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BLOW FLIES (INSECTA: DIPTERA: CALLIPHORIDAE) OF THE PHILIPPINES

H. Kurahashi and F. R. Magpayo

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ABSTRACT. - The Philippine calliphorid flies (83 species) are reviewed. List of new localities, distributions and ecological data are also recorded. Five new species are described and illustrated: *Onesia marina*, new species; *Phumosia nigricauda*, new species; *Phumosia setulosa*, new species; *Bengalia kanoi*, new species; and *Stomorphina neali*, new species. Male genitalia are also illustrated for ten poorly known species.

Twelve species are recorded for the first time from the Philippines. Keys are provided for identifications of 82 species recorded from the area, excluding one nominal taxon in need of revision: *Isomyia mallochi* James, 1977.

KEY WORDS.- Blow flies, Calliphoridae, new species, Philippines.

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Footnote *: Newly recorded species.

INTRODUCTION

Previously, only meagre information on the Philippine blow flies were reported and mostly as part of larger and geographically more inclusive works. James (1966), however, made the breakthrough and published the first report exclusively on the Philippine Calliphoridae based on the material collected by the Noona Dan Expedition in 1961-62 (Petersen, 1966). Thirty-two species were reported including seven new taxa in the genera, *Phumosia*, *Bengalia*, *Isomyia* and *Sumatria*. James (1977) also published a comprehensive list of the calliphorid species known from the Oriental Region at that time, recording 20 genera with a total of 48 species and two subspecies from the Philippine Islands. Kurahashi & Salazar (1977) added *Chrysomya cabrerai* from Mt. Makiling, Luzon to the blow fly fauna of the Philippines. Hii & Kurahashi (1977) described *Phumosia murphyi* from Singapore, Borneo and Palawan Island in the Philippines. Another report (Kurahashi, 1979) was made on *Chrysomya samarensis* and *Lucilia salazarae*, both of which were originally described from the Philippines.

Rueda (1985a, b) published his graduate thesis on the Philippine Calliphoridae, which may be considered as the first local work on the family. Thirty species were included, with five new Philippine records and one species new to science. Rueda's work followed James' classification and covered 13 genera. *Chrysomya chani* was newly recorded from the Philippines in the key to the Oriental, Australasian and Oceanian species of *Chrysomya* (Wells & Kurahashi, 1996).

In the present paper, 83 species distributed in 23 genera are reported. Included in this account are 12 species reported from the Philippines for the first time. These newly recorded species and localities are preceded by asterisk. Five species were found new to science.

The calliphorid fauna of the Philippines is characterized by Oriental (31 spp., 37.3 % of the total) and Oriental-Australasian (13 spp., 15.7 %) elements and by a high frequency of endemic species or species which have so far not been recorded elsewhere (29 spp., 34.9 %). The remaining 10 species comprise pantropical or cosmopolitan (4 spp., 4.8 %), East Palaearctic-Oriental-Australasian (3 spp., 3.6 %), Afrotropical-Oriental-Australasian (2 spp., 2.4 %) and East Palaearctic-Oriental (1 sp., 1.2%) elements.

Abbreviations for institutions housing specimens are as follows: BMNH, The Natural History Museum, London; BPBM, Bishop Museum, Honolulu; CAS, California Academy of Sciences, San Francisco; IRI, International Rice Research Institute, Los Baños; MU, Faculty of Agriculture, Meijo University, Nagoya; NIID, Reference Museum, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo; NSMT, National Science Museum (Natural History), Tokyo; USC, Biological Collections, University of San Carlos, Cebu; UPDA, Department of Agriculture, University of the Philippines, Los Baños; UP-IPH, Institute of Public Health, University of the Philippines, Manila; USNM, National Museum of Natural History, Washington, D. C.; ZMUC, Zoological Museum, University of Copenhagen, Denmark.

In order to save space, only references recording or otherwise referring to the Philippine fauna have been listed in the text. Taxonomic references (author, year: page) are used extensively, but not all have been included in the Literature Cited. Other relevant bibliographic information is found in the Oriental catalogue (James, 1977). Type localities are given in their original version, but they are not strict quotes. Modern names of countries are given in brackets. Locality names of specimens examined are cited as shown on the label. Countries given under distribution are listed roughly in east-west, north-south sequence. Terminology

mainly follows Senior-White et al. (1940) and measurement of frons was made in a similar manner to Fan (1965). Frons index is the same as Fan's index of frons. For the sake of convenience, some keys contain the genera and species not yet recorded from the Philippines that may be expected to occur here. The data of bionomics and localities whenever available are included in the text.

KEY TO THE SUBFAMILIES OF CALLIPHORIDAE

1. Stem vein of wing without setulae on dorsal side of basal section 2
- Stem vein of wing with distinct setulae on postero-dorsal side of basal section 3
2. Anterior lappet of metathoracic spiracle with a conspicuous backwardly directed tuft of long hairs; postscutellum forming a definite convex swelling which is microrugose and sometimes shows slight trace of shallow median incision; female postabdomen nontelescopic, modified for macro-larviparous deposition; large tachinid-like flies. SUBFAMILY AMENIINAE
- Anterior lappet of metathoracic spiracle bare or at most with a very few small inconspicuous hairs; postscutellum not at all convex or at most with rudimentary trace of swelling, not as above; female postabdomen forming a telescopic ovipositor, but sometimes short in larviparous species for deposition of first instar larvae. SUBFAMILY CALLIPHORINAE
3. Subalar knob with erect hairs; thoracic squama largely lobulate, subtruncate at apex, concave on outer margin, haired in parts of upper surface; upper occiput without glossy submarginal band. SUBFAMILY CHRYSOMYINAE
- Subalar knob bare or without distinct hairs; thoracic squama usually tongue-like, narrowly rounded at apex, straight on outer margin, rarely lobulate in some species of *Isomyia*; a bare glossy submarginal band on upper occiput extending almost entirely across its width. SUBFAMILY RHINIINAE

SUBFAMILY AMENIINAE

KEY TO THE TRIBES AND GENERA OF AMENIINAE

1. Head almost always with very large facial carina; propleuron and prosternum almost always haired; hind tibia with apical *pv*; outer *ph* situated mesad of *prs*; ventral surface of costa setulose between apices of subcostal (*sc*) and first longitudinal (*r*₁) vein. Tribe Ameniini, *Silbomyia* Macquart
- Head without facial carina; propleuron bare; prosternum bare, sometimes hairy; hind tibia without apical *pv*; outer *ph* situated laterad of *prs*; ventral surface of costa bare between apices of subcostal (*sc*) and first longitudinal (*r*₁) vein. Tribe Catapicephalini, *Catapicephala*

TRIBE AMENIINI

Genus *Silbomyia* Macquart

Silbomyia Macquart, 1843: 274 (117). Type species: *Musca fuscipennis* Fabricius, 1805, des. by Engel (1925: 348).

KEY TO THE SPECIES OF *SILBOMYIA*

1. Gena clothed with black hairs; parafrontalia dark metallic brassy green or violaceous, strongly contrasting in colour with whitish pollinose lower parts of parafrontalia. *S. philippinensis* Crosskey

- Gena clothed with pale to golden yellow hairs; parafrontalia entirely yellowish, not dark metallic and with yellow ground colour posteriorly. *S. palawana* Crosskey

***Silbomyia palawana* Crosskey**

Silbomyia palawana Crosskey, 1965: 63. Type locality: Binaluan, Palawan, Philippines.

Silbomyia palawana: James, 1977: 527.

Length: 14.1 mm.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Palawan: Balabac).

***Silbomyia philippinensis* Crosskey**

Silbomyia philippinensis Crosskey, 1965: 58. Type locality: Mount Makiling, Luzon, Philippines.

Silbomyia philippinensis: James, 1977: 527.

Silbomyia philippinensis: Rueda, 1985b: 386.

Length: 11.5-13.5 mm.

Material examined. - LUZON: 3 females, Laguna, Mt. Makiling, 300 m, Los Baños, 22 Oct.1975, H. Kurahashi (NIID); 1 female, Nueva Viscaya, Dalton Pass, 9-10 Apr.1968, M. D. Delfinado (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Mindoro, Mindanao).

TRIBE CATAPICEPHALINI

Genus *Catapicephala* Macquart

Catapicephala Macquart, 1851: 210 (237). Type species: *Catapicephala splendens* Macquart, 1851, orig. des.

Trongia Townsend, 1916: 299. Type species: *Trongia viridis* Townsend, 1916, orig. des. (= *Musca micans* Fabricius, 1805).

?*Catapicephala splendens* Macquart

Catapicephala splendens Macquart, 1851: 210 (237). Type locality: Java [Indonesia].

Catapicephala splendens: Rueda, 1985a: 351.

Rueda's record (1985a) from Bohol was based on a single female specimen, but a male is required for exact identification of the species.

Length: 15.0 mm.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - ?Philippines (Bohol), Burma (Tenasserim), Malaysia (Malaya, ?Sarawak), Singapore and Indonesia (Java).

SUBFAMILY CALLIPHORINAE

KEY TO THE TRIBES AND GENERA OF CALLIPHORINAE

1. Propleuron hairy. 2
- Propleuron bare. 11
2. Thoracic squama (Fig. 1) more or less hairy on upper surface. Tribe Calliphorini (in part) 6
- Thoracic squama entirely bare on upper surface. 3
3. Posterior part of suprasquamal ridge with a posterior parasquamal tuft (Fig. 1 b) of black setulose erect hairs on a small well-defined black sclerite. Tribe Luciliini 4
- Posterior parasquamal tuft absent. 5

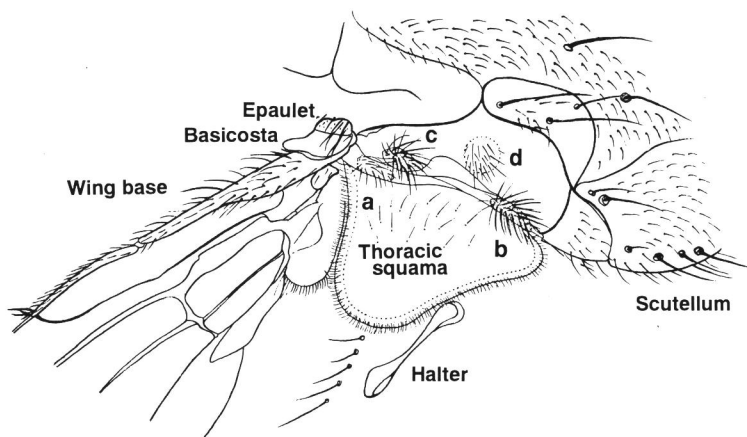


Fig. 1. Wing base, dorsolateral view. a, anterior parasquamal tuft; b, posterior parasquamal tuft; c, tympanic tuft; d, tuft in central circle of postalar declivity.

4. Supraspiracular convexity clothed with long, upstanding, fine hairs. *Hemipyrellia* Townsend
- Supraspiracular convexity bare or pubescent. *Lucilia* Robineau-Desvoidy
5. Anterior part of suprasquamal ridge bare; distance between right and left of presutural *ac* rather large (cf. Kurahashi, 1970: 521, Fig. 1 a); mesothoracic spiracle rather large, its operculum sometimes swollen. Tribe Phumosiini, *Phumosia* Robineau-Desvoidy
- Anterior parasquamal tuft (Fig. 1 a) present, if not so, distance between right and left presutural *ac* small (cf. Kurahashi, 1970: 521, Fig. 1 b); mesothoracic spiracle smaller, its operculum not particularly swollen. Tribe Calliphorini (in part) 6
6. Presutural *ac* usually 1, rarely absent; facial carina more or less developed. *Polleniopsis* Townsend
- Presutural *ac* 2; facial carina absent. 7

7. Thoracic squama entirely bare on upper surface; anterior parasquamal tuft developed. *Melinda* Robineau-Desvoidy
- Thoracic squama more or less hairy on upper surface, if not so, anterior parasquamal portion bare. 8
8. Male frons very broad; eyes dichoptic in male and female; 3rd antennal segment elongate, more than 4 X as long as 2nd; presutural *ia* absent. *Tainanina* Villeneuve
- Eyes holoptic or subholoptic in male and dichoptic in female; length of 3rd antennal segment variable; presutural *ia* present or absent. 9
9. Body medium-sized, largely testaceous, with yellow femora and tibiae. [No record, but probably found in the Philippines]. *Tricycleopsis* Villeneuve
- Body small- to large-sized, blackish, with metallic blue abdomen and black legs. 10
10. Body small- to medium-sized; distance between right and left of presutural *ac* small (cf. Kurahashi, 1970: 521, Fig. 1 b). *Onesia* Robineau-Desvoidy
- Body large-sized; distance between right and left of presutural *ac* rather large (cf. Kurahashi, 1970: 521, Fig. 1 a). *Calliphora* Robineau-Desvoidy
11. Prosternum usually hairy, bare in *Verticia*; thorax not clothed with golden curly hairs; eyes dichoptic in male and female; body at least partly yellowish. Tribe Bengaliini 12
- Prosternum bare; thorax usually with golden curly hairs, if no curly hairs, eyes holoptic in male and body black in male and female. Tribe Polleniini, *Dexopollenia* Townsend
12. Vibrissa inserted well above oral margin, if more or less level with oral margin then face not deeply sunk; arista long plumose to tip; frontal stripe clothed with rather long setulae. *Bengalia* Robineau-Desvoidy
- Vibrissa inserted at level of oral margin; face more or less deeply sunk; arista plumose or pectinate; frontal stripe without setulae. 13
13. Arista plumose; facialia and face normally formed; prosternum bare; proclinate *ors* and *ov* in male. [No record from the Philippines]. *Verticia* Malloch
- Arista pectinate; facialia diverging for the greater part of their length, then rapidly converging above oral margin; prosternum hairy; neither proclinate *ors* nor *ov* in male. *Booponus* Aldrich

TRIBE CALLIPHORINI

Genus *Calliphora* Robineau-Desvoidy

Calliphora Robineau-Desvoidy, 1830: 433. Type species: *Musca vomitoria* Linnaeus, 1758, orig. des.

KEY TO THE SPECIES OF *CALLIPHORA*

1. Gena reddish orange in ground colour; mesothoracic and metathoracic spiracles yellowish orange; presutural *ia* absent. *C. (Paracalliphora) fulviceps* van der Wulp
- Gena black in ground colour; mesothoracic and metathoracic spiracles blackish; presutural *ia* present. *C. (Calliphora) vomitoria* (Linnaeus)

Subgenus *Calliphora* Robineau-Desvoidy

Calliphora vomitoria (Linnaeus)

Musca vomitoria Linnaeus, 1758: 595. Type locality: Sweden.

Calliphora vomitoria: James, 1977: 531.

Calliphora vomitoria: Rueda, 1985a: 316.

A greater part of gena is covered with black hairs. Postgena (metacephalon) and posterior part of gena are clothed with pale hairs. Head is fuscous black in ground colour. Meso- and metathoracic spiracles are fuscous brown in colour.

Length: 10.5-13.0 mm.

Material examined. - LUZON: 1 female, Mt. Province, Mt. Polis (?), 24 May 1948, Celestino (UPDA); 1 female, Mt. Province, Lepanto, 28 May 1958, B. Cariaso (UPDA); 1 female, Laguna, Los Baños, 8 Aug.1978, A. Nakanishi & O. Yata (NIID). MINDANAO: 2 females, Mt. Apo, 14 Nov.1965, D. Davis (USNM); 6 females, Cotabato, Mt. Apo, 2,850 m, 4 Aug.1978, A. Nakanishi & O. Yata (NIID).

Bionomics. - Abundant around human dwellings in Europe, but hardly found within close range of domestic surroundings in the Philippines. The larvae of this species breed in human feces, carrion and other decaying animal matters.

Distribution. - Japan, Korea, Taiwan, Philippines (Luzon, Mindanao), China, Thailand, Nepal, Europe, Morocco, N. America and Hawaiian Is.

Subgenus *Paracalliphora* Townsend

Paracalliphora Townsend, 1916: 151. Type species: *Calliphora oceaniae* Robineau-Desvoidy, 1830, orig. des.

**Calliphora fulviceps* van der Wulp

Calliphora (Paracalliphora) fulviceps van der Wulp, 1881: 44. Type locality: Kerentji, Pic of Indrapura, Sumatra [Indonesia].

Calliphora (Paracalliphora) javanica de Meijere, 1914: 174, as *fulviceps* var. Type localities: Gunung Gedeh, Pangerango, and Tosari, Java [Indonesia].

Calliphora (Paracalliphora) malayana Malloch, 1927: 415. Type locality: Gunung Benom, Pahang, Malaya [Malaysia].

Most of gena, metacephalon and occiput are clothed with golden yellow hairs. Head is predominantly orange except for black parafrontalia and occiput. Thoracic spiracles are yellow to orange in colour.

Length: 9.0-12.0 mm.

Material examined. - MINDANAO: 1 female, Davao, Sta. Cruz, 2,000 ft, 12 Mar.1956, C. B. Viado (UPDA); 6 females, Cotabato, Lake Binado, 2,850 m, 4 Aug.1978, A. Nakanishi & O. Yata (NIID); 4 females, Mt. Apo, 14 Nov.1965, D. Davis (USNM); 5 females, Mt. Apo, 2,850 m, 4 Aug.1978, A. Nakanishi & O. Yata (NIID).

Bionomics. - Nothing is known from the Philippines.

Distribution. - *Philippines (Mindanao), Malaysia (Malaya, Borneo) and Indonesia (Sumatra, Java).

Genus *Polleniopsis* Townsend

Polleniopsis Townsend, 1917: 201. Type species: *Polleniopsis pilosa* Townsend, 1917, orig. des.

KEY TO THE SPECIES OF *POLLENIOPSIS*

1. Propleuron bare; facial carina weak. *P. inconclusa* (Walker)
- Propleuron hairy; facial carina strongly developed, forming deep antennal grooves. 2
2. Parafacialia indistinctly setulose above; postsutural *ia* 2. *P. toxopei* (Senior-White)
- Parafacialia distinctly setulose throughout; postsutural *ia* 3. ... *Onesia fae* Kurahashi et Miranda

***Polleniopsis inconclusa* (Walker)**

Musca inconclusa Walker, 1861: 160. Type locality: Amboina, Moluccas [Indonesia].

Polleniopsis inconclusa: Kurahashi, 1972: 714.

Length: 5.5 mm.

Material examined. - LUZON: 1 female, Ifugao, Liwa, 8 km E Mayoyao, 1,000-1,300 m, light trap, 2 Jun.1967, H. M. Torrevillas (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon) and Indonesia (Celebes, Ambon).

***Polleniopsis toxopei* (Senior-White)**

Paratricyclea toxopei Senior-White, 1926: 135. Type locality: Buru Is., Dutch East Indies [Indonesia].

Polleniopsis toxopei: James, 1966: 465, 1977: 540.

Polleniopsis toxopei: Kurahashi, 1972: 710.

Polleniopsis toxopei: Rueda, 1985a: 353.

Length: 6.0-8.5 mm.

Material examined. - LUZON: 1 female, Mt. Makiling, 17 Mar.1960, T. C. Maa (BPBM); 1 female, Ifugao, Jacmal Bunhian, 24 km E Mayoyao, 800-1,000 m, 19-21 Apr.1967, H. M. Torrevillas (BPBM); 4 males, Camarines Sur, Mt. Iriga, 500-600 m, 29 Mar.1962, 3 Apr.1962, H. M. Torrevillas (BPBM). PALAWAN: 1 male, 5 females, Montible, 100 m, 29 Oct.1975, H. Kurahashi (NIID). MINDANAO: 1 male, Misamis Or., Mt. Balatukan, 1,000-2,000 m, 15 km SW Gingoog, 27-30 Apr.1960, H. M. Torrevillas (BPBM).

Bionomics. - Nothing is known.

Distribution. - Taiwan, Philippines (Luzon, Palawan, Mindanao, Balabac), Malaysia (Borneo, Malaya), Indonesia (Sumatra, Java, Buru Is., Moluccas), Papua New Guinea (New Guinea, Bismarck Arch.), Solomon Is. and Admiralty Is.

Genus *Onesia* Robineau-Desvoidy

Onesia Robineau-Desvoidy, 1830: 365. Type species: *Onesia floralis* Robineau-Desvoidy, 1830, des. by Townsend (1916: 8).

KEY TO THE SPECIES OF *ONESIA*

1. Mesothoracic spiracle fuscous to black. 2
- Mesothoracic spiracle pale yellow. 3
2. Facial carina distinctly developed; abdomen black, more or less grey-dusted, without blue tinge, with tessellated pattern in male; basicosta fuscous brown to brown; presutural *ia* absent. ...
..... *O. fae* Kurahashi et Miranda
- Facial carina not developed; abdomen metallic blue to green, very slightly dusted; basicosta black; presutural *ia* present. *O. atripalpis* (Malloch)
3. *Ia* 1+2; postgena almost entirely with yellow hairs; male frons narrower than width of ocellar triangle; cercus and parolobus slender, the former sharply pointed.
..... *O. pubescens* (Macquart)
- *Ia* 1+3; postgena with some black hairs anteriorly; male frons broader than width of ocellar triangle; cercus robust, parolobus broad. 4
4. External *ph* present; frontal stripe broader than one of parafrontalia in male; mid tibia with 1 distinct *pd* in both sexes. *O. marina*, new species
- External *ph* absent; frontal stripe narrower than one of parafrontalia; mid tibia without *pd*, sometimes weakly developed *pd* present in female. *O. currani* Kurahashi

****Onesia atripalpis* (Malloch)**

Calliphora atripalpis Malloch, 1935: 669. Type locality: Kamborangah, Mt. Kinabalu, Borneo [Malaysia].

Length: 5.3-7.0 mm.

Material examined. - LUZON: 8 females, Mt. Prov., Abatan, Busuias, 60 km S of Bontoc, 1,800-2,000 m, 23 Apr.1964, H. M. Torrevillas (BPBM). MINDANAO: 1 female, Misamis Occ., Trib. of Clarin R., 1,200 m, jungle, 14-18 Jul.1958, H. E. Milliron (BPBM).

Bionomics. - Adults are found only in mountainous areas.

Distribution. - *Philippines (Luzon, Mindanao) and Malaysia (Malaya, Borneo).

****Onesia currani* Kurahashi**

(Fig. 2)

Melinda minuta Curran, 1929: 9 [Preocc. Malloch, 1928]. Type locality: Île Nou, New Caledonia. *Onesia currani* Kurahashi, 1989: 706 (n. name for *Melinda minuta* Curran, 1929)

Easily distinguished from *Onesia marina*, new species by the largely black haired gena and the absence of external *ph*. Male genitalia is basically similar to *O. marina*, new species except for just a slight sclerotization in the aedeagal apex.

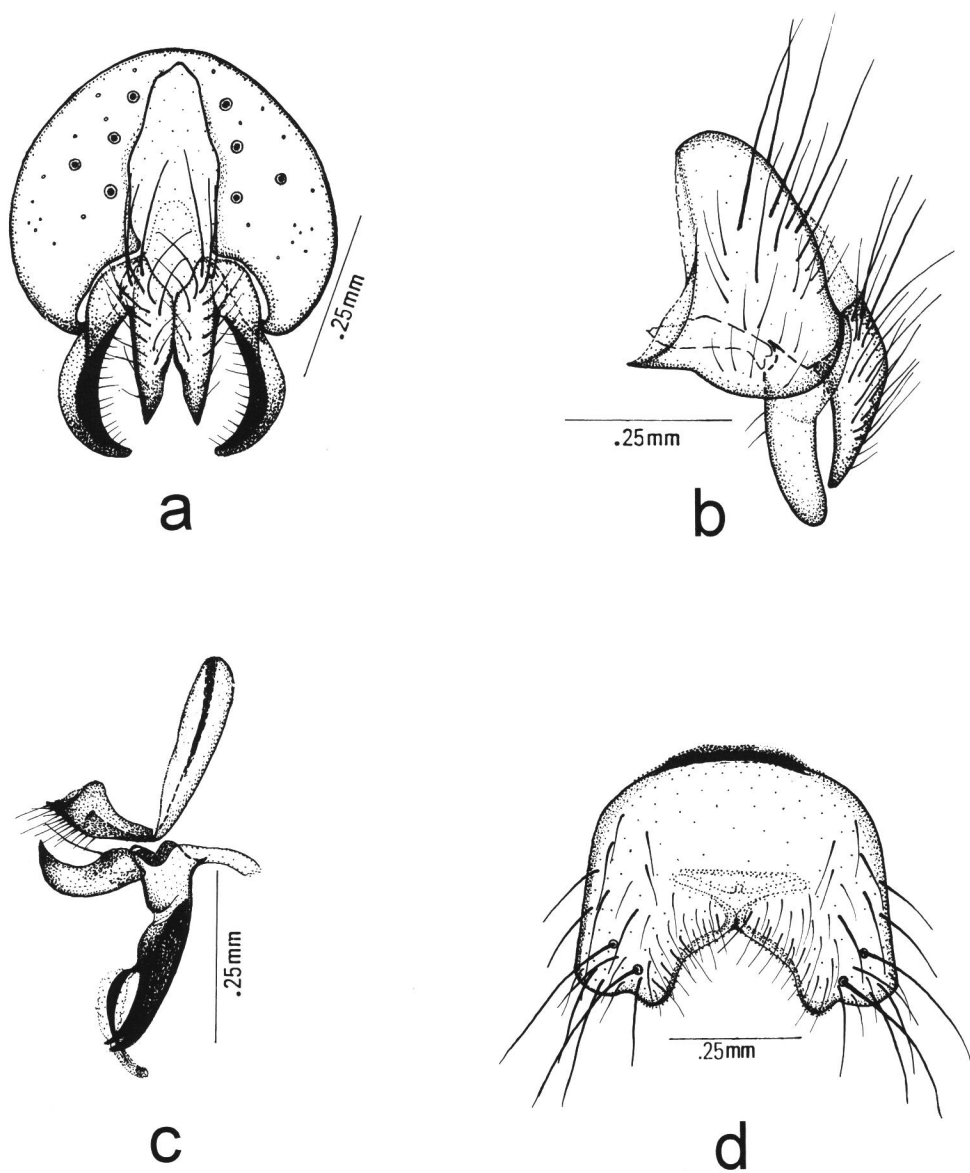


Fig. 2. *Onesia currani* Kurahashi, male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and parolobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

Length: 4.3-5.3 mm.

Material examined. - MINDANAO: 1 male 1 female, Surigao, Mainit, 20 May 1984, F. R. Magpayo (USC); 1 female, Agusan, Hubang, San Francisco, 23 May 1984, F. R. Magpayo (USC); 2 females, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NIID); 1 male, Marfori H., Davao City, 7 Feb.1982, F. R. Magpayo (USC).

Bionomics. - Nothing is known.

Distribution. - *Philippines (Mindanao), Indonesia (Irian Jaya), Papua New Guinea (New Guinea, Bismarck Arch., Bougainville I.) and New Caledonia.

Onesia fae Kurahashi et Miranda

Onesia fae Kurahashi et Miranda, 1988: 40. Type locality: Baracatan, Davao City, Mindanao I., Philippines.

Length: 7.0-10.0 mm.

Material examined. - MINDANAO: 11 males 1 female, Davao, Mt. Talomo, 1,000 m, 20 Feb.1983, 27 Mar.1983, 17-21 May 1988, F. R. Magpayo (NIID).

Bionomics. - Adults are found in primary forest.

Distribution. - Philippines (Mindanao).

Onesia marina, new species

(Fig. 3)

Type material. - Holotype male, PALAWAN: Kanigarang Beach, 3 Nov.1975, H. Kurahashi.

Paratypes. PALAWAN: 49 males, 15 females, same locality as holotype, 28 Oct.-3 Nov.1975, H. Kurahashi & R. Kano; 1 male, 2 females, Antipolo Beach, 1-3 Nov.1975, H. Kurahashi & R. Kano.

Type depository. Holotype (male) and paratypes (6 males 7 females) are preserved in Reference Museum, Taxonomy and Ecology Laboratory, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo; paratypes (3 males 3 females) are also deposited in Bishop Museum, Honolulu (BPBM); paratypes (3 males 3 females) in Natural History Museum, London (BMNH); paratypes (3 males 3 females) in Biological Collection, University of San Carlos, Cebu (USC); paratypes (35 males 1 females) in National Science Museum, Tokyo (NSMT).

Description. - Male.-Head: eyes bare, subholoptic, separated at narrowest point by more than width of ocellar triangle; frons index 0.10-0.13; frontal stripe blackish, slightly reddish anteriorly, widened anteriorly and posteriorly, about twice the width of one of parafrontalia at narrowest point of frons, distinctly broader than width of anterior ocellus; parafrontalia narrowed toward vertex, densely yellowish-grey dusted, darkened toward vertex, with black setulae anteriorly, with ca 13 pairs of ori; parafacialia fuscous, reddish along anterior margin, yellowish-grey dusted, with black setulae above; face fuscous, reddish brown on lower 1/3, slightly yellowish grey-dusted, without median carina; facialia reddish brown, slightly yellowish-grey dusted, setulose on lower half; medianae reddish brown, slightly yellowish-grey dusted, with black setulae close to anterior margin of gena; vibrissaria very narrow, reddish brown, slightly yellowish-grey dusted, with a few black setulose hairs; vibrissae

well developed; epistome reddish brown, slightly yellowish-grey dusted; gena black, grey-dusted, clothed with black hairs; postgena concolorous with gena, clothed with yellowish brown hairs except for several black ones anteriorly; occiput black, clothed with pale yellowish brown hairs on central portion; 2nd antennal segment fuscous brown; 3rd antennal segment except for venter of basal 1/2 reddish orange, about 2.5 X as long as 2nd; arista fuscous, long plumose on basal 2/3; palpus yellowish brown.

Thorax: black, sometimes slightly bluish tinged, yellowish- grey dusted on dorsum and pleura; prescutum with two narrow submedian stripes and broad triangular black lateral spots which are more or less distinct when viewed from behind; median and lateral black stripes on scutum usually obscure; humerus, postalar callus and scutellum concolorous with dorsum; prosternum blackish-haired; propleuron hairy; supraspiracular convexity pubescent, without erect hairs; hypopleural hairs rather long, black, bearing around row of hypopleural bristles; other pleural hairs fuscous to black, some hairs on anteroventral surface of sternopleuron becoming brownish apically; mesothoracic spiracle yellow; metathoracic one fuscous; postalar declivity with tuft of black hairs in central circle; tympanic tuft absent; anterior parasquamal tuft of black hairs. Chaetotaxy: *ac* 2+3; *dc* 3+3; *ia* 1+3-4; *h* 3; *ph* 3; *prs* 1; *sa* 3-4; *pa* 2; *st* 2+1; *sc* 3+1; *n* 2-3; *pp* 2; *pst* 2.

Wings: hyaline; veins brownish; epaulet brownish; basicosta pale yellowish brown; subcostal sclerite pale yellow on basal half, brownish on apical half, pubescent; node of 2nd and 3rd longitudinal veins (r_{2+3} and r_{4+5}) with several black setulae above and below; 4th longitudinal vein (*m*) bent with an obtuse angle; section of the 4th vein from bend to wing margin slightly curved inward on basal half; alar squama pale brown; thoracic one more brownish than alar one except for pale base, with black hairs on upper surface. Halteres yellowish brown.

Legs: black, black haired; fore tibia with 1 *p* and a row of short (4-5) *ad*; mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with 4-5 *ad*, 2-3 *pd* and 1 *av*.

