

## ON A COLLECTION OF CULICINAE (DIPTERA: CULICIDAE) FROM BRAZIL

C. JOHN LANE

*Department of Medical Parasitology, London School of Hygiene and Tropical Medicine,  
Keppel Street, London, WC1E 7HT, England*

**ABSTRACT.** A man-biting collection of culicine mosquitoes was studied, and it is thought useful to report on the species involved and their relative abundance. New distribution records are for *Aedes (Ochlerotatus) nubilus* (Theobald), *Psorophora (Janthinosoma) champerico* (Dyar and Knab), *Culex (Melanoconion) pedroi* Sirivanakarn and Belkin (for State), *Cx. (Mel.) portesi* Senevet and Abonnenc (for State), *Cx. (Mel.) vomerifer* Komp. Taxonomic problems are discussed.

### INTRODUCTION

A colleague at the London School of Hygiene and Tropical Medicine, Clive R. Davies, visited Amazonas, Brazil early 1990, investigating the distribution of monkey malaria and its vectors (see Davies et al. 1991). During the course of that work, biting collections on man were made at five locations near Tefe, at hourly intervals between 1800 and 2200 h from January 27 to March 2. The *Anopheles* were separated from the collections and the Culicinae given to me to work through.

More than 3,600 adults were examined, and with large numbers of what appeared to be the same species, some were discarded after examination. Over 2,000 were mounted and retained. The total list is presented followed with discussion and notes on identification.

### SPECIES LIST

#### Tribe Aedini

- Aedes (Ochlerotatus) fulvus* (Wiedemann), 110  
*Ae. (Och.)* sp. near *fulvus*, probably *Ae. stigmaticus* Edwards, 4  
*Ae. (Och.) nubilus* (Theobald), 57  
*Haemagogus (Haemagogus) capricornii* Lutz or *Hg. janthinomys* Dyar, 1  
*Psorophora (Janthinosoma) albipes* (Theobald), 437

- Ps. (Jan.) ? champerico* (Dyar and Knab), 2, and others with pale scutellar and prescutellar scales among the *Ps. albipes*  
*Ps. (Jan.) ferox* (von Humboldt), 12  
*Ps. (Psorophora) cilipes* (Fabricius), 8

#### Tribe Culicini

- Culex (Culex) spp.*, 68  
*Cx. (Melanoconion) pedroi* Sirivanakarn and Belkin, 4  
*Cx. (Mel.)* sp. near *pedroi*, 10  
*Cx. (Mel.) portesi* Senevet and Abonnenc, 24  
*Cx. (Mel.) spissipes* (Theobald), 17  
*Cx. (Mel.) vomerifer* Komp, 13  
*Cx. (Mel.)* sp., 2

#### Tribe Mansoniini

- Coquillettidia (Rhynchotaenia) chrysonotum* (Peryassu), 2 (or *Cq. (Rhy.) albifera* (Prado), ♀♀ not separable)  
*Cq. (Rhy.) hermanoi* (Lane and Coutinho), 6  
*Cq. (Rhy.) venezuelensis* (Theobald), 218  
*Mansonia (Mansonia) amazonensis* (Theobald), 1045  
*Ma. (Man.) humeralis* Dyar and Knab, 633  
*Ma. (Man.) indubitans* Dyar and Shannon, 37, this and the next species not all identified with certainty  
*Ma. (Man.) titillans* (Walker), 50  
*Ma. (Man.) indubitans* and/or *Ma. titillans*, 788, usually inseparable without slide preparation of terminalia

## Tribe Sabethini

*Sabethes (Sabethoides) sp.*, 1

*Trichoprosopon (Trichoprosopon) digitatum*  
(Rondani), 1

### NOTES ON IDENTIFICATION

Being a biting collection, determinations are of course on female characters, though three male *Ma. amazonensis* were present. Some new distribution records occur as far as I found in literature. My primary help was Lane (1953), with further works that are given below.

*Aedes nubilus* merits detailed explanation which is presented here. Belkin et al. (1970) restored *Ae. pertinax* Grabham and *Ae. nubilus* to species status from synonymy with *Ae. serratus* (Theobald). They give reasons including: "The past confusion of *serratus*, *nubilus* and *pertinax* is primarily due to the belief that the differences in mesonotal ornamentation are individual variations." Belkin et al. did not know of or did not comment on the thorough study of mesonotal color variations of 105 *Aedes serratus/nubilus* from Sao Paulo State reported by Antunes and Lane (1934). These authors discuss the presence or absence of a pale longitudinal line of mesonotal scales of females in detail in their section II on *Ae. serratus* and *Ae. nubilus*, and they had specimens there with the mesonotum all dark.

Komp (1949) declared *Ae. nubilus* a synonym of *Ae. serratus*. Lane (1953) followed Komp's decision, and in his key to species he keys out *Ae. serratus* twice, on the presence or absence of the median pale line on the mesonotum. The male genitalia of the three species are distinct.

