

ADDITIONAL NOTES ON THE TABANIDAE OF PANAMA  
(Diptera)

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ADDITIONAL NOTES ON THE TABANIDAE OF PANAMA<sup>1</sup>  
(Diptera)

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In 1942 I listed (Ann. Ent. Soc. Amer., 35, No. 4, p. 471) the 89 species of Tabanidae then known from the Republic of Panama and the Canal Zone. Since that time a certain amount of additional material has accumulated which makes it seem advisable to publish the present additional note. Nine species are added to the Panama fauna, six of which are described as new, bringing the total species recorded to 98. The heretofore unknown males of several species are described, and additional material and extension of ranges of a number of hitherto poorly known species are recorded.

I am very much indebted for much of what is interesting in this material to Messrs. Philip S. Marucci and George L. Wood, of the Army School of Malariaology, to Dr. Thomas G. Aitken and to Mr. C. M. Keenan, Assistant Sanitary Inspector, Panama Canal Department, and I hereby express my grateful acknowledgment of their invaluable cooperation.

*Assipala tanycerus* (Osten Sacken)

*Chrysops tanycerus* Osten Sacken, 1886, Biol. Cent. Amer., Dipt. I, pp. 46-47 (♀; Costa Rica). Kértesz, 1900, Cat. Tab., p. 12. Ricardo, 1901, Ann. Mag. Nat. Hist., Ser. 7, 8, pp. 310 and 313. Aldrich, 1905, Cat. Dipt. N. Amer. Ent., p. 198. Surcouf, 1921, Gen. Insec., Taban., p. 155. Hine, 1917, Trans. Amer. Ent. Soc., 43, p. 292 (♀; Peralta Station, Costa Rica). Kröber, 1925, Konowia, 4, pp. 217, 221, 238; 1930, Zool. Anz., 90, pp. 73-74, figs. 11-12 (♀; Higuito, San Mateo, Costa Rica); 1934, Rev. Ent., 4, 2, p. 229. Pechuman, 1937, Rev. Ent., 7, 2-3, p. 140.

*Assipala tanycerus* Philip, 1941, Canad. Ent., 73, p. 4 (January); 1941, Rev. Ent., 12, 3, pp. 470-473 (December).

A single female, El Volcan, Chiriqui Province, Panama, February 15, 1943, T. Aitken coll. This interesting species is the type of the genus, and has been hitherto known only from Costa Rica. It may be distinguished from all other species occurring in Panama by the greatly elongate antennae with the terminal segment not half as long as either of the two preceding segments. The wing pattern is not very *Chrysops*-like, consisting of an abbreviated cross-band and large separate apical spot, while the cross-veins and fork of the third vein are surrounded by dark clouds.

*Chrysops scalaratus* Bellardi

1859, Ditt. Mess., Pt. 1, p. 72, Pl. 2, fig. 19 (♀; Mexico). Osten Sacken, 1878, Cat. Dipt. N. Amer., p. 54. Kértesz, 1900, Cat. Taban., p. 11. Ricardo, 1901, Ann. Mag. Nat. Hist., Ser. 7, 8, pp. 299, 304 (♂, ♀; Mexico, Honduras,

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Chile; = ? *lateralis* Wied.). Kröber, 1925, *Konowia*, 4, pp. 216, 227, 362-363, Pl. 1, fig. 16; Pl. 3 and Pl. 5 (Br. Honduras, Costa Rica, Guatemala); 1934, *Rev. Ent.*, 4, 2, p. 229. Bequaert, 1938, *Carnegie Inst. Washington*, publ. 499, p. 226; 1940, *Rev. Ent.*, 11, 1-2, p. 270.

*Chrysops apicalis* Bellardi, 1850, *Ditt. Mess.*, pt. 1, p. 73 (♂, Mexico). Pechuman, 1939, *Bull. Brooklyn Ent. Soc.*, 34, 5, p. 241 (= ♂ of *scalaratus*).

*Chrysops lateralis*, Hine, 1925, *Occ. Pap. Mus. Zool. Univ. Michigan*, No. 162, pp. 14-15 (♂, ♀; Honduras, Guatemala = *scalaratus* Bell.). Not *C. lateralis* Wied., 1828.

A series of 12 females from near Almirante, Bocas del Toro Province, Panama, March 12, 1943, Marucci and Wood colls., a further series taken towards the end of August, 1944, by myself at the same locality, and a single female from Robalo on the shores of Chiriqui lagoon, Bocas del Toro Province, January 21, 1946, P. Galindo coll. Hitherto known from Mexico to Costa Rica, the present material extends the range of the species considerably.

