

of a gallery forest bisecting the semi-arid littoral of central Manabí. *Guttulatum* ranges into the arid montane valleys of Ríos Catamayo and Arenal (1,000 and 1,500 meters elevation) (Parker, 1938).

Guttulatum occupies disturbed and undisturbed habitats (Guayaquil). In the Peninsula of Santa Elena *Guttulatum* and *Ameiva edracantha* are sympatric; in more densely vegetated areas *Guttulatum* and *Tropidurus* are sympatric. Only *Tropidurus* and *Dicrodon* are known from Isla Santa Clara.

CONCLUSIONS

Dicrodon guttulatum is polytypic with two geographic races: *holmbergi* Schmidt and *guttulatum* Duméril and Bibron. The nominate race ranges from the Province of Manabí and probably the Province of Esmeraldas south to Sullana, Department of Piura, and questionably to Matucana, Department of Lima. *Holmbergi* is known from Pacasmayo, Department of Libertad, and the valleys of Ríos Virú and Chao, Department of Piura. *D. barbouri* is conspecific with *D. g. guttulatum*.

Key to the Subspecies of *D. guttulatum*

At least 2¾ posterior supraoculars separated from the median head scales by an intervening row of scales; usually three rows of enlarged anteb

Three posterior supraoculars usually in conta

median head scales; usually two rows of enlarged anteb-
brachials———*D. g. guttulatum*.

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LITERATURE CITED

- Barbour, T. and A. Loveridge. 1929. Typical Reptiles and Amphibians. *Bull. Mus. Comp. Zool.* 69(10):205-360.
- Burt, C. E. and M. D. Burt. 1931. South American Lizards in the Collections of the American Museum of Natural History. *Bull. Am. Mus. Nat. Hist.* 61(7):227-395.
- _____. 1933. A Preliminary Checklist of the Lizards of South America. *Trans. Acad. Sci. St. Louis* 28:vt104.
- Garman, S. 1892. On the Reptiles Collected by Dr. George Baur near Guayaquil, Ecuador. *Bull. Essex Instit.* 19:1-12.
- Noble, G. H. 1924. New Lizards from Northwestern Peru. *Occ. Papers Boston Soc. Nat. Hist.* 5:107-113.
- Parker, H. W. 1938. Vertebrate Distribution of Some Reptiles and Amphibians in Southern Ecuador. *Ann. Mag. Nat. Hist.* 11(2):438-450.
- Peters, J. A. 1967. The Lizards of Ecuador. *Proc. United States* 119(3545):1-49.
- _____. 1957. Notes on Lizards of the Genus *Dicrodon*. *Zool., Chicago Nat. Hist. Mus.* 39(9):65-71.
- _____. 1961. Principles of Animal Taxonomy. Columbia 244 pp.

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IMMATURE STAGES OF SOME EASTERN NEARCTIC TABANIDAE¹ (DIPTERA). IV. The Genus *Merycomyia*

JAMES T. GOODWIN

Memphis State University, Memphis, Tennessee 38111

ABSTRACT

This fourth in a series of discussions of the larvae and pupae of eastern Nearctic Tabanidae presents figures and descriptions of the larva and pupa of *Merycomyia brunnea* Stone and discusses the variability in larvae, pupae, and adults of *M. whitneyi* (Johnson). New distributions for both species also are noted.

KEY WORDS:

Chrysopsinae, Bouvieromyiini, horse and deer fly, larvae and pupae, *Merycomyia brunnea*, *Merycomyia whitneyi*, Tabanidae.

INTRODUCTION

The genus *Merycomyia* Hine includes the only species of the tribe Bouvieromyiini known to occur in the Nearctic. Pechuman (1964) recognized only two spe-

cies, *brunnea* Stone and *whitneyi* (Johnson), listing *mixta* Hine and *geminata* Hine as synonyms of the latter. Both species are poorly known. Only about 30 adults of *whitneyi* are available, and less than 20 are known for *brunnea*. Of these, approximately ⅓ of the former and all but 2 of the latter were reared from full-grown larvae. Jones and Anthony (1964) reported collecting and rearing both species, but they furnished no descriptions of the immatures. Dr. Mac Tidwell (personal communication) informed me that he had collected and reared *whitneyi* also. Teskey (1969) gave descriptions of the full-grown larva and the pupa of *whitneyi* based on specimens collected at Gilmour, Ontario, Canada. All larval collections by Tidwell and Jones and Anthony were made in Florida.

