

# INSECTS OF MICRONESIA

## Diptera: Bibionidae and Scatopsidae<sup>1</sup>

By D. ELMO HARDY

UNIVERSITY OF HAWAII  
AGRICULTURAL EXPERIMENT STATION

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The following symbols indicate the Museums in which specimens are stored: US (United States National Museum), CM (Chicago Natural History Museum), and BISHOP (Bernice P. Bishop Museum).

### FAMILY BIBIONIDAE

Previously Bibionidae have been unrecorded from either Micronesia or Polynesia. Numerous species occur in all of the fringe areas of the Pacific but have been completely lacking in that part of Oceania inside a line from New Zealand, through New Caledonia, the New Hebrides, New Guinea, the Philippine Islands, Formosa, and Japan. A single species of *Plecia* is represented in the collection from the Palau Islands. It shows affinity with *Plecia* from Indonesia, and it is most probable that it originally came from there.

### Genus *Plecia* Wiedemann

*Plecia* Wiedemann, 1828, Aussereur. Zweifl. Ins. 1: 72.

*Rhinoplecia* Bellardi, 1859, Saggio Ditterol. Messicana 1: 16.

*Penthera* Philippi, 1865, Zool.-bot. Ges. Wien, Verh. 15: 639.

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<sup>1</sup> Published with the approval of the Director of the University of Hawaii Agricultural Experiment Station as Technical Paper 363.

This genus is distinguished from other Bibionidae by the short, nearly vertical vein  $R_{2+3}$ . The male genitalia are strikingly developed and present the only reliable characters for separating most of the species.

Genotype: *Hirtea fulvicollis* Fabricius.

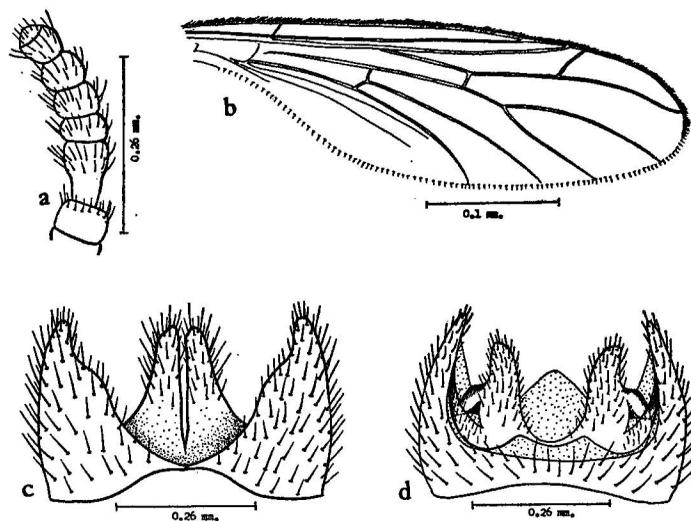


FIGURE 1.—*Plecia palauensis*: a, antenna; b, wing; c, male genitalia, dorsal view; d, male genitalia, ventral view.

### 1. *Plecia palauensis* Hardy, n. sp. (fig. 1, a-d).

*Male*. Head all black, eyes bare. Antenna eight-segmented; basal segment of flagellum nearly three times as long as second segment. Terminal portion consists of two closely joined segments, the apical one very tiny; often not clearly seen *in situ* (fig. 1, a). Ocellar triangle is well developed; it is nearly one-third as long as junction of compound eyes. Rostrum is not produced. Thorax entirely opaque black (dark brown in some specimens), nearly devoid of pile. Extreme bases of halteres are yellow, the remainder dark brown to black. A moderately deep furrow down each dorsocentral area and a faint indication of a median furrow is present on the anterior half of the mesonotum. Posterior median portion of mesonotum is depressed. Legs dark brown to black, faintly tinged with rufous in ground color. Segments are slender, the hind basitarsi about one-third as long as tibiae. Wings dusky fumose throughout, no stigma present, all veins black. Vein  $R_{2+3}$  arises just before middle of that portion of radius from r-m to wing tip and is almost vertical in position. Both of the anal veins evanesce before reaching wing margin. Costa extends about halfway between tips of  $R_{2+3}$  and  $M_1$  (fig. 1, b). Abdomen and genitalia opaque brown to black; in two alcoholized specimens abdomen is tinged with yellow; these may be teneral. Ninth tergum is deeply cleft, almost to base, on hind margin; lateral lobes are gradually tapered and obtuse at apices (fig. 1, c). (In *P. javensis* each side of tergum is bilobate, with a narrower, more V-shaped cleft on hind margin.) Aedeagus lacks the strong rodlike supporting structures characteristic of *P. javensis*. Ninth sternum is two-fifths times wider than long, posterior lateral margins are produced into rather elongate slender lobes which extend beyond apices of claspers; also median portion of sternum is very narrow measuring less than half length of a clasper. Claspers are rather simple, obtuse at apices, with a partial secondary lobe developed on lateral margins and a narrow sclerotized bridge con-

necting them on their inner anterior margins (fig. 1, *d*). (In *P. javensis* median portion of tergum is much broader, lateral lobes end before apices of claspers, and claspers are differently developed.)

Length: body, 3.0-3.8 mm.; wings, 3.8-4.5 mm.

Female unknown.

Holotype, male (US), Palau Is., Koror I., Limestone Ridge, south of inlet, Jan. 21, 1948, H. S. Dybas. Seven paratypes (US, CM, BISHOP, Univ. Hawaii), Ngergoi (Garakayo) I., five of them Aug. 7, 1945, Dybas, and two Aug. 8, 1945, E. Hagen. One additional paratype (BISHOP), same data as for holotype.

DISTRIBUTION: Western Caroline Is. (Palau).

