

Scientific Note

First record of beetle flies (Diptera: Celyphidae) from Brazil

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Abstract. *Atopocelyphus ruficollis* (Macquart, 1844) is the only known species of Celyphidae to occur in the Neotropical region, registered only in French Guiana. Here we provide the first record of this species and family for Brazil, based on material collected in Oyapock, Amapá state, along with detailed photographs of male and female terminalia.

Keywords: Beetle-backed flies, Acalypttratae, Lauxanioidea.

Celyphidae is a small family of Acalypttratae flies, comprising 115 valid species currently distributed in eight genera (Gaimari 2017). Celyphids are easily recognized by their shiny body and very enlarged scutellum almost covering the abdomen, which is suggestive of certain metallic chrysomelid beetles (Gaimari 2017). They can be found in wet grassy habitats and on leaves and stems of broad-leaved plants like banana trees (Gaimari & Miller 2021). These flies are often caught by sweeping in grassy areas and along river banks and ponds (Tenorio 1972). They are most diverse in tropical Asia and southeast Asia, with fewer species known from the Afrotropical region (Gaimari 2017). The only known genus in the Neotropical region is the monotypic *Atopocelyphus* Gaimari, 2017 by the species *Atopocelyphus ruficollis* (Macquart, 1844), known until now only from French Guiana. Despite its occurrence in French Guiana (Gaimari 2017), Celyphidae still had not been registered in Brazil (Carvalho et al. 2012).

Collecting was conducted in a well-preserved forest (3°39'35" N 51°46'17" W), near a small stream of water, 25 km away from Oyapock city, Amapá state, near the border of Brazil with French Guiana.

We used a 6-m long Gressitt & Gressitt-style Malaise trap, with two collecting jars. Samples were collected with an interval of 15 days, between July 2019 and July 2020, with support from the Universidade Federal do Amapá, Campus Binacional (UNIFAP). Collected samples were preserved in 96% alcohol and deposited at the Instituto Nacional de Pesquisas da Amazônia (INPA) and are available to the scientific community. The samples from March to July/2020 were not labelled so we combined them. The abdomens of one male and one female were removed and macerated at 150°C in 85% lactic acid for approximately 20 minutes. The structures were immersed in glycerin for dissection and to be photographed. After examination, terminalia were transferred to microvials with glycerin, and attached to the specimens. Photographs of the specimens were taken with a Leica DFC500 digital camera attached to a Leica M205C stereomicroscope, connected to a computer with the Leica Application Suite LAS V3.6 software, which includes an Auto-Montage module (Syncroscopy software).

Our search for target groups has found six specimens of Celyphidae, being three male and three female specimens of *A. ruficollis* (Figs. 1A, 1B). Specimens were found in samples of October, December and March-July, indicating that adults may be active throughout the whole year. *Atopocelyphus ruficollis* is considered a rare species, with only two specimens deposited in scientific collections, one male (holotype) in Paris (MNHN) (French Guiana as type locality) and one female in London (NHMUK) collected in the Réserve Trésor. Considering the scarcity of this family, any additional specimens are valuable for further

understanding the diversity, biogeography, behavior, biology and evolution of the family. The complementary description of the male and female terminalia provided below, along with detailed digital images, can be of great help on future works with Celyphidae taxonomy.

Complementary description. Male. Abdominal tergites 5 and 6 dorsally creased midlongitudinally, both with triangular median notch on anterior and posterior margins. Tergites and sternites 7 and 8 fused into a closed ring (syntergosternite 7 + 8), surrounding the terminalia. Epandrium subquadrate, as a complete ring, with articulated and short setulose surstyli, both fitting within anteriorly and over posteriorly of syntergosternite 7 + 8. Cerci small, setulose, placed over posterior margin of epandrium (Fig. 1C). Hypandrium thin as a complete ring. Postgonite short, comma-shaped. Subepandrial sclerite U-shaped. Phallus with six thin ejaculatory ducts (Fig. 1D). Phallapodeme rod-shaped, in an angle around 120 of the phallus axis (Fig. 1E).

Female. Sternite 8 enlarged (Fig. 1F), convex, canoe-shaped. Epiproct, hypoproct and cerci smaller than previous sclerites, distinctly setose (Fig. 1G). Three brown globular spermathecae (Fig. 1H).

Eggs. 25 internal eggs in one dissected female specimen (Figs. 1I, 1J). Measurements based on 16 eggs: length 0.88±0.07 mm, width 0.27 ±0.04 mm, white, ovoid; anteriorly with distinct tubercle shielding apical micropyle; posteriorly with knob-like swelling. Chorion with four distinct longitudinal ridges, with fine transverse striations between in one longitudinal half; the other half somewhat rounded with a pair of inconspicuous longitudinal ridge.

Examined material. BRASIL, Amapá, Oiapoque, BR 156, km 25, 3°39'35" N - 51°46'17" W, 5-27.x.2019, Malaise, floresta, J.A. Rafael, S.P. Lima & F.F. Xavier F^o (1 female - MNRJ); idem, 5-17.xii.2019 (1 male - MNRJ); idem, iii-vii.2020 (2 males, 2 females - INPA).

