

A NEW SPECIES OF *CULEX (MELANOCONION)* ENCOUNTERED DURING ARBOVIRUS SURVEILLANCE IN MEXICO (DIPTERA: CULICIDAE)¹

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ABSTRACT. The adult male of *Culex (Melanoconion) diamphidius*, a new species from southern Mexico, is described. The genitalia are illustrated and scanning electron micrographs of parts of the adult habitus are provided.

INTRODUCTION

During 1988-89 we received many adult mosquitoes from Werner L. Jakob of the Arbovirus Ecology Branch, Vector-Borne Diseases Division, Centers for Disease Control, Fort Collins, Colorado for verification or identification of species collected in connection with arbovirus surveillance in Mexico. Among these were four males, with dissected genitalia on microscope slides, that represented a species of *Culex (Melanoconion)* which we were unable to identify. In view of the unusual gonostylus of the genitalia, it seemed quite likely that the specimens represented an undescribed species, but at the time we were unable to make a thorough search of all published descriptions of the 236 nominal species in the subgenus. We have since had the opportunity to confirm the status of this species and here describe and name it *Culex (Melanoconion) diamphidius*.

All four males of the type series are incomplete, with varying degrees of damage, including some breakage of appendages, denuded or rubbed areas and the presence of scattered scales from other insects, which is a common condition for specimens collected in light

traps. The drawings of genitalic structures were made from the holotype, except for the ninth tergal lobes, which were drawn from a slide of paratype number 880526-15. The ninth tergal lobes of the holotype are in excellent condition, but are not positioned to fully show their distinctly produced, closely approximated, inner basal margins. Overall, the holotype is in poorer condition than any of the paratypes. Consequently, the following description of the male habitus is a composite of all four specimens. The morphological terminology follows Harbach et al. (1984).

