

77th Contribution to the Morphology and Taxonomy of the Scolytoidea.

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In the spring of 1939 I received a rather large collection of Scolytidae and Platypodidae by the courtesy of the Imperial Institute of Entomology of London which were mainly collected by O. H. Swezey, Consulting Entomologist of the Hawaiian Sugar Planters' Association, on the various islands of Hawaii. The material contains, besides several new species, most of the other species hitherto recorded from that region. Although it has been quite difficult to interpret some of the species without examination of the unique types in the British Museum, I think it will be more satisfactory to publish this preliminary account so that investigators interested in the biology of these species should find some grounds to work on.

For the comparison of some of the species I have to give my appreciation to E. B. Britton of the British Museum; others have been compared before communication of the collection to me by G. E. Bryant of the Imperial Institute of Entomology. Types of the following new species are deposited in the collection of the Hawaiian Entomological Society and in my own. Where no collector is mentioned, all specimens were collected by O. H. Swezey.

1. *Hypothenemus insularis* Perk.

Being not certain about the identity of this species, I have given a description (Stylops, 3, 1928: 178) of what I meant it should be. Specimens compared with the type by G. E. Bryant verified my determination.

Oahu: Manoa, 24-XI-1927, ex pea vine

Oahu: Manoa, 9-XI-1927, ex *Calotropis procera*

Oahu: Manoa, 25-II-1927, ex pigeon-pea (*Cajanus cajan*)

Oahu: Manoa, 30-XII-1928, ex *Calotropis procera*

Oahu: Manoa, 28-IX-1927, ex yellow *Ipomoea* (*Ipomoea tuberosa*)

Oahu: Waipio, 25-III-1920, ex pigeon-pea wood (*Cajanus cajan*)

Oahu: Waipio, 15-X-1924, under bark of monkeypod (*Samanea saman*)

Oahu: Kolekole Pass, 23-X-1927, ex *Bidens waianensis*

Oahu: Kaimuki, 14-I-1923, ex banyan

Oahu: Punaluu, 12-XII-1926, ex hau (*Hibiscus tiliaceus*)

Mau: Wailuku, 1-XI-1927, ex croton

Kauai: Lihue, 25-IV-1928 (Duvet), under bark of dead breadfruit

Oahu: Ft. Kamehameha, 8-V-1927, on *Batis maritima*, (F. X. Williams)

Oahu: Honolulu, 11-III-1923, ex orange twig

Oahu: Honolulu, 24-XI-1927, ex croton.

2. *Hypothenemus ruficeps* Perk.

I have just seen specimens which have been compared by E. G. Bryant. They are but little larger than *H. insularis* Perk., somewhat more slender, and the asperities of the frontal margin of the pronotum are subequal in size, while those of *H. insularis* gradually increase in size towards the middle.

Maui: Mahena, 12-X-1926, ex *Acacia koa*, and 13-X-1926, ex *Cibotium menziesii*.

3. *Hypothenemus eruditus* Westw.

Three specimens determined as *H. eruditus* by Perkins, I am unable to separate from *H. insularis* Perk.

4. *Hypothenemus oahuensis* n. sp.

Yellowish brown, 1.2-1.4 mm. long, 2.5 times as long as wide. The size and general appearance are rather similar to those of *H. areace* Horn, the sculpture and vestiture are quite different.

Front slightly transversely depressed below, a transverse carina above, densely and coarsely punctured, the median line impunctate and shining below.

Pronotum as long as wide, widest at the base, sides feebly narrowed in a shallow curve, apex broadly rounded, frontal margin with six asperities, of which the median two are larger and more closely placed; summit at the middle, strongly convex in front, with a shallow transverse impression behind, covered by rather small asperities on a narrow area, but leaving a wide space between the frontal margin and the first row, interspaces and basal area granulate-punctate, with short erect hairs. Scutellum small, triangular.

Elytra as wide and 1.5 times as long as the pronotum, base finely margined, sides parallel beyond the middle, apex moderately broadly rounded, declivity short, evenly convex; disc of a silky appearance, with rows of shallow punctures, interstices moderately wide, densely reticulately wrinkled, with rows of minute punctures, which bear small erect scales, these large on the declivity, with numerous reddish hairs of about the same length on each side of the scales.

Locality: Oahu: Punaluu, 12-XII-1926, ex hau (*Hibiscus tiliaceus*); Waipio, 25-III-1920, ex stem of pigeon pea.

5. *Hypothenemus mauiensis* n. sp.

Piceous, 1.3 mm. long, 2.4 times as long as wide. The specimens look like a large *H. oahuensis*, but are exceedingly coarsely sculptured.

Front uniformly convex, densely granulate-punctate, with indications of a median carina.

Pronotum but little wider than long, sides subparallel on the basal fourth, apex rather broadly rounded, the asperities of the frontal margin just as in *H. oahuensis*, interspaces and basal area granulate-punctate, with short erect hairs, especially on the sides. Scutellum small, triangular.

Elytra with the outline and shape of the declivity similar as in the foregoing species, but the disc with rows of very coarse punctures, the inter-

spaces narrower, more shining, without the dense reticulation, the striae punctures becoming larger and deeper on the declivity, the interspaces consequently narrower, the scales of the same shape, but on account of the shining interspaces and the darker color more conspicuous, without accompanying hairs.

Locality: Maui: Iao Valley, 8-VII-1920, ex *Euphorbia*.

6. *Ericryphalus sylvicola* (Perk.)

Specimens determined by G. E. Bryant on hand of material in the British Museum and my own careful examination of the antennae leave no doubt, that this species has to be placed in the genus *Ericryphalus* Hopk. The comparison with the description of *Ericryphalus henshawi* Hopk. although opens the question whether or not both species are the same.

Oahu: Waipio, 25-III-1920, ex pigeon-pea wood.

Oahu: Kaimuki, 14-I-1923, ex banyan.

Oahu: Manoa, 4-I-1920, ex *Clermontia* (Bridwell).

7. *Ptilopodius pacificus* n. sp.

The description of *Hypothenemus sylvicola* Perk. given by the author in *Stylops*, 3, 1934, p. 179, refers to a new species of the genus *Ptilopodius*, for which the name *pacificus* is proposed. A single specimen from Oahu: Waimano, 22-XI-1931, ex hau (*Hibiscus tiliaceus*) can be referred to this new *Ptilopodius*.