Belkin et al. say of females: "In all true *serratus* we have seen there is a broad whitish longitudinal line in both sexes . . . In *nubilus*, . . . the female mesonotum may be completely dark . . ." *Aedes pertinax* may be similar to *Ae. nubilus* but apparently is geographically restricted.

The specimens I have from Amazonas have a dark mesonotum. I think it valid to record the distribution of *Ae. nubilus* to include Bra-

zil, State of Sao Paulo (Antunes and Lane 1934) and Brazil, near Tefe, Amazonas, January and February 1990, C. Davies collection.

My query with *Ps. champerico* is because I have not seen a specimen to compare with the two here which fit the description of that species and because it is far from the known distribution of *Ps. champerico*.

The *Culex (Culex)* females I have been unable to identify with Lane (1953). All but three have pale tarsal bands and basal abdominal bands. One of the others is a remarkably dark purplish specimen which "should be" identifiable, and I am sure this is not in Lane. The *Culex (Melanoconion)* specimens were determined using more recent revisions of species groups. Following Sirivanakarn and Belkin (1980), I believe four specimens to be their new species, *Cx. pedroi*. The 10 specimens I call sp. near *Cx. pedroi* have those author's characteristics for that species but in addition have an apical white spot on the forefemora and dull pale bands at the joints of the fore- and midtarsomeres. Aitken and Galindo's 1966 paper made the identification of *Cx. portesi* and *Cx. vomerifer* possible (Fig. 1). Takahashi (1968) helped in determining *Cx. spissipes*. Many specimens of *An. amazonensis* are regarded as a variety of this species because the foretarsus has white on only the first three tarsomeres rather than on four, which is the usual case. A male of this form was present, and a slide mount of the genitalia looks good for *Ma. amazonensis* as well as a slide mount of the female terminalia. Slide preparations of the female terminalia are helpful for the identification of *Mansonia (Mansonia)* species and essential for accurate identification of *Ma. indubitans* and *Ma. titillans*. The 1953 paper by Harry Pratt describes and depicts tergum VIII and the post-genital plate of six described species plus a Bolivian species (Fig. 2). After examining nearly 800 females of these species I cannot accept the character of the maxillary palpus and palpomere size differences used by Lane and other authors. Pratt says of *Ma. titillans*, the apical margin of tergum VII has a row of short stout spines, not found in other species. On some specimens these spines can be seen *in situ* on that tergite, but usually a slide




Fig. 1. *Culex (Melanoconion)*, Brazil 1990, near Tefe, Amazonas, *Cx. portesi* above, *Cx. vomerifer* below. Note pleura: pale with *Cx. portesi* and dark with *Cx. vomerifer* on forecoxa, prealar area, upper and lower mesepimeron and much of anterior area.

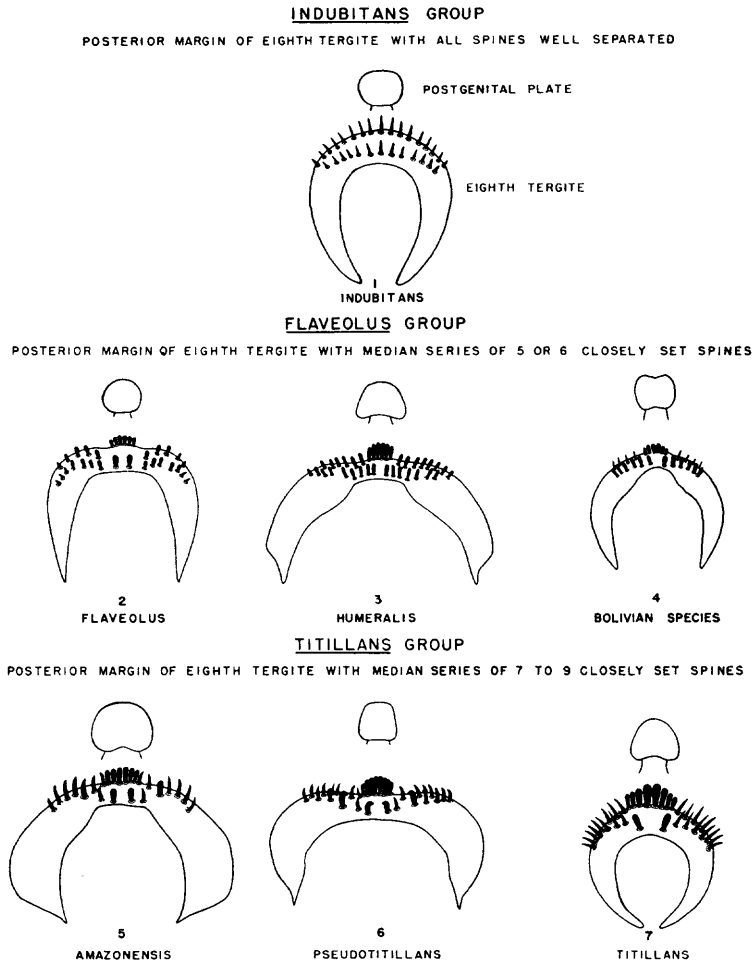


Fig. 2. Plate I of Pratt (1953) showing tergum VIII and the postgenital plate for females of *Ma. indubitans* (1), *Ma. flaveolus* (2), *Ma. humeralis* (3), *Ma. species* from Bolivia (4), *Ma. amazonensis* (5), *Ma. pseudotitillans* (6) and *Ma. titillans* (7).

