

Original Article

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Una nueva especie de *Tanaostigmodes* Ashmead, 1896 (Hymenoptera: Tanaostigmatidae) de Brasil asociada con *Machaerium acutifolium* Voguel, 1837 (Fabaceae)

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Abstract. A new species of *Tanaostigmodes* Ashmead (Hymenoptera: Tanaostigmatidae), *Tanaostigmodes anamariae* Perioto and Lara, sp. nov., is described and illustrated. This species was reared from fruits of *Machaerium acutifolium* Voguel (Fabaceae), popularly known in Brazil as “jacarandá-do-campo”. *Tanaostigmodes* is reported for the first time for the state of São Paulo. A key to species of *Tanaostigmodes* of the insculptus group of species is provided.

Key words: Chalcidoidea; Guatapará; neotropical; taxonomy.

Resumen. Una nueva especie de *Tanaostigmodes* Ashmead (Hymenoptera: Tanaostigmatidae), *Tanaostigmodes anamariae* Perioto y Lara, sp. nov., es descrita e ilustrada. Esta especie se crió a partir de frutos de *Machaerium acutifolium* Voguel (Fabaceae), conocido popularmente en Brasil como “jacarandá-do-campo”. *Tanaostigmodes* es reportado por primera vez para el estado de São Paulo. Se proporciona una clave para las especies de *Tanaostigmodes* del grupo de especies insculptus.

Palabras clave: Chalcidoidea; Guatapará; neotropical; taxonomía.

Introduction

The Tanaostigmatidae, with about 90 species distributed in nine genera (Noyes 2019), are a small and poorly studied family of chalcid wasps. The monumental work of LaSalle (1987), which includes a review of the fauna of the New World Tanaostigmatidae, reports of their known host plants, and a list of the species of the world, continues to be a reference in the study of those insects 34 years after its publication.

Tanaostigmatids have an unusual biology, since most of their species have a phytophagous habit rather than parasite (LaSalle 1987), acting as gall inducers or inquilines within galls induced by other species (LaSalle 1987, 2005, 2006). Fabaceae trees or shrubs appear to be the preferred host plants of these insects (LaSalle 2006), although there are records of species of Tanaostigmatidae reared from galls in Euphorbiaceae, Lecythidaceae, Malvaceae, Myrtaceae, Polygonaceae and Rhamnaceae (LaSalle 1987; Prinsloo and LaSalle 1995).

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Tanaostigmodes Ashmead, 1896, the largest and most poorly defined of the tanaostigmatid genera (LaSalle 1987), have a cosmopolitan distribution; the genus includes 65 species, of which 50 in the New World and 13 in Brazil (Noyes 2019; Perioto 2021) and is divided into twenty species groups, seven of them containing a single species (LaSalle 1987; Perioto and Lara 2013).

The new species now described belongs to insculptus species group (*sensu* LaSalle 1987) that includes only two known species: *T. insculptus* LaSalle, 1987 and *T. horacioi* Perioto and Lara, 2013.

Females of the insculptus species group can be distinguished from females of other species groups by the following set of characters: mesoscutellum coriaceous, *speculum* separated from posterior margin of fore wing by more than a single line of setae, scape more than three times longer than wide and without or with a small ventral plaque, and interantennal projection small but present (LaSalle 1987; Perioto and Lara 2013).

Three other Tanaostigmatidae species are known to develop in species of *Machaerium* Pers. (Fabaceae) as hosts: *Tanaostigmodes fernandesii* LaSalle, 1987, which acts as inquiline on galls produced by *Anadiplosis* sp. (Diptera: Cecidomyiidae) in *Machaerium aculeatum* Raddi, *Tanaostigma bennetti* LaSalle, 1987 in galls of *Machaerium robinifolium* Voguel and *Tanaostigma chapadae* (Ashmead, 1904) in galls of *Machaerium* sp. (Gomes 1942; Fernandes *et al.* 1987; LaSalle 1987).