Abdomen: black, with faint bluish green tinge, covered with silver grey dustings which produce a more or less tessellated pattern; trace of black median stripe present on tergites 3-5; tergite 1+2 with a few lateral marginal bristles; tergite 3 with several rather strong lateral marginals and a row of decumbent fine marginals; tergites 4-5 with a row of erect marginal bristles, discal bristles present on tergite 5; sternites black, black-haired, silver-grey dusted; hairs on sternites and lateral sides of tergites rather long, black. Hypopygium normal in size, black, slightly grey-dusted. Male genitalia including sternite 5, cercus, parolobus and aedeagus as shown in Fig. 3.

Female.-Head: eyes separated at vertex by a distance equal to 0.30-0.35 of head width; frontal stripe broad, parallel-sided, blackish brown posteriorly, reddish brown anteriorly, nearly 3 X the width of one of parafrontalia just in front of anterior ocellus; parafrontalia black, densely grey-dusted, with black setulae on entire length, provided with ca 8 pairs of *ori*; *ors* 2+1; *oc* developed; *acoc* indistinct; *pooc* fine; *ov* and *iv* well developed; *poc* parallel; *occ* 1-2.

Thorax and wings: similar to those of male.

Legs: mid tibia sometimes with 2 *ad*; hind tibia with 2 *av*.

Abdomen: more stout than that of male; abdominal bristles strong, but more or less decumbent. Ovipositor short, indicating a larviparous habit. Otherwise as for male.

Length: 4.5-7.5 mm.

Etymology. - The specific name refers to the maritime habitat.

Remarks. - The present species is very similar to *Onesia pubescens* (Macquart, 1851) from New Guinea. The principal differences between the two species are found in the shape of male genitalia and the presence or absence of an outer *ph*.

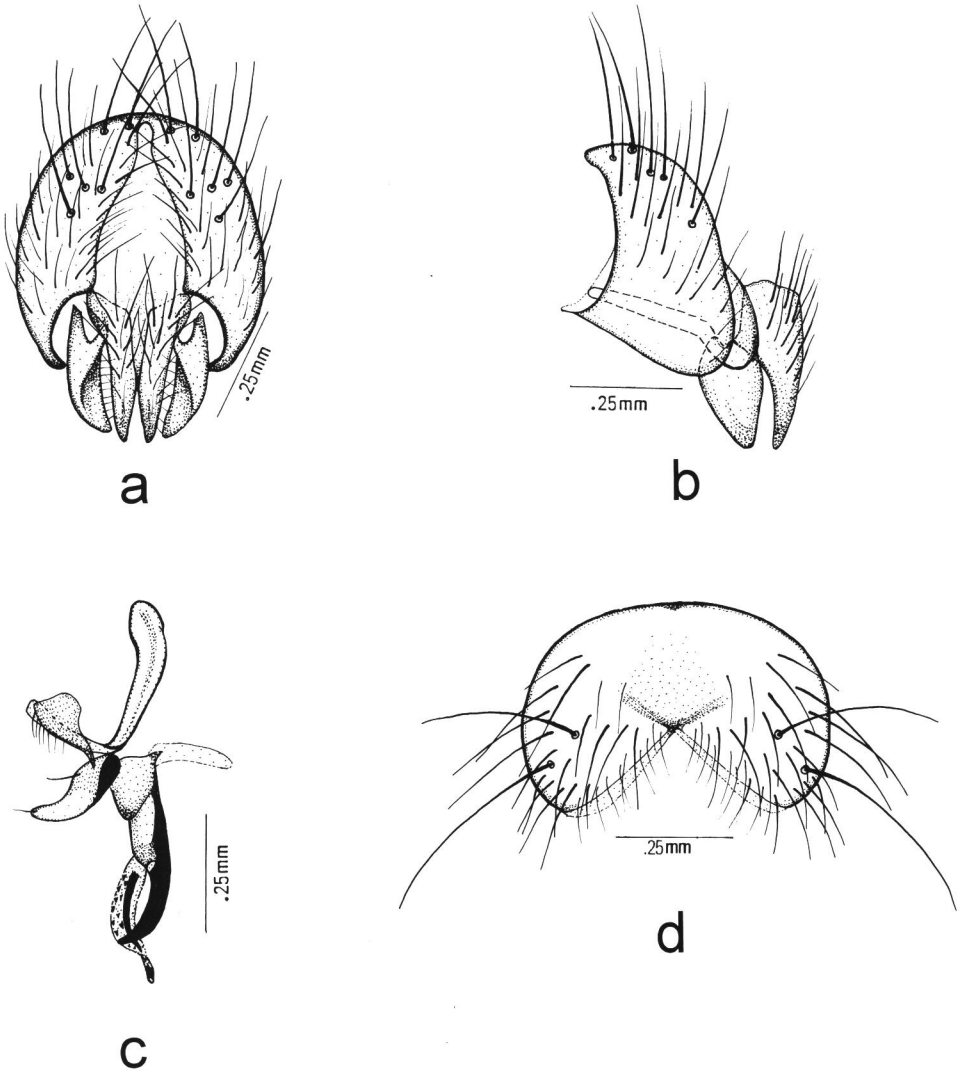


Fig. 3. *Onesia marina*, new species, male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

Bionomics. - Adults were found associated with mangrove trees.

Distribution. - Philippines (Palawan).

****Onesia pubescens* (Macquart)**

(Fig. 4)

Calliphora pubescens Macquart, 1851: 215 (242). Type locality: "côte orientale" [Australia].

The species is closely related to *Onesia currani* Kurahashi and *O. marina*, new species, but easily distinguished from these two species by the yellow hairs along posterior extremity of gena and on postgena.

Length: 4.8-5.5 mm.

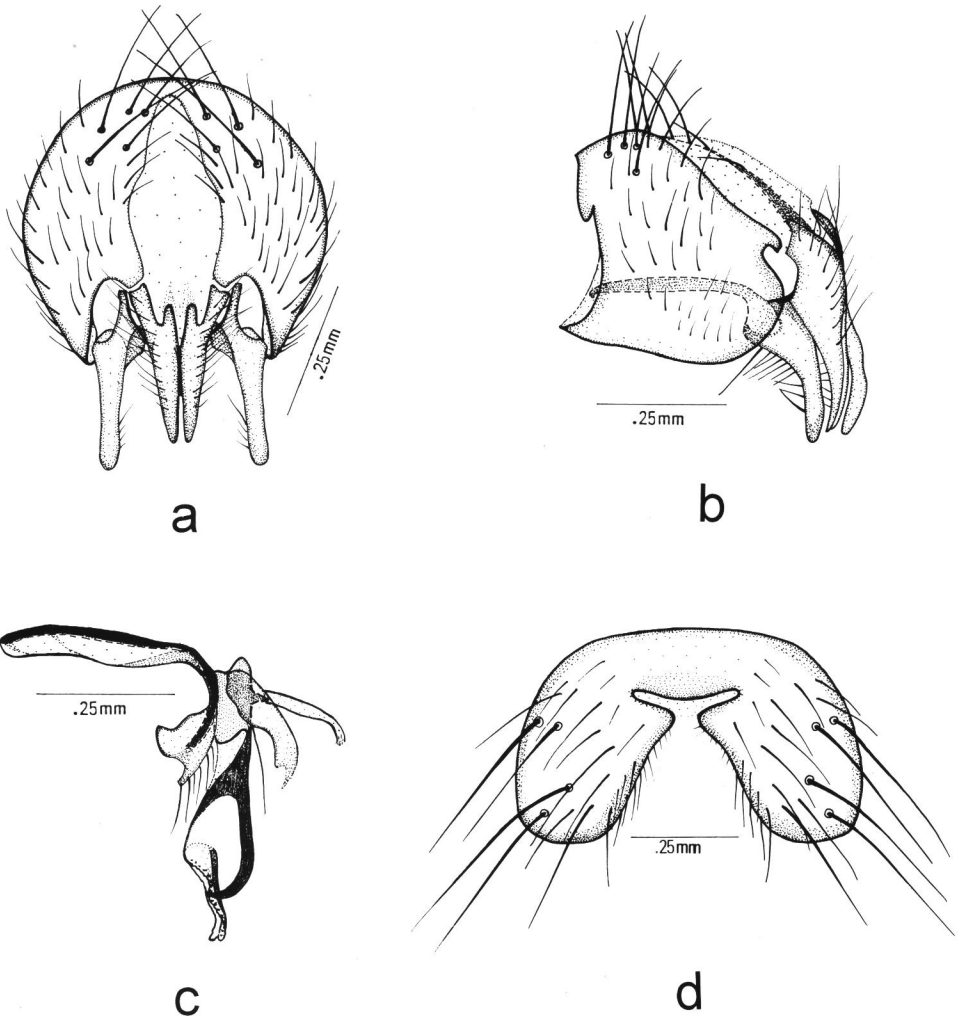


Fig. 4. *Onesia pubescens* (Macquart), male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

Material examined. - LUZON: 1 male 1 female, Laguna, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano (NSMT).

Bionomics. - Nothing is known.

Distribution. - *Philippines (Luzon), Indonesia (Irian Jaya), Papua New Guinea (New Guinea, Bismarck Arch., Bougainville I.), Vanuatu (Banks I., Espiritu Santo, Pentecost I., Malekula, Epi, Efate, Eromanga, Tanna), Loyalty Is., New Caledonia and Australia (New South Wales, Victoria, South Australia, Tasmania).

Genus *Tainanina* Villeneuve

Tainanina Villeneuve, 1926: 271. Type species: *Tainanina grisella* Villeneuve, mon. (= *Pollenia pilisquama* Senior-White, 1925).

KEY TO THE SPECIES OF *TAINANINA*

1. One proclinate and one reclinate fronto-orbital bristles (*ors*) developed in male and female; hairs on thoracic squama white. *T. pilisquama* (Senior-White)
- No fronto-orbital bristle in male, two proclinate and one reclinate fronto-orbital bristles developed in female; hairs on thoracic squama black. *T. sarcophagoides* (Malloch)

Tainanina pilisquama (Senior-White)

Pollenia pilisquama Senior-White, 1925: 84. Type locality: Ceylon [Sri Lanka].

Tainanina pilisquama: James, 1877: 540.

Tainanina pilisquama: Kurahashi, 1978: 2.

Length: 4.5-6.0 mm.

Material examined. - PALAWAN: 6 males 6 females, Pinigsan, Mantalingajan, 600 m, 4-23 Sep.1961, Noona Dan Exp. '61-62; 1 female, Uring-Uring, Brookes Pt., 23 Jul.1961, Noona Dan Exp. (ZMC). NEGROS: 1 female, Negros Or., Lake Balinsasayao, 1-7 Oct.1959, C. M. Yoshimoto (BPBM).

Bionomics. - Nothing is known.

Distribution. - Taiwan, Philippines (Palawan, Negros), Malaysia (Borneo), Indonesia (Java, Bali), India and Sri Lanka.

Tainanina sarcophagoides (Malloch)

Calliphora sarcophagoides Malloch, 1931: 192. Type locality: Pahang, Malaysia (Malaya).

Tainanina sarcophagoides: James, 1977: 540.

Length: 4.4-5.8 mm.

Material examined. - PALAWAN: 1 female, Montible, 24-27 Jan.1975, S. Shinonaga (NSMT). NEGROS: 1 male 1 female, Negros Or., Lake Balinsasayao, 1-7 Oct.1959, L. W. Quate (BPBM). MINDANAO: 1 male, Surigao, L. Mainit, 23 Nov.-1 Dec.1959, C. M. Yoshimoto (BPBM); 2 females, Davao City, Mt. Talomo, 1,000 m, 17 Jul.1983, on flying lemur's feces, D. Tadena (USC).

Bionomics. - The more recent collection data suggest that are attracted to animal feces in the forest.

Distribution. - Taiwan, Philippines (Palawan, Negros, Mindanao), Vietnam, Thailand, Malaysia (Malaya, Borneo), Indonesia (Lombok), Papua New Guinea (New Guinea, Bismarck Arch.).

Genus *Melinda* Robineau-Desvoidy

Melinda Robineau-Desvoidy, 1830: 439. Type species: *Musca coerulea* Meigen, 1826 (preocc., = *Melinda gentilis* Robineau-Desvoidy, 1830), des. by Hendel (1901: 32).

KEY TO THE SPECIES OF *MELINDA*

1. Eye bare; propleuron bare. *M. mindanaoa* Kurahashi
- Eye hairy; propleuron hairy. *M. sp. nr dubia* (Malloch)

Melinda mindanaoa Kurahashi

Melinda mindanaoa Kurahashi, 1992: 243. Type locality: Masawan-Gundawan, Zamboanga Del Norte, Mindanao, Philippines.

Type material examined.- Holotype male, MINDANAO: Zamboanga Del Norte, Masawan-Gundawan, 1,260-1,350 m, 3 Jul.1958, H. E. Milliron (BPBM).

Length: 6.0 mm.

Bionomics. - Nothing is known.

Distribution. - Philippines (Mindanao).

Melinda sp. nr dubia Malloch

Only a single female was available for study, but the male sex is needed for exact identification.

Length: 5.0 mm.

Material examined. - MINDANAO: 1 female, Lake Binado, Mt. Apo, 2,856 m, 4 Aug.1978, A. Nakanishi & O. Yata (NIID).

Bionomics. - Unknown.

Distribution. - Philippines (Mindanao).

TRIBE LUCILIINI

Genus *Lucilia* Robineau-Desvoidy

Lucilia Robineau-Desvoidy, 1830: 452. Type species: *Musca caesar* Linnaeus, 1758, des. by Macquart (1834: 162).

KEY TO THE SPECIES OF *LUCILIA*

1. Wings strongly infuscated along costal margin; parafacialia with a row of fine hairs. *L. fumicosta* Malloch
- Wings without a demarcated costal infuscation; parafacialia bare. 2
2. Basicosta yellow. 3
- Basicosta black. 4
3. Male sternites with tufts of long hairs; male abdomen usually arched in profile; female body usually brassy or coppery on greenish background, with dense pruinosity; cerebrale in female bearing one occipital hair on each side (cf. Kurahashi, 1966: 122, Fig. 10 A). *L. cuprina* (Wiedemann)
- Male sternites without tuft of long hairs; male abdomen not conspicuously arched in profile; female body usually metallic green, sometimes more or less with coppery tinge; cerebrale in female bearing 5-8 hairs on each side (cf. Kurahashi, 1966: 122, Fig. 10 B). *L. sericata* (Meigen)
4. Abdomen without distinct black marginal bands; genal hairs long throughout. 5
- Abdomen with broad black marginal bands; genal hairs short along upper extremity. 6
5. Wing usually more strongly brownish-tinged; tergite 3 sometimes with lateral purple marginal band. *L. salazarae* Kurahashi
- Wing hyaline or more or less pale testaceous; tergite 3 with no lateral purple marginal band. ... *L. porphyrina* (Walker)
6. Male: narrowest part of frons less than width of ocellar triangle; parafacialia narrower than width of 3rd antennal segment along upper extremity. 7
- Male: narrowest part of frons as wide as width of ocellar triangle; upper and lower squamae brown or fuscous in part. 8
7. Alar and thoracic squamae both fuscous brown. *L. hainanensis* Fan
- Alar squama yellowish brown, thoracic one fuscous brown. *L. sinensis* Aubertin
8. Female: alar and thoracic squamae entirely fuscous, the former with a tuft of blackish hairs on inner lower margin; parafacialia in male at least as broad as width of 3rd antennal segment. *L. papuensis* Macquart
- Female: alar squama fuscous to yellowish brown with a tuft of dark brown to black hairs on inner lower margin, thoracic one fuscous to brown; parafacialia in male more or less broader than width of 3rd antennal segment. *L. calviceps* Bezzi
- Female: alar and thoracic squamae entirely or largely whitish, the former usually paler than the latter, with a tuft of yellow hairs on inner lower margin; parafacialia in male as broad as width of 3rd antennal segment. *L. bismarckensis* Kurahashi

****Lucilia bismarckensis* Kurahashi**

Lucilia bismarckensis Kurahashi, 1987: 46. Type locality: Rabaul, Keravat, New Britain, Papua New Guinea.

Length: 9.5 mm.

Material examined. - LUZON: 1 male, Camarines Sur, Mt. Isarog, Pili, 800 m, 16 Apr.1965, H.

M. Torrevillas (BPBM); 1 female, Los Baños, Mt. Makiling, 17 Sep.1959, L. W. Quate (BPBM).

Bionomics. - Adults are found in forests.

Distribution. - *Philippines (Luzon), Bangladesh and Papua New Guinea (New Guinea, Ferg I., New Britain, New Ireland).

****Lucilia calviceps* Bezzi**

Lucilia calviceps Bezzi, 1927: 238. Type localities: Espiritu Santo and Epi Island, New Hebrides [Vanuatu].

Length: 9.0-11.0 mm.

Material examined. - LUZON: 1 female, Mt. Makiling, Los Baños, 17 Sep.1959, L. W. Quate & C. M. Yoshimoto (BPBM); 5 males 7 females, Mt. Makiling, 500 m, Los Baños, 16-17 Apr.1965, F. R. Magpayo (USC); 1 male, Camarines Sur, Mt. Isarog, 800 m, ? Apr.1965, H. M. Torrevillas (BPBM).

Bionomics. - Adults are attracted to decaying meat in the forest.

Distribution. - *Philippines (Luzon), Malaysia (Malaya, Borneo), Papua New Guinea (New Guinea, New Britain, New Ireland, Bougainville I.), Vanuatu, Loyalty Is. and New Caledonia.

***Lucilia cuprina* (Wiedemann)**

Musca cuprina Wiedemann, 1830: 654. Type locality: China.

Phaenicia cuprina: James, 1977: 537.

Phaenicia cuprina: Rueda, 1985a: 329.

Length: 6.5-8.0 mm.

Material examined.- PALAWAN: 1 female, Dicala, Caruray, 12 Feb.1972, B. D. Cabrera (NSMT); 1 male 2 females, Puerto Princesa, 29 Jan.1975, S. Shinonaga (NIID); 1 male, Macarascas, Ulugun Bay, 4 Nov.1975, H. Kurahashi (NIID); 1 female, Hot Spring, Sta. Lucia, 31 Oct.1975, H. Kurahashi (NIID). MINDANAO: 1 female, Surigao, Mainit, 20 May 1984, F. R. Magpayo (USC).

Bionomics. - This fly is relatively rare in the Philippines and is usually encountered as single individuals. Adults may be found feeding on bits of meat on market grounds and garbage piles. In Africa another subspecies, *L. cuprina dorsalis* Robineau-Desvoidy, 1830, has been involved in cases of myiasis in domestic animals and humans.

Distribution. - Philippines (Luzon, Palawan, Mindanao). Pantropical, partly invades southern parts of Holarctic Region such as Japan, Spain, North Carolina and California.

***Lucilia fumicosta* Malloch**

Lucilia fumicosta Malloch, 1926: 507. Type locality: Los Baños, Luzon, Philippines.

Lucilia fumicosta: James, 1977: 534.

Lucilia fumicosta: Rueda, 1985a: 323.

Length: 5.5-9.0 mm.

Material examined. - LUZON: 1 female, Mt. Province, Abatan, Buguias, 1,800-2,000 m, 60 km S Bontoc, 31 May 1964, H. M. Torreallas (BPBM); 1 male 1 female, Ifugao, Mayoyao, 1,000-1,500 m, 6-9 Jul.1966, H. M. Torreallas (BPBM); 1 male, Jacmal Bunhian, 800-1,000 m, 24 km E Mayoyao, 25-26 Apr.1967, H. M. Torreallas (BPBM); 3 females, Liwa, 1,000-1,300 m, 8 km E Mayoyao, 30 May 1967, H. M. Torreallas (BPBM); 2 males, Nueva Viscaya, Dalton Pass, 9-10 Apr.1968, D. E. Hardy (BPBM); 1 male, Laguna, Los Baños, date?, F. Muir (BPBM); 23 females, Mt. Makiling, Los Baños, 28 Feb.1975, 22-23 Oct.1975, 6-7 Jan.1976, H. Shima, S. Shinonaga, H. Kurahashi & R. Kano (NSMT); 1 male 3 females, Camarines Sur, Mt. Iriga, 500-600 m, 11-28 Apr.1962, H. M. Torreallas (BPBM); 1 female, Mt. Isarog, Pili, 15 Apr.1965, H. M. Torreallas (BPBM). MINDANAO: 1 male, Surigao, Mainit, 20 May.1984, F. R. Magpayo (USC); 2 females, Agusan, San Francisco, 6 Apr.1984, F. R. Magpayo (USC); 1 female, Misamis Or., Mt. Empagatao, 1,050-1,200 m, 18-30 Apr.1961, rainforest clearing, H. M. Torreallas (BPBM); 1 female, Cotabato, Agoko, Lake Binado, 3 Aug.1978, A. Nakanishi & O. Yata (NIID); 3 male, Davao, Mt. Talomo, 1,380 m, 19 Jun.1983, F. R. Magpayo (USC); 1 female, Zamboanga del Norte, Masawan, 1,250-1,400 m, 15 Jul.1958, H. E. Milliron (BPBM). SULU ARCH.: 1 female, Siasi Is., fish bait, sea level, 26 Aug.1958, H. E. Milliron (BPBM).

Bionomics. - The species may be found in high mountain areas or on plains bounded by mountains but close to rivers. Adults are attracted to fish baits.

Distribution. - Philippines (Luzon, Mindanao, Sulu Arch.), Indonesia (Irian Jaya) and Papua New Guinea (New Guinea).

****Lucilia hainanensis* Fan**
(Fig. 5)

Lucilia bazini hainanensis Fan, 1965: 176. Type locality: Hainan I., Guangdong Prov., China.

Length: 7.0-11.5 mm.

Material examined. - LUZON: 1 female, Ifugao, Jacmal Bunhian, 24 km E Mayoyao, 800-1,000 m, 7-8 Apr.1967, H. M. Torreallas (BPBM); 1 female, Liwa, 8 km E Mayoyao, 1,000-1,300m, 21 May 1967, H. M. Torreallas (BPBM). PALAWAN: 1 female, Dicala, Caruray, 14 Feb.1972, B. D. Cabrera (NSMT); 2 males 17 females, Montible, 500 m, 24-27 Jan.1975, 28 Oct.-2 Nov.1975, S. Shinonaga, H. Kurahashi & R. Kano (NIID); 9 males 13 females, Hill, c 40 km SW P. Princesa, 31 Oct.1975, H. Kurahashi (NSMT); 2 males 6 females, Forest, 36 km SW P. Princesa, 3 Nov.1975, R. Kano (NIID); 1 female, Kanigarang Beach, 3 Nov.1975, H. Kurahashi (NSMT); 5 females, Hot Spring, Sta. Lucia, 3 Nov.1975, H. Kurahashi & R. Kano (NSMT); 2 females, Macarascas Bay, 4 Nov.1975, H. Kurahashi (NSMT). MINDANAO: 1 male 5 females, Davao, Mt. Talomo, 1,000 m, fish bait, 3 Apr.1983, 30 Mar.1985, 1-4 Apr.1985, F. R. Magpayo (USC); 8 females, Zamboanga del Norte, Masawan, 1,250-1,400 m, 15 Jul.1958, H. E. Milliron (BPBM).

Bionomics. - Adults are commonly found in lowland forests.

Distribution. - Taiwan, China (Hainan), *Philippines (Luzon, Palawan, Mindanao) and Malaysia (Malaya, Borneo).

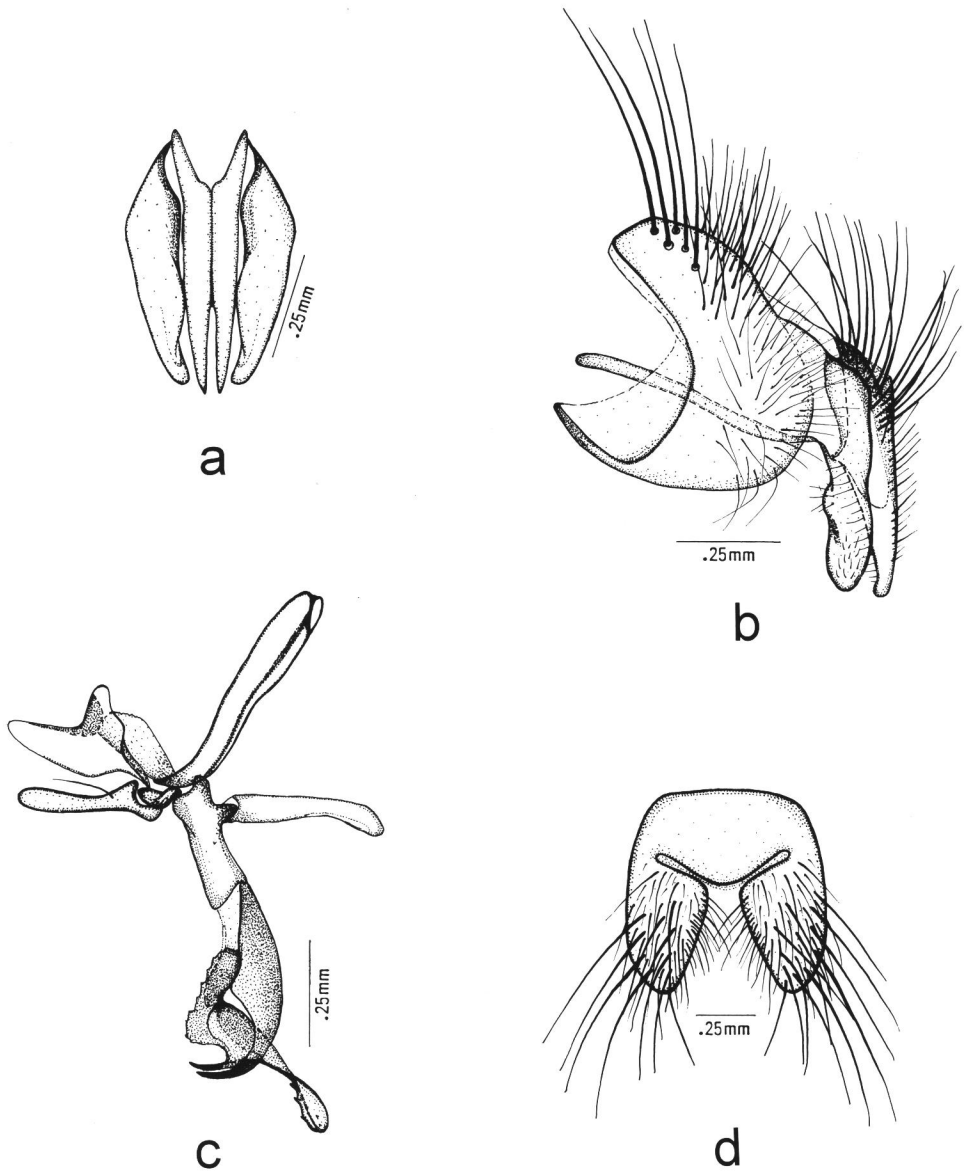


Fig. 5. *Lucilia hainanensis* Fan, male genitalia. a, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

***Lucilia papuensis* Macquart**

Lucilia papuensis Macquart, 1842: 298. Type locality: D'Offak, terre des Papoux [PNG].

Lucilia papuensis: James, 1977: 534.

Lucilia papuensis: Rueda, 1985a: 325.

Length: 7.5-11.0 mm.

Material examined. - LUZON: 1 male 1 female, Laguna, Mt. Makiling, Los Baños, 17 Sep.1959, L. W. Quate (BPBM); 1 female, Mt. Province, Abatan, Buguias, 1,800-2,000 m, 60 km S Bontoc, 3 Apr.-1 Jun.1964, H. M. Torrevillas (BPBM); 4 males 25 females, Mt. Makiling, Los Baños, 300-500 m, 28 Feb.1975, 22-23 Oct.1975, 6-7 Jan.1976, S. Shinonaga, R. Kano & H. Kurahashi (NIID); 1 female, UP campus, Los Baños, 140 m, 21 Oct.1975, H. Kurahashi (NIID); 7 females, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano & H. Kurahashi (NIID); 1 male 17 females, Cavite, Tagaytay, Forest, c 600 m, 6 Nov.1975, H. Kurahashi (NSMT). PALAWAN: 20 males, Montible, 500 m, 24-27 Jan.1975, 28 Oct.-2 Nov.1975, H. Kurahashi, R. Kano & S. Shinonaga (NSMT); 1 male, Hill, c 40 km SW P. Princesa, 31 Oct.1975, H. Kurahashi (NIID); 1 male, Antipolo Beach, 1 Nov.1975, R. Kano (NIID); 1 male, Hot Spring, Sta. Lucia, 31 Oct.1975, H. Kurahashi (NIID). CULION: 1 female, 6 km W Culion, 15 Jun.1962, Malaise trap, H. Holtman (BPBM). LEYTE: 1 female, Tacloban, 19 Feb.1975, S. Shinonaga (TMDU). MINDANAO: 2 females, Davao, Tagum, 4 Feb.1975, S. Shinonaga (TMDU).

Bionomics. - Adults are attracted to decaying animal matters.

Distribution. - Japan, Taiwan, Philippines (Luzon, Palawan, Clion, Leyte, Mindanao), China, Thailand, Malaysia (Malaya, Borneo), Indonesia, Papua New Guinea, Australia (Queensland, New South Wales), India, Sri Lanka and Micronesia.

***Lucilia porphyryna* (Walker)**

Lucilia porphyryna Walker, 1856: 24. Type locality: Mount Ophir, Malaya [Malaysia].

Lucilia porphyryna: James, 1977: 535.

Lucilia porphyryna: Rueda, 1985a: 327 (in part).

Length: 6.5-9.5 mm.

Material examined. - PALAWAN: 8 males 33 females, Montible, 500 m, 24-27 Jan.1975, R. Kano, H. Kurahashi & S. Shinonaga (NIID).

Bionomics. - Reported to breed in carcasses of birds and animals (Senior-White et al., 1940, as *L. craggi* Patton).

Distribution. - Japan, Korea, China, Taiwan, Philippines (Palawan), Thailand, Malaysia (Malaya, Borneo), Indonesia (Sumatra, Java), Papua New Guinea (New Guinea, Manus I., Mussau I., New Britain, New Ireland) and Australia (Queensland), Bangladesh, Nepal, India and Sri Lanka. Widely distributed in the Indo-Australian and East Palaearctic Regions.

***Lucilia salazarae* Kurahashi**

Lucilia salazarae Kurahashi, 1979: 376. Type locality: Mt. Maquiling, Los Baños, Luzon, Philippines.

Lucilia porphyryna: Rueda, 1985a: 327 (in part), misid.

Length: 5.5-10.0 mm.

Material examined. - LUZON: 1 male, Mt. Province, Abatan, Buguias, 1,800-2,000 m, 60 km S Bontoc, 3 Apr.-1 Jun.1964, H. M. Torrevillas (BPBM); 1 male 1 female, Nueva Viscaya, Dalton Pass, 9-10 Apr.1968, D. E. Hardy (BPBM); 8 males 18 females, Laguna, Mt. Makiling, 300-500 m, Los Baños, 28 Feb.1975, 22-23 Oct.1975, R. Kano, S. Shinonaga & H. Kurahashi (NIID); 1 female, Camarines Sur, Mt. Isarog, 1,600 m, 21 Jun.1963, H. M. Torrevillas (BPBM). NEGROS: 1 female, Mt. Talimas, 1,020 m, rainforest, light trap, 28 Jun.1958, H. E. Milliron (BPBM); 1 female, Lake Balinsasayao, 1-7 Oct.1959, L. W. Quate (BPBM). MINDANAO: 1 female, Misamis Or., Minalwang, 1,050 m, 24 Mar.-4 Apr.1961, H. M. Torrevillas (BPBM); 1 male 1 female, Mt. Kitanglad, Bukidnon, 1,480 m, on human feces, 27-31 Oct.1959, C. M. Yoshimoto (BPBM); 2 males 7 females, Davao, Mt. Talomo, 1,000 m, 20 Feb.1983, 1,28 Mar.1983, 4,17 Sep.1983, 1-4 Apr.1985, F. R. Magpayo (USC). COTABATO: 1 female, Mt. Matutum, 600 m, Polo, 14 Aug.1958, H. E. Milliron (BPBM).

