

# *Creagrura* Townes, 1971 and *Ptilobaptus* Townes, 1971 (Hymenoptera: Ichneumonidae) from Brazilian Amazon: new records and comments about morphological variation

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**Abstract.** *Creagrura nigripes* Townes, 1971 is recorded for the first time for the Brazilian Amazon, in the states of Acre, Amapá, Amazonas, Pará and Roraima. *Ptilobaptus cinctus* Townes, 1971 is registered for the first time in Brazil. Additionally, diagnosis, digital images, distribution maps, as well as comments on intraspecific morphological variations in the species are provided.

**Keywords.** Cremastinae; Darwin wasps; Neotropical Region; Parasitoids.

## INTRODUCTION

Cremastinae (Hymenoptera: Ichneumonidae) are greatly represented in tropical and subtropical regions but are scarcer in regions with low temperatures (Gauld, 2000). Species with known biology act as koinobiont endoparasitoids, mainly of Lepidoptera larvae, and mostly parasitize hosts that live in curled leaves, young shoots, and soft fruits. Some species are known also to parasitize aquatic lepidopteran larvae (Gauld, 2000; Fernandes *et al.*, 2018). Due to their wide variety of hosts, they are considered important biological control agents and are, among the Ichneumonidae, one of the most used subfamilies for this purpose (Narolsky, 2002).

Currently, the subfamily comprises 36 genera and more than 830 species (Yu *et al.*, 2016). For Brazil, there are records of only 9 genera and 38 species (Fernandes *et al.*, 2022), namely: *Creagrura* Townes, 1971; *Eiphosoma* Cresson, 1865; *Eutanygaster* Cameron, 1911; *Hanauella* Enderlein, 1921; *Pristomerus* Curtis, 1836; *Tanychela* Townes, 1971; *Temelucha* Föster, 1869; *Trathala* Cameron, 1899; and *Xiphosomella* Szépligeti, 1905.

*Creagrura* Townes, 1971 is a monotypic Neotropical genus containing only *Creagrura*

*nigripes* Townes, 1971, which occurs in Costa Rica, Suriname, Ecuador, and Brazil (Rio de Janeiro) (Townes, 1971; Gauld, 2000; Yu *et al.*, 2016; Fernandes *et al.*, 2022). As far as is known, *C. nigripes* acts as a parasitoid of Hesperiiidae (Lepidoptera) larvae (Gauld, 2000).

*Ptilobaptus* Townes, 1971 is a small Neotropical genus with four described species: *Ptilobaptus dentifer* Townes, 1971 recorded for Trinidad and Venezuela; *Ptilobaptus cinctus* Townes, 1971 for Peru and Costa Rica; *Ptilobaptus pamela* Gauld, 2000 for Costa Rica; and *Ptilobaptus solaniphilus* Gauld, 2000 for México and Costa Rica (Yu *et al.*, 2016). As far as is known, Chrysomelidae (Coleoptera) are the only host record for the genus, even though it is still unknown at what stage the larva is attacked (Gauld, 2000).

To date, *Ptilobaptus* has never been recorded for Brazil, and *Creagrura*, which has been recorded for the country, has only a generic record for the Brazilian Amazon, without any species-level identification (Antunes & Fernandes, 2020). The aim of this work is to expand the geographic distribution records of these genera in the Brazilian Amazon and discuss about intraspecific variations.

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## MATERIAL AND METHODS

This study was based on material deposited in Invertebrate Collection of Instituto Nacional de Pesquisas da Amazônia – INPA, Manaus, Amazonas, Brazil (M.L. Oliveira curator).

The specimens were identified based on the original description by Townes (1971) and using Gauld's

(2000) taxonomic key and were photographed with the aid of a Leica DMC4500 digital camera attached to a Leica M205A stereomicroscope and combined using the Leica Application Suite V4.10.0 and/or Helicon Focus 7.0 Pro software to align the images obtained in different planes of extended focus. The propodeum images were obtained through Low Vacuum Scanning Electron Microscopy (SEM), where the specimens were

