

The species of *Trichophthalma* (Diptera: Nemestrinidae) of Argentina

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Abstract: The genus *Trichophthalma* (Diptera: Nemestrinidae) was last revised for Argentina in 1939. Since then several species were newly cited or described for this country but no comprehensive treatment of the genus was published. The analysis of our own extensive collections and of the holdings of *Trichophthalma* at three major entomological collections in Argentina showed that eleven different species of *Trichophthalma* exist in this country, and that three of these have an unexpectedly ample distribution, including areas unconnected to the southern temperate forests of Patagonia, where all previous records were concentrated. A key for all Argentinean species is provided.

Key words: tanglewing flies - geographical distribution.

Resumen: El género *Trichophthalma* (Diptera: Nemestrinidae) fue revisado para la Argentina por última vez en 1939. Desde entonces se citaron y describieron varias especies nuevas para ese país sin que se haya publicado un tratamiento completo del género. Sobre la base de material de los autores, y del conservado en las tres mayores colecciones entomológicas de Argentina se concluye que existen once especies de *Trichophthalma* en el país, de las cuales tres poseen una distribución geográfica inesperadamente amplia, que incluye regiones desconectadas de los bosques templados de Patagonia, en los cuales se concentraban todos los registros previos del género. Se presenta una clave para todas las especies argentinas.

Palabras clave: nemestrínidos – distribución geográfica.

INTRODUCTION

The flies of the family Nemestrinidae (Diptera, Brachycera, Asiloidea), commonly known as tanglewing flies, are rather primitive among Diptera (Willemstein, 1987; Mostovski & Martinez Delclos, 2000). The number of described species, which was 150 nearly forty years ago (Cole, 1969), has grown with the addition of new species (e.g., Bernardi, 1975; 1977) while still many might remain undescribed (Goldblatt & Manning, 2000; N. Woodley personal communication).

Nemestrinidae are widespread throughout the globe, but they show a higher concentration in some areas: from the Mediterranean to Turkistan, eastern Australia, southern Africa, Chile and Argentina (Bernardi, 1973). Two extant subfamilies, the Nemestrininae and the Hirmonaurinae, are the most widely distributed. Nemestrininae genera are geographically segregated in South America and Australia (genus *Trichophthalma*), southern Africa (*Prosoeca* and *Stenobasipteron*) and the Palearctic region (*Nemestrinus* and *Stenopteromyia*, with a branch that, later, reached Africa, giving rise to *Moegistorhynchus*) (Bernardi, 1973).

Trichophthalma is the only genus of Nemestrinidae that occurs both in Australia (45 species) and South America (21 species) (Bernardi, 1973; 1975). This disjunct distribution resembles that of many other taxa with an ancient Gondwanian origin (Raven & Axelrod, 1974; 1975 and references therein). In spite of its primitiveness, *Trichophthalma* shows a rather specialized character (shared by all Nemestrininae): the proboscis is always well developed, thus enabling these flies to reach nectar hidden in deep flower tubes. This has led to reports of flower visitation by tanglewing flies in South America (Edwards, 1930; Devoto *et al.*, 2006) and South Africa (Marloth, 1908; Goldblatt & Manning, 2000), some of which are remarkable examples of specialized pollination mutualisms (e.g. Manning & Goldblatt, 1995). However, whereas southern African species have received much attention (Johnson & Steiner, 2000; Goldblatt & Manning, 2000 and references therein), the ecology and actual distribution of most southern South American species remain widely unknown (Peña, 1996; but see Devoto & Medan, 2006).

The number of *Trichophthalma* species known for Argentina increased steadily during the past century. On the basis of material collected in the

province of Chubut, Lichtwardt (1910) described two species (originally placed in the genus *Eurygastromyia*), *T. murina* (Lichtwardt) and a second one that resulted a junior synonym of *T. amoena* Bigot (nomenclature follows Bernardi, 1973). Edwards (1930) recorded in the province of Río Negro two taxa previously described for Chile, *T. philippii* Rondani and *T. niveibarbis* (Bigot) (sub *T. glauciventris* Edwards), and added a Río Negro record for *T. amoena*. Stuardo Ortiz (1939) recorded another Chilean species, *T. jaffueli* Stuardo Ortiz for Santa Cruz, and reported a possible new taxon (*Trichophthalma* sp., i.e., a formal epithet was not provided) on the basis of three females, one labelled 'Santa Cruz, Patagonia (nr. 7411)' apparently collected by C. Ameghino, another labelled 'San Jorge, Patagonia (nr. 39371)' (unknown collector), and a third labelled '*Trichophthalma Morenii* n. sp.' without collector nor locality, but which Stuardo Ortiz (1939) assumed to have been collected by the naturalist Francisco P. Moreno somewhere in the Argentinean Patagonia. In his revision of the Chilean Nemestrinidae Angulo (1971) provided a record for Chubut of his newly described *T. tigrina* Angulo. In his synopsis of Nemestrinidae Bernardi (1973) recorded for Argentina two other Chilean taxa, *T. nubipennis* Rondani for the Neuquén province and *T. sexmaculata* Edwards for Río Negro. He also applied the name *T. morenii* Stuardo Ortiz to the unnamed species of Stuardo Ortiz (1939), which resulted in a *nomen nudum*. Later Bernardi (1975) described a new species, *T. anguloi* Bernardi, on the basis of a male specimen from Argentina (collector and specific locality unknown).

