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NEOTROPICAL FLIES OF THE FAMILY STRATIOMYIDAE IN THE UNITED STATES NATIONAL MUSEUM

By Maurice T. James

A small collection of Neotropical Stratiomyidae submitted to me for determination through C. F. W. Muesebeck, of the U. S. Bureau of Entomology and Plant Quarantine, contained several new species and additional material of exceptional interest. The present paper is based on this collection. All holotypes and allotypes are in the United States National Museum.

Subfamily BERIDINAE

Genus HOPLACANTHA Rondani

HOPLACANTHA MEXICANA (Bellardi)

One male, 5 females, Higuito, San Mateo, Costa Rica (Pablo Schild).

HOPLACANTHA PERUANA Enderlein

One female, Perene, Peru, April 18, 1937 (H. Hanson). Bishopp No. 27099. This specimen has the abdomen yellow in the center dorsally on segments 2 to 4; the face and lower part of the front are densely whitish pollinose and have the long, dense pile; the scutellumis 8-spined. Since these characters may well be variable, I believe I can safely refer the specimen to this species.

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Genus HETERACANTHIA Macquart HETERACANTHIA RUFICORNIS (Macquart)

Three females, Higuito, San Mateo, Costa Rica (Pablo Schild).

Genus MACROMERACIS Enderlein
MACROMERACIS LONGICORNIS (Philippi)

FIGURE 71, c

One female, Ancud, Isla Chiloe, Chile, December 1926 (R. and E. Shannon). This specimen seems to belong to Philippi's *Beris longicornis*, and is clearly a *Macromeracis*, though differing somewhat in venation from Enderlein's diagnosis of the genus. It is here described in detail because of the brevity of Philippi's description.

Female.—Head black, subshining, with inconspicuous yellow hair; the occipital orbits (which are developed only on the upper part and are there very narrow), lower third of the front, and face whitish pollinose. Antennae black (segments beyond the second missing). Palpi and proboscis bright yellow. Thorax yellow; the dorsum, excluding the humeri, however, is brownish and becomes black laterally in front of the suture and posteriorly before the scutellum. Metapleura blackish. Scutellum blackish in the center, that color gradually merging into the broad yellow margin. Scutellum with four spines, the lateral pair directed outward, the median pair one and one-half times as long as the scutellum and three times as long as the lateral pair. Legs entirely yellow, the tarsi at most somewhat brownish at the apex. Discal cell large, two and one-half times as long as wide; the cross-vein r-m joins it at its basal fifth, and its apex reaches almost halfway between r-m and the origin of R₄. Four posterior cells; the fourth borders the discal cell for a greater distance than does the third. Abdomen three times as long as wide and three times as long as the thorax (excluding scutellum) and yellow, the first four segments dorsally with posterior subquadrate black spots, which are bluish in certain lights; those of the first segment are confluent with those of the second; a broad transverse band of similar color occupies the fifth and a broad, semicircular area on the basal and medial part of the sixth; this is confluent with the posterior spots of the fourth segment. Pile yellow, inconspicuous. Length, 7 mm.

The form of the discal cell readily distinguishes this species from *M. elongata* Aubertin and *M. thoracica* (Philippi).

Genus BERIDOPS Enderlein BERIDOPS MACULIPENNIS (Blanchard)

Male, Bariloche, Rio Negro, Argentina, November 1926 (R. and E. Shannon).

Subfamily CLITELLARIINAE

Genus DIAPHOROSTYLUS Kertész

DIAPHOROSTYLUS INTERRUPTUS, new species

Differs from the three described species of this genus in that the legs, with the exception of the three apical segments of the anterior tarsi, are entirely yellow or white, without a trace of black or brown, and that the brown of the wings is more dilute, by no means blackish brown. As in *flavipes* Kertész, the hyaline band of the wing is interrupted near the discal cell.

Male.—Head black, white-haired, the front with some brownish hair intermixed; antennae yellow, its style, however, white; the style about two-thirds as long as the annulated portion; the subterminal bristle smaller than the terminal one. Facial projection acute. Thorax black; the pleura white-haired, the dorsum and scutellum with appressed golden hair; broad apex of scutellum and spines yellow. Abdomen bare, with only microscopic pubescence on the disk, but with longer blackish and white hairs intermixed on the sides. Legs, including coxae and trochanters, yellow; the apical three segments of the anterior tarsi brownish; the tibiae constricted basally; the constricted portions of the middle and hind tibiae whitish. Wings light brown; a hyaline band crosses the wing beyond the stigma, but this is broadly interrupted beyond the apex of the discal cell, so that the second posterior cell has only a small hyaline spot in it and the third is broadly infumated basally. Halteres yellow. Length, 4-5 mm.