### *Chrysops auroguttata* Kröber

Two females from Coclé del Norte, Colon Prov., September 29, 1942; 9 from Robalo, Bocas Prov., January 21, 1946; 2 from Almirante, Bocas del Toro Prov., August 21, 1944, and 3 from Utria and Valle, Choco, Colombia, August 27 and September 1, 1942, Boshell coll.

Bequaert (*Psyche*, 51, p. 13, 1944) has recently revised the distinctions between *auroguttata* and *pallidefemorata* Kröber, and concludes that the two forms treated by Kröber as varieties of one species, are really distinct species. One of the specimens from each of the two Panama localities listed here approaches *pallidefemorata* in showing a marked encroachment of hyaline into the marginal cell at the apex of the cross-band, and in having the hyaline area in the fifth posterior cell extensive, reaching quite to the discal cell. All have a marked hyaline spot at the base of the first submarginal cell. The three Colombian specimens are darker, the wing markings more typical of *auroguttata*, but the hyaline spot at base of first submarginal cell is almost obsolete.

In 1942 (*Proc. Ent. Soc. Washington*, 44, 1, pp. 3-4) I concluded, on the basis of very limited material and largely on wing markings, that Panama material came closest to *pallidefemorata*, in this agreeing with Pechuman (1937, *Rev. Ent.*, 7, p. 136). However, the proportions of the frons, and especially the rather long basal antennal segments agree better with both Kröber's and Bequaert's definitions of *auroguttata*. I listed the specimens under *incisa* Macq., but Dr. Bequaert believes that species to be unrecognizable from the description.

### *Chrysops soror* Kröber

One female, Jaqué, Darien Prov., February 9, 1943, Marucci and Wood colls.

### *Chrysops mexicana* Kröber

Two females, Almirante, Bocas del Toro Prov., March 12, 1943, 1 female, Robalo, Bocas Prov., January 21, 1946, P. Galindo coll., and 2 females Pito, Intendencia de San Blas, June 20, 1943, Marucci and Wood colls. Those from Almirante agree with my fig. 6 (Fairchild,

1942, Proc. Ent. Soc. Washington, 44, 1, pp. 1-8), those from Pito with fig. 7. Extensive material may show two distinct species, but which, if either, is Kröber's species is uncertain.

#### *Scione maculipennis* Schiner

One female, El Volcan, Chiriqui Prov., July 4, 1943, T. Aitken coll. This specimen agrees with others previously reported from the same area (Fairchild, 1942). Two females from Jaqué, Darien Prov., February 9, 1943, Marucci and Wood colls., are unusual in that the locality is at sea level. The specimens are quite different in appearance from those from Chiriqui, being paler, more obscurely marked, and with the wing markings very faint. The frons is like my fig. 6 and the palpi as in fig. 6 b.

#### *Dichelacera analis* Hine and *Dichelacera marginata* Macquart

Two females of the former and one of the latter, Robalo Bocas del Toro Prov., January 21, 1946, P. Galindo coll. Both these species are on the wing only until November or early December on the Pacific side of the isthmus, but the lack of a well marked dry season on the Caribbean side evidently results in a much longer flight season.

#### *Dichelacera (Psalidia) fulminea* (Hine)

One male and 6 females from near Almirante, Bocas del Toro Prov., Panama, March 12, 1943, Marucci and Wood, and August 18, 1944, Fairchild. The male is quite similar to the female, but paler, and the dark markings of the wing are considerably reduced. The first posterior cell is open, though narrowly so, while the antennae are more slender and with a shorter tooth than in the female. A female from France Field, C. Z., September 30, 1943, Keenan coll., and another from Muzo, Dept. of Boyacá, Colombia, June 14, 1941, Gast Galvis coll., both show the first posterior cell open, quite widely so in the Panama specimen. This constitutes an exception to the statement (Fairchild, 1940, Ann. Ent. Soc. Amer., 33, p. 692) that this species always has the cell closed, and is a further confirmation of the worthlessness of this character for even specific definition.

#### *Dichelacera (Catachlorops) transposita* (Walker)

Three additional females (Pito, Int. de San Blas, June 20, 1943, Marucci and Wood colls.) of this interesting species enable certain corrections to be made to my earlier description (Fairchild, 1940). The sides of the mesonotum and apical third of the scutellum are clothed with white hairs, as is the posterior margin of the last visible tergite. The mid-tibiae are hardly white basally, merely somewhat paler than the remainder of the tibia.

#### *Dicladocera badia* Kröber

Nine females from Robalo, Bocas del Toro Prov., January 21, 1946, P. Galindo coll. This species has previously been taken only at Bocas del Toro and Porto Bello, and at El Valle, in Coclé Province. Dr.

