

**NOTES ON HAWAIIAN PHOENICOCOCCINAE, WITH
DESCRIPTION OF A NEW SPECIES
(Homoptera: Diaspididae)¹**

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The purposes of this article are to draw attention to recent nomenclatural changes which involve two species of Hawaiian Phoenicococcinae, to present new host and locality information based upon recent collecting, and to name an apparently undescribed species from the island of Oahu. The new species and two of the three others previously recorded from Hawaii have been the subjects of recent cytogenetic investigations by Dr. S. W. Brown, Department of Genetics, University of California, Berkeley, and a description of the new species is offered here so that the name will be available when the results of Dr. Brown's research are published.

Genus **Colobopyga** Brethes

Colobopyga Br., 1912, Ann. Mus. Nacional Buenos Aires **23**: 281.—Saccer, 1915, Proc. Ent. Soc. Wash. **17**: 30.—Ferris, 1952, Microent. **17** (1): 3.

Palmaricoccus Stickney, 1934, U. S. D. A. Tech. Bull. **404**: 49.—Ferris, 1942, Atlas of Scale Ins. No. America S-IV: 439.—Zimmerman, 1948, Ins. Hawaii **5**: 430.

Type of genus: *Colobopyga magnani* Brethes.

KEY TO KNOWN HAWAIIAN SPECIES OF COLOBOPYGA

(in part after Zimmerman, 1948)

1. Second stage exuvium with a distinct median hyaline point at posterior end of body, projecting beyond sclerotized region enclosing operculum; spiracles with not more than 4 or 5 associated disc pores; pygidium of adult ♀ roughly triangular in outline, with apex moderately acute **kewensis**
Second stage exuvium rounded apically, without such posteriorly projecting hyaline point; spiracles each with around 15 or more associated disc pores; pygidium of adult ♀ more or less rounded apically, not triangular in outline..... 2
2. Second stage exuvium with perispiracular disc pores relatively numerous, arranged in a compact arcuate group of 40-60 near each spiracle; adult ♀ with setae on posterior margin of pygidium 7-8 μ long or less; setae of antennal tubercles

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elongate, about 30–40 μ in length; larger species found on fruit and fruiting stems of host **pritchardiae**
 Second stage exuvium with perispiracular pores fewer, arranged in relatively loose clusters of 13–20 near each spiracle; adult ♀ with posterior margin of pygidium bearing 6 relatively large, elongate, conical setae around 15 μ in length; setae of antennal tubercles much shorter, about 15 μ in length; smaller species found on leaves and leaf petioles of host..... **browni**

Colobopyga browni Beardsley, n. sp. Figs. 1 & 2.

Second stage ♀ (fig. 1A): body pyriform, heavily sclerotized at full maturity; sclerotization limited to posterior abdominal segments 5–8 in young individuals. Length of slide-mounted specimens 0.65–0.90 mm. Marginal areas of body from head to abdominal segment 4 moderately thickly set with small conical spine-like projections, these absent on posterior abdominal segments and not extending completely across dorsum of anterior abdominal segments. Anal operculum (fig. 1B) well developed, heavily sclerotized and divided into a

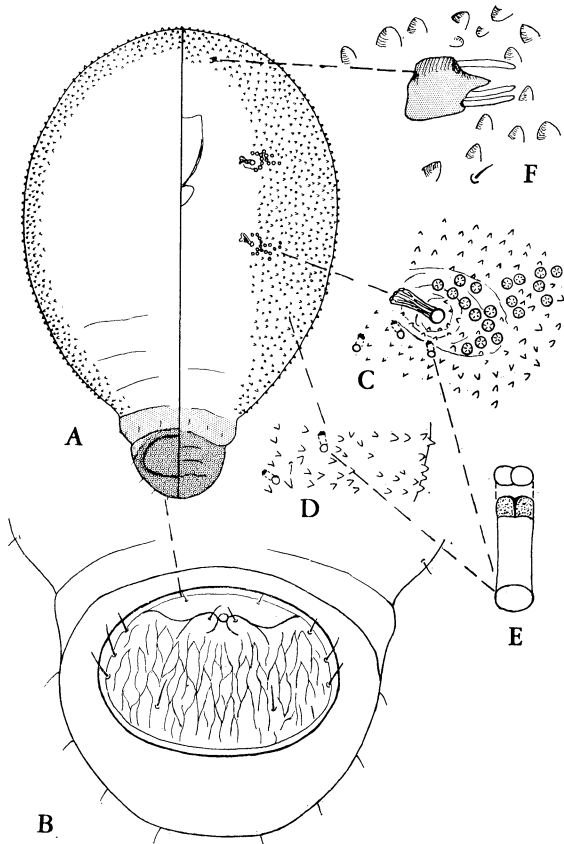


Fig. 1. *Colobopyga browni*, n. sp., young 2nd stage ♀ ; dorsal and ventral aspects and details.