TAXONOMIC TREATMENT

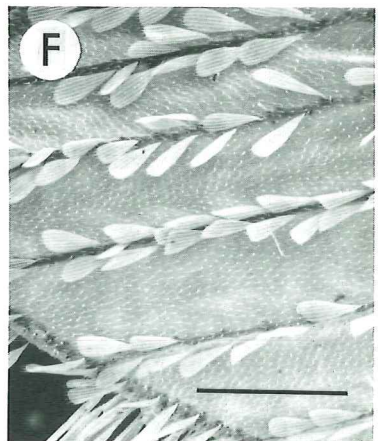
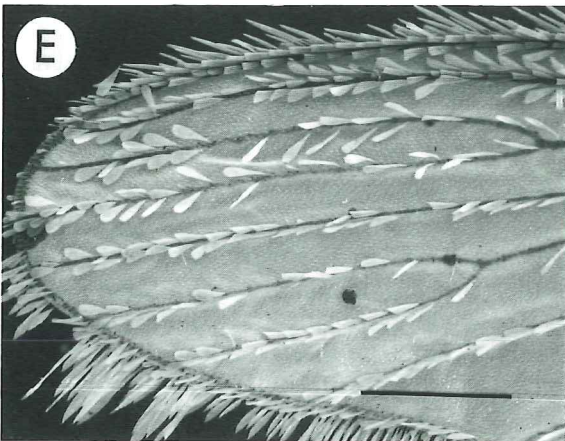
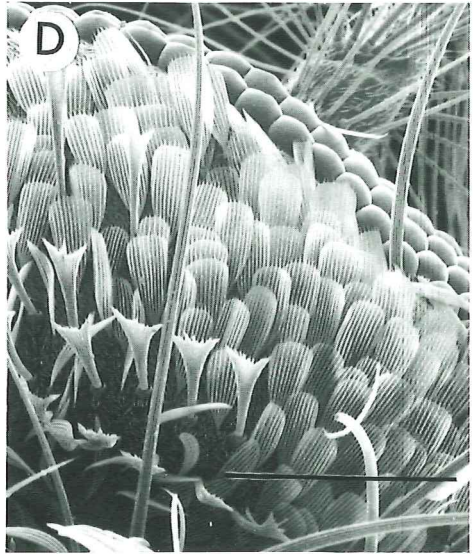
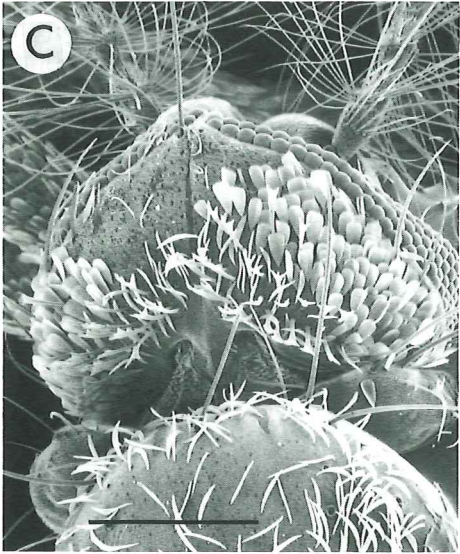
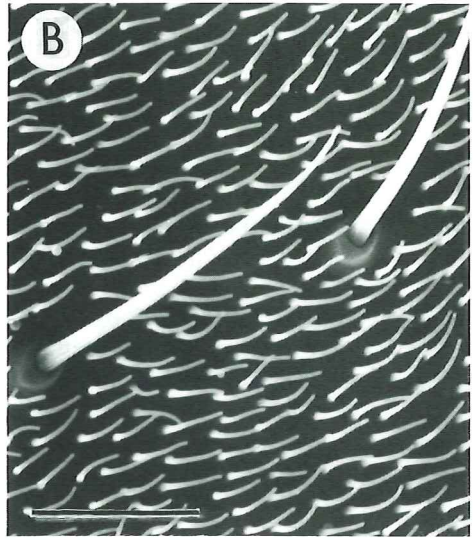
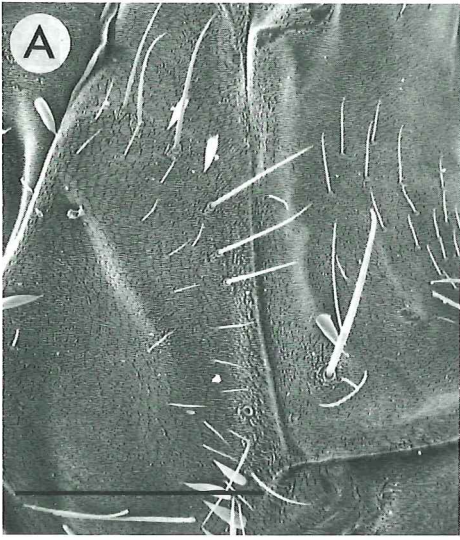
Culex (Melanoconion) diamphidius, new species

A small dark species with uncertain affinities. Differing from all known species of the subgenus in the highly specialized (derived) gonostylus of the male genitalia.

Male. Mostly clothed with brown scales. **Head:** Antenna strongly verticillate; length about 1.65 mm. Proboscis without apparent false joint; length about 1.75 mm. Maxillary palpus entirely dark-scaled; length about 2.1 mm, exceeding proboscis by about length of palpomere 5; palpomeres 4 and 5 with numerous setae along ventral margin, those on 4 longer, 5 with 3,4 long dark setae apically, palpomere 3 with 3-5 setae on inner apical area. Vertex (Fig. 1C,D) with broad spatulate scales, these very light brown dorsally, becom-

¹ The views of the authors do not purport to reflect the views of the Department of the Army or the Department of Defense.