Galindo, the collector, said he was informed it had been very abundant a few weeks previously, attacking both man and horses.

#### *Cryptotylus luteoflavus* (Bellardi) \*

*Male*.—Eyes bare, holoptic, not enlarged. The large facets are but very slightly enlarged, so that a superficial examination would suggest that all facets are of one size. The line of demarkation between large and small facets is imperceptible, and the area occupied by the large facets seems not to exceed about one-third of the total eye area. Vertexal tubercle well developed. Frontal triangle yellow pollinose. Antennae more slender than in female, the dorsal angle slightly more acute. Palpi erect, rather small and slender. Proboscis long and slender, the labelli partially sclerotized. Color almost wholly dull yellow, considerably paler than the female.

*Neallotype* male, Almirante, Bocas del Toro Province, March 12, 1943, Marucci and Wood colls.

The lack of enlarged eye facets and reduced antennal tooth place this species somewhat apart from its congeners, but the color, general facies, and vertexal tubercle indicates that it is closer to *Cryptotylus* than to *Chlorotabanus*. It is perhaps the least specialized member of the group, approaching in some aspects certain species of *Stenotabanus*.

#### *Diachlorus curvipes* Fab.

*Male*.—Eyes greatly enlarged, causing the head to be markedly wider than the thorax, holoptic, the large facets many times larger than the small, sharply demarcated from them, and occupying over two-thirds of the total eye area. The area of large facets is pale tan, with, in the lower third, a thick, dark, inverted U-shaped mark. Vertexal tubercle present, though small. Frontal triangle golden yellow pollinose. Palpi as large as in the female but more slender, yellow. Coloration much as in the female, though paler throughout. Mesonotal dark markings reduced, the median yellow stripe somewhat broader than in female. Abdomen wholly yellow and apparently wholly yellow haired.

*Neallotype* male, Almirante, Bocas del Toro, Panama, March 12, 1943, Marucci and Wood colls.

This appears to be the second species of *Diachlorus* of which the male has been described, Lutz (1913) having figured the male head of *D. conspicuus*, a closely related species. Two females of *curvipes* from the same locality were taken by myself August 18, 1944. These records extend the known range of the species nearly to the Costa Rican border.

#### *Diachlorus jobbinsi* Fairchild

Five females from near Almirante, Bocas del Toro Prov., Panama, taken in March and August, extend the range of the species considerably and enable a few additions to the description to be made. The eye pattern in fresh material differs slightly but consistently from the pattern in *curvipes*, the green markings being more slender throughout. Due to an oversight, no figure of this species accompanied the original description (Fairchild, 1942, Ann. Ent. Soc. Amer., 35, p. 296), so for the sake of completeness the species is here figured.

**Stenotabanus (Stenotabanus) lerida** Fairchild

Three females from El Volcan, Chiriqui Prov., March 6, 1943, T. Aitken coll. This is apparently one of the commonest Tabanids in the Volcan area.

**Stenotabanus (Stenotabanus) maruccii**, sp. nov.

*Female*.—Length 10 mm., of wing 10 mm. Eyes bare, in life green with a single broad median purple stripe. Frons parallel sided, about 4 times as high as wide, yellowish grey pollinose. Frontal callus black, nearly as wide as frons basally, tapering to a point at about the middle of the frons. Vertexal tubercle prominent, pollinose, and with well-marked vestiges of ocelli. Subcallus, face and cheeks yellowish brown pollinose, the latter with scattered dark erect hairs. Antennae reddish, the first two segments not inflated and with black hairs. Third segment with the dorsal angle acute and bearing a tuft of black hairs. Annulate portion black, hardly half the length of the basal portion. Palpi brownish, moderately slender, blunt-tipped, black haired. Proboscis about two-thirds head height, blackish, the labelli large and membranous. Beard sparse, greyish.

Mesonotum blackish, with a pair of narrow submedian yellowish stripes reaching the scutellum. Lateral margins yellowish and brassy haired. Scutellum blackish, with sparse brassy hairs. Pleura yellowish grey, a dark stripe passing forward from the wing bases. Legs wholly black and black haired. Wings with subepaulet bearing macrotrichia, but less dense than on the costa. Costa, subcosta, and first vein above with macrotrichia. Wings hyaline, the fore border yellowish smoky, and a light though distinct cloud on the fork of the third vein. All cells but the anal open; no appendix on upper branch of third vein. Abdomen mainly black, black haired. First segment wholly and succeeding segments on posterior margins pearly grey pollinose, changing to brilliant pale blue with light of proper incidence. Second, third, fourth and last tergites with small median tufts of pale hairs. Sides of all tergites with sparse pale hairs. Venter black, wholly pearly pollinose, sparsely pale haired on first and second sternites, the rest black haired.

