

# First records of Pantophthalmidae (Insecta: Diptera) for the state of Tocantins, Brazil

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**Abstract.** Pantophthalmidae (Diptera) are recorded exclusively in the Neotropical Region. Despite the large size of adults, their species are often rare and poorly represented in entomological collections. Only two genera and 20 species are known, of which 12 are recorded in the five regions of Brazil. In the North region, the family is reported from all states, except in Tocantins. The present work provides the first records of the family for Tocantins, expanding the distribution of two species, *Pantophthalmus kerteszi* (Enderlein, 1914) and *P. tabaninus* Thunberg, 1819. Both species are recorded for the first time in the Cerrado biome. In addition, we provide photographs of the species and a distribution map.

**Keywords.** Taxonomy; Biodiversity; Timber flies; Giant flies; Cerrado biome.

## INTRODUCTION

Pantophthalmidae are a small family of Diptera also known as timber flies or giant flies. They are robust flies, with adult body varying from 18 to 45 mm (Woodley, 2009). The family is found only in the Neotropical Region, with only two genera and 20 valid species: *Pantophthalmus* Thunberg, 1819, with 19 species and *Opetiops* Enderlein, 1921, with only one species (Val, 1976; Papavero, 2009). Of these, 11 species of *Pantophthalmus* and *Opetiops alienus* (Hermann, 1916) occur in Brazil, distributed in the five major regions of the country. Currently, eight species of Pantophthalmidae are reported from the states of the North region of Brazil, however, no records of the family have been reported from the state of Tocantins so far (Barros *et al.*, 2019; Fachin, 2023).

Pantophthalmids have economic importance due to the xylophagous habit of the larvae, which feed mainly on large trees. In Brazil, at least 13 native species are hosts of the family: *Araucaria brasiliana* A. Rich., *Chlorophora tinctoria* (L.) Gaudich., *Colubrina rufa* (Vell.) Reissek., *Erythrina falcata* Benth., *Esenbeckia leiocarpa* Engl., *Lonchocarpus spruceanus* Benth., *Mimosa scabrella* Benth., *Nectandra lanceolata* Ness & Mart., *Nectandra* sp., *Persea pyrifolia* (D. Don) Spreng,

*Piptadenia macrocarpa* Benth., *Schizolobium parahyba* (Vell.) S.F. Blake, and *Tachigali multijuga* Benth (Lunz, 2021). The North region has the highest number of species of Pantophthalmidae reported and this is possibly due to the wide diversity of tree species in the Amazon Forest biome (Carrera & d'Andretta, 1957).

Pujol-Luz & Morgado (2018) reported only three species of Pantophthalmidae in the Cerrado, the predominant biome in Tocantins: *Pantophthalmus planiventris* (Wiedemann, 1821) in Anapólis, state of Goiás, *P. vittatus* (Wiedemann, 1828) in Cuiabá, state of Mato Grosso, and *P. pictus* (Wiedemann, 1821) in Brasília and Águas Claras, Federal District. Here, we recorded for the first time *P. kerteszi* (Enderlein, 1914) and *P. tabaninus* Thunberg, 1819 in this biome by reporting them for the first time from Tocantins.

## MATERIAL & METHODS

The examined specimens are deposited at the Coleção de Entomologia da Universidade Federal do Tocantins (CEUFT) and were collected in the municipalities of Colinas do Tocantins, Paraíso, and Porto Nacional, both located in the state of Tocantins, North region of Brazil.

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**Table 1.** Distribution records of *Pantophthalmus kerteszi* (Enderlein, 1914) and *P. tabaninus* Thunberg, 1819. (\*) = New records.

