

TWO NEW SPECIES OF ORIENTAL BITING MIDGES (DIPTERA: CERATOPOGONIDAE)

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Abstract.—Two new species of oriental biting midges (Diptera: Ceratopogonidae) are described and illustrated: *Atrichopogon daleyae* from Malaysia, Philippines, and Vietnam, and *Alluaudomyia delfinadoae* from Malaysia.

Recently we published a description of an unusual species of *Atrichopogon* from Sri Lanka (Giles and Wirth, 1982). Further study of material from the Oriental Region has brought to light a similar species which we describe here. In addition we address ourselves to the problem of a Malaysian species, *Alluaudomyia infusca*, described by Wirth and Delfinado (1964). The holotype male (Type no. 67241), allotype female, paratype female, and 2 paratype males were deposited in the NMNH. While studying this type series we found that the two paratype males were not *A. infusca* but a different species that we describe as new in this paper.

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For explanation of measurements and ratios see Giles et al. (1981), Wirth (1980), and Wirth and Delfinado (1964). NMNH indicates the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Atrichopogon daleyae Giles and Wirth, NEW SPECIES

Fig. 1

Female.—Wing length 0.84 (0.79–0.89, $n = 5$) mm; breadth 0.36 (0.34–0.38, $n = 5$) mm.

Head: Brown. Eyes finely pubescent above, bare below; narrowly separated by a distance equal to 1 ommatidial facet. Antenna (Fig. 1a) light brown with well-developed verticils on all segments; flagellar segments in proportion of 24-14-16-19-20-20-20-22-54-54-58-60-86; antennal ratio 2.01 (1.81–2.01, $n = 6$); segment 15 with terminal papilla; segments 3–10 ovoid and not appressed. Palpus (Fig. 1b) light brown; segments in proportion of 15-29-38-22-22; 3rd segment moderately swollen from base with sensory pit both moderately large and deep; palpal ratio 2.71 (2.13–2.71, $n = 6$). Proboscis brown, long, sections A-B-C (see Wirth, 1980) in proportion of 46-32-30; mandible (Fig. 1d) with 16 (15–18, $n = 6$) large teeth becoming smaller proximad.

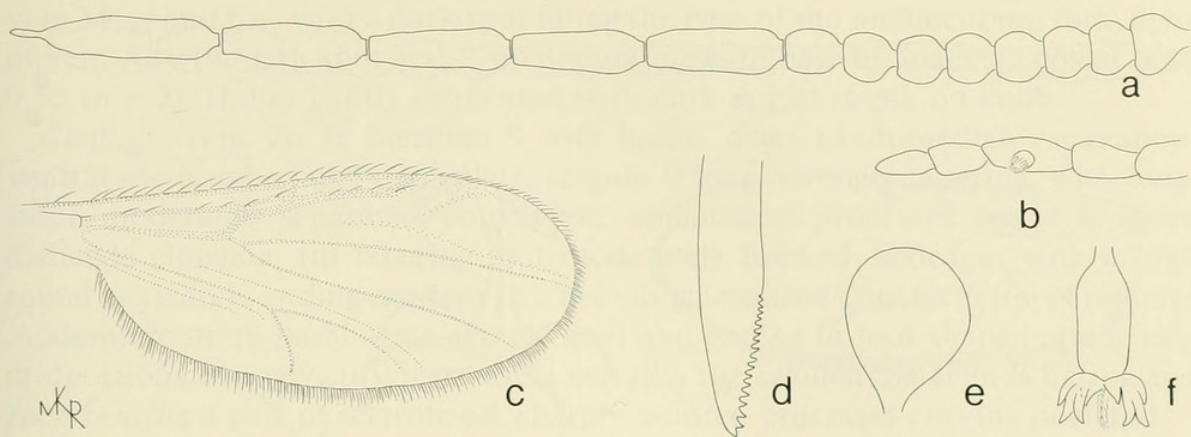


Fig. 1. *Atrichopogon daleyae*, female: a, antenna; b, palpus; c, wing; d, mandible; e, spermatheca; f, claws of midleg.

Thorax: Brown, pleura lighter. Legs with coxae brown, trochanters light brown; femora and tibiae light brown becoming paler proximally; hindtibial comb with 5 (5–7, $n = 6$) spines; hindtarsal ratio 2.92 (2.59–2.95, $n = 6$). Paired claws (Fig. 1f) of each leg trifold, the midtooth longest.

Wing (Fig. 1c): Light brown, veins darker; macrotrichia few on anterior veins, none on membrane. Costal ratio 0.70 (0.68–0.71, $n = 6$); 2nd radial cell 2.6 (2.4–3.3, $n = 6$) $\times$ length of 1st. Halter but lightly infuscated.