*Holotype* female, Pito, Int. de San Blas, Panama, June 20, 1943, Marucci and Wood colls. To be deposited in the Museum of Comparative Zoology, Cambridge, Mass.

This little species is structurally closest to the group of *St. lerida* Fchld., though in coloration and general appearance it approaches *tantulus* Hine and *constabulorum* Fchld.

**Stenotabanus (Stenotabanus) plenus** Hine

One female, Pinogana, Darien Prov., R. P., February 20, 1943, Marucci and Wood colls. The specimen is unfortunately headless, but the species is so characteristic that there is little doubt as to the identification.

**Stenotabanus (Stenotabanus) xenium** sp. nov.

*Female*.—Length 14 mm., of wing 11 mm. Frons about 6 times as high as wide, narrowest below, orange brown pollinose. Basal callus

chestnut brown, narrower than frons, club-shaped, extended as a raised ridge more than half the distance to the vertex. Vertexal tubercle present, small, pollinose, but with vestiges of 3 ocelli. Eyes bare, uniformly dark blackish green in life. Antennae orange, only the terminal annulus black. Palpi orange, mostly black haired. Proboscis shorter than head-height, the labelli large and fleshy. Subcallus orange pollinose, without hairs, genae and fronto-clypeus paler with scattered pale hairs.

Mesonotum greyish brown, unstriped. Pleura and sternum pale yellowish. Legs orange brown, black haired, the fore tarsi somewhat flattened. Wings with subepaulet thin and scale-like, pointed, and with about 12 black macrotrichia. Costa, subcosta, first and fifth veins with macrotrichia above. Fork of third vein with a moderate appendage. Whole wing dilute brownish, darker along the costal border. Abdomen bright orange brown, darker apically. Hind margins of tergites with orange hairs, which form complete transverse bands, widest in the middle and at the sides, on segments 2 to 4; segments 1 and 5 to 6 have only mid-dorsal and lateral patches. Rest of abdomen black haired above, orange haired below.

*Holotype* female and 2 female *paratypes* collected at light, Canal Zone Police Substation, Rio Pequeni, head of Madden Lake, Panama Canal Zone, June 23, 1944. One female *paratype*, San José, Villavicencio, Intendencia de Meta, Colombia, August 1, 1939, M. Bates coll. The specimen from Colombia is a little lighter in color and with slightly broader third antennal segment. *Holotype* and 1 *paratype* to be deposited in the Museum of Comparative Zoology, Cambridge, Mass.

This little species is close to *St. pequeniensis* Fehld., also from the Rio Pequeni, but differs slightly in the shape of frons and antennae, in having prominent bands of orange hairs on the abdomen, in the less prominently marked wings, and in larger size.

#### *Stenotabanus (Aegialomyia) paitillensis* Fairchild

Two females taken attempting to bite in a patch of thorny scrub on the tide flats near the salt pans at Aguadulce, Panama, March 4, 1944. These are the only specimens that have been taken since the type was collected.

#### *Tabanus praepilatus* Fairchild

Five females in poor condition taken in a mosquito stable trap at Old Panama, August 17, 1943, and two others from Juan Diaz, May 10, 1943, collected by Sr. Beleño.

#### *Tabanus punctipleura* Hine

1920, Ohio Journ. Sci., 20, No. 8, pp. 314-315 (♀, San Carlos and Carillo, Costa Rica). Kröber, 1930, Zool. Anz., 86, 9-10, pp. 261-262; 1934, Rev. Ent., 4, 3, p. 296.

*Tabanus (Lophotabanus) defilippii* Kröber, 1929, Zool. Anz., 83, 1-4, pp. 126-127, fig. 8 (nec *defilippii* Bell., 1859).

A single female from near Almirante, Panama, August 18, 1944. Kröber's (1929) description states that the frons is six times as high as wide, but his figure shows it but four times as high as wide. The

length of, and angle at which, the antennal tooth arises is also greater in his figure than in my specimen. The accompanying figure will serve for comparison.

Structurally this species is close to *T. importunus* and *T. ferrifer*, but the dark color and prominent prescutellar spot give it a strong superficial resemblance to *T. (Bellardia) de-filippii*. These two species form in many ways connecting links between the two groups.