Species	Geographic record	Coordinates in decimal degrees	Reference
<i>Pantophthalmus kerteszi</i>	Bolivia: Cochabamba (San Antonio)	-17.417868°, -66.165322°	Val, 1976
	Bolivia: Santa Cruz (Provincia de Sara)	-16.920806°, -63.739607°	Val, 1976
	Brazil: Amazonas (Manaus)	-03.130683°, -60.020486°	Val, 1976
	Brazil: Mato Grosso do Sul (Corumbá)	-19.008522°, -57.653893°	Carrera & d'Andretta, 1957
	Brazil: Mato Grosso (Barra do Bugres)	-15.073635°, -57.195608°	Carrera & d'Andretta, 1957
	Brazil: Pará (Óbidos)	-01.897759°, -55.517392°	Carrera & d'Andretta, 1957
	Brazil: Pará (Paragominas)	-02.998297°, -47.353214°	Lunz <i>et al.</i> , 2010
	Brazil: Tocantins (Porto Nacional – Setor Vila Operária)*	-10.725103°, -48.385207°	Present work
	Brazil: Tocantins (Porto Nacional – Jardim Querido)*	-10.704158°, -48.400074°	Present work
	Colombia, no other data	04.704784°, -74.057201°	Val, 1976
	Panama: Barro Colorado	09.165788°, -79.833440°	Val, 1976
	Panama: Gamboa (Canal Zone)	09.115837°, -79.696345°	Rapp, 2011
	Peru: Amazonas (Santiago River)	-05.214915°, -78.099167°	Val, 1976
	Peru: San Martin (Juanjui)	-07.325706°, -76.845731°	Val, 1976
	Peru: Tarapoto Region	-06.488643°, -76.372473°	Val, 1976
	<i>Pantophthalmus tabaninus</i>	Argentina: Buenos Aires	-34.728156°, -58.398800°
Argentina: Misiones (San Ignacio)		-27.328308°, -55.537210°	Val, 1976
Bolivia: Cochabamba (Cristal Mayo River)		-17.051540°, -65.646907°	Val, 1976
Bolivia: Cochabamba (Provincia Chaparé, Chipiriri River)		-16.712036°, -65.614510°	Val, 1976
Bolivia: Santa Cruz (Buenavista)		-17.773474°, -63.164861°	Val, 1976
Brazil: Amazonas (Amazon River)		-03.303499°, -60.664179°	Val, 1976
Brazil: Amapá (Macapá)		00.033265°, -51.056644°	Val, 1976
Brazil: Bahia, no other data		-11.447218°, -41.278168°	Carrera & d'Andretta, 1957
Brazil: Espírito Santo (Córrego do Itá)		-18.666674°, -40.879606°	Val, 1976
Brazil: Espírito Santo (Alegre, Jerusalém Farm)		-20.771989°, -41.532065°	Val, 1976
Brazil: Espírito Santo (Santa Leopoldina)		-20.105590°, -40.528085°	Val, 1976
Brazil: Minas Gerais (Mar de Espanha)		-21.872726°, -43.010145°	Carrera & d'Andretta, 1957
Brazil: Minas Gerais (Matipó River)		-20.031477°, -42.458718°	Carrera & d'Andretta, 1957
Brazil: Pará (Belém)		-01.471235°, -48.501830°	Val, 1976
Brazil: Pará (Mangabeira, Mocajuba River)		-01.365691°, -48.802301°	Val, 1976
Brazil: Pará (Óbidos)		-01.897759°, -55.517392°	Val, 1976
Brazil: Pará (Oriximiná, Porto Trombetas)		-01.772043°, -55.862745°	Santos <i>et al.</i> , 2005
Brazil: Rio de Janeiro (Angra dos Reis)		-23.007115°, -44.319522°	Carrera & d'Andretta, 1957
Brazil: Rio de Janeiro (Japuiba)		-22.976133°, -44.299635°	Carrera & d'Andretta, 1957
Brazil: Rio de Janeiro (Jussaral)		-22.940909°, -44.274423°	Carrera & d'Andretta, 1957
Brazil: Rio de Janeiro (Itaguaí)		-22.869936°, -43.778947°	Val, 1976
Brazil: Santa Catarina (Corupá)		-26.441996°, -49.242474°	Carrera & d'Andretta, 1957
Brazil: Santa Catarina (Santa Luzia)		-26.371375°, -49.126179°	Val, 1976
Brazil: São Paulo (Jacutinga)		-23.567856°, -46.637662°	Val, 1976
Brazil: São Paulo (Peruíbe, Bairro do Guaraú)		-24.317926°, -46.994590°	Maronezi, 2020
Brazil: Tocantins (Colinas do Tocantins)*		-08.059549°, -48.477156°	Present work
Brazil: Tocantins (Paraíso)*		-10.201604°, -48.884114°	Present work
Colombia: Meta (Villavicencio)		04.108631°, -73.631003°	Val, 1976
Colombia: Amazonas (Parque Natural: Amacayacú; Matamata)		-01.459849°, -71.575406°	Amat, 2005
Colombia: Antioquia (Caucasia)		07.980606°, -75.198406°	Wolff <i>et al.</i> , 2016
Colombia: Antioquia (San Luis)		06.041992°, -74.994694°	Wolff <i>et al.</i> , 2016
Colombia: Caquetá (Florencia)		01.612986°, -75.603826°	Wolff <i>et al.</i> , 2016
Colombia: Chocó (Cacarica)		07.723134°, -77.144632°	Amat, 2005
Colombia: Chocó (Quibdó)		05.691045°, -76.658184°	Amat, 2005
Colombia: Chocó (Ríosucio)		07.427906°, -77.116963°	Amat, 2005
Colombia: Putumayo (Valle del Guamués)		00.408498°, -75.529297°	Amat, 2005
French Guiana: Alicoto (Oyapock [River])		03.142845°, -52.353502°	Val, 1976
French Guiana: Cayenne		04.936012°, -52.336172°	Val, 1976
French Guiana: St. Jean du Maroni		05.400264°, -54.076525°	Val, 1976
Guatemala, no other data		15.780452°, -90.232443°	Val, 1976
Guyana: Kartabo (Bartica)		06.394020°, -58.626888°	Val, 1976
Lesser Antilles (St. Barthélemy)		15.439345°, -61.344911°	Papavero, 2009
Nicaragua, no other data		12.832503°, -85.209274°	Val, 1976
Panama: Ancón (Canal Zone)	09.052309°, -79.616627°	Knab, 1914	