Holotype.—Male, Alhajuelo, Panama, April 15, 1911 (August

Busck), U. S. N. M. No. 52766.

Paratype.—Male, Cangrejal de Aserri, Costa Rica, 600 m. April 1906 (P. Biolley). Colorado State College collection.

Genus DITYLOMETOPA Kertész

DITYLOMETOPA ELEGANS Kertész

Female, Boa Vista, Tapajos, Para, "BV. 23. II" (C. H. T. Townsend).

Subfamily STRATIOMYINAE

Genus NOTHOMYIA Loew

This genus has been placed in the Geosarginae by most workers, but its close relationship to *Myxosargus* indicates that it belongs in the Stratiomyinae.

NOTHOMYIA VIRIDIS Hine

Male, Faxon mills, Trujillo Alto, San Juan, Puerto Rico, March 6, 1934 (Anderson). No. 5283. Compared with paratype specimens. This species was described from a large series from Cedar Point, Sandusky, Ohio, and has not since been recorded in literature.

NOTHOMYIA PARVICORNIS, new species

FIGURE 71, a

Readily distinguished from described species by the small size and bright yellow color of the annulated portion of the flagellum of the antenna.

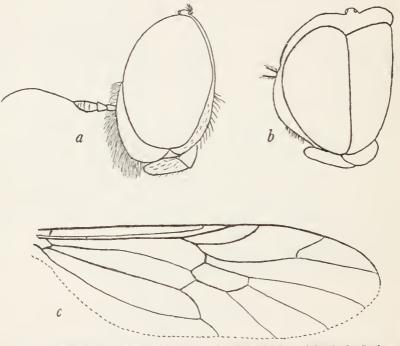


FIGURE 71.—a, Nothomyia parvicornis, new species, lateral view of head; b, Cyphomyia planifrons, new species, lateral view of head; c, Macromeracis longicornis (Philippi), wing.

Male.—Head greenish black. Face but little projecting forward, rather strongly produced downward, however, and rounded below; the face, front, and occiput clothed with dense pile, which, however, does not conceal the ground color; this pile is for the most part gray but is yellowish on the lower part of the face; in length it approximately equals the first antennal segment, but is somewhat longer on the lower part of the face and on the occiput below the neck. A tuft

of black pile on the ocellar triangle. Antennae small, in length, excluding the arista, less than half the longitudinal diameter of the eye, the arista almost as long as the longitudinal diameter of the eye; first and second segments subequal, shining black; the annulated part of the flagellum somewhat longer than the first or second segment, yellow; arista black. Dorsum of thorax densely punctured, emerald green, moderately shining, with yellowish-gray tomentum and scattered, erect, blackish pile; scutellum and spines concolorous, without the erect pile; spines divergent, almost as long as the scutellum. Pleura greenish black, well clothed with semiappressed grayish pile. Legs black, the posterior basitarsi white. Wings grayish hyaline; the stigma blackish; the area below it, including the discal cell, the apices of the basal cells, and the base of the first posterior, diffused yellowish brown. Discal cell hexagonal, but almost diamondshaped. Vein M3 weak, not much more than a fold. Vein R4 absent. Halteres green. Abdomen black with a slight greenish cast, elongated oval, about twice as long as wide, grayish-white pilose. Length, 6 mm.

Holotype.—Male, San Carlos, Costa Rica (Schild and Burgdorf). U. S. N. M. No. 52764.

Genus DICYPHOMA James

DICYPHOMA SCHAEFFERI (Coquillett)

Female, Caño Saddle, Gatun Lake, Panama, April 27, 1923 (R. C. Shannon).

Genus CYPHOMYIA Wiedemann

CYPHOMYIA ALBITARSIS (Fabricius)

Six females, 1 male, Higuito, San Mateo, Costa Rica (Pablo Schild); 1 female, Porto Bello, Panama, March 2, 1911 (August Busck); 1 female, San Rafael, Veracruz, Mexico, April 18 (Townsend); 1 female, 1 male, Caño Saddle, Gatun Lake, Panama, April 27, 1924 (R. C. Shannon), and May 6, 1923 (M. F. Close); 2 males, Tabogal, Panama, February 2 and 23, 1912 (August Busck); 1 male, Valera, Venezuela.