Bionomics. - Adults are found in dense forests and are attracted to decaying animal matters including human feces.

Distribution. - Philippines (Luzon, Negros, Mindanao, Cotabato).

****Lucilia sericata* (Meigen)**

Musca sericata Meigen, 1826: 53. Type locality: "Oesterreich" [Austria].

Specimens from Mindanao have only two pairs of postsutural *ac* instead of the usual three. James' (1967) report on variation in chaetotaxy in *Phaenicia sericata* should be consulted to elucidate taxonomic problems in connection with aberrant forms of some local members of the species.

Length: 4.5-7.0 mm.

Material examined. - LEYTE: 1 male, Tacloban, 19 Feb.1975, S. Shinonaga (NSMT). MINDANAO: 1 male, Davao City, Bankerohan, in mixed dung of pig, water buffalo and cow near abbatoire, 8 May 1983, F. R. Magpayo; 1 male, Davao City, Jacinto ext., garbage, 15 Jan.1983, F. R. Magpayo (NIID).

Bionomics. - The species has long been known as a primary cause of myiasis in sheep in England and it is a serious pest of the wool industry in Africa and Australia. On the other hand, the species also provide benefit to mankind through the use of its larvae in the healing of wounds, a procedure now abandoned since the introduction of modern therapy through drugs and antibiotics. Due to a lack of specific studies on the bionomics of this species in the Philippines, no information regarding its pathogenicity in the islands can be given here. The species are, however, known to occur in localities where there are pigsties, poultry, and abbatoire, and it is often seen in association with animal dung. *Lucilia sericata* is often found singly, never in large numbers in the Philippines.

Distribution. - *Philippines (Leyte, Mindanao). Widely distributed in Palaearctic and Afrotropical regions and has probably just been introduced in the Indo-Australian, Nearctic and Neotropical Regions.

****Lucilia sinensis* Aubertin**

Lucilia sinensis Aubertin, 1933: 407. Type locality: Chin-Fu-San, Szechuan, China.

Length: 10.0-11.0 mm.

Material examined. - LUZON: 1 male, Laguna, Los Baños, 300 m, 22 Oct.1975, H. Kurahashi (NIID). PALAWAN: 1 female, Hot Spring, Sat. Lucia, 3 Nov.1975, H. Kurahashi (NIID), 1 female, Macarascas, Ulugun Bay, 4 Nov.1975, H. Kurahashi (NIID).

Bionomics. - Adults are attracted to fish baits and other decaying animal matters.

Distribution. - *Philippines (Palawan, Luzon), China (Zhejiang, Sichuan, Hubei), Thailand, Malaysia (Malaya, Borneo), Indonesia (?Java) and Papua New Guinea (New Guinea) and Nepal.

Genus *Hemipyrellia* Townsend

Hemipyrellia Townsend, 1918: 154. Type species: *Hemipyrellia curriei* Townsend, 1918, orig. des. (= *Lucilia fernandica* Macquart, 1855).

KEY TO THE SPECIES OF *HEMIPYRELLIA*

1. Eyes in male closely approximated; posterior half of sternite 2 and ventral margins of all tergites with dense bunches of long bristly hairs as long or longer than longest bristles on dorsum; tergites without a trace of median vitta; metallic greenish-blue to blue species. *H. tagaliana* (Bigot)
- Eyes in male separated by at least width of 3rd antennal segment; posterior half of sternite 2 and ventral margins of tergites except first segment with sparse moderately developed bristles not longer and generally finer than strongest bristles on dorsum; tergites with a faint trace of black median vitta visible only at certain incidence of light; metallic green species. *H. ligurriens* (Wiedemann)

Hemipyrellia ligurriens (Wiedemann)

Musca ligurriens Wiedemann, 1830: 655. Type locality: Java [Indonesia] and China.

Hemipyrellia ligurriens: James, 1977: 523.

Hemipyrellia ligurriens: Rueda, 1985a: 318.

Length: 5.2-10.0 mm.

Material examined. - LUZON: 1 female, Mt. Province, Abatan, Buguias, 1,800-2,000 m, 60 km S Bontoc, 8 May 1964, H. M. Torrevillas (BPBM); 1 female, Ifugao, Mayoyao, 1,000-1,500 m, 6 Jul.1966, H. M. Torrevillas (BPBM); 3 female, Laguna, Mt. Makiling, 300-500 m, 28 Feb.1975, H. Kurahashi & S. Shinonaga (NIID); 8 females, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano (NIID); 1 male, Cavite, 15 Mar.1975, S. Shinonaga (NSMT); 1 male, Forest, c 600 m, Tagaytay, 6 Nov.1975, H. Kurahashi (NIID); 1 female, Malabon, Rizal, mangrove swamp, 26 Oct.1975, H. Kurahashi (NIID); 1 male, Cavite, 15 Mar.1975, S. Shinonaga (NSMT); 1 female, Camarines Sur, Mt. Isarog, 500-600 m, 20 km E Naga, light trap, 16 Apr.1963, H. M. Torrevillas (BPBM); 1 male 1 female, Sorsogon, Guiron, Pilar, 23,27 Apr.1968, D. E. Hardy & M. D. Delfinado (BPBM). PALAWAN: 1 male, Puerto Princesa, 29 Jan.1975, S. Shinonaga (NIID); 5 males 6 females, Montible, 100 m, 29 Oct.1975, R. Kano & H. Kurahashi (NIID); 3 females, Swamp, 10 km SW P. Princesa, 29 Oct.1975, R. Kano (NIID); 1 male, Hill, c 40 km SW P. Princesa, 31 Oct.1975, H. Kurahashi (NIID); 1 female, Antipolo Beach, 3 Nov.1975, H. Kurahashi (NIID); 1 male 1 female, Kanigarang Beach, 3 Nov.1975, H. Kurahashi (NIID); 8 males 3 females, Hot Spring, Sta. Lucia, 3 Nov.1975, H. Kurahashi (NIID). LEYTE: 1 female, Bo. Pitogo, Jardo, 1 Apr.1972, B. D. Cabrera (NIID); 6 females, Tacloban, 19 Feb.1975, S. Shinonaga (NIID). MINDANAO: 3 males 1 female, Surigao,

Mainit, fish bait, 20 May 1984, F. R. Magpayo (USC); 4 females, Agusan, San Francisco, riverside, fish bait, 6 Apr.1984, 22-23 May 1984, F. R. Magpayo (USC); 2 females, Lanao, Dansalan, fish bait, 17 Jun.1958, H. E. Milliron (BPBM); 4 females, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NIID); 1 male 1 female, Mt. Talomo, 1,000 m, chicken meat & fish bait, 18 Oct.1983, 30 Mar.1985, F. R. Magpayo (USC); 1 male 1 female, Zamboanga del Norte, Manucan, 11 Oct.1959, C. M. Yoshimoto (BPBM).

Bionomics. - The only available information on its bionomics is that of *L. ballardi*, the synonymy of which is doubtful, which according to Patton feeds on human excreta but the eggs are laid on decaying animal matter (Senior-White et al., 1940). In the Philippines, adults were caught mainly on fish baits exposed near rivers and lake.

Distribution. - Japan, Korea, China, Taiwan, Philippines (Luzon, Palawan, Leyte, Mindanao), Thailand, Malaysia (Malaya, Borneo), Singapore, Indonesia (Sumatra, Java, Celebes, Ambon), Papua New Guinea (New Guinea, Bismarck Arch., Bougainville I.), Australia (Queensland), India and Sri Lanka.

Hemipyrellia tagaliana (Bigot)

Satomyia tagaliana Bigot, 1877: 44. Type locality: Philippines.

Hemipyrellia tagaliana: James, 1977: 533.

Hemipyrellia tagaliana: Rueda, 1985a: 320.

Length: 6.0-10.5 mm.

Material examined. - LUZON: 1 female, Benguet, Mt. St. Thomas, 6 Jul.1970, T. Okadome (NIID); 1 female, Rizal, Manila, 13 Sep.1945, H. E. Milliron (BPBM); 1 female, Manila, seashore, 12 Jun.1975, S. Shinonaga (NIID); 2 females, Wa-Wa Dam, Mt. Montalban, 150-200 m, 6-26 Mar.1965, H. M. Torrevillas (BPBM); 3 males 1 female, Malabon, mangrove swamp, 26 Oct.1975, R. Kano & H. Kurahashi (NIID); 12 females, Cavite, Forest, c 600 m, Tagaytay, 6 Nov.1975, R. Kano & H. Kurahashi (NSMT); 1 male, Laguna, Los Baños, ? Mar.-? Jun.1925, Pemberton (BPBM); 1 female, Los Baños, 7 Jul.1930, F. C. Hadden (BPBM); 1 female, Los Baños, 19-20 Sep.1959, L. W. Quate (BPBM); 1 female, Mt. Makiling, Los Baños, 7 Sep.1959, C. M. Yoshimoto (BPBM); 8 males 77 females, Mt. Makiling, 300-500 m, Los Baños, 28 Feb.1975, R. Kano, S. Shinonaga & H. Kurahashi (NIID); 6 males, UP campus, Los Baños, 150 m, 21 Oct.1975, H. Kurahashi & R. Kano (NSMT); 2 males 16 females, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano (NSMT). PALAWAN: 1 male, Mt. Beaufort, 17 Apr.1968, M. D. Delfinado (BPBM); 1 female, Salacsacan, Dicala, Caruray, 21 Apr.1972, B. D. Cabrera (NIID); 8 males 28 females, Montible, 100 m, 24-27 Jan.1975, 28-29 Oct.1975, S. Shinonaga, R. Kano & H. Kurahashi (NIID); 1 male 2 females, Swamp, 10 km SW P. Princesa, 29 Oct.1975, R. Kano (NIID); 7 males, Hill, c 40 km SW P. Princesa, 31 Oct.1975, H. Kurahashi (NSMT); 3 males 1 female, Hot Spring, Sta. Lucia, 31 Oct.-3 Nov.1975, H. Kurahashi (NIID); 5 females, Forest, 36 km SW P. Princesa, 31 Oct.1975, R. Kano (NSMT); 3 males, Antipolo Beach, 3 Nov.1975, H. Kurahashi (NIID); 1 male, Rita I., Ulugan Bay, 4 Nov.1975, H. Kurahashi (NIID); 1 female, 10 km S Balabac, 21 Apr.1962, M. Thomson (BPBM). LEYTE: 5 males 1 female, Utap, 10 Nov.1957, 30 Jan.1958, 2 Mar.1958 (WUF?)(BPBM); 1 male, Bo. Pitogo, Jardo, 1 Apr.1972, B. D. Cabrera (NSMT); 6 males 13 females, Tacloban, 19 Feb.1975, S. Shinonaga (NSMT). SAMAR: 1 female, Maluio, Tarlac, 14 Mar.1972, B. D. Cabrera (NSMT); 1 female, Guiwan, 25 Mar.1972, B. D. Cabrera (NSMT); 13 female, Basey, 17-18 Feb.1975, S. Shinonaga (NSMT). BOHOL: 1 male, Longon, Bilar, 22 Jul.1970, T. Okadome (NIID); 1 male, Bilar, 23 Jul.1970, T. Okadome (NIID). MINDANAO: 3 males 12 females, Surigao, L. Mainit, 23 Nov.-1 Dec.1959, C. M. Yoshimoto (BPBM); 2 males 1 female, Agusan, 10 km SE San Francisco, 17 Nov.1959, C. M. Yoshimoto (BPBM); 1 male 1 female, Misamis Or., Balason, 4-19 Apr.1960, H. M. Torrevillas (BPBM); 1 male, Bukidnon, Alanib, 1,910 m, Malaybalay, 25 Oct.1959, C. M. Yoshimoto (BPBM); 1 male 2 females, Lanao, 4.8 km E Dansalan, 750 m, 11,17 Jun.1958, H. E. Milliron (BPBM); 2 males 25 females, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NSMT); 1 male, Davao City, Marfori H., 12 Jun.1982, F. R. Magpayo (USC); 1 female, Davao, Mt. Talomo, 1,000 m, 1 Aug.1983, F. R.

Magpayo (USC); 1 male, Cotabato, Agko-Iramabis, 1,350 m, 31 Jul.1978, A. Nakanishi & O. Yata (NIID); 2 males, Zamboanga del Norte, 11 km E Sindangan, 20 Jul.1958, H. E. Milliron (BPBM); 2 males 1 female, Manucan, 420 m, 12 Oct.1959, L. W. Quate (BPBM); 1 male, Zamboanga del Sur, 5.8 km W Zamboanga, 1 Aug.1958, H. E. Milliron (BPBM). SULU ARCH.: 2 males, Jolo Is., 24 Aug.1958, H. E. Milliron (BPBM); 2 females, Siasi Is., fish bait, 26 Aug.1958, H. E. Milliron (BPBM).

Bionomics. - Adults are usually found in mountainous areas and show preference for lowland forested areas near bodies of water.

Distribution. - Philippines (Luzon, Palawan, Leyte, Bohol, Samar, Mindanao, Sulu Arch.), Malaysia (Malaya), Singapore and Indonesia (Java, Lombok).

TRIBE PHUMOSIINI

Genus *Phumosia* Robineau-Desvoidy

Phumosia Robineau-Dèsvoidy, 1830: 427. Type species: *Phumosia abdominalis* Robineau-Desvoidy, 1830, mon.

Plinthomyia Rondani, 1875: 427. Type species: *Plinthomyia emimelania* Rondani, 1875, mon.

Caiusa Surcouf, 1920: 52. Type species: *Caiusa indica* Surcouf, 1914, mon.

KEY TO THE SPECIES OF *PHUMOSIA*

1. Postsutural *dc* 4. 2
- Postsutural *dc* 3. 5
2. Wing with distinct costal suffusion starting from apex of subcosta. *P. promittens* (Walker)
- Wing without costal suffusion. 3
3. Dorsum and part of abdomen heavily infuscated or black. 4
- Dorsum and abdomen pale brownish. *P. testacea* (Senior-White)
4. Dorsum and scutellum concolorous, black. *P. nigronittens* (Senior-White)
- Dorsum black; scutellum yellow to brownish. *P. indica* (Surcouf)
5. Fly wholly black; wing without distinct costal suffusion. *P. murphyi* Hii et Kurahashi
- Fly yellowish to brownish or partly blackish; wing with distinct costal suffusion. 6
6. Costal suffusion extending from apex of subcosta. 7
- Costal suffusion extending from apex of r_1 8
7. Fourth longitudinal vein (*m*) sparsely setulose above until *r-m*, sometimes also below; postsutural *ac* 2. *P. setulosa*, new species
- Fourth longitudinal vein (*m*) bare above and below; post sutural *ac* 1. *P. abdominalis* Robineau-Desvoidy
8. First longitudinal vein (r_1) setulose on apical half below, sometimes above; disc of thoracic dorsum and pleura in part often fuscous in ground colour, but not so distinct in teneral form; wing suffusion distinct. *P. nigricauda*, new species
- First longitudinal vein (r_1) bare below and above; thoracic dorsum and pleura wholly yellowish brown; wing suffusion distinct or paler. 9
9. Hind tibia with 2 *pd*; parafacialia bare, rarely with minute setulae; gena largely covered with yellow hairs, sometimes intermixed with black ones in central or anterior parts, especially in female. *P. costata* Malloch

- Hind tibia with 1 *pd*; parafacialia usually with black setulae above; gena clothed with black hairs on anterior 1/2 to 2/3. *P. pallida* James

***Phumosia abdominalis* Robineau-Desvoidy**

Phumosia abdominalis Robineau-Desvoidy, 1830: 427. Type locality: Timor.

Phumosia abdominalis: James, 1977: 537.

Phumosia abdominalis: Rueda, 1985a: 331.

Length: 8.0-19.0 mm.

Material examined. - LUZON: 1 male, 20 mi SW of Baguio, 2 Oct.1915, H. E. Milliron (BPBM); 3 males 2 females, Ifugao Prov., Jacmal Buhian, 24 km E Mayoyao, 800-1,000 m, 1-10 May 1967, L. M. Torrevillas (BPBM); 1 male 1 female, Albay Prov., Libon, Caguscus, 200 m, 15 May 1965, L. M. Torrevillas (BPBM); 1 female, Albay Prov., Mt. Mayon, 16 km NW of Lagaspi, 900-1,000 m, 18 May 1962, H. M. Torrevillas (BPBM); 1 female, Camarines Sur, Mt. Iriga, 500 m, 29 Mar.1962, H. M. Torrevillas (BPBM); 1 female, Mountain Prov., Mayoyao, Ifugao, 1,200-1,500 m, 19-21 Jul.1966, H. M. Torrevillas (BPBM); 4 females, 6 km W of Imugan, Nueva Viscaya, 11 Apr.1968, M. D. Delfinado (BPBM); 1 male 9 females, Mt. Makiling, Los Baños, 500 m, 28 Feb.1975, 6-7 Jan.1976, S. Shinonaga, H. Kurahashi & R. Kano (NIID).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon), Malaysia (Borneo) and Indonesia (Sumatra, Celebes, Moluccas, Timor).

***Phumosia costata* Malloch**

(Fig. 6)

Phumosia costata Malloch, 1926: 439. Type locality: Mount Makiling, Luzon, Philippines.

Phumosia costata: James, 1977: 537.

Phumosia costata: Rueda, 1985a: 335.

Length: 8.5-10.0 mm.

Material examined. - LUZON: 1 male, Mt. Makiling, Laguna, 18 Dec.1936, O. H. Swezov (BPBM); 1 female, Camarines Sur, Mt. Isarog, 800 m, 27 Apr.1965, H. M. Torrevillas (BPBM); 11 males 78 females, Laguna, UP campus, 150 m, Los Baños, 21 Oct.1975, R. Kano & H. Kurahashi (NSMT); 45 males 24 females, Mt. Makiling, 500 m, Los Baños, 28 Feb.1975, 22,23 Oct.1975, 6-7 Jan.1976, R. Kano, S. Shinonaga & H. Kurahashi (NSMT). SAMAR: 1 female, Basey, 17-18 Feb.1975, S. Shinonaga (NIID).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Samar).

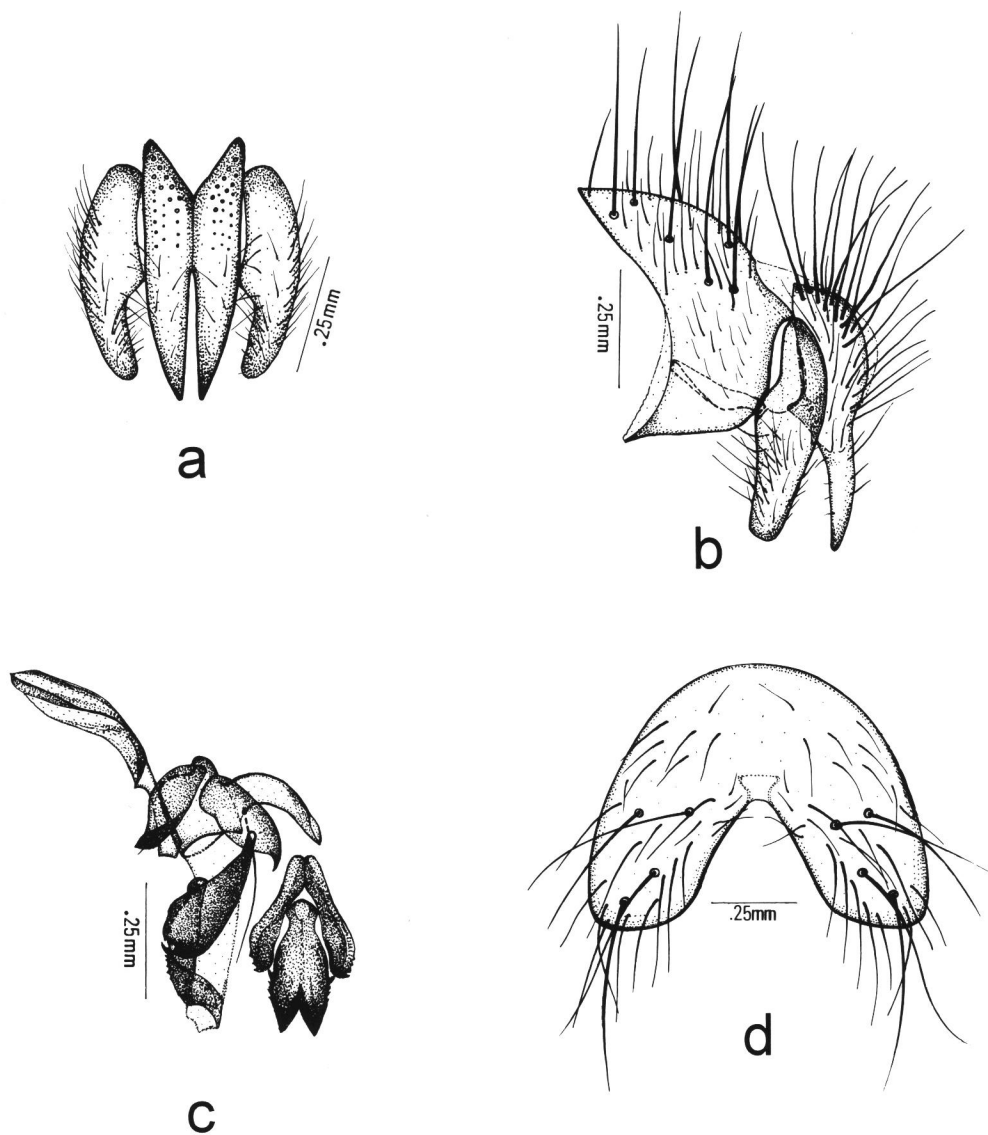


Fig. 6. *Phumosia costata* Malloch, male genitalia. a, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral and posterior view; d, sternite 5, ventral view.

***Phumosia indica* (Surcouf)**

Caiusa indica Surcouf, 1914: 53. Type locality: Trichinopoly [India].
Phumosia indica: Rueda, 1985a: 338.

Length: 7.0-8.2 mm.

Material examined. - LUZON: 2 males, Laguna, UP campus, Los Baños, 150 m, 21 Oct.1975, H. Kurahashi & R. Kano (NIID). PALAWAN: 1 male, 34 km SW of Puerto Princesa, forest, 31 Oct.1975, R. Kano (NIID); 1 female, 10 km SW Puerto Princesa, swamp, 29 Oct.1975, R. Kano (NIID). LEYTE: 2 females, Tacloban, 19 Feb.1975, S. Shinonaga (NIID). MINDANAO: 1 female, Surigao, Mainit, 20 May 1984, F. R. Magpayo (USC); 1 female, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NIID); 1 female, Madapo Hills, Davao City, 30 Oct.1982, N. Villamor (USC).

Bionomics. - Adults are attracted to fish baits.

Distribution. - Taiwan, Philippines (Luzon, Palawan, Leyte, Mindanao), Malaysia (Malaya, Borneo), Indonesia (Java, Celebes), India and Sri Lanka.

***Phumosia murphyi* Hii et Kurahashi**

Phumosia murphyi Hii et Kurahashi, 1977: 222. Type locality: Kats Kinabalu, Sabah, East Malaysia, Borneo [Malaysia].

Length: 7.0-7.5 mm.

Material examined. - PALAWAN: 17 males 2 females, 10 km SW Puerto Princesa, swamp, 29 Oct.1975, H. Kurahashi & R. Kano (NSMT); 6 males 15 females, Antipolo Beach, 1 Nov.1975, H. Kurahashi & R. Kano (NSMT); 10 males 12 females, Macarascas, Ulugun Bay, 4 Nov.1975, H. Kurahashi & R. Kano (NSMT).

Bionomics. - Adults are attracted to dead fishes in mangrove forests.

Distribution. - Philippines (Palawan), Singapore and Malaysia (Borneo).

***Phumosia nigricauda*, new species**

(Fig. 7)

Type material. - Holotype male, MINDANAO: Davao, Mt. Talomo, 1,000 m, 19-21 May 1988, F. R. Magpayo. The holotype was caught while feeding on chicken meat falling from an eagle's meal.

Paratypes. MINDANAO: 2 males 10 females, 1,000-1,500 m, same locality and collector as holotype, 27 Mar.1983, 3 Apr.1983, 28,30 Mar.1985 (fish bait), 2 Jan.1988, 17-21 Apr.1988; 1-4 Apr.1985 (fish bait); 1 May 1985 (ground, hovering); 1 male, Zamboanga, Del Norte, Summit of Mt. Malindang, 1,290 m, H. E. Milliron (BPBM); 1 male 24 females, Zamboanga del Norte, Masawan, 1,250-1,400 m, 15 Jul.1958, H. E. Milliron (BPBM); 1 male, Surigao, Tudaya-Sibulan, 30 Jul.1970, T. Okadome (NIID); 2 males 5 females, Agko-Sungho, 1,600 m, 1,2 Aug.1978, A. Nakanishi & O. Yata (NSMT); 3 females, Little Mt. Apo, 1 Aug.1978, A. Nakanishi & O. Yata (NSMT); 2 females, Agko-Lake Binado, 3 Aug.1978, A. Nakanishi & O. Yata (NSMT); 1 female, Lake Binado, 5 Aug.1978, A. Nakanishi & O. Yata (NSMT).

Type depository. Holotype and paratypes (3 males, 8 females) are deposited in Reference Museum, Taxonomy and Ecology Laboratory, Department of Medical Entomology, National

Institute of Infectious Diseases, Tokyo (NIID). Paratypes are also separately deposited in Bishop Museum, Honolulu (2 males, 24 females); National Science Museum, Tokyo (2 males, 11 females); and Biological Collections, University of San Carlos, Cebu (2 females).

Description. - Male.-Head: eyes bare, holoptic, very closely approximated, but not touching; frons index less than 0.01; frontal stripe fuscous brown to black, more or less grey-dusted when viewed from front, widening out anteriorly and posteriorly, reduced to a fine line medially; parafrontalia very narrow, grey-dusted, slightly with bluish tinge, very sparsely with minute black setulae anteriorly, provided with ca 8 pairs of *ori*; parafacialia narrow, yellowish-grey dusted, very sparsely with minute black setulae above; face pale yellowish brown, thinly yellowish-white dusted, with several minute black setulae medially, also with a pair of black setulose hairs present just above level of vibrissae, without median carina; facialia yellowish brown, thinly yellow-dusted, blackish setulose on lower 1/3 from vibrissae to antennal bases; medianae yellowish brown, thinly yellow-dusted, bare; vibrissaria very narrow, concolorous with medianae; vibrissae strongly developed; epistome yellowish white, slightly projecting forward; gena concolorous with medianae and with black hairs anterior 2/3, posterior 1/3 silver-grey dusted and with yellow hairs, concolorous with postgena; postgena entirely clothed with yellow hairs; occiput fuscous, silver-grey dusted, clothed with yellow hairs except for a row of postorbital bristles; 2nd antennal segment orange; 3rd antennal segment brown, orange on ventral and basal parts, yellowish pubescent, 3 X as long as 2nd; arista brown, long plumose; palpi yellowish orange.

Thorax: yellowish brown usually with fuscous dorsum, wholly covered with yellow dusting; prescutum with a trace of brown narrow submedian stripe and lateral spot when viewed behind; scutum usually with median triangular brown spot and lateral longitudinal stripe when viewed behind; humerus, notopleuron, postalar callus and scutellum yellowish brown to brown; prosternum and propleuron yellowish brown, yellow-haired; supraspiracular convexity and pleurotergite clothed with fine yellow upstanding hairs; hypopleuron with a few yellow hairs on anterior corner of upper part; mesopleuron, sternopleuron, pteropleuron and hypopleuron usually more or less fuscous black in part; mesopleuron clothed with black hairs except for posterior fringe of yellow ones; sternopleuron largely covered with yellow hairs, but intermixed with a few black ones below anterior *st*; pteropleuron clothed with yellow hairs except for tuft of black ones below upper margin; mesothoracic spiracle large, pale yellow; metathoracic one pale yellow; postalar declivity with a tuft of yellow hairs on central circle; tympanic tuft absent; suprasquamal ridge yellowish-haired, intermixed with black ones posteriorly. Chaetotaxy: *ac* 1+2; *dc* 2+3; *ia* 1+2; *h* 2; *ph* 2; *prs* 1; *sa* 3; *pa* 2; *st* 1+1, anterior one sometimes accompanying with 1 fine bristly hairs; *sc* 3+1, 1-2 fine interstitials present in front of two basal marginal bristles; *n* 2; *pp* 1; *pst* 1.

Wings: hyaline, with fuscous suffusion along costa from apex of r_1 ; veins fuscous brown to brown; epaulet and basicosta yellowish brown; subcostal sclerite yellowish brown, pubescent; r_1 more or less setulose on apical half below; node of *h* and *sc* with several fine black setulae below; base of *sc* with a few black setulae below; node of 2nd and 3rd longitudinal veins with several black setulae above and below; 3rd longitudinal vein setulose above from base to r-m cross vein, the setulose hairs extending to 1/2 to 2/3 way to r-m below; 4th longitudinal vein bare, 4th section bent with a right angle, and then inflexed from bend to wing edge; squamae fuscous brown, thoracic one bare on upper surface. Halteres yellow to yellowish brown.