Species	Geographic record	Coordinates in decimal degrees	Reference
	Panama: Barro Colorado (Canal Zone)	09.165788°, -79.833440°	Val, 1976
	Panama: El Cermeño	08.731003°, -79.818423°	Val, 1976
	Panama: Gatun Lake	09.191879°, -79.908019°	Val, 1976
	Peru: Cuzco (Quirós, Paucartambo River)	-13.533079°, -71.967374°	Val, 1976
	Peru: Huancayo	-12.072456°, -75.212196°	Carrera & d'Andretta, 1957
	Peru: Huánuco (Monzón Valley)	-09.921289°, -76.241084°	Val, 1976
	Peru: Huánuco (Tingo Maria)	-09.307110°, -76.002691°	Carrera & d'Andretta, 1957
	Peru: Junín (Satipo)	-11.158192°, -75.992631°	Carrera & d'Andretta, 1957
	Peru: Loreto (Iquitos)	-03.748426°, -73.251919°	Val, 1976
	Peru: Loreto (Pucallpa)	-03.745635°, -73.248184°	Val, 1976
	Suriname: Oelemarie	02.982888°, -54.563373°	Val, 1976
	Suriname: Paramaribo	05.844092°, -55.207286°	Val, 1976
	Suriname: Zanderij	05.452420°, -55.210999°	Val, 1976
	Trinidad and Tobago: Arima Valley	10.631702°, -61.284473°	Val, 1976
	Trinidad and Tobago: Mayaró State	10.280290°, -61.029658°	Val, 1976
	Trinidad and Tobago: Port of Spain	10.659322°, -61.508653°	Val, 1976
	Trinidad and Tobago: Sangre Grande	10.583036°, -61.128389°	Val, 1976
	Trinidad and Tobago: Tusure Forest	10.691722°, -61.222458°	Val, 1976
	Venezuela: Amazonas (Duida Mt.)	02.815448°, -65.108854°	Val, 1976
	Venezuela: Aragua (Maracay)	10.062457°, -67.284977°	Val, 1976
	Venezuela: Delta Amacuro	08.842080°, -61.137988°	Val, 1976
	Venezuela: Falcón	11.180769°, -69.859779°	Val, 1976
	Venezuela: Monagas (Caripito)	09.320143°, -63.014655°	Val, 1976

The specimens were identified with Val's (1976) key and compared with photos of the types deposited at the Museum für Naturkunde, Berlin, Germany (MfN) (Fig. 2) and also with additional material from the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP). Images of the adults were obtained through a Leica M165C stereomicroscope with a coupled camera. Editing of photos and plates were done with Adobe Photoshop. For plotting the distribution of each species on a map, we checked all the literature known to us, providing the approximate coordinates based on the center of the locations using Google Earth™ and informing which study was the source of each locality record (Table 1). The distributional map was elaborated with QGIS (2022) and the shapefile with the Brazil limits and the Brazilian biomes were obtained from the Instituto Brasileiro de Geografia e Estatística (IBGE) (<https://www.ibge.gov.br>) and that with South and Central America limits from Efran Maps (<https://www.efrainmaps.es-english-version/free-downloads/americas>). In the examined material section of each species, the label information was reproduced exactly as one can read from the labels and complementary data when added, is between parentheses [ ].

