OCCASIONAL PAPERS
OF
BERNICE P. BISHOP MUSEUM
HONOLULU, HAWAII

Volume XV | May 20, 1940 | Number 25

Synopsis of the Genera of Hawaiian Cossoninae with Notes on Their Origin and Distribution
(Coleoptera, Curculionidae)

By ELWOOD C. ZIMMERMAN
ENTOMOLOGIST, BERNICE P. BISHOP MUSEUM

INTRODUCTION

The principal purposes of this paper are to present a key for the identification of the genera of Cossoninae found in Hawaii and briefly to discuss each genus in the light of its endemicity, derivation, and distribution.

The supraspecific classification of the Cossoninae is chaotic. A complete revision of the subfamily is greatly needed. The genera must be evaluated and redefined; many need to be united and numerous new genera must be erected. Such a revision can be done only by an experienced monographer working probably at the British Museum, where, I have been told, most of the genera and more than 80 percent of the species are represented. I hope that such a revision soon will come from Sir Guy Marshall.

The Cossoninae reach their peak of development in the Indo-Pacific regions; but it is in those vitally important areas that we know, comparatively speaking, the least about the group. The insular regions of the world support many times the number of species on the continents, and the subfamily has come to be looked upon as one of the most successful colonizers of islands. In Polynesia, especially, the Cossoninae form one of the major components of the terrestrial faunas.

In Hawaii there are only three subfamilies of Curculionidae which have developed endemic species in the islands: Otiorrhynchinae,

Cryptorhynchinae, and Cossoninae. The Otiorrhynchinae are represented by one genus, *Rhyncogonus,* which is widely distributed in Polynesia east of Samoa; it contains 34 endemic Hawaiian species. The Cryptorhynchinae are represented by two genera: *Acalles,* which is world-wide, but composite, and which contains 22 endemic Hawaiian species, and *Chaenosternum,* which is endemic and contains one species. The Cossoninae are represented by 12 genera, which have 106 endemic species among them; and 7 of these 12 genera are considered endemic to Hawaii. These relationships can be graphically expressed in percentages as follows: 80 percent of the Hawaiian curculionid genera which include endemic species are Cossoninae, 13.3 percent are Cryptorhynchinae, and 6.6 percent are Otiorrhynchinae. There are 163 species of Hawaiian Curculionidae considered endemic products, of which 65 percent are Cossoninae, 20 percent Otiorrhynchinae, and 14 percent Cryptorhynchinae. Samoa has 12 subfamilies of Curculionidae that have developed endemic species in those islands. If for the sake of comparison, we exclude all the others and consider only the genera of Samoan Otiorrhynchinae, Cryptorhynchinae, and Cossoninae that contain endemic species, we have the following results: 60 percent are Cossoninae, 33 percent Cryptorhynchinae, and 6 percent Otiorrhynchinae.

The endemic Hawaiian Cossoninae average 8.1 species to the genus; the endemic Samoan species average only 1.3 species to the genus; this average is weighted on the Hawaiian side by the extensive developments of the genera *Dryopthorus* and *Oodemas,* particularly. This differential may be changed by more careful collecting in Samoa, but the ratio will not come near to that of the Hawaiian fauna. Much more speciation has gone on in the Hawaiian genera than in the Samoan genera. This can be interpreted as meaning that greater age and, most significantly I believe, greater, more constant, and more prolonged isolation must be attributed to the Hawaiian cossonine fauna. Any discussion of the origin and development of the endemic components of the Hawaiian fauna must, I believe, take into consideration that long chain of remnants of islands lying to leeward of the major Hawaiian islands from Kauai to Midway and Kure (Ocean) Islands. Apparently the outlying islands affected some groups, but not others. Biologists believe that parts of the Hawaiian

fauna indicate greater ages for the islands than those set forth by most geologists. However, without diverging greatly from the opinions of some geologists one might consider some of the outlying Hawaiian islands (Nihoa to Kure) to have been more extensive and higher during the Tertiary. Perhaps some of them supported a considerable flora and fauna, even as far back as middle Tertiary times; and perhaps some of the more aberrant and anomalous genera had their beginnings in the leeward islands.

Of all the oceanic islands, the Hawaiian Archipelago seems to me to present the most aberrant and anomalous insect fauna, and the most difficult of interpretation. Many of its genera are peculiar isolates whose relationships are most cryptic and whose allies are masked or have evidently been lost among the dregs of the evolution of the Pacific faunas.

