



## New records of nocturnal Anomaloninae (Hymenoptera: Ichneumonidae) in South America

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**Abstract:** We report for the first time *Aphanistes ruthae* Alvarado, 2018 in Venezuela and *Castrosion renei* Gauld & Bradshaw, 1997 in South America (Venezuela and Brazil). *Castrosion renei* is associated with the amazon rainforest in the Amazonas and Maranhão, States of Brazil.

**Key words:** *Aphanistes*, Amazon rainforest, *Castrosion*, Gravenhorstiini, neotropical region.

### INTRODUCTION

The family Ichneumonidae (Hymenoptera: Ichneumonoidea) comprises parasitoid insects, some of which are used in biological pest control. It is one of the largest families among insects, comprising 60 to 100 thousand estimated species (Townes 1969, Gauld 2002). In Brazil, the ichneumonid fauna is represented by 225 genera and 947 species (Fernandes et al. 2018). However, this is certainly an underestimated number when it is being considered that Brazil is one of the most diverse countries of the world and its fauna still remains poorly studied.

The Anomaloninae (Hymenoptera: Ichneumonidae) are easily recognized by their delicate and elongated habitus, the absence of an areolet on the fore wing and the presence of a reticulate propodeum (Gauld 2006). The subfamily is divided into two tribes, Anomalonini Viereck,

1918 and Gravenhorstiini Enderlein, 1912, which altogether have 45 genera (Yu et al. 2012, Sheng et al. 2012, Broad 2014).

There are 17 genera in the Neotropical region, but only eight genera and 24 species have been registered in Brazil and so far, neither of them has been formally registered in Venezuela (Yu et al. 2012, Fernandes et al. 2018).

*Aphanistes* Foerster, 1869 is a moderately large, widespread genus comprising 68 species, of which only 14 species occur in the Neotropical region (Yu et al. 2012, Alvarado 2018). Recently, Alvarado 2018 described five new nocturnal species from high mountainous areas of Ecuador and Peru, but currently, no species of this genus has been reported from Venezuela. *Castrosion* Gauld & Bradshaw, 1997 is a monotypic genus described from Costa Rica, and it may be easily recognized by the larger size in comparison to other Anomaloninae, large ocelli and specific fore wing venation (Gauld and Bradshaw 1997). At this moment no species of this genus has been formally reported from South America.

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## MATERIALS AND METHODS

This study was based on material deposited in the following institutions; names of curators given in parenthesis:

CZMA - Coleção Zoológica do Maranhão, Caxias, Maranhão, Brazil, (F. Limeira-de-Oliveira).

INBio - Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica, (R. Zuñiga).

INPA - Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas, Brazil, (M. L. Oliveira).

MJMO - Museo Entomológico “José Manuel Osorio”, Universidad Centroccidental “Lisandro Alvarado” (formerly UCOB), Cabudare, Lara, Venezuela, (F. A. Díaz).

Observations were carried out using a Leica MZ 9.5 stereomicroscope under fluorescent light source. Photographs were taken using a Leica (M165C) stereomicroscope with a DFC420 digital camera and Leica Application Suite V3.4.1 (Version 2009). Series of partially focused digital images were stacked using the Helicon Focus software (Version 6.7) to produce final images with enhanced quality. For a more efficient light diffusion, a dome was used along with a tracing paper ring around the specimens (Kawada and Buffington 2016).

Species distributions were assembled in a dataset and incorporated into distribution maps. Geographic coordinates of the species records, if not present in labels, were taken from Google Earth software (<https://www.google.com/earth/>), and the map was generated using SimpleMapp (Shorthouse 2010).

## TAXONOMY

Ichneumonidae Latreille, 1802

Anomaloninae Viereck, 1918

Gravenhorstiini Enderlein, 1912

*Aphanistes* Foerster, 1869

*Aphanistes ruthae* Alvarado, 2018

(Fig. 1).

**Distribution:** Venezuela (Trujillo and Portuguesa) and Peru (Cuzco and Pasco) (Fig. 2).

**Host:** unknown.

**Material examined:** 2 males. **VENEZUELA, Trujillo:** Parque Nacional Guaramacal, 1480m, 14-20.II.2002, 09°19'02"N-70°15'48"W, mixed light trap, R. Briceño; A. Chacon; J. Clavijo; F. Diaz; R. Paz; L. Joly, Proyecto S1-2000000479, 1 male (MJMO); **Portuguesa:** Parque Nacional Guache, 9°28'42"N-69°33'07"W, light trap, X.2014, F. J. Sosa, 1 male (MJMO).