Machaerium acutifolium Voguel is a semi-deciduous, heliophyte plant, characteristic of sandy savannahs, occurring in Brazil from the Amazon region to the states of São Paulo and Mato Grosso do Sul. The trees reach 8 to 14 meters high, with trunk diameter from 40 to 50 cm. It flowers from June to December, with simultaneous fruiting, from June to September. Its fruits are approximately 5 cm long and 1.5 cm wide, attached to the stalk by the end of the seed. In Brazil this plant has several common names, among which "jacarandá-do-campo", "bico-de-pato" and "guaximbé" (Lorenzi 1992; Durigan *et al.* 2004; Polido and Sartori 2007).

The goal of this study is to describe and illustrate a new species of *Tanaostigmodes* from Brazil and reports the first record of this genus to São Paulo state. A key to species of *Tanaostigmodes* of the insculptus group of species is provided.

Material and Methods

The research presented here is based on specimens of *Tanaostigmodes* reared by Ana Maria de Faria from *M. acutifolium* fruits collected at the Fazenda Restinga (21°26'03"S / 48°01'02"W), in the municipality of Guatapará, state of São Paulo, Brazil and deposited at the entomological collection of the Laboratório de Sistemática e Bioecologia de Predadores e Parasitoides (LRRP), Instituto Biológico, Ribeirão Preto, state of São Paulo, Brazil.

Observations and descriptions were made with a Leica S APO stereomicroscope with 10X oculars under a led light source. Color images were obtained with Leica MC170 HD digital camera attached to a Leica M205C APO stereomicroscope with 10X oculars using the Leica Application Suite software (LAS version 4.12.0) for the capture the images; a Leica LED5000 HDI dome illumination system was used as light source. The serial images from different layers were focus stacked using Helicon Focus (version 5.1). Image editing was done using Adobe Photoshop (version 11.0).

The consistency of anatomical data with the Hymenoptera Anatomy Ontology project (Yoder *et al.* 2010; Seltmann *et al.* 2012) was determined using the proofing tool available in the Hymenoptera Glossary (HAO 2019), except for the ventral plaque that refers to the refers to an expanded flange in the ventral margin of the scape (see Gibson 1997: 20).

The description follows, in general terms, those provided by LaSalle (1987).

The key proposed by LaSalle (1987) was used for identification of species. The sculpturing integument follows Harris (1979).

Abbreviations are as follows: *An*, anelli (*n* = number of the annelus); CC, costal cell; Fn, funicular segments (*n* = number of the funicular segment); Gtn, gastral tergite (*n* = number of the gastral tergite); LOL, lateral ocelar line; MV, marginal vein; OOL, ocular ocellar line; PMV, postmarginal vein; SV, stigmal vein.

The information on the labels of the specimens examined was transcribed in the section of type material as follows: the symbol backslash (\) indicates the different lines on the label and two quotation marks (" ") indicate different labels on the same specimen. The repository is indicated in square brackets ([]).

Results

From the fruits of *M. acutifolium* emerged two females specimens of *Tanaostigmodes anamariae* Perioto and Lara, sp. nov. *Tanaostigmodes* is, for the first time, reported to state of São Paulo, Brazil.

Taxonomy

Tanaostigmodes anamariae Perioto and Lara, sp. nov.
(Figs. 1-10)

Diagnosis. Females of *T. anamariae* sp. nov. are distinguished from other *Tanaostigmodes* species of the insculpus species group by the following set of characters: scape with small ventral plaque; marginal setae of fore wing extending to apex of wing, and ventral margin of metafemur with small subapical tooth.