8. *Stephanoderes (Hypothenemus) maculicollis* (Sharp).

Comparing the numerous specimens with *Stephanoderes alter* Egg., I can see only minor differences and it will probably become necessary to unite both species under one name. At the present the somewhat smaller Hawaiian specimens are kept separately.

Oahu: Kaimuki, 10-II-1923, ex dead *Indigofera anil*

Oahu: Kaimuki, 2-III-1922, ex dead *Crotalaria saltiana*

Oahu: Kaimuki, 14-VI-1921, ex *Clitoria ternatea*

Oahu: Waipio, 25-III-1920, ex stem of dead pigeon-pea.

9. *Stephanoderes lebronneci* Bees.

One specimen from Guam and several others from the Hawaiian Islands perfectly agree with the description of *Stephanoderes lebronneci* Bees., except that they are somewhat larger (1.5-1.6 mm.)

Guam: Piti, 5-I-1936, (O. H. Swezey)

Oahu: Manoa, 25-I-1927, ex pigeon-pea

Oahu: Kolekole Pass, 23-X-1927, ex *Bidens waiianensis*

Oahu: Honolulu, 18-VI-1924, ex dead cane

Oahu: Koko Head, 22-III-1927, ex *Panicum torridum*

Oahu: Kaimuki, 10-II-1923, ex dead *Indigofera anil*

10. **Stephanoderes hawaiiensis** n. sp.

Yellowish brown, 1.3 mm. long, 2.1 times as long as wide. A very stout and coarsely sculptured species.

Front transversely depressed and shining below, with a transverse carina above, remotely punctured.

Pronotum wider than long (31:28), widest at the base, sides and apex conjointly rounded, frontal margin with six subequal small asperities; summit in the middle, anterior area rather steeply convex, finely asperate on a narrow area, interspaces and the broad basal area densely and rugosely punctured, pubescence short. Scutellum small, triangular.

Elytra but little wider and 1.4 times as long as the pronotum, sides parallel on more than the basal half, apex somewhat angulately rounded, declivity commencing at the middle, obliquely convex; disc coarsely punctured in rows, the first row distinctly striate, interstices narrow, each with a row of very small punctures, those bearing pale, erect scales, more strongly developed on the declivity.

Locality: Oahu: Honolulu, 18-VI-1924, ex dead cane.

11. **Poecilips (Thamnurgides) persicae** (Hopk.).

A good series, undoubtedly of Hopkins' species before me, agrees in all respects with the generic characters of *Poecilips* Schauf., in fact, the two species, *Thamnurgides persicae* Hopk. and *Poecilips sannio* Schauf. are so extremely alike, that it is doubtful if Hopkins' species can hold good in the future.

Oahu: Mt. Tantalus, 28-XI-1926, ex *Pipturus albidus*

12. **Xyleborus fornicatus** Eichh.

Oahu: Kaimuki, 17-VII-1921, ex dead avocado (*Persea gratissima*)

Oahu: Waipio, 25-III-1920, ex dead pepper tree (*Schinus molle*)

Oahu: Honolulu, 24-IX-1927, ex *Sterculia foetida*

Oahu: Manoa, 2-IX-1930, ex *Nothopanax guilfoylei*, (E. M. Ehrhorn)

Oahu: Manoa, 4-XII-1926, ex kukui (*Aleurites moluccana*)

Hawaii: Kohala, VIII-1924, ex tamarind, (Mrs. Bond)

Maui: Puunene, 16-VIII-1930, ex avocado (*Persea gratissima*)

Oahu: Kualoa, 12-XII-1924, ex *Albizia lebbek*, (McEldowney)

13. **Xyleborus spinosulus** Schedl.

Oahu: Tantalus, 5-V-1918, ex monkeypod (*Samanea saman*)

14. **Xyleborus hawaiiensis** Perk.

Oahu: Makaleha Val., 13-XII-1919, ex *Pipturus albidus*

Oahu: Hauula Val., 17-V-1925, ex *Pipturus albidus*

15. **Xyleborus truncatus** Sharp.

This species shows variations in size not very common among the Scolytidae. The description states 2.5 mm. long, a cotype at the British Museum measures 2.73 mm., and the length of the specimens represented in this collection are given in the locality table (in brackets the number of specimens, then the range of variation, and again in brackets the mean length). Aside from

the length itself, and the proportional coarseness of the sculpture, there are no differences of taxonomic value. As all specimens before me, as well as the types, and other specimens I have seen before, originate from Oahu, the differences in size may be due to the altitude of the collecting place and perhaps the type of food-plant.

- Oahu: Manoa, 28-IV-1918, ex *Acacia koa*.....
(3), 2.47-2.50 mm. (2.48 mm.)
- Oahu: Manoa, 26-XII-1927, ex *Acacia koa*.....
(3), 2.39-2.50 mm. (2.46 mm.)
- Oahu: Manoa, XI-1919, ex *Syzygium sandwicensis*, (J. C.
 Bridwell)(4), 2.59-2.76 mm. (2.64 mm)
- Oahu: Manoa, 4-I-1920, ex *Straussia*, (J. C. Bridwell).....
(8), 3.07-3.13 mm. (3.08 mm.)
- Oahu: Kahauiki, 28-IX-1924, ex *Acacia koa*.....(1), (2.50 mm.)
- Oahu: Tantalus, 4-VII-1930, ex *Acacia koa*.....(1), (2.59 mm.)
- Oahu: Palolo, 11-XII-1921, ex *Syzygium sandwicensis*
 (Ohia ha)(5), 2.56-2.68 mm. (2.65 mm.)
- Oahu: Cooke Trail, 5-IV-1919, ex *Perrottetia sandwicensis*.....
(4), 2.73-2.85 mm. (2.79 mm.)

16. *Xyleborus oahuensis* Perk. var. *scabratus* n. var.

Specimens fitting the description were kindly compared with the type by E. B. Britton and found "having the sculptured lines (asperities) on the thorax more numerous, closer and extending slightly farther towards the base."