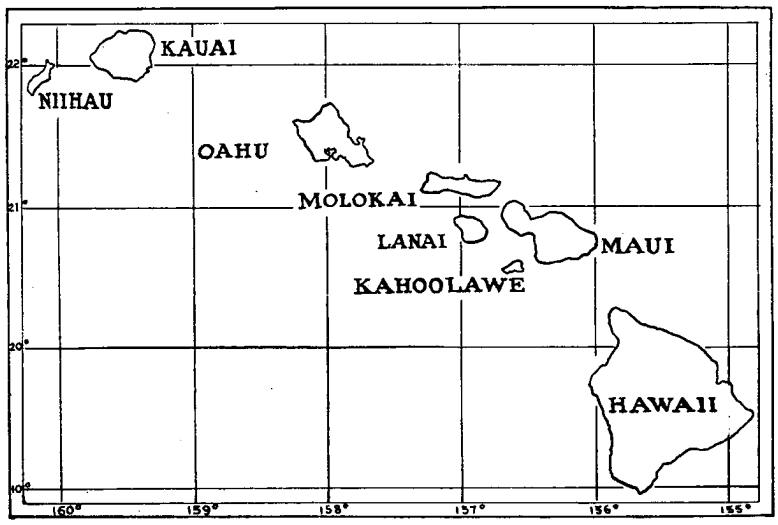

FIGURE 1.

The distribution of endemic species among the main islands (map, fig. 1) presents some interesting and pertinent facts. It is generally agreed by geologists, I understand, that the islands are successively younger from Kauai on the north to Hawaii with its active volcanoes on the south, a thesis substantiated by biologists.

The number of endemic species per island is not proportionate to the size of the island. If we tabulate the number of species of Cossoninae with the islands arranged roughly according to age, the results are as follows:

TABLE 1

ISLAND	AREA IN SQUARE MILES	NUMBER OF GENERA CONTAINING ENDEMIC SPECIES	NUMBER OF ENDEMIC[1] SPECIES AND SUBSPECIES
Kauai	555	6	29
Oahu	604	5	22
Maui	728	3	15
Molokai	260	2	3
Lanai	141	1	2
Hawaii	4,030	2	6

[1] By endemic species, I mean here those indigenous species which are confined to one island only.

The totals for the islands of Molokai and Lanai are less accurate than for the others, because they are small islands with limited areas of undisturbed native forest, and they have not been adequately explored. Lanai and Molokai are close to Maui and are considered by Stearns to have been connected, above water, with Maui. A number of species of Hawaiian insects inhabit all three of these islands, or one or the other and Maui. Some Maui species have "varieties" on Molokai or Lanai.

Kauai is the richest island in species and is inhabited by representatives of all of the endemic Hawaiian cossonine genera, and one endemic genus (*Dyssoma*) is confined to Kauai. It is probable that most of the endemic cossonine genera underwent considerable evolution and speciation on Kauai before their representatives were distributed southeastward among the other islands.

The orderly picture of distribution presented by the Cossoninae is not true of all groups of beetles, however. In some families, certain genera evidently arrived in the archipelago after some of the younger islands were formed, speciating greatly on certain islands but not reaching others. The Carabidae is such a group. In the Nomiini (Carabidae), for example, at least 78 species have been described,

but no specimen has ever been found on Kauai. These species are distributed as follows: Oahu 3, Maui 41, Molokai 18, Lanai 2, Hawaii 14. However, Kauai is the headquarters for the Bembidiini (Carabidae), and the development and distribution of that group parallels that of the Cossoninae. In "Fauna Hawaiiensis", there were recorded seven genera containing endemic Bembidiini on Kauai, but only three genera are represented among all of the other islands. Kauai has 14, Oahu 5, Maui 5, Molokai 4, Lanai none, and Hawaii 1 endemic species.

Key to the Genera of Hawaiian Cossoninae

1. Antennal funicle 4-segmented 2
   Antennal funicle 5- or 7-segmented 3

2(1). Eyes distant from the prothorax, widely separated below ..... **Dryopthorus.**
   Lower ends of the eyes contiguous to the prothorax, only narrowly separated below ..... **Stenommatus.**

3(1). Antennal funicle 5-segmented 4
   Antennal funicle 7-segmented 8

4(3). Antennal scape reaching back to or distinctly past the hind margin of the eye 5
   Antennal scape not reaching back beyond the middle of the eye, never reaching to the hind margin 6