Legs: yellowish brown except for hind tibia and tarsus and apical four segments of fore and mid tarsi darkened; fore coxa, trochanter and base of femur with yellow hairs; fore tibia

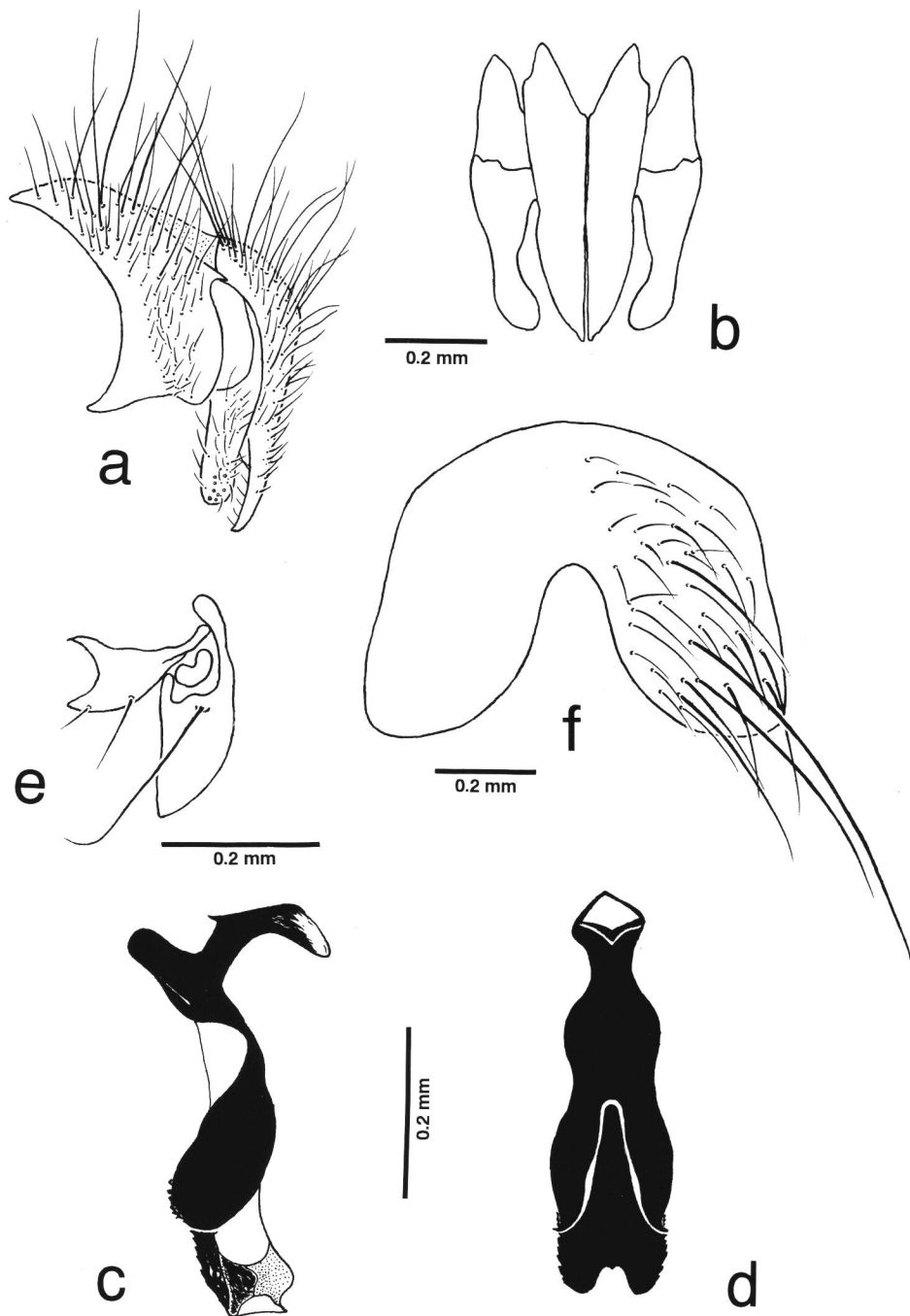


Fig. 7. *Phumosia nigricauda*, new species, male genitalia. a, epandrium, cerci and paralobi, lateral view; b, cercus and paralobus, caudal view; c, aedeagus, lateral view; d, aedeagus, posterior view; e, anterior and posterior parameres, lateral view; f, sternite 5, ventral view.

with 3-4 *ad* and 1 *p*; mid coxa and trochanter with both yellow and black hairs; mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind coxa and trochanter with both yellow and black hairs; hind femur with 3-4 paired *av* and *pv* on basal 1/2; hind tibia with 2 *ad*, 2 *pd*, without *av*.

Abdomen: tergites 1+2-3 and sternites 1-3 yellowish brown; posterior margin of tergite 3 and large or whole part of tergites 4-5 metallic bluish black; posterior margin of tergite 3 with median triangular spot; abdominal hairs mostly black except for some yellow ones on sternites 1-2 and ventral and anterior parts of tergite 1+2; tergite 1+2 with several lateral marginal bristles; tergite 3 with row of decumbent median and erect lateral marginal bristles; tergites 4-5 with row of erect marginal bristles, without discals; sternites 4-5 brown, clothed with black hairs. Hypopygium normal in size, pale brown, grey-dusted; male genitalia as shown in Fig. 7.

Female.-Head: eyes bare, dichoptic; frons index 0.23-0.26; frontal stripe broad, fuscous brown, reddish medially parallel-sided, slightly narrowed anteriorly and posteriorly, 3.5 X as broad as one of parafrontalia just in front of anterior ocellus; parafrontalia black, brownish-grey dusted, darkened toward vertex, with black setulae, provided with ca 5 pairs of *ori* and several interstitials; *ors* 2+1; *oc* developed; *acoc* absent; *pooc* weakly developed; *ov* and *iv* well developed; *poc* divergent; *occ* 1; occiput with several black hairs uppermost below a row of postorbital bristles.

Thorax: suprasquamal ridge with yellow hairs anteriorly and with black ones posteriorly.

Abdomen: marginal bristles finer and decumbent; tergite 3 with broad marginal band, broadest at middle, with triangular-shaped median spot combined with. Ovipositor short, modified for larviposition. Otherwise same as for male.

Length: 6.5-7.6 mm.

Etymology. - The specific name is derived from the colouration of the caudal portion of abdomen which is largely metallic.

Bionomics. - Adults are attracted to fresh bird meat and fish baits.

Distribution. - Philippines (Mindanao).

****Phumosia nigronitens* (Senior-White)**

Phumosia nigronitens Senior-White, 1923: 38. Type locality: Singapore.

Length: 7.0 mm.

Material examined. - LUZON: 3 males 1 female, Laguna, UP campus, Los Baños, 150 m, 21 Oct.1975, H. Kurahashi (NIID). PALAWAN: 1 male, Montible, 24-27 Jan.1975, S. Shinonaga (NIID); 1 female, Macarascas, Ulugun Bay, 4 Nov.1975, H. Kurahashi (NIID).

Bionomics. - Nothing is known.

Distribution. - *Philippines (Luzon, Palawan), Singapore and Malaysia (Malaya, Borneo)

***Phumosia pallida* James**

Phumosia abdominalis pallida James, 1966: 465. Type locality: Tarawakan, Tawi Tawi, Philippines.
Phumosia abdominalis pallida: James, 1977: 537.

Length: 8.0-10.0 mm.

Material examined. - SAMAR: 6 males 7 females, 17-18 Feb.1975, S. Shinonaga (NIID). MINDANAO: 3 females, Zamboanga d. Norte, Masawan, 1,250-1,400 m, 15 Jul.1958, H. E. Milliron (BPBM); 1 female, Misamis Or., Mt. Kibungol, 20 km SE of Gingoog, 700-800 m, 9-18 Apr.1960, H. Torrevillas (BPBM); 1 female, Misamis Or., Dinawiha, Gingog, 26 km E of Gingoog City, 100-300 m, 30 Aug.1965, H. M. Torrevillas (BPBM); 3 males 2 females, Surigao, Mainit Hot Spring, Tudaya, 27 Jul.1970, T. Okadome (NIID); 10 males 20 females, Davao City, Mt. Talomo, 1,000 m, 21 Aug.1983, 3 Oct.1983, 28 Mar.1985, 1-4 Apr.1985, 2 Jan.1988, 17-21 Apr.1988, 1-2 May 1988, 7 Jun.1997, F. Magpayo (NIID). SULU ARCH.: 1 female, Tawitawi, Tarakan Farm dist., 11 Feb.1957, Y. Kondo (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Samar, Mindanao, Sulu Arch.).

***Phumosia promittens* (Walker)**

Musca promittens Walker, 1860: 134. Type locality: Makasar, Celebes [Indonesia].

Phumosia promittens: James, 1977: 538.

Phumosia promittens: Rueda, 1985a: 333.

Length: 8.0-9.5 mm.

Material examined. - LUZON: 1 female, Los Baños, ? Jun.-vii.1917, F. X. Williams (BPBM); 3 males 2 females, Camarines Sur, Mt. Iriga, 500 m, 24,27,29,31 Mar.1962, H. M. Torrevillas (BPBM); 1 female, N. E. Luzon, Iragan, Dendro, 21 Apr.1983, S. Hashimoto (BPBM); 4 males 4 females, Laguna, UP campus, Los Baños, 150 m, 21 Oct.1975, R. Kano & H. Kurahashi (NIID); 31 females, Mt. Makiling, 300 m, Los Baños, 21 Oct.1975, R. Kano & H. Kurahashi (NIID). PALAWAN: 1 male, 8-13 km E of Tarumpitao Pt., in jungle, 21 May 1958, H. E. Milliron (BPBM); 2 females, Hill, c 40 km SW Puerto Princesa, 31 Oct.1975, H. Kurahashi; 2 females, 34 km SW Puerto Princesa, forest, 31 Oct.1975, R. Kano (NIID); 18 males 73 females, Montible, 24-27 Jan.1975, 28-30 Oct.1975, R. Kano, S. Shinonaga & H. Kurahashi (NIID).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan), Thailand, Malaysia (Malaya) and Indonesia (Sumatra, Celebes).

***Phumosia setulosa*, new species**

(Fig. 8)

Type material. - Holotype male, MINDANAO: Davao, Mt. Talomo, 1,300 m, on dead caterpillar in the forest, 19 Jun.1983, F. R. Magpayo.

Paratypes. MINDANAO: 1 male, Davao City, Baracatan, 21 May 1983, F. R. Magpayo; 1 female, same locality as holotype, 1,400 m, caught on the ground, 1 May 1983, F. R. Magpayo; 1 female, same locality as holotype, 1,000 m, on back of water buffalo, 19 Jun.1983, F. R. Magpayo.

Type depository. Holotype and 2 paratypes (1 male 1 female) are deposited in Reference Museum, Taxonomy and Ecology Laboratory, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo (NIID). Paratype (1 female) in Biological Collection, University of San Carlos, Cebu (USC).

Description. - Male.-Head: eyes bare, holoptic, very closely approximated, separated at narrowest point by less than width of anterior ocellus; frons index 0.01-0.02; frontal stripe reddish brown, darkened toward vertex, widened anteriorly and posteriorly, obliterated at narrowest point of frons; parafrontalia very narrow, grey-dusted, darkened posteriorly, very sparsely with black setulae anteriorly, provided with ca 5 pairs of *ori*; parafacialia slightly narrower than width of 3rd antennal segment, yellowish-grey dusted, virtually bare, sometimes with a few brownish minute setulae; face yellowish, thinly yellowish-dusted, with a pair of black setulose hairs just above level of vibrissae, without median carina; facialia yellowish brown, thinly yellow-dusted, blackish setulose on lower 1/3 from vibrissae to antennal bases; medianae yellowish brown, with yellow dusting, largely bare except for a few black setulose hairs below; vibrissaria very narrow, concolorous with medianae, thinly yellow-dusted, with a few black setulose hairs; vibrissae well developed; epistome yellowish white, slightly projecting forward; gena yellowish brown, more or less yellowish-grey dusted, with black hairs anteriorly, somewhat paler in ground colour and with yellow hairs posteriorly; postgena concolorous with posterior part of gena, clothed with yellow hairs; occiput fuscous except for brownish dilatation to gena, grey-dusted, clothed with yellow hairs except for a row of postorbital bristles; 2nd antennal segment orange; 3rd antennal segment orange, darkened dorsally and apically, pubescent, 3 X as long as 2nd; arista yellowish brown, long plumose; palpi orange, black-haired.

Thorax: yellowish brown, covered with yellowish grey dusting; prescutum sometimes with a trace of brown narrow submedian stripe when viewed from behind; dorsum black-haired; humeri, postalar calli and scutellum concolorous with dorsum, black-haired on dorsal surface; humerus yellowish-haired lateroventrally; scutellum yellowish-haired on ventral surface; prosternum and propleuron yellow-haired; supraspiracular convexity clothed with fine yellow upstanding hairs; pleurotergite clothed with fine yellow upstanding hairs intermixed with several black ones; hypopleural hairs yellow, present below metathoracic spiracle; other pleura largely clothed with yellow hairs except for black ones on upper half of mesopleuron, several black bristly hairs also intermixed on mesopleuron; mesothoracic spiracle large, pale yellow; metathoracic one pale yellow; postalar declivity with a tuft of yellow hairs on central circle; tympanic tuft absent; suprasquamal ridge with some fine yellow hairs at least on anterior half, with a few black ones on posterior half. Chaetotaxy: *ac* 1+2; *dc* 2+3; *ia* 1+3; *h* 2; *ph* 2; *prs* 1; *sa* 3; *pa* 2, 2 fine interstitials present; *st* 1+1, one fine bristle sometimes present below anterior *st*; *sc* 3+1, 1 fine bristle present in front of two basal marginal bristles; *n* 2; *pp* 1; *pst* 1.

Wings: hyaline, with fuscous suffusion along costa from apex of *sc*; veins fuscous brown; epaulet and basicosta yellowish brown; subcostal sclerite yellowish brown, with brown pubescence; node of *h* and *sc* with several fine black setulae below; node of *sc* and *r*₁ with several fine black setulae below; node of 2nd and 3rd longitudinal veins with several black setulae above and below; 3rd longitudinal vein with black setulae on 2/3 way from base to r-m cross vein above, the setulose hairs extending to 1/2 way to r-m below; 2nd section of 4th longitudinal vein setulose on the way to r-m; 4th section of 4th longitudinal vein bent with a right angle, then inflexed from bend to wing edge; squamae brown, thoracic one bare on upper surface. Halteres yellow.

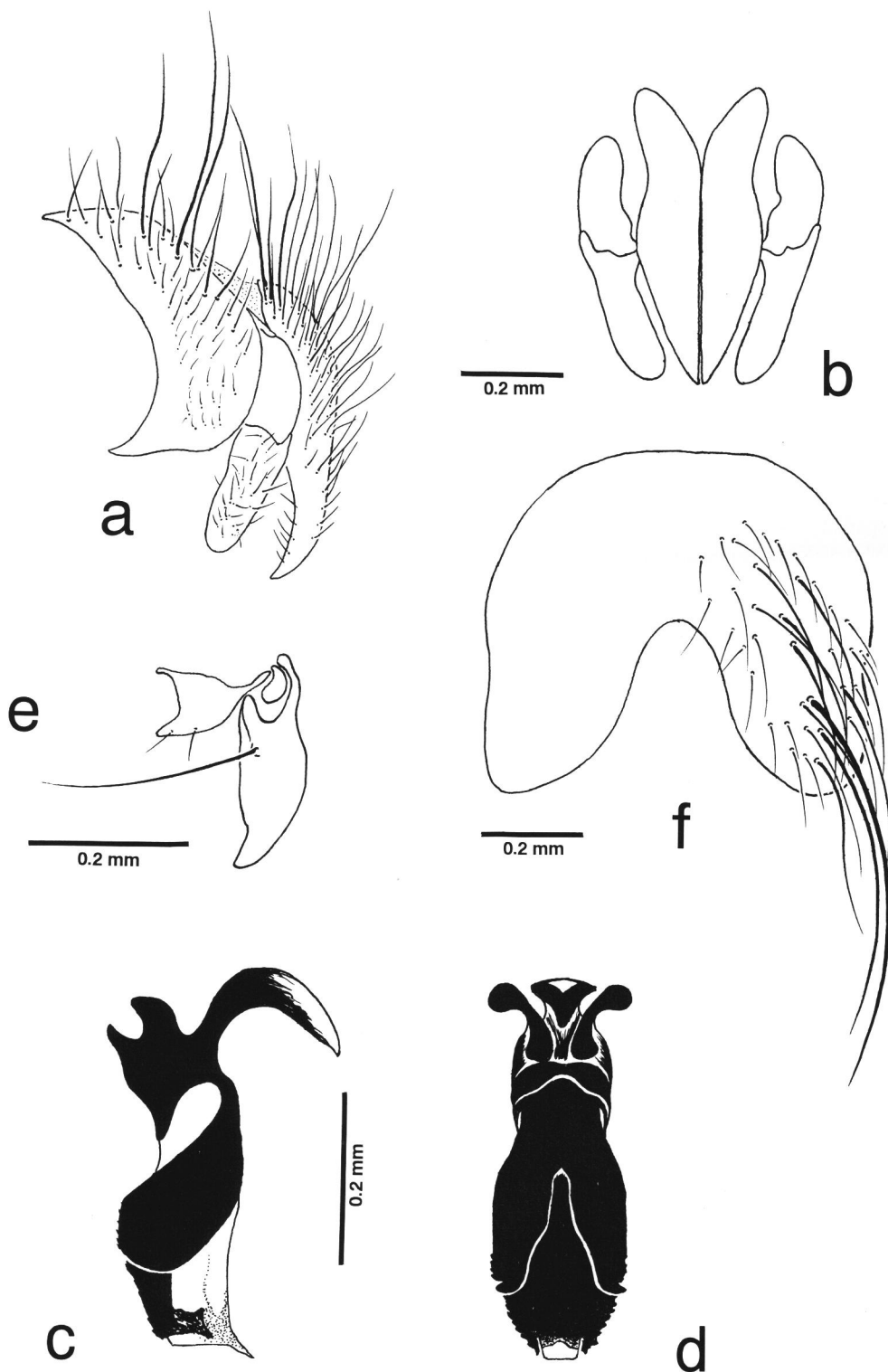


Fig. 8. *Phumosia setulosa*, new species, male genitalia. a, epandrium, cerci and paralobi, lateral view; b, cercus and paralobus, caudal view; c, aedeagus, lateral view; d, aedeagus, posterior view; e, anterior and posterior parameres, lateral view; f, sternite 5, ventral view.

Legs: yellowish brown except for hind tibia and tarsi, apical 4 segments of fore and mid tarsi more or less darkened; coxae, trochanters and ventral surfaces of base of femora clothed with yellow hairs; fore tibia with 3-4 *ad* and 1 *p*; mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with 1-2 *ad* and 1-2 *pd*.

Abdomen: tergites 1+2-3 and sternites 1-3 yellowish brown; tergite 3 with median metallic triangular spot posteriorly; tergites 4-5 largely metallic bluish black dorsolaterally, yellowish brown ventrally; tergite 1+2 with several lateral decumbent marginal bristles; tergite 3 with row of marginal bristles, but those on lateral sides erected; tergites 4-5 with row of erect marginal bristles; sternites 1-3 and ventral side of tergite 1+2 yellowish-haired; sternites 4-5 fuscous, black-haired, several bristles present on sternites 2-4. Hypopygium normal in size, pale yellowish brown; male genitalia as shown in Fig. 8.

Female.-Head: eyes bare, dichoptic; frons index 0.22, at narrowest point on vertex; frontal stripe broad, parallel-sided, slightly narrowed toward vertex, fuscous brown, somewhat reddish anteriorly and centrally, slightly narrower than 3 X as broad as one of parafrontalia just in front of anterior ocellus; parafrontalia black, yellowish-grey dusted, darkened posteriorly, sparsely with black setulae, provided with ca 6 pairs of *ori* and a few interstitials; *ors* 2+1; *oc* developed; *acoc* absent; *pooc* weakly developed; *ov* and *iv* well developed; *poc* parallel; *occ* 1.

Thorax: suprasquamal ridge without black setulose hairs posteriorly; sternopleuron with a few black hairs between anterior and posterior *st* and just below them; mesopleuron largely clothed with black hairs except for yellowish posterior fringe.

Wings: r_1 with 1 black setulose hair on apical half above and below.

Legs: hind tibia with 3 *ad*, 2 *pd* and 1 short *av*.

Abdomen: metallic bluish black portion largely extended from tergite 3 to tergite 5, but becoming fuscous brown on posterior margin of tergite 3; abdominal bristles decumbent, median marginals weak on tergite 3. Ovipositor short. Otherwise same as for male.

Length: 7.5-8.0 mm.

Etymology. - The specific name is derived from the 4th longitudinal vein which is setulose above.

Bionomics. - Several adults were found feeding on dead caterpillars. The attraction of one of the specimens to a water buffalo may be accidental or part of the feeding on wounds.

Distribution. - Philippines (Mindanao).

Phumosia testacea (Senior-White)

Caiusa testacea Senior-White, 1923: 310. Type locality: Emelina Estate, Maskeliya, Ceylon [Sri Lanka].
Phumosia testacea: James, 1977: 538.
Phumosia testacea: Rueda, 1985a: 337.

Length: 6.5-8.0 mm.

Material examined. - LUZON: 4 males 3 females, Laguna, Mt. Makiling, Los Baños, 22-23 Oct.1975, 6-7 Jan.1976, R. Kano, S. Shinonaga & H. Kurahashi (NIID); 1 male, UP campus, Los Baños, 150 m, 21 Oct.1975, H. Kurahashi (NIID); 1 male, Cavite, 15 Mar.1975, S. Shinonaga (NIID). SAMAR: 1 male, Basey, 17-18 Feb.1975, S. Shinonaga (NIID). MINDANAO: 1 male, Misamis Or., Mt. Empagatao, 1,100-1,600 m, 27 Apr.1961, rain forest, mid-mossy, H. M. Torrevillas (BPBM).

Bionomics. - Senior-White et al. (1940) recorded breeding of Indian specimens from a frog's egg mass.

Distribution. - Taiwan, Philippines (Luzon, Samar, Mindanao), Thailand, Malaysia (Malaya, Borneo), Papua New Guinea (Bougainville I.), India and Sri Lanka.

TRIBE POLLENIINI

Genus *Dexopollenia* Townsend

Dexopollenia Townsend, 1917: 201. Type species: *Dexopollenia testacea* Townsend, 1917, orig. des.

Dexopollenia sp. nr *maculata* (Villeneuve)

The specimen examined runs to *Dexopollenia maculata* (Villeneuve, 1933) in the previous key (Kurahashi, 1995), however, this specimen has wings yellowish basally. Further material, especially a male specimen, is needed for decisive determination of the species.

Material examined. - MINDANAO: 1 female, Zamboanga, Lemesahan, 600 m, light trap, 7 Sep.1958, H. E. Milliron (BPBM).

Length: 7.5 mm.

Bionomics. - Nothing is known.

Distribution. - Philippines (Mindanao).

TRIBE BENGALIINI

Genus *Bengalia* Robineau-Desvoidy

Bengalia Robineau-Desvoidy, 1830: 425. Type species: *Bengalia labiata* Robineau-Desvoidy, 1830, des. Townsend (1916: 6).

KEY TO THE SPECIES OF *BENGALIA*

1. Prealar knob pointed; sternite 4 with 1 pair of long and strong bristles in male; abdomen very slightly dusted; body small- to medium-sized. 2
- Prealar knob rounded; sternite 4 without strong bristles in male; abdomen slightly to heavily tessellated; body medium- to large-sized. 3
2. Mesonotum centrally blackish on disc. *B. calilungae* Rueda
- Mesonotum testaceous, more or less greenish-grey dusted. [No record from Philippines, but probably found in Palawan]. *B. hobbyi* Senior-White, Aubertin et Smart

3. Tergite 5 without discal bristles; hind tibia never fringed in male. 4
- Tergite 5 with 1 pair of discal bristles; hind tibia more or less fringed in male. 8
4. Hairs on pteropleuron wholly yellowish. 5
- Hairs on pteropleuron never wholly yellowish, some black hairs present at least on upper part. 7
5. Vibrissae far above oral margin; clypeus strongly projecting forward; posterior margin of eye concave at middle; fore tibia in male with 5+2 ventral spines. *B. torosa* (Wiedemann)
- Vibrissae level with oral margin; clypeus less strongly projecting; posterior margin of eye straight, not concave at middle; fore tibia in male with 3 ventral spines. 6
6. Mesopleuron partly black on upper 1/3. *B. xanthopyga* Senior-White
- Mesopleuron wholly testaceous. *B. recurva* Malloch
7. Mesopleuron more or less darkened, usually on lower 2/3, upper 1/3 yellowish but not distinctly demarcated from blackish lower 2/3; pteropleuron largely covered with black hairs; sternopleuron also mostly blackish-haired; femora entirely testaceous.
- *B. kanoi*, new species
- Mesopleuron yellowish, but more or less brownish and with yellowish brown dusting; pteropleuron largely covered with yellow hairs except for tuft of several blackish hairs; sternopleural hairs yellow intermixed with small number of black ones; femora yellow.
- *B. jejuna* (Fabricius)
8. Pteropleuron clothed only with yellow hairs; mid tibia with poorly developed fringe on posterior surface in male. *B. inermis* Malloch
- Pteropleuron clothed with yellow hairs except for some black ones less than 10 on upper part; mid tibia not fringed in male. *B. lyneborgi* James

***Bengalia calilungae* Rueda**

(Fig. 9)

Bengalia calilungae Rueda, 1985a: 341. Type locality: Mt. Makiling, Los Baños, Laguna, Luzon, Philippines.

Bengalia hobbyi: James, 1966: 472, probably misid.

Length: 8.0-12.0 mm.

Material examined. - LEYTE: 1 male, Dagami Mt., 8 Sep.1957, ? (BPBM). MINDANAO: 1 male, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NIID); 1 female, Agusan, Los Arcos, 19-23 Nov.1959, Malaise trap, L. Quate & C. Yoshimoto (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Leyte, Mindanao, Balabac?).

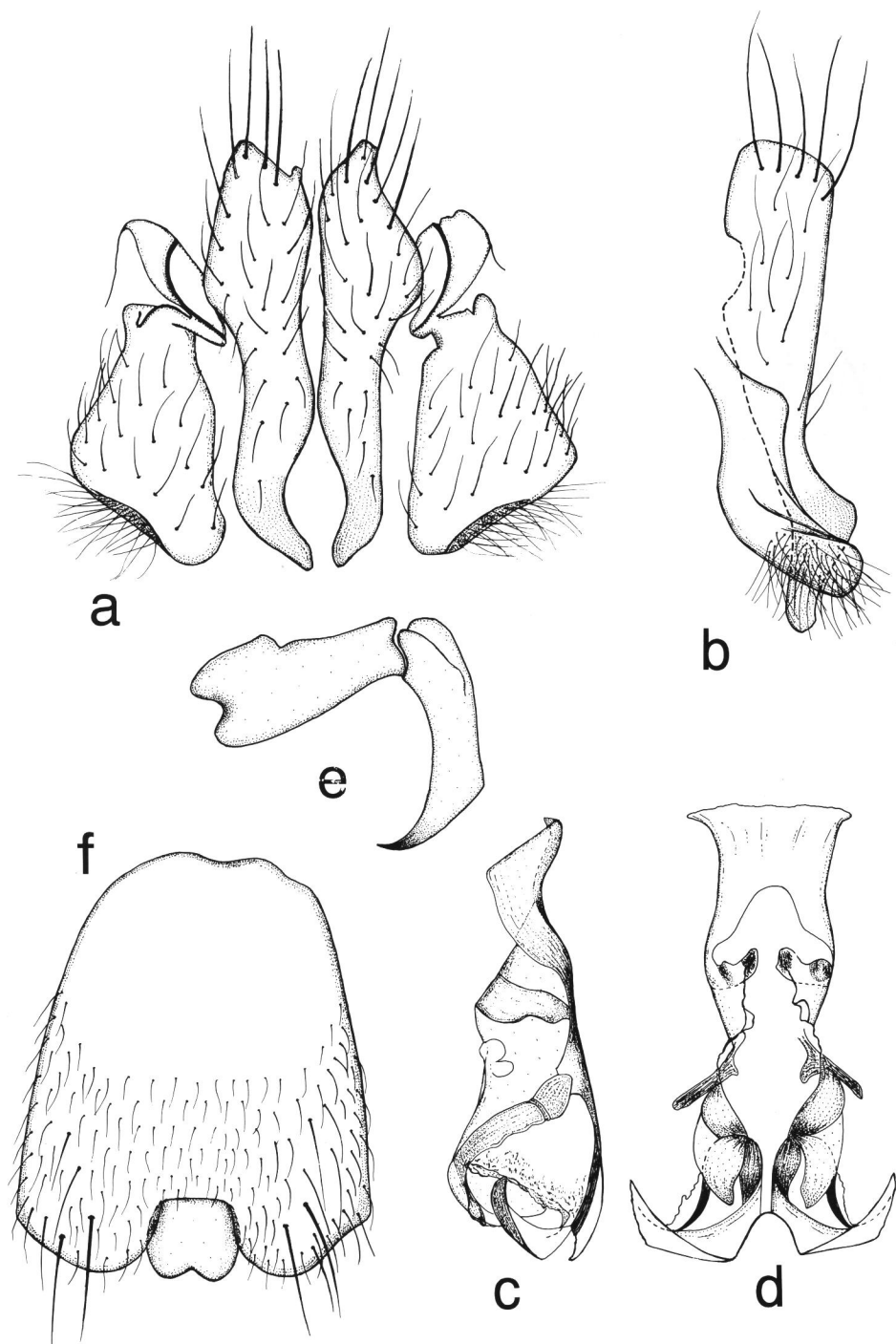


Fig. 9. *Bengalia calilungae* Rueda, male genitalia. a, cerci and paralobi, caudal view; b, cercus and paralobus, lateral view; c, aedeagus, lateral view; d, aedeagus, anterior view; e, anterior and posterior parameres, lateral view; f, sternite 5, ventral view.

***Bengalia inermis* Malloch**

(Fig. 10)

Bengalia inermis Malloch, 1927: 413. Type locality: Mount Makiling, Luzon, Philippines.
Bengalia inermis: James, 1977: 523.

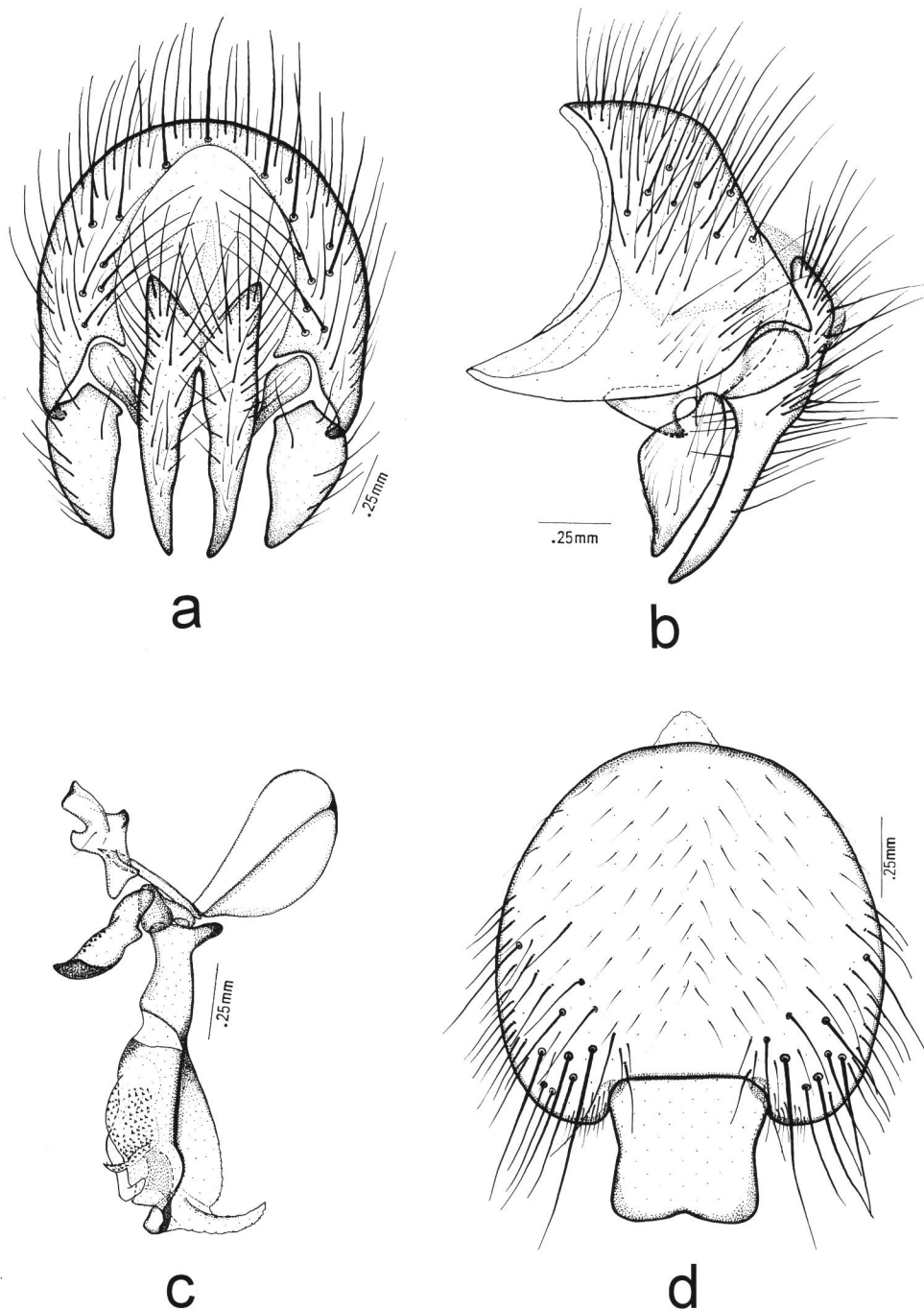


Fig. 10. *Bengalia inermis* Malloch, male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

Length: 10.0-13.5 mm.