This species fits into the complex of dark brown to black species, but by its male genital characters it appears related to *P. javensis* Edwards (*fulvicollis* complex: thorax entirely rufous). As in *P. javensis* the claspers are joined by a narrow sclerotized bridge, the ninth sternum is very broad, the median portion is narrow, and the posterior lateral margins are acutely pointed [fig. 1, *d*, and Hardy, 1952, Beitr. zur Ent. 2 (4-5): 431 fig. 4]. It differs from *P. javensis* and from other known *Plecia* in the details of the male genitalia (fig. 1, *c* and *d*) and in the characters discussed above. Furthermore, it has only six segments in the flagellum of the antenna (fig. 1, *a*). The ocellar triangle is not reduced in size as in *P. javensis*. This species is also much smaller, and the wing venation differs (fig. 1, *b*).

#### FAMILY SCATOPSIDAE

The Scatopsidae in Micronesia previously have been known from two species described from Guam by Johannsen (1946, B. P. Bishop Mus., Bull. 189: 187-188). Five species, including Johannsen's species, are in the collections which I have studied. It is also probable that a sixth species may be present; Johannsen apparently had before him a specimen, or specimens, of *Scatopse fuscipes* Meigen, accidentally included in his series of *Holoplagia guamensis* (Johannsen). (See discussion under *Holoplagia guamensis* or *Scatopse fuscipes*.)

I had previously followed Edwards (1925, Ann. Applied Biol. 12: 268-275) and Duda (1929, IN Lindner, Die Fliegen der Palaearktischen Region 5: 1-62) in considering most of Enderlein's genera of Scatopsidae as synonyms of *Scatopse s. l.* These were all based upon rather trivial differences in the wing venation which show intergrades in so many species that only the extreme examples of the various groups can be clearly delimited. Edwin F. Cook, of the University of Minnesota, has recently undertaken a thorough study of this family and, based upon a restudy of Enderlein's type species, has found that except for *Reichertella* his genera are good in spite of the fact that "the characters that Enderlein cites are wholly useless." Dr. Cook has placed

the taxonomy of this group on a sound basis by emphasizing the structural differences in the genitalia and abdominal sclerites of both sexes; details of chaetotaxy of the thorax and wing veins and the shape and development of the anterior spiracular sclerite, supported by the wing venation characters used by Enderlein [Enderlein, 1912, Zool. Anzeiger 40:265 and 1936, Die Tierwelt Mitteleur. 6 (3), Insekten 2:55; Melander, 1916, State Coll. Washington, Agric. Exper. Sta. Bull. 130:4; and others]. Following Cook's generic concepts, the six species from Micronesia belong in six different genera; four of these—*Psectrosciara brevicornis* Johannsen, *Holoplagia guamensis* (Johannsen), *Rhegmoclemina willistoni* (McAtee), and *Scatopse fuscipes* Meigen—also occur in the Hawaiian Islands. *Psectrosciara brevicornis* was described as a Sciaridae, but it is a true Scatopsidae.

#### Distributional List of Micronesian Scatopsidae

	MICRONESIAN ISLAND GROUPS								Other Localities
	S. Mariana	Caroline						Marshall	
		Palau	Yap	Caroline Atolls	Truk	Ponape	Kusate		
1. <i>Holoplagia guamensis</i>	×	×		×	×				Hawaiian Is.
2. <i>Psectrosciara brevicornis</i>	×								Hawaiian Is.
3. <i>Rhegmoclemina parvula</i>		×	×						Hawaiian Is.
4. <i>Rhexoza magnipalpus</i>		×		×		×	×		
5. <i>Scatopse fuscipes</i>	×								cosmopolitan
6. <i>Swammerdamella albimana</i>				×				×	Fiji, Samoa

#### KEY TO MICRONESIAN GENERA AND SPECIES<sup>2</sup>

1. Head higher than long (fig. 6, a). Abdomen rather narrow at base, expanded posteriorly. Antennae 10-segmented. Vein Cu<sub>2</sub> curved down sharply toward hind margin of wing (fig. 7, a)..... 2
- Body elongate, head nearly two times longer than high (fig. 3, a). Antennae nine-segmented (fig. 3, b). Vein Cu<sub>2</sub> very gently curved (fig. 3, d).....  
.....***Psectrosciara brevicornis***
- 2(1). Wings without setae on vein Cu<sub>2</sub>. Pedicel of halter with setae..... 3
- Wings with setae on Cu<sub>2</sub>. Pedicel of halter without setae. Seventh sternum of male shield-shaped. A distinct supraalar row of setae present. Anterior spiracular sclerite triangular. Vein M<sub>1+2</sub> very short, about one-fifth as long as M<sub>2</sub> (cell M<sub>1</sub> five times longer than stem; fig. 4, b).....  
.....***Rhegmoclemina parvula***

<sup>2</sup> Beyond the first couplet this key has been modified from a manuscript key sent to me by Edwin F. Cook.

- 3(2). Cross vein r-m lacking.  $R_{4+5}$  ends at or distinctly before middle of wing..... 4  
 Cross vein r-m present as an appendix near base of  $M_1$ .  $R_{4+5}$  extends to about  
 apical three-fifths of wing (fig. 2, b).....**Holoplagia guamensis**
- 4(3). Vein  $M_{1+2}$  shorter than  $M_2$  (cell M longer than its stem). Male with seven  
 visible abdominal segments..... 5  
 $M_{1+2}$  very elongate, four times longer than  $M_2$  (cell  $M_1$  not one-fourth as  
 long as its stem) (fig. 7, a). Male with only six visible abdominal seg-  
 ments.....**Swammerdamella albimana**
- 5(4). Second section of costa (between tips of  $R_1$  and  $R_{4+5}$ ) very short, less than  
 half as long as first (between humeral cross vein and  $R_1$ ). Seventh tergum  
 of male not produced. Male genitalia very small, aedeagus simple. Female  
 genitalia with a pair of small lobes at apex of seventh tergum (fig. 5, f)  
 .....**Rhexoza magnipalpus**
- Second section of costa equal to first. Seventh tergum of male produced (fig.  
 6, c). Male aedeagus highly modified in form. Female genitalia with a pair  
 of submedian lobes on eighth sternum (fig. 6, f).....**Scatopse fuscipes**

### Genus **Holoplagia** Enderlein

*Holoplagia* Enderlein, 1912, Zool. Anzeiger 40: 265, 267.