5(4). Distance between the fore and mid coxae almost as long as the distance between the mid and hind coxae; scrobes passing rapidly downward and not at all directed toward the eyes ..... **Dryotribus.**
   Distance between the fore and mid coxae only about one half as long as the distance between the mid and hind coxae; scrobes evidently expanded against the eye and not narrow and rapidly passing downward at a distance from the eyes . . . . part (s. str.) of **Stenotrupis.**

6(4). Body rather densely clothed above with long, fine, prostrate, conspicuous, golden, hairlike setae; head not at all constricted behind the eyes ..... **Orothreptes.**
   Body with at most short, minute, or inconspicuous setae, never conspicuously and densely clothed with golden hair; head constricted behind the eyes at least on the sides 7

7(6). Intercoxal process of the prosternum as broad or broader than a fore coxa; cephalic constriction at the hind margins of the eyes ..... **Pentarthrum.**
   Intercoxal process of the prosternum narrower than the breadth of a fore coxa; cephalic constriction distant from the eyes ..... part (s. l.) of **Stenotrupis.**

8(3). Antennal scape reaching distinctly behind the fore margin of the prothorax, funicular segments filiform, all slender and elongate; rostrum very long and slender, distinctly longer than the prothorax; large insects, usually more than 10 mm. long excluding the rostrum ..... **Nesotocus.**

Antennal scape not reaching the fore margin of the prothorax, funicular segments at least in part short, compact, moniliform or transverse; rostrum not so elongate; smaller insects 9

9(8). Fore coxae very narrowly separated, usually subcontiguous, hind coxae not far behind the mesocoxae; metepisterna not visible; body robust, strongly convex dorsally and laterally 10

Fore coxae not subcontiguous, moderately to widely separated; hind coxae usually not close to the mesocoxae; metepisterna visible; body usually rather elongate and narrow (*Heteramphus* excepted) 11

10(9). Eyes dorso-lateral, not visible when the head is viewed from beneath, interocular area narrower than the greatest chord of an eye ..... **Anotheorus.**

Eyes lateral, distinctly visible when the head is viewed from beneath, interocular area much broader than the greatest chord of an eye ..... **Oodemas.**

11(9). Scutellum invisible ..... **Heteramphus.**

Scutellum visible (check your specimens carefully) 12

12(11). Third tarsal segment subtruncate or emarginate but not bilobed 13

Third tarsal segment bilobed 15

13(12). Antennae inserted beyond the middle of the rostrum; scrobes parallel with the longitudinal axis of the rostrum, directed straight back to the eyes; eyes greatly reduced in size, only three or four facets broad, their longitudinal diameters less than the thickness of the apex of a scape ..... **Dysomma.**

Antennae inserted behind the middle of the rostrum; scrobes distinctly passing obliquely downward below the eyes; eyes normal, many facets broad, their longtitudinal diameters about twice or more than twice as great as the apex of a scape 14

14(13). Rostrum slightly but obviously narrowed from base to apex, the lateral outline almost straight and continuous from the apex to the inner hind edge of the eyes; eyes hardly interrupting the lateral contours of the head, hardly protuberant ..... **Macrancylus.**

Rostrum slightly expanded beyond the antennae, obviously not narrowed from the base to apex, the lateral outline not at all continuous from apex to the inner hind margins of the eyes; eyes obviously protuberant and interrupting the lateral cephalic outlines ..... **Phloeophagosoma.**

15(12). Rostrum shorter beyond the eyes than the head; dorsum clothed with long, fine, prostrate hair ..... **Deinocossonus.**

Rostrum longer beyond the eyes than the head; dorsum not hirsute 16

16(15). Distance between the eyes and the insertion of the antennae much greater than the greatest chord of an eye (about one and one half times as long); third hind tarsal segment obviously broader than the second ..... **Oxydema.**

Distance between the eyes and the insertion of the antennae not greater than the greatest chord of an eye; third hind tarsal segment hardly broader than the second ..... **Aphanocorynes.**

TRIBE COSSONINI

Genus **DRYOPTHORUS** Schoenherr

Dryopthorus Schoenherr (24, p. 332).[2]

This genus contains 37 species. It reaches its greatest development in Hawaii, where 17 of the species are found. The other 20 described species are recorded from Madagascar, the Seychelles, Guadaloupe, Europe, Ceylon, Lifu, New Guinea, New Caledonia, New Zealand, Samoa, Cocos Islands, North and Central America. All of these extra-Hawaiian localities have but one species recorded from each of them with the exception of Madagascar with six, Guadaloupe with two, and Samoa with two species. With further extermination of extra-Hawaiian forms, a condition parallel to, and not unlike the distribution and development of the aglycyderid genus *Proterhinus* would obtain. The genus has a more continuous distribution in the Pacific than is indicated, however, for I have seen or collected a number of undescribed species from various islands of Polynesia. (See map, fig. 2.)