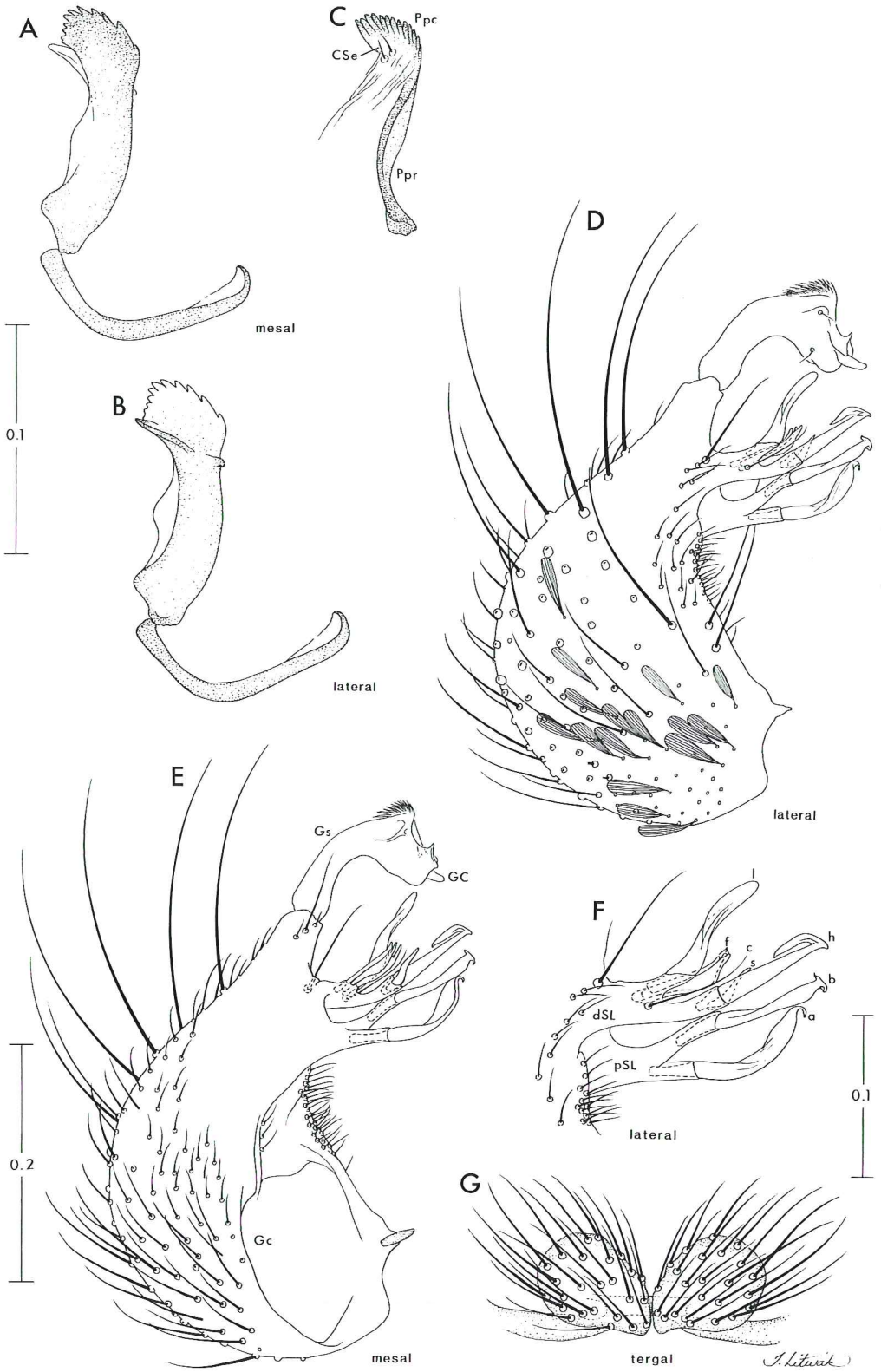
² Reprint requests: Walter Reed Biosystematics Unit, Museum Support Center, MRC 534, Smithsonian Institution, Washington, DC 20560.



ing dingy white laterally, no discernable lighter line of scales along margin of eye, erect forked scales black; occiput with some pale whitish, narrow falcate scales. *Thorax*: Integument light to dark brown. Scutum with narrow falcate scales of uniform size and color, brownish black with coppery reflections; scutal setae prominent, brownish black, acrostichal setae absent, 3 pairs of alveoli (setae missing) present on anterior portion of pre-scutellar area. Scutellar scales same as scutal scales; lateral lobes with 3 large setae, median lobe with 6 large setae. Antepnotum without scales; with evenly dispersed dark setae. Postpronotum with pale brown, narrow falcate scales on dorsal margin; with 3–5 dark setae on posterodorsal margin. Pleural integument light brown, postpronotal, prespiracular, postspiracular areas and prealar knob slightly to distinctly darker; setae pale yellowish or whitish, darker on prealar knob and lower mesepimeron, numbers present include about 10 upper proepisternal, 5,6 prealar, 5,6 upper mesokatepisternal, 12–14 progressively shorter and weaker lower mesokatepisternal, 4–6 upper mesepimeral and a long, strong, lower mesepimeral; upper and posterior surface anterior to marginal setae of mesokatepisternum and middle area of mesepimeron with small, inconspicuous, scattered, nearly colorless or whitish decumbent setae (Fig. 1A,B). Pleura with scales on mesokatepisternum only, a row of nearly colorless spatulate scales on posterior margin extending dorsally from about level of proximal 0.25 of midcoxa to about ventral 0.25 of mesepimeron (in least rubbed specimen). Mesopostnotum dark, bare. *Wing*: Length 2.2–2.4 mm; cell R_2 4.3–5.0 of R_{2+3} ; cell M_1 0.7–0.8 of cell R_2 ; subcosta intersects costa slightly proximal to furcation of R_{2+3} . Dorsal scaling (Fig. 1E,F): appressed spatulate scales on costa, subcosta, R, R_1 , R_{4+5} , M_1 , M_2 , M_{3+4} , mcu, CuA and 1A; linear plume scales on R_s , R_{2+3} , M and M_{1+2} ; remigium with appressed spatulate scales and 2 or