## RESULTS

### *Pantophthalmus kerteszi* (Enderlein, 1914) Figs. 1, 2, 4

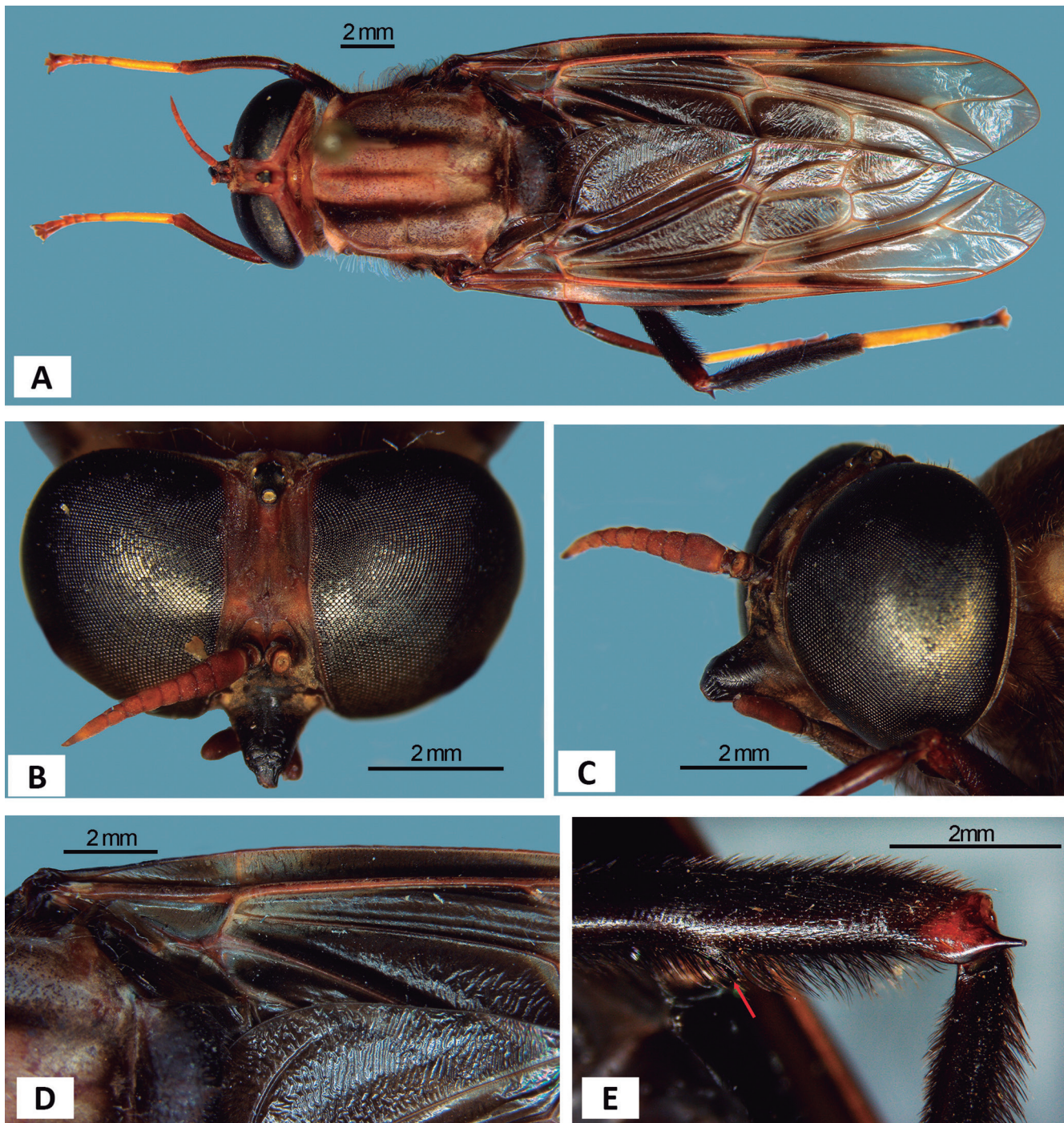
*Acanthomera kertésziana* Enderlein, 1914: 578. Lectotype: female (MfN, examined by photo; according to Val, 1976, the two females syntypes should be in Warsaw and Budapest, one in each collection, but no

specimen was found in Warsaw; a female labeled as the type was found in the Berlin collection and designated as lectotype, see Val, 1976: 79). Type locality: Peru, Mariscal Cáceres, Juanjui. [For nomenclatural history, see Papavero (2009: 3), no changes are proposed here].