CYPHOMYIA WIEDEMANNI Gerstaecker

Four males, Trinidad Rio, Panama, February 17, 1912 (August Busck); 1 male, Taboga Island, Panama, June 9, 1911 (August Busck); 1 male, 1 female, Caño Saddle, Gatun Lake, Panama, May 13 and 3, 1923 (R. C. Shannon); 1 male, 2 females, Higuito, San Mateo, Costa Rica (Pablo Schild); 1 female, Valera, Venezuela;

3 females, San Bernardino, Paraguay (K. Fiebrig); 1 female, Cavinas Beni, Bolivia, February (W. M. Mann), Mulford Biological Exploration of the Amazon Basin, 1921–22.

CYPHOMYIA NUBILIPENNIS, new species

A black species with predominantly yellow legs, white abdominal hair spots, and subhyaline wings, which are traversed by a brown cloud.

Female.—Head black; the lower part of the front and the upper part of the face, however, whitish to yellow, this color gradually darkening to black on the face. Front flat, slightly lower than the level of the eyes; almost parallel-sided, only slightly widened toward the vertex; there is no median furrow, but, on the other hand, the occular orbits on the upper half are very slightly depressed and punctured. Vertex behind the ocellar triangle elevated to the level of the triangle and separated from the occipital orbits by definite grooves. Occipital orbits of almost equal width throughout, though slightly broader above; they are narrow, averaging about a third the width of the front; the orbits angularly margined behind. Face divergent below, its width on the oral margin one and one-half times that at the base of the antennae. Pile vellowish white, on the front limited to the punctured areas, semiappressed; on the face longer, rather dense, and more erect. Proboscis brownish yellow; palpi black. Eyes bare. Antennae black, the first three segments yellowish basally; the first segment twice as long as the second, the second, ninth, and tenth of approximately equal length, the tenth acute at the apex; the flagellum (third to tenth segments) three times the length of the first. Thorax and scutellum black, slightly shining, with dense yellowishwhite tomentum; the scutellum separated from the dorsum by a groove, raised above the dorsum and directed slightly upward; the spines thick, blunt, three-fourths as long as the scutellum, slightly divergent, directed upward in respect to the dorsum but not in respect to the scutellum. Legs yellow; the coxae, a subapical annulus on each femur (at least, below), the apical half of the hind tibiae, a narrow longitudinal stripe on the upper surface of the fore and middle tibiae, and the last three tarsal segments brownish. Wings yellowish hyaline; stigma yellow; a brown cloud crossing the wings anterior to the stigma and taking in the apices of the basal cells, most of the discal and fifth posterior cells, and the base of the fourth posterior cell. Halteres vellow. Abdomen black, with conspicuous side spots of yellowish-white tomentum on segments 2 to 5 inclusive. Length, 8 mm.

Holotype.—Female, Cayuga, Guatemala, June 15 (William Schaus). U.S.N.M. No. 52760.

CYPHOMYIA PILOSISSIMA Gerstaecker

Female, Mexico, Mexico (Juan Miller); male, Distrito Federal, Mexico (L. Conrad).

CYPHOMYIA FASCIPES Walker

Female, Caño Saddle, Gatun Lake, Panama, April 27, 1928 (R. C. Shannon); female, Amazon River near Obidos, Brazil, September 18, 1930 (Holt, Blake, and Agostini).

CYPHOMYIA PULCHELLA Gerstaecker

Female, Higuito, San Mateo, Costa Rica (Pablo Schild).

CYPHOMYIA PICTA Schiner

Female, Caño Saddle, Gatun Lake, Panama, May 17. 1923 (R. C. Shannon).

CYPHOMYIA SHANNONI, new species

A metallic-blue species, with a wholly yellow head and semihyaline wings with a large median brownish area. Close to *C. bequaerti* James.