Considering the wide variations in *Xyleborus truncatus* Sharp, I hesitate to describe a new species, but shall regard it as a variety, *oahuensis* var. *scabratus*. Aside from the specimens mentioned below, I have seen a specimen from Honolulu, T. H. The length of the females varies from 3.64 to 3.87 mm.



FIG. 1. *Xyleborus oahuensis* var. *scabratus*, outline of the male.

Description of the male. Yellowish brown, 3.4 mm. long, not quite three times as long as wide.

Head entirely concealed by the pronotum, front plano-convex, depressed below, and along the median line above, so that at the commencement of the vertex two flat elevations appear, surface shining, punctuation not very distinct, eyes very small.

Pronotum with the outline as in fig. 1, excavate in front, cavity shining, polished in front, rugosely punctured behind, the punctures becoming remotely placed on the disc, and distinctly larger towards the base and the median line. Scutellum very small.

Elytra cylindrical on little more than the basal half, obliquely truncate behind, but the margins not acute; disc striate-punctate, the punctures rather small and closely placed, the interstices transversely wrinkled, more so on the sides, and with scattered punctures; declivital face nearly flat, a very shallow depression on both sides of the suture in the middle, strongly rugosely wrinkled, the striae punctures subobsolete, with two tubercles on the second and a few very small ones on the third interstices, the suture narrow, feebly elevated, impunctate; pubescence rather long on the pronotum and the elytra declivity.

Locality: Oahu: Pupukea, 26-IV-1925, ex *Xylosma hawaiiense* (3 ♂♂, 5 ♀♀).

Oahu: Honolulu (1 ♀).

17. *Xyleborus tantalus* n. sp.

Female.—Dark reddish brown, 3.4 mm. long, 3.0 times as long as wide. Of the same general appearance as *X. obliquus* Sharp (cotype at the British Museum), but very much smaller (4.0:3.4 mm.) and with other proportions.

Front feebly convex, minutely punctulate, medially broadly and feebly elevated, laterally with irregularly placed punctures.

Pronotum longer than wide (25:20), postero-lateral angles strongly rounded, sides parallel on more than the basal half, then rather abruptly broadly rounded; summit at the middle, anterior area obliquely declivous, densely and finely asperate; basal area shining, with scattered minute punctures. *X. obliquus* Sharp has the pronotum as long as wide, the apical margin more narrowly rounded, and the summit appearing higher.

Elytra as wide and 1.4 times as long as the pronotum (*X. obliquus* nearly twice as long as the pronotum), shining, sides parallel on the basal two thirds, rather narrowly rounded at the apex, the declivity commencing far beyond the middle, very oblique, with a similar depression as in *X. obliquus* Sharp; disc with regular rows of rather large and deep punctures, the sutural space strongly widened from the base to the commencement of the declivity, with a few punctures, the other interspaces regular, with scattered transverse wrinkles and punctures; declivity with the suture wide, with a fine granule at the commencement of the convexity, first and second striae rather deep, the punctures large, the second interstice with a row of very fine punctures, the third distinctly elevated, with several small granules, more of these fine tubercles on the sides.

Locality: Oahu: Tantalus, ex *Byronia sandwicensis*, (J. C. Bridwell).

18. *Xyleborus nuuanus* n. sp.

Female.—Yellowish brown, 2.6 mm. long, 2.76 times as long as wide. Another species of the difficult group of *X. mascarensis* Eichh., *X. torquatus* Eichh., *X. fuscobrunneus* Eichh., etc.

Front feebly convex, subshining, minutely punctate, coarsely punctate.

Pronotum longer than wide (55:47), of the same general outline as *X. mascarensis* but little more slender, the apex more narrowly rounded, summit high, at the middle, anterior area finely and densely asperate, basal area with the median line shining, with shallow but coarse and irregularly placed

punctures, giving the whole surface a rather rough appearance not existing in any one of the closer relatives.

Elytra feebly wider (50:47) and 1.5 times as long as the pronotum, widest at the middle, sides parallel on the basal fourth, then feebly widened in a very shallow curve, apex moderately broad and but little angularly rounded; compared with *X. mascarensis* Eichh. the declivity appears decidedly flatter, commences farther in front, and is more gradually convex; disc striate-punctate, the striae not deep but distinct, less so on the sides, the punctures shallow, deeper on the sides, somewhat irregular, interspaces wide, each with a fairly regular row of small setose punctures, less evident near the base, on the suture the punctures fewer in number, but larger and irregular in their position; declivity with 3-4 granules on the first and third interstices, the second feebly depressed, narrower with a few punctures, which appear like minute granules in a certain light, the punctures of the striae moderately large, rather shallow, somewhat irregular; in the whole, the declivity is rough, sloping down from the suture towards the sides, with sparsely placed inconspicuous hairs.

Locality: Oahu: Nuuanu, X-1919, in *Dracaena aurea*, (J. C. Bridwell).



FIG. 2. *Xyleborus lanaiensis* Perk., masc. nov., outline.

19. *Xyleborus lanaiensis* Perk., masc. nov.

Male.—Yellowish brown, 2.6 mm. long, 3.0 times as long as wide.

Front plano-convex, shining, with a longitudinal groove-like impression medially, some punctures on the sides. Eyes very small.

Pronotum projecting far beyond the front, outline as in figure 2, with a deep cavity behind the apex, the disc feebly convex, subshining, minutely strigose reticulate and shallow punctures, which are coarse, irregular in size and rather remotely placed behind, denser towards the anterior cavity. Scutellum small.

Elytra distinctly narrower and hardly longer than the pronotum, cylindrical, parallel-sided, disc with a triangular depression around the scutellum, another longitudinal depression along the suture, surface uneven and rough, with rather small punctures, rows hardly distinguishable; declivity truncate, short, rather steep, apical margin acute, sides rounded above, with a shallow depression on the upper two-thirds of the convexity, a small setose tubercle just below the upper margin on the second interspace, surface shining, densely wrinkled-reticulate-granulate, especially towards the apex, more polished near the narrowly elevated suture; with scattered long hairs, especially on the declivity.