The Hawaiian species have been keyed by Swezey (27, pp. 285-286). Most of them are rather common, widespread insects. They are often found in flocks beneath dead bark or in decaying wood.

Genus **STENOMMATUS** Wollaston

Stenommatus Wollaston (29, p. 442).

This genus is very closely allied to *Dryopthorus*. It contains four species: one each from Panama and Mexico, one from India, and one widespread Pacific species (*S. musae* Marshall, 1920), which is evidently Indo-Malayan in origin. *S. musae* was described from Hawaii but is now known from Java, and I have seen a specimen from Tahiti. It is omitted from "Coleopterorum Catalogus." This species is occasionally taken in numbers from decaying banana stumps.

Genus **DRYOTRIBUS** Horn

Dryotribus Horn (12, p. 433).

Thalattodora Perkins (16, p. 146). Synonymy by Champion (8, p. 123).

[2] Numbers in parentheses refer to Bibliography, p. 292.

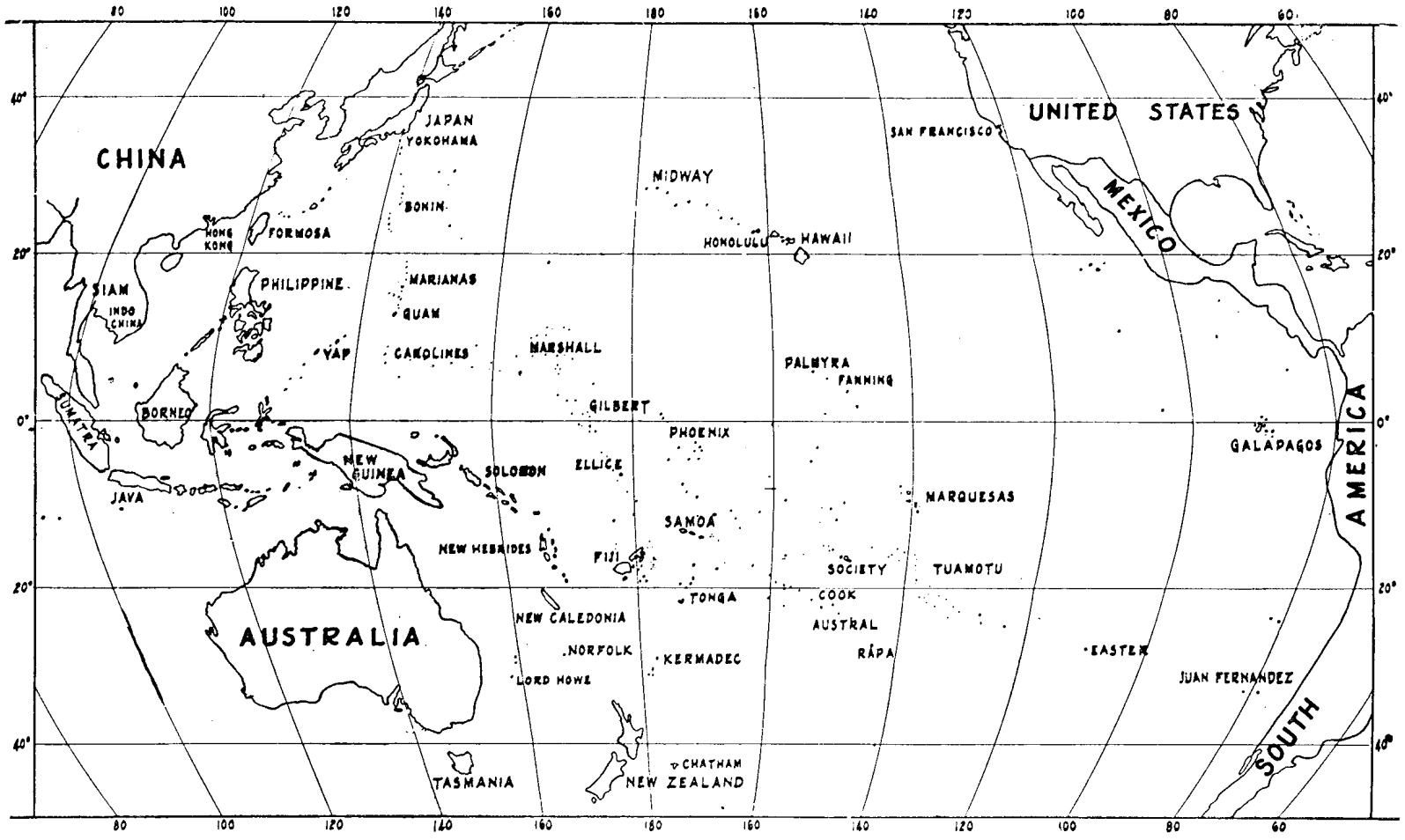
80
100
120
140
160
180
160
140
120
100
80
60
40°
20°
0°
20°
40°
CHINA
JAPAN
YOKOHAMA
BONIN
HONG KONG
FORMOSA
PHILIPPINE
SIAM
INDO CHINA
MARIANAS
GUAM
YAP
CAROLINES
MARSHALL
GILBERT
BORNEO
SUMATRA
JAVA
NEW GUINEA
SOLOMON
ELLICE
PHOENIX
NEW HEBRIDES
FIJI
SAMOA
TONGA
NEW CALEDONIA
NORFOLK
LORD HOWE
AUSTRALIA
TASMANIA
KERMADEC
CHATHAM
NEW ZEALAND
MIDWAY
HONOLULU
HAWAII
PALMYRA
FANNING
SAN FRANCISCO
UNITED STATES
MEXICO
GALAPAGOS
MARQUESAS
SOCIETY
TUAMOTU
COOK
AUSTRAL
RAPA
EASTER
JUAN FERNANDEZ
SOUTH AMERICA

