

Notes on Hawaiian *Pseudococcus*, with a Description of a New Endemic Species (Homoptera: Pseudococcidae)¹

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INTRODUCTION

The purposes of this brief paper are to call attention to what is currently accepted as the correct identity of one of our common introduced mealybug species; to provide a new name for an endemic species to replace a recently discovered homonym; and to describe and illustrate an unusual new species of *Pseudococcus* from the island of Hawaii.

1. *Pseudococcus obscurus* Essig.

Pseudococcus obscurus Essig, 1909. POMONA COLLEGE JOUR. ENT. 1:43.

Pseudococcus maritimus, Ferris 1918. STANFORD UNIV. PUB., UNIV. SER. p. 48.

Pseudococcus maritimus, Zimmerman 1948. INSECTS OF HAWAII 5:222 (misidentification).

Pseudococcus maritimus, Beardsley 1960. PROC. HAW. ENT. SOC. 17 (2) :230, fig. 3, H, male (misidentification).

Pseudococcus obscurus, Wilkey and McKenzie 1961. BULL. DEPT. AGRIC. CALIF. 50 (4) :246, fig. 2.

Ferris (1918) placed *P. obscurus* as a synonym of *P. maritimus* Ehrhorn. Recently Wilkey and McKenzie (1961) reexamined the types of both species, concluded that they are distinct, and pointed out morphological characters (chiefly the shape of the hind legs and the numbers and distribution of micropores in the hind femora and tibiae) by which they may be distinguished. In the light of Wilkey and McKenzie's finding, I have examined available Hawaiian specimens previously considered to be *P. maritimus*, and find all such specimens fit these authors' concept of *P. obscurus*. Furthermore, Dr. Harold Morrison has kindly examined Hawaiian specimens in the U. S. National Coccid Collection in Washington, D. C., and, except for a single aberrant specimen intercepted in quarantine at Honolulu, he finds that all the Hawaiian specimens there fit the Wilkey and McKenzie concept of *P. obscurus*. It therefore appears that the name *P. obscurus* Essig should be applied to the form present in

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Hawaii, and it is probable that all references to *P. maritimus* in Hawaii apply actually to the former species.

2. ***Pseudococcus pipturicolus*, new name.**

Pseudococcus dorsispinosus Beardsley, 1959. PROC. HAW. ENT. SOC. 17 (1) :40, fig. 1.

Pseudococcus dorsispinosus Beardsley, 1960. PROC. HAW. ENT. SOC. 17 (2) :226, fig. 3, D (male).

