

THE FRUIT FLIES OF THE PHILIPPINES

(Diptera: Tephritidae)^{1,2}

By D. Elmo Hardy³

Abstract. This study brings up to date the knowledge of the Tephritidae of the Philippines. The family is arranged in 4 subfamilies; 10 tribes; 53 genera, plus 1 undescribed genus; 156 species and 2 subspecies, plus 9 undescribed new species. Four genera and 48 species are described as new. The following are new synonyms: *Hexacina stigmatoptera* Hendel and *H. celebensis* Hering, new synonyms of *H. stellipennis* (Walker); *Themara enderleini* Hering, *T. palawanica* Hering and *T. yunmana* Zia, new synonyms of *T. hirtipes* Rondani; *Staurocneros* Hering, new synonym of *Euphranta (Staurella)* Bezzi; *Trypeta cassandra* Osten Sacken, new synonym of *Anoplomus flexuosus* Bezzi; *Prospilocosmia* Shiraki, new synonym of *Spilocosmia* Bezzi. The following are new combinations: *Sophira caeca* (Bezzi), *Sophira manto* (Osten Sacken), *Euphranta (Staurella) imitator* (Hardy), and *Myoleja comexa* (Hendel).

The knowledge of the fruit flies of the Philippines has been based largely upon the works of Osten Sacken (1882), Bezzi (1913b, 1919, 1926), Hering (1937), Perkins (1938b), Hardy & Adachi (1954) and Hardy (1955b) and 64 species have previously been recorded in the literature. The descriptions of these are widely scattered and no monographic studies have ever been done. The present study treats 156 species, 48 being described as new, plus 9 new species which are not being described at this time. This work brings the taxonomy of this family up to date for the Philippines. All of the available collections have been studied, amounting to several thousands of specimens. At best, however, I feel that the present monograph is still preliminary, since comparatively little has been done in the way of thorough field studies. Except for relatively few species, mostly *Dacus*, no biological data are available and many of the Islands have scarcely been sampled.

This fauna is of tremendous importance in gaining an understanding of the family over the Oriental Region. The affinities are direct with Taiwan (Formosa), Borneo and Indonesia. The region is replete with endemic genera and species and this study has provided much information useful in solving problems concerning the limitations and definitions of some of the tribes and genera of Tephritidae.

I am indebted to the following institutions for the loan of their collections from the Philippines: B. P. Bishop Museum, Honolulu; British Museum (Natural History), London; Bureau of Plant Industries, Manila; California Academy of Sciences, San Francisco; College of Agriculture, University of the Philippines, Laguna; Field Museum of Natural History, Chicago; Museo Civico di Storia Naturale, Milano (Bezzi Collection); National Institute of Agricultural Sciences, Tokyo; United States National Museum, Washington; University Zoological Museum, Copenhagen; and University Zoological Museum, Helsinki (Frey Collection).

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TAXONOMIC ARRANGEMENT

DACINAE

DACINI

- Callantra bioculata* (Bezzi)
C. indecora, n. sp.
C. mummularia (Bezzi)
C. pedunculata (Bezzi)
C. picta Hardy
C. subsessilis (Bezzi)
C. vittata, n. sp.
Dacus (Asiadacus) bakeri (Bezzi)
D. (Nesodacus) ablepharus (Bezzi)
D. (N.) ablepharus mindanauus (Bezzi)
D. (N.) atrichus (Bezzi)
D. (N.) atrichus davaoanus (Bezzi)
D. (Paradacus) fulvipes (Perkins)
D. (Paratridacus) expandens Walker
D. (Strumeta) cognatus Hardy & Adachi
D. (S.) continuus (Bezzi)
D. (S.) cucurbitae Coquillett
D. (S.) dorsalis Hendel
D. (S.) dorsaloides Hardy & Adachi
D. (S.) elegantulus, n. sp.
D. (S.) holtmanni, n. sp.
D. (S.) limbifer (Bezzi)
D. (S.) luzonae Hardy & Adachi
D. (S.) mcgregori (Bezzi)
D. (S.) nigrotibialis (Perkins)
D. (S.) occipitalis (Bezzi)
D. (S.) pedestris (Bezzi)
D. (S.) petersoni Hardy
D. (S.) propinquus Hardy & Adachi
D. (S.) umbrosus Fabricius
D. (Zeugodacus) abbreviatus, n. sp.
D. (Z.) calumniatus Hardy
D. (Z.) deceptus, n. sp.
D. (Z.) icelus, n. sp.
D. (Z.) indentus, n. sp.
D. (Z.) katoi, n. sp.

- D. (Z.) mundus* (Bezzi)
D. (Z.) pubescens (Bezzi)
D. (Z.) scutellinus (Bezzi)
D. (Z.) tau (Walker)
D. (Z.) tetrachaetus (Bezzi)
D. (Z.) trimaculatus Hardy & Adachi
D. (Z.) ubiquitous Hardy
Monacrostichus citricola Bezzi

TRYPETINAE

ACANTHONEVRINI

- Acanthonevra setosifemora*, n. sp.
Diarrhagma modestum (Fabricius)
Freyomyia (n. gen.) *bivittata*, n. sp.
Hexacinia pellucens Hardy
H. radiosa (Rondani)
H. stellipennis (Walker)
Paracanthonevra (n. gen.) *boettcheri*, n. sp.
P. dubia, n. sp.
Rioxa lucifer Hering
R. megaspilota Hardy
R. sexmaculata (van der Wulp)
Sophira caeca (Bezzi)
S. manto (Osten Sacken)
S. medioflava, n. sp.
S. philippinensis, n. sp.
S. signata (Walker)
Themara alkestis (Osten Sacken)
T. hirtipes Rondani
T. lunifera Hering
T. ostensackeni, n. sp.
Tritaenopteron flavifacies, n. sp.
Xarnuta leucotelus Walker
X. stellaris Hardy
- ##### ACIURINI
- Aciuroopsis* (n. gen.) *pusio*, n. sp.
Sphaeniscus atilius (Walker)
- ##### ADRAMINI

Adrama determinata (Walker)

A. selecta Walker

Antisophira (n. gen.) *vittata*, n. sp.

Nesadrama petiolata, n. sp.

Pseudosophira bakeri Malloch
n. genus and sp. nr. *Adrama*

EUPHRANTINI

Cyclopsia univittata Hardy

Dimeringophrys bilineata (Walker)

D. pallidipennis Hardy

Elleipsa quadrifasciata Hardy

Euphranta (*Euphranta*) *convergens*, n. sp.

E. (E.) flavoscutellata Hardy

E. (E.) ocellata, n. sp.

E. (E.) presignis Hardy

E. (E.) skinneri Hardy

E. (E.) stenopeza, n. sp.

E. (E.) striatella van der Wulp

E. (Staurella) apicalis Hendel

E. (S.) atrata, n. sp.

E. (S.) bischofi (Kertész)

E. (S.) canangae Hardy

E. (S.) ferenigra Hardy

E. (S.) imitator (Hardy)

E. (S.) latilimbata Enderlein

E. (S.) maculifemur (de Meijere)

E. (S.) notata, n. sp.

E. (S.) palawanica, n. sp.

Ptilona confinis (Walker)

P. continua, n. sp.

Scolocolus bicolor Hardy

Soita baltazarae, n. sp.

S. ensifera, n. sp.

GASTROZONINI

Acrotaeniostola megispilota, n. sp.

Anoplomus flexuosus Bezzi (*cassandra* Osten
Sacken is syn.)

Callistomyia icarus (Osten Sacken)

Carpophthorella capillata (Bezzi)

C. luteiseta (Bezzi)

Enicoptera cuneilinea Hering

E. flavofemoralis Hering

E. il Hering

E. interrupta Hering

E. palawanica Hering

E. proditrix Osten Sacken

E. spoliata Hering

Galbifascia quadripunctata Hardy

Spilocosmia bakeri Bezzi

TRYPETINI

Acidiella denotata Hardy

A. freyi Hardy

A. mimica, n. sp.

Acidoxantha balabacensis Hardy

A. hibisci, n. sp.

A. minor, n. sp.

A. quadrivittata, n. sp.

Anomoia klossi (Edwards)

A. melanobasis, n. sp.

A. steyskali, n. sp.

Hemilea bipars (Walker)

H., n. sp. nr. *araliae* Malloch

Myoleja commexa (Hendel)

M. fossata (Fabricius)

M. mindanaoensis, n. sp.

M. nigripennis, n. sp.

M. nitida, n. sp.

M. superflucta (Enderlein)

Vidalia tuberculata Hardy

SCHISTOPTERINAE

Rhabdochaeta asteria Hendel

R. bakeri Bezzi

R. brachycera, n. sp.

R. convergens, n. sp.

R. dorsosetosa Hardy

R. melanura Bezzi

R. multilineata Hendel

R. parva, n. sp.

TEPHRITINAE

PLATENSININI

Platensina amita, n. sp.

P. aptata, n. sp.

P. bezzii, n. sp.

P. zodiacalis (Bezzi)

P., n. sp. nr. *intacta* Hardy

TEPHRELLINI

Spathulina acroleuca Schiner

S. sp. ? prob. var. of *acroleuca*

Tephrella, prob. n. sp.

TEPHRITINI

Actinoptera formosana Shiraki

A. montana (de Meijere)

Dioxyna heringi, n. sp.

D. sororcula (Wiedemann)

Elaphromyia pterocallaeformis (Bezzi)

Ensina sonchi (Linnaeus)

Pliomelaena luzonica, n. sp.

Scedella formosella (Hendel)

Sphenella sinensis Schiner

Stylia philippinensis, n. sp.
S., 4 n. spp. undescr. poor condition
Trupanea convergens Hering

T. decepta Hardy
T. glauca Thomson

KEY TO SUBFAMILIES

1. Cell M broad, 2× wider than cell Cu and usually about 2× longer than wide (fig. 14). Cell Cu with an elongate apical lobe, equal to or longer than vein Cu₁+1stA. Almost without exception having a large, smooth, slightly depressed area on each side of 5th tergum (tergal glands) and usually a stridulatory apparatus developed on ♂♂; a row of prominent long hairs on each side of 3rd tergum and an area of dense microtrichia over cubital cell and lower margin of cell M₄. Female with 2 spermathecae consisting of tight set coils, somewhat resembling a bunch of grapes (fig. 16b). Third antennal segment 3 or more times longer than wide. Abdomen short and broad, in ♂ about 1/2 longer than wide. Chaetotaxy of head and thorax reduced; lacking ocellar, postocellar, dorsocentral, presutural, sternopleural and usually humeral bristles. Typically yellow and black flies with wings hyaline except for a brown band along costal margin and a brown streak through cubital area (fig. 15a). Fruit infesters.**Dacinae**
 Not as above, sometimes having reduced chaetotaxy (Adramini) but with cell M narrow, equal in width to Cu and usually over 4× longer than wide; lobe of cell Cu short (in Adramini, rarely elongate in other groups); tergal glands and stridulatory structures lacking; ♀ with 2-3 spermathecae but never formed of tight set coils; 3rd antennal segment typically short (except in Adramini); abdomen typically more slender, straight-sided. Wings usually with elaborate markings.2
2. Lacking ocellar, postocellar, dorsocentral, presutural and usually humeral bristles; postocular setae inconspicuous.**Trypetinae**, Adramini
 Never simultaneously lacking all of the above bristles, usually a full complement of head bristles and with the postocular setae (small bristles) well developed.3
3. Costa lacking a deep cleft and a lobe at end of subcostal vein.4
 Costa with a deep cleft at end of subcostal vein and forming a definite angle (lobe) at anterior side of the cleft which bears 2 bristles at its apex. Wing markings distinctive as in fig. 120b, 124 and 125.**Schistopterinae**, Genus *Rhabdochaeta* de Meijere
4. Postocular setae (occipitals) thin, pointed, black or dark brown. Sixth tergum of ♀ shorter than 5th (except in some Euphrantini and some Trypetini). Dorsocentral bristles usually behind supraalars. Wings variously marked but rarely spotted. Vertical suture of mesopleuron well developed. Mesonotum rarely tomentose, never with scale-like, white, recumbent setae.**Trypetinae**
 Postoculars stubby, thick, flat, rather scale-like, mostly white or yellow-white. Sixth tergum equal to or longer than 5th. Mesonotum usually tomentose and covered with flat, recumbent, scale-like white setae. Dorsocentrals before or near supraalars. Vertical suture on mesopleuron lacking or rudimentary. Wings typically spotted.**Tephritinae**

SUBFAMILY DACINAE

Members of this subfamily are characterized by having the chaetotaxy greatly reduced, lacking many of the major bristles of the head and thorax. The following are lacking: ocellars, postocellars, presutural and dorsocentrals; humeral and sternopleurals are rarely present, if with 1 of these bristles, all of the others mentioned above are lacking. Also the postocular setae are poorly developed, represented by fine hairs. Cell M short and broad, about 2× wider than cell Cu and scarcely over 2× longer than wide. Cubital

cell with an elongate apical lobe, equal to or longer than remainder of cell and to vein $Cu_1 + 1st\ A$ (fig. 7). Cell M broad, usually $2\times$ wider than cell Cu and straight-sided, not strongly narrowed basally, and comparatively short, in *Dacus* sens. lat. scarcely $2\times$ longer than wide, in *Callantra* approximately $3\times$ longer than wide. The ♀ has 2 spermathecae; these are very characteristic in form, often appearing somewhat like a cluster of grapes (fig. 16b).

Three genera are known from the Philippines and they are differentiated by the following key.

KEY TO GENERA OF DACINAE FROM THE PHILIPPINES

1. Vein M_{1+2} straight, not concave before r-m crossvein. Third costal section shorter than 4th. Mesonotal sutures abbreviated, as normal for family. Two pairs inferior fronto-orbital bristles. Front femora not spinose ventrally. Third antennal segment not longer than front, usually much shorter and 2 pairs of scapular bristles developed.2
 M_{1+2} strongly curved downward before r-m crossvein so that at apex cell 1st M_2 is $2\times$ wider than at basal 2/3 of the cell and 3rd costal section (cell Sc) over $2\times$ longer than 4th. Mesonotal suture almost complete. Inferior fronto-orbital bristles lacking. Front femora each with about 3 stout, black, posteroventral spines before apex. Antennae very elongate, 3rd segment at least 1/2 longer than front (fig. 3c), and inner scapular bristles lacking.**Monacrostichus** Bezzi
2. Antennae comparatively short, 1st segment about 1/2 as long as 2nd and less than 1/2 as long as face, with entire antennae about equal to or shorter than front. Abdomen not strongly petiolate or arched and with no well developed tubercles at sides of 1st tergum; the 1st segment $2\times$ as wide at apex as at base. Suture between terga 3 and 4 straight or nearly so. Ovipositor usually flattened dorsoventrally. Cell M broad, scarcely $2\times$ longer than wide.**Dacus** Fabricius, sens. lat.
 Antennae elongate, compared to *Dacus*. First segment equal in length to 2nd and at least 1/2 as long as face (fig. 3c); 2nd and 3rd segments combined about equal to vertical length of head and entire length of antennae about equal to combined length of front and face. Abdomen strongly clavate and petiolate, with a prominent hump on each side of 1st tergum. First segment parallel-sided or narrower at apex than at base. Abdomen arched as seen in lateral view and suture between terga 3 and 4 concave. Basal segment of ovipositor tubular in shape. Cell M rather elongate, approximately $3\times$ longer than wide.**Callantra** Walker

Genus *Callantra* Walker

Callantra Walker, 1860, *J. Proc. Linn. Soc. Zool.*, Lond. 4: 154. Type species: *smieroides* Walker, by original designation.

Mellessis Bezzi, 1916, *Bull. Ent. Res.* 7: 114. Type-species: *Monacrostichus crabroniformis* Bezzi, by original designation.

Calantra: Hendel, 1914, *Wien. Ent. Ztg* 33: 74. Error in spelling.

This genus is differentiated by the characters given in the key above. Because of the elongate 1st antennal segment it is similar to *Monacrostichus* Bezzi. In other respects, however, the 2 are quite dissimilar (refer to wing fig. 2c and 3a). Typically the abdomen is rather strongly petiolate (fig. 2a and 6c) and these flies are wasp-like in appearance. The femora are devoid of ventral bristles except for a few species (only 1 in the Philippines) which have black ventral spines on front femora. Approximately 3 dozen species

are known in this genus to date. These are widespread through the Oriental Region, through New Guinea, the Solomons and Australia. Seven species are recognized from the Philippines; 2 are new.

KEY TO KNOWN SPECIES OF CALLANTRA FROM THE PHILIPPINES

1. Wings with costal band greatly expanded at apex, filling all of cell R_5 , extending into upper edge of cell 2nd M_2 ; cubital streak distinct.2
 Costal band not filling cell R_5 , comparatively narrow and no distinct cubital streak.3
- 2(1). No median yellow vitta on mesonotum. Stalk of abdomen less developed than usually, short and broad (fig. 5b). Apical wing spot as in fig. 5a. Panay, Culion.
 *subsessilis* (Bezzi)
 With median yellow vitta on mesonotum. Abdomen distinctly stalked (fig. 2b). Apical wing spot larger, more rounded (fig. 2c). Luzon. *nummularia* (Bezzi)
- 3(1). Face with a black transverse band across lower edge.4
 Face with a black spot in each antennal furrow.5
- 4(3). Mesonotum with 3 bright yellow-white vittae. Yellow mark over mesopleuron continuous with yellow scutellum; upper margin of each sternopleuron broadly yellow. No apparent inferior fronto-orbital bristles. Lobe of cell Cu about equal in length to vein $Cu + 1st A$. Mindanao.....*vittata*, n. sp.
 Mesonotum rufous, with black, longitudinal, submedian bands and mostly black on sides, yellow only on sides in front of suture. Yellow mark of mesopleuron not continuous along upper edge and a small yellow spot on upper edge of each sternopleuron. Two inferior fronto-orbital bristles present. Lobe of Cu about 3× longer than $Cu + 1st A$. Luzon, Tawitawi. *pedunculata* (Bezzi)
- 5(3). Front femora with ventral spines. Front broad, as wide as long. Lobe of cell Cu very long, about 5× longer than $Cu_1 + 1st A$. Cell M narrow, about 3× longer than wide (fig. 1). Luzon.*bioculata* (Bezzi)
 Front femora lacking ventral spines. Front longer than wide. Lobe of Cu slightly over 2× longer than $Cu_1 + 1st A$6
- 6(5). Costal band broad, extending below vein R_{4+5} for entire length and filling upper 1/2 of cell R_5 . Second costal cell dark brown (fig. 4c). Mesonotum predominantly rufous with black marks on each side before and behind suture and median portion of mesonotum broadly rufous for entire length. Front with dark brown spots at bases of bristles. Palawan.*picta* Hardy
 Costal band narrow, not extending below vein R_{2+3} except at apex and extending only into upper apical edge of cell R_5 (pl. 1, fig. 1). Second costal cell hyaline. Mesonotum with a continuous black mark on each side from inner postalar bristles to behind humeri, and with a narrow rufous line down middle in area anterior to supraalars. Front yellow, lacking brown spots. Luzon.*indecora*, n. sp.

Callantra bioculata (Bezzi) Fig. 1.

Mellessis bioculata Bezzi, 1919, *Philipp. J. Sci.* 15: 437. Type-locality: Mt Makiling, Laguna, Luzon. Lectotype ♂ in the Museo Civico di Storia Naturale, Milano.

This species is differentiated from others of this genus in the Philippines by having the front femora with ventral spines; front broad, as wide as long; lobe of cubital cell very long, about 5× longer than vein $Cu_1 + 1st A$; cell M narrow, about 3× longer than wide. Bezzi in the original also said it was distinctive by having only 1 "hypopleural

spot." He probably was referring to the yellow mark over the metapleuron and possibly was indicating that the pleurotergon is not yellow. The species is not represented in the material I have examined. The following notes are taken from Bezzi's original description. Facial spots rather small and rounded. Mesonotum rufous with 3 very narrow, black longitudinal stripes and 2 black spots in front of scutellum. Wing as in fig. 1 (copied from Bezzi 1919, pl. 2, fig. 4). His illustration shows the costal band as being rather broad, extending below vein R_{4+5} for its entire length and filling upper 1/2 of cell

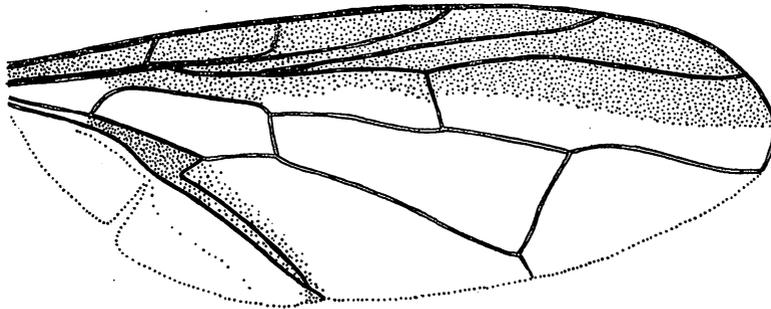


Fig. 1. *Callantra bioculata* (Bezzi): wing

R_5 . He shows the lobe of cubital cell as being unusually long compared to vein $Cu_1 + 1st\ A$, appearing to be about $5\times$ longer. Abdomen with long, narrow and cylindrical stalk at base. First and 2nd terga dark brown with a narrow hind border. Third tergum uniformly blackish brown, 4th tergum blackish brown with the rectangular, transverse, yellowish spot in middle at hind margin, and 5th tergum yellow with broad dark brown to black patches on sides and with tergal glands black. Legs rufous, femora broadly black.

For more complete details refer to original. Known only from the original ♂.

According to Bezzi the body measures 10.0 mm; wing 8.5 mm.

***Callantra indecora* Hardy, new species** Fig. 2a; pl. 1, fig. 1.

By having the face with 2 black spots, the costal band not enlarged at apex, front femora lacking ventral spines, and lobe of cell Cu just slightly over $2\times$ longer than vein $Cu_1 + 1st\ A$, this fits near *picta* Hardy, from Palawan. It differs by having costal band narrow, not extending below vein R_{2+3} except at apex and extending into only upper apical edge of cell R_5 (pl. 1, fig. 1); also the 2nd costal cell is hyaline and the mesonotum has a continuous black mark down each side from inner postalar bristle to behind humerus and only a narrow rufous line extending down middle. Face yellow, lacking brown spots. For the characters of *picta* refer to key and to description of that species.

♂. *Head*: Shaped as in most species of *Callantra* with the face very slightly indented in lower median portion as seen from lateral view and the antennae situated at about middle of head height. Front slightly longer than high, entirely yellow except for a faint brown discoloration in median portion. A shining black line extends across vertex connecting with black ocellar triangle. Two pairs inferior fronto-orbitals and 1 pair superior fronto-orbitals. Lunule dark brown. Face with a prominent black semi-circular spot in each antennal furrow, otherwise yellow. First

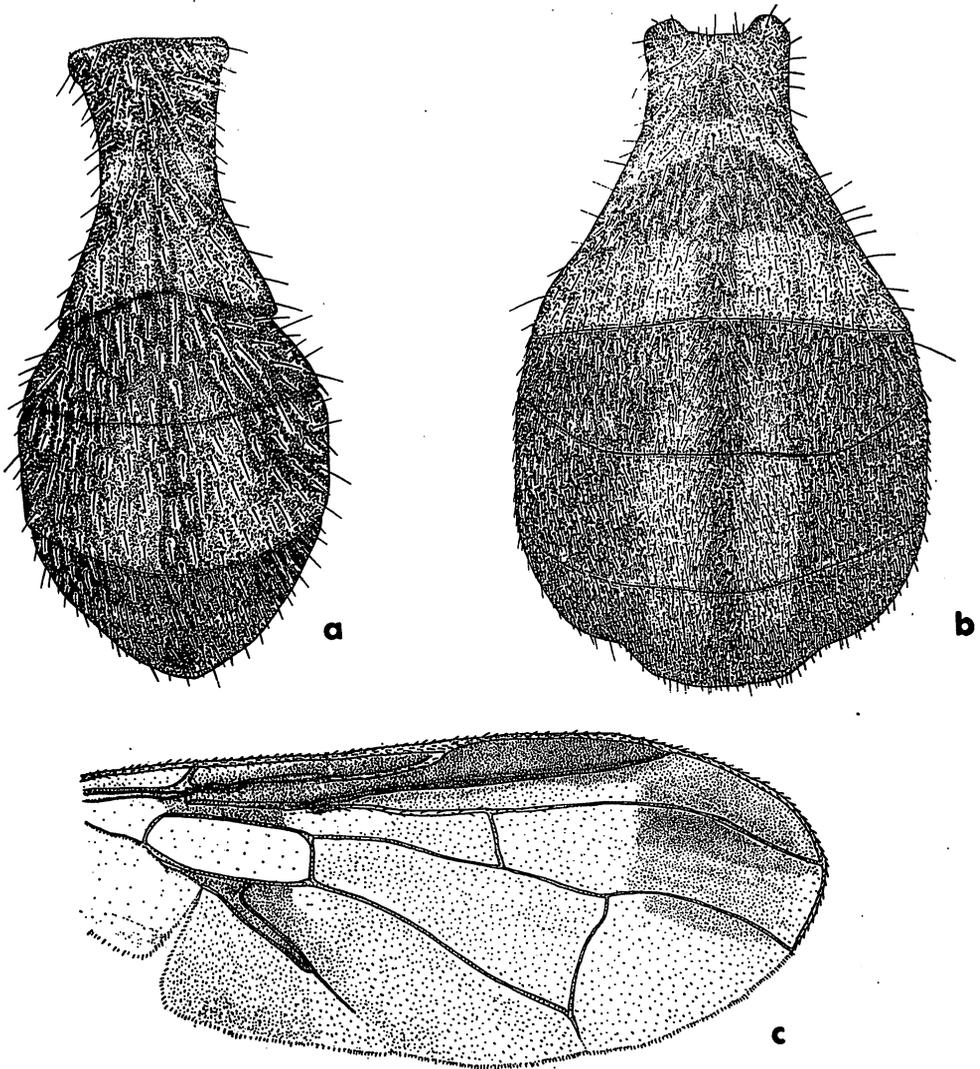


Fig. 2. *Callantra indecora*, n. sp.: a. abdomen of ♂, dorsal.
C. nummularia (Bezzi): b. abdomen of ♀, dorsal; c. wing.

antennal segment yellow, equal in length to 2nd. Second segment tinged with brown and with 1 prominent black dorsoapical bristle and a row of black ventral setae at apex. The 3rd antennal segment is missing on specimen at hand. Palpi entirely yellow. *Thorax*: Predominantly black; humeri, a transverse mark on each side of suture, hind portion of each mesopleuron and a spot on upper sternopleuron, also metanotum, pleuroterga and scutellum pale yellow; the latter with a narrow brown border at base. Mesonotum rufous over posteromedian portion; this area narrows sharply at about level with supraalar bristles and extends as a rather narrow rufous vitta to anterior margin of mesonotum just outside inner scapular bristles. A broad black mark extends on each side from just behind inner postalar bristles around inner edge of suture to anterior

margin of mesonotum, expanding broadly to cover entire area behind humeri. Yellow mark over mesopleuron not extending along the entire dorsal border and with front margin oblique. Spot on sternopleuron rather small, not extending posteriorly beneath pteropleuron. *Legs*: Front femora predominantly dark brown, yellow to rufous at apices and bases; middle pair dark brown on ventral surfaces, otherwise yellow to rufous and basal 2/3 of each hind femur bright yellow, apical portion dark brown. Hind tibiae dark brown, middle and front tibiae brownish red. Basitarsi yellow-white, other tarsomeres brownish yellow. Middle tibia with 1 strong plus 2 or 3 short black apical bristles. *Wings*: Subhyaline with the markings and venation as in pl. 1, fig. 1. First 2 costal cells entirely covered with microtrichia and subhyaline. Third costal section (subcostal cell) slightly shorter than 4th section and 4th and 5th sections equal in length. Vein R_{4+5} densely setose to a level opposite end of vein R_{2+3} . *Abdomen*: Moderately petiolate, similar in shape to most *Callantra* (fig. 2a). Black on basal margins of terga 1-3 and with a black longitudinal vitta extending down middle of abdomen from base to just before apex of 5th tergum, also with lateral margins of terga broadly black; abdomen otherwise yellow to rufous and with tergal glands rufous. The genitalia have not been dissected for study.

Length: body, 6.3 mm; wings, 5.5 mm.

♀. Unknown.

Holotype ♂ (BISHOP 10124), Mayoyao, Ifugao, Mt. Prov., Luzon, 1200-1500 m, 3. IX.1966, H. M. Torrevillas. One ♂ paratype, "Antimonan" (Atimonan), Luzon, XI.1915, no coll. given, in Frey collection.

Type in B. P. Bishop Museum. Paratype returned to University Zoological Museum, Helsinki.

Callantra nummularia (Bezzi) Fig. 2b-c.

Mellesis nummularia Bezzi, 1916, *Bull. Ent. Res.* 7: 115. Type-locality: Mt Banahao, Luzon.

Lectotype ♂ in Milano.

Mellesis nummularia: Bezzi, 1919, *Philipp J. Sci.* 15: 441, pl. 2, fig. 6.

This species fits near *subsessilis* (Bezzi) by having the costal band greatly expanded in wing apex. It is differentiated by having a median yellow vitta on mesonotum, by having the apical wing spot larger, more rounded (fig. 2c), and with base of abdomen more slender as in fig. 2b.

Front distinctly longer than wide and with faint brown spots at bases of bristles. Two pairs inferior and 1 pair superior fronto-orbitals. Face with a prominent oblong, dark brown to black spot in each antennal furrow. First antennal segment rufous, 2nd segment reddish brown and 3rd segment brown. Palpi yellow, tinged with brown on lower margin. Thorax predominantly yellow to rufous with indistinct postsutural markings of black on each side and with area behind each humerus discolored brown to black. The yellow median vitta wedge-shaped, extending from approximately opposite postalar bristles to suture, pointed anteriorly. A broad yellow mark present on each side in front of suture. Yellow mark over mesopleuron extending over dorsal margin, continuous with yellow of humerus. Yellow mark at upper portion of each sternopleuron rather small, not continued posteriorly under pteropleuron. Scutellum yellow except for narrow black base. Metanotum black on sides, rufous down middle. Legs predominantly yellow, front femur brown over posterodorsal and posteroventral surfaces. Middle femur brown on ventral surface. Hind tibia mostly brown. Wing as in fig. 2c. The apical marking extending well into upper portion to cell 2nd M_2 . First costal cell devoid of microtrichia, 2nd densely covered. Vein R_{4+5} setose approximately to a level opposite apex of vein R_{2+3} . Abdomen shaped as in fig. 2b, as seen from dorsal view; predominantly rufous, with a band of black across base of 2nd tergum and an almost complete band across base of 3rd with a median black vitta extending from apex of 5th tergum to base of 3rd and with a faint indication of a brown vitta on first 2 terga; also sides of terga

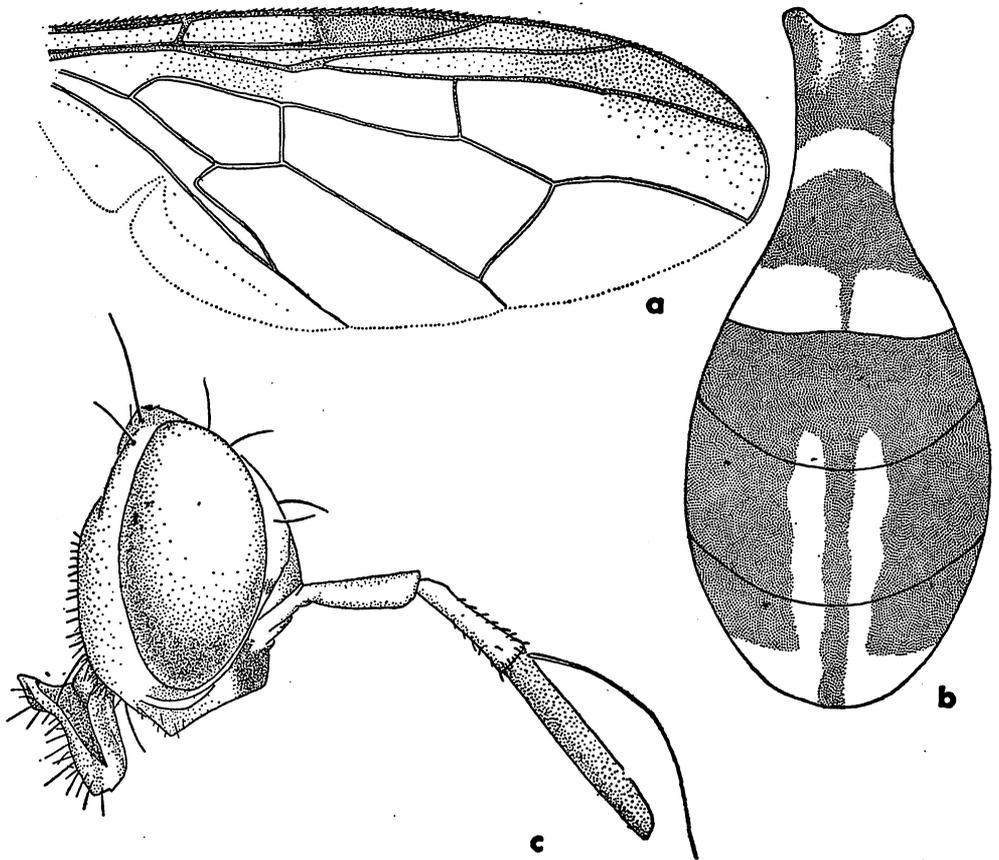


Fig. 3. *Callantra pedunculata* (Bezzi): a. wing; b. abdomen, dorsal; c. head, lateral.

broadly blackened but with the tergal glands rufous. Basal segment of ovipositor rufous, as seen from dorsal view the base is largely hidden in the concavity of underside of abdomen, the visible portion is less than the length of 5th tergum. As seen from ventral view the basal segment is approximately 1.5 mm long. The piercer has not been extruded for study. For more detailed description refer to Bezzi (1919: 441, pl. 2, fig. 6). Length: body, 8.0–8.5 mm; wings, 7.0–7.5 mm.

One ♀ specimen on hand: Lipa, Batangas, Luzon, XII.1958, C. B. Macabasco.

***Callantra pedunculata* (Bezzi) Fig. 3a-c.**

Mellessis pedunculata Bezzi, 1916, *Bull. Ent. Res.* 7: 115. Type-locality: Mt Makiling, Laguna, Luzon. Type ♂ in U. S. National Museum.

Mellessis pedunculata: Bezzi, 1919, *Philip. J. Sci.* 15: 439, pl. 2, fig. 5.

Because of the presence of a black band across lower margin of face, rather narrow costal band, lack of a cubital streak this species would fit near *vittata*, n. sp. It is differentiated by lacking yellow longitudinal vittae on mesonotum; by the comparatively narrow vertical yellow mark over mesopleuron, not extending across upper edge of sclerite as in *vittata*; and by the small yellow spot at upper edge of each sternopleuron;

also 2 distinct inferior fronto-orbitals are present.

Head shaped as in fig. 3c. The polished black mark over lower margin of face is concave in median portion, broadened on sides. Thorax yellow to rufous with a pair of narrow submedian black vittae extending from anterior margin to about opposite postalar bristles and with a broad black spot behind each humerus extending to yellow mark in front of suture, and another broad black mark on each side behind suture extending almost to postalar bristles. Anterior 1/2 of each mesopleuron black. Yellow spot on upper sternopleuron small, extended posteriorly for short distance under pteropleuron. Wings as in fig. 3a with costal band rather narrow, not filling cell R_3 and extending for only a short distance through upper apex of cell R_5 . Cubital streak lacking, but with a brown mark beyond apex of cubital cell over vein $Cu_1+1st\ A$. Vein R_{4+5} setose to a level about opposite apex of vein R_{2+3} . In ♂ wing vein $Cu_1+1st\ A$ is approximately 1/2 as long as lobe of Cu and a brown spot is present in this area of wing; in ♀ the posterior portion of wing is completely hyaline and vein $Cu_1+1st\ A$ is approximately equal in length to lobe of cell Cu . Abdomen shaped as in fig. 3b, with a broad black band over apical portion of 1st tergum. Second tergum with a broad black subbasal band and with apices of first 2 terga yellow. Third tergum entirely black, 4th and 5th terga each with a black vitta down middle and with sides broadly black, yellow down the submedian area and with tergal glands yellow. The ♂ genitalia have not been dissected for study. Female ovipositor largely hidden in cavity beneath abdomen; only a short portion of basal segment is visible from dorsal view. Measured on venter the basal segment is about 1.25 mm long. The piercer has not been extended for study.

One ♀ specimen has been seen from Tawitawi (reported in the Noona Dan Expedition report) and 1 ♂ specimen on hand from Mayoyao, Ifugao, Mt. Prov., Luzon, 1200-1500 m, 14.IX.1966, H. M. Torrevillas.

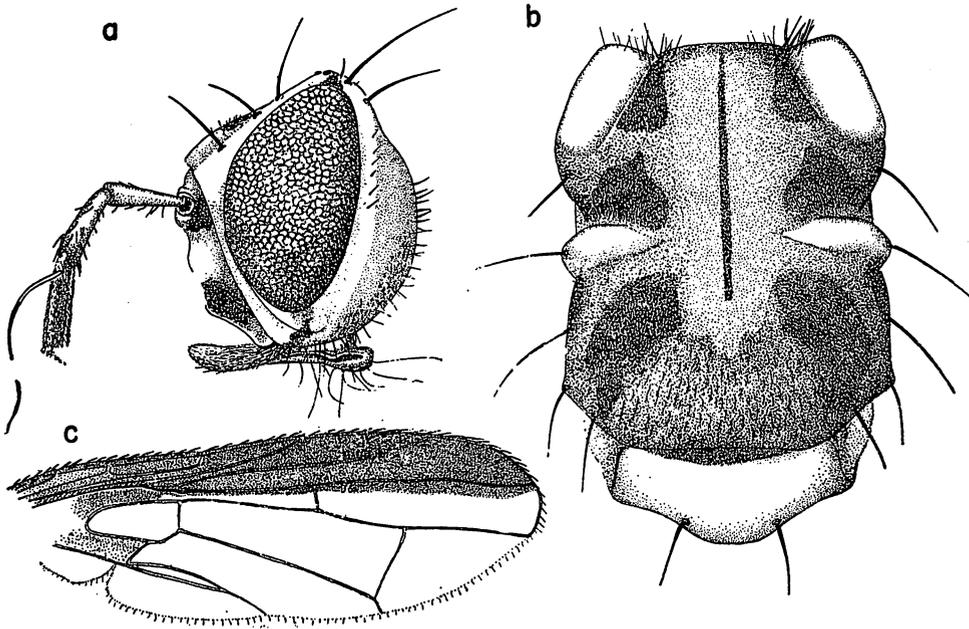


Fig. 4. *Callantra picta* Hardy: a. head, lateral; b. thorax, dorsal; c. wing.

Callantra picta Hardy Fig. 4a-c.

Callantra picta Hardy, 1970, *Ent. Meddel.* **38**: 72. Type-locality: Brooke's Point, Uring Uring, Palawan. Type ♀ in University Zoological Museum, Copenhagen.

Fitting in the group which has a black spot in each antennal furrow, near *indecora*, n. sp. and differentiated by the broad costal band which extends below vein R_{4+5} for its entire length and fills upper 1/2 of cell R_5 ; by having 2nd costal cell dark brown (fig. 4c); mesonotum predominantly rufous with black marks on sides before and behind suture and with median portion of mesonotum broadly rufous. Also having dark brown spots at bases of frontal bristles. Refer to the original for a detailed description. The head and antennae are as in fig. 4a. The mesonotal markings are as in fig. 4b, and the wing venation as in fig. 4c. Known only from the type ♀.

Callantra subsessilis (Bezzi) Fig. 5a-b.

Mellesis subsessilis Bezzi, 1919, *Philipp. J. Sci.* **15**: 435, pl. 2, fig. 3. Type-locality: Culasi, Antique Prov., Panay Island. Type ♀ in Milano.

Fitting in group which has costal band greatly expanded at apex (fig. 5a) and fitting closest to *nummularia* (Bezzi) but differentiated by its more robust appearance, with the stalk of abdomen less developed, short and broad (fig. 5b); by having no median

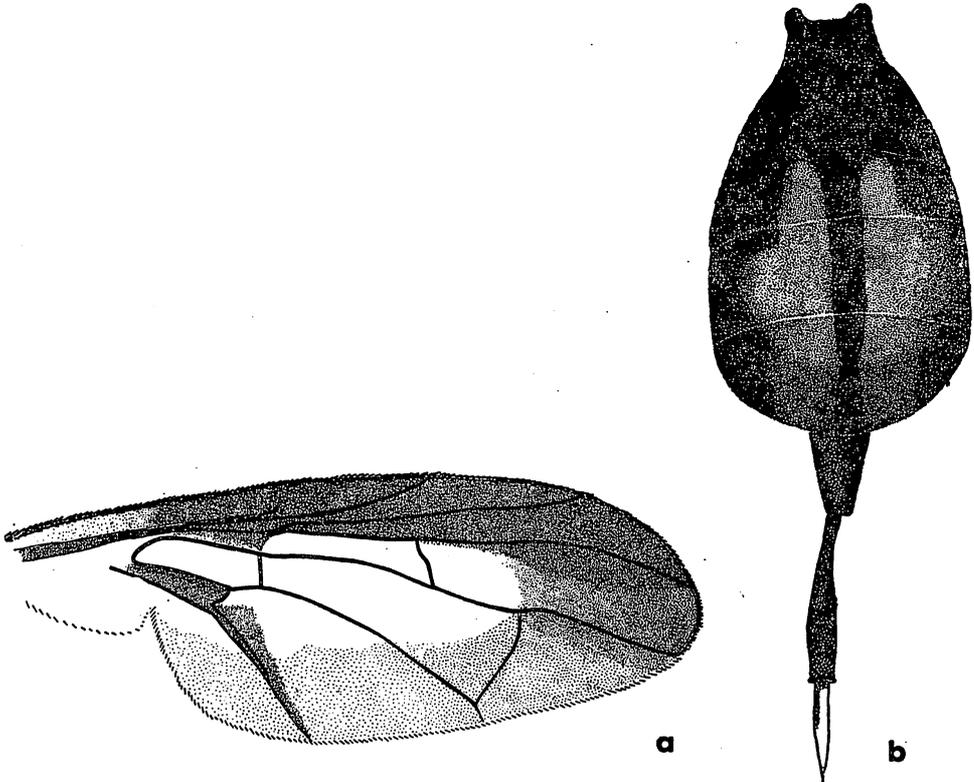


Fig. 5. *Callantra subsessilis* (Bezzi): a. wing; b. ♀ abdomen, dorsal.

yellow vitta on mesonotum and apical wing spot more diffused, not rounded.

Female head as in most species of *Callantra*, with oblong black spots in each antennal furrow and with front yellow except for a tinge of brown in median portion. Antennae typical of the group. Thorax predominantly black. Mesonotum rather distinctly gray pollinose and densely yellow pilose. Yellow markings as follows: humeri, a broad mark on each side in front of suture, a broad mesopleural mark extending over most of dorsal margin, a mark on each upper sternopleuron, and a yellow mark over metapleuron and pleurotergon; also scutellum yellow except for a narrow brown basal band. Legs yellow, tinged with brown on front femora and with hind tibiae mostly brown. Wings as in fig 5a, with short densely placed setae on upper surface of vein R_{4+5} extending to a level with apex of vein R_{2+3} , and with long, sparsely placed setae on undersurface extending distinctly beyond r-m crossvein. First costal cell covered with microtrichia on upper 1/2. Abdomen shaped as in fig. 5b. The specimen on hand is obviously darker, more black than was Bezzi's type; he reported the 1st tergum as "entirely reddish, with less distinct, darkish, longitudinal middle stripe; second segment reddish at base, yellowish on more than its apical half with less distinct middle stripes, and with no black spots at sides; third, fourth and fifth segment entirely reddish with no black spots on sides, with only a narrow and complete, black longitudinal stripe in the middle." The specimen at hand has first 2 segments predominantly black, tinged with rufous, especially in submedian areas of dorsum and on apex of 2nd tergum. A broad black vitta extends down middle of terga 2-5 to apex of abdomen, and sides of abdomen are broadly black with the submedian areas yellow to rufous. The tergal glands are rufous, tinged with brown. Also the basal segment of ovipositor is rufous, tinged with brown or black. As seen from dorsal view the visible portion of the basal segment is approximately equal to 5th tergum. Measured on venter the basal segment of ovipositor is about 1.5 mm long. Piercer slender, evenly tapered to sharp point at apex (fig. 5b) and very slightly over 1.1 mm long. Extended ovipositor 4.0 mm. Length: Bezzi measured the body of the type as 9.0 mm, excluding ovipositor and wings, 8.0 mm. The specimen at hand measures 8.5 mm for body and 7.0 mm for wing. ♂. Unknown.

One ♀ specimen on hand: Culion Island, 6 km W Culion, 6.II.1962, Malaise trap, H. Holtmann.

***Callantra vittata* Hardy, new species** Fig. 6a-c.

This species fits in the group which is characterized by having a broad polished black band across lower margin of face, costal band narrow, not expanded at apex, and no cubital streak in posterior portion of wing. It fits near *pedunculata* (Bezzi) but is readily differentiated by having 3 yellow-white vittae extending down mesonotum; by having the yellow mark over each mesopleuron occupying entire dorsal margin and continuous with yellow on humerus; by having a very extensive yellow mark occupying almost entire dorsal portion of each sternopleuron; by apparently lacking inferior fronto-orbital bristles, and having the lobe of cubital cell rather short, approximately equal in length to vein $Cu_1+1st A$ (fig. 6a).

♂. *Head*: Shaped as in fig. 6b, with no apparent inferior fronto-orbital bristles. Front comparatively broad; measured from median ocellus to frontal suture it is almost as wide as long. Front yellow except for a reddish brown discoloration extending from ocellar triangle to about middle and a brown transverse discoloration over lower 2/3. Vertex with a shining black transverse mark. Also with a brown to black spot on each side of lower front immediately opposite bases of antennae, and with lunule dark brown. The transverse polished black band across face is broad, occupying approximately lower 1/2 of face. Occiput reddish brown on hind portion, with a broad yellow band around margin. Antennae as in fig. 6b, with 1st segment

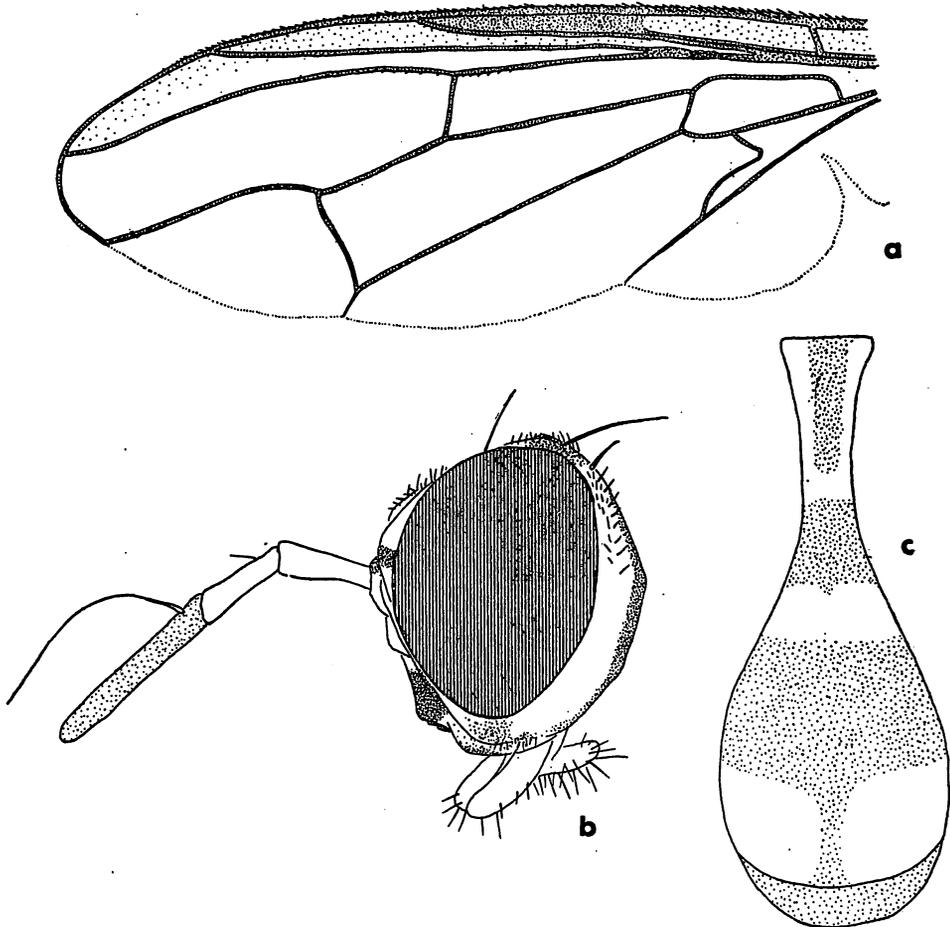


Fig. 6. *Callantra vittata*, n. sp.: a. wing; b. head, lateral; c. ♂ abdomen, dorsal.

rufous, and tinged faintly with brown on segments 2 and 3. Second segment with a rather prominent dorsal bristle in middle. Arista bare. *Thorax*: Conspicuously marked yellow-white and black, with 3 vittae on mesonotum. The yellow-white median vitta extends from a level near hind margins of humeri to approximately opposite supraalar bristles; posteromedian portion of the mesonotum rufous. The markings on pleura as noted in the introduction above. Scutellum yellow with 2 large apical bristles. Metanotum black, tinged with rufous down middle. Halteres with pale yellow stems and reddish brown knobs. *Legs*: Front femora brownish red, tinged with yellow at apices and bases. Middle femora yellow-brown on apical 2/3 with bases pale yellow, and hind femora largely brown except for broad yellow bases and apices. Tibiae brown. Basitarsi yellow-white, other tarsomeres rufous, tinged faintly with brown. One strong apical spur on middle tibia. *Wings* (fig. 6a): Subhyaline with a narrow, comparatively faint costal band; the brown infuscation extends into cell R₅ only along apical margin and blends rather gradually into the subhyaline, faintly infuscated coloring of the remainder of the wing. No brown markings along cubital cell or vein Cu₁+1st A. Vein R₄₊₅ with about 6 moderately long setae on ventral surface near base and dorsal surface of vein with closely placed setae extending almost entire length. *Abdomen*:

With a long slender stalk as in fig 6c. First tergum elongate, narrowed at apex, mostly yellow with a brown to black median vitta extending most of its length. Second tergum black on basal 1/2 and on extreme lateral margins, yellow on apex. Third tergum with a large brown to black mark extending longitudinally down middle connecting with a black median vitta extending over 4th and 5th terga, almost to apex of abdomen and with lateral margins of 3rd and 4th narrowly black, otherwise yellow to rufous. Fifth tergum black except for yellow tergal glands and rufous marking continuing on each side from tergal gland almost to base of segment. The genitalia have not been dissected for study. The sterna are polished black. Fifth sternum approximately 1/2-2/3 longer than wide.

Length: body, 7.75 mm; wings, 7.0 mm.

♀. Unknown.

Holotype ♂ (BISHOP 10125), Agusan, San Francisco, 10 km SE, Mindanao, 14.XI.1959, L. W. Quate.

Type returned to the B. P. Bishop Museum.

Genus *Dacus* Fabricius

Dacus Fabricius, 1805, Syst. Antliat., p. 272. Type-species: *armatus* Fabricius, by subsequent designation (Hendel 1927: 24).

Tridacus Bezzi, 1915, Bull. Ent. Res. 6: 88. Type-species: *Dacus armatus* Fabricius, by subsequent designation (Collart 1935: 9).

This group has been split into numerous "genera" by various authors, but as I have discussed (Hardy 1955a) these are all based upon the presence or absence of single bristles or upon secondary sexual characters. A considerable amount of intergradation of these characters has been observed and it seems much more logical to treat these as subgenera.

Dacus sens. lat. differs from other Dacinae by having the antennae comparatively short, the 1st segment about 1/2 as long as 2nd, and 2nd scarcely 1/4 as long as base, with entire antenna about equal to or shorter than the front. Abdomen not strongly petiolate or arched in profile and with no well developed tubercles at sides of 1st tergum. First tergum 2× as wide at apex as at base and suture between terga 3 and 4 straight or nearly so. Ovipositor typically flattened dorsoventrally. Two spermathecae present in the ♀; these are peculiar in shape, consisting of lightly coiled tubes often resembling a bunch of grapes (fig. 16b). Both sexes of *Dacus*, except for the *mcgregori* complex of species, have 2 glandular areas (tergal glands) on the 5th tergum and have a stridulatory structure developed in the cubital area of the wing.

The classification of Drew (1972: 5-8), in which he breaks the *Dacus* down into 2 subgeneric groups based upon the development of the ♂ surstylus and shape of 5th sternum, is not being used here since *Nesodacus* Perkins has not been checked for this character and it is not known to which group it belongs. *Asiadacus* Perkins, *Paradacus* Perkins, *Paratridacus* Shiraki and *Zeugodacus* Hendel fit in the *Dacus* group by having the posterior lobe of surstylus elongate, about 6× longer than anterior lobe and 5th sternum with the hind margin gently concave. *Strumeta* Walker is the only known subgenus in the Philippines which fits in Drew's *Strumeta* group: by having the posterior lobe of surstylus short and 5th sternum with a deep V-shaped concavity on hind margin.

Six subgenera have been recorded from the Philippines to date; these are differentiated by the following key.

KEY TO SUBGENERA OF DACUS FROM THE PHILIPPINES

1. Scutellum with 1 pair of bristles.2
Scutellum with 2 pairs of bristles.4
2. Prescutellar bristles absent3
Prescutellar bristles present. **Dacus (Strumeta)** Walker
3. Third abdominal tergum of ♂ with a row of prominent black cilia on each side, anterior supraalars absent.....**Dacus (Asiadacus)** Perkins
Third tergum of ♂ lacking the rows of cilia, anterior supraalars present.
..... **Dacus (Nesodacus)** Perkins
4. Third tergum of ♂ ciliated. With an indentation in wing margin at apex of vein Cu_1+1st
A. 5
Third tergum lacking cilia, and with no indentation in wing margin at apex of vein Cu_1+1st A. **Dacus (Paratridacus)** Shiraki
5. Prescutellar bristles present. **Dacus (Zeugodacus)** Hendel
Prescutellars absent. **Dacus (Paradacus)** Perkins

Subgenus *Asiadacus* Perkins

Asiadacus Perkins, 1937, *Proc. Roy. Soc. Qld* 48(9): 57. Type-species: *Chaetodacus bakeri* Bezzi, by original designation.

As pointed out by Drew (1972: 10) "When Perkins erected *Asiadacus* and made *C. bakeri* the type species, he incorrectly defined this genus stating that *bakeri* lacked a pecten of cilia on the abdomen and possessed both anterior supraalar and prescutellar bristles." I (Hardy 1954: 5) had previously synonymized this under *Neodacus* Perkins. Drew had an opportunity to study the type of *bakeri* and discovered that it does have a pecten of cilia on the 3rd abdominal segment and both prescutellar and anterior supraalar bristles are absent. Also he recorded that based on the characters of the surstylus and 5th sternum it fits in the *Dacus* group of subgenera. The posterior lobe of surstylus is elongate and the 5th sternum only slightly concave on hind margin. It would fit very near *Pacifodacus* Drew but differs by lacking anterior supraalars.

Drew also found that *Neodacus* Perkins is a synonym of *Dacus (Dacus)* based upon the character of the surstylus and the 5th sternum.

Dacus (Asiadacus) bakeri (Bezzi) Fig. 7.

Chaetodacus bakeri Bezzi, 1919, *Philipp. J. Sci.* 15: 426, pl. 1, fig. 8. Type-locality: Davao, Mindanao. Type ♂ in U. S. National Museum.

Dacus (Neodacus) bakeri: Hardy, 1954, *Proc. Ent. Soc. Wash.* 56: 8.

I have seen the type but have not seen subsequent specimens of this species. It is differentiated from other *Asiadacus* which have the costal band of the wing expanded into a large apical spot by having the mesonotum extensively marked with black and lacking a median postsutural yellow vitta.

This was the type of *Asiadacus* Perkins (1937: 57) based upon the supposed lack of ciliation on the 3rd abdominal tergum of the ♂. In Bezzi's key (1919: 419) he stated 3rd abdominal segment of ♂ not ciliated. This was an error; in his description, p. 428,

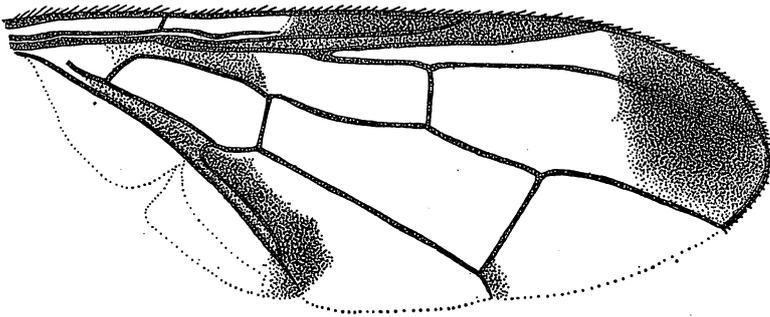


Fig. 7. *Dacus (Asiadacus) bakeri* (Bezzi): wing.

he says "hind border of third segment with black cilia on sides."

The following notes are taken from the original description: front entirely reddish yellow, lacking spots and with a black transverse vertical stripe extending to ocellar triangle. Lunule yellow. Antennae entirely yellow with 3rd segment narrow. Face concave, shining yellow with a black spot near anterior margin in each antennal furrow. Mesonotum rufous, roughly punctulate, subshining with short pale pubescence and with the following black markings: "a narrow middle stripe, ending at suture; triangular patch on each side before suture, with base on dorsocentral line and vertex on notopleural line just below humeral callosities; a broad patch on each side behind suture, reaching with its acute point at base of scutellum; a narrow transverse stripe just in front of scutellum." Legs predominantly black, front and middle tibiae darkened posteriorly and at bases. Hind tibiae brown to black "with a broad prominent tubercle at hind side before the end." Wings as in fig. 7. With the costal band narrow to the apex of vein R_{2+3} then abruptly enlarged into a large apical spot which extends through all of the apices of cells R_3 and R_5 . Also with a broad cubital streak. Abdomen convex in the middle and narrowed at base but not with a conspicuous stalk. First and 2nd terga yellow to rufous, black at bases and on sides. Third tergum with a black transverse band at base and on lateral margins and with a narrow black longitudinal vitta extending down middle, continuous with a narrow median vitta extending over 4th and 5th terga, narrowly interrupted at the sutures and ending slightly before apex of 5th tergum. Tergal glands black. Length: body, 6.5 mm; wings, 6.0 mm. ♀ unknown.

Subgenus *Nesodacus* Perkins

Nesodacus Perkins, 1937, *Proc. Roy. Soc. Qld* 48 (9): 57. Type-species: *Chaetodacus atrichus* Bezzi, by original designation.

Dacus (Nesodacus): Hardy & Adachi, 1954, *Pacif. Sci.* 8: 154.

The exact status of this subgenus cannot be assessed until the ♂ surstyli and 5th sternum can be studied; no specimens are presently on hand. If the surstyli are elongate and the 5th sternum only slightly concave it would run to *Dacus* Fabricius and *Pacifodacus* Drew, but would differ by lacking a pecten on each side of the 3rd abdominal tergum. If the surstyli are short and the 5th sternum deeply cleft it would run to *Gymnodacus* Munro and would differ by lacking prescutellar bristles.

The following key to species is from Hardy & Adachi (1954: 154). It should be noted that *longicaudatus* (Perkins) is known only from the type ♀ and there is question as to whether it actually fits in *Nesodacus*.

1. Costal band not expanded at wing apex. Philippine Islands.2

- Costal band enlarged apically, forming a large spot in apex of wing. Malaya.
 **longicaudatus** (Perkins)
2. Abdomen entirely black. **ablepharus** (Bezzi) 2A
 Abdomen reddish, with black crossbands..... **atricus** (Bezzi) 3A
- 2A. A black crossband present at vertex. Face of both sexes with a broad black band
 across lower margin. **ablepharus ablepharus** (Bezzi)
 No complete band over vertex. Face of ♀ (♂ unknown) with black spots.
 **ablepharus mindanaus** (Bezzi)
- 3A. Front black spotted. Face of ♂ entirely black, that of ♀ with 2 lateral spots and a
 median black spot just below antennae; smaller species; body, 4.5-5.0 mm.
 **atricus atricus** (Bezzi)
 Front without spots. Face of ♀ with only 2 black spots (♂ unknown); larger species;
 body, 6.0 mm. **atricus davaoanus** (Bezzi)

Dacus (Nesodacus) ablepharus (Bezzi) Fig. 8.

Chaetodacus ablepharus Bezzi, 1919, *Philipp. J. Sci.* 15: 422, pl. 1, fig. 2. Type-locality: Malinao, Tayabas Prov., Luzon. Lectotype ♂ in Museo Civico di Storia Naturale, Milano.

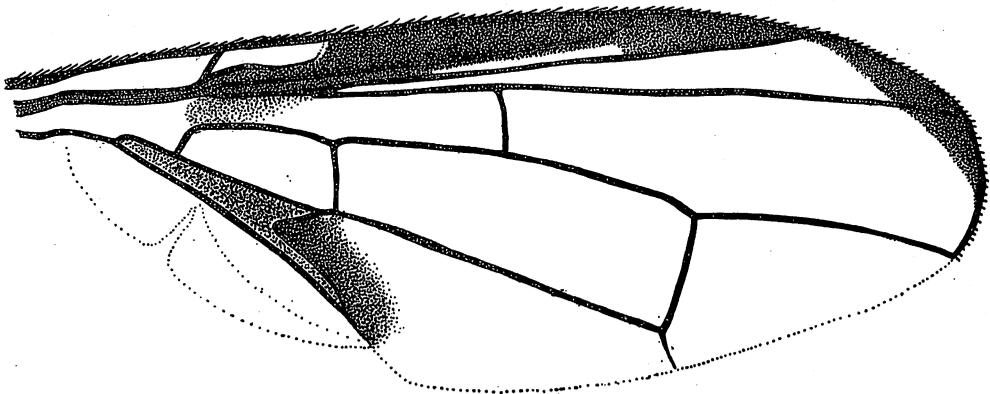


Fig. 8. *Dacus (Nesodacus) ablepharus* (Bezzi): wing (copied from Bezzi 1919, pl. 1, fig. 2).

This species is known, to me, only from the type series; it is differentiated by the entire black abdomen. The following notes are from Bezzi's original description. Face in both sexes with a black crossband over lower 1/2. Mesonotum shining black, with 2 postsutural yellow vittae. Wing predominantly hyaline with a narrow costal band extending through upper 1/2 of cell R_5 on the wing margin and with broad cubital streak (fig. 8). Femora yellow, broadly black before apices. Posterior tibiae black in ♂ and all tibiae black in ♀. Abdomen entirely black, except for the narrow apex of 5th tergum of ♂ which is rufous. Male genitalia and ovipositor entirely black. Perkins (1938b: 134) recorded 1 ♀ from Bettotan, nr Sandakan, North Borneo and said that the mesonotum behind the suture is very flat, not slightly convex as in most Dacinae. "Scutellum conspicuously flattened above, and the hind margin between the bristles noticeably straight."

Dacus (Nesodacus) ablepharus mindanaus (Bezzi)

Chaetodacus ablepharus mindanaus Bezzi, 1919, *Philip. J. Sci.* 15: 422. Type-locality: Davao, Mindanao. Type ♀ in Milano.

According to the original description this differs from the typical species "in some minor detail of the pattern of the head." The subspecies "differs only in the want of the black crossbands at vertex; and in the face, which has only two black spots, of elongate shape, at the lower ends of the antennal grooves."

Dacus (Nesodacus) atrichus (Bezzi) Fig. 9.

Chaetodacus atrichus Bezzi, 1919, *Philip. J. Sci.* 15: 420, pl. 1, fig. 1. Lectotype ♂: Batbatan Island, in Museo Civico di Storia Naturale, Milano. Bezzi's type series (Milano) also contains specimens from Antique Prov., Panay Island.

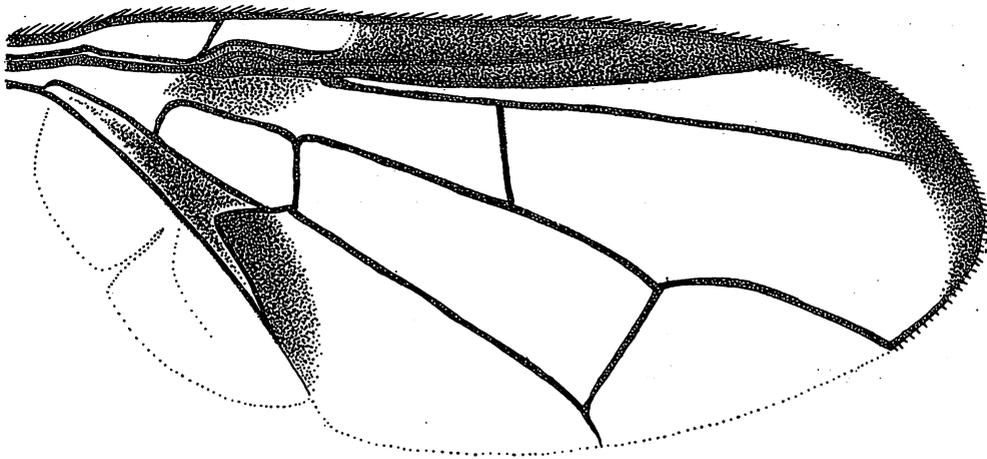


Fig. 9. *Dacus (Nesodacus) atrichus* (Bezzi): wing (copied from Bezzi 1919, pl. 1, fig. 1).

This species is differentiated by having the abdomen rufous, with 3 complete black crossbands. The typical species is differentiated by having the front spotted with black, face of ♂ entirely black, that of ♀ with 2 lateral dark brown to black spots with a median black spot just below antennae; also by being slightly smaller (body, 4.5-5.0 mm.) The wings are similar to those of *ablepharus* but according to Bezzi's figures the costal band is slightly more broad through cell R_3 in *atrichus* (fig. 9). The yellow vittae on mesonotum are evidently more broad in *atrichus* and continue in front of the suture. For more complete details refer to the original.

Dacus (Nesodacus) atrichus davaoanus (Bezzi)

Chaetodacus atrichus davaoanus Bezzi, 1919, *Philip. J. Sci.* 15: 421. Type-locality: Davao, Mindanao. Type ♀ in Milano.

According to Bezzi this differs from the typical species by being larger "and in some minor details of color pattern." Bezzi measured the body length as 6.0 mm; wings, 5.5 mm. It supposedly differs by lacking black spots on the front, and by the face of the

♀ with only 2 black spots (♂ unknown).

I question the validity of this subspecies and it probably is nothing more than a variation.

Subgenus *Paradacus* Perkins

Paradacus Perkins, 1938, *Proc. Roy. Soc. Qld* 49(11): 143. Type-species: *Paradacus fulvipes* Perkins, by original designation.

This subgenus resembles *Zeugodacus* except that the prescutellar bristles are absent. Four species are presently placed in this combination; they are differentiated by the following key:

1. Mesonotum with 3 postsutural yellow vittae.2
 Mesonotum with only 2 postsutural yellow vittae, median portion entirely black. Wing as in fig. 10a. Female ovipositor long and tubular (fig. 10b). Borneo and Philippines.
 **fulvipes** (Perkins)
2. Wings marked only with a brown costal band and a cubital streak and costal band enlarged into a spot at apex.3
 Wings with rather extensive brown markings: a broad costal band expanded into a mark over r-m crossvein, a transverse band across wing at level of m crossvein which extends basally as a broad band along vein M_{3+4} (refer to fig. 3D, Hardy & Adachi 1954: 156).
 Moluccas and New Britain. **perplexus** Walker
3. Median yellow vitta extending entire length of mesonotum; costal band extending to vein M_{1+2} . (Refer to fig. 1, Hering 1952a: 43). Two pairs inferior fronto-orbital bristles. Flores, Lesser Sunda Islands. **minimus** (Hering)
 Median yellow vitta postsutural; costal band extending into upper 1/2 of cell R_5 at apex (refer fig. 1, Shiraki 1968: 13). Three pairs inferior fronto-orbital bristles. Japan, Formosa, Ryukyu Islands. **depressus** (Shiraki)

Dacus (*Paradacus*) *fulvipes* (Perkins) Fig. 10a-c.

Paradacus fulvipes Perkins, 1938, *Proc. Roy. Soc. Qld* 49(11): 143, fig. 8. Type-locality: Bettotan, North Borneo. The type was in the Selangor Museum but it has evidently been lost.

One ♀ specimen on hand from the Philippines appears to fit Perkin's original description of the type ♂ of *fulvipes* in all respects except that he states that the m crossvein is slightly infuscated; this could be a sexual character. The ♀ has not been previously described. There is a possibility that the specimens on hand may belong to a distinct species; more material will need to be studied. The following descriptive notes are based on the Philippine specimen. Head predominantly yellow, discolored with brown on hind portion of occiput and with a prominent dark brown spot on lower portion of each antennal furrow. Two pairs inferior fronto-orbital bristles present. Thorax with mesonotum predominantly dark reddish brown with 2 prominent postsutural yellow vittae; these are straight-sided and extend beyond inner postalar bristle, blending with yellow-rufous coloring of posterolateral margins of mesonotum. Sides of mesonotum yellow, tinged with rufous. Scutellum yellow except for a narrow brown basal margin. The yellow mark over mesopleuron occupying approximately 2/3 of the length of that sclerite to the humerus and slightly tapered ventrally. Yellow mark on upper portion of sternopleuron expanded posteriorly, extending a short distance beneath pteropleura. Postscutellum and metanotum dark brown, tinged with rufous. Legs predominantly rufous, hind tibiae brown, other tibiae tinged faintly with brown. Wings marked as in fig. 10a, with costal band expanded at apex, filling all of apical portion of cell R_5 and with a distinct cubital streak. Abdomen predominantly yellow to rufous with a complete brown basal band on each of terga 2 and 3 and with bases of 4 and 5

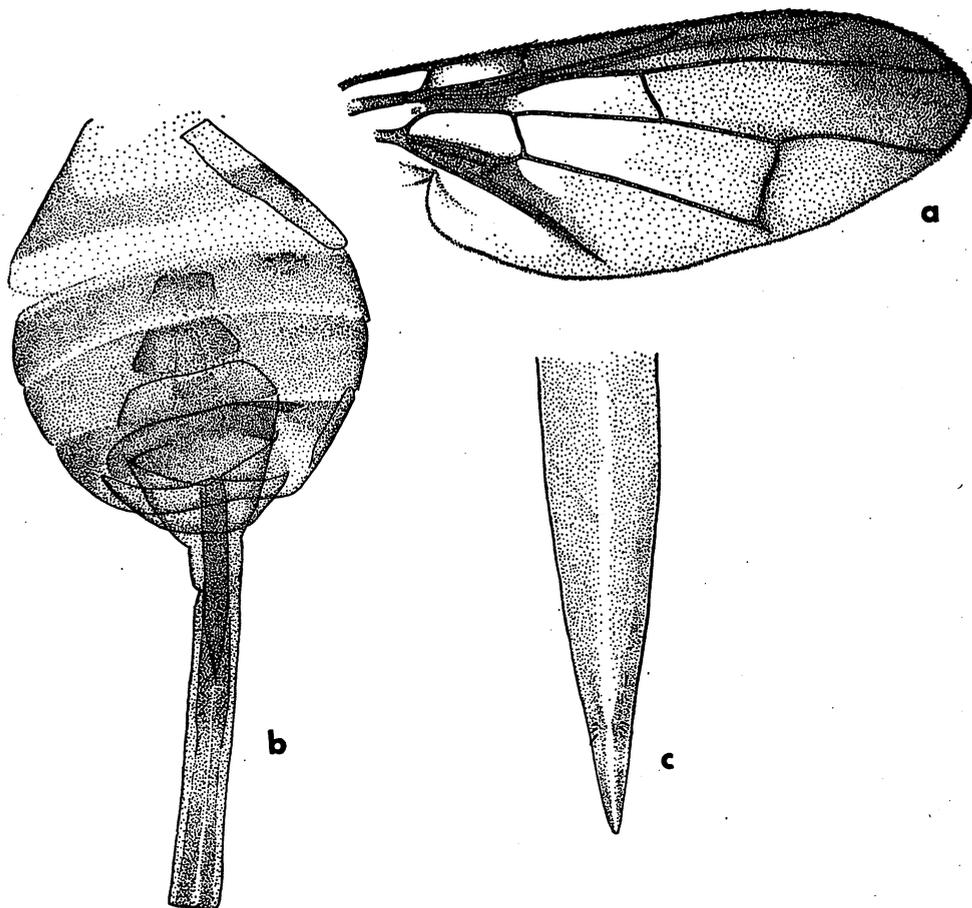


Fig. 10. *Dacus (Paradacus) fulvipes* (Perkins): a. wing; b. ♀ abdomen; c. piercer of ♀ ovipositor.

rufous, tinged with brown; no median vitta present and tergal glands yellow. Ovipositor yellow to rufous, very long straight-sided, tubular in shape. Basal segment as seen from above equal in length to remainder of abdomen. As seen from ventral view basal segment broadens abruptly anteriorly, just slightly beyond a level with the spiracles. Measured on venter the basal segment is 3.4 mm long. By comparison the piercer is comparatively short, approximately 1.4 mm and the extended ovipositor measures 7.7–8.0 mm. The apex of piercer is shaped as in fig. 10c and the ovipositor in relation to abdomen is as in fig. 10b. Length: body, 6.0–6.5 mm; wings, 5.5–6.0 mm.

The ♀ specimen on hand is from Batangas, Luzon, 8.VIII.1945, H. E. Milliron.

Subgenus *Paratridacus* Shiraki

Paratridacus Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* 8: 109. Type-species: *Dacus yayeyamanus* Matsumura (= synonym of *D. expandens* Walker), by original designation.

Dacus (Paratridacus): Hardy, 1951, *Pacif. Sci.* 5: 140.

This subgenus is differentiated from *Dacus (Zeugodacus)* only by secondary sexual characters in the ♂♂: the lack of the row of cilia on each side of the 3rd abdominal

tergum and lack of an indentation at the end of vein $Cu_1+1st\ A$.

Three known species are recorded in this subgenus, 1 widespread from Formosa, Japan, India, Ceylon, Philippines and Indonesia; 1 from New Guinea; and 1 from Ceylon, also 1 subspecies from Malaysia.

Dacus (Paratridacus) expandens Walker Fig. 11a-g

Dacus expandens Walker, 1859, *J. Proc. Linn. Soc. Zool.*, Lond. **3**: 114. Type-locality: Aru Islands. Type in the British Museum (Nat. Hist.)

Bactrocera garciniae Bezzi, 1913, *Mem. Indian Mus.* **3**: 97, pl. 8, fig. 9. Type-locality: Ceylon. Type in Zoological Survey of India collection.

Dacus yayeyamanus Matsumura, 1916, *Thous. Ins. Jap., Addit.* **2**: 412. Type-locality: Yayeyama Is., Ryukyus. Type in Entomological Museum, Hokkaido University, Sapporo.

Distribution: Indonesia, Ceylon, India, Japan, Ryukyus, Philippines, also Queensland.

Hosts: Reared from *Garcinia* sp. in India, *G. spicata* in the Ryukyu Islands and *G. xanthochymus* in Australia. Also in Japan it has been reared from *Cucurbita moschata* Duchesne.

This species is differentiated by the subgeneric characters in combination with the enlarged costal band (fig. 11a) and the predominantly brownish red mesonotum with 2 narrow submedian black vittae extending almost entire length and with the postsutural yellow stripes tapered posteriorly, ending approximately at the inner postalar bristle. Face with a large shining black spot in each antennal furrrow. Abdomen with a narrow black band across base of 2nd tergum, a black band across the base of 3rd tergum and with sides narrowly black and a black median vitta extending from base of 3rd almost to apex of 5th; otherwise yellow to rufous, also by the distinctive ♀ ovipositor, with a small preapical lobe on each side (fig. 11e). For a detailed description refer to Shiraki (1968: 14, pl. 6).

The coloring of the thorax and abdomen varies considerably dependent upon the degree of teneralty. In fully hardened specimens, the mesonotum is as in fig. 11d. The 5th sternum of ♂ is approximately as long as wide and gently concave on hind margin. Male genitalia as in fig. 11f and 11g, the surstyli bent upward at apices and not completely concealing the 10th sternum as seen in direct lateral view. Female ovipositor rufous, the basal segment slightly shorter than 5th tergum, as seen from dorsal view. Measured on venter the basal segment is about 1.5 mm long. Piercer slender, characteristically shaped at the apex as in fig. 11e and measuring approximately 1.6 mm. Extended ovipositor (fig. 11b) 4.75 mm. Spermathecae as in fig. 11c.

For more detailed description also refer to Hardy (1951: 140, fig. 10A-B).

Specimens have been studied from Bataan, Luzon.

Subgenus **Strumeta** Walker

Bactrocera Macquart, 1835, *Suites à Buffon, Hist. Nat. Ins. Dipt.* **2**: 452. Type-species: *longicornis* Macquart, by monotypy. Nomen oblitum.

Dasyneura Saunders, 1841, *Trans. Ent. Soc. Lond.* **3**: 60 (nec Rondani 1840). Type-species: *zonata* Saunders, by monotypy. Nomen oblitum.

Strumeta Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. **1**: 33. Type-species: *conformis* Walker (= synonym of *Dacus umbrosus* Fabricius), by monotypy.

Chaetodacus Bezzi, 1913, *Mem. Indian Mus.* **3**: 93. Type-species: *Musca ferruginea* Fabricius (= synonym of *Dacus dorsalis* Hendel), by original designation.

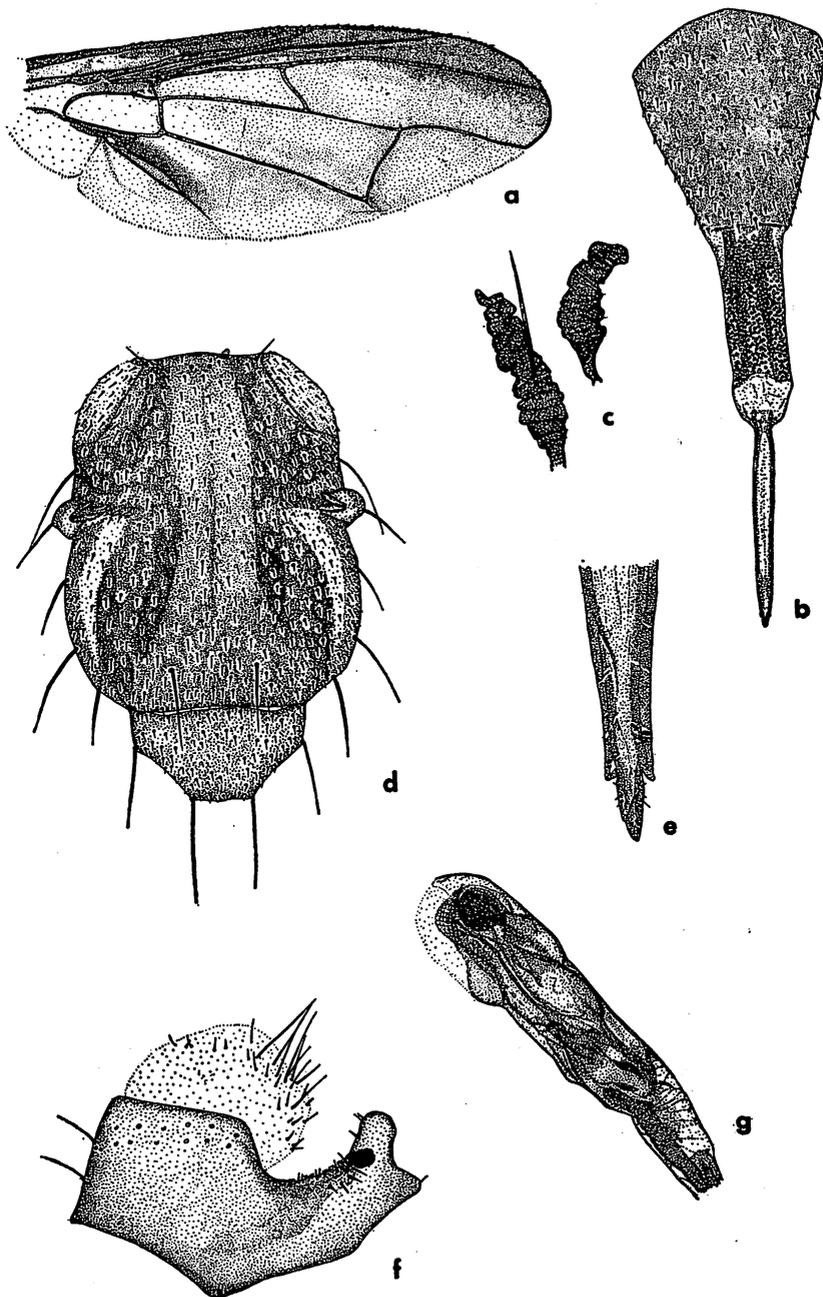


Fig. 11. *Dacus (Paratridacus) expandens* Walker: a. wing; b. ♀ ovipositor; c. spermathecae; d. thorax, dorsal; e. apex of piercer; f. ♂ genitalia, lateral; g. apex of aedeagus.

Dacus (Marquesadacus) Malloch, 1932, *Bishop Mus. Bull.* 98: 145. Type-species: *Chaetodacus perfuscus* Aubertin, by original designation.

Sinodacus Zia, 1936, *Chinese J. Zool.* 2: 157. Type-species: *hochii* Zia, by original designation.

Dacus (Strumeta): Hardy, 1951, *Pacif. Sci.* 5: 142.

This is the largest subgenus. It is presently composed of approximately 133 species which are widespread throughout the Oriental, Australian and Pacific regions. Eleven species and 1 subspecies have been previously recorded from the Philippines. Sixteen are treated in this study.

The members of this subgenus are characterized by having only a single pair of scutellar bristles, by having prescutellar and anterior supraalar bristles, also by having the 3rd tergum of ♂ with a row of cilia on each side, and with a distinct indentation present at the end of vein $Cu_1+1st A$. The posterior lobe of the surstylus is short and the hind margin of 5th sternum deeply cleft.

KEY TO SPECIES OF DACUS (STRUMETA) KNOWN FROM THE PHILIPPINES

1. Wings lacking complete cross bands.2
Wings with 3 complete cross bands (fig. 25). Widespread through Southeast Asia and Southwest Pacific. **umbrosus** Fabricius
- 2(1). Mesonotum with 2 postsutural yellow vittae. Crossvein m not infuscated. Two pairs of inferior fronto-orbitals.3
Mesonotum with 3 postsutural yellow vittae. A prominent brown mark over m crossvein.14
- 3(2). Face with a black spot in each antennal furrow or entirely black. No bulla developed in wing. Tergal glands present on 5th abdominal segment.4
Face entirely yellow. Wings of ♂ with a peculiar bulla above vein Cu (fig. 23a). Lacking tergal glands.15
- 4(3). Face yellow with a black spot in each antennal furrow.5
Face entirely shining black, except for narrow margins along eyes. Postsutural yellow vittae short, tapered to a sharp point posteriorly and ending before postalar bristles. Malaysia, Thailand, Laos, Philippines.**nigrotibialis** (Perkins)
- 5(4). Humeri and postalar calli joined by a broad yellow band; also yellow mark over mesopleuron is continuous to humerus. Costal band extending around wing margin to vein M_{1+2} . Philippine Islands. **continuus** (Bezzi)
Not as above.6
- 6(5). Costal band comparatively narrow, not filling all of cell R_37
Costal band broad, extending along top edge of cell R_{4+5} , filling all of cell R_3 . Ovipositor very long and slender (fig. 19e), 6.8-7.2 mm long. Philippine Islands.
..... **limbifer** (Bezzi)
- 7(6). Front and middle femora chiefly or entirely yellow. Facial spots not extending to oral margin. Tergal glands usually rufous.8
Front and middle femora chiefly brown to black. Facial spots large, extending to oral margin. Tergal glands brown to black. Philippine Islands. ...**luzonae** Hardy & Adachi
- 8(7). Ovipositor of ♀ with a prominent notch at apex (Fig. 18), wing similar to *occipitalis* (fig. 21a) with brown costal band extending under upper edge of vein (R_{3+4}). Busuanga Is., Philippines.**holtmanni**, n. sp.
Ovipositor pointed at apex (fig. 21b, 22).9
- 9(8). Female ovipositor evenly pointed at apex (fig. 21b).10

- Ovipositor trilobed at apex (fig. 24a). Malaysia, Philippines.
**propinquus** Hardy & Adachi
- 10(9). Basal segment of ♀ ovipositor distinctly longer than 5th tergum as seen from dorsal view. Ovipositor slender, elongate, when extended measuring 6.0 mm. Philippines, Indonesia, Malaysia.**pedestris** (Bezzi)
 Ovipositor base 3/4 or less the length of 5th tergum as seen from above. Extended ovipositor not over 4.5 mm.11
- 11(10). Postsutural yellow vittae broad, parallel-sided and extending beyond inner postalar bristles. Extended ovipositor about 4.5 mm, apex of piercer narrowed to a slender point (fig. 21b).12
 Yellow vittae on mesonotum wedge-shaped, ending before inner postalars. Ovipositor very short, fully extended measuring 2.9-3.4 mm, apex tapered gradually and comparatively broad (fig. 16a, c).13
- 12(11). Costal band not extending below vein R_{2+3} except at apex of wing (fig. 15a). Widespread over Orient and Pacific.**dorsalis** Hendel
 Costal band extending along underside of R_{2+3} its entire length. Philippines to Malaya.**occipitalis** (Bezzi)
- 13(11). Basal segment of ovipositor (1.1 mm) longer than inversion membrane (0.91 mm.) or piercer (0.91 mm). Piercer broader (0.18 mm wide) (fig. 16c). Apical portions of femora brown and humeri bordered with red. Philippine Islands.
**dorsaloides** Hardy & Adachi
 Basal segment (1.0 mm) shorter than inversion membrane (1.21 mm) or piercer (1.2 mm). Piercer narrower (0.13 mm wide). Femora yellow to rufous and humeri bordered with black. Philippine Islands.**cognatus** Hardy & Adachi
- 14(2). Mesonotum rufous except for yellow markings; median yellow vitta postsutural and not wider than lateral vittae. Crossvein r-m infuscated. Abdomen lacking black markings on sides. Three pairs inferior fronto-orbital bristles. Female piercer tapered to sharp point at apex. Widespread. (Fits in *Zeugodacus*, Drew 1972).
**cucurbitae** Coquillett
 Mesonotum and abdomen conspicuously marked with black; median yellow vitta much broader than lateral and extending anterior to the suture (fig. 17a). Crossvein r-m hyaline. Two pairs inferior fronto-orbitals. Ovipositor with short stubby piercer, very distinctive in shape (fig. 17b). Philippines.**elegantulus**, n. sp.
- 15(3). Thorax predominantly black; 3rd antennal segment rounded at apex; costal band greatly expanded at wing apex (fig. 23a). Tawitawi.**petersoni** Hardy
 Thorax chiefly or entirely rufous; 3rd antennal segment obliquely truncate at apex (fig. 20b); costal band not expanded (fig. 20a). Bathatan, Panay.**mccgregori** (Bezzi)

Dacus (Strumeta) cognatus Hardy & Adachi Fig. 12a-c; pl. 1, fig. 2.

Dacus (Strumeta) cognatus Hardy & Adachi, 1954, *Pacif. Sci.* 8: 162, fig. 6A-B. Type-locality: Los Banos, Luzon. Type ♀ in U. S. National Museum.

Hosts: This has been reared from *Eugenia* sp. in the Philippines.

This species is very close to *D. dorsalis* Hendel and is best differentiated by comparison of the ♀ ovipositors. In fully hardened specimens the markings of the mesonotum and abdomen appear to be distinctive. The postsutural yellow vittae on the mesonotum are wedge-shaped, distinctly tapered posteriorly and end slightly before the inner postalar bristles. The area around each inner postalar bristle is yellow-brown and contrasts with the yellow-white coloring of the vittae. In *dorsalis* the vittae are broad,

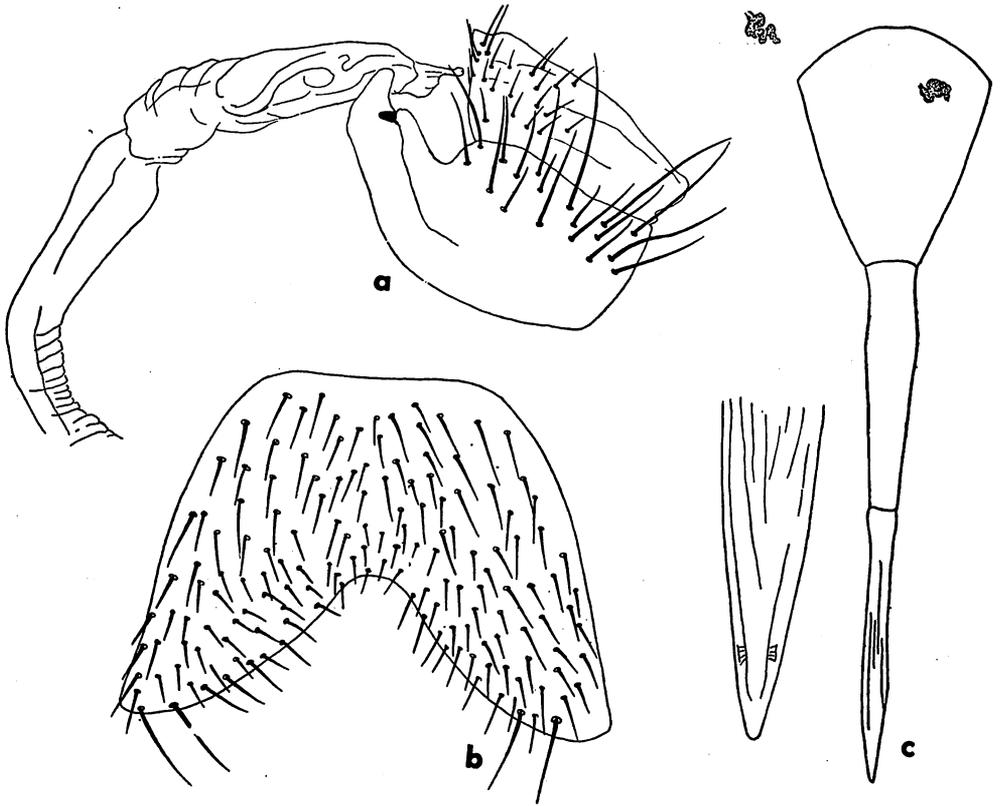


Fig. 12. *Dacus (Strumeta) cognatus* Hardy & Adachi: a. ♂ genitalia, lateral; b. 5th sternum of ♂; c. ♀ ovipositor.

parallel-sided, and the inner postalar are included within their boundaries. The sides of the abdomen of *cognatus* are extensively blackened, the tibiae are all discolored with brown and the specimens are consistently smaller than *dorsalis*. The ovipositor is distinctly shorter and the apex broader than in *dorsalis* (compare fig. 12c and 15a and refer to measurements of ovipositors of both species).

Fitting the description of *dorsalis* in most respects. Mesonotum predominantly shining black with a pair of gray submedian vittae extending from near anterior margin to a level about halfway between supraalar and postalar bristles. Also with a gray patch behind each humerus extending to suture. Mesopleuron yellow-white marking rather narrow, almost straight-sided, tapered only gently on lower portion with the front 1/2 of the mesopleuron broadly black in ground color. Spot on upper sternopleuron extending posteriorly for a short distance beneath the pteropleuron. Wings (pl. 1, fig. 2) with the costal band extending through apical portion of cells R_3 and upper R_5 . First and 2nd costal cells bare except for microchaetae in apical portion of 2nd. Vein R_{4+5} is setose above to a level approximately opposite apex of vein R_{2+3} . Abdomen mostly yellow with broad black bands on basal portions of terga 1 and 2 and a narrow black band continuous over base of 3rd tergum. Also with a black vitta extending down middle from base of 3rd to apex of 5th and with the sides of terga 3-5 almost all black. Tergal glands rufous. Fifth sternum of ♂ wider than long, thickly black setose and with a V-shaped concavity on hind

margin extending 1/2 its length (fig. 12b). The ♂ genitalia are as in fig. 12a. The ejaculatory apodeme is poorly developed, straight-sided, narrow, not enlarged at apex (note: specimen probably general). Female ovipositor rufous, basal segment short, as seen from dorsal view, only about 2/3 as long as 5th abdominal segment. Measured on the venter the basal segment is 1.0 mm. The piercer is slender, tapered to a sharp point as in fig. 12c with 4 tiny microscopic preapical setae. The ovipositor measures 1.2 mm. The extended ovipositor measures 3.4 mm. Spermathecae shaped as in fig. 12c. Length: body, 6.0 mm; wings, 5.0 mm.

To date this species is known only from Luzon.

Dacus (Strumeta) continuus (Bezzi) Fig. 13a-e.

Chaetodacus continuus Bezzi, 1919, *Philip. J. Sci.* 15: 424, pl. 1, fig. 6. Type-locality: Batbatan Island. Type ♀ in Milano.

Known distribution: Luzon, Panay and Batbatan Island. Probably widespread throughout the Philippines.

This species is differentiated from others known from the Philippines by having a broad yellow band connecting the notopleura and the humeri, also by having the mesonotum predominantly yellow with the anterior margin entirely so continuous to the edge of the humerus. Also by having the costal band extended through the apex of cell R. to the tip of vein M_{1+2} and slightly expanded at apex in fully hardened specimens. The black marks on the face are large, elongate and extend from oral margin at least 1/2 the length of antennal furrow. The mesonotum is predominantly rufous with 3 narrow brown lines extending down middle, the 2 outer vittae separated by 2 densely gray pollinose bands. Legs yellow, tinged with brown on middle and hind tibiae. Wings as in fig. 13e (copied from Bezzi — the specimens on hand are general, and the wing markings at apex are not distinct). From the specimens on hand the 1st and 2nd costal cells are covered with microtrichia except for a bare area in lower basal portion of 1st. Abdomen largely yellow on the specimens at hand with a basal brown band on each of terga 1-3, and a brown longitudinal vitta extending from base of 3 to apex of 5 (fig. 13d). Bezzi also said 4th and 5th segments black on sides. Tergal glands yellow to rufous. Venter entirely yellow to rufous. Genitalia rufous. Fifth sternum of ♂ slightly longer than wide and with a small concavity on posterior margin. Male genitalia as seen in fig. 13a. Surstyli slightly enlarged at apices, almost truncate as seen in direct lateral view and the ejaculatory apodeme gently enlarged apically. Female ovipositor yellow. Exposed portion of basal segment as seen from direct dorsal view is only 1/2 as long as 5th tergum. The basal segment is very short compared with the rest of the ovipositor, measured on the ventral margin it measures 1.0 mm. The fully extended ovipositor (fig. 13b) measures 4.0 mm. The inversion membrane and the piercer each measures 1.5 mm. The latter is slender, straight-sided, sharply pointed at apex; 3 microscopic preapical setae are present on each side of piercer (fig. 13c). Length: body, 6.0-6.4 mm; wings, 5.0-5.4 mm.

Dacus (Strumeta) cucurbitae Coquillett Fig. 14. The Melon Fly

Dacus cucurbitae Coquillett, 1899, *Ent. News* 10: 129. Type-locality: Honolulu, Hawaii. Type in U. S. National Museum.

This species is readily differentiated from other *Strumeta* by having brown markings along the m crossvein; by the moderately large apical wing spot formed by expansion of the costal band; its predominantly rufous color; the presence of 3 postsutural yellow vittae on mesonotum, and by having 3 pairs of inferior fronto-orbital bristles.

Distribution: Widespread throughout the Oriental Region, including China, Japan and Ryukyu Islands, much of the Pacific, including record from Darwin, Northern

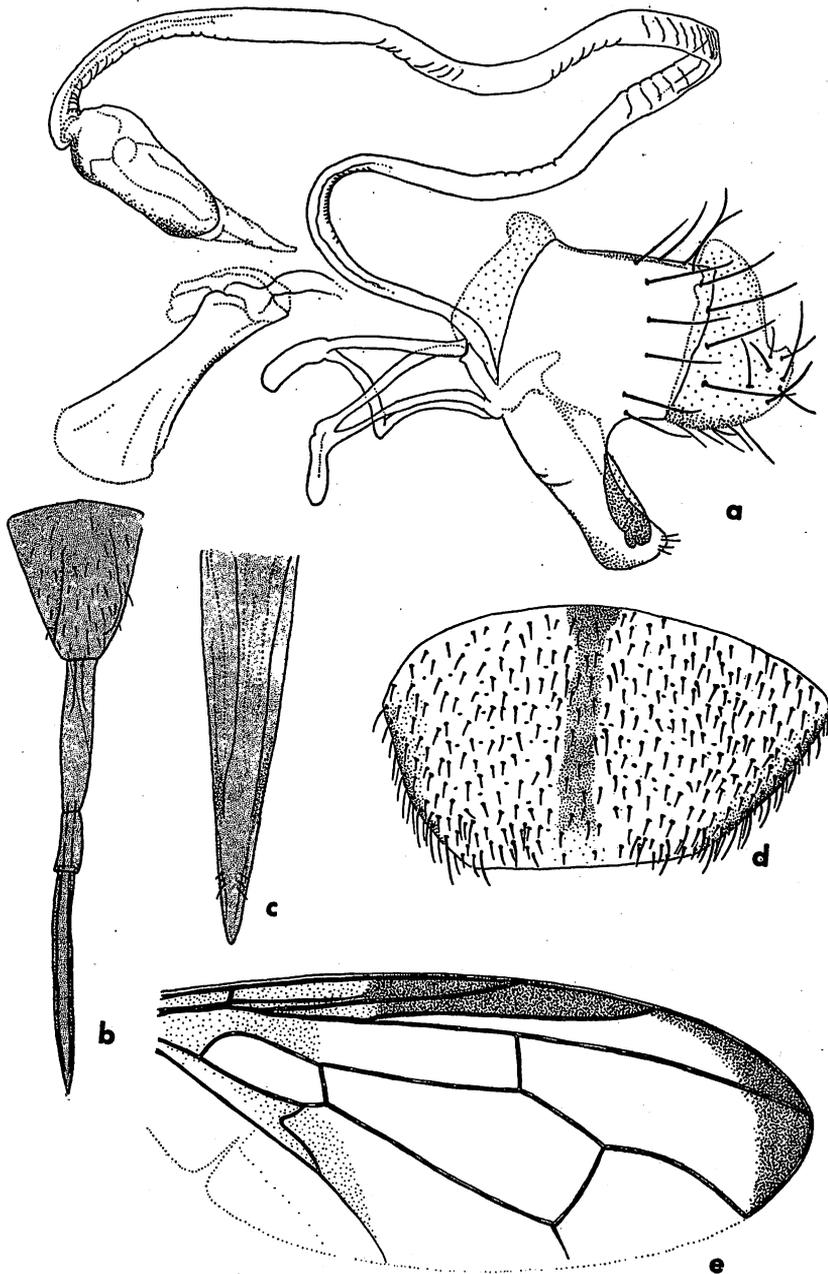


Fig. 13. *Dacus (Strumeta) continuus* (Bezzi): a. ♂ genitalia, lateral; b. ♀ ovipositor; c. piercer of ovipositor; d. 5th tergum of ♂; e. wing (copied from Bezzi 1919, pl. 1, fig. 6).

Territories, Australia; New Guinea; also from the Mauritius; East Africa, Kenya and Tanzania. A very common species throughout Southeast Asia. It occurs throughout the Philippines and has been recorded from most of the main islands.

Hosts: This species has a wide host range and is one of the most important pests of vegetable crops wherever it is found. It is a serious pest of wide variety of cucurbitaceous plants and of tomatoes, peppers, and other vegetables.

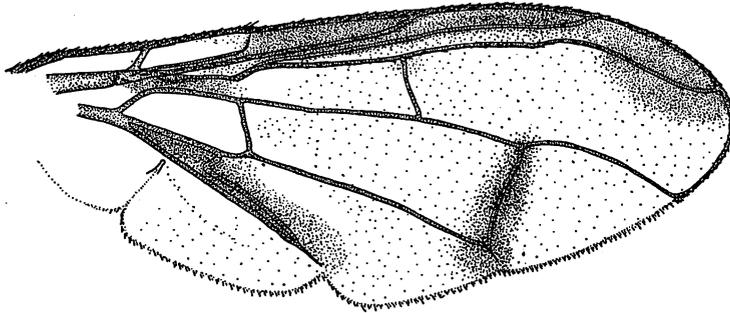


Fig. 14. *Dacus (Strumeta) cucurbitae* Coquillett: wing.

A predominantly yellow to rufous species with gray pubescence and short yellow setae over mesonotum; with 3 postsutural yellow vittae; a brown to black mark across base of 3rd tergum, and a rather faint brown to black, often incomplete median vitta extending from 3rd over 5th terga; also with a prominent oblong black spot in each antennal furrow. Front with 3 pairs of inferior fronto-orbital bristles. Tergal glands yellow. Front occasionally with 4 inferior fronto-orbital bristles on 1 side and in some specimens rudimentary basal scutellars have been seen; in 1 specimen on hand a well developed basal scutellar present on 1 side. Wings as in fig. 14. Crossvein r-m often infuscated with brown. First and 2nd costal cells hyaline and bare of microtrichia except at apex of 2nd cell. Fifth sternum of ♂ 1/2 wider than long, gently concave on posterior margin. Genitalia with the surstyli extended into long, slender, incurved apical lobes. Fitting in *Zeugodacus* according to Drew's (1972) classification. The ejaculatory apodeme is expanded fan-like in fully mature specimens. As seen from dorsal view the basal segment of the ovipositor is approximately 1/4 longer than 5th abdominal tergum. Measured on the venter the basal segment is 1.5 mm long. The extended ovipositor measures 5.0 mm. The piercer measures 1.6 mm, is rather abruptly tapered to a sharp point at apex and has 2 long and 2 short microscopic preapical setae.

***Dacus (Strumeta) dorsalis* Hendel** Fig. 15a-c.

Musca ferruginea Fabricius, 1794, *Ent. Syst.* 4: 342. Preoccupied by *Musca ferruginea* Scopoli (1763).

Bactrocera conformis Doleschall, 1858, *Natuurk. Tijds. Ned.-Ind.* 17: 122. Preoccupied by *Dacus conformis* Walker (1857).

Dacus ferrugineus var. *mangiferae* Cotes, 1893, *Indian Mus. Notes* 3(1): 17. Invalid name.

Dacus dorsalis Hendel, 1912, *Suppl. Ent.* 1: 18, pl. 1, fig. 3. Type-locality: Formosa. Type in Deutsches Entomologisches Institut, Eberswalde.

Chaetodacus ferrugineus var. *versicolor* Bezzi, 1916, *Bull. Ent. Res.* 7: 105.

Chaetodacus ferrugineus var. *okinawanus* Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* 8: 82; 1968, *Bull. U. S. Nat. Mus.* 263: 23, pl. 9, fig. 1-16.

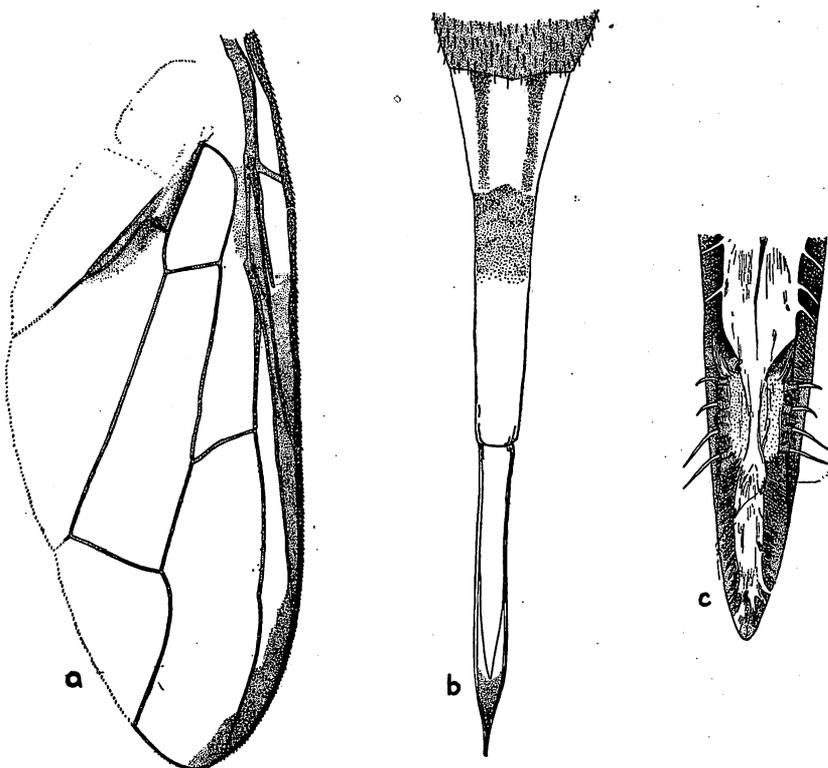


Fig. 15. *Dacus (Strumeta) dorsalis* Hendel: a. wing; b. ♀ ovipositor; c. apex of piercer.

For a detailed discussion of the synonymy under this species refer to Hardy (1969: 395).

Distribution: Widespread throughout India, Southeast Asia, Micronesia and the Hawaiian Islands. It is common throughout the Philippines.

Hosts: This fly has a very wide host range and apparently attacks all types of fleshy fruits. It is especially injurious to mango, guava, carambola, *Eugenia*, papaya, etc. It is the most injurious species of fruit fly found over its range and one of the most notorious and injurious species in the world.

As discussed by Hardy (1969) 16 species are similar to *dorsalis* in various characteristics of body coloring and wing markings. These all have the front distinctly longer than wide, with 2 pairs of inferior fronto-orbitals and the face with a black spot in antennal furrow. The mesonotum is predominantly black or is distinctly marked with black in mature specimens and with 2 postsutural yellow vittae. The scutellum is yellow except for a narrow band of black across the base. The 1st 2nd costal cells are devoid of microtrichia except in the apices of the 2nd cell and the costal band is moderately developed but not expanded at wing apex; also the abdomen is predominantly rufous with a black band across the base of 3rd tergum and a black vitta extending longitudinally down middle of at least terga 3 and 4. In *dorsalis* the costal band is comparatively narrow; in the typical form the band does not extend beneath vein R_{3+4} except

at extreme apex of cell R_3 (fig. 15a). The postsutural yellow vittae of mesonotum are broad in *dorsalis*, straight-sided and extend distinctly beyond inner postalar bristles. The yellow mark over mesopleuron is gradually narrowed basally and with a rather broad black transverse mark extending anterior to the yellow mark. The yellow mark on upper portion of each sternopleuron is extended posteriorly for a short distance beneath the edge of the pteropleuron. Legs predominantly rufous with the hind tibiae distinctly tinged with brown, middle tibiae tinged with brown at bases, and front tibiae tinged with brown on posterior margins. The 5th sternum of σ is distinctly longer than wide and has a moderately deep concavity in middle of hind margin extending almost to the middle of segment. I see nothing distinctive about the σ genitalia. The basal segment of the ovipositor as seen from dorsal view about $3/4$ as long as 5th tergum. The extended ovipositor (fig. 15b) measures 4.25 mm with the base, 1.25 mm measured on the venter, inversion membrane 1.55 mm, and the piercer 1.45 mm. The piercer is evenly tapered to a sharp point at apex and has 2 moderately large plus tiny preapical microscopic setae (fig. 15c).

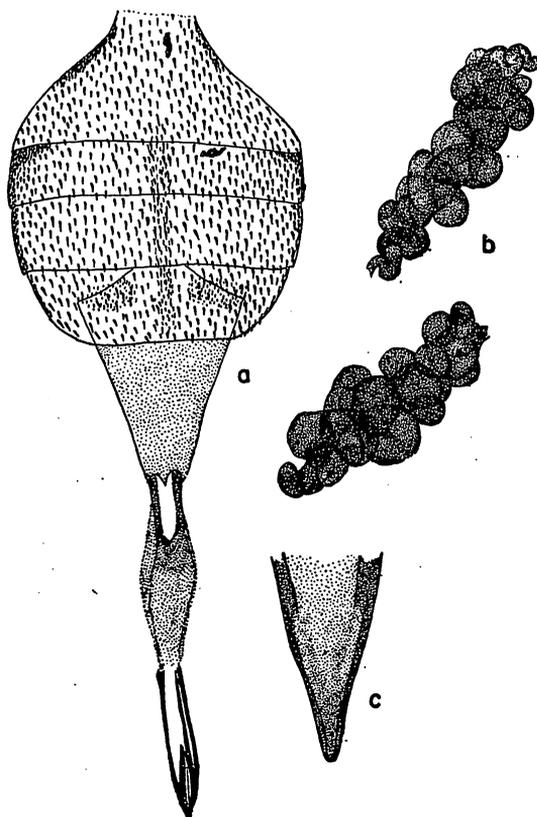


Fig. 16. *Dacus (Strumeta) dorsalooides* Hardy & Adachi: a. ♀ abdomen; b. spermathecae; c. apex of piercer.

Dacus (Strumeta) dorsaloides Hardy & Adachi Fig. 16a-c.

Dacus (Strumeta) dorsaloides Hardy & Adachi, 1954, *Pacif. Sci.* 8: 167. Type-locality: Mt Makiling, Luzon. Type in the U. S. National Museum.

Host: *Sideroxylon macranthum* Merr.

This species is related to *dorsalis* and to *cognatus* and closely resembles both of these. It is best characterized by the details of the ♀ ovipositor, it differs from both *dorsalis* and *cognatus*, as well as other *Dacus* from the Philippines, by having the basal segment of the ovipositor longer than the inversion membrane or the piercer and by having the ovipositor comparatively short, stubby. When fully extended (fig. 16a) the ovipositor measure 2.9 mm. The basal segment of ovipositor measures 1.15 mm, the inversion membrane measures 0.80 mm, and the piercer measures 0.95 mm. Piercer shaped as in fig. 16c, the preapical setae are situated much closer to the apex than in *dorsalis* or other related species. Spermathecae as in fig. 16b. The yellow postsutural vittae are narrowed behind and end before the inner postalar bristles. The humeri are narrowly bordered by rufous. The other details fit those of *dorsalis*.

To date specimens have been seen only from Luzon and Balabac Island in the Philippines; it has also been recorded (Hardy 1973) from Vietnam.

Dacus (Strumeta) elegantulus Hardy, new species Fig. 17a-f.

Resembling *D. cucurbitae* because of the brown marking over the m crossvein and the presence of 3 postsutural yellow vittae on mesonotum. It differs strikingly by having the thorax and abdomen conspicuously marked with black; by the median vitta being much larger and extending anteriorly to the suture; by having only 2 pairs of inferior fronto-orbital bristles; r-m crossvein hyaline; and the piercer of the ♀ ovipositor short and stubby, very distinctive in shape, as in fig. 17c.

♂. A rather distinctively marked species. *Head*: Yellow except for the brown compound eyes and brown discoloration on hind portion of occiput, the black ocellar triangle and a black spot on each side of vertex; also the face with an oval shining black spot on each side in antennal furrow. First 2 antennal segments yellow, 3rd segment brown, tinged with yellow. Palpi yellow, faintly tinged with brown. *Thorax*: Shining black except for prominent yellow markings over suture, a broad stripe on each side behind suture and the very broad median stripe which tapers anteriorly and extends from between bases of prescutellar bristles to a level with anterior notopleural bristles (fig. 17a). The immediate border behind each humerus tinged with yellow to rufous. The yellow vertical mark over each mesopleuron is almost straight-sided, only tapered ventrally and with a rather broad, shining black stripe extending transversely across anterior portion of mesonotum, continuous with the black mark on mesonotum behind humerus. Yellow mark on upper portion of each sternopleuron not expanded. Postscutellum and metonotum shining black, rufous medianly. Scutellum yellow except for a very narrow dark brown to black basal margin. *Legs*: Predominantly yellow, hind coxae and tarsi brown, tinged with rufous. A rather prominent ridged sensory structure is present on anterodorsal surface of each hind tibiae before apex. *Wings*: With markings and venation as in fig. 17d. With 1st 2 costal sections hyaline and devoid of microtrichia except in apical portion of 2nd. The costal band extending along upper margin of cell R_3 throughout its length and continuing around wing apex to vein M_{1+2} . Cubital streak broad, distinctive. Lobe of cubital cell approximately $2 \times$ longer than vein $Cu_1 + 1st A$ and with a very prominent notch at apex of vein $Cu_1 + 1st A$. *Abdomen*: Sides of terga polished black; terga 1-3 with rather broad, black, basal bands across the segment and with a median black vitta extending from base of 3rd tergum to apex of 5th. Tergal glands rufous. Sterna largely dark brown to black. Fifth sternum yellow except for dark brown lateral margins, about as wide

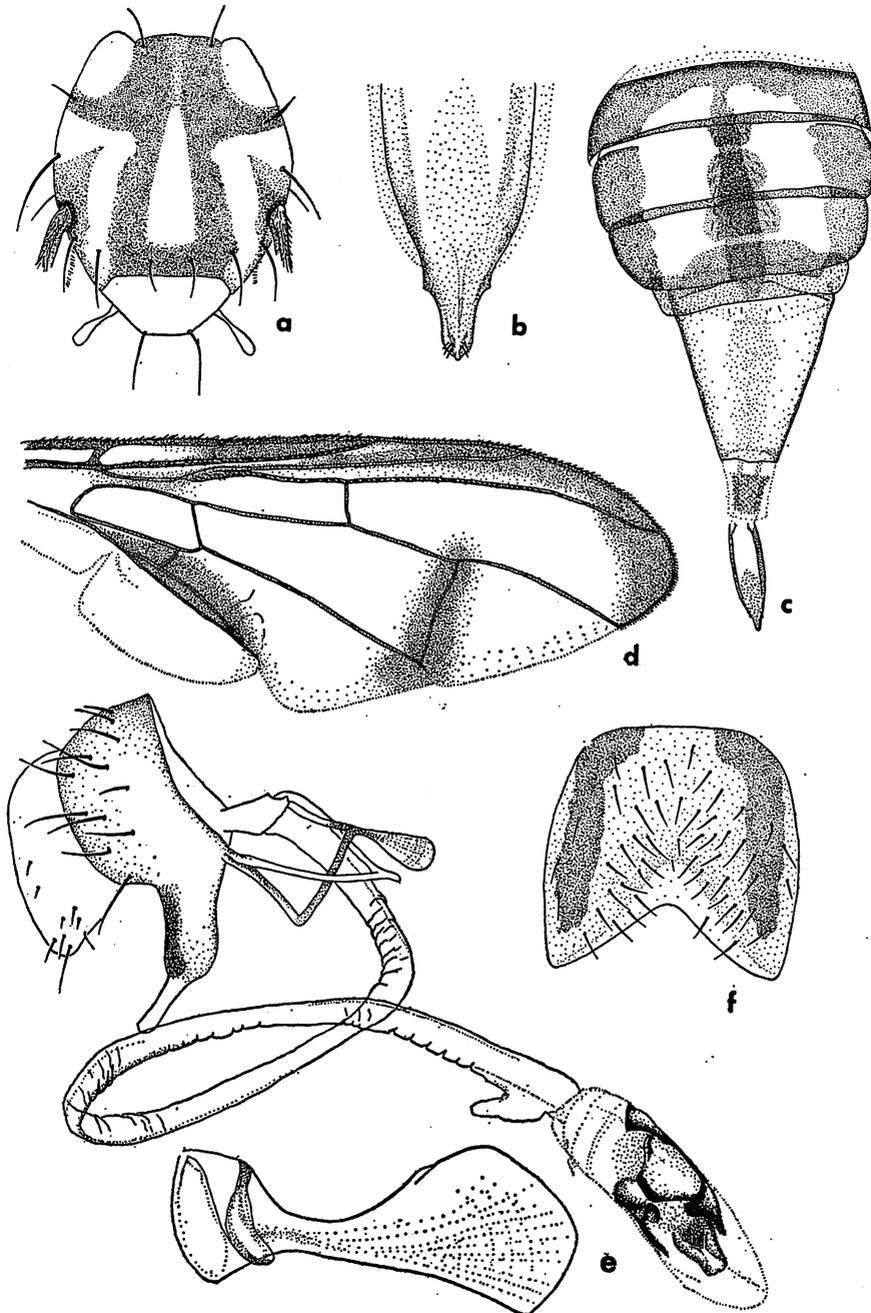


Fig. 17. *Dacus (Strumeta) elegantulus*, n. sp.: a. thorax, dorsal; b. apex of piercer; c. ♀ abdomen; d. wing; e. ♂ genitalia, lateral; f. 5th sternum of ♂.

as long, gently concave on the hind margin (fig. 17f). Genitalia as in fig. 17e with surstyli slender and attenuated, curved inward at apices.

Length: body, 5.75 mm; wings, 5.0 mm.

♀. Fitting description of ♂ except for sexual characters. Basal segment of ovipositor, as seen from dorsal view, approximately 1/2 longer than 5th tergum (fig. 17c). Measured on the venter, the basal segment measures 1.40 mm by 1.15 mm at its widest point. The piercer is short and thick, measuring 0.70 mm in length by 0.20 mm at its widest point, with the apex shaped as in fig. 17b.

Holotype ♂: Kalambuge, Mindanao, 12.I.1915, no collector given, from Frey collection.

Allotype ♀: Kalambugan, Leyte, 1.II.1915 (in Frey collection). Also 1 paratype ♂, same data as type.

Type and allotype returned to the University Zoological Museum, Helsinki. Paratype retained in the University of Hawaii collection.

Dacus (Strumeta) holtmanni Hardy, new species Fig. 18.

Fitting near *occipitalis* (Bezzi) because of the wing markings; with the costal band extended along the upper margin of cell R_3 throughout its length. The only notable difference which I see for separating these species is in the development of the ♀ ovipositor. The piercer is very distinctive in shape; it is comparatively short, rather broad, with a prominent notch at apex (fig. 18). No other Dacinae has been recorded with this type of piercer.