Material examined. - LUZON: 2 males 2 females, Los Baños, Mt. Maquiling, 1,000 ft, 17 Mar.1960, 30 Apr.1968, M. D. Delfinado, T. C. Maa & D. E. Hardy (BPBM); 3 males, Los Baños, Mt. Maquiling, 500 m, 28 Feb.1975, 16-17 Apr.1985, S. Shinonaga (NIID); 2 females, Los Baños, Mt. Maquiling, 500 m, 6-7 Jan.1976, 10 Aug.1978, H. Shima, A. Nakanishi & O. Yata (NIID); 8 females, Los Baños, ? Jul.1916, 19-20 Sep.1959, F. Muir (BPBM); 1 male, Camarines Sur, Mt. Isarog, Pili, 600 m, 7 Apr.1965, H. M. Torrevillas (BPBM); 2 males, Laguna, Mt. Maquiling, 500 m, Los Baños, 16-17 Apr.1985, F. R. Magpayo (USC). PALAWAN: 1 female, Montible, 24-27 Jan.1975, S. Shinonaga (NIID). MINDANAO: 1 male 2 females, Zamboanga del Norte, 11 km E of Sindangan, 20 Jul.1958, H. E. Milliron (BPBM); 1 male, Zamboanga del Sur, Lemesahan, 150 ft, 8 Sep.1958, H. E. Milliron (BPBM); 1 male, Agusan, Los Arcos, 19-23 Nov.1959, L. W. Quate (BPBM); 1 female, Cotabato Prov., Polo, nr Base of Mt. Matutum, 600 m, 14 Aug.1958, H. E. Milliron (BPBM). PALAWAN: 1 female, 11-13 km SE of Tarumpitao Pt., 150 m, 19 May 1958, H. E. Milliron (BPBM); 1 female, Montible, 24-27 Jan.1975, S. Shinonaga (NIID). MINDANAO: 4 males 1 female, Davao City, Mt. Talomo, 1,000 m, 1,15,21 Aug.1983, 15 Oct.1983, F. Magpayo (NIID).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan, Mindanao).

Bengalia jejuna (Fabricius)

Musca jejuna Fabricius, 1787: 342. Type locality: Tranquebar, India.

Bengalia jejuna: James, 1966: 471.

Bengalia jejuna: James, 1977: 529.

James (1966) recorded this species from the Philippines based on 1 male and 1 female collected at Brooke's Point, Uring Uring, Palawan. Also, he mentioned that the male genitalia are not significantly different from those of specimens from South India which he used for comparison. We have no material from the Philippines to confirm James' identification.

Length: 11.0-12.0 mm.

Bionomics. - Oviparous. The adult has been observed stealing pupae from ants on the march (Senior-White et al., 1940, as *B. lateralis* Macquart).

Distribution. - Philippines (Palawan), Thailand, Malaysia (Malaya), Indonesia (Celebes), India and Sri Lanka.

Bengalia kanoi, new species

(Fig. 11)

Bengalia jejuna: Rueda, 1985a: 349, misid.

Type material. - Holotype male, MINDANAO: Davao, Mt. Talomo, 1,000 m, 28 Aug.1983, F. R. Magpayo.

Paratypes. MINDANAO: 8 males 8 females, same locality and collector as holotype, 17 Apr.1983, 14 Jul.1983, 1,15,21,28 Aug.1983, 25 Sep.1983, 15 Oct.1983; 1 male, Misamis Or., Mt. Balatukan, 15 km SW of Gingoog, 1,000-2,000 m, 1-5 May 1960, H. Torrevillas (BPBM); 1 female, Davao, Genitalan, 8 km NW of Mt. Apo, 690 m, in jungle, 17 Aug.1958, H. E. Milliron (BPBM); 1 female, Z. Del Sur, 11 km NW of Milbuk, 390 m, in rain forest, 5 Aug.1958, H. E. Milliron (BPBM).

Type depository. Holotype and paratypes (4 males, 4 females) are deposited in Reference Museum, Taxonomy and Ecology Laboratory, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo (NIID). Paratypes (2 males, 2 females) in National Science Museum, Tokyo (NSMT); paratypes (2 males, 1 female) in Bishop Museum, Honolulu (BPBM); paratypes (1 male, 1 female) in Biological Collections, University of San Carlos, Cebu (USC).

Description.- Male.-Head: eyes bare, dichoptic, widely separated at vertex; frons index 0.31-0.33; frontal stripe barrel-shaped, brown, yellowish-brown dusted, bearing blackish setulae; parafrontalia narrow, widened anteriorly and posteriorly, brown, yellowish-brown dusted, with numerous black setulae, provided with ca 8 pairs of *ori*; proclinate *ors* 0+1, developed as a preverticals; *ov* and *iv* well developed; *oc* weakly developed; *pooc* fine; *poc* fine, divergent; *occ* 1; parafacialia narrowed below, yellowish brown, yellowish-brown dusted, with yellowish setulae below, upper part clothed with black setulae; face pale yellowish, only with trace of median carina; facialia yellowish brown, bare except for tuft of several black setulae just above vibrissae; medianae very narrow, yellowish brown, bare; vibrissaria very narrow, yellowish brown, with a few black setulae; peristomal bristles strong; vibrissae strongly developed; epistome yellowish brown; gena narrow, yellowish brown, slightly yellowish-brown dusted, clothed with black hairs below, with pale yellow hairs posteriorly; postgena concolorous with gena, yellowish-grey dusted, clothed with pale yellow hairs; occiput largely fuscous, reddish below and just behind vertex, yellowish-grey dusted, clothed with pale yellow hairs; 2nd antennal segment reddish brown; 3rd antennal segment largely fuscous brown except for apex and venter, slightly yellowish-grey dusted, 3.5 X as long as 2nd; arista yellowish brown, long plumose; palpi pale yellow, with black bristly hairs apically.

Thorax: testaceous, yellowish-grey dusted; dorsum with narrow median and a pair of submedian stripes, and with irregularly shaped lateral spots which extend to 2nd row of postsutural *dc* when viewed behind; mesonotum largely covered with black hairs; humerus concolorous with dorsum, clothed with both black and yellow hairs; postalar callus concolorous with thoracic dorsum, clothed with black hairs; scutellum concolorous with thoracic dorsum, blackish-haired on upper surface, ventral surface yellowish setulose; prosternum narrow, clothed with yellow hairs; propleuron bare; suprascapular convexity pubescent; hypopleural hairs yellow except for a few black ones in front of uppermost *hp*; mesopleuron largely clothed with black hairs except for several yellow ones anteroventrally; sternopleuron clothed with black hairs centrally, intermixed with yellow ones along margins; pteropleuron clothed with black and yellow hairs, number of black ones more than 30; pleurotergite clothed with yellow hairs; mesothoracic spiracle yellow, metathoracic one fuscous brown; postalar declivity with a tuft of yellow hairs; tympanic tuft of yellow hairs present; anterior parasquamal tuft absent; suprasquamal ridge bare. Chaetotaxy: *ac* 0+1 developed as prescutellars; *dc* 2+3-4; *ia* 0+2; *h* 2; *ph* 1; *prs* 1; *sa* 2; *pa* 2; *st* 1+1; *sc* 3+0; *n* 2; *pp* 2; *pst* 1.

Wings: brownish hyaline; veins brownish; epaulet brown to yellowish brown; basicosta yellow; subcostal sclerite yellowish brown, pubescent; 3rd longitudinal vein with setulae above and below, setulose hairs reaching 1/2 way to r-m; 4th longitudinal vein with right or obtuse angles; 4th section of the 4th vein from bend to wing edge slightly curved inwardly and then outwardly before wing margin; squamae yellowish brown, thoracic one lobulate, bare on upper surface. Halteres brown, darkened apically.

Legs: wholly testaceous yellow, black-haired except for coxae intermixed with black and yellow hairs; fore femur with row of *p_v*, submedian 3-4 spines; fore tibia with 3 fine *ad* and 1 *p*, fringed on posteroventral surface of apical 1/2, 3 strong ventral spines developed

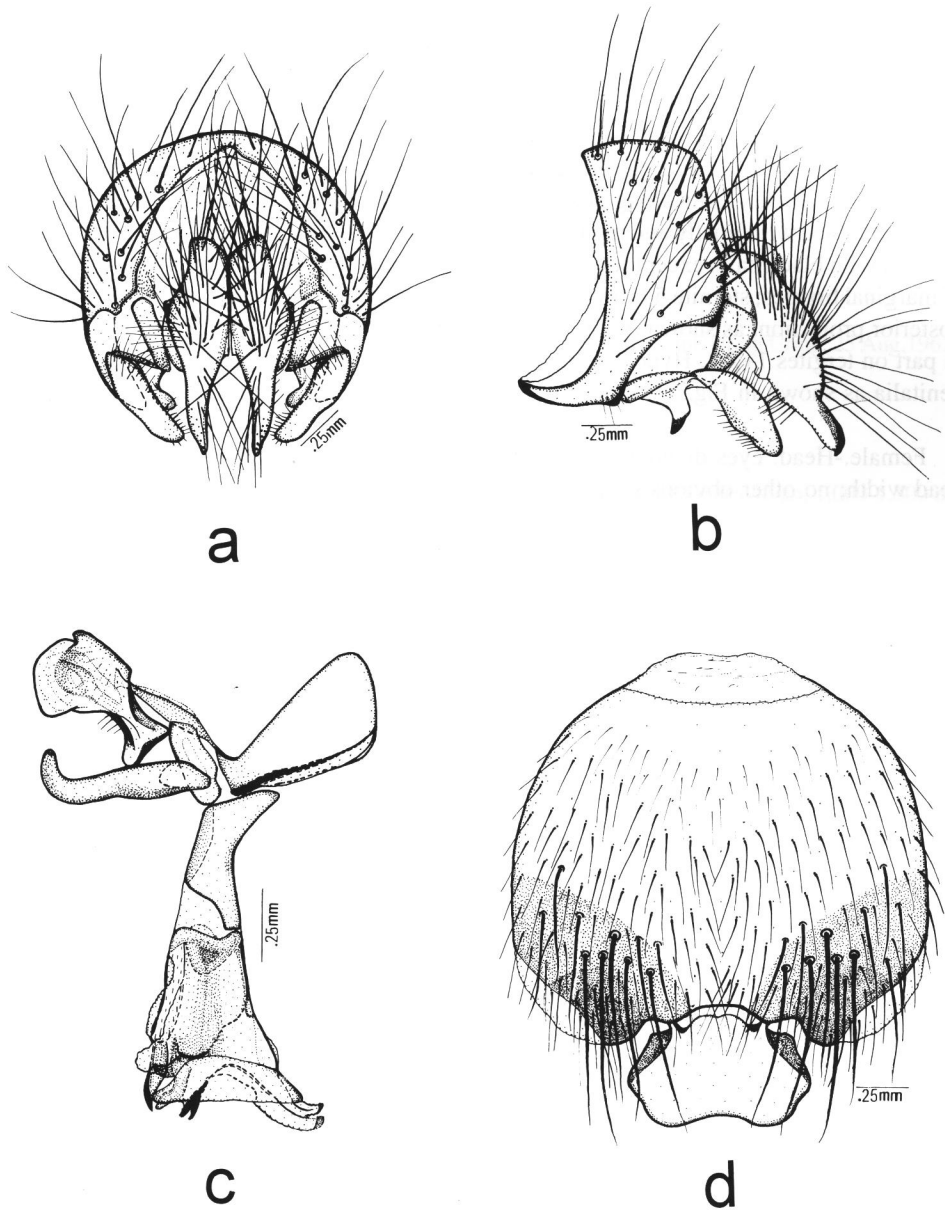


Fig. 11. *Bengalia kanoi*, new species, male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

on basal 1/4; mid femur with row of *pv*, apical 7 becoming short spines; mid tibia with 1 *ad* on apical 1/2 and 1-2 *pd*; hind femur with row of *v* along posterior edge, incomplete row of *v* present along anterior edge on apical 1/2; hind tibia with 3 *ad* and 2 *av*.

Abdomen: testaceous, with black marginal band on tergites 1+2-4, tergite 5 entirely fuscous, with silver-dusted band discally; trace of undusted median stripe present on tergites 2-4; tergite 1+2 silver-grey dusted, narrowly marginal banded; tergites 3-4 silver-grey dusted anteriorly, with broad fuscous marginal band, the width of marginal band broader than 1/3 of length of tergite; sternites 1-4 yellowish, darkened on posterior margin of sternites 3-4; sternite 1 yellowish-haired; sternite 2 yellowish-haired and with 1 pair of marginal bristles and a few fine bristly hairs along posterolateral margins; sternite 3 with 1 pair of marginal bristles, clothed with bristly and regular hairs along posterolateral margins; sternite 4 largely covered with black hairs except for some yellow ones along anterior margin, and with 1 pair of marginal bristles; sternite 5 brown, darkened posteriorly, black-haired, with characteristic posterior projection, as shown in Fig. 10; hairs on lateral sides of tergites yellowish at least in part on tergites 1+2-4. Hypopygium rather prominent, fuscous brown, subshining; male genitalia as shown in Fig. 11.

Female.-Head: eyes dichoptic, separated at vertex by a distance equal to 0.31-0.33 of head width; no other obvious sexual dimorphisms observed.

Thorax: sternopleuron largely clothed with yellow hairs except for black ones around area between anterior and posterior *st*; hypopleuron only with yellow hairs; postalar declivity with tuft of yellow and black hairs in central circle.

Wings: no obvious sexual dimorphisms observed.

Legs: fore tibia with 3 *ad* and 1 *p*, without apical fringe and basal spines; mid tibia with 1 *ad*, 2 *p* and 1 *v*.

Abdomen: several fine decumbent lateral marginal bristles present on tergites 1+2-3; marginal bristle on tergites 4-5 strong, but not erected; no other sexual dimorphisms observed except for ovipositor.

Length: 15.0-16.0 mm.

Other specimens examined. - LUZON: 2 males, Camarines Sur, Mt. Isarog, 750-850 m, light trap, 8-12 May 1963, H. M. Torrevillas (BPBM); 4 males 1 female, Mt. Makiling, 1,000', Laguna, 17 Mar.1960, 30 Mar.1968, 30 Apr.1968, T. C. Maa, M. D. Delfinado & D. E. Hardy (BPBM); 1 female, 6 km W of Imugan, Nueva Viscaya, 11 Apr.1968, M. D. Delfinado (BPBM); 1 female, Los Baños, light trap, 19-20 Sep.1959, L. Quate & C. Yoshimoto (BPBM); 1 female, Cagayan, Zitanga, 27 May 1972, A. D. Pawar (BPBM); 1 female, Ifugao Prov., Kinakin, 1,900 m, 3 Jun.1977, M. Sato (NIID).

Etymology. - The specific name is in honor of Dr. R. Kano, Professor Emeritus of Tokyo Medical and Dental University, who guided the authors in dipterology.

Remarks. - The present new species resembles *Bengalia escheri* Bezzi from Taiwan, but femora are entirely testaceous in the new species. Tuft of hairs at inner lower margin of alar squama is yellow in *B. kanoi*, new species, but blackish in *B. escheri*. Both species are easily distinguished by the shape of apical plate on male sternite 5 as shown in Fig. 11. *Bengalia kanoi*, new species, is also closely related to *B. jejuna* (Fabricius) and *B. martinleakei*

Senior-White from India, but differs from them in entirely yellowish brown epaulet and the shape of male sternite 5.

Bionomics.- Adults were caught in bushes and on the ground.

Distribution.- Philippines (Mindanao, ?Luzon).

***Bengalia lyneborgi* James**

(Fig. 12)

Bengalia lyneborgi James, 1966: 467. Type locality: Brooke's Point, Uring Uring, Palawan, Philippines.

Bengalia lyneborgi: James, 1977: 529.

Bengalia varicolor: Rueda, 1985a: 347, misid.

Type material examined. - Holotype male, PALAWAN, Brookes Point, Uring Uring, 25 Aug. 1961, caught in Malaise-traps, Noona Dan Exp. 61-62 (ZMUC).

Length: 7.6-10.5 mm.

Material examined. - LUZON: 2 males Ifugao Prov., Liwo, 8 km E of Mayoyao, 1,000-1,300 m, 4-8 Jun. 1967, L. M. Torre Villas (BPBM); 1 male, Ifugao Prov., Jacmal Bunhian, 24 km E of Mayoyao, 800-1,000 m, 9-12 Apr. 1967, H. M. Torre Villas (BPBM); 4 males 1 female, Los Baños, Mt. Makiling, 1,000 m, 17 Sep. 1959, 17 Mar. 1960, 30 Apr. 1968, L. W. Quate, D. E. Hardy & T. C. Maa (BPBM); 2 males 1 female, Los Baños, ? Sep. 1915, 19 Jul. 1921, F. X. Williams (BPBM); 3 males, Los Baños, Mt. Maquililing, 300 m, 22 Oct. 1975, 6-7 Jan. 1976, R. Kano, S. Shinonaga & H. Kurahashi (NIID); 1 male 2 females, Los Baños, Mt. Maquililing, 500 m, 16-17 Apr. 1985, F. Magpayo (NIID); 3 males, Los Baños, 10 Jul. 1970, 11 Aug. 1978, T. Okadome, A. Nakanishi & O. Yata (NIID); 1 female, Clark Field, 26 Jul. 1959, J. L. Gressitt (BPBM); 2 females, Albay Prov., Libon, Cagascos, 200 m, 7 May 1965, H. M. Torre Villas (BPBM); 1 male 2 females, Batangas Prov., Bo Cale, 7 km NW Tanauan, 14,23 Jul. 1977, 22 Aug. 1997, A. T. Barrion (IRI). PALAWAN: 1 male 1 female, Brookes Point, Uring Uring, Malaise-traps, 17, 25 Aug. 1961, Noona Dan Exp. 61-62 (ZMUC); 3 males, Agr. Expt. Sta., 11.2 km N of Puerto Princesa, 15-17 Apr. 1968, D. E. Hardy (BPBM); 1 male, Montible, 100 m, 29 Oct. 1975, H. Kurahashi (NIID); 1 female, Hill, c. 40 km SW of P. P., 31 Oct. 1975, H. Kurahashi (NIID). CULION IS.: 1 male 2 females, 6 km W of Culion, 9 Jun. 1962, H. Holtmann (BPBM). NEGROS: 1 male, Mt. Talinas, 1,000 m, 29-31 Dec. 1960, H. Torre Villas (BPBM); 1 female, Sibulan, 30 Sep. 1959, L. W. Quate (BPBM). MINDANAO: 1 male 1 female, Zamboanga del Norte, 11 km E of Sindangan, 20 Jul. 1958, H. E. Milliron (BPBM); 1 female, Mt. View Colleges, 15 km NW of Valencia, Bukidnon, 22-23 Apr. 1968, D. E. Hardy (BPBM); 1 male, Zamboanga del Norte, Manucan, 15 km S., 500 m, 18 Oct. 1959, L. W. Quate (BPBM); 6 males 3 females, Mt. Talomo, 1,000 m, 1,15,28 Aug. 1983, 17 Sep. 1983, 3,15 Oct. 1983, F. Magpayo (NIID); 1 female, S. Cotabato, Lake Sebu, Luhib, 29 May 1993, F. Magpayo (NIID); 1 male, Cavite, 15 Mar. 1975, S. Shinonaga (NIID).

Remarks. - The species is closely related to *B. bezzii* Senior-White, but easily distinguished from the latter by the shape of apical plate of male sternite 5 which is deeply waisted and rather pointed on extreme left and right apical margins in *B. bezzii*, but almost parallel-sided and with smoothly rounded apical curvature in *B. lyneborgi*. Second sternite in male of *B. lyneborgi* has normally no pair of strong median marginal bristles, while such bristles are otherwise conspicuous in *B. bezzii*.

Bionomics.- In Mt. Makiling, Luzon, adults were observed preying on a species of coconut termites which were abundant at the collection site.

Distribution. - Philippines (Luzon, Palawan, Mindanao, Balabac).

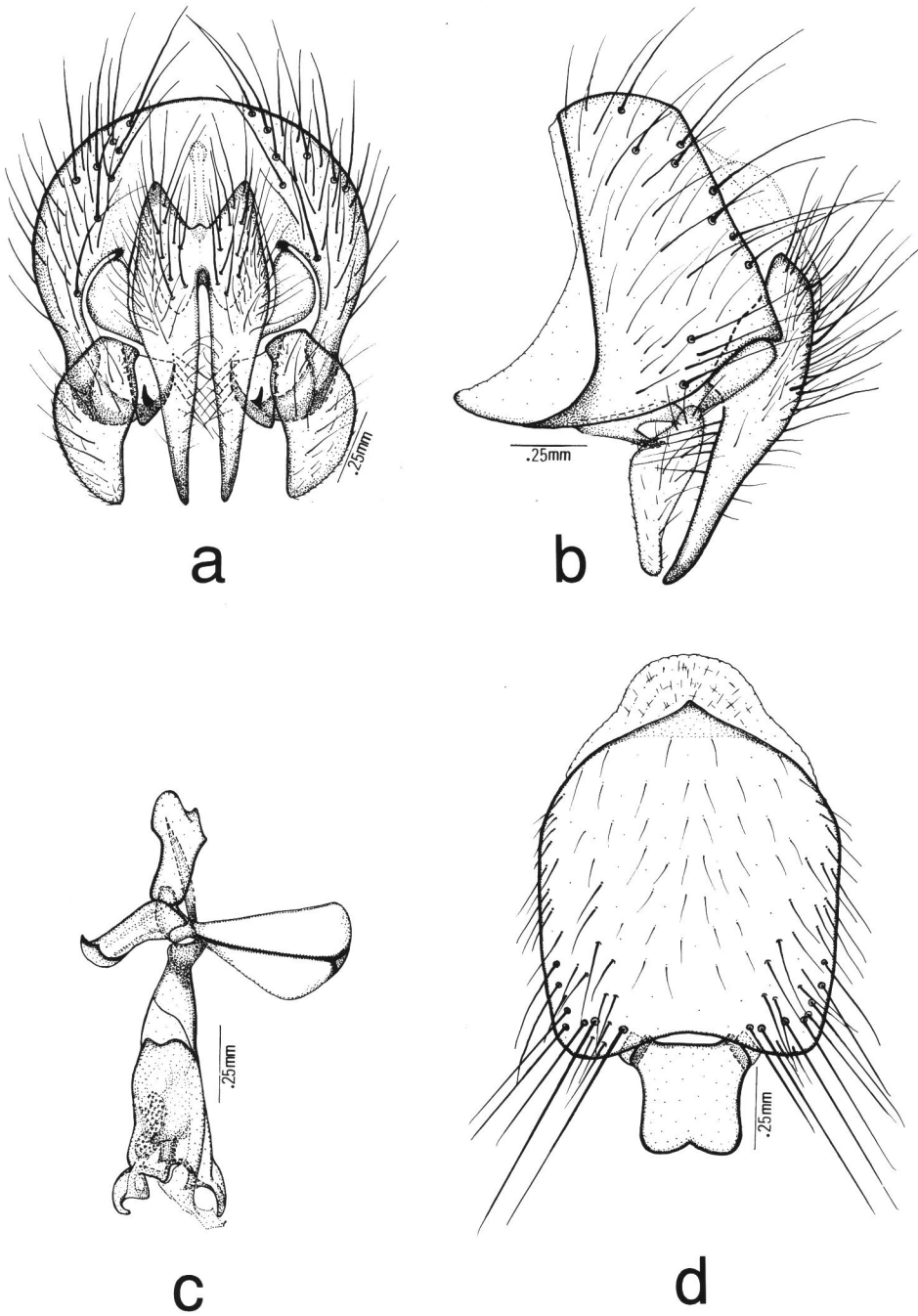


Fig. 12. *Bengalia lyneborghi* James, male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

***Bengalia recurva* Malloch**

Bengalia recurva Malloch, 1927: 404. Type locality: Mount Makiling, Luzon, Philippines.

Bengalia recurva: James, 1966: 467.

Bengalia recurva: James, 1977: 529.

Bengalia recurva: Rueda, 1985a: 343.

Length: 10.0-14.0 mm.

Material examined. LUZON: 1 female, Los Baños, 15 Aug.?, E. Muir (BPBM). NEGROS: 1 female, Negros Or., Palinpinon, Olcoy R., 28 Jul.1958, H. E. Milliron (BPBM). MINDANAO: 1 male, Misamis Or., Mt. Empagatao, 1,050-1,200 m, 19-30 Apr.1961, H. M. Torrevillas (BPBM); 1 female, Z. Del Sur, 32 km NW of Milbuk, 900 m, rain forest, light trap, 6 Aug.1958, H. E. Milliron (BPBM); 1 female, Bukidnon, Mt. Kitanglad, 1,250 m, 4-9 Dec.1959, L. W. Quate (BPBM).

Bionomics.- Nothing is known.

Distribution.- Philippines (Luzon, Palawan, Negros, Mindanao) and Malaysia (Malaya).

***Bengalia torosa* (Wiedemann)**

(Fig. 13)

Musca torosa Wiedemann, 1819: 21. Type locality: Bengal.

Bengalia lateralis: James, 1966: 466.

Bengalia jejuna: Senior-White, Aubertin & Smart, 1940: 88.

Bengalia torosa: James, 1977: 530.

Bengalia torosa: Dear, 1978: 234.

Bengalia torosa: Rueda, 1985a: 345.

Length: 12.0-15.0 mm.

Material examined. - LUZON: 1 male, Los Baños, ? Sep.1915, F. Muir (BPBM); 1 male, Los Baños, 11 Aug.1978, A. Nakanishi & O. Yata (NIID). PALAWAN: 1 female, Tarumpitao Pt., 1 Jun.1958, light trap, H. E. Milliron (BPBM); 1 male 2 females, Trident Mine, 500 m, 5 Sep.1985, K. Ishikawa (NSMT). MINDANAO: 1 male, Zamboanga del Sur, Lemesahan, 600 m, 7 Sep.1958, in jungle, ? (BPBM); 1 male, Zamboanga del Sur, 3.2 km NW of Milbuk, 150 m, 4 Aug.1958, light trap, in jungle, H. E. Milliron (BPBM); 1 female, Cotabato, Kalaong, 12 Aug.1958, H. E. Milliron (BPBM); 1 female, Agusan, S. Francisco, 10 km SE, 14 Nov.1959, C. M. Yoshimoto (BPBM); 1 female, Davao City, Madapo Hills, 20 Aug.1982, F. Guiapar (USC); 2 males 3 females, Mt. Talomo, 1,000 m, 7 Aug.1983, 11 Sep.1983, 3,7 Oct.1983, F. R. Magpayo (USC).

Bionomics. - In Australia, a rare collection of males and females of this species was done in a light trap and nocturnal habits may be expected (Farrow & Dear, 1978). Prefer forested habitats.

Distribution. - Taiwan, Philippines (Luzon, Palawan, Balabac, Mindanao), Thailand, Indonesia (Java), Australia, India and Sri Lanka.

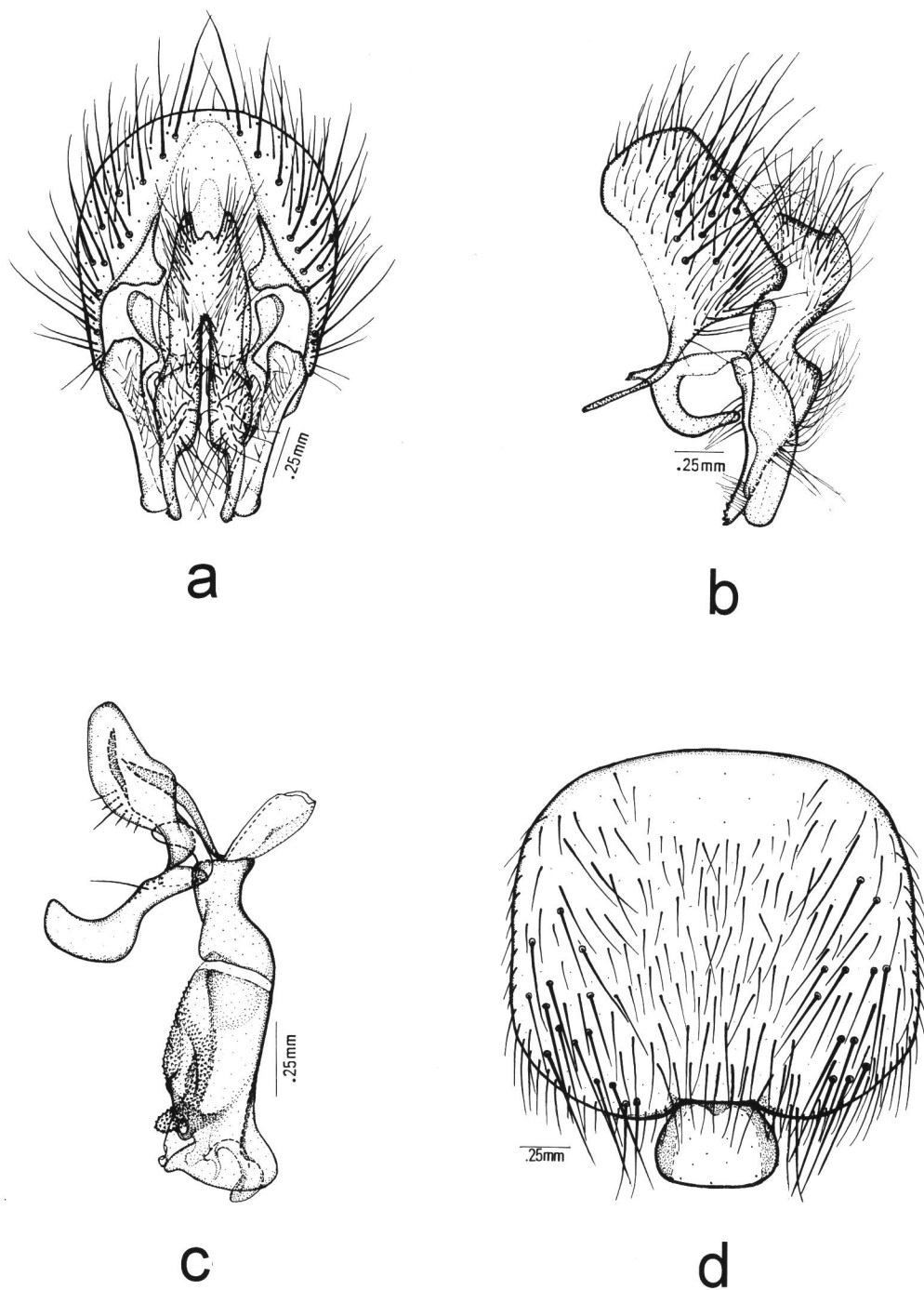


Fig. 13. *Bengalia torosa* (Wiedemann), male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cercus and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

***Bengalia xanthopyga* Senior-White**

Bengalia xanthopyga Senior-White, 1924: 107. Type locality: Singapore.