As proposed by Enderlein, the genus was distinguished from *Scatopse* by having the r-m cross vein complete and  $Cu_2$  strongly arched. The wings have no setae on  $Cu_2$  and the pedicel of each halter is setulose. The thorax is rather broad and stout, nearly as wide as long, and the wings are often pubescent. The labellae are normal in size, and the anterior spiracular sclerite is rather small on the species at hand. The Micronesian representative of this group differs from typical *Holoplagia* in having the r-m cross vein extending only two-thirds the distance to  $R_{4+5}$  (fig. 2, b).

Genotype: *Scatopse transversalis* Loew, 1846.

#### 1. **Holoplagia guamensis** (Johannsen), n. comb. (fig. 2, a-e).

*Scatopse guamensis* Johannsen, 1946, B. P. Bishop Mus., Bull. 189: 187, fig. 1, a-e.

This species appears more closely related to *S. albitarsis* Zetterstedt, of Europe, than to any other known species. The wing venation and most other details fit very closely but the male genitalia are very different. For comparison refer to Duda (1929, IN Lindner, Die Fliegen der Palaearktischen Region 5: 13, fig. 2). Johannsen's figure *F* and his description of the wing of *guamensis* is very misleading. He apparently drew and described the wing of *Scatopse fuscipes* Meigen, not *guamensis*. His other figures are correct. I have studied the type series in the Cornell University collection and in the collection of the Hawaiian Sugar Planters' Association; and all the specimens studied are *guamensis*. The specimen which provided the wing Johannsen figured was not among those studied, or perhaps he made his drawing from a slide-mounted specimen and could not see the r-m cross vein or the courses of veins  $M_1$  and  $M_{3+4}$ .

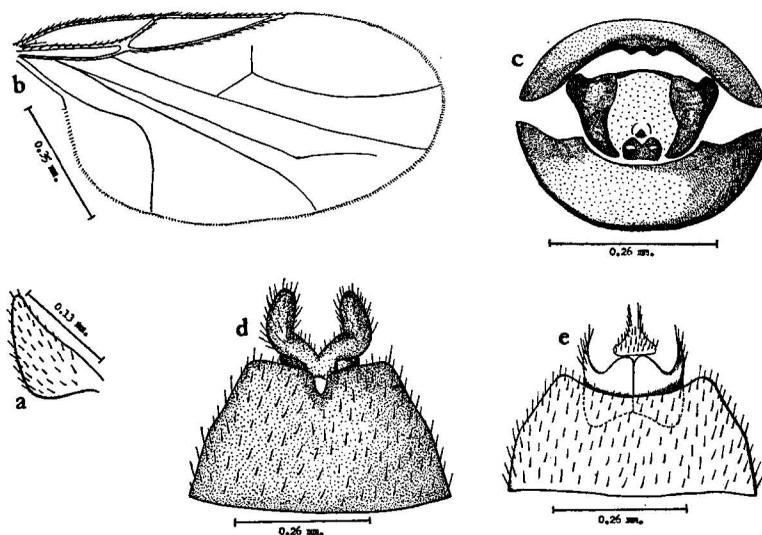


FIGURE 2.—*Holoplagia guamensis*: a, palpus; b, wing; c, male genitalia, end view; d, female genitalia, dorsal view; e, female genitalia, ventral view.

This species is differentiated from all other known species by the all yellow tarsi, by the wing venation (fig. 2, *b*), and by the genital characters of both sexes (fig. 2, *c-e*). These flies are moderately small and entirely opaque, dark brown to black except for the yellow tarsi; the apical portion of the pedicel of the antenna is also slightly yellow. The antennae are about equal in length to the thorax, the flagellum is gray pubescent and almost parallel-sided, except that the apical portion is slightly broadened; the apical portion is three times longer than the preceding segments. At the point of the junction of the eyes the eye bridge is about five facets wide. The palpi are short (fig. 2, *a*), about equal in length to the scape plus the pedicel. The dorsum of the thorax is covered with fine, closely appressed dark-colored hairs, the sides of the mesonotum have numerous short black bristles. The scutellum has 10 short black bristles on its hind margin and numerous black setae on the disc. The wings are hyaline. The costa and vein  $R_{4+5}$  extend just beyond the middle of the wing. The second costal section (that between tips of  $R_1$  and  $R_{4+5}$ ) is equal in length to the first (between the humeral cross vein and  $R_1$ ). Cross vein *r-m* is represented by an appendix extending about two-thirds the distance between veins  $M_1$  and  $R_{4+5}$ .  $M_{1+2}$  is about three-fifths as long as  $M_2$ .  $M_1$  beyond the appendix is gently concave.  $M_{3+4}$  curves upward sharply in the outer third of the wing but evanesces before reaching the margin. Vein  $Cu_2$  curves downward sharply to the hind margin (fig. 2, *b*). The abdomen is one-third to one-half longer than the remainder of the body,

the posterior portion is broadly expanded. The genitalia are dark brown and inconspicuous *in situ*. The seventh (visible) sternum of the male is evenly concave on the hind margin, the bottom of the concavity is almost flat. The seventh tergum is not produced on the hind margin. The penis is short and terminates in a thickened apex. A pair of well-developed claspers is present; these are expanded apically (fig. 2, *c*). In the female the hind margin of the seventh sternum is gently concave and the eighth sternum has a rather strong slender lobe on each posterior lateral margin and a small V-shaped concavity in the middle of the hind margin (fig. 2, *e*). The seventh tergum has a narrow V-shaped cleft in the middle of the hind margin (fig. 2, *d*). The body and wings are 1.5 mm. long.