METHODS

During the month of May, 1971, the author was fortunate to collect larvae of both species and subsequently reared two

1. This project was supported in part by a Faculty Research Grant from Memphis State University.

adults of *whitneyi*, and one of *brunnea*. One larva of *whitneyi* was taken from wet, silty mud in the bed of a stream crossing U. S. Hwy 441 about five miles south of Alachua, Alachua Co., Florida. The larva was found no more than 20 yards west of the bridge. The other larva of *whitneyi* and the single larva of *brunnea* were taken at the margin of a borrow pit at the north side of Georgia Hwy. 177 (between Fargo, Ga., and Stephen C. Foster State Park in the Okefenokee Swamp) near the western edge of Ware County. The larvae were in the upper half-inch of wet sand just beneath a 1-2-inch layer of wet, decomposing plant material. Shoreline grasses were growing in the area, their roots extending down into the sand. This is the first record for either species in the Swamp and the first record for *brunnea* outside of Florida. In May, 1972, I again collected a single larva of *brunnea*, from a similar area of the same borrow pit, and reared it. The author also reared two adults of *whitneyi*, during the same period from larvae purchased at a bait shop in Madison, Florida. Pechuman (1964) referred to these two species as "mystery insects", an expression referring to the lack of knowledge related to them. However, fishermen in Florida and southern Georgia have collected the larval stages of *whitneyi* for bait in large numbers for many years and refer to them as "sand maggots". The bait shop I visited had several hundred full grown larvae slightly submerged in two plastic dish-pans kept in a refrigerator. Most of them were apparently alive. The verbal accounts of collecting techniques revealed two methods of collecting the larvae. One method involved wading in shallow sandy-bottom ponds and using a yard rake to disturb the bottom. This freed the larvae from the sand, and they floated to the surface where they were hand collected. The second method, used commercially, involved the use of a wire-mesh (probably hardware cloth) dredge towed behind a boat in similar habitat to that noted above. The author did not see the method in use, but the number of larvae available in bait shops indicated it is very successful. The larvae which the author collected were taken at the margin of small ponds using a small hand-rake.

RESULTS

Below are found descriptions and figures of the full-grown larva and pupa of *brunnea*. Also, since some

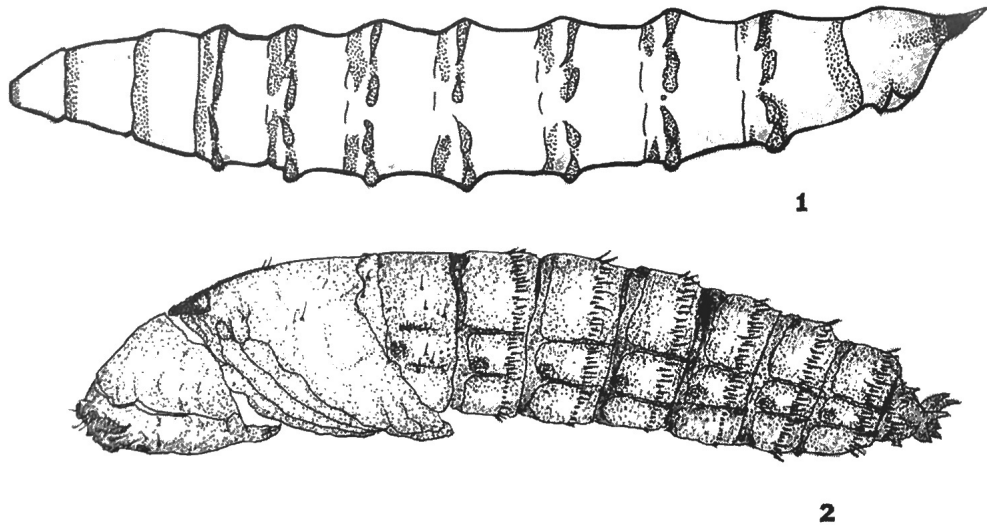


Figure 1. Lateral view of larva of *Merycomyia brunnea*.

Figure 2. Lateral view of pupa of *M. brunnea*.

variation is evident in the larvae, pupae, and adults of *whitneyi* some comments on this species are furnished. Furthermore, since *whitneyi* and *brunnea* are the only species known for the genus, generic diagnoses for the larvae and pupae are given, as is a key for distinguishing the larvae and pupae. Explanations and figures illustrating the terminology employed may be found in Teskey (1969) and Goodwin (1972).

Larvae may be recognized on the basis of the following: four pairs of pseudopodia on each of the first seven abdominal segments, the ventrolateral pair being incompletely separated from the ventral pair; anterior pubescent annuli of thoracic segments lacking posterior projections; anal segment lacking pubescence on median lateral surfaces; respiratory siphon composed of paired lateral sclerotized plates joined dorsally and ventrally by transparent striated integument; the siphon attached to anal segment near caudal third, being therefore largely invaginated; stigmal spine present, the spine unusual in that it is laterally compressed and as broad along basal 1/4 as the tracheal trunks of the anal segment and the dorsal and ventral edges exhibit a convex curvature as they taper to a point (the latter contrasts with the concave margins of stigmal spines of certain other tabanid larvae).

Pupae may be characterized as follows: antennal ridges not divided into median and lateral portions; callus tubercles each with a single seta and, in ventral view, globular or teardrop shaped, diverging laterally from ventral to dorsal margins; biseriate fringes of spines on abdominal segments 2-7 with posterior series reduced to a submedian and usually two lateral pairs on all tergites.