Locality: Oahu: Haleauau, 11-XI-1926, ex *Sideroxylon sandwicense*. Females are represented from the following localities:
Oahu: Haleauau, 11-XI-1926, ex *Sideroxylon sandwicense*
Oahu: Haleauau, 8-I-1933, ex *Sideroxylon sandwicense*

20. Xyleborus kauaiensis Perk.

Hawaii: Kohala Mts., Upper Hamakua Ditch Trail, 3-IX-1919,
ex *Cheirodendron*.

21. Xyleborus pseudoangustatus Schedl.

Maui: Olinda, 10-X-1926, ex *Acacia koa*
Oahu: Kahauki, 28-IX-1924, ex *Acacia koa*
Maui: Mahena, 12-X-1926, ex *Acacia koa*
Oahu: Pupukea, 26-IV-1925, ex *Xylosma hawaiiense*

22. Xyleborus testaceus Walk. (*immaturus* Blackb.).

Maui: Mahena, 12-X-1926, ex *Acacia koa*
Oahu: Haleauau, 14-VIII-1927, ex *Pipturus albidus*
Oahu: Palolo, 22-II-1922, ex dead kukui (*Aleurites moluccana*)
Oahu: Manoa, 4-I-1920, ex *Straussia*, (J. C. Bridwell)
Oahu: Honolulu, 11-V-1932, ex *Araucaria brasiliana*
Hawaii: Kaiwika, XI-1924, ex *Eucalyptus*, (L. W. Bryan)
Hawaii: Pepeekeo, 31-V-1932; Hilo, 13-VIII-1919.
Maui: Hana, 15-X-1926, ex dead sugar cane.

My suspicion that *X. immaturus* Blackb. is synonymous with *X. testaceus* Walk. has proven to be correct. E. B. Britton has compared specimens with both types and found full agreement.

23. Xyleborus confusus Eichh.

X. insularis Sharp is known to be synonymous with *X. confusus* Eichh. for a long time.

Oahu: Mt. Tantalus, 28-XI-1926, ex *Pipturus albidus*
Oahu: Manoa, 4-XII-1926, ex kukui (*Aleurites moluccana*)
Oahu: Makaleha Val., 13-XII-1919, ex kukui (*Aleurites moluccana*)
Oahu: Palolo, 22-II-1922, ex dead kukui (*Aleurites moluccana*)
Oahu: Kuliouou, 22-XII-1918, ex *Tetraplasandra* sp.
Oahu: Kuliouou, 11-XII-1927, ex kukui (*Aleurites moluccana*)
Oahu: Makiki Val., 27-XII-1924, ex kukui (*Aleurites moluccana*)
Oahu: Palolo, 11-XII-1921, ex kukui (*Aleurites moluccana*).

24. Platypus (Crossotarsus) externedentatus Fairm.

Oahu: Waimalu, 10-VII-1921, ex *Eleocarpus bifidus*
Oahu: Palolo, 22-II-1922, ex dead kukui (*Aleurites moluccana*)
Oahu: Makaleha Val., 13-XII-1919, ex *Maba sandwicensis*
Oahu: Moanalua, 30-XI-1930
Oahu: Honolulu, 13-V-1929, 24-I-1931, 15-IX-1932, ex avocado
(*Persea gratissima*)
Oahu: Hauula Val., 17-V-1925, 3-XI-1929, ex *Eugenia malaccensis*.

Notes on Food-Plant Relations of Scolytidae and Platypodidae in the Hawaiian Islands

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(Presented at the meeting of February 1, 1940)

For the past 20 years I have kept records of the trees from which I have obtained specimens of Scolytidae, particularly on collecting trips in the forests, but also from trees in the lowlands and inhabited regions. I have been interested in the problem of determining whether the endemic species had any host preferences, or were attached to particular trees. Many records have accumulated, but since the species were not determined these records were of no avail. As the Scolytidae described and recorded in the Fauna Hawaiiensis are so meagerly represented at the Bishop Museum, no attempt had been made to identify the species involved. Finally, however, considerable of the accumulated material was sent in 1939 to the British Museum for determination, as at that Museum would be the types of all of the Hawaiian species. However, this material was turned over to Dr. Schedl in Germany for determination.

Recently, a good portion of the species have been returned as determined by Dr. Schedl, and his manuscript concerning them received for publication. Due to the war conditions in Europe it is doubtful if, or when, any more of the material will be returned. That being the case, it seems opportune to present my notes and additional records on the species determined by Dr. Schedl, which seem to be the species usually met with. Not all are endemic. Records are given also on a few species which were already known, and hence no specimens present in the material studied by Dr. Schedl.

As seen by the appended list of food-plants, the majority of the species are not specific as to their host, but are found on quite a number of trees. A few have as yet been collected from a single species of tree, but in these cases not so many collections have been made, and more collecting should be done before determining definitely whether this represents a specific host. Apparently the species which might be considered endemic are chiefly confined to endemic trees, while the immigrant forms are in the main found on introduced trees.

1. *Hypothenemus insularis* Perkins.

Hypothenemus insularis Perkins, Fauna Hawaiiensis, II, Part III, p. 181, 1900.

This species was described from Kauai. Most of the records are from Oahu. Besides those given by Dr. Schedl, I add the following records:* Oahu: Manoa, April 28, 1918, ex *Acacia koa*;

Kaimuki, March 5, 1922, ex *Aleurites moluccana*; Honolulu, Jan. 21, 1930, ex *Nothopanax guilfoylei*; Poamoho, Nov. 11, 1933, ex koa pods; Honolulu, May 11, 1934, ex breadfruit; Keekee Gulch, Sept. 25, 1934, ex *Osmanthus*; Kalauao, Jan. 30, 1935, ex *Indigofera*; Palikea, Feb. 3, 1935, ex *Xanthoxylum*; Manoa, Feb. 16, 1940, ex breadfruit; Kokokahi, Jan. 25, 1941, ex *Thespesia* pods. Maui: Paia, Feb. 1931, ex fennel (Van Zwaluwenburg); Wailuku, Feb. 23, ex *Ficus*.

2. *Hypothenemus ruficeps* Perkins.

Hypothenemus ruficeps Perkins, Fauna Hawaiiensis, II, Part III, p. 181, 1900.

