Tabanidae (Diptera) of Amazônia XX. Description of Tabanus pseudonebulosus n.sp.

Inocêncio de Sousa Gorayeb/+, Antonio Thadeu Medeiros de Barros*

Departamento de Zoologia, Museu Paraense Emílio Goeldi, Av. Presidente Tancredo Neves 1901, 66017-970 Belém, PA, Brasil
+Corresponding author: gorayeb@museu-goeldi.br

Tabanus pseudonebulosus, new species, is described based on 217 female specimens and 5 males collected in Venezuela (Guarico, Aiguaio, Santa Elena, and Palmarito) and in Brazil (Pará: Santana do Araguaia, Serra das Andorinhas in São Geraldo do Araguaia, Serra Norte Carajás e Gorotire; Amazonas: Canutama; Mato Grosso do Sul: Corumbá), mostly in open vegetation, scrub forest and in rocky environments. Observed intraspecific variation in the specimens is presented and related to collection localities, and morphological differences are diagnosed in relation to the similar species Tabanus nebulosus DeGeer 1776 and T. importunus Wiedemann 1828. Morphometrical data and indices for specimens in different localities are provided. Drawings and photo of the new species are presented.

Key words: Insecta - Diptera - Tabanidae - Tabanus pseudonebulosus sp. n. - Brazil - Venezuela

Of the 4290 species and 137 genera of Tabanidae described worldwide, 27.3% (1172) of the species and 47.4% (65) of the genera are from the Neotropical Region. The genus Tabanus includes 190 species, 6 subspecies, and 3 varieties (Fairchild & Burger 1994).

Tabanus nebulosus DeGeer 1776 is a relatively common species widely distributed and found from Honduras to Brazil (Mato Grosso) and in Trinidad and Barbados. Tabanus importunus Wiedemann 1828 is another species, morphologically distinct from congeners, also common and widely distributed, occurring from Panamá to Brazil (Rio Grande do Sul), Eastern Peru, Eastern Bolívia, North of Paraguay, and Trinidad. Both are abundantly found in open areas and frequently attack livestock in pastures, but T. importunus shows greater voracity and occasionally attacks humans.

This paper adds another species to the Neotropical fauna of tabanids with the description of Tabanus pseudonebulosus n.sp., based on 217 female specimens and 5 male specimens collected in Venezuela (Guarico, Aiguaio, Santa Elena, and Palmarito) and in Brazil (Pará: Santana do Araguaia, Serra das Andorinhas in São Geraldo do Araguaia, Serra Norte Carajás e Gorotire; Amazonas: Canutama; Mato Grosso do Sul: Corumbá), mostly in areas of open vegetation, scrub forest and rocky outcroppings. It is morphologically similar to T. nebulosus and T. importunus with which it shares a wide geographical distribution and preference for habitat environments.

Tabanus pseudonebulosus n.sp.
Figs 1-14

Species of medium size, yellowish brown, thorax with stripes of whitish-gray pollinosity, tuffs of black hairs on the prescutellum, hyaline wings, base and costal cells also clear. Light brown abdomen with dark and light hairs in triangles on medial posterior of tergites 1 to 6 and in sublateral spots on tergites 2 to 6.