In recent years, studies on the pollination ecology of the *Nothofagus* southern temperate forests of Argentina led to two further Chilean species being recorded in Neuquén, *T. andina* (Philippi) and *T. porteri* Stuardo Ortiz (Devoto & Medan, 2006), and to the extension of the known distributions of several other taxa: *T. amoena* in Neuquén, *T. jaffueli* in Río Negro and Neuquén (Vázquez, 2002) and *T. philippii* and *T. niveibarbis* in Neuquén (Devoto & Medan, 2006). Devoto & Medan (2006) also reported two *Trichophthalma* morphospecies from Neuquén that could not be unequivocally assigned to any of the known species of the genus. These taxa were provisionally referred to as *T. sp. 1* and *T. sp. 2* by these authors.

Thus, by 2006 fourteen *Trichophthalma* nominal species and morphospecies had been recorded for Argentina, of which "*T. morenii*", *T. anguloi*, *T. sp. 1* and *T. sp. 2* were apparently exclusive of

this country, while the other ten species were also known for Chile. In an attempt to clarify this panorama, we contrasted the published specific descriptions of *Trichophthalma* with our own collections from Patagonia and with the holdings of this genus kept at three major entomological collections of Argentina.

MATERIAL AND METHODS

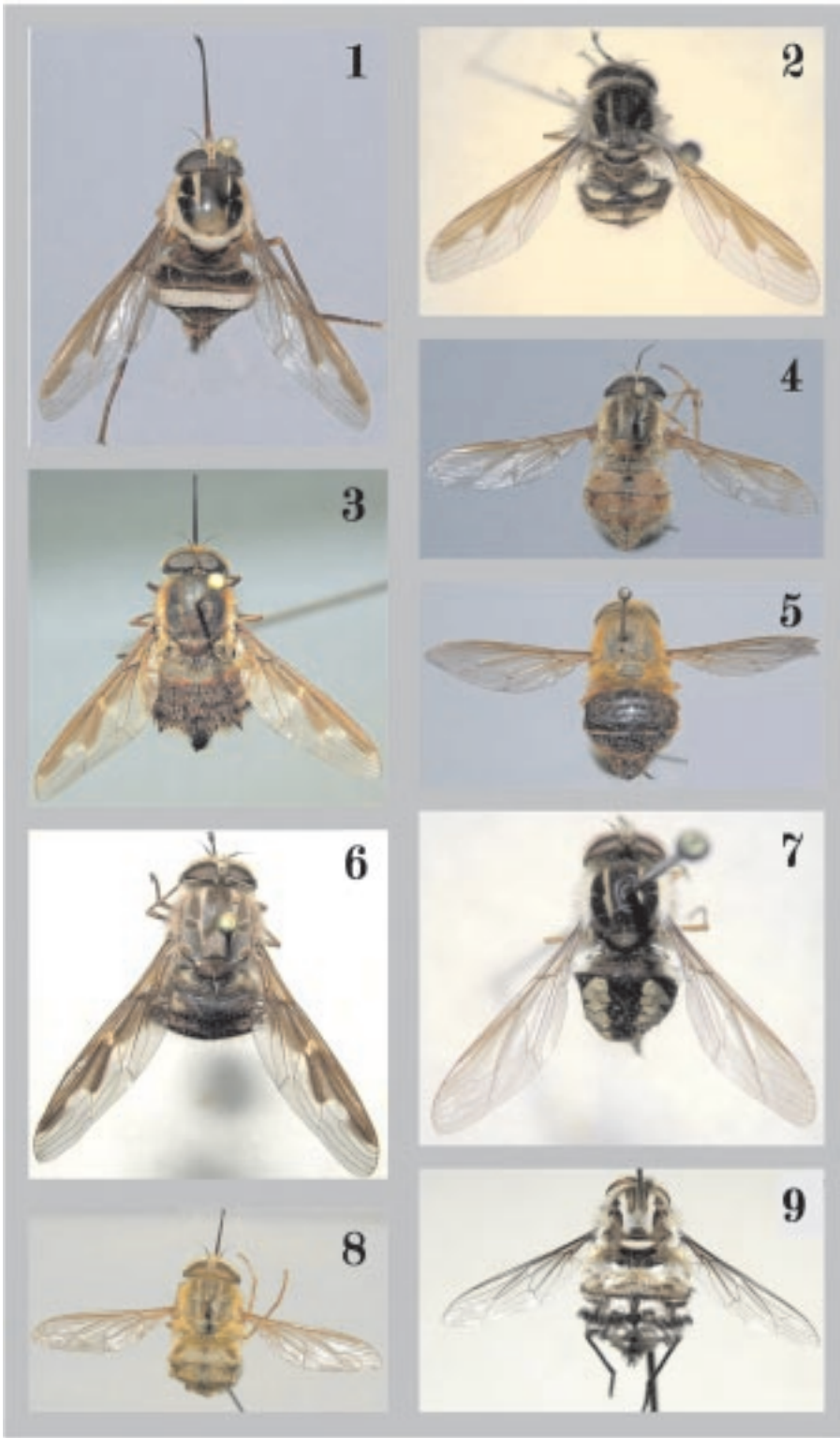
Published descriptions (Stuardo Ortiz, 1939; Angulo, 1971; Bernardi, 1975) were compared with the material of *Trichophthalma* deposited in our own collection at the Facultad de Agronomía, Universidad de Buenos Aires (hereafter: FAUBA) (>50 specimens), and in the entomological collections of the Museo de La Plata (La Plata), the Instituto Miguel Lillo (Tucumán) (hereafter: LILLO), and the Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia' (Buenos Aires) (together, ca. 110 specimens). Additionally we examined photographs of the holotype and the allotype of *T. tigrina*, deposited in the entomological collection of the Universidad de Concepción, Chile. The metasomal terga (T) are identified with Arabic numerals.

