupulehuensis* H.St.John, Pacific Sci. 39: 183. 1985.

The Hawai‘i Island species of halapepe (also known as le‘ie) has had a confusing nomenclatural and taxonomic history. *Pleomele hawaiiensis* O.Deg. was first published as a *nomen nudum*, as it was only passingly referenced during the treatment of *Pleomele aurea* (H.Mann) N.E.Br. (Degener 1932). This name was later transferred to *Dracaena hawaiiensis* (Fosberg 1962), but this name is both invalidly published as it is based on a *nomen nudum* basionym (Art. 41.5) and is illegitimate and superfluous as it includes the validly published *Pleomele fernaldii* H.St.John in synonymy (Art. 52.1; Turland *et al*. 2018). A valid name for the Big Island halapepe was finally provided when Degener and Degener (1980) effectively published *Pleomele hawaiiensis* O.Deg. & I.Deg.

However, Jankalski (2008), while transferring all *Pleomele* to *Dracaena*, created the new combination *Dracaena konaensis* (H.St.John) Jankalski using the basionym *Pleomele konaensis* H.St.John. This combination by Jankalski is superfluous, as it includes *Pleomele hawaiiensis* O.Deg. & I.Deg. in its synonymy (Art. 52.1; Turland *et al*. 2018),

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despite this name having five years of priority over their basionym *Pleomele konaensis* H.St.John, published by St. John (1985). Therefore, we create a new combination in *Dracaena* using the basionym with the oldest priority.

Campanulaceae

Clermontia lindseyana Rock **Correction**

In the *Manual of the Flowering Plants of Hawai'i* (Wagner *et al.* 1990:431), the distribution of *Clermontia lindseyana* is given as East Maui and Hawai'i. Reviewing the Maui specimens at BISH, we found that all specimens formerly identified as *C. lindseyana* are best identified as *C. kakeana* Meyen (*Oppenheimer H90637*, *Rock 8688*, *R. Hobdy s.n.* [BISH 572237], *C.N. Forbes 1888M*). Some of these specimens were also formerly annotated as *C. kakeana* by Richard Pender (OSH) in 2013. Pending further studies, the distribution of *C. lindseyana* is restricted to the island of Hawai'i.

Cibotiaceae

Cibotium* ×*palmeri Miles K.Thomas, **nothosp**. **nov**.
(Fig. 1)

Holotype: Hawai'i, O'ahu, northern Wai'anae Mountains, Ka'ala summit, near boardwalk with both parents, 1200 m elevation, 13 Aug 2025, *M.K. Thomas 1175* (BISH!).

Description: Intermediate between *Cibotium glaucum* (Sm.) Hook. & Arn. and *C. menziesii* Hook. (Fig. 2). Caudex up to 1 m tall. Petioles 1–1.5 m long, 3–5 cm thick, base rough-hairy as in *C. menziesii*, covered in a mix of rigid dark red and soft tan hairs, (on some fronds, the hairs mostly red). Fronds deltate, 1–1.5 m long, 1 m wide, coriaceous, undersurface semi-glaucous, some of the ultimate segments nearest the midrib bearing small auricles as in *C. glaucum* but not uniformly found on all fronds. Sterile fronds 2-pinnate-pinnatifid, ultimate segments typically 0.5 cm long from tip to sinus, mostly cut halfway to the costules, sometimes ⅓ of the way. Fertile fronds 3-pinnate, cut all the way to the costules, with revolute margins.

In August 2025 a small mixed patch of *Cibotium glaucum* and *C. menziesii* was studied at the summit of Ka'ala, O'ahu. Within this patch several plants of intermediate character were noted, displaying a range of variability in hair and frond pinnae characters, often on a single plant. Despite a lack of genetic study, this situation clearly suggests that hybridization is taking place between *C. glaucum* and *C. menziesii*. This hybrid will most likely be found wherever the two parents exist sympatrically and will likely vary in character along a range of intermediates. The selected holotype displays the best representation of this mix of characters. This hybrid will be recognized in the field by the combination of stiff, dark-red and softer lighter colored hairs on the petiole and the semi-glaucus undersurface of the frond. The basiscopid pinnules will often bear small auricles, although these will be somewhat less pronounced than that of *Cibotium glaucum*. The name *Cibotium* ×*palmeri* honors the late Daniel D. Palmer, who was an authority on the Hawaiian species of *Cibotium* and author of *Hawai'i's Ferns and Fern Allies* (Palmer 2003).