3 dark setae distally on posterior margin. Ventral scaling: appressed spatulate scales on costa, R_s , R_{2+3} , R_2 , R_3 , M, M_{2+3} , and proximally on M_2 ; linear plume scales on proximal 0.6 of R_{4+5} , M_{3+4} , mcu and CuA beyond mcu; CuA before mcu and proximal 0.5 of 1A devoid of scales; alula with prominent patch of narrow linear scales on distal 0.5 of posterior margin; upper calypter with long setae along most of margin. *Halter*: Scabellum, approximately basal two-thirds of pedicel and ventral portion of capitellum whitish; capitellum and distal third of pedicel dark. *Legs*: Anterior surface of forecoxa with patch of shiny, light cream-colored scales on dorsal 0.5 and scattered light brown scales on ventral 0.5; anterior surfaces of mid- and hindcoxae with vertical line of few nearly colorless scales. Antero- and posteroventral surfaces of trochanters with nearly colorless scales. Femora broadly covered with pale grayish or light cream-colored scales on ventral surfaces. Tibiae and tarsi entirely dark-scaled. *Abdomen*: Tergum I with median posterior patch of dark scales; terga II–VI dark-scaled with evidence of basolateral patches of light cream-colored scales on III–V (remaining terga removed with genitalia, or rubbed). Sterna I–VI with light brown to cream-colored scales. *Genitalia* (Fig. 2A–G): Gonocoxite markedly expanded on basal 0.5, outer margin strongly convex, inner concave; ventrolateral setae strongly developed, ventromesal surface with a median patch of small, short setae followed by longer, stronger setae basally, tergomesal surface with a narrow linear patch of small, short setae proximal to subapical lobe, proximal part of ventrolateral surface with scales; subapical lobe distinctly divided, divisions approximated, proximal division with 2 arms, basal arm shorter, each with a long sinuous, apically hooked seta (setae *a* and *b*); distal division elongated, with 2 apical and 5 subapical setae, apical setae include a long, strong, acutely hooked seta (*h*) and a short, pointed seta (*s*),

Fig. 1. *Culex (Mel.) diamphidius*, paratype male number 890411–4. A, Mesokatepisternum and mesepimeron showing presence of small, decumbent setae; B, two small decumbent setae on midregion of mesokatepisternum; C,D, dorsal scaling of head; E,F, dorsal scaling on distal portion of left wing. Scale lines = 0.01 mm (B), 0.10 mm (D,F) and 0.20 mm (A,C,E).