Female - Body length 12.58 mm (Fig. 14). Head (Figs 4, 14) - Eyes glabrous. Front (Fig. 1) slightly convergent at the base, brown with yellowish pollinosity and dark pilosity with bright yellow, height of the front 2.28 mm, width at base 0.44 mm, width of the vertex 0.56 mm, frontal index 5.21, divergence index 1.29; frontal callus drop-like in shape extending to the upper third of the front, bright brown with discrete rugosity, ocelli absent, reduced to two smooth areas, discrete vertical triangle formed by a slightly darker area. Subcallus with white pollinosity slightly yellowed. Genae, fronto-clypeus, region of the beard, and occipital with white pollinosity and pilosity. Antennae (Figs 3, 4) brown with scape and pedicel with whitish brown pollinosity, thick black short hairs concentrated on the distal dorsum of the scape and on the distal margins of the pedicel; the dorsal edge of the pedicel resembles a thick spine, dark with short dark hairs; flagellum with brown basal plate and black style; basal plate as wide as the scape; dark style larger than the basal plate. Palpi (Figs 2, 4) with white slightly yellowed pollinosity, 1st segment with all hairs fine and long; 2nd segment with shorter white fine hairs and strong short black hairs on the distal two-thirds of the external face. Thorax - Meso- notum (Fig. 14) grayish brown with stripes and areas of grayish white pollinosity and brown hairs with bright yellow; fine white hairs on the lateral margins of the wing insertion to the scutellum and the humeral callus. Humeral callus with yellowish brown integument. Notopleural lobe slightly lighter than mesonotum with brown hairs with bright yellow, pale, and a tuff of black hairs concentrated on the side of the pleura. Prescutellum with a tuff of black hairs. Scutellum with the same pattern of pollinosity and pilosity as the mesonotum. Wings (Fig. 14); length 11.77 mm, width 3.71 mm, wing index 3.17; hyaline with costal cell and base also clear; stigma yellow; fork of the 3rd
Tabanus pseudonebulosus n.sp.: 1-8 female (Fig. 1: frons; Fig. 2: palp; Fig. 3: antenna; Fig. 4: head in lateral view; Fig. 5: genital fork and spermathecal ducts; Fig. 6: tergites 9, 10 and cerci; Fig. 7: sternite 8 and gonopophysis; Fig. 8: abdomen in dorsal view). 9-13 male (Fig. 9: palp; Fig. 10: antenna; Fig. 11: head in lateral view; Fig. 12: aedeagus and gonostyle; Fig. 13: epandrium and cerci).
nized in two rows. Tarsi dark brown with dark hairs, ventral hairs are orange-brown. Abdomen (Figs 8, 14) - Tergites yellow-brown with black and yellow white hairs; medial areas of tergites 2 to 7 forming a dark stripe; tergite 2 with a well marked central black spot. Medial row of triangles of pale hairs on the central posterior of tergites 1 to 6. Triangular spots on the posterior lateral sides of tergites 1 to 6. Areas with pale pollinosity and pilosity on the lateral margins of tergites 1 to 6, forming a continuous stripe. Tergite 1 with a large area of white hairs on the anterior lateral. Tergite 7 dark with all hairs dark. Sternites 1 to 5 yellow with yellowish white pollinosity and white hairs; black hairs present: 3 or more on the medial area of sternite 5, on the larger part of the medial area of sternite 6, and all hairs of sternite 7. Genitalia (Figs 5-7): genital fork, spermatic ducts and spermatheca as in Fig. 5; tergites 9-10 and cerci, Fig. 6; sternite 8 with gonapophysis, Fig. 7.

Male - Without significant differences from the female. Body length variable as in Table I. Head, antenna and palpi as in Figs 9-11. Eyes with area of larger omatidia light brown, contrasting with area of smaller omatidia that is dark brown to black (Fig. 11). Genitalia (Figs 12, 13): aedeagus, gonostyli and dististyli, Fig. 12; epandrium and cerci, Fig. 13.

Types

PARATYPES


4♀♀ Brazil, Pará, São Geraldo do Araguaia, Serra das Andorinhas, 6°12'58.8"S 28°26'1.6"W, cerrado (scrub forest), armadilha suspensa 1.6 m, Cols. B. Mascarenhas, J. O. Dias, J. M. F. Ribeiro & D. Dalcides.


1♀ Brazil, Pará, Gorotire (Indian village) 51°W 8°S, 29-VII-1978, Col. D. A. Posey.

36♀♀ Brazil, Amazonas, Canutama, 8°19'18.6"S 63°46'28.6"W, 11-VII-2005, Col. N. Bittencourt (23♀♀, armadilha Malaise, cerrado, 4 deposited in the entomological collection of INPA - Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas, Brazil; 11♀♀, armadilha suspensa 2 m, Mata (Forest), 1 deposited in the entomological collection of BMNH - The Natural History Museum, London, England; 2♀♀, armadilha suspensa 2m, cerrado.

15♀♀ Brazil, Mato Grosso do Sul, Corumbá, Faz. Nhuminimar, 3 deposited in the entomological collection of EMBRAPA-Pantanal, Corumbá, Mato Grosso do Sul, (1♀♀ idem, equino (horse bait), 6:45h, mata (Forest), 24-IX-92, col. A.T.M. Barros; 1♂ idem, 7:45h; 4♀♀ idem 9:15h; 1♀♀ idem 9:45h; 1♀♀ idem 10:45h; 1♂ idem 11:45h; 1♀♀ idem 12:15h; 1♀♀ idem 15:15h; 1♀♀ idem 15:45h; 1♂ idem 11:15h, 28-X-92; 1♂ canopy trap, mata, 23-IX-92; 1♂ idem, 26-IX-92).