Material examined: **O'AHU**: Manana Ridge trail, 520 m, 4 Jun 1992, *D.D. Palmer 876* (BISH!); summit of Ka'ala, 8 Apr 1992, *D.D. Palmer 865* (BISH!).

Figure 1. Field photos of *Cibotium* ×*palmeri*: **A**, frond. **B**, undersurface of frond. **C**, ultimate segments of frond from the holotype. **D**, hairs on the petiole base from the holotype. **E**, caudex of plant with size 10 boot for scale. **F**, *Cibotium* ×*palmeri* pinnule (left) compared to *C. menziesii* (right).

Cyperaceae

Carex wahuensis C.A.Mey. subsp. ***wahuensis*** **New synonymy**

= *Carex wahuensis* subsp. *herbstii* T.Koyama.

Carex wahuensis subsp. *herbstii* was published by T. Koyama (Wagner *et al.* 1989) and accepted by Wagner *et al.* (1990) as an O‘ahu endemic subspecies. However, recent fieldwork has shown a continuous variation between this narrow-leaved form and the wider-leaved, nominate subspecies, with both forms often occurring within meters of one another (e.g., *Perlman et al. 21101*). Such observations have also been made in Wailupe by Miles K. Thomas and Kobey Togikawa of the O‘ahu Plant Extinction Prevention Program. On the basis of this continuous variation it does not seem appropriate to accept *C. wahuensis* subsp. *herbstii* as a biologically valid subspecies and we hereby synonymize it with the nominate subspecies.

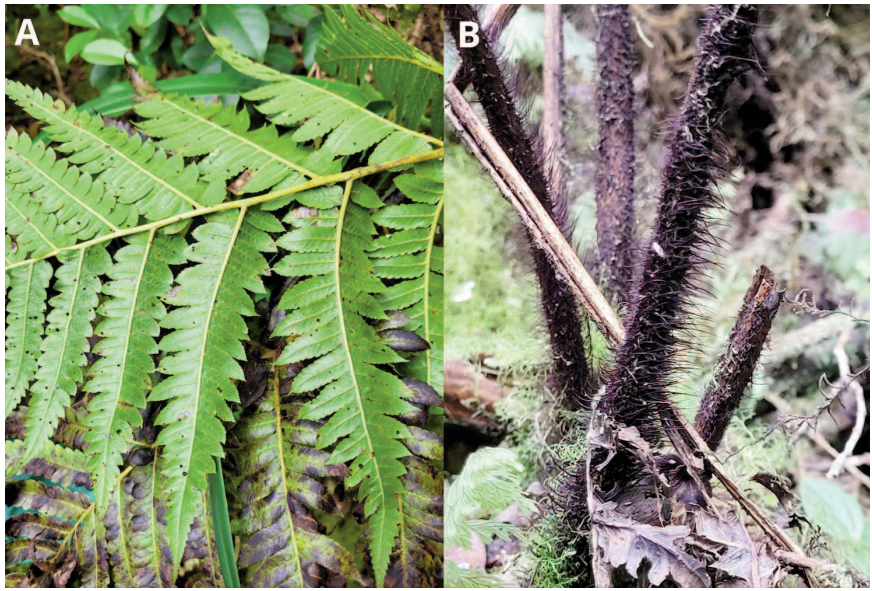

Figure 2. *Cibotium menziesii* sensu stricto: **A**, undersurface of frond. **B**, stiff, dark red hairs on petiole base.

Fabaceae

Acacia heterophylla (Lam.) Willd.

subsp. ***koaia*** (Hillebr.) Morden & Faccenda **New island record**

Acacia heterophylla subsp. *koaia* was noted as occurring on "perhaps O'ahu" (as *Acacia koaia*; Wagner & Herbst 1999) but never unambiguously published, although two well known populations have existed for decades. St. John (1979) highlighted that in the 1930s, seed from all variations of Hawaiian *Acacia* from across the islands were mixed together and used in reforestation practices by the Board of Agriculture and Forestry. This mixed seed batch almost certainly contained what is now recognized as *A. koaia* from other islands, but the location of these plantings is not precisely known and assumed to be widespread across several O'ahu forest reserves.

Collections of this species made in Wa'ahila and Wailupe confirm the existence of *A. koaia* on O'ahu. A single remnant tree on Wa'ahila Ridge is possibly from a forestry planting in the early 1900s, as that ridge was extensively planted with reforestation species, including koa (Skolmen 1980), and its morphology is typical of the material that comes from Hawai'i Island. The Wailupe population, however, has slightly wider pods but maintains the longitudinal seed orientation typical of koai'a. This Wailupe locality is composed of over 20 trees that form a cluster on a steep slope off a ridge in an area that was unlikely to be affected by reforestation efforts, since the topography is very steep, with the surrounding vegetation dominated by old growth *Diospyros*, *Metrosideros*, *Sideroxylon*, *Planchonella*, *Notelaea*, and other native taxa that are generally slow growing.

