



RESEARCH ARTICLE

First record of *Thambemyia* Oldroyd (Diptera, Dolichopodidae) from Brazil, with description of a new species

Renato S. Capellari¹

¹Instituto Federal de Educação, Ciência e Tecnologia do Triângulo Mineiro – Campus Uberlândia. Rodovia Joaquim Ferreira, Fazenda Sobradinho s/n°. Caixa Postal 1020. Uberlândia, Minas Gerais, Brasil, 38400-970. E-mail: rscapellari@gmail.com

[urn:lsid:zoobank.org/pub:43D4B602-1A55-46D8-80B3-E7C151CE8C66](http://urn.lsid:zoobank.org/pub:43D4B602-1A55-46D8-80B3-E7C151CE8C66)
urn:lsid:zoobank.org/author:813D5B21-3A3C-49EA-9063-11D01C335415

Abstract: A new species of *Thambemyia* Oldroyd, *T. fusariae* **sp. nov.**, is described from the Brazilian State of Bahia. This is the first record of *Thambemyia* from the Neotropical Region, apart the Palearctic *T. borealis* (Takagi), introduced in USA and Peru. *T. fusariae* **sp. nov.** belongs to the subgenus *Thambemyia*, making the group an unusual case of Neotropical-Oriental disjunction.

Key words: Hydrophorinae, Aphrosylinae, *Conchopus* Takagi, taxonomy.

Introduction

Hydrophorinae is a large subfamily of Dolichopodidae (Diptera) with more than 500 described species in some 40 genera (Yang *et al.* 2006). The Aphrosylinae were established by Aldrich (1905) and adopted by subsequent authors, as in Becker's (1917–18, 1922a, b, 1923) monographs of world fauna, until it was merged into Hydrophorinae by Robinson (1970). Meuffels & Grootaert (1984) keyed the hydrophorine genera with fronto-orbital (=vertical) bristles between the vertex and the antennae, a group that includes Becker's (1917–18, 1922a, b, 1923) and Negrobov's (1987) Aphrosylinae: *Abatetia* Miller (= *Nelsonia* Parent), *Acymatopus* Takagi, *Aphrosylus* Haliday, *Cemocarus* Meuffels & Grootaert, *Cymatopus* Kertész, *Paralipatus* Bezzi, *Scorpiurus* Parent, *Thambemyia* Oldroyd (*Conchopus* Takagi as synonym) and *Teneriffa* Becker. Grootaert & Meuffels (1988) also described *Thinolestris* Grootaert & Meuffels and referred the genus to that group, close to *Cymatopus*. Grichanov (2008) transferred *Epithalassius* Mik to Hydrophorinae and noted it belongs in the

group of genera with a pair of fronto-orbital setae and the first flagellomere pointed with apical to subapical stylus (couplet 1 in his key to the Hydrophorinae tribes), characters commonly associated with aphrosyline genera. More recently, the cladistic analysis by Lim *et al.* (2010) recovered a clade of aphrosyline genera separated from Hydrophorinae, suggesting that restoring subfamily status to Aphrosylineae would be warranted. Nevertheless, Germann *et al.* (2011) stressed the dataset of Lim *et al.* (2010) did not include any Palaearctic species of *Aphrosylus*, so that the usage of the name Aphrosylineae would require further investigation.

The aphrosyline genus *Thambemyia* (as synonym of *Conchopus*) consists of 30 described species (Yang *et al.* 2006; Masunaga & Saigusa 2010; Grichanov 2013) from China, Japan, Thailand, Malaysia, Brunei, Hawaiian Islands and India. Additionally, *T. borealis* (Takagi, 1965) is introduced in New World, with records from USA (Masunaga *et al.* 1999) and Peru (Brooks & Cumming 2009). Species of *Thambemyia* are exclusive inhabitants of rocky seashores, and the life history of *T. borealis* was described by Sunose & Satô (1994). In this paper I provide the first record of a native *Thambemyia* from Neotropical Region, with the description of a new species from Brazil.