DISTRIBUTION: Outside of Micronesia it is known only from Hawaii.

S. MARIANA IS. GUAM (type locality): Piti, July 1921, Swezey, and Sumay, June 1922, Swezey. SAIPAN: Near Garapan, Jan. 1945, Dybas; As Mahetog area, under bark, Nov. 1944, Dybas; and Hagman Pt. area, Apr. 1945, Dybas.

PALAU. KOROR: June 1953, at light (no collector given) and Nov. 1947, at light, Dybas.

TRUK. WENA (Moen): June 1946, Townes.

CAROLINE ATOLLS. WOLEAI: Utegal Is., Feb. 1953, Beardsley.

The type is in Cornell University.

#### Genus *Psectrosciara* Kieffer

*Psectrosciara* Kieffer, 1912, Linn. Soc. London, Trans. 15: 192.

This very characteristic genus is recognized by the elongate head, slender, linear abdomen and by the wing venation (fig. 3, *d*). The head is one and one-half to two times longer than high and the portion behind the eye is equal or longer than the eye (fig. 3, *a*). The abdomen is nearly two times longer than the head plus the thorax. The elongate costa, the long second costal section, and the gently curved vein  $Cu_2$  are distinctive. The costa extends to about the apical three-fourths of the wing. The second section of the costa (that portion from apex of  $R_1$  to  $R_{4+5}$ ) is two times longer than the first (from humeral cross vein to tip of  $R_1$ ). I find no evidence of vein  $M_{3+4}$  in the specimens I have studied.

Just one species (*P. brevicornis* Johannsen) is known to occur in Micronesia.

Genotype: *Psectrosciara mahensis* Kieffer.

#### 2. *Psectrosciara brevicornis* Johannsen (fig. 3, *a-d*).

*Psectrosciara brevicornis* Johannsen, 1946, B. P. Bishop Mus., Bull. 189: 188.—Bohart and Gressitt, 1951, B. P. Bishop Mus., Bull. 204: 65, fig. 4, *c*.

This species is characterized by the generic characters given above. The elongate head and body and the distinctive wing venation will separate it from any scatopsid known from Micronesia. It apparently is distinguished from all known species of *Psectrosiara* by having just nine segments in the antennae rather than 10. It appears to be related to *P. californica* (Cole) but the vertical portion of the radial sector is situated about half-way between the humeral cross vein and the apex of  $R_1$ , rather than near the basal one-fifth of this section.

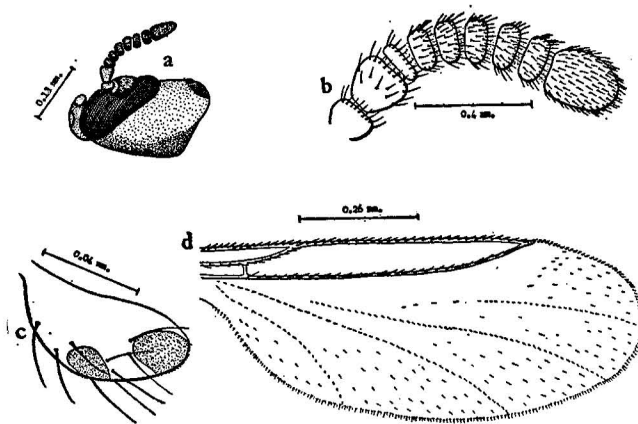


FIGURE 3.—*Psectrosiara brevicornis*: a, head; b, antenna; c, palpus; d, wing.

The head, thorax, and abdomen are predominantly dark brown to black. One Saipan specimen on hand, which is in alcohol, is almost entirely rufous; it may be teneral. The posterior portions of the abdominal segments are sometimes pale brown to yellowish. The head is shaped as in figure 3, *a*; the eyes are much higher than long. The apical segment of the antenna is about one-third longer than wide and is just longer than the preceding two segments of the flagellum (fig. 3, *b*). Each palpus has a large sensory structure at the apex and another near the middle of the hind margin (fig. 3, *c*). The thorax is shining brown to black, the scutellum with but two short bristles on the specimens at hand (some may be broken off). The legs are all yellow, tinged with brown. The wings are hyaline, anterior veins yellow faintly tinged with brown. The costa and vein  $R_{4+5}$  extend nearly to the apical three-fourths of the wing (fig. 3, *d*). Johannsen (1946, p. 189, fig. 1, *f*), and also Bohart and Gressitt (1951, p. 62, fig. 4, *c*) show the base of vein  $M_1$  present; the original description says it is distinct although weak. I find it very difficult to see on the specimens I have studied, and the base of  $M_{1+2}$  also seems to fade out.  $M_{1+2}$  measured from the fork to the vertical portion of  $R_s$ , is about two-thirds as long as  $M_2$  and is directly in line with this vein.  $M_1$  is gently



arched upward; apparently  $M_{3+4}$  is absent. The vein  $Cu_2$  is just slightly curved (fig. 3, *d*). The abdomen is about two times longer than the remainder of the body, the sclerites are brown, the conjunctiva yellow. The genitalia have not been studied. The body and wings are 1.5 mm. long.

DISTRIBUTION: Mariana Is., Hawaiian Is.

S. MARIANA IS. GUAM: June 1936, Swezey; Pilgo River, swept from low-growing vegetation, May 1945, G. Bohart and Gressitt. SAIPAN: One (CM), Mt. Tagpochau, Feb. 1945, Dybas.

I have specimens of *P. brevicornis* from Oahu and Maui, Hawaiian Islands.

The type is in the Cornell University collection. I have studied the paratype in the collection of the Hawaiian Sugar Planters' Association.

#### Genus *Rhegmoclemina* Enderlein

*Rhegmoclemina* Enderlein, 1936, Die Tierwelt Mitteleur. 6 (3), Insekten 2: 55.