Female.—Head yellow. Front approximately on a level with the eyes, slightly convex; its sides converging toward the base of the antennae, the relative widths at the anterior ocellus and at the insertion of the antennae being 16:11; the face likewise converging above, the relative widths at the base of the antennae and at the oral margin being 11:17. Occipital orbits moderately broad, broader above than below, their greatest width but slightly less than the width of the front at the narrowest point; the orbits moderately rounded behind. Vertex on a level with the front, sharply separated from the occipital orbits by deep furrows. Pile of front and vertex yellow, sparse, that of the rest of the head whitish, sparse, except on the sides of the face, where it is conspicuous and moderately long. Proboscis brown. Eyes bare; antennae black; the ratio of the first to the second segment 5:3; the third segment slightly shorter than the second, the others to the eighth gradually but slightly decreasing in length; the ninth and tenth segments are lost in the type. Thorax, including scutellum and spines, metallic bluish black, with abundant, mostly semiappressed, whitish pile; tips of scutellar spines yellow. Scutellum on a level with the dorsum; the spines three-fourths the length of the scutellum, directed backward on a plane with the scutellum, and slightly outward, the spines slightly bowed. Legs black or brownish black, the knees and the first two segments of all tarsi yellow. Halteres yellow. Wings pale brownish subhyaline; the stigma dark brown; an indefinitely outlined lighter brown area taking in the

discal cell, the lower basal corner of the first submarginal cell, the apices of the two basal cells and of the anal cell, the basal parts of the first, second, and third posterior cells, and most of the fourth and fifth posterior cells; this is darker toward the stigma than near the posterior margin of the wing. Abdomen concolorous with the thorax; the pile mostly whitish and semiappressed; however, there are some scattered erect black hairs on the posterior tergites; no lateral spots of silvery appressed hair. Length, 8 mm.

Holotype.—Female, Caño Saddle, Gatun Lake, Panama, May 13,

1923 (R. C. Shannon). U.S.N.M. No. 52761.

A group of six Neotropical species of *Cyphomyia* has the body bright metallic blue or bluish, the wings deeply and uniformly infuscated with black, the antennae wholly black, and the legs (except in some specimens the base of the middle basitarsi) black, or metallic blue. The black posterior basitarsi offer a good character for separating some of these species from related ones. The following key will separate the females of the six species of this group:

1.	Face black nigritarsis Enderlein
	Face yellow2
2.	Ocellar triangle situated on posterior margin of vertex; a black stripe connecting it with neck leucocephala Hoffmansegg
	Ocellar triangle remote from posterior margin of vertex; the space behind it wholly yellow
3.	Vertex with conspicuous golden pile zernyi Lindner
	Vertex with inconspicuous whitish pile or bare4
4.	Vertex elevated in middle, depressed laterally, ocellar triangle at anterior end of prominence; scutellar spines white or yellow on at least apical half ecuadorensis Enderlein
	Vertex lies below level of ocellar prominence, at least immediately behind it; scutellar spines at most tipped with yellow
5.	Ocellar triangle situated in a slight depression on front; front not elevated, but flattened and without a medlan trough. planifrons, new species
	Ocellar triangle elevated above vertex; front elevated laterally, with a median trough running from ocellar triangle to base of antennae altifrons, new species

CYPHOMYIA ECUADORENSIS Enderlein

Seven females, Bogota, Colombia (B. Guevara).

CYPHOMYIA PLANIFRONS, new species

FIGURE 71, b

Female.—Head yellow. Relative width of front at anterior ocellus, front above insertion of antennae, face immediately above oral margin, occipital orbit at upper corner of eye, and occipital orbit at center of eye, 30:23:28:20:17. Vertex separated from occipital

orbits by a moderately deep groove; the occipital orbits moderately rounded behind, front moderately convex, flattened above, and without a median groove; the posterior part of the front somewhat depressed, the ocellar prominence rising from this depression; the vertex rising from this depression, at its greatest elevation approximately level with the ocellar prominence. Pile of head white, inconspicuous except on the sides of the face. Eyes bare. Antennae black, the first two segments black-haired; the ninth segment twice as long as the tenth. Proboscis and palpi black. Thorax metallic violet-blue; scutellum and spines concolorous, the latter, however, tipped with yellow, scutellum on a level with the dorsum; the spines directed straight backward, slightly curved, about three-fourths the length of the scutellum. Pile of thoracic dorsum black, inconspicuous, that of pleura whitish. Wings deep black. Halteres black. Legs metallic blue, the tarsi black; the middle basitarsi at most slightly brownish basally; tarsi with dense, short, golden pile which may make them appear yellow to the naked eye. Abdomen concolorous with the thorax; pile inconspicuous, black dorsally, whitish on venter. Length, 12 mm.

Holotype.—Female, Bogota, Colombia (B. Gueyara). U. S. N. M.

No. 52762.

Paratype.—Female, same data.

CYPHOMYIA ALTIFRONS, new species

Male.—Head yellow, the occiput black only in the middle. Eyes separated at their nearest point by a distance equal approximately to the width of the second antennal segment; the vertical triangle, including the upper part of the front, enormous, inflated, greatly elevated above the eyes and the occipital orbits; the latter well developed. The relative width of the vertex at its widest point, of the front at its narrowest point, of the face above the oral margin, and of the occipital orbits (average), 26:4:22:10. Pile of vertex and occiput sparse, whitish; that of face light yellow, conspicuous. Eyes bare. Antennae black, the first and second segments black-pilose; segments 2, 8, 9, and 10 subequal in length, the first twice as long as the second. Thorax metallic violet-blue; pile black dorsally, whitish on pleura, in one specimen with slight evidence of a median dorsal golden band; scutellum and spines concolorous with the thorax, the spines yellowish at their tips; pile black. Spines almost as long as the scutellum. Legs metallic blue, the tarsi black; the middle and sometimes the other basitarsi somewhat yellowish basally; the basitarsi with dense yellow pile, which may make them appear yellow to the naked eye. Wings deep black. Abdomen concolorous with the thorax, black-haired. Length, 11-12 mm.

Female.—Sides of face and front parallel, only very slightly narrowed near the insertion of the antennae. Front and vertex elevated, the elevations taking the form of two folds running from the occiput to a point above the insertion of the antennae; the space between the folds is furrowed troughlike, but not sulcate; the ocellar triangle arises from this furrow. Vertex and occipital orbits divided by a distinct but only moderately deep groove, occipital orbits broader above than below; on an average, about three-fifths the width of the front. Tenth antennal segment twice as long as the ninth. Thoracic dorsum with a transverse patch of white pile, extending a short distance along the suture, and anterior to it; this is continuous with an area of similar hair on each pleuron; postalar calluses white-haired. Scutellar spines wholly blue, about half as long as the scutellum. Tarsi wholly black. Otherwise as in the male.

Holotype.—Male, Bogota, Colombia (B. Guevara). U.S.N.M. No.

52763.

Allotype.—Female, same data.

Paratopotypes.—3 males, 3 females, same data.

Remarks.—In spite of the differences in detail, I believe the males and females described above to be conspecific.

This species is close to that described by Gerstaecker as *C. cyanea* Fabricius but may readily be distinguished by the fact that in *altifrons* the vertex and front in the female are not so high, the former not being bubblelike ("blasenförmig"), and the basitarsi are black; and the occiput in the male is yellow, with the orbits well developed. The development of the male occipital orbits is a condition similar to that found in *C. androgyna* Williston.

CYPHOMYIA CYANEA (Fabricius)

Three females, upper Putamayo River, Colombia (B. Guevara); 1 male, Bogota, Colombia (B. Guevara).

These female specimens agree with Lindner's redescription and figure of *C. cyanea*, but not with Gerstaecker's figure, which Lindner considers an exaggeration. The eyes are hairy, as Lindner shows them. The male agrees with Fabricius's brief description, but it does not have the prominent vertex mentioned by Gerstaecker. The discovery of *altifrons* leads me to believe that Gerstaecker may have had a similar species, which he misidentified for *cyanea*.

CYPHOMYIA VARIPES Gerstaecker

Two females, Higuito, San Mateo, Costa Rica (Pablo Schild).

¹ Ann. Naturh, Mus. Wien, vol. 43, pp. 262-264, 1929.

CYPHOMYIA CHRYSODOTA Perty

Two females, San Jose, Costa Rica (Schild and Burgdorf); 1 female, Tucurrique, Costa Rica (Schild and Burgdorf). This species seems to be distinct from the closely related auriflamma; specimens of chrysodota are smaller and slenderer, and the face, especially in the male, is much more densely clothed with wholly snow-white pile.

Subfamily Geosarginae

Genus PTECTICUS Loew

PTECTICUS TESTACEUS (Fabricius)

One male, Cabima, Panama, May 21, 1911 (August Busck); 1 male, 1 female, Taboga Island, Panama, June 9 and 10, 1911 (Busck); 1 male, 1 female, Higuito, San Mateo, Costa Rica (Pablo Schild).

Genus MEROSARGUS Loew

MEROSARGUS CINGULATUS Schiner

Six females, Barro Colorado Island, Canal Zone, on fruits of *Ficus* sp., November 1934, No. 3415 (James Zetek); 1 female, Higuito, San Mateo, Costa Rica (Pablo Schild); 3 females, Caño Saddle, Gatun Lake, Panama, August 6 and 17, 1923 (R. C. Shannon).