reticulum of small sclerotized plates, except for transverse strip along anterior margin cephalad of the anal opening. Operculum bearing 6 discernible pairs of setae; 3 setae on each anterolateral margin, 1 in each posterolateral quadrant, 1 pair on anterior margin in non-reticulate portion, and 1 on each side of anal opening on small, rounded, slightly projecting lobe. Posterior margin of abdomen rounded, distance between apex and posterior margin of operculum slightly less than 1/2 length of operculum.

Perispiracular disc pores present (fig. 1C), arranged in loose clusters partly surrounding each spiracular opening laterally and anteriorly, plus from 2–8 pores in a scattered group extending outward toward lateral margin of body; 13–15 pores associated with each anterior spiracle and 14–20 associated with each posterior spiracle in available specimens.

Small tubular ducts, each with simple circular orifice and 8-shaped cross section at inner apex (fig.1E), sparsely scattered on dorsum and

venter. Body with few, very small, fine setae arranged in transverse rows of 6–8 or so across dorsum and venter of thoracic and abdominal segments, and scattered on head. Antennal tubercles (fig. 1F) each with 3 moderately stout blunt setae about $12\ \mu$ maximum length, 1 or 2 very small setae, and a spine like projection from distal margin of its lower face.

Adult ♀ (fig. 2A): Body roughly pyriform; membranous throughout; pygidial area staining weakly. Length of slide mounted specimens 0.7–0.9 mm. Pygidium (fig. 2B) with 3 pairs of moderately large, slender, conical setae, 12–16 μ long, on posterior margin, plus a smaller marginal seta, about 6–8 μ long, on each side, anterior to the outermost large seta. Dorsum with 3 small submarginal setae on each side, plus a few very small circular pores, possibly orifices of obscure tubular ducts, scattered near posterior margin. Anal opening well defined; dorsal derm irregularly wrinkled in area behind anus. Venter of pygidium with a transverse row of 8 setae, 6–9 μ long, anterior to vulva, the 3 inner pairs usually distinctly thicker than other body setae. Area behind vulva appearing more heavily wrinkled medially and staining slightly more heavily than anterior part of venter of pygidium. Spiracles (fig. 2C) without associated disc pores, each surrounded by a circular patch of derm bearing minute conical points arranged in roughly concentric circles. Derm of venter of thoracic and abdominal segment 1 with transversely oriented rows of very minute spicules (fig. 2D). Venter of thorax and abdomen with moderately sparse segmentally arranged rows or bands of small tubular ducts (fig. 2E) of type found in 2nd stage exuvium (fig. 2F); similar ducts present on venter of head, particularly numerous on derm surrounding mouthparts. Similar segmentally arranged transverse rows of ducts on dorsum of thorax and abdomen, very few or wanting on head. Body sparsely clothed with very small, fine, weakly conical setae about 3 μ long, segmentally arranged in transverse rows on dorsum and venter of thorax and abdomen, and scattered on head. Antennal tubercles (fig. 2G) each bearing 3 or 4 moderately stout blunt setae about 15 μ maximum length.