Material and methods

The holotype and all paratypes of the new species are housed in the Diptera collection of Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil. Terminology follows mainly Cumming & Wood (2009). Body length was measured from the insertion of the antenna to the tip of abdomen. Wing length was measured from the base to the apex of the wing, and the width, at the widest point of the wing, both given as ranges. Measurements for podomeres are representative ratios given according the formula: femur, tibia, tarsomeres 1, 2, 3, 4, 5. While describing the hypopygium, ‘dorsal’ and ‘ventral’ refer to the morphological position prior to genitalic rotation and flexion; as such, the top of drawings in lateral view is actually ventral in position on the specimens, and the bottom, dorsal. Photographs were taken using a Leica DC camera attached to a Leica MZ16 stereomicroscope, and mounted in Zerene Stacker software.

Results

Genus *Thambemyia* Oldroyd, 1956

Thambemyia Oldroyd, 1956: 210. Type-species: *T. pagdeni* Oldroyd (original designation).

Conchopus Takagi, 1965: 49. Type-species: *C. rectus* Takagi (original designation). Synonymized by Meuffels & Grootaert (1984), but see Masunaga *et al.* (2005) and Masunaga & Saigusa (2010).

Subgenus *Thambemyia* Oldroyd, 1956

Thambemyia (*Thambemyia*) *fusariae* sp. nov.

urn:lsid:zoobank.org:act:41FDE90C-8826-477A-8C9D-B3B77F649D47

Type material: Holotype ♂, BRAZIL, Bahia, Uruçuca, 14°28'41.68"S 39°01'51.99"W, 20.ix.2014, sweeping on rocky seashore, L.M. Fusari leg. Paratypes: 2♂♂ (one damaged, mounted on slide), 5♀♀ (one mounted on slide), same data as the holotype.

Description

Male (Fig. 1A). Body length, 3.0–3.5 mm. Wing length, 2.8–3.0 mm, width, 0.8–0.9 mm.

Head. Frons dark coppery with bluish reflections above, as wide as half of head width, slightly converging below; face and clypeus darker, whitish pruinose, as long as eye height or only slightly longer. Pair of ocellar and a minute pair of postocellar setae posteriad; pair of vertical (fronto-orbital) setae similar in length to ocellars; pair of paraverticilar setae in line with the row of postocular setae, the 6–8 dorsalmost stronger; ventral occiput with some scattered short setae. Antenna dark brown, first flagellomere as long as scape plus pedicel, tapering on apical half; scape bare above, pedicel with distal crown of setulae, first flagellomere shortly pubescent and with some scattered setulae; arista-like stylus apical, bare, bi-articulated at base, first stylomere and base of second flattened. Gena shining black. Palp shining dark green, as long as eye height, uniformly covered with short setae. Proboscis dark brown with fine setulae.

Thorax. Mesonotum mostly shining dark green, scutellum lighter; some bluish reflections on notopleuron and dense pruinosity on lateral pleura. Acrostichals irregularly uniseriate; 7 pairs of dorsocentrals; 1 postpronotal seta; 2 pre- and 2–3 post-sutural intra-alar setae; 2 pre- and 1 post-sutural supra-alar setae; 1 post-alar seta; 1 notopleural seta; proepisternum with some few setulae below and 1 stronger seta above; 6 setae on posterior part of anepisternum; anepimeron, in front of posterior spiracle, with 2 setae; 3 pairs of scutellar setae, inner pairs similar in length, outer pair about half as long as medial pairs (outer pair lacking in one male and one female examined).

Wings. Membrane slightly tinged of brown, veins brown. R_1 reaching basal 1/3 of wing length. R_{2+3} slightly arched anteriorly and converging to R_{4+5} at wing margin. M_1 ending after wing apex. Crossvein dm-cu and distal section of CuA_1 similar in length. A_1 evanescent, not reaching wing margin. Calypter brownish. Halter yellow.

