


Nomenclatural Act

urn:lsid:zoobank.org:pub:05707EA8-E43B-496C-9E14-63BC217A7781

Bephratelloides princepstenebris sp. nov. (Hymenoptera, Eurytomidae), a new species from Amazon Rainforest

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Edited by: Daniel Aquino 

Received: September 04, 2025. Accepted: February 03, 2026. Published: June 16, 2026.

Abstract. This study describes and illustrates a new species, *Bephratelloides princepstenebris* Perioto & Lara sp. nov. (Hymenoptera, Eurytomidae), based on a specimen collected in an area of Amazon rainforest near Manaus, Amazonas, Brazil. An identification key to the species of *Bephratelloides* is also provided.

Keywords: Chalcidoidea, Manaus, Neotropical Region, seed-feeding wasp, taxonomy.

Bephratelloides Girault, 1913 (Hymenoptera, Eurytomidae) is a small Neotropical genus within the Eurytominae, including six valid species: *Bephratelloides pomorum* (Fabricius, 1804) (= *Bephratelloides maculicollis* Cameron, 1913), *Bephratelloides cubensis* (Ashmead, 1894), *Bephratelloides paraguayensis* (Crawford, 1911), *Bephratelloides petiolatus* Grissell & Schauff, 1990, *Bephratelloides ablusus* Grissell & Foster, 1996, and *Bephratelloides duguetiarum* Perioto & Lara, 2025 (Grissell & Foster 1996; Perioto & Lara 2025a).

During their larval stage, species of *Bephratelloides* feed almost exclusively on seeds of Annonaceae (Magnoliales) (Grissell & Schauff 1990; DiGiulio 1997; Grissell & Foster 1996). However, there are reports of *B. ablusus* larvae feeding on seeds of *Diospyros nigra* (Ericales: Ebenaceae) in Mexico (Castañeda-Vildózola et al. 2011), suggesting that species of *Bephratelloides* may have hosts outside the Annonaceae family.

This study describes and illustrates a new species, *Bephratelloides princepstenebris* Perioto & Lara sp. nov.. An identification key to the species of *Bephratelloides* is also provided.

The description of this new species of *Bephratelloides* is based on a single specimen collected using a modified Malaise trap, installed eight meters above the ground, in an area of Amazon rainforest vegetation near Manaus (2°35'21"S, 60°06'55"W), state of Amazonas, Brazil.

The specimen studied herein is deposited in the Coleção Entomológica of the Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, AM, Brazil, under the curatorship of Dr. Marcio Luiz de Oliveira.

The key provided by Grissell & Foster (1996) and the description of *B. duguetiarum* Perioto & Lara (2025a) were used for identification of the studied specimen. The morphological terminology follows Gibson (1997) and that for surface sculpture follows Harris (1979).

Images and measurements were obtained using a Leica MC170 HD digital camera mounted on a Leica M205C APO automated research stereomicroscope. Measurements were taken using the "Distance Line Tool" of the Leica Application Suite software (LAS version 4.12.0). For image acquisition, series of photographs at different focal planes (Z-stacking) were captured and subsequently combined using Helicon Focus software (version 5.3). The studied specimen was illuminated using a Leica LED5000 HDI high-diffuse dome illumination system (Kerr et al. 2008), and the final images were edited using Adobe Photoshop software (version 11.0).

Figures from Grissell & Foster (1996) are cited with a lower case *f* (i.e., fig. 21).

Used abbreviations are: AM, Amazonas state; Fn, flagellomere (*n* = number of the flagellomere); OOL, ocular ocellar line; POL, posterior ocellar line; Mtn, metasomal tergum (*n* = number of the metasomal tergum).

Information on specimen labels is given *ad litteram*.