Observations by Miles Thomas and Ryan Chang in ʻAiea show that there are intermediates between koa and koaiʻa, where a single tree can bear transverse, diagonal, and longitudinal seeds within separate pods on different branches (Miles Thomas, pers. obs., 2024). It is possible that plants of *Acacia heterophylla* subsp. *koaia* exist nearby or in the adjacent mesic forests of the central Koʻolau Mountains and should be searched for to confirm its presence.

Material examined. **Oʻahu**: Southeastern Koʻolau Mountain Range, Waʻahila, 300 m, 15 Aug 2023, *M.K. Thomas & R. Chang 596*; Waʻahila Ridge, 27 Aug 1998, *D. Chung s.n.* (BISH 652754); Wailupe, east branch of central ridge overlooking Laulaupoe Gulch, 430 m, 4 Jun 2025, *M.K. Thomas et al. 1132.*

Canavalia pubescens Hook. & Arn. **Correction**

Canavalia pubescens was previously reported from the islands of Kauaʻi and Niʻihau in the *Manual of the Flowering Plants of Hawai'i* (Wagner *et al.* 1990). Kauaʻi botanists noticed that all of the extant populations previously referred to as *C. pubescens* should be re-evaluated due to the lack of differences with nearby populations of *C. napaliensis* H.St.John (Scott Heintzman, pers. obs.). Upon re-examination and comparison to the type specimen and other material from Lānaʻi and Maui housed at the Bishop Museum, it was determined that the Kauaʻi and Niʻihau plants (*St. John 23637*, *Stokes s.n.* [BISH 642542], *C. Christensen 47*, *St. John 23163*, *Neal s.n.* [BISH 54945], *Forbes 56K*, *Christensen 233*, *Hobdy 2*) are typical of *C. napaliensis*, based on the seed morphology, as well as the thin texture and sparse hairs of the leaves. Most of the Kauaʻi specimens were originally annotated as *C. napaliensis* prior to publication of the *Manual* (Wagner *et al.* 1990) and they have been re-annotated back to this name.

Malvaceae

Hibiscus hannerae (O.Deg. & I.Deg.) S. M. Heintzman & S. M. Deans, **comb**. **et stat**. **nov**. **Basionym**: *Hibiscus waimeae* A.Heller var. *hannerae* O.Deg. & I.Deg., Fl. Haw., fam. 221. *Hibiscus waimeae*. 1962.

Originally described as *Hibiscus waimeae* var. *hannerae* O.Deg. & I.Deg. (Degener & Degener 1962), and later reclassified as a subspecies (Wagner *et al.* 1990), *H. waimeae* subsp. *hannerae* is restricted to the northern portion of Kauaʻi and is geographically isolated from populations of *H. waimeae* subsp. *waimeae*. The two varieties occupy distinct habitats—*H. waimeae* subsp. *hannerae* occurs in wet forests, whereas *H. waimeae* subsp. *waimeae* is found in mesic to dry forests. Additional evidence for their separation comes from differences in floral morphology: the flowers of subsp. *hannerae* are smaller than those of subsp. *waimeae.* Calyx tubes range from 1–2 cm long in subsp. *hannerae,* and 2.5–4.5 cm in subsp. *waimeae* (S. Deans, unpubl. data), with similarly smaller corolla, staminal column, and involucral bracts. Genetic analyses by Huppman (2013) further support this distinction, revealing that *H. waimeae* subsp. *waimeae* is genetically closer to the Molokaʻi species *H. immaculatus* M.J.Roe than to *H. waimeae* subsp. *hannerae*. Based on Huppman's genetic work, the isolated populations, and field observations by Kauaʻi botanists, this taxon is best treated at the species level as *Hibiscus hannerae*.

Hibiscus waimeae A.Heller **Note**

Formerly recognized at the subspecific rank by Wagner *et al.* (1990), *Hibiscus waimeae* subsp. *waimeae* is best recognized at the specific level (see further discussion for *H. hannerae* above).

Polypodiaceae

Adenophorus* ×*bishopii W.H.Wagner ex Miles K.Thomas, **nothosp**. **nov**.

Holotype: Hawai‘i, O‘ahu, Pu‘u Lanihuli, growing epiphytically with both parents, 1400 ft elevation, 3 Nov 1968, *L.E. Bishop A110368* (HAW!).