Bengalia xanthopyga: James, 1977: 530.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon), Malaysia (Malaya), Singapore, Indonesia (Java) and India.

Genus *Booponus* Aldrich

Booponus Aldrich, 1923: 141. Type species: *Booponus intonsus* Aldrich, 1923, mon.

KEY TO THE SPECIES OF *BOOPONUS*

1. Third antennal segment wholly yellowish orange, sometimes slightly darkened dorsoapically; abdomen wholly testaceous yellow, sometimes largely fuscous brown. *B. intonsus* Aldrich
- Third antennal segment blackish with only extreme base reddish; abdomen black and with whitish grey dusting apically [No record from the Philippines]. *B. malayana* Kurahashi, Benjaphong et Omar

***Booponus intonsus* Aldrich**

Booponus intonsus Aldrich, 1923: 142. Type locality: Los Baños, Luzon, Philippines.

Booponus intonsus: James, 1977: 531.

One female specimen collected in a lowland locality in Davao, closely fits Aldrich's description of *B. intonsus*. However, another female specimen collected in the mountainous area of Talomo in Davao has an abdomen and 3rd antennal segment more or less darkened apically. We prefer to keep the identity of this specimen at hand tentative until more specimens are examined and compared with the type material.

Length: 6.2-6.6 mm.

Material examined. - MINDANAO: 1 female, Davao, hovering on a water buffalo's belly, 1 May 1983, F. R. Magpayo (USC); 1 female, Davao, Mt. Talomo, 950 m, hovering around water buffalo's leg, 1-4 Apr.1985, F. R. Magpayo (USC).

Bionomics.- The present species was discovered in 1923 in Los Baños, Luzon, and at that time was known to be the causative agent of foot myiasis in water buffaloes, cattle, and goats. In Mindanao, adults of the so-called "reddish fly" were observed to lay eggs on water buffalo hooves and were observed to be active only in the late afternoon and night time when the animals are at rest and their soles exposed. The majority, if not all water buffaloes in the area where the present sample was collected had infected hooves, usually of the hind pairs. In serious cases the animal will run around wildly in an effort to alleviate the irritation and often lost its appetite to eat.

Distribution. - Philippines (Luzon, Mindanao).

SUBFAMILY CHRYSOMYINAE

TRIBE CHRYSOMYINI

Genus *Chrysomya* Robineau-Desvoidy

Chrysomya Robineau-Desvoidy, 1830: 444. Type species: *Chrysomya regalis* Robineau-Desvoidy, 1830, des. by Coquillett (1910: 523).

KEY TO THE SPECIES OF *CHRYSOMYA*

1. Gena orange, clothed with yellow hairs. 2
- Gena brown to black, never orange. 3
2. Male eyes virtually touching and facets markedly enlarged on upper 2/3; alar squama whitish, thoracic one fuscous brown. *C. megacephala* (Fabricius)
- Male eyes separated by almost width of 3rd antennal segment, upper facets not conspicuously larger than those below; alar and thoracic squamae pale or whitish. *C. bezziana* Villeneuve
3. Sternites with whitish to yellowish hairs, at least on basal two segments. 4
- Sternites clothed with black hairs only. 7
4. Bigger flies, on the average 9-10 mm in length; *ov* well developed in male; female tergite 5 with median cleft. 5
- Smaller flies ca 6 mm in length; *ov* not developed in male; tergite 5 in female without median cleft. *C. nigripes* Aubertin
5. Tergites 3-4 black-banded; tergite 5 with discals; femora not markedly swollen. 6
- Tergites 3-4 without distinct bands; femora markedly swollen, more so in male; tergite 5 without discals. *C. villeneuve* Patton
6. Mesopleuron black-haired; mesothoracic spiracle yellowish; frons in male ca 3 X width of ocellar triangle, with well developed frontal stripe and complete row of frontal bristles. *C. schoenigi* Kurahashi et Magpayo
- Mesopleuron white-haired; mesothoracic spiracle white; frons in male not exceeding width of ocellar triangle at narrowest and frontal row composed of very fine bristles not conspicuously longer than longest parafrontal hairs. *C. rufifacies* (Macquart)
7. Basal part of alar squama opaque white, bare ventrally except for fringe. 8
- Basal part of alar squama fuscous and with black hairs ventrally. 9
8. Lower part of exposed margins of upper and lower squamae brown or dark brown; facets in male markedly enlarged on upper 2/3 and reaching occipital margin above. *C. chani* Kurahashi
- Lower part of exposed margins of upper and lower squamae whitish; facets in male small, uniform. *C. samarensis* Kurahashi
9. Mesopleuron and hypopleuron surrounding anterior part of metathoracic spiracle with pale brown or whitish hairs; male eye facets above level of antennal bases enlarged, sharply demarcated from lower small ones; cercus robust, blunt at apex in male (cf. Kurahashi & Salazar, 1988: 254, Fig. 1 b, 1 c). *C. cabrerai* Kurahashi et Salazar
- Pleura surrounding anterior part of metathoracic spiracle black haired; upper facets of male eye not conspicuously larger than lower ones; apex of cercus in male lobulate in male (cf. Kurahashi et al., 1997: 50. Fig. 7 a). *C. pinguis* (Walker)

***Chrysomya bezziana* Villeneuve**

Chrysomya bezziana Villeneuve, 1914: 430. Type locality: "Africa".

Chrysomya bezziana: James, 1977: 541.

Length: 8.5 mm.

Material examined. - PALAWAN: 1 female, nr jungle ravine, 3.2 km S Tarumpitao Pt., 31 May 1958, H. E. Milliron (BPBM).

Bionomics. - The species is known to be a true myiasis-producer but no case of myiasis from *C. bezziana* has ever been documented in the Philippine islands.

Distribution. - Widely distributed through the Afrotropical and Oriental Regions, including New Guinea and Bismarck Arch.

***Chrysomya cabrerai* Kurahashi et Salazar**

Chrysomya cabrerai Kurahashi et Salazar, 1977: 252. Type locality: Mt. Makiling, Los Baños, Laguna, Philippines.

Chrysomya defixa: James, 1977: 542, misid.

Chrysomya defixa: Rueda, 1985b: 371, misid.

Length: 7.7-11.0 mm.

Material examined. - LUZON: 1 female, Ifugao, Jacmal Bunhian, 800-1,000 m, 24 km E Mayoyao, 7-8 Apr.1967, H. M. Torrevillas (BPBM); 1 female, Nueva Viscaya, Dalton Pass, 915 m, 8-10 Apr.1968, D. E. Hardy (BPBM); 3 males 7 females, Laguna, Mt. Makiling, Los Baños, 16-17 Apr.1985, F. R. Magpayo (USC); 1 female, Camarines Sur, Mt. Iriga, 500 m, 29 Mar.1962, H. M. Torrevillas (BPBM); 2 females, Mt. Isarog, 500-600 m, 20 km E Naga, 6-12 Apr.1963, light trap, H. M. Torrevillas (BPBM); 1 female, Mt. Isarog, 800-1,200 m, 27 Apr.1963, H. M. Torrevillas (BPBM); 4 males 9 females, Laguna, UP Campus, Los Baños, 150 m, 21 Oct.1975, H. Kurahashi & R. Kano (NIID); 4 males 35 females, Mt. Makiling, 300-500 m, Los Baños, 28 Feb.1975, 22-23 Oct.1975, 6-7 Jan.1976, R. Kano, H. Kurahashi & S. Shinonaga (NIID). BUSUANGA IS.: 1 male, 4 km N San Nicolas, Malaise trap, 2 Jun.1962, H. Holtman (BPBM). CULION IS.: 1 male, 6 km W Culion, light trap, 11 Jun.1962, H. Holtman (BPBM). PALAWAN: 1 male, Brookes Pt., 75 m, Macagua, 1-4 Apr.1962, H. Holtman (BPBM); 1 female, 3 km NE Tinabog, 11 May 1962, H. Holtman (BPBM); 1 female, Panitian, 5 May 1967, M. D. Delfinado (BPBM); 1 male 1 female, Salacsacan, Dicala, Caruray, 21 Apr.1972, B. D. Cabrera (NIID); 1 male, Hot Spring, Sta. Lucia, 9 Nov.1975, H. Kurahashi (NIID); 2 females, Swamp, 10 km SW of P. P. 29 Oct.1975, R. Kano (NIID); 2 males, forest, 34 km SW Puerto Princesa, 31 Oct.1975, R. Kano (NIID); 205 males 35 females, Montible, 0-500 m, 24-27 Jan.1975, 28-30 Oct.1975, 2 Nov.1975, H. Kurahashi, R. Kano & S. Shinonaga (NSMT). SAMAR: 4 males 13 females, Basey, 17-18 Feb.1975, S. Shinonaga (NIID). LEYTE: 6 males 1 female, Tacloban, 19 Feb.1975, S. Shinonaga (NIID). NEGROS: 1 female, Lake Balinsasayao, 1-7 Oct.1959, C. M. Yoshimoto (BPBM); 1 female, Amlan, 17-18 Jul.1970, T. Okadome (BPBM). MINDANAO: 1 female, Misamis Or., Balason, 7-8 Apr.1960, H. M. Torrevillas (BPBM); 3 females, Mt. Kibungkol, 700-800 m, 20 km SE Gingoog, 9-18 Apr.1960, H. M. Torrevillas (BPBM); 1 female, Minalwang, 1,050 m, 24 Mar.-4 Apr.1961, H. M. Torrevillas (BPBM); 2 females, Misamis Occ., Trib. of Clarin R., 1,260 m, 14 Jul.1958, H. E. Milliron (BPBM); 1 female, Agusan, Los Arcos, Malaise trap, 19-23 Nov.1959, L. W. Quate & C. Yoshimoto (BPBM); 3 females, Bukidnon, Mt. Katanglad, 1,250 m, 26 Oct.1959, 4-9 Dec.1959, L. W. Quate (BPBM); 2 females, Bukidnon, Malaise trap, 27-31 Oct.1959, L. W. Quate & C. Yoshimoto (BPBM); 1 female, Lanao, Butig Mts., 1,080 m, 24 km NE Butig, 21 Jun.1958, H. E. Milliron (BPBM); 6 males 15 females, Davao, Mt. Talomo, 1,000 m, chicken meat, 1-21 Aug.1983, F. R. Magpayo (USC); 1 male 4 females, Zamboanga del Norte, Masawan, 1,250-1,400 m, 15 Jul.1958, H. E. Milliron (BPBM). SULU ARCH.: 1 female, Siasi Is., fish bait, 26 Mar.1958, H. E. Milliron (BPBM).

Bionomics. - The present species is widely distributed in the Philippine islands but is restricted to mountainous and forested areas. Adults are commonly found on decaying animal matters in the forest.

Distribution. - Throughout Philippine islands.

***Chrysomya chani* Kurahashi**

Chrysomya chani Kurahashi, 1979: 288. Type locality: Bukit Timah Nature Reserve, Singapore.
Chrysomya chani: Wells & Kurahashi, 1996: 134.

Length: 7.5-9.5 mm.

Material examined. - LUZON: 1 female, UP Campus, Los Baños, 150 m, 21 Oct.1975, H. Kurahashi (NIID); 5 males 7 females, Mt. Makiling, 300 m, Los Baños, 28 Feb.1975, 22-23 Oct.1975, S. Shinonaga, R. Kano & H. Kurahashi (NIID). PALAWAN: 1 male, Antipolo Beach, 3 Nov.1975, H. Kurahashi (NIID); 1 female, Hill, c 40 km SW Puerto Princesa, 31 Oct.1975, H. Kurahashi (NIID); 45 males 95 females, Montible, 24-27 Jan.1975, 20-30 Oct.1975, 2 Nov.1975, S. Shinonaga, H. Kurahashi & R. Kano (NSMT). SAMAR: 1 male 2 females, Baset, 17-18 Feb.1975, S. Shinonaga (NIID). MINDANAO: 1 male, Misamis Occ., Trib. of Clarin R., 1,260 m, jungle, 14 Jul.1958, H. E. Milliron (BPBM).

Bionomics. - Adults are attracted to decomposing animal matter in the forest.

Distribution. - Philippines (Luzon, Palawan, Samar, Mindanao), China (Hainan), Thailand, Malaysia (Malaya, Borneo), Singapore, Bangladesh and Nepal.

***Chrysomya megacephala* (Fabricius)**

Musca megacephala Fabricius, 1794: 317. Type locality: "Guinea" probably error, according to Senior-White et al., 1940.

Chrysomya megacephala: James, 1977: 542.

Chrysomya megacephala: Rueda, 1985b: 363.

Length: 7.5-10.0 mm.

Material examined. - LUZON: 2 males 1 female, Isabela, Iragan, 21 Apr.1983, S. Hashimoto (NIID); 1 male, Ifugao, Mayoyao, 1,200-1,500 m, 6-17 Sep.1966, H. M. Torre Villas (BPBM); 3 males, Benguet, Bagio, 1,525 m, 3 Apr.1968, D. E. Hardy (BPBM); 4 males 3 females, Rizal, Manila, 23-27 Aug.1945, 8-17.?.1945, H. E. Milliron (BPBM); 1 female, Manila, 27 Aug.1945, J. L. Gressitt (BPBM); 1 male 3 females, Manila, seashore, 12 Jun.1975, S. Shinonaga (NIID); 3 males 1 female, Malabon, mangrove swamp, 26 Oct.1975, R. Kano & H. Kurahashi (NIID); 1 male 8 females, Montalban, Wa-Wa Dam, 150-200 m, 16-24 Mar.1965, H. M. Torre Villas (BPBM); 1 male, Taytay, 2 Sep.1945, H. E. Milliron (BPBM); 2 males 1 female, Laguna, Los Baños, 7 Jul.1930, F. C. Hadden (BPBM); 1 male, Los Baños, 17 Jul.1921, F. X. Williams (BPBM); 9 males, UP Campus, 150 m, Los Baños, 21 Oct.1975, R. Kano & H. Kurahashi (NSMT); 14 males 7 females, Mt. Makiling, 500 m, 28 Feb.1975, 22-23 Oct.1975, H. Kurahashi, R. Kano & S. Shinonaga (NSMT); 1 male 7 females, Mt. Makiling, 500 m, 16-17 Apr.1985, F. R. Magpayo (USC); 2 females, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano (NSMT); 3 males 3 females, Nueva Ecija, San Jose, on fresh matting wood, 26 Aug.1945, J. L. Gressitt (BPBM); 2 males 15 females, Cavite, Tagaytay, forest, c 600 m, 6 Nov.1975, H. Kurahashi & R. Kano (NSMT); 2 females, Camarines Sur, Mt. Iriga, 500-600 m, 23 Apr.1962, H. M. Torre Villas (BPBM); 1 female, Mt. Isarog, 500-600 m, light trap, 20 km E Naga, 16 Apr.1963, H. M. Torre Villas (BPBM); 1 male 1 female, Pili, Mt. Isarog, 600-700 m, light trap, 25 Apr.1965, H. M. Torre Villas (BPBM); 3 males 2 females, Sorsogon, Sablayan, Juban, 1-8 Mar.1972, B. D. Cabrera (NSMT). BUSUANGA IS.: 4 females, 4 km N San Nicolas, 27 May 1962, M. Thomson (BPBM). PALAWAN:

1 female, 3.2 km S Tarumpitao Pt., jungle clearing, ? Jun.1958, H. E. Milliron (BPBM); 1 female, Macagua, Brookes Pt., 75 m, 1-4 Apr.1962, H. Holtman (BPBM); 1 female, Puerto Princesa, Salacsacan, 2 Mar.1972, B. D. Cabrera (NSMT); 3 males 9 females, Dicala, Caruray, 21 Apr.1972, B. D. Cabrera (NSMT); 16 males 12 females, Montible, 500 m, 24-27 Jan.1975, 28 Oct.-2 Nov.1975, S. Shinonaga, H. Kurahashi & R. Kano (NSMT); 1 female, Swamp, 10 km SW P. Princesa, 29 Oct.1975, R. Kano (NIID); 1 male, Forest, 3.4 km SW P. Princesa, 31 Oct.1975, R. Kano (NIID); 4 males 2 females, Hill, c 40 km SW P. Princesa, 31 Oct.1975, H. Kurahashi (NIID); 5 females, Macarascas, Ulugun Bay, 4 Nov.1975, H. Kurahashi (NSMT); 1 female, Rita Is., Ulugun Bay, 4 Nov.1975, H. Kurahashi (NIID); 1 male, Hot Spring, Sta. Lucia, 31 Oct.1975, H. Kurahashi (NIID); 3 females, Balabac Is., 10 km S Balabac, 21 Apr.1962, M. Thomson (BPBM). SAMAR: 5 males 1 female, Basey, 17-18 Feb.1975, S. Shinonaga (NIID); 4 males 1 female, Maluio, Tarlac, 14 Mar.1972, B. D. Cabrera (NIID). LEYTE: 3 males 2 females, Utap, 10-17 Nov.1957, 20 Dec.1957, 8 Feb.1958, WUF? (BPBM); 1 male, Babatngon, 24 Nov.1957, WUF? (BPBM); 4 males 2 females, Tacloban, 19 Mar.1975, S. Shinonaga (NIID). NEGROS: 1 female, Dumaguete, 16 Mar.1957, Y. Kondo (BPBM); 1 female, Dumaguete, 390 m, 7-11 Jun.1958, H. E. Milliron (BPBM); 2 females, Lake Balinsasayao, 1-7 Oct.1959, L. Quate & C. Yoshimoto (BPBM). MINDANAO: 3 males 6 females, Agusan, Esperanza, 4-11 Nov.1959, C. M. Yoshimoto (BPBM); 1 male, 10 km SE San Francisco, 12 Nov.1959, C. M. Yoshimoto (BPBM); 5 males 9 females, Lanao, Dansalan, fish bait, 17 Jun.1958, H. E. Milliron (BPBM); 2 males 1 female, Shore, 4.8 km E Dansalan, 11 Jun.1958, H. E. Milliron (BPBM); 1 female, Bukidnon, Mt. Kitanglad, 1,250 m, 1-2 Nov.1959, L. W. Quate (BPBM); 1 male 13 females, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NIID); 1 female, Davao City, Marfori H., nr w. buffalo, 27 Aug.1982, F. R. Magpayo (USC); 1 female, Mt. Talomo, 1,000 m, 1-4 Apr.1985, F. Magpayo (USC); 2 males, Zamboanga del Norte, Dipolog, light trap, 6-7 Jul.1958, H. E. Milliron (BPBM); 2 males 1 female, 11 km E Sindangan, 20 Jul.1958, H. E. Milliron (BPBM); 2 males 4 females, Zamboanga del Sur, 5.8 km W Zamboanga, 1 Aug.1958, H. E. Milliron (BPBM). SULU ARCH.: 7 females, Siasi Is., fish bait, 25-26 Aug.1958, H. E. Milliron (BPBM); 3 males 3 females, Jolo Is., Talipao, 15-30 m, grass, foothills and jungle clearings, 31 Aug.1958, H. E. Milliron (BPBM); 2 females, Batu-batu, 20-21 Feb.1957, Y. Kondo (BPBM).

Bionomics. - Adults are attracted to practically all kinds of filth and they are particularly abundant in slaughterhouses, pig pens, poultry, and in especially the fish and meat sections of market areas. It is also the predominant species frequenting open pit latrines still in use in rural areas. The larvae breed in decaying animal matters and feces.

Distribution. - Philippines (Luzon, Busuanga Is., Palawan, Samar, Leyte, Cebu, Negros, Panay, Mindanao, Sulu Arch.). Throughout Oriental, Australasian and Oceanian Regions. Recently introduced to Africa, South and Central America.

Chrysomya nigripes Aubertin

Chrysomya nigripes Aubertin, 1932: 26. Type locality: Trincomalee, Ceylon [Sri Lanka].
Chrysomya nigripes: Rueda, 1985b: 374.

Length: 5.5-7.3 mm.

Material examined. - LUZON: 1 female, Mt. Province, Abatan, Buguias, 60 km S Bontoc, 1,800-2,000 m, 27 May 1964, H. M. Torrevillas (BPBM); 2 males 8 females, Laguna, Los Baños, UP Campus, 150 m, 21 Oct.1975, R. Kano & H. Kurahashi (NSMT); 10 males, Mt. Makiling, 500 m, 28 Feb.1975, 22-23 Oct.1975, 6-7 Jan.1976, S. Shinonaga & H. Kurahashi (NSMT); 2 males 2 females, Mt. Makiling, 16-17 Apr.1975, F. R. Magpayo (USC); 1 female, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano (NIID); 1 female, Cavite, Tagaytay, c 600 m, forest, 6 Nov.1975, H. Kurahashi (NIID). BUSUANGA IS.: 1 male, 30 females, 4 km N San Nicolas, Malaise trap, 26-27 May 1962, H. Holtman & M. Thomson (BPBM). CULION IS.: 1 male 2 females, 6 km W Culion, light trap, 11-14 Jun.1962, H. Holtman (BPBM). PALAWAN: 2 females, 3 km NE Tinabog, 11 May 1962, H. Holtman (BPBM); 2 males, Hot Spring, Sta. Lucia, 31 Oct.-3 Nov.1975, H. Kurahashi (NSMT); 2 males 1 female, Kanigarang Beach, 3 Nov.1975, H. Kurahashi (NIID); 1 male 15 females, 3.4 km SW P. Princesa, forest, 31 Oct.1975, R. Kano (NIID); 5 males 15 females, Montible, 100-500 m, 24-27 Jan.1975, 28-30 Oct.1975, 2 Nov.1975,

R. Kano, H. Kurahashi & S. Shinonaga (NIID); 1 male 4 females, c 40 km SW P. Princesa, hill, 31 Oct.1975, H. Kurahashi (NIID); 1 female, Antipolo Beach, 8 Nov.1975, H. Kurahashi (NSMT). SAMAR: 2 males, Basey, 17-18 Feb.1975, S. Shinonaga (NIID). MINDANAO: 1 male, Agusan, Hubang, San Francisco, fish bait, 23 May 1984, F. R. Magpayo (USC); 1 male, Davao, Mt. Talomo, 1,000 m, fish bait, 7 Aug.1983, F. R. Magpayo (USC). SULU ARCH.: 1 female, Siasi Is., fish bait, 26 Aug.1958, H. E. Milliron (BPBM).

Bionomics.- Nothing is known.

Distribution.- Philippines (Luzon, Busuanga Is., Culion Is., Palawan, Samar, Mindanao, Sulu Arch.), Thailand, Malaysia (Malaya), India and Sri Lanka.

Chrysomya pinguis (Walker)

Lucilia pinguis Walker, 1858: 213. Type locality: India.

Chrysomya pinguis: James, 1977: 542.

Chrysomya pinguis: Rueda, 1985b: 369.

Rueda's (1985b) record from Luzon and Mindanao was most probably a misidentification of females of *C. cabrerai* Kurahashi. *Chrysomya pinguis* is a representative of Sundaland fauna and found only from Palawan and Tawi-Tawi in the Philippines.

Length: 7.0-9.7 mm.

Material examined. - PALAWAN: 14 males, Montible, 500 m, 24-27 Jan.1975, 30 Oct.-2 Nov.1975, S. Shinonaga, R. Kano & H. Kurahashi (NIID).

Bionomics.- Senior-White et al. (1940) cited the breeding of larvae of this species from the carcasses of birds and animals.

Distribution.- Japan, Korea, Taiwan, Philippines (Palawan, Tawi-Tawi), China, Thailand, Malaysia, Indonesia (Java, ?Moluccas), India and Sri Lanka.

Chrysomya rufifacies (Macquart)

Lucilia rufifacies Macquart, 1843: 303. Type locality: "Nouvelle-Hollande" [Australia].

Chrysomya rufifacies: James, 1977: 542.

Chrysomya rufifacies: Rueda, 1985b: 367.

Length: 7.3-9.5 mm.

Material examined. - LUZON: 1 female, Laguna, Laguna de Bay, 16 Sep.1945, H. E. Milliron (BPBM); 3 males 3 females, Mt. Makiling, 500 m, Los Baños, 28 Feb.-22 Oct.1975, S. Shinonaga & H. Kurahashi (NSMT); 2 males 4 females, Los Baños, Mt. Makiling, 500 m, fish bait, 16-17 Apr.1985, F. R. Magpayo (USC); 5 males 2 females, UP Campus, Los Baños, 150 m, 21 Oct.1975, R. Kano & H. Kurahashi (NIID); 2 males 3 females, Cavite, Tagaytay, c 600 m, forest, 6 Nov.1975, H. Kurahashi (NIID); 2 females, 15 Mar.1975, S. Shinonaga (NSMT). BUSUANGA IS.: 1 female, 4 km N San Nicolas, 27 May 1962, M. Thomson (BPBM). PALAWAN: 1 male 13 females, 3 km NE Tinabog, 11 May 1962, H. Holtman (BPBM); 1 male, Dicala, Caruray, 12 Feb.1972, B. D. Cabrera (NSMT); 1 female, Salacsacan, 21 Apr.1972, B. D. Cabrera (NIID); 1 female, Antipolo Beach, 1 Nov.1975, H. Kurahashi (NSMT); 6 males 9 females, Montible, 24-27 Jan.1975, 28 Oct.-2 Nov.1975, R. Kano, S. Shinonaga & H. Kurahashi (NSMT); 1 male, Puerto Princesa, 29 Jan.1975, S. Shinonaga (NIID); 1 male 1 female, Swamp, 10 km SW P Princesa, 29 Oct.1975, R. Kano (NIID); 1 male 1 female, Forest,

34 km SW P Princessa, 31 Oct.1975, R. Kano (NIID); 6 males, c 40 km SW P Princessa, hill, 31 Oct.1975, H. Kurahashi (NSMT); 2 males, Macarascas, Ulugun Bay, 4 Nov.1975, R. Kano & H. Kurahashi (NIID). SAMAR: 1 male 2 females. Basey, 17-18 Feb.1975, S. Shinonaga (NIID). LEYTE: 1 male, Palo, 21 Jul.1957, WUF? (BPBM); 10 males 5 females, Tacloban, 19 Feb.1975, S. Shinonaga (NIID). MINDANAO: 3 males, Agusan, Hubang, San Francisco, fish bait, 23 May 1984, F. R. Magpayo (USC); 1 female, Misamis Or., Mt. Balatukan, 1,000-2,000 m, 15 km SW Gingoog, light trap, 1-5 May 1960, H. M. Torrevillas (BPBM); 1 male 1 female, Lanao, Dansalan, 17 Jun.1958, H. E. Milliron (BPBM); 1 male 7 females, Davao, Tagum, 4 Feb.1975, S. Shinonaga (NIID); 2 males 1 female, Davao, Mt. Talomo, 1,000 m, fish bait, 19 Jun.1983, 15 Oct.1983, 1-4 Apr.1985, F. R. Magpayo (USC); 1 male 1 female, Zamboanga del Sur, 5.8 km W Zamboanga, 1 Aug.1958, H. E. Milliron (BPBM); 2 females, Lemesahan, 600 m, 8 Sep.1958, H. E. Milliron (BPBM). SULU ARCH.: 12 males 16 females, Bongao Is., 29 Aug.1958, H. E. Milliron (BPBM); 1 female, Tawi-Tawi, Sanga-Sanga R., 29 Aug.1958, H. E. Milliron (BPBM); 1 female, Jolo, light trap, 31 Aug.1958, H. E. Milliron (BPBM).

Bionomics. - A local breeding study using pork and chicken media exposed for 24 hours yielded only adults of *C. rufifacies*. This was done in several trials and in sets where *C. rufifacies* occurred it was either an all *C. rufifacies* colony or one predominated by it. This finding correlates with previous knowledge on the predaceous habits of the later larval stages of this species which, according to Senior-White et al. (1940) may prey on other necrophagous species in the same breeding media. The adults have no synanthropic habits and are thus considered to be of less medical importance, but cases of secondary sheep myiasis and bovine auricular myiasis them are on record.

Distribution. - Philippines (Luzon, Busuanga Is., Palawan, Leyte, Samar, Mindanao, Sulu Arch.). Widely distributed in Oriental, Australasian and Oceanian Regions.

Chrysomya samarensis Kurahashi

Chrysomya samarensis Kurahashi, 1979: 378. Type locality: Basey, Samar, Philippines.

Type material examined. - SAMAR: Holotype male and paratypes (2 males 4 females), Basey, 17-18 Feb.1975, S. Shinonaga (NSMT, UP-IPH, BMNH, BPBM).

Length: 6.0-8.0 mm.

Bionomics.- Adults are attracted to decaying animal matters.

Distribution. - Philippines (Samar).

Chrysomya schoenigi Kurahashi et Magpayo

Chrysomya schoenigi Kurahashi et Magpayo, 1987: 72. Type locality: Mt. Talomo, nr Davao, Mindanao, Philippines.

Type material examined. - MINDANAO: Holotype male and paratypes (3 males 5 females), nr Davao, Mt. Talomo, 1,000 m, fish bait, 19 Jun.1983, 15 Oct.1983, 1-4 Apr.1983, 28 Mar.1985, F. R. Magpayo (USC, NSMT, BMNH, BPBM); 1 female, Misamis Or., Balason, 4-5 Apr.1960, H. M. Torrevillas (BPBM); 1 female, Mt. Kibungkol, 20 km SE Gingoog, 700-800 m, 9-18 Apr.1960, H. M. Torrevillas (BPBM).

The present species is closely related to *C. villeneuvei* but easily differentiated from the latter by the following characteristics: postgena (metacephalon) and posterior margin of gena with black bristly hairs; epistome almost black; anterior lappet of metathoracic spiracle orange,

lined with black hairs; thoracic pilosity in male distinctly erect; female with strong discal bristles on tergite 5.

Length: 7.0-9.0 mm.

Bionomics. - Adults are attracted to decaying fish baits and occasionally visit horse dung.

Distribution. - Philippines (Mindanao).

Chrysomya villeneuvei Patton

Chrysomya villeneuvei Patton, 1922: 567. Type locality: S. India.

Chrysomya villeneuvei: Rueda, 1985b: 373.

Length: 9.0-10.8 mm.

Material examined. - PALAWAN: 21 males 15 females, Montible, 24-27 Jan.1975, 28-30 Oct.1975, S. Shinonaga, H. Kurahashi & R. Kano (NSMT); 1 male, Hot Spring, Sta. Lucia, 3 Nov.1975, H. Kurahashi (NSMT).

Bionomics. - Senior-White et al., (1940) described the second and third larval instar of the species as predaceous, even attacking other predatory larvae like *C. rufifacies*. The adults show no synanthropic habits.

Distribution. - China (Yunnan, Hainan), Philippines (Palawan), Thailand, Malaysia (Malaya, Borneo), Indonesia (Kalimantan, Sumatra), India and Sri Lanka.