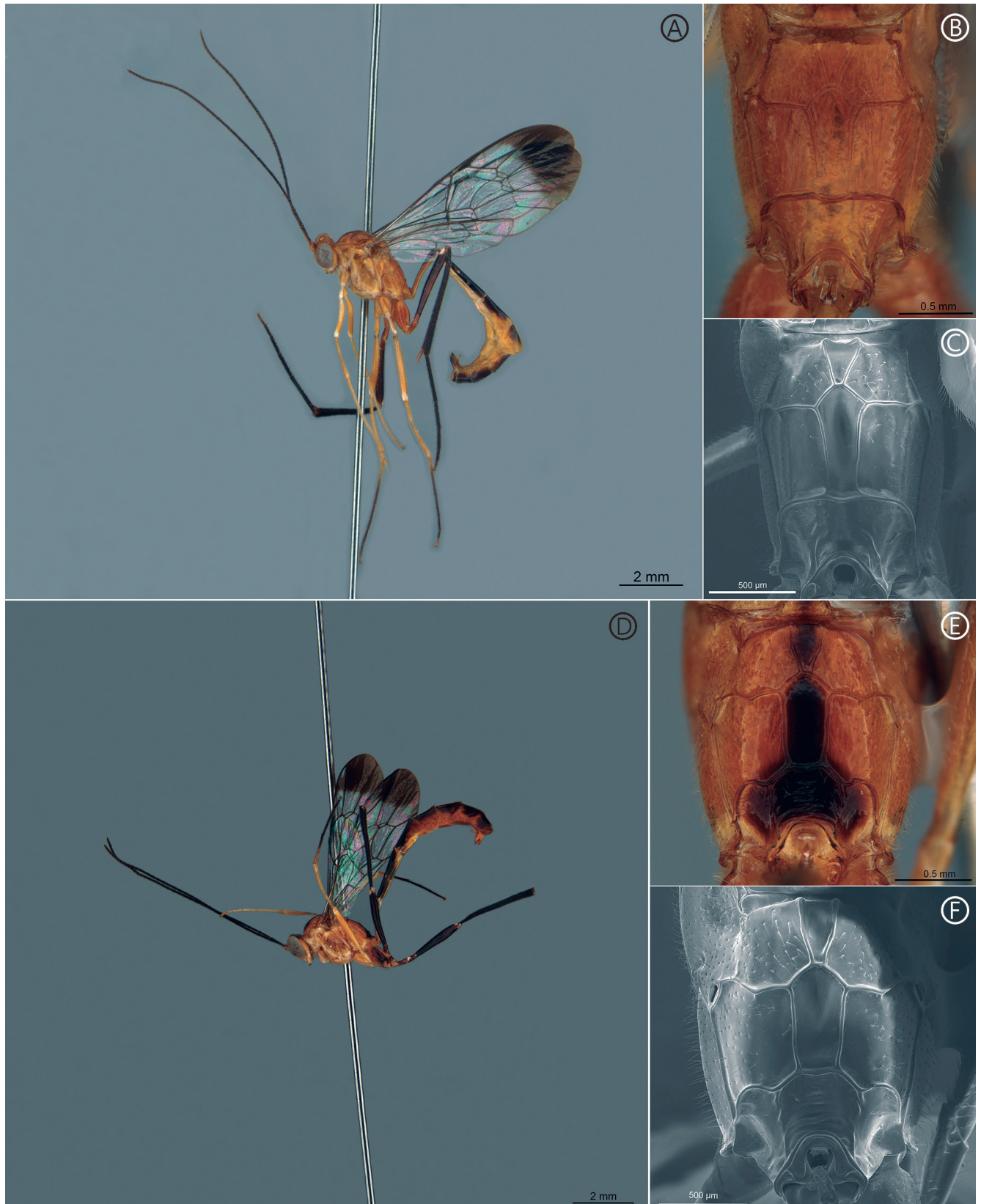


**Figure 1.** *Creagrura nigripes* Townes, 1971, females. (A) Lateral habitus. (B) Propodeum, dorsal view. (C) Propodeum SEM, dorsal view. (D) Lateral habitus. (E) Propodeum, dorsal view. (F) Propodeum SEM, dorsal view.



not metalized for the procedure, so the pins containing the specimens were fixed in modeling clay bases, which were adhered in metallic supports (stubs), in this way, they were photographed through the Scanning Electronic Microscope TESCAN® Model VEGA3 of INPA.

The geographic distribution maps were generated in the SimpleMappr software (Shorthouse, 2010), with the georeferencing data taken from the specimen labels, except, when these were not available, so approximate coordinates were obtained from Google Earth web software.



**Figure 2.** *Creagrura nigripes* Townes, 1971, males. (A) Lateral habitus. (B) Propodeum, dorsal view. (C) Propodeum SEM, dorsal view. (D) Lateral habitus. (E) Propodeum, dorsal view. (F) Propodeum SEM, dorsal view.