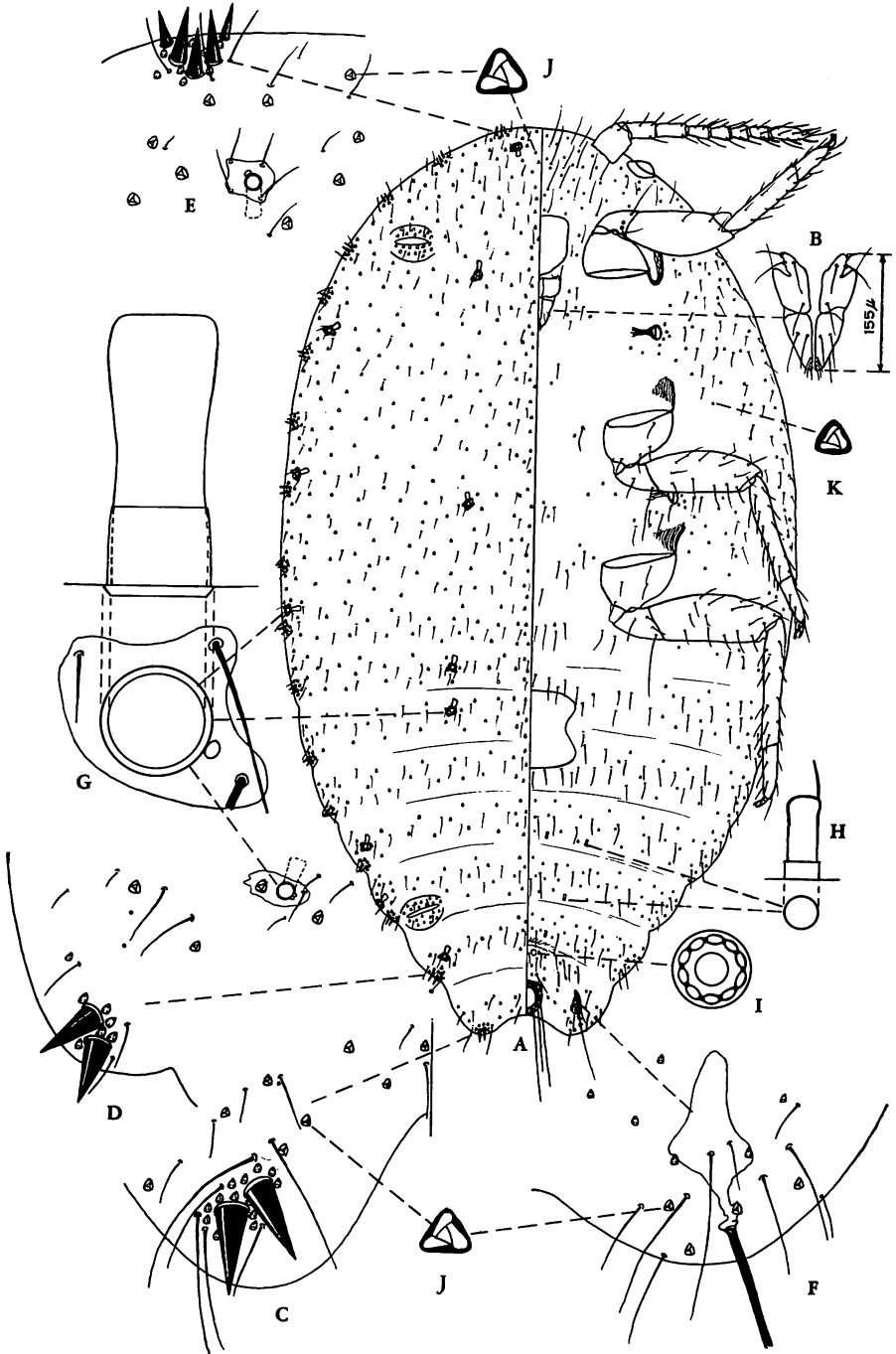
Dr. Harold Morrison has recently pointed out (personal communication) that under provisions of article 58 of the International Code of Zoological Nomenclature adopted by the XV International Congress of Zoology (p. 57), my *P. dorsispinosus* must be considered a junior primary homonym of *P. dorsospinosus* Wirjati, 1958 [IDEA 11 (1) :14, fig. 1], as the two names differ only in the connecting vowel of the compound word. The name *Pseudococcus pipturicolus* is therefore proposed to replace the invalid name *P. dorsispinosus* Beardsley.

3. ***Pseudococcus chloris*, new species (figs. 1, 2).**

Female. Size moderately large; length of slide-mounted specimens 2.2 to 3.8 mm. Anal lobes moderately to strongly protuberant. Antennae 8-segmented, about 530 μ long. Legs moderately large; hind femora about 330 μ long; hind tibiae about 340 μ long, somewhat narrowed toward middle (fig. 2, A). Hind coxae and trochanters without micropores (tiny translucent spots); hind femora each with around 30–35 micropores on upper surface; hind tibiae each with about 18–25 similar micropores (fig. 2, A). Labium (fig. 1, B) about 155 μ long. Anal ring cellular, about μ wide, bearing 6 setae about 240 μ maximum length; anal ring normally situated partially or completely on ventral side of apex of abdomen in slide-mounted specimens. Two pairs of dorsal ostioles present, their lips unsclerotized. Circulus present, very large, its length around 200 μ when fully expanded; extending across fold between abdominal segments 4 and 5; usually appearing slightly dumbbell-shaped. Eyes of moderate size, around 25 μ diameter; borne on a conspicuous sclerotized ocular cone; paraocular discoidal pores absent.

