AN ANNOTATED LIST OF THE CULEX OF PANAMA
(DIPTERA, CULICIDAE)

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The last comprehensive list of the *Culex* of Panama was published by Dyar in 1925. Since that date many new species have been described from this country and Rozeboom and Komp (1950) added several new records of species belonging to the subgenus *Melanoconion*.

During a light trap survey conducted in the years 1951, 1952 and 1953 (Blanton, Galindo and Peyton, in press) we personally examined a total of 22,878 terminalia of *Culex* males. This survey resulted in the discovery of a number of new species already described by the authors (Galindo and Blanton, 1954) and of several interesting new records for the country. The collections of the senior author in the last ten years which have covered every district in the Republic, as well as the intensive work on forest mosquitoes carried on by Dr. Harold Trapido and the senior author, have also yielded new records of *Culex* and interesting biological data on many of the species.

With this information at hand we have considered it advisable at this time to publish a list of the species of *Culex* known to occur in Panama, giving taxonomic, biological and distributional notes in cases of special interest. In this list we include 88 species distributed in 8 subgenera as follows: *Culex*, 15; *Neoculex*, 1; *Lutzia*, 1; *Aedinus*, 2; *Tinolestes*, 4; *Melanoconion*, 54; *Microculex*, 7; *Carrollia*, 4. With few exceptions we have followed the classification proposed by Lane (1953).

Subgenus Culex Linnaeus

1. *beauperthuyi* Antunes. Venezuela, Brazil and Panama.
   First record for the country. A single male was picked up during the light-trap survey in a trap set within an extensive fresh water swamp near the town of Aguadulce, province of Coclé.
2. *bonneae* Dyar and Knab. Surinam, Brazil and Panama.
   This relatively rare species was first recorded from Panama by Dunn (1934). Larvae are usually found in this country in fallen logs and at the base of buttressed roots. Males have been captured in light traps set 70 feet above the ground in the canopy of the forest.
3. *chidesteri* Dyar. Mexico to Brazil.
   Common in the lowlands of both coasts. Larvae may be found in large numbers throughout the year breeding in open fresh water swamps, particularly in the presence of the large sedge *Fuirena umbellata* Rottb.
4. *corniger* Theobald. Mexico to Uruguay.
5. *coronator* Dyar and Knab. Southern U. S. A. to Argentina.
6. *delys* Howard, Dyar and Knab. Panama.

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This species, which was considered a synonym of *mollis* D. & K. by Dyar (1928), was revived by Lane (1953) because of the peculiar line of white scales at the base of the first vein. We have seen no material of it and the only specimen known to us is the type.

7. *inflictus* Theobald. Mexico to Venezuela.
   Trapido and Galindo (manuscript in preparation) found females of this species attacking man on the ground and in the upper canopy of the forest after dusk.
8. *interrogator* Dyar and Knab. U. S. A., Mexico and Panama.
9. *laticlasper* Galindo and Blanton. Panama.
   Found only in the highlands of Chiriquí above 6,000 feet, where it breeds in very large numbers in the water held by fallen palm spathes in the forest.
10. *mollis* Dyar and Knab. Mexico to Brazil.
11. *nigripalpus* Theobald. Mexico to Brazil.
12. *pinarocampa* Dyar and Knab. Mexico and Panama.
    According to Martínez Palacios (personal communication) *pinarocampa* occurs in Mexico from sea level to over 7,000 feet, breeding commonly in water held by the grooved leaves of *Agave*. In Panama it is found only in the Chiriquí Volcano region at elevations between 4,000 and 6,000 feet, breeding normally in water held by the basal leaves of *Fureraea* sp. and occasionally in tree-holes. Galindo, Carpenter and Trapido (in manuscript) report a single larva from a bamboo internode set out as a larval "trap."
13. *pipiens quinquefasciatus* Say. Tropics and subtropics.
14. *thriambus* Dyar. Western U. S. A., Mexico and Panama.
    This species was described from Texas and in 1928 Dyar placed it in the synonymy of *stigmatosoma* Dyar. Galindo and Kelley (1943) revived the name, pointing out specific differences between the two forms. Martinez Palacios (1952 *a*) reported *thriambus* from Mexico and noted additional differences in the terminalia to separate it from *stigmatosoma*. In Panama the species is found in the highlands and it is possible that the records from Central America and Venezuela given by Dyar (loc. cit.) really refer to *thriambus* rather than to *stigmatosoma*.
15. *virgultus* Theobald. Mexico to Uruguay.
    Lane (1953) considers *declarator* D. & K. a synonym of this species.