KEY TO IMMATURES *Merycomyia*

LARVAE

- 1. Abdominal segment VI with a narrow but distinct posterior pubescent annulus (may be indistinct in specimens from extreme northern third of range). Head capsule of full-grown larva exceeds 3.8 mm. in length. Combined length of stigmal spine and internal sclerotized plates lying lateral to dorsal tracheae more than 4.0 mm in full-grown larva. Full-grown larva exceeds 38 mm in length *whitneyi*
- Abdominal segment VI lacking posterior pubescence. Head capsule less than 3.7 mm in length. Combined length of stigmal spine and plates less than 3.5 mm. Length of full-grown larva less than 35 mm *brunnea*

PUPAE

- 1. Length of pupa greater than 25 mm. Fringe of tergite VII of more than 75 spines *whitneyi*
- Length of pupa less than 22 mm. Fringe of tergite VII of less than 60 spines *brunnea*

MERYCOMYIA BRUNNEA STONE

Mature Larva (Fig. 1) 31 mm long; whitish with contrasting pale pubescent markings. Head capsule 3.67 mm in length, greatest width 0.83 mm. Anal segment 2.1 mm long, about 1/5 greater than its basal diameter. Respiratory siphon 0.7 mm long, about 1/3 greater than basal diameter; conforms to the generic characteristic in that it is composed of two parallel-sided, lateral sclerotized plates joined dorsally and ventrally by transparent striated integument; attached to anal segment near outer third, the invaginated portion visible through transparent integument of anal segment. Stigmal spine present, the spine laterally compressed; as wide basally as tracheal trunks of anal segment and maintaining the width for about 1/4 its length; tapering to a point over apical 3/4 with dorsal and ventral edges convex. Tracheal trunks 0.22 mm in diameter in preanal segment, tapering gradually anteriorly. Striations present on all lateral surfaces with most striae traversing the segment, spaced 0.035-0.05 mm; dorsally and ventrally with a few striae traversing the length of segments, but mainly striae irregular and incomplete. Four pairs of pseudopodia on each of the first seven abdominal segments, the ventrolateral pair only partially separated from the ventral pair. Pubescence found on all segments; pubescence pale brown, darkest on anal segment. Anterior pubescence on all segments except anal segment, forming complete annuli on thoracic and first abdominal segments; thoracic annuli lack caudal projections; anterior pubescence absent midlaterally on abdominal segments 2-7, the non-pubescent area increasing in size rearward. Pseudopodial pubescence on all pseudopodial segments, forming complete annuli on first two and being absent between lateral and ventrolateral pseudopodia on others; united with anterior pubescence dorsolaterally and ventrolaterally on abdominal segment 1 and dorsolaterally on abdominal segment 2. Posterior pubescence

present on anal and preanal segments where it forms complete annuli. Anal ridges and lobes pubescent; midlateral surface of anal segment lacking pubescent markings.

Pupa (Fig. 2-4) yellow brown; 18.5 mm long. Antennal ridges not divided into median and lateral portions; apices rounded; separated mesally; elevated above median cleft 0.18 mm. Callus tubercles each with a single seta; in ventral view appear as two diverging tear-drop shaped mounds with smooth surfaces; more widely separated at dorsal extremes; 0.2 mm high. Entire frontal area except for a shallow depression running from median cleft dorsally to a point between callus tubercles,

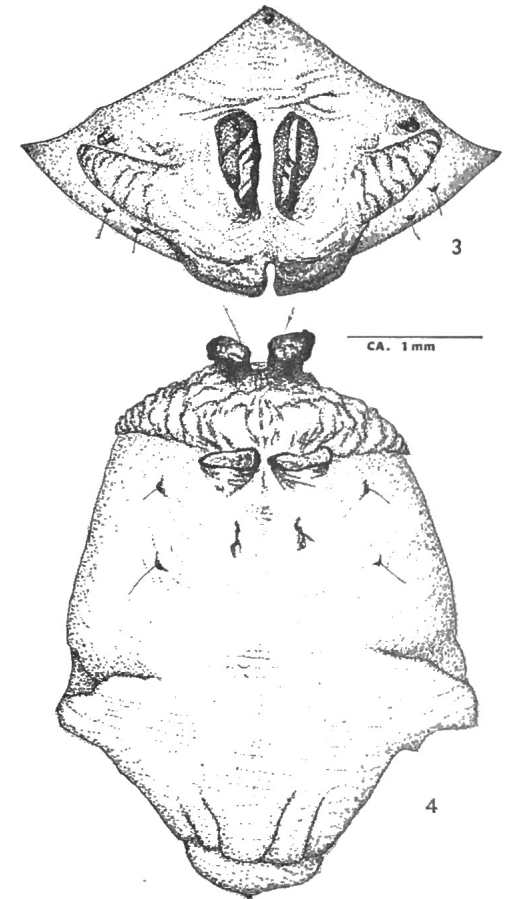


Figure 3. Anterior view (ventral edge at bottom) of frontal plate of pupa of *M. brunnea*.

Figure 4. Ventral view (anterior at top) of frontal plate of pupa of *M. brunnea*.