♀. A rather large species fitting the characteristics of *occipitalis* and the *dorsalis* complex of species. *Head*: Front with rather indistinct spots of brown at bases of bristles and a discoloration of brown in median portion. Facial spots oval, polished black, just slightly longer than wide. *Thorax*: Black with broad straight-sided postsutural yellow vittae on mesonotum which extend slightly beyond inner postalar bristles. Mesonotum evenly gray pubescent with no evidence of gray vittae. The transverse yellow mark over each mesopleuron with anterior margin gently oblique and widely separated from humerus by a black band. Yellow mark at upper portion of each sternopleuron extended posteriorly for a short distance beneath each pteropleuron. Scutellum with a narrow black band at base. Postscutellum entirely black and metanotum black except for a rufous spot over lower median portion. *Wing*: Fitting that of *occipitalis*. *Abdomen*: Brown on base of 1st tergum and black on lateral margins of 1st and 2nd terga. Second tergum with a black basal spot in middle. Third tergum brown to black except for submedian yellow markings extending 2/3 to 3/4 the length of segment and with a median black vitta extending longitudinally over terga 3-5. Posterolateral margins of terga 4 and 5 brown. Basal segment of ovipositor brownish red, as seen from dorsal view the basal segment is about 2/3 as long as 5th tergum. In the specimen at hand the apical portion of the basal segment is torn but the segment

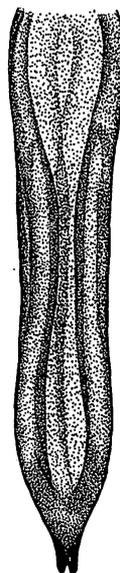


Fig. 18. *Dacus (Strumeta) holtmanni*, n. sp.: piercer of ♀ ovipositor.

apparently is rather broad compared to its length, appearing about 1/2 longer than wide and probably measuring about 0.25 mm in length. Piercer short, rather broad, shaped as in fig. 18, with the lateral margins slightly wavy and measuring 0.70 mm in length.

Length: body and wings, 7.0-7.3 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10126), Busuanga Island, 4 km N San Nicolas, 23.V.1962, H. Holtmann, collected in Malaise trap.

Type returned to the B. P. Bishop Museum.

Dacus (Strumeta) limbifer (Bezzi) Fig. 19a-e; pl. 1, fig. 3.

Chaetodacus ferrugineus var. *limbiferus* Bezzi, 1919, *Philip. J. Sci.* 15: 424, pl. 1, fig. 5. Type-locality: Batbatan Island. Lectotype ♂ in Milano.

Strumeta pedestris var. *limbiferus*: Perkins, 1938, *Proc. Roy. Soc. Qld* 49(11): 126.

Dacus (Strumeta) limbiferus: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 172, fig. 14a-c.

Distribution: It has been recorded from the islands of Luzon, Mindanao, Panay, and Batbatan.

Host: *Dracontomelum dao*.

Parasites: The following parasites have been reared from this species in the Philippines: *Opius longicaudatus* Ashmead, *O. skinneri* Fullaway, *O. fletcheri* Silvestri, *Pachycrepoideus dubius* Ashmead, *Galesus* sp., *Spalangia* sp. and an Encyrtid, genus and species unknown.

This species is readily differentiated by the very broad costal band, filling all of cell R_3 throughout its length, by the very long slender ovipositor (fig. 19e) and by the broadly blackened apices of the femora.

Fitting most of the characteristics of the *dorsalis* complex except for the broad costal band. The face with a prominent black spot in each antennal furrow and mesonotum predominantly black with submedian gray pollinose areas extending from scapular bristles to about 1/2 the distance between the supraalar and postalar. Postsutural yellow vittae broad, extending to or slightly beyond the inner postalar bristles and blending with the rufous coloring of the posterolateral portions of the mesonotum. The transverse yellow mark over the mesopleuron rather narrow, with the anterior border only slightly oblique and the front 1/2 of the mesonotum black. The yellow mark at upper portion of sternopleuron rather small, not extended posteriorly beneath pteropleuron. Legs mostly yellow, femora conspicuously marked with brown on apical 1/3. First 2 costal cells hyaline, devoid of microtrichia, except for the apex of 2nd. Wing markings and venation as in pl. 1, fig. 3. First 3 terga each with black crossbands basally and with a median longitudinal vitta extending from base of 3rd to the apex of 5th and with sides of terga broadly black, otherwise yellow to rufous with the tergal glands rufous, tinged with brown. Fifth sternum of ♂ with a deep V-shaped cleft on hind margin extending 3/4 the length of segment (fig. 19c). Male genitalia as in fig. 19a-b. Basal segment of ovipositor brownish red, as seen from dorsal view almost equal in length to terga 4+5. The extended ovipositor (fig. 19e) measures 6.8-7.2 mm. The basal segment, measured on the venter, is approximately 2.0 mm, the inversion membrane 2.7 mm and the piercer 2.5 mm. The latter is long and slender and has microscopic preapical setae (fig. 19d). Length: body, 6.5-7.0 mm; wings, 6.0-6.5 mm.

Dacus (Strumeta) luzonae Hardy & Adachi Pl. 1, fig. 4.

Dacus (Strumeta) luzonae Hardy & Adachi, 1954, *Pacif. Sci.* 8: 174, fig. 15a-b. Type-locality: Luzon. Type ♂ in U. S. National Museum.

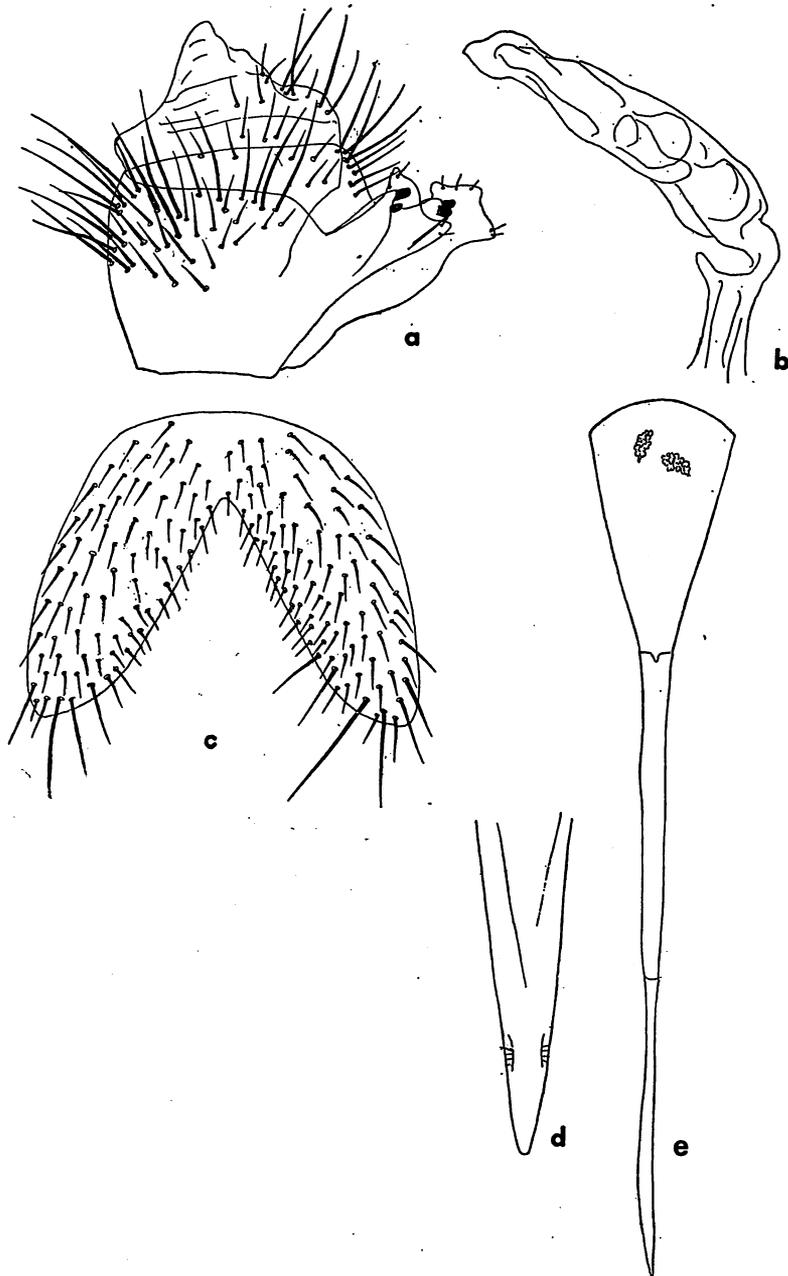


Fig. 19. *Dacus (Strumeta) limbifer* (Bezzi): a. ♂ genitalia, lateral; b. apical portion of aedeagus; c. 5th sternum of ♂; d. apex of piercer; e. ♀ ovipositor.

Known only from Luzon.

Host: Guava.

This species fits near *nigrotibialis* (Perkins) because of the brown to black middle femora. It

differs by having the face yellow with a black spot in each antennal furrow, rather than having the face shining black except for the narrow lateral margins. It also differs by having the abdomen conspicuously marked with yellow, rather than chiefly black or dark colored; by having the ♀ ovipositor shorter than 5th abdominal segment as seen from dorsal view, rather than longer; and by having the postsutural yellow vittae on the mesonotum broader, not pointed as in *nigrotibialis*. This species fits many of the details of the *dorsalis* complex by having the face with 2 black spots, mesonotum predominantly black and wings with a rather narrow costal band. The facial spots are much more extensive, however, than in most other species of *Dacus* and fill the anterior portion of each antennal suture about 1/2 its length. Front femora dark brown to black except for narrow yellow apices, middle femora predominantly brown, tinged with yellow at apices and bases and hind femora brown to black on apical 1/3. Tibiae dark brown and tarsi mostly yellow-white. The postsutural yellow vittae extend to or before the inner postalar bristles. The posterolateral corners of mesonotum are rufous, tinged with brown. Scutellum yellow-white with a prominent, convex, black basal margin. Wings with 1st 2 costal cells hyaline and devoid of microtrichia except in apex of 2nd. The costal band narrow, not extending below vein R_{2+3} except in apex of cell R (pl. 1, fig. 4). Abdomen with a broad basal black band on each of terga 1-3, with a median black vitta extending over terga 3-5 almost to apex of the latter; with sides of terga 3 and 4 broadly black and with the tergal glands dark brown to black. Fifth sternum of ♂ slightly longer than wide and with a V-shaped cleft on hind margin extending 1/2 the length of segment. Basal segment of ovipositor slightly longer than 5th. The extended ovipositor measures 3.75 mm; basal segment, 1.15 mm; inversion membrane, 1.35 mm; piercer, 1.25 mm. Piercer sharp-pointed with tiny preapical setae.

***Dacus (Strumeta) mcgregori* (Bezzi) Fig. 20a-b.**

Chaetodacus mcgregori Bezzi, 1919, *Philip. J. Sci.* 15: 426, pl. 1, fig. 7. Type-locality: Batbatan Island. Lectotype ♂ in Milano.

Dacus (Strumeta) mcgregori: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 176, fig. 16a-b.

Distribution: This species has been recorded only from Panay and Batbatan Island in the Philippines and from Singapore.

Host: In Singapore this species has been reared from *Gnetum gnemon* (Bulso vine).

This species belongs in a distinct complex of species characterized by lacking tergal

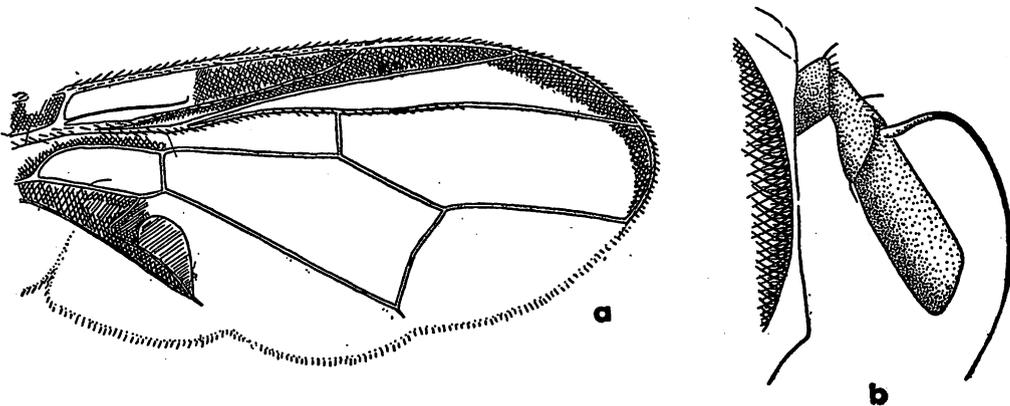


Fig. 20. *Dacus (Strumeta) mcgregori* (Bezzi): a. wing; b. antenna.

glands on the abdomen, having a peculiar bulla developed above vein Cu (fig. 20a) in the ♂, and the face all yellow. This is an Oriental complex; 3 species are known to date. It may eventually be feasible to erect a new subgenus or genus for this group but more knowledge of relationships is needed. The species are differentiated by the following key:

1. Thorax predominantly black, 3rd antennal segment not truncate at apex. Costal band expanded into a large apical spot.....2
 Thorax chiefly or entirely rufous, 3rd antennal segment obliquely truncate at apex. Costal band not expanded (fig. 20a). Philippines, Singapore.....**mcgregori** (Bezzi)
2. Posteromedian portion of mesonotum broadly shining black. Mid femora entirely yellow. Mid and hind tibiae yellow, tinged with brown at bases. Thailand **bullifer** Hardy
 Broad rufous median band continuous to hind margin of mesonotum. Mid femora brown to black at apices, mid and hind tibiae brown to black. Philippines.....**petersoni** Hardy

A rather small, predominantly pale species; the front is about 2× longer than wide, slightly discolored with brown medianly. Face lacking dark markings. Antennae shaped as in fig. 20b, 3rd segment comparatively short, about 3× longer than wide and in ♂ slightly oblique apically. Third segment yellow-brown. Palpi yellow, tinged with brown at apices. Thorax yellow except for a triangular black mark over mesonotum immediately in front of the transverse yellow-white mesonotal mark, a brown mark in middle of pteropleura, shining black on lower edges of hypopleura and pleuroterga, and broadly black on sides of postscutellum and metanotum, also scutellum with a narrow brown basal margin. Wings as in fig. 20a, 1st 2 costal cells and basal cell faintly yellow. Wing otherwise hyaline except for the brown costal band and cubital streak and devoid of microtrichia in the 1st costal and in the basal cell (basal section of cell R). Abdomen yellow to rufous except for a rather faint incomplete band of brown across basomedial portion of 2nd tergum, a complete band of black across base of 3rd tergum, and with a median black vitta extending longitudinally over 4th and 5th terga; also 4th tergum with a black spot on each anterolateral margin. Fifth tergum entirely yellow to rufous except for the black median line, tergal glands yellow. Fifth sternum of ♂ approximately as wide as long and with a U-shaped concavity on hind margin; extending about 1/2 the length of segment. Female ovipositor very short, inconspicuous, often scarcely visible from dorsal view and the basal segment extending just a short way beyond tip of 5th tergum. The extended ovipositor measures just slightly over 2.0 mm. Basal segment, measured on venter, 0.8 mm, inversion membrane 0.7 mm, and piercer 0.7 mm. Piercer sharp-pointed apically and with microscopic preapical setae. Two grape cluster-like spermathecae. Length: body, 4.5–5.0 mm; wings 4.25–4.75 mm.

Dacus (Strumeta) nigrotibialis (Perkins)

Strumeta nigrotibialis Perkins, 1938, *Proc. Roy. Soc. Qld* 49(11): 129, fig. 7. Type-locality: Larut Hills, Perak, Malaya. The type was in Selangor Museum and has apparently been lost.

Dacus (Strumeta) nigrotibialis: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 178, fig. 18a-c.

Distribution: Previously recorded from Malaya, Thailand and Laos. Some specimens were collected on *Ficus altissima* and on *Citrus grandis* (these are apparently not host records).

One specimen on hand from Abatan, Buguias, Mt. Prov., 60 km S of Bontoc, 1800–2000 m, 1.IV.1964, H. M. Torrevillas.

This species is readily differentiated by having the femora all black except for basal 2/3 of hind pair; by having face shining black except for narrow margin along the eyes; the postsutural yellow vittae short, tapered to sharp point posteriorly and ending well before inner postalar bristles. The abdomen is almost all black, yellow to rufous on posterior margin of 2nd tergum and some-

times tinged with rufous in ground color of apical portion of 5th tergum, with the tergal glands black. The species has been adequately described in the above cited references, except for genital characters. The sterna of both sexes are brown, the 5th sternum of ♂ is approximately as wide as long with a deep cleft in middle of hind margin extending $2/3$ to $3/4$ the length of sclerite. Surstyli slender, rather elongate, curved upward apically, rather hook-like. Tenth sternum plainly visible from direct lateral view. Basal segment of ovipositor brown, tinged with rufous apically and rather short, as seen from direct dorsal view about equal in length to 5th tergum and about 0.75 mm long, measured on venter. The extended ovipositor is 4.0 mm long. The piercer is tapered to a sharp point at apex and measures 1.25 mm. Wing predominantly hyaline with 1st and 2nd costal cells bare except in apex of 2nd and with a narrow costal band.

Dacus (Strumeta) occipitalis (Bezzi) Fig. 21a-c.

Chaetodacus ferrugineus var. *occipitalis* Bezzi, 1919, *Philipp. J. Sci.* 15: 423, pl. 1, fig. 3. Type-locality: Manila. Lectotype ♂ in Milano.

Dacus (Strumeta) dorsalis var. *occipitalis*: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 166.

This has previously been treated as a variety or subspecies of *dorsalis*, differentiated by the slightly broader costal band of the wing (fig. 21a). A series of specimens on hand from a number of localities in the Philippines fit the wing characteristics of typical *occipitalis* and also appear to differ from typical *dorsalis* by having the basal segment of the ♀ ovipositor distinctly longer, extending approximately $1/2$ longer than the 5th

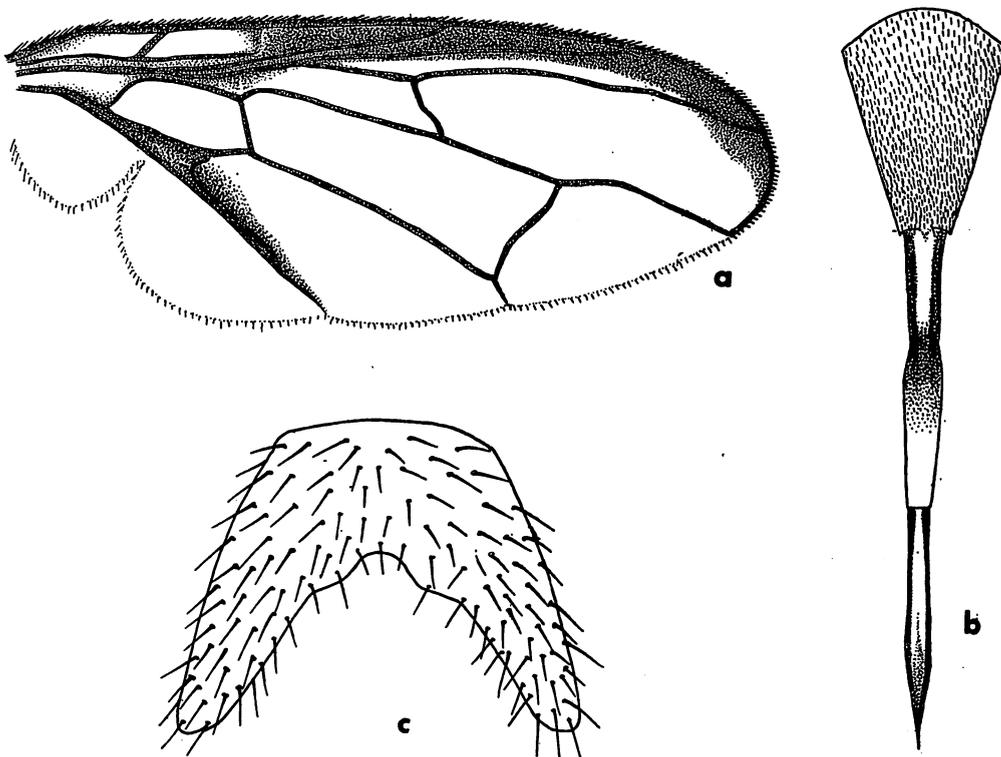


Fig. 21. *Dacus (Strumeta) occipitalis* (Bezzi): a. wing; b. ♀ ovipositor; c. 5th sternum of ♂.

tergum as seen from dorsal view. The ovipositor is slightly longer but the difference is not enough to be of significance and I see no differences in the ♂ genitalia, but the 5th sternum seems to be more deeply cleft on the hind margin; the concavity extends approximately $\frac{3}{5}$ the length of the segment in the dissected specimen of *occipitalis* on hand (fig. 21c). The ♀ ovipositor is as in fig 21b. When fully extended it measures 4.75 mm. The basal segment measures 1.4 mm and the piercer 1.6 mm. In other respects apparently fitting the characteristics of *dorsalis*. It is obvious that the *dorsalis* complex of species in the Philippines will require more careful study before the true relationships can fully be understood.

Dacus (Strumeta) pedestris (Bezzi) Fig. 22.

Chaetodacus ferrugineus var. *pedestris* Bezzi, 1913, *Philip. J. Sci.*, D 8: 322. Type-locality: Mt Makiling, Laguna, Luzon. Lectotype ♂ in U. S. National Museum.

Dacus (Strumeta) pedestris: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 180, fig. 20a-b.

Distribution: Widespread over the Philippines, Indonesia and Malaysia. A large series of specimens have been seen from the following islands: Luzon, Mindanao, Palawan, Tawitawi, and Balabac.

Hosts: Infests a wide assortment of fleshy fruits such as mango, guava, citrus, chico, carambola, chili, tomato, rambutan, bread-fruit and cashew.

Several species of *Opius* parasites have been reared from *pedestris*.

This species is closely related to *dorsalis* Hendel and is difficult to differentiate except by comparison of the ♀ ovipositors. These are similar in shape and general characteristics but differ in length. As seen in situ the basal segment of the ovipositor is distinctly longer than the 5th abdominal segment in *pedestris* and is approximately $\frac{3}{4}$ as long as this segment in *dorsalis*. The extended ovipositor of *pedestris* (fig. 22) averages 6.0 mm in length and in *dorsalis* 4.5 mm. Typically the front and middle coxae and trochanters of *pedestris* are yellow-brown to black and the front and hind tibiae are predominantly dark brown to black with the middle pair discolored with brown to black on basal $\frac{1}{3}$ to $\frac{1}{2}$. In typical *dorsalis* the front and middle coxae and trochanters are usually pale yellow and the front and middle tibiae chiefly yellowish.

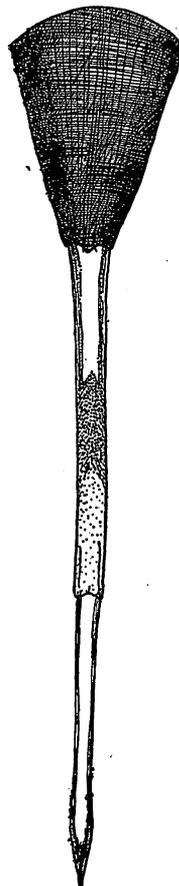


Fig. 22. *Dacus (Strumeta) pedestris* (Bezzi): ♀ ovipositor.

Dacus (Strumeta) petersoni Hardy Fig. 23a-b.

Dacus (Strumeta) petersoni Hardy, 1970, *Ent. Meddel.* **38**: 75, fig. 2a-b. Type-locality: Tarawakan, N of Batubatu, Tawitawi. Type in the University Zoological Museum, Copenhagen.

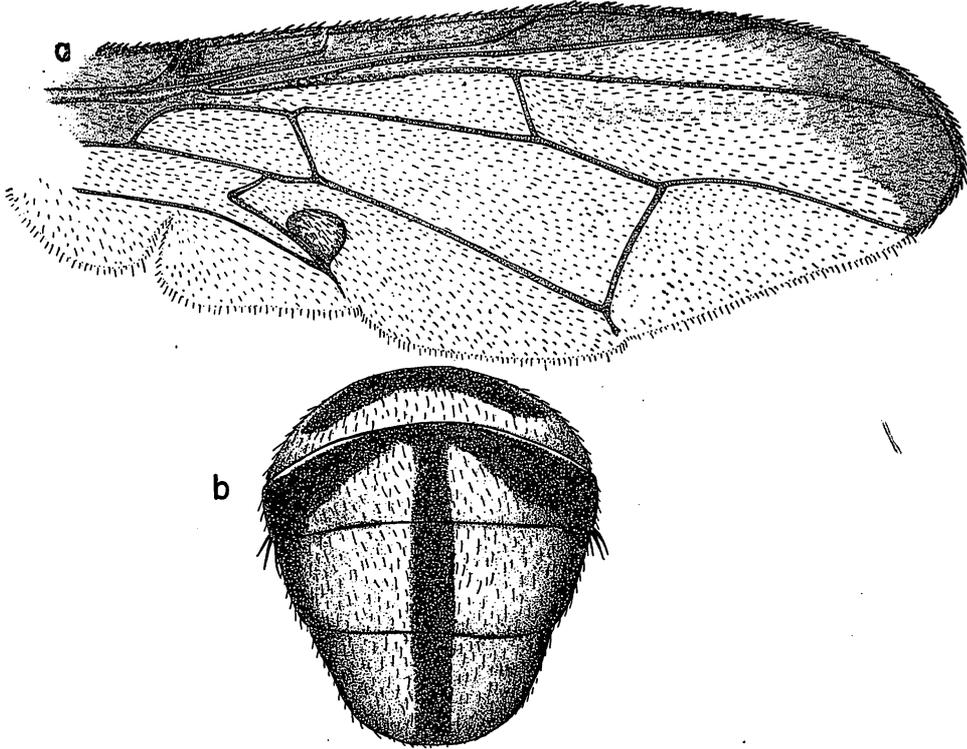


Fig. 23. *Dacus (Strumeta) petersoni* Hardy: a. wing; b. abdomen of ♂.

Presently known only from Tawitawi.

Because of the bulla in the ♂ wing, the lack of tergal glands on the 5th abdominal segment, the peculiar shape of the ♂ abdomen, the all yellow to white face, etc., this fits in a complex with *mcgregori* (Bezzi): It differs readily from *mcgregori* by having the thorax predominantly black, the 3rd antennal segment rounded at apex and the costal band expanded at wing apex and also with a streak of brown extending through most of cell R_5 beyond r-m crossvein. *D. mcgregori* has the thorax chiefly or entirely rufous with the 3rd antennal segment obliquely truncate at apex and the costal band not expanded, etc. The species has been adequately described in the original, the wing markings as in fig. 23a, and the shape of the abdomen and the markings on the dorsum are as in fig. 23b. Length: body and wing, 4.5-4.7 mm.

Dacus (Strumeta) propinquus Hardy & Adachi Fig. 24a-b.

Dacus (Strumeta) propinquus Hardy & Adachi, 1954, *Pacif. Sci.* **8**: 182, fig. 21a-c. Type-locality: Tagap, North Borneo. Type in U. S. National Museum.

Distribution: Borneo, Singapore, Laos, Vietnam, and the Philippine Islands.

Hosts: *Garcinia* spp. and *Sideroxylon* sp.

This species closely resembles *dorsalis* Hendel and is best differentiated by the shape of the ♀ ovipositor. The piercer is distinctly trilobed at apex. I see no characters for differentiating the ♂ from that of *dorsalis*. In the ♀ the basal segment of the ovipositor is distinctly longer than the 5th tergum; the extended ovipositor (fig. 24b) measures approximately 6.5 mm. The basal segment measures 2.0 mm, the inversion membrane 2.3 mm and the piercer 2.2 mm. The piercer is distinctive in shape at the apex as shown in fig. 24a; 4 tiny equal-sized preapical setae present.

It is possible that this species may be widespread throughout the Philippines. It is easily confused with *dorsalis*, which has been recorded only from Luzon.

Dacus (Strumeta) umbrosus Fabricius

Fig. 25.

Dacus umbrosus Fabricius, 1805, Syst. Antliat., p. 274. Type-locality: Sumatra. Type in University Zoological Museum, Copenhagen.

Dacus fascipennis Wiedemann, 1819, Zool. Mag. 1(3): 28. Type-locality: Java. Type in the Natural History Museum, Vienna.

Bactrocera fasciatipennis Doleschall, 1856, *Natuurk. Tijds. Ned.-Ind.* 10: 412. Type-locality: Java. Type probably lost.

Dacus conformis Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. 1: 34. Type-locality: Singapore. Type in British Museum (Nat. Hist).

Dacus frenchi: Froggatt, 1910, *Proc. Linn. Soc. N. S. Wales* 35: 866 (specimens from Java, not New Caledonia). Misidentification, not Froggatt (1909).

Distribution: Widespread throughout Malaysia, Indonesia, Philippines, New Guinea, New Hebrides and New Caledonia, also from Palau Island, Micronesia.

Hosts: This species infests various species of *Artocarpus*. I have 1 record of it having been bred from *Momordica charantia* L. in Borneo. The ♂♂ are strongly attracted to methyl eugenol.

This species is readily recognized by the presence of 3 brown transverse bands across the wing (fig. 25). It is the only known species from the Philippines which has complete crossbands in the wing.

Head yellow except for a prominent round black spot in each antennal furrow. In fully hardened specimens the mesonotum has a pair of broad submedian black vittae extending the

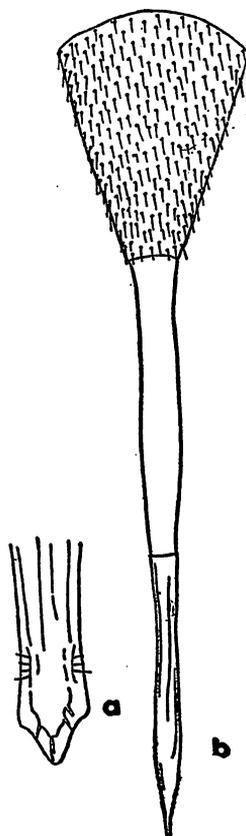


Fig. 24. *Dacus (Strumeta) propinquus* Hardy & Adachi: a. apex of piercer; b. ♀ ovipositor.

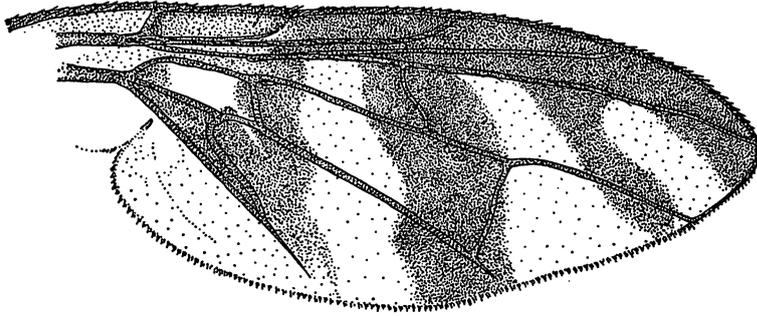


Fig. 25. *Dacus (Strumeta) umbrosus* Fabricius: wing.

entire length, separated by a rufous median vitta. Two broad postsutural yellow vittae are present and the supraalar area and the area along suture and around border of each notopleural callus are rufous. The yellow mark on mesopleuron is broad, continuous with marking on humerus. Abdomen predominantly yellow and somewhat variable in coloration; typically with brown on sides of terga 3 and 5 and with a black vitta extending down middle of terga 4-5; often the bases of 1st and 2nd terga are brown. The sterna of both sexes are entirely yellow to rufous. Fifth sternum of ♂ about as wide as long, gently concave on posterior margin. Ovipositor long and slender, basal segment 1.6 mm, measured on the venter; inversion membrane (8th segment) 3.25 mm and piercer 2.2 mm, totaling 6.8-7.0 mm for the entire ovipositor. Piercer gradually tapered at apex. Length: body, 7.0-8.0 mm; wings, 6.0-7.0 mm.

Numerous Philippine records are on hand from Luzon, Mindanao, Palawan, and Negros.

Subgenus *Zeugodacus* Hendel

Dacus (Zeugodacus) Hendel, 1927, in Lindner, Die Fliegen der palaeark. Reg. 49 (Trypetidae): 26.

Type-species: *Dacus caudatus* Fabricius, by original designation.

Zeugodacus: Shiraki 1933, Mem. Fac. Sci. Agr. Taihoku Imp. Univ. 8: 78.

This subgenus is differentiated from *Strumeta* only by the presence of 4 scutellar bristles, rather than 2. Also the posterior lobe of the ♂ surstylus is elongate and the 5th sternum gently concave on hind margin.

Seven species have been recorded from the Philippines. Thirteen are being treated in this study.

KEY TO SPECIES OF DACUS (ZEUGODACUS) KNOWN FROM THE PHILIPPINES

- 1. Three postsutural yellow vittae on mesonotum2
- Only 2 postsutural yellow vittae11
- 2(1). Wings with a prominent brown mark over m crossvein (fig. 32a)3
- Wings hyaline except for costal band and cubital streak, sometimes a faint mark at apex of vein M_{3+4} 5
- 3(2). Face with usual black spots in antennal furrows.4
- Face entirely yellow. Front femora reddish brown. Anterior median portion of mesonotum black. Philippines. **mundus** (Bezzi)
- 4(3). Costal band ending in upper portion of cell R_5 (fig. 27a). Fifth sternum of ♂

- narrow, over 2× wider than long (fig. 27d). Surstylus black at apex, attenuated apical lobe elongate, about equal in length to basal portion of surstylus and lacking basoapical lobe (fig. 27b). Female unknown. Tawitawi. **calumniatus** Hardy
- Costal band diffused apically, the brown coloring extending at least faintly through most of cell R₅. Fifth sternum about 1/2 wider than long. Surstylus rufous, apical portion much shorter than base and with a small basoapical lobe developed (fig. 37c). Female ovipositor as in fig. 37a. Philippines, New Ireland and Thailand (probably widespread through Southeast Asia). **ubiquitus** Hardy
- 5(2). Humeri and notopleural calli joined by a broad yellow band. Philippines.
 **tetrachaetus** (Bezzi)
 Not as above.6
- 6(5). Scutellum with a black spot at apex.7
 Scutellum yellow except for a narrow brown to black basal band.9
- 7(6). Costal band not expanded at apex (fig. 36a). Humeri bordered with black.8
 Costal band expanded into a large apical spot. Humeri bordered with rufous Philip-
 pines. **pubescens** (Bezzi)
- 8(7). Costal band narrow, extending as a thin line around margin to vein R₄₊₅ (fig. 36a).
 Front portion of mesonotum between humeri rufous. Larger species, body 8.0-9.5 mm.
 Philippines. **trimaculatus** Hardy & Adachi
 Costal band rather broad, extending 1/2 way through apex of cell R₅ at wing apex
 (pl. 1, fig. 7). Front portion of mesonotum black. Smaller species, body 5.0-5.5 mm.
 Philippines. **scutellinus** (Bezzi)
- 9(6). Costal band narrow, not enlarged apically. Female ovipositor with preapical denta-
 tions or indentations (fig. 30b).10
 Costal band expanded into a large apical spot (fig. 34). Female ovipositor simple.
 Widespread over Orient and Pacific. **tau** (Walker)
- 10(9). Mesonotum shining black in ground color except for postsutural yellow vittae; also a
 yellow mark on each side from notopleural callus to humerus and with posterolateral
 margins yellow-brown. Ovipositor with a tooth on each side well before apex of
 piercer (fig. 28a). Mindanao. **deceptus**, n. sp.
 Mesonotum nearly all yellow to rufous with brown to black markings as in fig. 30a.
 Ovipositor with an indentation on each side just before apex of piercer (fig. 30b).
 Luzon. **indentus**, n. sp.
- 11(1). Scutellum entirely yellow, except for narrow basal brown to black band. Costal band
 complete.12
 A black median longitudinal vitta extends from base to apex of scutellum. Costa
 brownish yellow only in Sc cell. Luzon. **abbreviatus**, n. sp.
- 12(11). Costal band broad, filling all or nearly all of cell R₅ and broadly expanded at apex,
 filling upper apical portion of cell. R₅ (fig. 31a). Median portion of mesonotum
 rufous. Female ovipositor trilobed at apex (fig. 31f). Costa of ♂ with short thick
 spinules at base (fig. 31b). **katoi**, n. sp.
 Costa comparatively narrow, extending only slightly below vein R₂₊₃ and scarcely
 expanded at apex. Mesonotum with a black median vitta. Female ovipositor simple
 (fig. 29a-b)..... **icelus**, n. sp.

Dacus (Zeugodacus) abbreviatus Hardy, new species Fig. 26a-c.

By having only 2 postsutural yellow vittae and the face with a black spot in each antennal furrow, this runs near *pendleburyi* (Perkins). The 2 are not related, however.

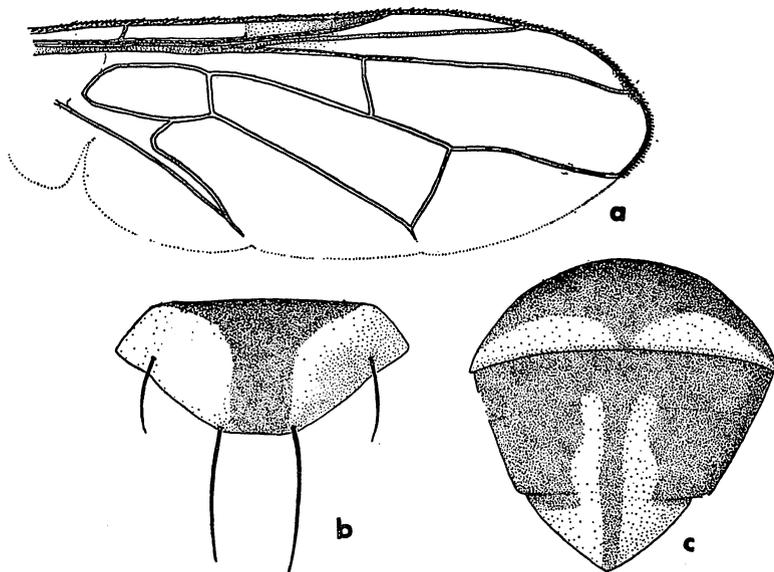


Fig. 26. *Dacus (Zeugodacus) abbreviatus*, n. sp.: a. wing; b. scutellum; c. ♂ abdomen, dorsal.

Abbreviatus is readily differentiated by having a broad black band extending longitudinally over dorsum of scutellum, also by lacking the costal band on the wing and having femora yellow except for a faint tinge of brown at extreme apices. They are alike in many other respects.

♂. **Head:** Yellow, brown on hind portion of occiput and in median portion of front. Facial spots oval. **Thorax:** Predominantly black, gray pollinose on dorsum. As seen from dorsal view the only yellow marks on the thorax are on the humeri, notopleural calli, suture, brief postsutural vittae, and broad sides of scutellum (fig. 26b). Postsutural vittae very abbreviated and ending about opposite anterior supraalar bristles. The yellow mark on each sternopleuron occupies about 2/3 of distance to humerus and is gradually narrowed ventrally. The yellow mark at upper portion of sternopleuron is rather small, extending just a slight distance beneath pteropleuron. Post-scutellum and metanotum shining black. **Legs:** Femora yellow except for a faint tinge of brown at extreme apices, hind tibiae dark brown, middle and front tibiae brown, tinged with yellow. **Wings:** Almost entirely hyaline, yellow only in the subcostal cell and with a very faint tinge of yellow-brown at apex of vein R_{4+5} (fig. 26a). Vein $Cu_1 + 1st\ A$ about 1/2 as long as lobe of Cu . **Abdomen:** Predominantly black with a black median vitta beginning on 2nd tergum and extending to apex; with broad yellow mark on each side along posterior margin of 2nd tergum; 3rd tergum shining black except for a small submedian yellow spot on each posterior margin, continuous with yellow submedian markings which extend over 4th and 5th terga. These are broadened on the latter and involve the tergal glands (fig. 26c). The genitalia have not been studied.

Length: body, 5.5 mm; wings, 5.0 mm.

♀. Unknown.

Holotype ♂ (BISHOP 10127), Los Banos, Laguna, Luzon, 7.VII. 1930, F. C. Hadden.

Type returned to B. P. Bishop Museum.

***Dacus (Zeugodacus) calumniatus* Hardy** Fig. 27a-d.

Dacus (Zeugodacus) calumniatus Hardy, 1970, *Ent. Meddel.* **38**: 77, fig. 3a-d. Type-locality: Tarawa.

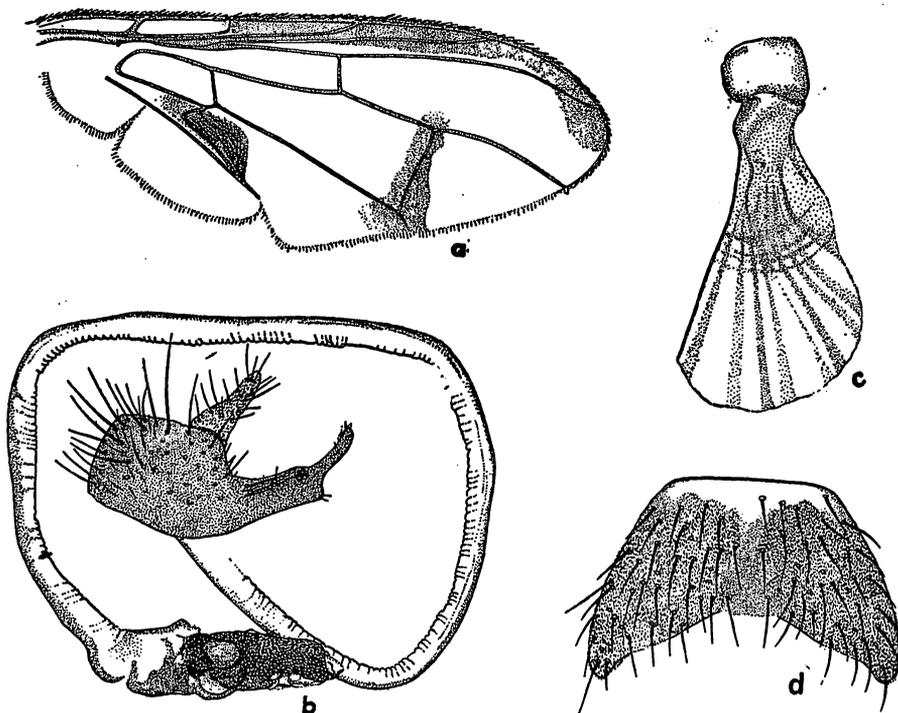


Fig. 27. *Dacus (Zeugodacus) calumniatus* Hardy: a. wing; b. ♂ genitalia; c. ejaculatory apodeme; d. 5th sternum of ♂.

kan, Tawitawi, Philippines. Type in University Zoological Museum, Copenhagen.

This species is differentiated from other *Zeugodacus* which have 3 postsutural yellow vittae, 2 black spots on face and the costal band enlarged at wing apex, by having a prominent brown vitta extending over the m crossvein (fig. 27a). It fits the concept of *Dacus caudatus* Wiedemann, 1830, nec Fabricius, 1805 and has been confused in much of the past literature of most authors. The species is similar in most respects to *tau* (Walker) and is differentiated by the presence of the prominent brown mark extending over the m crossvein.

***Dacus (Zeugodacus) deceptus* Hardy, new species** Fig. 28a-b; pl. 1, fig. 5.

By having 3 postsutural yellow vittae on mesonotum, the scutellum yellow except for a narrow black band, and a black spot present on each side of face, this would fit in the complex with *tau* (Walker) but differs by having the costal band narrow, ♀ ovipositor very different in development (fig. 28b), etc. It would appear to fit nearest to *diaphoropsis* (Hering), from East Borneo. I have no specimens of the latter on hand for comparison but from Hering's original description, *deceptus* would differ by having no cubital streak in the wing; by lacking a brown spot at apex of vein M_{3+4} ; having femora entirely yellow and by having 3 inferior fronto-orbital bristles, rather than 2. The ovipositor characters are also probably very different in these. It fits near *indentus*, n. sp.,

from Luzon but is readily differentiated by the predominantly shining black thorax and by the distinctive differences in the shape of the ♀ ovipositor (compare fig. 28a-b and 30b-c).

♀. *Head*: Largely yellow, hind portion of occiput brown and with an oblong black mark in each antennal furrow; also lunule brown. First 2 antennal segments yellow, 3rd segment yellow at base, yellow-brown apically. Three pairs inferior fronto-orbital bristles and lacking brown spots at bases of frontal bristles. *Thorax*: Mostly shining black in ground color with gray pollinose vittae extending down mesonotum, divided by 3 narrow shining black longitudinal lines. Postsutural yellow vittae rather narrow, the lateral pair ending at or near the inner postalar bristles and blending into the yellow-red coloring of the posterolateral margins of mesonotum. The median vitta extending from approximately level with prescutellars to about level with suture. Notopleural callus and humerus yellow and with a rather narrow yellow line connecting these. The lower margin of notopleuron is black; the anterior notopleural bristle rises from this black area. Scapular bristles almost as strong as notopleurals. Pleura predominantly shining black, propleura and anterior edge of each mesopleuron tinged with rufous. The yellow to rufous mark over each mesopleuron is oblique on its anterior margin. The yellow spot at upper portion of each sternopleuron is rather large, extending anteriorly well in front of the yellow mark on the mesopleuron. Postscutellum and metanotum entirely polished black. *Legs*: Femora entirely yellow, mid and hind coxae and trochanters and all tibiae brown. *Wings*: Subhyaline with the markings as in pl.

1, fig. 5. Cubital cell hyaline except for a faint streak of yellow-brown at extreme base. Vein $Cu_1 + 1st A$ almost equal in length to lobe of cubital cell. *Abdomen*: Yellow, rather blackened on sides of all terga, with bases of terga 1-3 black and with a broad black median vitta extending from 3 to 6. Tergal glands yellow. Ovipositor yellow; as seen from dorsal view the basal segment is about 1/2 longer than 5th tergum. Measured on venter the basal segment is 1.5 mm long, the inversion membrane is 2.0 mm and the piercer is 1.5 mm. Extended ovipositor (fig. 28b) measures 5.0 mm. The piercer is gradually tapered to a sharp point at apex and has a prominent tooth well before the apex on each side (fig. 28a).

Length: body, excluding ovipositor, 6.3 mm; wings, 6.6 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10128), 11 km E of Sindangan, Zamboanga del Norte, Mindanao, 20.VII.1958, H. E. Milliron.

Type in B. P. Bishop Museum.

Dacus (*Zeugodacus*) *icelus* Hardy, new species Fig. 29a-b.

Because of the presence of 2 postsutural yellow vittae, a large black spot in each

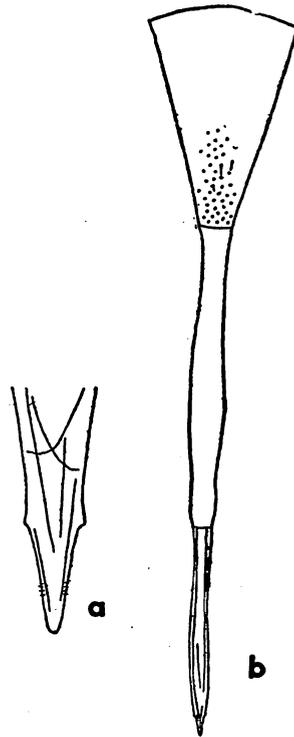


Fig. 28. *Dacus* (*Zeugodacus*) *deceptus*, n. sp.: a. apex of piercer; b. ♀ ovipositor.

antennal furrow, all yellow scutellum, and comparatively narrow costal band on wing, this would run to *pendleburyi* (Perkins) from Malaya. It differs by having the costal band extending a short way into cell R_3 along underside of vein R_{2+3} and into upper $1/2$ of cell R_5 at wing apex, and also with a distinct cubital streak, rather than having the costal band very narrow, confined to cells Sc and R_1 except at apex and extending just beyond apex of vein R_{4+5} , and with no cubital streak present. No brown spots at bases of frontal bristles; the postsutural yellow vittae normal in length, straight-sided, obtuse posteriorly and extending to inner postalar bristles, not with vittae very short, pointed posteriorly and terminating just past anterior supraalar bristles. Scutellum with a narrow black basal band, not with a "fairly wide, curved, basal black band." Femora all yellow, not dark brown to black on apical $1/3$. Abdomen predominantly yellow with the tergal glands yellow, not with terga 3-5 black with dark fulvous patches on either side of midline of 4 and 5, and tergal glands dark reddish brown.

♀. *Head*: Yellow except for a tinge of brown on hind portion of occiput, middle of front and over lunule. Facial spots oblong, rounded ventrally and not extending to oral margin. Third antennal segment brown, basal segments yellow. *Thorax*: Mesonotum predominantly dark colored with distinct black longitudinal markings including a black median vitta extending entire length and 2 submedian black vittae, the latter are broadly expanded behind suture and extend to hind margin with a broad black stripe extending transversely behind each humerus from margins at level with anterior notopleural bristle connecting with submedian longitudinal black vittae. The area just inside each humerus, area along the suture, lateral margins behind suture, and posterolateral borders of mesonotum dull yellow. Humeri, notopleural calli, postsutural vittae, scutellum and pale markings on pleura ivory white. Postsutural vittae straight-sided, extending from suture to inner postalar bristles. The ivory white mark over mesopleuron rather narrow, approximately equal in width to the notopleural callus and almost straight-sided, just slightly tapered ventrally. The ivory white mark at upper portion of sternopleuron extending a short distance posteriorly beneath pteropleuron. *Legs*: Coxae, trochanters and hind tibiae brown, front and middle tibiae brown, tinged with yellow; femora entirely yellow. *Wings*: Marked as noted above. *Abdomen*: Mostly yellow with brown markings along sides of terga, with an incomplete band across base of 2nd and a complete band across base of 3rd tergum; also with a black median vitta extending from 3rd over apex of 5th. Tergal glands yellow. Ovipositor yellow, basal segment tinged with brown at extreme base and apex and comparatively short, as seen from dorsal view only about $1/2$ to $2/3$ as long as 5th tergum. Basal segment just slightly longer than wide (fig. 29a). Measured on ventral margins it is 1.3 mm by 1.2 mm at its widest point. Piercer 1.4 mm, tapering to a sharp

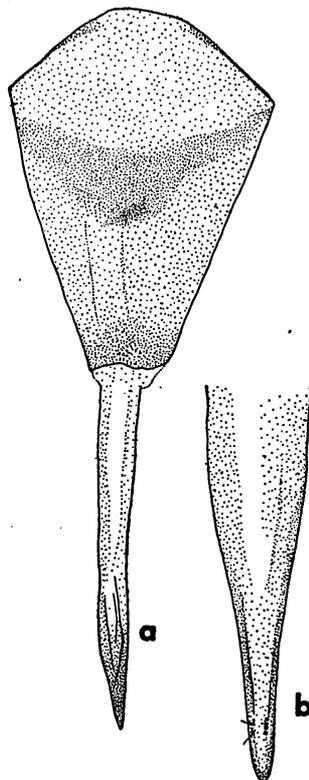


Fig. 29. *Dacus (Zeugodacus) icelus*, n. sp.: a. ♀ ovipositor; b. apex of piercer.

point at apex (fig. 29b).

Length: body, including ovipositor, 6.5 mm; wings, 6.0 mm.

♂. Unknown.

Holotype ♀ Muntinlupa, Luzon, 4.IX.1968, A. Pangga.

Type returned to the Bureau of Plant Industry, Manila.

Dacus (Zeugodacus) indentus Hardy, new species Fig. 30a-c.

Fitting near *deceptus*, n. sp. from Mindanao, but differing by having the mesonotum nearly all yellow to rufous with brown to black markings as in fig. 30a, and the ♀ ovipositor with an indentation on each side just before apex of piercer (fig. 30b).

♀. *Head*: All yellow except for a faint discoloration of brown on back portion of occiput and except for prominent dark brown oblong spots in antennal furrows. Only 2 pairs of inferior fronto-orbitals present. Basal segment of antennae yellow, 3rd segment brown, tinged with yellow. *Thorax*: Largely yellow-rufous, anteromedian and posteromedian portions also lateral margins of mesonotum, entirely yellow-red, the median area entirely pale except for a line of brown extending

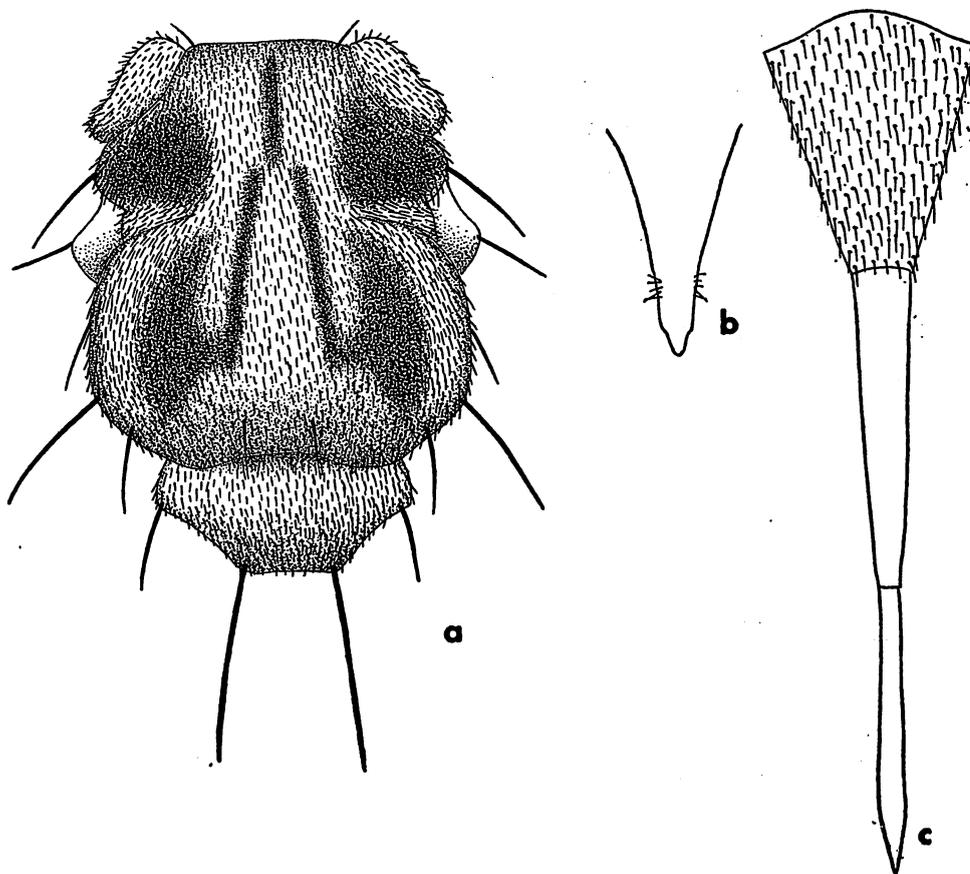


Fig. 30. *Dacus (Zeugodacus) indentus*, n. sp.: a. thorax, dorsal; b. apex of piercer; c. ♀ ovipositor.

along each side of median yellow vitta converging in front of suture and extending for a short distance down anterior portion of thorax as a narrow brown median line. Also with a prominent dark brown to black spot behind each humerus, but with the area immediately bordering the humerus yellow-rufous, and with an elongate black spot on each side extending from just behind humerus almost to a level with inner postalar bristle. Postsutural yellow vittae broad, shaped as in fig. 30a. The area in which the anterior notopleural bristle is placed is yellow, tinged with rufous. The yellow mark over mesopleuron is very broad, occupying most of dorsal margin of that sclerite and oblique on anterior margin with a dark brown triangular mark occupying anteromedian portion of mesopleuron, also immediate anterior portion bordering and behind the spiracle is yellow. The propleuron is yellow and the upper margin of each sternopleuron is mostly occupied by an elongate yellow spot. Scutellum entirely pale yellow except for a very narrow brown band along basal margin. Postscutellum yellow in middle, dark brown, tinged with red on sides. Metanotum brown, tinged with red on sides, brownish yellow in middle. *Legs*: Mostly yellow, tinged with brown on bases of tibiae. *Wings*: Subhyaline with a narrow costal band extending scarcely into upper portion of cell R_5 but with a distinct cubital streak developed. Vein $Cu_1+1st\ A$ equal in length to lobe of cubital cell. *Abdomen*: Mostly yellow brown on sides of terga, with a complete brown band across base of 3rd tergum and with a brown median vitta extending from 3rd over apex of 5th. Ovipositor yellow, basal segment about 1/2 longer than 5th tergum as seen from direct dorsal view and 1.5 mm long, measured on venter. Inversion membrane 2.0 mm and piercer 1.75 mm. Extended ovipositor (fig. 30c) 5.25 mm. Piercer rather slender, straight-sided, abruptly narrowed at apex and with small preapical indentations as in fig. 30b.

Length: body, excluding ovipositor, 7.5 mm; wings, 7.0 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10129) Los Banos, Laguna, Luzon, IX.1916, F. X. Williams.

Type in B. P. Bishop Museum.

Dacus (Zeugodacus) katoi Hardy, new species Fig. 31a-g.

This species runs near *quadrisetosus* (Bezzi) from the New Hebrides. It differs as follows: costal band and cubital streak brownish yellow, the former expanded at apex, broadly filling upper apical portion of cell R_5 , rather than costal band and cubital streak blackish and the former not expanded at apex. Median portion of mesonotum rufous and abdomen predominantly yellow to rufous, rather than with the central portion of mesonotum entirely black and abdomen black except for reddish band on hind margin of 2nd tergum and except for dark reddish apex of 5th tergum. Tergal glands yellow to rufous, rather than black. Yellow spot at upper portion of sternopleuron rather large, not with a small sternopleural spot. Postsutural yellow vittae tapered posteriorly, rather than straight-sided, and femora yellow except for a brown preapical spot on posterior or posteroventral surfaces, rather than femora blackish brown with yellow bases. The short thick spinules on the basal portion of costa of ♂ are also probably characteristic of *katoi* (fig. 31b).

♂. *Head*: Mostly yellow, tinged with brown on hind portion of occiput and in median portion of front and with a small brown spot at base of each frontal bristle. Facial spots prominent, shining black; rounded dorsally and pointed ventrally. First 2 antennal segments yellow, tinged with brown; 3rd segment brown, rather densely gray pubescent. *Thorax*: Conspicuously marked with black in fully hardened specimens with the broad median vitta extending from anterior margin to just beyond prescutellar bristles and typically with a shining black vitta on each side from about level with scapular bristles, enlarging beyond suture to form a broad mark extending to hind margin; hind margin narrowly black except for sides which are rufous; also the lateral

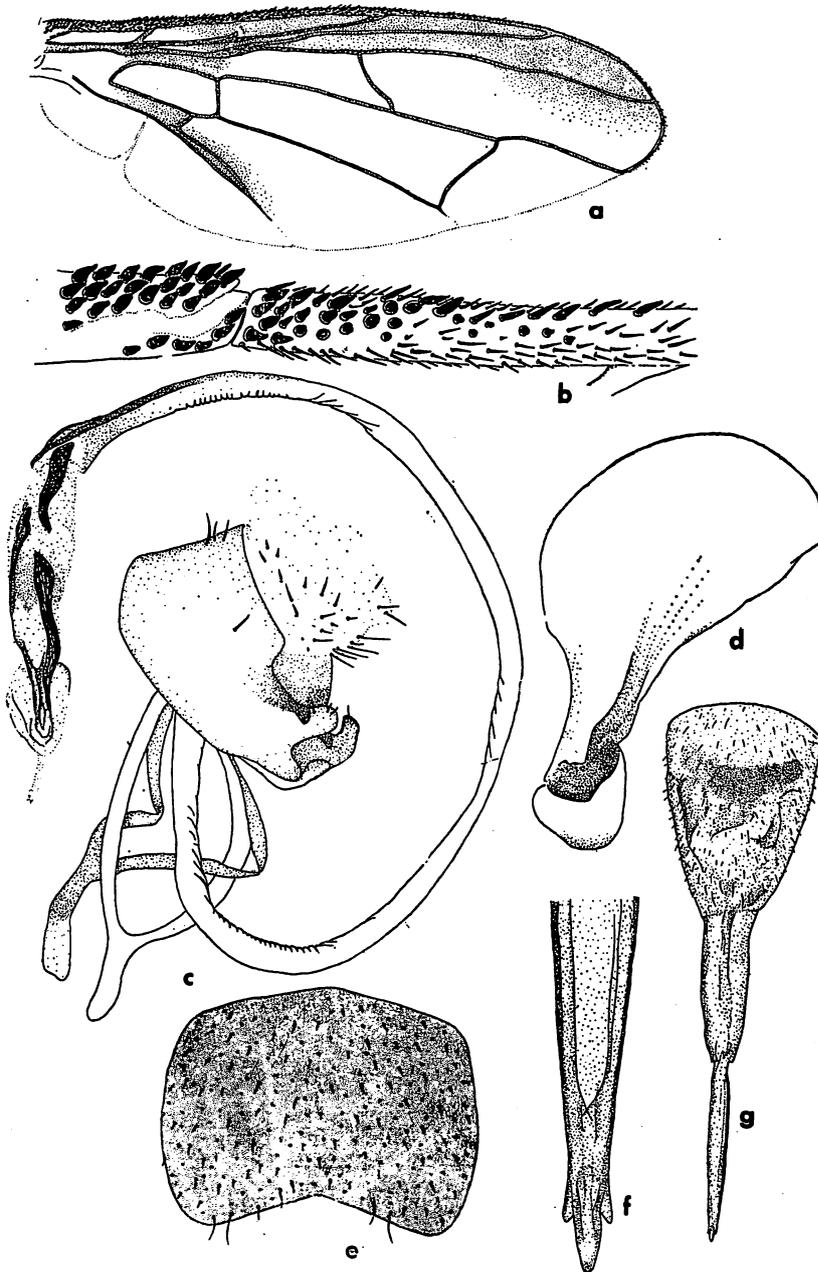


Fig. 31. *Dacus (Zeugodacus) katoï*, n. sp.: a. wing; b. basal portion of costal margin; c. ♂ genitalia; d. ejaculatory apodeme; e. 5th sternum of ♂; f. apex of piercer; g. ♀ ovipositor.

margins of mesonotum from suture to posterior border are rufous. The area immediately behind each humerus is broadly blackened. The yellow mark over each mesopleuron is comparatively narrow, on upper border occupying about 2/3 the distance to humerus and with anterior margin gradually tapered ventrally. The yellow mark on each sternopleuron extends anteriorly and posteriorly for a short distance beyond a level with yellow mark on mesopleuron. Scutellum entirely yellow except for a narrow black basal band. Postscutellum black, metanotum black on sides and rufous down the middle. Halteres yellow. *Legs*: Coxae and trochanters dark brown. Femora yellow except for a preapical brown spot on each pair, on posterior surface of front and postero-ventral surfaces of middle and hind pairs. Hind tibiae brown, front and middle tibiae brownish yellow. Tarsi mostly yellow, tinged with brown on apical tarsomeres. *Wings*: Subhyaline with markings as in fig. 31a. First 2 costal cells faintly tinged with yellow, devoid of microtrichia except in apical 1/2 of 2nd. Base of costa covered with short thick spinules (fig. 31b). Vein $Cu_1 + 1st\ A$ 2/3 to 3/4 as long as lobe of cubital cell. *Abdomen*: Shining black on sides of terga with an incomplete black band across 2nd tergum, a broad black band across 3rd and with a median black vitta extending from base of 3rd almost to apex of 5th. Otherwise yellow to rufous with yellow tergal glands. Sterna dark brown. Fifth sternum as wide as long, gently concave on hind margin (fig. 31e). Male genitalia as in fig. 31c-d.

Length: body, 8.5-9.25 mm; wing, 8.0 mm.

♀. Fitting the description of ♂ except for secondary sexual characters. Vein $Cu + 1st\ A$ is approximately equal in length to the lobe of cubital cell and the cubital streak is not so completely developed as in ♂. Ovipositor rufous. As seen from dorsal view, basal segment about 2/3 as long as 5th tergum. Measured on venter, basal segment about 1.5 mm long. Piercer about 1.4 mm in length, and extended ovipositor (fig. 31g) measures 4.25 mm. Piercer trilobed at apex as in fig. 31f.

Holotype ♂, La Granja, Negros, 8.XII.1960, collected at methyl eugenol bait, S. Kato. Allotype ♀, Bataan, Luzon, 20.I.1948, L. T. Karganillo. 21 paratypes: 11 ♂♂, 10 ♀♀, 2 same data as type, the remainder same locality as allotype, X.1947-I.1948, Q. C. Chock & Karganillo.

Type returned to the National Institute of Agricultural Science, Nishigahara, Tokyo. Allotype (BISHOP 10130a) is the B. P. Bishop Museum. Paratypes in the collections of the Bureau of Plant Industry, Manila; Bishop Museum; and University of Hawaii.

Dacus (Zeugodacus) mundus (Bezzi) Fig. 32a-e.

Chaetodacus mundus Bezzi, 1919, *Philip. J. Sci.* 15: 429, pl. 1, fig. 9. Type-locality: Los Banos, Laguna, Luzon. Lectotype ♀ in U. S. National Museum.

Zeugodacus tibialis Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* 8: 96, fig. 25, pl. 2, fig. 6. Type-locality: Kashoto, Formosa.

Dacus (Zeugodacus) mundus: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 193, fig. 27.

Distribution: Philippine Islands and Formosa.

Hosts: Reared from *Cucurbita maxima* Duch. in Formosa and from unidentified cucurbit in the Philippines.

This species is readily differentiated from other Philippine *Zeugodacus* which have 3 postsutural yellow vittae on the mesonotum by having the face entirely yellow and the 4th sternum of ♂ very large. Also the rather long, strongly tapered ovipositor base and the dark marking over the m crossvein, in combination with other wing markings (fig. 32a) will differentiate it.

Head entirely yellow except for a faint brown discoloration on hind portion of occiput. Appendages yellow. Thorax predominantly black, mesonotum densely gray pollinose except for

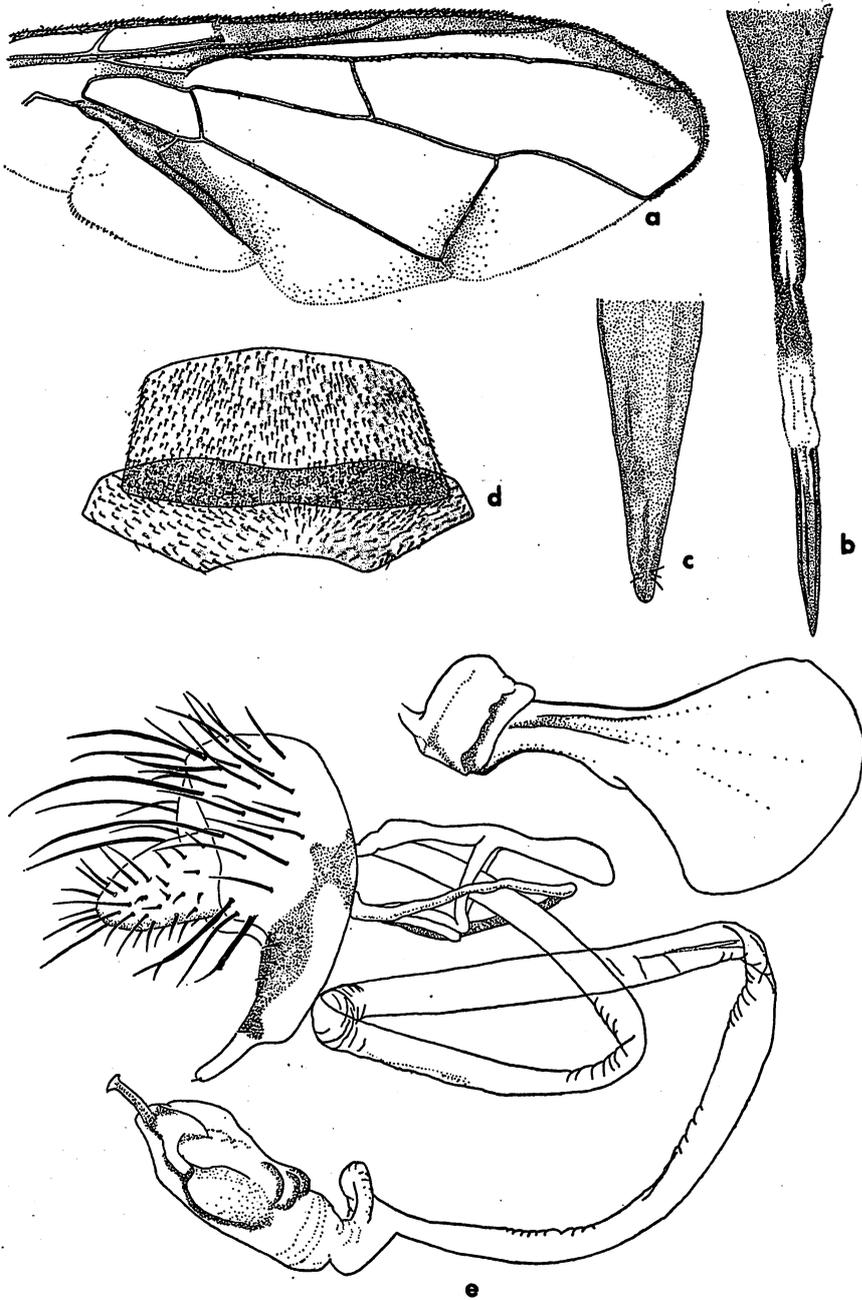


Fig. 32. *Dacus (Zeugodacus) mundus* (Bezzi): a. wing; b. ♀ ovipositor; c. apex of piercer; d. 4th and 5th sterna of ♂; e. ♂ genitalia.

the suture and the yellow postsutural vittae, with the gray area divided into 4 vittae by 3 narrow subshining black lines; the area on each side of the median yellow vitta and on the upper margins of the lateral vittae is polished black. The yellow mark on upper portion of each sternopleuron small, not extending posteriorly beneath pteropleura. Wings predominantly hyaline with a rather narrow dark brown costal band which is not expanded at wing apex. Also with a broad cubital streak and a brown mark over lower portion of m crossvein (fig. 32a). Legs predominantly yellow, femora tinged with brown on apices and tibiae yellow-brown. Abdomen colored very much as in *ubiquitus*. The tergal glands are yellow. Fourth sternum of ♂ larger than 5th and 2× wider than long, straight on hind margin. Fifth sternum nearly 4× wider than long and with hind margin straight (fig. 32d). Male genitalia as in fig. 32e. Basal segment of ♀ ovipositor (fig. 32b) brownish red, rather tubular, strongly tapered and as seen from dorsal view equal in length to terga 4+5. Measured on the venter, the basal segment is 2.25 mm long, the inversion membrane is black on lateral margins of basal 2/5 and measures 2.25 mm. The piercer is moderately tapered to a point at the apex (fig. 32c) and measures 1.5 mm. The extended ovipositor (fig. 32b) measures 6.0 mm.

This species has been recorded from numerous localities on Luzon, Mindanao, and Panay. It is probably widespread throughout the Philippines.

Dacus (Zeugodacus) pubescens (Bezzi) Fig. 33a-d; pl. 1, fig. 6.

Chaetodacus pubescens Bezzi, 1919, *Philip. J. Sci.* 15: 434, pl. 2, fig. 2. Type-locality: Los Banos, Laguna, Luzon. Lectotype in Museo Civico di Storia Naturale, Milano.

Chaetodacus scutellatus: Bezzi (nec Hendel), 1916, *Bull. Ent. Res.* 7: 114.

Dacus (Zeugodacus) pubescens: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 194. fig. 28a-b.

This species is related to *D. scutellinus* (Bezzi) and *trimaculatus* Hardy & Adachi by having a black spot at apex of scutellum, in combination with the 3 postsutural yellow vittae on mesonotum. It is differentiated by having the costal band expanded into a prominent brown spot in apex of wing; by having 3 pairs of inferior fronto-orbital bristles, not 2, and by having the humeri bordered by rufous, not black.

A moderately large species with prominent black on each side of face in antennal furrows and usually with brown discoloration at bases of frontal bristles. The facial marks are oblong, pointed ventrally and extend almost to oral margin. Mesonotum with a prominent black longitudinal band extending almost full length of dorsum at a level between inner and outer scapular bristles and filling most of area between prescutellar and inner postalar bristles; with a broad dark brown to black mark extending on each side to anterior notopleural bristle behind humerus. The black portion of mesonotum rather densely gray pollinose. A rufous line extends longitudinally down middle of mesonotum from anterior margin between inner scapular bristles to median yellow vitta. Wings mostly subhyaline with a narrow brown band along costal margin, greatly expanded at apex so that at its widest point the apical spot is at least 4× wider than costal band measured at apex of vein R_{2+3} . Cubital streak broad, wings markings as in pl. 1, fig. 6, and with microtrichia in apex of 2nd costal cell. Abdomen mostly yellow with base of 1st tergum brown to black; 2nd with an incomplete brown to black band across base; 3rd with a complete black band across base. Sides of terga black and with a black median vitta extending from terga 3 to apex of 5. Tergal glands yellow. Sterna dark brown to black. Fifth sternum of ♂ about as wide as long, gently concave on posterior margin (fig. 33c). Genitalia as in fig. 33d, with surstyli rather boot-shaped, having a short ventral lobe and a slender incurved dorsal lobe. Female ovipositor rufous. Basal segment, as seen from dorsal view, about equal in length to 5th tergum. Extended ovipositor (fig. 33a) 5.8 mm with basal segment, measured on venter, 1.75 mm; piercer 1.75 mm and inversion membrane 2.3 mm. Piercer indistinctly trilobed at apex (fig. 33b). Length: body and wings, 8.0-8.5 mm.

This species has been recorded from several localities on Luzon and Mindanao. It

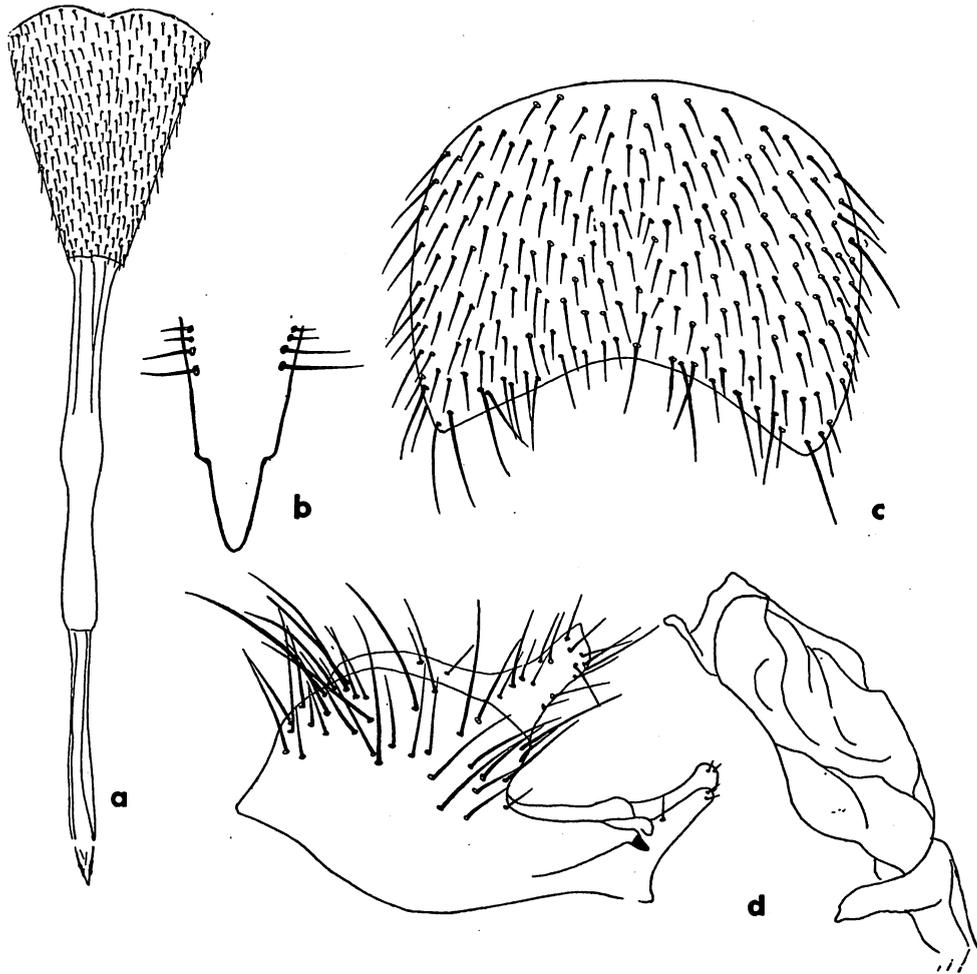


Fig. 33. *Dacus (Zeugodacus) pubescens* (Bezzi): a. ♀ ovipositor; b. apex of piercer; c. 5th sternum of ♂; d. ♂ genitalia.

probably is widespread over other islands.

***Dacus (Zeugodacus) scutellinus* (Bezzi)** Pl. 1, fig. 7.

Chaetodacus scutellinus Bezzi, 1916, *Bull. Ent. Res.* 7: 113; 1919, *Philipp. J. Sci.* 15: 431, pl. 2, fig.

1. Type-locality: Mt Makiling, Luzon. Lectotype ♀ in U. S. National Museum.

Dacus (Zeugodacus) scutellinus: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 195.

This species fits near *pubescens* (Bezzi) and *trimaculatus* Hardy & Adachi because of the 3 postsutural yellow vittae and the black spot at apex of scutellum. It differs from *pubescens* by having the costal band not expanded at apex and the humeri bordered with black. It differs from *trimaculatus* by having the costal band rather broad, ex-

tending halfway through apex of cell R_5 (pl. 1, fig. 7) and the front portion of mesonotum black. The species is also considerably smaller; the body length is 5.0-5.5 mm. In *trimaculatus* the costal band is much narrower, extending as a thin line around margin to vein R_{4+5} (fig. 36a); the front portion of the mesonotum between humeri is rufous and the body measures between 8.0 and 9.5 mm.

Bezzi recorded it from both Luzon and Palawan.

Two ♂ specimens on hand from San Jose, Mindoro, II.1945, Ross & Skinner obviously belong here. In 1 specimen the scutellar spot is distinct but brown; in the other there is only a faint indication of the apical scutellar spot. The characteristic features of this species are as follows: facial spots small, round to oval, occupying only a small area of lower portion of each antennal furrow. Mesonotum with 2 broad bands extending the entire length and with narrow posterior margin entirely black, also a broad black band extending on each side to lateral margin behind each humerus. Postsutural yellow vittae broad, the lateral extending well beyond inner postalar bristles, blending into the yellow-rufous coloring of the posterolateral margins of mesonotum; the median vitta broad posteriorly, tapered slightly anteriorly and ending approximately at suture. Also with a rufous line extending from end of median yellow vitta to anterior margin of mesonotum. Legs mostly yellow; femora marked with brown on apices, and hind tibiae brown, tinged with red. Wings marked as in pl. 1, fig. 7 and abdomen with 1st, 2nd, 4th and 5th terga broadly shining black on sides, with a narrow, sometimes incomplete band of brown to black across base of 2nd tergum, a rather broad black band across base of 3rd and with a black median vitta extending from 3rd over apex of 5th. Tergal glands not evident, apparently not distinctly developed on this species although this area on each side of 5th tergum is covered with fine, short, yellow pubescence and probably is glandular in function; this area is entirely yellow. First sternum black, 2nd and 3rd yellow, 4th yellow on base, dark brown to black on apical 3/5, and 5th black. Fifth approximately 2× wider than long, gently concave on posterior margin. The epandrium is highly arched and the surstyli narrow, each with a small heel-shaped lobe at lower apex and with upper apex curved inward.

Dacus (Zeugodacus) tau (Walker) Fig. 34.

Dasyneura tau Walker, 1849, List Dipt. Ins. Brit. Mus. 4: 1074. Type-locality: Foochow, China. Type ♂ in British Museum (Nat. Hist.).

Dacus hageni de Meijere, 1911, *Tijds. Ent.* 54: 375. — Hardy & Adachi 1954, *Pacif. Sci.* 8: 188, fig. 25a-b. Type-locality: Sumatra. Type in Leiden.

Zeugodacus caudatus: Perkins (nec Fabricius), 1938, *Proc. Roy. Soc. Qld* 49(11): 139.

Zeugodacus nibilus heinrichi Hering, 1941, *Siruma Seva* 3: 11. Type-locality: Celebes. Type in Zoological Museum, Berlin.

Zeugodacus bezziarius Hering, 1941, *Arb. Morph. Taxon. Ent. Berl.* 8: 26. Type-locality: Mou-Pin, W Szechwan, China. Type in Deutsches Entomologisches Institut, Eberswalde.

Distribution: Widespread throughout the Oriental Region.

Hosts: This is an important pest of a variety of cucurbitaceous plants including species of *Cucumis*, *Luffa*, *Citrullus*, *Trichosanthes*, *Lagenaria*, *Momordica*. It has also been recorded from guava, *Eugenia*, *Artocarpus*, *Dracontomelum*, *Averrhoa* and *Manilkara*.

This is the most common species of *Zeugodacus* found in the Oriental Region.

It is readily differentiated from other *Zeugodacus* which have 3 postsutural yellow vittae, 2 round spots on face, and scutellum yellow except for narrow black basal band by its having the costal band greatly expanded apically, forming a large brown spot broadly occupying the upper portion of cell R_5 (fig. 34). It fits near *diaphoropsis* (Hering) from Borneo and Thailand, but differs by having the costal band distinctly enlarged at apex; in *diaphoropsis* the costal band is not enlarged. Also the ♀ ovipositor of *tau* measures over 6.0 mm whereas in *diaphoropsis* it measures 4.3 mm.

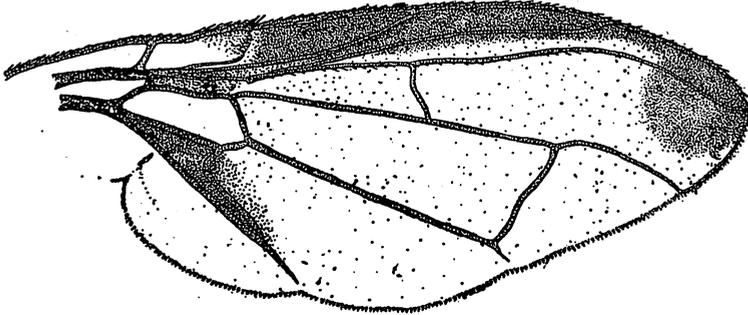


Fig. 34. *Dacus (Zeugodacus) tau* (Walker): wing.

In teneral specimens the costal band is often faint and not as enlarged as in fully hardened specimens but these specimens can be recognized by the simple ovipositor with the preapical setae immediately before tip of piercer.

This species has been adequately described by Hardy & Adachi (1954: 188, fig. 25a-b) under the name *D. hageni* and also by Hardy (1973). The wings are as in fig. 34. The tergal glands are yellow to rufous. Fifth sternum of ♂ nearly 2× wider than long, gently concave on hind margin and densely setose. Male surstyli extended into long inwardly curved lobes at upper apices and the 10th sternum plainly visible from direct lateral view. Basal segment of ovipositor subequal in length to terga 4+5 as seen from dorsal view and usually flattened, measuring approximately 1.6 mm. The extended ovipositor measures 6.8 mm. Piercer rather slender, gently tapered to a point at apex and with prominent setae immediately before apex, measuring approximately 2.1 mm.

This species is rather variable in size; specimens have been observed with the body varying from 6.0–9.0 mm, averaging near 8.0 mm; wings, 5.7–8.5 mm, averaging about 7.5 mm.

Common throughout the Philippines.

***Dacus (Zeugodacus) tetrachaetus* (Bezzi) Fig. 35.**

Chaetodacus tetrachaetus Bezzi, 1919, *Philip. J. Sci.* 15: 431, pl. 1, fig. 10. Type-locality: Batbatan Island. Lectotype ♂ in Milano.

Dacus (Zeugodacus) tetrachaetus: Hardy & Adachi, 1954, *Pacif. Sci.* 8: 196.

This species is differentiated from others which have 3 postsutural yellow vittae by having a broad yellow band extending between humeri and notopleural calli. Similar in this regard to *D. (Strumeta) continuus* (Bezzi) but readily differentiated by the narrow costal band which ends slightly beyond vein R_{4+5} in upper portion of cell R_5 (fig. 35)

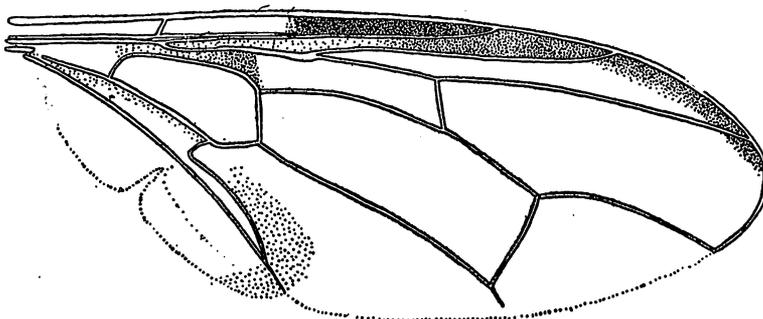


Fig. 35. *Dacus (Zeugodacus) tetrachaetus* (Bezzi): wing.

rather than expanding at apex and extending through cell R_5 to apex of vein M_{1+2} . Bezzi allied this species to *D. mundus* but it differs by having prominent black spots in the antennal furrows and by lacking the brown mark over m crossvein.

This species is known only from the type series. Bezzi's description is probably adequate except for details of the genitalia.

***Dacus (Zeugodacus) trimaculatus* Hardy & Adachi Fig. 36a-g.**

Dacus (Zeugodacus) trimaculatus Hardy & Adachi, 1954, *Pacif. Sci.* **8**: 196, fig. 29a-e. Type-locality: Penal Colony, Davao, Mindanao. Type in the U. S. National Museum.

Hosts: This species has been reared from *Momordica cochinchinensis* (Lour.) Spr. and *M. charantia* L.

This species fits near *scutellinus* (Bezzi) but is considerably larger (8.0–9.5 mm in length, compared to 5.0–5.5 mm); the costal band is very narrow through cell R_3 and ends at vein R_{4+5} , rather than the costal band being broad and extending halfway through cell R_3 (fig. 36a); also the front portion of mesonotum between humeri is rufous, not black. The ♀ ovipositor of *scutellinus* has not been studied but this also probably differs considerably. The very elongate ovipositor, trilobed apex of piercer and very narrow costal band readily differentiate *trimaculatus*. It has been adequately described in the original. The thoracic pattern is as in fig. 36g. The sterna are dark brown to black. Fifth sternum of ♂ about as wide as long, gently concave on hind margin and densely setose (fig. 36f). Male genitalia as in fig. 36d-e. Ovipositor long and conspicuous; the exposed basal portion as seen from dorsal view is equal in length to terga 4+5, and the basal segment measures 2.5 mm by 1.2 mm at its widest point. The extended ovipositor (fig. 36b) measures 8.32 mm. The piercer is 2.78 mm by 0.21 mm, trilobate at apex and with 2 pairs of strong preapical bristles plus 2 pairs of weak setae before apex (fig. 36c). The inversion membrane is approximately 3.0 mm in length. Length: body, excluding ovipositor, 8.0–9.5 mm; wings, 7.7–8.5 mm.

Presently known only from Mindanao.

***Dacus (Zeugodacus) ubiquitous* Hardy Fig. 37a-d.**

Dacus (Zeugodacus) ubiquitous Hardy, 1973, *Pacif. Ins. Monogr.* **31**: 71. Type-locality: Mt Isarog, Camarines Sur, Luzon. Type in the B. P. Bishop Museum.

Fitting very near *calumniatus* Hardy, differing by having the costal band diffused apically, the brown coloring extending at least faintly through most of cell R_5 ; the 5th sternum of ♂ scarcely 1/2 wider than long and the 4th sternum distinctly wider

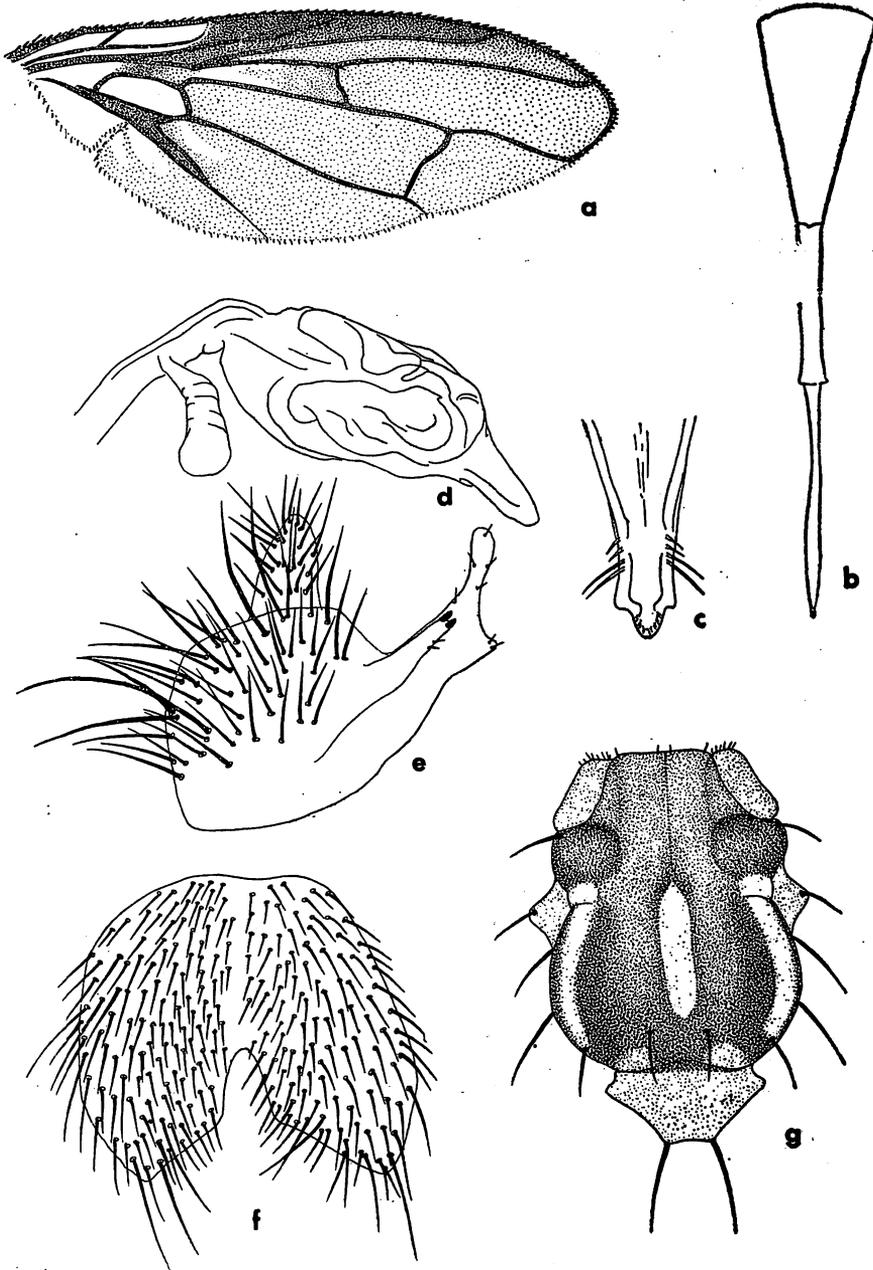


Fig. 36. *Dacus (Zeugodacus) trimaculatus* Hardy & Adachi: a. wing; b. ♀ ovipositor; c. apex of piercer; d. aedeagus; e. ♂ genitalia; f. 5th sternum of ♂; g. thorax, dorsal.

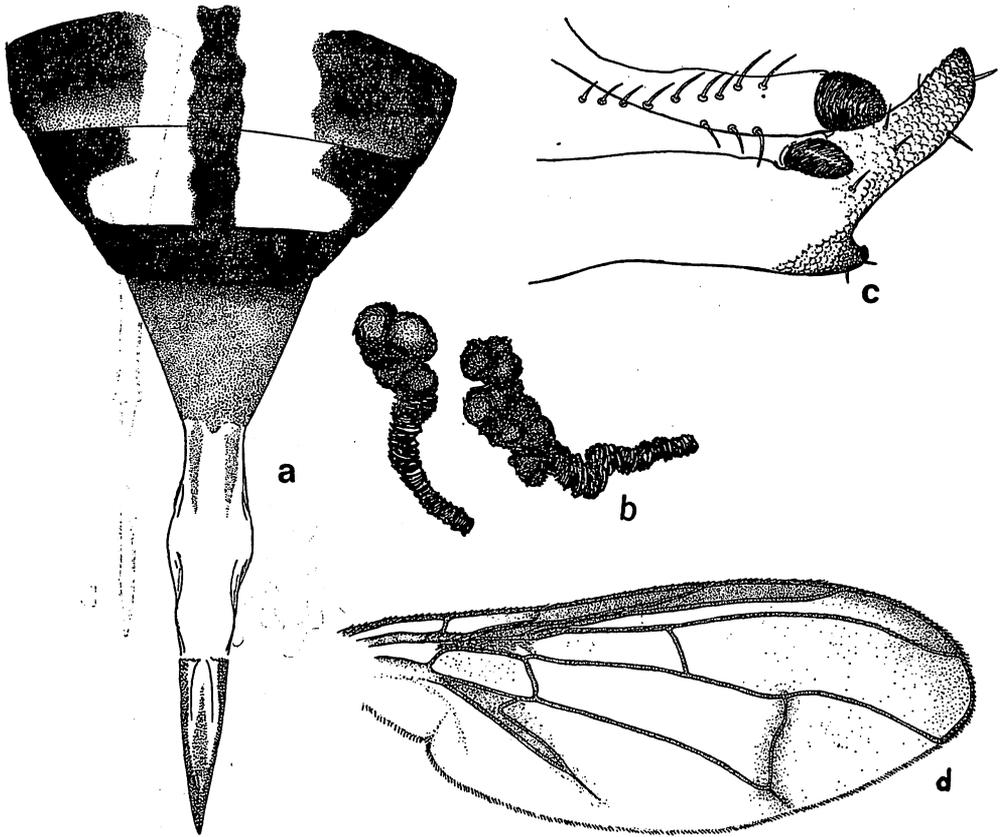


Fig. 37. *Dacus (Zeugodacus) ubiquitous* Hardy: a. ♀ abdomen; b. spermathecae; c. surstylus and 10th sternum of ♂; d. wing.

than long; surstyli rufous, with a small basal apical lobe developed and with the upper apical lobe much shorter than basal portion of surstylus (fig. 37c); compare with fig. 27b.

The species has been adequately described in the original. The wing markings and venation are as in fig. 37d. The ♂ genitalia are as in fig. 37c, ♀ ovipositor as in fig. 37a and spermathecae, fig. 37b.

Distribution: This species is obviously widespread over Southeast Asia and the South Pacific. Specimens have been seen from several localities on Luzon and Biliran Island, Philippines; also Thailand and New Ireland.

Genus *Monacrostichus* Bezzi

Monacrostichus Bezzi, 1913, *Philip. J. Sci.*, D 8: 322. Type-species: *citricola* Bezzi, by original designation.

This genus is differentiated from other Dacini by having a transverse depression or furrow connecting the lateral sutures on mesonotum; the presence of a transverse furrow across middle of face; lack of inferior fronto-orbital bristles; lack of a line of demarcation

around sides and hind margins of humeri; lack of inner scapular bristles; presence of 3 or 4 black posteroventral spines before apex of front femur; by the comparatively long 3rd costal section (subcostal cell) and short 4th section of costa (that section between apices of veins R_1 and R_{2+3}); by the strongly incurved basal section of vein M_{1+2} which greatly narrows the basal $3/4$ of cell 1st M_2 ; and by the abbreviated vein $Cu_1+1st A$ (pl. 1, fig. 8). The abdomen is petiolate and the antennae elongate with 1st segment almost equal in length to 2nd; in this regard fitting very near *Callantra* Walker. It is readily differentiated from *Callantra* by the transverse groove over mesonotum, by the row of spines on front femur, and by the wing venation. Other workers have considered the mesonotal suture as being complete; actually it is not but the lateral sutures are connected by a depression extending transversely over middle of mesonotum.

The genus contains only 1 known species.

***Monacrostichus citricola* Bezzi** Fig. 38a-g; pl. 1, fig. 8.

Monacrostichus citricola Bezzi, 1913, *Philip. J. Sci.*, D 8: 323. Type-locality: Los Banos, Laguna, Luzon. Lectotype ♂ in U. S. National Museum.

Distribution: Known from several localities on Luzon, Mindanao and Palawan. This species is very scarce in collections and is known from only 15 or 20 specimens.

Hosts: This breeds in citrus fruits. It has been reared from lime and pomelo.

A large conspicuous species, readily recognized by the generic characters given above. The species has been adequately described by Hardy & Adachi (1954: 198, fig. 30a-g). The head and antennae are shaped as in fig. 38b. Only 1 pair of fronto-orbital bristles present; these are superior fronto-orbitals. Arista comparatively short, subequal in length to 3rd antennal segment and bare except for some microscopic hairs near base. Mesonotum chiefly dark brown to black with a prominent yellow heart-shaped mark in middle of posterior portion (fig. 38a); with a pair of postsutural lateral yellow vittae extending from suture to beyond inner postalar bristles; yellow over the humeri and with a continuous yellow mark extending posteriorly on each side almost to suture. Scutellum yellow except for a rather broad brown band across base. Yellow mark over mesopleuron expanded dorsally and extending across entire top margin to humerus. Yellow spot on upper portion of each sternopleuron rather small, extending just a short distance posteriorly beneath pteropleuron. Metapleura and pleuroterga yellow. Metanotum and postscutellum polished black, tinged faintly with red and covered with gray pollen. Scutellum rather pointed, only 2 apical, scutellar bristles. Legs chiefly yellow to rufous, slightly discolored with brown on undersides of femora, coxae, and apical tarsomeres. Front femur as in fig. 38g, with 2 to 4 rather stout black posteroventral bristles before apex. Wings as in pl. 1, fig. 8, with a broad brownish yellow costal band filling cells anterior to vein R_{4+5} and extending a short way into cell R_5 beneath vein R_{4+5} . Vein $Cu_1+1st A$ extends only about $1/2$ the distance to wing margin. Abdomen distinctly club-shaped, 1st 2 segments narrow and almost parallel-sided, approximately $1/2$ as wide as remaining segments. First tergum largely yellow with apical portion brown to black. The 2nd tergum yellow except for a brown longitudinal band down middle which connects with the broad transverse band near apex of segment, forming a T. Terga 3 and 4 have brown to black bases and yellow apices. Fifth tergum narrows rather abruptly into an acute point at apex, is yellow in middle and at apex and black on sides and in middle of anterior margin. The 3rd tergum lacks rows of posterolateral hairs in ♂ and tergal glands are lacking on 5th tergum. Sterna yellow-brown. Fifth sternum almost $2\times$ wider than long, with a broad V-shaped concavity in middle of hind margin. Male genitalia as in fig. 38e; the surstyli are broad, blunt at apices and the 10th sternum is plainly visible from lateral view. Female ovipositor rather short. Basal segment as seen from dorsal view only about equal in length to 5th tergum. Measured on the venter it is 1.0 mm long. The pier-

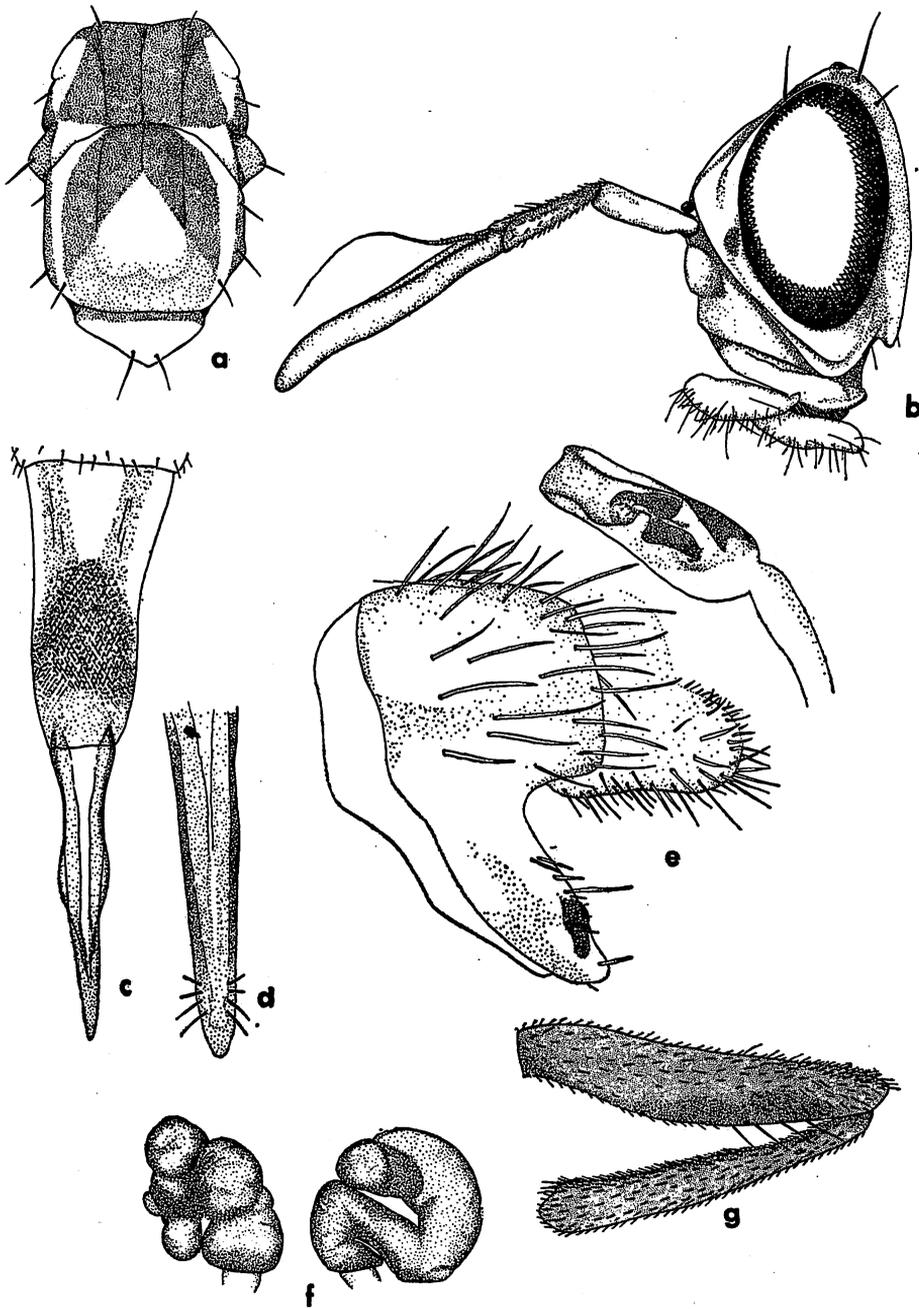


Fig. 38. *Monacrostichus citricola* Bezzi: a. thorax, dorsal; b. head, lateral; c. ♀ ovipositor; d. apex of piercer; e. ♂ genitalia; f. spermathecae; g. front femur and tibia.

cer is rather slender and evenly tapered to a sharp point at apex (fig. 38d); it measures 1.2 mm. Extended ovipositor (fig. 38c) 3.2 mm. Two spermathecae present; these are essentially like those of other Dacini but the tightly compressed coil is shorter and thicker (fig. 38f). Length: body, 8-10 mm; wings, 8-9 mm.

SUBFAMILY TRYPETINAE

Characterized by having the postocular setae thin and pointed, almost always dark brown or black; having a complete, or nearly complete set of head and thoracic bristles (except in Adramini); lacking the characteristics of Dacinae or Schistopterinae (refer to key to subfamilies, p. 4); vertical suture of mesonotum well developed, 6th tergum of ♀ shorter than 5th except in some genera of Euphrantini and Trypetini. The wings have a wide assortment of markings but are rarely spotted. The ♀♀ have 2 or 3 spermathecae.

The breakdown of the tribes is very artificial and much study is needed before we can understand the higher categories in this subfamily.

The recognition of a subfamily Ceratitinae, as used by Munro et al., or even a tribal status (Ceratitini by Hering et al.) for the group of genera which have the scutellum convex and the wings with prominent dark brown to black subbasal streaks (Ceratitis-like) does not appear tenable in treating Oriental genera. It seems most logical to consider the Oriental genera which have previously been placed under Ceratitini in the tribe Trypetini. The shape of the scutellum seems to intergrade to the point where a decision cannot be made on this character alone. Also the presence or absence of black streaks in the wing base and the body coloration are of questionable importance as higher category characters. One case in question, *Carpomyia vesuviana* A. Costa, has the scutellum slightly convex and the closely related *Myiopardalis* Bezzi has the scutellum flat; in other characteristics, however, the 2 are obviously related.

Based upon wing markings the genus *Anoplomus* Bezzi would fit "Ceratitini" and *Carpophthorella* Hendel is borderline in this regard (pl. 3, fig. 30 and pl. 4, fig. 31). The scutellum of these 2 genera shows a rather slight convexity as seen from lateral view but there is no measurable difference which will clearly set these apart from Gastrozonini and I think it much more logical to place *Anoplomus* and *Carpophthorella* in Gastrozonini. *Galbifascia* Hardy is the only known Philippine genus which has the scutellum distinctly convex; in this case it is short, approximately 2x wider than long and rounded as seen in lateral view. The wing markings (fig. 101a) are not *Ceratitis*-like and I prefer to treat this as a Gastrozonini.

KEY TO TRIBES OF TRYPETINAE FROM THE PHILIPPINES

- 1. A full complement of head and thoracic bristles present; always with dorsocentrals, almost always with sternopleurals and at least rudimentary ocellar bristles. Postorbital setae well developed.....2
- Chaetotaxy reduced, lacking ocellar, postocellar, dorsocentral, sternopleural, presutural and usually humeral bristles. Postocular setae small, poorly developed and inconspicuous. ...
.....**Adramini**
- 2. Pleuroterga bare, except for microscopic pubescence.....3
- Pleuroterga with abundant erect, fine hairs.....**Euphrantini**
- 3. Four (rarely 2) scutellar bristles present.....4
- Six or more scutellar bristles present or if secondary scutellars are rudimentary the wings

- are dark brown with hyaline wedges on margins and the body not polished black.
 Female with 3 spermathecae. **Acanthonevrini**
4. Arista pubescent or bare.5
 Arista long plumose or pectinate. Female with 2 spermathecae. (Note: *Freyomyia*, n. gen. and *Paracanthonevra*, n. gen., Acanthonevrini, will run imperfectly here. Refer to description and figures). **Gastrozonini**
5. Thorax and abdomen polished black, wings predominantly dark brown, with hyaline wedges on anterior and posterior margins (pl. 2, fig. 18). **Aciurini**
 Not as above, wings variously marked (fig. 110, 111, 112a, 113, 115 and 118c). **Trypetini**

TRIBE ACANTHONEVRINI

Characterized by typically having 6 scutellar bristles, but sometimes (*Xarnuta* Walker) having 8 or 10 scutellars or rarely having only 4 (*Paracanthonevra*, n. gen., *Freyomyia*, n. gen. and some *Sophira* Walker); or with secondary scutellars sometimes rudimentary (some species of *Acanthonevra* Macquart). Arista plumose except in *Paracanthonevra*. Female with 3 spermathecae. Wings often predominantly dark brown with hyaline wedges on margins (fig. 43a); if secondary scutellars are rudimentary or lacking the wings are this way.

The relationships of Acanthonevrini and Gastrozonini are not understood, detailed biological data are needed.

KEY TO GENERA OF ACANTHONEVRINI IN THE PHILIPPINES

1. Usually 6 pairs of scutellar bristles present, or the secondary scutellars may be small or rarely absent.2
 Ten scutellar bristles present. Densely short, black setose species. Aristae short pubescent. Wings entirely dark brown except for hyaline apex of cell R. (fig. 56a). Middle tibia with 2 apical spurs. **Xarnuta** Walker
2. Sternopleural bristles well developed.3
 Sternopleurals absent.9
3. Only veins R_1 and R_{4+5} setose above.4
 Vein M_{3+4} and the straight portion of Cu also setose. Vein R_{2+3} undulate, with markings as in pl. 2, fig. 16. Head broad, eyes of ♂ usually stalked. **Themara** Walker
4. Mesopleuron not with a bristle on lower median portion. Wings normal in shape.5
 Mesopleuron with a prominent bristle near lower edge centrally. Wings broad, about 2× longer than wide, *Platensina*-like (fig. 41a, 42f). **Hexacinia** Hendel
5. Only 1 strong apical spur on middle tibia.6
 Two strong subequal apical spurs on mid-tibia. A large white mark covers scutellum and hind portion of mesonotum. **Diarrhegma** Bezzi
6. Two or 3 pairs inferior fronto-orbital bristles. Wings as in fig. 43a and 55b.7
 One pair inferior fronto-orbitals. Subcostal cell as long as 2nd costal. Mesonotum sometimes with brownish vittae but not with isolated black spots. **Acanthonevra** Macquart, sens. lat.
7. Two pairs inferior fronto-orbitals; arista long plumose; 6 scutellar bristles.8
 Three pairs inferior fronto-orbitals; arista short plumose. Wing as in fig. 43a; only 4 scutellar bristles. Female ovipositor forked at apex (fig. 43e). **Paracanthonevra**, n. gen.
8. Subcostal vein not convex. Subcostal cell 1/2 to 2/3 as long as 2nd costal cell. Vein R_1

- ends about opposite r-m crossvein. Yellow species with prominent black markings on thorax and abdomen. Wings with 3 oblique crossbands (fig. 55b). Vertical plates short, superior fronto-orbitals confined to upper 1/3 of front. Arista with ventral rays.
**Tritaeiapteron** de Meijere
- Subcostal vein arched upward. Subcostal cell longer than 2nd costal cell. R_1 ends about opposite m crossvein except in ♀♀ of some species. Veins R_{4+5} and M_{1+2} divergent at apices. At least abdomen mostly black, not yellow with black crossbands. Wings brown with hyaline spots mostly in margin. Vertical plates rather long, arista bare ventrally. ...
**Rioxa** Walker
9. Six scutellar bristles and 2 pairs inferior fronto-orbitals. Vertical plates rather short, lower superior fronto-orbitals on upper 1/3 of front. Head as high as wide as seen from frontal view.....**Sophira** Walker
- Only 4 scutellars and 1 pair of inferior fronto-orbitals. Vertical plates elongate, lower superior fronto-orbitals at middle of front. Head 1/2 to 2/3 wider than high (fig. 40). Wings as in pl. 1, fig. 10.**Freyomyia**, n. gen.

Genus *Acanthonevra* Macquart

Acanthonevra Macquart, 1843, *Mem. Soc. Sci. Lille* 1842: 377, pl. 30, fig. 1A-B. Type-species: *fuscipennis* Macquart, by monotypy. Type-locality: Bengal. Type ♀ in Natural History Museum, Paris.

Acanthonevra: Schiner, 1868, *Reise Novara, Dipt.*, p. 228. Invalid emendation of *Acanthonevra*.

Rioxoptilona Hendel, 1914, *Wien. Ent. Ztg* 33: 78. Type-species: *Trypeta vaga* Wiedemann, by original designation.

As discussed in my monograph of the fruit flies of Thailand and surrounding countries (1973), the concept of this genus has been greatly confused in the literature. Much of this confusion has resulted from the misidentification of the type of the genus by Bezzi (1913a: 117). The type in the Natural History Museum, Paris is distinctly different from the species which Bezzi described as *fuscipennis* and the 2 do not appear to be congeneric. Bezzi described vein M_{3+4} as bristly and he very probably was dealing with a *Themara*, very likely *maculipennis* (Westwood).

Acanthonevra differs from other members of the tribe by having only 1 pair of inferior fronto-orbital bristles; the subcostal cell equal in length to 2nd costal; ocellar bristles rudimentary; and dorsocentral bristles situated distinctly behind anterior supraalar. In much of the previous literature the genus has been characterized as having vein R_{2+3} wavy. The previous concept implied that R_{2+3} was undulated in *Acanthonevra* and straight or nearly so in *Rioxoptilona*. As I have discussed in the monograph on Thailand fruit flies (1973) the amount of curvature of vein R_{2+3} is extremely variable and so much intergradation occurs that it is unreliable to use as a generic distinction in this particular case. Also it appears that the measurements of the 4th and 5th costal sections, the up-curve of vein R_{2+3} and other characters of the wing venation which I have compared are of no value in separating *Acanthonevra*. Malloch (1939: 417) differentiates the genus by having "setulae on first vein, not extending over node above" and in *Rioxoptilona* having "setulae on the first vein extending the entire length of the node above." Actually in the type of the genus, as well as in most species I have examined, the apical portion of the node has setae as in typical *Rioxoptilona*. I see no value in this character. Chen (1943: 84) stated that *Rioxoptilona* have 2 pairs of inferior fronto-orbitals bristles. This is not correct.

This is a large genus, approximately 4 dozen species have been described from the Oriental, Australasian and Pacific regions.

Only 1 species is presently known from the Philippines. Several have been recorded in the literature but these have now been moved into other combinations.

***Acanthonevra setosifemora* Hardy, new species** Fig. 39a-b; pl. 1, fig. 9.

Fitting near *A. inermis* Hering, from South India, but differing by having the thorax yellow with 4 faint brown vittae extending over mesonotum, rather than having the mesonotum yellow-brown, lacking vittae; by having 3rd abdominal tergum dark brown to black with a very narrow yellowish hind margin, not with 2 large black spots, leaving a triangular yellow spot in middle of hind margin; base of radial cell hyaline, not brown. The course of vein R_{2+3} is quite different, the apical portion beyond the concavity, directly above m crossvein, is straight or nearly so (pl. 1, fig. 9), rather than entering costa obliquely (refer to fig. 6, Hering 1951: 9); 1 elongate hyaline streak extends through apical portion of 1st M_2 , not with 2 hyaline spots; and the wedge from costa through cell R_1 extends to vein R_{4+5} , rather than ending in upper median portion of cell R_3 .

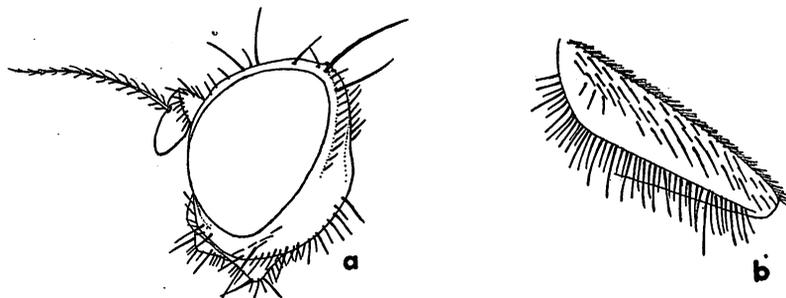


Fig. 39. *Acanthonevra setosifemora*, n. sp.: a. head, lateral; b. front femur.

♂. **Head:** Slightly higher than long with the occiput moderately swollen, at widest point slightly over 1/2 the width of eye. Yellow, tinged with brown on upper portion of occiput and with a faint brownish tinge in ground color of front. Face slightly concave as seen from lateral view. Head shape and bristle arrangement as in fig. 39a. Vertical plates elongate, anterior superior fronto-orbital bristles situated at middle of front. Third antennal segment tinged faintly with brown on apical 2/3, approximately 2× longer than wide, broadly rounded at apex. Arista long plumose. **Thorax:** Predominantly yellow with 4 faint brown vittae extending down mesonotum. Pleura entirely yellow except for a tinge of brown on lower portion of each metapleuron. Tinged with brown on pleuroterga, on sides of scutellum, on sides of metanotum, and sides of post-scutellum. Also a small shining black spot present on each posterior lateral margin of mesonotum above wing base. **Legs:** Yellow, rather densely covered with short black setae and with front femora distinctly swollen, densely long haired ventrally (fig. 39b), as is typical of many species of *Acanthonevra*. **Wings:** As in pl. 1, fig. 9. With hyaline mark in cell R_1 extending to vein R_{4+5} , and with prominent hyaline spots in cell R_3 , both before and after the r-m crossvein. R_{2+3} conspicuously curved, with the extreme apical portion almost straight. **Abdomen:** First tergum, narrow base and rather broad apex of 2nd, and narrow apex of 3rd, yellow, otherwise shining dark brown to black; The genitalia have not been relaxed for study.

Length: body and wings, 6.0-6.25 mm.

♀. Unknown.

Holotype ♂ (BISHOP 10131), Mt Empagatao, Misamis Or., Mindanao, 1050-1200 m, 19-30.IV.1961, in light trap, H. M. Torrevillas. One ♂ paratype, Minalwang, Misamis Or., Mindanao, 1050m, 24.III-4.IV.1961, H. M. Torrevillas.

Type returned to the B. P. Bishop Museum. Paratype in University of Hawaii collection.

Genus *Diarrhegma* Bezzi

Diarrhegma Bezzi, 1913, *Mem. Indian Mus.* 3: 108. Type-species: *Dacus modestus* Fabricius, by original designation.

Readily differentiated from other *Acanthonevrini* by the predominantly brown wings with hyaline wedges on margins, in combination with the presence of 2 large apical spurs on middle tibia; rudimentary ocellar bristles; r-m crossvein near apical 2/3 of cell 1st M_2 and subcostal cell short, scarcely 1/2 as long as 2nd costal cell.

Only 1 species is known from the Philippines.

Diarrhegma modestum (Fabricius)

Dacus modestus Fabricius, 1805, *Syst. Antliat.*, p. 278. Type-locality: Bengal, India. Lectotype ♂ in University Zoological Museum, Copenhagen.

Trypeta incisa Wiedemann, 1824, *Analecta Ent.*, p. 53. Type-locality: Bengal, India.

Tephritis paritii Doleschall, 1856, *Natuurk. Tijds. Ned.-Ind.* 10: 412, pl. 1, fig. 2. Type-locality: Amboina. Lectotype ♂ in Hungarian National Museum, Budapest.

Differs from all other known Philippine Tephritidae by having a white mark covering scutellum and hind portion of mesonotum. It has been adequately described and figured in my study of fruit flies of Thailand and bordering countries (Hardy 1973).

The species is widespread over the Oriental Region. Specimens are in the Bezzi collection from Dapitan and Port Banga, Mindanao and I have also seen it in the Field Museum, Chicago from Brooke's Point, Palawan, 29.IV.1947, F. G. Werner.