Enderlein allied the genus to *Swammerdamella* because of the rather Z-shaped (twice bent) vein  $Cu_2$  and separated it by having vein  $M_{1+2}$  shorter than cell  $M_1$ . These characters are of no value in differentiating this group. Cook, in correspondence, designates the following characters for distinguishing *Rhegmoclemina*: wings with setae on vein  $Cu_2$ ; pedicel of halter without setae; no setae on vein  $M_1$  or  $M_2$ ; vein  $M_1$  always complete; seventh sternum of male shield-shaped; a distinct row of supraalar setae present and the anterior spiracular sclerite triangular.

Genotype: *Scatopse vaginata* Lundström.

#### 3. *Rhegmoclemina parvula* Hardy, n. sp. (fig. 4, *a-d*).

A very tiny, principally dark brown to black species easily distinguished from other known Pacific species by wing venation, the small size, and the pale-colored tibiae. The antennae are short, 10-segmented, and dark brown to black in color. Apical portion is three times longer than preceding segment. Thorax subshining brown to black on dorsum; brownish tinged with yellow on sides. Scutellum with eight short marginal bristles. Spiracular plate as in figure 4, *a*, anterior thoracic spiracle tiny. Halteres brownish yellow. Femora are brownish yellow. Tibiae yellow with a narrow ring of brown near bases. Tarsi are yellow. Wings hyaline, the costa ending slightly before middle of wing. Second section of costa is about one-third as long as first. Vein  $M_{1+2}$  is very short, about one-fourth as long as  $M_2$ . Cell  $M_1$  distinctly narrowed in median portion by curvatures of veins  $M_1$  and  $M_2$ . Veins  $M_{3+4}$ ,  $Cu_1$ , and  $Cu_2$  evanesce before reaching wing margin. Vein  $Cu_2$  is strongly sinuate (fig. 4, *b*). Abdomen about one-half longer than wide, dull brown on dorsum, with hind margins of apical segments brownish yellow, and tinged with rufous on venter. Genitalia are yellow. In female, sclerites of seventh segment are straight on their hind margins. Eighth segment is reduced to a very narrow ring extending over dorsum. A pair of well-developed triangular-shaped plates extend around anal region (fig. 4, *c*). Sternum has a pair of shorter, rectangular-shaped sclerites (fig. 4, *d*). The male genitalia have not been studied.

Length: body and wing, 1.0 mm.

Male unknown.

Holotype, female (US 63300), Caroline Is., southwest Koror, 25 m. Palau, Dec. 11, 1952, light trap, J. L. Gressitt. One paratype, female, Colonia, Yap I., Yap, Aug. 29, 1950, R. J. Goss, and one paratype, Honolulu, May 1919, J. C. Bridwell. Paratypes in Bishop Museum and the University of Hawaii.

DISTRIBUTION. Western Caroline Is. (Palau, Yap), Hawaii.

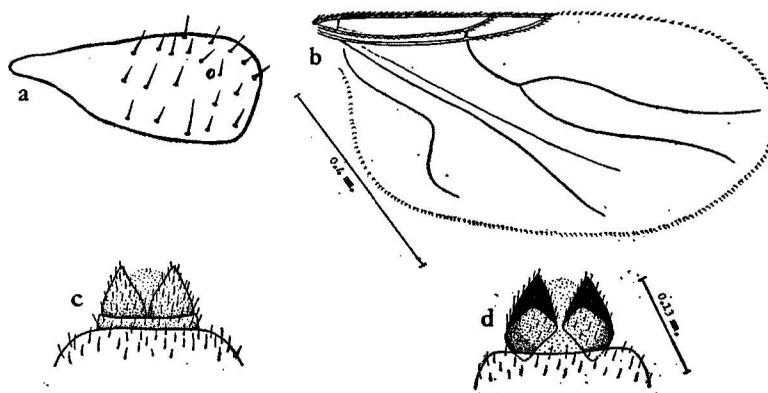


FIGURE 4.—*Rhegmoclemina parvula*: a, anterior spiracular plate; b, wing; c, female genitalia, dorsal view; d, female genitalia, ventral view.

In the literature this species fits the description of *Rhegmoclemina willistoni* (McAtee)—change of name for *Scatopse pygmaea* Williston, 1896, nec *S. pygmaea* Loew, 1864, except that *R. parvula* is apparently about half the size (1.0 mm.) of *willistoni* (2.0 mm.). Dr. Cook has informed me that there are two North American and two or three Central American and Caribbean species which have identical wing venation and which would fit Williston's description of *pygmaea* (West Indies). It is quite unlikely that the specimens at hand are *pygmaea* and it is perhaps best to describe it as new.

The wing venation is rather similar to that of *Rhegmoclema rufithorax* Enderlein (1912, Zool. Anzeiger 40: 277) from the Seychelle Islands, but that species apparently has the second costal section more than two times longer than vein  $R_1$  and the body is predominantly rufous.

#### Genus *Rhexoza* Enderlein

*Rhexoza* Enderlein, 1936, Die Tierwelt Mitteleur. 6 (3), Insekten 2: 55.

The wing characters used by Enderlein to distinguish this group are rather trivial and probably are not of more than specific importance. Cook (in correspondence) has pointed out that this fits near *Scatopse s. str.* by lacking setae on vein  $Cu_2$ , by having setae on the bases of the halteres, and by the male

abdomen having seven segments externally visible. He separates it from *Scatopse* by its having the anterior spiracular sclerite large and triangular (fig. 5, *b*), by the male genitalia being small with aedeagus simple, and by the females having no appendages on the eighth segment.

Genotype: *Rhexoza zacheri* Enderlein.