Description: Plants small, epiphytic, growing with one or both parents. Rhizomes short, erect. Fronds 3–10 cm long, erect or arching, foliar trichomes few and scattered over dorsal surface, of 2–6 cells, often glandular. Stipes 0.2–0.5 mm in diameter, terete at very base, soon alate distally and merging with the lamina. Blades coriaceous, long-elliptic, incised 2/3 the way to the midrib or less, with obliquely deltoid to oblong lobes or occasionally merely crenate, often provided with an unlobed elongated apex when well developed (occasionally bifurcating in some plants). Veins in each lobe generally 1–3-forked, rarely somewhat pinnate in the largest lobes, if once-forked, then with furcation usually in the proximal half of vein. Sori 1–2 mm in diameter, developed to the apex of fully fertile fronds, mostly solitary on each lobe; glandular paraphyses present. Sporangia with 10–12 thickened bow cells; spores fertile or not, mostly 36–45 µm in diameter.

This taxon was first described by Luther Earl Bishop (Bishop 1974) in his monograph on the genus *Adenophorus* as a hybrid between *Adenophorus oahuensis* L.E.Bishop and *A. pinnatifidus* Gaudich. This O‘ahu endemic is currently only known from the Ko‘olau Mountains. In this monograph, he only listed the hybrid combination and a description. In an unpublished checklist, Warren H. Wagner elevated the former subgenus *Oligadenus* to genus level and made combinations for several species. In that same checklist, he provided the hybrid name *Oligadenus* ×*bishopii* but never formally described it. Currently, subg. *Oligadenus* is no longer recognized based on molecular studies by Ranker *et al*. (2003). Here we formally describe the nothospecies *Adenophorus* ×*bishopii*. This hybrid is named in honor of Luther Earl Bishop (1943–1993).

According to Bishop (1974), the frond form of the hybrid is variable, and extremes may superficially resemble either parent. However, this hybrid is readily distinguished from *Adenophorus pinnatifidus* by the comparatively small, fertile fronds with very irregularly crenated to sinuous margins and by the long-caudate frond tip. Bishop also notes that a large proportion of the hybrid plants show affinities to *Adenophorus haalilioanus* (Brack.) K.A.Wilson, but can be separated by the very irregular lobing of the fronds and the forking of the veins. Examination of the spores shows that this hybrid is at least partially fertile (D. Palmer, pers. comm., 2022), but the hybrid is rare and seems to only appear where the two parents are found.

Material examined: **O‘AHU**: Pālolo Crater, 14 Jun 1908, *H.L. Lyon s.n.* (BISH!); Pālolo, large boulder along streambed, 1100 ft, 30 May 1988, *W. Takeuchi 3883* (BISH!).

Urticaceae

Touchardia sandwicensis (Wedd.) Magnacca, **comb**. **nov**.

Basionym: *Urera sandwicensis* Wedd., Ann. Sci. Nat., Bot., sér. 4, 1: 178. 1854.

= *Procris glabra* Hook. & Arn., Bot. Beechey Voy.: 96 (1832).

≡ *Urera glabra* (Hook. & Arn.) Wedd., Arch. Mus. Hist. Nat. 9: 149 (1856).

≡ *Urera sandwicensis* var. *glabra* (Hook. & Arn.) Wedd., de Candolle, Prodr. 16: 92. (1869).

≡ *Touchardia oahuensis* T. Wells & A.K. Monro, Molecular Phylogenetics and Evolution, 158(201) p. 13 (2021).

= *Urera glabra* var. *mollis* Wedd., Arch. Mus. Hist. Nat. 9(1–2): 149 (1856-1857).

≡ *Urera sandwicensis* var. *mollis* (Wedd.) Wedd., de Candolle, Prodr. 16: 93. (1869).

= *Urera konaensis* H.St. John, Pacific Sci. 30: 11 (1976).

= *Urera sandwicensis* var. *kauaiensis* Rock, Indig. trees Haw. Isl. 123. (1913).

Wells *et al.* (2021) published the name *Touchardia oahuensis* T.Wells & A.K.Monro as a replacement name for *Urera glabra* (Hook. & Arnott) Wedd. when placed in *Touchardia*, due to its being precluded by *Touchardia glabra* H.St.John. However, under Article 11.4, a new name should be chosen only if no other specific epithets are available among existing synonyms (Turland *et al.* 2018). In this case, the next available specific epithet is *Urera sandwicensis* Wedd., a name by which it had previously been long commonly known (Wagner *et al.* 1990). Therefore, we make this new combination to make the name available.

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