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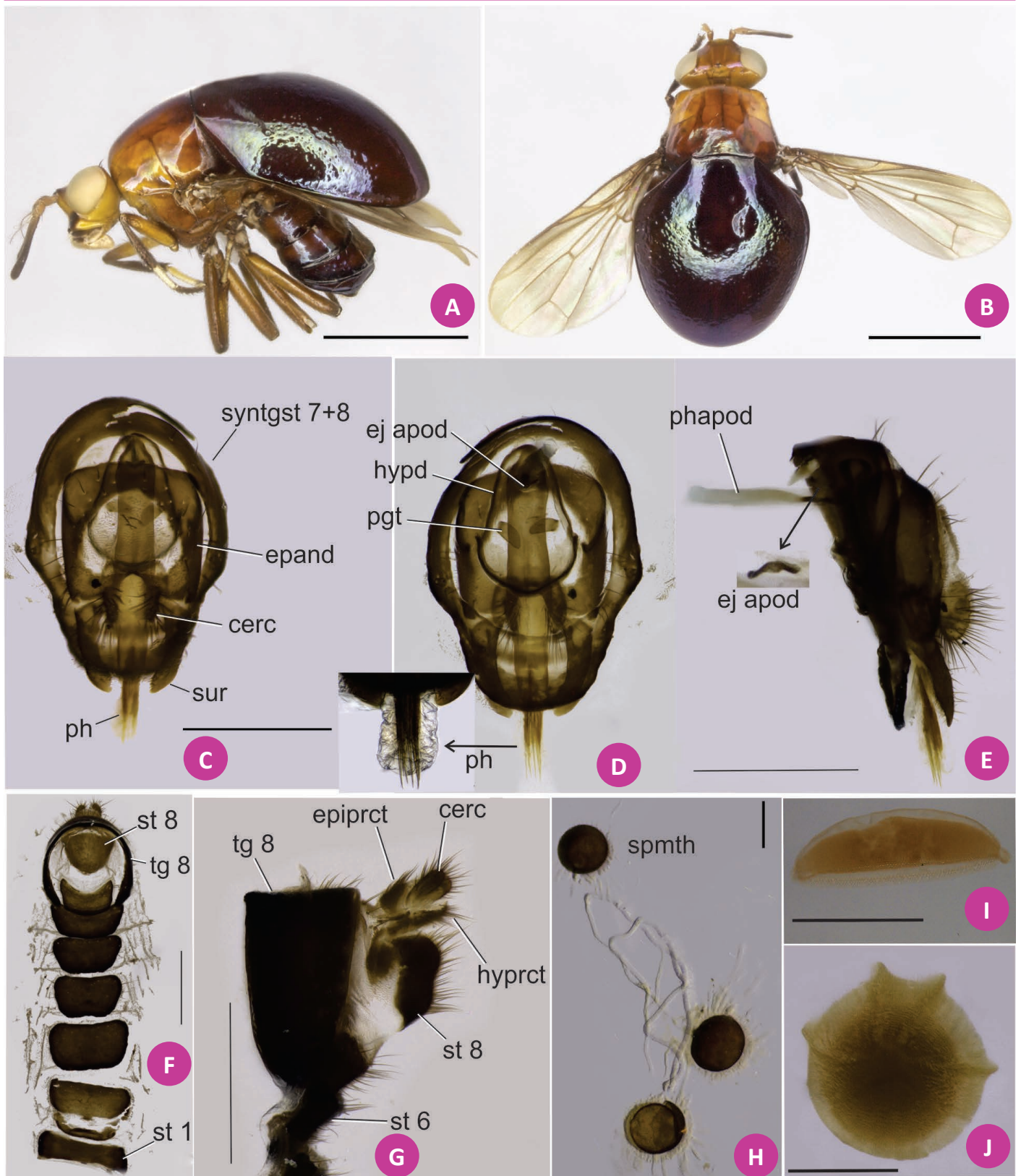


Figure 1. *Atopocelyphus ruficollis* (Macquart, 1844) (Diptera: Celyphidae), collected in Oyapock, Amapá, Brazil. **A.** Female, lateral view; **B.** Male, dorsal view; **C.** Male terminalia, dorsal view; **D.** Male terminalia, ventral view, with apex of phallus in detail; **E.** Male terminalia, lateral view, with ejaculatory apodeme in detail; **F.** Female sternites and distal sclerites; **G.** Female, apex of abdomen; **H.** Spermathecae; **I.** Egg, lateral view; **J.** Egg, anterior view. Scale bars: 2 mm (A, B); 0.5 mm (C, D, E, F, G, I, J); 0.1 mm (H). Abbreviations: cerc, cercus; ej apod, ejaculatory apodeme; epand, epandrium; epiprct, epiproct; hypd, hypandrium; hypprct, hypoproct; pgt, postgonite; ph, phallus; phapod, phallapodeme; spmth, spermatheca; st, sternite; sur, surstylus; syntgst, syntergostenite; tg, tergite.

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Authors' Contributions

JAR designed the project. JAR and SPL conducted the fieldwork.

DWAM sorted and identified the specimens. JAR and SPL dissected the specimens. SPL and DWAM produced the digital images. All authors contributed to the writing, revised the manuscript, and approved the final version.

Conflict of Interest Statement

The authors declare no conflict of interest.

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