Subgenus **Neoculex** Dyar

16. *derivator* Dyar and Knab. Mexico to Panama.
    First reported from Panama by Bohart (1948) from material sent to him by the senior author. Females have been observed feeding on lizards of the genus *Sceloporus* in the Chiriquí Volcano region. It is interesting to note that Galindo and Trapido (unpublished report) found these lizards commonly infected with a species of *Plasmodium* which has been isolated and is being studied by Dr. Clay Huff.

Subgenus **Lutzia** Theobald

17. *allostigma* Howard, Dyar and Knab. Central America to Brazil.

Subgenus **Aedinus** Lutz

18. *acceleratus* Root. Brazil and Panama.

This species was previously known only from the type locality in Brazil. The authors have several males taken in a light trap at Garachiné, Darién Province and one specimen from the Tocumen swamps near Panama City, both localities on the Pacific side of the Isthmus.

19. *amazonensis* Lutz. Panama to Brazil.
One of the commonest *Culex* of the Pacific coastal swamps of Panama. Males show a very strong positive phototropism and are picked up in large numbers in light traps set near their breeding place.

Subgenus **Tinolestes** Coquillett

20. *browni* Komp. Panama.
In the last few years we have reared abundant material of this species from tree-holes in deep forest. It is particularly common in the area known as La Victoria or Cerro Azul, just east of Panama City. Females are not known to bite man. Males are only occasionally found in light trap collections.
21. *conservator* Dyar and Knab. Panama to Brazil.
22. *corrigani* Dyar and Knab. Panama.
23. *latisquama* Coquillett. Costa Rica and Panama.

Subgenus **Melanoconion** Theobald

24. *aikenii* Aiken. Mexico to Brazil.
25. *albimensis* Bonne-Wepster and Bonne. Surinam, Brazil and Panama.
We have taken this species only in the vicinity of the extensive Tocumen swamps near Panama City where it appears to be fairly common.
26. *alogistus* Dyar. Surinam, Brazil, Panama and Costa Rica.
From the highlands of Chiriquí we have what appears to be a new species which differs from *alogistus* in larval characters (having the comb-scales in a patch as in *vexillifer*) and in details of the male terminalia.
27. *atratus* Theobald. U. S. A., Antilles, Panama, Trinidad and Guianas.
28. *bastagarius* Dyar and Knab. Mexico to Brazil.
29. *caribeanus* Galindo and Blanton. Panama.
30. *caudelli* Dyar and Knab. Surinam, Brazil, Trinidad and Panama.
31. *chanquinolae* Galindo and Blanton. Panama.
32. *commevynensis* Bonne-Wepster and Bonne. Surinam, Colombia and Panama.
33. *comminutor* Dyar (= *distinguendus* Dyar). Surinam, French Guiana and Panama.
34. *conspirator* Dyar and Knab. Mexico to Venezuela.
35. *crybda* Dyar. Central America to Brazil.
36. *dunni* Dyar. Mexico to Brazil.
Trapido and Galindo (manuscript in preparation) have found females of this species attacking man both on the forest floor and in the upper canopy after dusk.
37. *eastor* Dyar. Panama to Brazil.
38. *educator* Dyar and Knab. Mexico to Brazil.
39. *egeymon* Dyar. Panama.
Very common in the lowlands along both coasts of Panama, but found nowhere else.