Key to species of *Bephratelloides* adapted from Grissell & Foster (1996) and Perioto & Lara (2025a)

1. Cells of median area of propodeum with setae and similar to cells on remainder of propodeum... *Bephratelloides pomorum* (Fabricius, 1804)

1'. Cells of median area of propodeum without setae, these cells either absent anteriorly, transverse (and thus different than lateral cells, fig. 26 in Grissell & Foster (1996)), or forming two parallel vertical median rows 2

2(1'). Median area of the propodeum flat and glabrous, anteriorly without distinct carinae *Bephratelloides cubensis* (Ashmead, 1894)

2'. Median area of propodeum completely carinate, either with distinct transverse carinae (fig. 26 *ibid*) or with parallel vertical rows 3

3(2'). Both sexes: malar space without setigerous punctures (i.e. widest bare area 2 or 3× puncture diameters in width; fig. 24 *ibid*); speculum present although possibly small (figs. 15, 16 *ibid*). Females: first funicular segment constricted basally (figs. 4, 5 *ibid*); Mt1 (petiole) usually not readily visible and much wider than long (2.5 to 6.0×). Males: funicular segments with erect setae longer than width of segment (figs. 1, 2 *ibid*); Mt1 in dorsal view more than 2.5× as long as broad (figs. 10, 11 *ibid*), in lateral view (figs. 7, 8 *ibid*) more than 2.5× as long as greatest height, without apical dorsomedian flange 4

3'. Both sexes: malar space with nearly contiguous setigerous punctures; speculum essentially absent (fig. 17 *ibid*). Females: first funicular segment cylindrical, not constricted basally (fig. 6 *ibid*); Mt1 (petiole) short, wider than long (<1.8×). Males (only of *B. paraguayensis*): funicular segments with erect setae shorter than width of segment (fig. 9 *ibid*) 6

4(3). Both sexes: post-ocellar distance greater than ocellocular distance (fig. 22 *ibid*); speculum relatively large (fig. 16 *ibid*); cubital setal line without setae; anterior pronotal carina nearly meeting medially (fig. 14 *ibid*), separated by distance subequal to or less than post-ocellar

distance; median propodeum with two vertical rows of cells (though these may be irregular and difficult to discern). Females: basal constriction of first funicular segment asymmetrically bent (fig. 5 *ibid*) *Bephratelloides petiolatus* Grissell & Schauff, 1990

4'. Both sexes: post-ocellar distance less than ocellular distance (fig. 21 *ibid*); speculum relatively small (fig. 16 *ibid*) or absent; cubital setal line present 5

5(4'). Both sexes: ocellular distance about 1.2× post-ocellar distance (fig. 21 *ibid*); speculum present, relatively small; cubital setal line present basally; median panel of propodeum with single transverse cells. Females: basal constriction of F1 essentially symmetric (fig. 4 *ibid*) *Bephratelloides ablusus* Grissell & Foster, 1996

5'. Both sexes: ocellular distance about 1.7× post-ocellar distance; speculum absent; cubital setal line present; median panel of propodeum with median longitudinal carina vaguely indicated and transverse carinae irregular and interrupted. Females: basal constriction of F1 asymmetrical *Bephratelloides duquetiarum* Perieto & Lara, 2025

6(3). Both sexes: body entirely reddish-brown; head rectangular, in frontal view (fig. 20 *ibid*); malar space with nearly contiguous setigerous punctures with widest bare area 1× or less puncture diameters in width; eye height less than malar space (fig. 20 *ibid*); speculum essentially absent (fig. 17 *ibid*). Females: first funicular segment cylindrical, not

constricted basally (fig. 6 *ibid*); Mt1 about as wide as long. Males: funicular segments covered with recurved setae that are scarcely as long as width of segment (fig. 3 *ibid*); Mt1 in dorsal view about 1.5× as long as broad (fig. 12 *ibid*), in lateral view subequal in length to greatest height, with apical dorsomedian flange (fig. 9 *ibid*) *Bephratelloides paraguayensis* (Crawford, 1911)