Described from Oahu; also collected on Maui. Besides those given by Dr. Schedl, I add the following records: Oahu: Kaimuki, March 8, 1931, ex grass; Moanalua, April 24, 1914, ex bamboo; Ewa Plantation, March 9, 1920, ex *Datura*; Waipio, March 8, 1922, ex dead sugar cane; Honolulu, Aug. 19, 1925, ex *Cassia garatensis* (McEldowney); Honolulu, Oct. 10, 1931, ex mango grafts (H. L. Lyon); Honolulu, May 11, 1934, ex breadfruit; Kawela Bay, Dec. 16, 1934, ex grass.

3. *Hypothenemus eruditus* Westwood.

Tomicus (Hypothenemus) eruditus Westw. Trans. Ent. Soc. London, 1836, I, p. 34.

Hypothenemus eruditus, Sharp, Tr. Ent. Soc. London, p. 102, 1879.

Described in England from book bindings. Occurs also in Guinea, North America, Hawaii, and New Caledonia. Found by Blackburn "in bark of a species of *Acacia* on the plains of Oahu." It must have been *Acacia farnesiana*, or possibly algaroba. Our collections have specimens of it from dead sugar cane, Honolulu, June 29, 1907, April 23, 1908, June 26, 1918, Aug. 23, 1934, and Ewa Plantation, July 1, 1914; Waialua, Jan. 9, 1909, ex dead *Crotalaria saltiana*; Kaimuki, June 14, 1913, ex lima bean pod; Paia, Maui, Feb. 1931, ex fennel (Van Zwaluwenburg); Makapuu, April 1, 1939, ex dead twigs of *Gossypium tomentosum*; Honolulu, Feb. 14, 1940, in bark of dead branches of *Croton*; Kokokahi, Jan. 28, 1941, ex *Thespesia* pods. Honolulu, Jan. 21, 1930, ex *Nothopanax*.

4. *Hypothenemus oahuensis* Schedl.

Hypothenemus oahuensis Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 110, 1941.

I have other records besides those given by Schedl as follows: Oahu: Makua, May 30, 1925, ex kukui; Ewa coral plain, Dec. 18, 1926, ex *Euphorbia*; Waimano, Nov. 22, 1931, ex hau.

* Unless otherwise indicated, all material was collected by O. H. Swezey.

5. **Hypothenemus mauiensis** Schedl.

Hypothenemus mauiensis Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 110, 1941.

The record by Schedl is the only one yet known.

6. **Hypothenemus griseus** Blackburn.

Hypothenemus griseus Blkb., Tr. Dublin Soc., III, p. 194, 1885.

Described from Oahu. A single specimen taken on poppy on plains near Honolulu. Recent records are Honolulu, Sept. 19, 1931, ex mango scions (H. L. Lyon); Manoa, Feb. 12, 1940, at light (Ehrhorn).

7. **Ericryphalus sylvicola** (Perkins).

Hypothenemus sylvicola Perkins, Fauna Hawaiiensis, II, Part III, p. 181, 1900.

Described from Lanai and Kauai. Other records besides those given by Schedl are as follows: Oahu: Hauula, Nov. 3, 1929, ex *Pipturus*; Manoa, Dec. 28, 1930, ex *Pipturus*; Honolulu, May 11, 1934, ex breadfruit; Manoa, Feb. 16, 1940, ex breadfruit.

8. **Ptilopodius pacificus** Schedl.

Ptilopodius pacificus Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 111, 1941.

Described from Oahu. Collected abundantly on hau and monkeypod in 1926, Honolulu and Manoa Valley (F. C. Hadden). No doubt a somewhat recent immigrant at that time.

9. **Stephanoderes maculicollis** (Sharp).

Hypothenemus maculicollis Sharp, Trans. Ent. Soc. London, 1879, Pt. I, p. 101.

Described from Oahu, and the numerous records are all from that island. Besides those given by Schedl we have the following: Oahu: without locality, ex *Acacia* (Koebele); Kaimuki, Nov. 23, 1907, ex ironwood; Honolulu, March 11, 1925, ex peach twigs; Kalihi, Dec. 11, 1926, ex mangrove; Niu, Sept. 30, 1928, ex *Psidium cattleianum*; Manoa, Nov. 24, 1929, ex *Osteomeles*; Kalauao, Nov. 16, 1932, ex *Acacia confusa*; Makapuu, Feb. 4, 1934, ex *Gossypium tomentosum*; Koko Head, Feb. 13, 1934, ex basil; Mt. Tantalus, Oct. 28, 1934, ex *Euphorbia*; Honolulu, Oct. 27, 1935, ex *Barringtonia*; Honolulu, Oct. 16, 1937, ex *Leucaena glauca*.

10. **Stephanoderes lebronneci** Beeson.

Stephanoderes lebronneci Beeson, Marquesan Insects, III, B. P. Bishop Museum Bull. 142, p. 104, Fig. 3, 1935.

Described from the Marquesas Islands on guava. We have no other records in the Hawaiian islands except those on Oahu, given by Schedl.

11. *Stephanoderes hawaiiensis* Schedl.

Stephanoderes hawaiiensis Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 112, 1941.

We have no other record except the one on dead cane given by Schedl.

12. *Poecilips persicae* (Hopkins).

Thammurgides persicae Hopk., Report of Secy. U. S. Dept. of Agriculture, No. 99, p. 45, Pl. II, Fig. 30, 1915.

Described from imported peach trees in Honolulu, 1905 (Van Dine). Other recent records are: Manoa Valley, Dec. 28, 1930, ex *Pipturus*; Manoa, Dec. 24, 1937, ex avocado seed. A large number developed in a decaying avocado seed on the ground in my garden. Hawaii: Keopu, Kona, March 7, 1939, ex avocado (Nishimura).

13. *Coccotrypes dactyliperda* (Fab.).

Bostrichus dactyliperda Fab., Syst. Eleuth., II, p. 387, 1801.
Coccotrypes dactyliperda, Eichhoff, Rat. Tom., 1879, p. 309.

