

Description of the pupa of *Tanytarsus alatus* Paggi (1992) (Chironominae: Tanytarsini)

Mariano Donato¹, Juan Pablo Zanotto Arpellino² and Augusto Siri³

Instituto de Limnología 'Dr Raúl A. Ringuelet' (ILPLA), Universidad Nacional de La Plata – Consejo Nacional de Investigaciones Científicas y Técnicas, CCT La Plata, Boulevard 120 and 62, CC 712 (1900) La Plata, Buenos Aires, Argentina.

E-mail: ¹marianodonato@ilpla.edu.ar; ²zanottojp@ilpla.edu.ar; ³augusto@ilpla.edu.ar

Abstract

The pupa of *Tanytarsus alatus* Paggi (1992) is described and figured for the first time. Notes for comparison with other species of the genus are provided, as well as brief notes on its geographic distribution.

Introduction

The species *Tanytarsus alatus* was described by Paggi (1992) based on the male adult. Later, Sanseverino and Fittkau (2007) transferred this species to the genus *Caladomyia* after a reinterpretation of the characters of the male genitalia. The genus *Caladomyia* was erected by Säwedal (1981) based on the posteriorly directed bars on the hypopygial anal point as a synapomorphy. In later works (Reiss 1972, Paggi 1992, Sublette and Sasa 1994, Trivinho Strixino and Strixino 2000, Reiff 2000), more species were described or transferred from the genus *Tanytarsus* van der Wulp, and after the revision of Trivinho Strixino (2012) the genus comprised 31 species. Recently, Lin et al (2018) analyzed *Tanytarsus* sensu lato based on the combined analysis of five nuclear markers and concluded that *Tanytarsus* is paraphyletic with *Caladomyia* Säwedal placed among South American *Tanytarsus*, *Virgatanytarsus* Pinder as part of a Gondwanan clade, and *Corynocera* Zetterstedt within the *Tanytarsus norvegicus* (Kieffer) species group. Lin et al (2018) formally synonymized *Caladomyia* and *Virgatanytarsus* with *Tanytarsus*.

In the present study, the pupa of *Tanytarsus alatus* is described, its taxonomic relationships are discussed in the group of *Tanytarsus* species with the posteriorly directed bars on the hypopygial anal point, and its geographic distribution is updated.

Material and methods

Collection of a pharate adult, along with several pupal exuviae from the same stream, allowed for life-stage association and description of the pupa of *Tanytarsus alatus*. A microscope slide for the pharate adult was prepared by clearing the specimen with 10% KOH; neutralization with glacial acetic acid; dehydration in 80%, 96% and 100% ethanol and mounting in Canada Balsam. Pupal exuviae were mounted with the cephalothorax separated from the abdomen and split into two halves along the mid-dorsal ecdysial opening with the outer surface facing upwards. Morphological terminology and measurement standards follow Sæther (1980) and Langton (2004); the values are rounded off to the nearest 5 µm unless otherwise stated and measurements are given as ranges. The material is deposited in the collection of the Instituto de Limnología "Dr. Raul A. Ringuelet", Argentina (ILPLA).

Results

Tanytarsus alatus Paggi (1992)

(Figs 1A–I)

Tanytarsus alatus Paggi 1992: 302.

Caladomyia alata Sanseverino and Fittkau 2007: 266 (new combination).

Tanytarsus alatus, Lin et al. 2018: 667 (new combination).

Material examined. ARGENTINA: 1 pharate pupa, Buenos Aires, Carnaval stream, 34.870588° S, 58.089776° W, 07-ix-2017, D-net, J.P. Zanotto Arpellino (ILPLA); 5 pupal exuviae, Buñirigo stream, 35.143919° S, 57.570168° W, 07-viii-2018, D-net, J.P. Zanotto Arpellino (ILPLA).