#### 4. *Rhexoza magnipalpus* Hardy, n. sp. (fig. 5, *a-f*).

Small, predominantly black species. *Male*. Head entirely black, shining on vertex. Entire front between antennae and lower ocellus is covered by eye bridge. It is six to eight facets broad at its narrowest point. Antenna is dark brown to black, except for the yellow-brown apex of the second segment and is distinctly capitate; basal segments are rather narrow, apex is broad; apical portion is equal to nearly four of preceding flagellar segments (fig. 5, *a*). Palpi are yellow brown and are equal to combined length of scape, pedicel, and three to four flagellar segments. Thorax subshining black on dorsum, dark brown on sides. Anterior spiracular sclerite is well developed, rather triangular, enlarged on the anterior end (fig. 5, *b*). Scutellar bristles are well developed. Wings hyaline, anterior veins yellow brown. Costa and vein  $R_{4+5}$  end distinctly before middle of wing. Second costal section is about one-third as long as first. Vein  $M_1$  is about one-fourth longer than  $M_{1+2}$  and is directly in line with stem of cell  $M_1$ . Vein  $M_2$  fades out just before wing margin.  $M_{3+4}$  is very faint and curves upward slightly at its apex. Vein  $Cu_2$  is distinctly curved (fig. 5, *c*). Abdomen subshining black, about one-fourth longer than remainder of body, apical portion not noticeably produced. Genitalia are yellow brown and are inconspicuous, hidden within apical segments of abdomen. Seventh tergum forms a ring which extends around most of genitalia. Its hind margin is straight or nearly so. Ninth sternum is about one-half wider than long and has a pair of small lobes developed in middle of hind margin (fig. 5, *d*). A heavily sclerotized dark-brown hooklike structure protrudes from ventral portion of genitalia; this is visible *in situ* and is probably part of the aedeagus or may possibly be a development of the eighth segment (fig. 5, *e*).

Length: body, 1.3 mm.; wings, 1.2 mm.

*Female*. Fits description of male except for genital characters. Also, abdomen seems to be more opaque, not so subshining as in male. Seventh tergum is produced into a pair of small lobes in middle of hind margin (fig. 5, *f*).

Holotype, male (US), Kusaie I., Mutunlik, light trap, alt. 16 m., Jan. 23, 1953, J. L. Gressitt. Allotype, female (US), same locality, light trap, 22 m., Jan. 26, 1953, J. F. G. Clarke. Thirteen paratypes, nine males, four females, all from Caroline Is. Two same data as for allotype, one Kusaie, Lelu (Lele), 1 m., "beating," Mar. 12, 1953, Clarke; six from Ponape, Jokaj I. alt. 2 m., Feb. 26, 1948 and Jan. 29, 1953, H. S. Dybas and Gressitt; two from northwest Auluptagel, Palau, alt. 25 m., Dec. 13, 1952, Gressitt, and one from Auluptagel (Aurapushekaru) I., Palau, sweeping native vegetation, Feb. 7, 1952, J. W. Beardsley, and one from Fananu I., Nomwin Atoll, Feb. 17, 1954. Paratypes in Bishop Museum, the United States National Museum, the Hawaiian Sugar Planters' Experiment Station, and the University of Hawaii.

DISTRIBUTION: Caroline Is.

This species runs to couplet 37 in Duda's key (1929, IN Lindner, *Die Fliegen der Palaearktischen Region 5:12*), but is very different from *Scatopse cingulipes* Strobl and *S. hungarica* Duda. The most striking differences

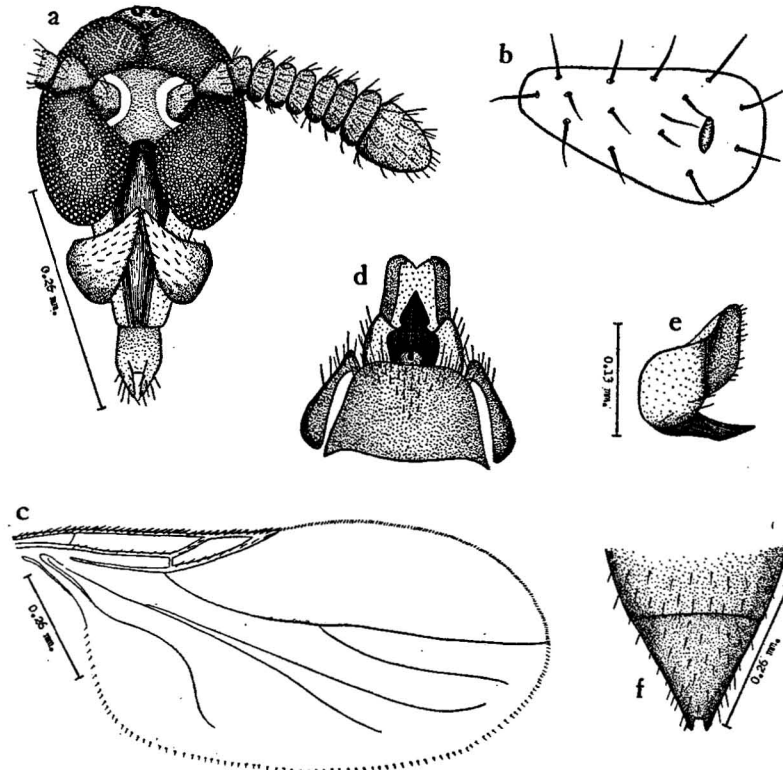


FIGURE 5.—*Rhexoza magnipalpus*: a, head, front view; b, anterior spiracular plate; c, wing; d, male genitalia, ventral view; e, male genitalia, lateral view; f, female genitalia, dorsal view.

are in the wing venation, in the genitalia, and in the development of the palpi. Vein  $M_2$  is three times longer than  $M_{1+2}$  in the two European species; these sections are about equal in *Rhexoza magnipalpus*. Also, in the latter the male genitalia are as shown in figure 5, *d* and the palpi are greatly developed, compared to other species which I have studied (fig. 5, *a*). In Melander's revision (1916, State Coll. Washington, Agric. Exper. Sta. Bull. 130: 12) it runs to *Rhegmoclema aterrima* Melander except that it has eight bristles on the hind margin of the scutellum, not two. From the original description, *R. aterrima* apparently differs from *Rhexoza magnipalpus* by the short setae on the scutellum and by having only six visible segments on the abdomen of the female; the last not excised. In *Rhegmoclema aterrima* vein  $M_1$  is at an angle with  $M_{1+2}$  rather than in direct line with it; the second costal section is at least half as long as the first, rather than one-third as long, and vein  $Cu_2$  is differently curved (compare fig. 5, *c* and Melander's fig. 15).