#### *Tabanus praeteritus* sp. nov.

*Female*.—Length 12–13 mm., of wing 11–12 mm. Eyes bare, in life dull green, unbanded. Frons about  $4\frac{1}{2}$  times as high as basal width, slightly narrowed below, yellowish grey pollinose. Frontal callus yellowish brown, narrower than frons, higher than wide and prolonged in a short line above. Vertexal tubercle wholly absent. Subcallus, frontoclypeus and genae yellowish grey pollinose, with a fairly dense grey beard. Antennae orange yellow, the first segment somewhat inflated, the third with a fairly well-marked dorsal angle and the darker annulate portion somewhat shorter than the basal portion. Palpi pale yellowish, black haired, inflated basally but with a rather slender apex. Proboscis short, less than head height, the labelli membranous and over two-thirds length of proboscis.

Mesonotum dark grey, unstriped, with mixed dark and brassy hairs. Pleura and sternum steel grey, sparsely pale haired. Scutellum concolorous with mesonotum. Legs orange brown, the fore femora, apical halves of fore tibiae and bases of mid- and hind femora darker. Wings with subepaulet, costa, subcosta and first vein setose. All cells but anal open, no appendix on branch of third vein. Wings entirely hyaline except for the yellowish stigma and faintly tinged costal cell. Abdomen mainly dull yellowish brown with, on the first two tergites, a narrow and not well defined inverted black triangle. The fourth and succeeding segments are darker in the middle, though there is no well defined stripe. The abdomen is mainly densely black haired, but with oval patches of yellow hairs dorsolaterally on the second to fifth tergites. On one specimen there is a very faint indication of a middorsal pale line. Sternites pale yellowish, wholly pale haired.

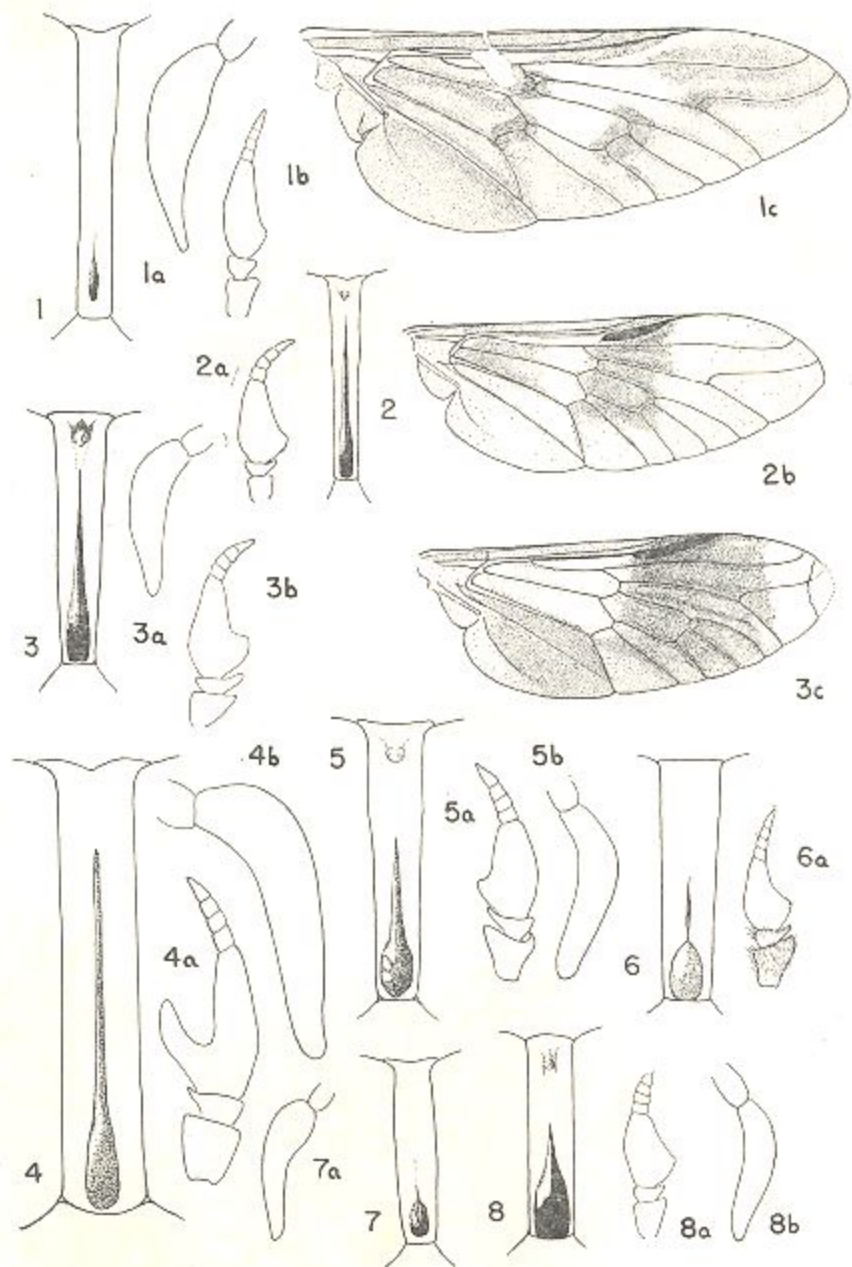
*Male*.—Eyes bare, holoptic, the facets hardly differentiated, those on the disk being very slightly larger than those on the margins. Vertexal tubercle present, small, densely haired. Coloration as in the female,