Abdomen: Light brown, darkening toward tip. Spermatheca (Fig. 1e) measuring 0.044 by 0.062 mm including neck; ovoid, sparsely punctate basally, with long tapering neck.

Male.—Unknown.

Distribution.—Malaysia, Philippines, Vietnam.

Types.—On slides in phenol balsam. Holotype female, Vietnam, Chu Lai, January 1969, B. L. Trap, Coll. J. E. Tisdale (Type no. 76599, USNM). Paratypes, 2 females, same data as holotype; 1 female, Malaya, Selangor, Kuala Lumpur, IMR Grazing Ground, vii.1958, light, coll. R. Traub; 1 female, Malaya, Selangor, Subang For. Res., 1959–60, trap, coll. H. E. McClure; 1 female, Philippine Islands, Mindanao, Mt. Apo School, 15 km SW Davao, 500 m, 22–31.x.1965, coll. D. Davis. Holotype and paratypes deposited in NMNH.

Etymology.—This species is named for Ms. Margaret Daley in appreciation of her humor and patience in typing our manuscripts.

Discussion.—*Atrichopogon schizonyx* Giles and Wirth (1982) from Sri Lanka is closely related but can be distinguished from *A. daleyae* by the following characters: proximal antennal segments are shorter and disciform, antennal ratio 2.49 (2.01 in *daleyae*); 3rd palpal segment is more swollen, with palpal ratio 2.1 (2.71 in *daleyae*) and in the wing the 2nd radial cell is $4\times$ length of the 1st (2.6 in *daleyae*). The spermatheca is larger (0.106 $\times$ 0.074 mm) and oval, not tapering to the neck (0.044 by 0.062 mm with tapering neck in *daleyae*).

Alluaudomyia delfinadoae Giles and Wirth, NEW SPECIES

Fig. 2

Alluaudomyia infuscata Wirth and Delfinado, 1964: 621 (in part; 2 paratype males from Kuala Singgora, Malaysia).