MEROSARGUS STAMINEUS (Fabricius)

One female, Cabima, Panama, May 23, 1911 (August Busck).

MEROSARGUS GOWDEYI Curran

Two males, Porto Bello, Panama, March 15, 1911 (August Busck); 1 female, Caño Saddle, Gatun Lake, Panama, May 17, 1923 (R. C. Shannon).

MEROSARGUS SUBINTERRUPTUS (Bellardi)

One male, Barro Colorado Island, Canal Zone, May 17, 1923 (R. C. Shannon).

Genus CHRYSOCHROMA Williston

CHRYSOCHROMA FLAVOPILOSUM (Bigot)

Two males, Higuito, San Mateo, Costa Rica (Pablo Schild).

CHRYSOCHROMA AENEIVENTRIS (Giglios-Tos)

One female, Cayuga, Guatemala, June 15 (William Schaus); 1 female, Tuxtepec, Oaxaca, Mexico, No. 59 (Joaquin Camelo). I be-

lieve these specimens to belong to Giglio-Tos' species, in spite of several variations from the original description, namely that the middle and posterior coxae are yellow, the abdomen is green on the venter as well as on the dorsum, and the face immediately below the antennae is yellow (only the depressed oral margin being black). In view of the variation that may occur in species of Geosarginae, these characters may easily be variable to this extent. The black areas on the apices of the middle femora are sharply defined, and less so on the fore and hind femora; on the middle femora the black area is much more extended ventrally than dorsally.

Subfamily PACHYGASTRINAE

Genus ARTEMITA Walker

ARTEMITA HIEROGLYPHICA (Wiedemann)

One female, Amazon River, Arary to Manaos, Brazil, September 20-21, 1930 (Holt, Blake, and Agostini).

Genus EUPACHYGASTER Kertész

EUPACHYGASTER VILLOSA, new species

Readily distinguishable from the two American species that have been referred to this genus by the narrow front and the dense silvery tomentum of the thoracic dorsum in the female and the contiguous eyes and slender abdomen in the male.

Female.—Head black, shining; the lower half of the front (except a narrow median longitudinal line) and the sides of the face silvery pollinose. Front narrow, at its narrowest part (near the middle) two-thirds as wide as the base of the ocellar triangle, and one-third as wide as at the insertion of the antennae; the face gradually becomes broader. Head three-fourths as long as high, the antennae inserted somewhat below the middle. Antennae and proboscis vellow. Arista bare. Occipital orbits undeveloped, except below. Thorax black, the dorsum and scutellum densely and uniformly clothed with silvery tomentum; the scutellum with a definite rim, which is beset with numerous minute teeth. Pleura shining, bare. Legs, including coxae, wholly yellow. Wings hyaline, with a slightly yellow cast; vein R₂₊₃ originating slightly beyond cross-vein r-m, which is short but distinct; R5 slightly more than twice as long as R4. Halteres yellow. Abdomen about as wide as long, black, with scattering whitish hairs. Length, 3 mm.

Male.—Eyes contiguous, the facets above larger than those below but not divided from them by a definite line. Head almost as long as high. Thorax and scutellum with scattering yellowish-white hair, the abdomen similarly haired. Body much slenderer than in the female, the abdomen being only three-fourths as broad as long. Vein Ross originating before cross-vein r-m. Length, 2.5 mm.

Holotype.—Female, Higuito, San Mateo, Costa Rica (Pablo Schild). U.S.N.M. No. 52765.

Allotype.—Male, same data.

Paratopotypes.—Three females and 3 males, same data.

Remarks.—The generic position of this species is given only provisionally. In Kertész's key 2 it traces to Abiomyia (males) or to couplet 152 (females); in Curran's key it traces readily to Eupachyquster. According to the classification of Kertész, our species of Eupachygaster are not congeneric with Pachygaster tarsalis Zetterstedt, the type of the genus; E. punctifer Malloch and E. henshawi Malloch should form a separate genus, and E. villosa still another one. To take such a step would, however, be unwise, unless one had abundant material and could make a thorough study of this difficult group. It is possible that too many genera of Pachygastrinae have already been proposed.

² Ann. Mus. Nat. Hungarici, vol. 14, pp. 127-140, 1916.

⁸ The families and genera of North American Diptera, 512 pp., 1934. New York.