Genus *Scatopse* Geoffroy

*Scatopse* Geoffroy, 1762, Hist. Abreg. des Ins. 2:450.

*Reichertella* Enderlein, 1912, Zool. Anzeiger 40:265, 268.

*Rhaeboza* Enderlein, 1936, Die Tierwelt Mitteleur. 6 (3), Insekten 2:55.

*Scatopse* is distinguished from other genera by the fully developed wings; rather short body and head; lack of spurs on front tibiae; antennae with 10 well-defined segments; petiole of median vein arising opposite transverse portion of radial sector; costa ending at or near tip of vein  $R_{4+5}$ ; veins  $M_1$  and  $M_2$  not interrupted at their bases; no macrochaetae present on wings; pedicel of halteres with setae; vein  $Cu_2$  usually sinuate; anterior spiracular sclerite very small (except in *S. fuscipes*); male genitalia with aedeagus large and highly modified in form. Female genitalia usually with one or two paired appendages.

Genotype: *Tipula notata* Linnaeus.

There is danger of the name *Scatopse*, as well as some other well-established generic names of Diptera, being invalidated because of the decision of the International Commission on Zoological Nomenclature at the Paris Congress to substitute the word "binomial" for the word "binary" in the Code. Since the generic names of Geoffroy were not proposed in binomial combinations this ruling would necessitate their being discarded even though they have been used commonly throughout entomological literature dating back to Linnaeus' time. Dr. Alan Stone and others requested (1954) the Commission to use its plenary powers to preserve the generic names of Geoffroy by placing them on the Official List of Generic Names in Zoology. They also requested that the name *Scathopse* Geoffroy (1762, p. 544; an incorrect spelling of *Scatopse* Geoffroy, 1762, p. 450) be placed on the Official List of Rejected and Invalid Generic Names in Zoology. They further pointed out that the Geoffroy names have often been cited in the literature dating from 1764. They were actually first published in 1762.

##### 5. *Scatopse fuscipes* Meigen (fig. 6, a-f).

*Scatopse fuscipes* Meigen, 1830, Syst. Beschreib. Eur. Zweifl. Insekten 6:314.

Entirely black except for yellow-brown tarsi. Superficially resembles *Holoplugia guamensis*, but details of wing venation and genitalia of both sexes are very different. Palpi are rather large; they are approximately equal to the combined length of the scape, pedicel, and two flagellar segments. At junction of eyes, eye bridge is six to eight facets wide. Antennae are nearly parallel-sided, slightly enlarged at apices. Apical portion is three to four times longer than penultimate segment (fig. 6, a). Wing is hyaline, costa extends just slightly beyond middle of wing and first two costal sections are approximately equal in length. Vein  $M_{1+2}$  is about three-fifths as long as  $M_2$ .  $M_1$  is simple, without an appendix;  $M_{3+4}$  is straight and evanesces well before wing margin. Vein  $Cu_2$  is rather strongly bent downward (fig. 6, b). Genitalia of both sexes are very characteristic, in male the seventh visible sternum is about two times wider than long, with a small V-shaped cleft in middle of hind margin and a rather well-developed lobe on each posterolateral margin (fig. 6, d). Seventh visible tergum has a well-developed slightly asymmetrical median projection from hind margin (fig. 6, c). Cole (1927, Calif. Acad. Sci., Proc. IV, 16:418) suggests that this is a joining of two lobes. Penis is elongate and coiled. Seventh sternum of female has a broadly U-shaped concavity in middle of hind margin (fig. 6, f),

and hind margin of seventh tergum is straight, whereas apex of tergum is rather deeply concave (fig. 6, *e*). Eighth sternum has a pair of submedian lobes as in figure 6, *f*.  
Length: body and wings, 1.75 mm.

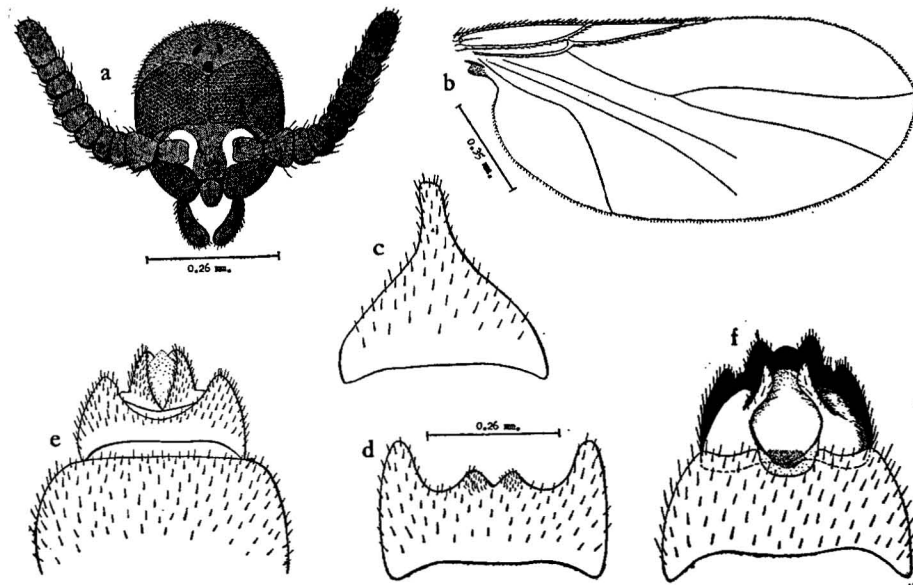


FIGURE 6.—*Scatopse fuscipes*: a, head; b, wing; c, seventh tergum of male; d, seventh sternum of male; e, female genitalia, dorsal view; f, female genitalia, ventral view.