Holotype (mature ♀) and 2 paratypes (mature ♀♀) on 1 slide: Poamoho Trail,

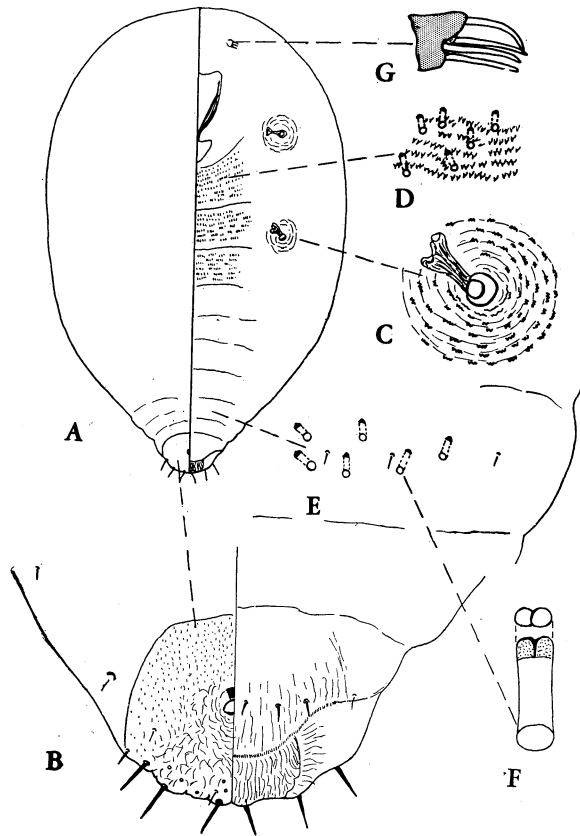


Fig. 2. *Colobopyga browni*, n. sp., adult ♀; dorsal and ventral aspects and details.

summit, 660 m, Koolau Mts., Oahu, 16. IV. 1960, S. W. Brown & Beardsley, on leaves of *Pritchardia Rockiana* Beccari (in collection HSPA Expt. Station, Honolulu). Twenty-two paratypes on 6 slides (5 young 2nd stage ♀♀ and 17 mature ♀♀): same data as type slide (in Bishop Museum, HSPA collection, and U. S. National Coccid Collection, Washington, D. C.).

The following additional collections of *C. browni* are at hand: Summit of Koolau Mts. behind Pupukea, Oahu, 12. IV. 1960, Brown & Beardsley, on *Pritchardia* sp.; Kahana, Oahu, IV. 1928, Swezey, on *Pritchardia martiodes* Rock; Pupukea, Oahu, XII. 1934, Swezey, on *Pritchardia* sp.; Kahana, Oahu, IX. 1939, Swezey, on *Pritchardia Kahana* Rock.

This species is named after Dr. Spencer W. Brown, cytogeneticist at the University of California, Berkeley, who has contributed much to the knowledge of the cytogenetics of the Coccoidea. Dr. Brown's interest in the cytogenetics of Hawaiian Phoenicococcinae resulted in the discovery of the species named here.

C. browni appears closely allied to *C. pritchardiae* (Stickney). Aside from the generally smaller size of mature individuals of the former, and the characters given in the key to species, the following differences have also been noted: In 2nd stage ♀♀ of *C. browni* there are noticeably fewer tubular ducts, and the portion of the derm clothed with small conical projections is less extensive. In *C. pritchardiae* specimens at hand these conical projections are present completely across the dorsum of the prepygidial abdominal segments, whereas in *C. browni* the middle part of the dorsum of these segments is free of projections. The operculum of *P. pritchardiae* does not possess the well defined weakly sclerotized unreticulate area along the anterior margin which is found in *C. browni*, and the setae on lateral margins of the operculum of the former and relatively small.

Colobopyga browni was found moderately abundant on leaves of the host trees. The scales were located on the lower surface of the leaf blade, particularly the basal portion, and on the leaf petiole near its junction with the blade. In the type host these areas are clothed with a thick wooly tomentum in which the scales are partly or completely hidden. The scales are reddish-brown to yellowish-brown in color, with a slight deposit of whitish wax along the lateral margins. Scales situated on the under surface of leaf blades tend to be broader and more flattened than those on the leaf petioles.

It is of interest that there appears to be a habitat separation between this species and the related *C. pritchardiae*. *C. browni* was found only on the leaves, whereas *C. pritchardiae* was confined to the fruiting branches, the fruit, and associated bracts.

***Colobopyga kewensis* (Newstead)**

Fiorinia kewensis News., 1901, Ent. Monthly Mag. ser. 2, 12: 82, figs. 3, 4.

Halimococcus nesiotis, Laing, 1925, Bull. Ent. Res. 15: 51, fig. 1.

Palmaricoccus nesiotis, Stickney, 1934, U. S. D. A. Tech. Bull. 404: 72, figs. 21, 22.—Zimmerman 1948. Ins. Hawaii 5: 430, fig. 236.

Colobopyga kewensis, Ferris, 1952, Microent. 17 (1): 3.

The synonymy cited above is based on Ferris' (1952) treatment. Apparently Ferris did not study type material of *kewensis*, but based his conclusion on Newstead's description and the fact that the type host of *kewensis* is a palm, *Howea forsteriana*, from the type locality, Lord Howe I., of *nesiotis*.