**Diagnosis:** Female – Body predominantly brownish to black (Fig. 1A). Frons and antenna orangish-brown (Fig. 1B, C). Face with a very prominent beak (Fig. 1C). Thorax covered with grayish pruinosity and three dark brown longitudinal bands; lateral bands thicker and almost parallel, medial band narrower than lateral bands and interrupted near the posterior margin of scutum (Fig. 1A). Wing with yellowish-brown base, most visible at the level of humeral vein (Fig. 1D). Legs reddish-brown to dark brown, except all tarsomeres 1-2 yellow (Fig. 1A), ventral spine of hind femur reduced in size (Fig. 1E). Abdomen black with small white spots on lateral margins of tergites 2 and 3.

**Material examined:** Brazil, TO [Tocantins], Porto Nacional, Jardim Querido [-10.704158°, -48.400074°], Casa, x.2018, coleta manual, Gaizer, F. leg. (1 ♀ CEUFT 005849); *idem*, Setor Vila Operária [-10.725103°, -48.385207°], 25.iii.2021, Silva, R.M. leg. (1 ♀ CEUFT 005850); *idem*, iv.2014, Krolow, T.K. leg. (1 ♀ CEUFT 005851).

**Comments:** Val (1976: 79, fig. 102, female) mentioned the presence of a dark triangular spot on the posterior region of the scutum. In the examined specimens, the triangular mark is small, barely visible, similar to that observed in the lectotype and additional female deposited in Berlin (Fig. 2). In addition, the studied specimens have considerable variation in size, the smallest measures



**Figure 1.** *Pantophthalmus kerteszius* (Enderlein, 1914), female. (A) Habitus, dorsal view. (B) Head, frontal view. (C) Head, anterolateral view. (D) Base of wing. (E) Apex of hind femur, anterior view. The ventral spine is indicated by the red arrow.

19 mm and the largest, 26 mm. This size difference was also noted by Carrera & d'Andretta (1957), who mentioned that the body length of this species varied between 20 and 35 mm.

***Pantophthalmus tabaninus* Thunberg, 1819**  
Figs. 2, 3, 4

*Pantophthalmus tabaninus* Thunberg, 1819: vii, pl., figs. 1-4.  
Type: 1 specimen, likely male as stated by Thunberg (UUZM, see Wallin & Wallin, 2001: 27; according to Val, 1976 only one male specimen, not labeled as type, was

found in Thunberg's collection in UUZM, but labeled from Brazil; presumed lost according to Papavero, 2009: 5). Type locality: Lesser Antilles, Saint Barthélemy (Forsström). [For nomenclatural history, see Papavero (2009: 3), no changes are proposed here].

**Diagnosis:** Female – Body predominantly brown to black (Fig. 3A). Frons yellow (Fig. 3A, B). Face with a slightly prominent beak (Fig. 3B, C). Antenna dark brown, covered with yellowish pruinosity, flagellum with the first two flagellomeres wider than the others, last flagellomere tapering towards apex, with an orange tip (Fig. 3D). Thorax predominantly brown with a wide yellowish longitudinal

median stripe. (Fig. 3A). Wing with brown base (Fig. 3E). Legs reddish brown to dark brown, hind femur without ventral spine (Fig. 3F). Abdomen black with small white spots on lateral margins of tergites 2 and 3.

**Material examined:** Brazil, TO [Tocantins], Paraíso [-10.201604°, -48.884114°], Aneliese, A.F. leg. (1 ♀ CEUFT 005852); *idem*, Colinas do Tocantins [-8.059549°, -48.477156°], 07.v.2013, coleta manual, Nascimento, W.P.L. leg. (1 ♀ CEUFT 005853).