**DISTRIBUTION:** This is a cosmopolitan species widespread throughout much of the world. It is known from Micronesia only by Johannsen's inclusion of it in his type series of *Scatopse guamensis*. He apparently had before him one or more specimens from Guam.

This species has never been recorded from Micronesia, but it appears that one or more specimens may have been included in the type series of *Scatopse guamensis* Johannsen. The wing figured by Johannsen is quite obviously that of *S. fuscipes*, and the description of the wing would fit this species. Refer to my discussion under *Holoplagia guamensis* (Johannsen).

The status of the name *fuscipes* is somewhat questionable. It is possible that it is a synonym of *Scatopse atrata* Say. Duda (1929, pp. 21-22) treats *Scatopse atrata* Wiedemann, 1828 (*nec* Say) as a synonym of *S. fuscipes* Meigen but lists *S. atrata* Say as a *sp. incerta*, probably not the same as *fuscipes* but from the description possibly fitting in the genus *Ectaetia* Enderlein. Since Say's type is lost and his species cannot be definitely recognized from his description, it is perhaps best to ignore it. *Scatopse fuscipes* is the genotype of *Rhaeboza* Enderlein. This was based only on the amount of curvature of vein  $Cu_2$ , and the character is not of generic importance.

Genus *Swammerdamella* Enderlein

*Swammerdamella* Enderlein, 1912, Zool. Anzeiger 40:265, 277.

This genus is recognized by its having vein  $M_{1+2}$  very elongate, four or five times longer than  $M_2$ ; cell  $M_1$  not over one-fourth as long as its stem (fig. 7, a); and the male abdomen having only six abdominal segments externally visible.

Genotype: *Scatopse brevicornis* Meigen, 1830.

6. *Swammerdamella albimana* Edwards (fig. 7, a-c).

*Swammerdamella albimana* Edwards, 1924, Ann. Mag. Nat. Hist. IX, 14: 571.

Head black, shining on vertex, slightly gray on occiput. At junction of eyes, eye bridge is five facets broad. Mesonotum is subshining black, faintly gray pollinose. Pleura, scutellum, and humeri are brown tinged with yellow. Scutellum has eight to 10 moderately developed bristles on its hind margin. Legs chiefly dark brown to black, tarsi whitish yellow. Wings hyaline, anterior veins yellow brown. Costa and vein  $R_{4+5}$  end at about basal two-fifths of wing. First costal section is three or more times longer than second. Vein  $M_{1+2}$  is more than four times longer than  $M_2$  (cell  $M_1$  is less than one-fourth as long as its stem). Vein  $Cu_2$  strongly curved (fig. 7, a). Abdomen is subshining black, slightly grayish pollinose, just slightly longer than remainder of body; apical portion is produced into a triangular point above (this is apparently the seventh segment, although I can account for only six segments on the specimen at hand). This projection appears to be slightly asymmetrical as in *Scatopse fuscipes*; from a dorsal view it is produced more to the right side on the specimen at hand (figs. 7, b, c). Apical sternum is approximately quadrate, hind margin very gently concave. Genitalia are yellow and are completely hidden within a hollow formed by apical segments on abdomen; they are visible in only direct end view. These have not been studied.

Length: body and wings 1.15-1.2 mm.

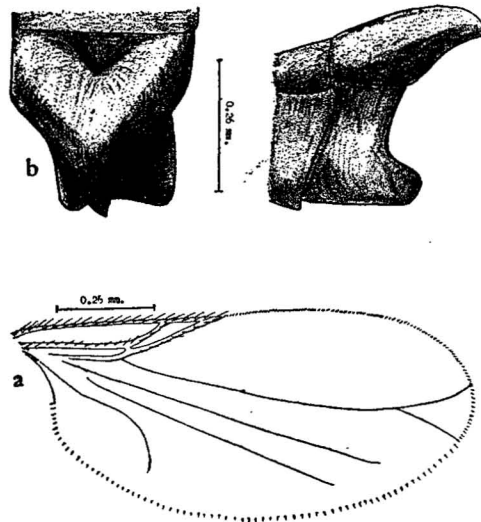


FIGURE 7.—*Swammerdamella albimana*: a, wing; b, male genitalia, dorsal view; c, male genitalia, lateral view.

DISTRIBUTION: Eastern Micronesia. Previously known only from the Fiji Islands and Samoa.

MARSHALL ISLANDS. MAJURO: One, Uliga I., Oct. 31, 1953, Beardsley.

CAROLINE ATOLLS. KAPINGAMARANGI: E. F. Cook has informed me that he has studied two specimens from Hare Islet and Machiro Islet, Kapingamarangi, central Carolines, collected Aug. 4, 1956, Townes.

The type is in the British Museum (Natural History).

One male specimen from Micronesia which appears to be this species is at hand. It fits Edwards' brief description well. This species is close to *S. brevicornis* Meigen, of Europe. Edwards says that it differs by having the antennae a little longer, with rather longer pubescence (the specimen at hand has the antennae broken); by having the tip of the last abdominal tergite of the male produced into a nearly equilateral, instead of a flattened, triangle; by having the tarsi wholly whitish ochreous instead of black; and by having the second costal division rather longer, one-third instead of only one-fourth as long as the first. I see no appreciable difference in the wing venation in the two species from the specimen at hand. The second costal section is between one-third and one-fourth as long as the first. The very short cell  $M_1$  (fig. 7, *a*), combined with the peculiar shape of the apex of the male abdomen (fig. 7, *b*) and the yellow-white tarsi, will distinguish this from all known species from the Pacific and the Oriental Region.