Alike *Castrosion* and others nocturnal ichneumonids, *A. ruthae* has an ophioniform habitus and all studied specimens were collected in light traps. The studied specimens were identified based on the original description (Alvarado 2018).

*Castrosion* Gauld & Bradshaw, 1997

*Castrosion renei* Gauld & Bradshaw, 1997

(Figs. 3 and 4).

**Distribution:** Costa Rica (Alajuela, Guanacaste, Heredia and Puntarenas), Venezuela (Lara and Barinas) and Brazil (Amazonas and Maranhão) (Fig. 2).

**Host:** unknown.

**Material examined:** 8 females and 3 males. **COSTA RICA, Guanacaste:** Bagaces, Parque Nacional Palo Verde, Stor Palo Verde. 10m. 14-17.VI.1999, I. Jiménez., light trap, L\_N\_260300\_390150,



Figure 1 - *Aphanistes ruthae* Alvarado, 2018, male habitus.





Figure 2 - Distribution records of *Aphanistes ruthae* Alvarado, 2018 and *Castrosion renei* Gauld & Bradshaw, 1997.



Figure 3 - *Castrosion renei* Gauld & Bradshaw, 1997, female habitus.



Figure 4 - *Castrosion renei* Gauld & Bradshaw, 1997, male habitus.

#53666, 1 male (INB0003040939, INBio); Bagaces, Parque Nacional Palo Verde, Stor Palo Verde. 10m. 14-17.VI.1999, I. Jiménez., light trap, L\_N\_260300\_390150, #53666, 1 male (INB0003040940, INBio). **VENEZUELA, Lara:**

Tarabana, 500m, 18.IV.91, col. A. J. Escalona, 1 female (MJMO); **Barinas:** Barinitas, via Barinitas, El Cacao, 25.V.1981, light trap, J. M. Osorio, C. Pereira, A. Escalona, 1 female (MJMO). **BRAZIL, Amazonas:** Manaus, ZF2, km14, Torre (35m),

02°35'21"S 60°06'55"W, mixed light trap and BLB light trap, 13-16.VIII.2014, J. A. Rafael, F. F. Xavier Filho, A. R. Ururahy, A. Silva Filho & S. Trovisco, 2 females (INPA); ZF2, Torre (40m), 02°35'21"S 60°06'55"W, light trap, 26.X.2003, J. A. Rafael, F. F. Xavier Filho & A. Silva Filho, 1 female (INPA); Borba, Rio Abacaxis, Paxiuba, 04°28'48"S 58°34'24"W, light trap in a boat, 02-04.VI.2008, J. A. Rafael e equipe, 1 female (INPA); Presidente Figueiredo, Estrada de Balbina km 12, Igarapé Santuário, 02°03'36"S 59°55'35"W, 19-30.IX.2003, Xavier Filho, F. F. & Vidal, J.M., 1 female (INPA); **Maranhão:** Bom Jardim, REBIO Reserva Biológica Gurupi, Mobile light trap, 17-27.I.2010, F. Limeira-de-Oliveira, J. T. Câmara & M. B. Aguiar Neto, 1 male and 1 female (CZMA).

*Castrosion renei* has an ophoniform habitus, such as *Netelia* Gray, 1860 (Tryphoninae) and *Rhopalosoma* Cresson, 1865 (Rhopalosomatidae), and alike them, is probably nocturnal (Gauld and Bradshaw 1997). All studied specimens were collected in light traps, which support this hypothesis. The studied specimens were identified based on the original description (Gauld and Bradshaw 1997).

The studied females show a variation in color of the posterior femur, a feature not recorded in original description, as well as a dark brown posterior tarsi in some specimens. One specimen from Borba in Amazonas possesses metasoma with tergites III to VII concolour with I and II (Fig. 5). In spite of this variation, as it was found in only one specimen, we consider it premature to treat it as a new species, although intermediate forms of this variation were not found.

This is the first record for *Aphanistes* species in Venezuela and *Castrosion* species in Venezuela and Brazil. In Brazil, *C. renei* is associated with the amazon rainforest of the Amazonas and Maranhão states.



**Figure 5** - *Castrosion renei* Gauld & Bradshaw, 1997, female metasoma, dorsal view.

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#### AUTHOR CONTRIBUTIONS

DRRF and FAD identified the species, prepared the figures and wrote the manuscript.

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