

***Megatrioza zanthoxyli*, n. sp.**
(Homoptera: Psyllidae), with Descriptions
of Adult and Immature Stages¹

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ABSTRACT. The adult and immature stages of a new endemic Hawaiian psyllid, *Megatrioza zanthoxyli*, are described. Keys to separate the adults and nymphs of this species from those of the *Megatrioza palmicola* Crawford group are presented.

The genus *Megatrioza* Crawford 1915 contains more than 30 described species and is widely distributed in the Pacific Basin. Taxonomic problems involving this genus were discussed by Uchida and Beardsley (1988) in their treatment of the endemic Hawaiian *Megatrioza palmicola* group. Until now, the only Hawaiian psyllids placed in *Megatrioza* were those species found on endemic *Pritchardia* palms. This paper provides descriptions of the adult and nymphal stages of a new species of *Megatrioza* collected by the senior author on Hawaii island on two species of endemic trees of the genus *Zanthoxylum*, (Rutaceae).

Descriptions of the immature stages follow the style of Uchida and Beardsley (1992). All measurements cited are in millimeters. For a key to the adults and immature stages of the *Megatrioza palmicola* group see Uchida and Beardsley (1988).

KEY TO THE ADULTS OF HAWAIIAN MEGATRIOZA

- 1. Wing apex blunt, M_{1,2} connected to costa posterior to wing apex *palmicola* group
- Wing apex acutely pointed, M_{1,2} connected to costa anterior to wing apex *zanthoxyli*, n. sp.

KEY TO THE NYMPHS OF HAWAIIAN MEGATRIOZA

First Instar

- 1. Meso- and metathorax with flattened spine-like structures along margin; length 0.51-0.59, width 0.29-0.34 *palmicola* group
- Meso- and metathorax without flattened spine-structures along margin; length 0.30, width 0.14-0.18 *zanthoxyli*, n. sp.

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Second, Third, Fourth and Fifth Instars

1. Submarginal sectasetae on cephaloprothorax and abdomen with truncate apices; second instar, length 0.39-0.42, width 0.28-0.32; third instar, length 0.61, width 0.44-0.47; fourth instar, length 0.87-0.91, width 0.71-0.75; fifth instar, length 1.31-1.41, width 1.12-1.19 *zanthoxyli*, n. sp.
- Not as above; second instar, length 0.86-0.98, width 0.60-0.71; third instar, length 1.28-1.62, width 0.97-1.22; fourth instar, length 2.07-2.67, width 1.53-1.90; fifth instar, length 3.40-4.50, width 2.45-3.35 *palmicola* group

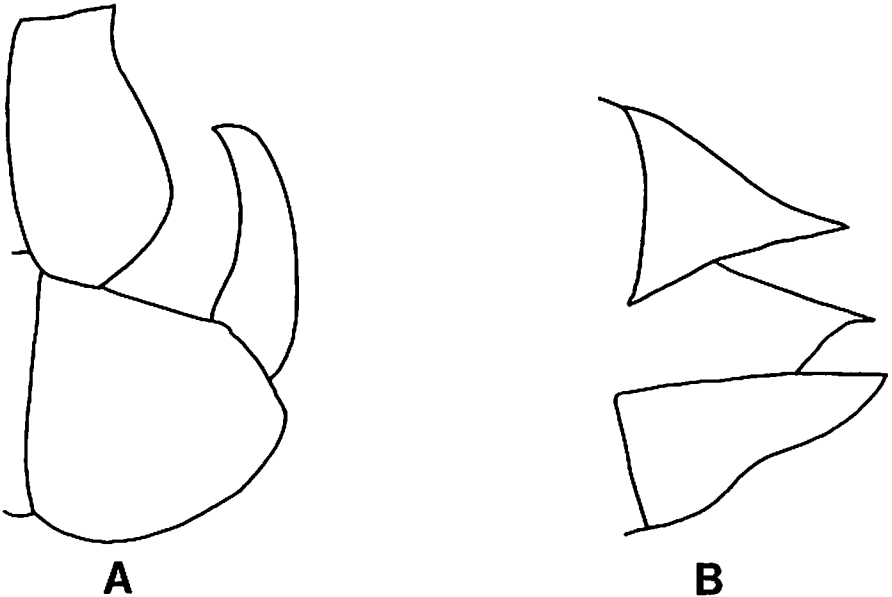


FIGURE 1. *Megatrioza zanthoxyli*, adult terminalia. A, lateral aspect of male; B, lateral aspect of female.

Megatrioza zanthoxyli, n. sp. (Figs. 1, A-B; 2, A-T).

Adult. (Fig. 1, A-B).

Diagnosis. $M_{1,2}$ vein connected to costa anterior to wing apex.

Dimensions. **Male:** length from front of head to tip of wing 2.9; body: length 1.3, width 0.5; anterior wing: length 2.4, width 0.8. **Female:** length from front of head to tip of wing 3.1; body: length 1.6, width 0.5; anterior wing: length 2.6, width 1.0.