#### EXPLANATION OF PLATE I

All figures are of the frons, antenna and/or palpus of female specimens, and are all to the same scale as that used in my previous papers on Panama Tabanidae. The figures of wings are drawn from specimens mounted in balsam, and are to a somewhat smaller scale than the other figures.

FIGS. 1, 1a, 1b, 1c, *Tabanus xenorhynchus* sp. nov. Holotype (head structures) and Paratype (wing). FIGS. 2, 2a, 2b, *Tabanus (Philipotabanus) keenani* sp. nov. Holotype. FIGS. 3, 3a, 3b, 3c, *Tabanus (Philipotabanus) inauratus* sp. nov. Holotype. FIGS. 4, 4a, 4b, *Tabanus punctipleura* Hine. FIGS. 5, 5a, 5b, *Stenotabanus (Stenotabanus) xenium* sp. nov. Holotype. FIGS. 6, 6a, *Tabanus praeteritus* sp. nov. Holotype. FIGS. 7, 7a, *Diachlorus jobbinsi* Pairch. FIGS. 8, 8a, 8b, *Stenotabanus (Stenotabanus) maruccii* sp. nov. Holotype.





but a little lighter in tone. One specimen has a clearly indicated middorsal line, the other not. In the first of these specimens, the upper branch of the third vein,  $r_1$ , and veins  $m_2$  and  $m_3$  are incomplete in both wings.

*Holotype* female, Chepo, Panama Province, Republic of Panama, January 19, 1930, L. H. Dunn coll. *Allotype* male, Ancon, Canal Zone, A. H. Jennings coll. *Paratypes*, 2 females with some data as holotype, 1 female, Porto Bello, Panama, March 2, 1911, A. Busck coll., 1 female, El Real, Darien Prov., Panama, February 7, 1940, D. M. Jobbins coll., 1 female Christobal, Canal Zone, November 2, 1939, Holder coll., 1 male, Ft. Randolph, Canal Zone, January 23, 1929, C. H. Curran coll.

*Holotype* and 1 female *paratype* to be deposited in the M. C. Z., *Allotype* and 1 female *paratype* in the U. S. National Museum, the male *paratype* in the American Museum of Natural History, and remaining *paratypes* in author's collection.

This little species has remained unnamed in my collection for a number of years. I had thought for a time it might be *T. sallei* Bell., and there is little in the description to disagree, but it has so few outstanding characteristics and belongs to a group of very similar appearing species which are only to be distinguished by small structural characters, that I feel obliged to describe it. Its relationships seem to be with the *nigrovittatus* group, its nearest allies in Panama being *T. rixator* Fairch. and *T. nereus* Fairch.

#### *Tabanus xenorhynchus* sp. nov.

*Female*.—Length 16–17 mm., of wing, 15–16 mm. Eyes bare probably uniformly dark blackish green in life. Frons about 8 times as high as basal width, slightly narrowed below the middle, light grey pollinose. Basal callus weakly developed, brown or blackish, about one-third width of frons and about 3 to 4 times as high as wide, slightly prolonged above. Vertex with a small discolored spot, but without a distinct tubercle. Antennae dark brown to blackish, the basal portion of third segment slender, somewhat less than twice the length of the annulate portion and with a moderate dorsal angle near the base. Palpi blackish or dark brown, black haired, the terminal segment basally inflated, with slender acute apex and longer than antennae. Proboscis long, about equalling head height, the labelli about half its length, wholly membranous. Subcallus, fronto-clypeus and genae brownish grey pollinose, beard brownish, sparse.

Mesonotum chocolate brown, with a pair of dorsolateral white lines reaching the scutellum. Sides of mesonotum and posterior border of scutellum with long and dense silvery white hairs. Pleura and sternum blackish, wholly black haired. Legs wholly black and black haired. Wings with subepaulet, costa, subcosta, first and fifth veins with macrotrichia above. All cells but anal open, no appendix at fork of third vein. Stigma pale yellowish. Apical and anal areas of wing and first basal cell lightly infuscated, and all cross-veins with large dark clouds.