For the distribution of species (\*) was used to emphasize the new records. In order to obtain the species distribution data, information was taken from the labels and pertinent literature in the section "Examined material".

## RESULTS

### *Creagrura nigripes* Townes, 1971 (Figs. 1A-G; 2A-F; 3)

*Creagrura nigripes* Townes, 1971: 7 [original description]; Gauld, 2000: 45 [taxonomic review]. Female holotype, Brazil (EMUS) [Entomology Museum, Utah State University, Logan, Utah, USA].

**Diagnosis:** This species can be distinguished by the combination of the following characters: mandible slightly

twisted, with a wide ventral flap; scutellum with strongly raised lateral longitudinal carinae (Fig. 1C); female with ovipositor very short, strongly curved downwards, being approximately 0.3 times as shorter as the hind tibia (Fig. 1A).

**Material examined:** 17 ♀♀ and 16 ♂♂. **BRAZIL, AC** [Acre], Bujari, F[loresta] ES[estadual] Antimary, 09°20'01"S, 68°19'17"W, 18-31.VII.2017, Malaise grande, E.F. Morato & J.A. Rafael cols., Rede BIA (1 ♀, INPA); same, except 18-31.V.2017 (1 ♀, INPA); same, except 25.XII.2016, Sweeping. (1 ♂, INPA); same, except 25.VIII.2006, Focagem noturna, F.F. Xavier & D.M.M. Mendes cols., Rede BIA (1 ♂, 1 ♀, INPA); same, except 19.XI-03.XII.2016, Malaise grande, E.F. Morato & J.A. Rafael cols., Rede BIA (1 ♀, INPA); same, except Cruzeiro do Sul, Rio Moa, 07°37'02"S, 72°46'15"W, 19-28.XI.1996, J.A. Rafael; J. Vidal & R.L. Menezes 0019241 (1 ♀, INPA). **AP** [Amapá], Serra do Navio Igarapé Cachaço, 00°52'49.8"N, 52°01'05.6"W, 20.XI.2014, J.A. Rafael &



**Figure 3.** Geographic distribution of *Creagrura nigripes* Townes, 1971. Legend: Brazilian state records are highlighted in gray. The circles represent the specimens: red for new records and blue for previous records.



F. F Xavier F<sup>o</sup> leg., Rede BIA (1 ♀, INPA). **AM** [Amazonas], Tefé, Várzea, 03°19'45"S, 64°41'13"W, 22.VIII-05.IX.2017, Malaise, J.A. Oliveira, D.M.M. Mendes, J.A. Rafael cols., Rede BIA (1 ♀, INPA); terra firme, 03°25'19"S, 64°37'05"W, 20-31. XII.2016, Malaise, J.A. Oliveira, D.M.M. Mendes, J.A. Rafael cols., Rede BIA (1 ♀, 1 ♂, INPA); same, except 25.I-08.II.2017 (1 ♀, INPA); same, except 01-21.VIII.2017 (1 ♀, INPA); Careiro Castanho, BR-319, km 181, Sítio São Paulo, 04°12'48"S, 60°49'04"W, Malaise grande, 10-24.IV.2017, J.A. Rafael & F.F. Xavier F<sup>o</sup> leg., Rede BIA (1 ♀, INPA); same, except

09-21.XI.2016 (1 ♀, INPA); Novo Airão, AM-352, km 68, Igarapé Mato Grosso, 02°48'58"S, 60°55'18"W, Malaise, 14-28.IX.2016, E.F. Morato & J.A. Rafael leg., Rede BIA (1 ♀, INPA); Manaus, Área de Estudos PDBFF, Fazenda Florestal, Reserva 1112, 02°26'57"S, 59°46'13"W, 26.IV.1985, col. Bert Klein (3 ♂♂, INPA). **PA** [Pará], Santarém, BR-163, km 19, Ramal das Lavras, Sítio do Recanto do Sabiá, 02°35'13.0"S, 54°43'15.3"[W], 01-15.II.2019, M.L. Oliveira leg., Malaise grande – Rede BIA (1 ♀, INPA); same, except 15-30.VI.2019, M.L. Oliveira leg Malaise grande, Rede BIA



**Figure 4.** *Ptilobaptus cinctus* Townes, 1971, females. (A) Lateral habitus. (B) Propodeum, dorsal view. (C) Propodeum SEM, dorsal view. (D) Lateral habitus. (E) Propodeum, dorsal view. (F) Propodeum SEM, dorsal view.