SUBFAMILY RHINIINAE

KEY TO THE TRIBES AND GENERA OF RHINIINAE

1. Arista pectinate; *ac* and *dc* not distinguishable from the general vestiture, prescutellar bristles at most weakly developed; suprasquamal ridge bare. Tribe Rhiniini 2
- Arista pubescent or plumose, not pectinate. Tribe Cosmini 5
2. Outer *ph* absent; *R*₅ petiolate; male eyes holoptic, female dichoptic; body metallic green or dark blue. *Chlororhinia* Townsend
- Outer *ph* present. 3
3. Hind tibia without a conspicuous row of *ad*, but with 2-3 *ad* as long or longer than the tibial diameter; *R*₅ open; body slender, parallel-sided; abdomen mostly testaceous. *Idiella* Brauer et Bergenstamm
- Hind tibia with a conspicuous row of subequal setae on anterodorsal surface, longer than the general vestiture, sometimes 2-3 rather strong *ad* developed among them; fore tibia with 1 *pv*; body rather stout with ovate abdomen and usually of a dark coloration. 4
4. *R*₅ petiolate; sternopleuron brassy, without dusting; mesopleuron without setigerous spots; mesopleural row of setae incomplete; legs entirely yellow; tergite 1+2 with rather long marginal bristles in male. *Rhinia* Robineau-Desvoidy
- *R*₅ open at wing margin or closed; if petiolate then sternopleuron heavily dusted. *Stomorhina* Rondani

5. Arista plumose, the rays at least as long as width of 3rd antennal segment in anterior view; fore tibia with or without *p* 6
- Arista pubescent, the longest hairs never exceeding 1.5 x width of 3rd antennal segment; fore tibia with 1 *p* 8
6. Outer *ph* absent; fore tibia without *p* 7
- Outer *ph* present; fore tibia with 1 *p* sometimes without in *Malayomyza* 9
7. Prostigmatal bristles absent; two longitudinal silver white stripes present on dorsum.
..... *Borbororhinia* Townsend
- Prostigmatal bristles present; yellowish brown dorsum with or without three fuscous longitudinal stripes; fuscous dorsum with two longitudinal silver white to grey stripes.
..... *Sumatria* Villeneuve
8. Propleuron hairy. [No record from the Philippines]. *Metallea* van der Wulp
- Propleuron bare. *Rhyncomya* Robineau-Desvoidy
9. Presutural *ac* absent or indistinct; *dc* and postsutural *ac* usually indistinct except for the prescutellars; if 1-2 postsutural *ac* developed as the prescutellars, then the propleuron hairy. [No record from the Philippines]. *Cosmina* Robineau-Desvoidy
- Presutural *ac* well developed at least in one pair; *dc* also well developed; propleuron bare.
..... 10
10. Fore tibia without *p*; a small fly, less than 4 mm in length, blackish shining, with bronzy tinge; humerus, propleuron, upper and anterior part of mesopleuron reddish brown; abdomen reddish brown in part on tergites 1+2-3; male eyes dichoptic. [No record from the Philippines].
..... *Malayomyza* Malloch
- Fore tibia with 1 *p*; a medium and large-sized fly having thorax usually metallic green, blue or purple, more or less dusted; humerus, propleuron and mesopleuron concolorous with thoracic dorsum; abdomen concolorous with thoracic dorsum, also dusted, sometimes tessellated; male eyes usually holoptic to subholoptic. 11
11. Mesopleuron with a group of bristles or bristly hairs on its upper part below notopleuron; bend of 4th longitudinal vein (*m*) regularly curved or angulated; male hypopygium of normal size, scarcely visible when the abdomen seen in profile; sternite 6 in female not protruding posteriorly.
..... *Isomyia* Walker
- Mesopleuron without such a group of bristles or bristly hairs on its upper part below notopleuron; bend of 4th longitudinal vein (*m*) smooth; male hypopygium remarkably large, larger than 1/2 the total length of preabdominal segments; female sternite 6 widely uncovered by corresponding tergites and its posterior border somewhat protruding outwards.
..... *Strongyloneura* Bigot

TRIBE RHINIINI

Genus *Chlororhinia* Townsend

Chlororhinia Townsend, 1917: 191. Type species: *Chlororhinia viridis* Townsend, 1917, orig. des. (= *Musca exempta* Walker, 1857).

KEY TO THE SPECIES OF *CHLORORHINIA*

1. Body metallic green with coppery reflections; hairs on mesopleuron, sternopleuron, postgena and prosternum pale to golden yellow; *pst* usually absent; mid and hind tarsal segments light brown except for fuscous apical one. *C. exempta* Walker
- Body metallic purple and blue; hairs on mesopleuron, sternopleuron, postgena and prosternum brown to black; *pst* always present; mid and hind tarsal segments usually entirely light brown.
..... *C. fuscohirta* Malloch

***Chlororhinia exempta* (Walker)**

Musca exempta Walker, 1856: 128. Type locality: Sarawak, Borneo [Malaysia].

Chlororhinia exempta: James, 1977: 544.

Length: 4.0 mm.

Material examined. - LUZON: 1 female, Ifugao, 8 km E Mayoyao, 1,000-1,300 m, light trap, 9-10 Apr.1967, H. M. Torrevillas (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan), Malaysia (Borneo), Nepal and India.

****Chlororhinia fuscohirta* Malloch**

Chlororhinia viridis var. *fuscohirta* Malloch, 1926: 408. Type locality: Lubok Tamang, Pahang, Malaya [Malaysia].

Length: 5.0-6.5 mm.

Material examined. - MINDANAO: 5 females, Cotabato, Little Mt. Apo, 1 Aug.1978, A. Nakanishi & O. Yata (NIID); 2 females, Cotabato, Agko to Sungho, 1,600 m, 1 Aug.1978, A. Nakanishi & O. Yata (NIID).

Bionomics. - Nothing is known.

Distribution. - *Philippines (Mindanao), Malaysia (Malaya, Borneo) and Australia (Queensland).

Genus *Rhinia* Robineau-Desvoidy

Rhinia Robineau-Desvoidy, 1830: 422. Type species: *Rhinia testacea* Robineau-Desvoidy, 1830 (= *Idia apicalis* Wiedemann, 1830), mon.

***Rhinia apicalis* (Wiedemann)**

Idia apicalis Wiedemann, 1830: 354. Type locality: Tenerife [Canary Is.]

Rhinia apicalis: James, 1977: 552.

Length: 5.6-6.3 mm.

Material examined.- LUZON: 1 male 11 females, Rizal, Manila, seashore, 12 Jun.1975, S. Shinonaga (NSMT). PALAWAN: 1 male, Salacsacan, Dicala, Caruray, 21 Apr.1972, B. D. Cabrera (NIID). LEYTE: 1 female, Tacloban, 19 Feb.1975, S. Shinonaga (NIID).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan, Leyte), Thailand, Keeling Is., Malaysia (Malaya, Borneo), Indonesia (Java), Australia (Northern Territory, Queensland), Sri Lanka,

Near East, Canary Is. and Hawaii. Widely distributed in Afrotropical Region .

Genus *Stomorphina* Rondani

Idia Wiedemann, 1820: 21; nec *Idia* Hübner, 1809, Lepidoptera. preocc.

Stomorphina Rondani, 1861: 9, n. name for *Idia* Wiedemann. Type species: *Musca lunata* Fabricius, 1805, des. by Brauer & Bergenstamm (1889: 86, 154).

Idiellopsis Townsend, 1917: 190. Type species: *Idiellopsis similis* Townsend, 1917, orig. des. (= *Idia xanthogaster* Wiedemann, 1820).

Euidiella Townsend, 1917: 192. Type species: *Musca discolor* Fabricius, 1794, orig. des.

KEY TO THE SPECIES OF *STOMORHINA*

1. Basicosta yellow to pale brown; mesopleuron with 1-2 bristles on the upper corner of posterior margin; a large polished black spot present behind fore coxa, on anterior parts of sternopleuron and adjacent mesopleuron. *S. discolor* (Fabricius)
- Basicosta black; mesopleuron with a complete row of black bristles on posterior margin; pleura wholly or largely pollinose, at most a small polished black spot limited to anterior part of sternopleuron. 2
2. Tergite 1+2 entirely fuscous, sometimes reddish in part of venter; male parafacialia as broad as width of 3rd antennal segment, entirely clothed with black hairs; mesothoracic spiracle fuscous with yellowish brown margin under certain incidence of light. *S. veterana* Villeneuve
- Tergite 1+2 largely testaceous yellow dorsally with black marginal band; male parafacialia narrower than width of 3rd antennal segment, sparsely beset with some black hairs; mesothoracic spiracle pale yellow. *S. neali*, new species

Stomorphina discolor (Fabricius)

Musca discolor Fabricius, 1794: 320. Type locality: "Ind. Or."

Stomorphina discolor: James, 1966: 483.

Stomorphina discolor: James, 1977: 554.

Stomorphina discolor: Rueda, 1985b: 385.

Length: 5.0-6.5 mm.

Material examined. - LUZON: 6 males 9 females, Mt. Province, Abatan, Buguias, 1,800-2,000 m, 60 km S Bontoc, light trap, 1-2 May 1964, 1 Apr.1964, H. M. Torre Villas (BPBM); 2 males 5 females, Ifugao, Mayoyao, 1,000-1,500 m, 26 Jun.-28 Feb.1966, H. M. Torre Villas (BPBM); 1 male, Ifugao, Jacmal Bunhian, 24 km E Mayoyao, 25-26 Apr.1967, H. M. Torre Villas (BPBM); 1 female, Ifugao, Liwa, 8 km E. Mayoyao, 1,000-1,300 m, light trap, 9-10 Jun.1967, H. M. Torre Villas (BPBM); 1 female, Benguet, La Trinidad, 1,388 m, 4-5 Apr.1968, M. D. Delfinado (BPBM); 4 males, Rizal, Wa-Wa Dam, Montalban, 150-200 m, 6-12 Mar.1965, H. M. Torre Villas (BPBM); 1 female, Laguna, Los Baños, 4 Aug.1921, F. X. Williams (BPBM); 1 female, Laguna, Los Baños, 7 Jul.1930, F. C. Hadden (BPBM); 4 females, Mt. Makiling, 300 m, 22 Oct.1975, H. Kurahashi (NIID); 1 male, Camarines Sur, Mt. Iriga, 500-600 m, 24 Apr.1962, H. M. Torre Villas (BPBM); 6 males, Mt. Isarog, 21-22 May 1963, H. M. Torre Villas (BPBM); 3 males, Mt. Isarog, 750-850 m, 8-12 May 1965, H. M. Torre Villas (BPBM). PALAWAN: 1 male 6 females, 150 m, 11-13 km SE Tarumpitao Pt., light trap, rainforest, 19-20 May 1958, H. E. Milliron (BPBM); 2 females, 3 km NE Tinabog, 8 May 1962, 14 May 1962, H. Holtman (BPBM); 1 male, Agr'l Exp't Sta., 11.2 km N Puerto Princesa, 15-17 Apr.1968, D. E. Hardy (BPBM); 1 female, Montible, 100 m, 29 Oct.1975, H. Kurahashi (NIID); 1 male 1 female, Sta Lucia, hot spring, 31 Oct.1975, R. Kano & H. Kurahashi (NIID). NEGROS: 1 female, Mt. Canlaon, 21-25 Dec.1959, L. W. Quate (BPBM); 1 female, Valencia, 300 m, 11-15 Jan.1961, H. M. Torre Villas (BPBM). MINDANAO: 1 female, Misamis Or., Mt. Kibungkol, 700-800 m, 20 km SE Gingoog, 9-

18 Apr.1960, H. M. Torrevillas (BPBM); 6 females, Mt. Empagatao, 1,050-1,200 m, 19-30 Apr.1961, H. M. Torrevillas (BPBM); 18 males, Bukidnon, Mt. View Colleges, 22-23 Apr.1968, D. E. Hardy & M. D. Delfinado (BPBM); 1 male 1 female, M. Fortich, Malaybalay, 23-24 Apr.1968, D. E. Hardy & M. D. Delfinado (BPBM); 1 male, Davao, Mt. Talomo, 1,000 m, 3 Apr.1983, F. R. Magpayo (USC); 1 female, Zamboanga del Norte, 8 km S Manucan, 12 Oct.1959, L. W. Quate (BPBM).

Bionomics. - Adults, usually the males, occur in swarms under shades in mountainous areas. The larvae are predaceous according to Kurahashi & Fauran (1980). Senior-White et al. (1940) found larvae of this species breeding on the nest of ant, *Camponotus angusticollis* Jerd.

Distribution. - Philippines (Luzon, Palawan, Negros, Mindanao, Tawi-Tawi). Widely distributed in the entire Oriental and Australasian regions from Sri Lanka to Marquesas Is. and Australia.

Stomorphina neali, new species

(Fig. 14)

Type material.- Holotype male, LUZON: 6 km W of Imugan, Nueva Vizcaya, 11 Apr.1968, M. D. Delfinado.

Paratypes. LUZON: 2 males 3 females, Albay Prov., Mt. Mayon, 16 km NW of Lagaspi, 1,200-1,800 m, 1,900-2,000 m, 13,15 May 1962, H. M. Torrevillas (BPBM); 1 male, Camarines Sur, Mt. Isarog, 1,600 m, 21 May 1963, N. M. Torrevillas (BPBM); 1 female, Mountain Prov., Abatan, Buguias, 60 km S of Bontoc, 1,800-2,000 m, 5 Apr.1964, light trap, H. M. Torrevillas (BPBM). NEGROS: 2 males 3 females, Mt. Canlaon, 2,100 m, 21-25 Dec.1959, L. W. Quate (BPBM). Mt. Province: 1 female, light trap, Abatan Buguias, 60 km S. Bontoc, 1,800-2,000 m, 5 Apr.1964, H. M. Torrevillas (BPBM).

Type depository.- Holotype (male) and paratypes (3 males 5 females) are deposited in Bishop Museum, Honolulu (BPBM). Paratypes (1 male 1 female) in Reference Museum, Department of Medical Entomology, National Institute of Infectious Diseases, Tokyo (NIID); paratypes (1 male 1 female) in Natural History Museum, London (BMNH).

Description. - Male.-Head: eyes bare, holoptic; frons index <0.01 ; frontal stripe black, widened anteriorly and posteriorly, obliterated at narrowest point of frons; parafrontalia narrow, black, dark grey-dusted, subshining posteriorly, bare, provided with about 10 pairs of *ori*; parafacialia narrower than width of 3rd antennal segment, black, dark-grey dusted on upper half, black shining and brassy tinged on lower half, with several black setulae; face black, shining and brassy-tinged, very slightly dark grey-dusted on upper parts under 3rd antennal segment; facialia black shining, with a few black setulae just above vibrissae; medianae very narrow, black subshining, bare; vibrissaria narrow, black shining, with a few black setulae; vibrissae developed; epistome projecting forward, black shining, not demarcated from face; gena black shining and with black hairs on anterior half, grey-dusted and yellowish-white haired posteriorly; postgena concolorous with gena, not demarcated from gena in lateral view, with long yellowish white hairs; occiput concolorous with gena, clothed with yellowish white hairs on lower and central portions, upper parts along posterior eye margins black shining, sparsely with yellowish hairs; 2nd antennal segment blackish, subshining; 3rd antennal segment blackish, greyish pubescent, slightly more than 2 times as long as 2nd; arista pectinate, blackish apically, blackish brown basally; palpi black, with black setulae.

Thorax: bronze with brassy and blue tinge, thickly blackish punctate, silver-grey dusted,

black-haired on dorsum; humeri, postalar calli and scutellum concolorous with dorsum; prosternum clothed with yellowish hairs; propleuron bare; mesopleuron slightly brownish-grey dusted, with a complete row of 4 bristles along hind margin; sternopleuron slightly grey-dusted except for a glossy black spot on anteroventral surface; suprascutellar convexity pubescent, without long upstanding hairs; several yellow hypopleural hairs present just below a row of hypopleural bristles; other pleural hairs mainly yellowish except for blackish ones on central and upper portions of mesopleuron and lower and anterior part of sternopleuron; mesothoracic spiracle rather large, yellow; metathoracic one fuscous brown, pubescent; postalar declivity bare; tympanic tuft absent; anterior and posterior parasquamal tufts absent. Chaetotaxy: *ac* 0+2?; *dc* 0+4?; *ia* 0+1?; *h* 1; *ph* 1; *prs* 1; *sa* 4; *pa* 2; *st* 1+1; *sc* 3-4+0, a few bristly hairs on apical portion; *n* 2; *pp* 1; *pst* 0.

Wings: brownish hyaline, slightly darkened apically; veins brown; epaulet blackish; basicosta black; subcostal sclerite brown, brownish pubescent; node of 2nd and 3rd longitudinal veins with a single black setulae above only; 4th longitudinal vein gently curved forward; R_5 open; section of the 4th vein from bend to wing edge slightly curved along the margin; squamae brown to fuscous black, externally yellowish at base of thoracic squama, thoracic one not lobulate, tongue-like, bare on dorsal surface. Halteres brown, with yellow apex.

Legs: femora bronze black, fore tibia blackish, mid and hind tibiae brownish; metatarsi usually brownish, other tarsal segments becoming brown to black toward apices; fore tibia with 3 *ad* and 1 *pv*; mid tibia with 1 *ad*, 1 *pd* and 2 *p*; hind tibia 3 *av* on apical half, row of short *ad* and 3-4 rather strong *ad*, and with incomplete row of *pd* (including 2 rather strong ones).

Abdomen: testaceous yellow basally, metallic bronze on tergites 4-5 in general appearance; tergite 1+2 testaceous yellow with metallic bronze black anterior and posterior borders and median stripe; tergite 3 testaceous yellow usually with broad median stripe and marginal dark band; tergites 4-5 metallic bronze, sometimes reddish along anterior margin of tergite 4; sternites 2-4 testaceous yellow; tergite 5 metallic, bronze; hairs on sternites 1-2 and lateral and ventral sides of tergites 1+2-3 yellowish, sternites 2-3 with black bristly hairs or hairs posteriorly; sternite 4 clothed with black hairs. Hypopygium normal in size, metallic; male genitalia as shown in Fig. 14.

Female.-Head: eyes separated at vertex by a distance equal to 0.23-0.26 of head width; frontal stripe black, sometimes reddish in part, parallel-sided, slightly narrowed posteriorly, about 1.5 X width of one of parafrontalia just in front of anterior ocellus; parafrontalia black, subshining, more or less grey-dusted, very sparsely setulose anteriorly, provided with about 10 pairs of *ori*; *ors* 4-6, fine, laterocline; *oc* developed; *acoc* absent; *pooc* small, procline, divergent; *ov* and *iv* well developed; *poc* parallel; *occ* absent.

Thorax: dorsum more bluish tinged than that of male; mesopleuron and sternopleuron rather densely grey-dusted than those of male, largely clothed with yellowish white hairs; *ac* 0+1; *dc* 1+2-5, anterior 3 usually fine; *sc* 3+2.

Wings: squamae pale brown, whitish on external part of thoracic squama and inner half of alar ones.

Legs: fore tibia with 2 *p*; mid tibia with 1 *ad*, 1 *pd*, 2 *p* and 1 *v*; hind tibia with 2 *ad*, 2 *pd* and 2-3 *av*.

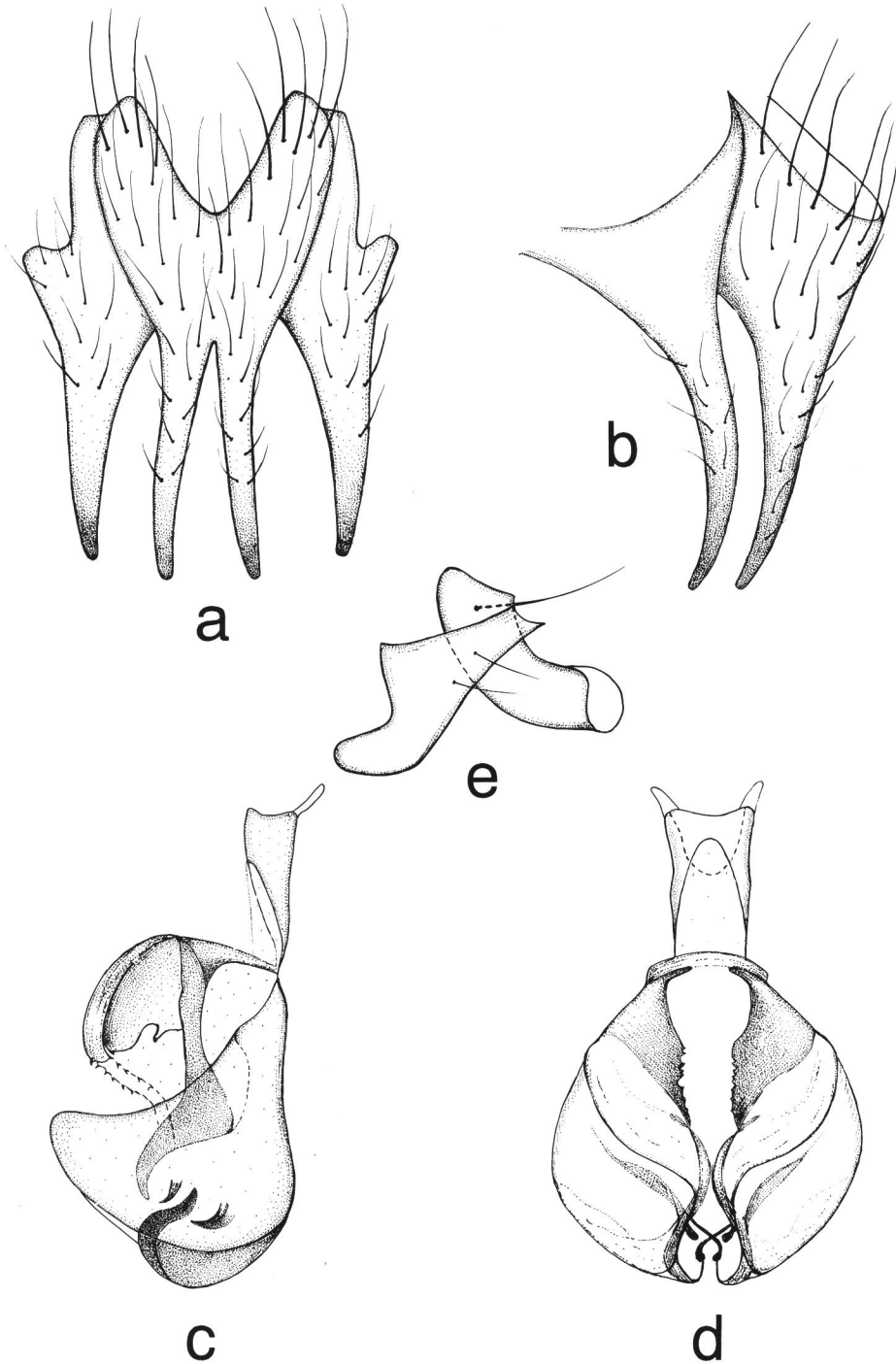


Fig. 14. *Stomorhina neali*, new species, male genitalia. a, cerci and paralobi, caudal view; b, cerci and paralobus, lateral view; c, aedeagus, lateral view; d, aedeagus, anterior view; e, anterior and posterior parameres, lateral view.

Abdomen: tergite 5 entirely bronze, with brownish grey dusting; discs of tergites 1+2-4 testaceous anterolaterally with broad dark marginal band; tergites 3-4 also with median broad dark stripe; tergites 1+2 and 4 darkened on lateral corners; venter of tergites 1+2-4 largely testaceous yellow, with dark marginal band; abdominal bristles weak, decumbent on tergites 4-5. Ovipositor of oviparous type. Otherwise same as for male.

Length: 7.0-7.4 mm.

Etymology. - The specific name is in honour of Dr. Neal Evenhuis, Entomology Department, Bishop Museum, Honolulu.

Remarks. - *Stomorhina neali*, new species, is similar to *S. veterana* Villeneuve, 1927 from Taiwan, but tergite 1+2 is largely testaceous yellow dorsally with black marginal band and mesothoracic spiracle is pale yellow in the new species. The present new species resembles *S. nigripes* (Senior-White, 1922) from Sri Lanka in general appearance, but can be distinguished from the latter by having the mesopleuron and sternopleuron intermixed with black hairs and aedeagus rather elongate.

Bionomics. - Unknown.

Distribution. - Philippines (Luzon, Negros).

?*Stomorhina veterana* Villeneuve

(Fig. 15)

Stomorhina veterana Villeneuve, 1927: 395. Type locality: Chip-Chip, Formosa [Taiwan].

For exact identification, a male Philippine specimen should be examined, but this has not been available to the authors. Male genitalia of a typical specimen collected in Taiwan is shown in Fig. 15.

Length: 6.5-8.5 mm.

Material examined. - MINDANAO: 1 female, Misamis Or., Masawan rainforest, Lake Duminagat, 1,260-1,500 m, 4 Jul.1958, H. E. Milliron (BPBM); 9 females, Bukidon, Mt. Kitanglad, 1,480 m, 27-31 Oct.1959, L. W. Quate & C. M. Yoshimoto (BPBM); 2 females, Cotabato, Agko-Sungho, 1,600 m, 1-2 Aug.1978, A. Nakanishi & O. Yata (NIID); 1 female, Zamboanga del Norte, Masawan-Gundawan rainforest, 1,260-1,350 m, 3 Jul.1958, H. E. Milliron (BPBM).

Bionomics. - Nothing is known.

Distribution. - Taiwan, Philippines (?Mindanao), Malaysia (Malaya, Borneo) and Indonesia (Sumatra, Java).

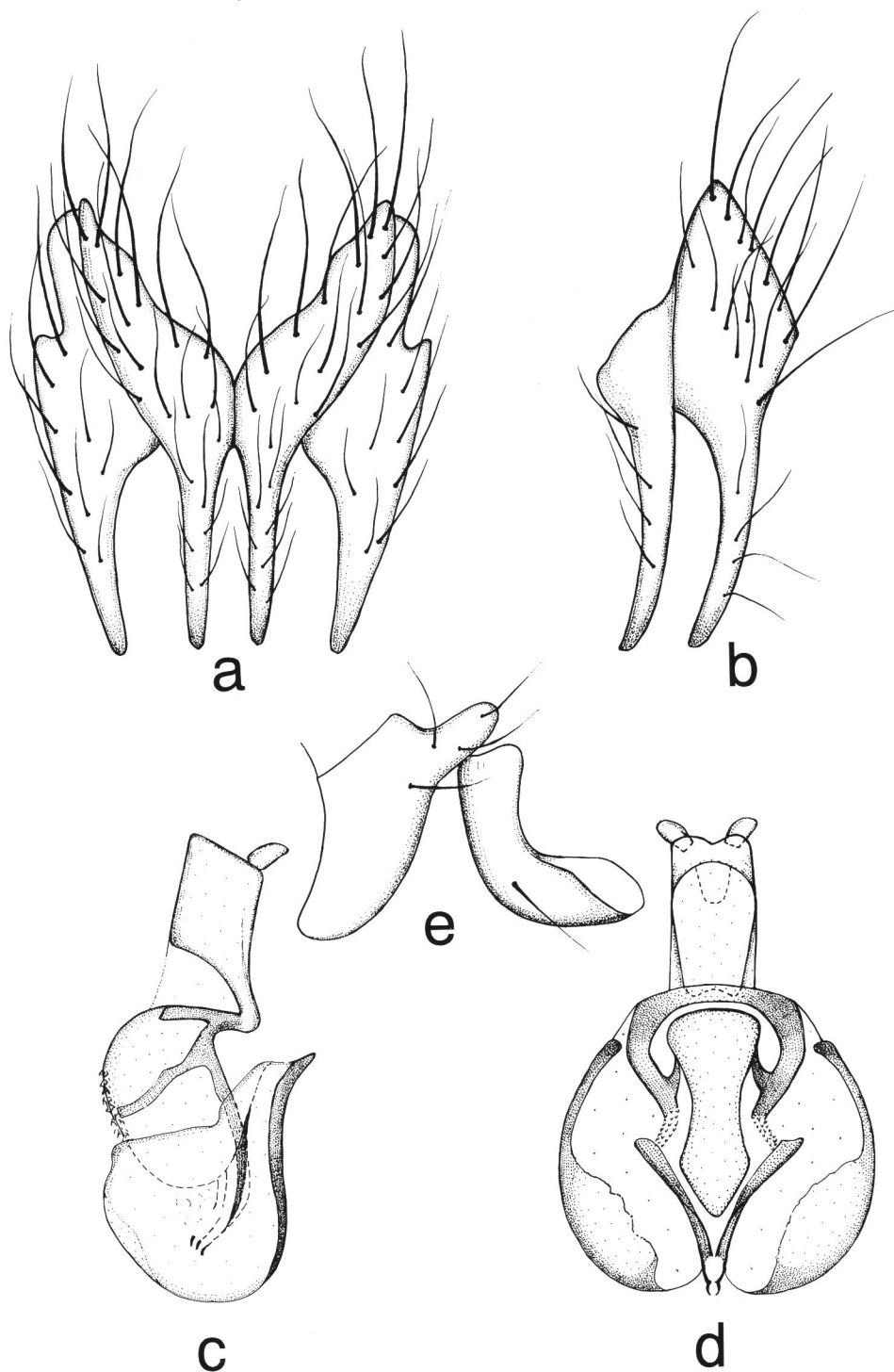


Fig. 15. *Stomorphina veterana* Villeneuve, male genitalia. a, cerci and paralobi, caudal view; b, cerci and paralobus, lateral view; c, aedeagus, lateral view; d, aedeagus, anterior view; e, anterior and posterior parameres, lateral view.

Genus *Idiella* Brauer et Bergenstamm

Idiella Brauer et Bergenstamm, 1889: 154. Type species: *Idia mandarina* Wiedemann, 1830, orig. des.

KEY TO THE SPECIES OF *IDIELLA*

1. Basicosta black; occipital dilatation, mesopleuron and sternopleuron with distinct piliferous spots. 2
- Basicosta brown; occipital dilatation, mesopleuron and sternopleuron without distinct piliferous spots. 3
2. Tergite 1+2 without lateral bristle among yellow fine general vestiture; male hind tibia with fine long hairs on posteroventral surface, the length of hairs more than tibial diameter. *I. divisa* (Walker)
- Tergite 1+2 with 1 to several black lateral bristles among yellow fine general vestiture; male hind tibia without fine long hairs on posteroventral surface, the tibial hairs not exceeding tibial diameter. *I. euidielloides* Senior-White
3. Sternopleuron with glossy spot anteriorly behind fore coxae; R_5 closed at wing margin; male frons broader than width of ocellar triangle; male sternite 5 protruding, lateral lobes with hairs only on apex, median lobe protruding, pointed and pilose apically. *I. sternalis* Malloch
- Anterior part of sternopleuron rather densely pollinose, without glossy spot; R_5 open; male frons as wide as or narrower than width of ocellar triangle; male sternite 5 not remarkably protruding, lateral lobes haired all along inner margin, inner lobes not protruding and lobulate apically. *I. tripartia* (Bigot)

****Idiella divisa* (Walker)**

Idia divisa Walker, 1861: 267. Type locality: East India.

Length: 5.3-7.5 mm.