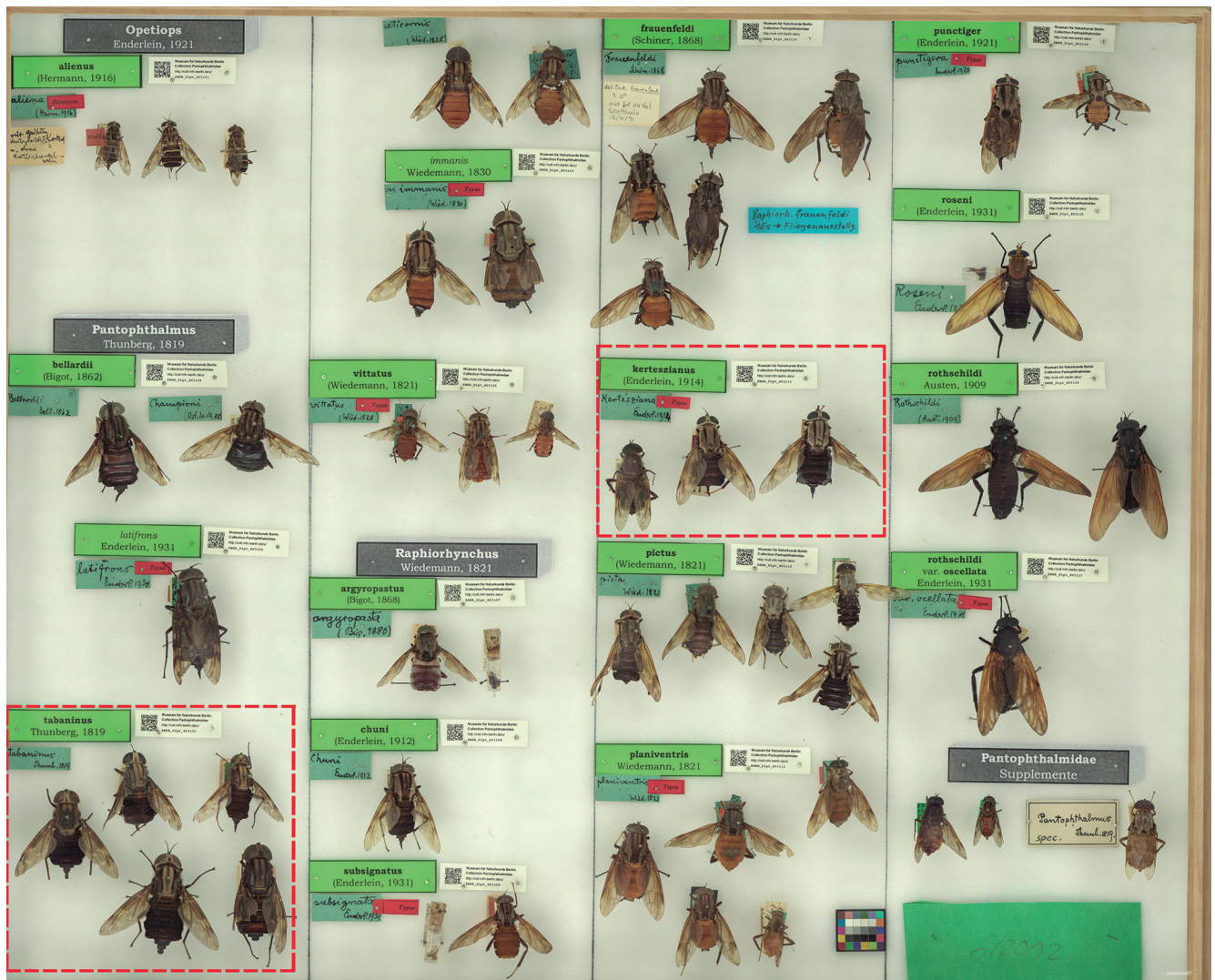
**Comments:** The beak on the face of one examined specimen is dented, giving the impression that the structure is excavated. In the illustration provided by Val (1976: 121, fig. 80, female) of *P. tabaninus*, it is possible to verify that the beak, although not very prominent, does not have a recess.