(1 ♀, INPA); same, except 01-15.IV.2019, M.L. Oliveira leg., Arm[adilha]. Malaise pequena. Projeto Rede BIA (1 ♀, INPA). **RR** [Roraima]-Amajari, Tepequém, SESC, 03°44'45"N, 61°43'40"W, 01-15.I.2016, R. Boldrini & J.A. Rafael, Malaise pequena, Rede BIA (1 ♀, INPA); same, except Malaise, 01-15.IV.2016, J.A. Rafael, R. Boldrini cols., Rede BIA (1 ♂, INPA); same, except 01-15.VIII.2016, R. Boldrini & J.A. Rafael, Malaise grande – Armadilha 02, Rede BIA (3 ♂♂, INPA); same, except Malaise, 14-29.XII.2015, R. Boldrini & J.A. Rafael leg. (2 ♂♂, INPA); same, except 01-15.X.2016, Boldrini & J.A. Rafael, Rede BIA (1 ♂, INPA); same, except 01-15.XII.2016, R. Boldrini & J.A. Rafael, Malaise pequena, Rede BIA (3 ♂♂, INPA); same, except Malaise, 01-15.VII.2016, J.A. Rafael, R. Boldrini cols., Rede BIA (1 ♂, INPA).

**Geographical records:** *Brazil* (Acre\*, Amapá\*, Amazonas\*, Pará\*, Rio de Janeiro, Roraima\*), *Costa Rica*, *Ecuador*, *Peru*, *Suriname* (Fig. 3).

**Remarks:** The males and females of *Creagrura nigripes* analyzed showed differences in size and color patterns (Figs. 1A-G; 2A-F), with variation in the spots on the propodeum (Figs. 1C-G; 2C-F) and on the hind coxae (Figs. 1A-B; 2A-B). In addition, the median longitudinal carinae (Figs. 1G; 2F) behind the posterior transverse carina (Figs. 1D; 2D) are strongly marked in the propodeum of some specimens (Figs. 1C-G; 2C-F). The variations of these characteristics had already been mentioned by Gauld (2000), who analyzed 87 specimens from Costa Rica, and we also treat them here as intraspecific variations. However, these differences deserve to be evaluated more in-depth in the future, using also molecular data as they can reveal the presence of cryptic species. In addition, a broader sampling of specimens in other environments and biomes is needed to characterize these variations more robustly.



**Figure 5.** Geographic distribution of *Ptilobaptus cinctus* Townes, 1971. Legend: Brazilian state records are highlighted in gray. The circles represent the specimens: red for new records and blue for previous records.

***Ptilobaptus cinctus* Townes, 1971**  
(Figs. 4A-F, 5)

*Ptilobaptus cinctus* Townes, 1971: 11 [original description]; Gauld, 2000: 151 [taxonomic review]. Female holotype, Peru (EMUS) [Entomology Museum, Utah State University, Logan, Utah, USA].

**Diagnosis:** This species can be distinguished from other *Ptilobaptus* species by the combination of the following characters: black flagellum with a wide white stripe in the center (Fig. 4A); mediodorsally complete occipital carinae (Fig. 4C); more or less entirely black mesosoma (Fig. 4A); simple posterior femur without any trace of a ventral tooth (Fig. 4B).

**Material examined:** 3 ♀♀. **BRAZIL, AM** [Amazonas] – Careiro Castanho BR-319, km 181, Sítio São Paulo, 04°12'48"S, 60°49'04"W, Malaise grande, 09-21.XI.2016, J.A. Rafael & F.F. Xavier Fº leg, Rede BIA (2 ♀♀, INPA). **RR** [Roraima]-Amajari, Serra do Tepequém, SESC 03°44'45"N, 61°43'40"W, Malaise, 01-15.II.2016, R. Boldrini & J.A. Rafael leg Rede BIA *Ptilobaptus* Det. D.R.R. Fernandes 2019 UCE\_INPA\_P\_010 (1 ♀, INPA).

**Geographical records:** *Brazil\** (Amazonas\* and Roraima\*), *Costa Rica, Peru* (Fig. 5).

**Remarks:** The females analyzed here are morphologically similar (Fig. 4A-B), except for the median longitudinal carinae which are distinct between the anterior and posterior transverse carina (Fig. 4D-E) or incomplete on the left and/or right side of the area superomedia (Fig. 4F-G).

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