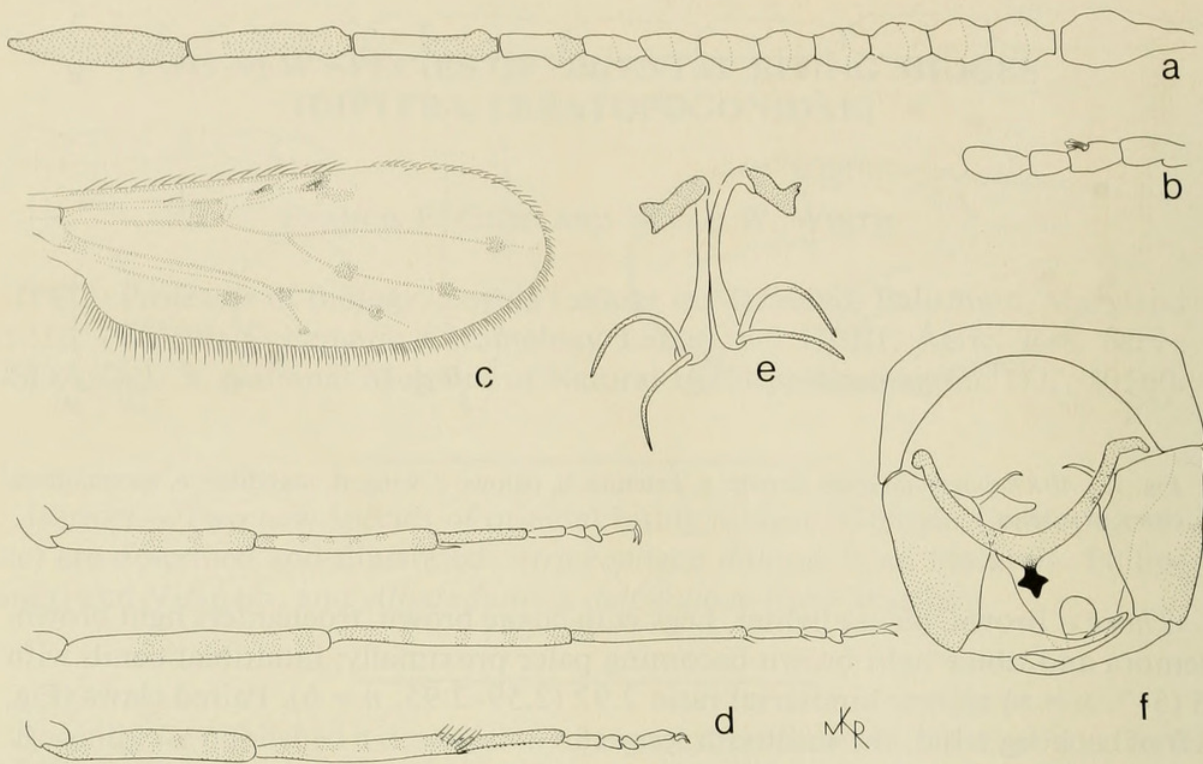


Fig. 2. *Alluaudomyia delfinadoae*, male: a, antenna; b, palpus; c, wing; d, fore-, mid-, and hindlegs (top to bottom); e, parameres; f, genitalia, parameres omitted.

Male.—Wing length 0.88 mm (0.85–0.88, $n = 2$).

Head: Brown. Eyes narrowly separated by a distance equal to 1 ommatidial facet. Antenna (Fig. 2a) stramineous with well-developed plume; flagellar segments dark at apical half of 3, tip of 12, base of 13, basal $\frac{2}{3}$ of 14 and all of 15; verticils large on segments 13 and 14, weakly developed on 15; segment 15 lanceolate. Palpus (Fig. 2b) dark brown, segment 3 with moderately large, irregular, shallow, sensory area; palpal ratio 1.86 (1.69–1.86, $n = 2$).

Thorax: Brown with dark brown mottling dorsad; pleura with dark brown vittae. Legs (Fig. 2d) yellowish, coxae and trochanters brown; femora dark at base, forefemur with weak dark bands at $\frac{1}{2}$ and $\frac{3}{4}$ the length and a subapical dark band; midfemur with weak subapical and apical dark bands and variable dark mottling on dorsal surface; hindfemur with weak dark bands apically, and at midlength wide dark markings varying from indistinct bands to mottling. Knee spots pale. Tibiae with basal and apical dark bands, 3 to 4 dark markings along the length varying from indistinct bands to mottling. Hindtibial comb with 6 spines ($n = 2$). Tarsi pale; fore- and hindbasitarsi, tip and base of mid basitarsus dark; hindtarsal ratio 3.42 (3.33–3.42, $n = 2$).

Wing (Fig. 2c): Light brown. Costal cell grayish; veins M_{1+2} , M_1 , M_{3+4} , Cu_1 , Cu_2 and A_1 with grayish streaks basally; dark spot over r-m crossvein extending from vein M_{1+2} and covering vein R_1 , small dark spot at junction of veins R_1 and R_{4+5} ; large dark spot covering veins R_{4+5} at end of second radial cell and a lighter poststigmatic spot extending laterally; distal end of vein R_{4+5} with 2 punctures; submarginal dark spots on veins M_1 and M_2 with a dark spot on vein M_1 approximately $\frac{1}{3}$ the distance from the medial fork; a submarginal dark spot on

vein M_{3+4} and Cu_1 with a dark spot filling the base of the mediocubital fork; apex of vein A_1 with dark spot and 2 small dark areas in base of anal cell; costal ratio 0.56 ($n = 2$). Halter lightly infuscated with dark dorsal streak on knob.

Genitalia (Fig. 2e, f): Sternum 9 with broad, deep, caudomedian excavation, ventral membrane lightly spiculate; tergum 9 long, strongly tapering, with long, stout, moderately separated, convergent, apicolateral processes; basistyle short; dististyle elongate, tip tapering and moderately hooked; aedeagus with a high round basal arch, ending caudally in a heavily sclerotized cruciform tip; parameres moderately stout, basal arms acutely bent and ending in foot-shaped apodemes, midportions strongly curving to meet mesally, the swollen distal ends flaring and each bearing a pair of sclerotized, sharply pointed processes curving posterad.

Female.—Unknown.

Distribution.—Malaysia.

Types.—On slides in phenol balsam. Holotype male, 1 male paratype, Malaya, Pahang, Kuala Singgora, 10.vii.1958, light trap, coll. R. H. Wharton (Type no. 76600, NMNH).

Etymology.—This species is named for Dr. Mercedes Delfinado Baker in recognition of her work on Oriental Ceratopogonidae.

Discussion.—The wing pattern and the leg bands and mottling place this species in the *Alluaudomyia annulata* Group. The species appears to be closely related to *A. bifurcata* Wirth and Delfinado and *A. griffithi* Wirth and Delfinado. *A. delfinadoe* is readily separated from *A. bifurcata* by obvious genitalic differences, and from both *A. bifurcata* and *A. griffithi* by the wing pattern, as the latter two species have many more black spots along the radial sector.

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