FIGURE 2.

This genus was described as American by Horn and has been considered so for many years. It was later shown that *Thalattodora* Perkins was a synonym and that the genotype of *Thalattodora* was the same as the genotype of *Dryotribus* found in driftwood in Florida and the West Indies. In more recent years *Dryotribus mimeticus* has been shown to have a wide distribution in the Pacific and is now recorded from the main and outlying Hawaiian islands, Wake Island, Australia, and the Ryukyu Islands. Three more species have been described from the Pacific (two from the outlying Hawaiian islands and one from the Sunda Islands), but no other species has been found in America. I believe, therefore, that the genus *Dryotribus* is a Pacific genus, and that the single species found in America is truly a Pacific species that has been carried to America by man.

Key to Hawaiian Dryotribus

1. Rostrum not or hardly expanded on the dorso-lateral margins from the base to the apices of the scrobes, the interocular area hardly narrower than the dorsal breadth at the antennae.....**D. solitarius** Perkins.
   Rostrum conspicuously expanded on the dorso-lateral margins from the base to the apices of the scrobes, the interocular area obviously narrower than the dorsal breadth at the antennae, usually about two thirds as broad..... 2
2. Postocular constriction shallowly and inconspicuously impressed across the dorsum; antennal scape very slender in the basal two thirds and thence clavate, the broadest part of the apical third twice as broad as the middle; elytral intervals not conspicuously coarsely sculptured.....**P. wilderi** Perkins.
   Postocular constriction deeply, angulately, conspicuously impressed across the dorsum; antennal funicle evenly and gradually widened from base to apex, the apex not twice as broad as the middle; elytral intervals coarsely sculptured, usually asperate or tuberculate.....**D. mimeticus** Horn.

Genus STENOTRUPIS Wollaston

Stenotrupis Wollaston (29, p. 447).

Dioedimorpha Broun (6, p. 489). Synonymy by Champion (8, p. 13).

The described members of this genus total 29; two are endemic to Hawaii and one has been introduced from Samoa. The other described species are recorded principally from Madagascar, the Seychelles, Malaya, New Guinea, New Zealand, Samoa, Panama, and Cuba. Many species from numerous Pacific islands await description. Most of the species breed in palms and ferns.

When I wrote the key to the Hawaiian species, I was not aware that *Pentarthrum pritchardiae* Perkins (1926) from Nihoa Island was a *Stenotrupis*. My key may be recast as follows:

KEY TO THE HAWAIIAN STENOTRUPIS

1. Head with the subbasal constriction inconspicuous, shallowly impressed on the sides and not impressed across the dorsum; scrobes deep, passing rapidly beneath, separated by a very narrow median carina between the eyes on the under side of the head; on sugar cane and other introduced plants in the lowlands.....**S. marshalli** Zimmerman.
   Head with a very prominent subbasal constriction continued deeply across the dorsum; scrobes lateral, short, rather shallow, not subcontiguous on the lower side of the head..... 2
2. Antennae inserted at distinctly more than the length of an eye in front of the eyes; elytra not conspicuously hirsute at the apex; in tree ferns in the mountains of the main islands—**S. prolixa** (Sharp) Champion.
   Antennae inserted nearer to the eyes than the length of an eye; elytra with long, fine, erect, conspicuous hair at the apex; in *Pritchardia* palms on Nihoa Island.....**S. pritchardiae** (Perkins), new combination.