Material examined. - LUZON: 4 males 5 females, Mt. Prov., Abatan, Buguias, 1,800-2,000 m, 60 km S Bontoc, 1 Apr.1964, 19 May 1964, 20 Jun.1964, H. M. Torrevillas (BPBM); 1 female, Ifugao, Mayoyao, 1,000-1,500 m, 29 Jun.1966, H. M. Torrevillas (BPBM); 1 male, Benguet, La Trinidad, 4-5 Apr.1968, M. D. Delfinado (BPBM); 7 males 1 female, Nueva Viscaya, Dalton Pass, 915 m, 9-10 Apr.1968, light trap, D. E. Hardy & M. D. Delfinado (BPBM); 2 males 6 females, Camarines Sur, Mt. Iriga, 500 m, 12 Apr.1962, H. M. Torrevillas (BPBM); 1 female, Mt. Isarog, 500-600 m, 15 Apr.1963, H. M. Torrevillas (BPBM); 1 female, Mt. Isarog, light trap, 750-850 m, 8-12 May 1963, H. M. Torrevillas (BPBM); 1 male, Mt. Isarog, 500-600 m, 20 km E Naga, 16 Apr.1963, H. M. Torrevillas (BPBM); 23 males 7 females, Mt. Isarog, 600-800 m, Pili, 11 Apr.1965 (light trap), 13 Apr.1965, H. M. Torrevillas (BPBM). NEGROS: 2 females, Lake Balinsasayao, Malaise trap, 1-7 Oct.1959, L. W. Quate & C. Yoshimoto (BPBM); 1 male 1 female, Mt. Talimas, 1,000 m, 29-31 Dec.1960, H. M. Torrevillas (BPBM). MINDANAO: 1 male, Misamis Or., Balason, 7-8 Apr.1960, H. M. Torrevillas (BPBM); 1 male, Minalwang, 1,050 m, 24 Mar.-4 Apr.1961, H. M. Torrevillas (BPBM); 1 male, Mt. Empagatao, wild banana leaves, 25 Apr.1961, H. M. Torrevillas (BPBM); 1 male, Empagatao, 1,050-1,250 m, 30.iv.1961, H. M. Torrevillas (BPBM); 1 male, Mt. Empagatao, 1,100-1,600 m, light trap, 22 Apr.1961, H. M. Torrevillas (BPBM); 1 female, Bukidnon, Mt. Katanglad, 1,480 m, 27-31 Oct.1959, C. M. Yoshimoto (BPBM); 1 female, Cotabato, Agko-Sungho, 1,600 m, 1-4 Sep.1978, A. Nakanishi & O. Yata; 3 males, Davao, Mt. Talomo, 1,000 m, 10 Apr.1983, 19 Jun.1983, 1-4 Apr.1985, F. R. Magpayo (USC).

Bionomics. - Nothing is known.

Distribution. - *Philippines (Luzon, Negros, Mindanao). China (Yunnan, Hainan), Vietnam, Thailand, Malaysia (Malaya, Borneo), Indonesia (Celebes), Nepal and India.

Idiella euidielloides Senior-White, 1923: 166. Type locality: Shillong, Assam, India.

Idiella euidielloides: James, 1977: 545.

Length: 8.0 mm.

Material examined. - LUZON: 1 female, Mountain Prov., Abatan, Buguias, 1,800-2,000 m, 60 km S of Bontoc, 1 Apr.1964, H. M. Torrevillas (BPBM).

Bionomics. - Nothing is known.

Distribution. - Taiwan, Philippines (Palawan, *Luzon), China (Fukien, Yunnan, Tibet), Thailand, Malaysia (Malaya, Borneo), Indonesia (Java), India (Assam) and Sri Lanka.

Idiella sternalis Malloch

Idiella sternalis Malloch, 1926: 508. Type locality: Baguio, Benguet, Philippines.

Idiella sternalis: James, 1977: 546.

Length: 7.2-9.0 mm.

Material examined. - LUZON: 8 males 7 females, Mt. Province, Abatan Buguias, 60 km S Bontoc, 1,800-2,000 m, light trap, 1 Apr.-8 Jun.1964, H. M. Torrevillas (BPBM); 2 males, Ifugao, Mayoyao, 1,200-1,500 m, 19 Jul.-viii.1966, H. M. Torrevillas (BPBM); 1 male 1 female, Benguet, La Trinidad, 4-5 Apr.1968, D. E. Hardy & M. D. Delfinado (BPBM). CULION IS.: 1 female, 6 km W Culion, Malaise trap, 15 Jun.1962, H. Holtman (BPBM). PALAWAN: 1 male, Palawan Agr'l Sta., 11 km N Puerto Princesa, 15-17 Apr.1968, D. E. Hardy (BPBM). NEGROS: 1 male, Mt. Talimas, 1,000 m, 29-31 Dec.1960, H. M. Torrevillas (BPBM); 1 male, 1 km N Dumaguete, 5 Jan.1961, H. M. Torrevillas (BPBM). LEYTE: 1 male 1 female, Utap, 17 Nov.1957, 8 Feb.1958, WUF? (BPBM). MINDANAO: 1 male, Cotabato, Little Mt. Apo, 1 Aug.1978, A. Nakanishi & O. Yata (NIID); 1 female, Mt. Apo, 2,850 m, 3-4 Aug.1978, A. Nakanishi & O. Yata (NIID).

Bionomics. - Nothing is known.

Distribution. - Taiwan, Philippines (Luzon, Culion Is., Palawan, Negros, Leyte, Mindanao), Cambodia and Thailand.

Idiella tripartia (Bigot)

Idia tripartia Bigot, 1874: 236. Type locality: "Indes orientales"

Idiella orientalis Malloch, 1926: 506. Type locality: Tatsienlu, China.

Idiella tripartia: James, 1977: 546.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Palawan, Tawi Tawi), China, Burma, Nepal and India.

TRIBE COSMININI

Genus *Borbororhinia* Townsend

Borbororhinia Townsend, 1917: 188. Type species: *Borbororhinia pubescens* Townsend, 1917, orig. des. (= *Idia bivittata* Walker, 1856).

***Borbororhinia bivittata* (Walker)**

Idia bivittata Walker, 1856: 128. Type locality: Sarawak, Borneo [Malaysia].

Borbororhinia pubescens Townsend, 1917: 188. Type locality: Parambikulam, Cochin, India.

Alikangia pulchella Villeneuve, 1927: 390. Type locality: Alikang and Toyenmongai, Formosa [Taiwan].

Borbororhinia bivittata: James, 1977: 544.

Length: 5.5-7.3 mm.

Material examined. - LUZON: 1 female, Ifugao, Liwa, 8 km E Mayoyao, 1,000-1,300 m, 9-10 Jun. 1967, H. M. Torrevillas (BPBM); 3 males 2 females, Laguna, Los Baños, 4 Aug. 1921, F. X. Williams (BPBM); 2 males 2 females, Camarines Sur, Mt. Iriga, 500 m, 12 Apr. 1962, H. M. Torrevillas (BPBM); 1 female, Negros, Lake Balinsasayao, 1-7 Oct. 1959, L. W. Quate (BPBM); 4 females, Mt. Maquiling, Los Baños, 500 m, 23 Oct. 1975, R. Kano & H. Kurahashi (NIID). PALAWAN: 1 female, Montible, 500 m, 30 Oct. 1975, H. Kurahashi (NIID). MINDANAO: 1 male, Surigao, Mainit Hot Spring, Tudaya, 27 Jul. 1970, T. Okadome (NIID); 1 female, Misamis Or., Mt. Kibungkol, 700-800 m, 20 km SE Gingoog, 9-18 Apr. 1960, H. M. Torrevillas (BPBM); 1 male, Mt. Balatukan, 1,000-2,000 m, 15 km SW Gingoog, 27-30 Apr. 1960, H. M. Torrevillas (BPBM); 5 males, Minalwang, 1,050 m, 24 Mar.-4 Apr. 1961, H. M. Torrevillas (BPBM); 5 males 2 females, Mt. Empagatao, 1,050 m, 19-30 Apr. 1961, H. M. Torrevillas (BPBM); 1 male, Mt. Empagaotao, 1,100-1,600 m, rain forest, 27 Apr. 1964, H. M. Torrevillas (BPBM); 1 male 1 female, Lanao, Butig Mts., 4-6 km NE Butig, 900 m, 19-21 Jun. 1958, H. E. Milliron (BPBM); 1 female, Butig Mts., 24 km NE Butig, 1,080 m, rain forest, 21 Jun. 1958, H. E. Milliron (BPBM); 1 male, Bukidnon, Mt. Kitanglad, 1,250 m, 4-9 Dec. 1959, L. W. Quate (BPBM); 1 female, Cotabato, Agko-Sungho, 1,600 m, 1 Aug. 1978, A. Nakanishi & O. Yata (NIID). SULU ARCH.: 1 male, Tawi-Tawi, Tarakan, farm dist., 11 Feb. 1957, Y. Kondo (BPBM).

Bionomics. - According to Senior-White et al. (1940), the present species associates with mound building termites particularly those of the genus *Eutermes*. Adults, chiefly males, are particularly attracted to freshly opened termitarium and with some females joining their flight, they readily copulate. However, the eggs are not deposited in the termitarium as no larvae nor puparia were ever found in fungus combs or galleries of the termites. Local bionomics of this species is still unknown.

Distribution. - Taiwan, Philippines (Luzon, Palawan, Mindanao, Tawi-Tawi), Laos, Thailand, Malaysia (Borneo), Indonesia (Java, Moluccas), India and Sri Lanka.

Genus *Sumatria* Malloch

Sumatria Malloch, 1926: 512. Type species: *Sumatria latifrons* Malloch, 1926, orig. des.

Alikangiella Villeneuve, 1927: 389. Type species: *Alikangiella flava* Villeneuve, 1927, mon.

***Sumatria brevis* James**

Sumatria brevis James, 1966: 484. Type locality: Pinigisan, Mantalingajan Range, Palawan, Philippines.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Palawan).

Genus *Isomyia* Walker

Musca, subg. *Isomyia* Walker, 1860: 134. Type species: *Musca delectans* Walker, 1860, mon.
Thelychaeta Brauer et Bergenstamm, 1891: 390. Type species: *Thelychaeta chalybea* Brauer et Bergenstamm, 1891, mon., orig. des. (= *Musca viridaurea* Wiedemann, 1819).
Apollonia Bezzi, 1911: 79. Type species: *Pollenia nudiuscula* Bigot, 1888, sensu Bezzi, nec. Bigot, orig. des. (= *Curtoneura tristis* Bigot, 1888).
Strongyloneurosis Townsend, 1927: 376. Type species: *Strongyloneurosis malayensis* Townsend, 1927, orig. des.
Pachycosmina Séguy, 1934: 18. Type species: *Pachycosmina oestracea* Séguy, 1934, orig. des.
Isomyia (*Thelychaetopsis*) Séguy, 1949: 18. Type species: *Strongyloneura pseudolucilia* Malloch, 1928, orig. des.
Strongyloneura authors, nec. Bigot.

KEY TO THE SPECIES OF *ISOMYIA* (excluding *I. mallochi* James)

1. Stem vein setulose below at base, the setulae in hollow. 2
- Stem vein bare in hollow below. 3
2. Mid tibia with 1 ν in male. *I. dotata* (Walker)
- Mid tibia without ν in male. *I. achaeta* James
3. Thoracic squama strongly lobulate; body very stout. 5
- Thoracic squama generally not lobulate and not reaching the base of scutellum, its longitudinal diameter longer than the transverse; body usually slender. 4
4. Parafrontalia, parafacialia and gena densely pale golden dusted; male frons index 0.18; parafrontalia with 1 strong reclinate *ors* in male. *I. flavicornis* James
- Parafrontalia, parafacialia and most of gena densely whitish-dusted; male frons index 0.10; parafrontalia without *ors*. *I. scabra* James
5. Lunule with several short black setulae (only one setulae in holotype of *I. palawanensis*).
- *I. palawanensis* James
- Lunule bare of setulae. 6
6. Mesopleural hairs and hairs of other pleural areas as well, soft and yellow to golden, except for usual black setulae just below notopleural suture; mesothoracic spiracle yellow (fuscous brown in male of *I. marginata*, but its posterior mesopleural fringe yellowish golden). 7
- Mesopleural hairs more extensively black than indicated above, with some soft black hairs on mesopleuron, sometimes remote from notopleural suture, and on sternopleuron. 8
7. Basicosta bright yellow. *I. viridaurea* (Wiedemann)
- Basicosta fuscous to black. *I. marginata* James (in part)
8. Disc of mesonotum largely black, contrasting to lateral slopes and prescutellar area of mesonotum, which, along with the scutellum, are bluish green or purple. 10
- Disc of mesonotum not conspicuously bicoloured. 9
9. Mesopleural hairs entirely black or virtually so except for some around *pst* and *pp*; tergite 5 with row of strong discs, slightly whitish-dusted in male; thoracic squama brown.

- *I. delectans* Walker
- Mesopleuron below notopleuron intermixed with yellow hairs in part; tergite 5 at most with fine bristly hairs on disc, rather densely whitish-dusted in male; thoracic squama dark brown. ...
..... *I. marginata* James (in part)
10. Pleural hairs wholly black to dark reddish brown, dense and long; thoracic and alar squamae wholly brown; body robust and purplish. *I. iris* James
- Pleural hairs posterior to and including posterior mesopleural fringe yellow to golden, hairs much less dense than in *I. iris*; lower part of thoracic squama white, squamae otherwise brown; body more slender and bluish green. *I. discalis* James

Isomyia achaeta James

Isomyia achaeta James, 1966: 473. Type locality: Dalawan Bay, Balabac, Philippines.

Isomyia achaeta: James, 1977: 547.

Length: 7.4-8.0 mm.

Material examined. - LUZON: 2 females, 2 km W of Santa Fe, Nueva Vizcaya, 11 Apr.1968, D. E. Hardy (BPBM); 1 male, Los Baños, U. P. Campus, 150 m, 2 Oct.1975, R. Kano (NIID); 4 females, Mt. Maquiling, Los Baños, 300 m, 21-23 Oct.1975, 6-7 Jan.1976, H. Kurahashi, R. Kano & H. Shima (NIID). PALAWAN: 3 males 2 females, Montible, 100 m, 28,29 Oct.1975, H. Kurahashi & R. Kano (NIID); 3 females, Montible, 24-27 Jan.1975 S. Shinonaga (NIID); 1 female, Sitio, Dicala, ex water buffalo trap, Jul.-Aug.1971, B. Cabrera (BPBM); 1 male, Mt. Beaufort, 17 Apr.1968, M. D. Delfinado (BPBM); 1 male, 3.2 km S of Tarumpitao Pt., near jungle, ravine, 31 May 1958, H. E. Milliron (BPBM); 1 male, Mt. Beaufort, Irawan Riv., 17 Apr.1968, N. D. Delfinado (BPBM); 1 female, Panitian, 6 May 1967, M. D. Delfinado (BPBM); 1 female, Dicala, Caruray, 14 Feb.1972, B. D. Cabrera (BPBM). LEYTE: 1 female, Tacloban, 19 Feb.1975, S. Shinonaga (NIID). MINDANAO: 1 female, Agusan, S. Francisco, 10 km SE, 12 Nov.1959, L. W. Quate (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan, Leyte, Mindanao).

Isomyia delectans Walker

Isomyia delectans Walker, 1860: 134. Type locality: Makasar, Celebes [Indonesia].

Musca conflagrans Walker, 1861: 262. Type locality: Menado, Celebes [Indonesia].

Isomyia delectans: James, 1977: 548.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines, Laos, Burma, Indonesia (Celebes) and India.

Isomyia discalis James

Isomyia discalis James, 1970: 12. Type locality: Biliran, Philippines.

Isomyia discalis: James, 1977: 548.

Length: 9.5-10.8 mm.

Material examined. - LUZON: 3 males, Camarines Sur, Mt. Isarog, 600 m, 800-900 m, 5,30

Apr.1965, 21 May 1965. PALAWAN: 2 males, Mt. Beaufort, Irawan R., 17 Apr.1968, M. D. Delfinado (BPBM); 1 male, 3.2 km S Tarumpitao Pt., nr jungle ravine, 31 May 1958, H. E. Milliron (BPBM); 1 female, Panitian, 6 May 1967, M. D. Delfinado (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan, Biliran).

Isomyia dotata (Walker)

Musca dotata Walker, 1856: 25. Type locality: Singapore, Malaya [Singapore and Malaysia].

Cosmina micans Bigot, 1874: 241. Type locality: Paolo Pinang, Java [Indonesia].

Strongyloneura apicipennis Senior-White, 1924: 116. Type locality: Calayan, Philippines.

Strongyloneura philippinensis Malloch, 1928: 482. Type locality: Los Baños, Luzon, Philippines.

Isomyia dotata: James, 1966: 473, 1977: 548.

Isomyia dotata: Rueda, 1985b: 379.

This species was recorded from Mindoro by James (1966) and from Luzon and Mindoro by Rueda (1985b), but we have no Philippine material available in our collection.

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Mindoro), Thailand, Burma, Malaysia (Malaya, Borneo) and Indonesia (Java).

Isomyia flavicornis James

Isomyia flavicornis James, 1966: 480. Type locality: Dalawan Bay, Balabac, Philippines.

Isomyia flavicornis: James, 1977: 548.

Length: 7.5 mm.

Material examined. - LUZON: 1 male, 6 km W Imugan, Nueva Viscaya, 11 Apr.1968, M. D. Delfinado (BPBM). PALAWAN: 1 male, Brookes Point, Uring Uring, 15 Aug.1961, Malaise-trap, Noona Dan Exp. 61-62 (ZMUC).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Palawan, Balabac).

Isomyia iris James

Isomyia iris James, 1970: 11. Type locality: Zamboanga, Mindanao, Philippines.

Isomyia iris: James, 1977: 549.

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Mindanao).

Strongyloneura micans Malloch, 1928: 481. Type locality: Kuala Lumpur, Selangor, Malaya [Malaysia].
Isomyia mallochi James, 1977: 549 (n. name for *micans* Malloch, 1928).

Material examined. - No Philippine specimen available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Mindanao), Malaysia (Malaya) and Indonesia (Java).

Isomyia marginata James

Isomyia marginata James, 1970: 7. Type locality: Kolambugan, Mindanao, Philippines.
Isomyia marginata: James, 1977: 549.

Length: 11.5 mm.

Material examined. - LUZON: 1 male, Ifugao Prov., Liwo, 8 km E of Mayoyao, 1,000-1,300 m, 25 May 1967, H. M. Torrevillas (BPBM).

Bionomics. - Nothing is known.

Distribution. - Philippines (*Luzon, Mindanao).

Isomyia palawanensis James

Isomyia pictifacies palawanensis James, 1966: 476. Type locality: Pinigisan, Mantalingajan Range, Palawan, Philippines.
Isomyia pictifacies palawanensis: James, 1977: 550.

Type material examined.- Holotype male, PALAWAN: Mantalingajan Pinigisan, 600 m, 1 Sep.1961, Malaise trap, Noona Dan Exp. 61-62 (ZMUC).

The present species is similar to *Isomyia oestracea* (Séguy) from Borneo, Malaysia, but the holotype male has the following criteria to distinguish it from the Malaysian species.

Diagnosis. - Lunule with 1 black setula (bare in *I. oestracea*); upper part of parafacialia brownish-grey dusted (silver-grey dusted in *I. oestracea*); disc of mesonotum largely black, with brassy tinge, more or less contrasting to lateral slopes and prescutellar area of mesonotum, which, along with the scutellum, are bluish green or purple (entirely bluish green in *I. oestracea*); disc of tergite 3 largely blackish with brassy tinge, more or less contrasting to lateral slopes which are bluish green to purple (entirely bluish green in *I. oestracea*).

Length: 9.0 mm.

Bionomics. - Nothing is known.

Distribution. - Philippines (Palawan).

Isomyia scabra James

Isomyia scabra James, 1966: 478. Type locality: Pinigisan, Mantalingajan Range, Palawan, Philippines.
Isomyia scabra: James, 1977: 550.

Material examined. - No Philippine specimens available.

Bionomics. - Nothing is known.

Distribution. - Philippines (Palawan).

Isomyia viridaurea (Wiedemann)

Isomyia viridaurea Wiedemann, 1819: 22. Type locality: Java [Indonesia].

Rutilla dubia Macquart, 1846: 311. Type locality: Manila, Philippines.

Isomyia viridaurea: James, 1977: 551.

Isomyia viridaurea: Rueda, 1985b: 377.

Length: 10.5-14.0 mm.

Material examined. - LUZON: 1 male 1 female, Ifugao, Mayoyao, 1,200-1,500 m, 12 Jul.1966, H. M. Torrevillas (BPBM); 2 females, 8 km E Mayoyao, 1,000-1,300 m, Liwa, 2-6 Jun.1967, H. M. Torrevillas (BPBM); 1 female, Benguet, Baguio, Asin Hot Spring, 7 Jul.1970, T. Okadome (MU); 1 female, Rizal, Montalban, 16 Mar.1975, H. M. Torrevillas (BPBM); 1 female, Nueva Viscaya, 6 km W Imugan, 11 Apr.1968, M. D. Delfinado (BPBM); 3 males, Laguna, Los Baños, 7 Jul.1930, D. C. Hadden (BPBM); 2 males 4 females, Mt. Makiling, 1000", mudspring, 30 Mar.-30 Apr.1968, D. E. Hardy & M. D. Delfinado (BPBM); 1 male 42 females, Mt. Makiling, 300-500 m, 22 Oct.1975, 6-7 Jan.1976, H. Kurahashi, R. Kano & S. Shinonaga (NIID); 1 female, Mt. Makiling, 500 m, nr fish bait, 16 Apr.1985, F. R. Magpayo (USC); 1 male, nr Lumbang, Laguna de Bay, 24 Oct.1975, R. Kano (NIID); 1 male 2 females, Camarines Sur, Mt. Isarog, 600-900 m, Pili, 1-29 Apr.1965, H. M. Torrevillas (BPBM). PALAWAN: 1 female, Montible, 500 m, 2 Nov.1975, H. Kurahashi; 1 female, Macarascas, Ulugun Bay, 4 Nov.1975, H. Kurahashi (NIID). LEYTE: 3 males, Tacloban, 19 Feb.1975, S. Shinonaga (NIID). NEGROS: 1 male, Basay, 14-17 Dec.1959, L. W. Quate (BPBM). MINDANAO: 1 male, Surigao, Mainit, forest near river & lake, 21 May 1984, F. R. Magpayo (USC); 1 male, Bukidnon, Mt. View Colleges, 15 km NW Valencia, 2,200 m, 22-23 Apr.1968, M. D. Delfinado (BPBM); 1 female, Davao, Mt. Talomo, 1,000 m, fish bait, 15 Oct.1983, F. R. Magpayo (USC).

Bionomics. - Generally a montane species but it may occur also in forested lowlands. Adults, especially females, are attracted to fish baits.

Distribution. - Taiwan and Philippines (Luzon, Mindoro, Leyte, Negros, Palawan, Tawi-Tawi, Sapaamor), Vietnam, Laos, Burma, Malaysia (Malaya, Borneo), Indonesia (Sumatra, Java, Bali) and India.

Genus *Strongyloneura* Bigot

Strongyloneura Bigot, 1886: 14. Type species: *Strongyloneura prasina* Bigot, 1886, mon.

Chloroidia Townsend, 1917: 196. Type species: *Idia prolata* Walker, 1860.

Strongyloneura prolata (Walker)

Idia prolata Walker, 1860: 133. Type locality: Makasar, Celebes [Indonesia]

Strongyloneura prasina: James, 1966: 484, 1977: 555, misid.

Length: 4.5-6.5 mm.

Material examined. - LUZON: 1 female, Camarines Sur, Mt. Isarong, 800-900 m, Pili, 22 Apr.1965, H. M. Torrevillas (BPBM). BUSUANGA IS.: 1 female, 4 km N San Nicolas, Malaise trap, 26 May 1962, H. Holtman (BPBM). CULION IS.: 1 female, 6 km W Culion, Malaise trap, 15 Jun.1962, H. Holtman (BPBM). PALAWAN: 1 female, Mt. Talimas, 1,000 m, 29-31 Dec.1960, H. M. Torrevillas (BPBM); 2 females, 3 km NE Tinabog, Malaise trap, 10 May 1962, H. Holtman (BPBM); 1 male, Agr'l Exp't Sta., 11.2 km N P. Princesa, 15-17 Apr.1968, D. E. Hardy (BPBM); 1 female, Balsahan R., nr Iwahig, SW P. Princesa, 18 Apr.1968, M. D. Delfinado (BPBM); 5 males 2 females, Dicala, Caruray, 13 Feb.-2 Apr.1972, B. D. Cabrera (NSMT); 1 male, Antipolo Beach, 1 Nov.1975, H. Kurahashi (NIID); 2 females, Montible, 100 m, 500 m, 29 Oct.1975, 2 Nov.1975, H. Kurahashi (NIID).

Bionomics. - Nothing is known.

Distribution. - Philippines (Luzon, Mindoro, Busuanga Is., Culion Is., Palawan, Balabac, Tawi Tawi), Malaysia (Malaya), Burma, Nepal and India.

Genus *Rhyncomya* Robineau-Desvoidy

Rhyncomya Robineau-Desvoidy, 1830: 424. Type species: *Musca felina* Robineau-Desvoidy, 1794, mon.

Rhynchomyiopsis Townsend, 1917: 195. Type species: *Rhynchomyiopsis indica* Townsend, 1917, orig. des. (= *Rhyncomya townsendi* James, 1977, n. name for *indica* Townsend, 1917).

Trichometallea Townsend, 1917: 194. Type species: *Trichometallea pollinosa* Townsend, 1917, orig. des.

Rhyncomya flavibasis (Senior-White)

(Fig. 16)

Metallea flavibasis Senior-White, 1922: 168. Type locality: Suduganga, Matale, Ceylon [Sri Lanka].

Rhyncomya setipyga Villeneuve, 1929: 62. Type locality: Koshun, Formosa [Taiwan], **syn. nov.**

Rhyncomya setipyga: James, 1977: 554.

Rhyncomya setipyga: Rueda, 1985b: 381.

Length: 4.3-6.0 mm.

Material examined. - LUZON: 2 males 2 females, Mountain Prov., Abatan Buguias, 60 km S Bontoc, 1,800-2,000 m, light trap, 20 May 1964, 25 May 1964, 1 Jun.1964, H. M. Torrevillas (BPBM). BUSUANGA IS.: 5 males 6 females, 4 km N San Nicolas, Malaise trap, 20-24 May 1962, 1 Jun.1962, H. Holtman (BPBM). PALAWAN: 2 males 3 females, 3 km NE Tinabog, Malaise trap, 8,11,12,15 May 1962, H. Holtman (BPBM); 1 male, Palawan Agr'l Exp't Sta., 11.2 km N Puerto Princesa, 15-17 Apr.1968, D. E. Hardy (BPBM). NEGROS: 2 males, Mt. Talimas, 900-1,200 m, rainforest and in jungle, 8 Apr.1958, 9 Jun.1958, H. E. Milliron (BPBM); 1 female, Maite R., nr Valencia, 300 m, 8 Jun.1958, H. E. Milliron (BPBM). MINDANAO: 3 females, Zamboanga del Norte, Manucan, 8 km S, 420 m, 12 Oct.1959, L. W. Quate (BPBM); 1 female, Misamis Occ., Mt. Malindang, 19 Oct.1959, C. M. Yoshimoto (BPBM); 4 males 3 females, Bukidnon, Mt. View Colleges, 15 km NW Valencia, 2,200 ft, 22-23 Apr.1968, M. D. Delfinado (BPBM); 7 females, Davao, Mt. Talomo, 1,000 m, nr horse & bird feces, 14 Jun.1983, 5 Jul.1983, D. Tadena & F. R. Magpayo (USC).

Bionomics. - Nothing is known.

Distribution. - Taiwan, Philippines (Luzon, Busuanga Is., Palawan, Negros, Mindanao),

Nepal, India and Sri Lanka.

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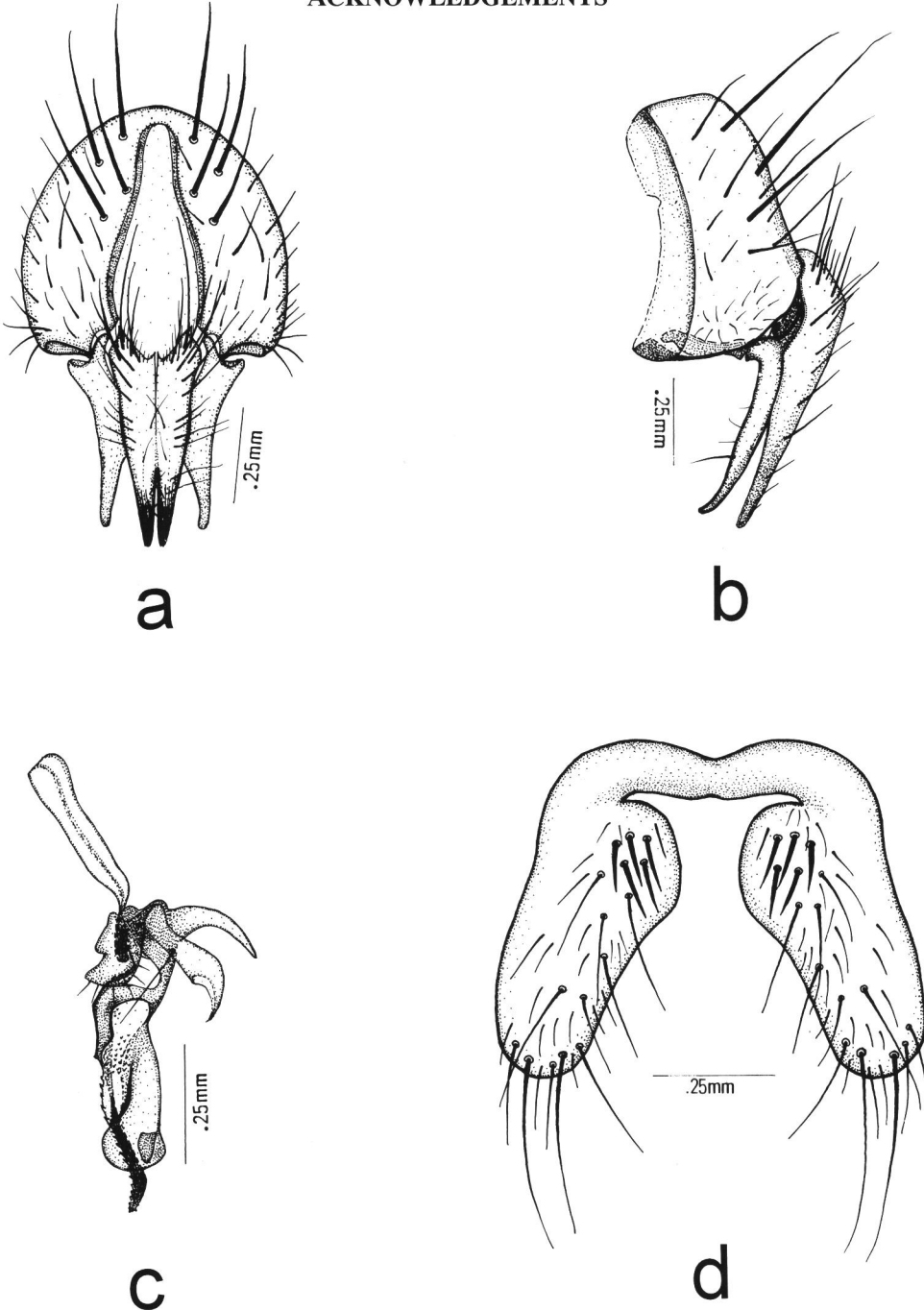


Fig. 16. *Rhyncomya flavibasis* (Senior-White), male genitalia. a, epandrium, cerci and paralobi, caudal view; b, epandrium, cerci and paralobus, lateral view; c, aedeagus, anterior and posterior parameres, lateral view; d, sternite 5, ventral view.

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