**DISCUSSION**

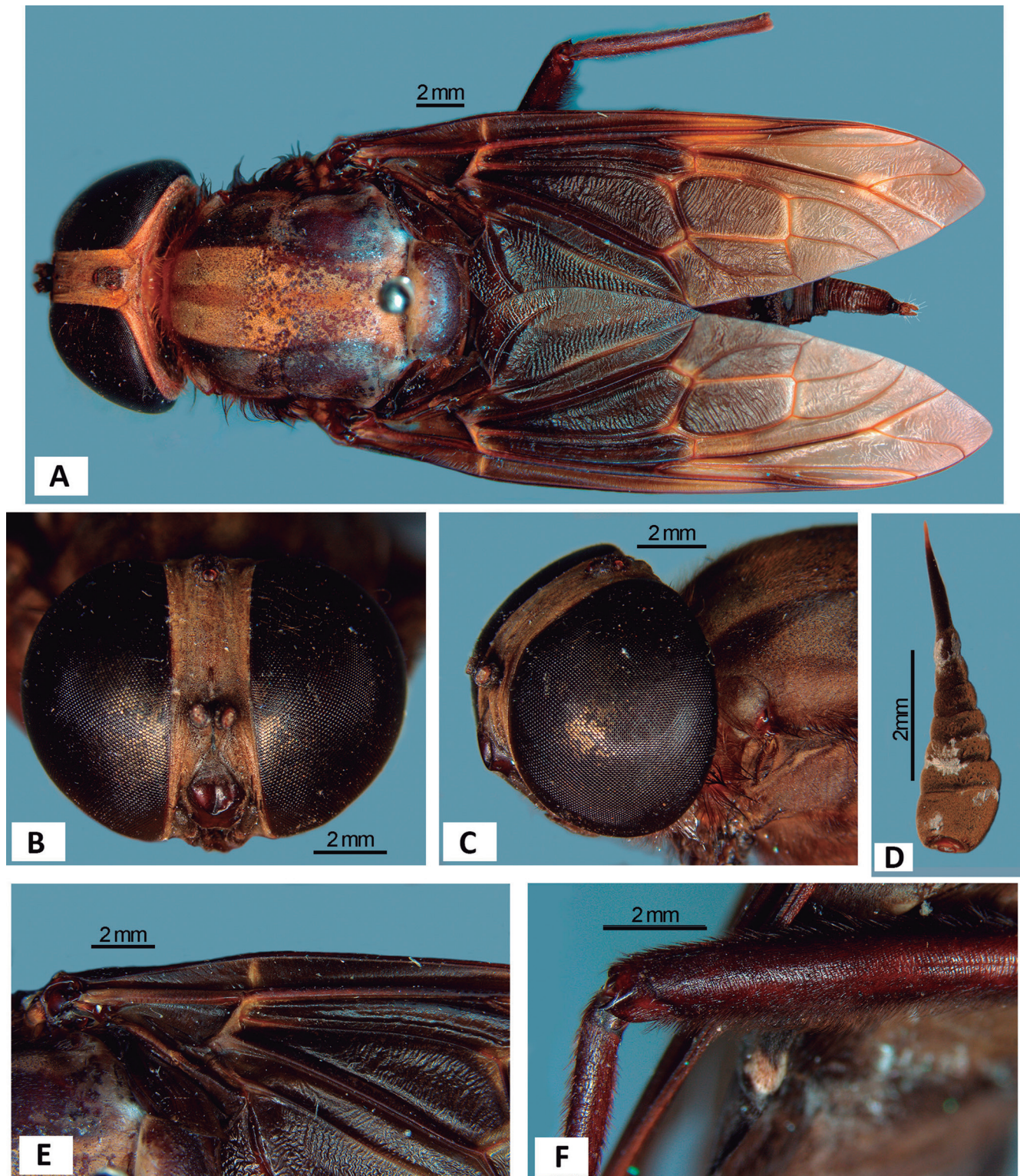
*Pantophthalmus kerteszi* is now reported from 15 localities in the Neotropical Region, of which six are

in Brazil. Three of these records are in the Amazon Forest biome (states of Amazonas, Mato Grosso, and Pará), one in the Pantanal biome (state of Mato Grosso do Sul), and now two in the Cerrado biome (state of Tocantins). *Pantophthalmus tabaninus* seems to be a more common species, often collected, reported from 67 localities, of which 22 are in Brazil. More than half of the Brazilian records of *P. tabaninus* are in the Atlantic Forest (13 records), followed by the Amazon Forest (six records), one record in the state of Bahia, this without information on the specific location, and now one in the Cerrado (Fig. 4).

Despite the economic importance of pantophthalmids, the group is still poorly studied, and the distribution of its species not completely understood. *Pantophthalmus kerteszi*, for example, has already been recorded feeding on plants in the states of Amazonas (Abreu & Rocha, 2003) and Pará (Lunz et al., 2010), neighboring states of Tocantins. Thus, the expansion of sampling in remote or poorly studied regions, such as Tocantins, will contribute to understanding the distributional patterns and feeding preferences of the family.



**Figure 2.** Photograph of the Pantophthalmidae drawer deposited at the Museum für Naturkunde, Berlin (MfN). Dashed rectangles indicate types of *Pantophthalmus kerteszi* (Enderlein, 1914) and *P. tabaninus* Thunberg, 1819 (as *P. immanis* (Wiedemann, 1830)). © Museum für Naturkunde, Berlin, Germany.



**Figure 3.** *Pantophthalmus tabaninus* Thunberg, 1819, female. (A) Habitus, dorsal view. (B) Head, frontal view. (C) Head, anterolateral view. (D) Flagellum, ventral view. (E) Base of wing. (F) Hind femur, anterior view.