Etymology
The specific epithet refers to the morphological resemblance of the new species with Tabanus nebulosus.
### TABLE I

Differential characters between *Tabanus pseudonebulosus* n.sp., *T. nebulosus*, and *T. importunus*

<table>
<thead>
<tr>
<th>Character</th>
<th><em>Tabanus pseudonebulosus</em> n.sp.</th>
<th><em>Tabanus nebulosus</em></th>
<th><em>Tabanus importunus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>General aspect</td>
<td>Small to medium yellowish brown species with striped mesonotum with light pollinosity, discrete tufts of hairs on the prescutellum, hyaline wings, abdomen with dark median stripe.</td>
<td>Large species with gray thorax and evident tufts of dark hairs on the prescutellum, wings transparent and weakly smoky and yellowish-brown around the veins, abdomen reddish brown with sublateral rows of light colored areas.</td>
<td>Large species with gray striped thorax and small tuft of dark hairs on the prescutellum, wings spotted on the anterior third, abdomen with medial dark stripe and row of large, light colored sublateral spots.</td>
</tr>
<tr>
<td>Size</td>
<td>Body size generally less than 15.0 mm. Wing length generally less than 15.0 mm. Thorax width generally less than 4.5 mm. Frons height less than 3.0 mm.</td>
<td>Body size generally more than 15.0 mm. Wing length generally more than 15.0 mm. Thorax width generally more than 4.5 mm. Frons height more than 3.0 mm.</td>
<td>Body size generally more than 15.0 mm. Wing length generally more than 15.0 mm. Thorax width generally more than 4.5 mm. Frons height more than 3.0 mm.</td>
</tr>
<tr>
<td>Antennae</td>
<td>Orange with dark stylus, basal plate dark, short and wide (Fig. 17).</td>
<td>Dark with yellowed base, basal plate long and narrow (Fig. 15).</td>
<td>Orange with dark stylus, basal plate long and narrow (Fig. 16).</td>
</tr>
<tr>
<td>Palpi</td>
<td>2nd segment with light hairs.</td>
<td>2nd segment with dark hairs and few pale.</td>
<td>2nd segment with dark and light hairs.</td>
</tr>
<tr>
<td>Wings</td>
<td>Hyaline, discrete smoky areas can appear on the fork in 3rd vein and on transverse veins. Generally without appendice on the fork of the 3rd vein. Wing base hyaline.</td>
<td>Hyaline, but with weak yellowish-brown smokyness around the veins. Weak spots are present on the fork of the 3rd vein and sometimes also on the transverse veins. Without appendice on the fork of the 3rd vein. Wing base hyaline.</td>
<td>With strong spots on the anterior third of the wing, generally covering: the wing base; the costal cell that is yellowed; the subcostal; the proximal half of the marginal cell; the 1st basal; the 2nd basal except the center that is hyaline; the proximal half of the 1st submarginal; the fork of the 3rd vein; the proximal third of the veins around the discal cell; proximal half of the of the 1st posterior cell; bases of the 4th and 5th posterior cells; proximal half and delimiting veins of the anal cell; basal wing lobe; base and anterior margin of the anal lobe.</td>
</tr>
</tbody>
</table>

### TABLE II

Morphometrical data (means and ranges) and indices for specimens of the type series of *Tabanus pseudonebulosus* n.sp., by collection locality