Genus *Freyomyia* Hardy, new genus

One species on hand would run to *Sophira* Walker because of the lack of sternopleural bristles. The head bristles are very similar to those of *Acanthonevra* because of the presence of only 1 pair of inferior fronto-orbitals situated at middle of front. It differs from *Acanthonevra* by lacking sternopleural bristles and having only 4 scutellars. Also the front femora are slender, sparsely setose and the head is comparatively broad, from frontal view 1/2 to 2/3 wider than high with genae broad and lower margin of each eye truncate (fig. 40).

Type-species: *Freyomyia bivittata*, n. sp.

Freyomyia bivittata Hardy, new species Fig. 40; pl. 1, fig. 10.

Superficially resembling *Sophira medioflava*, n. sp., but differing by having only 1 pair inferior fronto-orbital bristles, the posterior portion of mesonotum shining black and with 2 dark brown to black submedian vittae over mesonotum; by the long vertical plates, broad head, broad genae, only 4 scutellar bristles; also posterior 1/3 of pleura

brown and the wing markings distinctly different, with the hyaline wedge from costal margin in cell R_1 , beyond vein R_1 extending to vein M_{1+2} , and other wing markings differ as in pl. 1, fig. 10.

♂. Head: Yellow except for dark brown eyes and except for a brown crescent-shaped mark on lower front above suture. Head comparatively broad, as seen in direct frontal view $1/2$ to $2/3$ wider than high with the face very broad and flattened, slightly protruded just above epistoma. Front approximately as wide as long. Eye just slightly higher than long, straight on lower margin. Genae comparatively broad, almost equal to $1/2$ the eye height (fig. 40). Occiput moderately swollen on lower portion, at widest point about $3/5$ width of eye. Only 1 pair inferior fronto-orbital bristles, situated on lower $1/4$ of front. Two pairs superior fronto-orbital bristles and with vertical plates elongate so lower superior fronto-orbitals are located at or below middle of

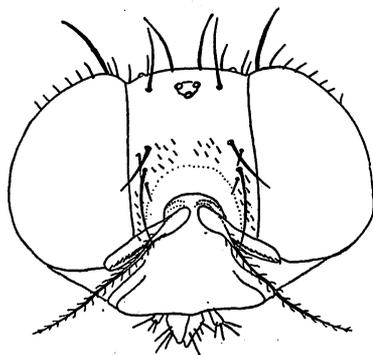


Fig. 40. *Freyomyia bivittata*, n.
gen. & sp.: head, front view.

the front. Antennae yellow, 3rd segment approximately $3\times$ longer than wide, rounded at apex. Arista long plumose. Palpi entirely yellow, with yellow setae around margins. **Thorax:** Predominantly yellow with a pair of complete, dark brown to black, submedian vittae extending from anterior to posterior margins, and with the posterior margin of mesonotum entirely dark brown to black. Also posterior $1/3$ of pleura dark brown to black; this coloration extending over pteropleura and sides of metanotum with median portion of metanotum yellow, tinged with brown. Scutellum and postscutellum pale yellow. Four strong scutellar bristles and no evidence of secondary bristles present. A few sparse brown setae scattered over disc of scutellum. Thorax with usual complement of bristles except for lack of sternopleurals, also lacking pteropleural bristles and possessing only 1 mesopleural. Dorsocentral bristles situated about $1/3$ the distance between inner postalar and supraalar bristles. **Legs:** Entirely yellow, femora slender, rather inconspicuously yellow setose but lacking black or dark brown hairs except for 3 posteroventral bristles near middle of front femora. Front tibia with a row of short, thick, black, ventral spines extending from near basal $1/4$ to about apical $3/4$ of segment. Middle tibia with 1 strong apical bristle. **Wings:** With markings and venation as in pl. 1, fig. 10. Vein R_{4+5} setose almost its entire length. **Abdomen:** With 1st tergum, base of 2nd and median portions of 3rd, 4th and 5th terga, plus medioapical portion of 2nd yellow, otherwise shining black. Sterna rufous. Genitalia predominantly brown to black; these have not been relaxed for study.

Length: body and wings, 7.0–7.25 mm.

♀. Unknown.

Holotype ♂ (BISHOP 10132), Agusan, Los Arcos, Mindanao, 19–23.XI.1959, C. M. Yoshimoto.

Type in B. P. Bishop Museum.

Genus *Hexacinia* Hendel

Hexacinia Hendel, 1914, *Wien. Ent. Ztg* **33**: 82; 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* **13**: 459.

Type-species: *Acinia stellata* Macquart, 1851 (nec Macquart, 1843), by original designation. *H. radiosa* (Rondani) is a replacement name.

This genus is differentiated from other Acanthonevrini by having a well developed

bristle near lower central margin of each mesopleuron; wings broad, *Platensina*-like, about 2× longer than wide and predominantly brown with hyaline spots around the margin and scattered over the field (fig. 41a). The head has 2 pairs inferior fronto-orbital bristles situated near lower edge of front, the lower bristle in-curved and upper bristles reclinate, rather widely separated from superior fronto-orbital bristles. Female with 3 spermathecae.

Four species are presently known in this genus plus 1 (*palpata* Hendel) which has been placed in *Parahexacinia* Chen. These range over Southeast Asia, through New Guinea and the Bismarcks.

KEY TO KNOWN SPECIES OF HEXACINIA

1. Mesonotum not vittate, apex of cell R hyaline.2
 Mesonotum with 6 dark brown vittae. No hyaline mark at apex of cell R₅. Formosa. Type of *Parahexacinia* Chen (1948: 121; refer to fig. 12, Zia 1927: 143). Note: Malloch (1939: 438) misspelled this "*palposa*."**palpata** Hendel
2. The sides of metanotum brown to black, or sometimes all yellow. Brown spots on thorax rather inconspicuous, lacking prominent brown spots on lateromedian portion of mesonotum and on margins of scutellum. Only 2 hyaline spots in cell R₁, counting the 1 at apex of vein R₁.3
 Hind portions of metanotum and postscutellum each with a brown to black spot on each side. Thorax with conspicuous dark brown to black markings, 7 large spots arranged in 2 rows on each side of mesonotum. Usually 3 hyaline marks in cell R₁, median spot sometimes lacking. New Guinea, Indonesia and New Britain. *H. multipunctata* Malloch is a synonym (refer to Hardy 1959: 202). *H. flavipunctata* Hering (1940, Siruna Seva 2: 8) from Amboina would fit here and may be a synonym.**punctifera** (Walker)
3. Subhyaline spots in wing field small, usually tiny round spots which are only a fraction of the width of the cell (fig. 42f).4
 Spots in wing field comparatively large, consisting mostly of transverse elongated spots equal or nearly equal to width of cell (fig. 41a). Philippines.**pellucens** Hardy
4. Antennae entirely yellow. Marginal wing spots small, mostly triangular in shape. Mark at apex of cell R₅ narrow, 3-4× wider than long and usually filling all of cell. Spot on each side of hind margin of mesonotum small, inconspicuous. Philippines, Indonesia. *H. celebensis* Hering and *stigmatoptera* Hendel are **new synonyms**. **stellipennis** (Walker)
 Apical 1/2 of antenna brown to black. A prominent brown to black spot present on each side of posterior margin of mesonotum, immediately in line with dorsocentral bristles. Marginal wing spots large, rather quadrate, scarcely longer than wide. Spot at apex of cell R₅ not filling cell. Philippines and Ceylon, probably widespread. *H. nigroantennata* Hering from Ceylon is a synonym.**radiosa** (Rondani)

Hexacinia pellucens Hardy Fig. 41a-e.

Hexacinia pellucens Hardy, 1970, *Ent. Meddel.* 38: 79. Type-locality: Tinabog, Palawan. Type ♂ in B. P. Bishop Museum.

This species is readily differentiated from all known *Hexacinia* by having the spots over the wing comparatively large, consisting mostly of transverse, elongated subhyaline marks equal or nearly equal to width of cells (fig. 41a). It is related to *stellipennis* (Walker) but that species has the spots in the wing field tiny, round, only a fraction of the width of the cells.

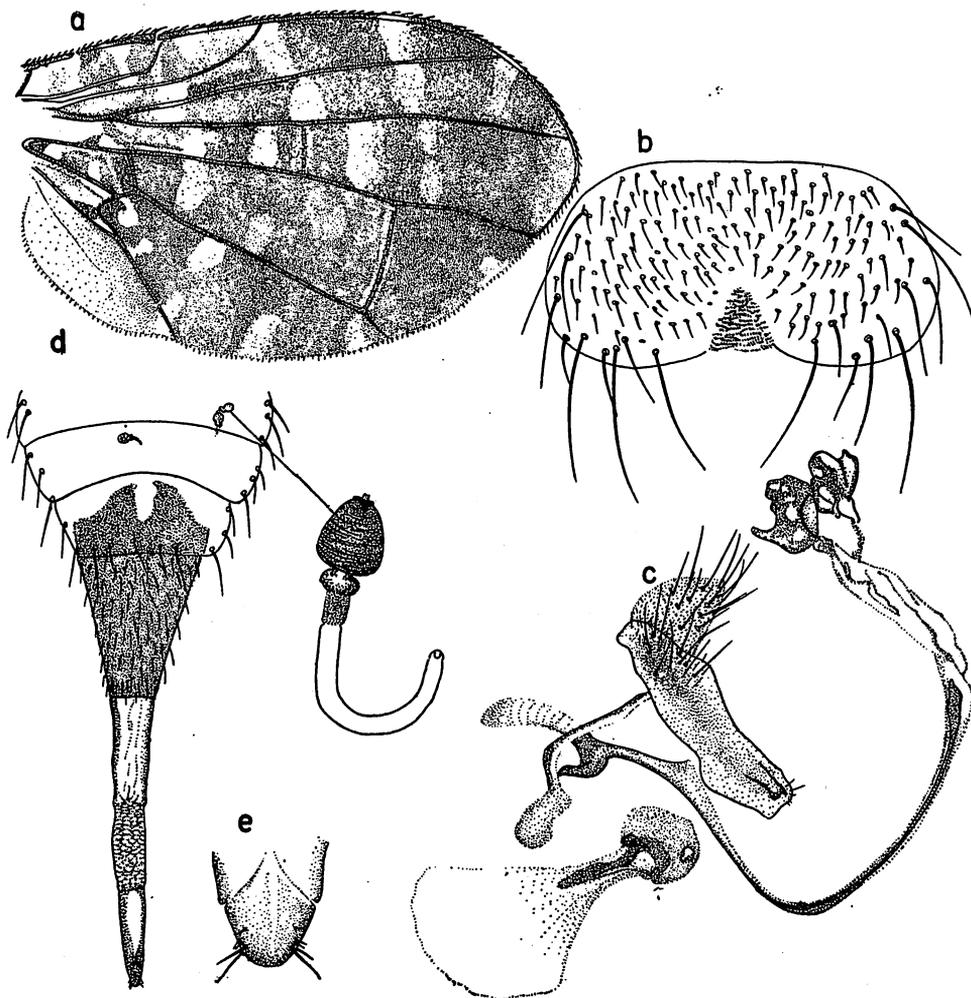


Fig. 41. *Hexacinia pellucens* Hardy: a. wing; b. 5th sternum of ♂; c. ♂ genitalia; d. ♀ ovipositor and spermathecae; e. apex of piercer.

An almost all-yellow species with sides of metanotum brown to black, lacking conspicuous brown spots on mesonotum and with small spots of brown at bases of scutellar bristles. Refer to original description for more complete details. Wings as in fig. 41a. Fifth sternum of ♂ as in fig. 41b and ♂ genitalia as in fig. 41c. Female ovipositor as in fig. 41d and 41e.

This species is obviously widespread throughout the Philippines; it has been recorded from numerous localities on Luzon, Mindoro, Mindanao, Palawan, Sibuyan, and Negros.

***Hexacinia radiosa* (Rondani)**

Acinia radiosa Rondani, 1868, *Ann. Soc. Nat. Modena* 3: 31. Replacement name of *stellata* Macquart,

1851, nec 1843.

Acinia stellata Macquart, 1851, *Mem. Soc. Sci. Lille* 1850: 266, pl. 17, fig. 7. Type-locality: Manila. Type in Bigot collection, Oxford, England.

Hexacinia nigroantennata Hering, 1956, *Verh. Naturf. Ges. Basel* 67: 70, fig. 4. Synonymy based upon a study of type ♀ from Ceylon, in Natural History Museum, Basel and the type ♀ of *stellata* from Manila, in the Bigot collection at Oxford. Refer to Hardy (1973).

This species fits near *stellipennis* (Walker) from the Philippines and Indonesia, and is differentiated by having the apical 1/2 of antenna brown to black, rather than entirely yellow; by having a prominent brown to black spot present on each side of posterior margin of mesonotum; immediately in line with dorsocentral bristles; by having marginal wing spots enlarged, rather quadrate, scarcely longer than high and the spot at apex of cell R_5 not filling the cell. Refer to description of *stellipennis* for the characteristics of that species.

A predominantly yellow species with small dark brown to black spots on each side of face, and thorax with a brown spot immediately above humerus and with a brown spot at edge of humerus extending to upper portion of propleuron. With lateral cervical sclerites dark brown to black on lower margins. A small black spot is present just beyond suture behind presutural bristles; also 2 small spots on metanotum and 1 brown spot on mesonotum at wing base, in addition to the prominent brown marks on posterolateral portions of mesonotum behind and between prescutellar and posterior supraalar. Five or 6 brown spots are present in a line along upper edge of each pleuron, 1 on propleuron, 2 on mesopleuron, 1 each on pteropleuron and metapleuron. One brown spot present near lower edge of pteropleuron, a spot on anterodorsal, and 1 near posterodorsal margins of sternopleuron; also with a brown spot at middle of hypopleuron. Sides of metanotum and postscutellum brown, median portion yellow. Other details as described and figured by Hardy (1973).

Widespread over Southeast Asia.

It should be noted that Enderlein (1911: 433) placed *Trypeta stellipennis* Walker and *Sophira punctifera* Walker as synonyms of *Acinia stellata* Macquart. This is not correct. Refer to Hardy (1959: 202, 204).

Hexacinia stellipennis (Walker) Fig. 42a-f.

Trypeta stellipennis Walker, 1860, *J. Proc. Linn. Soc. Zool.*, Lond. 4: 159. Type-locality: Macassar, Celebes. Type ♂ in British Museum (Nat. Hist.).

Hexacinia stigmatoptera Hendel, 1928, *Ent. Mitt.* 17: 353. **New synonym.** Type-locality: Luzon. Type in U. S. National Museum.

Hexacinia celebensis Hering, 1941a, *Siruna Seva* 3: 22, fig. 18. **New synonym.** Type-locality: Celebes. Type in Zoological Museum, Berlin.

I am unable to find any difference which I would consider significant for separating *stigmatoptera* and *celebensis* from *stellipennis* and consider these synonyms. Hering's type of *celebensis* does have an extra (median) tiny hyaline mark on costa in cell R_1 , but I do not consider this a significant difference. I have compared a good series of specimens from the Philippines (*stigmatoptera*) with the type of *celebensis*. I do find some differences in the arrangement and intensity of the spots on the thorax but those specimens with paler spots are obviously teneral. The type of *stellipennis* has a faint indication of the median costal pale mark in cell R_3 (at about 1/3 the distance from apex of vein R_1 to R_{3+3}) on the right wing and the costal vein is pale at this point; the left wing has 2 spots in cell R_3 . Except for the slight difference in wing markings, which

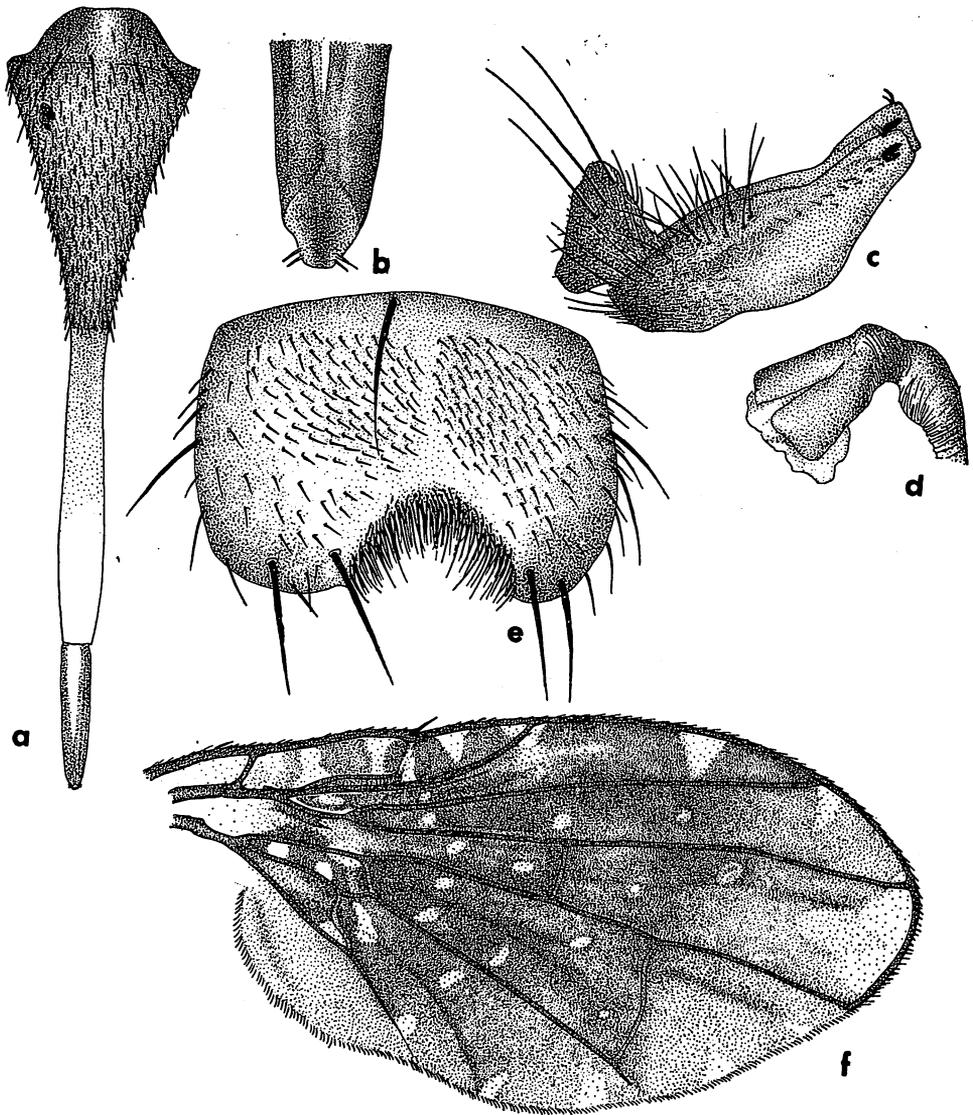


Fig. 42. *Hexacmia stellipennis* (Walker): a. ♀ ovipositor; b. apex of piercer; c. ♂ genitalia, lateral; d. apex of aedeagus; e. 5th sternum of ♂; f. wing.

I do not consider of any importance, Walker's type fits Hering's description of *celebensis* in all respects. Hering had indicated that there were no round spots on the mesonotum or sternopleura. His type ♂ in Zoological Museum, Berlin, may have been slightly teneral and the spots are very faint. Walker's type has 1 brown spot on posteroventral portion of mesopleuron and 1 on posteromedian of sternopleuron.

H. stellipennis fits near *radiosa* (Rondani) but is differentiated by the marginal

wing spots being small (fig. 42f), mostly triangular in shape and the mark at apex of vein R_5 narrow, $3/4$ wider than high and usually filling all of the apex of the cell. The spot on each side of hind margin of mesonotum is small, rather inconspicuous. The 5th sternum of σ has a dense patch of black setae on posteromedian margin as in fig. 42e, and the σ genitalia are as in fig. 42c-d. The epandrium is slender and the surstyli are truncate at apices. Abdomen predominantly yellow with sides broadly brown and with a pair of submedian brown spots on each tergum. Female ovipositor base brown, as seen from dorsal view approximately equal in length to terga 4-6. Measured on venter basal segment approximately 1.8 mm. Piercer very short, blunt at apex (fig. 42b), 0.75 mm long. The extended ovipositor (fig. 42a) 4.2 mm.

Widespread throughout the Philippines, having been seen from numerous localities on Luzon, Mindanao, Negros, Panay and Tawitawi.

Genus *Paracanthonevra* Hardy, new genus

Superficially resembling *Acanthonevra* but with the aristae very short plumose; 3 pairs of inferior fronto-orbital bristles; subcostal cell short, about $1/2$ as long as 2nd costal; only 4 scutellar bristles; and ♀ ovipositor short with piercer forked at apex (fig. 43e). Female with 3 spiny spermathecae.

Type-species: *Paracanthonevra boettcheri*, n. sp.

Paracanthonevra boettcheri Hardy, new species Fig. 43a-e.

Differing from all known *Acanthonevrini* by the characters given below. This specimen was in the Frey collection, Helsinki, under the manuscript name "*Acanthonevra boettcheri*."

♀ . *Head*: Yellow except for reddish brown eyes, almost $2\times$ higher than long with eyes oblong and occiput only slightly swollen on lower portion, at widest point scarcely over $1/3$ width of eye (fig. 43b). Face gently concave in median portion as seen from direct lateral view. Three pairs strong inferior fronto-orbitals and 2 pairs superior fronto-orbitals. Vertical plates rather short, lower superior fronto-orbital about opposite upper inferior fronto-orbital and located near upper $1/3$ of front. Ocellar bristles rudimentary, about $2\times$ longer than frontal setae. Median portion of front with numerous erect, short black setae. Antennae yellow, 3rd segment approximately $3\times$ longer than wide, rounded at apex. Arista short plumose (fig. 43b). *Thorax*: Predominantly yellow, with anterior $1/3$ including front portion of mesonotum, humeri, propleura and anterior margins of mesopleura yellow, also lateral margins of mesonotum yellow but with posterior $2/3$ to $3/4$ of pleura largely brown and posterior $2/3$ of mesonotum brown, also tinged with brown over the notopleura. Entire mesonotum rather densely gray pollinose and thickly covered with short yellow recumbent setae, with short black setae on humeri and scattered along sides of mesonotum. Scutellum entirely yellow, bare except for 4 large scutellar bristles. Postscutellum and metanotum dark brown. The usual complement of thoracic bristles present with the dorsocentrals situated approximately $1/2$ the distance between the supraalars and the inner postalars. Sternopleural bristles well developed. *Legs*: Yellow, tinged with brown on front femur with a row of prominent, black posteroventral bristles. Middle tibia with 1 strong apical spine. Hind tibia with a row of short, erect, brown anterior setae. *Wings*: With markings and venation as in fig. 43a. Apical $1/2$ of wing entirely dark brown except for a large hyaline spot in cell 1st M_2 directly beneath r-m crossvein. A small hyaline spot is present near apical portion of 1st costal cell, a large quadrate spot is present in middle of 2nd and a wedge-shaped hyaline mark is present in cell R_1 just beyond subcostal vein extending into upper $2/3$ of cell R_3 . Also a small hyaline spot

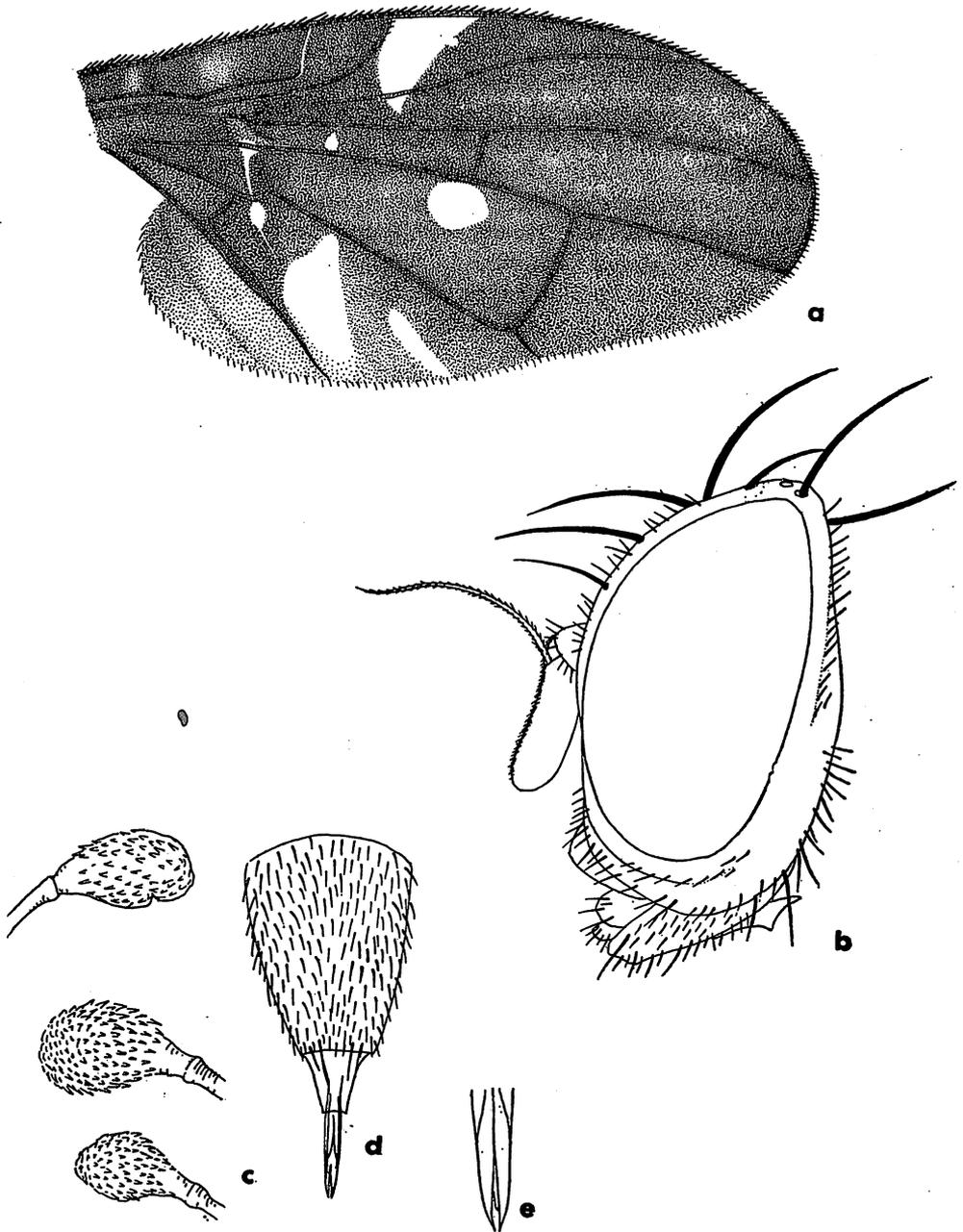


Fig. 43. *Paracanthonevra boettcheri*, n. gen. & sp.: a. wing; b. head, lateral; c. spermathecae; d. ♀ ovipositor; e. apex of piercer.

is present near basal portion of cell R_5 and a pair of hyaline streaks extend through cell M_1 . Subcostal cell scarcely over $1/2$ as long as 2nd costal. Vein R_{2+3} gently curved. Vein R_{4+5} setose to about level with the m crossvein and M_{3+4} bare. *Abdomen*: Yellow with a narrow brown band along apical margin of each tergum except the 1st. Thickly short black setose and with a row of about 8 strong bristles on hind margin of 6th tergum. Sixth tergum about $2/3$ as long as 5th. Ovipositor (fig. 43d) yellow, tinged with brown on apex of basal segment. Basal segment thickly black setose and with 4 apical bristles on dorsal margin and 2 apical bristles on ventral margin. As seen from dorsal view, the basal segment approximately equal in length to terga 5+6. Measured on the venter, the basal segment is 1.0 mm long. The piercer is also approximately 1.9 mm long and is forked at apex (fig. 43e). The inversion membrane has not been extended. The ovipositor of the specimen at hand is as in fig. 43d; when fully extended it probably measures 3.0 mm. Three spiny spermathecae present (fig. 43c).

Length: body, 5.5 mm; wings, 5.0 mm.

♂. Unknown.

Holotype ♀, Antimonan (equals Atimonan), Luzon, XI.1915, Frey collection, Helsinki. Type returned to University Zoological Museum, Helsinki.

***Paracanthonevra dubia* Hardy, new species** Fig. 44.

One ♂ specimen on hand appears to fit *Paracanthonevra* except that the lobe at apex of cubital cell is short. The wing markings are very different in the 2 species and it is probable that when a ♀ of *dubia* is studied this will prove to belong to a distinct genus.

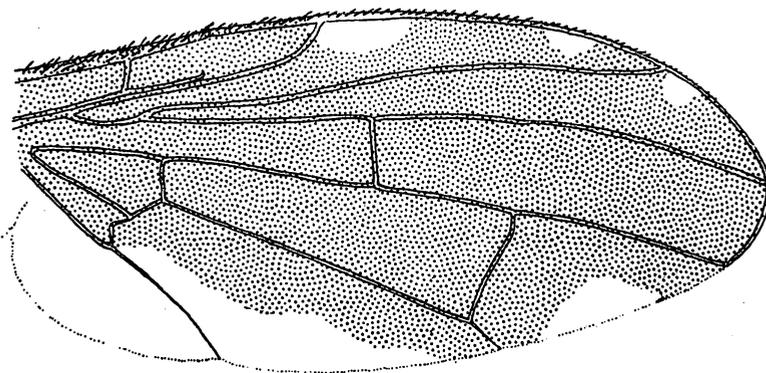


Fig. 44. *Paracanthonevra dubia*, n. sp.: wing.

♂. *Head*: Yellow except for the reddish brown eyes, slightly higher than long as seen in direct lateral view, with the lower occiput only slightly swollen, at its widest point about $1/3$ the eye width. Eyes oval, almost $1/2$ higher than long. Face almost vertical with the epistomal margin slightly protruded and the antennal furrows shallow. Genae narrow, scarcely $1/8$ as wide as the eye height. Three pairs strong inferior fronto-orbital bristles and 2 pairs of superior fronto-orbitals, the latter confined to upper $1/4$ of front. Front with numerous short, erect, black setae scattered over median portion and along sides. Antennae yellow, 3rd segment $3\times$ longer than wide, rounded at apex. Arista broken on specimen at hand. Palpi yellow with short setae around margins. *Thorax*: Yellow to rufous, distinctly marked with brown only on metanotum and postscutellum. Rather densely gray pollinose and thickly covered with short recumbent yellow setae over dorsum, except for some short dark erect setae on posterior portion of mesonotum.

Scutellum flat, with 4 strong bristles and no evidence of secondary bristles and with scattered pale setae on disc and on margins. The usual complement of thoracic bristles present, with dorsocentrals situated just slightly in front of a line drawn between inner postalar. *Legs*: Entirely reddish yellow, rather thickly reddish brown setose and with about 8 reddish brown posteroventral bristles extending almost entire length of segment. Hind femur with a row of erect, brown, anterior setae extending over basal 1/2 of segment and middle tibia with a row of anteroventral setae near median portion. Middle tibia with 1 strong apical spur and 6 short dark brown to black apical setae. Also middle tibia with 2 short thick setae on posterior surface near apical 2/3 of segment. *Wings*: Entirely dark brown except for subhyaline marks in costal cells, a prominent hyaline spot in cell R_1 just beyond end of vein R_1 and another smaller spot on margin before apex of cell R_1 ; also with a small hyaline marginal spot in cell R just beyond apex of vein R_{2+3} and the apicomedian portion of cell 2nd M_2 and the posterior margin of wing hyaline (fig. 44). Subcostal cell comparatively short, about 3/5 as long as 2nd costal. Vein R_{2+3} straight, vein R_{4+5} with scattered setae extending almost to a level with m crossvein. Cubital cell with a very short apical lobe. *Abdomen*: Rufous, tinged faintly with brown, subshining, rather thickly gray-brown pollinose. Fifth tergum with a row of about 16 bristles arranged around margin. Sterna yellow to rufous. The genitalia have not been studied.

Length: body and wings, 6.0-6.25 mm.

♀. Unknown.

Holotype ♂, Dapitan, Mindanao, no date given, Baker.

Type in U. S. National Museum.

Genus *Rioxa* Walker

Rioxa Walker, 1857, *J. Proc. Linn. Soc. Zool., Lond.*, 1: 35, pl. 2, fig. 3. Type-species: *lanceolata* Walker, by monotypy.

Ptilonina Enderlein, 1911, *Zool. Jahrb., Syst.* 31: 447. Type-species: *Ptilona sexmaculata* van der Wulp, by original designation.

The concept of *Rioxa* has been greatly confused in the literature. Approximately a dozen Oriental species have been placed under this combination but it is obvious that a number of these probably do not belong here. Based upon the type species, the genus is differentiated from other related Acanthonevrini by having the subcostal vein rather strongly arcuate, with apex of subcostal vein oblique, gradually sloping to the costa; by having subcostal cell comparatively elongate, except in ♀ of *lucifer* Hering, much longer than subcostal cell and extending well beyond r-m, ending in costa, almost opposite the m crossvein; veins R_{4+5} and M_{1+2} divergent at their apices. Two pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals with vertical plates rather elongate so that the anterior superior fronto-orbitals are situated at middle of front. Ocellar bristles rudimentary, seta-like and postalar bristles yellow. Arista lacking ventral rays, with long dorsal and moderately long hairs along inner margin. The thorax is distinctly elongate, about 1/3 longer than wide, not counting scutellum, and the scutellum is bare, devoid of setae. The arrangement of the hyaline spots on wing margin may be variable and several synonyms may be disclosed when larger series of specimens have been studied.

KEY TO KNOWN RIOXA (SENS. STR.) FROM THE PHILIPPINES

1. Second costal cell with a prominent hyaline spot, also a spot present in basal portion of cell R_1 2
- Costal cell and cell R_1 , except in apical portion, dark brown. Face yellow with a shining

- black spot on each lateral margin. Indonesia, Malaysia, Thailand, Vietnam and the Philippines.**sexmaculata** (van der Wulp)
2. Male wing with a prominent hyaline spot on margin in cell R_3 and ♀ with a hyaline spot in R_5 beyond r-m crossvein.**megispilota** Hardy
- Male and ♀ lacking such hyaline spots.**lucifer** Hering

Rioxa lucifer Hering Fig. 45.

Rioxa lucifer Hering, 1931a, *Siruna Seva* 3: 23, fig. 13. Type-locality: Imugan, Luzon. Type in Zoological Museum, Berlin.

This species is differentiated by the wing markings. It is related to *megispilota* Hardy from Tawitawi but differs by lacking the hyaline spot in cell R_3 in the ♂ and in cell R_5 just beyond r-m crossvein in the ♀. The body markings are similar to those of *sexmaculata* except that the propleura are dark brown to black and the mesopleura are predominantly dark brown to black. Also the face of the ♂ is tinged with brown to black on upper median portion. The chaetotaxy appears to be the same as in *sexmaculata*, the yellow median band down the abdomen extends from base not quite to apex of 3rd tergum in ♂, and to apex of 4th in ♀. Basal segment of ovipositor about equal in length to terga 2-5 as seen from dorsal view (fig. 45). Male genitalia and ♀ ovipositor like those of *sexmaculata* (fig. 46).

This species has been recorded from numerous localities on Luzon, Mindanao, Samar, Negros, Bohol and Tawitawi.

Rioxa megispilota Hardy

Rioxa megispilota Hardy, 1970, *Ent. Meddel.* 38: 82. Type-locality: Tawitawi. Type in University Zoological Museum, Copenhagen.

Very near *lucifer* Hering but differing by having a prominent hyaline spot developed on wing margin in apex of cell R_3 in the ♂, and a moderately large hyaline spot in the ♀. Also the face is contrasting black on upper 2/3, white on lower portion in *megispilota*. I see no other differentiating characters for separating these. In addition to the type series from Tawitawi, 1 ♀ specimen has been seen from Davao, Mindanao, no date given, Baker.

Rioxa sexmaculata (van der Wulp) Fig 46a-c.

Ptilona sexmaculata van der Wulp, 1880, *Tijds. Ent.* 23: 185; 1881, *Dipt. Sumatra*, p. 51, pl. 3, fig. 7-11. Type-locality: Sumatra. Type in Zoological Museum, Amsterdam.

Rioxa sexmaculata: van der Wulp, 1899, *Tijds. Ent.* 42: 56.



Fig. 45. *Rioxa lucifer* Hering: ♀ ovipositor.

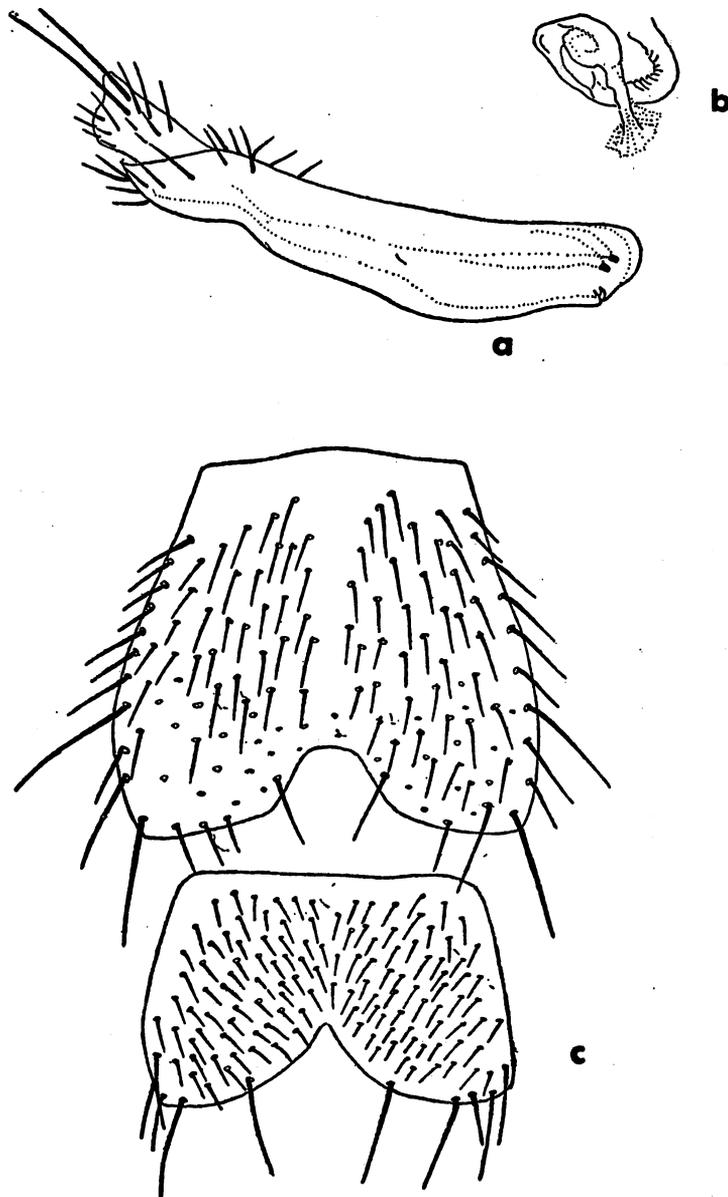


Fig. 46. *Rioxia sexmaculata* (van der Wulp): a. ♂ genitalia, lateral; b. apex of aedeagus; c. 4th and 5th sterna of ♂.

Rioxa sumatrana Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 449, fig. U. Type-locality: Sumatra. Type in Zoological Museum, Warsaw.

I have studied the types of both of the above from Sumatra, that of *sexmaculata* in Amsterdam and *sumatrana* in Warsaw, and have confirmed this synonymy.

This species is differentiated by the wing markings, the field is entirely dark brown and hyaline spots are present in the following areas on the margin: cell R_1 just beyond apex of vein R_1 ; middle of cell R_3 ; apical portion of cell R_3 ; middle apex of cell 2nd M_2 . The posterior margin of the wing is subhyaline; in some specimens (Indonesia) a hyaline spot is present in subcostal cell. The hyaline mark in cell R_1 varies considerably in size, in some specimens it fills almost the entire cell, in others it is a tiny spot. A predominantly yellow species with a narrow brown vitta extending down each side the entire length of the mesonotum, in line with dorso-central bristles, continuing on sides of scutellum to apical bristles; also with 2 brown vittae extending longitudinally the length of the pleura. With an incomplete brown marking along extreme lateral margin of mesonotum from above each humerus to wing base. Upper superior fronto-orbital bristles yellow, lower bristles situated near lower $3/5$ of front, measured from median ocellus to frontal suture. Face yellow except for a subshining dark brown to black spot on each lateral margin. Hind femur with 3 widely spaced posteroventral bristles and with 2 closely spaced preapical dorsal bristles. Hind tibia with 3 posteroventral bristles near middle of segment. One strong apical spur on middle tibia. Wing venation and markings as in Hardy (1973, fig. 46a). Abdomen predominantly dark brown to black, with a broad yellow median band extending from base over 1st 3 terga in ♂, and over terga 1-5 in ♀. Sterna brown, tinged with yellow medianly. First sternum with a pair of lateral arms directed anteriorly from margins. Second and 3rd terga slightly longer than wide with hind margin straight or nearly so. Fourth sternum longer than wide with a U-shaped concavity in middle of hind margin and 5th sternum almost $1/2$ wider than long with a V-shaped concavity in middle of hind margin (fig. 46c). Male genitalia as in fig. 46a-b, with epandrium very narrow and surstyli considerably broader than epandrium. Ninth sternum with a prominent distal appendage. Basal segment of ♀ ovipositor dark brown, as seen from dorsal view almost equal in length to terga 3-6. Measured on venter basal segment 2.0 mm. Extended ovipositor about 4.5 mm. Piercer short, measuring about 0.75 mm, blunt at apex. Three spermathecae present; these have binodose necks. Length: body, 6.75-7.0 mm; wings, 6.5 mm.

Distribution: Indonesia, Malaysia, Thailand, Vietnam and the Philippines. I have seen this only from Palawan and Balabac. Elera (1895: 517) recorded it from Luzon. I have not confirmed this record.

Genus *Sophira* Walker

Sophira Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. **1**: 34. Type-species: *venusta* Walker, by monotypy.

Predominantly yellow to rufous species fitting in Acanthonevrini by having 6 scutellar bristles, the arista plumose, etc. Differing from other genera by lacking sternopleural bristles. Having the following characters: Presutural bristles present; wings subhyaline to yellowish fumose with at least some fumose markings along costa or along some of the veins; 3rd costal cell (Sc) elongate, distinctly longer than 2nd costal cell with vein R_1 extending approximately to level with the m crossvein; vein R_{3+3} straight; 2 pairs inferior fronto-orbital bristles situated on lower portion of front, 1st pair smaller than 2nd and pairs superior fronto-orbitals confined to upper $1/3$ of front. Vertical plates rather short. The secondary scutellar bristles vary somewhat in size from species to species, from approximately $1/2$ to $2/3$ the length of the other bristles.

Thirteen species and 1 subspecies fit my concept of this genus. Refer to Hardy (1958) for a review of this genus and key to species. The genus is restricted to the Oriental Region, New Guinea, the Bismarck Archipelago and the Solomon Islands. It has not previously been recorded from the Philippines. Five Philippine species are being placed in this genus; 2 are apparently undescribed.

KEY TO KNOWN SPECIES OF SOPHIRA FROM THE PHILIPPINES

1. Wings predominantly hyaline or with a longitudinal hyaline to yellow band extending full length through middle (pl. 2, fig. 14, 15).2
 Wings dark brown except for a few hyaline spots; or with hyaline wedges on anterior margin; also costal and subcostal cells, and extreme apex of wing may be yellowish (pl. 2, fig. 11 and 12).3
2. Wings subhyaline, with a narrow band of brown along costa from cell Sc to upper middle of R_5 , and faint tinge of brown along vein M_{3+4} (pl. 2, fig. 15). All yellow except for a pair of black spots on 5th tergum, head and body bristles yellow. Celebes and Philippines. *signata* (Walker)
 Wings with a broad hyaline to yellow median band extending longitudinally the full length (pl. 2, fig. 14). Mesonotum with 2 brown to black vittae. Sterna prominently marked with polished black. Abdominal terga with black bands at bases. Head and thoracic bristles black. Philippines. *philippinensis*, n. sp.
3. With 1 or 2 large hyaline spots present in cell R_1 beyond apex of vein R_14
 Lacking such spots, entire anterior and apical portion of wing brown (pl. 1, fig. 11). Philippines. *caeca* (Bezzi)
4. Costal cells brownish yellow; 1 hyaline spot present in cell R_1 , confined to cell; vein R_{2+3} only slightly curved; cell R_5 entirely brown before r-m crossvein, and apex of cell R_5 yellow (pl. 1, fig. 13). Abdomen with a broad yellow vitta down middle...*medioflava*, n. sp.
 Costal cells each with a hyaline mark in middle; cell R_1 with 2 large hyaline wedges which extend across cell R_3 ; vein R_{2+3} strongly curved; apex of wing brown, and cell R_5 with a hyaline spot before r-m crossvein (pl. 2, fig. 12). First 2 abdominal terga yellow, otherwise abdomen shining black. *manto* (Osten Sacken)

Sophira caeca (Bezzi), new combination Fig. 47; pl. 2, fig. 11.

Rioxa caeca Bezzi, 1913, *Philipp. J. Sci.*, D 8: 326. Type-locality: Los Banos, Laguna, Luzon. Lectotype ♀ in U. S. National Museum.

Rioxoptilona caeca: Hering, 1941, *Siruna Seva* 3: 32.

This species appears to fit all of the characteristics of the genus *Sophira* except that the wings are predominantly dark brown. I see no structural characters which would differentiate it and prefer to treat *caeca* in the concept of *Sophira*. It shows close relationship to *medioflava*, n. sp., from the Philippines, and the 2 form a distinct complex which resemble *Rioxa* and *Acanthonevra* in details of wing markings and other aspects. They differ readily because of the lack of sternopleural bristles. *S. caeca* differs from *medioflava* by having the wing predominantly dark brown, lacking hyaline markings along anterior margin or a subhyaline yellowish mark at apex of wing; also other markings differ as in pl. 2, fig. 11 and 13.

A predominantly yellow species with a faint tinge of brown in ground color of the dorsum of thorax so that the dorsum is darker than the pale yellow pleura and venter. Abdomen brown on sides of terga and over entire 5th tergum of ♂ and 5th and 6th terga of ♀, and with a yellow

longitudinal band extending down middle from base of abdomen to apex of 4th tergum. Head entirely yellow except for reddish brown compound eyes. Occiput moderately swollen on lower portion at widest point scarcely over 1/2 the width of eye. Gena rather broad, almost 1/4 eye height. Face very slightly concave in median portion with rather shallow antennal furrows, with a small carina in upper median portion, and with face flattened on lower median part. Front almost 2× longer than wide. Two pairs of strong inferior fronto-orbitals and 2 pairs of strong superior fronto-orbitals; also with several small black setae arranged in line with the inferior fronto-orbitals. Ocellar bristles small, about equal in size to the extra setae in the inferior fronto-orbital row. Head shape and bristles as in fig. 47. Antennae entirely yellow, 3rd segment short, rounded, about 3/5 longer than wide. Arista moderately long plumose. Palpi and mouthparts entirely yellow, the former with rather prominent black setae around margins. All head and body bristles black. Thorax with the following bristles: 1 humeral, 2 notopleural, 1 presutural, 1 supraalar, 2 postalar, 2 prescutellar, 2 dorsocentral, 1 strong mesopleural, and 6 rather strong scutellars. Pteropleural bristle poorly developed, yellow-brown. No other bristles present on pleura except for a secondary, rudimentary mesopleural immediately below the strong bristle. Legs entirely yellow. Front femur with an abundance of erect, rather long, yellow hairs over posterior surface; with densely placed, short, yellow setae over ventral surface, and with a row of brown posteroventral bristles extending most of its length. Middle tibia with 1 strong apical spur. Wings as in pl. 2, fig. 11. Costal and subcostal cells entirely brown and the hyaline markings are arranged as in the figure. Vein R_{2+3} moderately curved and vein R_{4+5} setose almost the entire length. Crossvein r-m situated near apical 2/3 of cell 1st M_2 . Sterna yellow, 2nd sternum longer than wide, 3rd as wide as long, 4th almost 1/2 longer than wide, and 5th about 2× wider than long. Sterna 3-5 each with a concentric patch of erect setae covering each side and with a bare area through median portion. Posterior margin of 5th sternum straight. Male genitalia very similar to those of *mediostava* (fig. 49d), with a prominent appendage developed on distal portion of 9th sternum. Basal segment of ♀ ovipositor rather elongate, tubular, dark brown in color, as seen from dorsal view approximately equal in length to terga 3-5 and measured on the venter almost 3.0 mm long. The extended ovipositor is 6.7 mm and the piercer 2.75 mm long, blunt at apex, shaped as in fig. 49a of *mediostava*. Three round spermathecae, with short thick necks. Length: body, 8.0-8.5 mm; wings, 8.5-9.0 mm.

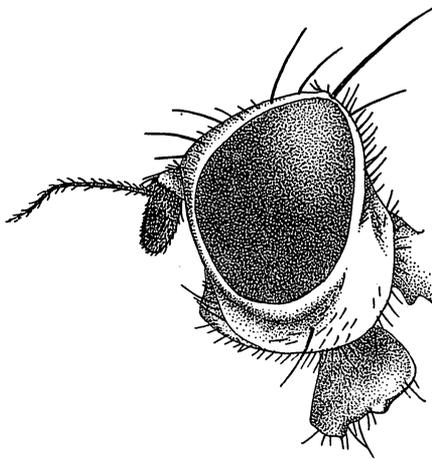


Fig. 47. *Sophira caeca* (Bezzi): head, lateral.

It has been recorded only from Luzon. Numerous specimens have been seen from a variety of localities on this island.

***Sophira manto* (Osten Sacken), new combination** Fig. 48a-b; pl. 2, fig. 12.

Trypeta manto Osten Sacken, 1882, *Berl. Ent. Zs.* 26: 231, fig. 11. Type-locality: Philippines (specific locality not given). Type ♂ (poor condition) in Deutsches Entomologisches Institut, Eberswalde.

Enderlein (1911: 420) said this species perhaps belongs in the genus *Acanthonevra*.

Bezzi (1913b: 310) treated it as a *Rioxa*.

The type ♂ is in poor condition, the head is missing, the wings are partially torn, and the body is discolored. Three specimens on hand from the Philippines appear to belong here; they fit my color photograph of the wing of the type and fit Osten Sacken's original description except that his wing drawing shows a small hyaline spot in cell 2nd M_2 beyond m crossvein and in the specimens at hand a conspicuous streak occurs through cell 2nd M_2 extending to wing margin. My photograph of the type also shows this feature so Osten Sacken's drawing was probably in error. Also the specimens on hand measure 4.5-4.75 mm for the length of the body whereas Osten Sacken in his original description gave the length as 7-8 mm.

The placement of this species is questionable. Because of the lack of sternopleural bristles I am considering it as a *Sophira*. The wings are very similar to those of *Rioxa* because of the rather long vein R_1 , wavy R_{2+3} and the arrangement of the markings of the wing, but the subcostal vein is straight or nearly so, not strongly curved upward. It is aberrant from other Acanthonevrini by having only 4 scutellar bristles. I see no evidence of secondary scutellars. I am placing it in Acanthonevrini on the basis of the presence of 3 spermathecae in the ♀, also the wing markings are rather typical of many genera and species of this tribe, being predominantly brown with hyaline wedges along costal margin. In some respects it resembles *Themara*; the wing markings and venation are rather similar but the subcostal cell is much more elongate. Vein M_{1+2} and Cu_1 are bare and the lack of sternopleurals and secondary scutellars readily distinguish it.

Head of ♂ rather broad, seen in direct frontal view almost 2× wider than high. Predominantly yellow species with abdominal terga 3-5 shining black and with hypopleura, metapleura, metaontum and pleuroterga brown, tinged with rufous. Also scutellum lightly tinged with brown. Two pairs inferior fronto-orbitals. Vertical plates rather short, superior fronto-orbitals confined to approximately upper 1/4 of front. Ocellar bristles tiny. Antennae entirely yellow, 3rd segment about 3× longer than wide, rounded at apex. Arista long plumose. Thorax with the full complement of bristles except for the lack of sternopleurals. The dorsocentrals are situated about 1/3 the distance between inner postalar and supraalar bristles. Legs entirely yellow. Front femur with 2 black posteroventral bristles near apical 1/3 of segment. One strong spur on middle tibia. Wing markings and venation as in pl. 2, fig. 12; the apex is yellow in the ♂ specimen at hand, subhyaline in the 2 ♀ specimens. Basal segment of ♀ ovipositor rather broad and short, scarcely longer than wide, as seen from dorsal view about equal in length to terga 5+6; measured on the venter the basal segment is approximately 0.65 mm long. Piercer 0.65 mm long, blunt at apex (fig. 48b) and with prominent preapical setae. Extended ovipositor (fig. 48a), 2.0 mm. Three spermathecae; these have bulb-like apices and thick coiled necks.

The specimens on hand are from Lake Balinsasayao, Negros Or., 1-7.X.1959, L. W. Quate; Agusan, San Francisco, 10 km SE, Mindanao, 12.XI.1959, L. W. Quate and Jacmal

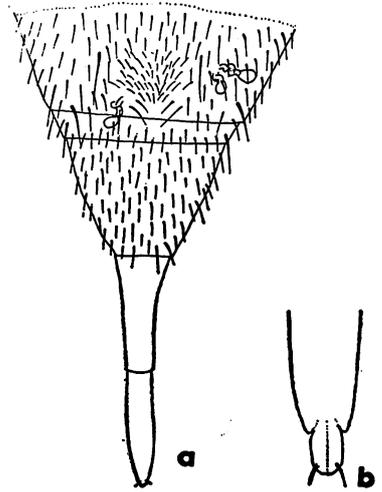


Fig. 48. *Sophira manto* (Osten Sacken): a. ♀ ovipositor; b. apex of piercer.

Bunhian, 24 km S, Mayoyao, Ifugao, Mt. Prov., Luzon, 800-1000 m, 13.V.1967, H. M. Torrevillas. One ♀ specimen is in the Frey collection from Taece, Luzon.

***Sophira medioflava* Hardy, new species** Fig. 49a-e; pl. 2, fig. 13.

Fitting near *caeca* (Bezzi) with which it forms a complex closely resembling the genera *Rioxa* and *Acanthonevra* because of the wing markings and general characteristics. Because of the character of the bristles and the wing venation, these fit the concept of *Sophira*. It should be noted that in most species of this genus vein R_{2+3} is straight, while in *medioflava* and *caeca* this vein is slightly undulated. This character

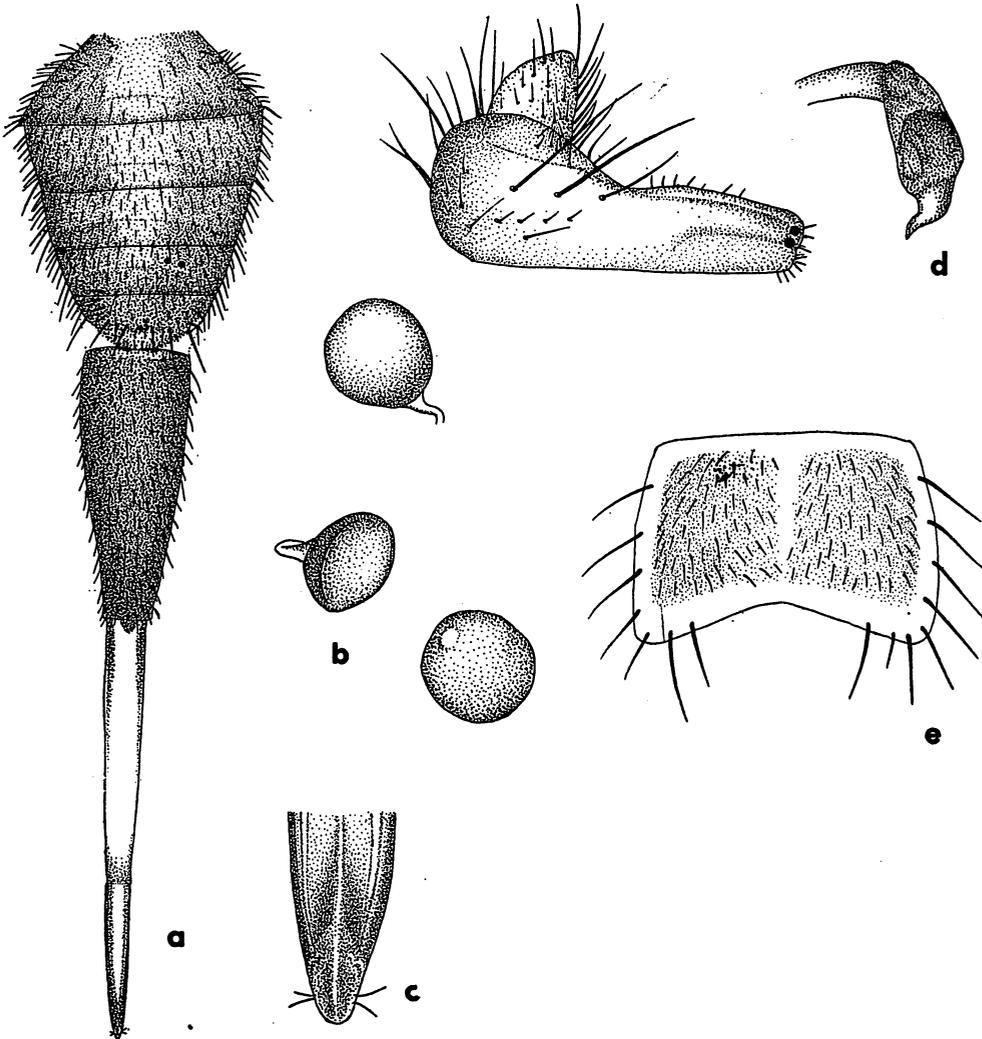


Fig. 49. *Sophira medioflava*, n. sp.: a. ♀ abdomen, dorsal; b. spermathecae; c. apex of piercer; d. ♂ genitalia; e. 5th sternum of ♂.

is not diagnostic. It is also undulated in *S. mantissa* Hering, from Sumatra which is a typical *Sophira* in all other respects. *S. medioflava* differs from *caeca* by the wing markings as shown in pl. 2, fig. 11 and 13.

♂. Predominantly yellow with the pleura much paler than the dorsum of thorax and with a distinct tinge of brown along sides of mesonotum. Fitting description of *caeca* in most details. Dorsocentral bristles situated approximately 1/2 the distance between postalar and supraalar bristles. Each sternopleuron with a dense clump of short black setae at lower margin, otherwise bare except for scattered, short, pale, inconspicuous setae along anterior margin. Mesopleuron densely covered with short, erect, yellow hairs. Propleuron with a clump of erect black hairs and with yellow hairs on lower margin. Wing venation and markings as in pl. 2, fig. 13. Costal and subcostal cells brownish yellow and extreme apex of wing yellow, tinged faintly with brown. Subcostal cell longer than 2nd costal. Vein R_{4+5} setose almost its entire length. Sterna similar to those of *caeca* but with the patches of short black setae on sides confluent in the posteromedian portion of the sclerite. Fifth sternum shaped as in fig. 49e. Genitalia as in fig. 49d, with epandrium narrow and surstyli broad, truncate at apices and completely hiding 10th sternum as seen from lateral view. Ninth sternum with a very prominent distal appendage (apodeme-like) which appears to be distinctive from all other Tephritidae which I have examined. It should be noted that the genitalia of *medioflava* and *caeca* do differ rather strikingly from other *Sophira* which have been studied. The epandrium is rather highly arched and is covered with short erect bristles rather than with long curled hairs.

Length: body, 8.5 mm; wings, 9.0 mm.

♀. Fitting the description of the ♂ except for sexual characters, also the median yellow band extending down thorax continues over 5th tergum. Female ovipositor rather elongate, basal segment dark brown and equal in length to terga 3-6 as seen in direct dorsal view. Measured on venter basal segment is 3.0 mm long. The extended ovipositor (fig. 49a) measures 7.5 mm. The piercer is rather short, 1.75 mm long, blunt at apex (fig. 49c). Three round spermathecae, with short thick necks (fig. 49b).

Holotype ♂ (BISHOP 10133), Manucan, Zamboanga del Norte, Mindanao, 8 km S, 420 m, 12.X.1959, in grasses, L. W. Quate. Allotype ♀, Surigao, Mindanao, Baker. Four paratypes, 2 ♂♂, 2 ♀♀, from the following localities on Mindanao: same data as allotype and Agusan, San Francisco, 10 km SE, 13.XI.1959, L. W. Quate; also Samar Island, Baker.

Type in B. P. Bishop Museum. Allotype and 1 paratype in U. S. National Museum, remainder of paratypes in the University of Hawaii collection.

***Sophira philippinensis* Hardy, new species** Fig. 50a-d; pl. 2, fig. 14.

Fitting very near *S. limbata borneensis* Hering; the wing markings and most details are very similar. *S. philippinensis* is differentiated by having the posterior 2/3 of each sternopleuron polished black, also lower portion of pteropleuron with the black markings continuous or nearly so over hypopleuron, metapleuron, pteropleuron and metanotum. In *borneensis* the hind 1/2 to 2/3 of sternopleuron, all of the pteropleuron and front edge of each hypopleuron is yellow to rufous. The black bands at bases of terga 2-4 on the ♀ are much broader, covering almost entire hind margin of each tergum, rather than having rather narrow, strongly curved bands on terga with lateral margins broadly yellow. The ♂♂ of *borneensis* are not known so cannot be compared.

♀. Predominantly yellow species, conspicuously marked with polished black on thorax and abdomen. *Head*: Shaped as in other *Sophira*, distinctly higher than long. Occiput moderately swollen

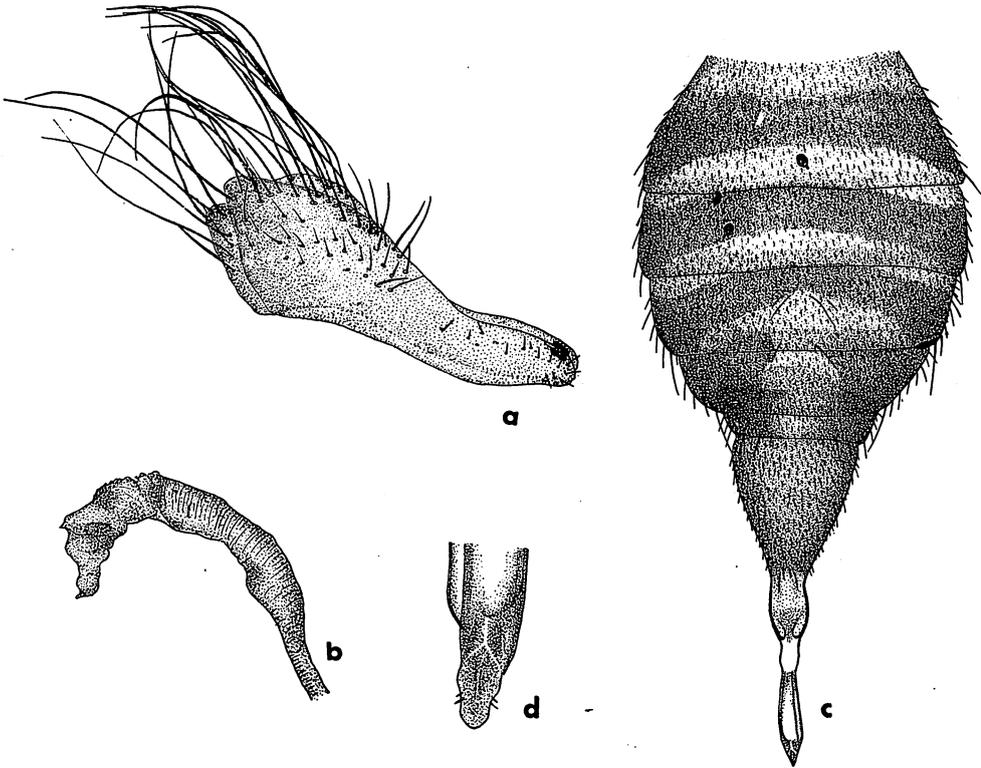


Fig. 50. *Sophira philippinensis*, n. sp.: a. ♂ genitalia; b. apex of aedeagus; c. ♀ abdomen; d. apex of piercer.

and face vertical with epistomal margin slightly protruded. Antennal furrow rather shallow. Head yellow except for a broad dark brown to polished black band across vertex and extending over upper portion of occiput; also with a brown spot on gena below eye margin. Eye about $1/2$ higher than long. Two pairs inferior fronto-orbitals; the lower inferiors are thin, hair-like, about $3/5$ as long as upper bristles. Ocellar bristles small, seta-like. Antennae yellow. Third segment approximately $3\times$ longer than wide, rounded at apex. Arista long plumose. **Thorax:** With the following polished black markings: the broad posterior margin of mesonotum; a longitudinal vitta on each side in line with dorsocentral bristles and continuous from black posterior border of mesonotum to anterior margin in line with inner scapular bristles, laterad of humeri; a large, black posthumeral mark which is continuous with the vertical band across mesopleuron and connecting with the black of the sternopleuron; lower portion of pteropleuron, the hypopleuron, metapleuron, pleuroterga and metanotum. Postscutellum yellow. Halteres yellow. **Legs:** Yellow except for brown hind tibiae. One strong apical spur on middle tibia. Leg joints slender. Hind femora lacking ventral bristles. Hind tibia with a row of black, erect, antero-ventral setae on apical $1/2$. **Wings:** Predominantly brown on anterior and posterior margins with a yellow longitudinal streak through middle as in pl. 2, fig. 14. Fitting description of wing of *borneensis*. **Abdomen:** First tergum yellow, terga 2-4 broadly black on anterior and lateral margins, yellow on posterior margins and with terga 5 and 6 black on sides, yellow medianly (fig. 50c). The sterna are entirely yellow. Ovipositor yellow, basal segment as seen from above almost equal in length to terga 4+5 and 1.0 mm long measured on venter. The piercer is 0.85 mm long, the apex is blunt (fig. 50d). The extended ovipositor (fig. 50c) measures approximately 2.7 mm.

Three spermathecae present; these are black, heavily sclerotized, oval with short thick necks.

Length: body, excluding ovipositor, 6.0–6.25 mm; wings, 6.5 mm.

♂. Fitting description of ♀ in most regards. Genitalia entirely yellow except for the black lobes at apex of 10th sternum. Epandrium rather highly arched and densely covered with long hairs. Surstyli nearly straight-sided, blunt at apices (fig. 50a). Apex of aedeagus as in fig. 50b.

Holotype ♀ (BISHOP 10134), Minubanan, Misamis Or., Mindanao, 1050–1200 m, 5–9.IV.1961, H. Torrevillas. Allotype ♂, Agusan, San Francisco, Mindanao, 10 km SE, 13.XI.1959, L. W. Quate. Eleven paratypes, 8 ♀♀, 3♂♂, 1, same data as allotype; 1, Minalwang, Misamis Or., 1050 m, 24.III–4.IV.1961, H. Torrevillas and 1, Zamboanga del Sur, 11 km NW of Milbuk, Mindanao, 390 m, 5.VIII.1958, H. E. Milliron; 2, Cuernos Mts, Negros, no date given, Baker and 6, Zamboanga, Mindanao, no date given, Baker.

Type and allotype returned to B. P. Bishop Museum. Paratypes in collections of U. S. National Museum and University of Hawaii.

Sophira signata (Walker) Fig. 51; pl. 2, fig. 15.

Seraca signata Walker, 1860, *J. Proc. Linn. Soc. Zool.*, Lond. 4: 165. Type-locality: Makassar, Celebes.

Type ♀ in British Museum (Nat. Hist.).

Sophira signata: Hardy, 1958, *Proc. Hawaii. Ent. Soc.* 16: 375.

This species is related to *S. quadripunctata* Malloch, Solomon Islands, and differs by having the wings subhyaline, slightly yellowish, with the posterior portion nearly hyaline and the apical portion of cell Sc brown fumose.

S. quadripunctata has the wings predominantly yellow, intensely so on anterior and basal portions with the posterior portion broadly gray-brown fumose and the subcostal cell yellow. *S. signata* also differs by having the 6th tergum of ♀ entirely yellow, rather than having 2 black spots. *S. signata* is somewhat more slender in build and the ovipositor base is shorter than in *quadripunctata*. The base is equal to 5th abdominal segment plus the visible portion of 6th rather than being equal to segments 4+5. In also shows relationship to *S. holoxantha* Hering, Bismarck Archipelago, but differs by having black spots on 5th tergum rather than having abdomen entirely yellow.

An entirely pale yellow species except for a small, round, black spot on each side of 5th tergum, occupying about 1/3 the length of the sclerite. In *quadripunctata* the black spots on the 5th are large, occupying almost the full length of sclerite. The wings are as in pl. 2, fig. 15. The costal and basal cells are almost hyaline, a very narrow costal band extends from apex of subcostal cell into upper portion of cell R₅ at wing apex and a faint tinge of brown is present along vein M₃₊₄. The subcostal cell is distinctly longer than 2nd costal and the r-m crossvein

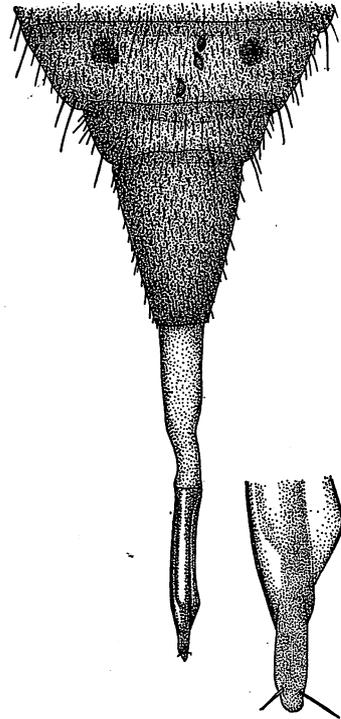


Fig. 51. *Sophira signata* (Walker): ♀ ovipositor and apex of piercer.

is situated near apical $3/5$ of cell 1st M_2 . Measured on venter the basal segment is 1.25 mm long. Piercer also 1.25 mm long, blunt at apex (fig. 51). Extended ovipositor (fig. 51) 3.5 mm. Three black, heavily sclerotized spermathecae. These are short, thick, narrowed at both ends as in fig. 51.

Previously known only from the Celebes. Two specimens on hand from the Bezzi collection, Milano from Butuan and Davao, Mindanao; also 1 from Mindanao, no specific locality or date given, Baker collection.

Genus *Themara* Walker

Themara Walker, 1957, *J. Proc. Linn. Soc. Zool.*, Lond. 1: 33. Type-species: *ampla* Walker, by monotypy. Type in British Museum (Nat. Hist.).

Differentiated from other *Acanthonevrini* by having vein M_{3+4} and the straight portion of vein Cu_1 setose above; vein R_{2+3} distinctly undulated; wings predominantly dark brown with hyaline wedges from the margin (pl. 2, fig. 16); r-m crossvein situated at outer $2/3$ to $3/4$ of cell 1st M_2 ; and head very broad. In ♂ the eyes are usually borne on long stalks. One pair inferior fronto-orbitals and 2 pairs superior fronto-orbital bristles present, the lower superior fronto-orbital situated near middle of front. Ocellar bristles rudimentary, represented by small setae. Third antennal segment rounded at apex. Arista long plumose.

KEY TO KNOWN SPECIES OF THEMARA

1. Wings with hyaline wedges, or a wedge, extending almost halfway across the brown field from both anterior and posterior margins (pl. 2, fig. 16).2
Without hyaline wedges extending into brown field from margin; wings hyaline along anterior and posterior margins or with longitudinal hyaline streaks at the apex of the wing.7
- 2(1). Apical portion of wing entirely dark brown.3
Apical portion of wing broadly subhyaline or yellow, contrasting from the dark brown coloring (pl. 2, fig. 16).5
- 3(2). Wings with a prominent round hyaline spot in cell R_5 just below convexity of vein R_{4+5} . Mesonotum vittate. Sides of ♂ head prolonged, eyes usually on prominent stalks.4
Cell R_5 lacking such a spot. No distinct vittae on mesonotum. Eyes of ♂ not stalked, lateral margins of head not greatly extended.8
- 4(3). Mesonotum with median brown vitta (3 longitudinal brown vittae). Pleura and disc of scutellum black. Java, Malaya, possibly India, Borneo, Sumatra. *Achias horsfieldi* Westwood (1850) is a synonym and also *Acanthoneura fuscipennis* Bezzi (1913a) nec Macquart is probably a synonym of *maculipennis*. **maculipennis** (Westwood)
Mesonotum lacking median vitta (2 brown longitudinal vittae). Pleura predominantly yellow. Median portion of mesonotum yellow. Java, Sumatra, Burma, Thailand, Laos, Philippines, and Borneo. **hirtipes** Rondani
- 5(2). Eyes of ♂ stalked. Thorax entirely rufous. Philippines. **lunifera** Hering
Head broad but eyes not stalked. Mesonotum with dark brown vittae.6.
- 6(5). Four brown to black vittae on mesonotum. Metanotum yellow to rufous medianly. Philippines. **alkestis** (Osten Sacken)
Five brown to black vittae on mesonotum. Metanotum all black. Philippines and Cambodia. **ostensackeni**, n. sp.

- 7(1). Costal cells and cell R_1 narrowly hyaline along wing margin; posterior margin of wing subhyaline, no hyaline streaks through median portion of wing. Sumatra.
**jacobsoni** de Meijere
 Not hyaline on anterior or posterior margins of wing but with longitudinal hyaline streaks through cells R_5 and M_2 . Engano Island, Sumatra.**extraria** Hering
- 8(3). Face yellow and legs predominantly yellow. Borneo, Sumatra.**ampla** Walker
 Face uniformly black, legs predominantly dark brown to black. Borneo.
**nigrifacies** (Perkins)

Themara alkestis (Osten Sacken) Fig. 52a-d; pl. 2, fig. 16.

Trypeta alkestis Osten Sacken, 1882, *Berl. Ent. Zs.* **26**: 229. Type-locality: "Philippinen". Type in Deutsches Entomologisches Institut, Eberswalde. I have seen the type.

This species is common throughout the Philippines and probably occurs over much of Southeast Asia; I have recorded it from Cambodia (Hardy 1973).

It is readily differentiated from other known *Themara* which have the apex of wing tinged with yellow, contrasting from the brown coloring over the remainder of the wing, by having 4 longitudinal brown vittae on mesonotum; and by lacking eye stalks in the ♂, with the head broad but not drawn out into stalks as in most species of *Themara*.

Predominantly yellow to rufous species except for the 4 brown longitudinal brown vittae on

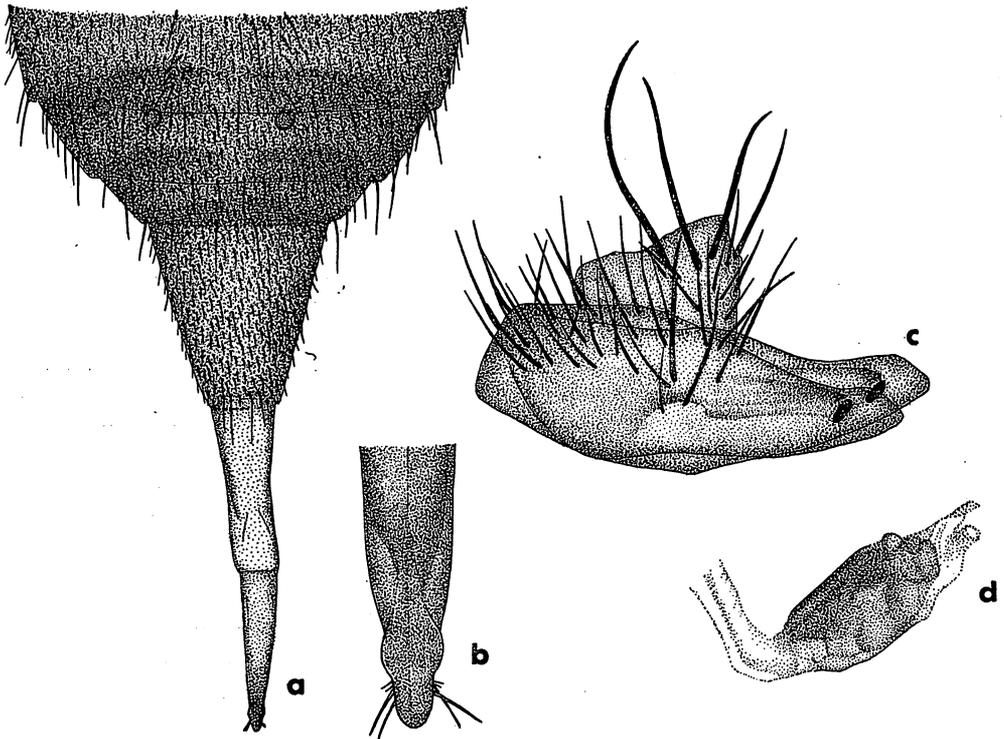


Fig. 52. *Themara alkestis* (Osten Sacken): a. ♀ abdomen; b. apex of piercer; c. ♂ genitalia; d. apex of aedeagus.

the mesonotum; brown sides of metanotum; also abdominal terga 2-4 with broad black basal bands and with 5th tergum entirely shining black; also in ♀ with 6th tergum entirely dark brown to black. The 2 lateral vittae on mesonotum are very briefly interrupted at the suture and the 2 vittae on each side are joined posteriorly just before scutellum. A small brown mark is present on lower edge of each notopleural callus, a small black spot is also present on posterolateral margin of mesonotum at wing base and the upper edge of mesopleuron is faintly tinged with brown. Wings as in pl. 2, fig. 16 with those of ♂ straight-sided, almost quadrate. Vein R_{2+3} strongly curved and R_{4+5} with a strong convexity beyond r-m crossvein. In ♂ the costa is greatly thickened in the area just beyond apex of vein R_1 and beyond apex of vein R_{2+3} . The sterna are yellow, setose and with rather prominent black setae (small bristles) at apices. Fifth sternum of ♂ about as wide as long, straight on hind margin. Male genitalia as fig. 52c-d. Surstyli and epandrium rather slender. Female ovipositor yellow, basal segment about equal in length to terga 5+6. Measured on venter basal segment approximately 1.0 mm. Piercer about 0.8 mm long, blunt at apex with prominent preapical setae as in fig. 52b. The extended ovipositor (fig. 52a) 2.9mm. Three rounded spermathecae present.

A series of specimens have been seen from numerous localities over Mindanao.

Themara hirtipes Rondani

Themara hirtipes Rondani, 1875, *Ann. Mus. Civ. Genova* 7: 435. Type-locality: Sarawak, Borneo.

Type ♂ in Museo Civico di Storia Naturale, Genova.

Themara enderleini Hering, 1938, *Deut. Ent. Zs.* 1938: 409. **New synonym** based upon a comparison of paratypes in the British Museum (Nat. Hist.) with a long series of *hirtipes*. Type-locality: Soekaranda, Sumatra. Type ♂ in Zoological Museum, Berlin.

Themara palawana Hering, 1938, *Deut. Ent. Zs.* 1938: 410, fig. 2. **New synonym** based upon study of the type in Berlin, also a series from the type-locality, in Helsinki. Type-locality: Binaluan, north Palawan. Type ♂ in Zoological Museum, Berlin.

Themara yumana Zia, 1963, *Acta Ent. Sinica* 12 (5-6): 646, fig. 16-19. This is apparently a synonym of *hirtipes*. From the original description I can find no differentiating characters. Type-locality: Yunnan, China.

This species is differentiated from other *Themara* which have the eyes of the ♂ situated on prominent stalks by having the median portion of mesonotum broadly yellow; lacking a median brown vitta; by the pleura being predominantly yellow; and by having a prominent hyaline spot in cell R_5 almost directly above m crossvein.

This species appears to show considerable variation in body coloration; it is predominantly pale colored with 2 rather distinct longitudinal brown vittae almost in line with dorsocentral bristles and a faint indication of lateral vittae from behind humeri to above wing bases, broadly interrupted at the suture. Abdomen mostly shining black with 1st tergum, narrow base of 2nd, and narrow apices of 2nd and 3rd terga yellow. The eye stalks of ♂ show considerable range of variation in the specimens at hand. In some the stalks are shorter than the thorax and in others are almost as long as thorax and abdomen combined. The scutellum is yellow on margin, yellow-brown at base. Pleura yellow except for a brown mark across upper portion of each mesopleuron and 1 over metapleuron and pleurotergon. Postscutellum yellow in middle, brown on sides. Metanotum yellow in middle, polished black on sides. Dorsocentral bristles situated distinctly behind anterior supraalars. Six strong scutellar bristles present. Legs entirely yellow. For figures of wing, genitalia, etc., refer to Hardy (1973, fig. 48a-f). Ovipositor yellow, basal segment short and thick, slightly shorter than abdominal segments 5+6 and approximately 0.8 mm. long with 4 prominent bristles at apex. Piercer blunt, rounded at apex. Three small brown spermathecae present. Length: body and wings, 6.5-6.75 mm.

I have studied a large series of specimens from Sumatra, Borneo, Burma, Thailand.

This species has not previously been recorded from the Philippines. A series of specimens are on hand from several localities on Palawan.

***Themara lunifera* Hering** Fig. 53a-d; pl. 2, fig. 17; pl. 6.

Themara lunifera Hering, 1938, *Deut. Ent. Zs.* 1938: 408, fig. 1. Type-locality: Luzon. Type ♂ in British Museum (Nat. Hist.).

This species is readily differentiated by having the apical portion of wing hyaline and the thorax entirely rufous, lacking brown vittae. Wings as in pl. 2, fig. 17. First 2 terga yellow with a faint tinge of brown in middle of 2nd. Abdomen otherwise shining black, narrowly yellow in middle and at apex of 3rd tergum. Male genitalia as in fig. 53 c-d. Female ovipositor as in fig. 53a. I do not see distinguishing characters in the ovipositors of the closely related species. Three round spermathecae, with short thick necks as in fig. 53b.

This species has been recorded from numerous localities over Luzon, and also from Negros and Tawitawi.

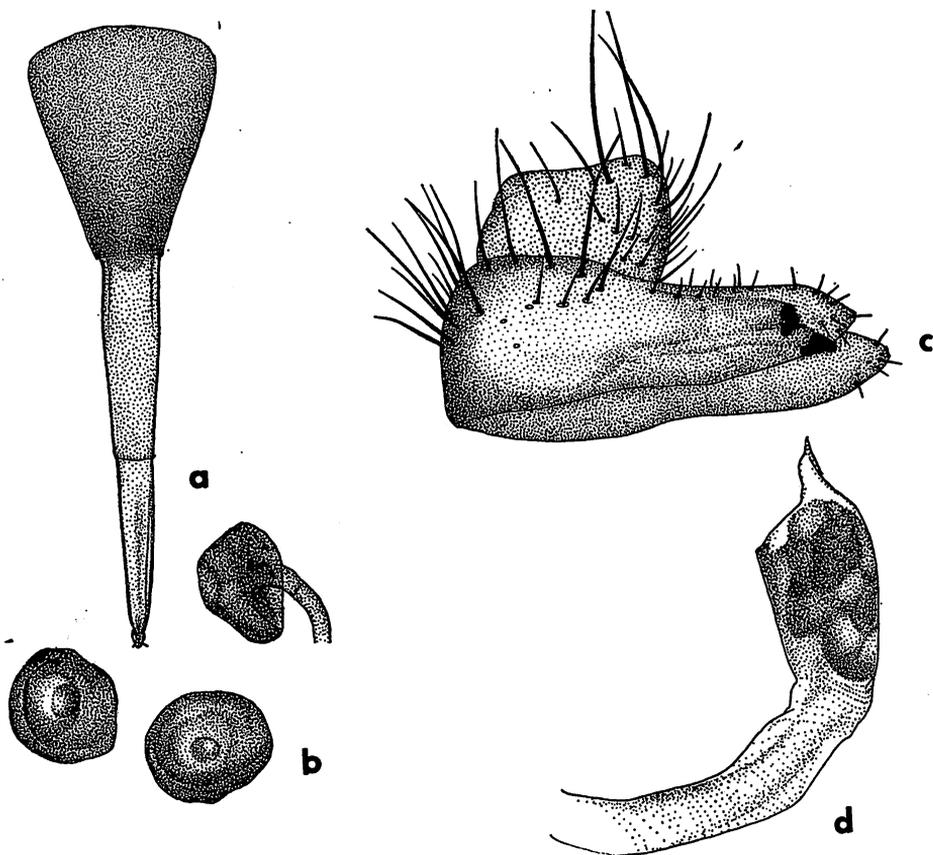


Fig. 53. *Themara lunifera* Hering: a. ♀ ovipositor; b. spermathecae; c. ♂ genitalia; d. apex of aedeagus.

***Themara ostensackeni* Hardy, new species** Fig. 54a-b.

Fitting near *alkestis* (Osten Sacken), but differing by having 5 brown to black vittae extending down mesonotum and having the metanotum entirely black, rather than with 4 brown to black vittae and metanotum yellow to rufous medianly. The phallic apodemes of the ♂ genitalia also differ as shown in fig. 52c-d and 54a-b. The wing venation and markings appear identical with *alkestis*; the costal band is greatly thickened beyond end of vein R_1 . I see no differences in the ♀ ovipositor of these 2 species but the ovipositors appear to be alike in all of the *Themara*. Otherwise fitting *alkestis* in all details.

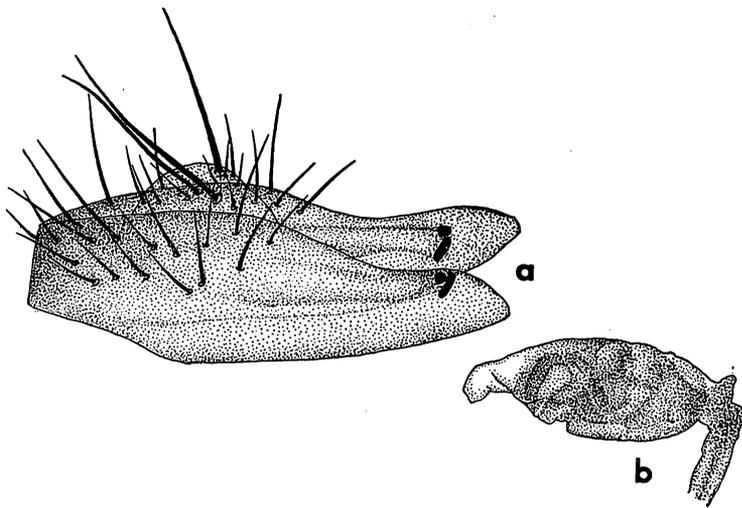


Fig. 54. *Themara ostensackeni*, n. sp.: a. ♂ genitalia; b. apex of aedeagus.

Holotype ♂, East slope, Mt McKinley, Davao Prov., Mindanao, VIII.1964, H. Hoogstraal. Allotype ♀, Agusan, San Francisco, Mindanao, 10 km SE, 17.XI.1959, C. M. Yoshimoto. Twelve paratypes, 6 ♀♀, 6 ♂♂, from the following localities on Mindanao: Minalwang, Misamis Or., 1050 m, 24.IV.1961, H. Torrevillas; Balason, Misamis Or., 4-5.IV.1960, H. Torrevillas; Mt Kibungol, 20 km SE of Gingoog, 700-800 m, Misamis Or., 9-18.VI.1960, at light, H. Torrevillas; Mainit, E slope, Mt Apo., Davao Prov., 1314 m, 21.XI.1946, H. Hoogstraal; Burungdot, Upi, Cotabato Prov., 457 m, 1-9.I.1947, F. G. Werner; Kolambungan, 12.I.1915; Momungan, 7.III.1915; Port Banga, 6.I.1915; Lemesahan, Zamboanga del Sur, 600 m, 7.IX.1958, H. E. Milliron.

Type returned to Field Museum, Chicago. Allotype (BISHOP 10135a) in B. P. Bishop Museum, paratypes in collections of B. P. Bishop Museum; U. S. National Museum; University Zoological Museum, Helsinki; and University of Hawaii.

This may be the species which Bezzi (1913b: 310) recorded as *Acanthoneura maculipennis* Westwood. The latter is from Indonesia and Malaysia and has previously been treated as a synonym of *ampla* Walker but I now consider it a distinct species related to *ampla* by having the entire apical portion of wing dark brown, lacking the hyaline mark at extreme apex, and differing by having a prominent round hyaline spot in cell R_5 just

below convexity of vein R_{4+5} ; also by having mesonotum vittate, and eyes of ♂ stalked.

Genus *Tritaenipteron* de Meijere

Tritaenipteron de Meijere, 1914, *Tijds. Ent.* 57: 209. Type-species: *eburneum* de Meijere, by monotypy.

Pale colored species with all bristles yellow, looking very much like *Sophira* Walker and having been treated as a synonym under *Sophira* by Hendel (1915: 441) and Shiraki (1933: 320). Differing, however, from *Sophira* by the short subcostal cell, scarcely over 1/2 as long as 2nd costal cell and by the presence of strong sternopleural bristles as well as by the presence of oblique bands on the wings (fig. 55b).

Three species have been previously recorded in this genus, *eburneum* (type of genus) from Java, *excellens* (Hendel) from Formosa and *punctatipleura* (Senior-White) from Ceylon. The latter was not treated in my review of this genus (Hardy 1958: 355) and would fit *eburneum* except that the abdominal black bands are apparently interrupted medianly, not complete over the terga; and the subcostal cell is brown, rather than predominantly hyaline. I have not seen the latter species. One additional new species is on hand from the Philippines.

Tritaenipteron flavifacies Hardy, new species Fig. 55a-b.

Fitting near *eburneum*, the wing markings appear to be similar in the 2 but in *flavifacies* the subcostal cell is brown and the brown marking through apex of cell R_5 is continuous to vein $Cu_1+1st A$ and connects with the basal transverse brown band of the wing (fig. 55b). It also differs by having the face all yellow, lacking a black median spot and by lacking a black spot immediately behind each humerus.

♂. *Head.* Entirely yellow except for the reddish brown eyes and a small brown spot on each gena, below eye margin. Front with 2 pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals and with ocellar bristles small, seta-like. Occiput moderately swollen, at widest point about 2/3 width of eye. Eyes higher than long, oblong, slightly over 1/2 higher than long. Genae comparatively narrow, not over 1/6 as high as eye. Front slightly expanded anteriorly, narrowed toward vertex. Face vertical on upper 3/4, gently protruded on lower margin. Antennal furrows rather shallow. Antennae yellow, 3rd segment about 3× longer than wide, rounded at apex. Arista long plumose. Palpi yellow, rather elongate, straight-sided, thickly covered with black setae on sides and venter. *Thorax.* Yellow except for the following shining black marks: narrow posterior border of mesonotum and a line continuing anteriorly on each side through area bordered by dorsocentrals and inner postalar bristles to a level slightly beyond supraalar bristles; a pair of narrow submedian vittae extending from anterior portion approximately opposite humeral bristles to a level opposite supraalars (fig. 55a); a pair of narrow vittae extending obliquely across anterolateral portions of metanotum from near level with humeral bristles across suture to wing base; a vertical black mark extending over median portion of each mesopleuron onto sternopleuron and expanding to cover approximately 1/2 of that sclerite; also with a dark brown to black spot on each metapleuron. The metapleura and pleuroterga are yellow, the sides of metanotum are polished black. The postscutellum and median portion of metanotum yellow. All bristles yellow. Intermediate scutellars well developed, almost 1/2 as long as basal bristles. *Legs.* Entirely yellow except for a tinge of brown on tibiae. Front femur with a prominent row of posteroventral bristles. Middle tibia with 1 strong and 3 or 4 short black bristles at apex. Hind tibia lacking ventral spines but with a pair of prominent black preapical dorsal bristles. *Wings.* As in fig. 55b. *Abdomen.* Predominantly pale yellow with a black band across base of each of terga 2-5 and with

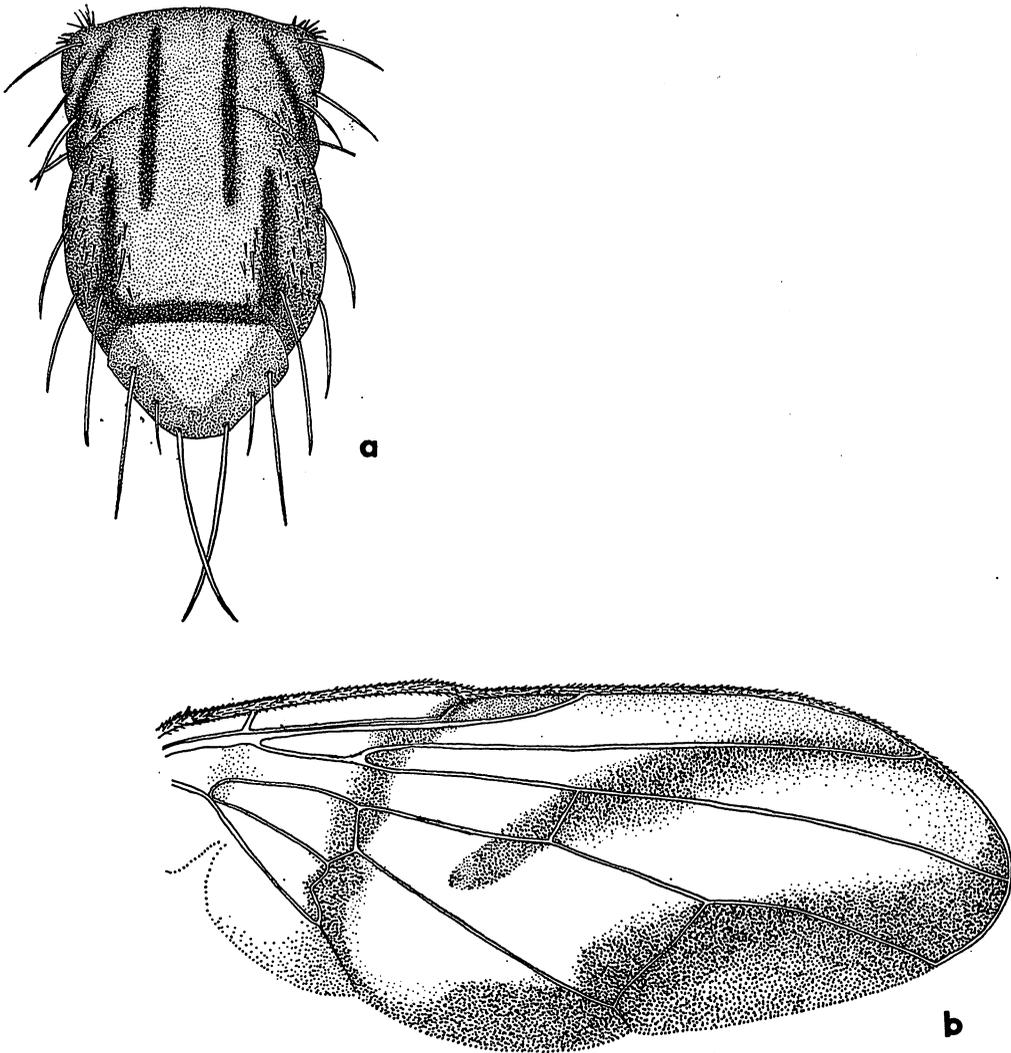


Fig. 55. *Tritaeniopteron flavifacies*, n. sp.: a. thorax, dorsal; b. wing.

lateral margins of 2-4 broadly black. Fifth tergum yellow on lateral margins with the black basal band extending posteriorly along each side almost to apex. Genitalia yellow. These have not been relaxed for study. In situ the surstyli are long and slender.

Length: body and wings, 6.0 mm.

♀. Unknown.

Holotype ♂, Mt Makiling, Luzon, no date given, Baker. Type returned to the Bezzi collection in Milano.

Genus *Xarnuta* Walker

Xarnuta Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. 1: 28. Type-species: *leucotelus* Walker, by monotypy.

This genus is easily differentiated from other Acanthonevrini by the flat, coarsely setose scutellum bearing 8 or more strong black marginal bristles. Also by having the wings predominantly brown (fig. 56a) and the squamae large, well developed. The dorso-central bristles are situated much nearer to the prescutellars than to a line drawn between supraalars. One or 2 propleural bristles, 2 mesopleurals, 1 pteropleural and 1 sternopleural bristles are present. Middle tibiae each with 2 strong, subequal apical spurs. Arista very short plumose. Three pairs inferior fronto-orbital bristles and 2 pairs superior fronto-orbitals. Ocellar bristles small, scarcely 2× larger than frontal setae.

Seven species are presently known in this genus; 5 are from Indonesia, New Guinea, Solomon Islands, Malaya and Thailand, and 2 (*inopinata* Hering and *fenestellata* Hering) are from the Talysch Region, Caspian Sea. For key to the known species, excluding Palaearctic Region, refer to Hardy (1973).

This genus has not previously been recorded from the Philippines. Two species are on hand.

Xarnuta leucotelus Walker

Xarnuta leucotelus Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. 1: 28. Type-locality: Singapore. Type ♂ in British Museum (Nat. Hist.). I have studied the type.

Oxyphora malaica Schiner, 1868, *Novara Reise*, Dipt. p. 274. Type-locality: Ceylon. Type in Natural History Museum, Wien. Synonymy by Bezzi (1913a: 75) and de Meijere (1914: 199).

Distribution: Recorded from Malaya, Indonesia, Ceylon, and Thailand. One ♀ specimen is on hand from Mt Isarog, Luzon, IV.1916, Frey collection, Helsinki.

This species is like most *Xarnuta* in general characteristics and is differentiated by the uniformly dark brown wing with only the apex of cell R_5 hyaline and with the posterobasal portion subhyaline to brownish tinged. This is an entirely yellow to rufous species except for a faint indication of 3 narrow brownish vittae extending down mesonotum and a small spot of brown across top of each humerus; also the postscutellum is brown on the sides. Vein R_{4+5} setose almost to a level with m crossvein. Sixth tergum of ♀ almost as long as 5th. Basal segment of ♀ ovipositor yellow except for a tinge of brown on apex, short and thick as seen from dorsal view; basal segment not quite as long as terga 5+6 and measured on venter equals 1.25 mm. Piercer rather short, about 1.0 mm in length, bifid laterally at apex. For figures refer to Hardy (1973).

The specimen on hand from the Philippines is slightly larger than others I have seen: body, 8.0 mm; wings, 7.25 mm.

Xarnuta stellaris Hardy Fig. 56a-d.

Xarnuta stellaris Hardy, 1970, *Ent. Meddel.* 38: 85. Type-locality: Brooke's Point, Uring Uring, Palawan. Type in University Zoological Museum, Copenhagen.

This species is close to *obsoleta* (Wiedemann) from Java, but differs by having 2 hyaline spots on wing margin in cell R_1 in the ♀ (fig. 56a) and 1 spot in the ♂, rather than no hyaline spots on margin until beyond apex of vein R_{2+3} ; by lacking a

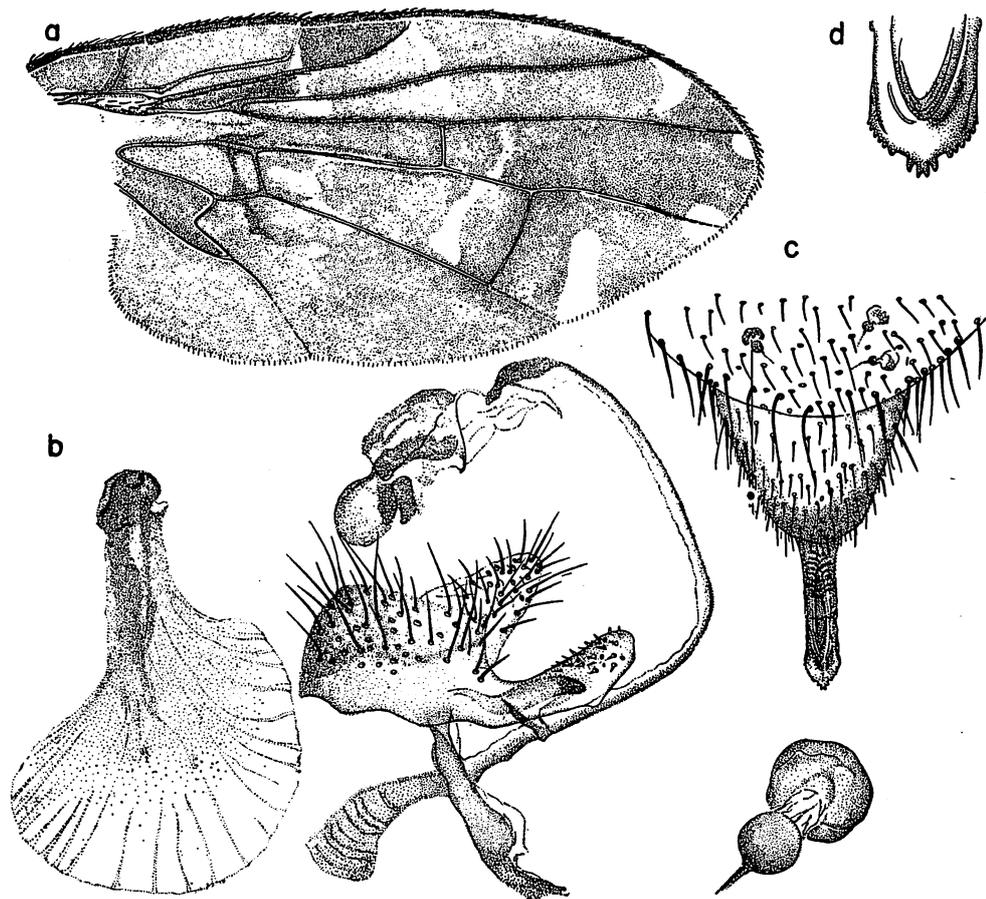


Fig. 56. *Xarmuta stellaris* Hardy: a. wing; b. ♂ genitalia; c. ♀ ovipositor and spermathecae; d. apex of piercer.

transverse hyaline streak through cells R_5 and 1st M_2 between the m and r-m crossveins. In other respects fitting the characteristic features of most known *Xarmuta* with the body reddish brown and very densely black setose; legs densely black setose and with prominent rows of black bristles on the femora and hind tibiae. For more complete details refer to the original description. Male genitalia as in fig. 56b and ♀ ovipositor and spermatheca characters as in fig. 56c, d. Length: body, 5.5–5.75 mm, wings, 4.8–5.0 mm.

Also recorded from Luzon.

TRIBE ACIURINI

As interpreted here the members of this tribe are differentiated by having the wings predominantly dark brown with hyaline wedges on anterior and posterior margins (pl. 2, fig. 18), in combination with the thorax and abdomen shiny black and the occipital setae thin, pointed, and brown to black.

This is a most artificial grouping and the status of the genera with this combination of characters needs a thorough review.

Two Philippine genera are presently placed here.

The known Philippine Aciurini are differentiated by the following characters:

- Wing hyaline at base and with 1 hyaline wedge in middle of anterior margin and 4 on posterior margin. **Sphaeniscus** Becker
 Wing brown at base. 2 hyaline spots in cell R_1 , a preapical hyaline streak plus a small round hyaline spot beyond r-m crossvein in cell R_5 , and 3 hyaline wedges in posterior portion of wing (pl. 2, fig. 18). **Aciuroopsis**, n. gen.

Genus **Aciuroopsis** Hardy, new genus

Similar to *Indaciura* Hering but differing by having the cubital cell developed into a moderately long slender lobe at apex, rather than terminating in a slight point; ocellar bristles rudimentary, rather than well developed; occipital setae thin and dark colored, rather than white, scale-like; 2 pairs superior fronto-orbital bristles, not 1; 6th tergum of ♀ longer than 5th, not shorter; vein R_{4+5} setose above to r-m crossvein, rather than bare except for a few setae at base; wings with a prominent preapical hyaline streak through cell R_6 , rather than apex entirely brown.

Thorax and abdomen polished black and wings predominantly brown with hyaline wedges from anterior and posterior margins, as in other Aciurini. Head slightly higher than long with front gently sloping and antennae situated at middle of head as seen in direct lateral view (fig. 57). Occiput moderately swollen, face gently concave as seen in direct lateral view with antennal furrows shallow. Three pairs inferior fronto-orbital bristles and 2 pairs superior fronto-orbitals. Ocellar bristles small, about equal in length to upper superior fronto-orbitals and to postocular setae. Postocellar bristles also small, about equal in size to postocular setae. Third antennal segment about 3× longer than wide, rounded at apex. Aristae long pubescent. Only 2 basal scutellar bristles present. Thorax with prescutellars and the usual complement of thoracic bristles present. The dorsocentrals are situated opposite the supraalars. Mesonotum lacking squamous setae. One strong apical spur present on middle tibia. Wings as in pl. 2, fig. 18.

Type-species: *Aciuroopsis pusio*, n. sp.

Aciuroopsis pusio Hardy, new species Fig. 57; pl. 2, fig. 18.

Differentiated from other known Aciurini by the generic characters given above.

♂. *Head*: Characters as given above under generic description and as in fig. 57. Front 2× longer than wide, yellow down median portion, brown along orbits. Occiput entirely brown, tinged with yellow on lower portion. Genae brownish yellow. Face brown, tinged with yellow. Antennae yellow-brown. Palpi and mouthparts yellow. *Thorax*: Shining dark brown to black with abundant erect brownish yellow setae over mesonotum and with pale setae on pleura. *Legs*: Entirely yellow, front femur with a row of 5 or 6 brown posteroventral bristles extending over most of the length of the segment and with a row of short, black, closely placed posteroventral setae on apical 1/3. *Wings*: With markings and venation as in pl. 2, fig. 18; with subcostal cell very short, a prominent hyaline spot in middle of 2nd costal spot, 2 hyaline wedges in cell R_1 , a hyaline preapical streak across cell R_5 , and another small, round, hyaline spot in R_5 just beyond r-m crossvein; also 3 hyaline wedges on posterior margin. Crossvein r-m situated near apical 2/3 of cell 1st M_2 and cubital cell with a moderately long, narrow, apical lobe. Vein R_{3+4} setose to the r-m crossvein. *Abdomen*: Polished black with abundant, rather long, erect, brown setae scattered over dorsum. The genitalia have not been dissected for study, in situ the surstyli and

cerci are plainly visible; these are slender, elongate. The surstyli are especially long, about equal in length to 5th sternum, curved upward and pointed at apices.

Length: body and wings, 2.0 mm.

♀. Fitting description of ♂ except for genital characters. Sixth tergum slightly longer than 5th. Basal segment of ovipositor rufous, tinged with brown, short and thick, as seen from above slightly shorter than terga 5+6. The basal segment is approximately as wide as long and measures about 0.5 mm in width and in length. The piercer has not been extruded for study.

Holotype ♂, Catbalogan, Samar, IV. 1915, no collector given, from Frey collection. Allotype ♀ (BISHOP 19136a), Luzon, Philippines, 29.IX.1945, H. E. Milliron. One ♀ paratype, Tolosa, Leyte, 8.I.1958, collector not given.

Type returned to University Zoological Museum, Helsinki. Allotype returned to B. P. Bishop Museum. Paratype at University of Hawaii, Honolulu.

It should be noted that this species was in the Frey collection under the manuscript name "*Oxyaciura pusio*."

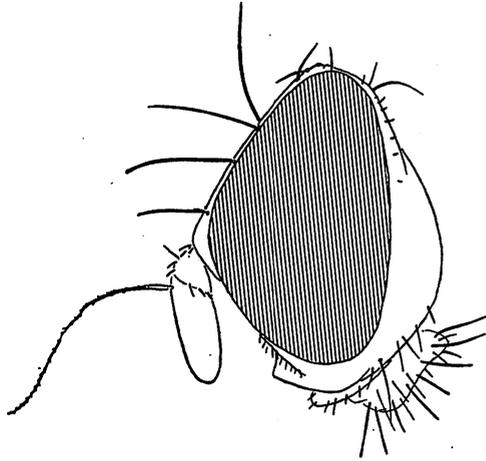


Fig. 57. *Aciuropsis pusio*, n. gen. & sp.: head, lateral.

Genus *Sphaeniscus* Becker

Sphaeniscus Becker, 1908, *Mitt. Zool. Mus. Berl.* 4: 138. Type-species: *brevicauda* Becker, by monotypy.

Equals synonym of *Aciura filiola* Loew, 1869. Bezzi (1913a: 147) was in error in designating *Trypeta quadrincisa* Wiedemann as the type.

Spheniscomyia Bezzi, 1913, *Mem. Indian Mus.* 3: 146. Invalid emendation of *Sphaeniscus* Becker. *Pseudopheniscus* Hendel, 1913, *Suppl. Ent.* 2: 62. Type-species: *Urophora sexmaculata* Macquart, by original designation, equal synonym of *Sphaeniscus* Becker, based upon misidentified type-species. *Pseudospheniscus*, emendation.

Hendel (1915: 451) said that he made an error in choosing the type-species of *Pseudopheniscus*, that it should have been *angulata* Hendel, not *sexmaculata* Macquart. This would not be a valid change and if it were accepted, the name would fall as a synonym under *Myoleja* Rondani.

This genus is readily recognized by its all shining black body, by the predominantly dark brown wings with the base hyaline and with a large hyaline wedge in middle of anterior margin plus several hyaline wedges on posterior margin; also by the pubescent arista and by having vein R_{4+5} bare except for a few setae on basal portion.

In Hering's key to subfamilies and tribes (1947: 14), this fits in Aciurinae by having the body all black, the wing markings of an "aciuroid" pattern and the occipital setae thin, black, sharply pointed. I prefer to treat Aciurini as a tribe under Trypetinae.

Sphaeniscus atilius (Walker)

Trypeta atilius Walker, 1849, List Dipt. Ins. Brit. Mus. 4: 1021. Type-locality: Foochow, China.

- Type ♂ in British Museum (Nat. Hist.). I have examined the type. It is in good condition. *Trypeta melaleuca* Walker, 1864, *J. Proc. Linn. Soc. Zool.*, Lond. 7: 238. Type-locality: Ceram. Type ♂ in British Museum (Nat. Hist.).
- Trypeta sexincisa* Thomson, 1869, *Eugen. Resa*, Dipt., p. 579. Type-locality: China. Type ♀ in Natural History Museum, Stockholm.
- Trypeta formosana* Enderlein, 1911, *Zool. Jahrb., Syst.* 31: 427. Type-locality: Akau, S Formosa. Type ♀ in Deutsches Entomologisches Institut, Eberswalde.
- Sphenisomyia sexmaculata*: Bezzi (nec Macquart), 1913, *Mem. Indian Mus.* 3: 148. Also other authors.
- Sphaeniscus sexmaculatus atilia*: Hardy, 1955b, *Pacif. Sci.* 9: 78.

Hosts: These flies infest the flower heads of an assortment of species of Compositae and Labiatae.

Distribution: Widespread over the Oriental and Pacific regions.

This has previously been treated as a subspecies of the African *sexmaculatus* but I am now following Munro (1938a: 36) in treating it as a distinct species. Munro differentiated these by the following characteristics: "Hind tibiae yellow, dorsum of thorax more strongly yellow-dusted and the first hyaline indentation from base of wing narrower...*atilius* (Walker). Hind tibiae black, only yellow distally, dorsum of thorax thinly dusted, showing as a rule three bare stripes, first hyaline indentation broader...*sexmaculata* Macquart."

This species is easily differentiated from all known fruit flies from Southeast Asia by the characteristic wing markings, with the base hyaline, 1 hyaline wedge on anterior margin in middle of wing and 4 wedges on posterior margin. Vein R_{4+5} is bare and the r-m crossvein is situated about its own length from m crossvein. The surstylus is broad, equal in width to the epandrium and completely hides the 10th sternum as seen in lateral view. The aedeagus is only slightly expanded at apex. Fifth sternum of ♂ as wide as long with hind margin straight. Sixth tergum of ♀ distinctly shorter than 5th and basal segment of ovipositor approximately equal in length to terga 5+6 as seen from direct dorsal view. Basal segment of ovipositor 0.7 mm long. Piercer thickened at base, sharply tapered to apex, approximately 0.5 mm long. Extended ovipositor 1.8 mm. Two spermathecae present; these are weakly sclerotized, elongate, slender.

This species is no doubt widespread throughout the Philippines. I have seen specimens from a number of localities on Mindanao, Luzon, and Bohol.

TRIBE ADRAMINI

This group has previously been treated as a tribe under Dacinae because of the reduced chaetotaxy of the head and thorax: lacking sternopleural, dorsocentral, presutural, ocellar, postocellar and usually humeral bristles. Also by having the postocular setae small, inconspicuous. The characteristics of the wings, the general facies of the body, presence of 3 spermathecae in the ♀ and presence of erect fine hairs over pleuroterga in some genera would indicate close relationship to *Euphranta* Loew and related genera (Euphrantini). I feel it is much more logical to treat this as a tribe under Trypetinae, differentiated from other tribes by the reduced chaetotaxy.

The biology and habits of Adramini are unknown. These are predominantly Oriental and Australasian flies. Five genera (1 undescribed) are recognized from the area being studied.

KEY TO ADRAMINI GENERA FROM THE PHILIPPINES

1. Femora lacking ventral spines; pleuroterga lacking erect fine hairs.3
All femora with ventral spines; pleuroterga with fine erect hairs.2
2. Humeral bristles absent. Two pairs inferior fronto-orbital bristles. Wings with apical portion brown to about m crossvein and with a brown mark over r-m crossvein from wing margin (fig. 59e).**Adrama** Walker
Humeral bristles present. Only 1 pair of inferior fronto-orbitals. Mostly rufous with wing hyaline except for a narrow yellow to brownish costal band. Mindanao.
..... new genus near **Adrama**
3. Four scutellar bristles. Third costal section (between apices of Sc and R₁) shorter than 4th (fig. 62b and pl. 2, fig. 19).4
Only apical scutellars present. Third costal section over 2× longer than 4th (fig. 61a). ...
..... **Nesadrama** Perkins
4. Outer scapular bristles absent, dorsocentrals rudimentary, seta-like; cubital cell sharp-pointed but not lobate at apex; vein R₄₊₅ bare except for a few setae at base and 3rd costal section (cell Sc) shorter than 2nd and about 1/3 as long as 4th section; wing as in fig. 62b. **Pseudosphira** Malloch
Outer scapulars and dorsocentrals well developed; cubital cell with a prominent apical lobe; vein R₄₊₅ over most of its length; 3rd costal section equal to 2nd and subequal to 4th; wing as in pl. 2, fig. 19. **Antisophira**, n. gen.

Genus *Adrama* Walker

Adrama Walker, 1859, *J. Proc. Linn. Soc. Zool.*, Lond. **3**: 117. Type-species: *selecta* Walker, by monotypy. (*Enicoptera rufiventris* Walker, 1861 and *Psila cruciata* Walker, 1865 are synonyms).

This genus is differentiated from other Adramini which have the pleuroterga with erect hairs and femora with stout ventral spines by having the subcostal cell short, usually 1/2 as long as 2nd costal cell; by having short black setae extending along radial vein almost to its base; arista plumose and antennae much shorter than face; cubital cell distinctly lobate; apex of wing beyond m crossvein brown; with a brown mark extending over r-m crossvein to the costa; and lower median portion of the front slightly gibbose. Humeral and sternopleural bristles are lacking. Scutellum usually with 4 bristles, rarely only the apical bristles are present. The basal segment of the ♀ ovipositor is well developed, rather elongate, cylindrical, tapered to apex. Three spermathecae are present.

A key to all known species of *Adrama* will be presented in a study of the tribe Adramini which is being prepared. Two species are known from the Philippines.

***Adrama determinata* (Walker) Fig. 58a-g.**

Dacus determinatus Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. **1**: 133. Type-locality: Sarawak, Borneo. Type ♂ (poor condition) in British Museum (Nat. Hist.). I have studied the type.

Adrama austeni Hendel, 1912, *Wien. Ent. Ztg* **31**: 12. Type-locality: Ceylon. Type ♂ and a ♀ in British Museum (Nat. Hist.).

This species has been recorded from Borneo, Java, Philippines, Malaysia, Thailand, Burma, Ceylon, and India. I have seen specimens from several localities on the following Philippine islands: Balabac, Mindanao and Palawan.

Hosts: Perkins (1938a: 401) said this species is an important pest of tea seeds in

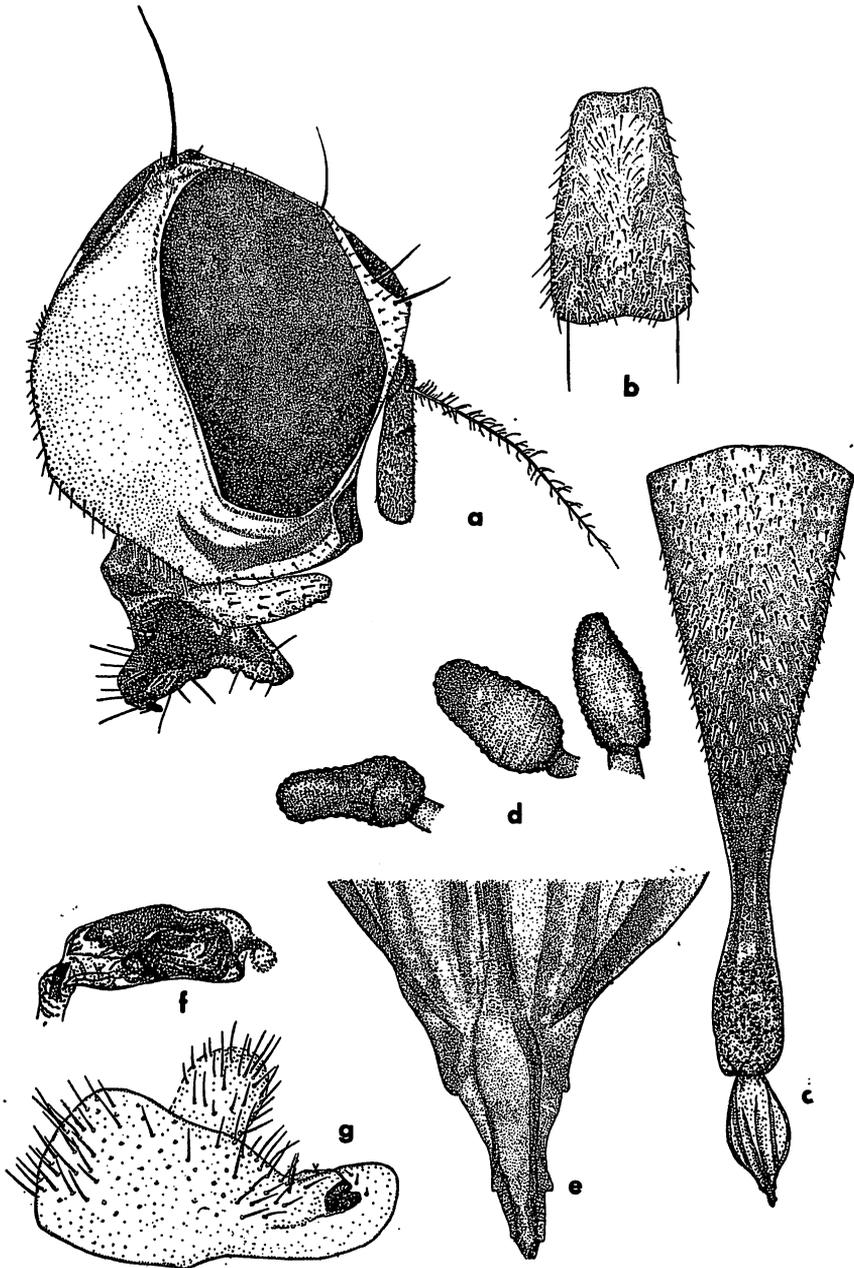


Fig. 58. *Adrama determinata* (Walker): a. head, lateral; b. 5th sternum of ♂; c. ♀ ovipositor; d. spermathecae; e. apex of piercer; f. apex of aedeagus; g. ♂ genitalia.