Described from Europe. Occurs also in Africa and Asia. First found established in California in 1926. The first record of it in Hawaii was 1928, though there were specimens in the collections bearing much earlier dates. I have reared it from date seeds on the ground, and the seeds of several other palms. Dates and host records are as follows: Oahu: Honolulu at Exp. Station, H.S.P.A., Dec. 28, 1907; Honolulu, Sept. 1907, ex palm seeds (Terry); Kaimuki, Jan. 25, 1913; Honolulu, Feb. 20, 1924, ex *Livistona rotundifolia* (Lyon); Kapiolani Park, Sept. 22, 1927, ex date seeds, Dec. 18, ex *Pritchardia pacifica*; Honolulu, Nov. 28, 1927, ex *Oreodoxa regia* and *Livistona chinensis*; Manoa, Nov. 13, 1927, ex *Livistona*, Dec. 17, 1927, ex *Washingtonia filifera*; Kamehameha School, Dec. 18, 1927, ex date; Waialua, Dec. 18, 1927, ex date. Kauai: Lihue, March 11, 1928. Hawaii: Kohala, May 13, 1931; Olaa, May 20, 1931, ex *Livistona* and *Dictyospermum album*.

14. *Coccotrypes pygmaeus* Eichhoff (?).

Coccotrypes pygmaeus Eichh., Rat. Tomic., p. 310, 1879.

Described from Philippines. Occurs also in Africa. First recorded in Hawaii in 1928, though it was collected considerably earlier. An undated specimen was collected on Oahu by Albert Koebele. It must have been collected sometime prior to 1902 as Koebele spent scarcely any time in Honolulu later than that. It is another palm seed weevil. I have reared it from seeds of several

palms. Dates and host records are as follows: Oahu: undated (Koebele); Pearl City, Feb. 4, 1905, ex date seed; Experiment Station, H.S.P.A., June 8, 1927, ex *Livistona chinensis* (Rosa); University of Hawaii campus, Dec. 6, 1927, ex *Sabal blackburiana*, *Coccothrinax argentea*, *Pritchardia thurstoni*; Kapiolani Park, Dec. 18, 1927, ex date seed; Punahou campus, Dec. 9, 1927, ex *Sabal palmetto*, Dec. 18, 1927, ex *Livistona chinensis*; Manoa, Dec. 17, 1927, ex *Washingtonia filifera*, Feb. 3, 1934, ex date, Sept. 20, 1934, ex almonds. Kauai: Lihue, March 11, 1928.

15. *Xyleborus fornicatus* Eichhoff.

Xyleborus fornicatus Eichh. Berl. Ent. Zeitschr., XII, p. 151, 1868.

Described from Ceylon in 1868, where it is injurious to tea. It is also known in India and the Dutch East Indies. It was not recorded in the Fauna Hawaiiensis, but has been known in the Hawaiian Islands since 1910, when it was collected from avocado. It was known on avocado for many years before its identity was known. Besides the records by Schedl, are the following: Oahu: Honolulu, Aug. 1910, ex avocado (Kuhns), Oct. 2, 1912, ex *Eugenia jambolana*, Sept. 24, 1927, ex *Sterculia foetida*; Kaimuki, June 25, 1914, July 6, 1926, ex avocado; Makiki Valley, Nov. 18, 1917, ex *Ricinus communis*; Mt. Tantalus, Oahu, Feb. 23, 1925, ex *Acacia koa*; Jan. 25, 1935, ex *Albizzia moluccana*. Maui: Puunene, Feb. 24, 1935, ex *Enterolobium cyclocarpum*; Lahaina, Nov. 22, 1935, ex avocado (Dunn). Molokai: Mapulehu, Dec. 1936, ex avocado (Otsuka). Hawaii: Hilo, March 1, 1919; Kukuau, Jan. 8, 1940, ex mango, citrus and *Spondias* (Maneki).

16. *Xyleborus spinosulus* Schedl.

Xyleborus spinosulus Schedl, Stylops, III, p. 178, 1934.

About a dozen of this species were collected from a monkeypod tree (*Samanea saman*) on Mt. Tantalus, Oahu, May 5, 1918. It was described from specimens collected from *Acacia koa*, Mt. Tantalus, Oahu, October 1925 (Hadden).

17. *Xyleborus hawaiiensis* Perkins.

Xyleborus hawaiiensis Perkins, Fauna Hawaiiensis, II, Part III, p. 175, 1900.

Described from Hawaii and recorded in Fauna Hawaiiensis only from that Island. Besides the record in Schedl's paper, are the following: Oahu: Kamokunui Valley, Oct. 1, 1933, ex *Pipturus albidus*; Haleauau Valley, Jan. 3, 1932, ex *Pipturus*; Mt. Olympus, Sept. 6, 1935, ex *Dubautia laxa*.

18. *Xyleborus truncatus* Sharp.

Xyleborus truncatus Sharp, Tr. Dublin Soc., III, p. 192, 1885.

Described from the Hawaiian islands, and recorded from Oahu, Lanai and Hawaii. A very common species on several native forest trees. Besides the records in Schedl's paper are the following: Oahu: Haleauau Valley, Dec. 1, 1929, ex *Elaeocarpus bifidus*; Feb. 9, 1930, ex *Acacia koa*, Sept. 14, 1930, ex *Elaeocarpus*; Kawaiiloa Ridge, Oct. 2, 1934, ex *Syzygium sandwicensis*; Kahana and Wai-kane, Jan. 19, 1930, ex *Pipturus* and *Bohea*. Maui: Nahiku, Aug. 20, 1929, ex *Pipturus*. Hawaii: Kilauea, July 9, 1934, ex *Pipturus*.

19. *Xyleborus oahuensis* var. *scabratus* Schedl.

Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 113, 1941.

Described on material from Oahu: Pupukea, April 26, 1925, ex *Xylosma hawaiiense*, and Honolulu without date. No other records.

20. *Xyleborus tantalus* Schedl.

Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 114, 1941.

Described from Oahu: Mt. Tantalus, without date, ex *Byronia sandwicensis* (Bridwell). Only one other record. Hawaii: South Kona, Aug. 11, 1919, ex *Byronia*.

21. *Xyleborus nuuanus* Schedl.

Schedl, Proc. Haw. Ent. Soc., XI, No. 1, p. 114, 1941.

Described from Oahu: Nuuanu, October, 1919, ex *Dracaena aurea* (Bridwell). No other records.

22. *Xyleborus lanaiensis* Perkins.

Perkins, Fauna Hawaiiensis, II, Part III, p. 176, 1900.