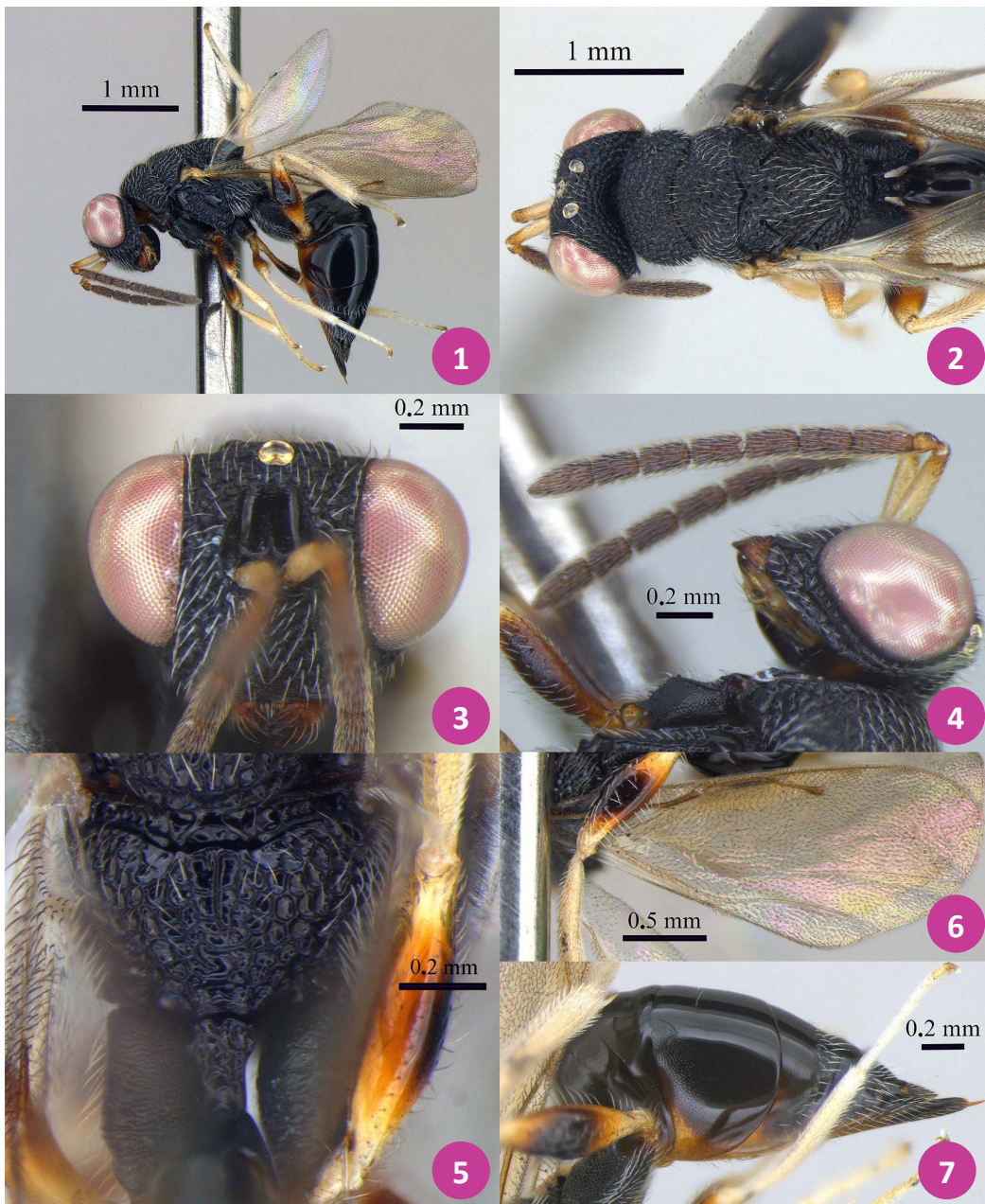
6'. Females: body predominantly blackish (Fig. 1); head triangular, in frontal view (Fig. 3); malar space with nearly contiguous setigerous punctures with widest bare area more than 1× puncture diameters in width; eye height 3.3× malar space (Figs. 1, 4); Mt1 about 2× longer than wide *Bephratelloides princepstenebris* Perieto & Lara **sp. nov.**

***Bephratelloides princepstenebris* Perieto & Lara **sp. nov.** (Figures 1-7)**

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Diagnosis. Females of *B. princepstenebris* **sp. nov.** (Figs. 1-2) can be distinguished from the other species of *Bephratelloides* by the body predominantly blackish, triangular head, eye height 3.3× the malar space, and Mt1 about 2× longer than wide.