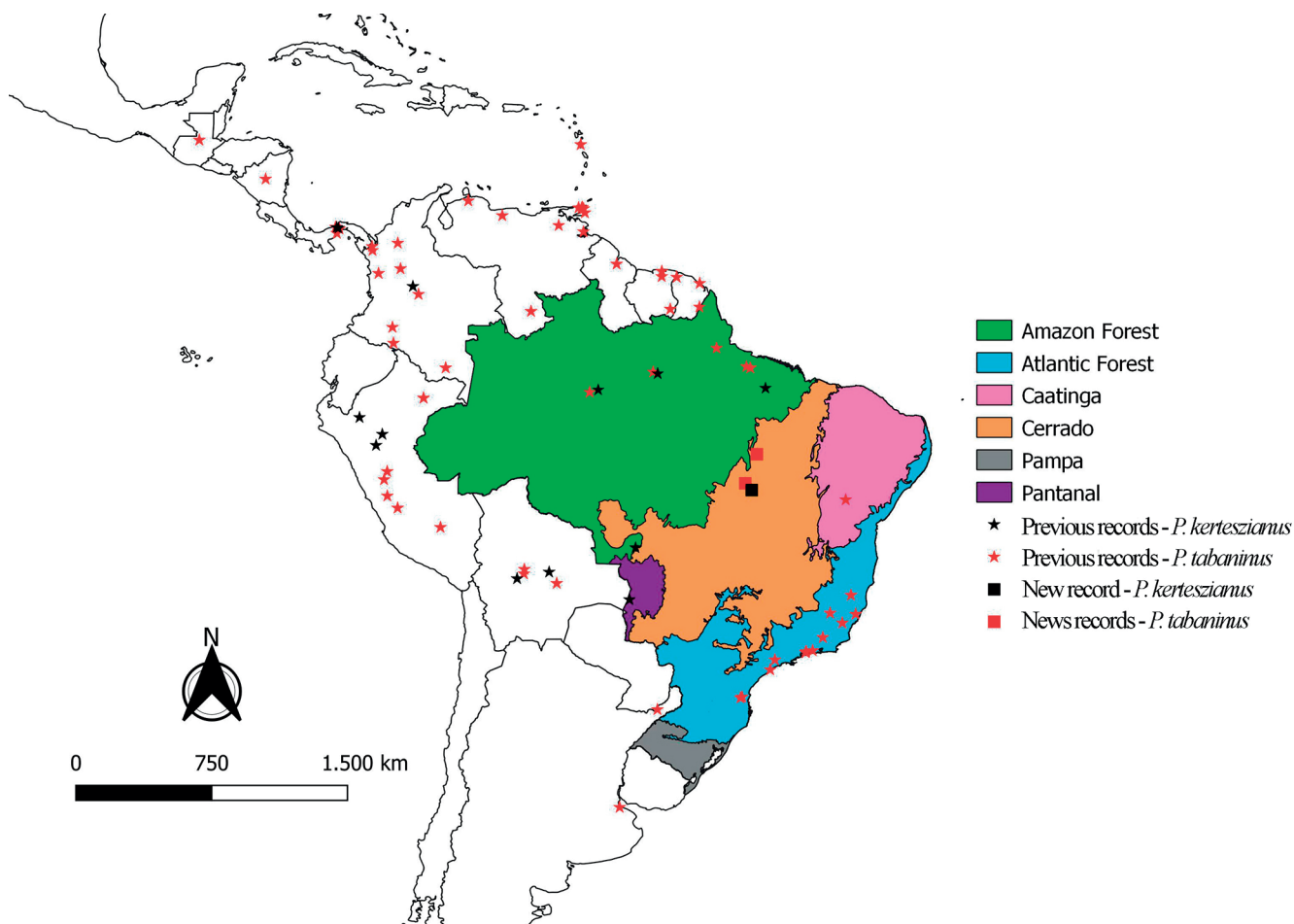
**AUTHORS' CONTRIBUTIONS:** LPO: Writing – original draft; LPO, TTK: Conceptualization, Data curation, Methodology; DAF, TTK: Supervision; Validation; Writing – review & editing. All authors actively participated in the discussion of the results; they reviewed and approved the final version of the paper.

**CONFLICTS OF INTEREST:** Authors declare there are no conflicts of interest.

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**Figure 4.** Geographic distribution of *Pantophthalmus kerteszius* (Enderlein, 1914) and *P. tabaninus* Thunberg, 1819.

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