Sarawak; also Menzel (1929: 57) records it as a pest of tea in Java.

A. determinata fits in the complex of species characterized by having a black spot on lower median margin of face, and another on lower median front; metanotum predominantly black and scutellum black over disc; and by having glossy black markings on mesopleura and sternopleura and over metapleura and hypopleura. It differs by having the brown band from wing margin at level with r-m crossvein extending into middle of cell 1st M_2 . Also by having the 1st tergum of abdomen and base of 2nd entirely black except for narrow yellow lateral margins and by having a median black vitta extending the full length of the 2nd tergum.

Head mostly yellow with a shining black spot at upper median portion of occiput immediately behind upper vertical bristles, a large velvety-black spot in lower median portion of front and a subshining black spot over median portion of face. Head shaped as in fig. 58a. Two pairs of inferior fronto-orbitals and 1 pair of superior fronto-orbitals. Third antennal segment almost 4× longer than wide, rounded at apex but not extending as far as margin of face. Thorax predominantly shining black with a prominent median yellow vitta which is expanded posteriorly; with the humeri, notopleural calli and suture on each side, also broad margins and venter of scutellum and hind portion of mesopleuron, yellow. A broad yellow mark extends vertically through posterior portion of each sternopleuron and the metapleuron is mostly yellow. Halteres pale yellow. Legs yellow except for front tibiae and tarsi brown and hind tibiae and tarsi tinged with brown. Each middle femur with 6 to 8 thick, short, black spines on anteroventral and posteroventral surfaces on apical 1/2 of segment. Each hind femur with about 3 pairs of short, black, preapical spines and front femur with 1 short, black, posteroventral spine at about apical 3/4 of segment. One strong black spine at apex of middle tibia. Vein R_{4+5} with numerous closely placed setae extending from base to just beyond r-m crossvein on upper surface. Abdomen rather clavate in shape, predominantly rufous; 1st tergum and base of 2nd black and with a black median vitta extending the full length of the 2nd tergum. The combined 1st and 2nd terga elongate, approximately equal to terga 3+5. Fifth sternum of ♂ narrow, approximately 2× longer than wide with the posterior margin straight (fig. 58b). Male genitalia as in fig 58f-g. Epandrium densely hairy and the surstyli broadly rounded at apices. Sixth tergum of ♀ when extended, almost equal in length to 5th. Basal segment of ovipositor rufous, tinged with brown at apex and seen from dorsal view almost equal in length to terga 4-6. Sterna of ♀ shining black. Measured on venter the basal segment is about 2.6 mm long. The piercer is short, rather widely expanded, abruptly sharp-pointed at apex and with 3 small teeth on each side of preapical portion (fig. 58e). The piercer measures 0.6 mm and the extended ovipositor (fig. 58c) approximately 4.0 mm. Three spermathecae. These are elongate (fig. 58d) compared to those of *selecta* Walker. Length: body, 9-10 mm; wings, 8.0-8.5 mm.

***Adrama selecta* Walker** Fig. 59a-e.

Adrama selecta Walker, 1859, *J. Proc. Linn. Soc. Zool.*, Lond. **3**: 118. Type-locality: Aru Islands. Type ♂ apparently lost.

Enicoptera rufiventris Walker, 1861, *J. Proc. Linn. Soc. Zool.*, Lond. **5**: 163. Type-locality: Amboina. Type ♀ in British Museum (Nat. Hist.).

Psila cruciata Walker, 1865, *J. Linn. Soc. Zool.*, Lond. **8**: 126. Type apparently lost. Synonymy by Osten Sacken, 1881, *Ann. Mus. Civ. Genova* **16**: 474. This has not been confirmed.

Distribution: Previously recored from Aru, Batjan, Amboina, and New Guinea. Specimens on hand from Mt Makiling, Laguna, Luzon, 23.IX.1953, A. S. Marmeto; Los Banos, Luzon, 1916-1917, F. X. Williams; and S Bullones, Bohol, 366 m, 26.IV.1955, C. R. Baltazar.

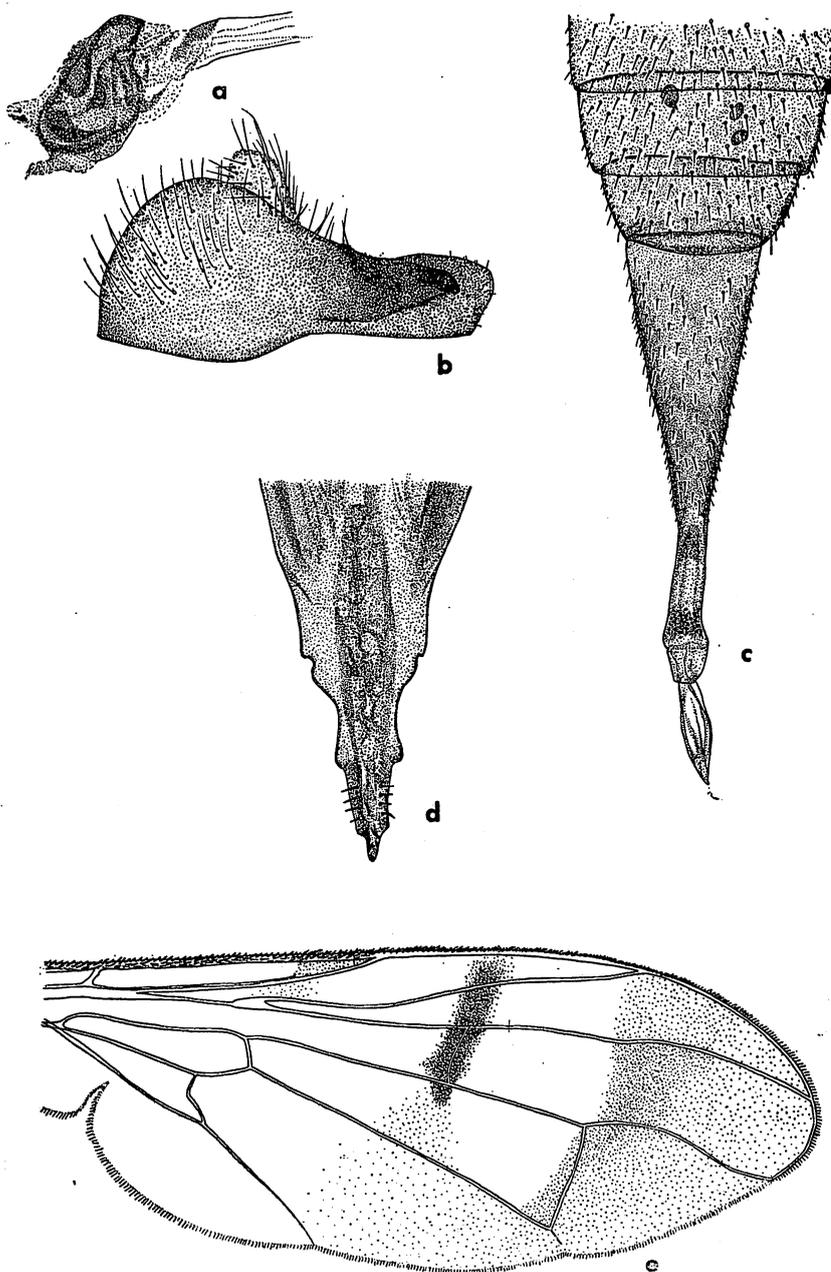


Fig. 59. *Adrama selecta* Walker: a. apex of aedeagus; b. ♂ genitalia; c. ♀ ovipositor; d. apex of piercer; e. wing.

This species is differentiated from other *Adrama* which have 4 scutellar bristles and polished black markings on the mesonotum, pleura, and scutellum by having the sterna, propleura and most of the sternopleura of the thorax yellow; a pair of small brown spots on face above oral margin and the piercer of ovipositor as in fig. 59d. It has been redescribed by Perkins (1939: 4, pl. 1, fig. 7) and Hardy (1959: 161, pl. 11, fig. 2).

The following notes are based upon specimens from the Philippines. These have not been compared.

Head yellow except for the compound eyes and for a black spot at lower portion of front above anterior margin, and with 2 brown spots at lower margin of face. Two pairs inferior fronto-orbitals and 1 pair of superior fronto-orbitals. Pleura with a large polished black spot covering anterior 1/2 of each mesopleuron extending onto the upper 1/3 to 2/5 of the sternopleuron. Posterior 1/2 of mesopleuron white; this mark extends along most of upper edge of the sclerite, almost continuous with the white humerus. The polished black mark extends over upper portion of pteropleura and over hypopleura. Metapleura white, narrowly black on hind margin. Sterna, ventral and posterior portions of sternopleura, lower portions of pteropleura and area around posterior spiracle, yellow. Metanotum and pleuroterga polished black, the latter bearing fine erect hairs. Mesonotum predominantly polished black, portion anterior to the suture entirely black except for a faint indication of rufous through median part. An elongate yellow-white spot is present behind the suture. This is slightly pointed anteriorly, blunt posteriorly and extends to a level about halfway to 2/3 the distance between supraalar and postalar bristles. Sides of mesonotum behind suture broadly yellow, hind portion otherwise black. Scutellum with a black triangular mark over disc, margins and venter broadly yellow. Four strong scutellar bristles present. Legs mostly yellow, front tibiae and tarsi brown. Front femora usually lacking ventral spines, or sometimes each with 1 tiny spine. Middle femora with 6-8 posteroventral and anteroventral spines and hind femora usually with 2 anteroventral and 1 posteroventral. Wings as in fig. 59e. Abdomen entirely yellow to rufous except for a tinge of brown on sides of 1st tergum. Male genitalia (fig. 59a-b), yellow to rufous. Surstyli broad and blunt at apices completely hiding the 10th sternum. Anal plates small. Sixth tergum of ♀, when fully extended, almost equal in length to 5th. Three oblong spermathecae present. Ovipositor yellow to rufous, basal segment about equal in length to terga 4-6. The fused terga 1 and 2 equal in length to terga 4-6. Basal segment of ovipositor measures 1.75 mm. Piercer short, broad medianly and serrated apically as in fig. 59d. The piercer measures 0.75 mm. The extended ovipositor (fig. 59c) measures 3.9 mm. Length: body, 8.5-9.0 mm; wings, 6.7-7.0 mm.

Genus *Antisophira* Hardy, new genus

This is an Adramini fitting very near *Pseudosophira* Malloch but differing by having outer scapulars and dorsocentral bristles well developed; cubital cell with a prominent apical lobe; vein R_{4+5} setose over most its length; 3rd costal section equal to 2nd and subequal to 4th; and wing markings (pl. 2, fig. 19), and body coloration very different. Also with 1 strong (longer than superior fronto-orbitals) and 1 weak inferior fronto-orbital bristles rather than with only 1 weak inferior fronto-orbital on each side; with 1 strong superior fronto-orbital situated at about upper 1/3 of front, plus 1 weak bristle almost opposite lower ocellus, rather than only 1 pair of superior fronto-orbitals located at about upper 2/5 of front. Other details as given under the species description below.

Type-species: *Antisophira vittata*, n. sp.

***Antisophira vittata* Hardy, new species** Fig. 60a-b; pl. 2, fig. 19.

This species is readily differentiated by the generic characters given above. The body and wings are strikingly marked.

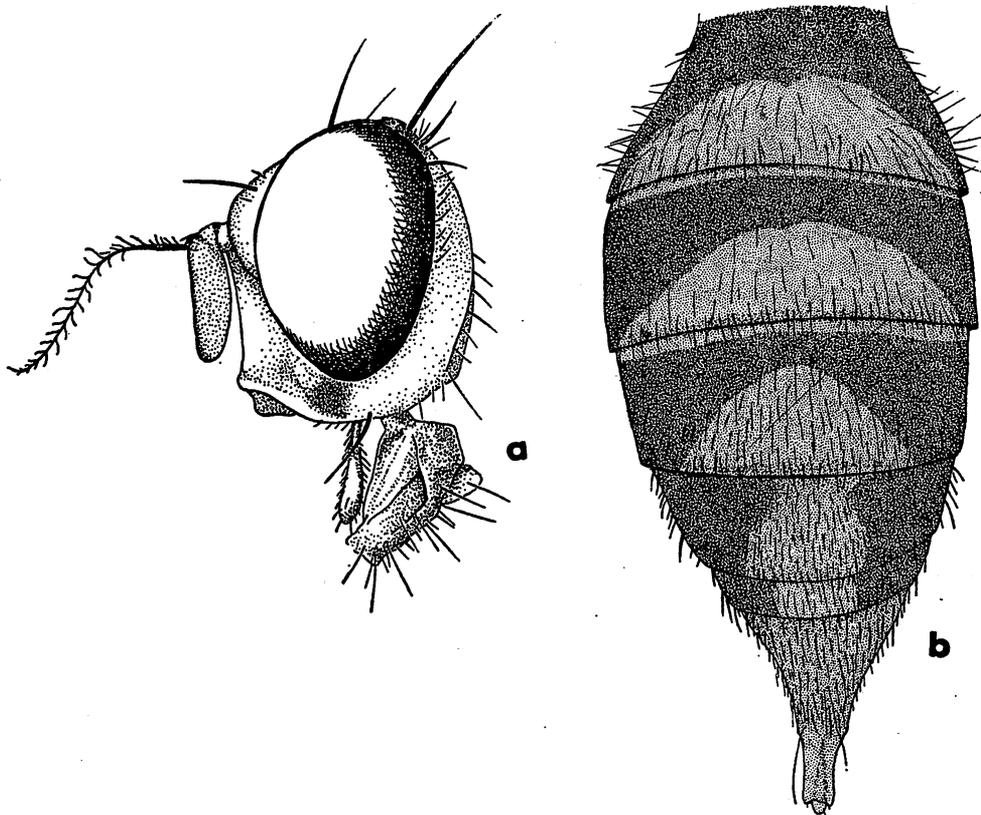


Fig. 60. *Antisophira vittata*, n. gen. & sp.: a. head, lateral; b. ♀ abdomen, dorsal.

♀. *Head*: Yellow except for a tinge of brown to black across vertex and upper edge of occiput. Also a brown tinge on each gena below hind margin. Occiput predominantly shining, front golden pollinose and face yellow-white pollinose. Only 2 pairs of well-developed bristles, 1 strong superior fronto-orbital near upper 1/3 of front and 1 strong inferior fronto-orbital near lower 1/3. A 2nd small, rather hair-like, superior fronto-orbital is situated just slightly below a line drawn across front at lower ocellus and with a hair-like inferior fronto-orbital near lower margin of front, also with 2 or 3 prominent hairs in the inferior fronto-orbital row above the strong bristle. Occiput moderately swollen, at its widest point over 1/2 the width of compound eye. Gena rather narrow, equal to about 1/6 the eye height. Eye oval, almost 1/2 higher than long. Head shaped as in fig. 60a, with the front gently sloping and face vertical. Antennal grooves moderately developed with the face raised down median portion. Antennae yellow, 3rd segment about 3× longer than wide and rounded at apex. Arista moderately long plumose, the longest hairs almost equal to width of 3rd antennal segment, also with a row of prominent hairs along inner edge of each arista. Ocellar bristles rudimentary, represented by tiny setae. Postocellars moderately

developed but long, thin, hair-like. Front rather narrow, measured from median ocellus to frontal suture about $\frac{2}{3}$ longer than wide. *Thorax*: Predominantly yellow with 2 broad, submedian, polished black vittae extending entire length of mesonotum; these are joined posteriorly so hind margin is entirely black except for posterolateral margins which are yellow. Also a shining black line runs along each side of mesonotum from behind humerus over postalar area to approximately opposite wing base. Pleura polished black over hind portions of mesopleura and sternopleura, over hypopleura, lower portions of metapleura, also pleuroterga and metanotum polished black. The pleuroterga bare except for dense microscopic pubescence. Following thoracic bristles present: 2 pairs notopleurals; 1 supraalar; 2 postalars; 1 strong dorsocentral, situated about $\frac{1}{2}$ the distance between postalars and supraalars; 4 scapulars; and 1 mesopleural. Other bristles lacking. Halteres yellow, tinged with brown on apices. *Legs*: Yellow except for brown hind tibiae and on bases of middle tibiae. Each middle tibia with 1 strong apical bristle. Leg segments slender. *Wings*: With venation and markings as in pl. 2, fig. 19. Third costal section, between apices of Sc and R₁, equal in length to 2nd costal section and subequal to 4th section. Vein R₄₊₅ setose above almost its entire length. Cell Cu with a prominent sharp-pointed lobe at apex. *Abdomen*: Bright yellow with a broad polished black band over bases of terga 2-4 and with sides of all terga beyond 1st broadly polished black. Sixth tergum about $\frac{2}{5}$ as long as 5th. Abdomen rather densely yellow setose. Ovipositor yellow, covered with yellow setae. Basal segment as seen from above about equal in length to terga 5+6 (fig. 60b). Piercer rounded at apex; it has not been extruded for study.

Length: body, 7.1 mm; wings, 7.8 mm.

♂. Fitting description of ♀ except for genital characters. The genitalia have not been dissected for study but the epandrium and 10th tergum (cerci) are covered with long curled cilia; these are equal or slightly longer than 5th abdominal tergum.

Holotype ♀ (BISHOP 10137), Minubanan, Misamis Or., Mindanao, 1050-1200 m, 5-9.IV. 1961, H. Torrevillas. Allotype ♂, Minalwang, Misamis Or., Mindanao, 1050 m, 24.III-4.IV.1961, H. Torrevillas.

Type and allotype in B. P. Bishop Museum.

Genus *Nesadrama* Perkins

Nesadrama Perkins, 1939, *Univ. Qld. Pap. Dep. Biol.* 1(10): 2. Type-species: *longistigma* Perkins, by original designation.

This genus is differentiated by the characters given in the above key. The elongate 3rd costal section, lack of ventral cilia on the arista and rather widely spaced antennae (the original description did not mention this character and it may be distinctive just of *petiolata*, n. sp.) are especially distinctive for this genus. Only the type species from New Guinea has previously been known. One new species is on hand from the Philippines.

Nesadrama petiolata Hardy, new species Fig. 61a-c.

This species differs from *longistigma* Perkins by having the wings predominantly brown with a hyaline wedge extending from cell R₃ below r-m crossvein across wing to margin in lower apex of cell 2nd M₂ and with the basal cells largely hyaline (fig. 61a). In *longistigma* the wing is hyaline except for a broad brown costal band which extends through cell R₃ and into upper portion of R₅ at apex and a longitudinal brown streak extending through cell M₄ (refer to fig. 9, pl. 1, Perkins 1939). Also differing by having the thorax predominantly black with a pair of prescutellar yellow marks on mesonotum

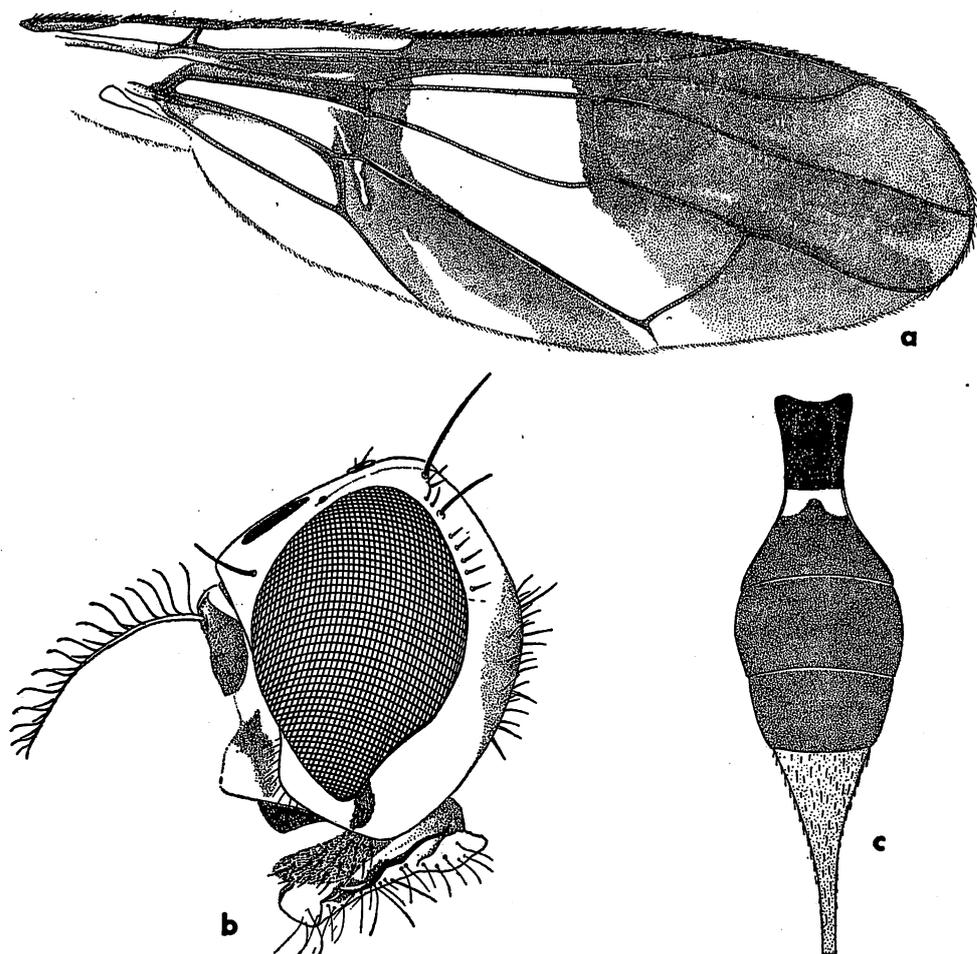


Fig. 61. *Nesadrama petiolata*, n. sp.: a. wing; b. head, lateral; c. ♀ abdomen, dorsal.

and with the abdomen entirely dark brown except for a broad yellow band on base of 2nd tergum. In *longistigma* the thorax is mostly yellow, with 3 black vittae down mesonotum and 2 oblique black bands across each pleuron; also the abdomen is marked with yellow on the 2nd, 4th and 5th terga.

♀. *Head*: Higher than long (fig. 61b), eyes oval. Occiput rather broad, almost equal in width to the compound eye. Occiput predominantly yellow, tinged with brown over upper portion and on undersides. Genae rather broad, about $1/4$ as high as eyes. Face almost straight, very slightly concave before epistomal margin. As seen from facial view, the antennal furrows are distinctly developed and the median portion of face is gently raised. Face yellow except for a brown spot in each antennal furrow; these almost converge medianly. Also the epistomal margin is brown. Front yellow, area of vertical plates brown and with a rather prominent pair of submedian brown spots. Front $1/2$ wider than long measured from the median ocellus to the frontal margin and approximately equal in width to 1 eye. One pair of weak inferior fronto-orbitals situated near

upper 3/4 of front (these are broken on the specimen at hand, but from the bases, they appear to be rather well developed). Ocellar bristles rudimentary, seta-like. Inner vertical bristles prominent, equal in size to apical scutellars. Outer vertical bristles small, scarcely larger than inferior fronto-orbitals. Antennae yellow to rufous. Third segment about 3× longer than wide, rounded at apex. Aristae with long dorsal cilia and with a row of shorter cilia along inner margins, directed dorsally. Ventral surfaces bare. Palpi rufous, tinged slightly with brown on ventral portions; each is straight along dorsal margin and broadly convex on ventral margin and with numerous scattered short black setae. *Thorax*: Cervical sclerites mostly polished brown to black. Thorax predominantly black in ground color with a pair of prominent yellow spots on posterior margin of mesonotum before suture, with an indistinct yellowish line extending down each dorsocentral row and a yellowish line extending across mesonotum at level with suture. Humeri brown, tinged with red in ground color. Notopleural calli yellow, prominent, more distinctly swollen and larger than in other Tephritidae which I have observed. Pleura mostly dark brown to black in ground color with metapleura and pleuroterga, also upper, hind, and front margins of mesopleura and lower portions of sternopleura, bright yellow; also the prosternum is pale yellow. Humeral, presutural, prescutellar, sternopleural, mesopleural, and pteropleural bristles lacking. Two pairs of weak postalar bristles; 1 pair moderately developed supraalar, 2 notopleurals with the anterior very weak, rudimentary and 2 pairs of scapular bristles present. Dorsocentral bristles rudimentary, small, seta-like, and situated approximately opposite the supraalar bristles. Scutellar bristles rather well developed, about equal in size to inner vertical bristles and apical in position. Metascutellum and metanotum black on sides, yellow down the middle. Scutellum yellow-brown, paler around the margin. Halteres pale yellow. *Legs*: Predominantly dark brown, broadly yellow at bases of femora and apices of front femora. Middle tibia with 1 strong and 2 short apical spurs. *Wings*: As in fig. 61a. Costa with 3 breaks, 1 before and 1 just beyond humeral crossvein, in addition to the break at end of subcosta. Vein R_1 ends in the costa almost opposite m crossvein and is separated from apex of R_{2+3} by less than the length of m crossvein. Vein R_{2+3} very slightly curved and bent upward at apex. Fifth costal section, between apices of veins R_{2+3} and R_{4+5} , longer than the 4th, between apices of veins R_1 and R_{2+3} . Vein M_{1+2} is curved downward before r-m crossvein and r-m is situated near the apical 2/3 of cell 1st M_2 . *Abdomen*: Strongly petiolate at base with 2nd tergum very sharply narrowed (fig. 61c). Dark brown to black except for a broad yellow band at base of 1st tergum and rather lightly brownish gray pollinose. Sixth tergum about 2/3 as long as 5th. Basal segment of ovipositor yellow-brown, as seen from dorsal view about equal in length to terga 3-5 and rather slender (fig. 61c). Measured on the venter the basal segment is 2.5 mm. The piercer has not been extruded for study and the spermathecae have not been seen.

Length: body, excluding ovipositor, 9.3 mm; wings, 8.25mm.

Holotype ♀ (BISHOP 10138), Zamboanga del Sur, Lemesahan, Mindanao, 600 m, 7.IX.1958, in light trap, H. M. Milliron.

Type returned to the B. P. Bishop Museum.

Genus *Pseudosophira* Malloch

Pseudosophira Malloch, 1939, *Proc. Linn. Soc. N. S. Wales* 64: 414. Type-species: *bakeri* Malloch, by original designation.

A monotypic genus known only from the Philippine Islands, this belongs in the group of genera which is characterized by having the femora devoid of ventral spines and lacking erect hairs on the pleuroterga, also which lacks the sternopleural, humeral and prescutellar bristles. It fits nearest to *Nesadrama* Perkins and is differentiated by the characteristics given in the key above. It is readily differentiated from all known fruit flies from the Philippines by its predominantly rufous color and distinctive wing

markings (fig. 62b).

***Pseudosphira bakeri* Malloch Fig. 62a-g.**

Pseudosphira bakeri Malloch, 1939, *Proc. Linn. Soc. N. S. Wales* 64: 415, pl. 11, fig. 3. Type-locality: Kolambugan, Mindanao. Type ♂ in U. S. National Museum.

Head slightly higher than long, rather similar to *Nesadrama* in shape and with only 1 rudimentary inferior fronto-orbital bristle situated on lower 1/4 of front and 1 rather well-developed superior fronto-orbital; this is approximately 3/4 as long as inner vertical bristles. Inferior fronto-orbital bristle pale yellow, about equal in size to 1 of the dorsal cilia of the arista, also genal bristle weak, yellow, 1/3 to 1/2 longer than inferior fronto-orbitals. Superior fronto-orbitals and inner vertical bristles black. Outer vertical bristles scarcely differentiable from the few surrounding yellow setae on back of head. Ocellar bristles represented by a pair of small pale setae. Head yellow except for reddish brown eyes, a large velvety-black mark on upper median portion of front extending about 2/3 the length, and except for a black band extending vertically down the middle of face. Vertical plates rather large, polished yellow, extending almost 1/2 the length of front measured from median ocellus to frontal suture. Measured down middle the front is just slightly longer than wide. Occiput entirely polished yellow, slightly bulged on lower median portion and at widest point about 2/3 the width of eye. Face very gently concave as seen in lateral view (fig. 62d), with shallow antennal furrows and with the upper median portion slightly carinate directly beneath antennae. Bases of antennae fitted close together, no visible space between. Antennae yellow, 2nd segment thickly black setose dorsally with a fringe of long yellow setae around ventral margin. Third segment 3× longer than wide, rounded at apex. Aristae long plumose and also with a row of closely placed setae down middle of anterior margin. Palpi and mouthparts entirely yellow, palpi very densely yellow-white pubescent with a few very scattered brown setae over outside surface and yellow setae around margins. Thorax entirely yellow except for a prominent polished brown spot on upper posterior portion of each mesopleuron, also a small spot of brown on each side behind each humerus and very faint marking of brown behind each notopleural callus. The only strong bristles on the thorax are 4 large scutellars, 2 moderately well-developed postalars, 1 supraalar, 1 posterior notopleural, and 1 mesopleural. The anterior notopleural bristle is small, about 1/2 the size of the posterior bristle; also the dorsocentral bristles are small, about equal in size to anterior notopleural and situated in line with postalars. A small erect seta is present on each humerus in the position where the humeral bristle should be; it is not developed bristle-like. Mesonotum and dorsum of scutellum thickly covered with short brown to black setae. The 2 submedian scapular bristles are moderately developed, yellow-brown in color; the outer scapulars are lacking. Legs yellow, except for tinge of brown on hind tibiae of ♂; middle tibiae of ♂ sometimes tinged faintly with brown. Legs of ♀ entirely yellow. Wings yellow except for a transverse brown mark extending from costal margin near basal 2/5 of 4th costal section through cells R₁, R₃, R₅ and into upper portion of cell 1st M₂ just beyond r-m crossvein; also with a large brown subapical mark which is somewhat variable in shape but extends from apex of cell R₁ over posterior portion of wing, covering the area from just before m crossvein to apex of cell R₅, except for a large round hyaline spot in middle of cell 2nd M₂. The apex of R₃ and upper apex of R₅ are yellow. In the specimen drawn the preapical brown mark is narrowed dorsally so that apices of cells R₁, R₃ and R₅ are entirely yellow. Also a rather faint transverse streak of brown is present from costa in apex of subcostal cell extending over wing into cell R₅; this is well developed in some specimens and very faint in others. Subcostal cell, 3rd costal section, comparatively long; vein R₁ reaching the costa almost opposite r-m crossvein so that the cell is at least 2/3 as long as the 2nd costal cell. Vein R₂₊₃ distinctly curved, bent upward at the apex so that cell R₃ is convergent apically and approximately 2/3 wider than cell R₅. Crossvein r-m situated near apical 3/5 of cell 1st M₂. Cubital cell just slightly pointed at lower apex (fig. 62b). Abdomen entirely yellow to rufous, rather thickly covered with short brown setae and with

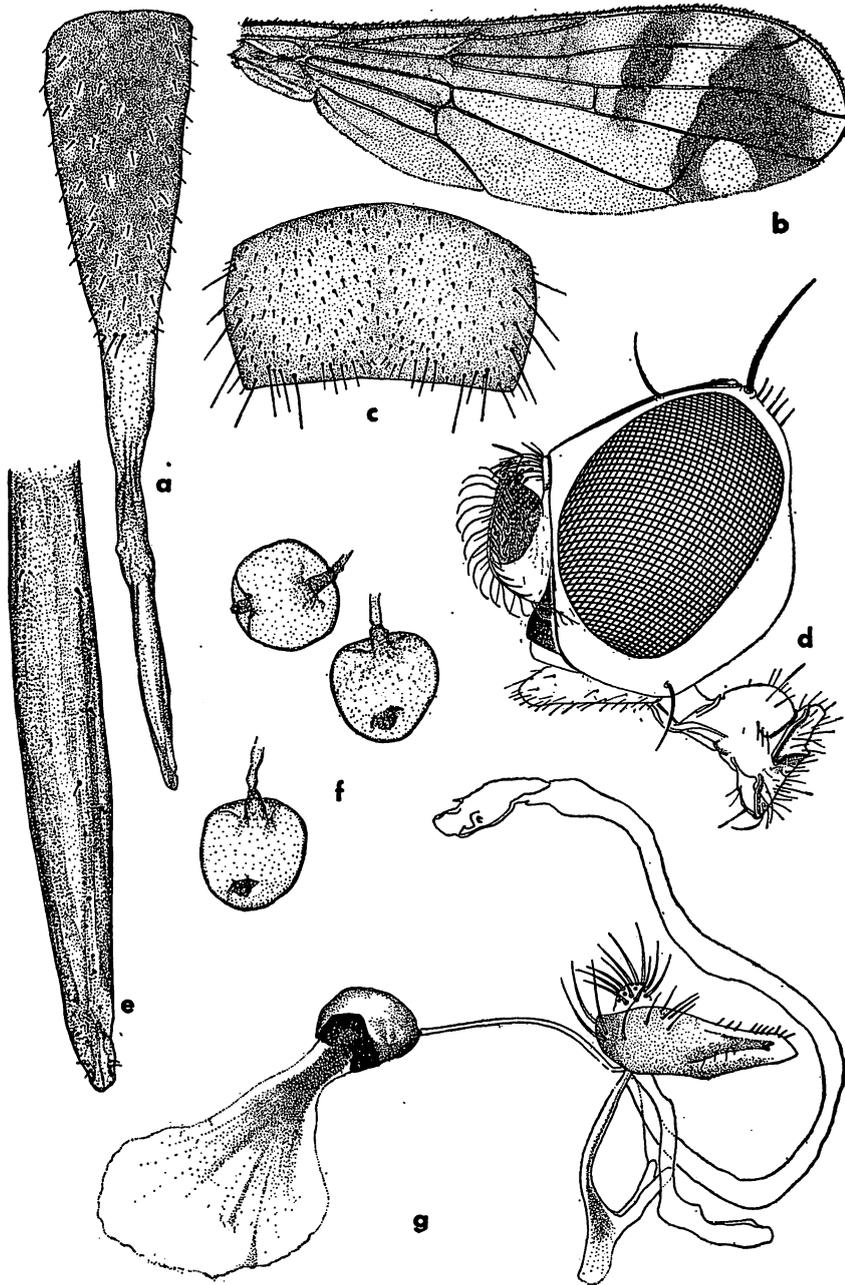


Fig. 62. *Pseudosphira bakeri* Malloch: a. ♀ ovipositor; b. wing; c. 5th sternum of ♂; d. head, lateral; e. apex of piercer; f. spermathecae; g. ♂ genitalia.

yellow bristles at apices of terga. Fifth sternum of ♂ 2× wider than long, densely covered with short spicules and with a row of brownish red bristles along posterior margin. Hind margin with a concavity in middle (fig. 62c). Male genitalia as in fig. 62g. The ejaculatory apodeme is very large. The surstyli completely cover the 9th sternum, as seen from direct lateral view. Sixth tergum of ♀ very short, as seen from dorsal view, about 1/2 as long as 5th. Ovipositor entirely yellow, exposed portion equal in length to terga 3-6, and approximately 6.0 mm long. Measured on the venter the basal segment is 2.5 mm long. Piercer expanded before apex, rounded at tip and with prominent preapical setae (fig. 62a,e). Piercer 1.5 mm long. Three small round spermathecae (fig. 61f). Length: body and wings, 6.5-8.5 mm.

Over 2 dozen specimens have been seen from numerous localities on Mindanao, Samar and Bohol.

New Genus near *Adrama* Walker

One ♀ specimen on hand, from Kolambugan, Mindanao, Baker, fits near *Adrama* by having all of the femora spinose on apicoventral surfaces, the pleuroterga with long fine hairs and the thorax comparatively elongate. The antennae are lacking and only 1 wing is present, so the genus and species is not being described at this time.

It is readily differentiated from *Adrama* and any previously described species from the Philippines by having well-developed humeral bristles and only 1 pair of inferior fronto-orbitals; also by the distinctive wing markings. The wings are hyaline except for a yellow costal band through first 2 costal cells, subcostal cell and cell R₁, with a brown costal band beginning in apex of cell R₁ and continuing along margin to apex of cell R₃. Also the all rufous body is different from any known *Adrama*.

Fitting most of the characteristics of *Adrama* except those mentioned above. Front femur with 3 strong posteroventral spines just beyond middle of segment. Middle and hind femora with posteroventral and anteroventral spines extending over apical 3/5 of segments, and each with 2 or 3 preapical posterodorsal bristles. Vein R₄₊₅ is setose on about the basal 2/5 of the distance from base to r-m crossvein. Also a faint tinge of yellow is present in upper portion of cubital cell. Abdomen entirely yellow to rufous. Ovipositor base black at extreme apex, tubular in shape and as seen from dorsal view slightly longer than terga 4-6. Measured on the venter the basal segment of ovipositor is 1.7 mm. The piercer has not been extruded for study. Length: body, excluding ovipositor, 6.2 mm; wings, 5.5 mm.

The specimen has been returned to the Bezzi collection in Milano.

TRIBE EUPHRANTINI

Differing from other Trypetinae by having fine erect hairs on the pleuroterga (area between the metanotum and metapleura, above the spiracles); presutural bristles absent in Oriental genera, except for *Soita* Walker. Three spermathecae are present in the ♀ and the wing markings are extremely variable. Some species somewhat resemble Acanthonevrini but would immediately differ by having only 4 scutellar bristles, haired pleuroterga, and by lacking presutural bristles. The concept of the tribe is somewhat confused in the literature and will have to be revised after more detailed information is available. This tribe is very poorly known in the Philippines.

KEY TO GENERA AND SUBGENERA OF EUPHRANTINI FROM THE PHILIPPINES

1. Front with at least 2 pairs of orbital bristles, superior fronto-orbitals strong.....2

- Front with only 1 pair of orbitals, situated near anterior margin (fig. 65a); superior fronto-orbitals lacking. Dorsocentral bristles rudimentary.....**Dimeringophrys** Enderlein
- 2(1). Front with 2 to 3 pairs of inferior fronto-orbitals.....3
Only 1 pair inferior fronto-orbital bristles and 1 pair superior fronto-orbitals, located below middle of front (fig. 85b). Wings dark brown with hyaline wedges from margin (fig. 85a).....**Ptilona** van der Wulp
- 3(2). Vein R_{4+5} with short inconspicuous setae above. M_{3+4} and base of Cu_1 bare. Wings variously marked with brown, cubital cell with a distinct apical lobe. Mostly dark-colored species, not slender, *Ichneumon*-like. Frontal plates short, frontal bristles normal. Four strong scutellars present.....4
Veins R_{4+5} , M_{3+4} , and base of Cu_1 with long conspicuous hairs above. Wings almost or entirely hyaline (fig. 88a); cell Cu pointed at lower apex but not lobate. Thorax yellow, abdomen usually all yellow; slender, *Ichneumon*-like species. Vertical plates elongate, lower superior fronto-orbitals located below middle of front and flat, strap-like (fig. 87c). Only 2 strong scutellars present. New Guinea and Philippines.....**Soita** Walker
- 4(3). Prescutellar bristles present.....5
Prescutellar bristles absent.....7
- 5(4). Arista bare or short plumose, the hairs not over 1/4 the width of 3rd antennal segment. Front and middle, or middle and hind femora, with rows of short black ventral spines. Dorsocentral bristles lacking in *Elleipsa* Hardy, rather small in *Scolocolus* Hardy.....6
Aristae long plumosa, the hairs about equal to width of 3rd antennal segment. Femora lacking ventral spines. Dorsocentral bristles well developed.....**Euphranta (Staurella)** Bezzi
- 6(5). Front and middle femora with rows of short black ventral spines on apical portions. Arista short plumose. Two pairs inferior fronto-orbital bristles. Dorsocentrals present and humerals lacking. Wings as in fig. 86a. Palawan.....**Scolocolus** Hardy
Middle and hind femora with rows of ventral spines. Arista bare. Three pairs inferior fronto-orbital bristles. Dorsocentrals absent and humerals well developed. Wings as in fig. 66b. Balabac.....**Elleipsa** Hardy
- 7(4). Upper inferior fronto-orbital bristles situated near superior fronto-orbitals (fig. 70a). Humeral, dorsocentral and sternopleural bristles well developed.....**Euphranta (Euphranta)** Loew
The 2 pairs of inferior fronto-orbitals situated near lower margin of front widely spaced from superior fronto-orbitals (fig. 63b). Humeral bristles absent. Dorsocentral and sternopleural bristles rudimentary, often difficult to differentiate. Wings as in fig. 63a. New Guinea, Indonesia and Philippines.....**Cyclopsia** Malloch

Genus *Cyclopsia* Malloch

Cyclopsia Malloch, 1939, *Proc. Linn. Soc. N. S. Wales* 64: 444. Type-species; *inaequalis* Malloch, equals synonym of *Dacus inscriptus* Walker (1861, *J. Proc. Linn. Soc. Zool.*, Lond. 5: 162). (Reference Hardy 1959: 176). Both types ($\sigma\sigma$) are in the British Museum (Nat. Hist.).

As pointed out by Malloch (1939) this genus is intermediate between the Adramini and the Euphrantini. Malloch treated it in the same group with *Euphranta* and Hering (1941a: 4) treated it as an Adramini. Because of the presence of the dorsocentral and sternopleural bristles, even though these are rudimentary, I am tentatively placing this

in Euphrantini. In many respects it is very similar to the genus *Adrama* Walker but lacks ventral spines on the femora, and rudiments of the dorsocentral and sternopleural bristles are present. Also like *Adrama* the occipital row of setae (short bristles) which are distinctive of Trypetinae are poorly developed. Under Euphrantini it will fit near genus *Euphranta* (*Euphranta*) because of the lack of prescutellar bristles. It is differentiated by having 2 pairs of inferior fronto-orbital bristles situated near lower margin of front and widely spaced from the superior fronto-orbitals (fig. 63b); also by lacking humeral bristles and by the rudimentary dorsocentral and sternopleurals. The wing markings (fig. 63a) are rather *Adrama*-like.

Two species presently known in this genus: the type, *inscripta* (Walker) from Indonesia and New Guinea, and *univittata* Hardy from the Philippines.

Cyclopsia univittata Hardy Fig. 63a-d.

Cyclopsia univittata Hardy, 1970, *Ent. Meddel.* **38**: 87. Type-locality: Mt Makiling, Luzon.

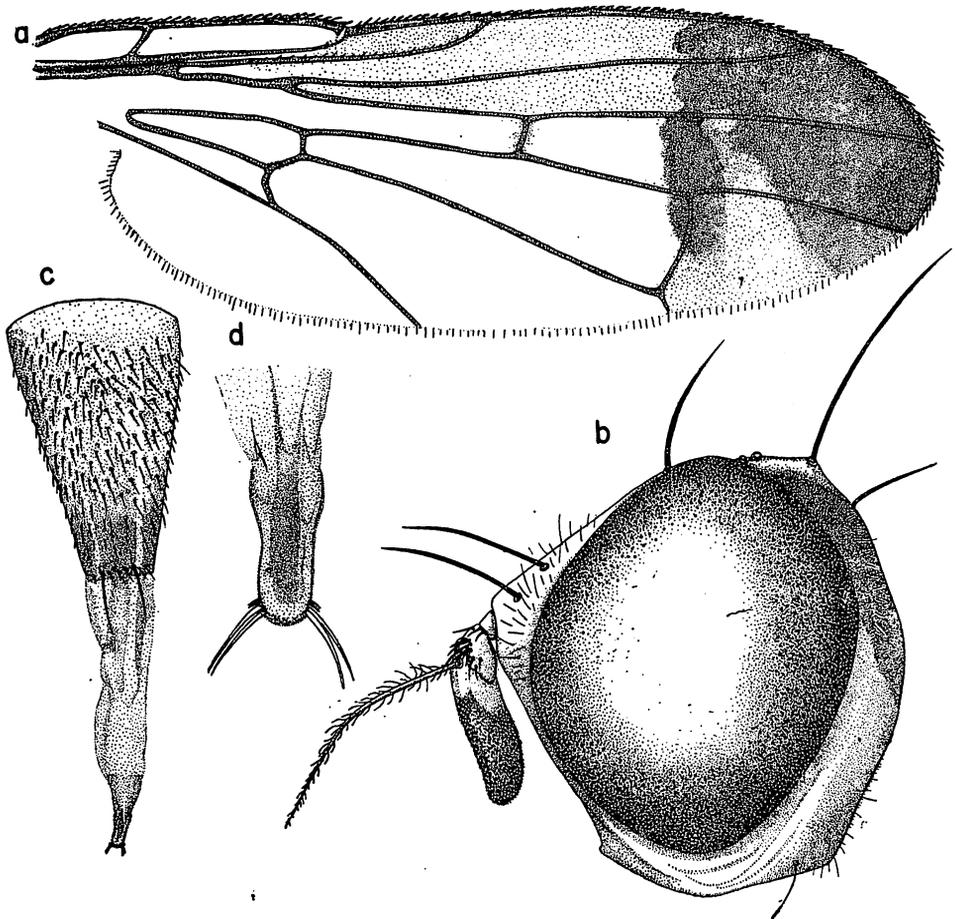


Fig. 63. *Cyclopsia univittata* Hardy: a. wing; b. head, lateral; c. ♀ ovipositor; d. apex of piercer.

This species has also been recorded from Palawan. About a dozen additional specimens are on hand from Los Banos and Mt Makiling, Luzon and from "Buranen" (Buraen), Leyte.

This species shows relationship to *inscripta* but differs by having a subhyaline wedge from wing margin extending through cells 2nd M_3 and R_5 to vein R_{4+5} , rather than with the entire wing apex beyond m crossvein brown; by having thorax and abdomen predominantly black with a median yellow vitta on mesonotum and with yellow marks on basal abdominal segments, rather than having thorax brownish yellow, mesonotum with 2 broad brown vittae and abdomen reddish yellow. The species has been adequately described in the original. It is readily differentiated from any known Philippine Tephritidae by generic characters given above. Refer to fig. 63b for head characteristics, fig. 63a for wing and to fig. 63c and 63d for the characteristics of the ♀ ovipositor. Fifth sternum of ♂ slightly longer than wide, with a small V-shaped cleft in middle of hind margin. Male surstyli slender and hiding the 10th sternum as seen from lateral view. Apex of aedeagus greatly enlarged. Piercer of ovipositor very short, measuring 0.375 mm in length. Three spermathecae, 2 round, 1 elongate. Length: body, 7.0 mm; wings, 6.0 mm.

The ♂ has not previously been recorded. It fits the description of ♀ except for sexual characters.

Genus *Dimeringophrys* Enderlein

Dimeringophrys Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 452. Type-species: *ortalina* Enderlein from Sumatra, by original designation. Equals synonym of *Dacus bilineatus* Walker (refer to Hardy 1959: 165, pl. 2, fig. 5).

Readily differentiated from other Euphrantini by having only 1 pair of frontal bristles. These are incurved and are located near lower margin of front; the superior fronto-orbital bristles are lacking; by having the dorsocentral bristles rudimentary, represented by just a tiny seta on each side, located about 1/3 the distance between inner postalar bristles and supraalars. Also by having the ocellar bristles rudimentary, seta-like. Prescutellar bristles are present; these are about 2/5 to 1/2 as long as inner postalars. Wings predominantly hyaline with a brown costal band and in 1 species with a brown mark over m crossvein and apical portion of vein M_{3+4} . Vein R_{2+3} straight. Vein R_{4+5} setose to just beyond r-m crossvein and r-m crossvein situated at or slightly beyond middle of cell 1st M_2 . The cubital cell has a short pointed lobe at apex. Female with 3 spermathecae; these are elongate, tubular as in fig. 65d. Only 2 species are presently known, both of these occur in the Philippines.

KEY TO SPECIES OF DIMERINGOPHRYS

- Wings hyaline except for narrow costal band (pl. 2, fig. 20). Thailand and Philippines.....
 *pallidipennis* Hardy
- Wings with a broad, brownish yellow costal band, brownish yellow in basal cell, over m cross-
 vein in apical portion of vein M_{3+4} (fig. 64). Indonesia, Laos, and southern Philippines...
 *bilineata* Walker

Dimeringophrys bilineata (Walker) Fig. 64.

Dacus bilineatus Walker, 1860, *J. Proc. Linn. Soc. Zool.*, Lond. **4**: 150. Type-locality: Celebes. Type ♀ in British Museum (Nat. Hist.).

Dimeringophrys ortalina Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 452, fig. W. Type-locality: Sumatra. Type ♀ in Zoological Museum, Warsaw.

Dimeringophrys bilineata: Hardy, 1959, *Bull. Brit. Mus. (Nat. Hist.), Ent.* **8**(5): 165, 234, pl. 11, fig. 5.

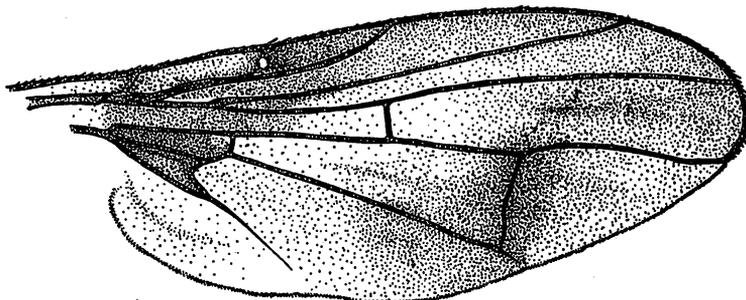


Fig. 64. *Dimeringophrys bilineata* (Walker): wing.

I have studied both types and have seen specimens from Tarawakan, north of Batu Batu, Tawitawi, southern Philippines, and also from Laos.

This species is differentiated from *pallidipennis* Hardy by the presence of rather extensive brown markings in the wings; the costal band is comparatively broad, filling all of cell R_1 and extends basad through 2nd costal cell and through the basal cells of wing; also a broad brown mark extends over m crossvein and the apical portions of cells 1st M_3 and M_4 (fig. 64). In other regards these appear to be alike. I have not examined the ♀ reproductive system, but the external characters of the ovipositor appear the same, except that in the specimen of *bilineata* on hand the basal segment of the ovipositor is predominantly yellow.

***Dimeringophrys pallidipennis* Hardy** Fig. 65a-f; pl. 2, fig. 20.

Dimeringophrys pallidipennis Hardy, 1973, *Pacif. Ins. Monogr.* **31**: 143. Type-locality: Nan, Thailand. Type ♂ in B. P. Bishop Museum.

This species differs from *bilineata* (Walker) by having the wings entirely hyaline except for a narrow marking of brown along costal margin from apex of vein R_1 to upper apex of cell R_5 . The subcostal cell is yellow but the remainder of wing is hyaline (pl. 2, fig. 20). I see no other characteristics for differentiating these; for a detailed description refer to original. For wing markings refer to pl. 2, fig. 20. Head as in fig. 65a and the characteristics of ♀ ovipositor and spermathecae as in fig. 65b-d. It should be noted that considerable variation seems evident in the body coloration. Most specimens from the Philippines have the abdomen predominantly black, the pleura dark brown and the mesonotum mostly dark-colored. Upon clearing the abdomen the typical yellow band down the middle is clearly visible and the specimens are obviously discolored. The humeri, propleura, and lower portions of sternopleura and hind portions of mesopleura are yellow on the type and are discolored with brown on most of the Philippine specimens. I feel that this is an abnormality and is not of specific importance. It should also be noted that on 1 or 2 of the specimens seen from the Philippines, weak superior fronto-orbital bristles are developed. These are represented as rather small hairs on upper por-

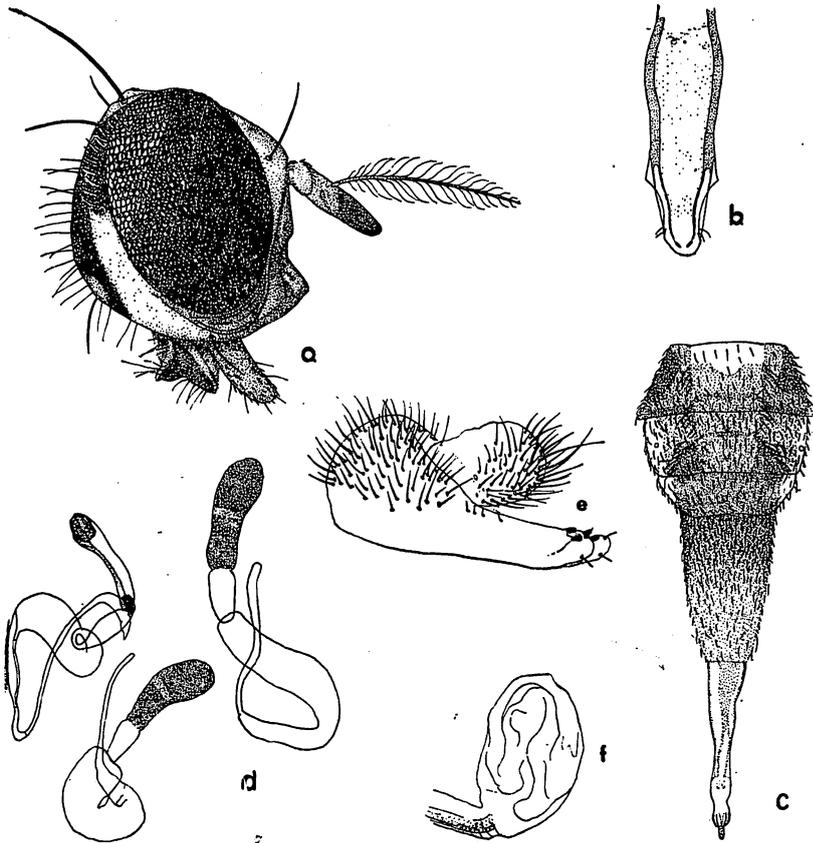


Fig. 65. *Dimeringophrys pallidipennis* Hardy: a. head, lateral; b. apex of piercer; c. ♀ abdomen, dorsal; d. spermathecae; e. ♂ genitalia, lateral; f. apex of aedeagus.

tion of front and it may eventually be necessary to combine *Tetrameringophrys* Hardy (with strong superior fronto-orbitals) with this genus; these might possibly integrate. The ♂ of *pallidipennis* has not previously been described. It fits the details of the ♀ except in the specimens on hand the middle and hind femora are consistently darker in color, predominantly black. Fifth sternum of ♂ 1/2 longer than wide, gently concave on posterior margin and with 4 strong marginal bristles. Male genitalia as in fig. 65e. Epanthrium shining black, highly arched. Surstyli long, straight-sided and slender, rounded at apex and not concealing all of 10th sternum as seen from lateral view. Aedeagus greatly expanded at apex (fig. 65f).

Six specimens on hand from the following localities in the Philippines, all on the island of Luzon: Los Banos, Mt Makiling, and Albay, Rizal.

Genus *Elleipsa* Hardy

Elleipsa Hardy, 1970, *Ent. Meddel.* **38**: 90. Type-species: *quadrfasciata* Hardy, by original designation.

This remarkable Trypetinae from Balabac Island, southwest Philippines fits in Euphrantini by having the pleuroterga covered with fine erect hairs and the presutural bristles lacking. It differs from all known members of this tribe by having the arista bare and in this regard resembles Trypetini. It also differs by lacking dorsocentral bristles and by having rows of short black ventral spines on middle and hind femora, similar to *Callistomyia* Bezzi; however, these are not related.

***Elleipsa quadrifasciata* Hardy** Fig. 66a-b.

Elleipsa quadrifasciata Hardy, 1970, *Ent. Meddel.* **33**: 90. Type-locality: Dalawan Bay, Balabac, Philippines. Type ♂ in University Zoological Museum, Copenhagen.

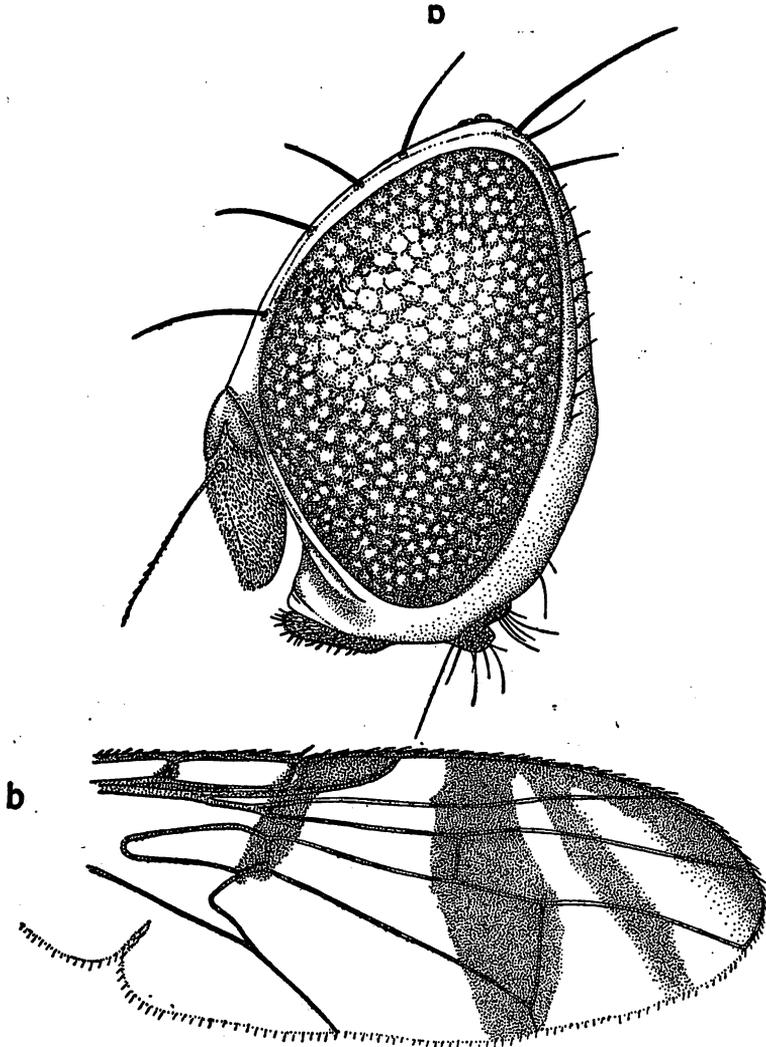


Fig. 66. *Elleipsa quadrifasciata* Hardy: a. head, lateral; b. wing.

A very distinctive species characterized by the generic characters noted above and the wing venation and markings (fig. 66b).

Head entirely rufous except for the dark reddish brown eyes, approximately 1/3 higher than long with occiput only slightly swollen. Eyes oval, front sloping, antennae situated at or slightly below middle of head as seen in direct lateral view (fig. 66a). Face slightly concave as seen from direct lateral view, flat on lower 1/2, antennal furrows shallow. Antennae entirely yellow, 3rd segment 3× longer than wide, rounded at apex. Three pairs inferior fronto-orbitals and 1 pair superior fronto-orbitals. Ocellar bristles rudimentary or lacking, postocellars moderately developed, about 2/3 as long as superior fronto-orbitals. Dorsum of thorax, including humeri and scutellum, rufous with a broad black vitta extending down median portion of mesonotum from anterior margin between outer scapular bristles almost to hind margin, ending just beyond prescutellar bristles; this area is densely gray pollinose and the entire mesonotum is covered with short, yellow recumbent setae. Scutellum with 4 strong, reddish brown, marginal bristles and almost devoid of setae except for a few scattered hairs around margin. Pleura mostly black in ground color, covered with gray pollen and pubescence. Postscutellum and metanotum polished black, pleuroterga densely gray pubescent and with numerous erect yellow hairs over most of its surface. Halteres pale yellow. Legs yellow, tinged with brown on hind tibiae. All femora rather stout, middle and hind pairs with short black posteroventral and anteroventral spines extending over apical 1/2 to 2/5 of segment. Middle tibia with 1 strong apical spur. Wings predominantly hyaline with 4 brown bands as in fig. 66b. Crossvein r-m situated near apical 2/3 of cell 1st M_3 and lobe of cubital cell short, scarcely 1/4 as long as vein $Cu_1 + 1st A$. Vein R_{4+5} with only 4 or 5 setae at base; these do not extend much beyond a level with apex of subcostal vein. Abdomen rather clavate, gradually expanded, widest at segment 4. Rufous except for black 1st tergum and narrow laterobasal margins of 2nd tergum; yellow pilose on sides of first 2 terga, otherwise covered with reddish brown setae and with dark brown to black marginal bristles on 5th tergum. The genitalia have not been studied. Length: body, 5.7 mm; wings, 4.4 mm. ♀. Unknown.

Genus *Euphranta* Loew

Euphranta Loew, 1862, Die Eur. Bohrtl., p. 28. Type-species: *Musca comexa* Fabricius, by monotypy. *Mosina*: Rondani, 1871, Prodr. Dipt. Ital. 7: 45, not Robineau-Desvoidy, 1830.

Lagarosia van der Wulp, 1891, Tijds. Ent. 34: 210. Synonymy by Malloch (1939: 442). Type-species: *lacteata* van der Wulp, by subsequent designation (Hendel 1914: 78).

Members of the genus *Euphranta* are differentiated from other members of this tribe by lacking presutural bristles, possessing sternopleurals, humerals and dorsocentrals with the latter rather variable in position, and with 2 or 3 pairs of superior fronto-orbitals present. Arista typically plumose and 3 elongate spermathecae present in ♀.

Only 1 species (*skinneri* Hardy) has been previously recorded from the Philippines; 7 species of the typical subgenus are now recognized.

Having gone through all of the previously used characters for separating *Euphranta* and *Staurella* I have decided that none of these are of generic importance. The length of the subcostal cell compared to 2nd costal is not of value, the setation on vein R_{4+5} is a species character and also the placement of the dorsocentral bristles is not reliable, even though typical of *Staurella*. These are closer to the supraalars and in some species they are situated closer to the postalars. I have not had an opportunity to make comparisons of the full range of genital characters throughout the entire genus but have now compared ovipositors and ♂ genitalia of 15 or more species, and the ovipositors of most of the *Euphranta* (*Euphranta*) studied to date have distinctively short rounded piercers (fig. 69c and 74e). It is obvious that these have a very different mode of laying

their eggs than those species with long slender ovipositors. On the other hand most of the species of *Euphranta* (*Staurella*) examined do have long slender, straight-sided, pointed piercers with preapical serrations which are obviously fitted for injecting eggs well into the host's tissue. The value of this character, however, completely breaks down in treating *apicalis* Hendel and *bischofi* (Kertész); these have the very short, stubby, rounded ovipositor typical of *Euphranta* (*Euphranta*), but have strong prescutellar bristles and have the dorsocentral bristles situated just behind a line drawn between the supraalar. I am still taking the stand that this is a rather large complex and extremely variable genus and that it is best to treat these as subgenera.

Subgenus *Euphranta* Loew

KEY TO KNOWN EUPHRANTA (EUPHRANTA) FROM THE PHILIPPINES

1. Thorax dark colored, predominantly or entirely black.....2
 Thorax yellow with 4 shining black spots on mesonotum. Wings marked as in fig.
 72b. Mindanao.**skinneri** Hardy
- 2(1). Wing with a large brown preapical spot, a narrow brown band along costa through cell R_1 and continuing obliquely over apical portion from apex of vein R_{2+3} to upper apex of cell 2nd M_2 (pl. 3, fig. 22). Also a transverse brown band from subcostal cell extending to m-cu crossvein.3
 Wing lacking a large preapical brown spot and an oblique band through apex.4
- 3(2). Wing lacking a transverse band of brown at level with r-m crossvein; costal band not connected with transverse brown band from subcostal cell (pl. 3, fig. 22); lower portion of face black. Front femur with a pair of short, black, posteroventral bristles. Java, India, Philippines..... **striatella** (van der Wulp)
 Wing with an extension of the preapical brown band which crosses wing at level of m crossvein; costal band broad, continuous with band across wing from subcostal cell (pl. 3, fig. 21). Face yellow. Front femur lacking ventral bristles. Philippines.**ocellata**, n. sp.
- 4(2). Wings with 3 radiating brown bands in apical 1/2 (fig. 67). Luzon.....**convergens**, n. sp.
 Not as above5
- 5(4). Wings entirely hyaline except for narrow costal band (fig. 73), or with 2 narrow transverse streaks of brown (fig. 70b).6
 Apical 2/3 of wing broadly brown, hyaline at apex (fig. 68a). Philippines**flavoscutellata** Hardy
- 6(5). Wings hyaline, except for narrow brown costal band (fig. 73). Thorax and abdomen black, except for yellow scutellum. Legs black, except for front femora. Samar.....**stenozeza**, n. sp.
 Wings with a narrow transverse streak at level of m crossvein and a partial crossband at level of r-m crossvein (fig. 70b). Thorax polished black, with 3 yellow vittae over mesonotum. Legs yellow. First 2 terga and base of 3th yellow to rufous. Thailand and Philippines..... **presignis** Hardy

Euphranta (*Euphranta*) **convergens** Hardy, new species Fig. 67.

Resembling *transiens* (Walker) from the Moluccas because of the convergent bands of brown in apical portion of wing. It differs by having the apices of cells R_3 and R_5 hyaline, rather than having a narrow band of brown extending around margin; by having

the brown band extending transversely over wing at level of m crossvein widely isolated from brown transverse band extending from subcostal cell, rather than being connected in cell R_5 ; also the subcostal and basal cells hyaline, rather than brownish yellow. It is readily differentiated from any other known species from the Philippines by the wing markings (fig. 67).

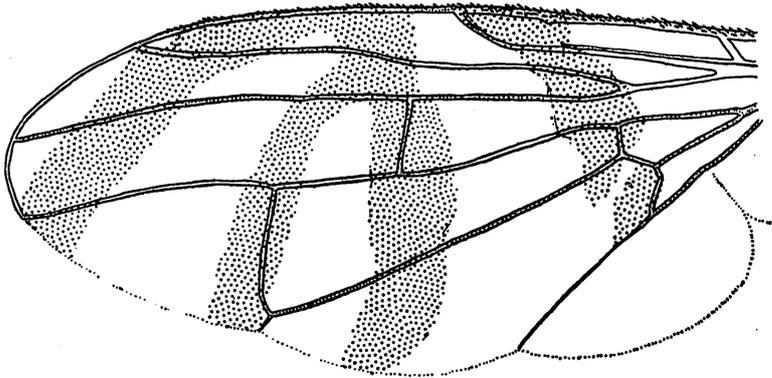


Fig. 67. *Euphranta (Euphranta) convergens*, n. sp.: wing.

♀. **Head:** Similar in shape and chaetotaxy to other *Euphranta*, with 3 pairs inferior fronto-orbitals and 1 pair superior fronto-orbitals and the face almost vertical, just slightly concave medianly. Side of occiput dark brown, median and ventral portions yellow. Genae yellow, except for a black mark along each margin and a brown discoloration just below eye margin. Front reddish brown on upper 1/2, yellow to rufous below. Face entirely yellow, antennal furrows shallow. Front 1/2 to 2/3 longer than wide. Third antennal segment brown, tinged with yellow at base. Arista moderately long plumose, the longest rays approximately 2/3 width of 3rd segment. **Thorax:** Dark brown to black in ground color, thickly gray pubescent, covered with short brownish yellow setae over dorsum and longer pale hairs on sides. Scutellum entirely yellow. Humeri yellow, tinged with brown. Also notopleural calli and edges of suture yellow, tinged with brown. Chaetotaxy as is typical of members of this genus. Pleuroterga densely white haired. **Legs:** Mid and hind tibiae and femora brown, tinged with yellow at bases. Front legs yellow, tinged with brown on posteroapical portions of femora. Other characteristics as is typical of this genus. **Wings:** With markings and venation as in fig. 67. Vein R_{2+3} very slightly curved and r-m crossvein situated near apical 2/3 of cell 1st M_2 . **Abdomen:** Dark brown on sides broadly yellow down median portions of terga 2-5 and with 6th tergum entirely dark brown. Sixth tergum approximately 2/3 as long as 5th. Basal segment of ovipositor dark brown, as seen from dorsal view almost equal in length to terga 4+5. The piercer has not been extended for study.

Length: body, excluding ovipositor, 6.0 mm; wings, 5.25 mm.

♂. Unknown.

Holotype ♀, Mt Makiling, Luzon, no date given, Baker.

Type returned to Museo Civico di Storia Naturale, Milano (Bezzi collection).

***Euphranta (Euphranta) flavoscutellata* Hardy Fig. 68a-f.**

Euphranta (Euphranta) flavoscutellata Hardy, 1970, *Ent. Meddel.* **38**: 92, fig. 9. Type-locality: Dalawan Bay, Balabac, Philippines. Type ♂ in the University Zoological Museum, Copenhagen.

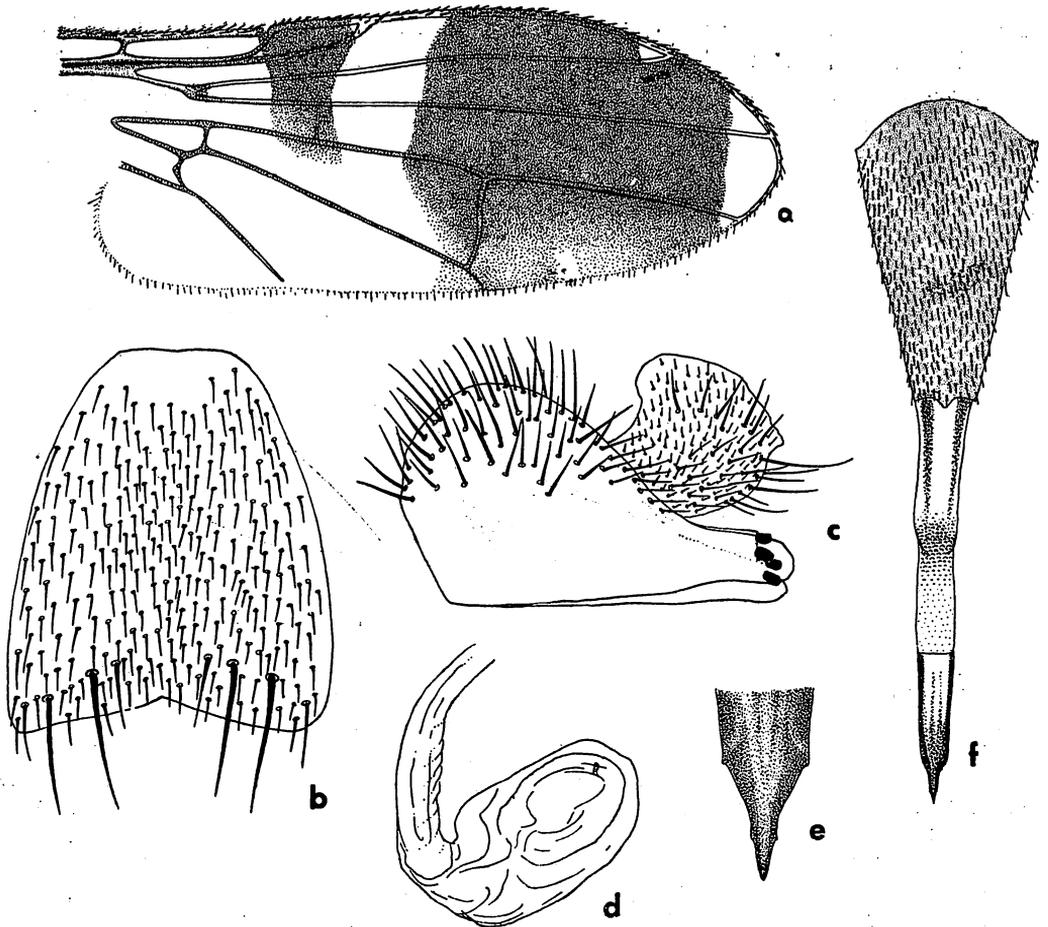


Fig. 68. *Euphranta (E.) flavoscutellata* Hardy: a. wing; b. 5th sternum of ♂; c. ♂ genitalia, lateral; d. apex of aedeagus; e. apex of piercer; f. ♀ ovipositor.

This species is differentiated from all known *Euphranta* by the wing markings and body coloration. The wings are characterized by having apical 2/3 predominantly brown with entire apex hyaline and with a tiny hyaline spot at apex of cell R_3 and another spot on margin in cell 2nd M_2 ; also with a brown mark extending from subcostal cell across r-m crossvein into upper portion of cell 1st M_2 . Thorax polished black in ground color with scutellum yellow, tinged with brown on disc. Crossvein r-m situated near basal 1/3 of cell 1st M_2 . Upper 2/3 of front brown, lower portion yellow. Face entirely pale yellow, distinctly concave as seen from lateral view, with epistomal margin projecting. Only 2 pairs inferior fronto-orbital bristles. Antennae yellow, 3rd segment rounded at apex. Thorax predominantly black, tinged with yellow along suture and in the ground color of posterolateral margins. Scutellum yellow except for brown discoloration over disc. The bristling is typical of this subgenus. Legs with femora mostly yellow, with middle and hind pairs discolored with brown in some specimens and with a prominent preapical brown spot on front pair. Wings as in fig. 68a. Abdomen prodominantly polished black, yellow to rufous on first 2 terga. Fifth sternum of ♂ longer than wide with a broadly V-shaped convexity

on hind margin (fig. 68b). Male genitalia as in fig. 68c-d. Epandrium polished black, surstyli yellow and rounded at apices, rather slender, not hiding the 10th sternum as seen from lateral view.

The ♀ has not previously been described. It fits the description of ♂ except for genital characters. The 1st tergum is yellow, mottled with brown and 2nd tergum brown, tinged with yellow basally; 3rd narrowly yellow on basal margin. Sixth tergum 2/3 as long as 5th. Basal segment of ovipositor dark brown, as viewed from above slightly longer than terga 4-6. Measured on venter basal segment 1.5 mm. Piercer short, 0.7 mm long, abruptly pointed at apex, shaped as in fig. 68e. Extended ovipositor (fig. 68f) 3.5 mm. Three elongate spermathecae. Length: body, 5.5 mm; wings, 5.0 mm.

Additional specimens of both sexes have been seen from Dalton Pass, Nueva Vizcaya, Luzon, 9-10.IV.1968, Malaise trap, D. E. Hardy & M. D. Delfinado; Sibuyan Island, Baker; and Dapitan, Mindanao, Baker.

Euphranta (Euphranta) ocellata Hardy, new species Fig. 69a-f; pl. 3, fig. 21.

Showing relationship to *striatella* (van der Wulp) but differing by having an arm of brown from upper margin of preapical brown spot extending transversely a short distance through middle of cell R_3 , than curved sharply and extending as a transverse band over wing at level of r-m crossvein; the brown costal band continuous with the transverse streak extending across wing from subcostal cell and extending to anal vein (pl. 3, fig. 21); a subbasal streak of brown present over wing at level just beyond humeral crossvein; the subcostal cell equal in length to 2nd costal, rather than being less than 1/2 this length (compare pl. 3, fig. 21 and 22); head almost entirely yellow and legs with femora predominantly yellow; also the genitalia of both sexes are very different in these species; compare fig. 69d-e and 74a-b.

♀. Similar in most respect to *striatella*. **Head:** Shape and bristling typical of most of *Euphranta*, face very slightly concave as seen in direct lateral view (fig. 69a). Head mostly yellow, tinged faintly with brown on hind portion of occiput and with a faint tinge of brown in middle of front. Third antennal segment brown, arista long plumose. **Thorax:** Predominantly brown, yellow on propleura, anterior and ventral margins of humeri, and margins of scutellum. Rather densely gray pollinose (pubescent) and covered with short dark setae over dorsum and with longer yellow-white hairs on sides. Bristles as typical of members of *Euphranta* with dorsocentrals situated distinctly in front of inner postalars, about 1/3 the distance to supraalars. **Legs:** Femora yellow, tinged with brown and tibiae and tarsi brown; fitting characteristics of other *Euphranta*. **Wings:** As in pl. 3, fig. 21, with vein R_{2+3} distinctly undulated. **Abdomen:** Brown, tinged with rufous basally. Sixth abdominal tergum about 3/5 as long as 5th. Basal segment of ovipositor dark brown, elongate compared to that of *striatella*, as seen from dorsal view approximately equal in length to terga 4-6 and measured on the venter equals 2.0 mm. Piercer short and thick, shaped as in fig. 69c, 0.5 mm long. Extended ovipositor (fig. 69b) 3.5 mm. Three oval spermathecae.

Length: body, excluding ovipositor, 7.0 mm; wings, 7.4 mm.

♂. Fitting description of ♀ except for sexual characters. Fifth sternum just slightly longer than wide with a deep V-shaped cleft in middle of hind margin extending 2/3 the length of sclerite (fig. 69f). Male genitalia as in fig. 69d-e, each surstylus with a short preapical dorsal lobe and rounded, almost truncate at apex, completely hiding 10th sternum as seen from lateral view.

Holotype ♀ (BISHOP 10139), 9.6 km E of Sindangan, Zamboanga del Norte, Mindanao, 20.VII.1958, H. E. Milliron. Allotype ♀, Mt Makiling, Luzon, Baker. Six paratypes, 5 ♂♂, 1 ♀, from the following localities: 4, same as allotype; 1, Mt Banahao, Luzon, Baker; and 1, 11 km NW of Mileuk, Zamboanga del Sur, Mindanao, 390 m, 5.VIII.1958, logged

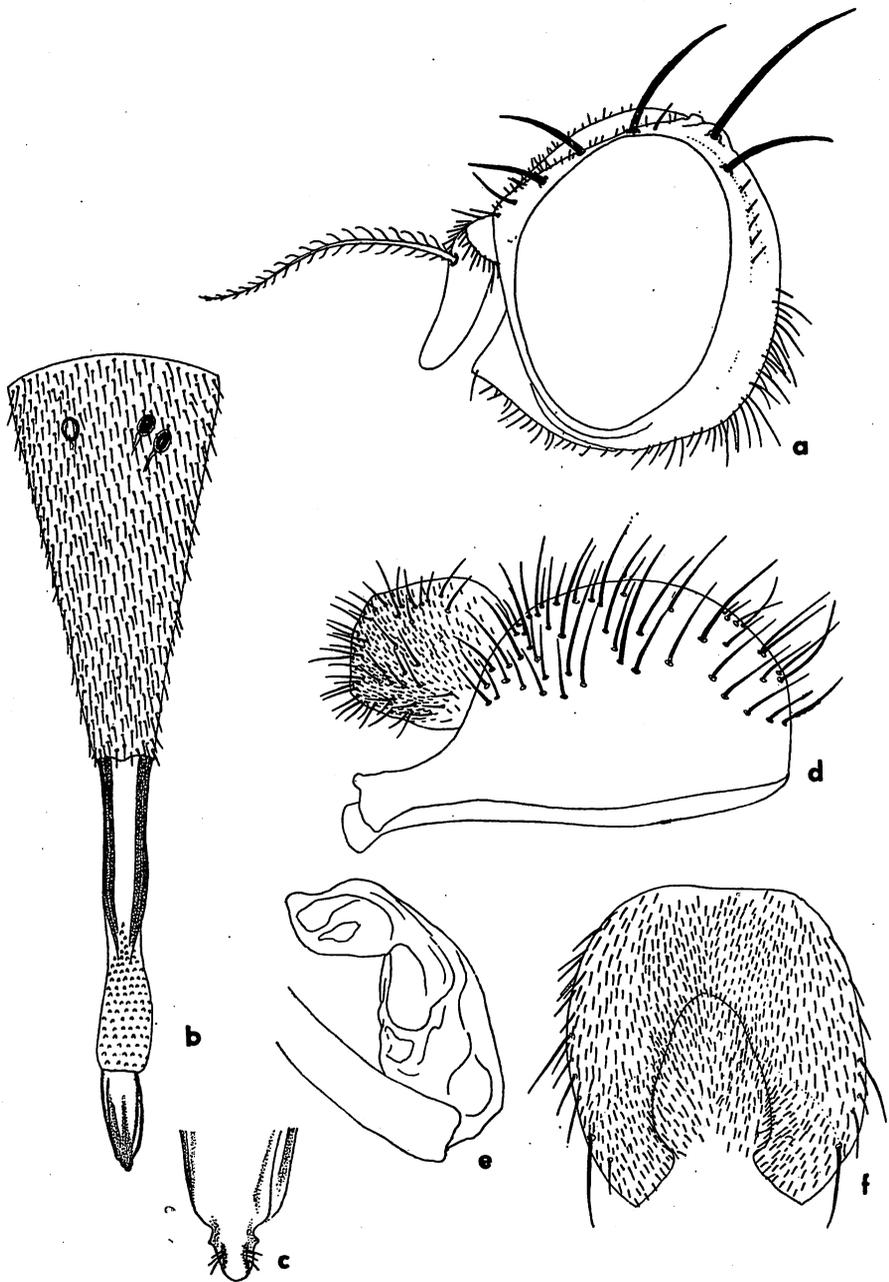


Fig. 69. *Euphranta (E.) ocellata*, n. sp.: a. head, lateral; b. ♀ ovipositor; c. apex of piercer; d. ♂ genitalia; e. apex of aedeagus; f. 5th sternum of ♂.

area, H. E. Milliron.

Type returned to B. P. Bishop Museum. Allotype returned to Museo Civico di Storia Naturale, Milano (Bezzi collection). Paratypes in U.S. National Museum, the Bezzi collection, Milano, and the University of Hawaii.

***Euphranta (Euphranta) presignis* Hardy** Fig. 70a-b, 71a-c.

Euphranta (Euphranta) presignis Hardy, 1973, *Pacif. Ins. Monogr.* **31**: 147, fig. 65a-b. Type-locality: Songkhla, Thailand.

This species is readily differentiated from all known *Euphranta* by having the arista short plumose; thorax polished black with 3 longitudinal yellow vittae on mesonotum (fig. 71a) and with a yellow longitudinal vitta along upper margin of each pleuron continuous with the yellow humerus; scutellum yellow with a black streak extending down dorsum on each side; wings predominantly hyaline with a narrow black streak extending transversely at level of m crossvein and another partial streak extending from margin to vein M_{1+2} at level of r-m crossvein; also the r-m crossvein is situated well beyond apex of vein R_1 , near apical 2/3 of cell 1st M_2 (fig. 70b). Only 2 pairs inferior fronto-orbital bristles present, 1 near lower 1/5 of front and the other just slightly below lower superior fronto-orbital (fig. 70a). Fifth sternum of ♂ approximately as wide as long with a narrow V-shaped cleft in middle of hind margin, extending 1/2 the length of segment (fig. 71b). Male genitalia as in fig. 71c, with epandrium black, rounded, and surstyli very long and slender. Length: body, 4-8 mm; wings, 4.5 mm. For a detailed description refer to original.

Previously known only from Thailand. One ♂ specimen on hand from Busuanga Island, 4 km N San Nicolas, Philippines, 21.V.1962, Malaise trap, H. Holtmann.

***Euphranta (Euphranta) skinneri* Hardy** Fig. 72a-c.

Euphranta skinneri Hardy, 1955, *Pacif. Sci.* **9**: 80, fig. 3a-f. Type-locality: Pangl, Mindanao. Type in U. S. National Museum.

Hosts: This has been reared from Cucurbitaceae.

Distribution: Known only from Philippines.

This species is closely related to *maxima* Hering from Borneo. It differs by having the subbasal spot on margin of wing occupying only subcostal cell, not extending through cell R_1 to vein R_{2+3} ; thorax predominantly yellow, not yellow-brown and the paler marks of the thorax described by Hering as "hellgelben" are whitish, just faintly yellowed; front yellow in *skinneri* with a faint brownish discoloration medianly, not with a velvety black spot as in *maxima*; the whitish median stripe on mesonotum ends before suture in *skinneri*, in *maxima* it extends beyond suture halfway between the presutural and scapular bristles; 1st abdominal tergum rufous medianly in *skinneri* and all black in *maxima*; also in the ♀ of *skinneri* the dark brown to black stripes extending down sides of dorsum converge on 5th tergum and extend as a median line over apex of 6th tergum, in *maxima* the side stripes extend to middle of 5th tergum and the 6th is entirely yellow-brown. *E. skinneri* is readily differentiated from all known Philippine *Euphranta* by having the thorax yellow except for 4 dark brown to black spots on mesonotum, a transverse mark through middle of each mesopleuron, brown over lower portion of each metapleuron and over metanotum and postscutellum, also abdomen predominantly yellow with dark brown to black stripes extending longitudinally down sides from base to apex of 4th tergum. Head with 3 pairs inferior fronto-orbitals and 1 pair of superior fronto-orbitals; these are spaced as in fig. 72a. Markings on wings as in fig. 72b. Fifth sternum of ♂ approximately as wide as long with a V-shaped cleft in middle of hind margin and with the setae arranged as in fig. 72c. Male with epandrium dark brown to black, rather highly arched. Surstyli slender, curved upward and slightly pointed apically. Cerci yellow. Basal segment of ♀ ovipositor dark brown, very well

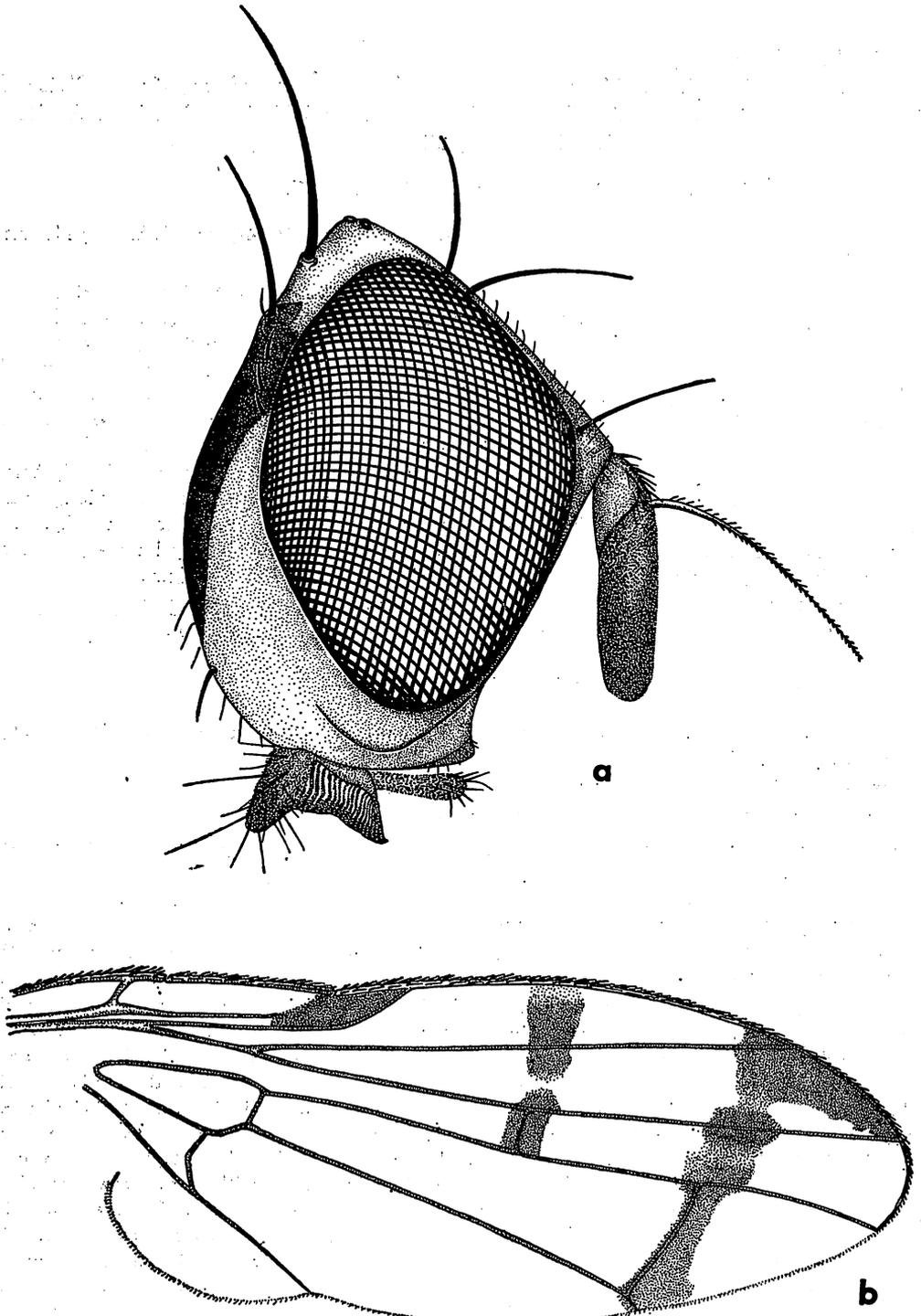


Fig. 70. *Euphranta (E.) presignis* Hardy: a head, lateral; b. wing.

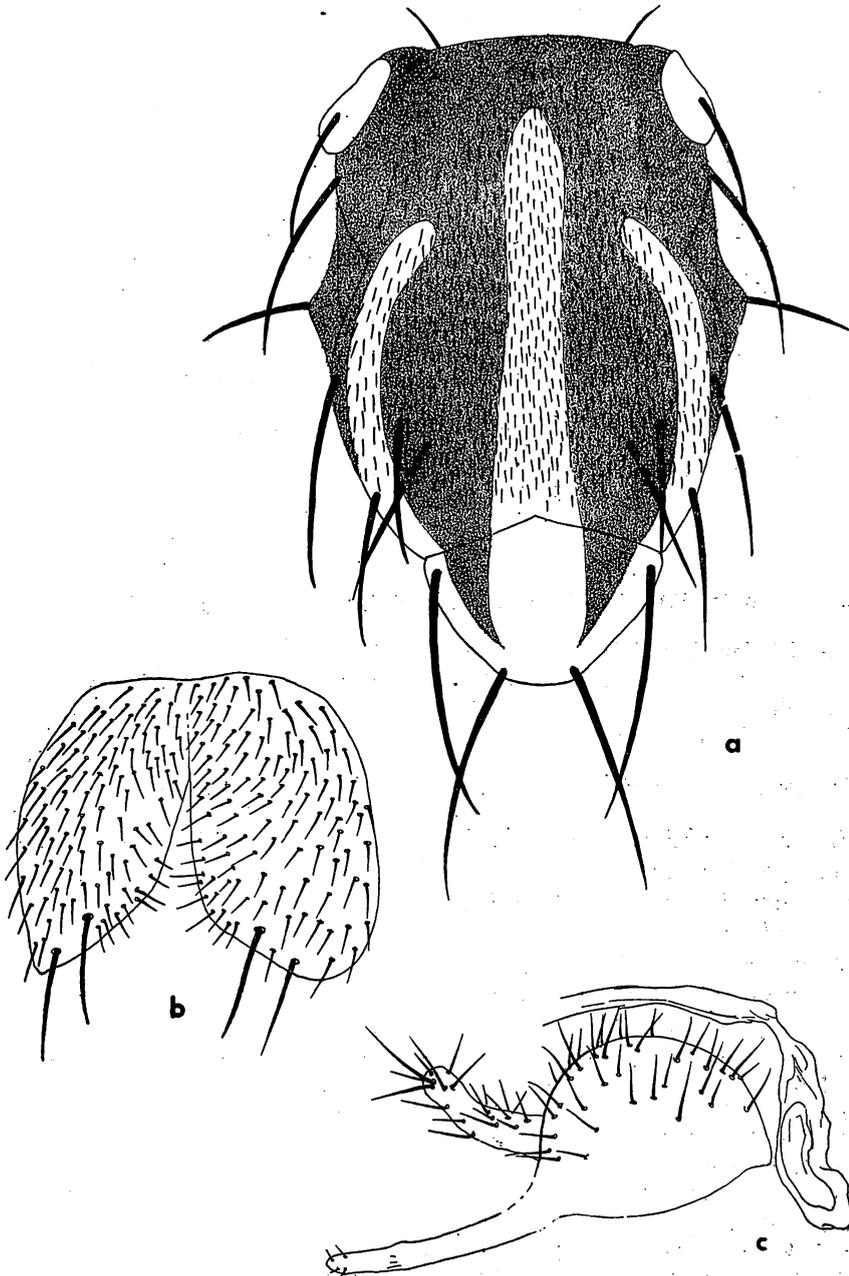


Fig. 71. *Euphranta (E.) presignis* Hardy: a. thorax, dorsal; b. 5th sternum of ♂; c. ♂ genitalia.

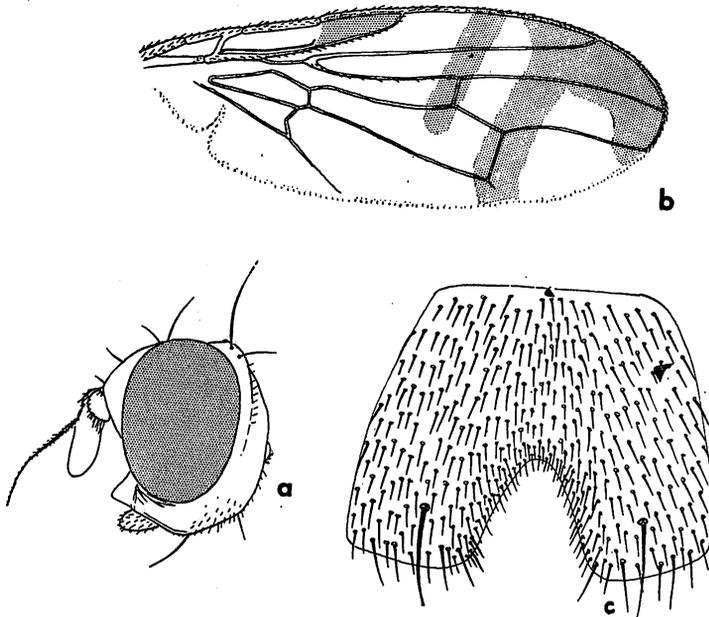


Fig. 72. *Euphranta (E.) skinneri* Hardy: a. head, lateral; b. wing; c. 5th sternum of ♂.

developed, equal in length to abdominal segments 3 to 6 and approximately 3.0 mm long. Extended ovipositor measures approximately 6.5 mm. The piercer is straight-sided, slender, about 1.7 mm long and gradually tapered at apex; under high power the apex is minutely serrated. Length: body, 8.5–8.8 mm; wings, 7.5 mm.

***Euphranta (Euphranta) stenopeza* Hardy, new species** Fig. 73.

Superficially resembling species of *Dimeringophrys* Enderlein because of the wing markings and predominantly dark slender body. It is not related to this genus and differs by having 2 pairs of inferior fronto-orbital bristles, 1 pair superior fronto-orbitals; strong dorsocentrals and no prescutellar, as well as by other details. It differs from all known *Euphranta* by having the wing hyaline except for a narrow brown costal band (fig. 73).

♂. *Head*: Slightly higher than long with occiput moderately swollen and face with a small concavity at about upper 2/3 and gently sloped ventrally with epistomal margin not expanded. Occiput dark brown on sides, yellow medianly and on ventral margin. Front yellow-brown, more distinctly yellow on lower margin, 1/2 longer than wide. Three pairs inferior fronto-orbital bristles, the upper and the lower are strong, the middle pair rather rudimentary; on the left side of the specimen at hand it is small, only 2× longer than surrounding setae and on right side, it is approximately 4× longer than the setae. One pair of strong superior fronto-orbitals. Front rather densely covered with short black setae in middle and on sides. Face shining brown in lower median portion, yellow on sides and above. Antennal furrows shallow. Genae yellow except for shining black spot on lower margin. First 2 antennal segments and base of 3rd yellow, apical portion of 3rd brown. Third segment 4× longer than wide, rounded at apex. Arista long plumose. Palpi yellow with short black setae around margins. *Thorax*: Mostly black, densely gray pubescent, with short black setae over dorsum and pale yellow hairs around sides. Scutellum entirely yellow. Chaetotaxy as is typical of this subgenus with dorsocentral bristles situated

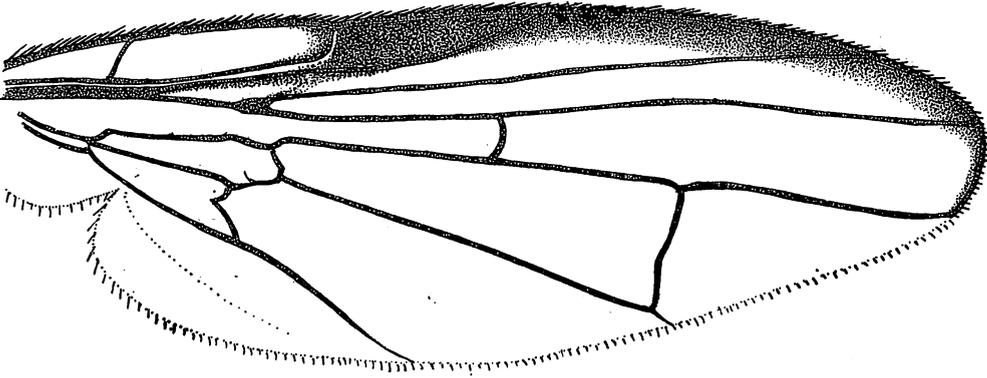


Fig. 73. *Euphranta (E.) stenopeza*, n. sp.: wing.

distinctly in front of inner postalars. **Legs:** Predominantly dark brown to black, front femora mostly yellow. Other details as is typical of *Euphranta*. **Wings:** Hyaline except for narrow costal band extending from base of subcostal cell into upper apical portion of cell R_5 . Subcostal cell subequal to 2nd costal. Crossvein r-m situated near middle of cell 1st M_2 and cubital cell with a short pointed lobe at apex (fig. 73). Vein R_{4+5} setose to a level approximately halfway between r-m and m crossveins. **Abdomen:** Entirely black, polished in ground color, rather densely gray pubescent, partially obscuring the polished ground color and thickly covered with short black setae. Fifth tergum rather elongate, almost 1/2 longer than 4th and with a row of about 6 black bristles at apex. The genitalia have not been relaxed for study.

Length: body, 7.75 mm; wings, 7.0 mm.

♀. Unknown.

Holotype ♂, Samar Island, no date given, Baker.

Type returned to Museo Civico di Storia Naturale, Milano (Bezzi collection).

***Euphranta (Euphranta) striatella* (van der Wulp) Fig. 74a-e; pl. 3, fig. 22.**

Lagarosia striatella van der Wulp, 1891, *Tijds. Ent.* **34**: 213, pl. 12, fig. 14. Type-locality: Java. Type in Zoological Museum, Amsterdam.

Euphranta nigra Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 439, fig. Q. Type-locality: Sumatra. Type ♂ in Zoological Museum, Warsaw. I have studied the type and have confirmed the synonymy.

Distribution: Indonesia, Philippines, India; probably through Southeast Asia.

Predominantly black, very readily differentiated by the distinctive wing markings. It is closely related to *lacteata* (van der Wulp) from Java, but is differentiated by having a complete, narrow, brown band extending obliquely across apex of wing, continuous with the brown band along costa in cell R_1 . In *lacteata* this band is not continuous beyond basal portion of cell R_3 . Closely resembling *ocellata*, n. sp. from the Philippines, but the wing markings are distinctly different (pl. 3, fig. 21 and 22); also the front femora are yellow, devoid of ventral spines and middle and hind femora are yellow, tinged with brown, rather than all femora dark brownish red to black and front pair typically with 2 short, black posteroventral bristles near apical 2/3 to 3/4 of segment. Also the head and appendages of *striatella* are entirely dark brown to black and in *ocellata* mostly yellow. Head similar in shape and bristling to other members of this complex, with 3 large inferior fronto-orbitals and 1 pair superior fronto-orbitals. Front brown, tinged faintly with rufous and covered with gray pubescence and fine, short, pale setae. Face dark brown to black on lower 1/2, densely gray pubescent. Upper portion of face yellow. Antennae brown, 3rd seg-

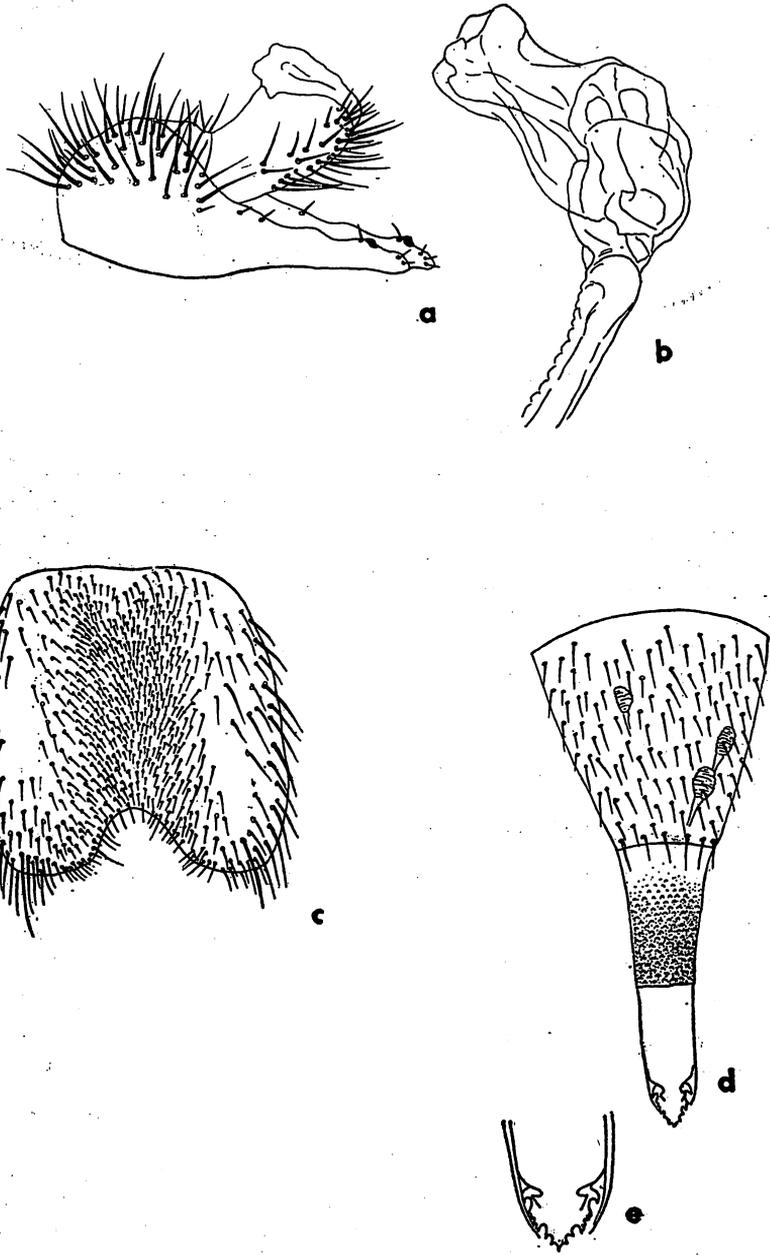


Fig. 74. *Euphranta (E.) striatella* (van der Wulp): a. ♂ genitalia, lateral; b. apex of aedeagus; c. 5th sternum of ♂; d. ♀ ovipositor; e. apex of piercer.

ment gray pubescent, nearly 4× longer than wide, rounded at apex. Aristae long plumose. Palpi brown to black, covered with yellow-gray pubescence and short black bristles around margins. Thorax entirely brown to black in ground color with a faint tinge of rufous, densely gray pubescent, covered with short yellow-brown setae over dorsum and longer yellow-gray setae on sides. Bristling typical of this genus with dorsocentral bristles situated just slightly in front of a line drawn between inner postalaris. Scutellum brown to black on dorsum, yellow on margin, gray pubescent and with numerous brown setae over dorsum. Postscutellum and metanotum black. Halteres pale yellow. Legs predominantly brown to black, tinged with rufous. One strong apical spur on middle tibia. Wings as in pl. 3, fig. 22. Abdomen entirely subshining black, rather elongate, 5th sternum of ♂ slightly longer than wide, with a V-shaped concavity in middle of hind margin and with setae arranged as in fig. 74c. Male genitalia as in fig. 74a-b. Surstyli slender and on the specimen at hand it would appear that the 10th sternum is rudimentary and possibly fused with the surstyli. Sixth tergum of ♀ 1/2 to 3/5 as long as 5th. Basal segment of ovipositor brown, tinged faintly with yellow, as seen from dorsal view scarcely longer than 5th tergum. Basal segment 1.0 mm long by 1.0 mm wide across anterior margin. Piercer very short, 1.3 mm long, broad, highly ornated apically as in fig. 74e. Extended ovipositor (fig. 74d) slightly over 2.0 mm. Three oblong spermathecae present. Length: body, 8.5-9.25 mm; wings, 7.0-7.75 mm.

Ten specimens have been studied from several localities on Luzon, Samar, and Mindanao. A specimen is also on hand from South India; this is a new record.

Subgenus *Staurella* Bezzi

Staurella Bezzi, 1913, *Mem. Indian Mus.* 3: 121. Type-species: *Musca crux* Fabricius, by original designation.

Euphranta (*Staurella*): Hardy, 1955, *Pacif. Sci.* 9: 82.

Staurocneros Hering, 1944, *Siruna Seva* 5: 2. New **Synonym** based upon comparative studies of approximately 2 dozen species of *Staurella* and all of the species which have previously been placed in *Staurocneros* [*circumscripta* Hering, *imitator* Hardy, *flavina* (Hering), *latilimbata* (Enderlein) and *punctilabris* (Bezzi)]. Type-species: *Staurella circumscripta* Hering, by original designation.

Members of this subgenus are differentiated from typical *Euphranta* by possessing prescutellar bristles.

Hering (1944) differentiated *Staurocneros* from *Staurella* by having the 3rd costal section (cells Sc) in *Staurocneros* long, as long or longer than 2nd costal section. I find this to be a variable character and in *Staurella* is evidently not of more than species-group importance. Typical *Staurella* have the subcostal cell comparatively short, scarcely over 1/2 as long as 2nd costal but all degrees of integration have been found in the species examined, from those with the cell short to those with the cell longer than 2nd costal. Hering also used the following characters for differentiating *Staurocneros*: ocellar bristles short, 1 superior fronto-orbital plus 3 inferior fronto-orbital bristles present; arista short plumose; dorsocentral bristles situated near a line drawn between supraalaris; prescutellar and dorsocentral bristles present; 2nd tibia with only 1 long end spine; with 4 to 5 posterodorsal bristles on hind tibia; and vein R₁ situated beyond middle of cell 2nd M₂. I find these characters of no value; in all *Euphranta* and *Staurella* which I have examined, the ocellars are small, the middle tibia has 1 spur, the front has 2 or 3 inferior fronto-orbital bristles. The positioning of the fronto-orbital bristles is obviously of only specific importance and shows considerable range of variation. The length of the plumosity on the arista is also variable among the species and I find nothing of value

in the bristling of the hind tibiae.

Most of the species which have been placed under *Staurocneros* have been predominantly or entirely yellow and in my Noona Dan Expedition report (Hardy 1970: 101) I stated that the head shape may be important for differentiating *Staurocneros*. The extremes of this condition would be that of *imitator* Hardy (fig. 80a) where the head is distinctly longer than high, narrowed anteriorly, and the head of typical *Euphranta* (*Staurella*) (fig. 81) where the head is distinctly higher than long. This character again apparently intergrades; various species have the head slightly different in shape and I now believe this character is of not more than species importance in the *Euphranta*.

Approximately 28 species of *Staurella* have been reported throughout Asia and the Pacific. Previous to my Noona Dan report (1970) only 1 species had been recorded from the Philippines; 10 are recorded in this paper.

KEY TO KNOWN EUPHRANTA (STAURELLA) FROM THE PHILIPPINES

1. Wings lacking complete brown crossbands, with various arrangements of brown marks (fig. 79, 80b, 82a and 84a).2
 Wings with a complete, isolated, brown crossband at level of m crossvein (fig. 75d).
 Only 2 inferior fronto-orbital bristles. Formosa, Philippines.**apicalis** Hendel
- 2(1). Wings with a brown costal band from base of cell Sc which expands in apex of cell R_5 and fills all of apical portion of cells R_5 and 2nd M_2 , except for extreme apex of R_5 , and a large hyaline spot present on margin in cell 2nd M_2 (fig. 80b).3
 Not as above.4
- 3(2). Thorax and abdomen entirely pale colored, no black markings. Wings as in fig 80b. Philippines. **imitator** (Hardy)
 Thorax and abdomen predominantly polished black. Wings as in pl. 3, fig. 26. Sumatra, Philippines.**latilimbata** Enderlein
- 4(2). Wings lacking a triangular-shaped hyaline area on anterior margin which encloses a brown mark in cell R_15
 Wings with a large triangular hyaline area occupying most of cell R_1 , extending across wing into or through cell 1st M_2 and with an isolated brown spot near basal portion of cell R_1 (pl. 3, fig. 23). Philippines.**atrata**, n. sp.
- 5(4). Wings brown on apical 2/3 with 2 large, hyaline spots on anterior margin, 1 at apex and 1 on posterior margin as in pl. 3, fig. 25. Philippines. **canangae** Hardy
 Not as above.6
- 6(5). Wings with a broad hyaline area across middle between r-m and m crossveins extending at least from costa to vein M_{1+2} through middle of cell 2nd M_2 or complete (fig. 79, 82a and 84a).7
 Wing lacking a crossband between r-m and m; markings quite different (fig. 83a).
 Third tergum with a shining black spot on each side and a brown spot in middle (fig. 83b). Luzon. **notata**, n. sp.
- 7(6). Hyaline band from cell R_1 complete (fig. 79 and 82a). A large yellow spot on hind portion of mesonotum.8
 Hyaline band not extending beyond middle of cell 1st M_2 (fig. 84a).9
- 8(7). Mesopleuron entirely black, humeri dark brown to black. Hind median margin of mesonotum broadly yellow. Wings as in fig. 79. Balabac. **ferenigra** Hardy
 Mesopleuron with a large yellow spot, humeri yellow; mesonotum with a preapical yellow spot bordered by prescutellar and dorsocentral bristles. Wings as in fig. 82a.

- Indonesia, Burma, Thailand, and Philippines.**maculifemur** de Meijere
 9(7). Hyaline mark from cell R_1 extending to middle of cell 1st M_2 ; a complete hyaline band
 present between r-m crossvein and subcostal cell. Apex of wing brown (fig. 84a).
 Palawan.**palawanica**, n. sp.
 Hyaline mark from R_1 extending only to vein M_{1+2} ; a band of brown connects r-m to
 the subcostal cell, and apex of wing hyaline (pl. 3, fig. 24). New Guinea and Phi-
 lippines.**bischofi** (Kertész)

Euphranta (Staurella) apicalis Hendel Fig. 75a-d.

Euphranta apicalis Hendel, 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* **13**: 440, pl. 8, fig. 1. Type-locality:
 Tapani, Taiwan. Type in Hungarian National Museum.

Euphranta apicalis: Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* **8**: 336.

Staurella apicalis: Hering, 1938, *Ark. Zool.* **30A**(25): 26.

Hering (1938b) has recorded this from Tenasserim, Burma, and I have recorded it
 (Hardy 1973) from Vietnam. Three specimens are on hand from the Philippines. This
 is probably widespread throughout the Oriental Region.

Hosts: Reared from stem of *Aeginetia indica* L. (in Taiwan).

This species is differentiated from all known *Euphranta* (*Staurella*) by the wing
 markings (fig. 75d); by having a narrow crossvein continuous over wing at r-m crossvein,
 an incomplete band from subcostal cell to base of cell R_4 and with a large brown mark
 covering most of apical 1/3 of wing, leaving a large hyaline spot covering apex of cell
 R_5 and lower apex of R_3 and a tiny hyaline spot in apex of cell R_1 .

Head shaped as is typical of *Euphranta*, very slightly higher than long with the face gently
 concave in median portion and occiput moderately swollen with eyes oval, slightly higher than
 long. Two pairs inferior fronto-orbital bristles; these are widely spaced with upper pair placed
 near the single pair of superior fronto-orbitals. Head mostly yellow, front tinged with brown in
 median portion. Upper median portion of occiput brown and face with 2 large dark brown to
 black spots on lower margin. Aristae long plumose. Mesonotum predominantly black with a
 narrow, yellow median vitta extending entire length and with posterior margin yellow, and a pair
 of submedian yellow vittae extending in line with dorsocentral bristles from a level near hind
 margin of humerus to posterior margin of mesonotum; also the area around suture is yellow and
 a yellow vitta extends posteriorly at level with inner postalar bristles. In some specimens the
 mesonotal vittae are indistinct, obscured by the gray-brown pollinosity of mesonotum. Scutellum
 predominantly yellow, tinged with brown on disc and in some specimens, entirely brown over
 disc. Legs entirely yellow. Wings as noted above and as in fig. 75d. Abdomen brown, tinged
 with yellow in ground color and rather densely black setose. Fifth sternum of ♂ slightly longer
 than wide, gently concave on posterior margin with setae arranged as in fig. 75b. Male genitalia
 as in fig. 75c. Epanthrium dark brown to black, rounded. Surstyli long and slender and apex of
 10th sternum plainly visible from lateral view. Sixth tergum of ♀ almost as long as 5th (fig. 75a).
 Base of ovipositor short, thick, densely black setose, apical 2/3 yellow with basal portion brown. As
 seen from above basal segment approximately equal to terga 5+6 and measured on ventral margin
 1.2 mm. Piercer very short, blunt, rounded at apex, approximately 0.4 mm long. Extended ovi-
 positor (fig. 75a), approximately 2.0 mm. Three gourd-shaped spermathecae present. Length:
 body, 5.75 mm; wings, 5.0 mm.

It should be noted that this species represents the minimum range of variability in
 length of piercer in the subgenus *Staurella* and in this regard would fit more closely
 the known species of typical *Euphranta*.

Three specimens on hand from the following localities on Luzon: 33 km SW of

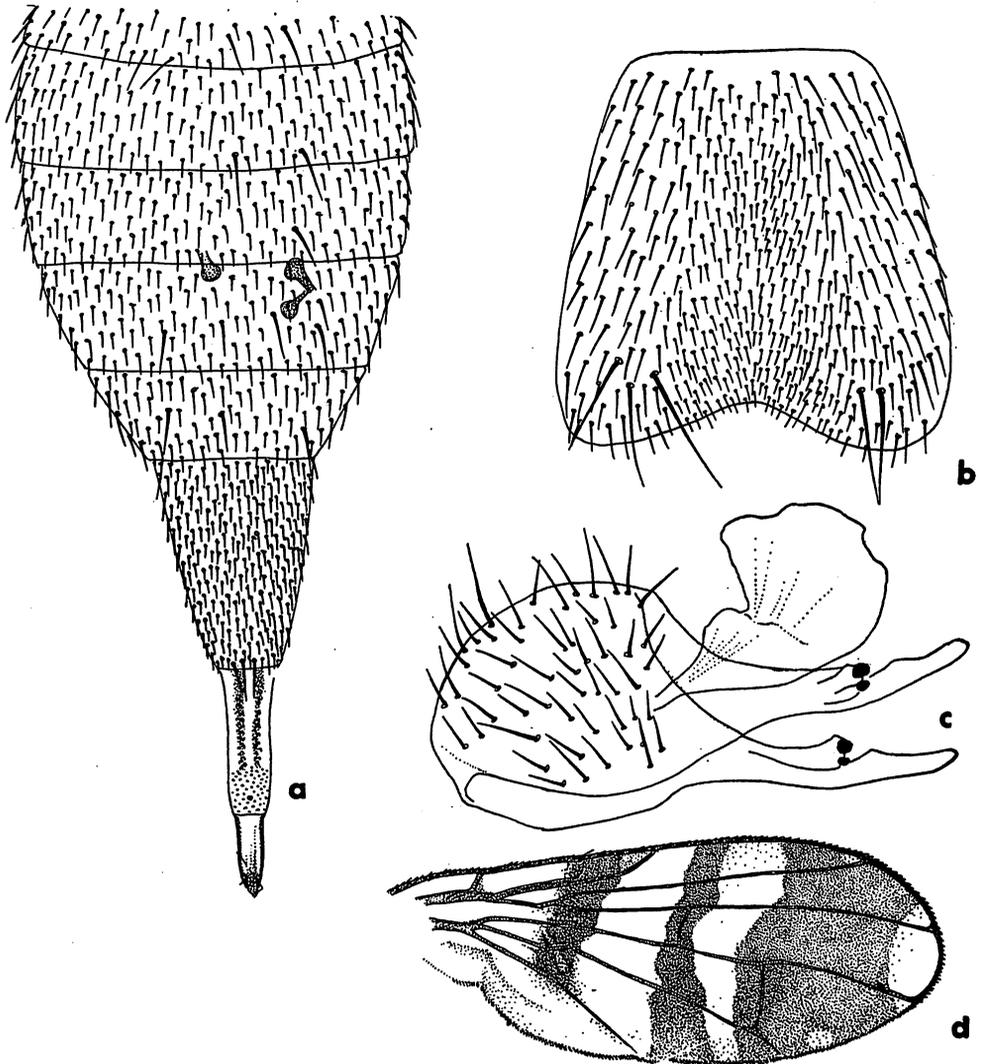


Fig. 75. *Euphranta (Staurella) apicalis* Hendel: a. ♀ abdomen, dorsal; b. 5th sternum of ♂; c. ♂ genitalia; d. wing.

Bagolo, 2.X.1945, H. E. Milliron, and Ifugao, Mayoyao, Mt. Prov., 1000-1500 m, 9.VII.1966, H. M. Torrevillas.

***Euphranta (Staurella) atrata* Hardy, new species** Fig. 76a-d; pl. 3, fig. 23.

Fitting very near *lemniscata* (Enderlein) from Taiwan and Mariana Islands and externally differing mainly by size. The specimen at hand measures 5.5 mm for the body and 4.75 mm for the wings, whereas *lemniscata* measures 7.0-7.25 mm for the body and 6.4-6.7 mm for the wings. Thorax predominantly black in ♂, rather lightly gray

pollinose with the polished black background shining through, with a short yellow vitta extending from posterior margin to about level with supraalar bristles and pleura of ♂ entirely dark brown to black except for a yellow-white mark along upper margins of pteropleuron and mesopleuron, continuous with coloration of humerus. In ♀ the yellow median vitta of mesonotum extends almost to suture and a very faint indication of a complete vitta is present in ground color of anterior portion, also posterolateral margins and notopleura are yellow and the pleura are yellow except for brown over pteropleura, metapleura and hypopleura. In *lemniscata* the thorax is densely gray pollinose, a complete median vitta extends entire length in both sexes and the pleura are entirely yellow. The wing markings are very similar in the 2 species and the difference seen may not actually be of species importance. In *atrata* a distinct hyaline spot is present in apex of cell R_1 . This is absent in specimens of *lemniscata* I have seen, and the hyaline wedge from margin through cell 2nd M_2 does not extend beyond vein M_{1+2} in *atrata* (in ♂ it ends well before this point) (pl. 3, fig. 23), while in *lemniscata* this mark is either

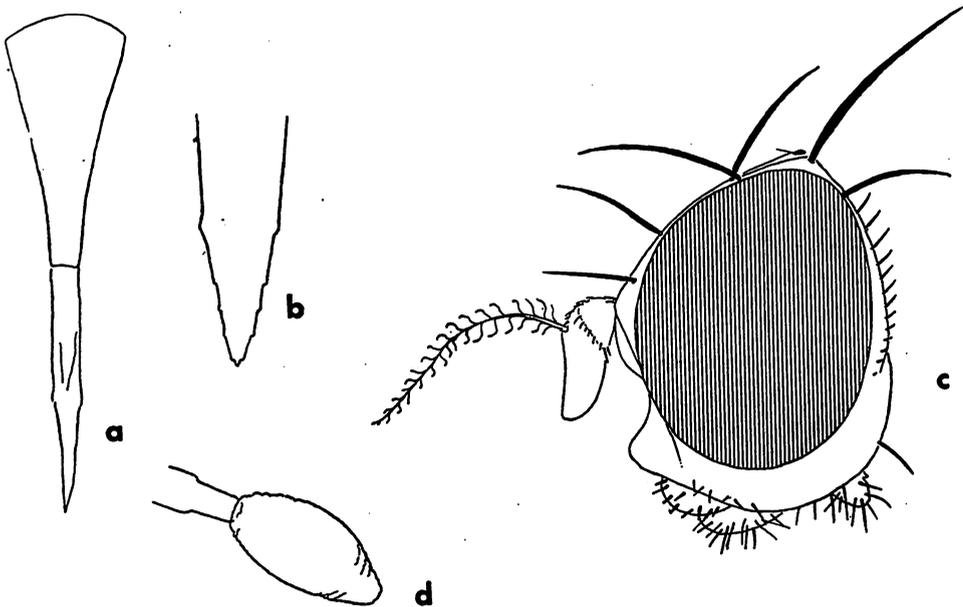


Fig. 76. *Euphranta (S.) atrata*, n. sp.: a. ♀ ovipositor; b. apex of piercer; c. head, lateral; d. spermatheca.

continuous into cell R_5 or the small isolated hyaline spot is present in middle of cell R_5 . The most striking differences are in the ♀ ovipositors. The ovipositor of *atrata* is comparatively short, the basal segment measures 2.25 mm and the piercer only 0.9 mm; in *lemniscata* the basal segment measures 3.5 mm and the piercer is long and slender, straight-sided, measuring 2.5 mm. The piercer of *atrata* is evenly tapered from the base, rather than being straight-sided.

♂. *Head*: Slightly higher than long, shaped as in fig. 76c, with the occiput only slightly swollen and the face distinctly concave in median portion. Occiput black over upper median portion, yellow below. Front yellow except for a brown to black median mark on upper portion

extending from ocellar triangle, expanded laterally, almost to bases of superior fronto-orbital bristles and narrowed anteriorly, extending just beyond level with 2nd inferior fronto-orbitals. Face and genae entirely yellow. Three pairs of strong inferior fronto-orbitals, 1 pair superior fronto-orbitals, the latter situated opposite upper inferior fronto-orbitals. Ocellars rudimentary, postocellars moderately developed. *Thorax*: Predominantly subshining black, gray pubescent, with a yellow median vitta from posterior margin to about level with supraalar bristles. Mesonotum otherwise yellow only on suture and very faintly tinged with yellow in ground color of posterolateral margins and thickly covered with short black setae. Notopleura yellow. Humeri yellow-white with a continuous yellow-white line extending over upper edge of each mesopleuron and pteropleuron to wing base. Pleura otherwise black except for posteroventral margin of sternopleuron which is narrowly yellow; also the front edge of hypopleuron is yellow. Halteres pale yellow. Bristles as is typical of *Staurella* with dorsocentrals situated just slightly behind supraalars. *Legs*: Entirely yellow, front femora lacking prominent posteroventral bristles but with a row of short black bristles on this surface and with several irregular rows of black bristle-like setae. Legs otherwise as is typical of this genus. *Wings*: Marked as in pl. 3, fig. 23. Vein R_{4+5} bare except for a group of setae at base. *Abdomen*: Predominantly polished black, 1st tergum, base and median portion of 2nd, narrow median and apicomedian portion of 3rd, and narrow apical margins of 4th and 5th yellow, also lateral margins of 2nd yellow. Sterna brown to black. The genitalia have not been relaxed for study.

Length: body, 5.5 mm; wings, 4.75 mm.

♀. Fitting description of ♂ in most respects. Thorax with a faint indication of a continuous yellow vitta over anterior portion of mesonotum and posterolateral portions of mesonotum yellow. Anterior 2/3 of each pleuron yellow with brown over pteropleuron, metapleuron, and hypopleuron. Wing with the hyaline triangle extending almost completely through cell 1st M_2 and with the hyaline wedge from margin in 2nd M_2 extending almost to vein M_{1+2} . Sixth tergum approximately equal in length to 5th. Basal segment of ovipositor almost equal in length to remainder of abdomen (fig. 76a), the measurements as noted above. Piercer serrated at apex (fig. 76b) and slightly curved downward; the extended ovipositor probably measures about 5.2 mm (the inversion membrane has not been extended on the specimen at hand). Three oblong spermathecae present (fig. 76d).

Holotype ♂ (BISHOP 10140), Dalton Pass, Nueva Vizcaya, Luzon, 9-10.IV.1968, in Malaise trap, D. E. Hardy & M. D. Delfinado. Allotype ♀, Mt Beaufort, Irawan River, Palawan, 17.IV.1968, M. D. Delfinado.

Type deposited in B. P. Bishop Museum collection, allotype in University of Hawaii collection.

***Euphranta (Staurella) bischofi* (Kertész) Fig. 77a-c; pl. 3, fig. 24.**

Ptilona bischofi Kertész, 1901, *Termész. Füzet.* **24**: 427, pl. 20, fig. 16. Type-locality: New Guinea.

Type ♂ in Hungarian National Museum. I have studied the type and have a color photograph.

Euphranta bischofi: Hendel, 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* **13**: 440.

Staurella bischofi: Hering, 1941, *Ann. Hist. Nat. Mus. Nat. Hung. Zool.* **34**: 49.

One ♀ specimen on hand from the Philippines fits the description and my photograph of *bischofi* and apparently is this species.

Differentiated from other known *Staurella* by the distinctive wing markings (pl. 3, fig. 24): having a narrow hyaline band continuous to margin in subcostal cell, over r-m crossvein; a prominent hyaline mark extending from basal portion of cell R_1 just beyond apex of vein R_1 through cells R_1 , R_3 , and R_5 , just beyond r-m crossvein; a small triangular hyaline mark in apical 1/3 of cell R_1 and a tiny hyaline spot at apex of this cell; a large hyaline mark extending across apex of wing; a mark extending from costa over halfway

through cell 2nd M_3 ; also by having r-m crossvein near basal 1/3 of cell 1st M_2 and by the coloration of mesonotum, with anterior portion polished black and median portion predominantly black in ground color, densely gray pubescent.

The ♀ has not previously been described. The following notes are based upon the specimen from the Philippines. Head mostly yellow, upper portion of occiput polished dark brown to black, lower portion yellow. Head higher than long with face gently concave in median portion and occiput moderately swollen. Upper 2/3 of front tinged with brown and lower portion yellow. Front approximately as wide as long. Three pairs inferior fronto-orbitals, upper pair rather widely spaced, situated opposite superior fronto-orbitals. Antenna yellow, 3rd segment about 3× longer than wide. Aristae long plumose. Mesonotum as noted above, with humeri, notopleura, lateral and posterior margins yellow. Pleura mostly yellow with brown markings extending over median portions of mesopleura, over most of sternopleura, lower edges of hypopleura and hind portions of metapleura. Pleuroterga, metanotum and postscutellum polished black, the former with numerous pale erect hairs. Scutellum entirely yellow with sparse setae around margins and on disc. Chaetotaxy as is typical of this subgenus with dorsocentral bristles situated approximately opposite supraalars. Legs entirely yellow. Front pair lost on specimen at hand, hind femora with distinct, short, posteroventral and anteroventral bristles. Wings as noted above and as in pl. 3, fig. 24. Abdomen polished black except for yellow first 2 terga, with apex of 2nd narrowly margined with black. Sixth tergum subequal to 5th. Basal segment of ovipositor polished black, short and thick, about equal in length to terga 5+6 and measured on venter 0.75 mm long. Piercer very short, thick, only about 1/2 longer than wide, abruptly tapered at apex as in fig. 77c, measuring only 0.25 mm in length. This has the shortest piercer of any known *Euphranta* and the length of the piercer is obviously not of value in differentiating *Staurella*. Extended ovipositor (fig. 77a) 1.5 mm long. Spermathecae capitate (fig. 77b), only 2 visible on specimen at hand; 1 evidently lost. Length: body, 4.75 mm; wings, 4.5 mm.

The specimen on hand is from 3 km NE Tinabog, Palawan, 7.V.1962, in Malaise trap, H. Holtmann. It is in B. P. Bishop Museum.

***Euphranta (Staurella) canangae* Hardy** Fig. 78a-c; pl. 3, fig. 25.

Euphranta (Staurella) canangae Hardy, 1955, *Pacif. Sci.* 9: 83, fig. 4a-d. Type-locality: Los Banos, Luzon. Also recorded from Bohol and Tawitawi. Type ♂ in U. S. National Museum.

Host: Reared from *Cananga odorata* (Lam.) Hook., ("Ilang-Ilang").

This species is readily differentiated by the distinctive wing markings: by having apical 3/5 of wing dark brown except for 4 large hyaline marginal spots (pl. 3, fig. 25).

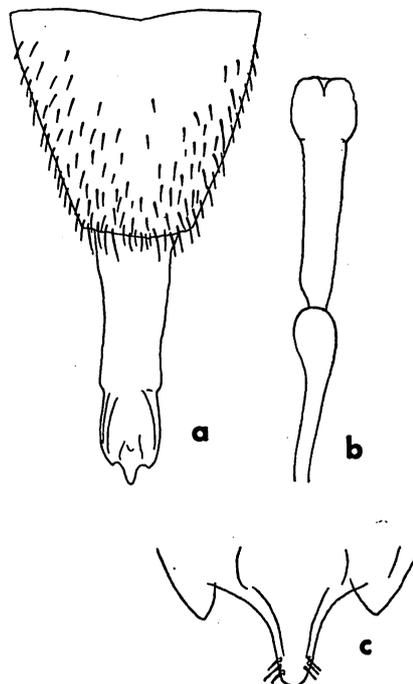


Fig. 77. *Euphranta (S.) bischoffi* (Kerteszi): a. ♀ ovipositor; b. spermatheca; c. apex of piercer.

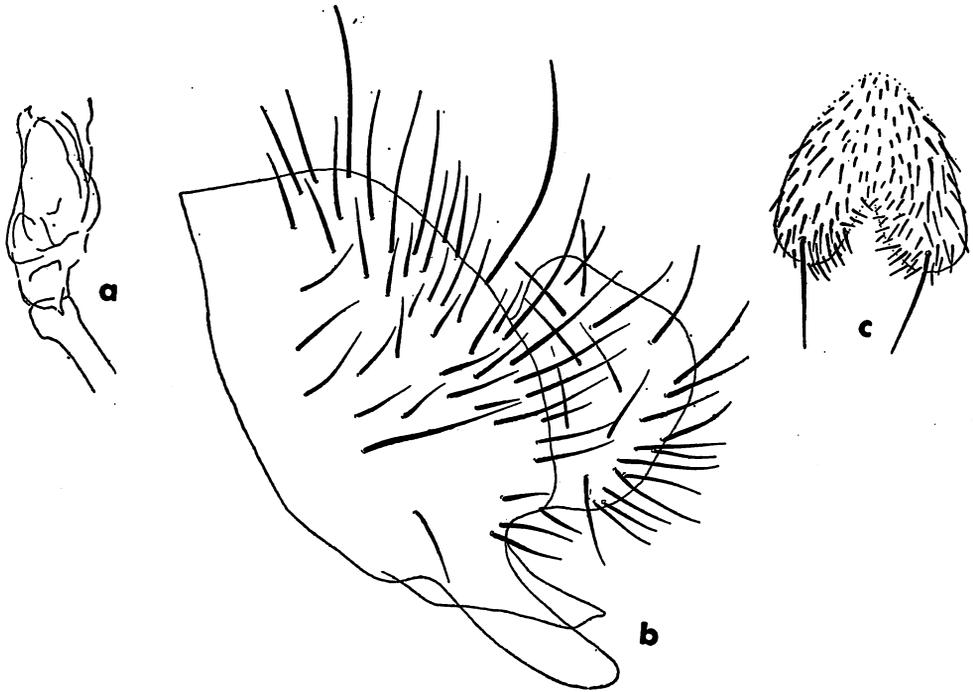


Fig. 78. *Euphranta* (*S.*) *canangae* Hardy: a. apex of aedeagus; b. ♂ genitalia, lateral; c. 5th sternum of ♂.

Head shaped as in other members of this genus and with 3 strong pairs of inferior fronto-orbitals and 1 pair superior fronto-orbitals. The postocellar bristles are strong, about equal in size to lower inferior fronto-orbitals. Face slightly concave in profile and entirely yellow. Antennal furrows shallow. Antennae reddish yellow, 3rd segment 3× longer than wide, rounded at apex. Aristae long plumose. Mesonotum chiefly reddish brown, median portion yellowish in ground color and also the sides are yellow, including the notopleura and humeri. Scutellum yellow to rufous, tinged with brown in median portion. Pleura pale yellow, tinged faintly with brown along upper margins. Postscutellum and metanotum dark brown to black, yellow tinged down median portions. Legs entirely yellow. Wings as in pl. 3, fig. 25. Vein R_{2+3} is straight and r-m crossvein situated near apical 3/5 of cell 1st M_2 . Abdomen chiefly dark brown to black with a yellow band extending longitudinally down middle from base over 4th tergum. Fifth sternum of ♂ longer than wide, narrowed basally and with a V-shaped concavity in middle of apical margin and a strong bristle on each side of apex (fig. 78c). Male genitalia as in fig. 78a-b with 10th sternum visible from lateral view and lacking the apical teeth which are found in most Tephritidae. Male aedeagus elongate. Female ovipositor very elongate, basal segment approximately equal in length to remainder of abdomen and 2.7 mm long. The piercer is long and slender, 2.0 mm long, sharply tapered at apex. Extended ovipositor 7.2 mm long. The spermathecae have not been observed.

***Euphranta* (*Staurella*) *ferenigra* Hardy** Fig. 79.

Euphranta (*Staurella*) *ferenigra* Hardy, 1970, *Ent. Meddel.* **38**: 94, fig. 10a-b. Type-locality: Dalawan Bay, Balabac. Type ♂ in University Zoological Museum, Copenhagen.

Somewhat resembling *maculifemur* (de Meijere) from Sumatra, but differs by having

r-m crossvein situated slightly beyond middle of cell 1st M_2 and distinctly beyond a level with apex of vein R_1 , rather than being distinctly before middle of 1st M_2 and before apex of R_1 ; the brown mark through r-m crossvein oblique in position, rather than transverse; the large brown preapical mark over wing unbroken except for hyaline apex and a tiny hyaline spot in apex of cell R_1 ; lacking a large preapical hyaline spot in R_1 and a large spot in cell 2nd M_2 , compare fig. 79 and 82a; also the pleura are entirely black, the large spot on mesopleuron which is typical of *maculifemur* is lacking; the humeri are black, rather than yellow; the scutellum is entirely yellow, not with broad black basal band; and the posteromedian portion of mesonotum is entirely yellow, rather than having a large yellow spot confined by the prescutellar and inner postalar bristles.

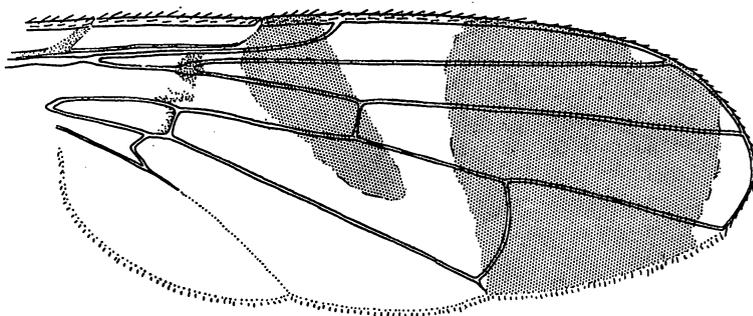


Fig. 79. *Euphranta (S.) ferenigra* Hardy: wing.

Head almost entirely brown to black, tinged with rufous in ground color of front, yellow over vertex and on upper portion of face and lower margin of front. Clypeus black, mouthparts brown, tinged with red. Labella fringed with long pale hairs. Palpi brownish red with black setae around margins. First 2 antennal segments rufous, tinged with brown; 3rd segment brown, 3× longer than wide. Aristae plumose. Three pairs inferior fronto-orbital bristles present. Front just slightly longer than wide. Eyes oval, higher than long and occiput only slightly swollen. Thorax entirely polished black in ground color, densely gray pubescent except for yellow scutellum. Posteromedian portion of mesonotum, behind area bounded by inner postalar bristles, entirely yellow (this character was overlooked in the original description). Legs predominantly black, tarsi yellow, tinged faintly with brown and extreme apices of hind tibiae tinged with rufous. Wings as in fig. 79. Abdomen with terga 2 and 3 broadly yellow through median portions, black on sides; abdomen otherwise polished black in ground color. The genitalia have not been dissected for study, the epandrium is polished black, global in shape, and the surstyli are yellow to rufous, elongate, straight-sided. The anal plates (cerci) are elongate, almost as long as surstyli. Length: body, 5.0 mm; wings, 4.5 mm. ♀. Unknown.

***Euphranta (Staurella) imitator* (Hardy), new combination** Fig. 80a-b.

Staurocneros imitator Hardy, 1970, *Ent. Meddel.* 33: 99, fig. 12a-b. Type-locality: Dalawan Bay, Balabac, Southwest Philippines. Type ♂ in University Zoological Museum, Copenhagen.

This species fits near *circumscripta* (Hering) from the Lesser Sunda Islands, and is differentiated by having only 2 pairs inferior fronto-orbital bristles, not 3; by having thorax and abdomen entirely yellow to rufous except for yellow-white median vitta extending down mesonotum from suture to apex of scutellum and a white longitudinal mark along upper edge of each mesopleuron extending over humerus, rather than mesonotum

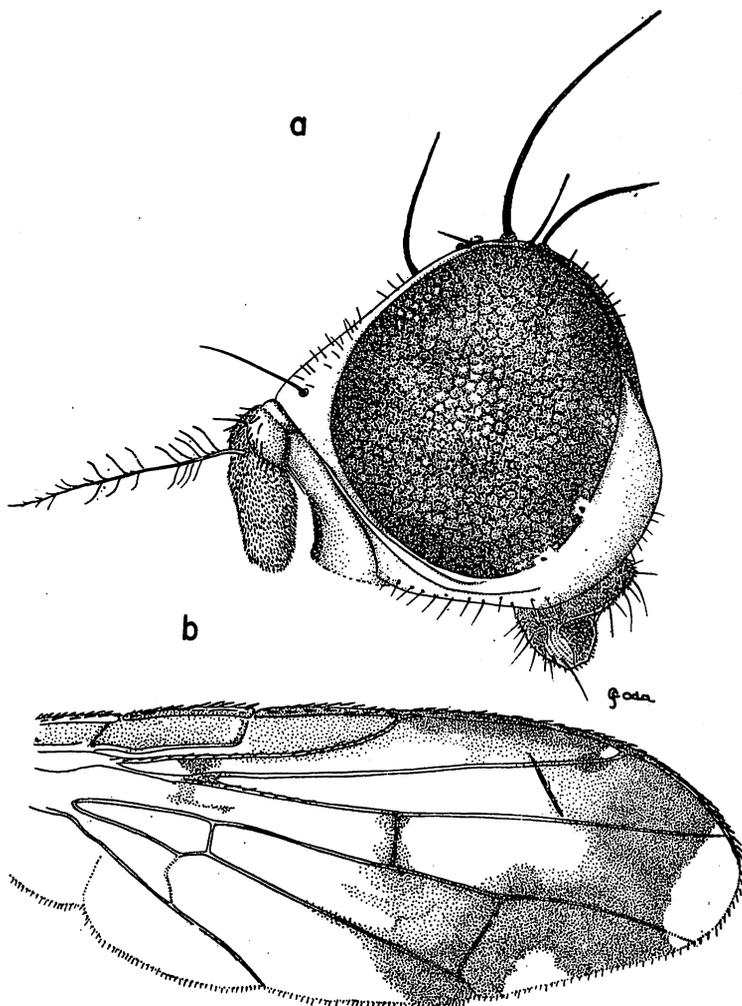


Fig. 80. *Euphranta (S.) imitator* (Hardy): a. head, lateral; b. wing.

and abdomen conspicuously marked with black; basal segment of ovipositor rufous except for a brownish tinge at apex and equal in length to terga 3-5, rather than brown to black, tinged with rufous and about as long as abdomen. This also resembles *flavina* (Hering) from New Guinea and Bismarck Archipelago but differs by having the head distinctly longer than wide, narrowed anteriorly and by having a large black spot occupying middle of front and a prominent pale yellow-white median vitta down mesonotum. The species has been adequately described in the original. For head and wing characteristics, refer to fig. 80a and 80b. The ♂ genitalia have not been studied. Basal segment of ♀ ovipositor about equal in length to terga 4-6; measured on venter basal segment is 1.5 mm. long. Piercer comparatively short, 0.75 mm long, straight-sided, tapered to a sharp point and serrated on sides of apex. Extended ovipositor 3.5 mm. Three oblong spermathecae, with short thick necks. Length: body, 6.0 mm; wings, 5.0 mm.

Previously known only from the type ♂ and allotype ♀. One additional ♀ specimen on hand from Dapitan, Mindanao, Baker.

Euphranta (Staurella) latilimbata Enderlein Fig. 81; pl. 3, fig. 26.

Euphranta latilimbata Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 438, fig. T. Type-locality: Sumatra.

Type ♀ in Zoological Museum, Warsaw. I have studied the type.

Stawrocneros latilimbata: Hering, 1944, *Siruna Seva* **5**: 2.

Previously recorded only from Indonesia. Four specimens on hand from the Philippines obviously belong here.

By the wing markings, the species resembles *imitator* (Hardy) but the preapical brown crossband is much broader. It is readily differentiated from *imitator* by having the thorax and abdomen predominantly black rather than entirely pale. It is also related to *circumscripta* (Hering) but differs by having the ♀ thorax, abdomen, including ovipositor, mostly shining black. The ♂ has not previously been recorded. There is apparently considerable dimorphism in color of the sexes. In the ♀ specimens at hand (2) the pleura are black, tinged with rufous ventrally and the abdomen is black with a narrow rufous line extending down middle of first 3 terga. In the ♂ specimens (2) the pleura are yellow, the abdomen broadly yellow on sides of terga 1-4 and a narrow yellow vitta extends longitudinally from middle of 5th tergum to base, leaving the 5th tergum otherwise polished black and with a pair of polished submedian vittae extending to base of abdomen.

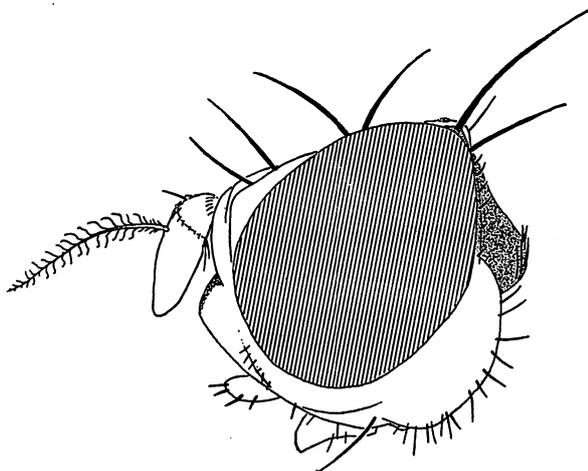


Fig. 81. *Euphranta (S.) latilimbata* Enderlein: head, lateral.

Head slightly longer than high with the front very gently sloping and antennae situated near upper 2/3 of head as seen from direct lateral view (fig. 81). Occiput moderately swollen, at widest point about equal to 1/2 the eye width. Eyes almost round, face slightly gibbose on lower median 1/2. Occiput yellow except for polished black upper portion. Genae entirely yellow, face yellow except for polished black in lower median portion. Upper median portion of face developed into a narrow carina extending between antennae. Front yellow with a large, polished black spot extending from ocellar triangle about 2/3 length of front, expanded on sides to encompass superior fronto-orbital bristle, and pointed anteriorly. Vertex yellow except on sides which are covered

by the extension of the black coloring of occiput. Three pairs inferior fronto-orbitals, 1 pair superior fronto-orbitals. Ocellar bristles rudimentary, postocellars moderately developed. Antennae entirely yellow, 3rd segment about 2× longer than wide, rounded at apex. Arista moderately plumose. Palpi and mouthparts yellow, palpi with just a few scattered black and pale setae around margins. Thorax polished black on dorsum, gray pollinose down median portion and with a yellow vitta extend from suture over scutellum. Sides of scutellum dark brown to black. Humeri, and a line over notopleura, yellow-white. In ♂ entire pleura yellow-white, continuous with the humerus. Each metapleuron with a faint spot of brown on upper margin and median portion of pleurotergon brown. Postscutellum and metanotum polished black, tinged with rufous down middle. Halteres rufous. Chaetotaxy as in other members of this subgenus with dorsocentral bristles situated just behind a line drawn between supraalars. Also in ♂ posterolateral margins of mesonotum are rufous, tinged faintly with brown and a very narrow line of rufous extends above anterior supraalar bristle to suture. In ♀ the mesonotum, including the notopleura, is entirely polished black, gray pubescent. Pleura black, tinged with rufous on lower portions of sternopleura, except for a yellow-white line along upper edges of pteropleura and mesopleura, continuous with the yellow-white mark over humerus. Legs entirely yellow, lacking prominent ventral bristles on front femora. Wings as in pl. 3, fig. 26, vein R_{4+5} setose only a short distance beyond base. Subcostal cell 2/3 to 3/4 as long as 2nd costal. Wings hyaline except for brown marginal and subapical marks. Crossvein r-m situated near apical 2/3 of cell 1st M_2 and cell Cu with short, pointed, apical lobe. Abdomen of ♂ and ♀ as noted above. Male genitalia have not been relaxed for study. The sterna are brown to black, the 5th sternum appears to be deeply cleft on hind margin. Basal segment of ovipositor polished black, almost equal in length to remainder of abdomen. Measured on venter the piercer is 2.0 mm. Piercer straight-sided, serrated at apex and 1.0 mm long. Extended ovipositor, 4.5 mm. Three oval-oblong spermathecae with short necks. Length of specimens at hand: body, excluding ovipositor, 5.5 mm; wings, 5.3 mm. Enderlein (1911) in the original descriptions measured the body as 8.5 mm and the wings as 8.25 mm.

Four specimens on hand from the following localities in the Philippines, all on the island of Luzon: Jacmal Bunhian, 24 km E Mayoyao, Ifugao, Mt. Prov., 800-1000 m, 30.IV. 1967, H. M. Torre Villas; La Trinidad, Benguet, 31.XII.1907, C. S. Banks; and Zambales Prov., no date given, Baker.

Euphranta (Staurella) maculifemur (de Meijere) Fig. 82a-d.

Staurella maculifemur de Meijere, 1924, *Tijds. Ent.* 67 (suppl.): 39, fig. 9. Type-locality: Sumatra.

Type ♀ in Zoological Museum, Amsterdam.

Staurella maculifemur: Hering, 1941, *Ark. Zool.* 33B(11): 5. (Description of ♂, from Burma.)

I have also recorded this from Thailand and 2 specimens are on hand from the Philippines. It is obviously widespread over the Oriental Region.

This species is differentiated from other known *Staurella* by the distinctive wing markings (fig 82a); by the predominantly shining black body with a bright yellow pre-scutellar spot on mesonotum; the apical 2/3 of scutellum yellow, basal portion black; pleura black except for large pale yellow spot on mesopleuron; abdomen black on sides with a yellow median band from 1st tergum over apex of 4th and with 6th tergum and sides of 5th on ♀ entirely yellow.

Front with a large shining black spot in middle extending from ocellar triangle between superior fronto-orbital bristles and expanding to eye margin in area between superior fronto-orbitals and upper inferior fronto-orbitals. Lower margin and upper sides of front and vertex yellow. Occiput yellow with a large polished black spot on each side, extending from eye margin about 3/4 to 4/5 the length of back of head. Genae yellow and face yellow except for prominent

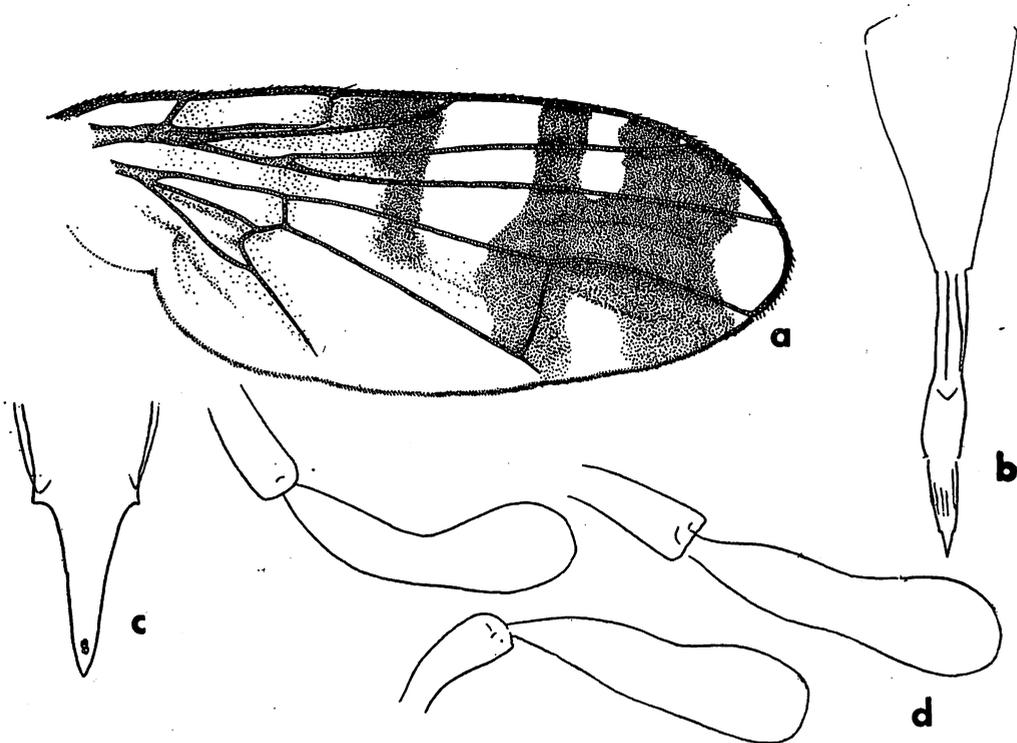


Fig. 82. *Euphranta (S.) maculifemur* (de Meijere): a. wing; b. ♀ ovipositor; c. apex of piercer; d. spermathecae.

black spot in middle, on lower margin. Antennae yellow, tinged faintly with brown at apices of 3rd segment. Aristae long plumose. Thorax predominantly black with a prominent prescutellar spot bordered by the prescutellar and dorsocentral bristles. Humeri, notopleura and mesonotal suture yellow. Thorax otherwise polished black except for yellow markings noted above. Legs mostly yellow, middle tibia brown on basal 1/2 and hind tibia brown except for apex. Front femur with a row of prominent posteroventral bristles and with numerous erect black setae or small bristles on anterodorsal surface. Wings marked as in fig. 82a. Often with a tinge of brown in cell M_4 below the interrupted mark across wing at level with r-m crossvein. With a large isolated hyaline spot before apex of cell R_1 and another in cell 2nd M_2 . Crossvein r-m situated before middle of cell 1st M_2 . Vein R_{4+5} setose to a level slightly beyond r-m crossvein. Cubital cell with a short pointed lobe at apex. Abdomen polished black, yellow down middle of terga 1-4 and on lateral margins of 1st tergum, also yellow on sides of terga 4-6 in ♀ and with 6th tergum of ♀ entirely yellow. Fifth sternum of ♂ as wide as long, concave on posterior margin. Epandrium black, rather globose in shape. Surstyli and cerci yellow, long, slender, parallel-sided; this is a distinctive character for the species. The surstyli are almost equal in length to the 5th sternum. Basal segment of ♀ ovipositor polished black, as seen from dorsal view about equal in length to terga 4-6. Sixth tergum of ♀ approximately as long as 5th. Measured on venter, basal segment of ovipositor approximately 2.0 mm in length. Piercer short, intermediate with those of more typical *Euphranta* (*Euphranta*) and definitely an intergrading form. The piercer measures 0.75 mm in length, is sharply tapered at apex as in fig. 82c. Extended ovipositor (fig. 82b) 4.0 mm. Three

spermathecae present; these are elongate gourd-shaped (fig. 82d). Length: body, 6.5-7.5 mm; wings, 5.75-6.5 mm.

Two ♀ specimens on hand from Luzon, Mt Makiling, Baker and Manila and 1 ♂ from Dimaniang, Busuanga Is., Philippines (Calamianes group), near sea level, III.1947, H. Hoogstraal.

Euphranta (Staurella) notata Hardy, new species Fig. 83a-c.

Somewhat resembling *canangae* Hardy, but the wing and body markings are very different; the complete hyaline mark across wing between apices of subcostal cell and r-m crossvein (fig. 83a) and the presence of 3 large dark spots on 3rd tergum (fig. 83b) immediately differentiate *notata*.

♀. *Head*: Higher than long, entirely yellow except for compound eyes and except for a faint tinge of brown in median portion of front. Front almost 2× longer than wide and with 3 pairs inferior fronto-orbital bristles. Third antennal segment nearly 3× longer than wide. Aristae long plumose. Face moderately concave medianly. Palpi entirely yellow with numerous black setae around margins. *Thorax*: Yellow to rufous, lacking dark markings. With a tinge of brown in ground color of postscutellum, metanotum, pleuroterga and metapleura. Chaetotaxy as is typical of this subgenus with dorsocentral bristles situated about 2/5 the distance between supraalars and inner postalars. Scutellum thickly short brown setose over disc. *Legs*: Entirely yellow. Front femur with about 5 posteroventral bristles and hind femur with 4-5 posteroventrals on basal 1/2. *Wings*: As in fig. 83a. With vein R_{4+5} setose to about level with m crossvein and r-m crossvein situated near apical 2/3 of cell 1st M_2 . *Abdomen*: First 2 terga entirely yellow, 3rd tergum yellow with a large shining black spot on each side and a shiny brown spot in middle. Fourth tergum brown medianly, yellow on sides. Fifth and 6th terga dark, shining brown to black. Sixth tergum slightly over 1/2 as long as 5th, as seen from dorsal view. Basal segment of ovipositor dark brown to black, as seen from dorsal view almost equal in length to terga 4-6 (fig. 83b). Measured on venter the basal segment is 1.75 mm long, extended ovipositor 3.3 mm. Piercer straight-sided, 0.7 mm long, tapered at apex as in fig. 83c. The spermathecae have not been studied.

Length: body, excluding ovipositor, 5.75 mm; wings, 5.2 mm.

♂. Unknown.

Holotype ♀ and 1 ♀ paratype: Mt Makiling, Luzon, no date given, Baker.

Type returned to the Museo Civico di Storia Naturale, Milano (Bezzi collection). Paratype in University of Hawaii collection.

Euphranta (Staurella) palawanica Hardy, new species Fig. 84a-b.

Differing from other known species of *Staurella* by the wing markings (fig. 84a), having a large subhyaline mark extending across wing from middle of cell R_1 through upper 1/2 of cell 1st M_2 between r-m and m crossveins, a complete subhyaline band over wing basad of r-m crossvein and with basal portion of wing tinged with yellow; only 2 pairs of inferior fronto-orbital bristles; mesonotum predominantly yellow but with a pair of abbreviated submedian shining brown vittae on posterior portion; and first 3 terga of abdomen entirely yellow.

♀. *Head*: Shaped as in most species of *Euphranta*, slightly higher than long with face gently concave in middle. Entirely yellow except for reddish brown eyes. Front almost 1/2 longer than wide. Only 2 pairs inferior fronto-orbitals, upper pair situated slightly below level with superior fronto-orbitals. Antenna entirely yellow, 2nd segment densely black setose dorsally. Third segment 2.5× longer than wide, rounded at apex. Aristae long plumose. *Thorax*: Mostly yellow

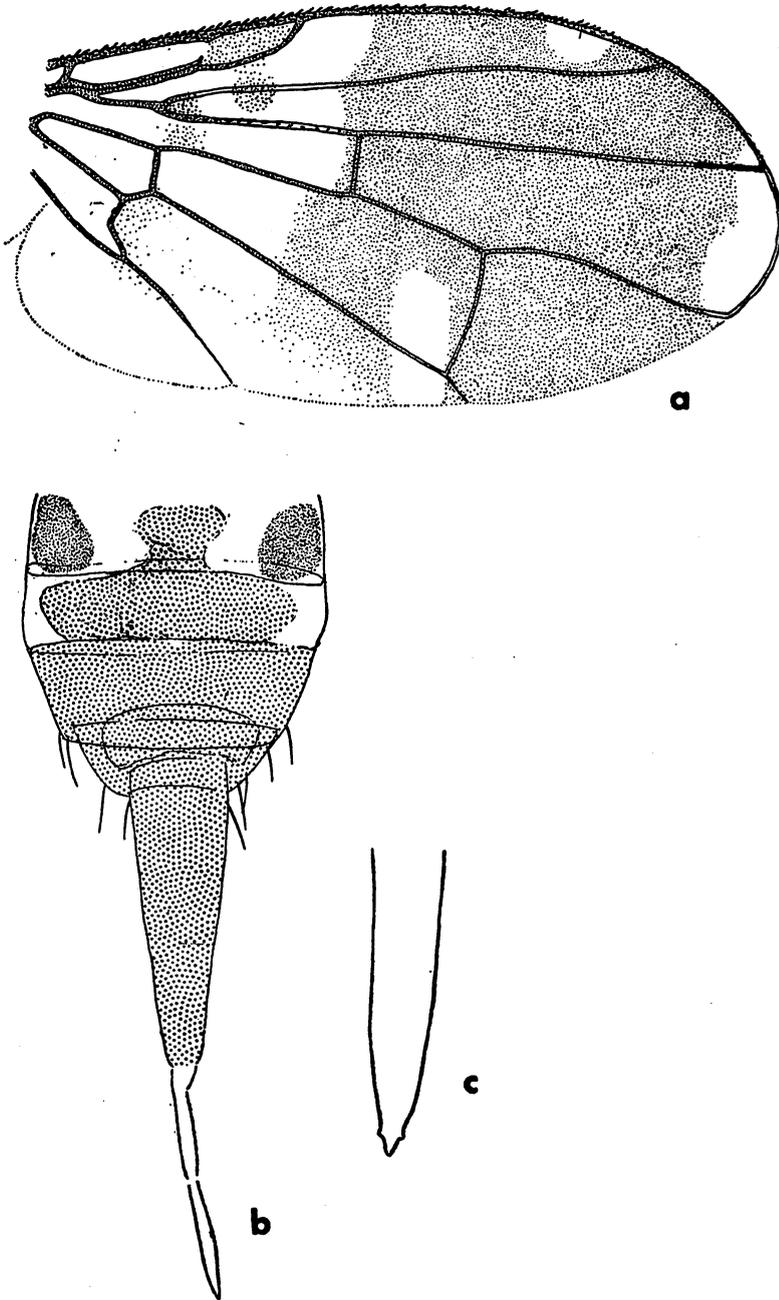


Fig. 83. *Euphranta (S.) notata*, n. sp.: a. wing; b. ♀ ovipositor; c. apex of piercer.

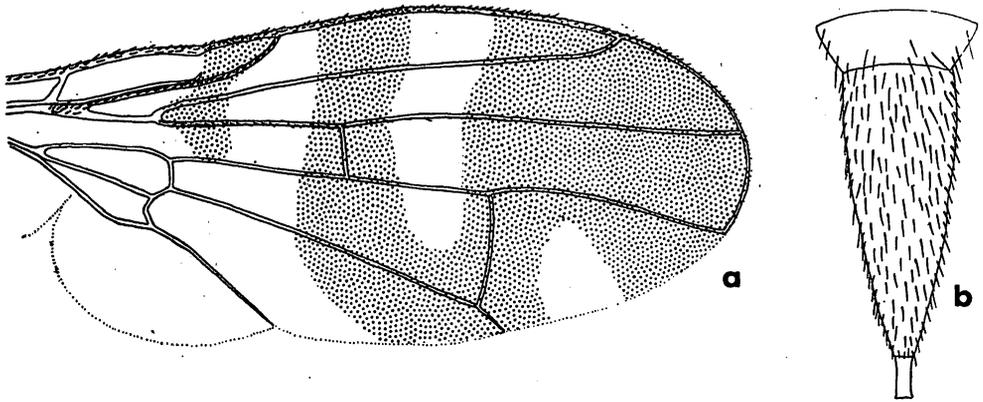


Fig. 84. *Euphranta (S.) palawanica*, n. sp.: a. wing; b. ♀ ovipositor, piercer not extruded.

to rufous. With a pair of short, submedian, brown vittae extending from approximately level with dorsocentral bristles to hind margin, with a distinct tinge of brown in the area before suture on each side and with a brown mark extending transversely through middle of each mesopleuron. A tiny black spot is present on each side just above wing base. Pleuroterga, metanotum, and post-scutellum yellow. Scutellum entirely yellow, rather thickly setose. *Legs*: Yellow, front femur with a row of 4 or 5 posteroventral bristles. *Wings*: As noted above and as in fig. 84a; with the pale markings distinctly yellow tinged. Vein R_{4+5} setose over most its length. Crossvein r-m situated slightly beyond middle of cell 1st M_2 . *Abdomen*: Basal 3 terga and sides of 4th yellow, otherwise polished black. Sixth tergum about $3/4$ as long as 5th. Basal segment of ovipositor polished black, densely dark brown setose, equal in length to terga 3-6, shaped as in fig. 84b as seen from lateral view and measured on venter 1.7 mm long. The piercer has not been extended for study.

Length: body, 5.5 mm; wings, 5.0 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10141), mouth of Malabangan River, Palawan, 25.V.1958, in jungle, H. E. Milliron.

Type returned to B. P. Bishop Museum.

Genus *Ptilona* van der Wulp

Ptilona van der Wulp, 1880, *Tijds. Ent.* **23**: 183. Type-species: *brevicornis* van der Wulp (= synonym of *Rioxa confinis* Walker), by subsequent designation (Bezzi 1913a: 68).

This genus is characterized from other Euphrantini by having only 1 inferior fronto-orbital bristle and 1 superior fronto-orbital; these are placed close together near lower $1/3$ of front. Vertical plates elongate, extending to lower $2/5$ of front (fig. 85b). Dorsocentral bristles situated just slightly in front of a line drawn between inner postalaris. Prescutellar and presutural bristles lacking and ocellars rudimentary. Third antennal segment comparatively short, scarcely $2\times$ longer than wide, rounded at apex. Aristae long plumose. Front femur of ♂ with a row of strong posteroventral bristles and ventral surface densely setose. Wings dark brown with hyaline wedges from margin and a few hyaline spots in the field (fig. 85a). Pleuroterga with rather numerous erect hairs. Crossvein r-m situated near apical $2/3$ of cell 1st M_2 and lobe of cubital cell rather short, about $1/3$ as

long as $Cu_1 + 1st\ A$. Three small, round spermathecae present in ♀.

Approximately a dozen species have been treated under *Ptilona*. Some of these have been removed to other combinations and several others are obvious synonyms. I presently recognize only 7 apparently valid species. Much confusion has been caused by the variability in shape and distribution of the hyaline spots in the wings and larger series of specimens need to be studied. Two species of *Ptilona* occur in the Philippines. Only 1 has been previously recorded [*confinis* (Walker), as *brevicornis* van der Wulp].

KEY TO KNOWN SPECIES OF PTILONA

1. Hyaline wedge from costal margin of wing beyond end of vein R_1 ending at or slightly before vein R_{4+5} (fig. 85a)2
 Hyaline mark from costa extending through cell R_5 almost to m crossvein (pl. 3, fig. 27)5
- 2 (1). Hyaline mark in cell R_5 not extending across entire cell and situated about opposite m crossvein. Cell M_4 predominantly brown3
 Hyaline mark in R_5 extending transversely across entire cell and situated beyond m crossvein. Cell M_4 subhyaline, faintly brownish tinged. Burma *dolorosa* Hering
- 3 (2). A transverse hyaline streak extending over most of cell 1st M_2 before m crossvein.....4
 A small round or oblong spot present in cell 1st M_2 (fig. 85a). Widespread throughout Asia and Southwest Pacific *confinis* (Walker)
- 4 (3). A small round spot in cell R_5 opposite m crossvein and only a single isolated hyaline spot in apical part of cell M_4 (fig. 55, Hering 1938b: 52). Burma and possibly Thailand..... *maligna* Hering
 A prominent oblong spot present in cell R_5 and 3 spot in apical portion of M_4 . Formosa. *persimilis* Hendel
 (These 2 are similar and may be synonymous. I doubt that the above characters are reliable.)
- 5 (1). Wings with isolated hyaline spots or hyaline wedges in posterior portion below vein M_{1+2} . Second costal cell brown at apex (pl. 3, fig. 27). Head and appendages yellow. Legs mostly yellow6
 Wings lacking hyaline marks below M_{1+2} except for a continuation of wedge from cell R_1 extending into upper 1st M_2 . Basal portion of wings subhyaline. Lower 1/2 of face, margin of gena and mouthparts, except palpi, black. Pleura all black, femora and tibiae mostly black. Vietnam..... *nigrifacies* Hardy
- 6 (5). Wings with 3 isolated hyaline spots below vein M_{1+2} , hyaline wedge from cell R_1 not continuous into cell 1st M_2 and cell M_4 and basal section of 1st M_2 subhyaline. Thorax with a pale yellow mark continuous from humerus over upper mesopleuron to wing base. Burma *malaisei*, Hering
 Wings with a prominent hyaline wedge from margin through each of cells 2nd M_2 and M_4 ; hyaline wedge from anterior margin continuous into cell 1st M_2 and cells 1st M_2 and M_4 predominantly brown (pl. 3, fig. 27). No such yellow mark over pleura. Philippines *continua*, n. sp.

Ptilona confinis (Walker) Fig. 85a-f.

Rioxa confinis Walker, 1857, *J. Proc. Linn. Soc. Zool.*, Lond. **1**: 132. Type-locality: Sarawak, Borneo. Type ♀ in British Museum (Nat. Hist.).

Themara alboguttata Doleschall, 1858, *Natuurk. Tijds. Ned.-Ind.* **17**: 124. Type-locality: Amboina.

(Sex and location of type unknown).

Trypeta basifascia Walker, 1860, *J. Proc. Linn. Soc. Zool.*, Lond. 4: 158. Type-locality: Makassar, Celebes.

Type ♀ in British Museum (Nat. Hist.).

Rioxa (?) *bimaculata* Walker, 1861, *J. Proc. Linn. Soc. Zool.*, Lond. 5: 164. Type-locality: Amboina.

Type ♀ in British Museum (Nat. Hist.).

Ptilona brevicornis van der Wulp, 1880, *Tijds. Ent.* 23: 185, pl. 11, fig. 7. Type-locality: Java. Type ♀ in Zoological Museum, Amsterdam.

Ptilona nigriventris Bezzi, 1913, *Mem. Indian Mus.* 3: 110, pl. 8, fig. 20. Type-localities: Assam and Sylhet. Syntypes ? in Zoological Survey of India collection?

Ptilona armatipes Hering, 1953, *Siruna Seva* 8: 4, fig. 4. Type-locality: Kuatun, Fukien. Type ♂ in Zoological Museum, Bonn.

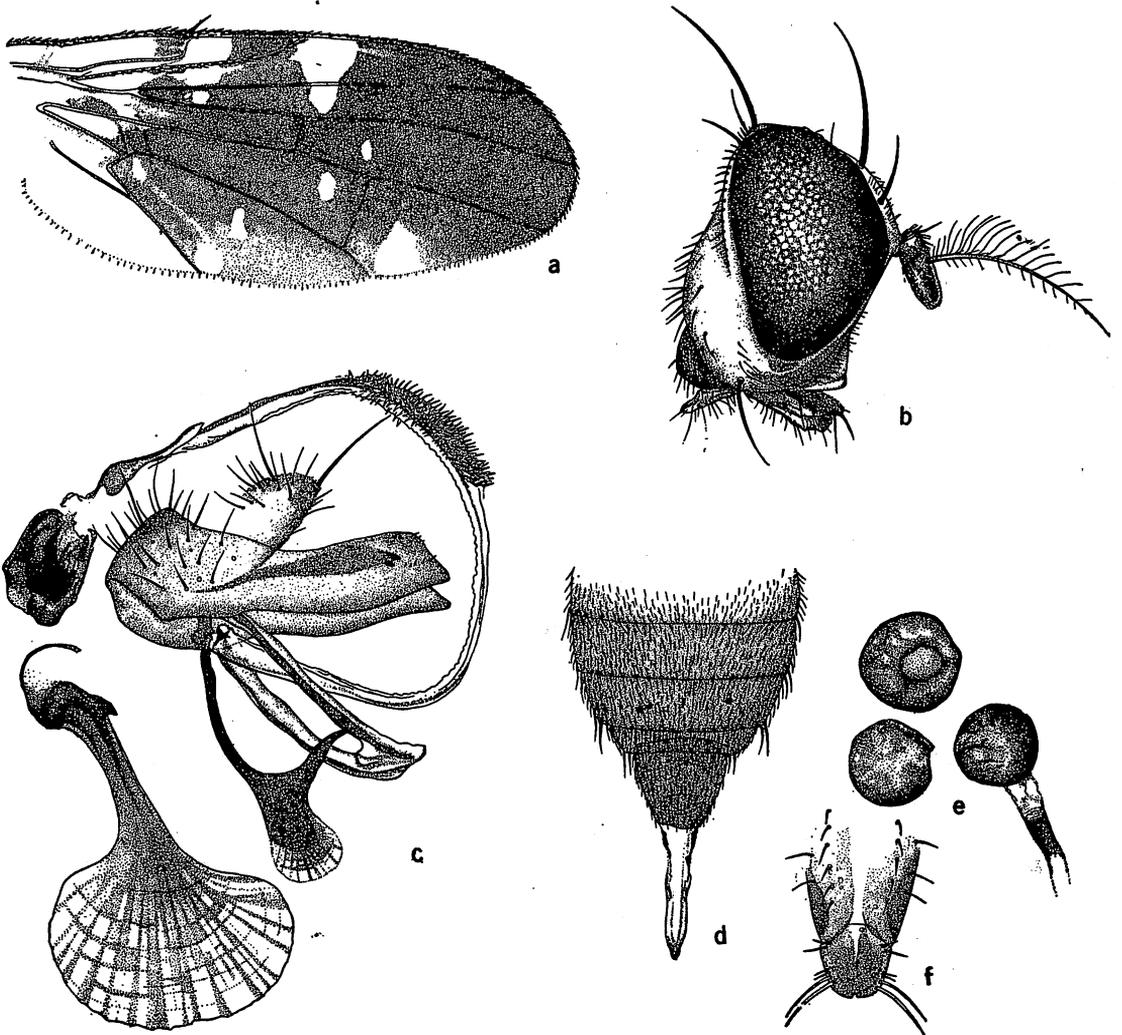


Fig. 85. *Ptilona confinis* (Walker): a. wing; b. head; c. ♂ genitalia; d. ♀ abdomen; e. spermathecae; f. apex of piercer.

This is the common species of *Ptilona* throughout the Oriental region and the South-west Pacific. It is differentiated by the wing markings: by having an oblong hyaline spot in cell R_5 immediately above m crossvein, another oblong spot near apical portion of cell 1st M_2 and a pair of spots (often confluent) in lower portion of cell M_4 . Wing markings and venation as in fig. 85a. Head shaped as in fig. 85b. Thorax predominantly yellow, tinged with brown, with dark brown to black markings over pleura and metanotum and mostly gray pubescent on mesonotum and scutellum. Scutellum entirely yellow. Legs yellow, tinged with brown on apices of middle and hind femora. In the ♂ the brown discolorations appear more extensive over middle and hind femora. Abdomen predominantly dark brown to black, 1st tergum tinged with brown, 2nd largely yellow, and 3rd yellow at base, brown over remainder of segment. Terga 4-5 in ♂ and 4-6 in ♀ dark brown to black. Male genitalia as in fig. 85c. Base of ♀ ovipositor short, shining dark brown to black, about equal to abdominal terga 5+6 and approximately 0.8 mm long. Piercer (fig. 85f) short and thick, blunt at apex, approximately equal in length to basal segment. Extended ovipositor (fig. 85d) 2.3 mm. Three small round spermathecae present (fig. 85e). Length: body and wings, 6.0-7.0 mm.

This species has been studied from numerous localities over Luzon, Negros and Mindanao. It is probably widespread over the Philippines.

***Ptilona continua* Hardy, new species** Pl. 3, fig. 27.

Fitting near *malaisei* Hering from Burma, and differing by having a prominent hyaline wedge from margin extending through each of cells 2nd M_2 and M_4 ; hyaline wedge from anterior margin continuous into cell 1st M_2 and 1st M_3 and M_4 predominantly brown (pl. 3, fig. 27). In *malaisei* the wing has 3 isolated hyaline spots below vein M_{1+2} , the hyaline wedge from cell R_1 is not continuous into cell 1st M_2 and cell M_4 and basal section of 1st M_2 are subhyaline. The thorax of *malaisei* has a pale yellow mark continuous from humerus over upper mesopleuron to wing base; no such mark is present over pleuron of *continua*.

♀. **Head:** Similar in shape to other *Ptilona* except that the face is swollen, tumescent medianly. Face entirely yellow except for a faint tinge of brown on lower margins along suture. Gena tinged with brown directly beneath eye margin. Front slightly narrowed dorsally. Antennae yellow, 3rd segment 2× longer than wide. Aristae long plumose. Palpi yellow with numerous short, black setae. **Thorax:** Reddish brown over mesonotum, with humeri, notopleural calli, and most of pleura yellow, except for a brown mark over middle portion of mesopleuron, front portion of sternopleuron, and over the metapleuron. Pleuroterga and mesonotum dark shining brown to black. Scutellum brown on basomedian portion of disc and with a brown spot on each basolateral margin. Thorax with the usual complement of bristles typical of *Ptilona*, with dorsocentrals situated slightly in front of a line between inner postalaris. Mesonotum gray pubescent, almost obscuring ground color and densely covered with short black setae. Scutellum with 4 strong bristles and with scattered black setae around margin. **Legs:** Predominantly yellow, tinged faintly with brown on apices of middle and hind femora and on bases of mid and hind tibiae. One strong apical spur on middle tibia. **Abdomen:** Black except for 2 basal terga which are rufous, tinged with brown to black. Sixth tergum of ♀ about 2/3 as long as 5th. Basal segment of ovipositor black, about equal in length to terga 5+6, and measuring 0.9 mm. Piercer short, blunt at apex, and 0.75 mm long. Extended ovipositor 2.4 mm.

Length: body, 6.5 mm; wings, 7.25 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10142), Masawan-Gundawan, Zamboanga del Norte, Mindanao, 1260-1350 m, 3.VII.1958, H. E. Milliron. Two ♀ paratypes: Masawa, trail to Mt Malindang, Zamboanga del Norte, Mindanao, 1290 m, 5.VII.1958, in rain forest, H. E. Milliron, and Banahao, Luzon, VI.1914, (in Frey collection, Helsinki).

Type in B. P. Bishop Museum. One paratype returned to University Zoological Museum, Helsinki, and 1 in University of Hawaii collection.

Genus *Scolocolus* Hardy

Scolocolus Hardy, 1970, *Ent. Meddel.* **38**: 95. Type-species: *bicolor* Hardy, by original designation.

This genus is intermediate between Adramini and Euphrantini but best fits in the latter because of the presence of postocellar, dorsocentral and prescutellar bristles. The pleuroterga are thickly covered with erect pale hairs. It fits nearest to *Elleipsa* Hardy but differs by having the front and middle femora with rows of short black ventral spines on apical portions rather than middle and hind femora with black spines; arista short plumose, rather than bare; 2 pairs inferior fronto-orbital bristles, rather than 3; dorsocentral bristles present, not lacking and humeral bristles lacking, rather than present. The head shape and wing markings are very different in the 2. Three spermathecae present in the ♀.

Scolocolus bicolor Hardy Fig. 86a-c.

Scolocolus bicolor Hardy, 1970, *Ent. Meddel.* **38**: 96, fig. 11a-h. Type-locality: Mantalingajan, Tagem-bung, Palawan. Type ♂ in University Zoological Museum, Copenhagen.

Differing from all known Euphrantini by the characters given above. Head entirely black except for brownish red eyes, a dull black vitta extends down front about level with upper inferior fronto-orbital bristles and also with a polished black spot on lower portion of each antennal furrow. The latter spot extends from anterior margin in an elongate triangle about 2/5 the length of face. Basal 1/2 of each palpus black, apical portion yellow. Front distinctly narrowed above, broadest at about level with anterior inferior fronto-orbital bristles and narrowest just before vertex. Front approximately 2× longer than wide. Two pairs inferior fronto-orbital bristles, the upper pair widely spaced from the single pair of superior fronto-orbitals. Head higher than long, face almost vertical as seen in direct lateral view and occiput moderately swollen, at its widest point about 1/2-2/3 as wide as eye. Antennae yellow to rufous, 3rd segment about 3× longer than wide, rounded at apex. Aristae short plumose, the longest hairs are only a fraction of the width of 3rd segment. Thorax mostly black in ground color, densely gray pubescent. Mesonotum with a pair of narrow shining black vittae extending in dorsocentral line from just before dorsocentral bristles to a line drawn between posterior 1/3 of humeri. Mesonotum otherwise black in ground color, obscured by gray pollen except for a yellow line continuous with yellow humeri, extending posteriorly over and along the suture covering all except anterior edge of notopleural callus. A small isolated brown spot is present behind each suture, continuous over posterolateral margins to hind margin of sclerite. Lateral margins of mesonotum beneath notopleural bristles narrowly black. Scutellum black, covered with gray pubescence on the disc, yellow on hind margin and on venter. Postscutellum, metanotum and pleuroterga black in ground color, densely gray pubescent, the latter thickly covered with erect yellow hairs. Pleura black, covered with gray pubescence except for the yellow propleura, anterior portion of each mesopleuron, hind margin of each mesopleuron behind suture, upper portion of pteropleuron, and posteroventral and narrow posterior border of sternopleuron; also upper edge of each mesopleuron with a rather broad white stripe extending to base of humerus and metapleura largely white. Dorsocentral and prescutellar bristles rather short, approximately 1/2 as long as inner postalar bristles. Four strong scutellar bristles present. Scutel-

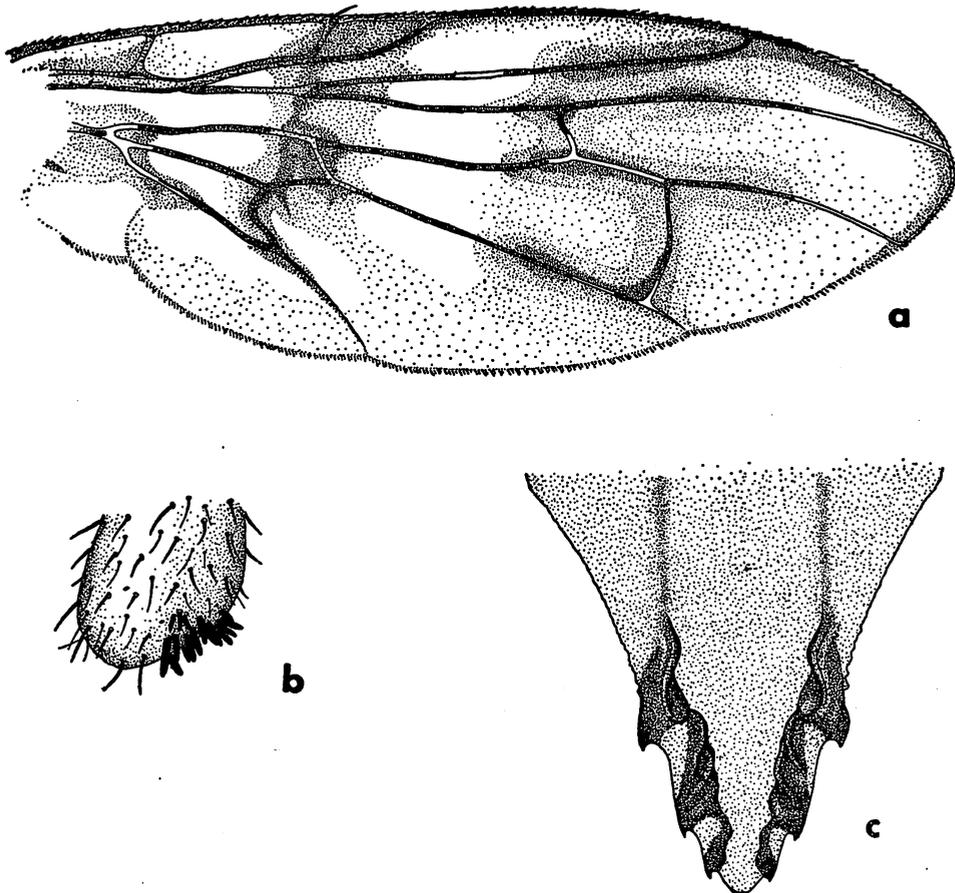


Fig. 86. *Scolocolus bicolor* Hardy: a. wing; b. apex of front tibia of ♂; c. apex of piercer.

lum flat, with sparse setae around margins. Legs mostly yellow, middle and hind coxae brown, front tibiae each with a black line extending down posterior surface and a brown line extending down anterior surface. Front femur with a small brown posterior spot near apical 2/3 and front basitarsus brown. Middle femur brown on ventral surface and hind femur with a preapical ring of brown. Front femur with about 5 prominent posteroventral spines before apex and a row of small, anteroventral, preapical spines. Middle femur with 4-5 preapical spines in each of the anteroventral and posteroventral rows. Middle tibia with 1 strong apical spur. Front tibia with a cluster of short, thick, black spines on anteroventral surface at apex (fig. 86b). Wings largely hyaline with a prominent dark brown to black crossband extending from subcostal cell to upper basal portion of cell M_4 ; also with a broad brown band extending across apical 1/3 of wing covering area occupied by r-m and m crossveins and extending around margin as a very narrow band to apex of cell R_5 , the venation as in fig. 86a. Abdomen largely black, densely gray tomentose and covered with yellow setae; apical 2/3 of 5th tergum shining black. Terga 1-4 each with yellow marks on posterolateral margins; 5th tergum entirely black. Fifth sternum of ♂ about as wide as long with a deep narrow cleft extending 1/2 the length on hind margin. Male genitalia as in fig.

11e (Hardy 1970: 97). Female spermathecae clavate in shape. Basal segment of ovipositor measures 1.75 mm. Piercer short, minutely serrated at apex (fig. 86c), 1.2 mm long. The extended ovipositor measures 4.4 mm. Length: body, 9.2 mm; wings, 8.0 mm.

Genus *Soita* Walker

Soita Walker 1865, *J. Linn. Soc. Zool.*, Lond. 8: 136. Type-species: *psiloides* Walker, by monotypy. Type ♂ in the British Museum (Nat. Hist.).

Belonging in the Euphrantini because of the arrangement of the thoracic bristles and the presence of fine erect hairs on the pleuroterga. Fitting near *Ichneumonosoma* de Meijere. Superficially the 2 are much alike, having predominantly or entirely yellow bodies, clear wings; being rather large, slender, *Ichneumon*-like in shape and having only 1 pair of strong scutellar bristles. *Soita* is readily differentiated by having vein M_{1+2} and base of vein Cu covered with long conspicuous hairs on dorsal surface, rather than having these veins bare; by having cell Cu just slightly pointed at lower apex, rather than developed into a distinct lobe; head and thorax yellow, lacking conspicuous markings, rather than with head, thorax and abdomen with prominent black markings; and lower superior fronto-orbital bristle situated below middle of face, very large, flat, strap-like (fig. 87c). The presence of very long conspicuous hairs along upper sides of veins R_1 and R_{4+5} is also characteristic; in *Ichneumonosoma* the setae on these veins are rather small and inconspicuous.

The thorax is elongate; as seen in lateral and dorsal views it is approximately 2× longer than wide. A rather distinct furrow connects the lateral suture over middle of mesonotum. Bristles on dorsal portion of thorax very strong, inner postalar and basal scutellars equal in length to 2nd costal and subcostal cells combined. Second abdominal tergum with a strong bristle on each side and a row of 4-6 strong bristles at apex of 5th tergum; these are approximately equal in length to the tergum. Middle tibia with 3 prominent, well developed apical spines and with a row of dark brown posteroventral bristles extending almost the entire length of the segment. Also middle femur with 2 preapical posterior bristles. Also sterna 3-5 have strong bristles on posterior margins.

The type species, from Salawati, nr New Guinea, is the only previously known species. Two additional new species are on hand from the Philippines.

KEY TO KNOWN SPECIES OF SOITA

1. Wings entirely hyaline except for a faint tinge of brown at apex of vein M_{3+4} , and pale brownish yellow subcostal cell. Abdomen all yellow.2
 With narrow margin of brown in apices of cells R_3 and R_5 (fig. 87a). Cell Sc dark brown. Abdomen with broad black bands at apices of terga 1-5. Bohol, Philippines.
 *baltazarae*, n. sp.
2. Only 2 scutellar bristles. A tinge of brown present at apex of vein M_{3+4} . Mesopleura and sternopleura lacking longitudinal rows of short black spines. Sternopleura normal in shape, approximately as high as long. Salawati nr New Guinea.*psiloides* Walker
 Four scutellars present, the apical pair weak; wings entirely hyaline except for yellow subcostal cell (fig. 88a). A row of short black spines extending longitudinally on each mesopleuron and sternopleuron. Sternopleura 2× longer than high. Luzon, Philippines.
 *ensifera*, n. sp.

***Soita baltazarae* Hardy, new species** Fig. 87a-c.

This species shows relationship to *psiloides* Walker from New Guinea but differs by having a narrow marking of brown along margins of cells R_3 and R_5 and by having broad black bands at apices of terga 1-5.

♀. *Head*: As long as high with the eyes nearly round, the front gently sloping so the antennae are situated at middle of head and the face is extremely short (fig. 87c). Occiput moderately swollen, at widest point about equal in width to 1/2 of eye. Head yellow except for

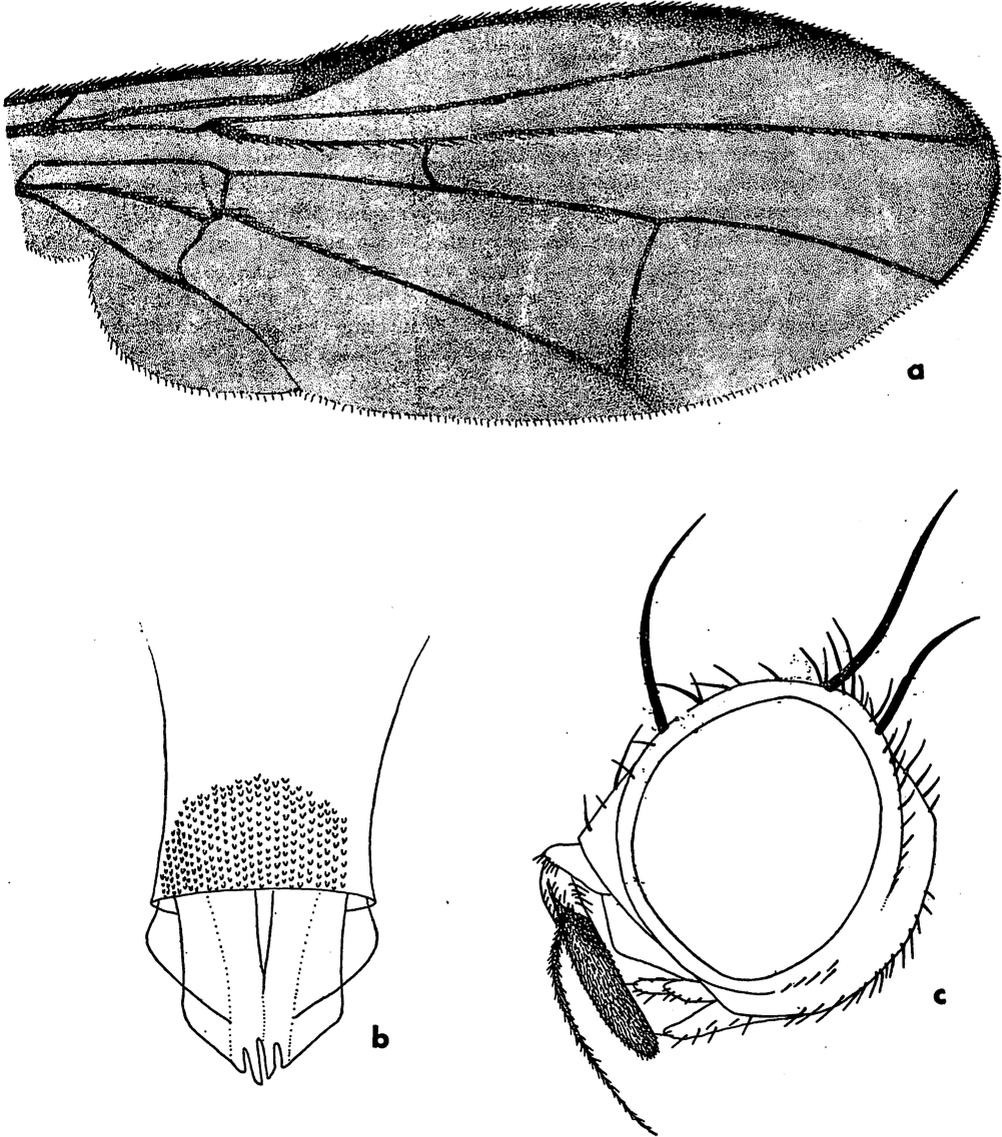


Fig. 87. *Soita baltazarae*, n. sp.: a. wing; b. apex of piercer; c. head, lateral.

dark reddish brown eyes and except for a prominent dark brown to black spot on upper median portion of occiput extending over median portion of vertex, and a brown elliptical-shaped spot on each side of front, surrounding bases of lower superior fronto-orbital bristles. Vertical plates very large, the shining triangular areas on each side from vertex extend approximately $2/3$ length of front and lower superior fronto-orbital bristles situated slightly below middle of front; the latter are greatly enlarged and flattened. Only 1 pair of clearly differentiable superior fronto-orbitals present; 2 or 3 small black setae are present on each side of front in line with the large superior fronto-orbitals and may possibly be rudiments of bristles. Also 1 displaced bristle, almost equal in size to inferior fronto-orbitals, is present on each eye margin, about $1/3$ the distance between the strong superior fronto-orbital and lower ocellus. Two pairs incurved inferior fronto-orbitals present; these are about equal in size to scapular bristles and postocellar bristles. Ocellars small, seta-like. Face vertical, with a large shining black spot covering median portion and very short, only about $1/4$ as long as front. Genal bristles lacking (on the specimen at hand), genae rather narrow, at widest point about $1/7$ or $1/8$ eye height. Antennae predominantly yellow, apical $2/3$ of 3rd segment brown. Third segment rather elongate, $4\times$ longer than wide and round at apex. Arista short plumose. Palpi yellow except for dark brown apices. *Thorax*: Yellow except for a tinge of brown in ground color on notopleura. Thoracic bristles strong, with the usual complement: 1 humeral, 1 strong plus 1 weak (anterior) notopleural, 1 dorsocentral, 1 supraalar, 2 postalars, 1 prescutellar, and 1 presutural; 2 mesopleural, 1 (very strong) pteropleural, 1 sternopleural and 2 strong scutellars. Scapular bristles well developed. Dorsocentrals situated nearer to suture than to supraalar. Mesonotum with a transverse furrow connecting sutures. Scutellum very short, almost square at apex, over $2\times$ wider than long and with a dense patch of short black setae on each lateral margin and with the large scutellar bristles lateral in position. *Legs*: Yellow, rather conspicuously black setose and with the bristles as mentioned under generic discussion above. Also with 2 rather strong anterodorsal bristles on each hind femur on apical $1/3$ of segment and with a pair of preapical bristles, 1 anterodorsal and 1 posterodorsal. Hind tibia thickly black setose and with a row of small bristles down each of the posterodorsal and anterodorsal surfaces. *Wings*: Almost entirely hyaline except for dark brown subcostal cell, the narrow marking of brown along anterior margin and a faint spot of brown at apex of M_{3+4} . Densely covered with microtrichia in apical $2/3$ of wing and over anal cell. With the basal cells and costal cells, also bases of cells R_1 , R_2 , 1st M_2 and M_4 , bare, devoid of microtrichia and with a dense narrow patch of microtrichia extending longitudinally down middle of cell R, opposite radial sector. Venation as in fig. 87a, cubital cell acutely pointed. *Abdomen*: Predominantly yellow with a broad black band at apices of each of terga 1-5, with 6th tergum and ovipositor entirely yellow. Also with venter yellow. One strong bristle present on each side of 2nd tergum and about 6 strong bristles present at apex of 6th tergum. Sixth tergum equal in length to 5th. Ovipositor base short, broad, scarcely tapered, about $1/3$ longer than 6th tergum as seen from dorsal view, as seen from above almost as wide as long and measuring 1.0 mm. Piercer broad and flat, split at apex (fig. 87b). The ovipositor has not been fully extended for study, and the spermathecae have not been seen.

Length: body, 8.5 mm; wings, 8.0 mm.

♂. Unknown.

Holotype ♀. (BISHOP 10143), S Bullones, Bohol, 366 m, 26.IV.1955, C. R. Baltazar. Type in B. P. Bishop Museum.

It is a pleasure to name this species after Dr Clare R. Baltazar who has made outstanding contributions to the knowledge of the insect fauna of the Philippines.

***Soita ensifera* Hardy, new species** Fig. 88a-d.

Resembling *psiloides* Walker by the almost entirely hyaline wings and by the all-yellow thorax, abdomen, and legs, differing by having 4 scutellar bristles, with the apical

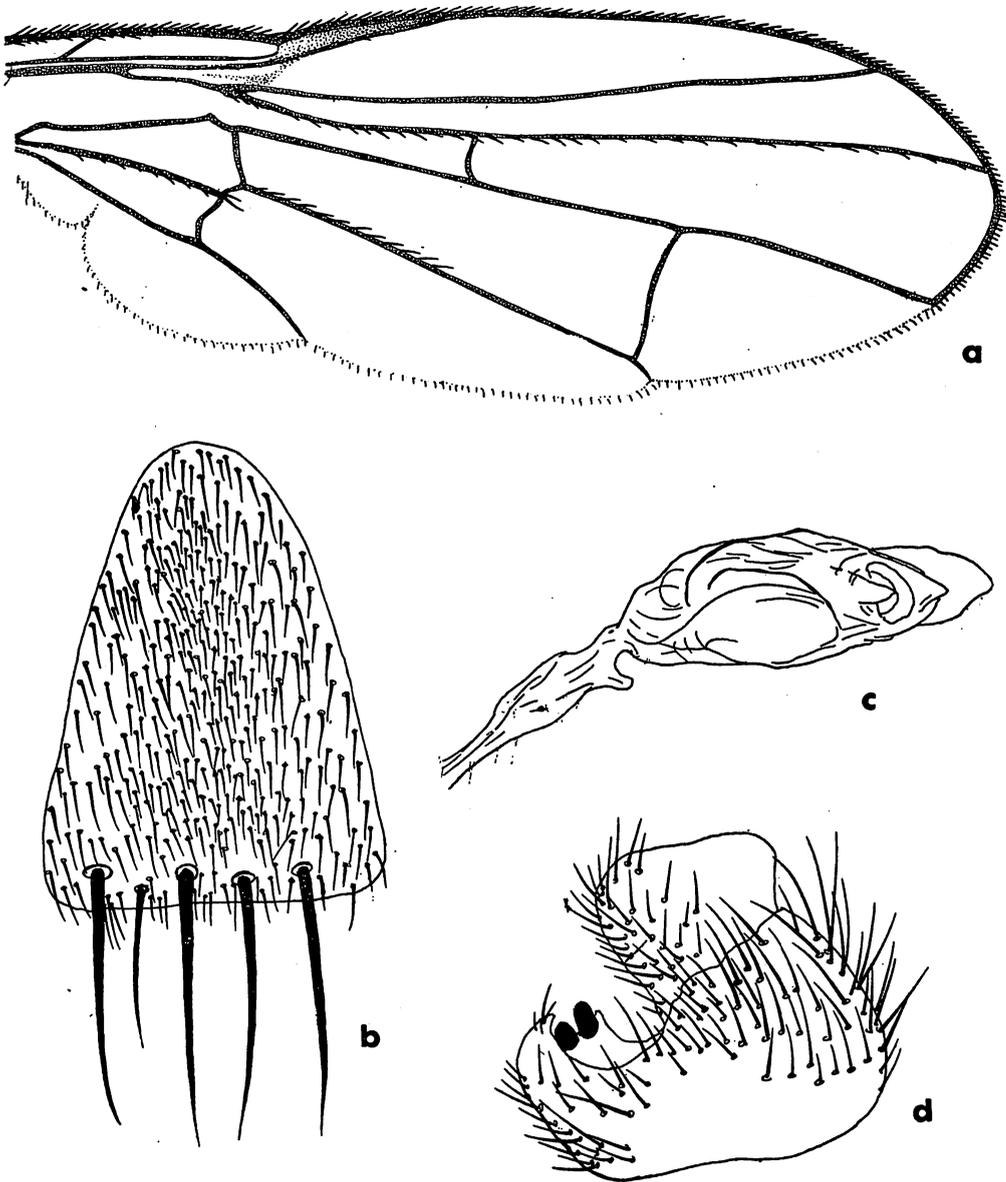


Fig. 88. *Soita ensifera*, n. sp.: a. wing; b. 5th sternum of ♂; c. apex of aedeagus; d. ♂ genitalia, lateral.

bristles developed, although small; wings entirely hyaline except for yellow-gray subcostal cell; the sternopleura very narrow, over $2\times$ longer than wide and with a row of short black bristles extending longitudinally on the lower edge of each sternopleuron and mesopleuron.

♂. *Head*: Similar in shape to that of *baltazaræ*, n. sp. but entirely yellow, lacking the brown spots on occiput, front or face. The head bristles are as in *baltazaræ*. No genal bristles are differentiated but 1 of the yellow hairs is slightly larger than the others and may represent the genal bristle. Antennae shaped as in *baltazaræ*, yellow with the apical 1/2 of 3rd segment brown. Palpi entirely yellow except for faint tinge of brown at apices. *Thorax*: With bristles as in *baltazaræ* except for the presence of a pair of small yellow apical scutellar, these are 1/3 as long as basal bristles. Also the sternopleural bristle is reddish yellow, about equal in size to mesopleural bristle and the anterior notopleural bristle is not differentiable; in *baltazaræ* this is represented by rather small black seta and in *ensifera* it obviously is represented by a pale yellow hair which is scarcely larger than the surrounding yellow setae on sides of thorax. Notopleural callus not developed; the entire notopleuron is flat. Thorax entirely pale yellow, rather thickly covered with yellow setae and with the strong bristles characteristic of this genus; the inner postalars, basal scutellars and pteropleurals are especially strong. A row of 5 or 6 dark brown, short thick spines extends longitudinally along anteroventral margin of each sternopleuron and along anteroventral margin of each mesopleuron, and 1 strong black bristle is present on lower posterior margin of each sternopleuron. Propleuron with 2 bristles, equal or slightly larger than scapulars. *Legs*: Entirely pale yellow, thickly covered with short yellow setae, with a pair of yellow-brown bristles on each coxa; front femur with 3 brown posteroventral bristles and an irregular row of yellow-brown posterodorsal bristles; middle femur with a pair of preapical, black, posterodorsal bristles and hind femur with about 3 brownish yellow anterodorsal bristles at apical 1/3 plus a pair of brownish yellow preapical anterodorsal and posterodorsal bristles. Middle tibia with a row of prominent, black posterodorsal bristles extending from basal 1/3 to near apex of segment and with a pair of preapical dorsal bristles. Middle tibia with 3 strong apical spurs. Hind tibia with a row of yellow-brown posterodorsal and 1 row of anterodorsal bristles extending over most of its length. *Wings*: except for faintly yellowish subcostal cell, with venation as in other species of this genus (fig. 88a); with some microtrichia in apical portion of cell M and a narrow line through cubital cell. *Abdomen*: Entirely pale yellow with lateral bristles at base of 2nd tergum yellow, tinged with brown. Sixth tergum of ♂ with 8 strong bristles at apex. Fifth sternum elongate, tapered anteriorly, almost truncate at apex, densely setose and with 4 strong apical bristles (fig. 88b). Male genitalia as in fig. 88c-d. With epandrium rather thick and surstyli curved upward apically and 10th sternum clearly visible from lateral view. Abdomen very slender.

Length: body, 9.25 mm; wings, 7.0 mm.

♀. Unknown.

Holotype ♂, Mt Makiling, Luzon, Baker.

Type returned to the Bezzi collection, Museo Civico di Storia Naturale, Milano.

TRIBE GASTROZONINI

The members of this tribe are differentiated from other Trypetinae by having 4 scutellar bristles, rarely 2; the scutellum typically flat, sometimes slightly convex (*Anoplomus* Bezzi) or slightly inflated (*Galbifascia* Hardy); wings lacking *Ceratitis*-like black subbasal streaks and usually no prominent subbasal brown to black spot; the arista plumose or pectinate with the longest hairs usually equal in length to width of 3rd antennal segment; dorsal surface of scutellum setose; pleuroterga bare and ♀ with 2 spermathecae. In the Oriental genera known to date the wings are never predominantly brown with hyaline wedges on anterior margins.

KEY TO GENERA OF PHILIPPINE GASTROZONINI

1. Middle and hind femora lacking rows of short ventral spines. Propleural bristles

- lacking.2
 Mid and hind femora with short, stout anterovental and posterovental spines on apical 1/2. Propleural bristle well developed. Wing as in pl. 3, fig. 29.
 **Callistomyia** Bezzi
- 2(1). Vein R_1 ending near apical 1/4 of wings; vein R_{2+3} with a strong upward loop opposite end of R_1 , usually joined with the latter; veins R_{4+5} and M_{1+2} convergent apically, strongly narrowing cell R_5 ; vein M_{1+2} strongly bent downward before r-m crossvein and r-m situated near apex of cell 1st M_2 (fig. 99d). Philippines, Indonesia.
 **Enicoptera** Macquart
 Not as above.3
- 3(2). Humeral bristles lacking. Wing with a large subbasal black or dark brown mark and a brown band crossing wing obliquely at level of r-m crossvein and continuous around costa to upper apex of cell R_5 (pl. 3, fig. 28). Scutellum yellow, with large black, sometimes confluent, apical spots.
 **Anoplomus** Bezzi
 Not as above.4
- 4(3). Third antennal segment terminating in a sharp apicodorsal point (fig. 89a).5
 Third antennal segment rounded at apex.7
- 5(4). Wings with 3 longitudinal bands, 1 on costa, 1 on vein M_{1+2} and 1 on vein M_{3+4} . Head nearly quadrate, antennae situated almost in line with upper margin of eye.
 **Galbifascia** Hardy
 Not as above.6
- 6(5). Ocellar bristles strong. Wings dark brown with large hyaline spots (fig. 89c). Thorax all yellow. Aristae short plumose.
 **Acrotaeniostola** Hendel
 Ocellars rudimentary. Wings with transverse brown bands (fig. 102e). Thorax with polished black spots. Aristae long plumose. Philippines, Vietnam. ...**Spilocosmia** Bezzi
- 7(4). Wing with 4 brown transverse bands. Three pairs inferior fronto-orbital bristles. Thorax opaque, mostly reddish brown, lacking yellow-white markings.
 **Taeniostola** Bezzi*
 Wing with a broad costal band from base to apex and lacking complete transverse bands (pl. 3, fig. 30). Six to 8 pairs of inferior fronto-orbitals. Thorax shining dark brown to black or yellow with scutellum and a mark on each side yellow-white.
 **Carpophtherella** Hendel

Genus *Acrotaeniostola* Hendel

Acrotaeniostola Hendel, 1914, *Wien. Ent. Ztg* **33**: 80, 88. Type-species: *sextivittata* Hendel from Formosa, by original designation.

A Gastrozoniini characterized by the plumose aristae, the sharply pointed 3rd antennal segment; only 1 strong spur on middle tibia; and the strong ocellar bristles, equal or longer than lower superior fronto-orbitals. The wings are typically banded and the thorax unicolorous, with scutellum yellow to white. Only 2 species are known which lack crossbands on wings, *dissimilis* Zia from Szechuan, China and a new species on hand from the Philippines. Chen (1948: 93) presented a key to the 10 species known to him. *A. quadrifasciata* (Enderlein) (1911: 436) from Sumatra, *extorris* Hering (1942a: 277) from India and the new species below should be added to this list.

***Acrotaeniostola megispilota* Hardy, new species** Fig. 89a-d.

Readily differentiated from all known species of *Acrotaeniostola* by the large hyaline

*Not yet recorded from the Philippines.

spots scattered over the wings as in fig. 89c. It appears more similar to *dissimilis* Zia from China, than to any other known species because of the lack of bands on the wing and because of the short plumose aristae; the wing markings are distinctly different (compare fig. 89c with fig. 17a of Zia 1937: 160); also it differs by lacking a black median vitta on mesonotum, as well as by other details.

♀. *Head*: Entirely yellow except for reddish brown eyes and a tinge of brown over ocellar triangle. Slightly higher than long with face gently concave as seen from direct lateral view and occiput only slightly swollen on lower portion. Gena rather narrow, scarcely 1/6 as high as eye.

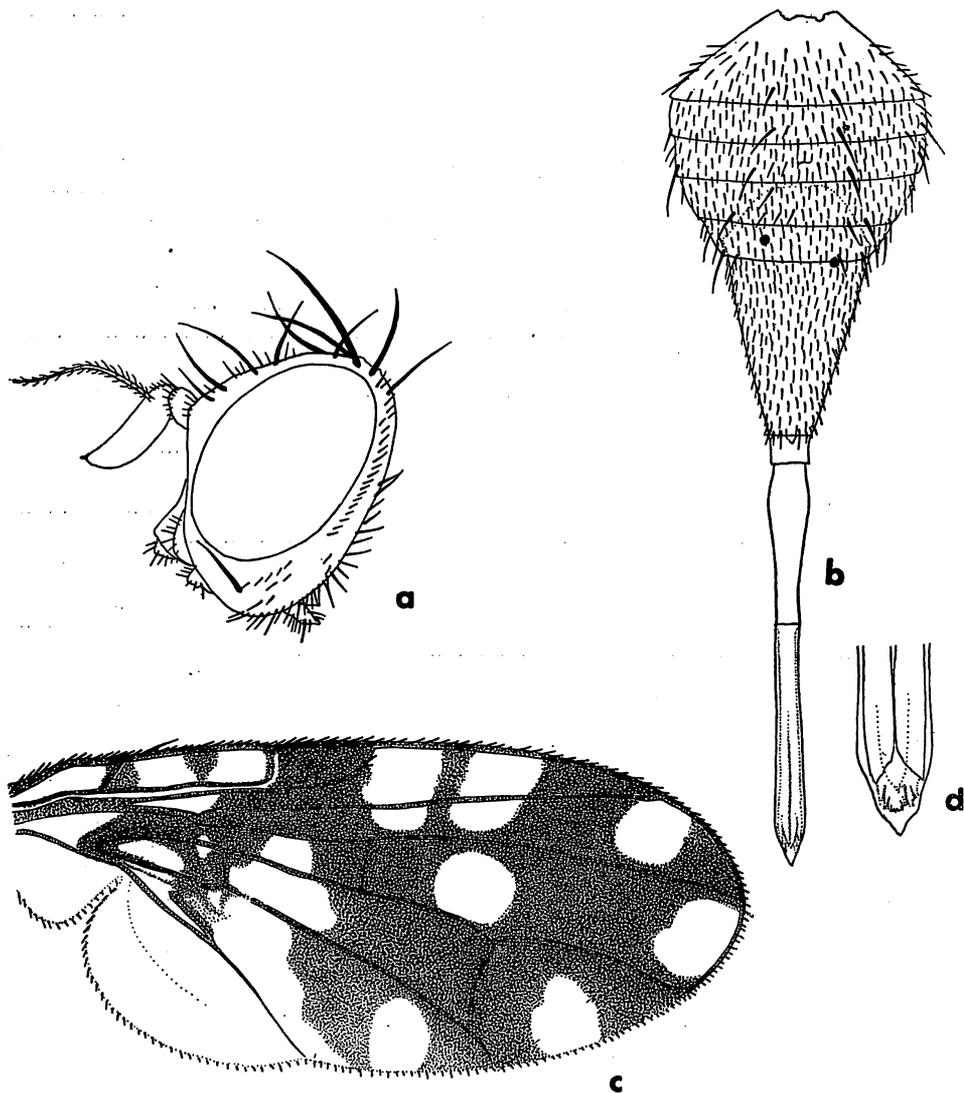


Fig. 89. *Acrotaeniostola megispilota*, n. sp.: a. head, lateral; b. ♀ abdomen, dorsal; c. wing; d. apex of piercer.

Three pairs strong inferior fronto-orbitals and 2 pairs superior fronto-orbitals. Vertical plates extending about 2/5 length of front. Ocellar bristles strong, equal in length to lower superior fronto-orbitals. Antennae entirely yellow, 3rd segment 3-4× longer than wide with a prominent spine-like point at upper apex (fig. 89a). Aristae short plumose. Palpi and mouthparts yellow with short, stout setae around margins of the former. *Thorax*: Entirely yellow except for the brown postscutellum and metanotum. Mesonotum rather densely gray pollinose and covered with short black and yellow setae. The usual complement of the thoracic bristles present with dorsocentrals situated approximately opposite supraalar. Scutellum flat, entirely pale yellow with 4 strong marginal bristles and a few scattered, erect, black setae on margin. *Legs*: Entirely yellow, front femur with about 6 posteroventral, black bristles. Middle tibia with 1 strong apical spur and with 3 posterodorsal, short, thick setae at middle of segment. Hind tibia with a row of erect dark brown to black setae on anteroventral surface in middle of segment. *Wings*: With markings and venation as in fig. 89c. Vein R_{4+5} setose to a level approximately opposite m crossvein and M_{3+4} entirely bare. *Abdomen*: With 2 basal terga entirely yellow, other terga brown, except for a small spot of yellow on each posterolateral margin and another on each posteromedian margin, with sides of 6th tergum entirely yellow. Sixth tergum approximately 2/3 as long as 5th. Basal segment of ovipositor dark brown, equal in length to terga 4-6 as seen from dorsal view. Measured on venter basal segment 2.0 mm in length. Piercer straight-sided, rather abruptly pointed at apex as in fig. 89d, measuring 2.4 mm. Extended ovipositor (fig. 89b) approximately 6.2 mm. Two heavily sclerotized, round spermathecae present.

Length: body, excluding ovipositor, and wings, 6.5 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10144), Abatan, Buguias, 60 km S of Bontoc, Mt. Prov., Luzon, 1800-2000 m, 15.V.1964, H. M. Torrevillas.

Type returned to the B. P. Bishop Museum.

Genus *Anoplomus* Bezzi

Anoplomus Bezzi, 1913, *Mem. Indian. Mus* 3: 100. Type-species: *flexuosus* Bezzi, by original designation.

This genus has previously been placed under Ceratitinae, of Hering and other authors, because of the wing markings and slightly convex scutellum. I see no logical reason for not treating it under Gastrozonini. The evident differences certainly do not appear to warrant placing this in a different tribe or subfamily.

The genus is readily differentiated by lacking humeral bristles; by the distinctive pattern of the wing (pl. 3, fig. 28); the very swollen occiput; by having the 2nd and 4th abdominal terga densely gray to yellow-gray pollinose; the aristae long plumose; and the 3rd antennal segment very slightly pointed at upper apex (fig. 90a).

Only 3 species are known in this genus, the type from India and the Philippines, and *nigrifemoratus* Hardy and *rufipes* Hardy from Vietnam and Laos.

KEY TO KNOWN SPECIES OF ANOPLOMUS

1. Cell Sc mostly yellow, brown only at base of cell. Three conspicuous, polished black spots cover apex of scutellum. Oblique, preapical crossband not connected with the brown mark over m crossvein.2
- Cell Sc entirely dark brown. Ventral portion of scutellum nearly all yellow, lateral black spots tiny and confined to under portion. Oblique, preapical crossband connected with the brown marking around anterior margin of wing and with the mark over m crossvein. Laos.*nigrifemoratus* Hardy

2. Femora all yellow. Second costal cell mostly hyaline. Wings of ♂ sharp-pointed apically.
 Thailand, Laos. **rufipes** Hardy
 Mid and hind femora broadly brown to black at apices. Second costal cell dark brown
 except for small subhyaline spot near base. Wings rounded apically (pl. 3, fig. 28).
 India and Philippines. **flexuosus** Bezzi

Anoplomus flexuosus Bezzi Fig. 90a-f; pl. 3, fig. 28.

Anoplomus flexuosus Bezzi, 1913, *Mem. Indian Mus.* 3: 100, pl. 8, fig. 12. New name for *Tephritis fasciventris* Macquart, 1847, *Dipt. Exot., Suppl.* 3: 225, pl. 7, fig. 7, not Macquart, 1843. Type-locality: Java.

Trypeta cassandra Osten Sacken, 1882, *Berl. Ent. Zs.* 26: 228, fig. 9. New **Synonym** based upon a study of the type ♂ in the Deutsches Entomologisches Institut, Eberswalde. Type-locality: "Philippinen" and a series of specimens from Panay.

This species is readily differentiated from all other fruit flies from the Philippines by the generic characters given above and the distinctive wing venation (pl. 3, fig. 28). It is separated from *rufipes* Hardy from Thailand and Laos by having the wings not sharply pointed at apex, the middle and hind femora broadly brown to black at apices, 2nd costal cell dark brown except for a small hyaline spot towards basal portion and mesonotum lacking prominent gray vittae.

Head shaped as in fig. 90a, with occiput rather strongly swollen, eye elongate and face vertical. With 2 pairs of inferior fronto-orbitals and 2 pairs superior fronto-orbitals. Ocellar bristles small. Third antennal segment very slightly pointed at upper apex and arista long plumose. Thorax polished black except for yellow-white humeri and a continuous yellow-white mark on each side over most of mesopleuron. Also scutellum, metapleuron and pleurotergon yellow-white except for narrow black base and for 3 shining black apical spots; sometimes these are confluent. Dorsocentral bristles situated about opposite supraalar. Front legs predominantly or entirely rufous, often with a brown discoloration on posterior apical portion of front femur; middle femur mostly dark brown to black and hind femur brown to black on apical 1/2. Wing as in pl. 3, fig. 28. Vein R_{1+5} setose to about level with m crossvein. Two prominent costal spines, 1 rather long, and 1 short. Abdomen black with a broad gray densely tomentose band across each of terga 2 and 4. Fifth sternum of ♂ over 2× wider than long, gently concave on posterior margin (fig. 90b). Male genitalia as in fig. 90d. Surstyli gradually tapered from epandrium and pointed at apices. Tenth sternum with 2 large black apical lobes on each side. Cerci very broad, wider than epandrium. Sixth tergum of ♀ about 1/2 as long as 5th as seen from dorsal view. Ovipositor long and conspicuous, basal segment, as seen from above, almost equal in length to terga 2-6. Measured on venter, the basal segment is 4.0 mm long. Piercer broad, flat, rather abruptly tapered to a sharp point at apex (fig. 90f), and measures 3.3 mm in length. Extended ovipositor (fig. 90c) measures 10.8 mm. Two heavily sclerotized spermathecae present, shaped as in fig. 90e. Length: body, excluding ♀ ovipositor, 6.5-7.5 mm; wings, 7.5-8.5 mm.

The series of specimens on hand are from Busuanga Island and from Culion Island.

Genus Callistomyia Bezzi

Callistomyia Bezzi, 1913, *Mem. Indian Mus.* 3: 124. Type-species: *pavonina* Bezzi, by original designation.

This genus is readily recognized by the presence of a row of short spine-like anteroventral and posteroventral bristles on apical portions of each middle and hind femur, by the presence of a strong black propleural bristle; the distinctive wing markings with

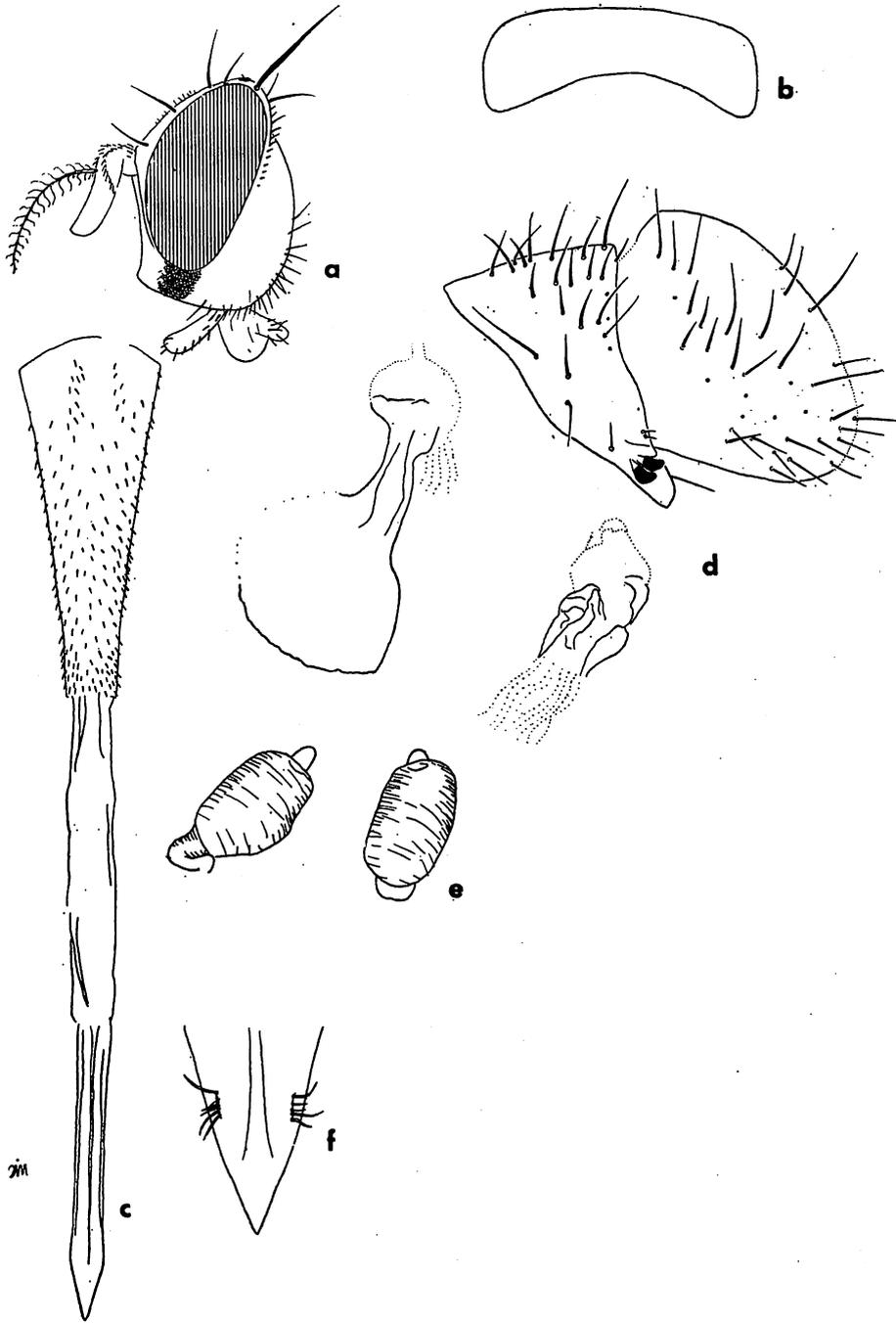


Fig. 90. *Anoplomus flexuosus* Bezzi: a. head, lateral; b. 5th sternum of ♂; c. ♀ ovipositor; d. ♂ genitalia; e. spermathecae; f. apex of piercer.

a large brown apical wing spot and a brown transverse band at level with r-m crossvein (pl. 3, fig. 29); also by lacking prescutellar and ocellar bristles. Hering (1941a: 13) treated this as a Euphrantini because of the ventral spines on the femora and "presut" (presutural) bristles lacking. I am sure Hering meant that the prescutellar bristles are lacking, not presutural. I do not agree with this placement since the pleuroterga are bare, the ♀ has only 2 spermathecae and the general facies more nearly fits Gastrozonini. It differs from other members of this tribe by having the hairs of aristae shorter but this alone would certainly not be diagnostic. Shiraki (1933: 292) stated that *Callistomyia* have no presutural or dorsocentral bristles; Chen (1948: 81) also stated "dorsocentral bristles wanting." This is not correct; the dorsocentrals are present but are posterior in position, situated just slightly in front of a line drawn between the postalar bristles. Malloch's description (1939: 447) of this genus is correct.

This genus is apparently restricted to the Orient and Australasia. Five species are known to date; only 1 has been recorded from the Philippines. Following is a key to the known species.

KEY TO KNOWN SPECIES OF CALLISTOMYIA

1. Face with 1 or 2 black spots.....2
 Face lacking black markings.....4
2. A single black spot in middle of face.....3
 A black spot on each side of face. E India.....**klugii** (Wiedemann)
3. Abdominal terga with black bands at bases. Brown apical wing spot isolated by a hyaline band. India, Pakistan, China, Ceylon, Formosa, Sumatra, Vietnam, Thailand, and Laos**pavonina** Bezzi
 Abdomen not banded. Apical band connected with brown band over r-m crossvein in lower 1/2 of cell 1st M_2 (refer to fig. 26, Hardy 1951: 174). Australia**horni** Hendel
4. Brown apical spot in wing joined to the brown crossband over r-m crossvein along vein R_{4+5} (pl. 3, fig. 29). Philippine Islands.....**icarus** (Osten Sacken)
 Apical spot isolated by a hyaline band (refer to fig. 4, Hering 1953: 517). New Guinea and Malaysia.....**flavilabris** Hering

Callistomyia icarus (Osten Sacken) Fig. 91a-c; pl. 3, fig. 29.

Dacus icarus Osten Sacken, 1882, *Berl. Ent. Zs.* 26: 224, fig. 8. Type in the Deutsches Entomologisches Institut, Eberswalde.

This species fits the general characteristics of the genus and cannot be confused with any other known species from the Philippines. The wing markings and body coloration combined with the short stout ventral spines on middle and hind femora, and the well developed propleural bristle will differentiate it. Because of the black markings on face this species is closely related to *flavilabris* Hering from New Guinea and Malaysia, and apparently is differentiated only by having the apical brown wing spot connected with the brown transverse band over wing at level of r-m crossvein along vein M_{3+4} (pl. 3, fig. 29). I see no other characters for separating these. The face is entirely yellow; in 1 specimen on hand a slight discoloration is present in lower median portion of face; this is apparently an aberration. Thorax almost entirely yellow with 3 brown to black vittae down mesonotum and with some brown to black markings on pleura. Metanotum and postscutellum dark brown to black on sides, narrowly yellow to

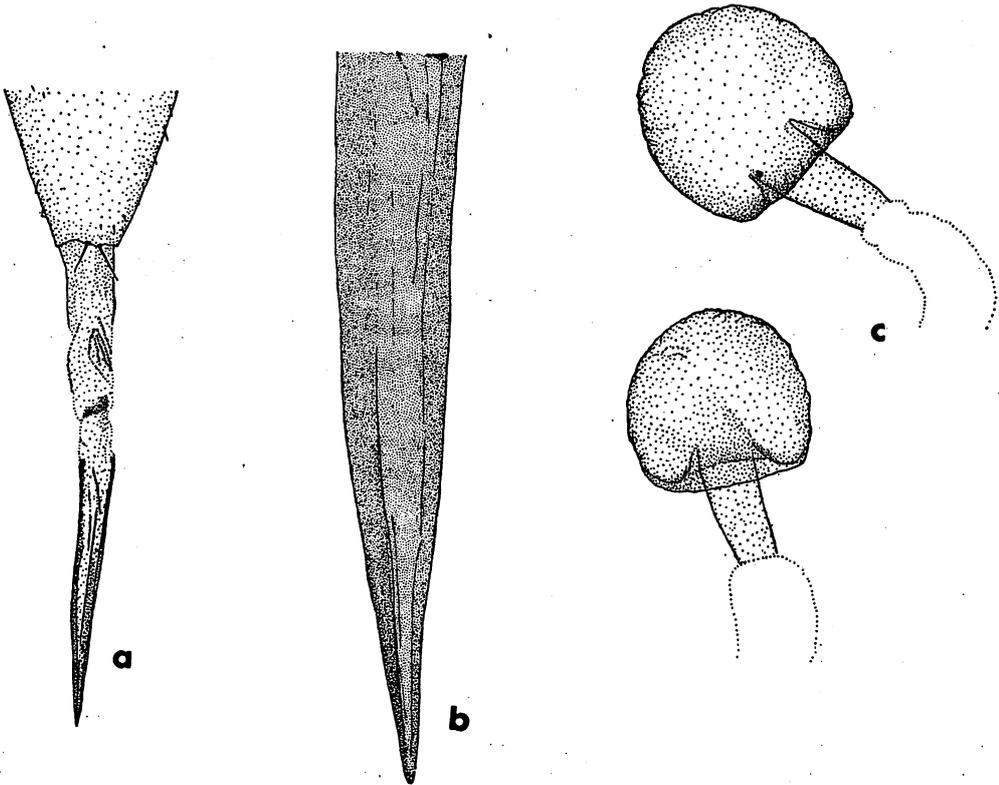


Fig. 91. *Callistomyia icarus* (Osten Sacken): ♀ ovipositor; b. apex of piercer; c. spermathecae.

rufous in middle. Middle tibia with 2 strong apical spines, 1 smaller than the other. Wings as in pl. 3, fig. 29. Vein R_{4+5} setose to a level opposite end of vein R_{2+3} . Abdomen yellow with prominent black bands at bases of terga and with lateral margins of terga narrowly black. The ♂ genitalia have not been studied. Sixth tergum of ♀ almost $2/3$ as long as 5th. Ovipositor yellow to rufous. Basal segment as seen from dorsal view approximately equal in length to terga 5+6. Measured on venter the basal segment is 1.9 mm long. Piercer slender, sharp-pointed (fig. 91b), flat ventrally and with a dorsal keel over apical $1/2$, visible only in lateral view. Piercer 1.5 mm in length. Extended ovipositor (fig. 91a) 4.7 mm. Two mushroom-shaped spermathecae (fig. 91c). Length: body, not including ovipositor, 8.0 mm; wings, 7.0 mm.

I have seen specimens from several localities over Luzon.

Genus *Carpophthorella* Hendel

Carpophthorella Hendel, 1914, *Wien. Ent. Ztg* **33**: 80; 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* **13**: 448. Type-species: *magnifica* Hendel, by original designation.

This genus is characterized by having 6-10 pairs of inferior fronto-orbital bristles on

the front. It has been placed in the tribe Ceratitini by Hering and others but bears strong resemblance to *Gastrozona* Bezzi and related genera and is on the borderline between those genera which have the scutellum flat and those which have it convex on the dorsum. In *Carpophthorella* the scutellum shows only a slight convexity and I feel without doubt that it should be placed in the Gastrozonini.

The species all possess a conspicuous white mark extending from each humerus over most of the mesopleuron onto the upper portion of pteropleuron and all have a narrow brown preapical band extending obliquely from wing margin in apex of cell 2nd M_2 , usually connecting with the costal band, and an oblique brown band extends across posterior portion of wing from about middle of 2nd section of cell R_5 through apical portions of cells 1st M_3 and M_4 to vein $Cu_1+1st A$ (pl. 3, fig. 30).

Nine species from the Oriental Region and 1 from the Solomon Islands have been placed in this genus. Two species are known from the Philippines.

***Carpophthorella capillata* (Bezzi)** Fig. 92a-c; pl. 3, fig. 30.

Gastrozona capillata Bezzi, 1913, *Philip. J. Sci.*, D 8: 324. Lectotype ♀, Los Banos, Laguna, Luzon, in U. S. National Museum collection.

Carpophthorella capillata: Bezzi, 1926, *Boll. Lab. Zool. Portici* 28: 264.

This species is readily differentiated from *luteiseta* (Bezzi) by its predominantly black body coloring, the dark brown markings in wings, and the all-black head bristles, with only 6 pairs of inferior fronto-orbitals.

Head predominantly yellow, tinged with brown on upper portion of occiput and shaped as in fig. 92a. Thorax polished dark brown to black except for yellow markings typical of this genus. Scutellum entirely yellow with 4 strong black bristles and with rather abundant yellow setae on disc. Legs entirely yellow, 1 strong apical spine on middle tibia. Wings with markings dark brown, shaped as in pl. 3, fig. 30. Abdomen with first 2 terga yellow to rufous and with a yellow to rufous mark down median portion of 5th tergum of ♂ and 5th and 6th in ♀, otherwise polished black. Fifth sternum of ♂ wider than long and gently concave on posterior margin with rather prominent posterior bristles (fig. 92b). Male genitalia as in fig. 92c. Surstyli prominent, slender, drawn out to a point in apex. Cerci very large, longer than wide, very conspicuous. Sixth tergum of ♀ about 1/2 as long as 5th. Basal segment of ovipositor dark brown, about equal in length to terga 3-6; measured on venter, the basal segment is approximately 2.0 mm. Piercer almost 2.0 mm, sharply tapered, minutely serrated on the edges of apex. Extended ovipositor 6.0 mm. Two heavily sclerotized spermathecae present. Length: body, 5.5-6.2 mm; wings, 5.5-6.0 mm.

I have seen about 2 dozen specimens from a number of different localities on Luzon.

***Carpophthorella luteiseta* (Bezzi)** Fig. 93a-b; pl. 4, fig. 31.

Gastrozona luteiseta Bezzi, 1913, *Philip. J. Sci.*, D 8: 325. Lectotype ♂, Los Banos, Laguna, Luzon, in U. S. National Museum.

Carpophthorella luteiseta: Bezzi, 1926, *Boll. Lab. Zool. Portici* 28: 264.

Readily differentiated from other known members of this genus by having the body almost entirely yellow, the head bristles yellow and with 8 pairs of inferior fronto-orbitals (fig. 93a); also the wing markings yellow, tinged lightly with brown, rather than dark brown as in most species.

Body entirely yellow to rufous except for a tinge of brown on anteromedian portion of mesonotum, a brown line along hind margin of mesonotum, the dark brown to black postscutellum

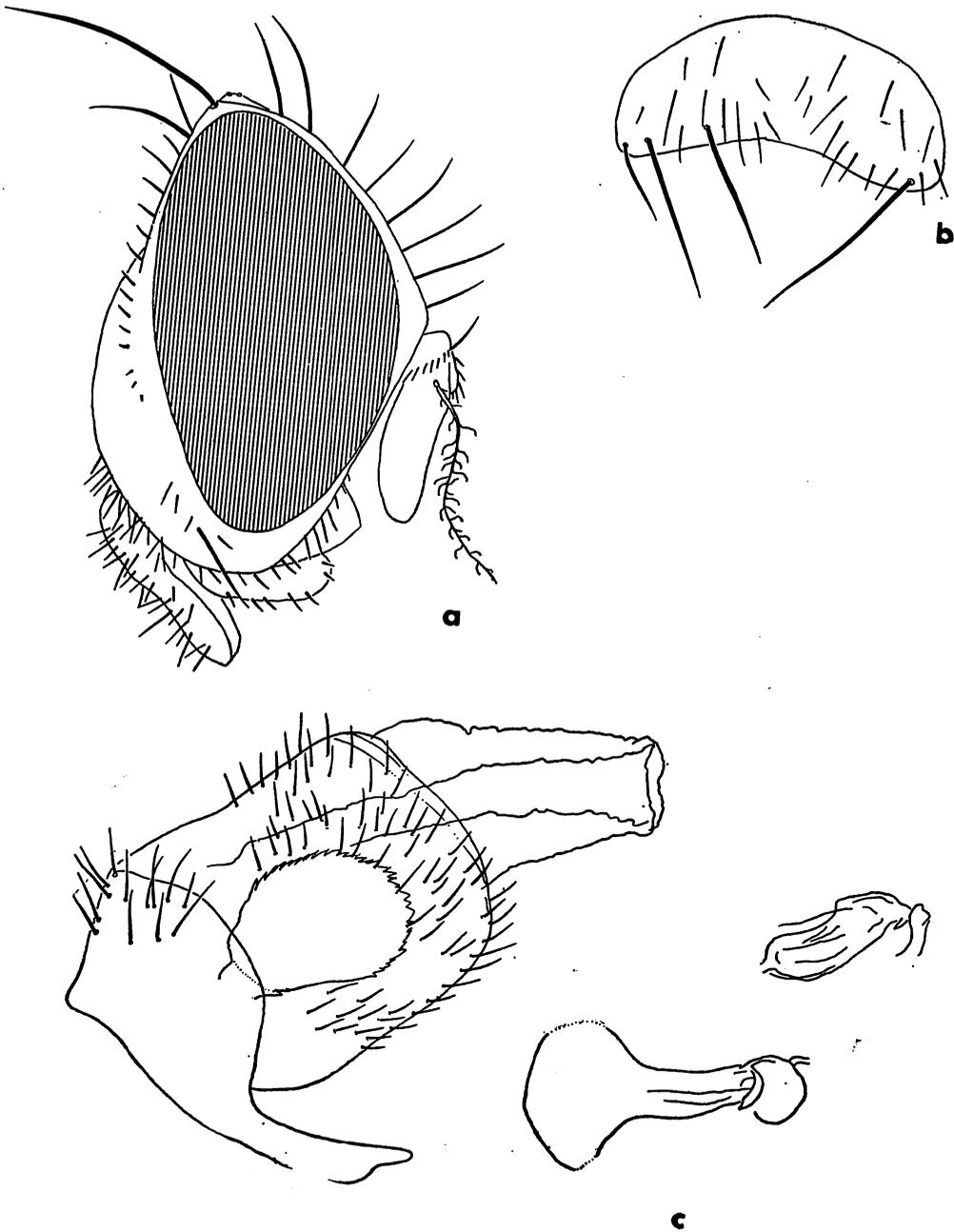


Fig. 92. *Carpophthorella capillata* (Bezzi): a. head, lateral; b. 5th sternum of ♂; c. ♂ genitalia.

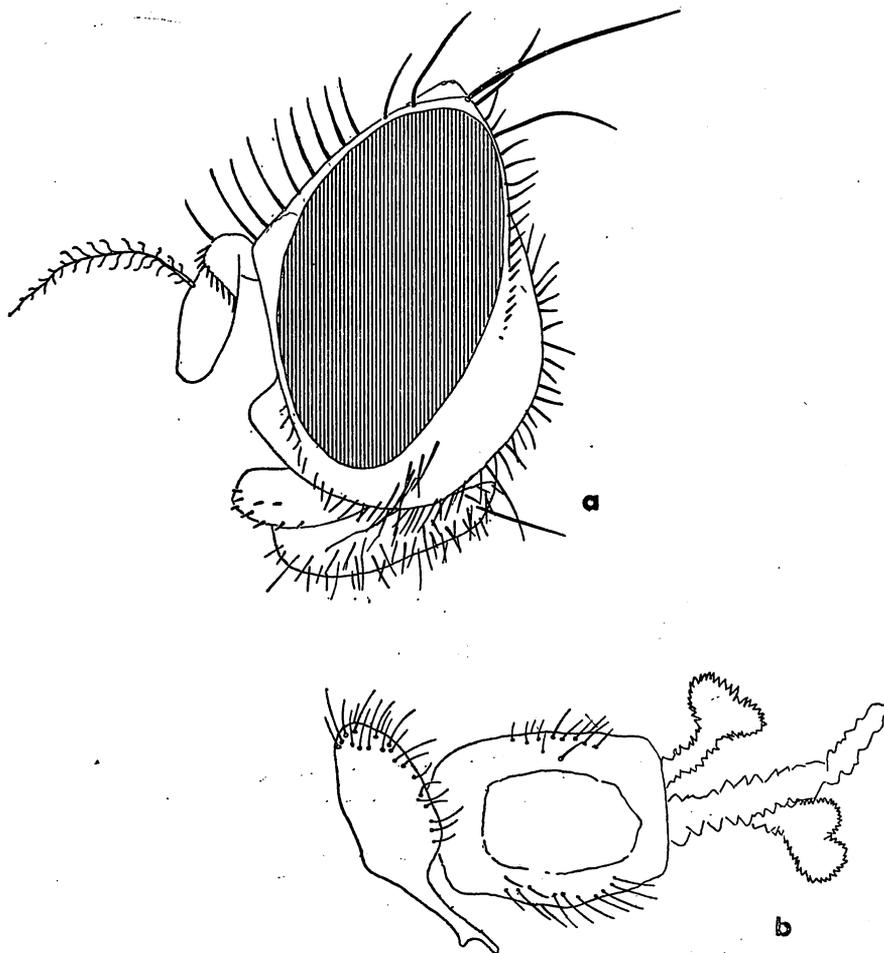


Fig. 93. *Carpophthorella luteiseta* (Bezzi): a. head, lateral; b. ♂ genitalia, showing anal papillae.

and metanotum, a tinge of brown along lower margin of each metapleuron and a brown submedian line extending down each side of the abdomen from base of 3rd tergum over anterior 1/2 of 5th, and with a narrow line of dark brown to black along lateral margins of terga 3-5. Head characters as in fig. 93a. Wings as in pl. 4, fig. 31, vein R_{4+5} setose to a level slightly beyond apex of vein R_{2+3} and well beyond m crossvein. The ♀ has not been studied. Fifth sternum of ♂ about 2× wider than long, almost straight on hind margin and with about 6 prominent bristles on each side of posterior margin. Male genitalia as in fig. 93b with surstyli rather elongate, indistinctly bilobed apically and with cerci very large, 2× longer than wide and with 3 prominent anal papillae (fig. 93b). Length: body and wings, 5.4-5.6 mm.

I have seen about a dozen specimens from several areas on Luzon; it has been reported only from this island.

Genus *Enicoptera* Macquart

Enicoptera Macquart, 1848, *Mem. Soc. Sci. Lille* 1847 (2): 223, pl. 7, fig. 9. Type-species: *flava* Macquart, by monotypy.

Hemicoptera: Loew, 1873, *Smiths. Misc. Coll.* 11: 21. Invalid emendation.

This genus is readily differentiated from other Gastrozonini by the distinctive wing venation and pattern of markings (fig. 96, 97, and 99d). Vein R_1 ends near apical 1/4 of wing, vein R_{2+3} has an upward loop just before apex of R_1 , usually joining with the latter vein for a short distance; veins R_{4+5} and M_{1+2} are strongly convergent at their apices, greatly narrowing cell R_5 ; r-m crossvein situated near apical 1/4 of wing, approximately opposite end of vein R_1 ; and vein M_{1+2} curved downward before r-m crossvein. The calypters are narrow. These are large (body, 9.0–10.0 mm; wings 10.0–11.0 mm) conspicuously marked species, with thorax yellow, black vittate on mesonotum, and with abdomen shining black except for a broad yellow median vitta. The ♀♀ have 2 strangely shaped spermathecae, each consisting of 2 sac-like portions connected by a narrow neck (fig. 99c). Male aedeagus with a fleshy, preapical, ventral lobe which is densely covered with spinules (fig. 100a).

This is a predominantly Philippine genus; 11 species are known to date; 7 occur in the Philippines and 4 in Indonesia. It should be noted that Malloch (1939: 441) was in error in the treatment of this genus; in his key (couplet 7), he said "first posterior cell not narrowed at apex; gena nearly as high as eye." Actually the 1st posterior cell (cell R_5) is strongly narrowed at apex and the genae are rather narrow, scarcely 1/6 as high as eye.

It should be noted that "*arenosa* Walker" as used by Hering (1938a: 412) is no doubt a typographical error for *Enicoptera arcuosa* Walker (1860: 156). The latter belongs in the genus *Neosiphira* Hendel and *ferruginea* Hendel is a synonym (refer to Hardy 1959: 185).

Nothing is known of the habits or hosts of species of this genus.

KEY TO KNOWN SPECIES OF ENICOPTERA

1. Mesonotum lacking a median longitudinal brown to black vitta.....2
Mesonotum with a median longitudinal brown to black vitta.....3
- 2(1). Mesonotum predominantly rufous, brown to black on posterior margin and with a large brown spot behind each humerus. Scutellum entirely yellow to rufous. Celebes.....**tortuosa** Walker
Mesonotum with 2 brown to black submedian longitudinal vittae (these are interrupted at the suture). Scutellum with a brown spot. Java.....**flava** Macquart
- 3(1). Mesonotum with 2 submedian yellow to rufous vittae extending the entire length.4
The 3 brown to black vittae joined on posterior margin of mesonotum.....9
- 4(3). Median vitta on mesonotum narrow, not expanded posteriorly. Scutellar spot rather small, confined to space between scutellar bristles (or extending slightly beyond in *interrupta* Hering).....5
Median vitta expanded posteriorly. Scutellar spot large, extending beyond confines of apical scutellars or longer than wide.....7
- 5(4). Vein R_{2+3} joined to R_1 along upper edge of upcurve portion, no spurvein present (fig. 96). Hind femora all rufous or predominantly rufous, dark brown ventrally.....6
 R_{2+3} not joined to R_1 except by a short spurvein ($R_?$) (fig. 97). Hind femora

- uniformly brownish. Vein $Cu_1+1st\ A$ about $1/3$ as long as the narrowed portion of cell Cu in σ . Philippine Islands: Surigao, Mindanao.....**interrupta** Hering
- 6(5). Hind femora all rufous. Abdomen with a broad, yellow, longitudinal, median vitta extending full length of dorsum. Vein $Cu_1+1st\ A$ slightly longer than narrowed portion of cell Cu (pl. 4, fig. 33; also fig. 3a, Hering 1937). Luzon.....**flavofemoralis** Hering
- Hind femur dark brown ventrally, otherwise rufous. Base of 2nd tergum brown. Vein $Cu_1+1st\ A$ very short in σ (fig. 96), about $1/5$ as long as narrowed portion of Cu . Philippine Islands: Luzon, Samar.....**il** Hering
- 7(4). Wings with streaks of brown extending through posterior portion (pl. 4, fig. 32). Second abdominal tergum yellow medianly.....8
- Wings brown only on anterior margin and subbasally, lacking brown markings in posterior portion. Second tergum with a dark brown to black crossband connecting the 2 lateral longitudinal vittae. Sumatra.....**gigantea** Enderlein
- 8(7). Face of ♀ with a black spot in middle, sometimes in σ . A prominent brown to black spot present on each eye margin at base of antenna in σ . Front coxae dark brown to black. Black spots on scutellum much longer than wide, extending $1/2$ to $1/3$ the length of scutellum. Female ovipositor sharply pointed. Luzon.....**cuneilinea** Hering
- Face and lower front entirely yellow. Front coxae yellow. Scutellar spot large, extending well beyond bases of apical bristles and extending $1/2$ the length of scutellum. Female ovipositor blunt, obtuse at apex. Sumatra, Java.....**sumatrana** Hering
- 9(3). Wing with a brown band extending from anterior margin, over r-m crossvein, filling apical portion of cell $1st\ M_2$, over m crossvein, along vein M_{3+4} diagonally to margin along vein $Cu_1+1st\ A$ and to base along, and filling, cell Cu (fig. 99d). Median vitta broad anteriorly, narrowed opposite dorsocentral bristles. Front femur dark brown to black posteriorly at apical $1/3$. Luzon, Philippine Islands.....**proditrix** Osten Sacken
- Wing lacking a continuous brown band from anterior margin to cell Cu . Apex of cell $2nd\ M_2$ largely hyaline. Median vitta on mesonotum gradually expanded posteriorly. Front femora entirely yellow.....10
- 10(9). Cell Cu entirely brown, except for usual narrow hyaline streak in basal portion. Cell R_3 hyaline or very faintly yellow. Cell R_1 yellowish. Face with black median spot in both sexes and middle femora yellow brown to brown ventrally. Male wing lacking brown marks over m crossvein or extending diagonally through posterior portion. Palawan, Philippines.....**palawanica** Hering
- Attenuated portion of cell Cu hyaline; cells R_1 and R_3 brown; mid femora and face yellow; a transverse brown band over m crossvein and an oblique brown band from r-m crossvein along upcurved portion of vein R_3 through middle of cells M_3 and M_4 to wing margin at vein $Cu_1+1st\ A$. Mindanao, Philippines.**spoliata** Hering

Enicoptera cuneilinea Hering Fig. 94a-g; pl. 4, fig. 32.

Henicoptera cuneilinea Hering, 1937, *Philip. J. Sci.* 63: 108, fig. 4a-b. Type-locality: Manila, Luzon. Type σ and allotype ♀ in British Museum (Nat. Hist.).

Fitting in the complex of species which has a narrow black median band extending full length of mesonotum, broadly expanded on posterior portion, and with submedian portion of mesonotum yellow for its entire length, the hind margin not continuously

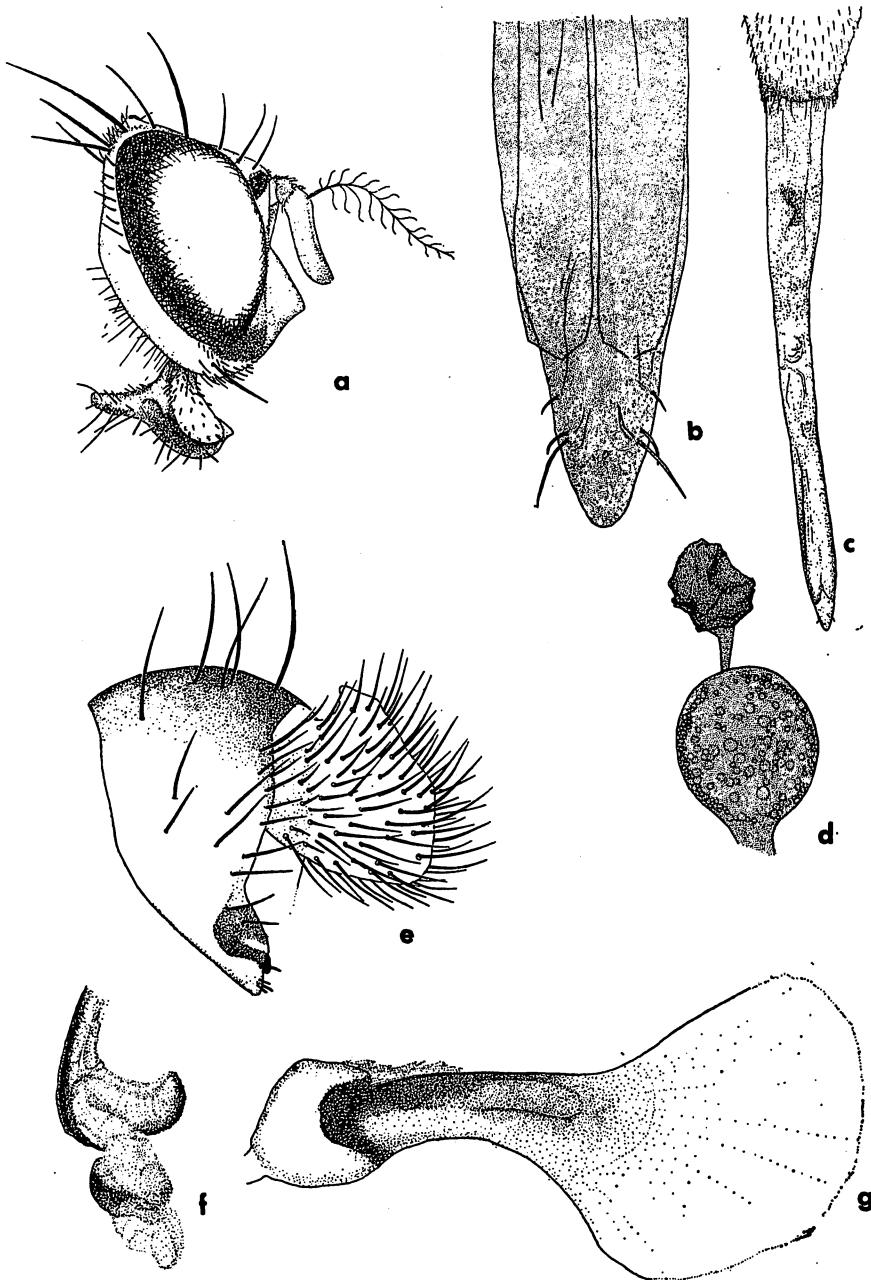


Fig. 94. *Enicoptera cuneilinea* Hering: a. head, lateral; b. apex of piercer; c. ♀ ovipositor; d. spermatheca; e. ♂ genitalia; f. apex of aedeagus; g. ejaculatory apodeme.

black; the scutellar spot large, extending approximately $1/2$ the length of sclerite on dorsum; wings with oblique streaks of brown extending through posterior portion and abdomen with a broad yellow band extending longitudinally the entire length. It fits near *sumatrana* Hering. It differs by having a vertical black spot in middle of ♀ face; this is sometimes present in ♂; by having a prominent brown to black spot present on each eye margin at base of antenna in ♂; front coxae brown to black; basal spot on scutellum much longer than wide, extending $1/2$ to $2/3$ length of scutellum; and ♀ ovipositor sharp-pointed (fig. 94b). In *sumatrana* the face and lower front are entirely yellow; coxae yellow; scutellar spot broader than high; and ♀ ovipositor blunt, obtuse at apex. The latter is known only from Sumatra and Java.

The head of *cuneilinea* is as in fig. 94a. Wings as in pl. 4, fig. 32. The ♂ has upper edge of upcurved portion of vein R_{2+3} joined to R_1 and the ♀ has R_{2+3} connected to apex of R_1 by a spurvein (R_2). Sterna brown to black on lateral margins, yellow medianly. Fifth sternum of ♂ slightly longer than wide, straight on hind margin. Male genitalia as in fig. 94e-g; the epandrium is polished black over dorsum and the surstyli are short. The aedeagus has a thumb-like preapical ventral lobe which is microscopically spinose (fig. 94f). Sixth abdominal tergum of ♀ about $3/4$ as long as 5th. Basal segment of ♀ ovipositor about equal in length to terga 4+5 as seen from dorsal view. Measured on venter the basal segment is 2.7 mm long. Piercer straight-sided, gradually narrowed to a point at apex as in fig. 94b, measuring 2.4 mm. Extended ovipositor (fig. 94c) 7.5 mm. Two spermathecae, each consisting of a rounded portion and a moderately large round portion connected by a narrow neck (fig. 94d). Length: body, 9.0-10.0 mm; wings, 9.5-10.5 mm.

Known only from Luzon.

Enicoptera flavofemoralis Hering Fig. 95a-d; pl. 4, fig. 33.

Henicoptera flavofemoralis Hering, 1937, *Philip. J. Sci.* **63**: 107, fig. 3a-b. Type-locality: Limay, Luzon. Type ♂ in British Museum (Nat. Hist.).

Similar to *cuneilinea* Hering in most respects; differing by having a very narrow median vitta extending down mesonotum, not expanded posteriorly; by the all-yellow face, front and legs; by the small black spot at apex of scutellum; by having vein R_{2+3} joined with R_1 for a short distance in both sexes (pl. 4, fig. 33); and by the differences in the shape of the ♀ spermathecae (fig. 95b). It fits near *il* Hering but is differentiated by the all-yellow hind femora; the elongate vein $Cu_1+1st A$ (slightly longer than the narrowed portion of cell Cu); and by having a broad yellow longitudinal vitta extending full length of abdomen on dorsum. Wing as in pl. 4, fig. 33. Male genitalia as in fig. 95c-d.

Female ovipositor similar to that of *cuneilinea*; piercer as in fig. 95a. Spermathecae as in fig. 95b. Length: body, 9-10.0 mm; wings, 10-11.0 mm.

Known from numerous localities over Luzon.

Enicoptera il Hering Fig. 96.

Henicoptera il Hering, 1938, *Deut. Ent. Zs.* **1938**: 411. Type-locality: Mt Makiling, Luzon. Type ♂ in British Museum (Nat. Hist.).

Based upon the type ♂ this fits near *E. interrupta* Hering, because of the narrow median vitta on mesonotum, the all-yellow face, brown to black basal portion of 2nd abdominal tergum, and short vein $Cu_1+1st A$. It differs by having vein R_{2+3} joined to

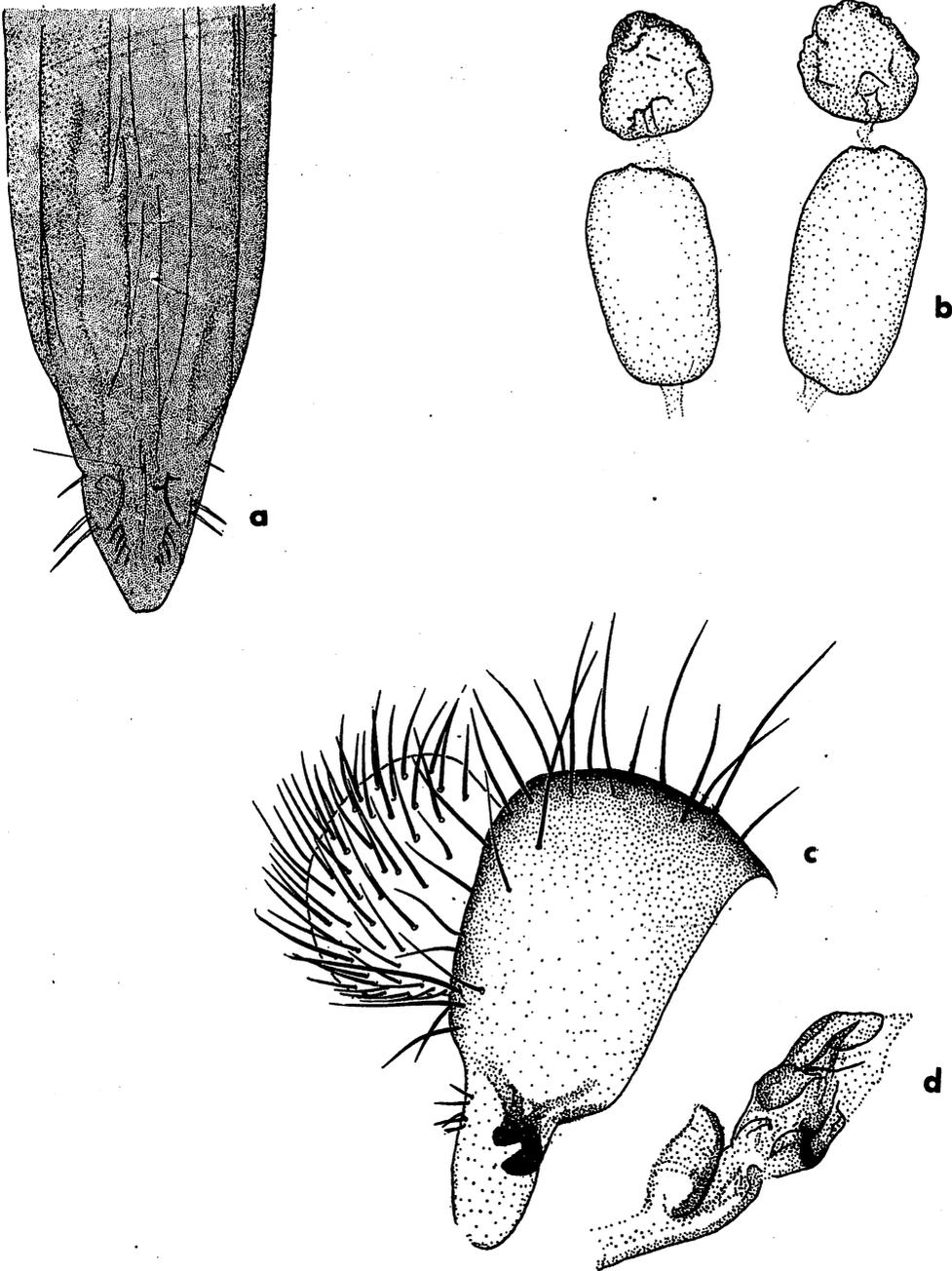


Fig. 95. *Enicoptera flavofemoralis* Hering: a. apex of piercer; b. spermathecae; c. ♂ genitalia; d. apex of aedeagus.

R_1 along upper edge of the upcurved (looped) portion and no spurvein present (fig. 96). Also the upcurved portion of vein R_{2+3} is slightly distad of r-m crossvein and hind femora of ♂ dark brown ventrally, otherwise rufous. Vein $Cu_1+1st\ A$ of ♂ very short, about $1/5$ as long as narrowed portion of cell Cu. In *interrupta* R_{2+3} is not jointed to R_1 except for a short spurvein (R_2) at extreme apex and with upcurved portion of vein R_{2+3} nearly opposite r-m crossvein. Hind femora (both sexes) uniformly brownish; $Cu_1+1st\ A$ about $1/3$ as long as narrowed portion of cell Cu in ♂ and approximately equal to this portion in ♀. Also the dark brown spot at apex of scutellum is smaller in *il*, confined to space between apical bristles; in *interrupta* it is typically larger and extends slightly beyond confines of scutellar bristles.

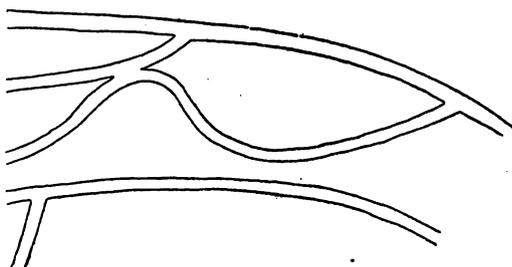


Fig. 96. *Enicoptera il* Hering: anteromedian section of wing.

Hering (1938a: 411) related *il* to *cuneilinea* and separated it by *il* lacking a black spot on face of ♀ and by having a brown spot on eye margin at base of antenna in ♂. These characters are of questionable value.

E. il also fits near *flavofemoralis* Hering. I am unable to separate the ♀ specimens which Hering described as *il* from *flavofemoralis*. The ♂ is readily differentiated by the bicolored hind femora, the very short vein $Cu_1+1st\ A$ and by having the basal portion of 2nd tergum brown to black.

The species has been recorded only from Luzon. Specimens which appear to belong here are in the Frey collection, Helsinki from several localities on Luzon and Leyte. Specimens have been examined from 2 localities on Luzon which appear to fit *il* except that vein R_{2+3} is not joined with R_1 except by a short spur and vein $Cu_1+1st\ A$ is almost equal in length to the lobe of Cu. This may represent a new species or this character may prove to be unreliable.

Enicoptera interrupta Hering Fig. 97.

Hemicoptera interrupta Hering, 1937, *Philipp. J. Sci.* 63: 107, pl. 1, fig. 2a-b. Type-locality: Surigao, Mindanao. Type ♂ in British Museum (Nat. Hist.). Two additional ♂♂ in the British Museum collection and 1 ♀ from Frey collection from the type-locality have been studied.

This species fits near *il* Hering and based on ♂♂ it is differentiated by having vein R_{2+3} joined to extreme apex of R_1 , or to costa slightly beyond apex of R_1 , by a short spurvein (fig. 97). I am not at all sure of the reliability of this character; there is obviously some variation in the looping of vein R_{2+3} and large series of specimens of *Enicoptera* must be studied to learn the extent of variation of this and many of the other characters. Also the length of vein $Cu_1+1st\ A$ compared to the length of the cubital cell may be variable. In the ♂ specimens from the type-locality this vein is approximately $1/3$ as long as the narrowed portion of the cell Cu. The ♀ ovipositor appears to be distinctive in the 1 topotypic ♀ which has been examined. The basal segment of ovipositor is much longer, more slender and gradually tapered than in related species which have been examined. The base measures 4.75 mm long by 2.1 mm at its

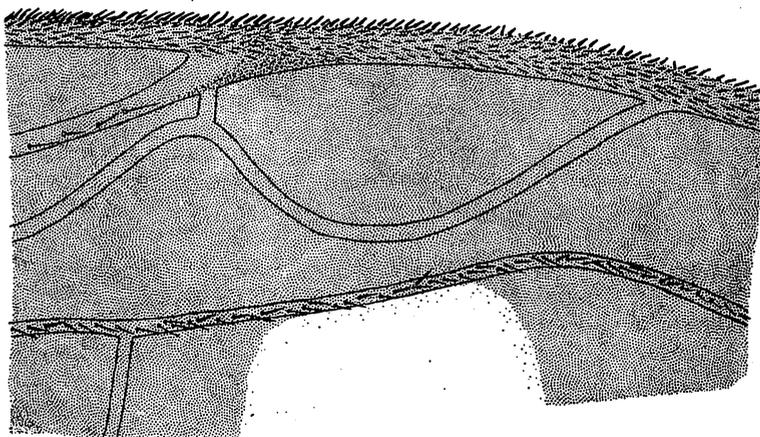


Fig. 97. *Enicoptera interrupta* Hering: anteromedian section of wing.

widest point. In related species the basal segment is comparatively short and thick, usually about 1/2 longer than wide. The piercer of *interrupta* is more elongate and slender, measuring 4.1 mm in length and gradually tapered at apex. In related species the piercer averages about 3.0 mm in length and the apex is rather abruptly tapered. The spermathecae have not been seen on the specimens at hand.

***Enicoptera palawanica* Hering** Fig. 98a-e; pl. 4, fig. 34.

Hemicoptera palawanica Hering, 1942, *Mitt. Zool. Mus. Berl.* 25(2): 278. Type-locality: Palawan. Type ♀ in Zoological Museum, Berlin.

This species fits near *spoliata* Hering by having the posterior margin of mesonotum black and with a black band across 2nd abdominal tergum. It is differentiated by having a black spot on lower median portion of face in both sexes; cell Cu entirely brown (except for usual narrow hyaline streak in basal portion above anal vein); cell R_3 hyaline almost to curve of vein R_{2+3} in ♀ and subhyaline in ♂; by having upcurved portion of vein R_{2+3} touching along vein R_1 , rather than being connected to it by a short spurvein as in *spoliata*; femora yellow-brown to brown ventrally in both sexes; also the wings of the ♂ are differently marked, the apical 1/2 of cell 1st M_2 is yellowish with no distinct brown marks over m crossvein or extending diagonally across the posterior portion of wing. I have seen the original series and 1 ♂ and 1 ♀ from North Palawan, Binaluan in the Frey collection, Helsinki.

Wing markings and venation as in pl. 4, fig. 34. Male genitalia as in fig. 96d-e. Sixth tergum of ♀ 3/4 as long as 5th. Ovipositor approximately equal in length to terga 4-6. As seen from above basal segment only slightly longer than wide. Measured on venter the base is 2.75 mm. The piercer is rather evenly tapered to a point at apex (fig. 98c) and measures 2.3 mm in length. The extended ovipositor (fig. 98a) measures 7.5 mm. Spermathecae as in fig. 98b.

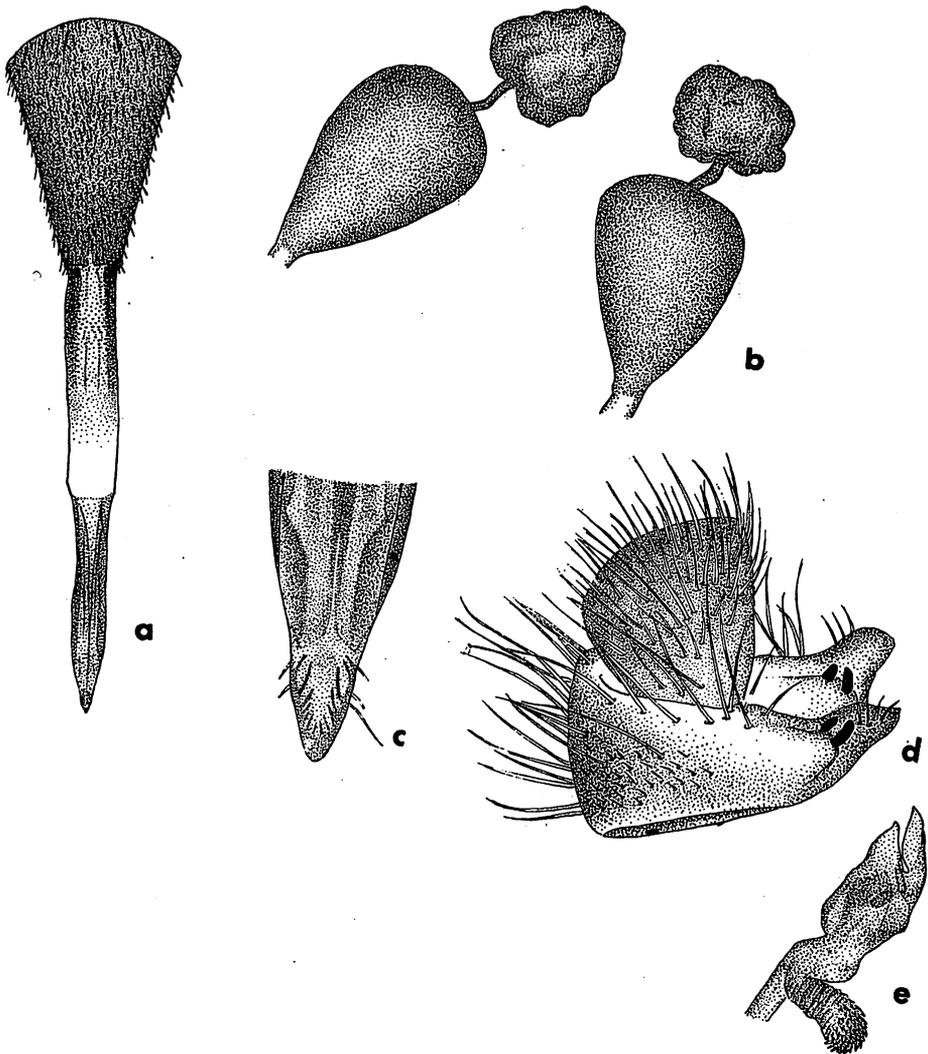


Fig. 98. *Enicoptera palawanica* Hering: a. ♀ ovipositor; b. spermathecae; c. apex of piercer; d. ♂ genitalia; e. apex of aedeagus.

***Enicoptera proditrix* Osten Sacken Fig. 99a-d.**

Enicoptera proditrix Osten Sacken, 1882, *Berl. Ent. Zs.* 26: 233. Type-locality: Luzon. Lectotype ♂ in Deutsches Entomologisches Institut, Eberswalde. Four syntype ♀♀ are in the type series. The ♀ specimens appear to be a different species from the ♂ and the following diagnosis is based upon the lectotype.

The species is characterized by having the band of brown extending diagonally across wing from broad marginal band over r-m crossvein filling apex of cell 1st M_2 over m crossvein along veins M_{1+2} , Cu_1 +1st A and through all of cell Cu. The upcurve

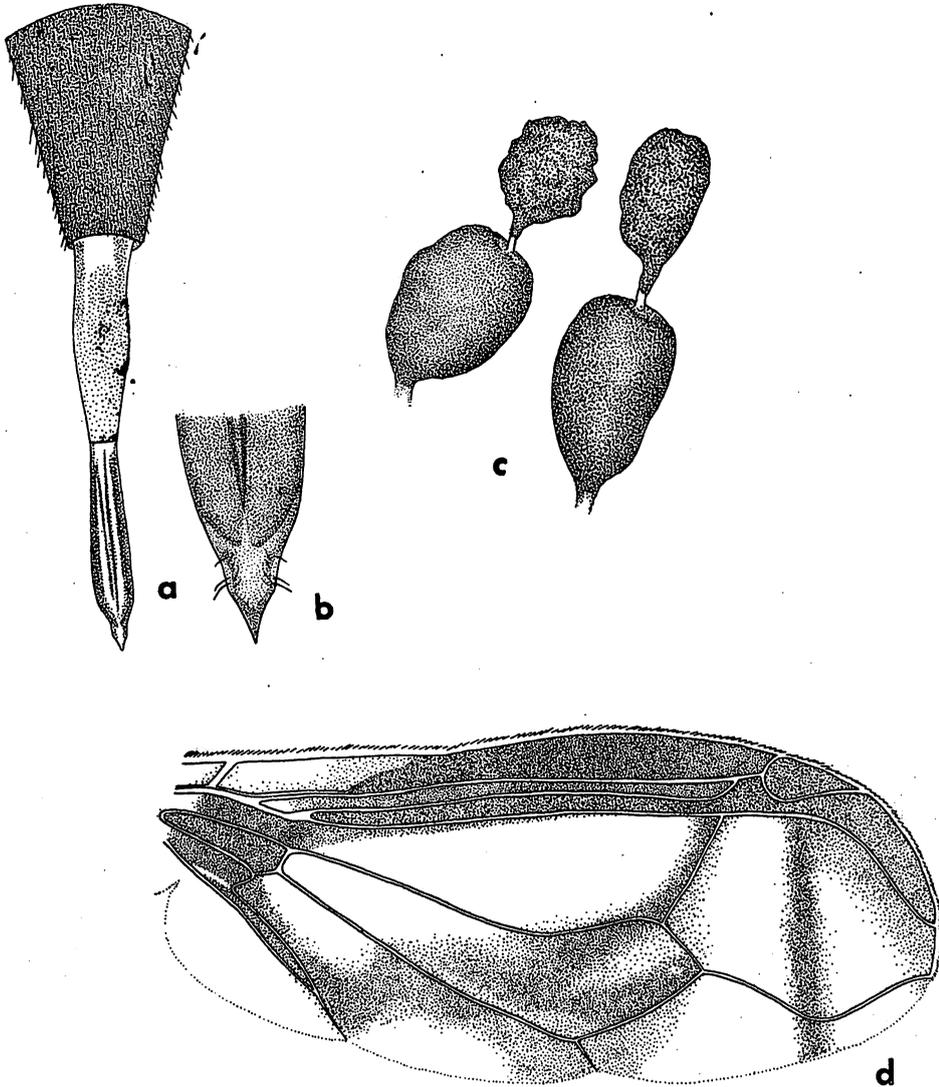


Fig. 99. *Enicoptera proditrix* Osten Sacken: a. ♀ ovipositor; b. apex of piercer; c. spermathecae; d. wing.

portion of vein R_{2+3} is fused with R_1 along top edge (fig. 99d). Front femur with a prominent dark brown to black posterior mark at apical 1/3. Median vitta on mesonotum expanded anteriorly and distinctly narrowed opposite suture and opposite dorsocentral bristles. The face has a black median spot above epistoma. The front has a small brown to black spot at each lower margin at sides of antennae. A black spot covers most of humerus. Propleura, most of mesopleura, and metapleura yellow. Scutellum with a round black apical spot extending between median bristles. Postscutellum yellow, with a

longitudinal black mark in middle. Median vitta of mesonotum narrowly jointed to lateral vittae along hind margin. The 2nd abdominal tergum and apex of 1st black; sides of terga 3-5 reddish brown. Middle femora black ventrally on apical 2/3; hind femora entirely reddish brown. One ♀ specimen on hand from Mud Spring, Mt Makiling, Luzon, 305 m (1000 ft), 30.II.1968, D. E. Hardy appears to belong here but the oblique band across wing is not completely continuous through cubital cell; it extends only across apical 3/5 of vein $Cu_1+1st\ A$ and the extreme apical portion of cubital cell is hyaline. Also the median black vitta on mesonotum is not so broadly expanded anteriorly as in ♂. The shape of the piercer is very distinctive in this specimen and this probably is a diagnostic character. The extreme apex is abruptly narrowed to a very sharp point (fig. 99b). The extended ovipositor (fig. 99a) measures 6.5 mm. The piercer is 2.0 mm. The spermathecae (fig. 99c) are also distinctly shaped.

Specimens are on hand from the island of Samar and from Sibuyan Island which appear to fit very close to *proditrix* but the brown band is not completely joined with the brown over cubital cell and the median black vitta on mesonotum is not expanded anteriorly, also the ♀ ovipositor is not so sharply pointed at apex, shaped more like that of *palawanica*. This is apparently a distinct species (probably undescribed) but it will be necessary to examine larger series of specimens of *Enicoptera* in order to determine the range of variability of the characters.

***Enicoptera spoliata* Hering** Fig. 100a-b; pl. 4, fig. 35.

Enicoptera spoliata Hering, 1937, *Philip. J. Sci.* 63: 106, fig. 1a-b. Type-locality: Port Banga (this has been given on some labels as Port Bauga), Southwest Mindanao. Type ♂ in British Museum (Nat Hist.).

This species fits near *palawanica* Hering by having the posterior margin of mesonotum black. It differs by having the attenuated portion of cell Cu hyaline; cells R_1 and R_3 brown, very faintly tinged with yellow; a brown transverse band extending over m crossvein and an oblique brown band extending over $r-m$ crossvein along upcurved portion of vein R_{4+5} through middle of cells M_3 and M_4 to wing margin; also the face and middle femora

yellow and the upcurved portion of vein R_{3+4} not touching R_1 but joined to it by a short spurvein similar to that of *interrupta* Hering (fig. 97).

This species is presently known only from the ♂♂. The face is entirely yellow, the median black vitta on mesonotum is narrowed anteriorly, gradually expanded posteriorly and the entire posterior margin of mesonotum is black except for reddish brown posterolateral margins. The spot at apex of scutellum is slightly longer than wide but extends barely beyond lateral confines of apical scutellar bristles. First tergum of abdomen entirely yellow, the 2nd with a broad black band across base and with lateral margins

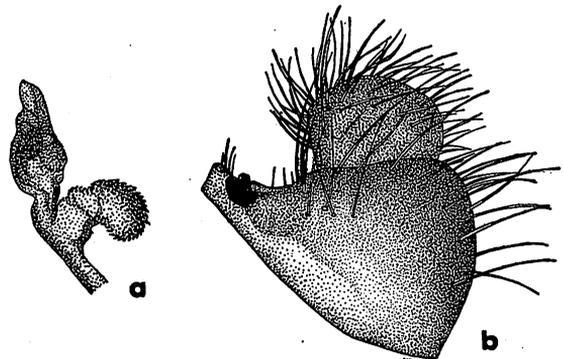


Fig. 100. *Enicoptera spoliata* Hering: a. apex of aedeagus; b. ♂ genitalia.

broadly black. Other terga with lateral margins broadly black and a broad yellow vitta extending longitudinally down middle. Wings as in pl. 4, fig. 35. Hind femora brown. Sterna broadly brown to black on sides, yellow down middle. Male genitalia as in fig. 100b, the surstyli almost truncate at apices. Apex of aedeagus as in fig. 100a.

The species is known only from Mindanao.

Genus *Galbifascia* Hardy

Galbifascia Hardy, 1973, *Pacif. Ins. Monogr.* **31**: 247. Type-species: *sempunctata* Hardy, by original designation.

This genus is closely related to *Xanthorrhachis* Bezzi but is characterized by having the front horizontal, the head nearly quadrate, approximately as high as long with the antennae situated almost in line with upper margin of eye (fig. 117a, Hardy 1973); by having subcostal cell about equal in length to 2nd costal cell; lobe of cell Cu scarcely over 1/3 as long as vein $Cu_1 + 1st\ A$ (fig. 101a); and 2nd tergum of σ not expanded over bases of 3rd tergum and basal portion of \varnothing ovipositor with strong bristles at apex. The wing markings are very similar to those of *Xanthorrhachis*. Vein R_{2+3} is only slightly curved, straight or nearly so and the r-m crossvein is situated near middle of cell 1st M_2 . Ocellar bristles are not developed; these are represented by tiny setae about equal in size to the setae along eye orbits. Three pairs inferior fronto-orbital bristles and 2 pairs superior fronto-orbital bristles present. Middle tibia with 1 long apical spur. Female with 2 heavily sclerotized spermathecae.

Two species are known in this genus, the type from Laos and Vietnam and *quadripunctata* from Ceylon and the Philippines.

Members of this genus may possibly breed in bamboo shoots.

Galbifascia quadripunctata Hardy Fig. 101a-c.

Galbifascia quadripunctata Hardy, 1973, *Pacif. Ins. Monogr.* **31**: 247, fig. 117a-d. Type-locality: Pundaluoya, Ceylon. Type \varnothing in the British Museum (Nat. Hist.).

This species is readily differentiated by the generic characters given above; the wing venation and markings (fig. 101a) are characteristic. The species is entirely yellow except for 4 polished black spots on scutellum at bases of bristles and except for a small black spot on each posterolateral margin of mesonotum. The head characters are as in fig. 117a, Hardy 1973. The 3rd antennal segment is about $2\frac{1}{3} \times$ longer than wide and terminates in a distinct point at upper apex. The head bristles, the dorsocentrals and prescutellars are black; the other thoracic bristles are yellow, tinged with brown. The dorsocentrals are situated approximately in line with the supraalar. The scutellum is rather strongly convex, rounded as seen in lateral view, short, $\frac{1}{2}$ wider than long. Vein R_{4+5} is setose to a level opposite end of vein R_{2+3} . Crossvein r-m situated at about apical $\frac{3}{5}$ of cell 1st M_2 , nearly opposite apex of vein R_1 . Subcostal cell almost equal in length to 2nd costal. Wing markings mostly yellow, tinged with brown, especially on apical portion and brown along vein M_{3+4} and apex of M_{1+2} . The $\sigma \sigma$ have not been studied. Sixth tergum of \varnothing almost as long as 5th. As seen from dorsal view the basal segment of ovipositor slightly longer than terga 4-6 and measured on venter the basal segment is 1.7 mm long. Piercer 1.5 mm long, tapered at apex as in fig. 101b, expanded medianly. Extended ovipositor 4.2 mm. Two black spermathecae present (fig 101c). Length: body

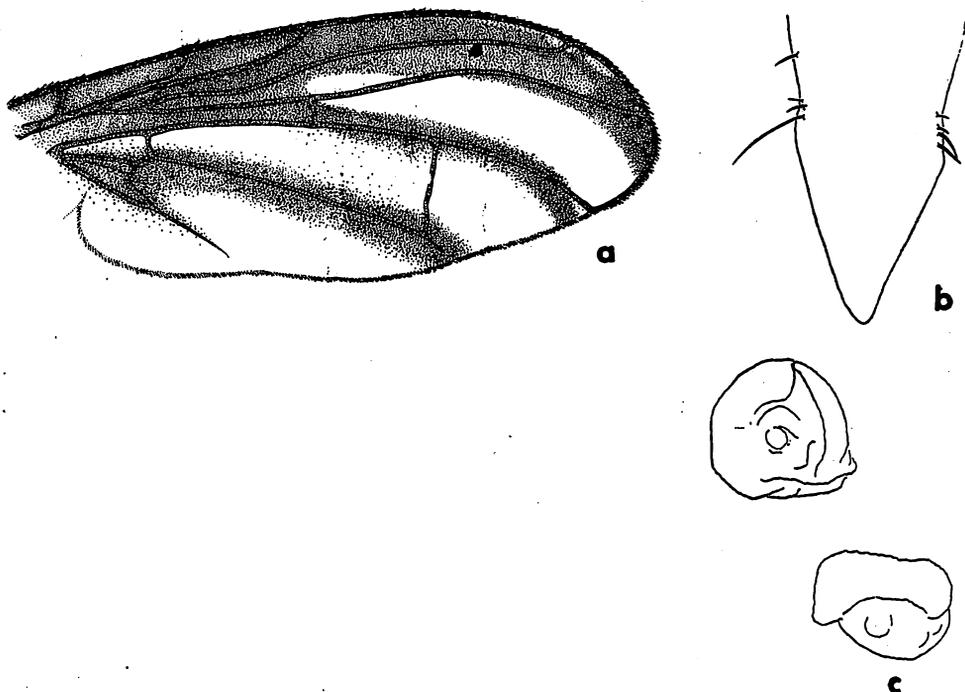


Fig. 101. *Galbifascia quadripunctata* Hardy: a. wing; b. apex of piercer; c. spermathecae.

and wings, 5.4 mm.

One ♀ specimen on hand: Mt Limay, Luzon, Baker. This was in the Bezzi collection as a new species of *Xanthorrhachis*.

Genus *Spilocosmia* Bezzi

Spilocosmia Bezzi, 1913, *Philip. J. Sci.*, D 8: 327. Type-species: *bakeri* Bezzi, by original designation. *Prospilocosmia* Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* 8: 212. New synonym.

Type-species: *punctata* Shiraki, by original designation.

This genus is readily differentiated from other Gastrozonini by having the ocellar bristle weak to well developed, the 3rd antennal segment terminating in a sharp apical point above, and front femora of ♂ thickened and densely black setose ventrally. The body is yellow with 4 shining black spots on each side of mesonotum, 1 on each humerus and also with the apex of scutellum shining black. Wings with 4 crossbands as in fig. 102e.

Known only from the type-species which is apparently widespread in Southeast Asia, being presently known from the Philippines, Laos and Vietnam (Hardy 1973) and *punctata* Shiraki from Formosa. This genus has previously been differentiated only by the presence of ocellar bristles and Shiraki in his description says "ocellar bristles weak or strong." I find this to be a variable character. The lectotype ♂ has tiny, rudimentary ocellars; a syntype ♀ in U. S. National Museum has well developed ocellars, approximately equal in size to upper inferior fronto-orbital bristles.

Spilocosmia bakeri Bezzi Fig. 102a-i.

Spilocosmia bakeri Bezzi, 1913, *Philip. J. Sci.*, D 8: 327. Type-locality: Mt Makiling, Luzon. Lectotype ♂ in U. S. National Museum.

I see nothing to differentiate *Prospilocosmia punctata* Shiraki, 1933 from Formosa, except that it has 2 submedian black spots on anterior margin of mesonotum and apparently has more distinct ocellar bristles. I believe these species are certainly congeneric. Shiraki further differentiated *punctata* by having 2 conspicuous costal bristles on wing as well as "a very short spine-like apical process of antennae." *S. bakeri* has 2 bristles, 1 is short and 1 long and the 3rd antennal segment terminates in a prominent spine-like point. It will be necessary to compare specimens from Formosa in order to determine the status of these.

This species is readily recognized by the all-yellow body, with large conspicuous black spots on dorsum of thorax; by the sharply-pointed 3rd antennal segment; swollen front femora, densely short bristled on venter; and by the banded wings as in fig. 102e. The face is entirely yellow except for a prominent opaque black spot in middle at lower edge. The development of the ocellar bristles obviously is variable; in most specimens these are weak, rather seta-like (fig. 102h). In some they are moderately to well developed (fig. 102c). The black spots on thorax are arranged as follows: 1 each on humeri; 1 on each notopleural callus at base of posterior notopleural bristle; 1 on each side of mesonotum at suture; a large black spot surrounding each inner postalar bristle; a large spot at apex of scutellum; and a small black spot on each side above wing base. Male abdomen yellow except for a prominent black spot on each side of 5th tergum. Female abdomen with a narrow dark brown to black border along lateral margins of terga 2-6; this is especially prominent in the ♂. Sterna entirely yellow, 6th sternum of ♂ almost 1/2 wider than long, gently concave on hind margin, densely setose and with 4 black bristles on posterior margin. Epandrium of ♂ predominantly polished black, highly arched. Surstyli slightly expanded apically and almost truncate (fig. 102i). Aedeagus as in fig. 102g and ejaculatory apodeme as in fig. 102h. Female ovipositor yellow to rufous with a brown band across apex of basal segment large, approximately equal in length to terga 4-6 as seen from dorsal view and measured on venter 1.5 mm long by 1.2 mm at its widest point. Piercer blunt at apex as in fig. 102f, 1.35 mm in length. Extended ovipositor (fig. 102d) 4.5 mm. Two spermathecae; these are long, tubular, coiled apically (fig. 102a). Length: body, 6.5-8.0 mm; wings 5.7-6.7 mm.

Specimens have been studied from a number of localities over Luzon, Mindanao, and Leyte. We have no host information for this species.

TRIBE TRYPETINI

Members of this tribe in the Philippines are characterized by having the scutellum flat, pleuroterga bare, arista short pubescent or bare, 4 scutellar bristles, a full complement of head and thoracic bristles, and postocular row of short bristles, prominent, sharp-pointed.

KEY TO GENERA OF TRYPETINI IN THE PHILIPPINES

1. Wings normal in shape, variously marked as in fig. 103a, 105, 111, 113 and 118c. 2
 Wings long and slender, almost straight-sided, 3× longer than wide; posterior margin hyaline and anterior 3/4 dark brown (fig. 112a). **Hemilea** Loew
2. Wings with r-m and m crossveins approximately parallel, cell 1st M₂ not sharply pointed at apex. Markings as in fig. 103a, 105a, 113 and 118c. 3

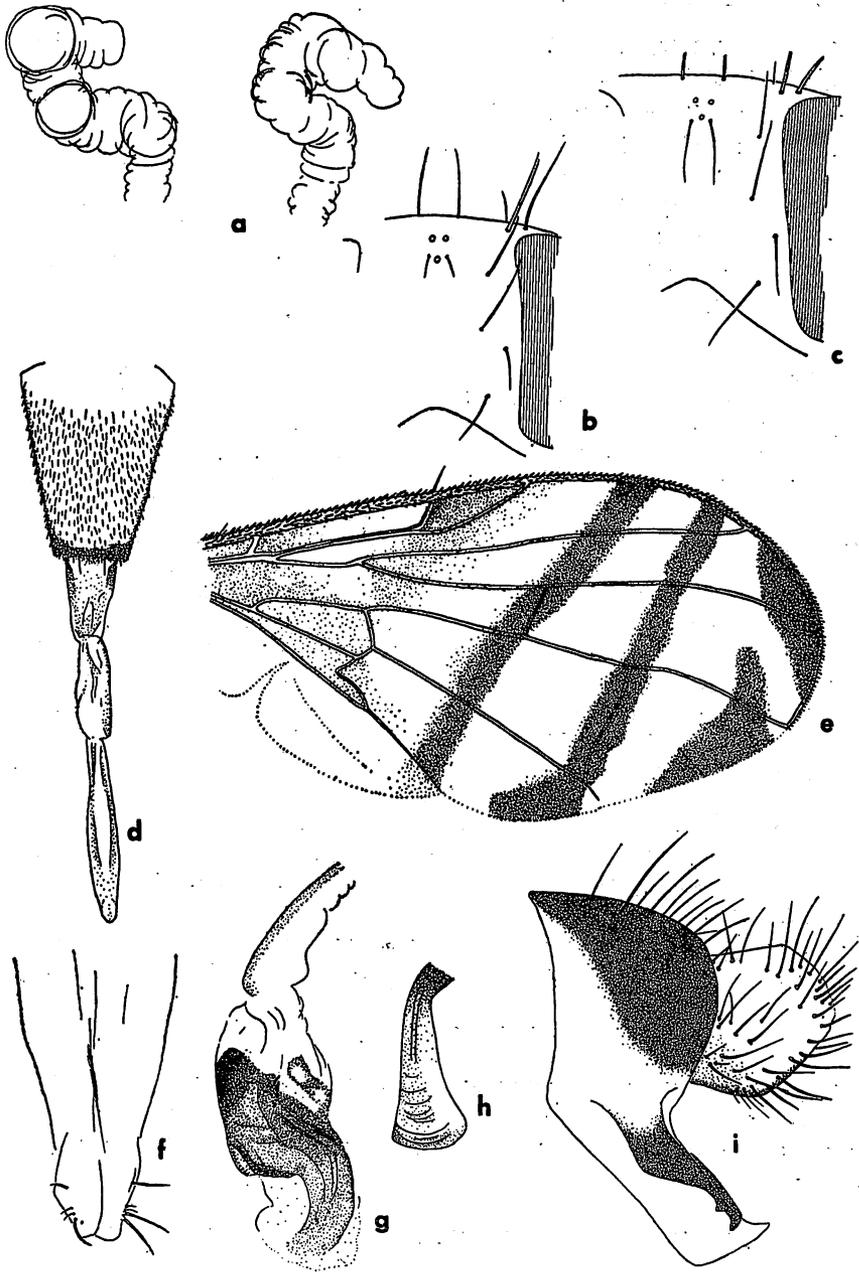


Fig. 102. *Spilocosmia bakeri* Bezzi: a. spermthecae; b. head, frontal view; c. same as b, aberration; d. ♀ ovipositor; e. wing; f. apex of piercer; g. apex of aedeagus; h. ejaculatory apodeme; i. ♂ genitalia.

- Crossvein m strongly oblique in position, cell 1st M_2 acutely pointed. Vein R_1 bent rather sharply, almost at a right angle, entering costa parallel to Sc; apex of cell Sc nearly square (fig. 111). **Anomoia** Walker
3. Head and body bristles black. Wing markings dark brown, pattern as in fig. 103a, 105a, and 113. Vein R_{4+5} with numerous setae above extending to r-m crossvein. 4
- Head and body bristles yellow. Wing markings yellow, tinged faintly with brown, with a Y-shaped mark in middle from anterior margin and a complete transverse band over m crossvein (fig. 105a). Vein R_{4+5} bare, or with 1 (rarely 2) black seta near r-m crossvein. **Acidoxantha** Hendel
4. Ocellar bristles well developed. Two pairs superior fronto-orbitals. Front not tuberculate. Wing markings as in fig. 103a and 115. 5
- Ocellars rudimentary, seta-like; only 1 pair (small) superior fronto-orbitals. Front tuberculate at bases of inferior fronto-orbital bristles (fig. 118a). **Vidalia** Robineau-Desvoidy
5. Thorax rufous, sometimes tinged with brown on dorsum. Propleural hairs fine, pale except for 2-3 dark hairs in *freyi* Hardy. Wings as in fig. 103a; pl. 4, fig. 36, 37. **Acidiella** Hendel
- Body predominantly shining black. Propleura with black bristle-like hairs. Wings as in fig. 113 and 115. **Myoleja** Rondani

Genus **Acidiella** Hendel

Acidiella Hendel, 1914, *Wien. Ent. Ztg.* **33**: 83; 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* **13**: 457. Type-species: *longipennis* Hendel, by original designation.

This "genus" is of very questionable status. I see no logical way to differentiate it from *Philophylla* Rondani except perhaps by having the propleura yellow-haired, rather than with black setae. Hendel in the original differentiated it from *Pseudospheniscus* Hendel (= synonym of *Philophylla* Rondani) by having the body rust-colored and the occiput swollen ("mit gepolstertem Hinterkopf"). He differentiates *Pseudospheniscus* by having the occiput flat, not swollen and body black. I have found the extent of swelling of the occiput rather variable throughout the range of species of *Philophylla* which I have studied and doubt that this character is of much value. In Hendel's type-species the occiput is only slightly developed. The body coloring does appear useful in separating these but I would hesitate to use this as a generic character unless supported by other good structural characters. The species of *Acidiella* which I have seen are all rufous, frequently tinged with brown on mesonotum while species of *Philophylla* are typically shining black. Hendel (1927: 101) treated *Acidiella* as a subgenus of "*Myiolia*" (= *Myoleja*) Rondani (also Shiraki 1933: 249) and characterized it by the straight vein R_{2+3} , parallel veins R_{4+5} and M_{1+2} , and by having r-m crossvein situated in apical portion of cell 1st M_2 . Shiraki further characterized *Acidiella* by lacking the prothoracic row of bristles. As has been discussed by Chen (1948: 111) this character apparently refers to the prothoracic hairs being black, rather bristle-like in 1 case and fine and pale in the other. Chen separates *Acidiella* from *Pseudacidia* Shiraki by having propleural hairs flavous in the 1st case and black, bristle-like in the 2nd. I find these characters of little or no value and feel *Acidiella* eventually must be treated within the concept of *Philophylla*. This is obviously a large assemblage of species which show considerable range of characters and it will be necessary to study this entire complex of Trypetini thoroughly in order to understand the generic limitations. In light of the paucity of materials on hand,

I am considering these as distinct for the present and separate *Acidiella* on the basis of having the body predominantly or entirely rufous, the wings markings (of the Philippine species) as in fig. 103a; pl. 4, fig. 36 and 37, not with a narrow brown band on posteroapical margin, and usually a narrow brown band extending across wing at level of m crossvein. Also the hairs on the propleura are fine, pale yellow-white except for 2 or 3 dark, bristle-like setae on anterior margin of propleuron in *freyi* Hardy.

It should be noted that Hendel (1927: 101) described *Acidiostigma* Hendel as a new subgenus under *Myiolia* with *Acidiostigma longipennis* Hendel as the type. Under this treatment this species would be a homonym of *Acidiella longipennis* Hendel (type-species of *Acidiella*). I have not seen *Acidiostigma* but from the original description it would appear to belong to a distinct genus differentiated by having vein R₁ ending well beyond the r-m crossvein and the subcostal cell elongate, almost equal in length to first 2 costal cells combined.

Head of *Acidiella* higher than long. Aristae varying from bare to short pubescent. Ocellar bristles usually rudimentary, in *freyi* rather well developed. The wings seem extremely variable in *Acidiella* and do not appear to follow a definite pattern. Vein R₄₊₅ usually setose to r-m crossvein, sometimes with very sparse setae on vein. Ovipositor short, piercer flat, serrated on each side before apex (fig. 103b, 104b). Two or 3 spermathecae present (2 in *denotata* and *freyi* and 3 in *mimica*).

Three species are known from the Philippines.

KEY TO KNOWN ACIDIELLA FROM THE PHILIPPINES

1. Wings with 2 prominent hyaline wedges in middle of anterior margin, 2 wedges on posterior margin and with a hyaline spot near basal portion of cell R₅ (pl. 4, fig. 37).
Palawan. **mimica**, n. sp.
Not as above..... 2
2. Wings all brown except for a few small hyaline marks on margin (fig. 103). Female ovipositor with few serrations on side of apex of piercer (fig. 103b). Palawan. **denotata** Hardy
Wings with a large wedge-shaped mark in basal R₁, extending through cell R₅; a large hyaline wedge from margin to cell 2nd M₂ through cell R₅ and a large hyaline spot in area between r-m and m crossveins (pl. 4, fig. 36). Apex of piercer with numerous serrations.
Luzon and Tawitawi. **freyi** Hardy

Acidiella denotata Hardy Fig. 103a-b.

Acidiella denotata Hardy, 1970, *Ent. Meddel.* **38**: 102. Type-locality: Brooke's Point, Uring Uring, Palawan. Type in University Zoological Museum, Copenhagen.

This species resembles *tumifrons* Chen from Chekiang, China but is differentiated by having the dorsocentral bristles situated near inner postalars, rather than just slightly behind supraalars; by having the subcostal cell almost entirely brown, rather than predominantly hyaline and having 4 small hyaline spots on wing margin just beyond middle of cell R₁ in middle of cells 2nd M₂ and M₄, rather than having large hyaline spots in these cells; also by lacking a hyaline spot at upper apex of cell 2nd M₂ (compare fig. 14, Chen 1948: 114). The front is not swollen and produced above the antennae as in *tumifrons* (it should be noted that *tumifrons* was described from the ♂ and this may be a sexual character).

A. denotata is differentiated from other known Philippine *Acidiella* by lacking

large hyaline wedges extending through cell R_1 and through posterior portion of wing; the wing is predominantly dark brown with just a few small marginal hyaline spots (fig. 103a). Predominantly yellow to rufous species, discolored with brown only on abdomen. Head shaped as in other members of this group and with 3 pairs of inferior fronto-orbitals and 2 pairs superior fronto-orbitals. Chaetotaxy of thorax as is typical of members of

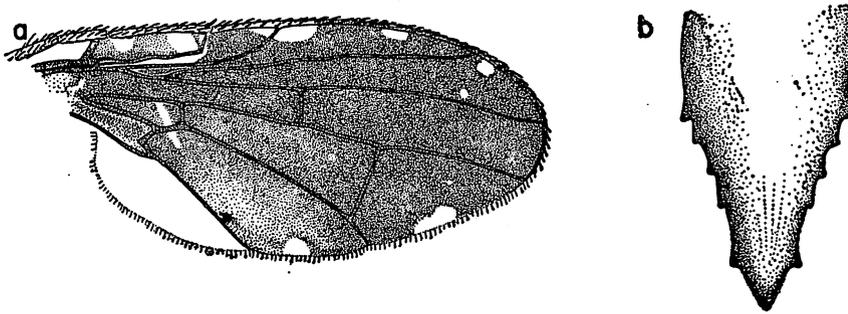


Fig. 103. *Acidiella denotata* Hardy: a. wing; b. apex of piercer.

this group and as described under *mimica* except that the dorsocentral bristles are nearer to a line drawn between inner postalaris than to supraalaris. The propleura have numerous long yellow hairs. Legs entirely yellow. Bristles of front femora yellow, tinged faintly with brown. Wings as in fig. 103a. Vein R_{4+5} setose to r-m crossvein. Abdomen mostly yellow-brown, darker down median portions of terga, yellow on sides. Sixth tergum almost as long as 5th. Entire abdomen densely yellow-brown setose. Base of ovipositor brownish red; as seen from dorsal view almost as long as terga 5+6 and measured on venter 1.0 mm. Extended ovipositor approximately 2.0 mm long with piercer 1.0 mm long and with few serrations at tip, as in fig. 103b. Two rather elongate spermathecae present; these are 4 or more \times longer than wide. The eggs are distinctly pointed at one end. Length: body, excluding ovipositor, and wings, 6.0 mm. σ . Unknown.

Known only from Palawan.

***Acidiella freyi* Hardy** Pl. 4, fig. 36.

Acidiella freyi Hardy, 1970, *Ent. Meddel.* **38**: 104. Type-locality: Banahao, Luzon. Type in University Zoological Museum, Helsinki.

This species differs from any other known *Acidiella* by having 1 large wedge-shaped mark in middle of anterior margin and a large hyaline spot extending through the area between r-m and m crossveins; also a large hyaline wedge fills most of cell 2nd M_2 and extends through cell R_5 to vein R_{4+5} .

Predominantly rufous species, tinged lightly with brown on mesonotum and with dark brown on sides of terga 5 and 6 and with basal segment of ovipositor shining black. Head with 3 pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals. Ocellar bristles rather well developed, much larger than in other *Acidiella* which I have observed, almost equal in size to postocellars. Aristae short pubescent. Dorsocentral bristles situated about $1/2$ the distance between supraalaris and postalaris. Propleura each with 3 brown to black bristle-like setae on front margin and with a number of yellow hairs scattered over the sclerite. Legs entirely yellow, densely setose and with rows of posteroventral and posterodorsal setae (small bristles) on front femur and a prominent row of

anterodorsal setae on hind tibia; middle tibia with 1 strong apical spur. Wings as in pl. 4, fig. 36 with r-m crossvein situated near apical 3/4 of cell 1st M_2 and m crossvein slightly bent, convergent to r-m crossvein. Vein R_{4+5} with only very few setae on upper side, usually about 4 near basal portion of vein and 1 or 2 near apical portion about opposite end of vein R_1 . Abdomen mostly yellow, rather thickly black setose with the broad black bands on terga 3 and 4 as noted above. Sixth tergum approximately 2/3 to 3/4 as long as 5th. Basal segment of ovipositor shining brown to black, about equal in length to 5th tergum, just slightly longer than wide and approximately 0.7 mm long, Piercer short; thick, 0.5 mm long, tapered to sharp point at apex and with numerous serrations along tapered margin. Extended ovipositor 1.2 mm. Two oval spermathecae present in the specimen studied. Length: body and wings, excluding ovipositor, 5.4 mm. ♂ unknown.

Also known from Tawitawi.

Acidiella mimica Hardy, new species Fig. 104a-d; pl. 4, fig. 37.

Acidiella longipennis: Hardy (nec Hendel), 1970, *Ent. Meddel.* **38**: 108. Misidentification.

The species which I have previously recorded as *longipennis* from Hendel Palawan is apparently undescribed. It fits *longipennis* very closely; the 2 are almost identical but the Philippine specimens differ by having 4 pairs of inferior fronto-orbital bristles and only 1 pair of superior fronto-orbitals, rather than 3 and 2; and by having abdominal terga 4-6 polished black, rather than yellow with a large black spot on each side.

♀. Predominantly rufous species except for the polished black apical portion of abdomen. **Head**: Slightly higher than long, front sloping, antennae situated at middle of head, face almost vertical as seen from direct lateral view (fig. 104c). Occiput slightly swollen on lower portion, scarcely wider than gena as seen in direct lateral view. Four pairs inferior fronto-orbital bristles, or the 2 (upper) superior fronto-orbital may be displaced so that it is in line with inferior fronto-orbital; the latter bristle is placed distinctly above and laterad to the prominent superior fronto-orbital bristle situated at end of the very short vertical plates. Ocellar bristles rudimentary. Antenna yellow, 3rd segment less than 3 × longer than wide, rounded at apex and 2nd segment with a prominent black dorsal bristle in middle. Aristae bare or nearly so. **Thorax**: Rufous, with a faint tinge of brown in ground color of dorsum and with scutellum, humeri, notopleura, and upper margins of mesopleura and pteropleura yellow-white. All head and thoracic bristles black. Dorsocentrals situated almost opposite supraalars. Two strong mesopleural bristles present, also 1 strong pteropleural. Propleura covered with fine yellow hairs. **Legs**: Yellow, front femur with a row of posteroventral bristles extending most of the length; these are dark brown in ground color. Middle tibia with 1 strong black apical spur. **Wings**: As in pl. 4, fig. 37. Vein R_{4+5} setose to r-m crossvein. Crossvein r-m situated near apical portion of cell 1st M_2 . **Abdomen**: With basal 3 segments and narrow basal margin of 4th tergum yellow, remainder of terga, including ovipositor, polished black. Sterna rufous, tinged faintly with brown. Sixth tergum about 3/4 as long as 5th. As seen from above, basal segment of ovipositor about equal in length to 5th tergum and approximately as long as wide; measured on venter it is 0.9 mm long. Piercer short, thick and flattened dorsally with apex serrated (fig. 104b), measuring 0.55 mm in length. Extended ovipositor (fig. 104a) 2.0 mm. Three oblong spermathecae present (fig. 104d). Length: body, excluding ovipositor, and wings, 4.5-4.75 mm.

♂. Unknown.

Holotype ♀ Mantalingajan, Pinigisan, Palawan, 600 m, 7.IX.1961 (Noona Dan Exped. 61-62). Three ♀ paratypes, 2 same data as type, and 1, Brooke's Point, Uring Uring, Palawan, 14.VIII.1961 (Noona Dan Exped.)-

Type and 1 paratype returned to University Zoological Museum, Copenhagen. Other paratypes in University of Hawaii collection.

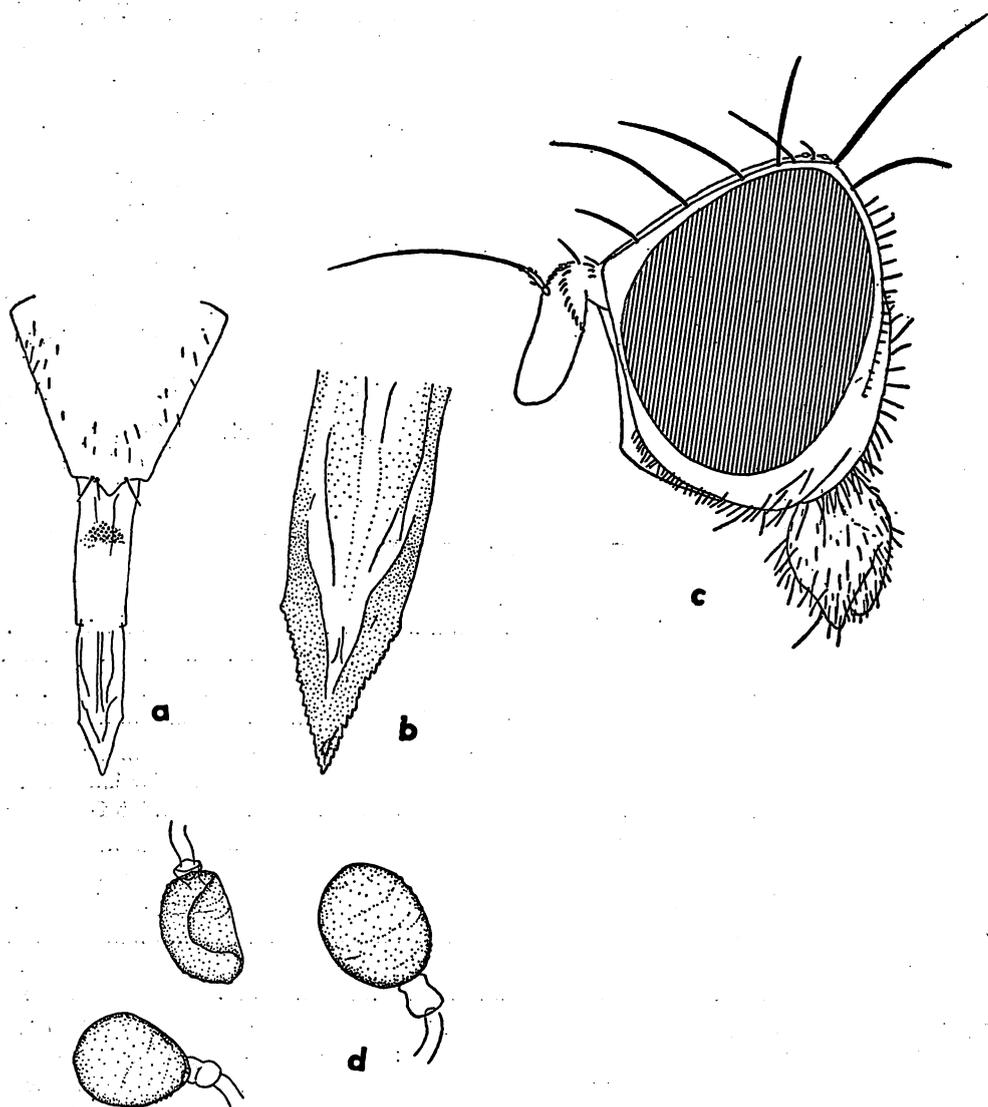


Fig. 104. *Acidiella mimica*, n. sp.: a. ♀ ovipositor; b. apex of piercer; c. head, lateral; d. spermathecae.

Genus *Acidoxantha* Hendel

Acidoxantha Hendel, 1914, *Wien. Ent. Ztg* **33**: 83. Type-species: *punctiventris* Hendel, by original designation.

Acidoxantha: Hendel, 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* **13**: 450 (emend. or error). Shiraki (1933: 355) also repeated the erroneous spelling.

Acidoxantha differs from *Acidia* Robineau-Desvoidy by having the ocellar bristles

rudimentary, vein R_{4+5} bare, rarely with 1 or 2 black setae near r-m crossvein, and head and body bristles yellow. It keys near *Myoleja* Rondani but is differentiated by the bare vein R_{4+5} ; by the distinctive wings markings, with a Y-shaped yellow-brown mark in middle of wing (fig. 105a); the all-yellow head and thoracic bristles and by having 2 pairs of inferior fronto-orbital bristles. The ♂ genitalia are strange in development. The epandrium is broad, almost semi-circular, it has a strong dorsoapical bristle and numerous setae on each side. The surstyli are short, scarcely developed beyond margin of epandrium (fig. 105b). The 10th sternum is poorly developed and is not visible from lateral view. The anal plates are large, often $2\times$ larger than epandrium, sometimes greatly expanded (fig. 106a). In the ♀ the 6th tergum is longer than 5th and the basal segment of ovipositor is short and thick, not strongly tapered. The piercer is long, slender, straight-sided, needle-like (fig. 105d). Two spermathecae present; these are slender, pointed at both ends.

The members of this genus evidently infest the buds of large flowers. *A. bombacis* de Meijere has been reared from flowers of *Bombax malabaricum* (in Java) and I have seen specimens from the Philippines reared from the buds of "hau" (*Hibiscus* sp.), *Bauhinia* and *Tiliceus*.

KEY TO KNOWN ACIDOXANTHA

1. Dorsocentral bristles situated well behind anterior supraalars, about $2/5$ the distance between supraalars and inner postalars. 2
Dorsocentral bristles situated in line with anterior supraalars. 8
- 2(1). Mesonotum yellow to rufous, lacking distinct brown to black vittae. 3
Mesonotum with 3 or 4 brown to black longitudinal vittae. 7
- 3(2). Lower margins of metapleura, hypopleura and pleuroterga brown to black. 4
Metapleura, hypopleura and pleuroterga yellow. Laos, Vietnam, and Thailand.....
..... **totoflava** Hardy
- 4(3). Fourth tergum with 1 or 2 pairs of prominent black spots. 5
Fourth tergum entirely yellow, ♂ genitalia and ♀ ovipositor as in fig. 106a and 106c.
Infests buds of *Hibiscus*. Philippines. **hibisci**, n. sp.
- 5(4). Fourth tergum with 2 pairs of black spots. 6
Fourth tergum lacking submedian spots, with only 1 pair of posterolateral black spots.
Formosa, Java? **punctiventris** Hendel
- 6(5). Y-shaped mark through middle of wing broad, in middle of cell 1st M_2 the width is almost equal to length of m crossvein and about $2\times$ longer than r-m crossvein. Anterior arm of Y nearly filling basal portion of cell R_5 ; the costal band very narrow in apex of wing and not filling all of cell R_5 . Laos..... **assista** Hardy
Width of stem of Y in cell 1st M_2 about equal to length of r-m crossvein and anterior arm narrower, leaving a large, elongate, hyaline spot occupying basal $3/5$ to $2/3$ of cell R_5 (from base of R_5 at junction of vein R_{4+5} with R_{2+3} $3/5$ to $2/3$ distance to r-m crossvein) (fig. 105a). Costal band broad, filling all of apex of cell R_5 . Philippines.
..... **balabacensis** Hardy
- 7(2). Mesonotum with 3 brown vittae. Abdomen lacking black spots on terga 4-5 but with black anterior borders on terga 3-5. Java, breeds in flowers of *Bombax malabaricum*.
..... **bombacis** de Meijere
Mesonotum with 4 black vittae. Terga 4 and 5 each with 4 black spots, abdomen otherwise yellow. Philippines. **quadrivittata**, n. sp.

- 8(1). Head 1/2 higher than long. Wings of ♂ brown through lower 1/2 of cell 2nd M_2 (pl. 4, fig. 39). Philippines.**minor**, n.sp.
 Head scarcely higher than long. Wings not as above; the crossband over m not expanded into 2nd M_2 or into apex of M_4 (typical of most *Acidoxantha*). Lesser Sunda Islands.**nana** Hering

***Acidoxantha balabacensis* Hardy** Fig. 105a-d.

Acidoxantha balabacensis Hardy, 1970, *Ent. Meddel.* **38**: 106. Type-locality: Balabac, Dalawan Bay, Philippines. Type in University Zoological Museum, Copenhagen.

This species resembles *A. punctiventris* Hendel from Formosa, but differs by having the 4 prominent black spots on 4th tergum of ♂ and having lower portions of metapleura marked with black. It appears most closely related to *assista* Hardy from Laos, but differs by having the Y-shaped mark through anteromedian portion of wing much narrower, with width of the stem of the Y in cell 1st M_2 about equal to length of r-m crossvein and with the anterior arm of the Y narrower, leaving a large elongate hyaline spot occupying the basal 3/5 to 2/3 of cell R_5 (from base of R_5 at junction of vein R_{4+5} with R_{2+3} , 3/5 to 2/3 the distance to r-m crossvein). In *assista* the Y-shaped mark through middle of wing is very broad and in middle of cell 1st M_2 the width is almost equal to the length of the m crossvein and about 2× longer than r-m. The anterior arm of the Y nearly fills the basal portion of cell R_5 . Also in *balabacensis* the costal band fills all of apex of cell R_5 ; it is rather broad (fig. 105a), while in *assista* the costal band is very narrow at wing apex and does not fill apical portion of cell R_5 .

Otherwise fitting description of most species of *Acidoxantha* with thorax lacking dark markings except for a pair of tiny brown to black submedian spots on hind margins of hypopleura, metapleura, and pleuroterga and also a prominent black spot on each side of postscutellum and a brown mark on posterolateral margins of mesonotum above wing bases. Dorsocentral bristles situated approximately 2/5 the distance between inner postalars. Wings as in fig. 105a; the markings are much darker in color than in most species. Male genitalia as in fig. 105b; the cerci are not so greatly enlarged as in *hibisci*. Abdominal terga 4 and 5 each with 2 submedian basal black spots and 2 posterolateral black spots. Sixth tergum of ♀ with a pair of posterolateral black spots and with only the submedian black spot present on 4th tergum of ♀. Basal segment of ♀ ovipositor almost straight-sided, thick, rather bulbous and as seen from direct dorsal view about equal in length to terga 5 and 6. Measured on venter the base is 1.4 mm long by 0.6 mm wide. Piercer measures 2.7 mm and the tip is developed into a distinct spear-head (fig. 105d). The extended ovipositor (fig. 105c) measures 6.7 mm. Two large, bulbous, weakly sclerotized spermathecae present; each of these has a long tube-like extension from the anterior end. Length: body, 5.5–6.0 mm; wings, 5.0–5.5 mm.

Probably widespread throughout the Philippines. Specimens have been seen from Luzon, Samar, Mindanao, and Balabac.

***Acidoxantha hibisci* Hardy, new species** Fig. 106a-c; pl. 4, fig. 38.

Fitting near *punctiventris* Hendel from Formosa. Hering (1952b: 285) also recorded it from Java. I have not seen specimens from Indonesia. It differs by having the 4th tergum entirely yellow, lacking the pair of posterolateral black spots which are characteristic of *punctiventris*.

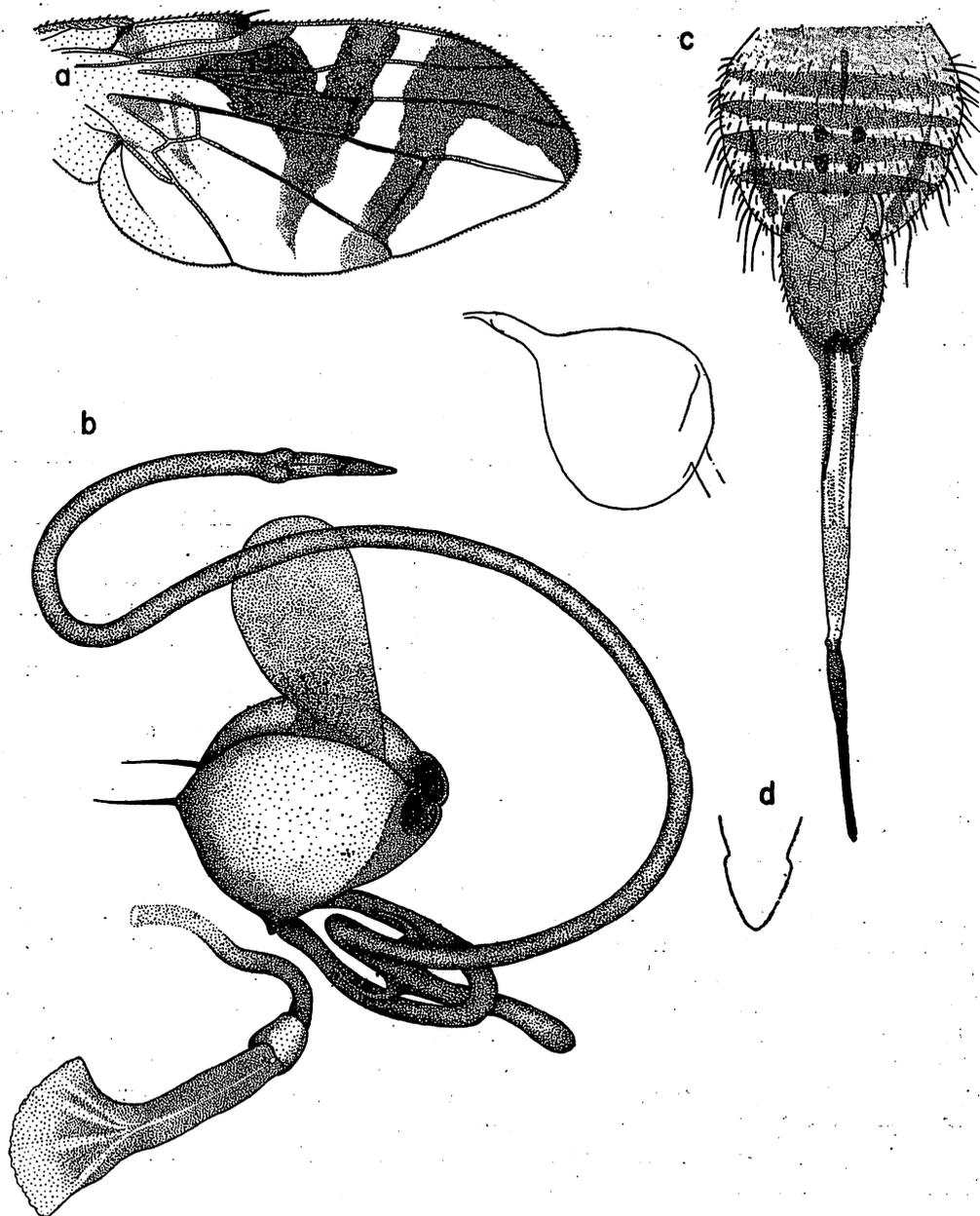


Fig. 105. *Acidoxantha balabacensis* Hardy: a. wing; b. ♂ genitalia; c. ♀ abdomen, dorsal; d. apex of piercer.

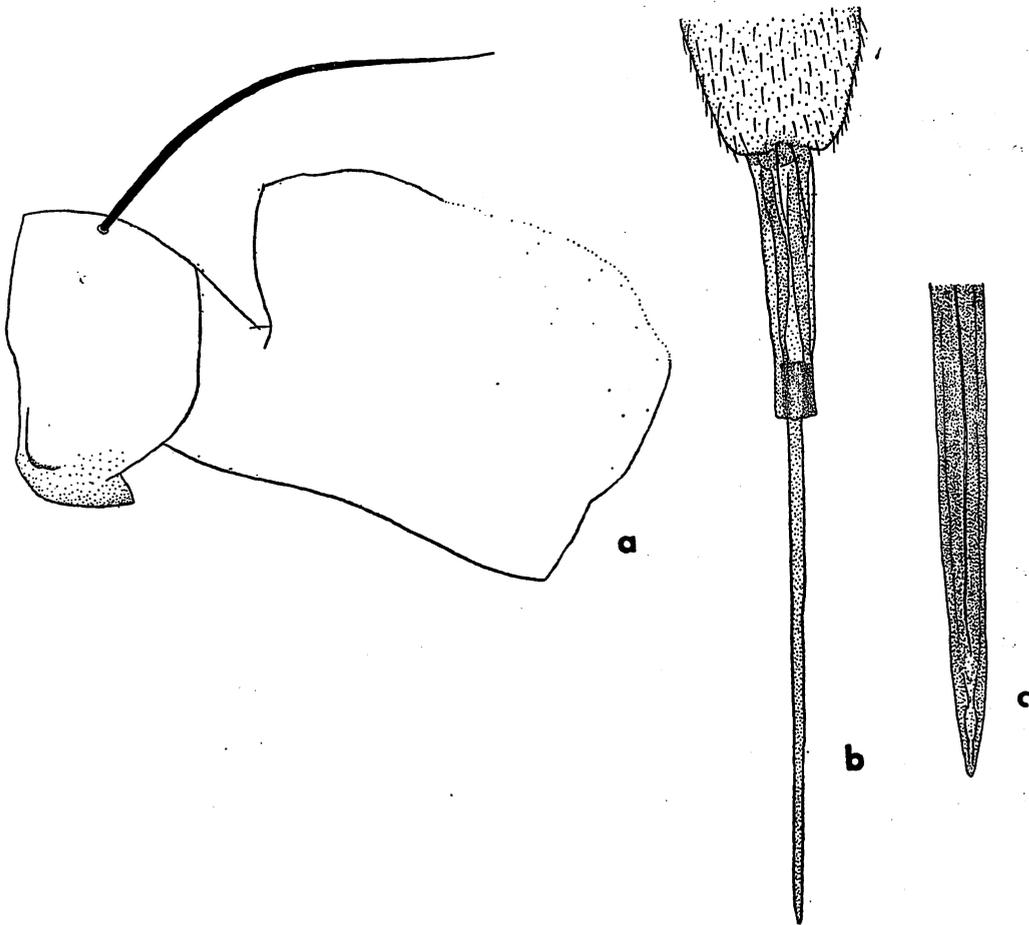


Fig. 106. *Acidoxantha hibisci*, n. sp.: a. ♂ genitalia; b. ♀ ovipositor; c. piercer.

Entirely yellow species except for the 4 black spots on 5th tergum of abdomen; the dark brown to black lower margins of hypopleura, metapleura, and pleuroterga; a black spot on each side of postscutellum and metanotum; and a brown to black spot on posterolateral margin of mesonotum above wing base. The head shape, chaetotaxy and wing markings are similar to those of most species of *Acidoxantha*. The dorsocentral bristles are situated almost halfway between inner postalar and supraalars. Wing markings and venation as in pl. 4, fig. 38. Distance from r-m crossvein to m crossvein almost $2\times$ length of r-m. Some specimens have 1 black seta on vein R_{4+5} near r-m crossvein. Fifth sternum of ♂ about as long as wide, almost straight on hind margin and with 3 prominent yellow-brown bristles on each side of hind margin. Male genitalia as in fig. 106a with surstyli small, poorly developed and anal area greatly enlarged, $2\times$ larger than epandrium. Basal segment of ♀ ovipositor equal in length to terga 5+6 and viewed on venter more elongate than in most species of *Acidoxantha*, almost $3\times$ longer than wide, measuring 1.5 mm long. Piercer long, slender, sharp-pointed, 2.7 mm long with apex of piercer shaped as in fig. 106c. Extended ovipositor (fig. 106b) 6.75 mm. The spermathecae have not been observed; these are obviously weakly sclerotized, and difficult to see.

Length: body, 5.5–6.0 mm; wings, 5.0–5.5 mm.

The parasite *Opius acidoxanthicida* Fullaway has been reared from this species on Mindanao.

Holotype ♂ (BISHOP 10145), Davao, Mindanao, 22.I.1948, reared from "hau" (*Hibiscus*) buds, Q. C. Chock. Allotype ♀, same data as type. 29 paratypes: 18 ♂♂, 11 ♀♀, from the following localities: same as type; Oroquieta, Misamis Occ., Mindanao, 28.I.1948, reared from "hau" buds; Zamboanga, Mindanao, 12.I.1948, reared from "hau" buds", Q. C. Chock; Cotabato, Mindanao, 19.II.1947, reared from "hau" buds, Q. C. Chock; Sierra Bullones, Bohol, 19.I.1948, on "Balibago" (*Bauhinia*), Q. C. Chock; Guinobatan, Albay, Luzon, 100 m, 16.VI.1949, A. Bigornia; Puerto Princesa, Palawan, 24.I.1948, reared from "hau" buds, Q. C. Chock; and Calicoan Island, 25–26.IX.1945, reared from flower-heads of *Hibiscus* and *Tiliceus*, F. F. Bidy.

Type, allotype and some paratypes in B. P. Bishop Museum; remainder of paratypes in collections of U. S. National Museum, British Museum (Nat. Hist.), Bureau of Plant Industry, Manila and University of Hawaii.

***Acidoxantha minor* Hardy, new species** Fig. 107; pl. 4, fig. 39.

Apparently fitting near *A. nana* Hering from the Lesser Sunda Islands, because of the placement of the dorsocentral bristles in line with the supraalars and by the small size. It differs from *nana* by having the head normal in shape for *Acidoxantha*, at least 1/2 higher than long; Hering characterized *nana* as having the head scarcely higher than long. Also the wing markings of the ♂ of *minor* are very distinctive, the lower 1/2 of cell 2nd M_2 and the apical portion of cell M_4 are brown and the Y-shaped mark from the anterior margin of wing joins with the transverse band over m crossvein in lower apical portion of cell 1st M_2 (pl. 4, fig. 39). Hering's original of *nana* is based upon the ♂; he recorded the ♂ sex from Soembawa (1941b: 31) but did not mention any sexual dimorphism. I doubt that he could have overlooked this.

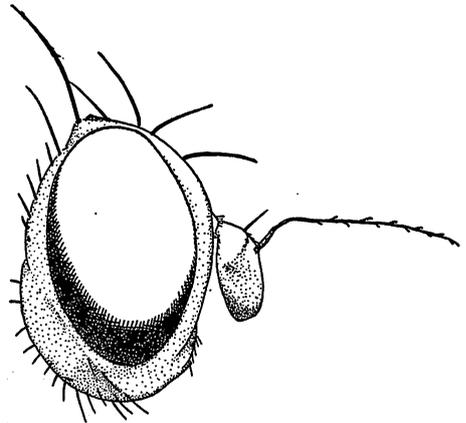


Fig. 107. *Acidoxantha minor*, n. sp.: head, lateral.

♂. Small, almost entirely yellow species having most of the typical characters of *Acidoxantha* including the head distinctly higher than long, at least 1/2 higher than length at widest point, but fitting near *nana* by having dorsocentral bristles in line with supraalars. Head shaped as in fig. 107, with antennae situated near upper 3/5 of head height. Wings very characteristic, with crossbands over r-m and m crossveins joined together in lower portion of cell 1st M_2 and through apical portion of cell M and with a brown marking extending through lower apical portion of cell 2nd M, as in pl. 4, fig. 39. Postscutellum entirely yellow, metanotum predominantly yellow with a black spot on each side and each metapleuron with a tinge of brown on posterior margin. Abdomen predominantly yellow to rufous, 3rd and 4th terga with a black longitudinal spot on each lateral margin, 4th with a pair of submedian basal black spots, and 5th with a pair of sublateral

basal black spots and also a pair of small lateral black spots at apex of segment. Sterna of ♂ yellow. Fifth sternum about 1/2 wider than long with hind margin straight or nearly so and with 3 prominent bristles on each side. Male genitalia with epandrium globose and surstyli very short, poorly developed, characteristics of this genus. With a pair of strong dorsal bristles on epandrium and with surstyli greatly enlarged rather fan-shaped in lateral view.

Length: body, 3.0-3.2 mm; wings, 3.5 mm.

♀. Fitting description of the ♂ in most respects but having a pair of submedian basal brown spots on 3rd abdominal tergum and wings rather typical of *Acidoxantha* with the Y-shaped mark over anteromedian portion isolated from crossband over m crossvein and differing from the typical only by having the mark across m slightly expanded on basal portion, extending a short distance into base of cell 2nd M_2 and darker brown in this portion. Fourth and 5th terga each with a pair of submedian basal brown spots, and 5th and 6th terga each with a pair of apicolateral brown spots. Sixth tergum slightly longer than 5th. Ovipositor entirely yellow, as seen from dorsal view basal segment just slightly longer than 6th tergum. Measured on the venter, basal segment 0.6 mm long. Piercer long, slender, sharp-pointed, measuring 1.0 mm. Extended ovipositor 2.4 mm. The spermathecae have not been observed.

Holotype ♂ (BISHOP 10146), Libon, Caguscus, Albay Prov., Luzon, 200 m, 11.V.1965, H. M. Torre Villas. Allotype ♀, same data as type except collected 18.V.1965. 7 paratypes: 3 ♂♂, 4 ♀♀, 1, same data as type; 2, Los Banos, no date, Baker; 1, Mt Makiling, Baker; 1, Agusan, San Francisco, Mindanao, 10 km SE, 16.XI.1959, C. M. Yoshimoto; 1, Davao, Mindanao, Baker; and 1, Balason, Misamis Or., Mindanao, 19.IV.1960, H. M. Torre Villas.

Type and allotype returned to B. P. Bishop Museum. Paratypes in the collections of the U. S. National Museum, the Museo Civico di Storia Naturale, Milano (Bezzi collection) and the University of Hawaii.

***Acidoxantha quadrivittata* Hardy, new species** Fig. 108; pl. 4, fig. 40.

Fitting near *bombacis* de Meijere, from Java, but differing by having 4 longitudinal black vittae extending down mesonotum, rather than 3 brown vittae; terga 4 and 5 each with 4 prominent black spots and abdomen otherwise yellow, rather than having terga 4 and 5 lacking black spots but with anterior borders of 3-5 black. The wing venation also appears to differ slightly; in de Meijere's figure of *bombacis* he shows the r-m crossvein situated about its own length from m crossvein. In *quadrivittata* this section of vein M_{1+2} is distinctly longer than r-m crossvein (pl. 4, fig. 40).

♂. *Head*: Higher than long, shaped as in fig. 108, with the occiput only slightly swollen and the face vertical as seen from direct lateral view. Front sloping, antennae situated near upper 2/3 of head. Two pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals; the anterior pair of inferior fronto-orbitals situated near lower 1/3 of front. Ocellar bristles rudimentary or lacking. No dark markings on head. Third antennal segment approximately

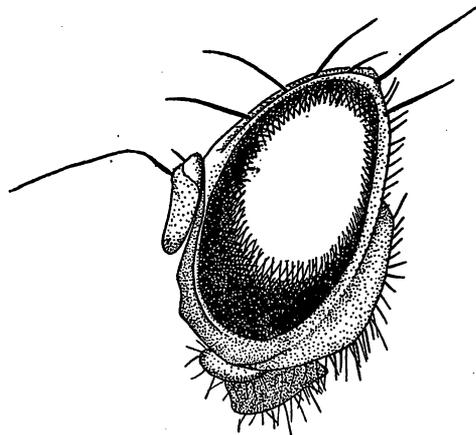


Fig. 108. *Acidoxantha quadrivittata*, n. sp.: head, lateral.

$2\frac{1}{8} \times$ longer than wide, rounded at apex. Aristae bare. Face slightly raised down median portion and antennal furrows rather shallow. Eyes oblong, much higher than wide. Genae moderately broad, the width approximately $\frac{1}{2}$ greater than width of 3rd antennal segment. *Thorax*: Predominantly yellow to rufous, rather densely gray pollinose and yellow pilose with 4 black vittae on mesonotum; the submedian pair are complete or nearly so, slightly interrupted at a level just behind line between humeral bristles and lateral pair continuous behind suture and represented by just a small dot of black immediately in front of suture. Postscutellum yellow to rufous in middle, shining black on sides. Metanotum black on sides and hind margin, yellow on anteromedian portion. Each sternopleuron tinged with brown to black on lower median portion, each hypopleuron with a shining black spot on lower margin and each metapleuron and pleurotergon with a shining black spot on lower margin; also posterolateral margins of mesonotum with a dark brown to black spot behind each wing base. Dorsocentral bristles situated approximately $\frac{2}{5}$ the distance between supraalar and inner postalars. Scutellum entirely yellow, bare, with 4 strong brownish yellow bristles. *Legs*: Yellow except for a faint tinge of brown on dorsal margins of mid and hind femora; all bristles and setae yellow. Front femur with a row of strong posteroventral bristles extending full length of segment and with an abundance of moderately long, erect setae scattered over posterior surface. Middle tibia with 1 strong apical yellow spine. Hind tibia with a row of prominent erect bristle-like setae extending entire length down anteroventral surface. *Wings*: As in pl. 4, fig. 40, vein R_{4+5} bare. *Abdomen*: Entirely yellow except for a pair of anterior submedian spots on each of terga 4 and 5 and a pair of posterolateral black spots. The genitalia have not been dissected for study; the visible portions are entirely yellow.

Length: body and wings, 5.0-5.2 mm.

♀. Unknown.

Holotype ♂, Baguio, Luzon, 9.IV.1955, C. R. Baltazar. One ♂ paratype, Los Banos, Luzon, Baker.

Type in U. S. National Museum. Paratype returned to the Bureau of Plant Industry collection, Manila.

Genus *Anomoia* Walker

Anomoia Walker, 1836, *Ent. Mag.*, Lond. 3(1): 80. Type-species: *Trypeta gaedii* Meigen (as *goedii*), (= synonym of *Musca permunda* Harris), by monotypy.

Anomoia: Lacordaire, 1848, *Mem. Soc. Sci. Liege* 5: 131. Invalid emendation.

Phagocarpus Rondani, 1847, *Bull. Soc. Ent. Ital.* 3: 171. Type-species: *Musca permunda* Harris, by original designation.

Neanomoea Hendel, 1914, *Wien. Ent. Ztg.* 33: 84; 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* 13: 454.

Type-species: *approximata* Hendel, by original designation. Synonymy based upon examination of syntype series in Hungarian National Museum. Chen (1948: 107) placed *Neanomoea* as a synonym of *Euleia* Walker (= *Myoleja* Rondani); because of the oblique position of the m crossvein, however, it best fits in *Anomoia* Walker.

Hamoucheta Blanchard, 1929, *Physis* 9: 458. Type-species: *ogloblini* Blanchard, by monotypy.

The controversy concerning the various names which have been used for this genus has been discussed in my monograph of Thailand and surrounding countries (Hardy 1973).

This genus fits close to *Myoleja* Rondani and is differentiated by having the m crossvein rather strongly oblique in position so that cell 1st M_2 is sharply pointed at its lower apex, rather than having m crossvein transverse, approximately parallel with r-m crossvein; also by having vein R_1 bent rather sharply upward at apex, entering costa at almost a right angle and with apical portion almost parallel to subcosta (fig. 111). I have found no other reliable characters to differentiate these and in the course of

studying the several dozen species assigned to these groups I have found indications of intergradations of these characters and feel that it may eventually be necessary to combine *Anomoea* and *Myoleja*.

Approximately 20 species from the Oriental and Pacific Regions have been described under this genus, predominantly as *Phagocarpus*. None has previously been recorded from the Philippines. Three species are on hand, 2 are apparently undescribed.

KEY TO KNOWN ANOMOIA FROM THE PHILIPPINES

1. First and 2nd costal cells with hyaline marks. Narrow brown band on costa at apex of wing connected with brown basomedian marking of wing (fig. 111), or not continuous with band over m crossvein (fig. 109d).2
- First 2 costal cells entirely brown. Brown costal band not joined to basomedian mark but continuous with band over m crossvein (fig. 110).**melanobasis**, n. sp.
2. Brown costal band connecting with basomedian markings of wing at r-m crossvein. Hyaline wedge in R₁ occupying entire cell (fig. 111). Polished black species with contrasting pale yellow scutellum.**steyskali**, n. sp.
- Brown costal band isolated from other marks and hyaline wedge occupying only basal portion of cell R₁ (fig. 109d). Brownish red species. Sumatra and Philippines.....**klossi** (Edwards)

Anomoia klossi (Edwards) Fig. 109a-d.

Phagocarpus klossi Edwards, 1919, *J. Fed. Malay States Mus.* 8: 51. Type-locality: Sandaran Agong, Sumarta. Type ♂ in British Museum (Nat. Hist.).

One ♀ specimen on hand from Imugin, Nueva Viscaya, Luzon, Baker apparently belongs here; it fits in all respects except that the dark marking through mediobasal 1/2 of the wing extends rather broadly into the posterior portion (fig. 109d) rather than extending as a narrow brown line across middle of cell M₄. With only 1 specimen it is not possible to determine whether or not this is of significance.

This species is characterized by having large hyaline marks in the first 2 costal sections; by having the narrow brown mark over m crossvein connected with basomedian brown marking along vein M₁₊₂ just beyond r-m crossvein, and with the narrow brown mark around apical margin not connected with the basomedian mark (fig. 109d).

The ♀ has not been previously described; the following notes are based upon specimens from the Philippines.

Head yellow except for reddish brown compound eyes. Front gently sloping and face almost vertical, very slightly raised down median portion and with shallow antennal furrows. Front about 1/2 wider than long, rather densely setose. Three pairs inferior fronto-orbital bristles and 2 pairs of superior fronto-orbitals, the latter situated on upper 1/5 of front. Ocellar bristles moderately developed, almost as long as postocellars. Antennae entirely yellow, 3rd segment 4× longer than wide, rounded at apex. Thorax brown, tinged with yellow to rufous, more distinctly yellow around margin of scutellum, on humeri and notopleural callus, also lower portions of sternopleura. Dorsocentral bristles situated approximately 1/3 the distance between inner postalar and supraalar bristles. Mesonotum rather densely gray pollinose and thickly brownish yellow setose. Propleura covered with fine yellow hairs. Scutellum with scattered yellow setae around margins. Legs predominantly yellow, mid and hind femora brown, tinged with rufous. One strong apical spur on middle tibia. Wings marked as in fig. 109d, vein R₄₊₅ setose to r-m crossvein. Abdomen rufous, tinged lightly with brown over basal 3 to 4 segments and with apex dark brown to black. Sixth

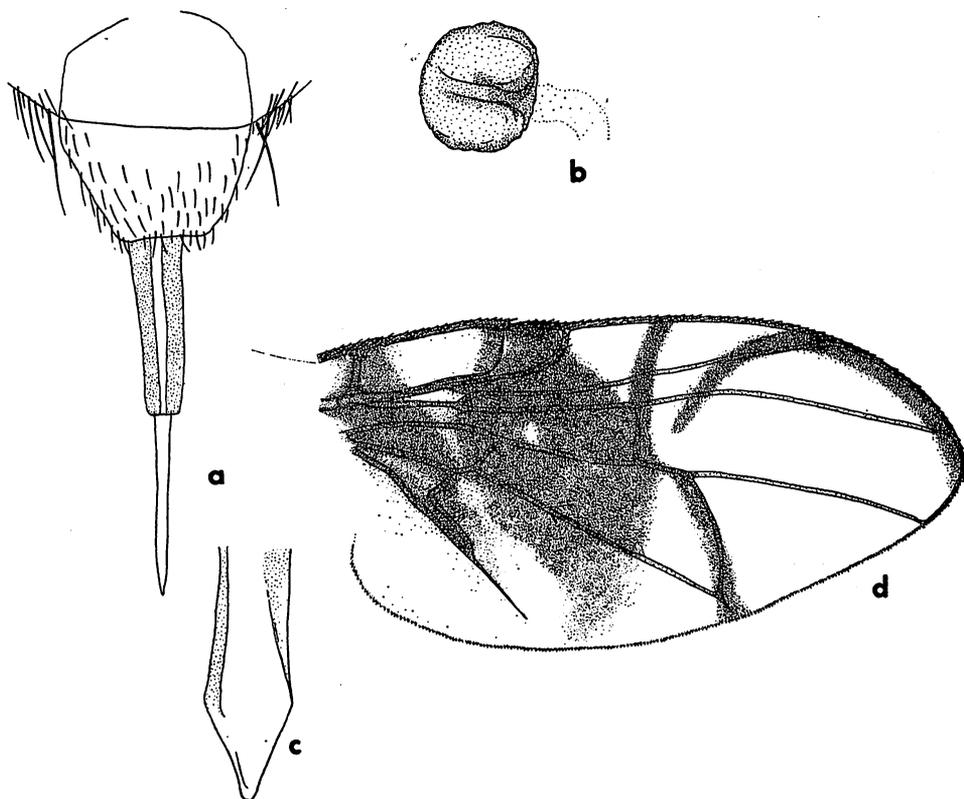


Fig. 109. *Anomoia klossi* (Edwards): a. ♀ ovipositor; b. spermataeca; c. apex of piercer; d. wing.

tergum about 2/3 as long as 5th as seen from dorsal view. Basal segment of ovipositor dark brown, tinged with red in ground color and as seen from dorsal view scarcely longer than 5th tergum. Measured on venter the basal segment is approximately 1.0 mm long. Piercer approximately 1.0 mm long, curved downward, flattened laterally, sharply pointed at apex (fig. 109c). The extended ovipositor (fig. 109a) measures approximately 3.0 mm. Three round spermataecae present (fig. 109b). Length: body and wings, 5.8–6.0 mm.

***Anomoia melanobasis* Hardy, new species** Fig. 110.

This species is readily differentiated from all known *Anomoia* by having the costal cells entirely dark brown, lacking hyaline markings. By having the narrow brown costal band continuous with the band over m crossvein and not connected with basomedian dark marking of wing. This somewhat resembles *A. flavifemur* (Hering) from Burma, but the 2 are not related.

♂. Predominantly dark-colored species. *Head*: Mostly yellow, except for eyes, and tinged with brown on upper median portion of occiput. Front golden pollinose with a very faint tinge of brown on upper portion, about 1/2 wider than long, gently sloping with antennae situated near upper 3/5 of head as seen in direct lateral view. Four pairs inferior fronto-orbitals and 2 pairs

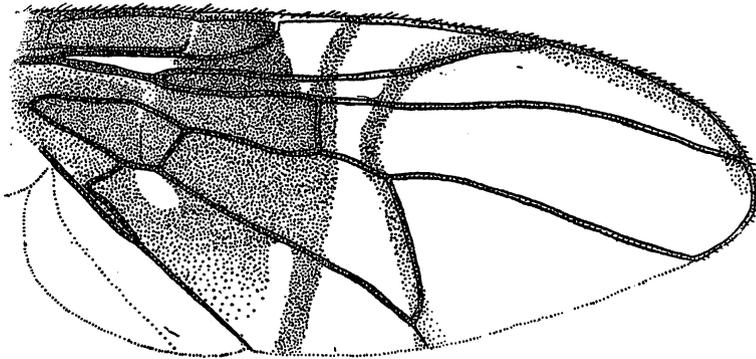


Fig. 110. *Anomoia melanobasis*, n. sp.: wing.

superior fronto-orbitals, the latter are situated on upper $1/4$ of front. Ocellar bristles moderately developed, approximately equal in size to postocellars. Antennae yellow, tinged with brown on apical $2/3$ of 3rd segment. Third segment about $2\frac{1}{2}$ \times longer than wide and rounded at apex, aristae short pubescent. Face very slightly concave as seen from direct lateral view, with median portion almost flat and antennal furrows not noticeably developed. Occiput only slightly swollen, the head is only about $1/4$ higher than long. **Thorax:** Dark brown to black in the ground color of mesonotum, rather densely gray pollinose and with abundant short brown to black setae. Humeri yellow except for brown hind margins and scutellum yellow. Notopleura dark brown, pleura brownish red. Postscutellum and metanotum polished black, covered with gray pollen. Scutellum bare except for a few scattered setae around margins, with 4 strong marginal bristles. Dorsocentral bristles situated almost $1/2$ the distance between inner postalar and supraalar. Propleura with fine yellow hairs. **Legs:** Entirely yellow to rufous, the bristling as in other members of this genus. **Wings:** As in fig. 110. The hyaline wedge at base of cell R_1 is comparatively small and extends through cell R_3 to vein R_{4+5} . Vein R_{2+3} is very slightly undulated. Vein R_{4+5} almost straight, parallel with vein M_{1+2} . Crossvein r-m situated about its own length from m crossvein and vein M_{1+2} very gently concave before r-m crossvein. **Abdomen:** Entirely polished black, densely black setose and with rather prominent black bristles at apices of 4th and 5th terga. The genitalia have not been studied. Length: body, 3.8 mm; wings, 4.0 mm.

♀. Unknown.

Holotype ♂, Mt Makiling, Luzon, no date given, Baker. Type returned to Bezzi collection, Milano.

***Anomoia steyskali* Hardy, new species** Fig. 111.

This species differs from all known *Anomoia* by the peculiar wing markings, having the narrow apical brown band on costa connected with the mediobasal brown band at r-m crossvein as in fig. 111. I know of no other species with this type of marking.

This species was first brought to my attention by Mr George Steyskal, U. S. National Museum, when he sent me a specimen of an unknown fruit fly intercepted on an airplane, "JAL-8036, from San Francisco to Honolulu, October 6, 1967." This was recognized as an undescribed species but was so unlike anything I had previously seen that there was no way of knowing from which part of the Pacific area it might have originally come. The next specimen to show up was from the island of Tawitawi, Sulu Archipelago, Philippines taken by the Noona Dan Expedition. The specimen sent to me

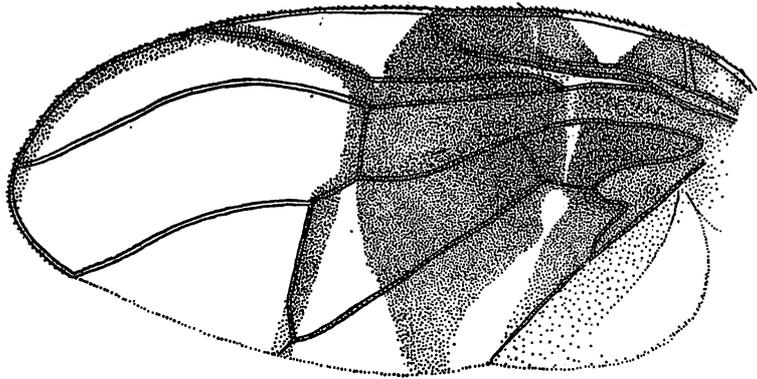


Fig. 111. *Anomoia stzyskali*, n. sp.: wing.

by Steyskal had evidently survived the trip from the Philippines to the mainland United States and back to Honolulu.

♀. A predominantly polished black species with the scutellum contrasting pale yellow. *Head*: Distinctly higher than long, the front strongly sloping with the antennae situated near middle of head as seen from lateral view. Face gently concave as seen from lateral view with median portion flat and antennal furrows scarcely developed. Head entirely yellow to rufous except for dark brown to black over most of occiput and on ocellar triangle. Front and face entirely yellow. With 3 pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals, the latter situated on upper 1/4 of front. Ocellar bristles rather small, about 2/3 length of postocellars. Antennae yellow, 3rd segment about 4× longer than wide, rounded at apex. Aristae short pubescent. Palpi yellow. Thorax polished black in ground color, rather lightly gray pollinose over mesonotum and with an abundance of short yellow setae over dorsum. Scutellum entirely yellow except for a dark brown to black line across base; almost bare, sparsely setose on margin. Dorsocentral bristles situated approximately 2/5 the distance between inner postalar and supraalar. *Legs*: Middle and hind femora shining black, front femora brown, tinged with yellow. Front and middle tibiae yellow, tinged with brown on bases of latter; hind tibiae predominantly brown, yellow only at apices. Tarsi entirely yellow. *Wings*: As in fig. 111, with 1st costal cell brown except for narrow hyaline streak through middle. Second costal cell also predominantly brown with a hyaline wedge through middle. A large hyaline wedge fills all of the 4th costal section, between apices of vein R_1 and vein R_{2+3} , except for the very narrow line of brown which continues around wing margin from apex in upper portion of cell R_5 along vein R_{2+3} joining with the brown mediobasal marking at r-m crossvein. Also with an oblique band of brown extending from M_{1+2} just beyond r-m crossvein to wing apex along m crossvein. Vein R_{2+3} strongly curved. Vein R_{4+5} also curved upward beyond r-m crossvein. Section of vein M_{1+2} between r-m and m crossvein very short, scarcely over 1/2 length of r-m. Vein R_{4+5} setose to r-m crossvein. *Abdomen*: Entirely shining black, rather thickly black setose and with rather prominent black bristles at apices of terga 4, 5, and 6. Sixth tergum about 2/3 as long as 5th. Basal segment of ovipositor polished black, short and thick, as seen from above about equal in length to 5th tergum. The piercer has not been extruded for study.

Length: body, 3.5 mm; wings, 4.0 mm.

♂. Fitting description of ♀ except for sexual differences. The genitalia have not been relaxed for study.

Holotype ♀, Tarawakan, N of Batu Batu, Tawitawi, 16.XI.1961 (Noona Dan Exped.).

Allotype ♂ intercepted at Honolulu in aircraft from San Francisco to Honolulu, 6.X.1967.

Type returned to University Zoological Museum, Copenhagen; allotype returned to U. S. National Museum.

Genus *Hemilea* Loew

Hemilea Loew, 1862, Die Eur. Bohrf., p. 32. Type-species: *Trypeta dimidiata* O. Costa, by monotypy,

(= synonym of *pulchella* Fabricius, 1805; see Séguy, 1932, *Enc. Ent. Dipt.* 6: 181).

Ocneros: Rondani, 1871, *Bull. Soc. Ent. Ital.* 3: 180, nec O. Costa, 1844.

The type of the genus is European. Five species from the Oriental Region and the South Pacific appear to belong here; there has been some controversy in the placement of some of these. *H. araliae* Malloch is placed in *Pseudacidia* Shiraki in Hering's card file, and Munro (1935: 237) described *hemiloides* Munro under *Pseudacidia* because "the dorso-central bristles are behind the line of the anterior supra-alar, not before as in *Hemilea*." In the species of *Hemilea* which I have examined the dorsocentral bristles are typically just behind the supraalars. The positioning of these varies considerably and I question that this is of any value in separating them. Shiraki (1933: 124) differentiated *Hemilea* from "*Myiolia*" and related genera by *Hemilea* supposedly lacking propleural bristles or bristly hairs. As noted by Chen (1948: 111) this is a very dubious character and probably refers to the presence of black bristle-like setae as opposed to pale finer setae. Some species of *Hemilea* have 1-3 black bristle-like setae on anterior margin of propleuron and I doubt that this character is of value. *Pseudacidia* has been treated as a subgenus of *Acidiella* (Chen 1948: 111). I prefer to treat those species of Trypetini which have the wings long, narrow, rather parallel-sided, approximately 3× longer than wide, which have the anterior 3/4 entirely dark brown and only the posterior margin hyaline (fig. 112a) under *Hemilea*. At present I find no good supportive characters and the entire complex of genera related to *Myoleja* and *Acidiella* needs to be studied thoroughly.

Head higher than long, occiput moderately swollen on lower portion and face vertical as seen in direct lateral view, with front gently sloping and antennae situated near upper 2/3 of head. Three pairs inferior fronto-orbital bristles and 2 pairs superior fronto-orbitals. Ocellar bristles strong, equal in length to postocellars. Genae comparatively narrow, equal to about width of 3rd antennal segment. Thorax with the usual complement of bristles, including sternopleurals and with propleura covered with fine yellow hairs and in some species a few black bristle-like setae on anterior margin. Dorsocentral bristles in most species I have seen situated slightly behind a line drawn between supraalars. The positioning is variable; in some species they may be nearer to the inner postalars than to the supraalars. Four strong scutellar bristles present. Middle tibia with 1 strong apical spur. Wings as noted above and in fig. 112a, subcostal cell rather short, about 2/3 as long as 2nd costal and vein R₄₊₅ sparsely setose with the setae not extending beyond a level with m crossvein. Crossvein r-m situated near apical portion of cell 1st M₂.

Two species apparently occur in the Philippines.

Hemilea bipars (Walker) Fig. 112a-c.

Sophira bipars Walker, 1862, *J. Proc. Linn. Soc. Zool.*, Lond. 6: 23. Type-locality: Moluccas. Type ♀ in British Museum (Nat. Hist.).

Hemilea bipars: Hardy, 1959, *Bull. Brit. Mus. (Nat. Hist.)*, Ent. 8: 199, 234, pl. 14, fig. 22.

A ♀ specimen on hand from Mt Banahao, Luzon, VI.1914 (in Frey collection,

Helsinki) fits my redescription and figure of the type of *bipars*. I have also seen a specimen from Laos.

This species is characterized by having the mesonotum and scutellum pale rufous, with the latter concolorous with the mesonotum; by having a hyaline spot in cell R_1 just beyond vein R_1 and a distinct band of brown extending to hind margin of wing along m crossvein and over apex of vein M_{3+4} . One ♀ specimen on hand from Mt Santo Tomas, near Baguio, Luzon, 2196 m (7200 ft), 27.XII.1952, H. M. & D. Townes is probably *bipars* although it closely resembles *praestans* (Bezzi) from India by having

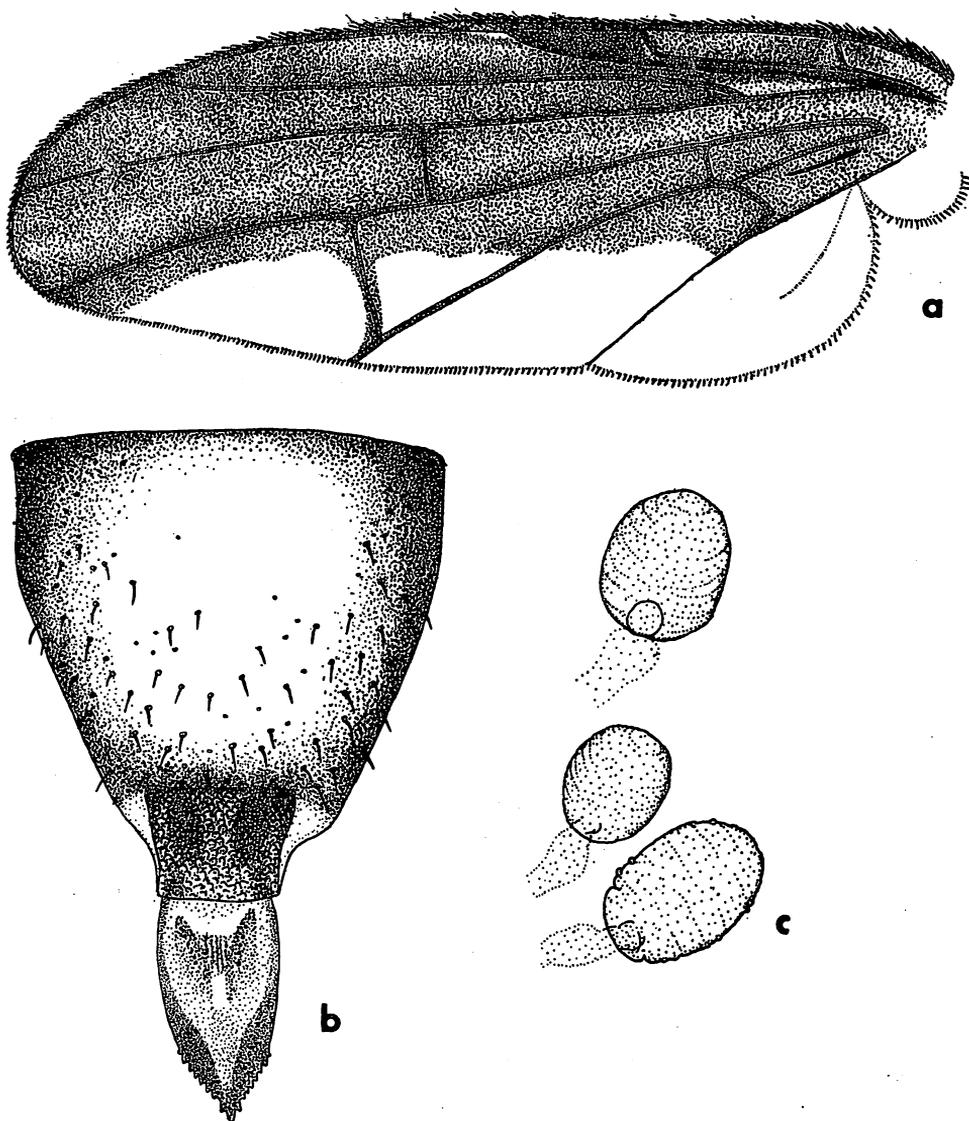


Fig. 112. *Hemilea bipars* (Walker); a. wing; b. ♀ ovipositor; c. spermathecae.

the apical portion of 1st M_3 and also 2nd M_3 predominantly hyaline and having only a faint indication of a brown marking over m crossvein (fig. 112a). I suspect that this may be a variable character and further specimens need to be examined in order to determine the extent of variability of the markings. The ♀ ovipositor is as in fig. 112b. Three spermathecae as in fig. 112c.

Hemilea, n. sp.

One ♂ specimen on hand, headless, from East Slope, Mt McKinley, Davao Prov., Mindanao, IX.1946, H. Hoogstraal is apparently undescribed. It appears to fit near *araliae* Malloch from New Britain, but differs by having a prominent hyaline wedge through cell R_1 just beyond apex of vein R_1 ; also the mesonotum is entirely rufous, rather than pale brown and setae on vein R_{4+5} extend to approximately opposite the m crossvein, rather than opposite r-m. There are probably other differences. The genitalia have not been studied.

The specimen is being returned to the Field Museum of Natural History in Chicago.

Genus **Myoleja** Rondani

Myoleja Rondani, 1856, Dipt. Ital. Prodr. 1: 112. Type-species: *Tephritis lucida* Fallén, by original designation.

Myioleja, *Myioleia*, *Myiolia*, and *Myolia*, errors or emendations.

Philophylla Rondani, 1870, Bull. Soc. Ent. Ital. 2: 9; 1871, Bull. Soc. Ent. Ital. 3: 175. Type-species: *Musca caesio* Harris, by original designation.

Euleia, of authors, not Walker, refer to discussion below.

Pseudosphenicus, of authors.

Hendelina Hardy, 1951, Pacif. Sci. 5: 179. Invalid replacement name for *Pseudosphenicus* Hendel, 1914.

As pointed out by Foote (1959: 145) the concepts of *Euleia* and *Philophylla* (= *Myoleja*) have been totally confused in the literature. The treatment in the sense of Hendel (1927: 96, 100) and others, must be reversed. As stated by Foote: "Walker, in 1836, proposed the genus *Euleia*, with *Musca onopordinis* F. as sole species and *Musca caesio* Harris and *Musca centaureae* F. in synonymy. Under the present rule it is necessary to consider *Euleia* as originally monobasic with *onopordinis* as the sole included species. The names originally in synonymy with it may not be used for the designation of a type for *Euleia*, both *onopordinis* and *centaureae* have long been accepted as synonyms of *Musca heraclei* L., but *caesio* has been shown to be specifically and generically distinct."

I agree with Chen (1948: 107) that there seems to be no satisfactory way to separate this large complex of species into distinct genera and I too prefer to treat them under 1 group until characters can be demonstrated which would clearly be of generic importance. I have studied representatives of the different names involved and have found that the characters which have been used are rather trivial and for the most part intergrade. I have discussed this in more detail in my monograph of the Thailand Tephritidae (Hardy 1973).

The present concept of this genus includes those Trypetini which have 3 pairs inferior fronto-orbital bristles; 2 pairs of superior fronto-orbitals, and ocellars rather weak; face vertical, not gibbose or convex in median portion; subcostal cell short, not more than

1/2 as long as 2nd costal cell with vein R_1 sloping rather gradually into costa; apex of cell Sc pointed; crossvein m parallel or nearly so with r-m crossvein and perpendicular in position (fig. 114d). These are mostly shining black species. Mesonotum densely setose, and propleura usually with several strong, black, bristle-like setae. Dorsocentral bristles variable in position, in some species only slightly behind supraalars and situated well behind these bristles nearer to the inner postalars in others. Front approximately 1/2 longer than wide in majority of species. Crossvein r-m situated distinctly beyond middle of cell 1st M_2 and vein R_{4+5} setose to about level with r-m crossvein. Lobe of cubital cell approximately 1/2 as long as vein $Cu_1 + 1st A$. In species from the Oriental Region wings with a large dark brown spot occupying most of basomedian portion to approximately r-m crossvein, and with a transverse band across m crossvein continuing around anterior margin of wing to apex at middle of cell R_5 (fig. 113). The ♀♀ of the species which have been examined have 2 spermathecae.

Six species of *Myoleja* are presently being recorded from the Philippines. Three are apparently undescribed.

KEY TO KNOWN SPECIES OF MYOLEJA FROM THE PHILIPPINES

1. Wing with a subapical oblique band of brown, crossvein r-m situated well beyond middle of cell 1st M_2 (fig. 113 and 114d).2
Wings lacking a subapical band, r-m crossvein situated before middle of cell 1st M_2 (fig. 116). Luzon.**nitida**, n. sp.
- 2(1). Subapical oblique band isolated, not connected with crossband over m crossvein or with basomedian brown marking of wing (fig. 113 and 115).3
Subapical band connected with the broad brown band extending over m crossvein (fig. 117), or joined with basomedian brown marking (fig. 114d).5
- 3(2). Costal cell brown, hyaline band extending over wing in area between r-m and m crossveins, not complete (fig. 115 and pl. 5, fig. 41).4
Costal cells almost entirely hyaline, hyaline band complete over wing between r-m and m crossveins (fig. 113). Widespread from Japan, Formosa, over Southeast Asia.
..... **fossata** (Fabricius)
- 4(3). With a prominent hyaline spot in apical portion of cell M_4 , extending into lower edge of 1st M_2 in line with hyaline crossband in area between r-m and m crossveins. Formosa and Philippines.**connexa** (Hendel)
Apex of M_4 entirely dark brown, 2nd hyaline mark from cell R_1 extending to middle of cell 1st M_2 (fig. 115). Luzon.**nigripennis**, n. sp.
- 5(2). Hyaline wedge at base of cell R_1 isolated from apical brown band by a hyaline mark extending over wing in area between r-m and m crossveins. Wings marked as in fig. 117. Widespread from Japan, Formosa, over Southeast Asia.
.....**superflucta** (Enderlein)
The brown costal band continuous with the distal arm of wedge-shaped mark at base of cell R_1 and no transverse hyaline band on wing. The subapical oblique brown band is connected with basomedian brown marking of wing (fig. 114d). Entire posterior portion of wing brown except for a hyaline spot in base of cell M_4 . Mindanao.
..... **mindanaoensis**, n. sp.

Myoleja connexa (Hendel), new combination Pl. 5, fig. 41.

Pseudospheniscus connexus Hendel, 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* 13: 453. Type-locality:

Kankau, Formosa. Syntypes (σ - ρ) in Deutsches Entomologisches Institut, Eberswalde. I have studied the type series.

Three specimens have been seen from Luzon and Panay which fit the description and my notes and color photograph of the type of *connexa*.

This species is readily differentiated by having the hyaline crossband over wing in a line between r-m and m crossveins broadly interrupted in cell 1st M_2 ; also by having the costal cells entirely brown, in combination with the subapical, imcomplete, oblique brown streak through cell R_5 (pl. 5, fig. 41).

Small, dark brown to black species, tinged with rufous over pleura and humeri. Head mostly yellow, tinged with brown on back part of upper occiput and with front almost $2\times$ longer than wide. The chaetotaxy is typical of members of this genus, with 2 pairs of superior fronto-orbital bristles, except that the ocellar and postocellar bristles are small, scarcely larger than the strong postorbital setae. Dorsocentral bristles situated just slightly behind a line drawn between supraalars. Mesonotum rather densely gray pollinose and covered with short brown to black setae. Propleura each with several prominent black bristle-like setae along front margin. Scutellum bare except for a few dark setae around margin. Apical scutellars rather small compared to basals, only about $1/2$ to $3/5$ as long. Legs mostly yellow with middle and hind femora dark brown. Wings as in pl. 5, fig. 41, with the 1st hyaline wedge in base of cell R_1 extending to vein R_{4+5} and 2nd hyaline wedge extending through most of cell R_5 . Vein R_{2+3} slightly undulated and R_{4+5} almost straight, approximately parallel with apical portion of M_{1+2} . Crossvein r-m situated about its own length from m crossvein. Lobe of cubital cell comparatively short. Abdomen subshining dark brown to black. The genitalia have not been dissected for study. Length: body and wings, 3.25-4.0 mm.

I have not seen the ρ .

Shiraki (1933: 171) reported that the adults of this species are often captured on the flowers of *Tetrapanax papyrifera* Koch.

It should be noted that *connexa* is very probably a synonym of *conjuncta* (de Meijere) from the Moluccas. I have examined the type σ of the latter, in the Zoological Museum, Amsterdam. It is in poor condition. The head is missing; the wing markings of these compare very favorably except that the shape of the hyaline mark at base of cell R_1 is abruptly narrowed in *conjuncta* so that the portion extending through cell R_3 is straight-sided, rather than being evenly tapered, wedge-shaped. I feel this is nothing more than a variation but specimens need to be examined from Indonesia to settle this question.

Myoleja fossata (Fabricius) Fig. 113.

Tephritis fossata Fabricius, 1805, Syst. Antliat., p. 320. Type-locality: "Tranquebariae." Type (sex?) in University Zoological Museum, Copenhagen.

Trypeta elimia Walker, 1849, List Dipt. Ins. Brit. Mus. 4: 1033. Type-locality: "Philippine Islands." Type ρ in British Museum (Nat. Hist.).

Ortalis regularis Doleschall, 1859, *Natuurk. Tijds. Ned.-Ind.* 17: 119. Type-locality: Amboina. The type (sex?) has evidently been lost.

A moderately small, subshining black species characterized by the wing markings (fig. 113); by having an oblique preapical streak of brown extending from upper apex of cell 2nd M_2 to vein R_{4+5} through cell R_5 and a narrow, longitudinal, hyaline streak through entire length of cell M_4 .

Head yellow to rufous except for dark eyes. Front comparatively narrow, almost $2\times$ longer

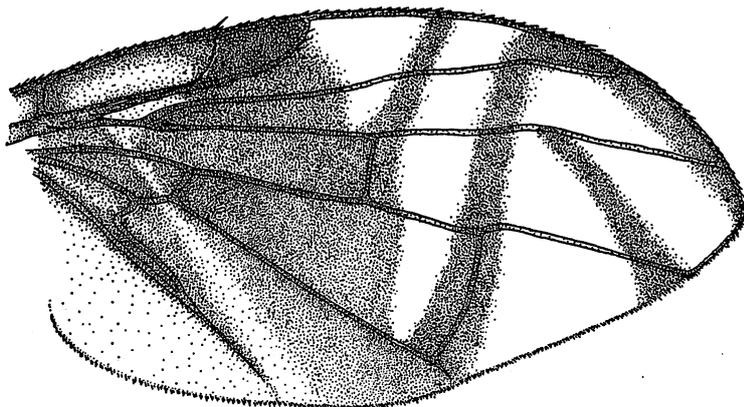


Fig. 113. *Myoleja fossata* (Fabricius): wing;

than wide, with 3 pairs inferior fronto-orbitals, 2 pairs superior fronto-orbitals, and with ocellar bristles strong, equal or slightly longer than postocellars. Antennae yellow, 3rd segment about $2\frac{1}{2}$ \times longer than wide. Arista pubescent. Thorax, including scutellum, entirely black in ground color, yellow only on humeri and tinged with yellow on propleura; rather densely gray pubescent and with dorsum thickly covered with short black setae. Dorsocentral bristles situated almost in line with supraalars. Scutellum bare on disc and with a few scattered setae around margins. Legs mostly yellow to rufous and mid and hind femora dark brown to black and hind tibiae tinged with brown. Wings as in fig. 113. First 2 costal cells predominantly hyaline; some specimens from India, and other areas, apparently have the cells completely hyaline; the ones from the Philippines have the upper margin of 2nd costal cell brown and the narrow apices and bases of this cell are brown. One ♀ specimen on hand from the Philippines has the transverse hyaline band over wing through area between r-m and m crossveins incomplete, ending at vein M_{3+4} . Vein R_{4+5} curved upward in median portion of last section. Crossvein r-m situated about its own length from m crossvein. The following characteristics of the ♂ genitalia are taken from Thailand specimens. Fifth abdominal sternum of ♂ about $2\times$ longer than wide, hind margin straight and with about 4 small bristles on each side. Male genitalia with surstyli long and slender, pointed apically and with appendages at apex of 10th sternum visible from lateral view. Sixth tergum of ♀ $\frac{3}{4}$ as long as 5th. Basal segment of ovipositor short and thick, as seen from dorsal view about $\frac{1}{3}$ to $\frac{1}{2}$ longer than 5th tergum. Measured on ventral margin basal segment is about 0.6 mm. Piercer short and thick, abruptly tapered to a sharp apex and approximately 0.6 mm. Extended ovipositor 1.8 mm long. Length: body, 3.5–4.0 mm; wings, 3.3–3.7 mm.

This species is widespread throughout the Oriental Region. I have also recorded it from New Ireland.

To date this has been seen only from localities on Luzon. I have 2 specimens on hand.

***Myoleja mindanaoensis* Hardy, new species** Fig. 114a-d.

This species is readily differentiated from all known *Myoleja* by the distinctive wing markings (fig. 114d), by having the distal arm of brown which sets off the hyaline wedge in basal portion of cell R_1 connected with the brown band extending around costal margin, and by having the preapical oblique brown band continuous with the baso-

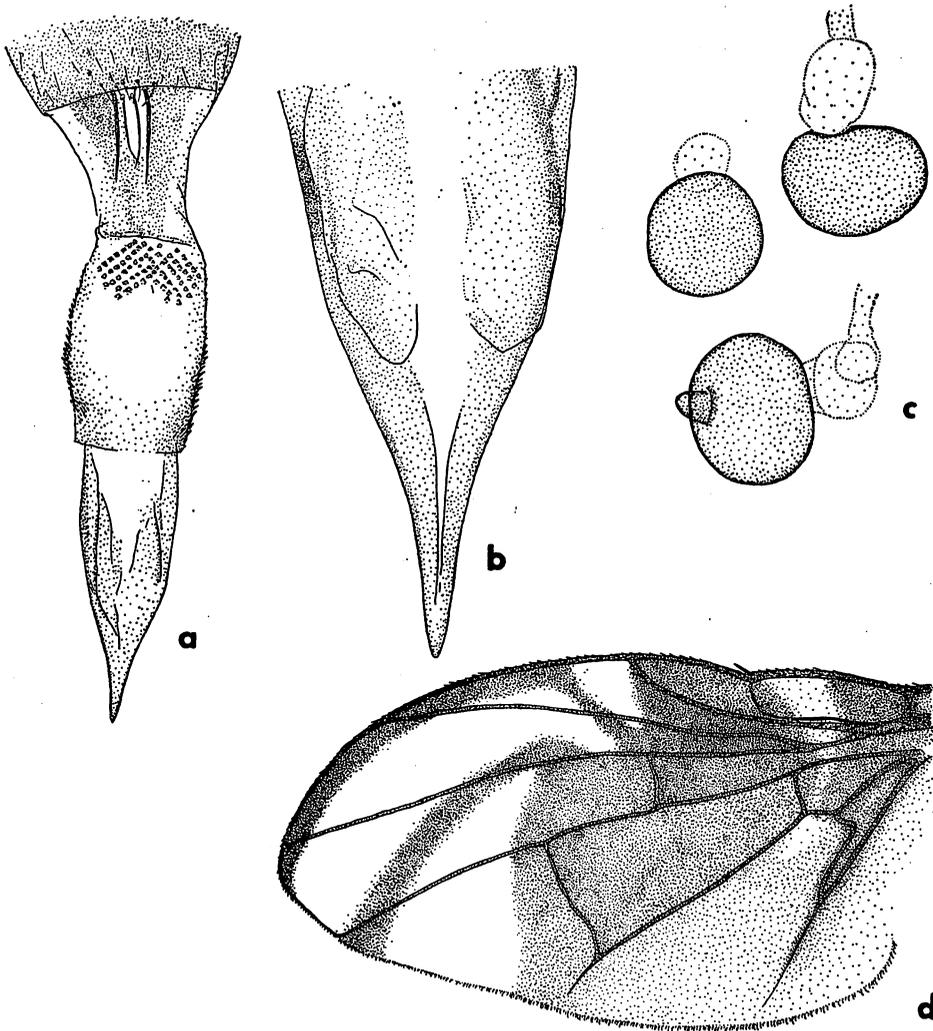


Fig. 114. *Myoleja mindanaensis*, n. sp.: a. ♀ ovipositor; b. apex of piercer; c. spermathecae; d. wing.

median brown marking of the wing. Also by having the entire posterior portion of wing brown except for a hyaline spot in base of cell M_4 and by having the lobe of cubital cell elongate, slightly over $1/2$ as long as vein $Cu_1 + 1st A$.

♀. *Head*: Nearly $2\times$ higher than long with the occiput only slightly swollen on lower portion and the front sloping so that the antennae are situated near middle of head as seen in direct lateral view. Yellow except for dark brown to black upper sides and median portions of occiput, with upper median occiput and lower $2/5$ to $1/2$ pale yellow. Genae, face and front yellow. Face vertical as seen in direct lateral view, flattened down median portion and with shallow antennal furrows. Eyes about $1/2$ higher than wide. Front with the usual arrangement of inferior and superior fronto-orbitals. The ocellars are broken from the specimen at hand; from the size of the

base these are obviously well developed bristles. Antennae yellow, 3rd segment about $3\times$ longer than wide, rounded at apex and arista long pubescent. *Thorax*: Entirely shining black, moderately gray-brown pubescent over dorsum and thickly covered with short black setae and with numerous black bristle-like hairs on propleura. Dorsocentral bristles situated nearly $3/5$ the distance between supraalars and inner postalars. *Legs*: Front pair yellow except for brown discoloration over dorsal surfaces of femora. Middle and hind coxae and trochanters yellow, tinged faintly with brown. Middle and hind femora brown, tinged with rufous basally and middle and hind tibiae brown to black at bases, yellow at apices. All tarsi yellow. Each front femur with a row of strong posteroventral bristles and with posterior surface covered with short, black, erect hairs. Each hind femur with 1 strong, black, hair-like anteroventral bristle just before base; this is longer than the strong spur at apex of middle tibia. Hind tibia with a complete row of closely placed, short, erect, anterodorsal setae. *Wings*: As noted above and as in fig. 114d. First 2 costal cells each with a large quadrate hyaline mark in middle portion and subcostal cell distinctly longer than wide, pointed apically. Crossvein r-m situated near apical $3/5$ to $2/3$ of cell 1st M_2 and vein R_{4+5} setose to r-m crossvein. *Abdomen*: Polished black. Sixth tergum about $2/3$ as long as 5th. Basal segment of ovipositor polished black, as seen from above about equal in length to terga 5+6. Measured on venter, basal segment 1.0 mm. Piercer short, abruptly tapered to a sharp point at apex (fig. 114b) and measuring 0.6 mm in length. Extended ovipositor (fig. 114a) 2.5 mm. Three round spermathecae present (fig. 114c).

Length: body, excluding ovipositor, 4.25 mm; wings, 5.5 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10147), Lake Lanao, Tagaya, Mindanao, 470-720 m, 15.VI. 1958, H. E. Milliron. One paratype, ♀, Butuan, Mindanao, Baker.

Type returned to B. P. Bishop Museum; paratype returned to Bezzi collection, Milano.

***Myoleja nigripennis* Hardy, new species** Fig. 115.

Resembling *connexa* but lacking the prominent hyaline marking at apex of cell M_4 , having the mediobasal marking of wing much darker brown, almost black; the ocellar bristles distinctly larger, stronger than upper superior fronto-orbitals; the pleura black, rather than brownish red; and apical scutellar bristles almost as strong as basal bristles. Also the species is larger.

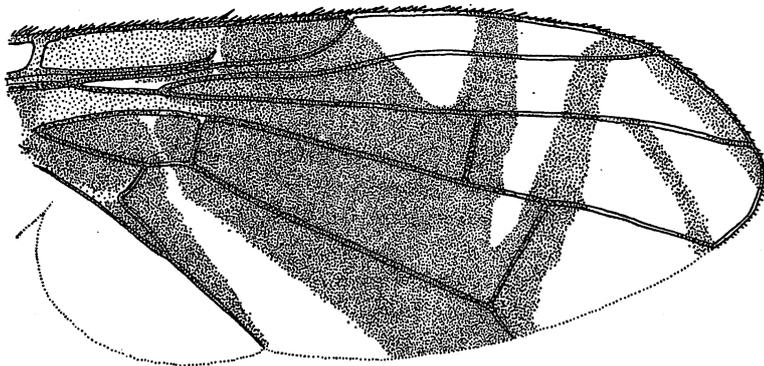


Fig. 115. *Myoleja nigripennis*, n. sp.: wing.

Head: Yellow except for a brown tinge across upper median portion of occiput and the reddish brown eyes. Shaped as in other *Myoleja* with the occiput slightly swollen on lower portion. I see nothing distinctive about the head. The ocellar bristles are moderately developed, stronger than upper superior fronto-orbitals and also stronger than postocellar bristles. **Thorax:** Entirely shining black in ground color, rather densely gray pollinose, especially on dorsum and covered with short black setae. Propleura with a number of prominent bristle-like hairs. Dorsocentral bristles situated slightly behind a line drawn between supraalars. Halteres black. Front legs yellow, femora rather thick and with only a few short, black bristles down posteroventral surface. Middle and hind femora dark brown to black. Middle tibiae yellow, each with a strong black spine at apex plus 2 short black bristles. Hind tibia dark brown to black at base, yellow apically. Tarsi yellow. **Wings:** As in fig. 115. The markings are dark brown to black. **Abdomen:** Entirely shining black, covered with black setae and with strong bristles at apex of 5th tergum. The genitalia have not been relaxed for study. The visible parts are black.

Length: body, 4.5 mm; wings, 4.25 mm.

♀. Unknown.

Holotype ♂ (BISHOP 10148), Mayoyao, Ifugao, Mt. Prov., Luzon, 1200-1500 m, 3 IX.1966, H. M. Torrevillas.

Type in B. P. Bishop Museum.

***Myoleja nitida* Hardy, new species** Fig. 116.

This species somewhat resembles *erebia* (Hering) from New Guinea, but differs by having the r-m crossvein situated well before middle of cell 1st M_2 , rather than beyond; the brown band over wing at level of m crossvein widely spaced from basomedian brown marking, the space equal to nearly 4× length of r-m crossvein, rather than this space being narrow, less than the length of the crossvein; 1st costal cell dark brown, rather than hyaline; occiput black and upper front tinged with brown, rather than head all yellow except for ocellar triangle; thorax entirely polished black, not with humeri and propleura yellow-brown; and all coxae and femora black, not with front femora yellow.

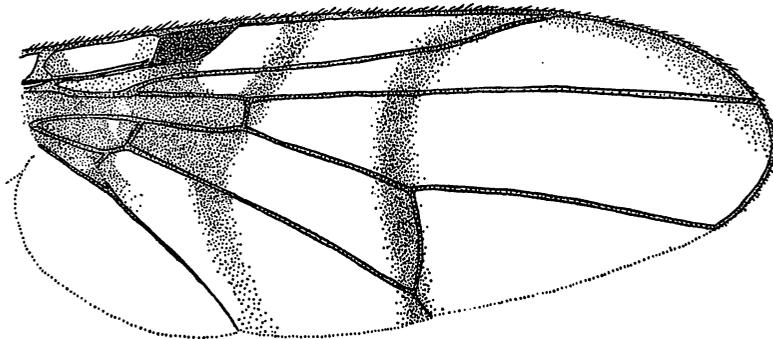


Fig. 116. *Myoleja nitida*, n. sp.: wing.

♀. Small species, thorax and abdomen entirely polished black. **Head:** Higher than long, shaped as in other *Myoleja* and with 3 pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals, with upper superior fronto-orbitals and ocellar bristles rather small, only 1/2 to 3/5 as long as postocellars. Occiput entirely black. Gena dark brown on hind portion, otherwise yellow. Face entirely yellow, slightly concave in median portion and with antennal furrows scarcely de-

veloped. Front brown on upper 1/2, yellow below, about 1/2 longer than wide. Antennae yellow, 3rd segment about 2× longer than wide, broadly rounded at apex; arista bare. *Thorax*: Almost entirely polished black with a patch of gray pubescence along sides and over notopleura, also along posterior margin of mesonotum and over dorsum of scutellum. Entirely black setose including the bristle-like setae on propleura. Dorsocentral bristles situated slightly behind a line drawn between inner postalaris. Halteres yellow-white on knobs. *Legs*: Coxae, trochanters, and femora shining black; hind tibiae dark brown to black on basal 1/2 to 2/3, yellow apically; middle and front tibiae and all tarsi yellow. *Wings*: Very distinctive because of the position of r-m crossvein and with markings as in fig. 116. First costal cell entirely brown, the 2nd is brown at base and at apex, hyaline through median portion. Subcostal cell slightly longer than wide and approximately 2/3 as long as 2nd costal. The hyaline mark in base of cell R is quadrate in shape and extends to vein R_{4+5} . Crossvein r-m situated between basal 1/3 and basal 2/5 of cell 1st M_2 and vein R_{4+5} setose to r-m crossvein. *Abdomen*: Entirely polished black, 6th tergum about 2/3 as long as 5th and basal segment of ovipositor as seen from dorsal view about equal in length to 6th tergum. The piercer has not been extended for study.

Length: body, 2.75 mm; wings, 3.0 mm.

♂. Unknown.

Holotype ♀ (BISHOP 10149), 60 km S of Bontoc, Abatan, Buguias, Mountain Province, Luzon, 1800–2000 m, 28–29.V.1964, H. M. Torrevillas.

Type in B. P. Bishop Museum.

***Myoleja superflucta* (Enderlein), Fig. 117.**

Trypeta superflucta Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 428, fig. J. Type-locality: Takao, South Formosa. Lectotype ♂ in Zoological Museum, Warsaw. I have studied the type.

This species is evidently widespread through Southeast Asia, from Formosa, Japan, and Ryukyu Islands, through the Philippines, Borneo, Singapore and Malaysia.

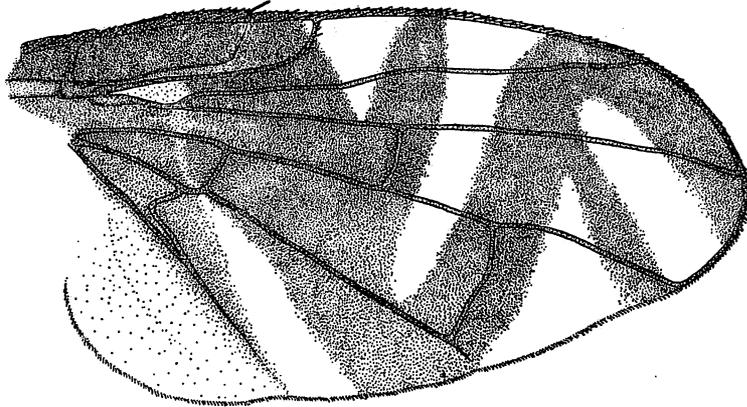


Fig. 117. *Myoleja superflucta* (Enderlein): wing.

Predominantly shining black species, moderately gray pollinose over metanotum. Fitting the general characteristics of most species of *Myoleja* and differentiated by the distinctive wing characters (fig. 117). The costal cells are usually entirely brown. In 1 specimen on hand from the Philippines a narrow streak extends through middle of 2nd costal cell; this is probably an aberration. The subcostal cell is unusually short, about as

long as wide. Crossvein r-m situated near apical $3/5$ of cell 1st M_2 ; other details of wing markings and venation as in fig. 117. Length: body and wings, 3.5 mm.

One specimen has been seen from Manila, in U. S. National Museum collection.

For a complete description and figures refer to Shiraki 1968: 39-42, fig. 1-13).

Genus *Vidalia* Robineau-Desvoidy

Vidalia Robineau-Desvoidy, 1830, *Mém. Près. Acad. Roy. Sci. Inst. France* **2**: 719. Type-species: *impressifrons* Robineau-Desvoidy, by monotypy.

Stemonocera Rondani, 1870, *Prodr. Dipt. Ital.* **7**: 30. (Synonymy by Hendel 1927: 71). Type-species: *Musca cornuta* Scopoli, by monotypy.

This genus fits near *Trypeta* Meigen but is differentiated by having only 1 pair of superior fronto-orbital bristles; the ocellar bristles rudimentary, seta-like; and the front of the ♂ tuberculate and with the inferior fronto-orbital bristles often borne on strong prominences.

Just over 2 dozen species are presently placed in *Vidalia*; 14 are from the Oriental Region, 11 are Palearctic and 1 is from Eritrea.

Only 1 species is known from the Philippines.

Vidalia tuberculata Hardy Fig. 118a-c.

Vidalia tuberculata Hardy, 1970, *Ent. Meddel.* **38**: 108, fig. 16a-b. Type-locality: Dalawan Bay, Balabac. Type ♂ in University Zoological Museum, Copenhagen.

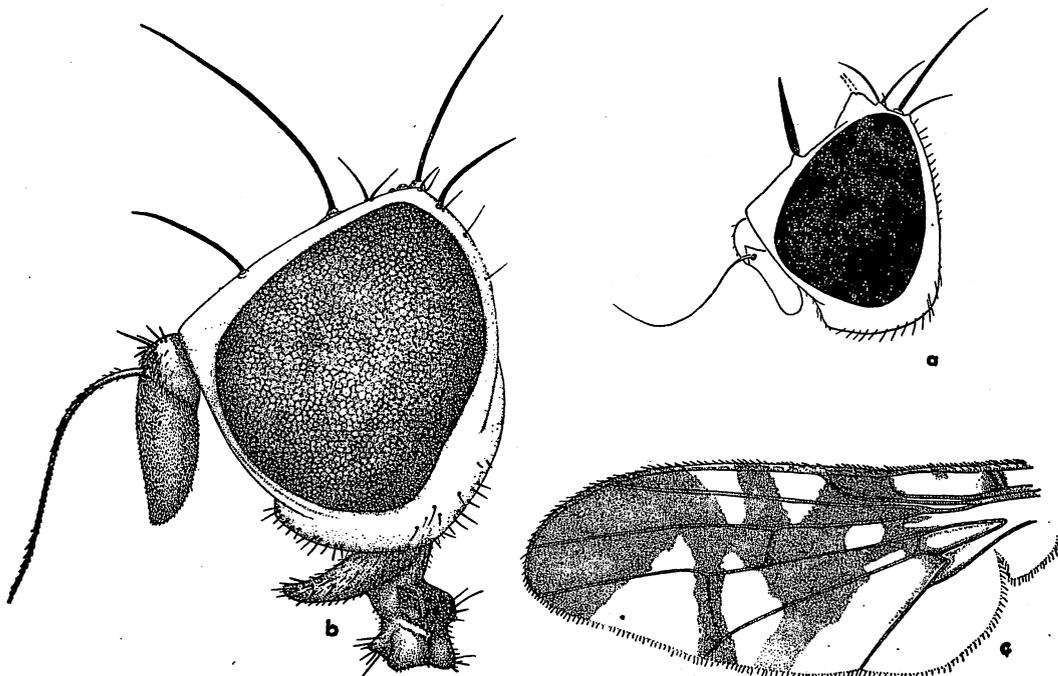


Fig. 118. *Vidalia tuberculata* Hardy: a. head of 2nd ♂ specimen; b. head of type ♂; c. wing.

This species differs from others known in this genus by lacking the long processes developed from the front; it does show the beginning stage of this development, however. The front is carinate on each side and the upper inferior fronto-orbital bristle is situated on a prominent tubercle, showing some variation in development (fig. 118a-b). In the 2nd ♂ specimen on hand the lower inferior fronto-orbital bristle is also situated on a tubercle and the upper tubercle is much more developed than in the type. Only 1 pair of inferior fronto-orbital bristles remains on the 2nd specimen on hand, but this bristle is modified, flat, lanceolate (fig. 118b).

This species appears to fit nearest *bidens* Hendel from Formosa; the wing markings are almost identical in the 2. It differs by having the head almost normal in shape with sides of front raised and with just a small tubercle at base of upper superior fronto-orbital bristle, rather than having both pairs of inferior fronto-orbitals situated on very prominent tubercles and the bristles large and flattened. In *bidens* the upper inferior fronto-orbitals are nearly 2× longer and more than 2× as broad as inner vertical bristles. In *tuberculata* the upper inferior fronto-orbital bristles are just slightly longer and slightly thicker than inner verticals and the lower inferior fronto-orbital is comparatively small on the type but is thick and flattened on the 2nd specimen which is now on hand. Head shaped as in fig. 118a-b, with front gently sloping and antennae situated near middle of head height. Head entirely yellow except for reddish compound eyes and long black ocellar triangle. Front narrowed anteriorly, at broadest point as wide as long. Lateral margins of front gently carinate, median portion flat, smooth, devoid of setae. One pair of small superior fronto-orbital bristles; these are rather hair-like, approximately equal in size to postocular bristles. Ocellar bristles rudimentary, seta-like. Antennae yellow, 3rd segment about 2× longer than wide, rounded at apex. Aristae nearly bare. Palpi yellow with few scattered black setae around margins. Thorax yellow to rufous with humeri yellow-white and notopleura and scutellum white. Propleura with prominent yellow setae. Thoracic bristles black, having the usual complement of bristles and with dorsocentrals situated opposite supraalars. Legs entirely yellow. Wings marked as in fig. 118c with 2 hyaline wedges on costal margin beyond apex of vein R₁ extending to vein R₄₊₅. Vein R₄₊₅ setose to r-m crossvein. Abdomen with first 3 terga entirely yellow and with 4th and 5th polished black. The genitalia have not been dissected for study; the surstyli are long and narrow. Length: body, 3.9 mm; wings, 3.6 mm. ♀. Unknown.

One ♂ specimen on hand from Lake Balinsasayao, Negros Or., 1-7.X.1959, L. W. Quate.

SUBFAMILY SCHISTOPTERINAE

This subfamily is characterized by the distinctive wing features; by having the costal margin deeply cleft at apex of subcostal vein and with a prominent lobe developed at apex of 2nd costal section and the wing markings consisting of radiating dark lines extending to costa along anterior and apical margins, with the center of the wing predominantly brown, and in all known Southeast Asian species with bullae (shining areas) developed.

Only 1 genus is known from Southeast Asia.

Genus **Rhabdochaeta** de Meijere

Rhabdochaeta de Meijere, 1904, *Bijdr. Dierk.* **17-18**: 109. Type-species: *pulchella* de Meijere, by monotypy.

This genus is differentiated from all other fruit flies from Southeast Asia by the subfamily characters given above, also by the distinctive palpi: long, slender, thickly covered with short black scale-like setae on the dorsal and ventral margins. By having the antennae typically pointed, in most species drawn out into a long slender apical point (fig. 119b and 120a); the upper inferior fronto-orbital bristles flat and scale-like (fig. 123a); the wing with at least 2 bullae in the median portion and the subcostal cell short and the cubital cell with a short point at the apex (fig. 121a and 123b). The ♀♀ have 2 spermathecae (fig. 119c).

Fourteen species have been previously recorded from the Oriental and Pacific Regions and 13 species are known from Africa. Eight species are presently recognized from the Philippines; only 2 (Bezzi 1926) have been previously recorded.

KEY TO RHABDOCHAETA KNOWN FROM THE PHILIPPINES

1. Third antennal segment short, scarcely 1/2 longer than wide and only slightly pointed at upper apex (fig. 121b). Front femora each with a row of about 6 short black spines before apex on posteroventral surface; upper inferior fronto-orbital bristles normal in shape. Wings as in fig. 121a and pl. 5, fig. 42.2
 Third antennal segment drawn out into a slender point at apex, usually 3 or more × longer than wide (fig. 120a). Front femora lacking the ventral row of black spinules, and upper inferior fronto-orbitals flat, lanceolate. Wings not marked as above.3
- 2(1). Cell R₁ with 1 narrow and 1 broad brown band. Apex of cell R₅ hyaline except for 2 broad bands along apices of veins R₄₊₅ and M₁₊₂ which converge in cell R₅ well beyond level of apex of vein R₃₊₄. Other wing markings as in fig. 121a. **brachycera**, n. sp.
 Two narrow brown bands extending through R₁, also 2 long narrow bands extending longitudinally to apex of cell R₅, converging at level of tip of vein R₂₊₃; and with a short interrupted streak of brown in apex of R₅. Other details of wing venation as in pl. 5, fig. 42.**convergens**, n. sp.
- 3(1). The dark rays in the anterior margin of the wing consist of narrow brown to black streaks as in fig. 123b and 125.4
 The radiating rays through cell R₁ and usually through R₃ are broad, consisting of a white streak through the middle bordered by brown on each side, as in fig. 120b and 124.7
- 4(3). Cell R₃ with only 1 brown streak through middle. Vein M₁₊₂ bent sharply upward just beyond m crossvein and with a reddish bulla in upper basal portion of cell 2nd M₂ (fig. 125). No presutural dorsocentrals present.5
 Cell R₃ with 2 streaks of brown through middle. Vein M₁₊₂ not strongly curved upward and no bulla present in 2nd M₂ (fig. 123b). With at least 1 pair of presutural dorsocentral bristles.6
- 5(4). Two complete brown streaks through middle of cell R₃. Base of subcostal cell with only a narrow streak of brown, other details of wing markings as in fig. 125. Indonesia, Malaya (Pahang), and the Philippines. **multilineata** Hering
 Only 1 streak of brown through cell R₃. Basal 1/2 of subcostal cell brown with 1 or 2 small hyaline spots. Formosa, Japan, Ryukyus, India, through Southeast Asia, and

- the Philippines. **asteria** Hendel
- 6(4). Terga 2-4 (♂) and 2-5 (♀) yellow, sometimes tinged with brown at apices. Fifth tergum of ♂ large, almost equal in length to remainder of abdomen and polished black. Sixth tergum of ♀ at least as long as terga 4+5 and polished black except for broad lateral margins and narrow apices. Basal segment of ovipositor broadly brown at base, narrowly so at apex. Hyaline marks through cell R_5 , slightly interrupted along vein R_{4+5} ; wings with a brown bulla in base of cell R_5 beyond r-m crossvein and with a rufous bulla in cell 1st M_2 . Other wing markings as in pl. 5, fig. 43, and 3rd antennal segment comparatively short. Luzon. **parva**, n. sp.
- Abdominal terga broadly yellow down middle and on lateral margins. brown submedianly. Fifth tergum of ♂ about equal in length to 3+4 and yellow in middle, on sides and at apex, and with a small shining brown preapical mark on each side. Sixth tergum of ♀ about 1/2 longer than 5th and yellow except for shining brown crescent-shaped mark in middle. Ovipositor base yellow. First hyaline mark through cell R_5 beyond vein R_{3+4} extending into cell R_5 and 2nd hyaline mark continuous through R_5 to vein M_{1+2} . No brown bulla in cell R_5 , and no rufous bulla in 1st M_2 . Other markings as in fig. 123b. Third antennal segment more elongate, as in fig. 123a. Palawan. **dorsosetosa** Hardy
- 7(3). Vein M_{1+2} strongly curved upward, just beyond m crossvein and with a rufous bulla in upper basal portion of cell 2nd M_2 . Crossvein m oblique, slightly curved. Fourth costal section distinctly longer than 5th and other wing characters as in fig. 120b; a dark brown spot present near base of cell R_5 beyond r-m crossvein; cell R_5 with 2 white, bordered with brown, streaks extending to margin and 2nd M_2 with several brown streaks extending to margin. **bakeri** Bezzi
- Vein M_{1+7} straight, not noticeably curved upward beyond m crossvein and m crossvein straight, transverse in position. No rufous bulla in upper base of 2nd M_2 ; 4th costal section about equal to 5th; an eye-like spot (a white spot surrounded by brown) present near base of cell 2nd R_5 ; the rays through cell R_5 are brown, lacking the white central markings; and cell 2nd M_2 is marked with diffuse spots (fig. 124). Philippines. **melanura** Bezzi

Rhabdochaeta asteria Hendel Fig. 119a-c.

Rhabdochaeta asteria Hendel, 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* 13: 462, pl. 2, fig. 18. Type-locality: Formosa. Syntypes (♂-♀) in the Hungarian National Museum, Budapest.

A widespread species; it has been recorded from Formosa, Japan, Ryukyus, India, Thailand, Laos, and Vietnam.

Hosts: Hendel in the original said the larvae live in flowerheads of *Blumea lacerae* D.C. One specimen from Japan contained the label "Pupen in Infloresenz von *Wedelia chinensis* Osbeck (Merrill)" and a series from India were labeled "emerged in cage with gall on *Eclipta alba* (L.) Hook. f."

This species is differentiated from other Oriental *Rhabdochaeta* which have narrow dark rays through the anterior margin of wing by having only 1 brown ray extending to margin through middle of each of cells R_1 and R_5 ; by having only 4 scutellar bristles; vein M_{1+2} curved strongly upward just beyond m crossvein and with a rufous bulla developed in upper basal portion of cell 2nd M_2 ; basal 1/2 of subcostal cell brown, with 1 or 2 small hyaline spots. Head with the 2 upper pairs of inferior fronto-orbitals and inner vertical bristles brown; lower superior fronto-orbitals yellow-brown, and with other bristles white. All frontal bristles distinctly flattened. Four pairs inferior fronto-orbitals, 2 pairs superiors, 1 pair of interfrontal bristles in middle directly

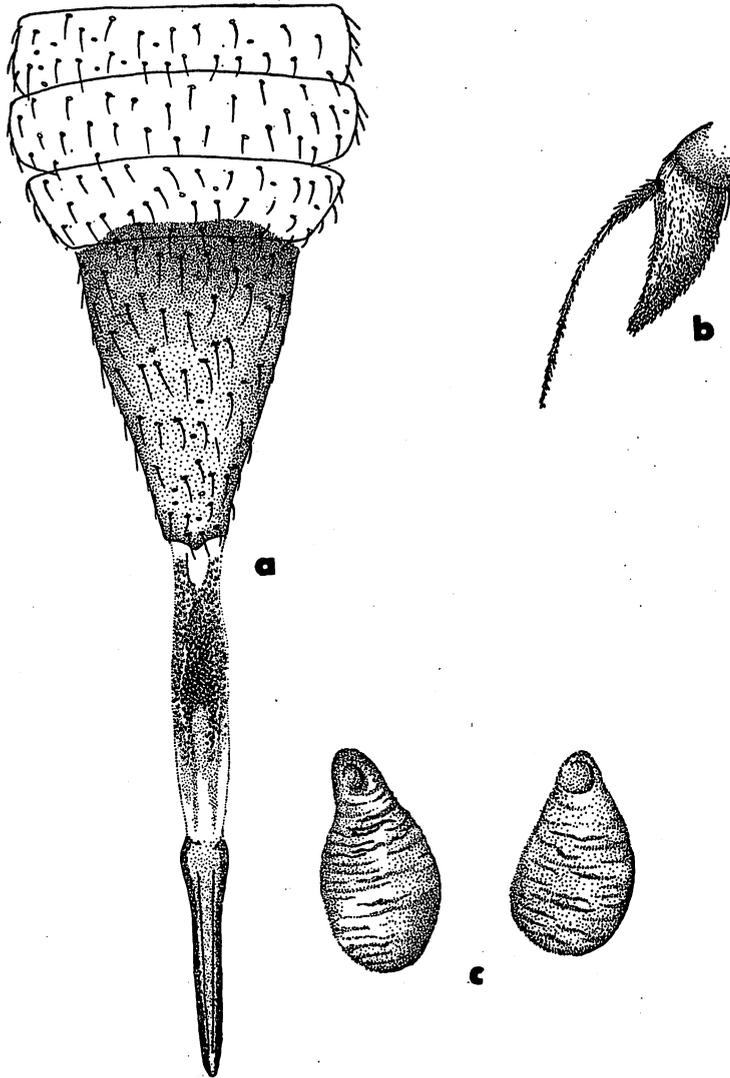


Fig. 119. *Rhabdochaeta asteria* Hendel: a. ♀ abdomen, dorsal; b. antenna; c. spermathecae.

beneath ocellars, and 1 pair of ocellar bristles. Upper sides of face with a brown to black spot on each side just slightly below level of base of antenna. Face otherwise entirely yellow, distinctly concave from lateral view with a small prominence developed above directly below antennae. Antennae yellow, 3rd segment extended into a slender point (fig. 119b). Two pairs of dorsocentral bristles developed on thorax, and 2 pairs of scutellar bristles. All of the major thoracic bristles brown, tinged with yellow except for the white apical scutellars and the sternopleural bristles. Legs yellow with a preapical brown band on each middle and hind femur and a faint subasal brown band on each hind tibia. Abdomen largely brown, narrowly yellow at apices of terga and yellow through median portions of terga 3-5. Apical 1/3 of 5th tergum predominantly polished

brown in ♂. Sixth tergum of ♀ slightly shorter than 5th and mostly polished brown. The ♂ genitalia have not been studied. The basal segment of the ovipositor is dark brown on basal 3/5, yellow apically and approximately equal in length to last 3 abdominal segments and measured on venter is approximately 1.0 mm. The piercer is slender, sharp-pointed and approximately 0.7 mm long. The extended ovipositor (fig. 119a) is approximately 2.4 mm. Spermathecae as in fig. 119c. Length: body, 2.4-2.7 mm; wings, 2.7-3.0 mm.

To date only 1 ♀ specimen has been seen from the Philippines. It is from Mayo-yao, Ifugao, Mt. Prov., Luzon, 1200-1500 m, 4.IX.1966, H. M. Torrevillas.

Rhabdochaeta bakeri Bezzi Fig. 120a-e.

Rhabdochaeta bakeri Bezzi, 1913, *Philipp. J. Sci.*, 8: 328. Type-locality: Los Banos, Laguna, Luzon, Syntypes (♂-♀) in the U. S. National Museum.

This species fits in the complex which is characterized by having the dark rays through cell R_1 rather broad, consisting of a white streak through middle bordered with brown on each side (fig. 120b); 3rd antennal segment long and slender, sharp-pointed (fig. 120a) and 2 pairs of dorsocentral bristles. The wing markings and venation are very similar to those of *pulchella* de Meijere from Java; vein M_{1+2} is sharply curved upward just beyond m crossvein and a prominent reddish brown bulla is present in upper basal portion of cell 2nd M_2 ; also 2 complete brown rays extend to margin of cell R_1 and m crossvein is oblique in position, slightly curved. According to Bezzi (1926: 309) *pulchella* differs from *bakeri* by having only 4 scutellar bristles, by having vein R_{2+3} long and straight, and the 4th costal section (between apices of veins R_1 and R_{2+3}) $2\times$ longer than the 5th (between apices of R_{2+3} and R_{4+5}). *R. bakeri* has 6 scutellar bristles, vein R_{2+3} is slightly wavy and the 4th costal section is about $1/3$ longer than 5th (fig. 120b). Another feature which is probably characteristic of *bakeri* (this has not been checked on *pulchella*) is the presence of a small dark brown to black spot in middle of face and a very prominent protuberance in upper median portion of face, directly beneath antennae. Bezzi (1926: 310, pl. 18, fig. 1) indicates that there are dark spots between the fuscous rays along anterior margin of wing. None of the specimens I have seen have these spots; in their place are white streaks between the prominent rays. Three pairs of inferior fronto-orbitals, the upper pair very broad, flat, leaf-like with longitudinal striations and yellow-brown in color. Third antennal segment about $5\times$ longer than wide, gently curved on upper portion and drawn into a long slender point, as in fig. 120a. Face with a prominent keel on upper median portion beneath antennae and as seen from lateral view with a narrow, rather deep, concavity on lower portion above epistoma. Epistomal margin projecting. Thorax predominantly dark brown to black in ground color, densely gray pollinose, completely obscuring the ground color. When the thorax is wet with 70% alcohol the scutellum is largely yellow, the posteromedian portion of scutellum is yellow and the narrow yellow line extends down middle to anterior margin; also a narrow line of yellow extends along each side from inner postalar bristle to suture. Humeri, notopleura and most of pleura yellow in ground color with a streak of brown across hind portion of each mesopleuron, and with brown over sternopleuron, pteropleuron, metapleuron, and hypopleuron. Postscutellum and metanotum dark brown to black. Legs yellow, hind femora with 2 brown bands; the basal band is less distinct than the preapical. Wing venation and markings as in fig. 120b. The m crossvein is distinctly oblique and slightly curved. Abdomen densely gray pollinose, obscuring ground color. The color

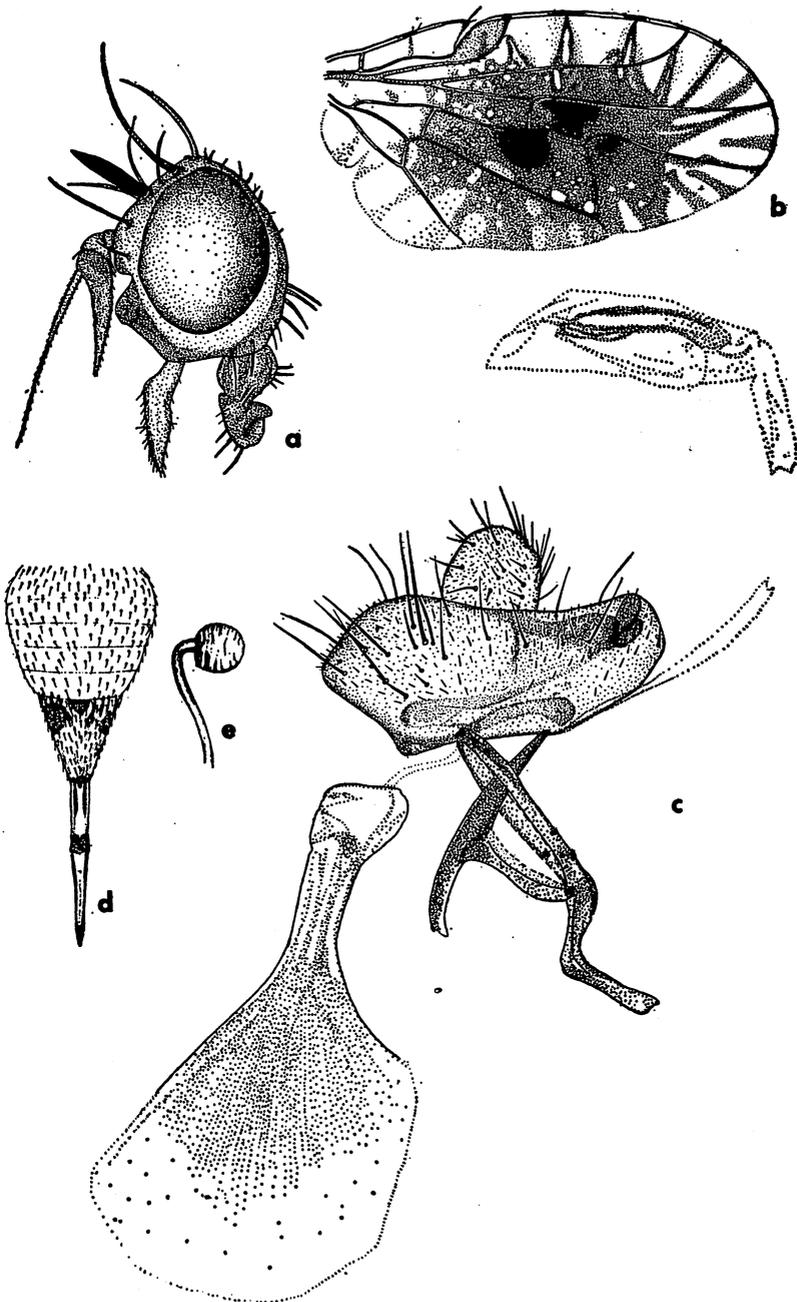


Fig. 120. *Rhabdochaeta bakeri* Bezzi: a. head, lateral; b. wing; c. ♂ genitalia; d. ♀ abdomen, dorsal; e. spermatheca.

markings appear somewhat variable in the ♂, with terga predominantly yellow, tinged with brown and with 5th tergum mostly brown to black, yellow around apex and extreme lateral margins and with a yellow-red line down middle; with posterior 1/3 to 1/4 of 5th tergum polished. The ♀ abdomen is mostly yellow in ground color with brown marks on sides of terga. The 6th tergum is approximately equal in length to 5th. The ♀ ovipositor is yellow except for extreme base which is brown. As seen from dorsal view the visible portion is almost as long as terga 5-6. Fifth sternum of ♂ about as wide as long with deep V-shaped concavity in middle of hind margin, extending approximately 1/2 length of segment. Male genitalia as in fig. 120c, with surstyli tapered to a point and not completely covering 10th sternum as seen in direct lateral view. As seen from end view apices of lobes of 10th sternum are flat, leaf-like. Measured on the venter the base of ♀ ovipositor is 0.8 mm. The piercer is rather slender, sharp-pointed and measures 0.7 mm (fig. 120d). The extended ovipositor measures 2.25 mm. Two spermathecae present; these are brown with short straight necks (fig. 120e). Length: body and wings, 2.5-3.0 mm.

This species is probably widespread over the Philippines. About 2 dozen specimens are on hand from several localities on Luzon and Palawan; also it was recorded in the Noona Dan Expedition report from Tawitawi.

Rhabdochaeta brachycera Hardy, new species Fig. 121a-b.

This species fits near *convergens*, n. sp. in a complex which is characterized by having 3rd antennal segment short, not extended into a long slender point at apex. In this regard both of these species would appear to be near *venusta* de Meijere from Java. In the original of *venusta* de Meijere stated 3rd antennal segment "eiformig, in eine kurze, scharfe Spitze verlängert" indicating that the segment is short but extended into a short sharp point at apex. *R. brachycera* is readily differentiated from any other known *Rhabdochaeta* by having 1 narrow and 1 broad brown band through cell R_1 ; having apex of cell R_5 hyaline, except for 2 broad brown bands which extend along apices of veins R_{4+5} and M_{1+2} and converge in cell R_6 well beyond a level with apex of vein R_{3+4} (fig. 121a). Also as in *convergens* the upper inferior fronto-orbital bristles are not flat, leaf-like.

♂. *Head*: With 4 pairs of inferior fronto-orbital bristles, the upper 2 pairs are strongest and are brownish yellow, the lower bristles are yellow-white. No interfrontal bristles or prominent setae present. Head entirely yellow except for reddish brown eyes and for a dark brown to black mark over upper median portion of occiput. Antennae and mouthparts entirely yellow. Third antennal segment about 1/2 longer than wide and slightly pointed at upper apex (fig. 121b). Arista short pubescent. Face gently concave. I see no evidence of a median carina on upper portion in specimen at hand. Palpi distinctly shorter, less conspicuous than in most *Rhabdochaeta* and lacking short, flat, scale-like seta on dorsal and ventral margins but instead having scattered pale setae along dorsal margin and with scattered black and yellow setae around apex. *Thorax*: Predominantly black in ground color, densely gray pollinose, completely obscuring ground color. Scutellum yellow on broad apical margin. Humeri, notopleural callus, and basal suture yellow, also propleura yellow in ground color. Two pairs of strong, yellow, dorsocentral bristles, the anterior pair situated just slightly behind suture. Two pairs of scutellar bristles plus a basal white seta on each side at base. The scutellars are brownish yellow, the apical pair are 1/2 to 2/5 as long as subbasal pair. Halteres rufous. *Legs*: Each front femur with about 6 short, thick, spine-like setae on posteroventral surface just before apex. This is the only known species of the

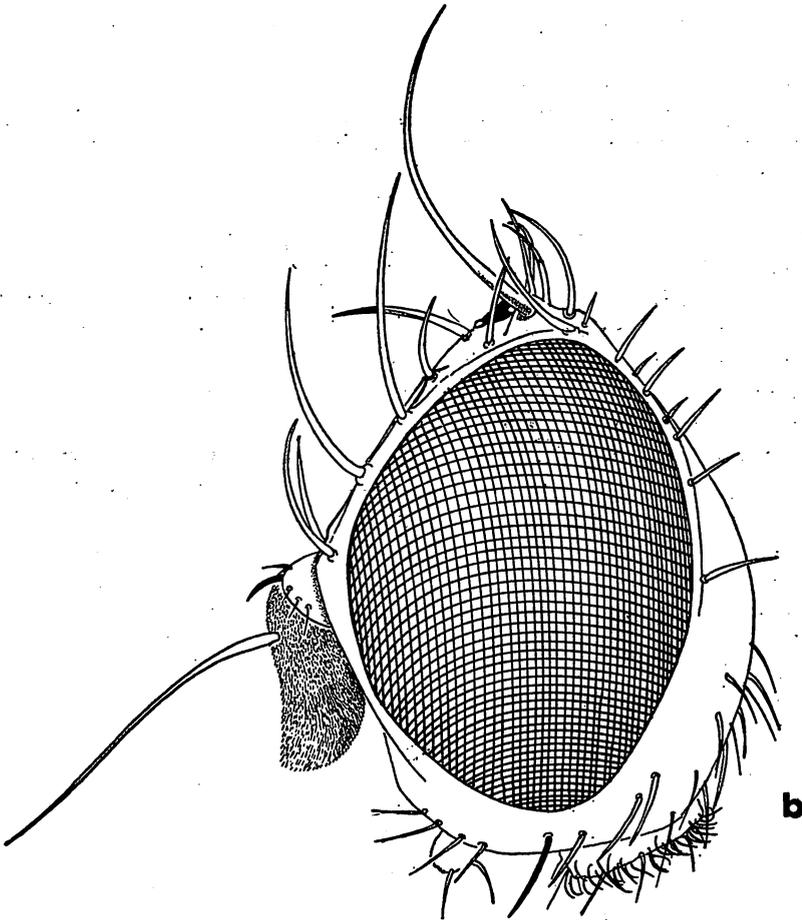
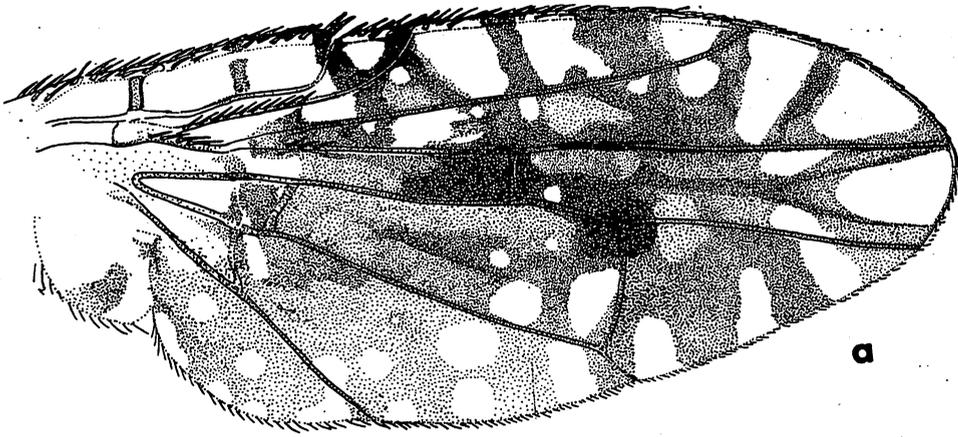


Fig. 121. *Rhabdochaeta brachycera*, n. sp.: a. wing; b. head, lateral.

the genus which has these black setae. Also with 5 white bristles along anteroventral surface of each front femur just dorsad of ventral bristle row. No distinguishable brown bands present on middle or hind femora on specimen at hand. *Wings*: With markings and venation as in fig. 121a. The brown markings very dark and prominent, with a short brown streak through middle of 2nd costal cell. Basal and apical portions of subcostal cell brown. One narrow and 1 broad brown band in cell R_1 , 1 brown band in middle of cell R_3 , and a pair of broad converging brown bands in apex of cell R_5 . Cell 2nd M_2 has 3 oblong hyaline spots along wing margin, cell 1st M_2 has 2 hyaline spots. Three rufous bullae are present in median portion of wing. Vein R_{4+5} is straight or nearly so, not at all bent downward beyond m crossvein. Vein R_{4+5} with scattered setae on basal portion to about r-m crossvein. *Abdomen*: Predominantly black in ground color, tinged with rufous on sides of first 2 terga. The genitalia have not been dissected for study.

Length: body and wings, 2.5-2.6 mm.

♀. Unknown.

Holotype ♀ (BISHOP 10150), Abatan, Buguias, 60 km S of Bontoc, Mt. Prov., Luzon, 1800-2000 m, 15.VI.1964, H. M. Torrevillas.

Type returned to the B. P. Bishop Museum.

***Rhabdochaeta convergens* Hardy, new species** Fig. 122a-f; pl. 5, fig. 42.

Fitting near *brachycera*, n. sp. because of the short 3rd antennal segment, the shorter palpi, lacking the flat black scale-like setae along dorsal and ventral margins which are present in other known species of *Rhabdochaeta*; by having upper inferior fronto-orbital bristles normal in shape, not flat leaf-like as in most other species of this genus; and by the presence of a row of about 6 short, black spines before apex on posteroventral surface of each hind femur. It should be noted that *venusta* de Meijere from Java may possibly have a short 3rd antennal segment but from de Meijere's description and figure it differs distinctly from the species on hand by having the upper inferior fronto-orbital bristle flat, lanceolate in shape, and by having very different wing markings. The long converging lines to apical portion of cell R_5 (pl. 5, fig. 42), and the more extensive brown pattern through the middle of wing would immediately differentiate *convergens* (compare with fig. 18, pl. 57, de Meijere 1914). *R. convergens* differs from *brachycera* by having 2 narrow brown bands extending to cell R_1 and 2 long narrow bands extending longitudinally through apex of R_5 , converging at a level with tip of vein R_{2+3} ; also by having the short interrupted streak of brown present in apex of cell R_5 .

♀. *Head*: Higher than long and with face gently concave as seen from direct lateral view, with a weak carina extended down upper median portion. Four pairs of inferior fronto-orbital bristles, the upper 2 pairs are strongest and are yellow-brown. No interfrontal bristles or setae present. Third antennal segment scarcely 1/2 longer than wide, very slightly pointed at upper apex (fig. 122a). Arista short pubescent. Palpi small, rather inconspicuous, with scattered yellow and black setae around margins; the black setae are more numerous around apex. *Thorax*: Predominantly black in ground color, densely gray pollinose. Humeri and notopleural calli yellow, tinged with brown. Propleura brownish yellow in ground color and margin of scutellum yellow. Except for the yellow-white sternopleural and pteropleural bristles, the major thoracic bristles are yellow, tinged with brown. Two pairs dorsocentral bristles, anterior pairs situated just behind suture. Four pairs scutellar bristles present. *Legs*: Yellow except for discolorations of brown on ventral portions of middle and hind femora. Each front femur with a row of 6 or 7 short, black, posteroventral spinules just before apex and with about 5 yellow-brown bristles scattered along posteroventral surface dorsad of short spinules. *Wings*: As in pl. 5, fig. 42. With a short interrupted brown streak in middle of subcostal cell, 2 complete brown streaks through each of

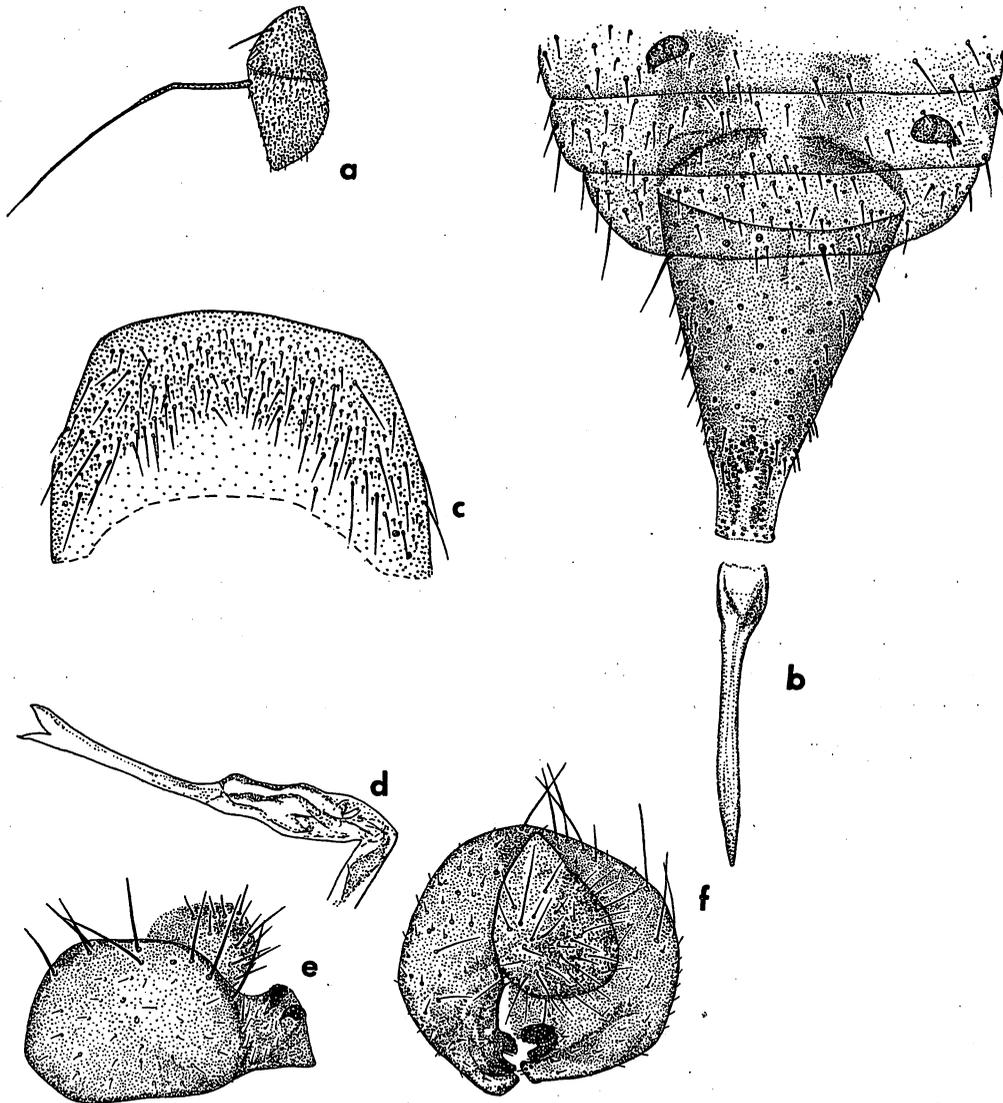


Fig. 122. *Rhabdochaeta convergens*, n. sp.: a. antenna; b. ♀ ovipositor; c. 5th sternum of ♂; d. apex of aedeagus; e. ♂ genitalia, lateral; f. ♂ genitalia, end view.

cells R_1 and R_3 with 2 converging lines in apical portion of R_3 , and an incomplete apical brown streak in R_3 . Also with 3 hyaline streaks in apex of 2nd M_2 extending approximately halfway through cell and brown median marking rather extensive. Vein M_{1+2} just slightly curved upward beyond m crossvein and a rufous bulla present in upper basal portion of cell 2nd M_2 . Also a rufous bulla in upper apical portion of 1st M_2 , 1 in upper basal portion of cell 2nd R_3 and with 3 dark brown spots in median portion of wing. Cubital cell with a distinct but short lobe at lower apical portion. Vein R_{4+5} with numerous setae scattered on ventral surface between base and r-m crossvein and with a few scattered setae on dorsal surface. *Abdomen*: Predominantly yellow and

usually with some discolorations of brown in submedian area on each side of terga 3-6. The 6th tergum is approximately equal in length to 5th. Basal segment of ovipositor polished black, as seen from dorsal view approximately equal to terga 5+6. The bristles at apex of 6th tergum are entirely white. Measured on venter the basal segment is 0.75 mm. The piercer is broad at extreme base, narrowed gradually to a sharp point at apex (fig. 122b) with no preapical setae present; the piercer is 0.63 mm long. The inversion membrane has not been extended but the full length of ovipositor would probably measure 1.9 mm. Two spermathecae present; these are broad at base, gradually narrowed to apex, flattened on 1 side and with a short thick neck.

Length: body, excluding ovipositor, 2.6 mm; wings, 3.0 mm.

♂. Fitting description of ♀ in most respects. The abdomen of the allotype is greased, the basal and posterior portions appear entirely dark brown to black in ground color. In the paratype the 1st tergum is discolored with brown, terga 2 and 3 are entirely yellow, except for a faint brown line along extreme lateral margins; the 4th tergum has a pair of rather large submedian brown spots and extreme lateral margins brown, and 5th tergum is entirely brown except for rather broad yellow apex and narrow yellow lateral margins. Fifth sternum about 2× longer than wide and a broadly U-shaped concavity in middle of hind margin extending approximately 1/2 length of segment (fig. 122c). Male genitalia as in fig. 122d-f, with epandrium broad. The surstyli are short, flattened, curved under. The black apical protuberances on 10th sternum are plainly visible from direct lateral view (fig. 122e). In end view the genitalia are as in fig. 122f.

Holotype ♀ (BISHOP 10151), allotype ♂ and 3 paratypes (2 ♂♂, 1 ♀) from Abatan, Buguias, 60 km S Bontoc, Mt. Prov., Luzon, 1800-2000 m, 16-18.IV.1964, in light trap, H. M. Torrevillas. Also 1 ♀ paratype, Banahao, Luzon, VII.1914, no collector given, in Frey collection, Helsinki.

Type returned to the B. P. Bishop Museum. One paratype returned to the University Zoological Museum, Helsinki and 2 retained in the University of Hawaii collection.

***Rhabdochaeta dorsosetosa* Hardy Fig. 123a-b.**

Rhabdochaeta dorsosetosa Hardy, 1970, *Ent. Meddel.* **38**: 110, fig. 17a-b. Type-locality: Mantalingajan, Pinigasan, Palawan. Type ♂ in University Zoological Museum, Copenhagen.

This species fits in the group which has narrow brown streaks extending through cell R_1 ; cell R_3 with 2 brown streaks through median portion; only a faint incomplete mark of brown in apex of cell R_5 ; vein M_{1+2} not curved strongly upward beyond m crossvein; and no bulla present in base of cell 2nd M_3 . It shows close relationship to *parva*, n. sp. from Luzon and differs by having the abdomen of ♂ brown on sides, yellow down median portion with 5th tergum equal in size to terga 3+4 and yellow down median area, lateral margins and at apex and with a small shining brown preapical mark on each side; by having 1st hyaline mark through cell R_5 beyond vein R_{2+3} extending into cell R_5 and 2nd hyaline mark continuous through R_5 to vein M_{1+2} ; no round bulla present in cell R_5 and no rufous bulla in cell 1st M_3 ; also 3rd antennal segment more elongate as in fig. 123a. The ♀ abdomen differs by being yellow down middle and on sides with 6th tergum yellow except for a crescent-shaped shining black mark in middle; also basal segment of ovipositor yellow. For a detailed description refer to the original. The wings are as in fig. 123b. The genitalia have not been dissected for study. Length: body and wings 2.0 mm.

Known only from Palawan.

***Rhabdochaeta melanura* Bezzi Fig. 124.**

Rhabdochaeta melanura Bezzi, 1926, *Spolia Zeylanica* **13**: 311, fig. 2. Type-locality: Baguio, Benguet, Luzon. Lectotype ♂ in Museo Civico di Storia Naturale, Milano.

This species fits near *bakeri* Bezzi by having the dark rays through anterior portion

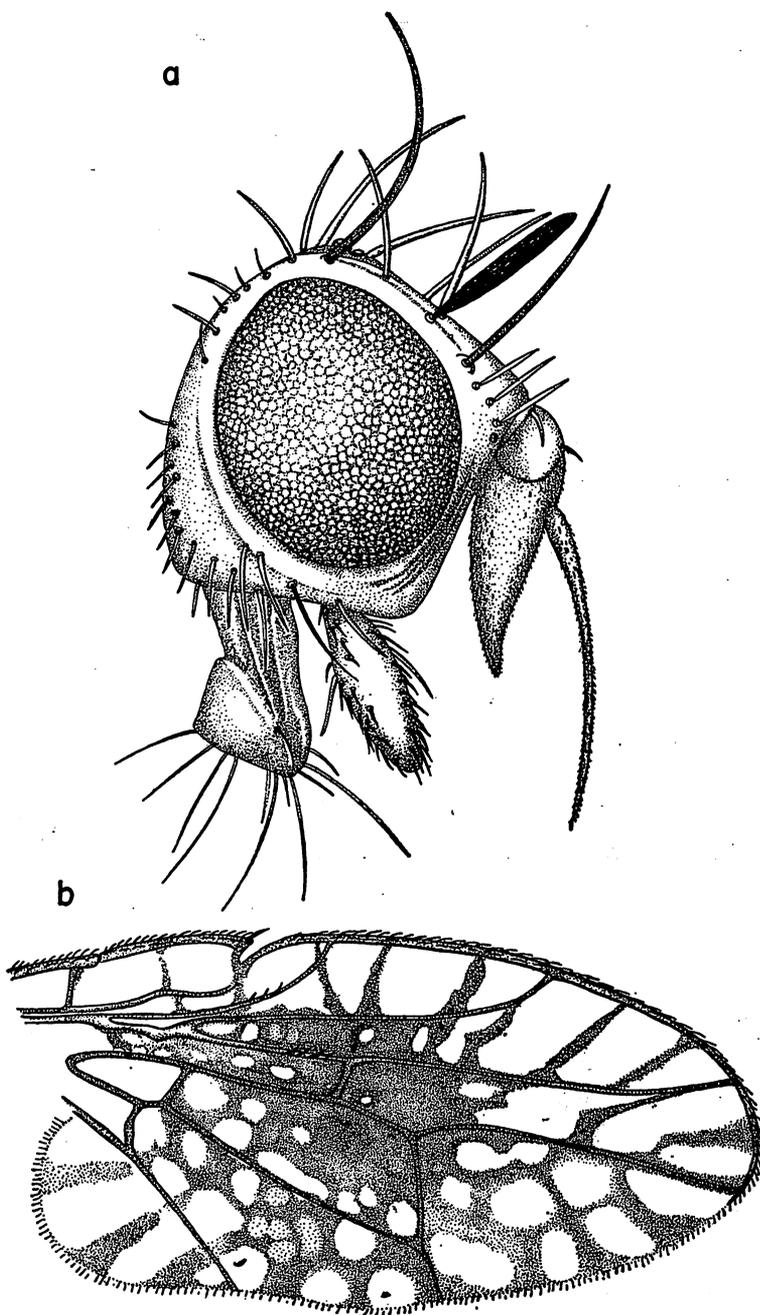


Fig. 123. *Rhabdochaeta dorsosetosa* Hardy: a. head, lateral; b. wing.

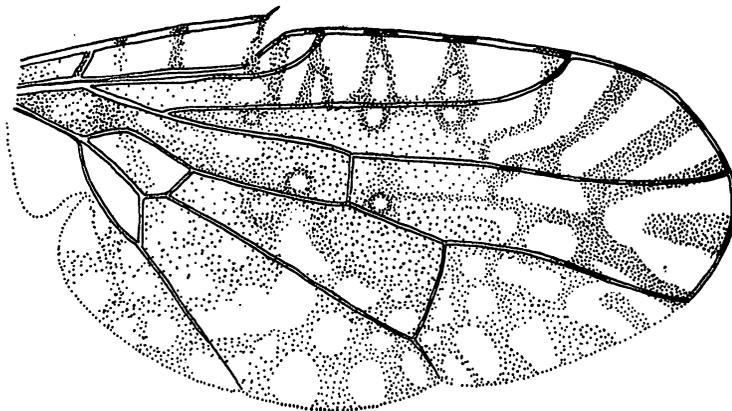


Fig. 124. *Rhabdochaeta melanura* Bezzi: wing.

of wing broad with a white streak through middle, bordered by 2 brown lines (fig. 124), only 2 pairs of dorsocentral bristles, and with 6 scutellar bristles. It differs from *bakeri* by having vein M_{1+2} straight, or nearly so, not noticeably curved upward beyond m crossvein and m crossvein straight, transverse in position. Also by having no rufous bulla in upper base of cell 2nd M_2 ; 4th costal section about equal in length to 5th; an eye-like spot (a white spot surrounded by brown) present near base of cell 2nd R_5 beyond r-m crossvein; the rays through cell R_3 brown; and cell 2nd M_2 with diffuse spots (fig. 124), rather than with complete streaks of brown extending to margin (fig. 120b). For a more complete description refer to the original.

I have not seen specimens other than the type series and it is presently known only from Luzon and Basilan.

***Rhabdochaeta multilineata* Hering** Fig. 125

Rhabdochaeta multilineata Hering, 1941, *Arb. Morph. Taxon. Ent. Berl.* 8(1): 44, fig. 14. Type-locality: Flores, Lesser Sunda Islands. The type ♀ was deposited in the Zoological Museum, Halle am Salle, D.D.R.

I have previously recorded this (Hardy 1973) from Pahang, Malaya, reared from *Wedelia biflora* flowers and from Balabac Island, Southwest Philippines.

This species fits in the complex which has narrow brown streaks extending to costa along anterior margin. It shows relationship to *asteria* Hendel but differs by having 2 brown rays extending to middle of cell R_3 , rather than 1; a distinct isolated streak of brown present in apex of cell R_3 , rather than having a faint indication of a brown streak in this area; by differences in wing pattern, i.e., no isolated hyaline spot present in basal portion of subcostal cell, as found in *asteria*; and with 2 small white spots in cell R_3 , just beyond r-m crossvein, rather than 1. Also the specimens which have been observed differ by having only 3 shining red bullae in middle of wing, not 5; and by having a pair of black cruciate setae situated at apex of scutellum immediately below the pair of white apicomedian bristles, these setae and also the prominent subbasal pair of white setae are not present in *asteria*. The femora are entirely yellow in specimens of *multilineata* which have been observed; in *asteria* each femur has a dark preapical ring. Hering made no mention of this character. Otherwise fitting description of *asteria*. The wing marking and venation are as in fig. 125. The abdomen is brown down sides, broadly yellow medianly; 5th tergum brown

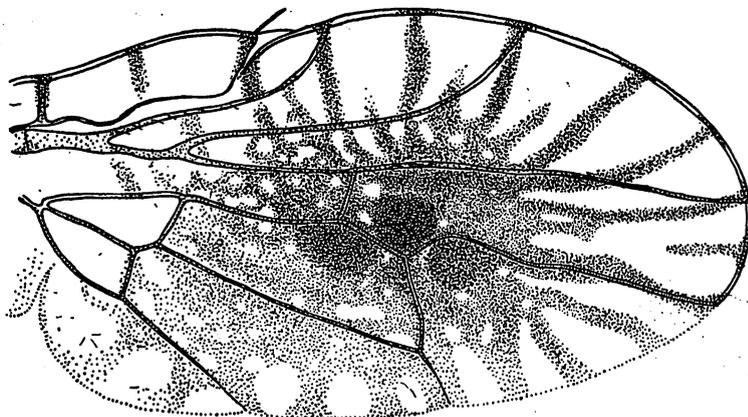


Fig. 125. *Rhabdochaeta multilinta* Hering: wing.

except for yellow apicomedian portion and narrow hind margin. Sterna yellow. Fifth sternum of ♂ about 1/2 longer than wide, hind margin straight; the sclerite is almost devoid of setae except for a few along hind margin. Surstyli rather short, gradually tapered from epandrium, subacutely pointed at apices, not completely covering apex of 10th sternum as seen from lateral view. Aedeagus not expanded at apex and ejaculatory apodeme greatly expanded distally, fan-shaped. Female with first 2 terga brown except for extreme lateral margins. Terga 3, 4, and 5 with a brown vitta extending down each side. The 6th tergum yellow, approximately equal in length to 5th. Ovipositor yellow, as seen from above, basal segment about equal to terga 4-6. Measured on venter the basal segment is 0.8 mm in length. Piercer slender, sharp-pointed at apex, 0.65 mm in length. The extended ovipositor measures 2.2 mm. Two oblong spermathecae present. Length: body, 2.0 mm; wings, 2.4 mm.

In the Philippines it is known only from Balabac Island.

***Rhabdochaeta parva* Hardy, new species** Fig. 126a-c; pl. 5, fig. 43.

Fitting in the complex of species which is characterized by having thin brown streaks extending to costa along anterior margin of wing (pl. 5, fig. 43), and at least 1 pair of presutural dorsocentral bristles. It fits near *dorsosetosa* Hardy from Palawan, but differs by having abdominal terga 2-4 in the ♂, and 2-5 in the ♀ yellow to rufous, sometimes tinged with brown along anterior margins with 5th tergum of ♂ very large, about equal in length to remainder of abdomen and polished black. Sixth tergum of ♀ about equal in length to terga 3-5 and polished black, except for lateral margins and narrow apex. Sixth tergum with yellow bristles on hind margin except for 1 black bristle on each side. Basal segment of ovipositor broadly brown at base, narrowly so at apex. Wings with the hyaline marks extending through cell R_{4+5} and with rather distinct isolated spots in basal portion of cell R_5 . With a brown bulla in base of cell 2nd R_5 beyond r-m crossvein and a rufous bulla present in cell 1st M_2 , and other markings as in pl. 5, fig. 43. Also the antennae are distinctive in shape; they are shorter than those of *dorsosetosa*.

♂. Very small species, the smallest known from Southeast Asia. *Head*: Upper median portion of face produced into a small carina below antennae and epistomal margin rather prominent.

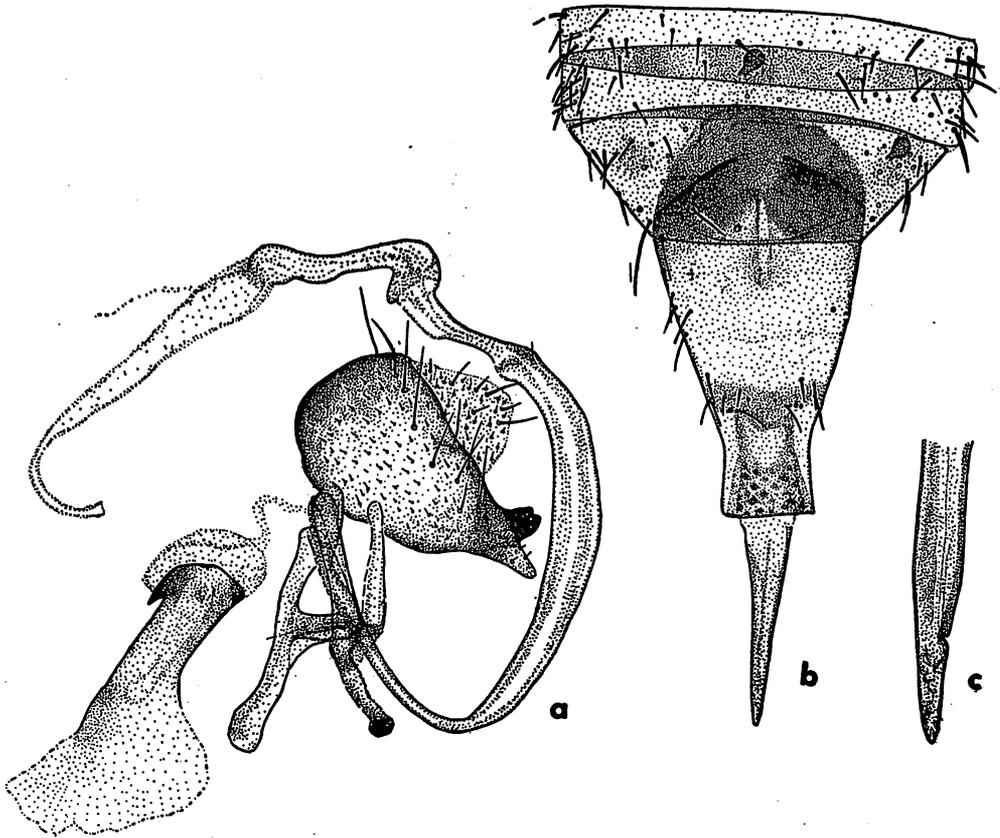


Fig. 126. *Rhabdochaeta parva*, n. sp.: a. ♂ genitalia; b. ♀ ovipositor; c. piercer.

Three pairs inferior fronto-orbital bristles present, the upper pair flat, leaf-like. Third antennal segment tapered to a sharp point at apex, not as long and as drawn out as in most species of *Rhabdochaeta*. **Thorax:** Densely gray pollinose, predominantly brown in background of mesonotum, yellow on humeri, notopleura, scutellum and upper portions of pleura. Six distinct pairs of dorsocentral bristles present, 1 pair presutural in position, and a secondary pair of erect, small, white bristles, or large setae, situated in dorsocentral line immediately in front of suture. The scutellum has a pair of strong subbasal brownish yellow bristles, a pair of basal short white bristles, or enlarged setae, a pair of dorsoapical, moderately strong white bristles and a pair of apical white bristles; the latter are about 3/4 as long as dorsoapical bristles. **Legs:** Predominantly yellow with a faint preapical brown spot on posterior and posteroventral surface of each front femur. Middle and hind femora each with 2 brown bands, 1 preapical and 1 subbasal, and middle and hind tibiae each with a subbasal band of brown. Front femora each with 1 brown and about 4 yellow-white anteroventral bristles. **Wings:** With venation and markings as in pl. 5, fig. 43. Subcostal cell very short, hyaline except for a narrow brown mark at base. Second costal cell with a narrow brown streak through median portion. Cells R_1 and R_3 each with 2 narrow brown streaks through median portions. Cell R_5 with an incomplete, rather faint streak of brown at apex. The 4th costal section, between apices of veins R_1 and R_{2+3} , about equal in length to 5th section, between apices of veins R_{2+3} and R_{4+5} . Vein R_{4+5} with several scattered setae, both on

dorsal and ventral surfaces, from base to r-m crossvein. Cell R_5 has 3 round, isolated, hyaline spots beyond level of m crossvein and cell 2nd M_2 has an irregular grouping of brown hyaline spots. *Abdomen*: The details are as given above in the introduction. With a pair of dorsomedian white bristles at each apex of terga 2-5. Male genitalia as in fig. 126a. Predominantly yellow, brown over dorsal portion of epandrium. Surstyli sharp-pointed as seen from direct lateral view and with the thick black projections at apices of 10th sternum clearly visible from lateral view. As seen from end view the apices of surstyli are greatly flattened dorsoventrally.

Length: body and wings, 1.75 mm.

♀. Fitting description of ♂ except for differences in development of abdominal terga, with 6th tergum equal in length to terga 4+5 and in some specimens 3-5 and yellow on sides with a large shining black spot in middle. Terga 2-6 each with a pair of median bristles at apex. Base of ovipositor, as seen from above, about equal to or slightly shorter than 6th tergum. Basal segment of ovipositor broadly dark brown on base, narrow at apex and as seen from ventral view approximately 0.6 mm in length. Piercer tapered to a sharp point at apex (fig. 126c), short, about 0.4 mm long. Extended ovipositor (fig. 127b) about 1.5 mm. Two spermathecae; these are dark brown, gourd-shaped, wrinkled, with long necks.

Holotype ♂ (BISHOP 10152), and allotype ♀, Abatan, Buguias, 60 km S of Bontoc, Mt. Prov., Luzon, 1800-2000 m, 18-19.VI.1964, in light trap, H. M. Torrevillas. Thirty-three paratypes (18 ♂♂, 15 ♀♀), mostly same locality and data as type, some from Ifugao, Mayoyao, Mt. Prov., Luzon, 1000-1500 m, 7-9.VII.1966, H. M. Torrevillas; and Manila, Luzon, II. and XI.1914, no collector given.

Type, allotype, and a series of paratypes in the B. P. Bishop Museum. Other paratypes in the collections of the U. S. National Museum, British Museum (Natural History), University Zoological Museum, Helsinki, and the University of Hawaii.

SUBFAMILY TEPHRITINAE

As used here this group is differentiated by having the occipital row of bristles or strong setae flattened, rather scale-like, yellow-white or white; postocellar, outer vertical and upper superior fronto-orbital bristles (if present) white or yellow-white; mesonotum densely covered with flat, scale-like, white or yellow-white, recumbent setae; 6th tergum of ♀ longer than the 5th; apex of cubital cell acutely pointed, to short lobate, but not extended into a prominent apical lobe; vertical suture over mesonotum rudimentary or lacking, not plainly marked; arista short pubescent or bare; and wings variously marked as in fig. 131a, 132a, 135b, 136a and 143.

KEY TO TRIBES AND GENERA OF PHILIPPINE TEPHRITINAE

1. Wings dark brown with large hyaline marks, usually wedge-shaped, on anterior and posterior margins and only a few hyaline spots in middle of wing (fig. 131a). Body shining black, gray pollinose on thorax and with abdomen polished, very lightly dusted. Only basal scutellars present.**Tephrellini**..... 2
 - Not as above, abdomen opaque, densely pollinose, wings differently marked. Usually 4 scutellars.3
- 2(1). Proboscis rather elongate, geniculate. Dorsocentral bristles situated at or near suture. Wings as in fig. 131a. **Spathulina** Rondani
 - Proboscis short, broad, not geniculate. Dorsocentals situated distinctly behind suture.**Tephrella** Bezzi
- 3(1). Four scutellar bristles.4

- Only the basal scutellars present.10
- 4(3). Vein R_{4+5} bare above or with not more than 2-3 setae at extreme base, wings normal in shape. Usually only 2 inferior fronto-orbitals.**Tephritini**.....5
 Vein R_{4+5} setose above at least halfway to r-m crossvein. Front of head rounded, not angulate at bases of antennae. Wings as in fig. 129 and 138a, very broad and rounded in *Platensina*. Three pairs of inferior fronto-orbital bristles present.13
- 5(4). Wings long and narrow, nearly parallel-sided, about 3× longer than wide and brown with numerous subhyaline spots and pale along posterior margin (fig. 136a).
**Elaphromyia** Bigot
 Wings normal in shape and not marked as above.6
- 6(5). Proboscis long and slender, conspicuously geniculate, with labellum slender and almost equal in length to oral opening. Head longest on lower margin (fig. 137a).8
 Proboscis comparatively short, not so conspicuously extended; labellum short, fleshy, about 1/2 as long as oral opening. Lower margin of head not extended.7
- 7(6). Apical scutellars large, equal in size to basal bristles. Anterior dorsocentral bristles situated distinctly before suture. Wing markings as in fig. 139e. Aedeagus of ♂ with a dense patch of dorsal setae, before swollen apical portion (fig. 139a).
**Scedella** Munro
 Apical scutellars less than 1/2 as long as basal bristles. Anterior dorsocentrals situated on suture. An apical fork usually present in wing pattern.**Tephritis** Latreille
- 8(7). Wings conspicuously marked with brown (fig. 140). Head as high as long. Two pairs superior fronto-orbital bristles.9
 Wings nearly clear, only faint tinges of brown (fig. 137d). Head distinctly longer than high (fig. 137a). Only 1 pair of superior fronto-orbitals.**Ensiina** Robineau-Desvoidy
- 9(8). Front bare in middle. Lacking ventral bristles on hind femora. Wings brown with numerous white spots, no continuous brown and hyaline bands across wings and with 3 hyaline spots in cell R_1 (fig. 141f). Dorsocentral bristles situated at or near suture.
**Stylia** Robineau-Desvoidy
 Frons with numerous scale-like hairs in middle. With 2-4 anteroventral bristles before apex of hind femur. Wings with a continuous brown band through area occupied by r-m and m crossveins and a complete hyaline band just beyond (fig. 140). Dorsocentrals approximately in line with supraalars.**Sphenella** Robineau-Desvoidy
- 10(3). Wings very broad, about 2× longer than wide, broadest at m crossvein; dark brown, with rather few hyalines spots and with R_{4+5} setose above.**Platensinini**
**Platensina** Enderlein [*zodiacalis* (Bezzi)]
 Wings normal in shape, rather slender, predominantly hyaline (fig. 132a, 135b, 144a).**Tephritini**.....11
- 11(10). Proboscis short, labella fleshy, much shorter than head. Epistoma not strongly produced and lower margin of head not longer than upper. Dorsocentrals situated at or near suture. Wings with prominent brown markings.12
 Proboscis long, slender, geniculate; labella as long as lower margin of head. Epistoma produced, so head is longer on lower margin than on upper (fig. 134c). Dorsocentrals near a line between supraalars. Wings hyaline, with numerous, somewhat diffused brownish spots (fig. 135b).**Diioxyna** Frey
- 12(11). Cell Cu pointed. Two pairs superior fronto-orbital and 3 pairs inferior fronto-orbital bristles. Basal 1/2 to 3/5 of wings hyaline (fig. 142a, 143, 144a).**Trupanea** Schrank
 Apical margin of cubital cell straight or nearly so, only a slight point to cell. One pair superior fronto-orbitals and 2 pairs inferior fronto-orbitals. Wings with scattered

- brown marks basad of r-m crossvein (fig. 132a, 133a).**Actinoptera** Rondani
- 13(4). Wings very broad, scarcely over 2× wider than long, widest at level of m crossvein and with comparatively few hyaline spots (fig. 128b, 129). Apical scutellar bristles less than 1/2 as long as basal.**Platensinini**.....**Platensina** Enderlein
- Wings normal in shape, nearly 3× longer than wide, widest at level of r-m crossvein and with 3 prominent hyaline streaks through cell 2nd M₂ (fig. 138a). Apical scutellars as long as basal.**Tephritini**.....**Pliomelaena** Bezzi

TRIBE PLATENSININI

Characterized by the very broad, rounded wings which are mostly dark brown with white spots (fig. 129); having vein R₄₊₅ setose above for most of its length and the front margin of head rounded, not angulate at antennal bases.

Only the genus *Platensina* Enderlein has been recorded from the Philippines.

Genus **Platensina** Enderlein

Platensina Enderlein, 1911, *Zool. Jahrb., Syst.* **31**: 454. Type-species: *sumbana* Enderlein, by original designation. Type ♀ in Zoological Museum, Warsaw.

Tephrostola Bezzi, 1913, *Mem. Indian Mus.* **3**: 153. Type-species: *Trypeta acrostacta* Wiedemann, by original designation. Lectotype ♂ in University Zoological Museum, Copenhagen.

This genus is readily differentiated from other Tephritinae by the very broad, rounded wing, approximately 2×, or less, longer than wide; dark brown, typically with prominent hyaline marks around the margin and a few scattered spots in the field (fig. 127a, 128b and 129); 2 prominent costal spines present; cubital cell acutely pointed at apex, developed into a short lobe; vein R₄₊₅ with scattered setae extending over most of its length; typically with 3 pairs inferior fronto-orbitals and 2 pairs superior fronto-orbital bristles; arista pubescent; and ♀ with 2 spermathecae, each rather elongate, usually pointed apically and typically spiny; ovipositor curved downward, slender, sharp-pointed but lacking preapical setae; inversion membrane of ♀ (8th segment) densely covered with coarse spines.

KEY TO KNOWN SPECIES OF PLATENSINA FROM THE PHILIPPINES

1. Four scutellar bristles present.2
 Only the basal scutellars present. Wings as in fig. 130d.**zodiacalis** (Bezzi)
2. With conspicuous white markings around wing margin and usually in field (fig. 127a, 128b).3
 Wings brown, with small, pale brown, spots scattered mostly through field (fig. 129); wing very broad, almost oval, less than 1/2 longer than wide.**bezzii**, n. sp.
3. With hyaline spots in field of wing and brown spots in costal cells. Cell Sc entirely dark brown.4
 No hyaline spots in field. Costal cells and basal 2/3 of Sc hyaline (fig. 127a).**amita**, n. sp.
4. With 2 large hyaline spots in base of cell R₁ and numerous small white spots over field and around margins.n. sp. (poor condition)
 Only 1 spot at base of cell R₁, 1 spot in field (2nd R₅) and 3-4 other spots on margin (fig. 128b).**aptata**, n. sp.

Platensina amita Hardy, new species Fig. 127a-b.

This species differs from all known *Platensina* by having the costal cells completely hyaline and the subcostal cell predominantly so. Because of the lack of hyaline spots over the field of the wing it somewhat resembles *extincta* Hering from Sumba, Indonesia but the 2 species obviously are not related. The arrangement of the hyaline marks in cell R₁ is distinctive, as in fig. 127a, and the frontal bristles are also distinctive; only 1 pair of prominent inferior fronto-orbitals is developed; in other *Platensina* 3 pairs of prominent inferior fronto-orbitals are present.

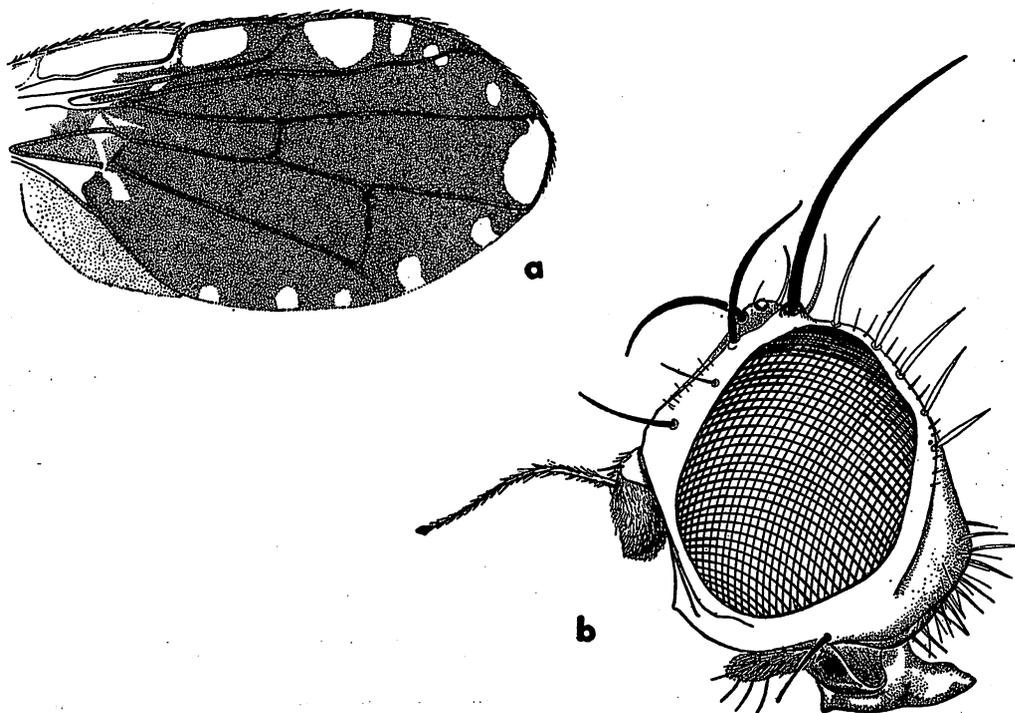


Fig. 127. *Platensina amita*, n. sp.: a. wing; b. head, lateral.

♂. *Head* (fig. 127b): Yellow, except for a tinge of brown in ground color of upper median occiput and front. Slightly higher than long with the face short, concave, with shallow antennal furrows and weakly raised down median portion. Occiput moderately swollen, at its widest point almost 1/2 the width of compound eye. Eyes almost oval. Front broad, 1/2 wider than long, measured from median ocellus to frontal suture, and almost equal in width to compound eye. Lower sides of front, the face and genae gray pollinose. One prominent inferior fronto-orbital present, approximately equal in size to genal bristles, plus 1 small brown bristle on left side of front of the type situated approximately halfway between the prominent inferior fronto-orbital and lower superior fronto-orbital; on the right side of the front of the type the secondary rudimentary bristle is missing; this is also missing on the paratype specimen. The front has numerous fine, yellow setae scattered over median and lateral portions, 2 of these in the area between inferior fronto-orbitals and superior fronto-orbitals are longer than the other setae and represent rudimentary

bristles. Upper superior fronto-orbital bristles pale yellow-brown. Ocellar bristles well developed. Palpi pale yellow, with scattered short black setae around upper margin. Antennae yellow, tinged with rufous; 3rd segment short, rounded, about 1/2 longer than wide. Arista short pubescent. *Thorax*: Brown to black in ground color, densely gray pollinose, with a faint tinge of brown on each side at suture in line with dorsocentrals and thickly covered with flat, yellow, scale-like setae. Dorsocentral bristles situated slightly in front of a line drawn between supraalars. Apical scutellars cruciate, rather small, approximately 2/3 as long as basal bristles. Knobs of halteres tinged with brown. *Legs*: Entirely yellow, thickly covered with recumbent black setae, except for the front femora which are densely covered with erect brown hairs over dorsal surfaces, and front tibiae with erect hairs over posterior surfaces. *Wings*: Venation and markings as in fig. 127a. Vein R_{4+5} with scattered setae extending well beyond m crossvein. *Abdomen*: Polished black in ground color, rather lightly gray pollinose and thickly covered with black setae. The genitalia have not been dissected for study.

Length: body, 4.5 mm; wings, 4.75 mm long by 2.5 mm wide.

♀. Unknown.

Holotype ♂ (BISHOP 10153), Mt Santo Tomas, near Baguio, Luzon, 2196 m (7200 ft), 27.XII.1952, H. M. & D. Townes. One ♂ paratype, Oak Forest, Mt Data, Luzon, 2379 m (7800 ft), 31.XII.1952, H. M. & D. Townes.

Type returned to the B. P. Bishop Museum. Paratype in the University of Hawaii collection.

***Platensina aptata* Hardy, new species** Fig. 128a-d.

This species is readily differentiated from other known *Platensina* by having only 1 prominent white mark in base of cell R_1 , only 1 large brown spot in middle of wing in cell R_5 , and only 1 white spot in each of cells 2nd M_3 and M_4 (fig. 128b).

♀. *Head*: Similar in shape and other features to other *Platensina*, slightly higher than long with face gently concave and front approximately as long as wide and bearing 3 pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals, with lower inferior fronto-orbitals white and rather flattened. *Thorax*: Brown to black in ground color of dorsum, densely covered with gray-brown pollen, yellow on pleura, humeri and notopleural calli. Dorsocentral bristles situated slightly in front of a line between supraalars. Apical scutellars cruciate, approximately 2/5 to 1/2 as long as basal bristles. *Legs*: Entirely yellow. *Wing*: Markings and venation as in fig. 128b. *Abdomen*: Yellow-brown at base, otherwise polished black, lightly brown pollinose and thickly black setose. Sixth tergum 2/3 to 3/4 as long as 5th. Basal segment of ovipositor shining black, as seen from dorsal view about equal in length to terga 4-6. Measured on venter the basal segment is 1.1 mm long. Piercer slender, tapered to a sharp point, slightly curved upward, lacking preapical setae (fig. 128d) and approximately 1.0 mm in length. Inversion membrane (segment 8) thickly covered with strong spines. Extended ovipositor (fig. 128a) 3.0 mm. Two elongate, smooth spermathecae present in the 5th abdominal segment (fig. 128c).

Length: body, excluding ovipositor, 4.25 mm; wings, 4.7 mm long by 2.35 mm wide.

♂. Unknown.

Holotype ♀ (BISHOP 10154), Dalton Pass, Nueva Vizcaya, Luzon, 915 m, 9-10.IV. 1968, M. D. Delfinado. One ♀ paratype, Los Banos, Laguna, Luzon, 23.II.1953, Townes family.

Type in the B. P. Bishop Museum. Paratype in the University of Hawaii collection.

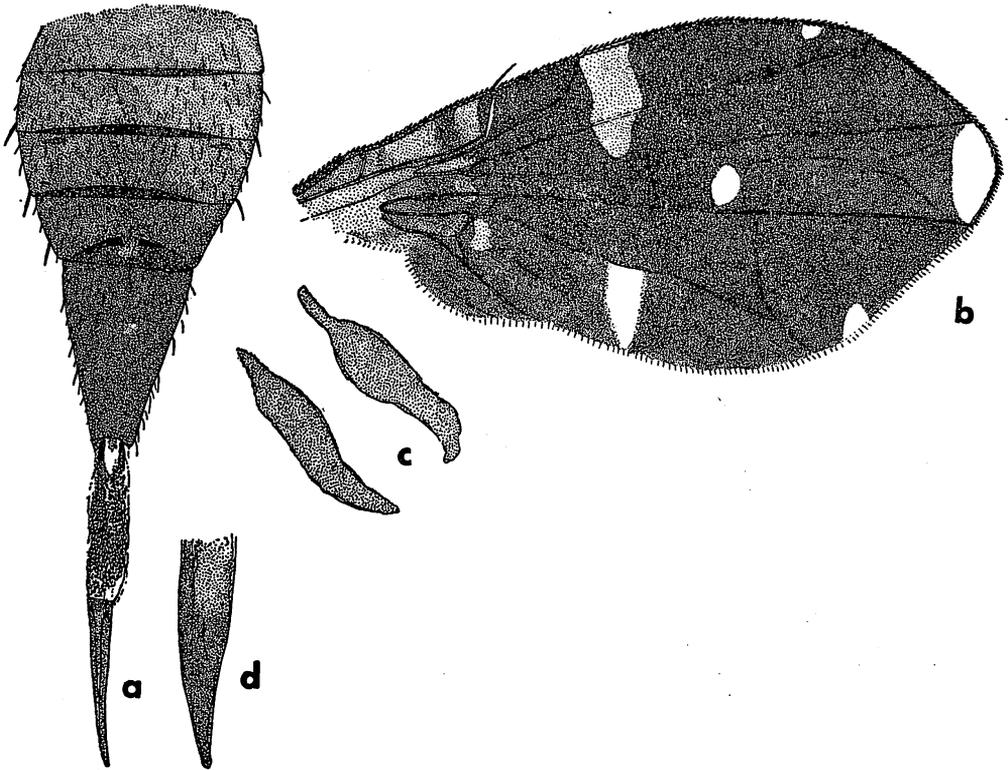


Fig. 128. *Platensina aptata*, n. sp.: a. ♀ abdomen, dorsal; b. wing; c. spermathecae; d. apex of pierce r.

***Platensina bezzii* Hardy, new species** Fig. 129.

This species is somewhat similar to *ampliipennis* (Walker) but differs by lacking white spots on margin or in field of wing (fig. 129). All spots are pale brown, not strongly contrasting from dark brown color of wing membrane and apex of wing entirely dark brown, not with a hyaline spot occupying apex of cell R_5 . This is obviously the species which was recorded by Bezzi (1913a: 66) as *ampliipennis* from the Philippines.

♂. *Head*: Predominantly yellow, fitting the description of most *Platensina* with the 3 pairs of inferior fronto-orbitals brown, lightly tinged with yellow and with upper superior fronto-orbitals yellow-white. *Thorax*: Mostly black in ground color of dorsum, yellow on pleura, humeri and notopleura; densely gray pollinose, the pollinosity almost completely obscuring ground color. Scutellum brown to black on disc, broadly yellow on sides and venter. Postscutellum and metanotum dark brown to black, covered with gray pollen or pubescence. Upper mesopleural bristle yellow-brown, pteropleural, sternopleural, and the bristle on notopleural callus yellow-white. Other thoracic bristles yellow, tinged with brown. Dorsocentrals slightly in front of supraalars and apical scutellars cruciate, about 2,5 as long as basal bristles. *Legs*: Yellow, front femora with 2 strong, yellow-brown, posteroventral bristles in about middle of segment. *Wings*: Very broad and round, scarcely over 1/2 longer than wide, almost completely dark brown, subhyaline at extreme

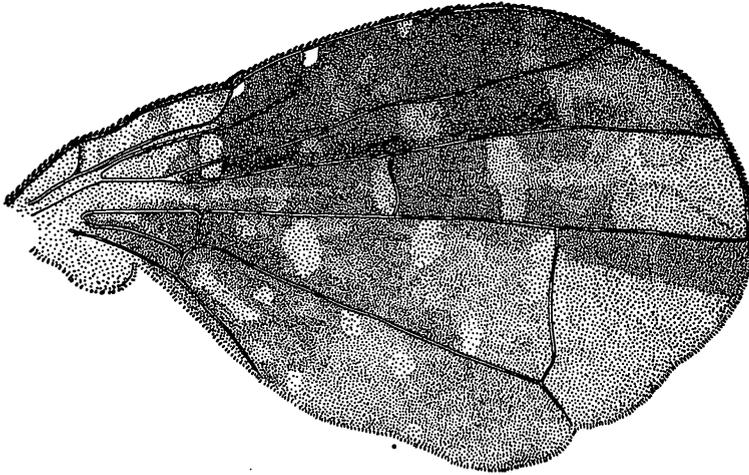


Fig. 129. *Platensina bezzii*, n. sp.: wing.

base and with scattered pale brown spots on anterior margin and through wing field; apical portion entirely brown. Crossvein r-m situated near middle of 1st M_2 (fig. 129). *Abdomen*: Shining black, black setose. The genitalia have not been dissected for study. The sterna and visible genitalia are rufous.

Length: body, 4.0 mm; wings, 4.0 mm long by 3.3 mm wide.

♀. Unknown.

Holotype ♂, Mt Makiling, Luzon, no date given, #2008, Baker, from the Bezzi collection, Milano. One ♂ paratype, Lanao, Luzon, VII.1914, no collector given, (from the Frey collection, Helsinki).

Type returned to the Museo Civico di Storia Naturale, Milano, Italy. Paratype returned to the University Zoological Museum, Helsinki.

***Platensina zodiacalis* (Bezzi) Fig. 130a-d.**

Tephritis zodiacalis Bezzi, 1913, *Mem. Indian Mus.* 3: 163, pl. 10, fig. 65. Type-locality: Calcutta, India. Type ♀ in Zoological Survey of Indian collection. I have studied the type.

The species has been recorded from over India, Ceylon, Nepal (Hardy 1964: 153), Malaya, and Thailand (Hardy 1973: 309).

This species is readily differentiated from other known *Platensina* by having only 2 scutellar bristles, only basal scutellars are present. In other regards it is very similar to *malaita* Curran from the Solomon Islands and Bismarck Archipelago. Also note 1 ♀ specimen on hand from Queensland, Australia fits here, except that the white spot at tip of cell R_5 does not fill entire apex of cell; this is probably a variable character. The species has been adequately described by Bezzi although he misplaced it under *Tephritis* and should have treated it in his genus *Tephrostola* (equal synonym of *Platensina*). Also it has been redescribed by Hardy (1964: 153, fig. 10, 11). Wings as in fig. 130d. The 5th sternum of the ♂ is broadened apically and concave on posterior margin. The ♂ genitalia are as in fig. 130a-b, the surstyli are very broad, equal in width to epandrium and the aedeagus is scarcely enlarged at apex. Female ovipositor as in fig. 130c; very similar to

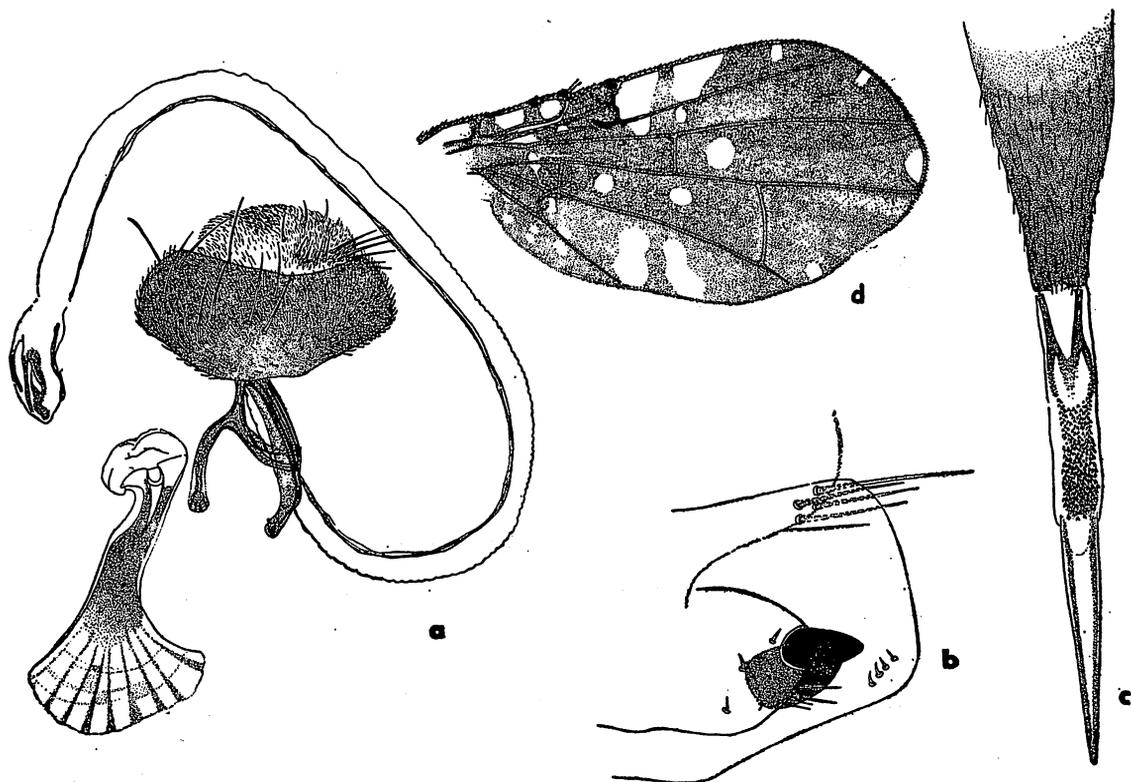


Fig. 130. *Platensina zodiacalis* (Bezzi): a. ♂ genitalia; b. surstylus and 10th sternum of ♂; c. ♀ ovipositor; d. wing.

those other *Platensina*. Two oblong spermathecae; these are very spiny under high power.

This species has been seen from the following localities on Luzon: Mayoyao, Ifugao, Mountain Province, 1200-1500 m, VIII-IX.1966, H. M. Torre Villas; Batan, Buguias, 60 km S of Bontoc, Mountain Province, 1800-2000 m, 28.IV.1964, H. M. Torre Villas; Limay, Bataan, no date, McGregor; Manila, XI.1914, no collector given; Mindoro: Mangarin, XI.1917, no collector.

***Platensina* new species?**

Two specimens on hand from the Philippines fit near *intacta* Hardy from Thailand, but differ by lacking the hyaline spot at apex of cell R_3 and by having 2 hyaline spots at wing margin at apex of cell 2nd M_3 , rather than 1. Also the spermathecae are densely spinose, rather than with very few spines. The specimens are in poor condition and will be described when further material is available.

TRIBE TEPHRELLINI

Hering (1947: 15) has treated this tribe under the subfamily Aciurinae which he differentiated on the basis of body coloration and wing markings. I do not see justification for treating Aciurinae as a subfamily and am treating Tephrellini as a tribe under

the subfamily Tephritinae on the basis of the head bristles and by having the 6th abdominal tergum of ♀ slightly longer than 5th. The only character I see which appears to be of any value in separating this group, for the genera represented in Southeast Asia, is the wing marking. The wings are predominantly dark brown with hyaline marks around margin and few hyaline spots in the field (fig. 131a); this does not seem to be a satisfactory tribal character and its proper placement requires much further study.

Two Philippine genera, *Spathulina* Rondani and *Tephrella* Bezzi, fit here.

Genus *Spathulina* Rondani

Spathulina Rondani, 1856, Dipt. Ital. Prodr. 1: 113. Type-species: *sicula* Rondani (nom. nud.), by original designation. This was not described until 1871 and has been treated as a synonym of *Tephritis tristis* Loew (1869: 23) by Hendel (1927: 117).

Members of this genus are characterized by having the wings dark brown with hyaline incisions along margin and at most 4 hyaline dots in the field; abdomen polished black; epistoma prominent, protruding; scutellum with only 2 bristles; and proboscis geniculate with spatulate labella and narrow mentum.

Spathulina acroleuca (Schiner) Fig. 131a-g.

Tephritis acroleuca Schiner, 1868, Reise Novara, Dipt. p. 268. Type-locality: Sydney, Australia. Type ♀ in Natural History Museum, Wien.

Trypeta undecimguttata Thomson, 1869, Eugen. Resa, Dipt., p. 581. Type-locality: Sydney. Type ♀ in University Zoological Museum, Copenhagen.

Oxya parca Bezzi, 1913, Mem. Indian Mus. 3: 159, pl. 10, fig. 62. Type-locality: Calcutta, India. Syntypes (♂-♀) in Zoological Survey of India.

Oxya nigrifemorata de Meijere, 1914, Tijds. Ent. 57: 220. Type-locality: Java. Type ♀ in Zoological Museum, Amsterdam.

Distribution: Widespread throughout Africa and Asia, extending to Australia through much of the Pacific, Bonin Islands, Japan, Formosa, Ryukyus, Indonesia, Solomon Islands, New Guinea, New Caledonia, Philippines, Fiji, and Micronesia.

Hosts: Breeds in flowerheads of various Compositae. In the Philippines it has been reared from *Tithonia diversifolia*, at La Trinidad, Luzon.

This species is differentiated from other Tephrellini in the Philippines by the wing markings (fig. 131a): the wing is predominantly dark brown with extreme base hyaline; with 4 hyaline spots on anterior margin, 5 on posterior margin, 1 at apex, and 2 spots in middle of wing. The hyaline spots are typically arranged as follows: 1 occupying apex of 2nd costal cell; 3 rather evenly spaced through cell R_1 ; a large spot filling or almost filling entire apex of cell R_5 , extending as a small preapical spot through R_3 ; 2 spots in 2nd M_3 ; 3 spots in M_4 ; 1 spot in 1st R_1 extending over into 1st M_3 ; and 1 spot in R_5 beyond r-m crossvein (fig. 131a-b). In the large series of specimens which have been studied considerable variation has been noted in the development of the spots; in a few specimens the 3rd spot is missing in cell R_1 ; in some an isolated hyaline spot is present in apex of cell R_3 , and in some the spots vary considerably in size. In a few specimens the brown mark at extreme lower apex of cell R_5 is missing so that the hyaline mark is continuous through apices of cells R_5 and lower 1/2 of R_3 . The ♂ genitalia and characteristics of the ovipositor are as in fig. 131c-g.

A large series of specimens have been seen from many localities on Luzon, Negros,

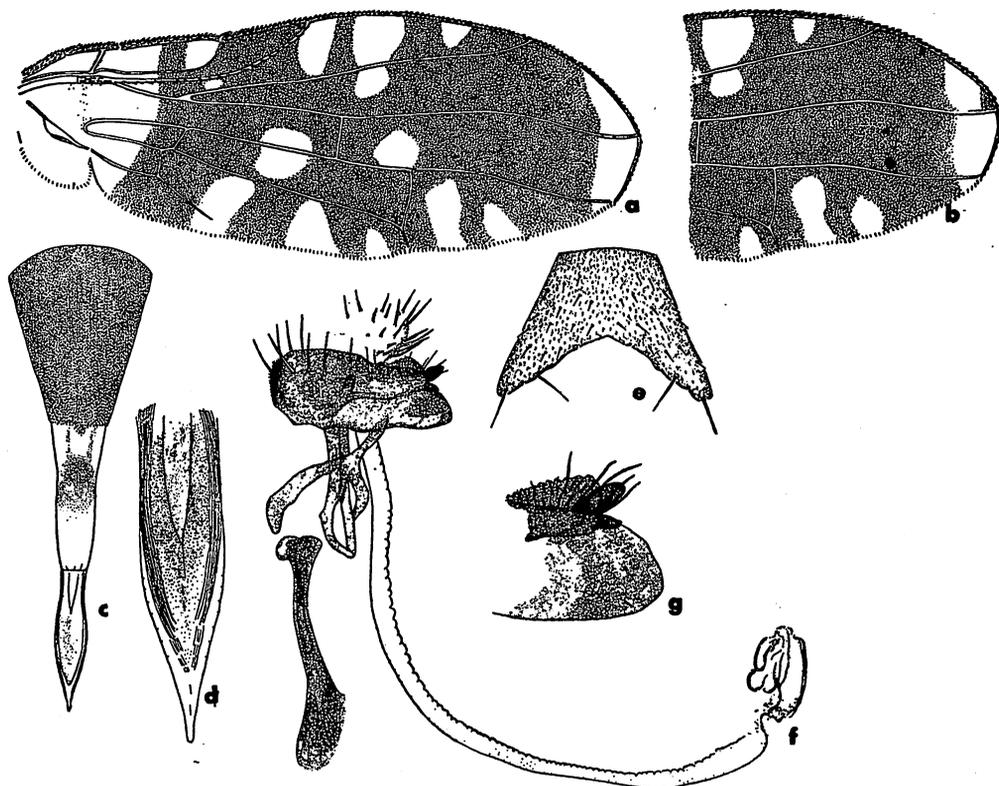


Fig. 131. *Spathulina acroleuca* (Schiner): a. wing; b. apical 1/2 of wing, variation; c. ♀ ovipositor; d. apex of piercer; e. 5th sternum of ♂; f. ♂ genitalia; g. apex of surstylus and 10th sternum of ♂.