40. *elephas* Komp. Panama.
Closely related to *egcymon* but much rarer than the latter species.
41. *elevator* Dyar and Knab. Mexico to Brazil.
42. *erraticus* Dyar and Knab. U. S. A. to Brazil.
43. *evansae* Root. Brazil and Panama.
44. *fairchildi* Galindo and Blanton. Panama.
45. *flabellifer* Komp. Mexico, Honduras and Panama.
46. *foliafer* Komp and Rozeboom. Surinam and Panama.
We have a single slide in perfect condition of this distinct species originally described from Surinam. Our male was captured in a light trap set at Patiño Point in the Province of Darien.
47. *fur* Dyar and Knab. Panama, Surinam, Belice and Mexico.
This species was described from Panama in 1907 and wrongly synonymized under *spissipes* Theob. by Bonne-Wepster and Bonne (1921). Lane (1953) revived the name after examining the type of *spissipes* in the British Museum. The only specimen from Panama known to the authors is the type.
48. *galindoi* Komp and Rozeboom. Panama.
49. *iolambdis* Dyar. Mexico to Colombia.
50. *jubifer* Komp and Brown. Panama.
Previously known from a single specimen. The senior author has reared abundant material of this species from larvae collected in forested marshy springs some 15 miles east of Panama City.
51. *kummi* Komp and Rozeboom. Panama.
Locally common in the mountains to the northwest of Almirante, Bocas del Toro, in deep tropical rain forest.
52. *lacertosus* Komp and Rozeboom. Panama.
This species was described from two males captured by Komp in Almirante. No specimens have been taken since.
53. *limacifer* Komp. Costa Rica and Panama.
Commonly found breeding in shaded pot-holes along streams in the semi-arid region between Chame and Rio Hato on the Pacific side of Panama.
54. *menytes* Dyar. Honduras to Brazil.
We have found this species breeding in large, shallow, fresh water swamps covered with sedges. Trapido and Galindo (manuscripts in preparation), working in Panama and Honduras, have found females attacking man in the upper canopy of the forest, both during the day and at night, being particularly common during hours 1800 to 2000.
55. *mistura* Komp and Rozeboom. Panama to Brazil.
This species was recently described from Colombia and additional specimens were reported from Venezuela and Brazil in the same publication. The authors have two males captured in a light trap set near Aguadulce, Coclé Province and one male from the Tocumen swamps near Panama City.
56. *mutator* Dyar and Knab. Mexico to Panama.
This represents the first time that true *mutator* is reported from Panama. We have taken larvae several times from pot-holes along rocky mountain streams, as well as males in light traps.
57. *oedipus* Root. Brazil to Panama.
58. *opisthopus* Komp. U. S. A., Puerto Rico, Mexico, Honduras and Panama.

59. *paracrybda* Komp. Panama.
Described from a single male. We have additional light trap material from the Upper Chagres River, from the Madinga River in the Canal Zone, and from the Tocumen swamps.
60. *phlogistus* Dyar. Panama to Brazil.
61. *pilosus* Dyar and Knab (= *hesitator* D. & K.). U. S. A. to Brazil.
62. *plectoporpe* Root. Brazil, French Guiana and Panama
63. *psatharus* Dyar. Panama.
Previously known from the Atlantic side of Panama only. We recently took two males in a light trap set by a mangrove swamp near Garachiné, Darién Province, on the Pacific side of the isthmus.
64. *pseudotaeniopus* Galindo and Blanton. Panama.
65. *quadrifoliatus* Komp. Panama.
66. *quasihibridus* Galindo and Blanton. Panama.
67. *rooti* Rozeboom. Panama and Mexico.
68. *sardinerae* Fox (= *bilobatus* Galindo and Blanton). Puerto Rico and Panama.
When the manuscript in which we described *bilobatus* Galindo and Blanton, 1954, was already in press, we noted the description of *sardinerae* Fox, 1953. The excellent drawings and the description of this species leaves no doubt as to the conspecificity with *bilobatus*, thus making the latter a synonym.
69. *serratimarge* Root. Panama to Brazil.
70. *spissipes* Theobald (= *chrysonotum* Dyar and Knab). Mexico to Brazil. Lane (1953) has included *chrysonotum* D. & K. and *theobaldi* Lutz in the synonymy of *spissipes* Theob.
71. *sursumptor* Dyar. Colombia and Panama.
72. *taeniopus* Dyar and Knab. Honduras south to Bolivia and Brasil.
We have abundant material of this species from the north coast of Honduras where it is far more abundant than its close relative *opisthopus* Komp as judged by densities in light trap collections. Trapido and Galindo (manuscript in preparation) record *taeniopus* females attacking man in upper canopy of the forest after dark.
73. *tecmarsis* Dyar. Panama and Venezuela.
74. *trifidus* Dyar. Mexico to Panama.
Found in Panama along precipitous mountain streams breeding in shaded rock-holes. The lobes of the ninth tergite in specimens from Panama consistently show three to five hairs instead of the single one typical of northern material, which may possibly indicate a subspecific difference.
75. *vexillifer* Komp. Panama.
The species referred to as *vexillifer* by Galindo, Carpenter and Trapido (1951) and found commonly breeding in tree-holes in La Victoria (Cerro Azul) near Panama City probably represents a distinct and undescribed species, as it obviously differs in several important details of the male terminalia from typical *vexillifer* collected by us in the Mojinga swamp and in Gatún Lake.
76. *vomerifer* Komp. Panama and French Guiana.
77. *zetcki* Dyar. Panama, Venezuela and French Guiana.

Subgenus **Microculex** Theobald

78. *chryselatus* Dyar and Knab. Panama to Brazil.
79. *daumastocampa* Dyar and Knab. Panama.
80. *erethyzonfer* Galindo and Blanton. Panama.
81. *gaudeator* Dyar and Knab.
Lane (1953) recognizes this species as valid despite the fact that Howard, Dyar and Knab (1915) and Dyar (1928) had considered it a synonym of *jenningsi* D. & K. It differs from the latter in the ornamented mesonotum, as in *imitator* Theobald. We have no specimens in our collection.
82. *imitator imitator Theobald.* Panama to Argentina.
83. *jenningsi* Dyar and Knab. Panama.
84. *restrictor* Dyar and Knab. Mexico, Honduras, Costa Rica and Panama.
Larvae of this species are encountered rather frequently in tree-holes in the highlands of Chiriquí above 3,000 feet. It is here reported from Panama for the first time.

Subgenus **Carrollia** Lutz

85. *bihaicolus* Dyar and Nuñez Tovar. Mexico to Brazil.
This widely distributed species was first recorded from Panama by Galindo, Carpenter and Trapido (1951) and later Martínez Palacios reported it from Mexico (1952 *b*). It is very common in tropical rain forests as judged by larval collections, but does not appear to attack man and is seldom taken in light traps.
86. *metempsytus* Dyar. Costa Rica, Panama and Colombia.
87. *secundus* Bonne-Wepster and Bonne. Panama, Colombia and Brazil.
88. *urichii* Coquillett. Panama to Brazil and Peru.

References

Blanton, F. S., P. Galindo and E. L. Peyton, 1955. Report of a three year light-trap survey for biting Diptera in Panama. Mosq. News (in press).

Bohart, R., 1948. The subgenus *Neoculex* in America North of Mexico (Diptera, Culicidae). Ann. Ent. Soc. Amer. *41*:330-345.

Bonne-Wepster, J. and C. Bonne, 1921. Notes on South American mosquitoes in the British Museum. Ins. Ins. Mens. *9*:20.

Dunn, L. H., 1934. Entomological investigations in the Chiriquí region of Panama. Psyche *41*:166-183.

Dyar, H. G., 1925. The mosquitoes of Panama. Ins. Ins. Mens. *13*:101-195.

————, 1928. The mosquitoes of the Americas. Carnegie Ins. of Wash., Pub. No. 387.

Fox, I., 1953. Notes on Puerto Rican mosquitoes including a new species of *Culex*, Jour. Parasit. *39*:178-181.

Galino, P. and T. F. Kelley, 1943. *Culex (Culex) thriambus* Dyar, a new mosquito record for California. Pan Pacific Ent. *19*:87.

————, S. J. Carpenter and H. Trapido, 1951. Ecological observations on forest mosquitoes of an endemic yellow fever area in Panama. Amer. Jour. Trop. Med. *31*:98-137.

———— and F. S. Blanton, 1954. Nine new species of neotropical *Culex*, eight from Panama and one from Honduras (Diptera, Culicidae). Ann. Ent. Soc. Amer. *47*:231-247.

Galindo, P., S. J. Carpenter and H. Trapido, (in manuscript). A contribution to the ecology and biology of tree-hole breeding mosquitoes in Panama.

Howard, L. O., H. G. Dyar and F. Knab, 1915. The mosquitoes of North and Central America and the West Indies. Carnegie Inst. of Wash., Pub. No. 159, vol. 3, p. 443.

Lane, J., 1953. Neotropical Culicidae (vol. I). Univ. Sao Paulo, Brazil, 2 vols., 1112 pp.

Martínez Palacios, A., 1952 a. *Culex inflictus* Theobald y *Culex thriambus* Dyar, mosquitoes nuevos para Mexico (Diptera, Culicidae). Rev. Soc. Mex. Hist. Nat. *13*:75-87.

————, 1952 b. Nota sobre la distribución de los mosquitos *Culex* en Mexico (Diptera, Culicidae). Rev. Soc. Mex. Hist. Nat. *13*:75-87.

Rozeboom, L. E. and W. H. W. Komp, 1950. A review of the species of *Culex* of the subgenus *Melanoconion* (Diptera, Culicidae). Ann. Ent. Soc. Amer. *43*:75-114.

Trapido, H. and P. Galindo, (manuscript in preparation). Mosquitoes associated with sylvan yellow fever near Almirante, Panama.