preparation must be made. If that character is positive only for *Ma. titillans*, the preparations I have made show the postgenital plate tending toward that of the Bolivian species. Only one of my preparations tends toward Pratt's illustration of the postgenital plate of *Ma. titillans*, all others are globular as with *Ma. amazonensis*, most with the apex truncate and slightly concave as shown for the Bolivian species. All have the median crown on tergum VIII with six stout spines (Fig. 3). If the form of the postgenital plate of *Ma. titillans* is certainly as shown and described by Pratt, these Amazonas specimens might be the Bolivian species about which nothing is known apart from Pratt's brief note. I have

corresponded with Dr. Pratt asking about this, who very kindly replied, with no further information on the Bolivian species. He suggests that I describe these as a new species but that is beyond the scope of my expertise. I have since had two specimens of *Ma. titillans* from Mexico to identify. The postgenital plate of one is globular and slightly concave apically and the other is "typically *Ma. titillans*." Both have eight stout spines to the median crown (Fig. 4). I am sure that a complete revision of *Mansonia* (*Mansonia*) is needed, and one new species at least will be described. Much material is here, but none reared from the larval stage. Belkin et al. (1970) do not mention the postgenital plate.

Fig. 3. *Mansonia (Mansonia)*, Brazil 1990, near Tefe, Amazonas, A--E, *Ma. titillans*, postgenital plate (A), Te-VIII (B), Te-VII (C), postgenital plate showing globular shape (D), Te-VIII arrangement of spines (E). F,G, *Ma. amazonensis*, postgenital plate (F), Te-VIII (G). H,I, *Ma. indubitans*, postgenital plate (H), Te-VIII (I).

Fig. 4. *Mansonia (Mansonia) titillans*, Guerrero, Mexico, A–D, October 1990, postgenital plate showing globular truncate shape (A), Te-VIII (B), Te-VII (C), Te-VIII arrangement of spines (D). E–H, August 1991, postgenital plate (E), Te-VIII (F), Te-VII (G), postgenital plate of “typical shape” for this species (H).

## ACKNOWLEDGMENTS

My thanks to John Williams and Bridget Irving for their help with the photography. Ronald A. Ward, Editor of the *Journal of the American Mosquito Control Association*, advised on the usefulness of published records and suggested I write up this study.

## REFERENCES CITED

- Aitken, T.H.G. and P. Galindo. 1966. On the identity of *Culex (Melanoconion) portesi* Senevet and Abonnenc 1941 (Diptera: Culicidae). *Proc. Entomol. Soc. Wash.* 68:198-208.
- Antunes, P.C.A. and J. Lane. 1934. Notes on some species of *Aedes (Ochlerotatus)* (Diptera: Culicidae). *Rev. Biol. Hyg. Sao Paulo* 5:35-40.
- Belkin, J.N., S.J. Heinemann and W.A. Page. 1970. Mosquito Studies (Diptera: Culicidae) XXI. The Culicidae of Jamaica. *Contr. Am. Entomol. Inst. (Ann Arbor)* 6(1):1-458.
- Davies, C.R., J.M. Ayres, C.M. Dye and L.M. Deane. 1991. Malaria infection rate of Amazonian primates increases with body weight and group size. *Funct. Ecol.* 5:655-662.
- Komp, W.H.W. 1949. *Aedes (Ochlerotatus) nubilus* (Theobald) 1903, a synonym of *Aedes (Ochlerotatus) serratus* (Theobald) 1901 (Diptera: Culicidae). *Proc. Entomol. Soc. Wash.* 51:105-114.
- Lane, J. 1953. Neotropical Culicidae. Vols. 1 and 2. University of Sao Paulo, Sao Paulo, Brazil.
- Pratt, H.D. 1953. Notes on American *Mansonia* mosquitoes. *Proc. Entomol. Soc. Wash.* 55:9-19.
- Sirivanakarn, S. and J.N. Belkin. 1980. The identity of *Culex (Melanoconion) taeniopus* Dyar and Knab and related species with notes on the synonymy and description of a new species (Diptera: Culicidae). *Mosq. Syst.* 12:7-24.
- Takahashi, M. 1968. Taxonomic and ecological notes on *Culex (Melanoconion) spissipes* (Theobald). *J. Med. Entomol.* 5:329-331.