Legs. Mostly dark brown, covered with short black vestiture, except as noted; femora with little pruinosity; tarsomere 5 of all legs broader than preceding tarsomeres and with pair of claws. **Fore leg.** Podomere ratios: 30, 32, 7, 8, 5, 3, 5. Anterior surface of coxa covered with scattered short setulae and some short setae on distal edge. Femur and tibia without conspicuous setae. Tarsus (Fig. 1B): tarsomere 1 slightly shorter than 2, with ventral swelling bearing a fringe of marginal short setae, and with 1 larger ventral seta at apex; tarsomere 2 with ventral swollen at base with some short spine-like setae (all male secondary sexual characters, MSSC). **Mid leg.** Podomere ratios: 45, 45, 19, 10, 6, 4, 5. Antero-lateral surface of coxa with 3–4 short setae. Tibia with conspicuous subapical ventral seta. **Hind leg.** Podomere ratios: 49, 46, 13, 11, 7, 5, 6. Coxa with 1 lateral seta near middle. Femur with row of some 10 ventral setae, as long as diameter of femur. Tibia with delicate anteroventral ciliation at apical 1/3.

Abdomen. Shinning green with coppery reflections on dorsum. Tergites 1–6 covered with short black setae, setae on sternites a little shorter. Segment 7 reduced and hidden under preabdomen. Sternite 8 oval, covered with scattered short setae. **Hypopygium** (Fig. 2A). Genital capsule ovoid with ventral projection on right side; epandrial lobe (“dorsal arm of surstylus” in Grichanov 2013) shortly projected, with 3 long setae and 1 short seta above; surstylus digitiform, as long as distal part of hypandrium, covered with many setae; a short appendage weakly sclerotized, inner to surstylus; cercus broad, almost as long as epandrium length, covered with long setae.

Female (Fig. 1C). Body length, 2.9–3.5 mm. Wing length, 2.8–3.3 mm, width, 0.9–1.0 mm. Very similar to males, except by MSSC and as noted. Femora mostly light brown,

tibiae lighter; hind tibia and femur without conspicuous setae. Abdominal segments 6 and 7 exposed (not retracted under segment 5), tergites lighter and covered with short setae. **Ovipositor** (Fig. 2B). Tergite 10 divided into two acanthophorites and bearing 2 slender medial spines and 1 lateral seta each.



Figure 1. *Thambemyia fusariae* sp. nov., habitus. **A**, male habitus; **B**, detail of male fore tarsus; **C**, female habitus. Scale bars: 1,0 mm.

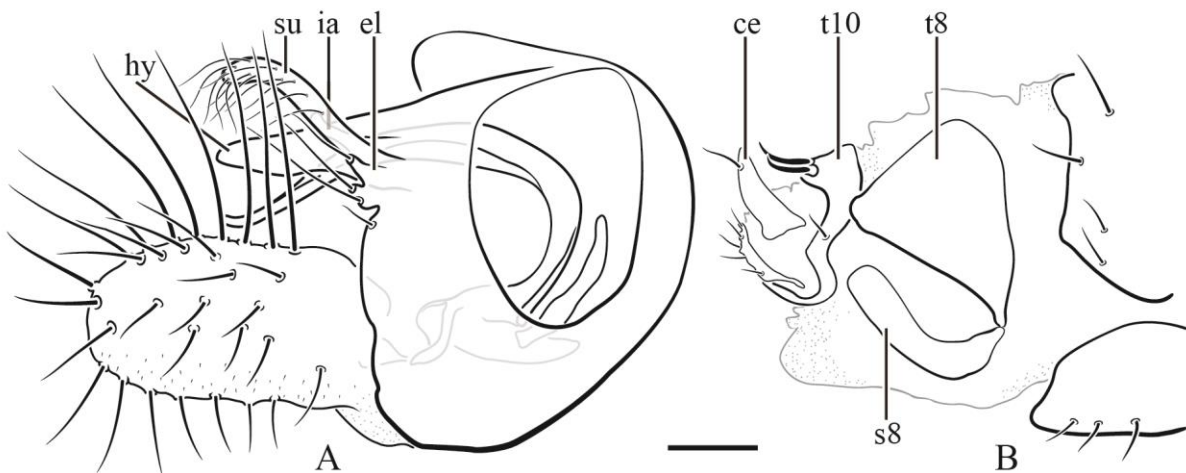


Figure 2. *Thambemyia fusariae*, sp. nov., terminalia. **A**, hypopygium, left lateral; **B**, ovipositor, right lateral. Scale bar: 0.1 mm. Legends: ce, cercus; el, epandrial lobe; hy, hypandrium; ia, inner appendage; su, surstylus; s8, sternite 8; t8, tergite 8.