RESULTS AND DISCUSSION

The distribution of *Trichophthalma* in Argentina

Nine of the species of *Trichophthalma* previously recorded for Argentina were found among the examined material (Table 1, Figs. 1-9). No material was seen of the enigmatic *T. anguloi* (which is still known from the type specimen only) and of *T. sexmaculata*. Except for *T. porteri*, found only in Neuquén, all other species were recorded for two or more provinces, with a maximum of five provinces in the case of *T. jaffueli*. The newly reported records extend the area of five of the species: *T. andina*, *T. jaffueli*, *T. murina*, *T. nubipennis* and *T. tigrina*.

An unexpected result was the finding of *Trichophthalma* in areas of Argentina biogeographically unrelated to the southern temperate forests dominated by the Southern Beeches (*Nothofagus* spp.), the region in which all previous records of *Trichophthalma* were concentrated. Although the analysis of the zoogeographical implications of this extended distribution of *Trichophthalma* is out of the scope of this paper, the presence of three *Trichophthalma* species (*T. jaffueli*, *T. murina* and *T. nubipennis*) in one or two of the provinces Catamarca, Córdoba, Misiones, and Santiago del Estero (Table 1), indi-



Figs. 1-9. Habitus of *Trichophthalma* spp. of Argentina. 1, *T. philippi*; 2, *T. amoena*; 3, *T. niveibarbis*; 4, *T. nubipennis*; 5, *T. andina*; 6, *T. porteri*; 7, *T. jaffueli*; 8, *T. murina*; 9, *T. tigrina*. No material of *T. anguloi* and *T. sexmaculata* was available to authors.

Table 1. Geographical distribution of accepted *Trichophthalma* spp. in Argentina. Provinces in **bold type** are disconnected from the southern temperate forests. Small type and capital letters indicate already published and new records, respectively. Letters in parentheses indicate unconfirmed published records. The distribution of *T. anguloi* is unknown.

species	Provinces							
	Catamarca	Chubut	Córdoba	Misiones	Neuquén	Río Negro	Santa Cruz	Santiago del Estero
<i>amoena</i>		(x)			x	(x)		
<i>andina</i>					x		X	
<i>jaffueli</i>				X	x	x	x	X
<i>murina</i>		x	X		X		X	
<i>niveibarbis</i>					x	(x)		
<i>nubipennis</i>	X		X		x			
<i>sexmaculata</i>						(x)		
<i>tigrina</i>		x			X		x	
<i>philippii</i>					x	(x)		
<i>porteri</i>					x			

cates that this genus is by no means restricted to the *Nothofagus* forests adjacent to Chile, as previously thought. Perhaps it is no coincidence that the species with the widest distribution (*T. jaffueli*) showed also the highest ecological amplitude among its congeners in north-western Patagonia (Devoto & Medan 2006).