<table>
<thead>
<tr>
<th>Collection locality</th>
<th>Body length</th>
<th>Wing length</th>
<th>Wing width</th>
<th>Wing index</th>
<th>Height of frons</th>
<th>Frons basal width</th>
<th>Frons width at vertex</th>
<th>Frons index</th>
<th>Divergence index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canutama, AM, Brazil</td>
<td>13.53(11.45-15.16)</td>
<td>12.40(10.81-13.55)</td>
<td>3.81(3.14-4.19)</td>
<td>3.26(3.08-3.49)</td>
<td>2.33(2.03-2.53)</td>
<td>0.47(0.39-0.53)</td>
<td>0.59(0.50-0.66)</td>
<td>4.95(4.2-5.3)</td>
<td>1.25(1.1-1.4)</td>
</tr>
<tr>
<td>Carajás, Serra Norte, PA, Brazil</td>
<td>12.58(10.64-13.71)</td>
<td>11.56(10.00-12.26)</td>
<td>3.71(3.22-4.03)</td>
<td>3.13(2.96-3.23)</td>
<td>2.17(1.87-2.33)</td>
<td>0.44(0.41-0.49)</td>
<td>0.55(0.47-0.59)</td>
<td>4.93(4.4-5.2)</td>
<td>1.25(1.1-1.4)</td>
</tr>
<tr>
<td>Pantanal, MS, Brazil</td>
<td>14.97(14.03-15.68)</td>
<td>13.17(12.74-13.71)</td>
<td>4.16(3.95-4.35)</td>
<td>3.17(3.08-3.27)</td>
<td>2.48(2.45-2.56)</td>
<td>0.46(0.43-0.51)</td>
<td>0.65(0.59-0.67)</td>
<td>5.39(4.8-5.9)</td>
<td>1.41(1.2-1.5)</td>
</tr>
<tr>
<td>Santana do Araguaia, PA, Brazil</td>
<td>13.38(11.61-14.52)</td>
<td>12.20(10.81-13.23)</td>
<td>3.84(3.39-4.19)</td>
<td>3.18(3.00-3.33)</td>
<td>2.26(1.97-2.45)</td>
<td>0.44(0.39-0.51)</td>
<td>0.56(0.47-0.67)</td>
<td>5.14(4.7-5.8)</td>
<td>1.27(1.2-1.4)</td>
</tr>
<tr>
<td>Serra das Andorinhas, PA, Brazil</td>
<td>14.68(13.71-15.16)</td>
<td>12.86(11.93-13.39)</td>
<td>4.19(3.71-4.35)</td>
<td>3.07(2.96-3.22)</td>
<td>2.30(2.12-2.37)</td>
<td>0.46(0.44-0.50)</td>
<td>0.55(0.53-0.56)</td>
<td>5.00(4.7-5.4)</td>
<td>1.20(1.1-1.3)</td>
</tr>
<tr>
<td>Venezuela</td>
<td>15.82(15.00-17.42)</td>
<td>14.22(12.90-15.48)</td>
<td>4.41(4.03-4.76)</td>
<td>3.22(3.04-3.32)</td>
<td>2.57(2.34-2.75)</td>
<td>0.47(0.42-0.50)</td>
<td>0.58(0.53-0.62)</td>
<td>5.54(5.1-6.3)</td>
<td>1.25(1.1-1.4)</td>
</tr>
<tr>
<td>All specimens</td>
<td>14.16(10.64-17.42)</td>
<td>12.73(10.00-15.48)</td>
<td>4.02(3.14-4.35)</td>
<td>3.17(2.96-3.49)</td>
<td>2.35(1.87-2.75)</td>
<td>0.46(0.39-0.53)</td>
<td>0.58(0.47-0.67)</td>
<td>5.16(4.2-6.3)</td>
<td>1.28(1.1-1.5)</td>
</tr>
</tbody>
</table>
DISCUSSION

Tabanus pseudonebulosus n.sp. has previously been confused with T. nebulosus and T. importunus because of its morphological proximity. It is common to find specimens of the new species mixed with those of the other two species in entomological collections. The characters listed in Table I can be used to separate these species.

Morphological variation

The 222 specimens of the type series were collected in diverse localities, some of which exhibit characteristics that could have contributed to the separation of contained populations for long periods of time. For this reason, these populations show morphological variations, as explained in the following.

Average body length is 14.16 mm, with a range from 10.64 to 17.42 mm. Specimens from Venezuela and the Brazilian Pantanal (Brazil, Mato Grosso do Sul) are larger than those from other localities, and those from the Serra dos Carajás, (Pará, Brazil) are smaller. Besides body size, other morphological measurements are presented in Table II. General body integument generally is yellow-brown, but some specimens are darker with brown tones on the pleura, legs, and mesonotum. The antennae generally exhibit an orangish basal plate and dark stylus, but specimens can be found with completely dark or completely orange antennae. The stylus can be as long as or longer than the basal plate, but specimens have shorter styli. The format of the basal plate also varies, presenting the area of spines as a right angle or an obtuse angle. In the wing, the fork of the 3rd vein varies from an acute angle to a right angle with a long appendice. This fork is covered by a cloudy spot that can be weak or absent. The second abdominal segment shows a black tegumental spot that can be long and strong to small and weak.

ACKNOWLEDGEMENTS

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REFERENCES


Antennae of the species - Fig. 15: Tabanus nebulosus; Fig. 16: T. importunus; Fig. 17: T. pseudonebulosus n.sp.