Description. Female holotype (Fig. 1). **Body length:** 3.5 mm. **Color:** head light brown; antenna and mandible dark brown. Mesosoma light brown with darker brown areas on dorsal mesonotum and mesoscutellum. Metasoma brown, except light brown basal portion of Gt2. Legs light brown. Wings hyaline, veins light brown. **Head** (Figs. 2-4): rectangular in frontal view, 1.3× wider than high. Face and front imbricate to coriaceous, with small, sparse minute setiferous punctures; frontal depression emarginate, not sculptured dorsally; interantennal area about 1/3 of the height of frontal depression; lateral ocellus farther from eye margin than from median ocellus (OOL/LOL= 1.6) (Fig. 3); eye 1.3× higher than wide; malar space 0.7× eye height and subocular sulcus incomplete (Fig. 4). Antenna (Fig. 5): scape 3.1× longer than wide, with small ventral plaque; pedicel 1.6× longer than wide; A1 subequal in length and width to A2; F1 1.5, F2 1.2, F3-4 1.1, F5 1.0, F6 0.9 and clava 1.7× longer than wide. **Mesosoma** (Figs. 6-9): 1.4× longer than wide in dorsal view (Fig. 6). Mesoscutum imbricate to coriaceous, 0.6× as long as broad, with sparse minute, setiferous punctures; notaulus complete. Mesoscutellum with sparse minute, setiferous punctures. Propodeum, in lateral view, forming a 110° angle with mesosoma and, in dorsal view, median furrow concave, shallow, smooth, wide U shaped like, bordered antero laterally by irregular asetose cells, with thin central carina that does not reach the posterior margin; callus finely coriaceous with sparse setae antero laterally; spiracle almost transversely oriented, reniform, ~1.0× its length from dorsellum (Fig. 7). Mesopleuron mainly glabrate, lightly strigulate anterodorsally. Sternopleural suture not reaching anterior margin of mesopleuron (Fig. 8). Fore wing 2.3× as long as broad, with marginal setae extending to apex of wing. Stigmal vein almost straight, forming an angle of about 55° with postmarginal vein. Basal cell with 26 setae. **Speculum** separated from posterior margin of fore wing by more setae (on ventral surface of wing) than a single line representing subcubital vein. CC/MV= 2.3, MV/PMV= 1.4, MV/SV= 1.7, PMV/SV= 1.8. Ventral margin of metafemur with a small subapical tooth (Fig. 9). **Metasoma** (Fig. 10): coriaceous. Posterior margin of Gt2 with strong

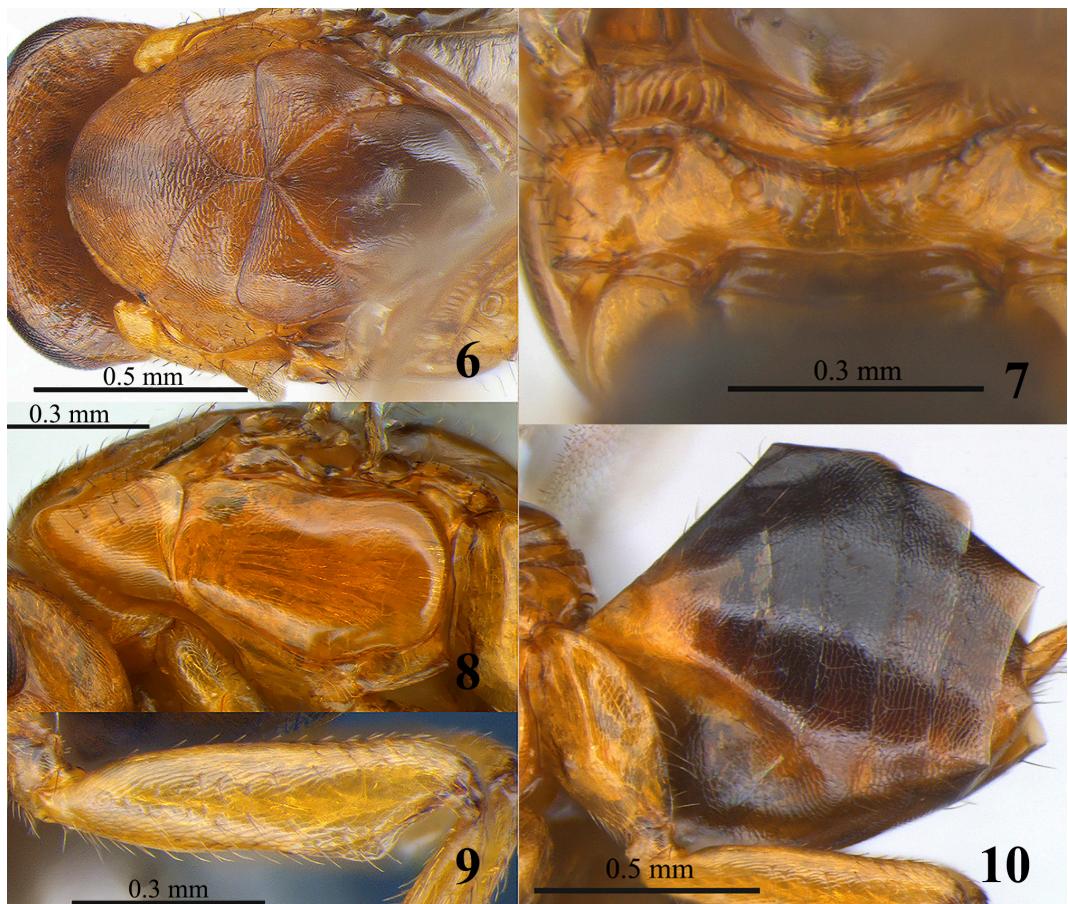
medial incision; posterior margin of Gt3-5 with slight medial incision and medial line.