Genus **OROTHREPTES** Perkins

Orothreptes Perkins (16, p. 147).

This is a monotypic genus based on a species that has been found on Kauai, Oahu, and Hawaii. I doubt that it will be endemic to Hawaii alone when collections from other parts of the Pacific have been more adequately studied. Perkins goes so far as to suggest that perhaps the species is introduced.

Genus **PENTARTHRUM** Wollaston

Pentarthrum Wollaston (28, p. 129).

This genus contains 66 species, but it is probably quite composite and contains a number of species incorrectly referred to it. With the exception of a few, the species are restricted to the tropics and southern hemisphere and, principally, to islands.

Of the three species recorded from Hawaii, *P. blackburni* Sharp which has been found on Oahu and Laysan, may be an introduced species. Perkins suggests that *P. obscurum* is an introduction from Fiji. *P. halodorum* Perkins was described from Midway and Kure (Ocean) Islands. It is the same as Marshall's *P. hirticolle* from Samoa, and the following synonymy is necessary:

Pentarthrum halodorum Perkins (20, p. 156).

Pentarthrum hirticolle Marshall (14, p. 324), **new synonym.**

This species is evidently widespread. I have seen specimens from the Marquesas.

Key to Hawaiian Pentarthrum

1. The head, when viewed from the side, with the longitudinal dorsal contour of the crown, interocular area and rostrum forming a continuous curve; color reddish brown.....**P. blackburni** Sharp.
   The head, when viewed from the side, with the longitudinal dorsal contour conspicuously interrupted between the posterior margins of the eyes by a conspicuous transcephalic constriction; color mostly black.... 2
2. Second funicular segment similar in size and shape to the third, not longer than broad; length, excluding head and rostrum, 2.5-2.75 mm. .....**P. obscurum** Sharp.
   Second funicular segment obviously elongate, distinctly longer than broad and about as long as segments three plus four; length, excluding head and rostrum less than, 2.25 mm.....**P. halodorum** Perkins.

Genus NESOTOCUS Perkins

Nesotocus Perkins (16, p. 150).

This evidently relict endemic genus is one of the most aberrant of the Hawaiian insecta. It is an isolated genus the close allies of which have evidently disappeared from the earth, leaving it without determinable relatives. For this reason, it is difficult to ascertain from what regional fauna the genus has been derived and most difficult to satisfactorily place it in phylogenetic lists. In "Coleopterorum Catalogus" it has been appended to the end of the Trypetini, following Champion. It does not belong to the Trypetini but should, I believe, be placed among the Cossoni; but my knowledge of the genera of the group from the world standpoint is too limited to offer a suggestion as to the exact place to insert it. Though the question has arisen as to whether the genus truly belongs to the Cossoninae, there can now be little doubt that it belongs to the subfamily. It is an anomaly.

Although I admit that, on the basis of allies I cannot now assign the genus as positively coming from a definite zoogeographical region, I believe that there is some rather good evidence that points to the western Pacific origin or derivation of *Nesotocus*. For some time the species of this genus were considered to be confined to *Cheirodendron,* but there are now records of their breeding in *Pterotropia* and *Tetraplasandra*. These three genera of trees, belonging to the Aralia-

ceae, are endemic to Hawaii. Their generic allies reach their greatest developments toward and in Malaya and have numerous representatives in Polynesia as well as being well developed in Indo-and Austro-Malaya.

Nesotocus contains four closely allied species which have been found on Kauai, Oahu, Molokai, Maui, and Hawaii. Two of the species evidently inhabit more than one island. They are fully winged and quite capable of active flight. These are our largest Cossoninae, and some specimens attain a length of 25 or more millimeters, including the rostrum. Their large size together with their very long legs, rostra, and antennae, and their pubescent bodies give them a distinctive appearance.

Genus ANOTHEORUS Blackburn

Anotheorus Blackburn (1, p. 4).