Colobopyga kewensis (as *Palmaricoccus nesiotis*) has been included in the Hawaiian

fauna on the basis of a single collection by Kotinsky in 1906. The exact locality of this collection remains unknown as it is given only as "Macheno, Hawaii", and this locality name does not appear in any Hawaiian gazetteer known to me. Through the courtesy of Dr. Harold Morrison, it has been possible to examine slide mounted specimens from Kotinsky's 1906 collection. These agree well with Ferris' figure of *P. nesiotus* (in Zimmerman, 1948), which was drawn from type material of that species, from unidentified palm from Lord Howe I. Unless an error in labeling has occurred, it appears that this species is, or once was, present in Hawaii.

The Kotinsky collection was from an unidentified palm. The type host of *C. kewensis*, *Howea forsteriana*, is widely cultivated as an ornamental and, according to Neal (1948: 97), is one of 2 species of *Howea* common in Hawaii. It seems possible that a careful search of *Howea* palms in Hawaii might result in the rediscovery of *C. kewensis* there. The species very probably is an accidental introduction into the Hawaiian Islands.

Colobopyga pritchardiae (Stickney), n. comb.

Palmaricoccus pritchardiae Stick., 1934, U. S. D. A. Tech. Bull. 404: 67, figs. 1B, 18-20.—Zimmerman, 1948, Ins. Hawaii 5: 432, fig. 237.

This species was described from 2 lots of specimens, 1 from Oahu and 1 stated to be from fruit of *Pritchardia hardyi* collected at 900 m elevation, Molokai I., Hawaii, in 1919 by J. F. Rock. Rock (1921: 61) described *P. hardyi* from the island of Kauai. According to Beccari and Rock, (1921) none of the endemic Hawaiian *Pritchardia* palms occur naturally on more than 1 island. Consequently it appears that either the host species or the locality of this record must be erroneous.

I have collected this scale on *Pritchardia* sp., near the summit of Poamoho Trail, Koolau Mts. Oahu. Stickney described it as occurring on fruit, and I have found it also infesting the stems and bracts of the fruiting branches.

Genus ***Platycoccus*** Stickney

Platycoccus Stick., 1934, U. S. D. A. Tech. Bull. 404: 107.

Type of genus: *Platycoccus tylocephalus* Stickney.

This monotypical genus appears to be an endemic Hawaiian offshoot of *Colobopyga*, distinguished principally by the flattened, elongate body form and the anteriorly produced head.

Platycoccus tylocephalus Stickney

Platycoccus tylocephalus Stick., 1934, U. S. D. A. Tech. Bull. 404: 108, figs. 40-46.—Zimmerman, 1948, Ins. Hawaii 5: 434, fig. 238.

The type locality of this scale is given as Honolulu. It was described from material collected in 1920 by L. A. Whitney, on "palm." The only known collections made in recent years have been from endemic Hawaiian *Pritchardia* palms. I have taken it several times on leaves of *P. Rockiana* trees growing at the summit of the Koolau Mts. Oahu, near the top of Poamoho Trail. Additional lots of material collected by Swezey in the Koolau Mts. at Kahana, from *P. Kahanae* and *P. martiodes* during 1924-39, are in the HSPA collection.

In June, 1962, I found this species abundant on leaves of *Pritchardia remota* Beccari on isolated Nihoa I. This is the first record of its occurrence outside of Oahu.

GENERAL COMMENTS

Zimmerman (1948) considers the three species of Hawaiian Phoenicococcinae which he records to be immigrants. One of these, *Colobopyga kewensis*, is very probably a relatively recent accidental introduction. However, the three other species now known from Hawaii, (*C. browni*, *C. pritchardiae*, and *Platycoccus tylocephalus*) will likely prove to be endemic to these islands. None of these is known from outside Hawaii, and the only accurately determined hosts records for any of them are endemic *Pritchardia* palms. The presence of *Platycoccus tylocephalus* on the endemic palms of isolated, uninhabited and seldom visited Nihoa I. strongly suggests a natural infestation rather than an accidental introduction in recent times. It seems likely that additional endemic species of Phoenicococcinae will be discovered when careful collections can be made from native *Pritchardia* palms throughout the Hawaiian group. If, as I believe, these scales are endemic, they constitute the second known group of Coccoidea (the other being the Pseudococcidae) containing indigenous Hawaiian forms.

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