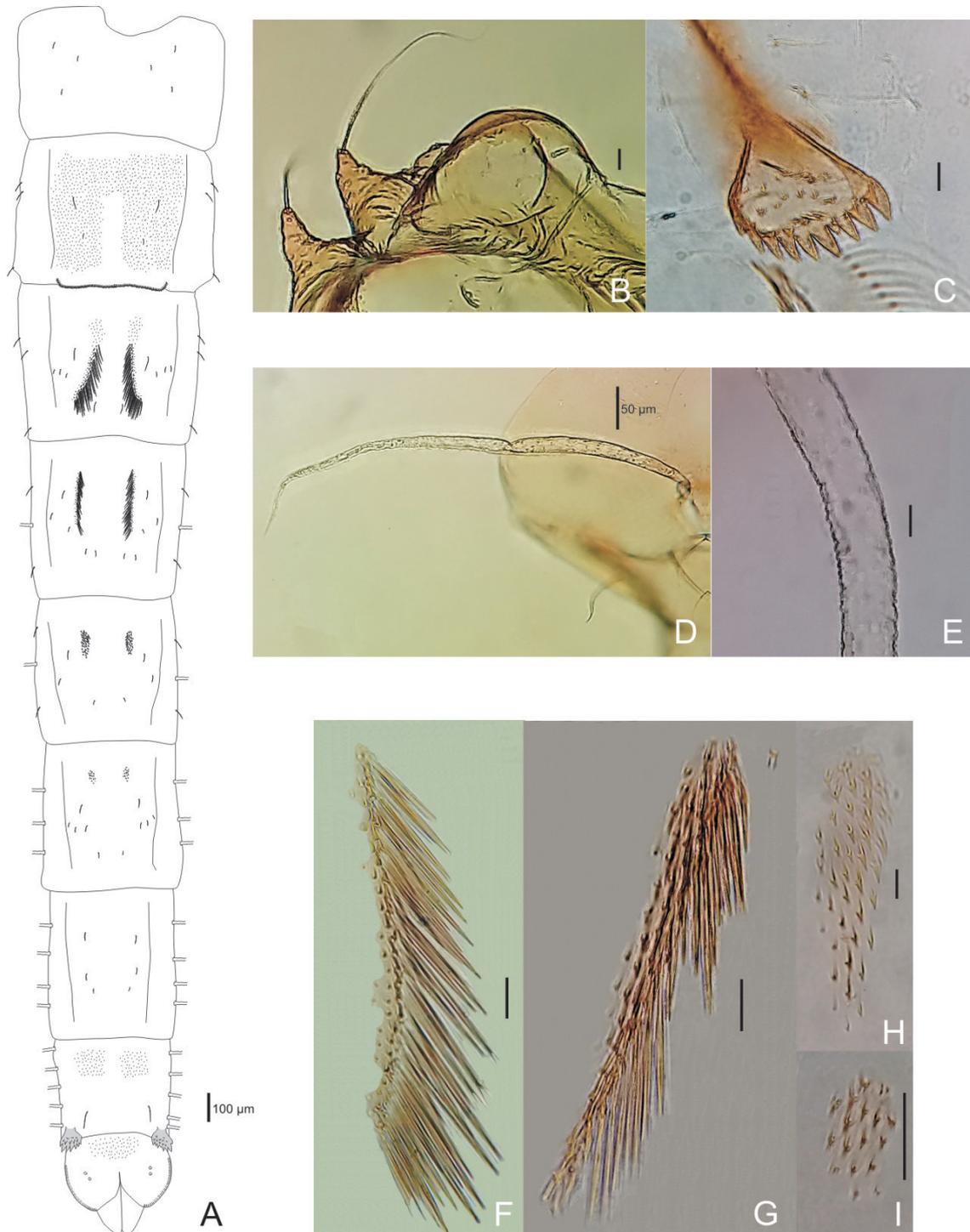


Figure 1. *Tanytarsus alatus* Paggi (1992) pupa. A) abdomen, dorsal view; B) frontal tubercles; C) posterolateral comb of abdominal segment VIII; D) thoracic horn; E) detail of the pores in the thoracic horn; F) patch on tergite III; G) patch on tergite IV; H) spinules on tergite V; I) spinules on tergite VI. Scale bar = 10 µm, except otherwise stated.

Pupal exuviae ($n = 6$)

Color: slightly brownish. Total length 3.83–4.7 (5) mm; cephalothorax length 0.84–1.2 mm (5); abdomen length 2.82–3.5 mm (5).

Cephalothorax. Frontal setae elongate, slender, 118–144 (5) μm long; cephalic tubercles present (Fig. 1B). Thoracic horn slender with small pores (Figs 1D–E). Thorax smooth; wing sheath with short nose. Thoracic setation: 3 precorneals: 144–176, 116–170, 126–142 (5) μm long, and 2 lateral anteprenotals. Dc1–4 present and situated in two groups widely separated; distance between Dc1–Dc3 217–284 μm .

Abdomen (Fig. 1A). Tergite I bare; T II with central field of fine shagreen; T III with longitudinal paired bands of long spines (Fig. 1F); T IV with a paired long bands of hair-like fine spines in slightly curved line (Fig. 1G); T V–VI with anterior pair of semi-oval patches of short single spinules (Figs 1H–I); T VII bare. T VIII with anterior paired patches of fine shagreen. Hook row continuous, with approximately 200–250 hooklets. Segment VIII with posterolateral combs consisting of 5–10 large marginal teeth and 14–31 overlapping ventral teeth (Fig. 1C). Anal lobe with an oval field of fine shagreen; 37–48 taeniae and 2 dorsal setae taeniae. Segment II with 3 L setae; segments III–IV with 3 setae, middle setae teniate; segment V–VI with 3 teniate setae; segment VII with 4 taeniae; segment VIII with 5 taeniae.

Discussion

The presence of paired longitudinal bands of long spines on TIII and IV, patches of spinules in the anterior part of TIII–V separated, segments V and VI with 3 taeniate setae, lateral anteprenotal setae without spinules, spine bands on TIV nearly parallel or slightly divergent posteriorly fits the description of *T. bruneola* (Trivinho Strixino) and *T. kapilei* (Trivinho Strixino) in the key to pupa by Trivinho Strixino (2012). However, those species differ from *T. alatus* by the possession of a wrinkled frontal apotome and lacking cephalic tubercles, by having patches on T V–VI with short multiple spines, and no anterior paired patches of fine shagreen on T VIII, nor an oval field of fine shagreen on the anal lobe. Sanseverino and Fittkau (2007) described the occurrence of short spines on T IV–VI sitting close to each other or placed on the same base and giving the appearance of multiple spines, a useful character to recognize the previously *Caladomyia* pupae. The character was not found to be consistent within the genus as several species possess single spinules on T IV–VI. This is also the case for *Tanytarsus alatus*.