This peculiar endemic genus is very closely allied to the following *Oodemas,* and it may be questioned as to whether or not the group of included species should be given full generic rank. However, I believe that *Anotheorus* represents a more basic stock than *Oodemas,* that it has not been carried to the extremes in specialization as has *Oodemas,* and that it may be closer to the ancestral form than our present-day *Oodemas.* The genus should be placed immediately before *Oodemas* and not in a different subtribe, as was done in "Coleopterorum Catalogus."

There are three species: *A. robustus* Perkins, Kauai; *A. montanus* Blackburn, genotype, Oahu; and *A. ignavus* Blackburn, Maui and Lanai.

Genus OODEMAS Boheman

Oodemas Boheman (5, p. 138).

This endemic genus (together with its close ally, *Anotheorus*) constitutes another of the most peculiar components of the Hawaiian endemic fauna. It is an aberrant genus, but it, as well as *Anotheorus,* can be placed in the Rhyncoli. They are most certainly out of place in "Coleopterorum Catalogus" and should be transferred to the Rhyncoli. This genus, like *Nesotocus,* is evidently so old and isolated that we do not now find any of its close allies living. Dr. Marshall has written me that "one species of *Acanthomerus* from St. Helena is

extraordinarily like it in general facies, though the other members of the genus are elongate." *Oodemas* is remarkable for the great shortening of the thoracic sterna. The metasternum is often only one sixth to one tenth as long as the first two ventrites, and the coxae are longitudinally approximate. The very convex form, both dorsally and laterally, is characteristic and peculiar. *Oodemas* and *Anotheorus* have the scutelli hidden.

Oodemas must have been among the very early colonizers of the islands. Species are found on the main islands as well as some of the outlying islands. It is the largest genus of Hawaiian Curculionidae; 58 species and three varieties are described. These forms are distributed as follows: in the outlying islands four species are found, one on Necker, two on Nihoa, and one inhabiting Laysan, Midway, Nihoa, and Necker; on the main islands three species are considered to inhabit most or all of the islands, one is found on both Oahu and Molokai, one on both Molokai and Lanai, one on Molokai, Maui, and Hawaii, but the others seem to be insular specific. Kauai is the headquarters of the genus, 20 are confined to that island; Oahu has 11, Maui 11, Molokai 2, Lanai 2, and Hawaii 5 confined within their boundaries. The species of Maui, Molokai, and Lanai show a very close relationship.

The species inhabiting Oahu and Maui have been keyed by Perkins (23, pp. 77, 80), and Blackburn (4, p. 185) gives a key to the species known in 1885.

I know of no genus or group of genera closely allied to or resembling *Oodemas*. The species are found on many plants and some are quite polyphagous.

Genus DYSOMMA Perkins

Dysomma Perkins (16, p. 151).

This endemic genus was founded on a unique specimen collected by Perkins in the highlands of Kauai. Evidently only two individuals of this peculiar insect have been collected since that time. Mr. Swezey kindly called my attention to a specimen which was found by C. L. Shear on a dead *Cyrtandra* leaf from the ground along Kalalau Trail, Kokee, Kauai, March 8, 1928. I found an immature specimen while collecting beneath logs and stones on Kaunuohua Ridge, Kauai,

July 22, 1937; this locality is near the place where Dr. Shear's specimen was taken. These notes indicate the great rareness of the species.

In spite of the comparatively slender body and the exposed scutellum, I believe that this genus is obviously allied to *Heteramphus*. It is so similar in structure to *Heteramphus* that it should probably be placed in that genus if it lacked a scutellum. The widely separated coxae, the sternum, venter, and legs are similar to *Heteramphus,* although the metasternum is longer than the length of a metacoxa on *Dysomma* but shorter than the coxa on *Heteramphus*. The head and rostrum are identical to those of *Heteramphus*. The eyes are greatly reduced, but such reduction in the size of eyes, although uncommon, is not an exceptional occurrence in cossonids occupying similar ecological niches in wet forests and may arise as a specific, instead of a generic, change. The antennae vary among the species of *Heteramphus*. The antennae of *Dysomma sylvicola* are like those of *Heteramphus cylindricus* Sharp, and that species seems to bridge the gap between *Dysomma* and the more robust species of *Heteramphus*. I believe that *Dysomma* and *Heteramphus* have a definite ancestral affiliation.