Trichophthalma tigrina Angulo

When examining the material of *Trichophthalma* deposited in the Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia' we found the three females used by Stuardo Ortiz (1939) to describe the species that he recognized as new, but he left unnamed (see Introduction), i.e., the one which later Bernardi (1973) referred to as *T. morenii*. The labels accompanying these specimens exactly correspond to Stuardo Ortiz (1939) specifications, except that the specimen labeled *Trichophthalma Morenii* n. sp.' carries also a label with the number 39373. Interestingly, these specimens exactly matched the Neuquén female specimen we had called *Trichophthalma* sp. 1 (Devoto & Medan, 2006). Moreover, all this material seemed to correspond with the description of *T. tigrina* (Angulo, 1971), a view which was confirmed by the identification of photographs of

our Neuquén material as *T. tigrina* by Andrés Angulo (pers. comm. 2006). Also, the photographs of the typical material of *T. tigrina* provided to us by Dr. Angulo leave no doubt about the coincidence of *T. morenii*, our morphospecies *T. sp. 1* and *T. tigrina*. Perhaps all this would have been detected earlier had Angulo (1971) examined more material of *Trichophthalma* from Argentina when he revised the genus for Chile, or had Bernardi (1973) examined material of *T. morenii* and *T. tigrina* when he revised the world genera of Nembrinidae. Because Bernardi's (1973) main objective was to better define taxa at the generic level, he studied material from many, but not all species recognized in his paper: he studied no material of *T. tigrina* or *T. Morenii*. The name *T. morenii* was arbitrarily attributed to Stuardo Ortiz by Bernardi (1973), and was never made available, so it should be considered a *nomen nudum*.

Trichophthalma amoena Bigot

The examination of additional specimens of *T. amoena* Bigot suggested us that the specimen we called *T. sp. 2* in a previous study (Devoto & Medan, 2006) fell within the phenotypical range of that species. This view was confirmed by the identification of photographs of our Neuquén material as *T. amoena* by Andrés Angulo (pers. comm. 2006).

New records of *Trichophthalma* for Argentina

Trichophthalma andina (Philippi). 1 female, province Santa Cruz: El Chaltén, visiting *Hypochaeris radicata* L., col. D. Medan, 31.01.2005 (FAUBA).

Trichophthalma jaffueli Stuardo Ortiz. 2 females: province Misiones: Apóstoles, col. Willink, Fidalgo, Claps & Domínguez, 19.11.1980 (LILLO); province Santiago del Estero: San Ramón, col. M. L. Aczél, 09.04.1949 (LILLO).

Trichophthalma murina (Lichtwardt). 3 females: province Córdoba: Departamento San Martín, col. F. López, 27.01.1948 (LILLO); province Neuquén: Chapelco, 1700 m a.s.l., col. L. Schajovskoi, 24.11.1952 (LILLO); province Santa Cruz: El Chaltén, visiting *Hypochaeris radicata* L., col. Diego Medan, 03.02.2005 (FAUBA).

Trichophthalma nubipennis Rondani. 1 female: province Catamarca: Hualfín, col. A. Ares, 18.11.1948 (LILLO); 1 male and 1 female, province Córdoba, col. Padre López, 19.11.1949 (LILLO).

Trichophthalma tigrina Angulo. 1 female, province Neuquén: costa Lago Huechulafquen, visiting *Adesmia boronioides* J.D. Hooker, col. D.

Medan, M. Devoto & J. P. Torretta, 13.12.2003 (FAUBA).

allotype of *T. tigrina*, and Guillermo Claps and an anonymous reviewer for useful comments on previous drafts of this paper.

Key to the species of *Trichophthalma* of Argentina

1. Wings with anterior half mainly dark brown, posterior half clear, these areas separated by an irregular line 2
 - Wings clear or only gradually darkened towards costa 7
2. T3 or T4 pale or with a pale fascia 3
 - T3 and T4 not pale nor conspicuously fasciated 4
3. T3 blackish, T4 pale fasciated posteriorly, scutellum pale *T. philippii*
 - T3 white, T4 black, scutellum black *T. amoena*
4. Mesonotum mainly blackish with two conspicuous pale longitudinal stripes 5
 - Mesonotum light grey or brown with two thin pale longitudinal stripes 6
5. Abdomen largely dark, but with posterior margins of T3-5 continuously grey *T. niveibarbis*
 - Abdomen blackish with six pale spots, the first pair located at the base of T3 *T. sexmaculata*
6. Proboscis 2.5 times head height *T. nubipennis*
 - Proboscis 4 times head height *T. porteri*
7. Proboscis shorter than head height *T. anguloi*
 - Proboscis longer than head height 8
8. Body entirely covered by reddish brown indument *T. andina*
 - Indument variable but not entirely reddish brown 9
9. T3-5 gray, anteriorly with three separate to confluent dark brown spots *T. murina*
 - T3-5 without anterior, confluent dark spots 10
10. Body indumentum sparse, light brown to yellow *T. jaffueli*
 - Body indumentum dense, woolly, white interspersed with black *T. tigrina*

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