Described from Lanai and recorded in Fauna Hawaiiensis only from that Island. Recent collections were from Haleauau Valley, Oahu, Nov. 11, 1926 and Jan. 8, 1933, ex *Sideroxylon sandwicense*; Halona Valley, Oahu, March 12, 1933, ex *Sapindus oahuensis*.

23. *Xyleborus kauaiensis* Perkins.

Perkins, Fauna Hawaiiensis, II, Part III, p. 174, 1900.

Described from Kauai, and no other record in Fauna Hawaiiensis. Recent collections were from Hawaii: Upper Hamakua Ditch trail, Sept. 3, 1919, Oct. 4, 1929, ex *Cheirodendron platyphyllum* (Swezey and Whitten); Kilauea, July 9, 1934, ex *Cheirodendron*. Kauai: Kokee trail to Kalalau, Aug. 15, 1925, ex *Cheirodendron*.

24. *Xyleborus pseudoangustatus* Schedl.

Besides the records in Schedl's paper we have the following: Oahu: Manoa, Dec. 28, 1930, ex *Pipturus*; Haleauau Valley, Jan. 3, 1932, ex *Pipturus*; Kawailoa, Oct. 2, 1934, ex *Perrottetia*; Waipio Ridge, Sept. 18, 1934. Maui: Haelaau, Dec. 18, 1928, ex *Byronia*. Hawaii: Kilauea, Oct. 12, 1929, ex *Acacia koa*.

25. *Xyleborus testaceus* (Walker).

Bostrichus testaceus Walker, Ann. Mag. Nat. Hist. (3), 3, p. 260, 1859.
Xyleborus immaturus Blackburn, Tr. Roy. Soc. Dublin, III, p. 193, 1885.
Xyleborus testaceus Hagedorn, Junk Cat. Col., XXVI, p. 112, 1910.
Xyleborus kraatzi Eichh., Beeson, Insects of Samoa, IV, 4, p. 240, 1929.

This pale species was first described from Ceylon. It has a wide distribution under several names, from India through Malaya, Philippines, Formosa, New Guinea, Solomon Islands, Australia to Samoa and Hawaii. It was the most abundant of the scolytids we collected in Guam in 1936.

Besides numerous records in Schedl's paper, we have the following: Oahu: Helemano, Oct. 18, 1907, ex dead cane (Terry); Honolulu, July 19, 1911, ex dead petiole of date palm (Higgins); Kamehameha Schools, Jan. 22, 1917, ex redwood staves of silo (Bridwell); Manoa, Dec. 20, 1919, ex *Cordyline terminalis* (Bridwell); Nuuanu, Oct. 1919, ex *Dracaena aurea* (Bridwell); Mt. Kaala, Nov. 11, 1926, ex *Elaeocarpus bifidus*; Waikane, Jan. 19, 1930, ex *Bobea elatior*; Kailua, Oct. 9, 1930, ex dead sugar cane; Honolulu, Nov. 3, 1933, ex *Poinciana regia*; Manoa, Jan. 19, 1935, ex *Eugenia malaccensis*; Honolulu, July 17, 1935, ex *Poinciana regia* (Martin). Maui: Haelaau, Dec. 18, 1928, ex *Byronia sandwicensis*.

26. *Xyleborus confusus* Eichhoff.

Xyleborus confusus Eichh., Berl. Ent. Zeitschr., XI, p. 401, 1867.
Xyleborus insularis Sharp, Tr. Roy. Dublin Soc., III, p. 193, 1885.

This widely distributed species was described from South America. It is also recorded from Africa, Madagascar, Seychelles, Keeling Island, and was recorded in the Fauna Hawaiiensis from Kauai, Oahu, Maui and Hawaii. We found it in Guam in 1936. Besides the records in Schedl's paper, we have the following: Oahu: Cooke Trail, Nuuanu, April 5, 1919, ex *Perrottetia*; Mt. Tantalus, Sept. 7, 1923 (Ball); Manoa, Jan. 12, 1929 (Bryan); Waialae Iki, Jan. 20, 1929 (Bryan); Hauula, Nov. 3, 1929, ex *Aleurites* and *Eugenia malaccensis*; Manoa, Dec. 28, 1930, ex *Pipturus*; Paumalu, June 16, 1935, ex *Dracaena aurea*. Molokai: Kainalu, July 29, 1927 (Bryan).

27. **Xyleborus mauensis** Perkins.

Perkins, Fauna Hawaiiensis, II, Pt. III, p. 175, 1900.

Described from Haleakala, Maui, ex *Cheirodendron* (Perkins). The only other record is from Haelaau, Maui, ex *Cheirodendron*.

28. **Xyleborus molokaiensis** Perkins.

Perkins, Fauna Hawaiiensis, II, Pt. III, p. 174, 1900.

Described from Molokai, ex *Cheirodendron* (Perkins), and there is no other record.

29. **Xyleborus frigidus** Blackburn.

Blackburn, Tr. Dublin Soc., III, p. 193, 1885.

Described from Maui, ex *Acacia falcata* (Blackburn). There is no other record. Undoubtedly the host tree was the well-known koa.

PLATYPODIDAE

30. **Crossotarsus externedentatus** (Fairmaire).

Platypus externedentatus Fairm., Rev. Mag. Zool., p. 51, 1850.

Crossotarsus externedentatus, Chap., Monogr. Platyp., p. 81, Fig. 20, 1865.

Described from Fiji and Tahiti. Recorded in Fauna Hawaiiensis from Oahu, two specimens from *Acacia koa*. Its presence was known as early as 1885. Besides the records in Schedl's paper we have the following: Oahu: Maunawili, Nov. 17, 1903, ex avocado (Giffard); Kualoa, Jan., 1925, ex *Albizia lebbek* (McEldowney); Honolulu, Feb. 1, 1933, ex *Cassia nodosa*, Feb. 9, 1934, ex *Cassia*; Haleauau Valley, Nov. 13, 1934, ex *Sideroxylon sandwicense*; Halawa, May 26, 1935, ex *Acacia koa*.

LIST OF SCOLYTIDS AND THEIR FOOD-PLANTS

Hypothenemus insularis Perkins. Banyan, breadfruit, croton, fennel, lima bean pod, pea vine, orange, *Hibiscus tiliaceus*, *Acacia farnesiana*, *Indigofera anil*, *Cajanus cajan*, *Crotalaria saltiana*, *Calotropis procera*, *Nothopanax guilfoylei*, *Bidens waianensis*, *Ipomoea tuberosa*, *Batis maritima*, *Samanea saman*, *Acacia koa* pods, *Aleurites moluccana*, *Thespesia populnea* pods, *Osmanthus sandwicensis*, *Xanthoxylum* sp.

Hypothenemus ruficeps Perkins. *Acacia koa*, *Cassia garatensis*, *Cibotium menziesii*, *Datura stramonium*, *Mangifera indica*, breadfruit, bamboo, Bermuda grass, dead sugar cane.

Hypothenemus eruditus Westwood. Bermuda grass, sugar cane, croton, *Acacia farnesiana* pods, *Gossypium tomentosum*, *No-*

thopanax, tennel, *Amherstia nobilis*, *Samanea saman*, *Thespesia populnea* pods.

Hypothenemus oahuensis Schedl. *Hibiscus tiliaceus*, *Cajanus cajan*.

Hypothenemus mauiensis Schedl. *Euphorbia hookeri integrifolia*.

Ericryphalus sylvicola (Perkins). *Cajanus cajan*, *Clermontia* sp., banyan, breadfruit, *Pipturus albidus*.

Ptilopodius pacificus Schedl. *Hibiscus tiliaceus*, *Samanea saman*, *Gossypium tomentosum*.

Stephanoderes griseus (Blackburn). Mango scions, poppy.

Stephanoderes perkinsi Hopkins. Orange wood.

Stephanoderes maculicollis (Sharp). *Acacia confusa*, *Indigofera anil*, *Crotalaria saltiana*, *Clitoria ternatea*, *Cajanus cajan*, *Leucaena glauca*, *Gossypium tomentosum*, basil, ironwood.

Stephanoderes lebronneci Beeson. *Cajanus cajan*, *Bidens wai-anensis*, *Indigofera anil*, *Panicum torridum*, dead sugar cane.

Stephanoderes hawaiiensis Schedl. Dead sugar cane.

Poecilips persicae (Hopkins). *Pipturus albidus*, imported peach trees, old avocado seed.

Xyleborus fornicatus Eichhoff. *Persea gratissima*, *Eugenia jambolana*, *Sterculia foetida*, *Ricinus communis*, *Schinus molle*, *Tamarindus indica*, *Albizia lebbek*, *Acacia koa*, *Aleurites moluccana*, *Enterolobium cyclocarpum*, *Ficus altissima*, *Nothopanax guilfoylei*.

Xyleborus spinulosus Schedl. *Samanea saman*.

Xyleborus hawaiiensis Perkins. *Pipturus albidus*, *Dubautia laxa*, *Cheirodendron*.

Xyleborus truncatus Sharp. *Acacia koa*, *Syzygium sandwicensis*, *Straussia* sp., *Perrottetia sandwicensis*, *Elaeocarpus bifidus*, *Bobeia elatior*, *Pipturus albidus*.

Xyleborus oahuensis var. **scabratus** Schedl. *Xylosma hawaiiense*.

Xyleborus tantalus Schedl. *Byronia sandwicensis*.

Xyleborus nuuanus Schedl. *Dracaena aurea*.

Xyleborus lanaiensis Perkins. *Sideroxylon sandwicense*, *Sapindus oahuensis*.

Xyleborus kauaiensis Perkins. *Cheirodendron gaudichaudii*.

Xyleborus pseudoangustatus Schedl. *Acacia koa*, *Xylosma hawaiiense*, *Perrottetia sandwicensis*, *Pipturus albidus*, *Byronia sandwicensis*.

Xyleborus testaceus (Walker). *Bohea elatior*, *Dracaena aurea*, *Straussia* sp., *Elaeocarpus bifidus*, *Aleurites moluccana*, *Pipturus albidus*, *Acacia koa*, *Eucalyptus* sp., *Araucaria brasiliana*, *Poinciana regia*, *Samanea saman*, avocado, *Byronia sandwicensis*.

Xyleborus kraatzi Eichhoff. *Poinciana regia*, *Phoenix dactylifera*, dead sugar cane, *Jambosa malaccensis*, avocado, Ceara rubber.

Xyleborus confusus Eichhoff. *Aleurites moluccana*, *Pipturus albidus*, *Dracaena aurea*, *Tetraplasandra* sp., *Bohea elatior*, *Pisonia sandwicensis*, *Perrottetia sandwicensis*.

Xyleborus molokaiensis Perkins. *Cheirodendron gaudichaudii*.

Xyleborus mauiensis Perkins. *Cheirodendron gaudichaudii*.

Xyleborus frigidus Blackburn. *Acacia koa*.

Coccotrypes dactyliperda (Fabricius). Palm seeds: *Phoenix dactylifera*, *Livistona chinensis*, *Livistona rotundifolia*, *Oreodoxa regia*, *Washingtonia filifera*, *Pritchardia pacifica*, *Oreodoxa oleracea*, *Dictyosperma album*.

Coccotrypes pygmaeus Eichhoff. *Phoenix dactylifera*, *Livistona chinensis*, *Sabal palmetto*, *Sabal blackburniana*, *Coccothrinax argentea*, *Pritchardia thurstoni*, *Washingtonia filifera*.

Platypus (Crossotarsus) externedentatus Fairmaire. *Acacia koa*, *Aleurites moluccana*, *Maba sandwicensis*, *Elaeocarpus bifidus*, *Eugenia malaccensis*, *Sideroxylon sandwicense*, *Cassia nodosa*, *Albizia lebbek*, avocado, *Eucalyptus citriodora*.

The following species of Scolytidae have been recorded in Hawaii, but without food-plant records in literature: *Xyleborus obliquus* Sharp, *simillimus* Perkins, *oahuensis* Perkins, *dubiosus* Perkins, *rugatus* Blackburn, *frigidus* Blackburn, *agamus* Perkins, *exsectus* Perkins, *vulcanus* Perkins, *littoralis* Perkins, *ignobilis* Perkins; *Hypothenemus bradfordi* Hopkins, *Ericryphalus henshawii* Hopkins.