Abdomen dark brown, black haired, but with the following patches of silvery white hairs. Small middorsal triangles on the first, second and fifth tergites, and a large patch on the fourth tergite. Lateral tufts on

the first, second and third tergites, smallest on the first. Sternum dark and dark haired.

*Male*.—Eyes bare, the area of large facets about one-half area of the small facets, the areas fairly well demarcated. Vertexal tubercle present. Antennae much more slender than in female. Mesonotum without white stripes or lateral white hairs, only the scutellum being white margined. Abdomen with small tufts of white hairs on second, fifth and sixth tergites, a large white haired patch on fourth tergite. No lateral white patches. Wings and other characters as in the female.

*Holotype*, female, Escobal, Colon Province, Panama, March 11, 1945, C. M. Keenan coll. *Allotype* male, Barro Colorado Island, C. Z., March 17, 1936, W. J. Gertsch coll. One female *paratype*, Cayuga, Guatemala, Schaus and Barnes coll., 1 female *paratype*, Punta Rieles, Golfito, Costa Rica, May 14, 1943, T. Aitken coll. *Holotype* to be deposited in M. C. Z., *allotype* in American Museum of Natural History, 1 *paratype* in U. S. National Museum, 1 *paratype* in author's coll.

This species does not seem very obviously related to other middle-American forms known to me, so I have refrained from trying to place it subgenerically. The disproportionately long proboscis is noteworthy.

#### *Tabanus (Philipotabanus) inauratus* sp. nov.

*Female*.—Length 13 mm., of wing, 11 mm. Frons about 7 times as high as basal width, slightly narrowed below, pale grey pollinose. Callus black, club-shaped, about half width of frons basally and extending as a raised ridge nearly to vertex. Vertexal tubercle prominent, with vestiges of 3 ocelli, and placed upon a triangular black denuded area. Subcallus dark grey pollinose. Face and cheeks dark grey pollinose, both with fairly numerous erect grey hairs. Eyes apparently unbanded, greenish black. Antennae black, black haired. First segment somewhat swollen, second with a long dorsal spine, third with the basal part longer than wide, longer than the annulate part and with a prominent though blunt dorsal angle. Palpi blackish, black haired, rather slender. Proboscis black, short, the large membranous labelli accounting for three-fourths of its length.

Mesonotum black, black haired on the disk, but with a patch of rich golden hairs on each side at the transverse suture, and with the whole posterior border of the mesonotum and whole scutellum densely clothed with rich golden hairs. Pleura and sternum black, grey pollinose, mostly black haired, except for tufts of white hairs beneath and above wing bases. Legs black, black haired, except a tuft of long white hairs on bases of fore coxae. Wings with subepaulet, costa, subcosta and first vein all with dense macrotrichia. Venation normal, no appendix on fork of third vein. Wing largely black, apex hyaline, basal cells yellowish hyaline, costal cell brown, anal area somewhat dilute blackish. Abdomen above mostly black and black haired, but sides of first and second tergites and a broad middorsal patch on fourth tergite silvery white haired. Venter wholly black.

*Holotype* female, Almirante, Bocas del Toro Prov., Panama, March 12, 1943, Marucci and Wood colls. One female *paratype*, Ft. Sherman Reservation, C. Z., March, 1945, Keenan coll. To be deposited in the Museum of Comparative Zoology, Cambridge, Mass.

This very striking species is an interesting and handsome addition to the Panama fauna. It seems most closely related to *T. (Ph.) fascipennis* Macq., from which it differs in the golden haired scutellum, broader frons, stouter palpi, and almost wholly clear basal cells of the wing.

***Tabanus (Philipotabanus) magnificus* Kröber**

Three females, Almirante, Bocas del Toro Prov., March 12, 1943, 1 female, Chiriqui Point, Bocas del Toro Prov., April 1, 1943, and 1 female, Pito, Intendencia de San Blas, June 20, 1943, all Marucci and Wood colls.

***Tabanus (Philipotabanus) keenani* sp. nov.**

*Female*.—Length, 11 mm., of wing, 11 mm. Frons narrow, a little over 7 times as high as basal width, narrower below, dark yellowish grey pollinose. Basal callus black, club-shaped, about half as wide as frons and extended upwards as a narrow raised line two-thirds of the distance to the vertex. Vertexal tubercle not prominent, represented by a small bare spot. Antennae yellowish orange throughout, the upper angle on the third segment poorly developed. Palpi slender, dark brown, black haired. Subcallus, fronto-clypeus and genae dull yellowish grey pollinose. Beard sparse, of mixed grey and black hairs and confined to the lower parts of the genae. Eyes bare, unicolorous, probably dark bronzy or greenish in life.