When Perkins wrote his description of *Dysomma,* he was not equipped with modern optical aids; thus there are discrepancies in his description which should be corrected. He said that the rostrum was subequal in length to the pronotum. On the specimens at hand, the rostrum, although elongate, when measured with the aid of an eyepiece micrometer from the basal angulation with the head to the apex, is approximately three-fourths as long as the pronotum (on one, 3.3:4.7). The specimens before me are evidently both males. However, if Perkin's holotype was a female, and the female of the species has a distinctly longer rostrum, his statement may be correct. The third tarsal segments do not have short lobes, but they are subtruncate distally. The tibiae are strongly uncinate and mucronate.

Genus HETERAMPHUS Sharp

Heteramphus Sharp (4, p. 187).

This is another aberrant, anomalous endemic genus whose ancestors and allies evidently cannot now be traced. Although the characters used for generic separations are of such nature on *Heteramphus* as to place it in a different subtribe, the general facies

of the species have something about them that suggests to me the possibility of an ancient relationship or community of origin with an extinct ally of *Oodemas*. Marshall writes that "*Heteramphus* has its facies approximately reproduced by the *Tychiorrhinus* of St. Helena." I can offer no definite suggestions as to the origin and affinities of the genus, but in Fiji I collected undescribed representatives of what is probably a new genus that may prove to be allied to *Heteramphus*.

Heteramphus includes 12 species, seven of which are found on Oahu, one on Kauai, one on Molokai, and one on Maui. Most of the species are rarities. I have published a key to the Oahu species (31, p. 138).

Genus MACRANCYLUS Le Conte

Macrancylus Le Conte (13, p. 338).

Haloxenus Perkins (16, p. 149), synonymy by Champion (7, p. 123).

The two species described in this genus have an irregular distribution. *Macrancylus linearis* Le Conte, the genotype, is recorded as a North American insect found in Florida, Texas, and the West Indies; it is a litoral species found in driftwood. The other species, *Macrancylus immigrans* (Perkins) Champion, has similar habits and has been found on the coasts of several of the main and outlying Hawaiian islands. This unusual distribution so much resembled that of *Dryotribus* that I compared our Hawaiian specimens with some from Florida, and I have found that there is only one species involved. The following synonymy is necessary:

Macrancylus linearis Le Conte (13, p. 339).

Haloxenus immigrans Perkins (16, p. 149, pl. 8, fig. 4).

Macrancylus immigrans (Perkins) Champion (7, p. 123), **new synonym.**

The discovery of another Pacific species on Guam (34, description in press) further substantiates my belief that *Macrancylus* is a Pacific genus and that the genotype has been introduced to America through the agencies of man.

Genus PHLOEOPHAGOSOMA Wollaston

Phloeophagosoma Wollaston (29, p. 23).

This genus includes 27 described species distributed from Mada-

gascar through the Seychelles Islands to India and through Austro-Malaya into the eastern Pacific. We have only one species [*P. tenuis* (Gemminger)] which Perkins says has been found on Fijian plants examined in quarantine at Honolulu and is, therefore, an introduced species.

Genus DEINOCOSSONUS Perkins

Deinocossonus Perkins (16, p. 147).

At present this monotypic genus is considered endemic to Hawaii, but I believe that, when revisional studies of the Pacific Cossoninae are made, it will be found elsewhere. Its short rostrum and hirsute body are distinctive characters, but the genus is not an aberrant one. In "Coleopterorum Catalogus" it is erroneously placed among the Pentarthri; it should be transferred to the Cossonini. Perkins considered a specimen of the genotype found on Hawaii to be a variety of the typical form found on Kauai and Oahu.

Genus OXYDEMA Wollaston

Oxydema Wollaston (29, pp. 487-488).

Pseudolus Sharp (4, p. 190), **new synonym.**

I know of no generic key in which *Oxydema* and *Pseudolus* are separated. If an author had written such a key, the synonymy should probably have been made, because he should have discovered that no characters could be found by which to separate *Pseudolus* from *Oxydema*. I have carefully checked and compared *Oxydema fusiforme* Wollaston and *Pseudolus longulus* Sharp and have been unable to find a single character that might be of generic value; in fact, the two species are very closely allied. *Oxydema fusiforme* Wollaston was redescribed as *Pseudolus hospes* by Perkins. *Pseudolus* is monotypic; *Oxydema* includes six species, which, with the exception of the widespread *O. fusiforme,* are all confined to the Pacific from Sumatra eastward.

No genotype has been designated for *Oxydema,* so far as I know. From the three species originally described with the genus, *Oxydema fusiforme* Wollaston is here designated as the genotype.

There are two adventitious members of this genus in Hawaii. The closest endemic species to Hawaii is *O. simplex* Marshall from Samoa. The species found in Hawaii may be separated as follows: