

STUDIES ON THE PHILIPPINE PSYLLIDAE  
(HEMIPTERA: HOMOPTERA) II.

Results of the Natural History Survey by Osaka Museum of Natural History  
and National Museum of the Philippines, 1969. Part II.\*

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Among 27 species of psyllids obtained during the Natural History Survey of the Philippines by Osaka Museum of Natural History and National Museum of the Philippines in 1969, the remaining 16 species are recorded in the present paper. Ten species of them are new to science and one species is a new addition to the psyllid fauna of the Philippine Islands. Two species are left undetermined since the material is represented by only female or damaged specimen. The genera *Pseudotrioza* and *Leptotrioza* are newly erected. There still remains many problems which the generic status and treatment is concerned with in the present report. It is really hoped that those will be put into shape in studying further material from the area.

The types of the new species, except those otherwise designated, are at present kept at the Osaka Museum of Natural History, but will be finally deposited in the National Museum of the Philippines, Manila. The paratypes will be preserved in the collection of Osaka Museum of Natural History.

In the first report of this series (Bull. Osaka Mus. Nat. Hist. 25: 51~60, 1971), some old names of psyllids were used by mistake, because of failing to refer some important literatures. *Sympauropsylla triozyptera* (CRAWF.) should be used for *Pauropsylla triozyptera* CRAWF. (p. 52). *Microceropsylla nigra* (CRAWF.) should be used instead of *Pauropsylla nigra* CRAWF. (p. 52). *Pelmatobrachia spondiasae* (CRAWF.) should be used for *Pauropsylla spondiasae* CRAWF. (p. 54-55). The relationship between the genus *Pelmatobrachia* ENDERLEIN and the subgenus *Neocalophya* MIYATAKE will be discussed in the future publication.

I wish to express my appreciation to Dr. M. M. LOGINOVA, Zoological Institute, Academy of Sciences, USSR for her kind advice in pointing out my mistake mentioned above.

Genus *Tenaphalara* KUWAYAMA, 1908

12. *Tenaphalara umalii* sp. nov. (Fig. 1, U<sub>1</sub>~U<sub>8</sub>; Pl. 5-12)

Color: General color yellowish to coffee brown. Thoracic dorsum with a broad central and two pairs of narrow lateral stripes of lighter color. Vertex brown in posterior half and whitish in anterior half in dorsal view, ventrally with two pairs of narrow brown

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bands near upper edge and behind antennal socket as figured (Fig. 1-U<sub>4</sub>). Eyes reddish brown, ocelli orange. Antenna light brown, darker in apical half, with X dark brown. Forewing transparent, maculated rather regularly with brown markings as figured (Fig. 1-U<sub>1</sub>), with a dark brown spot at apex of Rs. Legs light brown, apical segments of all tarsi and streaks on posterior femora and tibiae dark brown. Abdomen testaceous dorsally, dark brown laterally, light brown ventrally. Genitalia yellowish to reddish brown.

Structure: Head (Fig. 1-U<sub>3</sub>·U<sub>4</sub>) not deflexed, nearly as wide as or slightly narrower than thorax. Vertex in dorsal aspect nearly half as long as wide on median line, with rather deep depression on each side of median line near posterior margin, strongly concave posteriorly, anterior portion rather sharply bent downward making somewhat an edge. Genae scarcely swollen beneath antennal sockets, without cones. Frons covered by genae. Eyes hemispherical, ocelli small. Antenna 1.5 times as long as width of head, slender, with 1 long and 1 short apical setae, relative length of each antennal segment for example as 2 : 2 : 11 : 6 : 6 : 5 : 6 : 5 : 2 : 2 .

Thorax moderately arched, without pubescence; pronotum long, slightly deflexed, with a conspicuous anterior epiphysis medially; praescutum elongate, 6×7. Forewing (Fig. 1-U<sub>1</sub>) long, slender, broad basally, narrow apically, subacute at apex, 3.3 times as long as wide, with triozone venation; Rs short, arched; M<sub>1+2</sub> ending at or close to wing apex; cubital cell large; clavus long, ending near apex of Cu<sub>2</sub>. Hind wing (Fig. 1-U<sub>2</sub>) moderately long, nearly 2/3 as long as forewing, about 3.7 times as long as wide, narrowly rounded apically, venation triozone. Legs short; posterior tibia (Fig. 1-U<sub>5</sub>) with a prominent basal spur, with 1 outer and 3 inner apical spurs; proximal segment without apical spur; meracanthus (Fig. 1-U<sub>6</sub>) moderately large, stout, subacute at apex, projected caudad in lateral aspect. Abdomen (excl. genitalia) short, with short pubescence only ventrally.

Male genitalia (Fig. 1-U<sub>7</sub>) small, shorter than half as long as rest of abdomen; procitiger in lateral view long, much longer than forceps, somewhat D-shaped, with anterior margin almost straight, with posterior margin strongly produced caudad, with a row of long bristles along posterior margin, obliquely truncate at apex; forceps simple in lateral view, parallel-margined, blunt apically. Female genitalia (Fig. 1-U<sub>8</sub>) long, nearly as long as rest of abdomen; dorsal valve distinctly longer than ventral, with a large prominent dorsal protuberance behind large anus as figured, narrowly rounded at its apex and bearing a single horizontal row of about ten long setae, apical portion of dorsal valve attenuate, slightly upturned, acute at apex; ventral valve broad basally, apical portion attenuate and upturned, acute at apex.

Length of body ♂ 2.0 mm, ♀ 3.3 mm; to tip of folded wings ♂ 3.8 mm, ♀ 4.5 mm; length of forewing ♂ 3.1 mm, ♀ 3.5 mm; width of forewing ♂ 0.8 mm, ♀ 1.0 mm; length of hind wing ♂ 2.0 mm, ♀ 2.2 mm; length of antenna ♂ 1.0 mm, ♀ 1.1 mm.

Holotype (♀): Mt. Maquiling, alt. 100 m, Laguna, Luzon, 16. xii. 1969, Y. Miyatake leg.



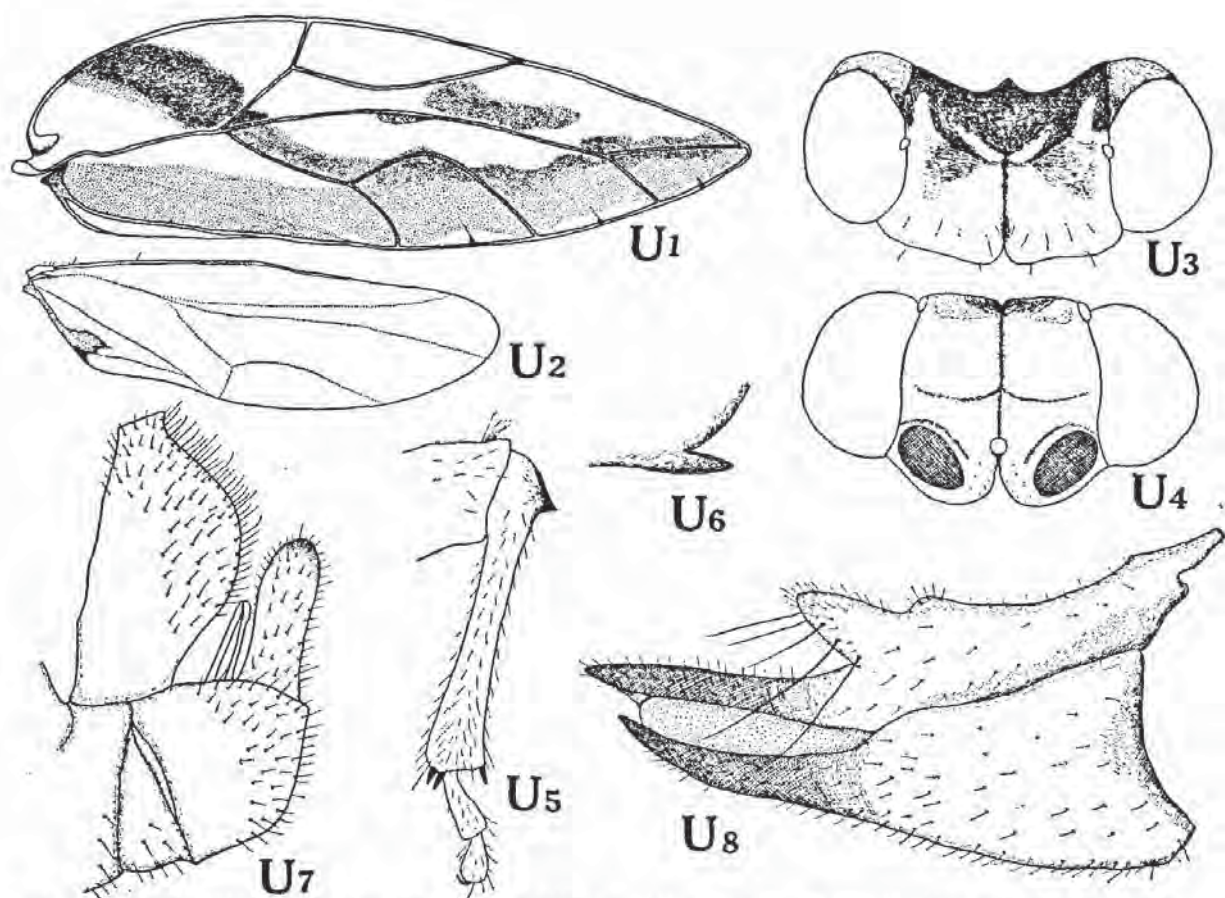


Fig. 1. *Tenaphalara umalii* sp. nov. U<sub>1</sub>, Forewing, ♀; U<sub>2</sub>, Hind wing, ♀; U<sub>3</sub> and U<sub>4</sub>, Head, dorsal and frontal views, ♀; U<sub>5</sub>, Posterior tibia and tarsi, ♂; U<sub>6</sub>, Meracanthus; U<sub>7</sub>, Male genitalia; U<sub>8</sub>, Female genitalia.

Paratopotype: 1 ♂ (teneral), the same data as the holotype.

Distribution: Philippines (Luzon).

Host plant: unknown.

This species is very close to *T. triozipennis* CRAWFORD, described from Singapore, but differs from the latter in being larger, in shape, maculation and venation of forewing and characters of female genitalia. This species is also resembling *T. striata* CRAWFORD in structure of female genitalia, but differs from the latter in venation.

It seems that the genus *Tenaphalara* had been treated by CRAWFORD in rather rough sense, as HESLOP-HARRISON emphasized (Ann. Mag. Nat. Hist. XIII, 1: 570, 1958). However, this new species is included in the genus until its generic position will be clear.

The specific name of this handsome psyllid is dedicated to Dr. D. L. UMALI, Vice President of the University of the Philippines, who insured our survey in Laguna Province.

Genus *Psylla* GEOFFROY, 1762

13. *Psylla fulguralis* KUWAYAMA (Fig. 2-F; Pl. 5-13)



*Psylla fulguralis* KUWAYAMA, 1908, Trans. Sapporo Nat. Hist. Soc. 2: 177.

Specimen examined: 1 ♀, Upper Bayabas River, alt. 900 m, Davao City, Mindanao, 23. xi. 1969, on *Elaeagnus cuprea*, Y. Miyatake leg.

Distribution: Philippines\* (Mindanao), Ryukyus, Amami-Oshima, Japan.

Host plant confirmed: *Elaeagnus cuprea* ELM.\* [Elaeagnaceae].

Comparing with specimens from other countries, an unique specimen collected in the Philippines is slightly bigger and having a longer forewing and genal cones which are shorter and stouter apically. These differences are too minor, however, to warrant it a new species or subspecies as this species is fairly variable in dimensions and morphological characters in Japan and the Ryukyus.

14. *Psylla* sp. (Fig. 2-P; Fig. 3-P; Pl. 6-14)

Specimens examined: 2 ♀, Mt. Maquiling (alt. 100 m ~ Mudspring, alt. 400 m), Laguna, Luzon, 17. xii. 1969, Y. Miyatake leg.

Host plant: unknown.

Length of body ♀ 1.0 mm; to tip of folded wings ♀ 1.6 mm; length of forewing ♀ 1.3 mm; width of forewing ♀ 0.5 mm; length of hind wing ♀ 1.1-1.2 mm; length of antenna ♀ 0.4 mm.

This very minute species which seems to be new to science is quite similar to *Psylla jamatonica* KUWAYAMA in many respects and it is supposed to be included in the same species group. As the male genitalia is characteristic of this group, it remains unnamed until further material including male specimens is available, however.

15. *Psylla aranetae* sp. nov. (Fig. 2-A<sub>1</sub>-A<sub>2</sub>; Fig. 3-A; Pl. 6-15)

Female: General color orange yellow to testaceous, with markings of yellowish white and black. Vertex with small black area on each side of median suture, anterior margin with black area medially behind frontal ocellus. Genal cones testaceous. Antenna orange to light brown, with scape dark brown, ocelli orange. Pronotum black cephalad and with black band along posterior margin medially, with whitish lateral band centrally. Praescutum orange, with white area along lateral margin. Mesoscutum with obvious longitudinal stripes of yellowish white, with conspicuous black markings anteriorly on each side of praescutum, slightly black posteriorly in front of mesoscutellum. Mesoscutellum mostly whitish, orange only medially. Metascutellum entirely white. Forewing transparent, slightly flavous, veins yellowish brown in basal half and darker in apical half, alar radulae weak. All tarsi dark brown.

Head (Fig. 2-A<sub>2</sub>) wider than thorax, deflexed. Vertex short, 1/3 as long as wide, roundly convex on each side of median line in front, with a small discal depression on each side of median line, elevated at posterior ocelli, with several setae near anterior margin. Genal cones long, 1.3 times as long as vertex, well separated, blunt at apex, with long bristles as figured.



Antenna long, 2.2 times as long as width of head, moderately thick, with two apical setae, relative length of each antennal segment as 4 : 3 : 15 : 14 : 14 : 14 : 10 : 10 : 4 : 4 .

Thorax broad, strongly arched, without pubescence; pronotum large, rather vertical, produced forward; praescutum rather small compared with large mesoscutum. Forewing (Fig. 2-A<sub>1</sub>) large, rather elongate, narrowly rounded apically, 2.5 times as long as wide, anterior margin with dense pubescence; pterostigma prominent, narrow; Rs quite long; both medial and cubital cell elongate. Hind wing large, broad, about 2/3 as long as forewing, 2.7 times as long as wide, with anterior margin rather straight, with posterior margin strongly produced caudad. Legs long, hairy; posterior tibia without basal spur, with 5 apical spurs; proximal segment of posterior tarsi with a pair of apical spurs; meracanthus rather long, acute apically, projected ventro-caudad. Abdomen (excl. genitalia) short, pubescent only ventrally.

Female genitalia (Fig. 3-A) long, as long as rest of abdomen, broad basally, narrowing to subacute tip; dorsal valve conspicuously longer than ventral, apical portion attenuate, pubescent throughout, with several long bristles medially; ventral valve slightly upcurved apically, acute at apex, pubescent.

Male: unknown.

Length of body ♀ 2.7 mm; to tip of folded wings ♀ 4.5 mm; length of forewing ♀ 3.7 mm; width of forewing ♀ 1.5 mm; length of hind wing ♀ 2.6 mm; length of antenna ♀ 2.1 mm.

Holotype (♀): Upper Bayabas River, alt. 900 m, Davao City, Mindanao, 23. xi. 1969, Y. Miyatake leg.

Distribution: Philippines (Mindanao).

Host plant: unknown.

This is a close relative of *P. bakeri* CRAWFORD from Luzon, but differs from the latter in being much larger, in coloration, in having longer genal cones and much more elongate marginal cells of forewing. (A female specimen of *P. bakeri* collected at Baguio, Benguet by BAKER with CRAWFORD's determination label in the collection of B. P. Bishop Museum was examined.)

The specific name for this beautiful psyllid is dedicated to Mrs. G. C. ARANETA, the former director of the National Museum of the Philippines.

16. *Psylla dalbergiae* sp. nov. (Fig. 2-D<sub>1</sub>•D<sub>2</sub>; Fig. 3, D<sub>1</sub>~D<sub>5</sub>; Pl. 6-16)

Color: General color yellowish to deep green. Eyes reddish to dark brown, ocelli yellow to orange. Antenna green to light brown, apices of III to VIII and two apical segments dark brown or black. Forewing milky or semiopaque, with veins green or yellowish brown, apex of Cu<sub>2</sub> and alar radulae dark brown or black.

Structure: Head (Fig. 2-D<sub>2</sub>) deflexed, nearly as wide as thorax. Vertex slightly longer than half as long as wide, with shallow discal depressions, with a small tubercle behind antennal socket. Genal cones short, stout, blunt, more or less divergent, about half as long as vertex, nearly on same plane as vertex, with a pair of long setae in addition to



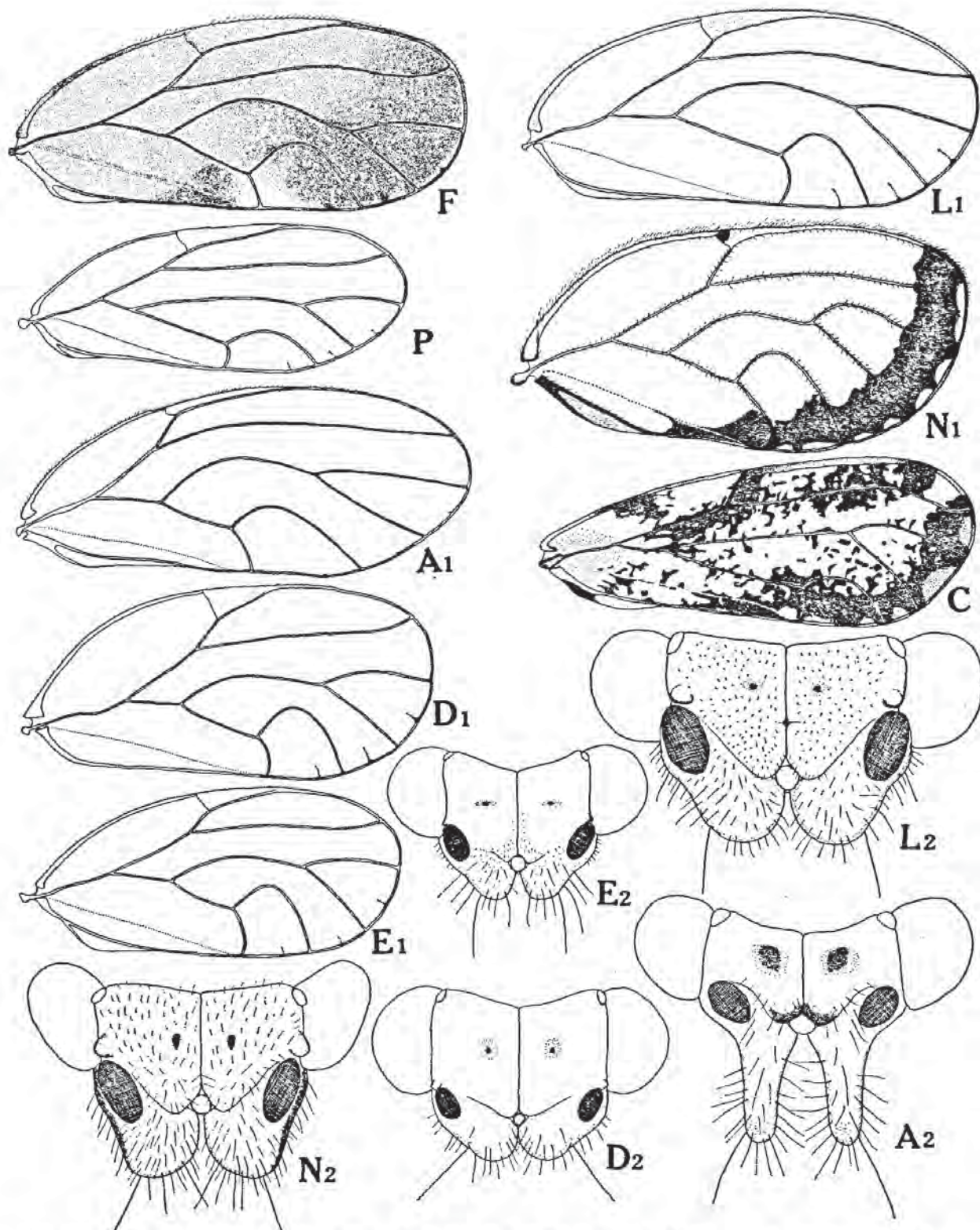


Fig. 2. Forewing (1) and head, frontal view (2). F, *Psylla fulgurata* Kuw., ♀. P, *Psylla* sp. A, *Psylla aranetae* sp. nov., ♀. D, *Psylla dalbergiae* sp. nov., ♀. E, *Psylla derricola* sp. nov. (E<sub>1</sub>, ♂; E<sub>2</sub>, ♀). L, *Insnesia lagunensis* sp. nov., ♀. N, *Insnesia nigrivittata* (CRAWF.), ♂. C, *Diaphorina citri* Kuw., ♀.



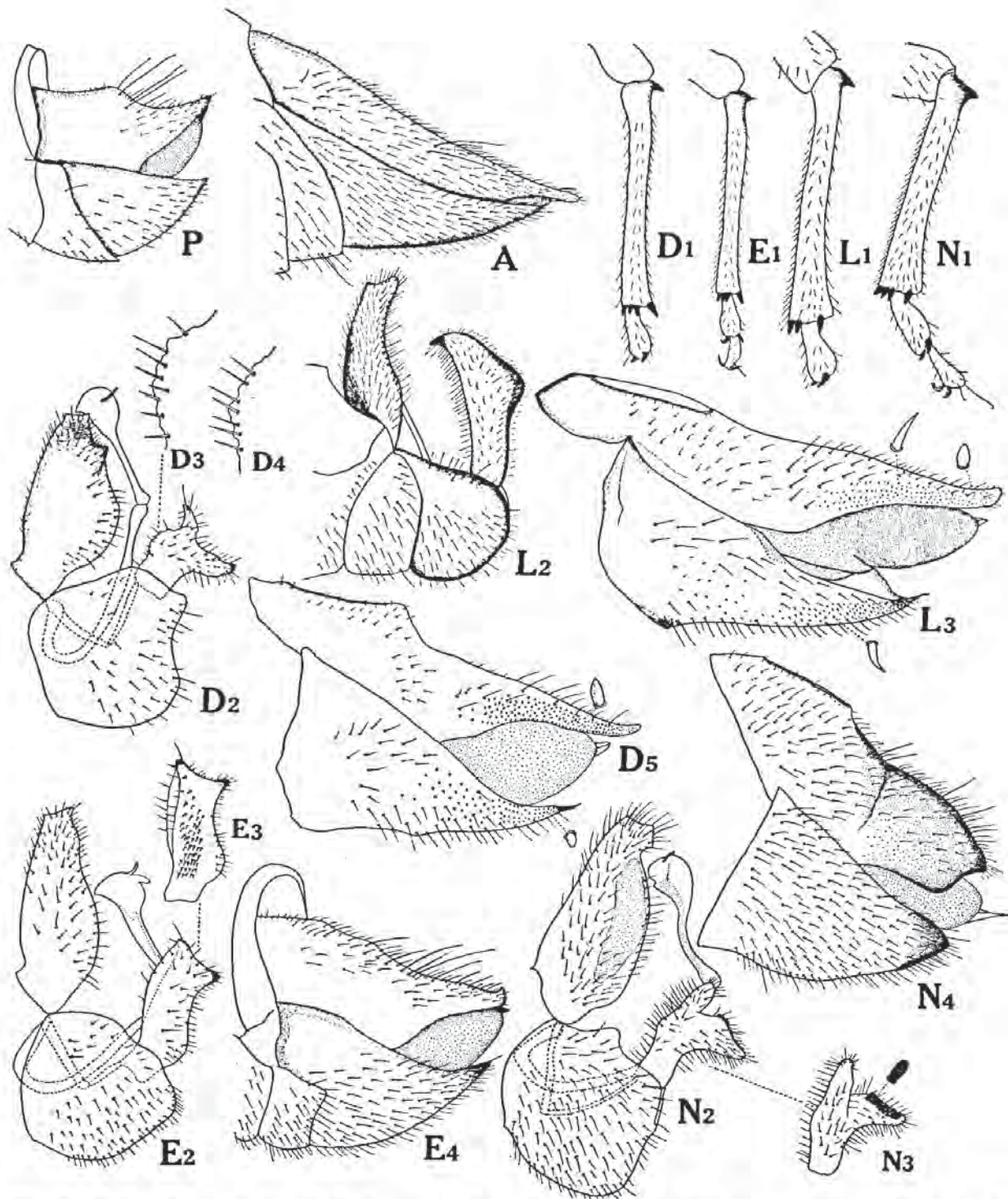


Fig. 3. P, Female genitalia of *Psylla* sp. A, Female genitalia of *Psylla aranetae* sp. nov. D, *Psylla dalbergiae* sp. nov. (D<sub>1</sub>, Posterior leg; D<sub>2</sub>, Male genitalia; D<sub>3</sub> & D<sub>4</sub>, Anterior margin of male forceps; D<sub>5</sub>, Female genitalia). E, *Psylla derricola* sp. nov. (E<sub>1</sub>, Posterior leg; E<sub>2</sub>, Male genitalia; E<sub>3</sub>, Inner face of male forceps; E<sub>4</sub>, Female genitalia). L, *Insnesia lagunensis* sp. nov. (L<sub>1</sub>, Posterior leg; L<sub>2</sub>, Male genitalia; L<sub>3</sub>, Female genitalia). N, *Insnesia nigrivittata* (CRAWF.) (N<sub>1</sub>, Posterior leg; N<sub>2</sub>, Male genitalia; N<sub>3</sub>, Inner face of male forceps; N<sub>4</sub>, Female genitalia).



ordinary setae. Antenna long, slender, 2.0-2.1 times as long as width of head, with a long and a short apical setae, relative length of each antennal segment for example as 3 : 2 : 8 : 8 : 8 : 8 : 10 : 7 : 4 : 4 .

Thorax broad, well arched, without pubescence; pronotum long, half as long as praescutum; praescutum small. Forewing (Fig. 2-D<sub>1</sub>) short, broad, broadly rounded, 2.2-2.3 times as long as wide, veins with minute setae; pterostigma short and broad. Hind wing 4/5 as long as forewing, about 2.5 times as long as wide, M+Cu short, Cu-stem long. Legs stout; posterior tibia (Fig. 3-D<sub>1</sub>) with a prominent basal spur and 5 apical spurs; proximal segment of posterior tarsi with a pair of apical spurs; meracanthus short, projected ventro-caudad, acute. Abdomen short, sparsely pubescent only ventrally.

Male genitalia (Fig. 3-D<sub>2</sub>) 1/2 as long as rest of abdomen; proctiger long, 2 times as long as forceps, strongly produced caudad medially, with a small epiphysis near apex on posterior margin; forceps very short, in lateral view enlarged apically, somewhat bilobed as figured, apex of posterior lobe subacute, with anterior margin produced cephalad medially and with strong setae (Fig. 3-D<sub>3</sub>·D<sub>4</sub>); subgenital plate quite high. Female genitalia (Fig. 3-D<sub>5</sub>) long, nearly as long as rest of abdomen, both valves with area of minute spines in addition to usual setae laterally on apical half; dorsal valve longer than ventral, attenuate apically, slightly upturned and blunt at apex; ventral valve broad basally, sharply pointed and upturned at apex.

Length of body ♂ 1.7-1.9 mm, ♀ 2.1-2.4 mm; to tip of folded wings ♂ 2.5-2.6 mm, ♀ 2.8-3.0 mm; length of forewing ♂ 2.0-2.1 mm, ♀ 2.1-2.4 mm; width of forewing ♂ 0.9-1.0 mm, ♀ 1.0-1.1 mm; length of hind wing ♂ 1.6-1.8 mm, ♀ 1.7-1.9 mm; length of antenna ♂ 1.4-1.5 mm, ♀ 1.4-1.5 mm.

Holotype (♂): Sibulan Beach, Darong, Davao del Sur, Mindanao, 25. xi. 1969, on *Dalbergia* sp., Y. Miyatake leg.

Paratopotypes: 10♂14♀ (1♂1♀ on slides), the same data as the holotype. Paratypes: 1 ex. (broken), 25. iv. 1947; 1♂4♀ (1♂1♀ on slides), 28. v. 1947; Mt. Maquiling, alt. 50 m, on *Antidesma bunius*, L. B. Uichanco leg. (UPCA Collection).

Distribution: Philippines (Luzon, Mindanao).

Host plant confirmed: *Dalbergia* sp. [Leguminosae]. *Antidesma bunius* (LINN.) SPRENG. (?) [Euphorbiaceae]. Nymphs were also found on *Dalbergia* sp. It is uncertain whether nymphs of this species feeds on *Antidesma bunius* or not.

This species seems to be closely related to *P. muiri* CRAWFORD, 1919 described from Teninber Islands and Moluccas, but differs from the latter in having a forewing with a wider pterostigma and shorter marginal cells, forceps of male genitalia bilobed and longer female genitalia. Differs from *Arytaina iolani* CRAWFORD, 1919 in venation and genital characters.

It appears that the present species and the next species are closely affinitive with the members of *Insnesia* in many respects, but they are still far from the typical forms of



*Insnesia*. Therefore, they are at present included in *Psylla*. Further studies should be necessary to clarify their generic position.

17. *Psylla derricola* sp. nov. (Fig. 2-E<sub>1</sub>·E<sub>2</sub>; Fig. 3, E<sub>1</sub>~E<sub>4</sub>: Pl. 6-17a·17b)

Color: General color fresh green to deep green. Eyes reddish brown to brown, ocelli orange. Antenna green to light brown, apical half of each antennal segment (III to VIII) and two apical segments black. Forewing semitransparent, flavous, veins yellowish brown.

Structure: Head (Fig. 2-E<sub>2</sub>) slightly wider than thorax, deflexed. Vertex nearly half as long as wide, with a small tubercle behind antennal socket, with a shallow discal depression on each side of median suture. Genal cones short, 1/2 as long as vertex or shorter, blunt, continuous with vertex, widely separated, pubescent. Antenna long, 2.1-2.2 times as long as width of head, with 1 long and 1 short apical setae, relative length of each antennal segment for example as 2 : 2 : 8 : 8 : 7 : 7 : 9 : 7 : 4 : 3 .

Thorax broad, not strongly arched, without pubescence; pronotum nearly on same plane as vertex and praescutum, long medially; praescutum short. Forewing (Fig. 2-E<sub>1</sub>) oval, broadly rounded, 2 times as long as wide, venation as figured. Hind wing 4/5 as long as forewing, 2.7 times as long as wide. Legs long, hairy; posterior tibia (Fig. 3-E<sub>1</sub>) with a prominent basal spur, with 5 apical spurs; meracanthus short, subacute, projected ventro-caudad. Abdomen short, with short pubescence ventrally.

Male genitalia (Fig. 3-E<sub>2</sub>) small, 1/2 as long as rest of abdomen; proctiger longer than forceps, slender, broad basally, slightly narrowed apically, truncate at apex; forceps in lateral view slightly sinuate, narrower basally, then nearly parallel-sided to slightly flaring, truncate apex, in dorsal view both apices acute and curved mesad, inner surface beset with many strong retrorse setae (Fig. 3-E<sub>3</sub>). Female genitalia (Fig. 3-E<sub>4</sub>) large, almost as long as rest of abdomen; dorsal valve slightly longer than ventral, blunt and upturned at apex; ventral valve stout, sharply pointed and upturned at apex.

Length of body ♂ 1.7 mm, ♀ 1.8 mm; to tip of folded wings ♂ 2.3 mm, ♀ 2.4 mm; length of forewing ♂ 1.7 mm, ♀ 1.9 mm; width of forewing ♂ 0.8 mm, ♀ 0.8 mm; length of hind wing ♂ 1.4-1.5 mm, ♀ 1.6 mm; length of antenna ♂ 1.4 mm, ♀ 1.4 mm.

Holotype (♂): Tabon, alt. 0-10 m, West Coast of Palawan, Palawan, II, xii, 1969, on *Derris cebuensis*, Y. Miyatake leg.

Paratopotypes: 1♂1♀ (1♂ on slide), the same data as the holotype.

Distribution: Philippines (Palawan).

Host plant confirmed: *Derris cebuensis* MERR. [Leguminosae].

Differs from *P. dalbergiae* in being smaller and in having different shape of male forceps and shorter female genitalia.

Genus *Insnesia* TUTHILL, 1964

18. *Insnesia lagunensis* sp. nov. (Fig. 2-L<sub>1</sub>·L<sub>2</sub>; Fig. 3, L<sub>1</sub>~L<sub>3</sub>; Pl. 6-18)

Color: General color testaceous, with green markings and stripes. Vertex and genae



green, more or less brownish in matured individuals. Eyes reddish to dark brown. Antenna light brown in basal half, dark brown to black in apical half, with X always black. Thoracic dorsum yellowish brown, with green markings on mesoscutum medially, on praescutum along posterior margin, on mesoscutellum laterally. Forewing transparent, with a dark spot near apex of clavus. Abdomen dark brown ventrally, with darker stripes dorsally.

Structure: Head (Fig. 2-L<sub>2</sub>) wider than thorax, rather vertical. Vertex short, half as long as wide, narrowed anteriorly, rounded down to frontal ocellus, with a shallow depression on each side of median line, with a prominent tubercle between lateral ocellus and antennal socket, with short hairs throughout. Genal cones short, stout, 1/2 as long as medial length of vertex, strongly divergent, blunt at apex, with a pair of long setae outer-laterally, with pubescence throughout. Eyes somewhat recessive. Antenna exceedingly long, slender, 3.4 times as long as width of head, with short pubescence throughout, with 2 short apical setae, relative length of each antennal segment for example as 2 : 2 : 15 : 15 : 19 : 19 : 20 : 25 : 7 : 4 .

Thorax broad, well arched, without pubescence; pronotum rather long, slightly deflexed; mesoscutum wide, 2.1 times as wide as long. Forewing (Fig. 2-L<sub>1</sub>) large, broad, broadly rounded apically, 2.3-2.4 times as long as wide; pterostigma prominent, opaque; membrane with numerous points throughout, alar radulae very prominent; venation typical *Insnesia* type. Hind wing long, 4/5 as long as forewing, 2.8-3.0 times as long as wide, M and Cu with common petiole, cubital cell small, flat. Legs massive, hairy; posterior tibia (Fig. 3-L<sub>1</sub>) with a prominent basal spur, with 1 outer and 3 inner apical spurs; proximal segment of posterior tarsi with a pair of apical setae; meracanthus small, broad basally, acute apically, projected caudad. Abdomen (excl. genitalia) long, pubescent ventrally.

Male genitalia (Fig. 3-L<sub>2</sub>) small, 1/3 as long as rest of abdomen; proctiger simple, in lateral view slender, slightly sinuate, broader basally, with long pubescence throughout; forceps almost as long as or slightly shorter than proctiger, narrow basally, enlarged apically and produced both cephalad and caudad as figured, apex obliquely truncate, anterior lobe incurving and almost sharp at tip; subgenital plate large, higher apically. Female genitalia (Fig. 3-L<sub>3</sub>) long, as long as rest of abdomen; dorsal valve elongate, distinctly longer than ventral, slightly sinuate, obliquely truncate at apex; ventral valve heavy, upturned and acute at apex; both dorsal and ventral valves with area of minute spines laterally in apical portion in addition to usual setae.

Length of body ♂ 2.7 mm, ♀ 2.5-2.7 mm; to tip of folded wings ♂ 3.5 mm, ♀ 3.5 mm; length of forewing ♂ 2.5 mm, ♀ 2.7-2.9 mm; width of forewing ♂ 1.0 mm, ♀ 1.1-1.2 mm; length of hind wing ♂ 2.0 mm, ♀ 2.3-2.4 mm; length of antenna ♂ 3.1 mm, ♀ 3.1-3.4 mm.

Holotype (♂): Mt. Maquiling, alt. 100 m, Laguna, Luzon, 16. xii. 1969, Y. Miyatake leg.

Paratopotypes: 2 ♀ (1 ♀ on slide), the same data as the holotype. 1 ♀, Mt. Maquiling (alt. 100m~Mudspring, alt. 400 m), Laguna, Luzon, 19. xii. 1969, Y. Miyatake leg. Paratype: 1 ♀, Mt. Maquiling, alt.



1500 m, 20. iv. 1951, F. B. Calora leg. (UPCA Collection).

Distribution: Philippines (Luzon).

Host plant: unknown.

This species is evidently related to *I. clara* (TUTHILL), *I. extrema* (TUTHILL) and *I. glabrascuta* (CALDWELL), all of which are known from Micronesia, in many respects, especially wing venation and genitalia of both sexes. Differs from *clara* in having a less elongate cubital cell of forewing and male forceps, apices of which are more slender and their anterior margins are smooth toward apex of anterior lobe. Differs from *extrema* in being larger, in having a longer antenna and more slender forceps of male genitalia. Differs from *glabrascuta* in being much larger and in having forewing without maculae, although very similar in male genital characters.

**19. *Insnesia nigrivittata* (CRAWFORD) comb. nov.** (Fig. 2-N<sub>1</sub>·N<sub>2</sub>; Fig. 3, N<sub>1</sub>~N<sub>4</sub>; Pl.6-19)

*Euphalerus nigrivittatus* CRAWFORD, 1913, Phil. J. Sci. 8 (4) Sec. D: 298.

Specimens examined: 5♂4♀, Mt. Maquiling, alt. 100 m, Laguna, Luzon, 16. xii. 1969, Y. Miyatake leg. 4♀, Mt. Maquiling (alt. 100m~Mudspring, alt. 400m), 17. xii. 1969, Y. Miyatake leg. 2♂6♀ (1♀, teneral), Mt. Maquiling (alt. 100 m~Mudspring), 19. xii. 1969, Y. Miyatake leg. 1♂1♀, Mudspring, alt. 400 m, Mt. Maquiling, Laguna, Luzon, 21. xii. 1969, Y. Miyatake leg. 1♂, 19. iv. 1960; 1♂, 25. iv. 1960; alt. 50 m, Los Baños, Laguna, Luzon, S.G. Fajardo leg. (UPCA Collection). 1♂, Quezon, alt. 5-50 m, West Coast of Palawan, Palawan, 13. xii. 1969, Y. Miyatake leg.

Distribution: Philippines (Luzon, Mindanao, Palawan\*).

Host plant: unknown. Considerable number of adults including a teneral one were collected on the host plant at Mt. Maquiling, but the plant could not be determined as its foliage was too immature.

All structures show that this species should be included in *Insnesia* rather than in *Euphalerus*. No definite differences can be recognized between a Palawan specimen and those of Mt. Maquiling, Luzon, except for the former being slightly smaller.

Genus *Diaphorina* Löw, 1879

**20. *Diaphorina citri* KUWAYAMA** (Fig. 2-C; Pl. 6-20)

*Diaphorina citri* KUWAYAMA, 1908, Trans. Sapporo Nat. Hist. Soc. 2: 160.

Specimens examined: 15♂16♀, Tungkalán, alt. 550 m, Toril, Davao City, Mindanao, 4. xii. 1969, on *Citrus mitis*, Y. Miyatake leg.

Distribution: Philippines (Luzon, Mindanao\*), Formosa, S. China, Ryukyus, Amami-Oshima, Malaya, Java, India, Moluccas.

Host plant confirmed: *Citrus mitis* BLANCO\* [Rutaceae]. This plant is cultivated and known as "Calamansi" or "Calamondin" in local name.

The famous "citrus psyllid" was found only at Tungkalán, Mindanao throughout the survey. They are not a bit different from the specimens from other countries of the South-



east Asia in morphological characters.

*Murraya paniculata* (LINN.) JACK, which is one of the common host plants of this psyllid in the Ryukyus and Taiwan, was abundant in most of provinces visited in the Philippines, but continuous search for this psyllid proved abortive all the time.

Genus *Trioza* FÖRSTER, 1848

21. *Trioza apoensis* sp. nov. (Fig. 4, A<sub>1</sub>~A<sub>7</sub>; Pl. 6-21a-21b)

Color: General color yellowish to greenish brown. Eyes brown to reddish brown, ocelli yellow to orange. Antenna dark brown, with 2 basal segments yellowish to light brown. Forewing transparent, slightly flavous, veins yellowish brown to brown, with dark markings at apex of clavus, Cu<sub>2</sub> and R<sub>1</sub>, alar radulae prominent. Tibiae brownish apically, all tarsi dark brown. Abdomen often dark brown dorsally.

Structure: Head (Fig. 4-A<sub>3</sub>) small, slightly deflexed, nearly as wide as thorax. Vertex slightly longer than half as long as wide, a little bulging in front on each side of median suture, with prominent discal impressions rather posteriorly, elevated at lateral ocelli, sparsely pubescent. Genal cones long, 1.1-1.2 times as long as vertex, divergent, acute apically, with long pubescence. Antenna moderately long, about 2 times as long as width of head or longer, two basal segments hairy, apex of each segments slightly swollen and with 2 long setae, with 1 long and 1 short apical setae, relative length of each antennal segment for example as 2 : 2 : 13 : 6 : 5 : 5 : 5 : 4 : 2 : 2 .

Thorax well arched, distinctly pubescent; pronotum moderately long, depressed below plane of praescutum. Forewing (Fig. 4-A<sub>1</sub>) long, narrow basally, widest medially, bluntly angulate at apex, 2.8-2.9 times as long as wide, veins prominently setigerous; Rs long and sinuate; medial cell small; Cu<sub>1</sub> strongly arched; cubital cell large, quadrate; clavus short. Hind wing (Fig. 4-A<sub>2</sub>) long, slender, 2/3 as long as forewing, 3.3-3.4 times as long as wide, venation triozone. Legs stout, hairy; posterior tibia (Fig. 4-A<sub>4</sub>) without prominent basal spur, with 1 outer and 3 inner apical spurs; proximal segment of posterior tarsi without apical spur; meracanthus short, stout, subacute at apex, projected ventro-caudad. Abdomen long, stout, densely pubescent only ventrally.

Male genitalia (Fig. 4-A<sub>5</sub>) moderately large, 1/2 as long as rest of abdomen; proctiger longer than forceps, broad, strongly produced caudad medially, pubescent; forceps sinuate in lateral view, blunt at apex, in dorsal view apex acute and curved mesad, inner surface beset with strong setae as figured (Fig. 4-A<sub>6</sub>); aedeagus long, structure as figured; subgenital plate quite high, sparsely pubescent. Female genitalia (Fig. 4-A<sub>7</sub>) long, almost as long as or slightly shorter than rest of abdomen; dorsal valve distinctly longer than ventral, with dorsal margin sinuate, with apical portion attenuate and slightly upcurved, blunt apically, with several areas strongly sclerotized basally, with some long setae dorsally, apical portion with area of small spines laterally in addition to ordinary setae; ventral valve sharply



upturned at apex, with small setae ventrally.

Length of body ♂ 1.8-1.9 mm, ♀ 2.1-2.4 mm; to tip of folded wings ♂ 3.3-3.5 mm, ♀ 3.6-4.0 mm; length of forewing ♂ 2.8-2.9 mm, ♀ 3.0-3.2 mm; width of forewing ♂ 1.0 mm, ♀ 1.0-1.2 mm; length of hind wing ♂ 1.8-1.9 mm, ♀ 2.0-2.1 mm; length of antenna ♂ 1.1-1.2 mm, ♀ 1.1-1.3 mm.

Holotype (♂): Upper Bayabas River, alt. 900 m, Davao City, Mindanao, 23. xi. 1969, Y. Miyatake leg.

Paratopotypes: 11 ♂ 7 ♀ (1 ♂ 1 ♀ on slides), the same data as the holotype. Paratypes: 1 ♂ 1 ♀, Capatagan, alt. 1100m, Davao del Sur, Mindanao, 27. xi. 1969, Y. Miyatake leg.

Distribution: Philippines (Mindanao).

Host plant: unknown. Material was obtained from the host plant where galls and

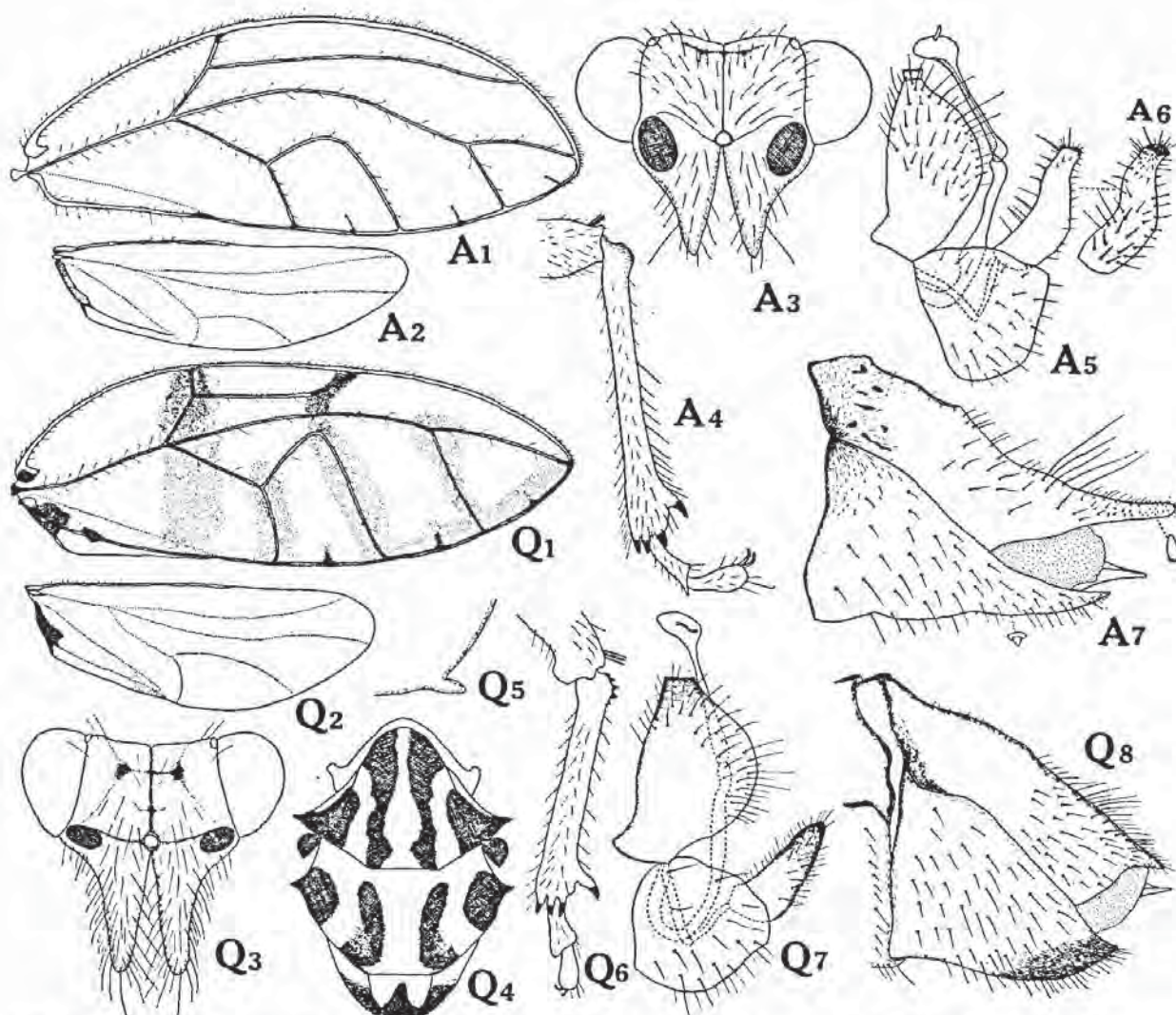


Fig. 4. A, *Trioza apoensis* sp. nov. (A<sub>1</sub>, Forewing, ♂; A<sub>2</sub>, Hind wing, ♂; A<sub>3</sub>, Head, ♀; A<sub>4</sub>, Posterior leg; A<sub>5</sub>, Male genitalia; A<sub>6</sub>, Inner face of male forceps; A<sub>7</sub>, Female genitalia). Q, *Trioza quadrifasciata* sp. nov. (Q<sub>1</sub>, Forewing, ♀; Q<sub>2</sub>, Hind wing, ♀; Q<sub>3</sub>, Head, ♀; Q<sub>4</sub>, Maculation of thoracic dorsum, ♀; Q<sub>5</sub>, Meracanthus; Q<sub>6</sub>, Posterior leg; Q<sub>7</sub>, Male genitalia; Q<sub>8</sub>, Female genitalia).



nymphs were also seen, but the plant could not be determined. It might be a species belonging to Euphorbiaceae.

Differs from *T. nigra* KUWAYAMA found in the Ryukyus and Japan in having a shorter forewing and a longer antenna, in having a forewing with conspicuous setigerous veins and both  $M_{1+2}$  and  $Cu_1$  more arched, a more elongate hind wing with shorter cubital cell, more sinuate forceps of male genitalia which are less constricted near apex, and dorsal valve of female genitalia which is sinuate on dorsal margin.

22. *Trioza* sp. (Fig. 5-T<sub>1</sub>·T<sub>2</sub>; Pl. 6-22)

Specimen examined: 1 ♀ (slightly damaged), Tabon, alt. 0-10 m, West Coast of Palawan, Palawan, 11. xii. 1969, Y. Miyatake leg.

Host plant: unknown.

This species is rather characteristic in venation and structure of head and might be a new species, but it remains unnamed until further material in good condition will be available.

23. *Trioza quadrifasciata* sp. nov. (Fig. 4, Q<sub>1</sub>~Q<sub>8</sub>; Pl. 6-23)

Color: General color yellowish brown to brown, with black markings on dorsum. Vertex with a pair of small spots of dark brown to black on discal depressions. Antenna light brown, with 2 apical segments and apex of VIII (sometimes apices of IV to VII also) dark brown to black. Thoracic dorsum with black stripes and maculae as figured (Fig. 4-Q<sub>4</sub>). Forewing transparent, with 1 large and 1 small black markings basally on posterior side, with several linear markings of yellowish brown along veins as figured (Fig. 4-Q<sub>1</sub>). Legs light brown, except for proximal segments of tarsi darker brown. Abdomen sometimes greenish, especially on sternal side, with tergum more or less brownish or with brown lateral stripes.

Structure: Head (Fig. 4-Q<sub>3</sub>) moderately large, nearly as wide as thorax, almost vertical. Vertex quadrate, 2/3 as long as wide, with a rather conspicuous depression on each side of median line, with posterior margin slightly incised, with long pubescence sparsely. Genal cones quite long, 1.3 times as long as vertex, slender, divergent, blunt at apex, with long pubescence rather densely. Antenna long, slender, 1.9 times as long as width of head, each segment with a long seta at apex, with a long and a short apical setae; relative length of each antennal segment for example as 3 : 2 : 13 : 8 : 5.5 : 6 : 5 : 5 : 2 : 2 .

Thorax strongly convex, with long pubescence; pronotum short, rather vertical, much depressed below praescutum; praescutum strongly convex, rounded down to pronotum. Forewing (Fig. 4-Q<sub>1</sub>) broad, 2.7 to 2.8 times as long as wide, subacute to roundly angulate at apex, veins set with a row of setae which are usually erect; Rs short, turned cephalad to anterior margin apically;  $M_{1+2}$  ended nearly at wing apex;  $Cu_1$  strongly arched toward M-stem; marginal cells large. Hind wing (Fig. 4-Q<sub>2</sub>) not large, 2/3 as long as forewing, 3 times as long as wide, anterior margin nearly straight, posterior margin produced caudad,



venation triozine. Legs massive, pubescent; posterior tibia (Fig. 4-Q<sub>6</sub>) with several short basal spurs, with 1 outer and 3 inner long finger-like apical spurs; proximal segment of posterior tarsi without apical spur; meracanthus (Fig. 4-Q<sub>5</sub>) small, projected ventro-caudad, acute at apex. Abdomen (excl. genitalia) short, 1/2 as long as thorax, densely pubescent ventrally.

Male genitalia (Fig. 4-Q<sub>7</sub>) moderately large compared with small abdomen, over 1/2 as long as rest of abdomen; proctiger large, robust, 1.4 times as long as forceps, strongly produced caudad, with long setae in apical half as figured; forceps simple, broad basally, narrowed to blunt tip, with setae as figured; aedeagus long, especially basal segment, with apical swollen part small; subgenital plate high, sparsely pubescent. Female genitalia (Fig. 4-Q<sub>8</sub>) moderately large, stout, about 7/10 as long as rest of abdomen, hairy; dorsal valve longer than ventral, in lateral view with apical portion attenuate, with dorsal margin downcurved to subacute apex; ventral valve large, blunt at apex; ovipositor projecting beyond apex of dorsal valve.

Length of body ♂ 1.7-1.8 mm, ♀ 2.1-2.3 mm; to tip of folded wings ♂ 3.2-3.3 mm, ♀ 3.8 mm; length of forewing ♂ 2.8 mm, ♀ 3.1-3.3 mm; width of forewing ♂ 1.0 mm, ♀ 1.1 mm; length of hind wing ♂ 1.8 mm, ♀ 2.0-2.2 mm; length of antenna ♂ 1.1-1.2 mm, ♀ 1.1 mm.

Holotype (♂): Mt. Talinas, alt. 1000 m, Negros Or., 29-31. xii. 1960, at light, H. Torrevillas leg. (Bishop Museum Collection. The type specimen will be deposited in the Bernice P. Bishop Museum, Honolulu.)

Paratopotypes: 2♂4♀ (1♂ on slide), the same data as the holotype. Paratype: 1♀, Capatagan, alt. 1100 m, Davao del Sur, Mindanao, 27. xi. 1969, Y. Miyatake leg.

The shape and venation of forewing, structure of genal cones, antenna and genitalia suggest some relationship with *T. divisa* CRAWFORD, 1917, but differs from the latter in maculation and venation of forewing and triozine venation of hind wing. Four linear markings on forewing and four pairs of black stripes on thoracic dorsum are the characteristics of this species in distinguishing it from the relating species. The part of Bishop Museum collection was used together for describing the present species as written above.

#### 24. *Trioza (Megatrioza) sympauropsylloides* sp. nov. (Fig. 5, S<sub>1</sub>~S<sub>6</sub>; Pl. 6-24)

Female: General color orange to reddish brown. Eyes dark brown. Antenna orange basally, black from IV to X. Pronotum, praescutum and dorsum of mesoscutum dark brown to black. Forewing transparent, veins yellowish orange, dark brown antero-apically, with alar radulae dark brown. Posterior femora more or less reddish brown. Abdomen and genitalia dark brown dorsally and laterally, yellowish ventrally.

Head (Fig. 5-S<sub>3</sub>) nearly as wide as thorax, slightly deflexed. Vertex short, 2/5 as long as wide, elevated at lateral ocelli, with long pubescence sparsely, with shallow depression near caudal margin on each side of median line. Genae roundly swollen and produced vertically as blunt cones, as long as or longer than vertex, continuous with vertex basally, with long pubescence densely. Antenna moderately long, rather thick, 1.7 times as long



as width of head, with long pubescence from I to III, apices of IV to IX with a pair of long setae, X with 1 long and 1 short apical setae, relative length of each antennal segment as 2:3:14:9:6:6:5:5:3:2.

Thorax broad, strongly arched, conspicuously with long pubescence; pronotum strongly depressed below plane of vertex. Forewing (Fig. 5-S<sub>1</sub>) large, narrow basally and widened subapically, rather square at apex, 2 times as long as wide, veins distinctly setigerous; Rs long, reaching wing apex, sinuate; medial cell small; clavus short. Hind wing (Fig. 5-S<sub>2</sub>) large, 2/3 as long as forewing, 2.9 times as long as wide, venation not triozone, M and Cu with a long common petiole. Legs long, stout, prominently hairy; posterior tibia

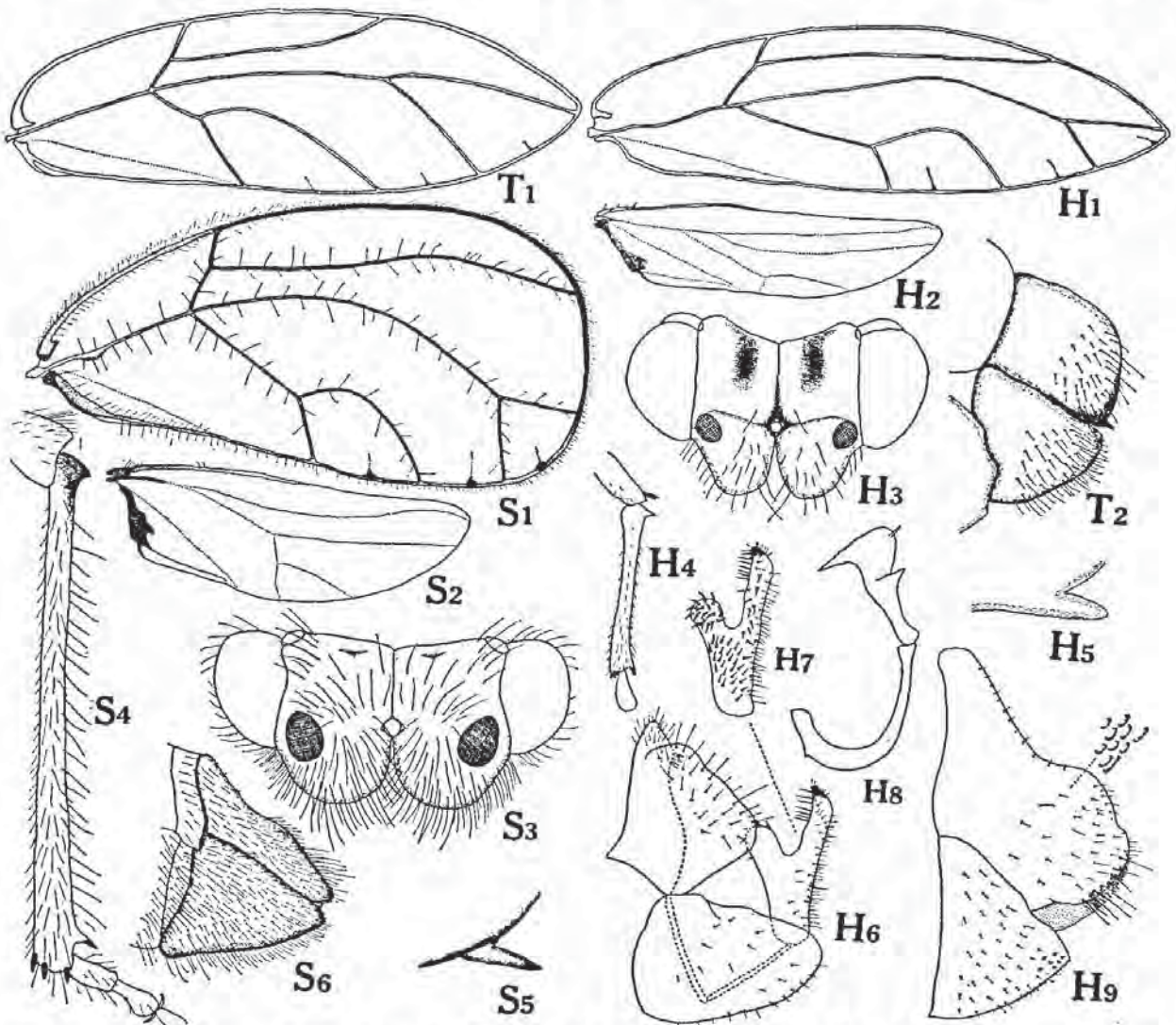


Fig. 5. T, *Trioza* sp., ♀ (T<sub>1</sub>, Forewing; T<sub>2</sub>, Female genitalia). S, *Trioza* (*Megatrioza*) *symbauropsylloides* sp. nov., ♀ (S<sub>1</sub>, Forewing; S<sub>2</sub>, Hind wing; S<sub>3</sub>, Head; S<sub>4</sub>, Posterior leg; S<sub>5</sub>, Meracanthus; S<sub>6</sub>, Genitalia). H, *Pseudotrioza hiurai* sp. nov. (H<sub>1</sub>, Forewing, ♂; H<sub>2</sub>, Hind wing, ♂; H<sub>3</sub>, Head, ♂; H<sub>4</sub>, Posterior leg; H<sub>5</sub>, Meracanthus; H<sub>6</sub>, Male genitalia; H<sub>7</sub>, Inner face of male forceps; H<sub>8</sub>, Aedeagus; H<sub>9</sub>, Female genitalia).



(Fig. 5-S<sub>4</sub>) quite long, with a short basal spur, with 1 outer and 3 inner apical spurs; proximal segment of posterior tarsi without apical spur; meracanthus (Fig. 5-S<sub>5</sub>) long, acute at apex, projected ventro-caudad. Abdomen (excl. genitalia) short, posteriorly pubescent sparsely on dorsum, densely pubescent ventrally.

Female genitalia (Fig. 5-S<sub>6</sub>) large, stout, nearly as long as rest of abdomen, densely pubescent throughout, both valves nearly equal in length as figured.

Male: unknown.

Length of body ♀ 2.6 mm; to tip of folded wings ♀ 4.5 mm; length of forewing ♀ 3.9 mm; width of forewing ♀ 1.9 mm; length of hind wing ♀ 2.5 mm; length of antenna ♀ 1.4 mm.

Holotype (♀): Mt. Apo, Upper Varoreng, alt. 1300 m, Davao del Sur, Mindanao, 29-30. xi. 1969, Y. Miyatake leg.

Distribution: Philippines (Mindanao).

Host plant: unknown.

This new species looks like *Sympauropsylla triozopectera* (CRAWFORD, 1913) of Pauropsyllini in general appearance, but differs from the latter basically as follows: vertex not deeply concave as in *triozopectera*; genal cones short, but present and prominent; frons covered by genae, not visible; wing veins much thicker and setigerous, alar radulae thick and not like in *triozopectera*; venation of hind wing not triozone; posterior tibia more or less enlarged apically, with a short basal spur. This species seems to be a member of *Megatrioza* group, many species of which were described from the Philippines by CRAWFORD.

#### Genus *Pseudotrioza* nov.

Type-species: *Pseudotrioza hiurai* sp. nov. (here designated).

Body medium size, very slender. Head nearly as wide as thorax, slightly deflexed. Vertex longer than half as long as wide, emarginate in front, with prominent depressions. Genal cones short, stout, shorter than vertex, more or less divergent. Antenna slender, longer than width of head.

Thorax narrow, arched, without pubescence. Pronotum long medially. Mesothorax quite elongate. Forewing long, narrow, acute at apex, with venation not triozone, M and Cu with distinct common petiole. Hind wing elongate, with venation not triozone, R and M with common petiole. Posterior tibia with a prominent basal spur, with 1 outer and 1 inner apical spurs. Proximal segment of posterior tarsi without apical spur.

Male proctiger with a large caudal lobe, forceps not simple, modified. Female genitalia short, with dorsal valve rounded at apex, punctate in apical half, ventral margin with numerous stiff setae.

Although the venation is not triozone, the genus is most affinitive with *Trioza*, but too specialized in many characters. It is somewhat similar to *Paratrioza* and *Kuwayama* in some respects, but distinct from those in the characters mentioned above.



25. *Pseudotrioza hiurai* sp. nov. (Fig. 5, H<sub>1</sub>~H<sub>9</sub>; Pl. 6-25)

Color: General color yellow to yellowish brown with brown markings and stripes. Vertex with a narrow brown macula on each side of median line as figured (Fig. 5-H<sub>3</sub>). Genal cones brown ventrally. Antenna light brown, with 10th segment brown. Eyes reddish brown, ocelli orange to red. Thoracic dorsum and each pleura with a pair of brown longitudinal stripes. Forewing transparent, with veins yellow to yellowish brown. Legs dull yellow to yellowish brown. Abdomen with brown to dark brown markings or lateral stripes dorsally and laterally, yellowish ventrally. Subgenital plate of male genitalia dark brown to black on anterior half and light brown in posterior half. Female genitalia with 2 lateral stripes of dark brown.

Structure: Head (Fig. 5-H<sub>3</sub>) small, nearly as wide as thorax, a little deflexed. Vertex slightly longer than half as long as wide, elevated along median line, emarginate in front at median line, with a large shallow depression on each side. Genal cones short, shorter than 2/3 as long as vertex, stout, very obtuse at apex, divergent or sometimes divergent only in apical half, sparsely pubescent. Antenna moderately long, slender, about 1.5 times as long as width of head, with 2 basal segments wollen, with III very long, with X thickened, with 1 long and 1 short apical setae; relative length of each antennal segment for example as 2 : 2 : 13 : 4.5 : 3 : 3 : 3 : 3 : 2 : 2 .

Thorax narrow, well arched, without pubescence; pronotum moderately long, below plane of praescutum, nearly on same plane as vertex, strongly protuberant medially, produced cephalad; praescutum elongate, with an anterior epiphysis medially. Forewing (Fig. 5-H<sub>1</sub>) long, very narrow, 3.4-3.5 times as long as wide, acute at apex, venation not triozone, media and cubitus with a short common petiole as figured; Rs nearly straight; M<sub>1+2</sub> ended almost at wing apex; cubital cell oblong, nearly 2 times as wide as high; clavus ended far before apex of Cu<sub>2</sub>. Hind wing (Fig. 5-H<sub>2</sub>) 2/3 as long as forewing, about 4 times as long as wide, very slender, narrowly rounded at apex, venation not triozone, radius and media with a common petiole. Legs long; posterior tibia (Fig. 5-H<sub>4</sub>) with a prominent basal spur, with 1 outer and 1 inner apical spurs (with one more inner apical spur which is reduced and not black as other ordinary apical spurs); proximal segment of posterior tarsi without apical spur; meracanthus (Fig. 5-H<sub>5</sub>) small, projected caudad, blunt at apex. Abdomen (incl. genitalia) long, nearly as long as thorax, with short pubescence only ventrally.

Male genitalia (Fig. 5-H<sub>6</sub>) small, 2/5 as long as rest of abdomen; proctiger short, as long as forceps, with caudally projecting lobes, surrounding anterior portion of forceps, apex obliquely truncate; inner apex with several spurs projected caudad, sparsely pubescent in apical half; forceps in lateral view strongly bilobed, anterior lobe shorter than caudal lobe, rounded at apex, caudal lobe more slender, and with sharp black tip turned cephalad, inner face with numerous strong setae as figured (Fig. 5-H<sub>7</sub>); aedeagus (Fig. 5-H<sub>8</sub>) with



short apical segment, sharply pointed at apex, with a sharp epiphysis projected caudad medially; subgenital plate long, basally with a large protuberance near proctiger, punctate in anterior half, with short hairs. Female genitalia (Fig. 5-H<sub>9</sub>) very short, 1/3 as long as rest of abdomen; dorsal valve longer than ventral, broadly rounded at apex, dorsal margin sinuate, ventral margin with numerous stiff setae, punctate in apical half; ventral valve small, subtriangular, subacute at apex, with short pubescence, with several small setae near apex.

Length of body ♂ 2.2-2.3 mm, ♀ 2.1-2.5 mm; to tip of folded wings ♂ 3.8-4.1 mm, ♀ 4.0-4.2 mm; length of forewing ♂ 3.2-3.4 mm, ♀ 3.4-3.7 mm; width of forewing ♂ 0.9-1.0 mm, ♀ 1.0-1.1 mm; length of hind wing ♂ 1.8-2.1 mm, ♀ 2.1 mm; length of antenna ♂ 0.8-0.9 mm, ♀ 0.8-0.9 mm.

Holotype (♂): Tagburos, alt. 5 m, 13 km N. of Puerto Princesa, Palawan, 15. xii. 1969, on *Buchanania* sp. (?), Y. Miyatake leg.

Paratopotypes: 5♂2♀ (1♂1♀ on slides), the same data as the holotype.

Distribution: Philippines (Palawan).

Host plant confirmed: *Buchanania* sp. (?) [Anacardiaceae]. There is a possibility that this plant is one of species belonging to Flacourtiaceae on the other hand.

#### Genus *Leptotrioza* nov.

Type-species: *Neotriozella bicolor* CRAWFORD, 1915 (here designated).

Body small to medium size, very slender. Head narrower than thorax, not strongly deflexed. Vertex elongate, nearly as long as wide. Genae produced as elongate, slender, rather horizontal processes, longer than vertex, rather parallel to each other. Eyes small, not hemispherical, recessive. Antenna moderately long, longer than width of head.

Thorax slightly arched, sparsely pubescent. Pronotum nearly vertical. Forewing membranous, often maculated, slender, acute at apex, venation triozone, Rs long, clavus long, reaching near apex of Cu<sub>2</sub>. Hind wing long, venation not triozone. Posterior tibia with a basal spur and 4 apical spurs. Proximal segment of posterior tarsi without apical spur. Male proctiger and forceps often modified. Female genitalia short.

In long and rather contiguous genal cones this genus resembles North American genus *Neotriozella* CRAWFORD, but differs from the latter in many characters as follows: head narrower than thorax, not strongly deflexed; vertex elongate, nearly as long as wide (half as long as wide in *Neotriozella*), strongly incised posteriorly; genal cones rather horizontal, more or less divergent in apical half, each corn not strongly tapering to apex (strongly narrowed apically in *Neotriozella*); eyes not hemispherical, flattened, recessive; forewing quite slender, longer than 3.5 times as long as wide, maculated, sharply angulate at apex; venation of hind wing not triozone; male genitalia more specialized.



26. *Leptotrioza bicolor* (CRAWFORD) **comb. nov.** (Fig. 6, B<sub>1</sub>~B<sub>8</sub>; Pl. 6-26a•26b)

*Neotriozella bicolor* CRAWFORD, 1915, Phil. J. Sci. 10(4) Sec. D: 265.

Specimens examined: 3♂5♀, Mt. Maquiling, Mudspring, alt. 400 m, Laguna, Luzon, 21. xii. 1969, Y. Miyatake leg.

Color: General color dark brown in dorsal half and yellowish or light brown in ventral half. Vertex reddish or dark brown, with black stripes on median line, more or less lighter near posterior margin. Genal cones dark brown on dorsal surface and contrastively yellowish laterally and ventrally. Antenna light brown, with 2 apical segments more or less brownish. Eyes black. Front ocellus reddish brown and lateral ocelli orange or yellow. Forewing transparent, with a conspicuous fascia of dark brown along posterior margin from base to apex as figured (Fig. 6-B<sub>1</sub>), with 6 small transparent portions on each side of apices of Cu<sub>1</sub>, Cu<sub>2</sub> and M<sub>3+4</sub>. Hind wing transparent, with veins brownish near base. Legs light brown. Abdominal tergites dark brown and sternites yellow or greenish yellow. Male genitalia with subgenital plate and forceps yellowish brown, with proctiger dark brown in anterior two-thirds and light brown in posterior third.

Structure: Head (Fig. 6-B<sub>3</sub>) distinctly narrower than thorax, not strongly deflexed. Vertex elongate, nearly as long as wide, with sparse short pubescence. Genal cones characteristically long, 1.4-1.5 times as long as vertex, nearly on same plane of vertex, directed forward, rather parallel to each other, slightly divergent apically, more or less tapering to blunt apex, pubescent. Eyes small, flattened, not hemispherical, recessive. Antenna moderately long, slender, about 1.3 times as long as width of head, with a long and a short apical setae, relative length of each antennal segment for example as 2 : 1.5 : 7 : 4 : 4 : 4 : 4 : 4 : 2.5 : 1.5 .

Thorax slightly arched, sparsely clothed with short hairs; pronotum nearly vertical; mesoscutum flat dorsally. Forewing (Fig. 6-B<sub>1</sub>) long, about 3.8 times as long as wide, slender, broad basally, tapering to acute apex, with venation as figured. Hind wing (Fig. 6-B<sub>2</sub>) moderately long, about 2/3 as long as forewing, slender, nearly 2.2 times as long as wide, rounded at apex, with venation not triozone. Legs short, with short pubescence sparsely; posterior tibia (Fig. 6-B<sub>4</sub>) with a sharp basal spur, with 1 outer and 3 inner apical spurs; proximal segment of posterior tarsi without apical spurs; meracanthus (Fig. 6-B<sub>5</sub>) moderate, in lateral view projected caudad, subacute at apex. Abdomen (excl. genitalia) moderately long, pubescent ventrally, with first sternum big and produced ventrad in lateral view.

Male genitalia (Fig. 6-B<sub>7</sub>) large, nearly 6/7 as long as the rest of abdomen; proctiger big, about 1.6 times as long as forceps, overhanging in lateral view, upper margin strongly convex, ventral margin produced outward, especially near middle, beared with a row of long bristles along ventral (caudal) margin as figured; forceps short, stout, with a long posterior process as figured, in lateral view anterior margin straight, blunt at apex, sparsely



hairy, inner face beset with many strong retrorse setae as figured (Fig. 6-B<sub>8</sub>); subgenital plate subtriangular in lateral view, quite high anteriorly, sparsely pubescent; aedeagus short, proximal segment produced ventrad medially, apical portion of second segment slender. Female genitalia (Fig. 6-B<sub>6</sub>) moderately large, nearly as long as the rest of abdomen; dorsal valve slightly longer than ventral, with a prominent convexity dorsad near midpoint, apical portion attenuate, with sparse pubescence apically, with a subacute apex; ventral valve swollen basally, upturned apically, sharply pointed at apex.

Length of body ♂ 2.2-2.3 mm, ♀ 2.3-2.4 mm; to tip of folded wings ♂ 3.4-3.6 mm, ♀ 3.5-3.8 mm; length of forewing ♂ 2.5-2.8 mm, ♀ 2.6-2.8 mm; width of forewing ♂ 0.6 mm, ♀ 0.6-0.7 mm; length of antenna ♂ 0.7-0.8 mm, ♀ 0.8 mm; length of head (from posterior margin of vertex to apices of genal cones on median line) ♂ 0.5-0.6 mm, ♀ 0.6 mm.

Distribution: Philippines (Luzon).

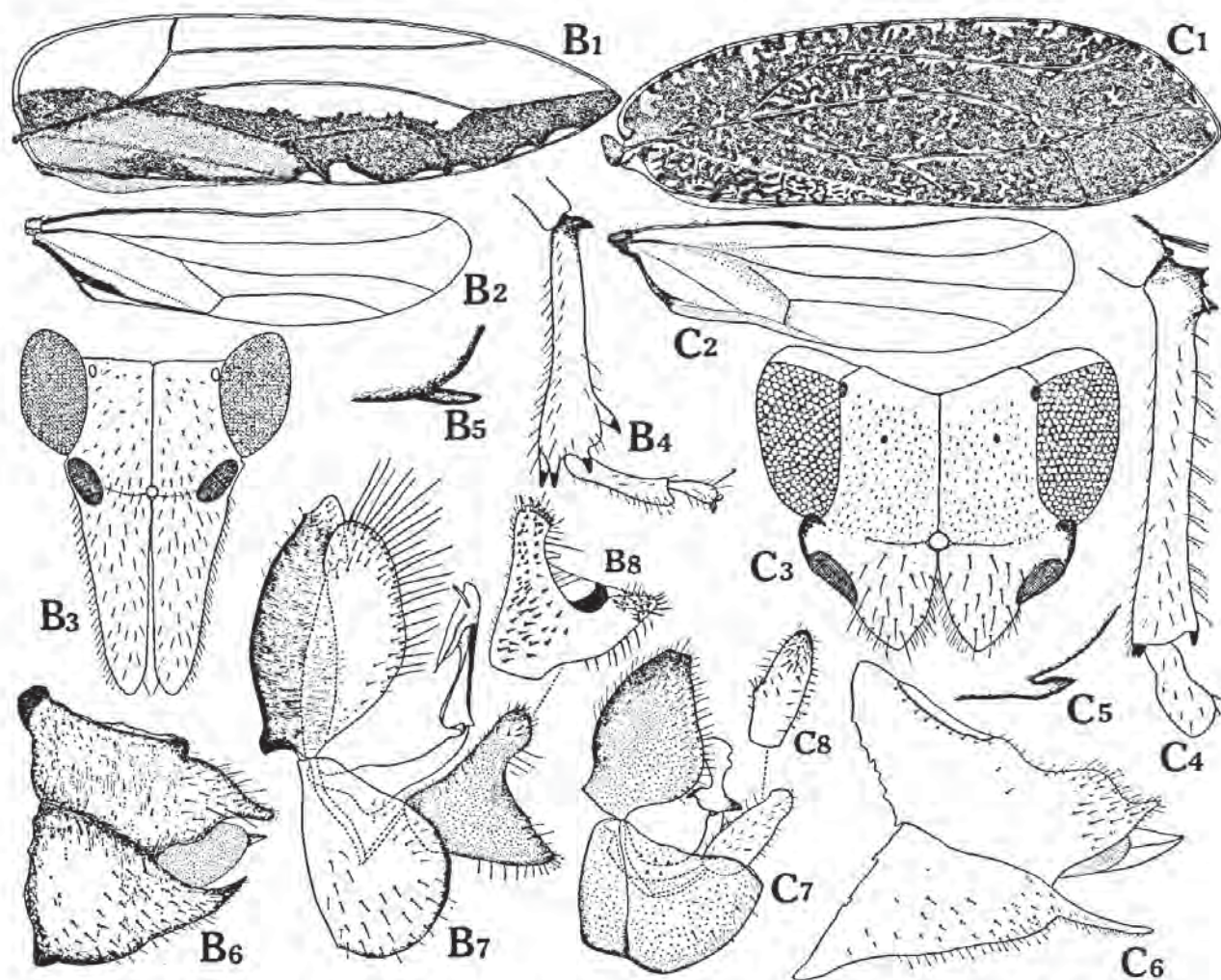


Fig. 6. B, *Leptotrioza bicolor* (CRAWF.). C, *Leuronota calophylli* sp. nov. (1, Forewing, ♀; 2, Hind wing, ♀; 3, Head, dorso-frontal view, ♀; 4, Posterior leg; 5, Meracanthus; 6, Female genitalia; 7, Male genitalia; 8, Inner face of male forceps).



Host plant: unknown. The above specimens were obtained on the host plant. It possibly belongs to Anonaceae, but it could not be identified because of the sample being incomplete. Nymphs are gall formers.

Genus *Leuronota* CRAWFORD, 1914

27. *Leuronota calophylli* sp. nov. (Fig. 6, C<sub>1</sub>~C<sub>8</sub>; Pl. 6-27a·27b)

Color: General color straw color to brown. Vertex chocolate brown in front of and behind eyes. Eyes dark brown to black, margined with a light brown band. Antenna dull yellow, with two basal segments dark brown, apices of IV, VI, VIII and two apical segments black. Thorax dark brown laterally. Forewing opaque, with irregular brown maculae as figured (Fig. 6-C<sub>1</sub>), somewhat coriaceous, with surface more or less wrinkled. Hind wing with dark brownish veins. Abdomen darker dorsally, each tergite and sternite usually margined with brown stripes.

Structure: Head (Fig. 6-C<sub>3</sub>) slightly narrower than thorax, not deflexed, rather horizontal. Vertex narrow, slightly shorter than wide (between eyes), produced laterad as a somewhat tubercle behind antennal socket, with a shallow depression on each side of median line, with short hairs throughout. Genal cones short, 2/3 as long as vertex, almost on same plane as vertex, directed forward, divergent, subacute apically, hairy; frons covered by genae. Eyes not spherical, elongate and flattened. Antenna short and rather stout, about 1.2 times as long as width of head, two basal segments swollen, with a long and a short apical spurs; relative length of each antennal segment for example as 3:4:6:4:4:4:4:4:2:2.

Thorax rather flat, scarcely arched, without pubescence; pronotum flat, rather long, slightly below plane of praescutum, nearly on same plane as vertex, produced cephalad as blunt epiphysis which is tightly inserted in posterior depression of vertex; praescutum flat, strongly produced cephalad medially. Forewing (Fig. 6-C<sub>1</sub>) long, slender, 3.2-3.3 times as long as wide, rather narrow basally, acute at apex; Rs long, upturned to anterior margin of wing apically; M angulated at two-thirds of its length, attached with Cu<sub>1</sub> making a cross; medial cell small, with wing apex prominently inside; cubital cell large, rather quadrate; clavus ended very close to apex of Cu<sub>2</sub>. Hind wing (Fig. 6-C<sub>2</sub>) long, nearly 4/5 as long as forewing, slender, 3.5-3.6 times as long as wide, rounded at apex, venation rather triozone, with bases of R and M more or less obscure, with long and narrow cubital cell. Legs short; posterior tibia (Fig. 6-C<sub>4</sub>) with several basal spurs, with 1 outer and 2 inner apical spurs; proximal segment of posterior tarsi without apical spur; meracanthus (Fig. 6-C<sub>5</sub>) small, projected caudad, acute at apex. Abdomen (excl. genitalia) large, nearly as long as thorax, with short hairs ventrally, first segment of visible sternum with long pubescence laterally and ventrally.

Male genitalia (Fig. 6-C<sub>7</sub>) small, less than 1/3 as long as the rest of abdomen; proc-



tiger small, nearly 1.5 times as long as forceps, in lateral view stout, both anterior and posterior margins produced outward medially, hairy in apical half; forceps simple as figured, blunt and moderately sclerotized at apex, inner face with a small epiphysis on anterior margin, with retrorse setae apically (Fig. 6-C<sub>8</sub>); aedeagus short, stout, apical segment in lateral view peculiarly shaped, basally with a beak-like projection which is strongly sclerotized and a caudal epiphysis, with apex swollen; subgenital plate small, subtriangular, with only several short hairs posteriorly and several microscopic short setae anteriorly. Female genitalia (Fig. 6-C<sub>6</sub>) moderately large, nearly 1/2 as long as the rest of abdomen; dorsal valve small, shorter than ovipositor, with dorsal margin in lateral view sinuate, with apex subacute; ovipositor stout, longer than dorsal and ventral; ventral valve long, large basally, with apical portion attenuate, acute at apex.

Length of body ♂ 2.3-2.8 mm, ♀ 2.7-2.9 mm; to tip of folded wings ♂ 3.5-3.9 mm, ♀ 3.9-4.2 mm; length of forewing ♂ 2.7-3.0 mm, ♀ 2.9-3.3 mm; width of forewing ♂ 0.8-0.9 mm, ♀ 0.9-1.0 mm; length of hind wing ♂ 2.1-2.3 mm, ♀ 2.3-2.5 mm; length of antenna ♂ 0.7-0.8 mm, ♀ 0.7-0.8 mm.

Holotype (♂): Tagburos, alt. 5 m, 13 km N. of Puerto Princesa, Palawan, 14. xii. 1969, on *Calophyllum blancoi*, Y. Miyatake leg.

Paratopotypes: 4♂ 14♀ (1♂ 1♀ on slides), the same data as the holotype.

Distribution: Philippines (Palawan).

Host plant confirmed: *Calophyllum blancoi* PL. & TR. [Guttiferae]. Nymphs are gall-makers.

This species is easily distinguishable from the relating species of the genus in peculiar venation of the forewing, M-stem of which is touching with Cu<sub>1</sub> forming an X. The present new species is included in this genus with much hesitation, because some characters are not identical with those of typical forms of the genus, especially the short and stout antenna. The generic status concerned will be discussed some time in future, since it seems that many more representatives from the Southeast Asia and the Pacific which are at hand and undescribed will get involved.