With 17 pairs of marginal cerarii. Anal lobe cerarii (fig. 1, C) each with 2 large conical setae about 45 μ maximum length, 5 or 6 slender accessory setae about 70 μ maximum length, plus a small group of 15–20 trilocular pores around bases of conical setae; the surrounding derm unsclerotized. Penultimate cerarii (fig. 1, D) each with 2 conical setae around 30 μ long, occasionally with a third much smaller conical seta 10–15 μ long; 2–3 slender accessory setae about 45 μ maximum length, and a few (8–12) trilocular pores around bases of conical setae. Anterior

FIGURE 1.—*Pseudococcus chloris*, new species, adult female: dorsal and ventral aspects and details.



cerarii each usually with 2 conical setae about $27\ \mu$ maximum length, some of those of head and anterior part of thorax with 3 to 6 such conical setae (fig. 1, E); usually with 2 or 3 slender accessory setae around $30\ \mu$ maximum length, plus a few trilocular pores about bases of conical setae.

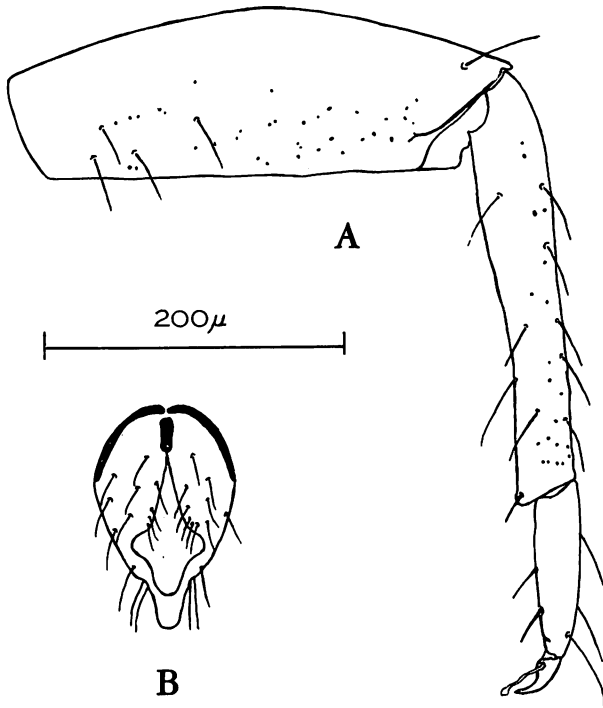


FIGURE 2.—*Pseudococcus chloris*, new species: A, "upper" surface of hind leg of adult female (coxa and trochanter omitted) showing distribution of translucent spots or micropores; B, ventral aspect of male penial sheath.

Venter of anal lobe (fig. 1, F) with a small elongate area of weak sclerotization anterior to and sometimes extending back to the base of the anal lobe seta. Anal lobe seta about $160\ \mu$ long.

Dorsum bearing around 15–22 large oral patch tubular ducts (fig. 1, G) about $10\ \mu$ diameter at orifice; distributed in a marginal series of 5–7 on each side of the body, and a longitudinal submedian series of 3 or 4 on each side. These ducts relatively elongate (about $30\ \mu$ deep), with a narrow oral rim, and relatively long oral collar; the orifice of each surrounded by an irregular area of weak sclerotization bearing one or more small satellite pores near oral rim, 1 to 4 small setae, and sometimes including a trilocular pore. Venter with a few (around 8–10 total) very small oral collar tubular ducts (fig. 1, H) on abdominal segments 6–8 anterior to vulva. Multilocular disc pores frequently absent; with a

single such disc pore discernible on posterior margin of vulva in some specimens (fig. 1, I). Dorsum and venter with sparsely scattered very tiny simple disc pores about $1.5\text{--}2\ \mu$ diameter. Trilocular pores of two distinct sizes present; those of dorsum, except around conical setae of cerarii, relatively large, (fig. 1, J) about $6\ \mu$ wide; sparsely scattered over entire dorsum, but slightly more concentrated in a median longitudinal band, and noticeably more concentrated on lips of dorsal ostioles; a few large trilocular pores present also along extreme lateral margins of venter. Trilocular pores associated with conical setae of cerarii and scattered sparsely over venter smaller, about $4.5\ \mu$ wide (fig. 1, K); largely wanting on midventral parts of thorax and anterior abdominal segments. Body sparsely clothed with fine setae; those of dorsum about $30\ \mu$ maximum length; those of venter more elongate, about $75\ \mu$ maximum length; longer setae of venter of head anterior to mouthparts up to about $100\ \mu$ long.

Male. Size relatively large; body length about 1.8 mm. in slide-mounted specimens. Antennae 10-segmented, about 1.1 mm. over-all length; segment 3 about $165\ \mu$ long. Antennae clothed with slender digitiform setae about $48\ \mu$ maximum length, plus a very few slender filamentous setae about $45\ \mu$ maximum length. Thicker specialized sensory setae on three apical segments $60\text{--}75\ \mu$ long. Midcranial suture of head well developed dorsally. Eyes of moderate size; dorsal pair each about $40\ \mu$ diameter; ventral pair each about $45\ \mu$ diameter.

Dermal discs with 3 to 5 peripheral loculi, $8\text{--}9\ \mu$ outside diameter; a group of 10–15 on each side of basal abdominal segment, apparently absent on posterior abdominal segments; a band of 15 or so dorsolaterally on each side of prothorax, plus 1–3 ventrolaterally near or behind the propleural sclerite; 6–8 on each side of midcranial ridge between bases of antennae. Very small circular pores or shallow tubular ducts, about $1.5\ \mu$ diameter, associated with dermal discs on thorax and basal segment of abdomen, and scattered along lateral margins of posterior abdominal segments. Tail-forming pore clusters limited to pair on abdominal segment 9; each composed of about 60–70 stellate pores $5\text{--}6\ \mu$ diameter. Each tail-forming cerarius bearing two long hairs situated in a small pocketlike depression in center of stellate pore cluster.

Penial sheath (fig. 2, B) about $150\ \mu$ over-all length; without discernible median lobes; posterior extension tapering to a bluntly rounded apex about $20\ \mu$ wide at $9\ \mu$ before tip.

Legs elongate; hind femora about $300\ \mu$ in length, clothed with numerous slender digitiform setae about $42\ \mu$ maximum length plus a very few slender filamentous setae of similar length or shorter. Claw of hind tarsus about $45\ \mu$ long.

Abdominal sclerotization consisting of a broad median transverse patch on dorsum of segment 9; a pair of smaller sublateral patches on venter of segment 9; and small paired dorsal sublateral intersegmental patches between each abdominal segment from 2 to 6, and sometimes be-

tween 6 and 7, the patches becoming smaller and more weakly sclerotized posteriorly. Posterior dorsal ostioles present but poorly defined.

Holotype female and 6 female paratypes on 6 slides: Pohakuloa, Hawaii, 6,000 ft., August 19, 1958, J. W. Beardsley, ex *Sophora chrysophylla* foliage. Allotype male, 5 male paratypes, and 14 female paratypes on 7 slides: same locality, collector, and host, Feb. 10, 1962. Holotype and allotype in B. P. Bishop Museum, Honolulu; paratypes in U.S. National Coccid Collection, Washington, D. C. and in Experiment Station, HSPA, Honolulu.

Living mature females of *Pseudococcus chloris* are bright green, the coloration being nearly identical with that of the *mamani* (*Sophora*) foliage on which they are found. The dorsum is covered with a very light bloom of white powdery wax, somewhat more conspicuous in a longitudinal line down the middle of the back. The lateral margins of the body bear very fine threadlike filaments of wax. Two such filaments arise from each cerarius, but are usually coalesced into a double filament. The longest of these marginal filaments are equal in length to from one-half to two-thirds the maximum width of the dorsum, and are situated about half way between anterior and posterior ends of the body. Young last-instar females are usually pale green to pale yellow green in color. The species appears to be ovoviviparous as no trace of an ovisac could be found, and mature females were frequently found harboring several unfed first instar nymphs (crawlers) beneath their bodies.

This is a distinctive species of *Pseudococcus*, not only in the living state (it is the only bright green mealybug that I have ever encountered) but also in microscopic features of the derm. The peculiar oral patch tubular ducts of the dorsum suggest the type found in the genus *Ferrisia* Fullaway, but in all known members of that group, cerarii are present only on the anal lobes. The large conical setae of the anal lobe cerarii, the large circulus, the two sizes of trilocular pores, and the absence or greatly reduced number of multilocular disc pores will also serve to distinguish *P. chloris* females from those of any other known Hawaiian *Pseudococcus*. In the male, the relatively large size of body and appendages, the form of the penial sheath, and the absence of dermal discs on the posterior abdominal segments will distinguish this species from males of any other known Hawaiian mealybug.