Color. General color light brown with darker brown markings. **Head:** antenna flagellum nearly entirely dark brown except for basal segment; vertex dark brown; ocelli reddish; eyes black; clypeus brown. **Thorax:** pronotum dark brown; mesonotum: prescutum with large dark brown spot

anteromedially; scutum with submedial, triangular mark on each side. **Wings:** hyaline, veins noticeably brown. **Legs:** pro- and mesofemora each with brown apical stripe, tibiae and tarsi dark brown; metafemora with brown lateral stripe, tibiae brown basally and apically, basal spur brown; basal tarsal segment brown, apical segment dark brown. **Abdomen:** dorsal aspect brown; male anal valve brown and forceps dark brown; female with dorsal and ventral valves dark brown apically.

Structural characters. **Head:** positioned below dorsal surface of prescutum, declivious; antennae 10 segmented; vertex half as long as wide, anterior margin not extending beyond anterior ocelli; genae conical, short, about as long as wide. **Thorax:** arched. **Wings:** apices acutely pointed, $M_{1,2}$ connected to costa anterior to wing apex. **Legs:** metatibiae with basal spur; with 2 apical spurs, outer spur simple and inner spur bifid. **Abdomen:** male proctiger stout (Fig. 1, A), truncate apically, parameres relatively stout, anteriorly directed; female proctiger triangular (Fig. 1, B), subgenital plate weakly notched ventrally.

Immature Stages.

FIRST INSTAR (Figs. 2, A, F, K, P).

Dimensions. Length 0.30; width 0.14-0.18.

Shape. Elongate-obovate.

Margin. Specialized structures absent.

Dorsum. Sclerotization weak; head fused with prothorax, separated from meso- and metathorax by distinct arcuate suture; wing pads absent; abdomen well defined, separated by distinct suture, 3 basal segments separated by distinct suture, remaining posterior segments fused. **Indumenta:** sectasetae (Figs. 2, A, F, K) borne on short protuberances, stout to moderately stout, dorsoventrally compressed, apex either truncate or emarginate, cephaloprothorax and abdomen with submarginal row, meso- and metathorax each with 1 sectaseta on each side. Setae simple, few, arranged in uneven longitudinal row on each side of body. **Cuticular structures:** convex, blister-like protuberances absent. Minute points absent.

Venter. Sclerotization absent except for cuticular structures and circumanal pore ring plate. **Indumenta:** Setae simple, few, sparse, subequal in size; cephaloprothorax with 2 long setae on each side; setae absent from clypeus base; abdomen with elongate setae on apical segment anterolateral to circumanal pore ring; circumanal pore ring surrounded by 3 setae on each side, (1 anterior and 2 posterior). **Cuticular structures:** spinules in short transverse band on each abdominal segment, alternating with a short transverse band of minute points; minute points dense in submarginal region of body. **Antennae:** one segmented, elongate; with 3 setae (1 elongate blunt apical seta, 1 long subapical seta and 1 medial specialized seta); with 4 sensoria (3 subapical and 1 dorsal near base). **Labium:** basal segment with small seta on each side. **Legs:** slender, trochanter undefined; femora not reaching margin of body; tibiotarsal articulations absent; claws present; pulvillus somewhat elliptical in shape; setae few, simple, subequal in length,

long capitate seta on each tibiotarsus; spinules sparse. **Circumanal pore ring** (Fig. 2, P) consisting of single row of pores.

SECOND INSTAR (Figs. 2, B, G, L, Q).

Dimensions. Length 0.39-0.42; width 0.28-0.32.

Shape. Somewhat elliptical; anterior and posterior wing pads laterally produced.

Dorsum. Cephaloprothorax and anterior wing pads separated by a submarginal suture. **Indumenta:** sectasetae (Figs. 2, B, G, L) with apical margin