Differential diagnosis: The new species is morphologically similar to the Indian *T. lopatini* Grichanov and both share a conspicuous row of ventral setae on hind femur. Nevertheless *T. fusariae* sp. nov. can be separated by hypopygial characters, including a curved surstylus (straight in *T. lopatini*), tapering hypandrium (with truncated apex in *T. lopatini*) and shorter epandrial lobe (projected in *T. lopatini*).

Etymology: Named after Lívia M. Fusari, who collected the type series of the species.

Discussion

Meuffels & Grootaert (1984) established the synonymy of *Conchopus* with *Thambemyia*, a decision endorsed in recent catalogues (Bickel & Dyte 1989; Pollet *et al.* 2004; Yang *et al.* 2006). Nevertheless, Masunaga *et al.* (2005) and Masunaga & Saigusa (2010) reported on their unpublished phylogeny, in which they found that *Conchopus* in the sense of Takagi (1965) and *Thambemyia* are not sister groups. Rather, there are three distinct clades: (1) the *rectus*-group of *Conchopus*, comprising the genus concept in a narrower sense, (2) the species of *Conchopus* exclusive of the *rectus*-group, and (3) *Thambemyia*. The two later are sister groups and a new genus name would be established for the clade (2). In this scenario, the issue of establishing such a new genus is actually a decision about the generic limits of *Thambemyia*, since the species of *Conchopus* exclusive the *rectus*-group could be well accommodate into an expanded concept of *Thambemyia*. Whatever the decision, the generic placement of *T. fusariae* **sp. nov.** should not be affected, since it fits in a restrict concept of *Thambemyia* (as in Masunaga *et al.* 2005), recognizable by the following characters: presence of gena, absence of posterior notopleural setae, white pollinosity of male mesonotum weak, tarsomere 1 of male fore leg weakly modified, female segments 6 and 7 with many setae and exposed (not telescoped into preabdomen), female cercus weakly sclerotized, female tergite 10 with two pairs of spines, and female paraproct reduced.

Additionally, Masunaga *et al.* (2005) recognized two subgenera for *Thambemyia* (treated separately from *Conchopus*): *Prothambemyia*, with a single Palearctic species from Japan, and *Thambemyia*, with five Oriental species, including the recently described *T. lopatini* Grichanov, from India (Grichanov 2013). *T. fusariae* **sp. nov.** belongs in the subgenus *Thambemyia* (as proposed by Masunaga *et al.* 2005) by having elongated gena (to which the palp is fused), separation between face and clypeus indistinct, acrostichal setae present, unmodified wing venation, tarsomere 2 of male fore leg swollen, and male mid tibia with ventral subapical seta. Accordingly, the subgenus *Thambemyia* currently has an Oriental-Neotropical distribution. Taking into account that the Holarctic Hydrophorinae are relatively well known (Negrobov 1977, 1978, 1979a, b; Hurley 1985, 1995), the absence of the *Thambemyia* (*Thambemyia*) in Nearctic and Palaearctic Regions is probably not a by-product of under sampled fauna. As such, the present data suggests a Gondwanan origin for the group or its later extinction in Laurasian areas, with a rather unusual distribution pattern, but reported for other Dipteran groups (*e.g.* Stratiomyidae, see Hauser 2014). It seems premature to further discuss the position of *T. fusariae* **sp. nov.** among the other Oriental species in the subgenus and its biogeographic implications, since more Neotropical species may be found, and will potentially fulfill the taxonomic gap of the genus at this point.

Acknowledgements

Livia Fusari (Museu de Zoologia da Universidade de São Paulo) collected the specimens and Maria Isabel P. A. Balbi (Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto) carefully prepared them for examination. Igor Grichanov (All-Russian Institute for Plant Protection, St. Petersburg) reviewed an early version of the manuscript. This work was funded by FAPESP (2013/01392-0).

References

Aldrich J. M. 1905. A catalogue of North American Diptera. *Smithsonian Miscellaneous Collections* 46(2): 1–680.