Variation. No significant differences were observed between the specimens studied.

Type material. Holotype ♀ (Fig. 1) [LRRP] labeled “BRASIL / SP / Guatapará \ Fazenda Restinga \ 21°26'03"S / 48°01'02"W \ Ex. Fruits Machaerium acutifolium \ 24 / V / 2013 \ Ana Maria de Faria, col.”; “HOLOTYPE \ *Tanaostigmodes* \ *anamariae* sp. nov. \ Perioto & Lara”; “LRRP # 22749”. Paratype: same data as holotype, 1 ♀ [LRRP], “LRRP # 22750”. The holotype and the paratype examined are in good condition. The holotype is glued on pin, missing right A1-clava; the female paratype, glued on card, has remnants of the pupal skin attached to the antennae.



Figures 1-5. *Tanaostigmodes anamariae* Perioto and Lara, sp. nov., female. 1. Habitus, lateral. 2. Head, frontal. 3. Head, dorsal. 4. Head, lateral. 5. Antenna, frontal. / *Tanaostigmodes anamariae* Perioto y Lara, sp. nov., hembra. 1. Hábitos, lateral. 2. Cabeza, frontal. 3. Cabeza, dorsal. 4. Cabeza, lateral. 5. Antena, frontal.



Figures 6-10. *Tanaostigmodes anamariae* Perioto and Lara, sp. nov., female. 6. Mesosoma, dorsal. 7. Propodeum, dorsal. 8. Mesosoma, lateral. 9. Metafemur, lateral. 10. Metasoma, lateral. / *Tanaostigmodes anamariae* Perioto y Lara, sp. nov., hembra. 6. Mesosoma, dorsal. 7. Propodeo, dorsal. 8. Mesosoma, lateral. 9. Metafémur, lateral. 10. Metasoma, lateral.

Etymology. This epithet is a patronym, genitive, in honor of Ana Maria de Faria, retired colleague of the Instituto Biológico, collector of the new species.

Distribution. *T. anamariae* sp. nov. is known only for the municipality of Guatapará, state of São Paulo, Brazil.

Biology and host. *T. anamariae* sp. nov. was reared from fruits of *Machaerium acutifolium* (Fabaceae).

Species identification. In the key to species of New World *Tanaostigmodes* provided by LaSalle (1987) this species runs to couplet 17 and can be separated by additional couplets as follows:

- 17 (16) Interantennal projection absent (see Fig. 31 in LaSalle (1987)). Toruli separated from each other by a distance distinctly greater than diameter of torulus. (kiefferi group)
..... *T. kiefferi* (Mayr, 1905)
- 17' Interantennal projection small, but present (see Fig. 47 in LaSalle (1987)). Toruli

separated from each other by a distance only slightly, if at all, greater than diameter of torulus. (insculptus group)	46
46 Ventral margin of metafemur without subapical tooth <i>T. horacioi</i> Perioto and Lara, 2013	
46' Ventral margin of metafemur with small subapical tooth (Fig. 9)	47
47 Scape without ventral plaque. Basal cell of fore wing with 32 setae. Marginal setae of fore wing extending only as far as the postmarginal vein <i>T. insculptus</i> LaSalle, 1987	
47' Scape with small ventral plaque (Figs. 2, 5). Basal cell of fore wing with 26 setae. Marginal setae of fore wing extending to apex of wing <i>T. anamariae</i> Perioto and Lara, sp. nov.	

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