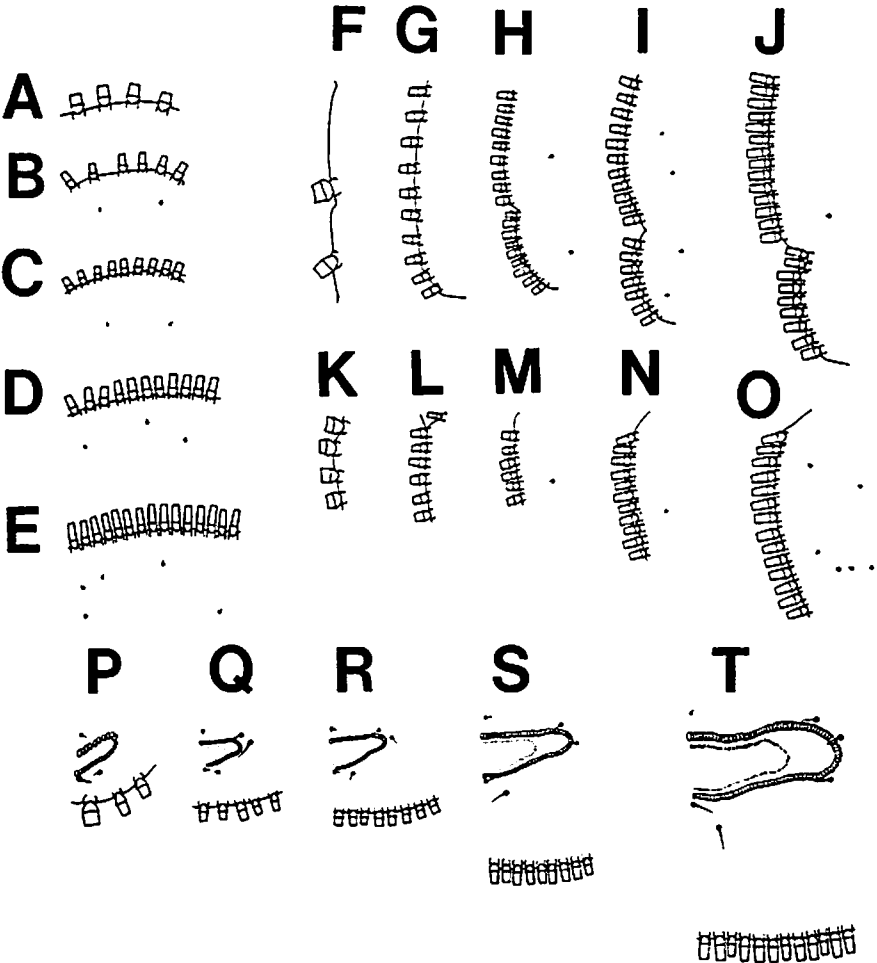


FIGURE 2. *Megatrioza zanthoxyli*, nymphal instars, submarginal sectasetae of cephaloprothorax (A-E), thorax (F-J), and abdomen (K-O). A, F, K, first instar; B, G, L, second instar; C, H, M, third instar; D, I, N, fourth instar; E, J, O, fifth instar. Circumanal pore ring (lower), P, first instar; Q, second instar; R, third instar; S, fourth instar; T, fifth instar.

truncate or nearly so. Setae simple, reduced in size, few, scattered; circum-anal pore ring surrounded by 5 setae on each side (2 anterior, 1 lateral and 2 posterior).

Venter. Indumenta: cephaloprothorax with 2 setae on each side; abdomen with submarginal row setae. **Antennae:** one segmented, resembling antennae of first instar. **Legs:** relatively stout. **Circumanal pore ring** (Fig. 2, Q).

THIRD INSTAR (Figs. 2, C, H, M, R).

Dimensions. Length 0.61; width 0.44-0.47.

Shape. Somewhat elliptical; cephaloprothorax anteriorly produced on each side; anterior and posterior wing pads each well defined, laterally produced; abdominal apex weakly emarginate.

Dorsum. Indumenta: sectasetae (Figs. 2, C, H, M).

Venter. Indumenta: cephaloprothorax with 3 setae on each side, subequal in length; 4 distal abdominal segments with few setae on each segment. **Antennae:** one segmented; resembling second instar antennae, except for presence of 1 submedial sensorium below specialized seta. **Circumanal pore ring** (Fig. 2, R).

FOURTH INSTAR (Figs. 2, D, I, N, S).

Dimensions. Length 0.87-0.91; width 0.71-0.75.

Dorsum. Indumenta: sectasetae (Fig. 2, D, I, N). Setae minute, many scattered over dorsum.

Venter. Antennae: one-segmented, resembling second instar antennae, except with 2 sensoria below specialized seta. **Legs:** femora with 3 sensoria near base. **Circumanal pore ring** (Fig. 2, S).

FIFTH INSTAR (Figs. 2, E, J, O, T).

Dimensions. Length 1.31-1.41; width 1.12-1.19.

Dorsum. Indumenta: sectasetae (Fig. 2, E, J, O). Setae more numerous than previous instar, scattered.

Venter. Indumenta: cephaloprothorax with 4 setae on each side; circum-anal pore ring surrounded by 6 setae on each side, with 2 anterior, 1 lateral and 3 posterior. **Antennae:** two-segmented, otherwise resembling fourth instar antennae, separation of segments occurring distal to specialized seta. **Circumanal pore ring** (Fig. 2, T).

Types. Holotype male, Hawaii, Hawaii I.: OIaa Forest Reserve, 3,800 ft, 26•XI•1988, ex *Zanthoxylum kauaense*, G.K. Uchida; allotype female, Bobcat Trail, 5,200 ft, 25•XI•1988, ex *Zanthoxylum hawaiiensis*, G.K. Uchida. Paratypes, 1 male, 1 female, locality data same as holotype; 1 male, 20 nymphs (3 I, 5 II, 4 III, 5 IV, 3 V), locality data same as allotype. The female which was collected with the male holotype was not designated as the allotype since it was teneral; therefore, a female from a different locality (Bobcat Trail) serves as the allotype.

Holotype and allotype deposited in Bernice P. Bishop Museum, Honolulu. Paratype adults and slide-mounted nymphs in collection of senior author.

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