subapical setae include a relatively long, slender, flexible seta (*c*) on lateral side and 3 short, subequal, narrow, appressed setae (*f*) and a long, moderately broad, apically rounded, twisted foliform seta (*l*) on caudal side. Gonostylus very short, robust, strongly curved at midlength, distal part expanded, thickened and bearing a prominent, spiculate, subapical crest on ventral side, sloping sharply from crest to a small, raised, transverse ridge just proximal to broadly rounded apex, which bears a prominent, thick, apically rounded gonostylar claw, expanded part also with 2 minute setae on mesal side. Phallosome with lateral plates and aedeagal sclerites of nearly equal length; aedeagal sclerite narrow and curved in lateral view, anterior margin not noticeably thickened, dorsal connection to plates not strong (detached in slide preparations, true positional relationship approximated in Fig. 2A,B). Distal part of lateral plate with apical, ventral and lateral processes; apical process broad, caudal (apical) margin slightly convex in lateral view, tergal margin almost perpendicular to caudal margin, these margins conspicuously serrate; ventral process very short, blunt, barely extending beyond ventral margin of plate; lateral process a strong ridge basally, with pointed apex extending slightly beyond tergal margin of apical process; remainder of plate without distinctly thickened areas. Aedeagal sclerites not connected by dorsal aedeagal bridge. Proctiger elongate; paraproct narrow distally, expanded basally, crown with row of 12–14 short, simple blades. Cercal sclerite long and narrow; 2 cercal setae. Tergum X large, concavo-convex with dorsolateral surface convex, somewhat rectangular with mesal part only slightly broader.

Type data. Holotype male, with associated genitalia on a microscope slide, bearing the following collection data: MEXICO, Oaxaca (17°00'N 96°30'W), Talosita, 17 January 1988, coll. Jorge Hernandez, WRBU acces-

sion number 1379 and CDC microscope slide preparation number 890201–6, collected in CDC light trap supplemented with dry ice. Paratypes: 3 males, with associated genitalia on separate microscope slides, Veracruz (19°20'N 96°40'W), Playa Vicente, 8 and 9 March and 18 October 1988, coll. Jorge Hernandez, CDC microscope slide preparation numbers 880526–6, 880526–15 and 890411–4 (adult gold-coated for SEM), also collected in light trap. The specimens are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC, U.S.A.

Distribution. Known only from the southern states of Veracruz and Oaxaca, Mexico.

Etymology. *Culex diamphidius* is named for the salient character of the gonostylus. The specific name is derived from the masculine Greek adjective *diamphidios* meaning “utterly different.”

DISCUSSION

We are uncertain of the affinities of this species. The adult male has a very short uniquely shaped gonostylus. A few species such as *Cx. abominator* Dyar and Knab, *Cx. anips* Dyar and *Cx. peccator* Dyar and Knab resemble *Cx. diamphidius* in having apically enlarged gonostyli, but other than this there is little similarity. The presence of small decumbent setae on the surface of the mesokatepisternum as well as the mesepimeron may be unique. According to Sirivanakarn (1983), these setae are present on the “lower posterior part” of the mesepimeron in *Cx. vomerifer* Komp and the 14 species included in the Bastagarius Group, i.e., *Cx. bastagarius* Dyar and Knab, *Cx. bifoliolatus* Duret and Barreto, *Cx. comatus* Senevet and Abonnenc, *Cx. confundior* Komp and Rozeboom, *Cx. coppenamensis* Bonne-Wepster and Bonne, *Cx. correntynensis* Dyar, *Cx. creole* Anduze, *Cx. dolichophyllus* Clastrier, *Cx. dureti* Casal and

Fig. 2. Male genitalic structures of *Culex (Mel.) diamphidius*, aspects as indicated. A,B, Lateral plates and aedeagal sclerites, positional relationships (attachments) approximated; C, proctiger; D,E, gonocoxopodite; F, subapical lobe; G, tergum IX. Scales in mm.

Garcia, *Cx. intonsus* Galindo and Blanton, *Cx. iolambdis* Dyar, *Cx. limacifer* Komp, *Cx. quasihybridus* Galindo and Blanton and *Cx. tournieri* Senevet and Abonnenc. We examined specimens representing 11 of these species (specimens of *Cx. bifoliolatus*, *Cx. confundior*, *Cx. dolichophyllus* and *Cx. dureti* were unavailable for study), and none of them had these setae on the mesokatepisternum. The lateral plate of the phallosome of *Cx. diamphidius* is of the type found in all members of the Bastagarius Group, which suggests that it may belong to this group.

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REFERENCES CITED

- Harbach, R.E., E.L. Peyton and B.A. Harrison. 1984. A new species of *Culex* (*Melanoconion*) from southern South America. *Mosq. Syst.* 16:185-200.
- Sirivanakarn, S. 1983. A review of the systematics and proposed scheme of internal classification of the new world subgenus *Melanoconion* of *Culex* (Diptera: Culicidae). *Mosq. Syst.* (1982) 14:265-333.