Palawan and Mindanao.

Genus *Tephrella* Bezzi

Tephrella Bezzi, 1913, *Mem. Indian Mus.* 3: 151. Type-species: *decipiens* Bezzi, by original designation.

This fits near *Spathulina* Rondani and is differentiated by lacking a white mark at apex of wing, the wings about 2× longer than wide and the 6th tergum of the ♀ not longer than the 5th. It superficially resembles *Sphaeniscus* Becker but has only 2 scutellars and fits in Tephrellini rather than Aciurini.

It is close to *Hendrella* Munro and there is some question of the reliability of the characters used to differentiate these. Munro (1938b: 118) separated them by the following characters: *Tephrella* — arista bare; frons pubescent; 3 strong, brown inferior fronto-orbitals and 2 strong, brown superior fronto-orbitals; dorsocentrals nearer anterior supra-alars than to suture; and vein R_{4+5} setose at base. *Hendrella* — arista pubescent; frons bare; 2 strong, brown inferior fronto-orbitals, rarely an additional white one in front and 1 brown and 1 white superior fronto-orbitals; dorsocentrals nearer suture; and R_{4+5} bare ("setulose at base in *basalis*").

Bezzi (1913a) said this "genus is one of those which link the two tribes Ceratitinae and Trypanininae." Hering, in his personal card file has it marked "Aciurini and Tephrellini."

Tephrella new species?

Two ♂ specimens, in poor condition, are on hand from Ifugao, Mt. Province, Liwo, 8 km E Mayoyao, Luzon, 1000-1300 m, 7.VI.1967, H. M. Torrevillas. These seem to fit near *heringi* Hardy from Mussau by lacking hyaline marks in cell R_5 , but it differs by having only 2 white marks in cell R_1 , only 3 marks in cell 2nd M_2 , etc.

The 2 specimens have been returned to the B. P. Bishop Museum.

TRIBE TEPHRITINI

This tribe is differentiated by having the abdomen densely gray pollinose, obscuring the ground color; vein R_{4+5} bare or with just a few setae at extreme base; and wings normal in shape with markings as in fig. 132a, 133a, 136a, 137d, 140 and 143.

Genus *Actinoptera* Rondani

Actinoptera Rondani, 1871, *Bull. Soc. Ent. Ital.* **3**: 162. Type-species: *Tephritis discoides* Fallén, by subsequent designation (Hendel 1927: 161).

Members of this group are differentiated from other Tephritini which have only 2 scutellar bristles by having only 1 pair of superior fronto-orbital bristles; the apical margin of cubital cell straight or nearly so, with just a slight point on lower apex of cell; wings largely brown with numerous hyaline spots as in fig. 132a and 133a. The dorso-central bristles are situated just behind suture and in the known species from Southeast Asia 2 pairs of inferior fronto-orbital bristles are present. Labellum short, fleshy (fig. 133b); 3rd antennal segment short, rounded, scarcely 1/2 longer than wide. Arista short pubescent. Fifth sternum of ♂ with a broad V-shaped concavity on hind margin extending 3/5 length of segment (fig. 132b). Two small rounded spermathecae are present in the ♀.

Shiraki (1968: 88) placed *Actinoptera* in the subfamily Euribiinae because of the straight-sided apex of cubital cell, lacking a distinct lobe or point. I do not feel this is reliable and place this genus under Tephritini. It should be noted that the apical margin of the cubital cell is straight in *montana* and is slightly pointed in *formosana*.

To date 25 African and European and 11 Oriental species have been recorded. Two species occur in the Philippines.

Apparently the genus *Tephritis* Latreille does not occur in the Philippines. I have seen no specimens which fit here. The record by Elera (1895: 518), unnamed species of *Tephritis*, is probably an error.

For a review of the African *Actinoptera*, refer to Munro (1957a: 898-919).

Actinoptera formosana Shiraki Fig. 132a-c.

Actinoptera formosana Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* **8**: 447, fig. 87, pl. 13, fig. 2. Type-locality: Formosa. Syntypes (♂-♀) in the National Taiwan University collection.

This species was previously recorded only from Formosa until Hering (1938b: 55) recorded it from Burma. I have seen Hering's specimens, 1 ♂, 1 ♀, from Kambaiti, in the Natural History Museum, Stockholm; they do appear to be *formosana*. I have re-

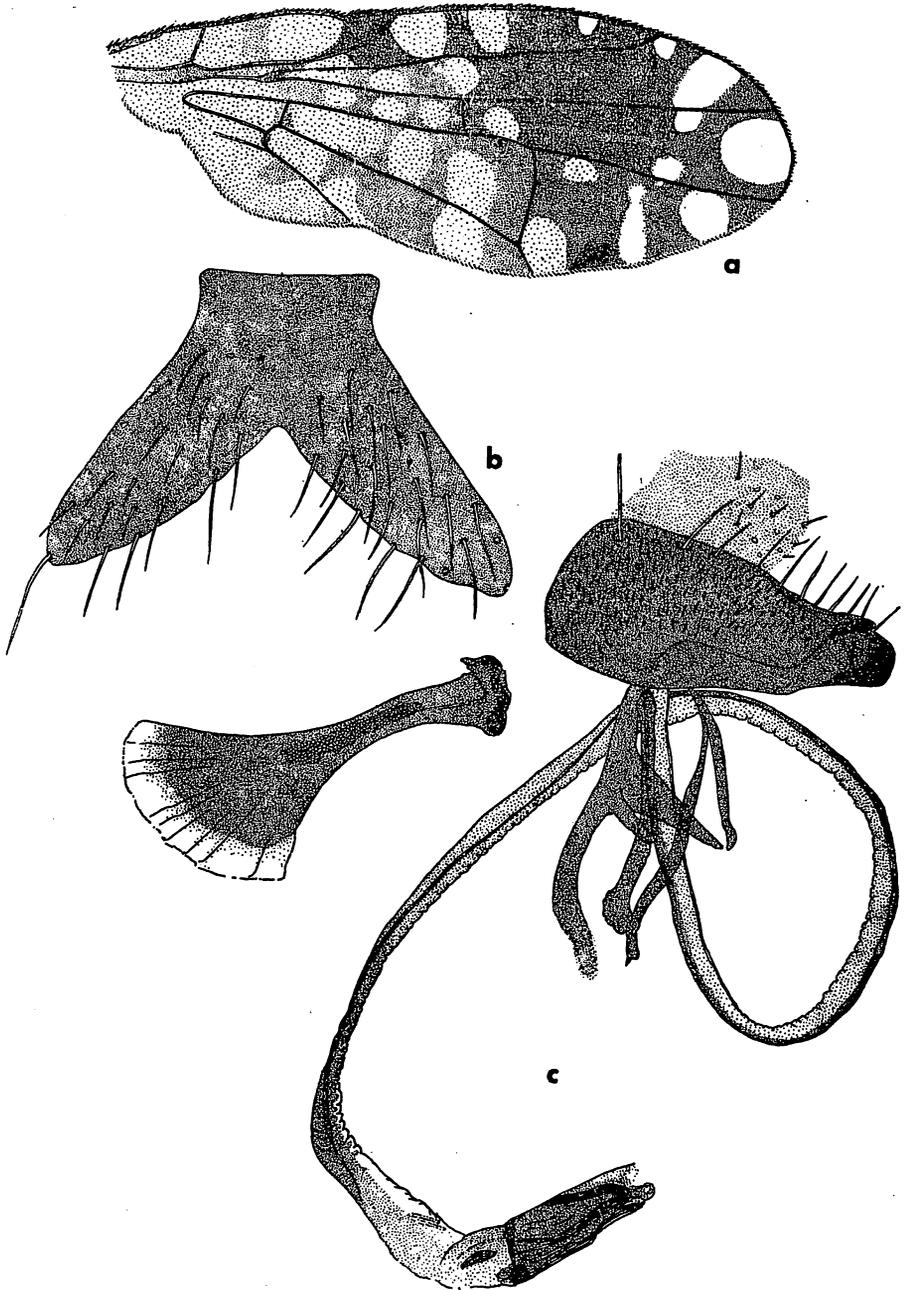


Fig. 132. *Actinoptera formosana* Shiraki: a. wing; b; 5th sternum of ♂; c. ♂ genitalia.

corded it from Nepal (Hardy 1964: 161, fig. 27-28) and also have seen specimens from Japan which appear to be this species and it is probable that it is widespread. Six specimens on hand from the Philippines appear to belong here.

This species is characterized by having 3 hyaline spots in cell R_1 and a transverse brown streak across middle of 2nd costal cell (fig. 132a); also by the predominantly yellow legs.

Mostly black in ground color with thorax and abdomen densely gray pollinose, with yellow-white scales over mesonotum and abdomen. The major head and thoracic bristles are yellow-brown; the posterior notopleural, pteropleural, sternopleural and genal bristles are yellow-white. Head yellow, tinged with rufous. Front rather broad, about as wide as long with 2 pairs inferior fronto-orbitals and 1 pair superior fronto-orbitals. The ocellars are strong, approximately equal in size to upper vertical bristles. Legs yellow, tinged faintly with brown on bases of femora, especially the hind pair and ventral margin of 2nd pair. Wings as in fig. 132a. Abdomen entirely gray pollinose, lacking brown markings on specimens which have been observed. With a row of brown to black bristles at apex of 5th tergum of σ . Fifth sternum of σ Y-shaped, with a broad V-shaped cleft on hind margin, extending $3/5$ length of segment (fig. 132b). Male genitalia as in fig. 132c. Apices of surstyli black and the black projections from tips of lobes of 10th sternum are plainly visible from direct lateral view. Length of specimens on hand: body, 3.0 mm; wings, 3.2 mm.

The ♀ has not been seen from the Philippines.

The series on hand is from Abatan, Mt. Province, Luzon, 1800-2000 m, IV-V.1964, H. M. Torrevillas, some specimens collected in light trap.

***Actinoptera montana* (de Meijere) Fig. 133a-e.**

Tephritis montana de Meijere, 1924, *Tijds. Ent.* 67: 223, fig. 3. Type-locality: Pangerango, Java. Type ♀ in the Zoological Museum, Amsterdam. I have studied the type.

A series of specimens on hand from the Philippines apparently belongs here; they fit the original description and my photograph of the type in all respects. This species is differentiated from other *Actinoptera* known from Southeast Asia by having only 2 hyaline spots in cell R_1 and having the femora predominantly black, yellow only on apices. It fits very near *trypaneoides* Shiraki from the Ryukyus and the latter may eventually prove to be synonymous with *montana*. The only difference that I see in Shiraki's description and figures is that *trypaneoides* has an extra, small, hyaline spot in cell R_2 opposite m crossvein and the hyaline marks in cell 2nd M_2 are broader, more extensive; also Shiraki says the "legs light reddish yellow, brownish pubescent, hind femora more or less blackish basally." Considerable variation in wing markings is evident in the series of specimens at hand and since Shiraki had only 1 σ specimen before him it is possible that he was dealing with a variation. It is likely that this species will be found to be widespread in Southeast Asia, the flowerhead-infesting species are still poorly known in this part of the world.

In addition to the above the head is shaped as in fig. 133b. The major head and thoracic bristles are brownish yellow, the outer vertical, postocellar, genal, posterior notopleural, and sternopleural bristles are yellow-white. Wings as in fig. 133a. Vein R_{2+3} slightly wavy. Apex of cubital cell straight, not developed into a point at lower apex. Abdomen dark brown to black in ground color, gray pollinose. Fifth sternum of σ with a deep V-shaped cleft on hind margin. Male genitalia as in fig. 133e, surstyli distinctly narrowed apically. Sixth tergum of ♀ at least $2\times$ longer than 5th. Basal segment of

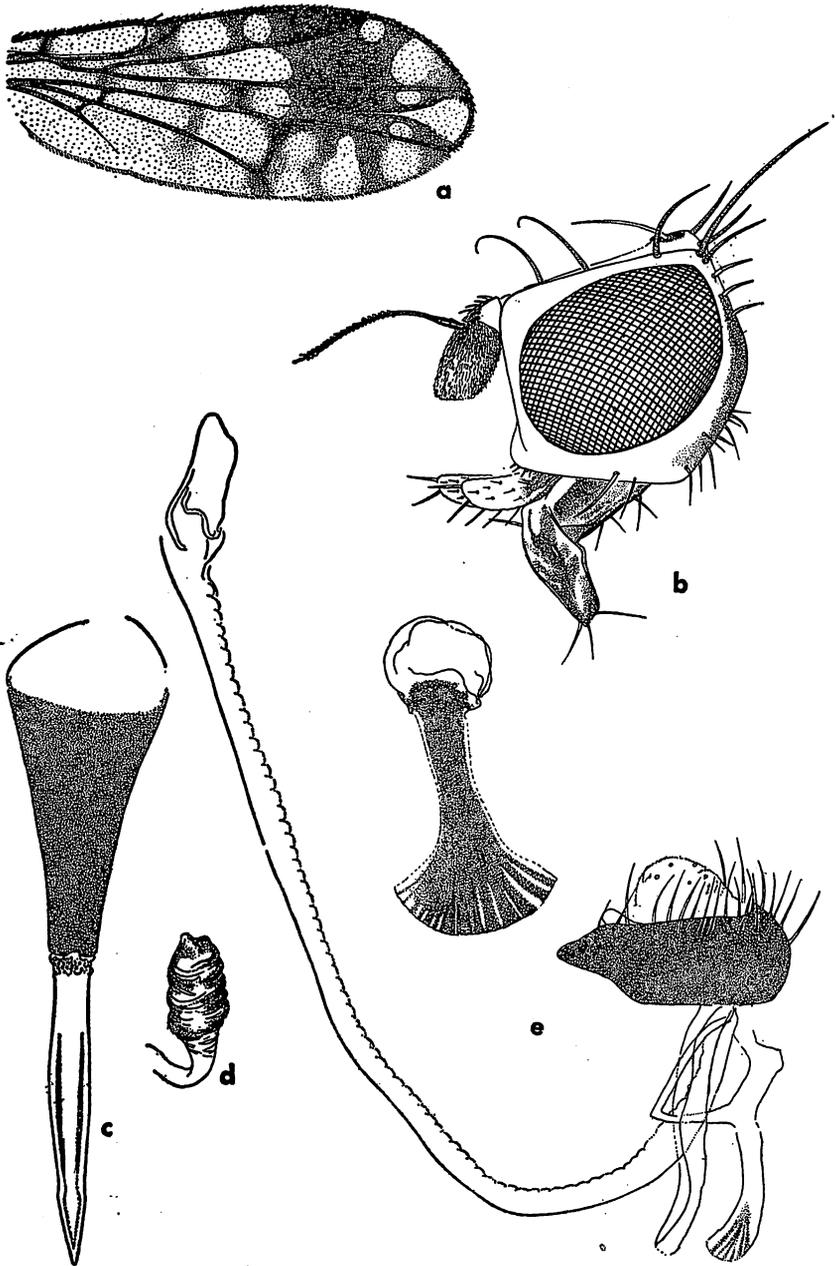


Fig. 133. *Actinoptera montana* (de Meijere): a. wing; b. head, lateral; c. ♀ ovipositor; d. spermatheca; e. ♂ genitalia.

ovipositor polished black, sharply tapered to apex and equal or slightly longer than terga 4-6. Measured on venter the basal segment is 0.8 mm. The piercer is rather abruptly tapered at apex (fig. 133c) and measures 0.75 mm. Two oblong spermathecae present, pointed on 1 end (fig. 133d). Rather small species, body, 1.75-1.9 mm; wings, 2.0-2.2 mm.

Previously known only from Java. A large series of specimens are on hand from Abatan, Mt. Prov., Luzon, 1800-2000 m, IV-V.1964, H. M. Torre Villas. Many of the specimens collected in light trap. The species is probably common throughout the Philippines.

Host: It has been reared from flowerheads of *Buchanania arborescens* Blume at Baguio, Luzon.

Genus *Dioxyna* Frey

Dioxyna Frey, 1944, *Comment. Biol.* 3(10): 62. Type-species: *Trypeta sororcula* Wiedemann, by original designation.

As pointed out by Munro (1957a: 936) this appears to be a distinct genus, differentiated from other Tephritini which have 2 scutellar bristles by the elongate head, distinctly longer than high, and by the absence of setae before apex of aedeagus. It is closely related to *Stylia* Robineau-Desvoidy (*Paroxyna* Hendel is a synonym, refer to Hardy & Adachi 1956: 21) but in that genus the head is short at least as high as long, and the aedeagus has numerous setae just before the swollen apical portion. Two spermathecae in ♀♀ in the specimens on hand; these are oval, slightly narrower on 1 end.

Five species and 2 subspecies have been placed in *Dioxyna*; 1 tropicopolitan, 2 from North America, 1 from South America, and 1 species (*conflicta* Curran) and 2 subspecies (*funalis* Hering and *gemina* Hering) from New Caledonia, New Guinea, and Indonesia. One new species is on hand from the Philippines.

***Dioxyna heringi* Hardy, new species** Fig. 134a-c; pl. 5, fig. 44.

This species is related to *conflicta* (Curran) from New Caledonia and the subspecies *gemina* (Hering) from the Lesser Sunda Islands. It differs by having the base of subcostal cell hyaline, rather than all brown; by having a continuous hyaline mark across wing beyond apex of vein R_{3+4} , rather than lacking such a mark; the brown mark near middle of cell R_1 narrow, isolated, fading out in upper cell R_3 , not extending through R_3 and connecting with brown mark over m crossvein; hyaline mark through basal portion of cells 2nd M_2 continuous into cell R_5 ; and no distinct brown mark present through median portion of cell 1st M_2 . For a key to the 3 subspecies of *conflicta* refer to Hering (1944: 8). *D. heringi* is readily differentiated from *sororcula* (Wiedemann), the only other Philippine species known in this genus, by having the costal cells entirely hyaline, only 2 brown marks in cell R_1 , and with the wing markings brown, not diffuse (refer to pl. 5, fig. 44 and fig. 135b).

♂. *Head*: Shaped as in other *Dioxyna*, elongate with the epistomal margin distinctly produced (fig. 134c). Mouthparts very elongate, each joint is considerably longer than the head. Palpi long, slender, straight-sided. Front distinctly longer than wide, gray pollinose along orbits, dull golden yellow over median portion. Upper superior fronto-orbitals, postocellars and outer vertical bristles white. Other head bristles black, except for the white occipital row. *Thorax*: Black in ground color, densely gray pollinose, no evidence of brown vittae on specimens at hand. Humeri and

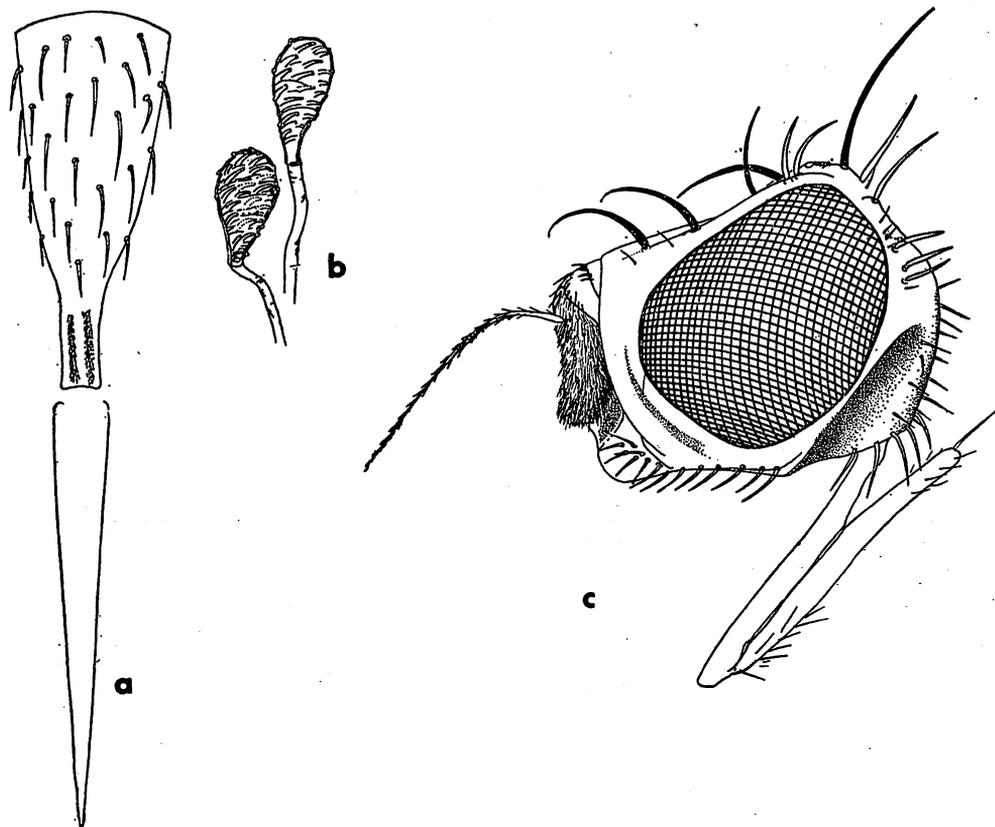


Fig. 134. *Dioxyyna heringi* n. sp.: a. ♀ ovipositor; b. spermathecae; c. head, lateral.

notopleura yellow and pleura dark brown, tinged with red in ground color. Apex of scutellum tinged with yellow in ground color. **Legs:** Yellow, except for a tinge of brown to black on basal 1/2 of each hind femur. **Wing:** As in pl. 5, fig. 44 (photograph of allotype ♀). In 1 paratype ♂ on hand from Mindanao the hyaline preapical band is not complete but is interrupted by a brown marking extending to lower portion of apical part of cell R_5 ; this may be a variable character. Vein R_{4+5} entirely bare. Two strong costal spines at end of subcostal vein. **Abdomen:** Basal portion of 1st tergum yellow to rufous in ground color. Other terga dark brown to black, tinged with yellow at apex of 5th tergum and densely covered with gray pollen except for indistinct submedian markings of brown on each of the abdominal terga. Abdomen densely covered with white scale-like setae and white marginal bristles, except for the 5th tergum which has the bristles on the apical margin dark brown to black. The genitalia have not been dissected for study.

Length: body and wings, 2.8–3.0 mm.

♀. Fitting description of the ♂. It should be noted, however, in the allotype (pl. 5, fig. 44) a small hyaline spot is present in basal portion of brown area occupying apex of cell R_5 ; this is not present on other specimen and is obviously a variable character. Also a faint indication of a connection across the preapical hyaline band through cell R_5 in the allotype; this may be variable. Basal segment of ovipositor reddish brown, elongate, approximately equal in length to remainder of abdomen, as seen from dorsal view. Inversion membrane black, tinged faintly with red and

piercer rufous. Measured on venter the basal segment is 1.4 mm long. Piercer long, slender, gradually tapered into an elongate sharp point (fig. 134a), 1.0 mm in length. Two pear-shaped spermathecae present (fig. 134b).

Holotype ♂, Mt Makiling, Luzon, Baker. Allotype ♀, Basilan, Mindanao, XII.1914 (from Frey collection). Two paratypes, 1 ♂, 1 ♀: 1, same data as allotype; 1 Bayombong, Luzon, no date or collector (from the Frey collection).

Type returned to Museo Civico di Storia Naturale, Milano, (the Bezzi collection). Allotype and 1 paratype returned to University Zoological Museum, Helsinki, 1 paratype in University of Hawaii collection.

Dioxyna sororcula (Wiedemann) Fig. 135a-b.

Trypeta sororcula Wiedemann, 1830, Aussereur. Zweifl. Ins. 2: 509. Type-locality: Teneriffe. Location of type ♂ not known.

Dioxyna sororcula: Frey, 1944, *Comment. Biol.* 8: 62.

This has also been treated in the literature under *Oxyna*, *Ensina* and *Paroxyna*.

A very common, widespread, easily recognized species characterized by having only 2 scutellar bristles, head elongate with epistoma and sides of face protruded and proboscis slender, elongate and geniculate with labella equal in length to lower margin of head (fig. 135a). The wing markings are as in fig. 135b.

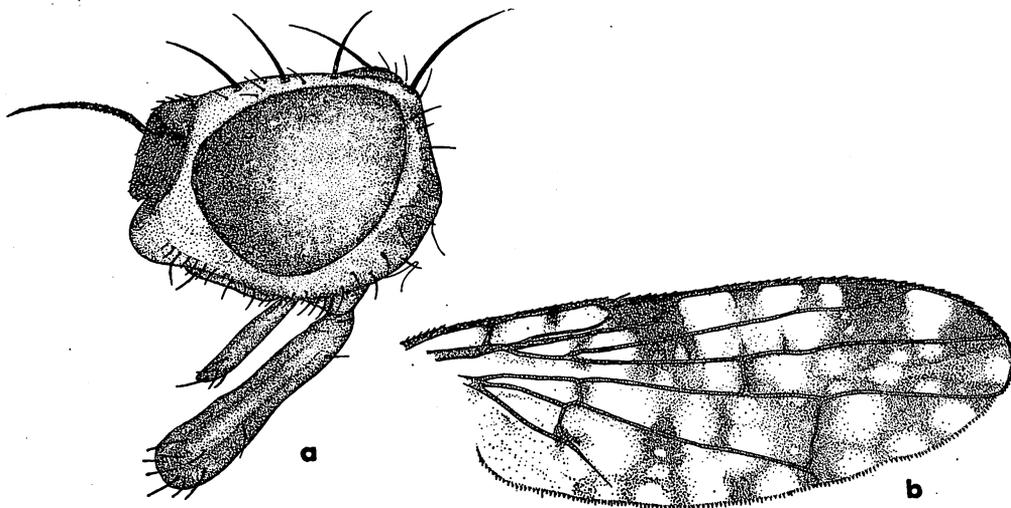


Fig. 135. *Dioxyna sororcula* (Wiedemann): a. head, lateral; b. wing.

Large numbers of specimens have been seen from many localities over Luzon, Mindanao, and Negros. It obviously is a breeder in the flowerheads of Compositae and possibly other plants. It has been bred from *Lactuca sativa* (lettuce) in the Philippines.

Genus **Elaphromyia** Bigot

Elaphromyia Bigot, 1859, *Rev. Mag. Zool.* ser. 2, 11: 314. Type-species: *melas* Bigot, by monotypy,

equals synonym of *Trypeta adatha* Walker (1849). *Trypeta ulula* Loew (1861) is also a synonym.

Paralleloptera Bezzi, 1913, *Mem. Indian Mus.* 3: 154. Type-species: *pterocallaeformis* Bezzi, by original designation.

This genus is differentiated from other Tephritinae by the long slender, parallel-sided wings, and by the wing markings (fig. 136a). The wings are approximately 3× longer than wide and are covered with numerous subhyaline spots. The dorsocentral bristles are situated in line with anterior supraalar. Scutellum with 4 bristles, the apical pair small compared to basal pair. Three pairs inferior fronto-orbitals present. Third antennal segment short, about 1/3 to 1/2 longer than wide with arista pubescent.

Shiraki (1968: 2 and 90) treated this under the subfamily Euribiinae on the basis of the apical margin of the cubital cell ("anal") supposedly being straight or convex (it is this way on the specimen illustrated by Shiraki). In the specimens at hand the cubital cell is slightly pointed at lower apex (fig. 136a). This genus best fits in Tephritini.

Seven species and 1 subspecies are presently known in this genus, 3 from Africa, 4 species and 1 subspecies from the Orient. Only 1 is known from the Philippines.

***Elaphromyia pterocallaeformis* (Bezzi) Fig. 136a-d.**

Paralleloptera pterocallaeformis Bezzi, 1913, *Mem. Indian Mus.* 3: 155, pl. 10, fig. 58. Type-locality: Simla Hills, India. Type ♀ in Zoological Survey of India collection. I have studied the type.

Distribution: Widespread through India, Southeast Asia to the Philippines and Formosa.

Munro (1935: 262) divided the species of *Elaphromyia* into 2 groups, those with black, and those with yellowish pubescence on the dorsum of thorax; *pterocallaeformis* falls in the group with the yellow pubescence. I am skeptical of the value of this character. In the series of specimens on hand from India and from the Philippines the setae on mesonotum vary considerably in coloration; in some the entire mesonotum is covered with yellow setae; in others the anteromedian portion is covered with brown to black setae and yellow setae are found on sides and along posterior margin; in still others all or most of the setae are brown to black. I also question the value of the number and size of spots in cell R₁. I find considerable variation in this character. In the series at hand the number varies from 4 to 6 hyaline marks on margin, in some specimens with 4 or 5 spots on 1 wing and as many as 6 on the other; 2 specimens have only 3 hyaline spots in R₁ (1 with 4 on 1 wing, 3 and with on the other) and fits *incompleta* Shiraki, in this regard. The spotting on the posterior terga of the abdomen, however, is like that of *pterocallaeformis*, rather than having only 2 round spots on the 5th tergum of ♂, as in *incompleta*, and I feel that these are just variations.

I believe it is probable that *Elaphromyia incompleta punctata* Shiraki (1968: 90) is a synonym of *pterocallaeformis*. The only differences I see are that the ♀ of his specimens, from the Ryukyus apparently had 2 brown spots on 4th tergum and these are absent in specimens of *pterocallaeformis* which I have examined; also the hyaline spots in cell R₁ appear slightly larger in the specimen he drew than the ones I have examined. These characters may be variable. In the Philippines this species is differentiated from all other fruit flies by the wing shape and markings as in fig. 136a. The ♂ surstyli are broad, rounded at apex, equal in width to epandrium and completely cover the 10th

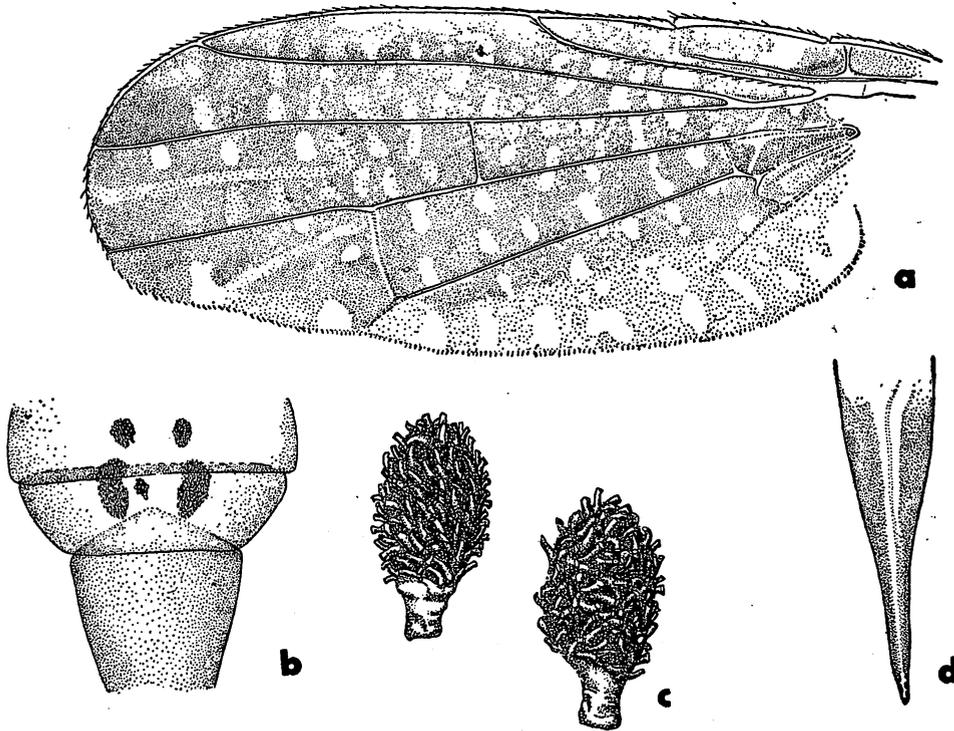


Fig. 136. *Elaphromyia pterocallaiformis* (Bezzi): a. wing; b. ♀ terga 4-5 and base of ovipositor; c. spermathecae; d. apex of piercer.

sternum. The characteristics of the ♀ ovipositor and the spermathecae are as in fig. 136b-d.

Genus *Ensina* Robineau-Desvoidy

Ensina Robineau-Desvoidy, 1830, *Mém. Près. Acad. Roy. Sci. Inst. France* 2: 751. Type-species: *Musca sonchi* Linnaeus (1767), by subsequent designation (Hendel 1914: 96).

This genus is readily differentiated by the almost completely hyaline wing, lacking brown markings except for a spot in subcostal cell and very faint indications of brown in cell R_1 (fig. 137d.) It is further characterized by the long, slender, geniculate proboscis; by having 3 pairs inferior fronto-orbitals and only 1 pair of superior fronto-orbitals; aristaе very short; apical scutellar bristles approximately equal in size to basal bristles; dorsocentral bristles situated nearer to supraalar than to suture; and head narrowed anteriorly (fig. 137a).

About 6 Palearctic and Neotropical species fit here. One species is widespread over Europe, Asia, to Hawaii. The concepts of this genus have been confused in the literature.

Ensina sonchi (Linnaeus) Fig. 137a-e.

Musca sonchi Linnaeus, 1767, *Systema Naturae*, (Ed. 12) 1(2): 998. Type-locality: Europe (sex?).

For synonymy under this species refer to Hendel (1927: 171); also Shiraki (1968: 82).

Distribution: Widespread over Europe and probably over Asia; it has previously been recorded from Formosa, Ryukyus, Japan, and Manchuria. The species is also established in Hawaii.

Hosts: The larvae breed in the developing seeds of various Compositae such as *Sonchus*, *Crepis*, *Tragopogon*, *Lactuca*, *Aster*, and *Cirsium*.

The species has been adequately described, except for genital characters, by Shiraki (1968: 82, pl. 31, 13 fig.). It is differentiated from all other known *Ensina* from Southeast Asia by the almost complete lack of wing markings (fig. 137d). This varies somewhat, some specimens have more indications of brown markings than others. Typically only faint markings are present in the middle and apex of cell R_1 , on r-m and m crossveins, and in median portion of cell R_5 . Usually a short spurvein is present on upper side of vein R_{3+8} , about opposite m crossvein. Vein R_{4+5} is bare. Vein M_{3+4} evanesces before reaching wing margin and the cubital cell has only a slight indication of a point at lower apex. Head shaped as in fig. 137a. Mesonotum dark brown to black in ground color, bordered with yellow; scutellum largely yellow, tinged faintly with brown; and pleura predominantly yellow with a large polished black mark in median portion of each sternopleuron. Abdomen dark brown to black in ground color with narrow apices and lateral margins yellow. Male genitalia as in fig. 137e. Sixth tergum of ♀ is just slightly longer than 5th. Basal segment of ♀ ovipositor shining brown to black on base, yellow to rufous on apical 2/3 and dark brown on narrow apex. As seen from dorsal view basal segment just slightly longer than terga 5+6. Measured on venter the basal segment is 0.85 mm long. The piercer is slender, almost straight-sided, only slightly narrowed at apex (fig. 137c), measuring 0.65 mm. Inversion membrane with a number of large spicules in median portion. Two rather elongate spermathecae present (fig. 137b). Length: body and wings, 3.0 mm.

This species is probably common over the Philippines but records are available only from a series of specimens which have been collected in the Mountain Province on the island of Luzon.

Genus *Pliomelaena* Bezzi

Spathulina (*Pliomelaena*) Bezzi, 1918, *Bull. Ent. Res.* 8: 220. Treated in key coming directly from the *Spathulina* couplet. Bezzi obviously meant to describe it as a subgenus of *Euaresta* Loew. He treated it this way in a subsequent publication (1918b: 30). Type-species: *Pliomelaena brevifrons* Bezzi, by subsequent designation, the 1st included species of Bezzi (1918a). Apparently designated by Munro (1937: 13).

Protephritis Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* 8: 439. Type-species: *Tephritis sauteri* Enderlein, by original designation. Synonymy by Hering (1942b: 6).

This genus has been placed in the tribe Platensini by having vein R_{4+5} setose to about r-m crossvein; front broadly rounded, not angulate at base of antennae and wings dark brown with comparatively few hyaline spots. It fits near *Platensina* Enderlein but is differentiated by having the wings normal in shape, nearly 3× longer than wide, widest at level of r-m crossvein and with 3 prominent hyaline streaks through cell 2nd M_2 (fig. 138a). Also the apical scutellars are strong, as long as basal bristles. I prefer to treat *Pliomelaena* under Tephritini. In the *Platensina* from Southeast Asia, the

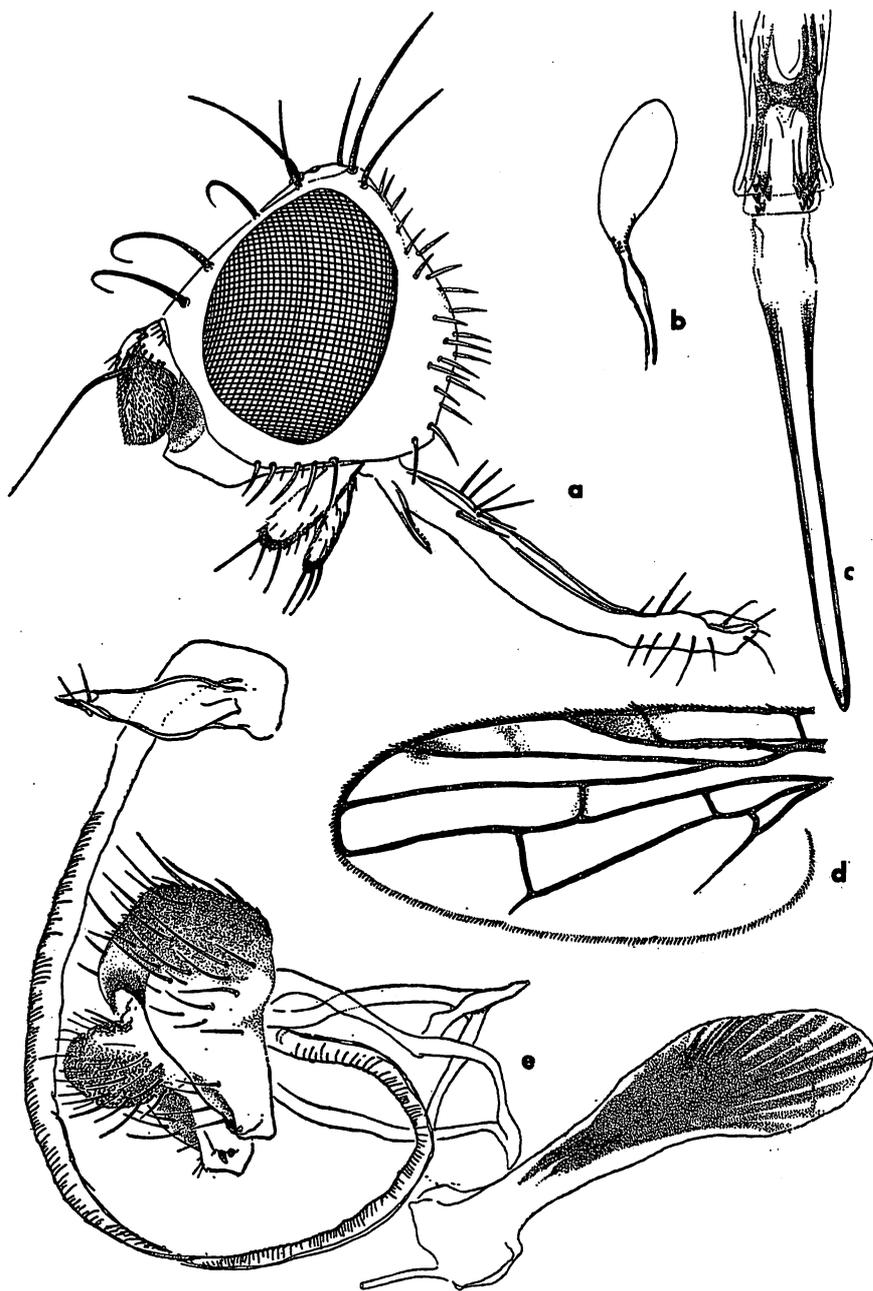


Fig. 137. *Ensina sonchi* (Linnaeus): a. head, lateral; b. spermatheca; c. ♀ ovipositor; d. wing; e. ♂ genitalia.

wings are very broad, scarcely over $2\times$ longer than wide, widest at level of m crossvein and with comparatively few hyaline spots (fig. 129); also the apical scutellar bristles are less than $1/2$ as long as basal.

To date 13 species have been placed in this genus; 9 are African, and 4 are Oriental. Based upon *P. zonogastra* the piercer of ♀ is flattened ventrally, broadly rounded dorsally, tapered gradually to a rather long slender point and has no preapical setae. Two spermathecae present; these are elongate gourd-shaped and densely covered with microchaetae.

***Pliomelaena luzonica* Hardy, new species** Fig. 138a-c.

Fitting very close to *zonogastra* (Bezzi) from India, and differentiated by having a prominent brown mark extending through middle of cell 2nd M_2 , rather than having the

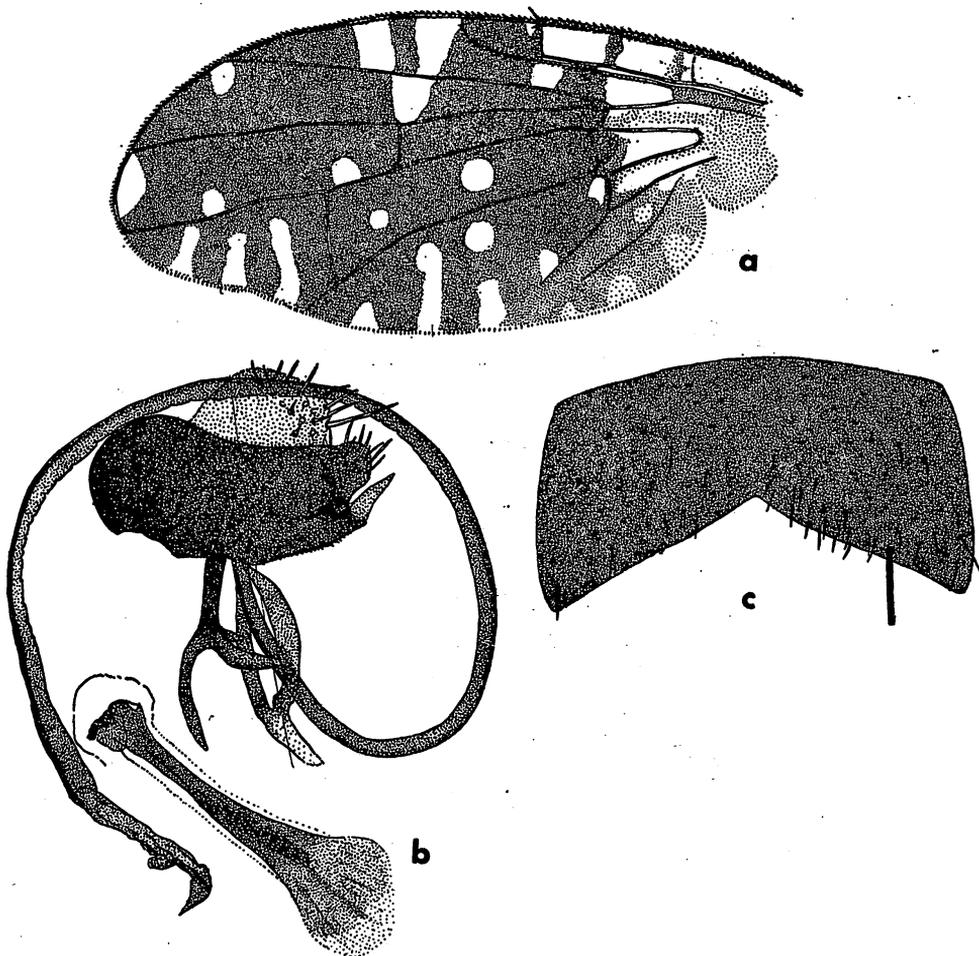


Fig. 138. *Pliomelaena luzonica* n. sp.: a. wing; b. ♂ genitalia; c. 5th sternum of ♂.

cell entirely hyaline except for a very faint indication of a brown mark in middle; abdominal terga predominantly dark brown in ground color, yellow only at extreme apex of 5th tergum and along extreme lateral margins, rather than having apices of terga broadly yellow-rufous. Also the ♂ genitalia are distinctive in shape; the surstylus is rather truncate on upper apical margin (fig. 138b), rather than being slightly pointed at upper apex and the apex of aedeagus ends in a sharp point. The ♀ has not been studied but will probably fit close to *zonogastra*.

Fitting description of *zonogastra* except as above. It should be noted that the latter species has been redescribed by Zaka-ur-Rab (1963). He did not, however, discuss the ♂ genitalia or the microscopic details of the ♀ ovipositor, or spermathecae. All of the principal head and thoracic bristles are yellow, tinged faintly with brown. Anterior dorsocentral bristles situated in line with supraalars. *Thorax*: Black in ground color, densely gray pollinose, completely obscuring the ground color. Scutellum predominantly dark brown to black but yellow around margin and on venter. *Legs*: Entirely yellow to rufous. *Wings*: As in fig. 138a. With vein R_{4+5} setose to approximately 1/2 distance to r-m crossvein. *Abdomen*: Predominantly brown, tinged with rufous in ground color of first 2 terga and yellow at extreme apex of 5th tergum and extreme lateral margins of other terga. Male genitalia as in fig. 138b, with surstyli broadly rounded, almost truncate at upper apices and extended into a sharp slender lobe at lower apices completely obscuring the 10th sternum as seen from lateral view. Tenth sternum with 2 blunt black projections at apex. Fifth sternum 1/2 wider than long and with hind margin gently concave (fig. 138c).

Length: body and wings, 4.7–5.0 mm.

♀. Unknown.

Holotype ♂, Los Banos, Luzon, II.1914, no collector given, in Frey collection, University Zoological Museum, Helsinki.

This specimen was in the Frey collection, Helsinki, as *Platensina sauteri*, manuscript name of Frey. The name *sauteri* is preoccupied in *Pliomelaena*.

Genus *Scedella* Munro

Scedella Munro, 1957, Brit. Mus. (Nat. Hist.) Ruwenzori Exped. 1934–35, 2(9) Trypetidae: 988.

Type-species: *Trypeta caffra* Loew, by original designation.

This genus was erected for 14 African and 1 Oriental species *spiloptera* (Bezzi) from India and Ceylon). It fits in the group of genera related to *Stylia* Robineau-Desvoidy (*Paroxyna* Hendel is a synonym) by having 4 scutellar bristles; the proboscis elongate and geniculate; lower lobe of squama narrow, not broader than upper; front bare through median portion; pteropleural bristles white or yellow-white; wings largely brown with scattered hyaline spots, almost always 3 spots in cell R_1 and 1 spot in R_3 just beyond tip of vein R_{2+3} (fig. 139e); and abdomen typically black in ground color, densely gray pollinose with a row of submedian brown spots on the terga and with about 2 small setae at base of vein R_{4+5} above. It is differentiated from other genera in this complex by having the apical scutellars large, almost equal in size to basal; labella about 1/2 as long as oral opening; and dorsocentral bristles situated behind suture, about 1/3 the distance to supraalars.

Scedella formosella (Hendel) Fig. 139a-e.

Euribia formosella Hendel, 1915, *Ann. Hist. Nat. Mus. Nat. Hung.* 13: 465, fig. 20. Type-locality: Formosa. Type in Hungarian National Museum, Budapest.

Tephritis formosella: Shiraki, 1933, *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* 8: 422.

This species appears to be similar to *dissoluta* (Loew) from Africa but is characterized by having a broad round mark in middle of 2nd costal cell extending through base of cell R_5 , rather than with a very narrow brown mark in 2nd costal which diffuses in basal cells; by hyaline mark in apex of cell R_5 confined to the cell, not extending into cells R_3 or into apex of 2nd M_2 with 5 distinct hyaline spots, rather than having the spots fused together as in *dissoluta*; and apical portion of cell 1st M_2 broadly brown, fill-

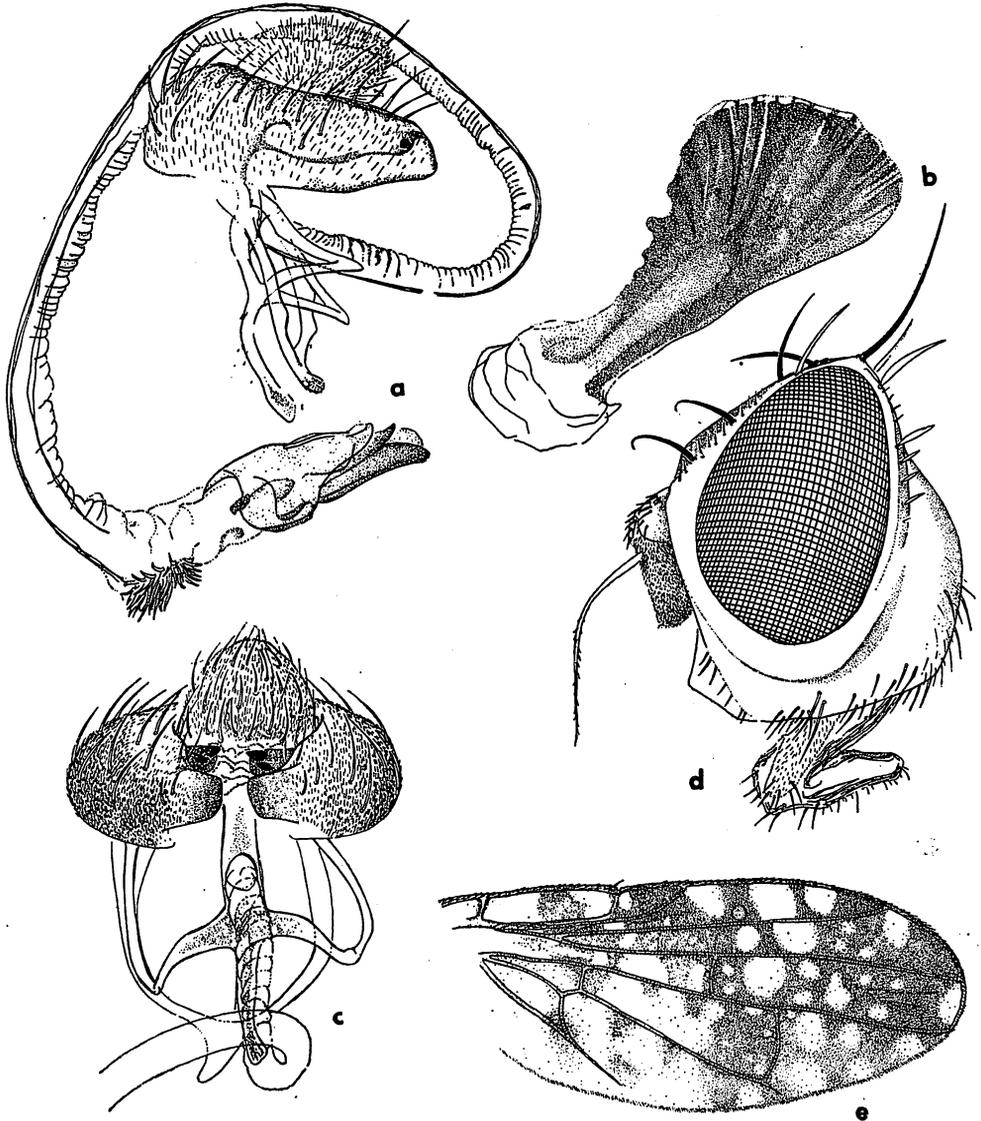


Fig. 139. *Scedella formosella* (Hendel): a. ♂ genitalia, lateral; b. ejaculatory apodeme; c. ♂ genitalia, ventral; d. head, lateral; e. wing.

ing all or nearly all of area distad of r-m crossvein to m crossvein, rather than with the brown being confined to a narrow mark along m crossvein. The wing markings distinctly different from those of *spiloptera* (Bezzi), the only other recognized Oriental species. Compare fig. 68, pl. 10, of Bezzi (1913a) with fig. 139e.

This species is differentiated from others known from Southeast Asia by the generic characters given above and by the wing markings as shown in fig. 139e.

On the specimens at hand the sides of face, parafacialia, are rather broad and the genae are just slightly less than 1/3 as wide as eye height, as in fig. 139d. Sides of front and parafacialia are densely silvery gray pubescent, front otherwise golden yellow, except for rather faint gray pollinose (microscopically pubescent) vitta extending from ocellar triangle to frontal suture down middle. Upper superior fronto-orbitals and genal bristles white. Bristles on notopleural calli black; upper (strong) mesonotal bristle black, lower (weak) yellow-white. Pteropleural bristles yellow and sternopleurals black. Anterior dorsocentrals situated slightly nearer to suture than to a line drawn between supraalars. Mesonotum densely silvery gray pubescent with faint indications of 3 brownish vittae extending full length. Scutellum mostly yellow in ground color, gray pollinose with a faint tinge of brown around bases of basal bristles. Apical scutellars almost equal in size to basal. Vein R_{4+5} bare below and with a few scattered setae above between base and about 1/2 the distance to r-m crossvein. Abdominal terga 1 and base of 2 yellow, tinged with brown in ground color, abdomen otherwise predominantly dark brown to black in ground color, densely gray pollinose and with a pair of brown submedian spots on terga 3-5. All setae yellow-white, flat except for 6-8 black bristles at apex of 5th tergum. Fifth sternum of ♂ approximately as wide as long but with a V-shaped concavity on hind margin extending approximately 1/2 length of sclerite. Male genitalia as in fig. 139a-c. With a dense clump of ventral setae before apex of aedeagus, and with 2 prominent black processes at apex of each lobe of 10th sternum. The genitalia seem to show close relationship of African species which have been treated by Munro. Length: body and wings, 3.0-3.2 mm.

The ♀ is not represented in the specimens at hand.

Hosts: Specimens have been reared from *Wedelia biflora* flowers.

Distribution: This species was described from Formosa but has been recorded from Guam (Hardy & Adachi 1956: 26) and is probably widespread through Micronesia and Southeast Asia. Specimens on hand are from Pahang, Malaya; it has also been recorded from Brooke's Point, Palawan and a specimen on hand is from Antimonan (=Atimonan), Luzon, Philippines.

Genus *Sphenella* Robineau-Desvoidy

Sphenella Robineau-Desvoidy, 1830, *Mém. Près. Acad. Roy. Sci. Inst. France* 2: 773. Type-species: *linariae* Robineau-Desvoidy, by monotypy. Equals synonym of *marginata* (Fallén), refer to Loew (1862: 76).

Sineura Liroy, 1864, *Atti Ist. Veneto* (ser. 3), 9: 1024. Type-species: *Tephritis marginata* Fallén, by monotypy.

Sineura, emendation or error.

This genus has been treated in detail by Munro (1957b: 25). He says, of the species which can be identified, 1 is European, 1 Oriental, 1 Australian, and 11 are African, including 3 subspecies of *marginata* which range from Europe, to Africa and Australia. He also says *nigropilosa* de Meijere from Java, "does not seem to be a *Sphenella*." I have seen the type in the Zoological Museum, Amsterdam. It is in poor condition, but from the wing it does appear to fit in this genus.

Sphenella is differentiated from other Tephritini from Southeast Asia which have 4 scutellar bristles and the proboscis slender and geniculate, by the distinctive wing markings: i.e., apex brown, with a complete, broad, hyaline band extending transversely just beyond level with m crossvein and a brown band extending over wing at level of r-m and m crossveins (fig. 140); also by having median portion of front with numerous, flat, scale-like setae; and anterior dorsocentral bristles approximately in line with supraalars. Munro differentiates *Sphenella* by having scutellum flat, hind femora with a distal row of 2 to 4 anteroventral bristles, and abdominal pubescence always pale. He also says there are strong generic characters in the ♂ terminalia "the single preniseta [the thick black process at apex of tenth sternum] being the most remarkable." Two oval spermathecae present; these are densely spinose on the species at hand. Female ovipositor short and thick, with piercer abruptly tapered at apex.

***Sphenella sinensis* Schiner** Fig. 140.

Sphenella sinensis Schiner, 1868, Reise Novara, Dipt., p. 267. Type-locality: Shanghai, China. Type ♀ in Natural History Museum, Wien.

Sphenella indica Schiner, 1868, Reise Novara, Dipt., p. 267. Type-locality: Madras, India. Type ♂ in Natural History Museum, Wien.

Trypeta sinensis Thomson, 1869, Eugen. Resa, Dipt., p. 585. Type-locality: China. Type ♂ in Natural History Museum, Stockholm.

I have studied the types and have confirmed the synonymy by Munro (1957b: 41). As I have pointed out (1968: 140), however, the name *sinensis* should be attributed to Schiner, not Thomson, since Thomson's paper did not appear until 1869.

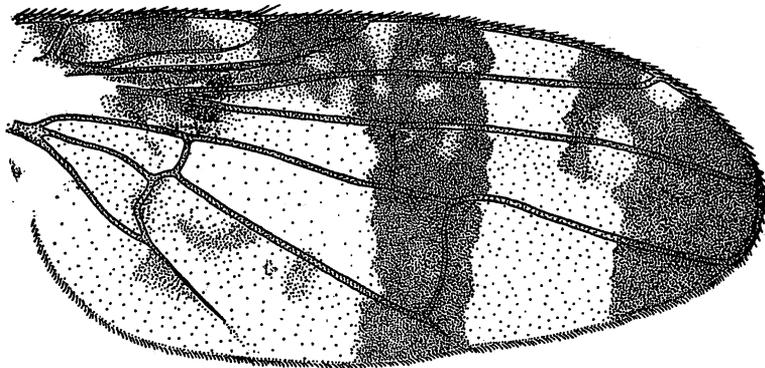


Fig. 140. *Sphenella sinensis* Schiner: wing.

The species is readily differentiated from other Southeast Asian fruit flies by the wing markings and characters given above. The wing marks do, however, show considerable variations in the large series of specimens I have studied and the exact arrangement of the marks is not specific. Head yellow, except for upper median portion of occiput which is brown to black. Scutellum, humeri, upper margins of pleura and hind margins of abdominal terga yellow. Legs yellow, tinged with brown on hind femora. Wing vein R_{4+5} with 2 setae at base on upper side. Fifth sternum approximately as wide as long and with a moderate U-shaped concavity on posterior margin. In ♂ the lobe of 10th sternum long, slender with a single blunt black process at apex. Female ovipositor short and thick, basal segment dark brown to black basally and at apex, rufous in median portion;

only slightly longer than 6th tergum as seen in dorsal view. Measured on venter the basal segment is 0.75 mm in length. Piercer short, thick, abruptly tapered at apex, approximately 0.6 mm long. Extended ovipositor 1.9 mm. Two spermathecae present; these are pear-shaped and thickly spiculose.

Specimens have been examined from a wide range of localities throughout the Oriental Region and from the following islands in the Philippines: Luzon, Mindanao, Negros, and Tawitawi.

The species of *Sphenella* infest flowerheads of Compositae; according to Munro they sometimes cause a swelling. The biology has been discussed by Munro (1957b: 35).

Genus *Styilia* Robineau-Desvoidy

Styilia Robineau-Desvoidy, 1830, *Mém. Près. Acad. Roy. Sci., Inst. France* 2: 754. Type-species: *bidentis* Robineau-Desvoidy [= *elongata* Loew, 1844; according to Hendel (1927: 149) this is a synonym of *absinthii* Fabr., 1805]. By subsequent designation (Hering 1954: 167).

Paroxyna Hendel, 1927, in Lindner, *Die Flieg. Palaeark. Reg.* 49 (Trypetidae): 146. Synonymy by Hering (1954: 167). Type-species: *Trypeta tessellata* Loew, 1844, by original designation.

Munro (1957a: 919) was unjustified in designating *Styilia mentharum* Robineau-Desvoidy as the type-species of *Styilia* since a type had previously been designated by Hering.

Refer to Munro (1957a: 919, 936) for a thorough discussion of the "*Paroxyna*" series" in Africa.

As pointed out by Hering (1954) *Trypeta tessellata* Loew is congeneric with *Styilia bidentis* Robineau-Desvoidy. He also points out that Hendel (1927: 50) was in error in considering *Styilia* as a synonym of *Myopites* Brébisson, 1827. Hering, in litt., says not one of the 3 *Styilia* species described by Robineau-Desvoidy is a *Myopites*. All of these fit the generic concepts of *Paroxyna* Hendel which equals *Styilia* Robineau-Desvoidy.

This is a very large genus widespread throughout much of the world. To date approximately 190 species have been described; about 30 are known from the Oriental Region.

Styilia fits with the group of genera which have 4 scutellar bristles, the proboscis long, slender, geniculate, epistomal margin distinctly produced as seen in lateral view, and vein R_{4+5} completely bare. It fits near *Sphenella* Robineau-Desvoidy but is differentiated by having wings brown, with numerous white spots and no continuous brown or hyaline bands extending transversely. Also the Philippine species at hand have 3 hyaline spots in cell R_1 (fig. 141f) and dorsocentral bristles situated at or near the suture and front bare in middle (refer to discussion under *Sphenella*). Front distinctly narrowed anteriorly and devoid of setae except along orbits. Two pairs inferior fronto-orbitals and 2 pairs superior fronto-orbitals present; the upper is white and flattened. Third antennal segment very slightly pointed at upper apex. Ocellar bristles strong and black, equal in length to upper inferior fronto-orbitals. Head shaped as in fig. 141a. The 2 basal scutellars are long, the apical bristles short, less than 1/2 as long as basal and cruciate. Aedeagus with numerous preapical ventral setae (fig. 141e).

Five species have been seen from the Philippines; only 1 of these is being described at this time. Four apparently new species are on hand represented by specimens in poor condition (badly greased).

The species may be differentiated by the following key:

1. Wings with 3 hyaline spots in cell R_12
Only 2 spots in R_14
2. Subapical row of spots below tip of R_{2+3} in a straight line and fused or nearly so into a narrow hyaline band. Mark in R_3 continuous across cell and fused with mark in R_53
Spots isolated and not in a straight line (fig. 141f).*philippinensis*, n. sp.
3. With a hyaline spot at apex of cell R_5n. sp. #I
(1 ♂, 1 ♀, Abatan, Buguias, 60 km S of Bontoc, Mountain Prov., Luzon, 1800–2000 m, 27–29.V.1964, H. M. Torrevillas).
Apex of R_5 entirely brown.n. sp. #II
(1 ♀, same data as above).
4. A hyaline spot at apex of cell R_5n. sp. #III
(2 ♂♂, 1 ♀, same data as above, 11.V.–9.VI.1964).
Apex of R_5 all brown.n. sp. #IV
(2 ♀♀, same data as above, 6–11.V.1964).

The specimens of undescribed species are being returned to the B. P. Bishop Museum.

***Styilia philippinensis* Hardy, new species** Fig. 141a-f.

In Zia & Chen (1938: 65) this would run to *Paroxyna occultella* Chen from Kansu, China, and differs by having subcostal cell entirely dark brown, lacking a hyaline spot in middle; by the spot in apex of cell R_3 just beyond tip of R_{2+3} large, filling most of cell R_3 , rather than small, not filling more than 1/2 the cell; by having only 5 spots in cell 2nd R_5 , rather than approximately 10 hyaline spots in this cell; femora predominantly black, rather than yellow-red and 2nd notopleural bristle black, rather than yellow-red. It also resembles *tessellata* (Loew) which is widespread over Central Asia, Europe and North Africa but the wing markings are different; the latter species has a small hyaline spot in subcostal cell, the spot in apex of R_3 is large and extends into upper portion of R_5 ; also 8 hyaline spots are present in cell R_5 .

♂. *Head*: Shape as typical of this genus (fig. 141a) with front gently sloping and antennae situated near upper 2/3 to 3/4 of head height. Labella elongate, equal in length to lower margin of head. Front distinctly narrowed anteriorly, entirely yellow, paler along orbits and densely gray pollinose along eye orbits. Median portion of front opaque golden yellow, completely devoid of setae. Antennae yellow with a faint tinge of brown on 2nd segment. Third segment slightly narrowed at upper apex. Aristae microscopically pubescent. Face and genae entirely pale yellow, occiput yellow below and along eye margin, brown to black in upper median portion, covered with gray pollen. Palpi long, slender, almost straight-sided, pale yellow with a few black setae scattered around margins. Ocellar bristles equal in size to inferior fronto-orbitals. *Thorax*: black in ground color, rather densely gray pollinose and with 3 pale brown vittae extending down median portion of mesonotum, 2 on dorsocentral lines and 1 down middle. Thoracic bristles black except for strong, yellow pteropleural bristle. Halteres yellow, tinged faintly with brown at apices. *Legs*: Femora predominantly black, covered with gray pollen, yellow at narrow apices. Tibiae and tarsi yellow. *Wing*: With markings as in fig. 141f. Vein R_{4+5} entirely bare. *Abdomen*: Dark brown to black in ground color, covered with gray pollen and thickly covered with yellow-white, scale-like setae, with a few black bristles along lateral margins and at apex. Male genitalia as in fig. 141e. Aedeagus conspicuously setose before apical, bulbous portion. Surstyli broad, rounded apically, completely covering 10th sternum.

Length: body, 2.8 mm; wings, 3.0 mm.

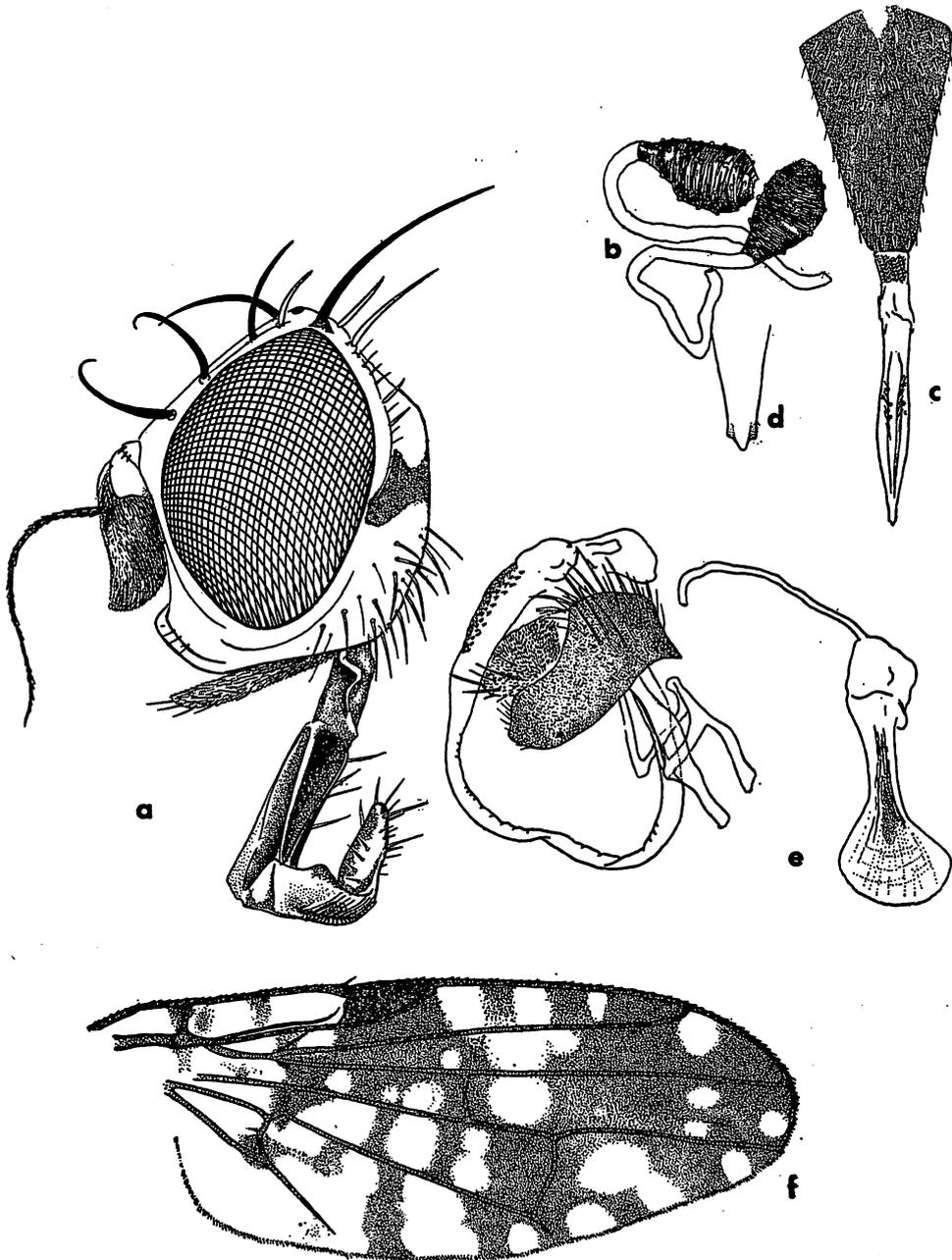


Fig. 141. *Stylia philippinensis*, n. sp.: a. head, lateral; b. spermathecae; c. ♀ ovipositor; d. apex of piercer; e. ♂ genitalia; f. wing.

♀. Fitting description of ♂ except for sexual characters; also each abdominal tergum has a large brown submedian spot on each side extending over most of segment (probably also found on ♂♂ although not visible on specimens on hand). Sixth tergum slightly longer than 5th. Basal segment of ovipositor shining black, about equal in length to last 2 abdominal terga as seen from dorsal view. Measured on venter the basal segment is 0.8 mm long. Piercer measures 0.6 mm and minutely trilobed at apex (fig. 141d). Extended ovipositor (fig. 141c) measures approximately 2.0 mm. Two spermathecae present (fig. 141b); these are oval, slightly narrowed on 1 end, and with small bumps around margin.

Length: body, excluding ovipositor, 2.9 mm; wings, 3.2 mm.

Holotype ♂ (BISHOP 10155) allotype ♀, Abatan, Buguias, 60 km S of Bontoc, Mt. Prov., Luzon, 1800-2000 m, 5.VI.1964, H. M. Torrevillas. Eight paratypes: 4 ♂♂ and 4 ♀♀, all same data as type, except 1 from Mayoyao, Ifugao, Mt. Prov., Luzon, 1200-1500 m, 29.VIII.1966, H. M. Torrevillas.

Type, allotype, and some paratypes in the B. P. Bishop Museum. Other paratypes in the collections of the U. S. National Museum, British Museum (Nat. Hist.) and the University of Hawaii.

Genus *Trupanea* Schrank

Trupanea Guettard, 1762, *Acad. Roy. Sci. Hist., Mém. Math. Phys.* 1756: 170-73. Unavailable name, author not using binomial.

Trupanea: Schrank, 1795, *Naturh. u. ökon. Briefe über Donaumoor, Mannheim*, p. 147. Type-species: *radiata* Schrank, by monotypy; equals synonym of *Musca stellata* Fuessley (1775).

Trypanea: Agassiz, 1846, *Nomen. Zool. Index Univ.* 9-10: 40, emendation.

Urellia Robineau-Desvoidy, 1830, *Mém. Près. Acad. Roy. Sci., Inst. France* 2: 774. Type-species: *calcitrapae* Robineau-Desvoidy, by subsequent designation (Coquillett 1910: 618), equals synonym of *stellata* (Fuessley).

spine-like process.

Members of this genus are characterized from other Tephritini by having only 2 scutellar bristles, with wing markings usually limited toward apex and typically of a stellate pattern (fig. 142a and 144a), with a brown subapical central marking with radiating hyaline marks to wingmargin; also anterior dorsocentral bristles are situated very near suture; abdomen entirely opaque, except on ovipositor, densely gray pollinose; vein R_{4+5} bare except for 1 or 2 setae at extreme base and ♂ aedeagus terminates in a sclerotized spine-like process.

A large, world-wide genus which infest flowerheads, principally of Compositae. Approximately 3 dozen species have been recorded from the Oriental and Pacific Regions.

Trupanea convergens Hering Fig. 142a-c.

Trypanea convergens Hering, 1936, *Konowia* 15: 188, fig. 8. Type-locality: Charbin, Manchuria. Type ♀ in British Museum (Nat. Hist.).

Trypanea sinensis Zia, 1937, *Sinensia* 8: 218, pl. 7, fig. 69. Type-localities: Nanking, Shanghai, and Chusan, China. Syntype ♀♀ in Institute of Zoology, Shanghai.

Trypanea cosmina Hendel, 1938, *Ark. Zool.* 30A(3): 9. Type-locality: China. A specimen in the Hendel collection, Natural History Museum, Wien, from China, has been studied.

The specimens on hand from the Philippines appear to fit this species and it is probable that this is widespread over Southeast Asia. One specimen has also been seen from Pahang, Malaya.

This species is characterized by having a pair of brown apical streaks converging with

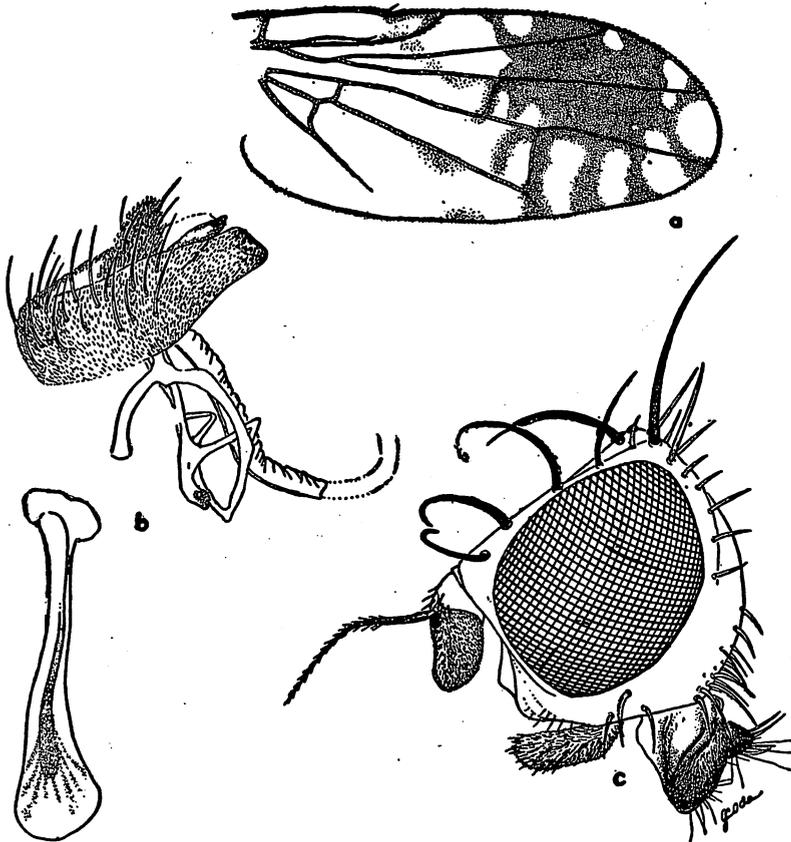


Fig. 142. *Trupanea convergens* Hering: a. wing; b. ♂ genitalia; c. head, lateral.

preapical brown wing marking in cell R_5 (fig. 142a). The apical marking is formed is by a large hyaline spot filling almost all of the apex of cell R_5 , a hyaline streak from before apex of cell R_5 extending into upper apical portion of cell R_5 , and a hyaline streak from before apex of cell 2nd M. extending into cell R_5 . In the specimens at hand the rather prominent oblique brown band extends from about upper margin of crossvein r-m along vein R_{4+5} to cell Sc; this is obviously variable and in some specimens is much more distinct than in others. It other respects fitting characteristics of most *Trupanea*. Head as in fig. 142c. Wings as in fig. 142a. Male genitalia as in fig. 142b; epandrium rather narrow, straight-sided and surstyli rather truncate at apices, almost completely obscuring 10th sternum. Tenth sternum with 2 prominent black processes at apex of each lobe. Female ovipositor very similar to that of *glauca* (fig. 144b).

The species is probably widespread and may be common over the Philippines but to date only 7 specimens have been seen from the following provinces on Luzon: Mountain Prov. and Albay.

***Trupanea decepta* Hardy** Fig. 143.

Trupanea decepta Hardy, 1970, *Ent. Meddel.* **33**: 114. Type-locality: Brooke's Point, Uring Uring, Palawan. Type in University Zoological Museum, Copenhagen.

Fitting near *ambigua* Shiraki from Formosa, but differing by having subcostal cell short, less than $1/2$ the length of 2nd costal cell, rather than costal cell comparatively elongate, $2/3$ as long as 2nd costal; by having the thorax yellow to rufous in ground color, except for brown discoloration over posterior portion of mesonotum, rather than having thorax entirely black in ground color; also the wing differs as shown in fig. 143 (compare with fig. 5, pl. 13, Shiraki 1933).

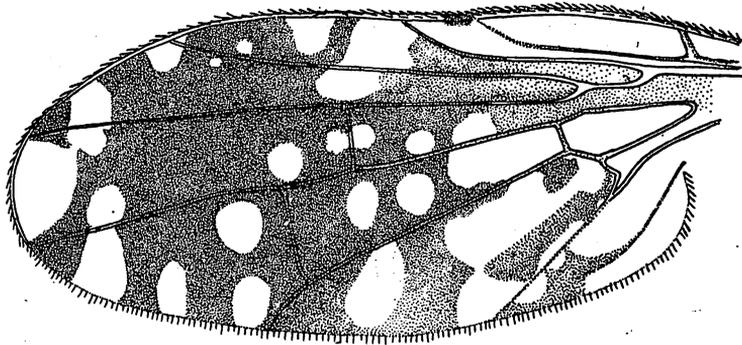


Fig. 143. *Trupanea decepta* Hardy: wing.

Head yellow except for dark-colored eyes and a tinge of brown on hind portion of occiput. Front with a faint tinge of brown in ground color and densely gray pollinose. Head approximately as high as long, front gently sloping so antennae are situated at middle of head as seen in direct lateral view. Occiput gently swollen, at widest point approximately $2/5$ width of eye. Eye oblong, narrower on upper portion, broadly rounded below. Genae rather broad, at widest point about $1/5$ height of eye. All head and body bristles yellow with a faint tinge of brown. Three pairs inferior fronto-orbital and 2 pairs superior fronto-orbitals; these are comparatively short, only about $2 \times$ longer than squamose, white, postocular setae on occiput. Antennae yellow, 3rd segment short, scarcely longer than wide. Aristae short pubescent. Palpi with numerous yellow hairs on ventral margin and with brown to black setae at apices. Thorax yellow-red in ground color, brown on posterior portion of mesonotum, tinged with brown on upper portion of pteropleuron and brown to black on metanotum, except for a rufous tinge down median portion. Mesonotum yellow-gray pubescent, thickly covered with flat recumbent pile. Humeri pale yellow. Scutellum sparsely setose, with flat, scale-like setae around margins and with 2 strong yellow bristles. Dorsocentral bristles situated distinctly in front of a line drawn between supraalars. Legs entirely pale yellow. Wings hyaline basally, mostly dark brown over apical $1/2$ with hyaline spots around margin and in field as in fig. 143. Crossvein r-m situated near apical $4/5$ of cell 1st M_2 and cubital cell with a very short point at lower apex. Only vein R_1 setose, others bare. Abdomen mostly yellow, tinged with brown at apices and on median portions of terga. The genitalia have not been relaxed for study. Length: body, 5.0 mm; wings, 4.75 mm. ♀. Unknown.

***Trupanea glauca* (Thomson) Fig. 144a-d.**

Trypeta glauca Thomson, 1869, Eugen. Resa, Dipt., p. 581. Type-locality: Sydney, Australia. Syntypes in Natural History Museum, Stockholm. I have studied the syntypes. I have also compared specimens from the Philippines in the British Museum with specimens of *glauca* from Australia.

Bezzi (1913b: 328) and also Zia (1937: 218) recorded *amoena* Frauenfeld from the Philippines; this obviously was an error for *glauca*. The 2 species are extremely close; the only difference I see in these is that *amoena* has a narrow oblique band of brown

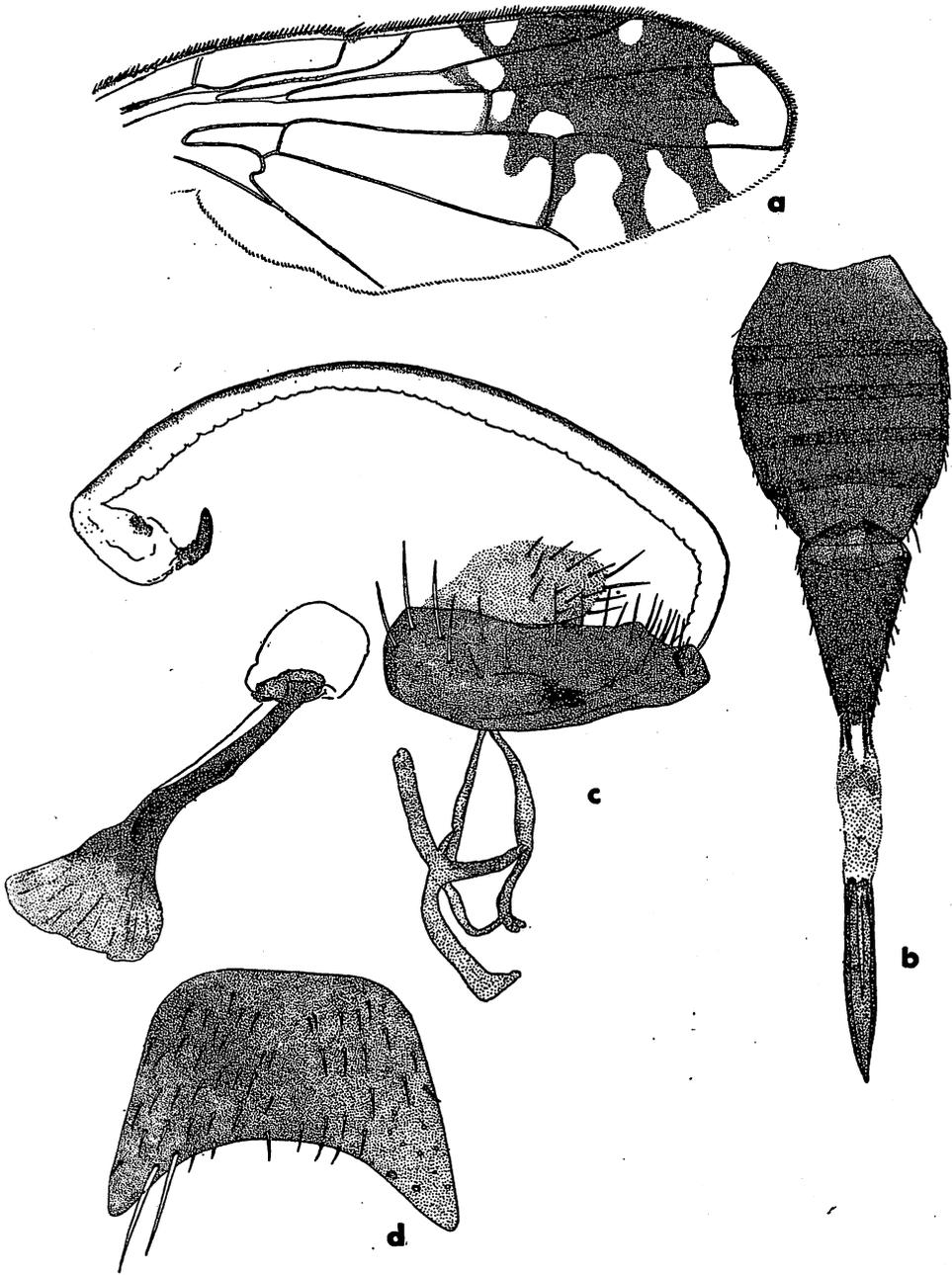


Fig 144. *Trupanea glauca* (Thomson): a. wing; b. ♀ abdomen, dorsal; c. ♂ genitalia; d. 5th sternum of ♂.

extending from base of subcostal cell to vein M_{1+2} , just anterior to r-m crossvein. In *glauca* this mark is lacking. This may possibly be a variable character and the 2 may prove to be synonymous.

Fitting the general characteristics of most members of this genus with thorax and abdomen mostly brown to black in ground color, densely gray pollinose, obscuring ground color, and thickly covered with yellow-white setae and with most bristles yellow, tinged faintly with brown. Upper superior fronto-orbital, outer vertical, postocellar, notopleural, genal, pteropleural, and sternopleural bristles pale, white or yellow-white. Frontal bristles of ♀ much stronger than those of ♂; ocellar and inferior and superior fronto-orbitals about equal in length to antennae in ♀ and approximately 1/2 this length in ♂. Head just slightly longer than high, gradually narrowed anteriorly, with face gently concave as seen in direct lateral view and epistomal margins slightly protruding. Compound eyes broadly rounded below, distinctly narrowed on upper hind margin. Head and appendages entirely yellow except for reddish brown eyes. Labellum short, fleshy. Legs entirely yellow. Wings as in fig. 144a, with basal 2/3 milky white; apex of cell R_5 and upper apex of 2nd M_2 white with a narrow brown extension of the preapical brown marking extending along costa in apex of cell R_5 , with a short arm of brown extending into apical portion of R_5 ; 2 broad brown arms to middle of 2nd M_2 ; also 1 in base of 2nd M_2 along m crossvein, and with a short arm of brown extending about halfway through 1st M_2 just before m crossvein. Abdomen completely gray pollinose, lacking brown markings. Basal segment of ovipositor shining black as seen from above, approximately equal in length to terga 4-6. Extended ovipositor (fig. 144b) measures approximately 3.0 mm with each of the segments approximately 1.0 mm. Piercer evenly tapered to a sharp point at apex and lacking preapical setae. The spermathecae have not been observed; they are obviously weakly sclerotized and inconspicuous. Male genitalia as in fig. 144c. Fifth sternum wider than long, gently concave on posterior margin (fig. 144d). Two prominent black processes at apex of each lobe of 10th sternum. Length: body and wings, 2.75-3.0 mm.

This species is probably common as a breeder in flowerheads of Compositae throughout the Pacific. It has been reared from flowerheads of *Ageratum conyzoides* at Davao, Mindanao. Specimens have been examined from the following islands: Luzon, Mindanao, Negros, and Tawitawi.

LITERATURE CITED

- Becker, T. 1908. Dipteren der Kanarischen Inseln. *Mitt. Zool. Mus. Berl.* 4: 1-180, 4 pl.
- Bezzi, M. 1913a. Indian trypaneids (fruit-flies) in the collection of the Indian Museum, Calcutta. *Mem. Indian Mus.* 3: 53-175, pl. viii-x.
- 1913b. Studies in Philippine Diptera I. *Philip. J. Sci.*, D 8: 305-32.
1915. On the Ethiopian fruit-flies of the genus *Dacus*. *Bull. Ent. Res.* 6: 85-101, 14 fig.
1916. On the fruitflies of the genus *Dacus* (s. l.) occurring in India, Burma and Ceylon. *Bull. Ent. Res.* 7: 99-121.
- 1918a. Notes on the Ethiopian fruit-flies of the family Trypaneidae, other than *Dacus* (s. l.) with descriptions of new genera and species (Dipt.). I. *Bull. Ent. Res.* 8: 215-51.
- 1918b. Notes on the Ethiopian fruit-flies of the family Trypaneidae, other than *Dacus* (s. l.) (Dipt.). II. *Bull. Ent. Res.* 9: 13-46.
1919. Fruitflies of the genus *Dacus* sensu latiore (Diptera) from the Philippine Islands. *Philip. J. Sci.* 15(5): 411-43, 2 pl.
1926. New species of *Rhabdochaeta* (Diptera, Trypaneidae) from Ceylon and the Philippines. *Spolia Zeylanica* 13: 309-14, 1 pl.
- Bibby, F. F. 1947. Notes on the insect fauna of the Samar group, Philippines. *Philip. J. Sci.* 77: 61-81.
- Bigot, J. M. F. 1859. Dipterorum aliquot nova genera. *Rev. Mag. Zool.* (2) 11: 305-15, pl. 11.

- Chen, S. H.** 1948. Notes on Chinese Trypetinae. *Sinensia* **18**(1-6): 69-123, 18 fig.
- Collart, A.** 1935. Les Dacinae du Congo Belge (Diptera: Trypetidae). *Bull. Mus. Roy. Hist. Nat. Belg.* **11**(1): 1-45.
- Coquillett, D. W.** 1899. A new trypetid from Hawaii. *Ent. News* **10**: 129-30.
1910. The type species of North American genera of Diptera. *Proc. U. S. Nat. Mus.* **37**: 499-647.
- Costa, O. G.** 1844. Descrizione di dodici nuove specie dell'ordine de' Ditteri ed illustrazione di altre quattordici meno ovvie. *Atti Accad. Sci. Napoli* **5**: 81-107. According to Horn & Schenkling's *Index Litt. Ent.*: 215, this was published (27 p., 2 pl.) independently first in 1835.
- Cotes, E. C.** 1893. Miscellaneous notes. *Indian Mus. Notes* **3**(1): 17-18, 2 fig.
- Cresson, E. T., Jr.** 1914. Some nomenclatorial notes on the dipterous family Trypetidae. *Ent. News* **25**: 275-79.
- Doleschall, C. L.** 1856. Bijdrage tot de kennis der dipterologische fauna von Nederlandsch Indië, I. *Natuurk. Tijds. Ned.-Ind.* **10**: 403-14, 12 fig.
[1858]. Derde bijdrage tot de kennis der dipteren fauna van Nederlandsch Indië, III. *Natuurk. Tijds. Ned.-Ind.* (1858-1859) **17**: 73-128.
- Drew, R. A. I.** 1972. The generic and subgeneric classification of Dacini (Diptera: Tephritidae) from the South Pacific area. *J. Austral. Ent. Soc.* **2**: 1-22.
- Elera, Casto de** 1895. Catalog sistemático de tod la fauna de las Islas Filipinas. **2**: 676 p.
- Enderlein, G.** 1911. Trypetiden-Studien. *Zool. Jahrb., Syst.* **31**: 407-60.
- Fabricius, J. C.** 1794. Entomologia systematica emendata et aucta. **4**: 472 p.
1805. Systema antliatorum secundum ordines, genera, species. 373 p.
- Foote, R. H.** 1959. Notes on the genus *Euleia* Walker in North America (Diptera: Tephritidae). *J. Kans. Ent. Soc.* **32**(4): 145-50.
- Frauenfeld, G. R. von.** 1857. Beiträge zur Naturgeschichte der Trypeten. *Sitzber. Akad. Wiss. Wien* **22**: 523-57, 1 pl.
- Froggatt, W. W.** 1910. The entomological fauna of Nauru Island, of the Ocean Island Group. *Proc. Linn. Soc. N. S. Wales* **35**: 407-10.
- Guettard, J. E.** 1762. Observation qui peuvent servir à former quelques caractères de coquillages. *Acad. Roy. Sci. Hist. [Paris], Mém. Math. Phys.* **1756**: 145-83.
- Hardy, D. E.** 1951. The Krauss collection of Australian fruitflies (Tephritidae - Diptera). *Pacif. Sci.* **5**(2): 115-89, 84 fig.
1954. The *Dacus* subgenera *Neodacus* and *Gymnodacus* of the world. *Proc. Ent. Soc. Wash.* **56**(1): 5-23, 23 fig.
1955a. A reclassification of the Dacini (Tephritidae - Diptera). *Ann. Ent. Soc. Amer.* **48**(6): 425-37, 19 fig.
1955b. *Sphaeniscus* Becker and *Euphranta* Loew of the Oriental and Pacific Regions (Tephritidae - Diptera). *Pacif. Sci.* **9**(1): 77-84, 13 fig.
1958. A review of the genera *Sophira* Walker and *Tritaenopteron* de Meijere. *Proc. Hawaii. Ent. Soc.* **16**(3): 366-78.
1959. The Walker types of fruitflies (Tephritidae - Diptera) in the British Museum Collection. *Bull. Brit. Mus. (Nat. Hist.), Ent.* **8**(5): 159-242, 50 fig.
1964. Diptera from Nepal. The fruit flies (Tephritidae). *Bull. Brit. Mus. (Nat. Hist.), Ent.* **15**: 145-69.
1968. The fruit fly types in the Naturhistorisches Museum, Wien. *Ann. Naturh. Mus. Wien* **72**: 107-55, 7 fig.
1969. Taxonomy and distribution of the Oriental Fruit Fly and related species (Tephritidae: Diptera). *Proc. Hawaii. Ent. Soc.* **20**(2): 395-428.
1970. Tephritidae (Diptera) collected by the Noona Dan Expedition in the Philippine and Bismarck Islands. *Ent. Meddel.* **38**: 71-136, 26 fig.
1973. The fruit flies (Tephritidae - Diptera) of Thailand and bordering countries. *Pacif. Ins.*

Monogr. 31: 1-353, 8 pl.

- Hardy, D. E. & M. S. Adachi.** 1954. Studies in the fruitflies of the Philippine Islands, Indonesia, and Malaya, Part I. Dacini (Tephritidae - Diptera). *Pacif. Sci.* 8(2): 147-204, 93 fig.
1956. Insects of Micronesia, Diptera: Tephritidae. *Ins. Micronesia*, B. P. Bishop Mus. 14(1): 1-28, 50 fig.
- Hendel, F.** 1912. H. Sauter's Formosa-Ausbeute. Trypetidae. *Suppl. Ent.* 1: 13-24, 1 pl.
1913. H. Sauter's Formosa-Ausbeute. Acalyptrate Musciden ii. *Suppl. Ent.* 2: 77-112.
1914. Die Gattungen der Bohrfliegen. *Wien. Ent. Ztg* 33(3-4): 73-98.
1915. H. Sauter's Formosa-Ausbeute. Tephritinae. *Ann. Hist. Nat. Mus. Nat. Hung.* 13: 425-67, 2 pl.
1927. [Fam.] 39. Trypetidae 221 p., 17 pls. (=Lfg. 19). In Lindner E., ed., Die Fliegen der palaearktischen Region. 5, Stuttgart.
1928. Neue oder weniger bekannte Bohrfliegen (Trypetidae) meist aus dem Deutschen Entomologischen Institut Berlin-Dahlem. *Ent. Mitt.* 17(5): 341-70.
- Hering, E. M.** 1937. Die *Henicoptera* Arten der Philippinen. *Philip. J. Sci.* 63(1): 105-08, 1 pl.
- 1938a. Neue palaearktische und exotische Bohrfliegen, 21. Beitrag zur Kenntnis der Trypetidae (Dipt.). *Deut. Ent. Zs.* 1938: 397-417, 1 pl.
- 1938b. Entomological results from the Swedish Expedition 1934 to Burma and British India. 1. Diptera: Fam. Trypetidae. *Ark. Zool.* 30A (25): 1-56.
1940. Neue Arten und Gattungen. *Siruna Seva* 2: 1-16.
- 1941a. Neue Dacinae und Trypetinae des Zoologischen Museums der Universität Berlin. *Siruna Seva* 3: 1-32, 20 fig.
- 1941b. Dipteren von den Kleinen Sunda-Inseln. *Arch. Morph. Taxon. Ent. Berl.* 8(1): 24-45, 1 pl.
- 1942a. Neue Gattungen und Arten von Fruchtfliegen aus dem Zoologischen Museum der Universität Berlin. *Mitt. Zool. Mus. Berl.* 25(2): 274-91.
- 1942b. Neue Gattungen und Arten palaearktischer und exotischer Fruchtfliegen. *Siruna Seva* 4: 1-32.
1944. Neue Gattungen und Arten von Fruchtfliegen der Erde. *Siruna Seva* 5: 1-32.
1947. Neue Gattungen und Arten der Fruchtfliegen. *Siruna Seva* 6: 1-16.
1951. Neue Fruchtfliegen der Alten Welt. *Siruna Seva* 7: 1-16.
- 1952a. Trypetidae von Sumba und Flores. *Verh. Naturf. Ges. Basel* 63: 41-48, 4 fig.
- 1952b. Fruchtfliegen (Trypetidae) von Indonesien. *Treubia* 21(2): 263-90.
1953. Results of the Archbold Expeditions. Fruchtfliegen (Trypetidae) von Neu-Guinea (Dipt.). *Treubia* 21(3): 507-24.
1954. Trypetidae aus Ostafrika. *Bonn. Zool. Beitr.* 1-2: 167-72.
- Latreille, P. A.** 1804. Tableau méthodique des Insectes. In Société de Naturalistes et d'Agriculteurs, Nouveau dictionnaire d'histoire naturelle, appliqué aux arts, principalement à l'agriculture et l'économie rurale et domestique. 24 (3): 129-200. Paris.
- Loew, H.** 1862. Die europäischen Bohrfliegen (Trypetidae). 128 p., 26 pl. Wien.
1869. Revision der europäischen Trypetina. *Zs. Gesam. Naturw.* 34: 1-24.
- Macquart, J.** 1835. Histoire naturelle des Insectes. Diptères, Tome deuxième. Diptera, vol. 2, 703 p., 12 pl. In [Roret, N. E., ed.], Collection des suites à Buffon. Paris.
1843. Diptères exotiques nouveau ou peu connus. *Mém. Soc. Sci. Lille* 1842: 162-460, 36 pl.
1848. Diptères exotiques nouveau ou peu connus. Suite de 2^{me} supplément. *Mém. Soc. Sci. Lille* 1847(2): 161-237, 7 pl. Also published separately as "Diptères exotiques nouveau ou peu connus." Suppl. III: 1-77, 7 pl. Paris, 1848.
1851. Diptères exotiques nouveau ou peu connus. Suite du 4^e supplément. *Mém. Soc. Sci. Lille* 1850: 134-294.
- Malloch, J. R.** 1932. Two Trypetidae from the Marquesas Islands, with one new species (Diptera). *Bishop Mus. Bull.* 98: 145-47, 1 fig.

1939. The Diptera of the Territory of New Guinea, XI. *Proc. Linn. Soc. N. S. Wales* **64**(3-4): 409-65, 1 pl.
- Matsumura, S.** 1916. Thousand insects of Japan. Additamenta. **2**: 185-473, pl. xvi-xxv (Diptera). Tokyo.
- Meigen, J. W.** 1803. Versuch einer neuen Gattungseintheilung der europäischen zweiflügeligen Insekten. *Mag. Insektk.* **2**: 259-81.
- Meijere, J. S. H. de** 1904. Neue und bekannte süd-asiatische Dipteren. *Bijdr. Dierk.* **17-18**: 85-117, pl. 8, fig. 22-23.
1911. Studien über südostasiatische Dipteren VI. *Tijds. Ent.* **54**: 373-85.
1914. Studien über südostasiatische Dipteren IX. *Tijds. Ent.* **57**: 137-274, pl. 5-7.
- Menzel, R.** 1929. De Plagen van de Thee in Nederlandsch-Indie (Java en Sumatra) en hare beftrijding. *Arch. Theecult. Ned.-Ind.* **1**: 1-106, 40 pl., 8 fig.
- Munro, H. K.** 1935. Observations and comments on the Trypetidae of Formosa. *Arb. Phys. Ang. Ent. Berl.* **2**(3/4): 195-271.
1937. A study of the African species of Platensinini, a tribe of the family Trypetidae (fruit-flies, Diptera). *Mem. U. S. Afr. Dept. Agr. Forestry, Ent.* **2**(1-2): 7-28.
- 1938a. Studies on Indian Trypetidae (Diptera). *Rec. Indian Mus.* **40**: 21-37.
- 1938b. New genera of African Trypetidae (Dipt.). *Proc. Roy. Ent. Soc. Lond.*, **B 7**: 117-120.
1947. African Trypetidae (Diptera). *Mem. Ent. Soc. S. Afr.* **1**: 1-284, 321 figs.
- 1957a. Trypetidae. Brit. Mus. (Nat. Hist.) Ruwenzori Exped. 1934-35, **2**(9): 853-1054.
- 1957b. *Sphenella* and some allied genera (Trypetidae). *J. Ent. Soc. S. Afr.* **20**(1): 14-57, 95 fig.
- Osten Sacken, C. R.** 1882. Diptera from the Philippine Islands brought home by Dr. Carl Semper. *Berl. Ent. Zs.* **26**: 83-120; 187-252, 13 fig.
- Perkins, F. A.** 1937. Studies in Australian and Oriental Trypaneidae. Part I. New genera of Dacinae. *Proc. Roy. Soc. Qld* **48**(9): 51-60.
- 1938a. Results of the Oxford Univ. Exped. to Sarawak (Borneo), 1932. Diptera Trypaneidae. *Ann. Mag. Nat. Hist.* (11) **2**: 401-09, 1 pl.
- 1938b. Studies in Oriental and Australian Trypaneidae. Part II. Adraminae and Dacinae from Indian, Ceylon, Malaya, Sumatra, Java, Borneo, Philippine Islands, and Formosa. *Proc. Roy. Soc. Qld* **49**(11): 120-44, 1 pl.
1939. Studies in Oriental and Australian Trypetidae. Part III. Adraminae and Daciae from New Guinea, Celebes, Aru Is. and Pacific Islands. *Univ. Qld Pap. Dep. Biol.* **1**(10): 1-34, 1 pl.
- Robineau-Desvoidy, J. B.** 1830. Essai sur les Myodaires. [Paris] Inst. de France, [Cl. des] Sci. Math. et Phys., Acad. Roy. des Sci., Mém. présentés par divers Savans [ser. 2] **2**: 1-813.
- Rondani, C.** 1856. Dipterologiae Italicae prodromus. vol. 1: Genera Italica ordinis dipterorum ordinatim disposita et distincta et in familias et stirpes aggregata, 228 p. Parmae.
1871. Ortalidinae Italicae collectae, distinctae et in ordinem dispositae. Dipterologiae Italicae prodromi Pars [=vol.] VII.-Fasc. 4 [concl.]. *Bull. Soc. Ent. Ital.* **3**: 3-24, 161-88.
- Schiner, I. R.** 1868. Diptera. In Reise der österreichischen Fregatte Novara, Zool., **2**(1) [Sect.] B: 388 p., 4 pl.
- Schrank, F. von P.** 1795. Naturhistorische und ökonomische Briefe über das Donaumoos. 211 p., 1 pl. Mannheim.
- Scopoli, J. A.** 1763. Entomologia carniolica exhibens insects carnioliae indigene et distributa in ordines, genera, species, varietates methodo Linnaeana. 421 p. Vindobonae [=Vienna].
- Shiraki, T.** 1933. A systematic study of Trypetidae in the Japanese Empire. *Mem. Fac. Sci. Agr. Taihoku Imp. Univ.* **8** [Ent. No. 2; Contr. #43 Ent. Lab.]: 1-509, 14 pl.
1968. Fruitflies of the Ryukyu Islands. *Bull. U. S. Nat. Mus.* **263**: 1-104.
- Thomson, C. G.** 1869. 6. Diptera. Species nova descripsit. p. 443-614, pl. 9. In K. Svenska Ve-

- tenskaps-Akademien, Konglige svenska fregatten Eugénies resa omkring jorden Pt. 2: Zoologie, [sect.] 1: Insekter, 617 p., 9 pl. Stockholm, "1868."
- Walker, F.** 1836. Descriptions of the British Tephrites. *Ent. Mag.*, Lond. **3**: 57-85, 1 pl.
1849. List of the specimens of dipterous insects in the collection of the British Museum. **4**: 1005-42, 1071-77.
- 1857a. Catalogue of the dipterous insects collected at Singapore and Malacca by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc., Zool.*, Lond. **1**: 4-39.
- 1857b. Catalogue of the dipterous insects collected at Sarawak, Borneo, by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc., Zool.*, Lond. **1**: 105-36.
1859. Catalogue of the dipterous insects collected in the Aru Islands by Mr. A. R. Wallace with descriptions of new species. *J. Proc. Linn. Soc., Zool.*, Lond. **3**: 77-131.
1860. Catalogue of the dipterous insects collected at Makassar in Celebes by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc., Zool.*, Lond. **4**: 90-172.
1861. Catalogue of the dipterous insects collected in Amboyna by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc., Zool.*, Lond. **5**: 162-65.
1864. Catalogue of the dipterous insects collected in Waigiou, Mysol, and North Ceram by Mr. A. R. Wallace, with descriptions of new species. *J. Proc. Linn. Soc., Zool.*, Lond. **7**: 202-38.
- Westwood, J. O.** 1848. The cabinet of Oriental entomology. 88 p., 42 pl. London.
- Wiedemann, C. R. W.** 1819. Zoologisches Magazin. **1**(3): 1-183. Kiel.
- Wulp, F. M. van der.** 1880. Eenige Diptera van Nederlandsch Indie. *Tijds. Ent.* **23**: 155-94.
1891. Eenige Uitlandsche Diptera. *Tijds. Ent.* **34**: 193-217, 1 pl.
1896. Catalogue of the described Diptera from South Asia. 220 p.
- Zaka-ur-Rab, M.** 1963. A redescription of *Tephritis zonogastra* Bezzi, 1913 (Diptera: Trypetidae). *Beitr. Ent.* **13**: 657-67, 5 fig.
- Zia, Y.** 1937. Study on the Trypetidae or fruit-flies of China. *Sinensia* **8**(2): 103-219, 6 pl.
- Zia, Y. & S. H. Chen.** 1938. Trypetidae of North China. *Sinensia* **9**(1-2): 1-180.

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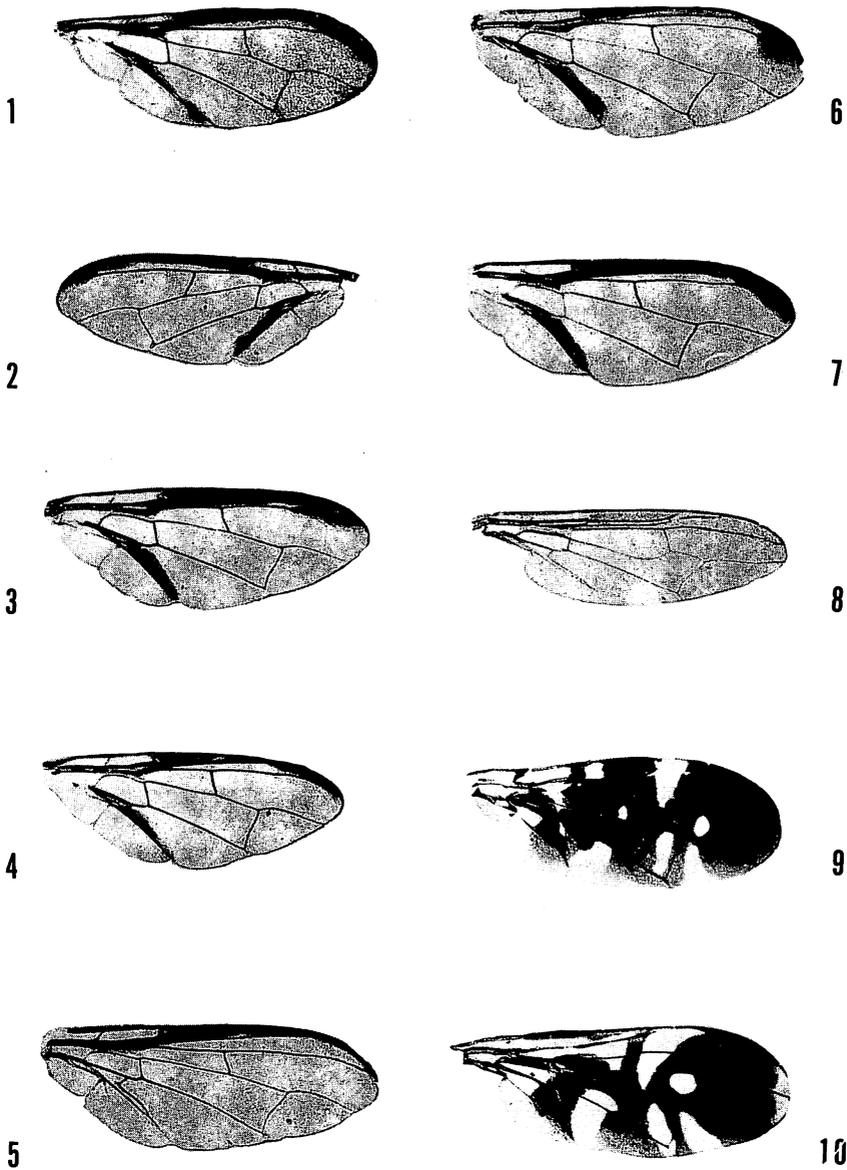
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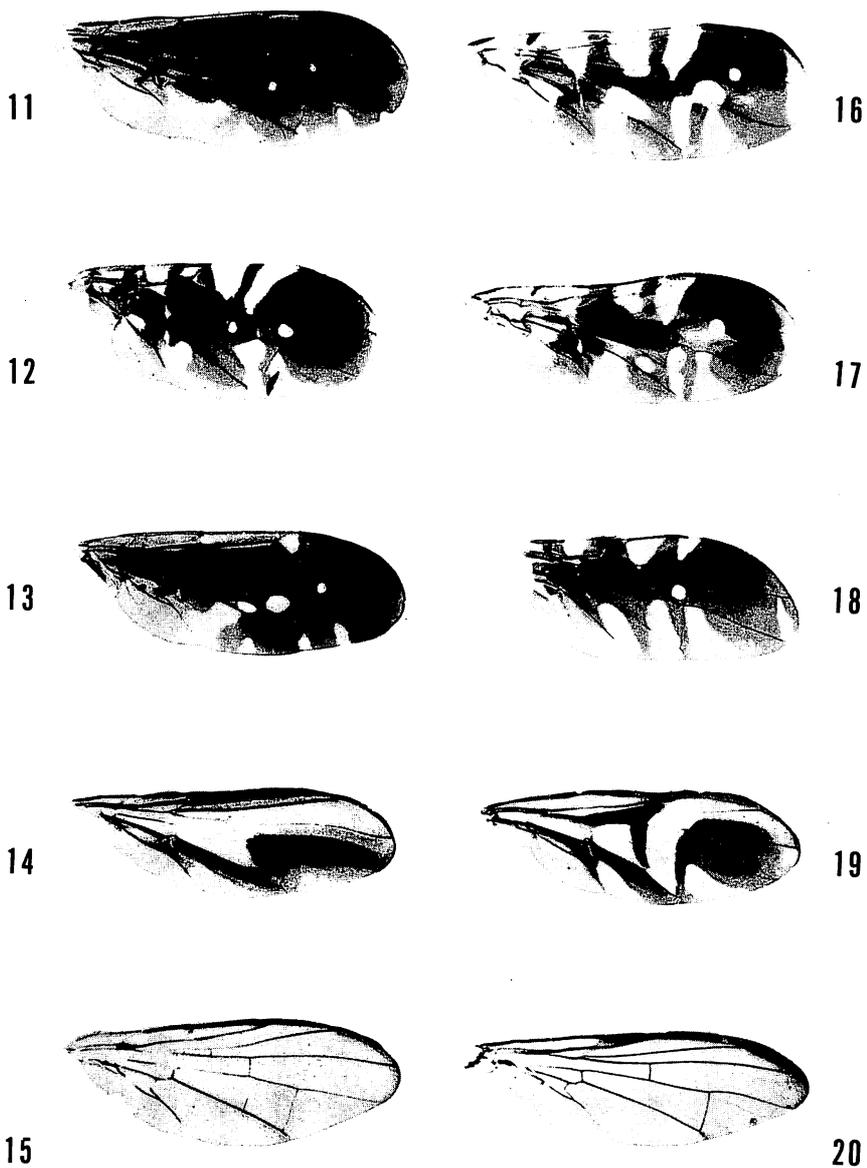
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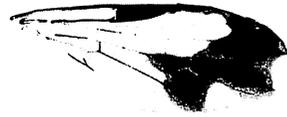
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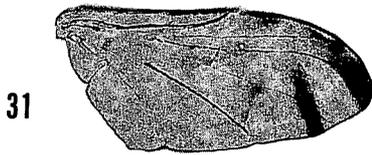
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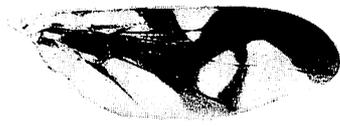


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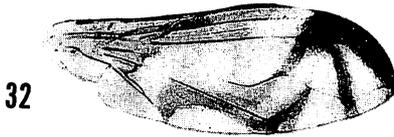
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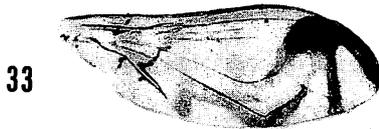
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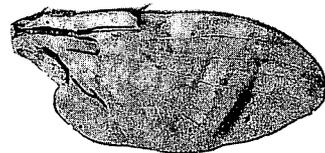
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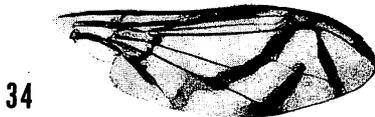
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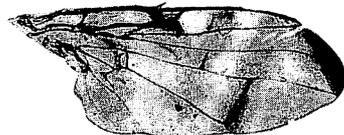
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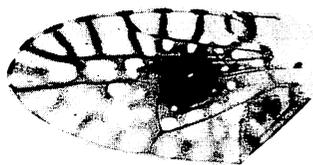
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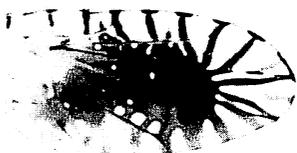
- 36. *Acidiella freyi* Hardy
- 37. *A. mimica*, n. sp.
- 38. *Acidoxantha hibisci*, n. sp.
- 39. *A. minor*, n. sp.
- 40. *A. quadrivittata*, n. sp.



41



43



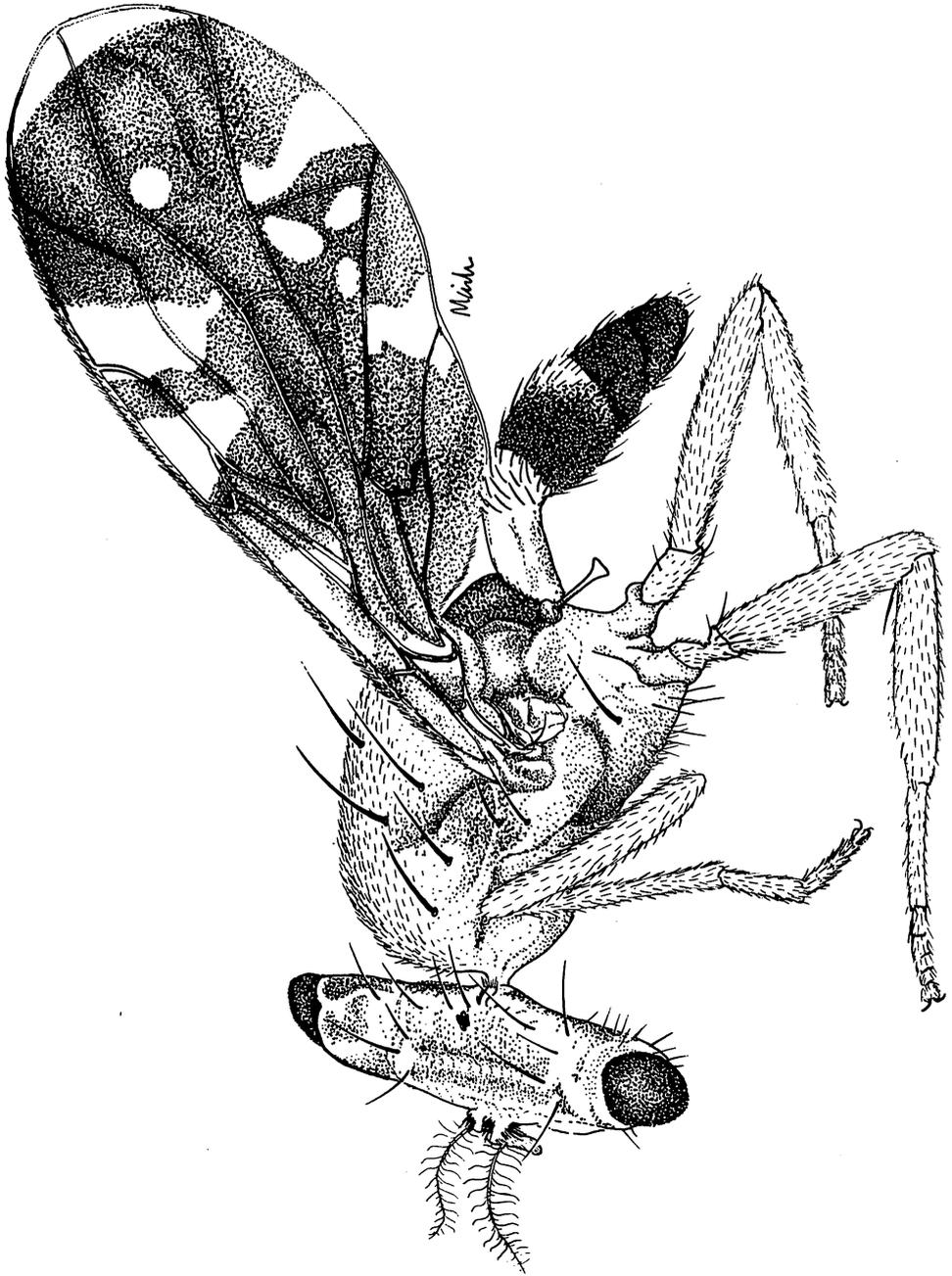
42



44

41. *Myoleja connexa* (Hendel)
42. *Rhabdochaeta convergens*, n. sp.

43. *Rhabdochaeta parva*, n. sp.
44. *Dioxyna heringi*, n. sp.



Themara lunifera Hering, ♂.