

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

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Tabanus pseudonebulosus, new species, is described based on 217 female specimens and 5 males collected in Venezuela (Guarico, Aguaio, Santa Elena, and Palmarito) and in Brazil (Pará: Santana do Araguaia, Serra das Andorinhas in São Geraldo do Araguaia, Serra Norte Carajás and 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 Bolivia, 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, Aguaio, Santa Elena, and Palmarito) and in Brazil (Pará: Santana do Araguaia, Serra das Andorinhas in São Geraldo do Araguaia, Serra Norte Carajás and 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, tufts 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 pillosity 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 pillosity. 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* - Mesonotum (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 tuft of black hairs concentrated on the side of the pleura. Prescutellum with a tuft of black hairs. Scutellum with the same pattern of pollinosity and pillosity 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

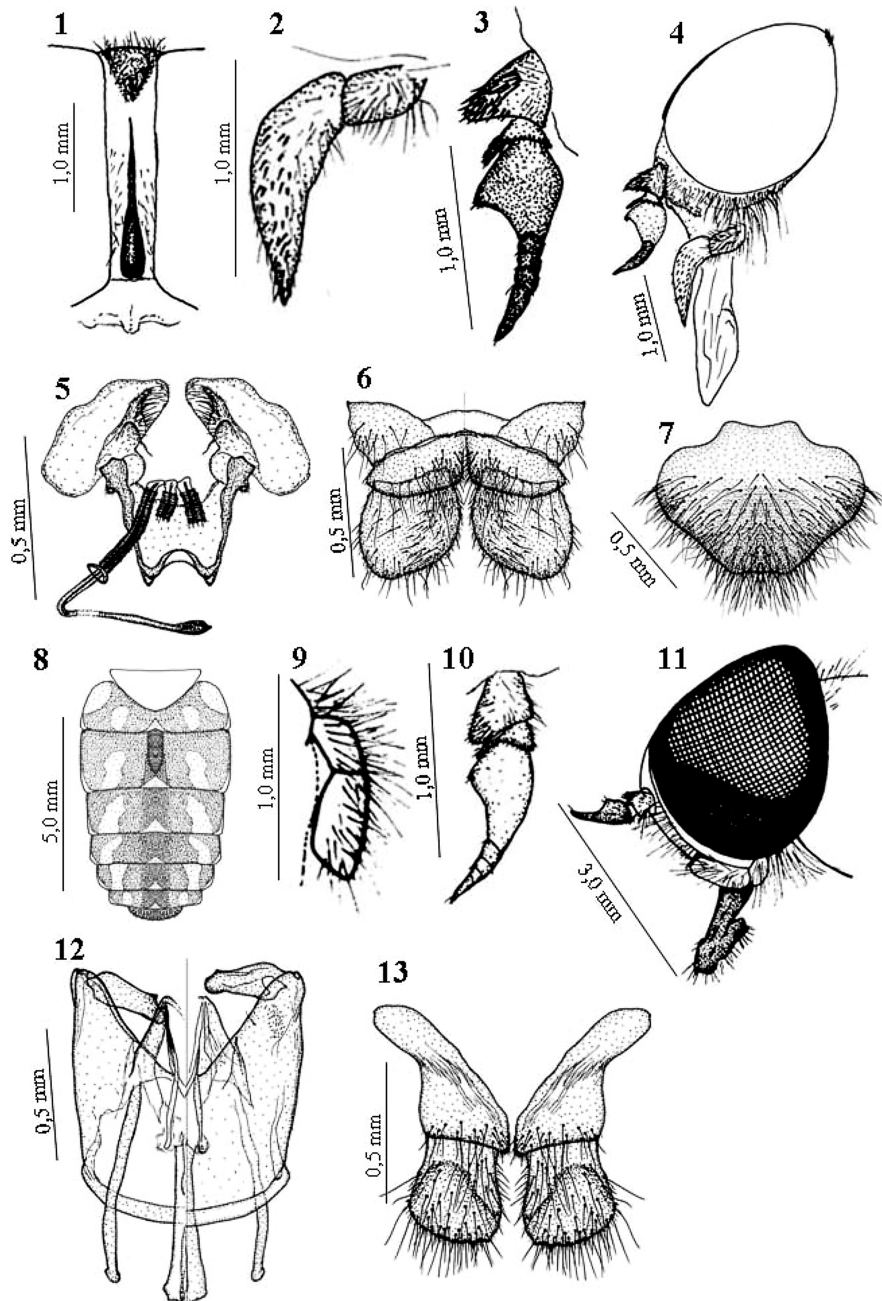
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vein with a weak brown spot and a rudimentary appendice; weak brown spot inconspicuously around the transversal veins r-m and cu-a, as well as those of the distal margin of the distal cell; brown tegula almost black with white hairs, proximal calypter with tuff of white hairs; yellow halteres. Pleura gray with white yellowish pollinosity; white pillosity with the exception of a group of black hairs on the posterior dorsal area of the mesanepisternum. Coxae with the same pattern of pollinosity and pillosity as the pleura. Coxal-femoral articulations and trochanters dark brown. Femurs with brown tegument covered with yellowish white pollinosity; fore femur with white pillosity on the external face and black on the internal face; mid femur with white hairs, black hairs concentrated on the proximal two-thirds of the lateral dorsal area; hind femur with all hairs white. Fore tibia bicolor but without evident division, proximal half with pollinosity and pale hairs and distal half with less pollinosity and dark hairs. Mid tibia with pollinosity and pale hairs, dark hairs on proximal dorsal lateral and on the distal extremity that is dark. Hind tibia with pattern of pollinosity and pillosity like the mid tibia, but the black hairs of the proximal dorsolateral orga-

lowish white pollinosity; fore femur with white pillosity on the external face and black on the internal face; mid femur with white hairs, black hairs concentrated on the proximal two-thirds of the lateral dorsal area; hind femur with all hairs white. Fore tibia bicolor but without evident division, proximal half with pollinosity and pale hairs and distal half with less pollinosity and dark hairs. Mid tibia with pollinosity and pale hairs, dark hairs on proximal dorsal lateral and on the distal extremity that is dark. Hind tibia with pattern of pollinosity and pillosity like the mid tibia, but the black hairs of the proximal dorsolateral orga-



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 espermathecal 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 pillosity 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, spermathecal 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 ommatidia light brown, contrasting with area of smaller ommatidia that is dark brown to black (Fig. 11). Genitalia (Figs 12, 13): aedeagus, gonostyli and dististyli, Fig. 12; epandrium and cerci, Fig. 13.

Types

HOLOTYPE ♀ Brazil, Pará, Santana do Araguaia, 10 - 13-VIII-92, armadilha Malaise (Malaise trap), Col. D. Pimentel. Deposited in the entomological collection of Museu Paraense Emílio Goeldi, Belém, Pará, Brazil.

PARATYPES

23 ♀♀ + **4** ♂♂ Venezuela (11 ♀♀ Guarico, 44 km S. Calabozo, Hato Masaguaral, 8°34'N 67°35'W, 60 m, 17-III-1987, Cols. R. B. Miller & L. A. Stange, 3 deposited in the entomological collection of MIZA - Museo del Instituto de Zoología Agrícola Francisco Fernández Yépez, Maracay, Aragua, Venezuela; 5 ♀♀ + 1 ♂ idem, 9-11-II-1986; 1 ♀ + 1 ♂ idem, 28-II-1986; 5 ♀♀ idem, 15-III-1967; 1 ♀ Aguao, 7-IV-1954, Ortiz; 1 ♂ BO, Santa Elena, 23-II-1967, Col. R. L. Dressler; 1 ♂ Palmarito, Est. Apure, 15-VIII-1954, Col. Ortiz).

99 ♀♀ Brazil, Pará, Santana do Araguaia, Col. D. Pimentel (31 ♀♀ idem, 3 - 6-VII-92, armadilha Malaise; 3 ♀♀ idem, 25 - 28-VI-92; 10 ♀♀ idem, 20 - 31-VII-92; 18 ♀♀ idem, 10 - 13-VIII-92; 4 ♀♀ idem, 22 - 25-VI-92; 28 ♀♀ idem, 6 - 10-VIII-92, 4 deposited in the entomological collection of MZUSP - Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil; 5 ♀♀ idem, 22 - 25-VI-92, armadilha suspensa - suspended trap - 1,6 m).

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.

38 ♀♀ + **1** ♂ Brazil, Pará, Serra Norte, N1 Canga, armadilha suspensa 1,6 m (3 ♀♀ idem, 2 - 5-VII-1986, Col. J. Dias; 4 ♀♀ idem, 5 - 9-VII-1986; 3 ♀♀ idem, 28-VI - 2-VII-1986; 1 ♀ idem 20 - 23-VI-1986; 1 ♀ idem, 2 - 5-VII-86, Col. W.

França; 1 ♀ idem, 16 - 19-VIII-1984, Col. W. França; 2 ♀♀ idem, 28-VI - 2-VII-86, Col. W. França; 1 ♀ idem, 20 - 23-VI-86, Col. W. França; 2 ♀♀ idem, 5 - 9-VII-86, Col. Márcio Zanuto; 1 ♀ idem, 1 - 3-VII-85, sem Col.; 6 ♀♀ idem, 13 - 16-VIII-84, without collector name, 3 deposited in the entomological collection of Fiocruz - Instituto Oswaldo Cruz, Rio de Janeiro, Brazil; 6 ♀♀ + 1 ♂ idem, 10 - 13-VIII-84, without collector name; 4 ♀♀ idem, 16 - 19-VIII-84, without collector name; 3 ♀♀ idem, 19 - 22-VIII-1984, without collector name).

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. Nhumirim, 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*.



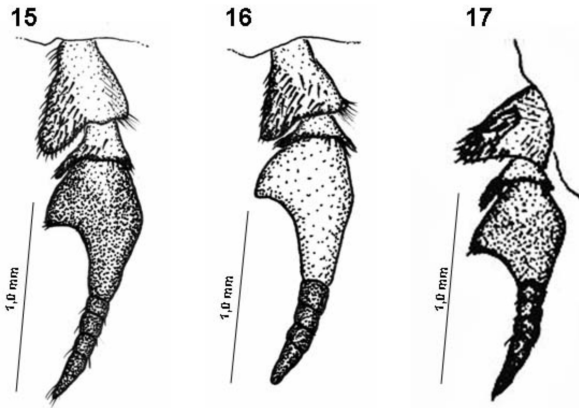
Fig. 14: *Tabanus pseudonebulosus* n.sp. (dorsal view).

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

Character	<i>Tabanus pseudonebulosus</i> n.sp.	<i>Tabanus nebulosus</i>	<i>Tabanus importunus</i>
General aspect	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.	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.	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.
Size	Body size generally less than 15.0 mm. Wing length generally less than 15.0 mm. Wing width generally less than 4.5 mm. Thorax width generally less than 4.5 mm Frons height less than 3.0 mm.	Body size generally more than 15.0 mm. Wing length generally more than 15.0 mm. Wing width generally more than 4.5 mm. Thorax width generally more than 4.5 mm Frons height more than 3.0 mm.	Body size generally more than 15.0 mm. Wing length generally more than 15.0 mm. Wing width generally more than 4.5 mm. Thorax width generally more than 4.5 mm Frons height more than 3.0 mm.
Antennae	Orange with dark stylus, basal plate dark, short and wide (Fig. 17).	Dark with yellowed base, basal plate long and narrow (Fig. 15).	Orange with dark stylus, basal plate long and narrow (Fig. 16).
Palpi	2nd segment with light hairs.	2nd segment with dark hairs and few pale.	2nd segment with dark and light hairs.
Wings	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.	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.	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.

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

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



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

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.

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