- Becker T. 1917–1918.** Dipterologische Studien. Dolichopodidae. A. Paläarktischen Region. *Nova Acta Academiae Caesareae Leopoldinisch-Carolinae Germanicae Naturae Curiosorum* 102(2) (1917): 113–361, 103(3) (1918): 203–315, 104(2) (1918): 35–214.
- Becker T. 1922a.** Dipterologische Studien, Dolichopodidae. B. Nearktische und Neotropische Region. *Abhandlungen der Zoologisch-Botanischen Gesellschaft in Wien* (1921) 13(1): 1–394.
- Becker T. 1922b.** Dipterologische Studien. Dolichopodidae der Indo-Australische Region. *Capita Zoologica* 1(4): 1–247.
- Becker T. 1923.** Dipterologische Studien. Dolichopodidae. D. Aethiopische Region. *Entomologische Mitteilungen* 12: 1–50.
- Bickel D. J. & Dyte C. E. 1989.** Family Dolichopodidae, pp. 393–418. *In: Catalog of the Diptera of the Australasian and Oceanian regions.* (N. L. Evenhuis, editor). Honolulu, Bishop Museum Press, 1155 pp.
- Brooks S. E. & Cumming J. M. 2009.** First record of a Japanese marine shore dolichopodid fly, *Thambemyia* (= *Conchopus*) *borealis* (Takagi), from the Neotropical Region (Diptera: Dolichopodidae). *Zootaxa* 2112: 65–67. <http://www.mapress.com/zootaxa/2009/f/zt02112p067.pdf>
- Cumming J. M. & Wood D. M. 2009.** Adult morphology and terminology. *In: Brown BV, Borkent A, Cumming JM, Wood DM, Woodley NE, Zumbado MA (eds) Manual of Central American Diptera*, Volume 1, NRC Research Press, Ottawa, pp. 9–50.
- Germann C., Pollet M., Wimmer C. & Bernasconi, M. V. 2011.** Molecular data sheds light on the classification of long-legged flies (Diptera: Dolichopodidae). *Invertebrate Systematics* 25: 303–321. DOI: 10.1071/IS11029
- Grichanov I. Ya. 2008.** Systematics of the genus *Epithalassius* Mik, 1891 (Diptera, Dolichopodidae). *Caucasian Entomological Bulletin* 4(1): 131–136.
- Grichanov I. Ya. 2013.** A new species of *Thambemyia* Oldroyd, 1956 (Diptera: Dolichopodidae) from Gujarat, India. *Caucasian Entomological Bulletin* 9(1): 191–193.
- Grootaert P. & Meuffels H. J. G. 1988.** Dolichopodidae (Diptera) from Papua New Guinea VII. Description of *Thinolestris* gen. nov., a new beach dwelling genus of Hydrophorinae. *Indo-Malayan Zoology* 5: 31–39.
- Hauser M. 2014.** On tapirs and flies – the overlooked connection between the Oriental and Neotropical regions. *In: Dorchin N., Kotrba M., Mengual X., Menzel F. (eds.), 2014: 8th International Congress of Dipterology.* Potsdam (Germany), August 10-15, 2014. p. 133.
- Hurley R. L. 1985.** Dolichopodidae: Hydrophorinae. *In: Griffiths, G. C. D. (ed.) Flies of the Nearctic Region (Volume VI) – Orthogenya (Part 6, Number 1).* E Schweizerbart, Stuttgart, pp. 1–112.
- Hurley R. L. 1995.** Dolichopodidae: Hydrophorinae. *In: Griffiths, G. C. D. (ed.) Flies of the Nearctic Region (Volume VI) – Orthogenya (Part 6, Number 2).* E Schweizerbart, Stuttgart, pp. 113–224.
- Lim G. S., Hwang W. S., Kutty N. S., Meier R. & Grootaert P. 2010.** Mitochondrial and nuclear markers support the monophyly of Dolichopodidae and suggest a rapid origin of the subfamilies (Diptera: Empidoidea). *Systematic Entomology* 35: 59–70. DOI: 10.1111/j.1365-3113.2009.00481.x
- Masunaga K., Saigusa T. & Woodley N. E. 1999.** A remarkable disjunct introduction of *Conchopus borealis* Takagi to the New World (Diptera: Dolichopodidae). *Entomological Science* 2(3): 399–404.