Type material. **Holotype female.** Labels: 1: {printed text on white label} "BRASIL, Amazonas, Manaus, ZF-2, km 14, 2°35'21"S, 60°06'55"W, 1-18.ix.2018, Malaise gde, 8m, poente, JARafael – RedeBia" / 2: {printed text on red label} "HOLOTYPE, *Bephratelloides princepstenebris* **sp.**



Figures 1-7. *Bephratelloides princepstenebris* Perieto & Lara **sp. nov.** (Hymenoptera, Eurytomidae), female holotype. 1. Habitus, lateral view. 2. Head and mesosoma, dorsal view. 3. Head, anterior view. 4. Head and antenna, lateral view. 5. Propodeum and Mt1, dorsal view. 6. Fore wing. 7. Metasoma, lateral view.

nov. Perioto & Lara" (deposited at INPA). The holotype, glued on pin, is in good condition.

Geographical distribution. BRAZIL, state of Amazonas.

Etymology. The specific epithet *princepstenebris* is a neologism formed by the junction of two Latin words: *princeps* (prince, chief) and *tenebris* (ablative/dative plural of *tenebrae*, darkness or shadows). It is a noun in apposition, coined in tribute to John Michael 'Ozzy' Osbourne, the 'Prince of Darkness', legendary British rock musician, for his invaluable contribution to music and culture for over five decades.

Holotype female. Body length 4.3 mm.

Color (Figs. 1-2). Body predominantly blackish. Head black except light brown on scape, brown on flagellum and dark orange-brown on mandible. Mesosoma black except dark orange-brown on trochanters and femurs, the last ones dark brown infuscated medially, and pale yellow on tibia and tarsomeres. Metasoma predominantly dark brown. Fore wing hyaline, slight shaded; veins and setae brown. Body setation white.

Head (Figs. 3-4). Triangular, 0.7× as high as wide, predominantly foveolate; POL/OOL= 2.0; eye height 3.3× malar space; scrobal depression smooth, except dorsally finely striate, carinate laterally; genal carina well developed; ventral margin of clypeus slight bilobate (Fig. 3). Antenna (Fig. 4): scape 3.9×, pedicel 1.1×, F1 2.3×, F2-F3 2.0×, F4 2.1×, F5 1.9×, F6 1.8× and clava 2.4× as long as wide.

Mesosoma (Figs. 1-2). 1.7× as long as wide, densely foveolate dorsally, prepectus and upper mesepimeron smooth, and femoral depression striate. Mesoscutum 1.3× as long as pronotum and 0.7× as long as mesoscutellum measured medially; notauli complete, demarcated by a line of foveae. Mesoscutellum 0.5× as long as wide, arched in lateral view, scarcely overlapping metanotum. Propodeum with central depression roughly areolate; lateral panel with large fovea; callus with long white setae (Fig. 5). Fore wing (Fig. 6) 2.5× as long as wide; speculum absent; cubital setal line present; basal cell asetose; submarginal vein 2.6× and 1.5× as long as marginal and postmarginal veins, respectively; postmarginal vein 2.1× as long as stigmal vein.

Metasoma. Mt1 dorsally 1.8× longer than wide, roughly sculptured, with lateral expansion apically (Fig. 5). Gaster strongly compressed, wide dorso-ventrally, 2.3× as long as high and 1.1× as long as head+mesosoma, smooth and shiny, with fine coriarius sculpture (Fig. 7).

Male. Unknown.

Biology. Unknown.

Comments. In the key provided by Grissell & Foster (1996), *B. princepstenebris* **sp. nov.** is close to *B. paraguayensis* but can be easily differentiated by a suite of morphological characters. The new species is characterized by a predominantly blackish body, a postmarginal vein longer than the marginal vein, triangular head in frontal view, eye height greater than malar space, and Mt1 about 2× as long as wide. In contrast, *B. paraguayensis* possesses entirely reddish-brown body, postmarginal vein approximately as long as marginal vein (cf. fig. 17 in Grissell & Foster 1996), rectangular head in frontal view (cf. fig. 20 *ibid.*), eye height less than malar space (cf. fig. 20 *ibid.*), and Mt1 about as wide as long.