Mesonotum and scutellum light chocolate brown, the former sparsely black haired, the latter with pale hairs. Pleura dark grey with sparse dark hairs. Legs wholly black and black haired. Wings with subepaulet setose and no appendix on fork of third vein. Wing markings reduced to a discal patch below the stigma and including the whole discal cell and extreme bases of all posterior cells. The proximal halves of the basal cells and most of the costal cell are also brown. Abdomen black and black haired, the posterior margins of all tergites and most of the first tergites bluish white pruinose. Beneath, the pruinosity is more extensive.

*Holotype* female, near Piña, Colon Province, Panama, October 14, 1943, C. M. Keenan coll. To be deposited in the Museum of Comparative Zoology, Cambridge, Mass.

This species appears to connect in some ways the species, such as *medius* Kröb., having hyaline fenestrae about the cross-veins, with those in which the dark pattern is solid, like *fascipennis* Macq. The lack of fenestrae will separate it from any of the former group, while the greatly reduced pattern will distinguish it from *fascipennis* and its allies. Named in honor of the collector, Mr. C. M. Keenan, Assistant Sanitary Inspector for the Panama Canal Department.

***Tabanus (Bellardia) albocirculus* Hine<sup>2</sup>**

Six females, Almirante, Bocas del Toro Prov., March 12, 1943, Marucci and Wood colls., August 18, 1944, Fairchild coll., and Robalo,

<sup>2</sup>Dr. Bequaert informs me that *Lophotabanus* Szilady is the correct name for this group, *Bellardia* Rondani 1863 being presumably preoccupied by *Bellardia* Rob.-Desv. 1863, in the Tachinidae.

January 21, 1946, P. Galindo coll. These are the darkest specimens seen from Panama, being nearly coal black in ground color, with heavily fumose wings. They are also much larger than specimens from the Pacific coast.

***Tabanus (Hybomitra) quadripunctatus* Fab.**

A single female approaching the variety *amabilis* Walk. from Almirante, Bocas del Toro, March 12, 1943, Marucci and Wood colls.

***Tabanus (Neotabanus) unistriatus* Hine**

Two females from near Almirante, Panama, August 21, 1944. This locality is on the Caribbean coast whereas the only previous known records in Panama were from the Pacific coast in Chiriqui Province.

***Tabanus (Neotabanus) vittiger* var. *guatemalanus* Hine**

A single female from Mt. Hope, C. Z., June 28, 1944, Keenan coll., invalidates the statement (Fairchild, 1942, p. 181) that this form is confined to the Pacific coast of Panama, as Mt. Hope is on the Atlantic side.

REFERENCES

- Bequaert, J. 1944. Further studies on the Tabanidae of Trinidad, B. W. I. *Psyche*, 51, 1-2, pp. 12-21.
- Fairchild, G. B. 1940. Notes on Tabanidae from Panama. II. The Genus *Dichelacera* Macquart and Related Genera. *Ann. Ent. Soc. Amer.*, 33, 4, pp. 683-700, 2 Pls.
1942. Notes on Tabanidae from Panama. VII. The Subgenus *Neotabanus* Ad. Lutz. *Ann. Ent. Soc. Amer.*, 35, 2, pp. 153-182, 2 Pls.
1942. Notes on Tabanidae from Panama. VIII. The Genera *Pityocera*, *Scioma* and *Esenbeckia*. *Ann. Ent. Soc. Amer.*, 35, 2, pp. 183-199, 2 Pls.
1942. Notes on Tabanidae from Panama. IX. The Genus *Stenotabanus* Lutz, *Lepiselaga* Macquart and related genera. *Ann. Ent. Soc. Amer.*, 35, 3, pp. 289-309, 1 Pl.
1942. Notes on Tabanidae from Panama. X. The Genus *Tabanus* Linn., and Resume of the Tabanidae of Panama. *Ann. Ent. Soc. Amer.*, 35, 4, pp. 441-474, 2 Pls.
1942. Notes on Tabanidae from Panama. III. The Genus *Chrysops* Meigen. *Proc. Ent. Soc. Washington*, 44, 1, pp. 1-8, 1 Pl.
- Kröber, O. 1929. Über einige kleinere Gattungen der sudamerikanischen Tabanini. *Zool. Anz.*, 83, pp. 115-137, Figs. 4-13.
- Lutz, Adolfo. 1913. Tabanidas do Brazil e de alguns Estados vizinhos. *Mem. Inst. Oswaldo Cruz*, 5, 2, pp. 3-52, Pls. 12-13.
- Pechuman, L. L. 1937. Notes on some Neotropical species of the genus *Chrysops* (Dipt. Tabanidae). *Rev. Ent.*, 7, 2-3, pp. 134-141, 2 figs.