- Masunaga K. & Saigusa T. 2010.** A revision of the Hawaiian and Wake Island species of the genus *Conchopus* Takagi (Diptera, Dolichopodidae). *Zootaxa* 2729: 1–35.
- Masunaga K., Saigusa T. & Grootaert P. 2005.** Revision of the genus *Thambemyia* Oldroyd (Diptera: Dolichopodidae) with description of a new subgenus. *Entomological Science* 8: 439–455. DOI: 10.1111/j.1479-8298.2005.00143.x
- Meuffels H. J. G. & Grootaert P. 1984.** Dolichopodidae (Diptera) from Papua New Guinea I: The genus *Cymatopus* Kertész with a discussion on *Abatetia* Miller and *Cemocarus* gen. nov. *Indo-Malayan Zoology* 1: 141–158.
- Negrobov O. P. 1977.** Dolichopodidae. In: Lindner, E. (ed.) *Die Fliegen der Palaearktischen Region*. Lieferung 316, Nägele & Obermiller, Stuttgart, pp. 347–386, plates CVIII–CL.
- Negrobov O. P. 1978.** Dolichopodidae. In: Lindner, E. (ed.) *Die Fliegen der Palaearktischen Region*. Lieferung 319, Nägele & Obermiller, Stuttgart, pp. 387–418, plates CLI–CLXXIII.
- Negrobov O. P. 1979a.** Dolichopodidae. In: Lindner, E. (ed.) *Die Fliegen der Palaearktischen Region*. Lieferung 321, Nägele & Obermiller, Stuttgart, pp. 419–474, plates CLXXIV–CLXXXVIII.
- Negrobov O. P. 1979b.** Dolichopodidae. In: Lindner, E. (ed.) *Die Fliegen der Palaearktischen Region*. Lieferung 321, Nägele & Obermiller, Stuttgart, pp. 475–530, plates CLXXXIX–CCVII.
- Negrobov O. P. 1987.** On the system and phylogeny of flies of the Fam. Dolichopodidae (Diptera). *Entomological Review* 65: 16–20.
- Oldroyd H. 1956.** A new genus and species of Dolichopodidae (Diptera) from Malaya. *Proceedings of the Royal Entomological Society of London ser. B* 25: 210–211.
- Pollet M. A. A., Brooks S. E. & Cumming J. M. 2004.** Catalog of the Dolichopodidae (Diptera) of America North of Mexico. *Bulletin of the American Museum of Natural History* 283: 1–114. URL: <http://hdl.handle.net/2246/451>
- Robinson H. 1970.** 40. Family Dolichopodidae. In: Papavero N. (ed.), *A catalogue of the Diptera of the Americas South of United States*. Museu de Zoologia, São Paulo, 92 pp.
- Sunose T. & Satô M. 1994.** Morphological and ecological studies on a marine shore dolichopodid fly *Conchopus borealis* Takagi (Diptera, Dolichopodidae). *Japanese Journal of Entomology* 62: 651–660.
- Takagi S. 1965.** A contribution to the knowledge of the marine shore Dolichopodidae of Japan (Diptera). *Insecta Matsumurana* 27(2): 49–84. URL: [http://eprints.lib.hokudai.ac.jp/dspace/bitstream/2115/9721/1/27\(2\)_p49-84.pdf](http://eprints.lib.hokudai.ac.jp/dspace/bitstream/2115/9721/1/27(2)_p49-84.pdf)
- Yang D., Zhu Y. J., Wang M. & Zhang L. L. 2006.** *World Catalog of Dolichopodidae (Insecta: Diptera)*. China Agricultural University Press, Beijing, 704 pp.

Correspondence: Renato S. Capellari, e-mail: rscapellari@gmail.com

Received: 16.11.2015 Accepted: 04.12.2015 Published: 11.12.2015

Cite paper: Capellari R. S. 2015. First record of *Thambemyia* Oldroyd (Diptera, Dolichopodidae) from Brazil, with description of a new species. *Journal of Insect Biodiversity* 3(20): 1–7.

<http://dx.doi.org/10.12976/jib/2015.3.20>

<http://www.insectbiodiversity.org>