The description of *B. princepstenebris* **sp. nov.** expands the known diversity of the genus in the Neotropical region, particularly within the undersampled Amazon biome. This newly described species constitutes the second congeneric species recorded in the Brazilian state of Amazonas, alongside *B. pomorum* (Perioto & Lara 2025b). The recurrent discovery of new taxa, such as *B. duquetiarum* and now *B. princepstenebris* **sp. nov.**, suggests that the true diversity of *Bephratelloides* remains significantly underestimated. The botanical context of the Amazon supports this notion, given that the Amazonian biome houses approximately 270 species of Annonaceae distributed in 27 genera (Flora e Funga do Brasil 2025). The documented presence of only two species of *Bephratelloides* seems to be an indicator of subsampling.

The discovery of *B. princepstenebris* **sp. nov.** from a single female specimen collected by a Malaise trap in the forest canopy, highlights the importance of using diverse sampling techniques to capture cryptic components of the insect fauna.

Morphologically, *B. princepstenebris* **sp. nov.** is most similar to *B. paraguayensis*, an affinity supported by shared characters including: the absence of a speculum on the forewing, the presence of a cubital setal line, a malar space with nearly contiguous setigerous punctures, and a cylindrical F1 funicular segment in females. The new species, however, is distinguished from *B. paraguayensis* and all other congeners by the predominantly black body coloration of the female. This characteristic, in combination with a distinct suite of morphological features such as a triangular head, an eye height 3.3 times the malar space, and a metatibia approximately twice as long as wide, provides a robust diagnosis for *B. princepstenebris* **sp. nov.**

The biology of *B. princepstenebris* **sp. nov.** remains unknown. Based on the known ecology of the genus, it is hypothesized that its larvae are endophagous seed feeders. The vast majority of *Bephratelloides* species are associated with Annonaceae (Grissell & Schauff 1990; Grissell & Foster 1996; Perioto & Lara 2025a). An exception is *B. ablusus*, which has been recorded attacking seeds of *Diospyros nigra* (Ebenaceae) in Mexico (Castañeda-Vildózola et al. 2011). This record demonstrates a degree of host range plasticity within the genus. Consequently, while Annonaceae remains the most plausible host family for the new species, the potential for an association with other plant families, such as Ebenaceae, cannot be dismissed.

Taxonomic Authorities

Bephratelloides Girault, 1913 in Girault (1913). *Bephratelloides pomorum* (Fabricius, 1804) in Fabricius (1804). *Bephratelloides maculicollis* Cameron, 1913 in Cameron (1913). *Bephratelloides cubensis* (Ashmead, 1894) in Ashmead (1894). *Bephratelloides paraguayensis* (Crawford, 1911) in Crawford (1911). *Bephratelloides petiolatus* Grissell & Schauff, 1990 in Grissell & Schauff (1990). *Bephratelloides ablusus* Grissell & Foster, 1996 in Grissell & Foster (1996). *Bephratelloides duquetiarum* Perioto & Lara, 2025 in Perioto & Lara (2025a).

Authors' Contributions

NWP: Conceptualization, investigation, writing original draft, review & editing; RIRL: Conceptualization, investigation, writing original draft, review & editing.

Conflict of Interest Statement

Authors declare there are no conflicts of interest.

Ethical Approval

This study was conducted in accordance with Brazilian legislation regarding scientific research and biodiversity collection. The specimen examined was obtained using a passive collection method that does not involve direct manipulation or experimentation on animals. All collection activities complied with the relevant national and institutional guidelines for the ethical study of insects.

Data Availability

The specimen data and occurrence record are included in this published article. No separate data repository was used.

Generative AI Statement

During the preparation of this manuscript, the authors used Reverso and DeepSeek software (<https://reverso.net> and <https://deepseek.com>, respectively) exclusively for language review and to improve the clarity and readability of the text. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content and its originality.

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