The type locality of *Tanytarsus alatus* is Embalse Arroyito and the paratypes were collected in Marimenuco, both localities belonging to Neuquen province of Argentina. These localities are in the Monte province of the biogeographic scheme of Cabrera and Willink (1973). This province covers sandy plains, plateaus and low mountain slopes, with a dry and warm climate in its northern portion and dry and cool in the south. Precipitation is scarce with 80 mm per year in the north and 250 mm in the south, and the temperature between 13° and 17°C on annual average respectively. The predominant vegetation type is the xerophilous scrubland or sammophilic or halophilic shrub steppe. The new records presented in this study together with male adults collected in piedmont areas of Tandilia and Ventania mountain hills (both in Buenos Aires province, Argentina) extends the geographic distribution of this species northwards. These localities occur in the Pampean province (Cabrera and Willink 1973) that occupies the plains of eastern Argentina between 31° and 39° south latitude. It extends over horizontal or slightly undulated plains, with some low-rise mountain ranges (up to 1200 m in Ventania Mountain Hills) that emerge as islands. There are slow rivers and numerous lagoons of fresh or brackish water. The climate is warm temperate, with rains throughout the year that decrease from north to south and from east to west (1100 to about 600 mm per year). The average annual temperature ranges between 13° and 17°C. The dominant vegetation is the grass steppe, there are also grasslands, sammophilic steppes, halophilic steppes, marginal forests and various types of hydrophilic vegetation.

Acknowledgements

This study was supported by Universidad Nacional de La Plata (FCNyM, #11/N785) and Consejo Nacional de Investigaciones Científicas y Técnicas (PIP #1010).

References

- Cabrera, A.L. and Willink, A. 1973. *Biogeografía de América Latina. Monografía 13. Serie de Biología*. Secretaría General de la Organización de los Estados Americanos. Washington DC. EEUU. 120 p.
- Langton, P.H. 1994. If not “filaments” then what? - *CHIRONOMUS Newsletter on Chironomidae Research* 6: 9–9.
- Lin, X.L., Stur, E. and Ekrem, T. 2018. Molecular phylogeny and temporal diversification of *Tanytarsus* van der Wulp (Diptera: Chironomidae) support generic synonymies, a new classification and centre of origin. - *Systematic Entomology* 43(4): 659–677. DOI: <https://doi.org/10.1111/syen.12292>
- Paggi, A.C. 1992. Two new species of genus *Tanytarsus* from Argentina (Diptera, Chironomidae). - *Fragmenta Entomologica* 23: 299–306.
- Reiff, N. 2000. Review of the mainly Neotropical genus *Caladomyia* Sæwedal, 1981, with descriptions of seven new species (Insecta, Diptera, Chironomidae, Tanytarsini). - *Spixiana* 23: 175–198.
- Reiss, F. 1972. Die Tanytarsini (Chironomidae, Diptera) Südchiles und Westpatagoniens. Mit Hinweisen auf die Tanytarsini-Fauna der Neotropis. - *Studies on Neotropical Fauna* 7: 49–94.
- Sæther, O.A. 1980. Glossary of chironomid morphology terminology (Diptera, Chironomidae). - *Entomologica scandinavica*, Supplement 14: 1–51.
- Sanseverino, A.M. and Fittkau, E.J. 2007. Taxonomy of *Caladomyia alata* (Paggi, 1992) and *Caladomyia tuberculata* (Reiss, 1972), new combinations (Diptera: Chironomidae). In Andersen, T. (Ed.), *Contributions to the Systematics and Ecology of Aquatic Diptera: A tribute to Ole A. Sæther*. Columbus, Ohio: The Caddis Press. pp. 265–73.
- Sæwedal, L. 1981. Amazonian Tanytarsini 2. Description of *Caladomyia* n. gen. and eight new species (Diptera: Chironomidae). - *Entomologica scandinavica* 12: 123–43.
- Sublette, J.E. and Sasa, M. 1994. Chironomidae collected in onchocerciasis endemic areas of Guatemala. (Insecta, Diptera). - *Spixiana Supplement* 20: 1–60.
- Trivinho-Strixino, S. 2012. A systematic review of Neotropical *Caladomyia* Sæwedal (Diptera: Chironomidae). - *Zootaxa* 3495: 1–41. DOI: <https://doi.org/10.11646/zootaxa.3495.1.1>
- Trivinho-Strixino, S. and Strixino, G. 2000. A new species of *Caladomyia* Sæwedal, 1981, with description of the female and immature stages (Insecta, Diptera, Chironomidae). - *Spixiana* 23: 167–173.

Article submitted 11. November 2019, accepted by Alyssa M. Anderson 23. Januar 2020, published 12. February 2020.