

## THE GIANT BUTTERFLY MOTHS (LEPIDOPTERA, CASTNIIDAE) OF RESERVA NATURAL LAGUNA BLANCA, DEPARTAMENTO SAN PEDRO, PARAGUAY, WITH A NEW COUNTRY RECORD

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**Abstract:** Five species of Castniidae are reported from Reserva Natural Laguna Blanca, Departamento San Pedro, Paraguay at the interface of the Cerrado and Atlantic Forest zones. These include a new country record *Eupalamides geron* (Kollar, 1839), a species formerly considered endemic to Brazil. The locality is thus one of the most biodiverse for the family in Paraguay and may be considered of vital importance for its conservation.

**Key words:** Lepidoptera, Castniidae, *Castnia invaria*, *Ceretes marcelserres*, *Eupalamides geron*, *Gazera heliconioides*, *Geyeria uruguayana*, distribution, Reserva Natural Laguna Blanca, Paraguay.

### Los castniidos (Lepidoptera, Castniidae) de la Reserva Natural Laguna Blanca, Departamento San Pedro, Paraguay, con un nuevo registro nacional

**Resumen:** Se reportan cinco especies de Castniidae de la Reserva Natural Laguna Blanca, Departamento San Pedro, Paraguay, una zona de transición entre el Cerrado y Bosque Atlántico. Se incluye un nuevo registro nacional, *Eupalamides geron* (Kollar, 1839), una especie anteriormente considerada endémica del Brasil. La localidad se califica como una de las de mayor biodiversidad para la familia en el país, y en consecuencia podría ser considerada de importancia crítica vital para su conservación.

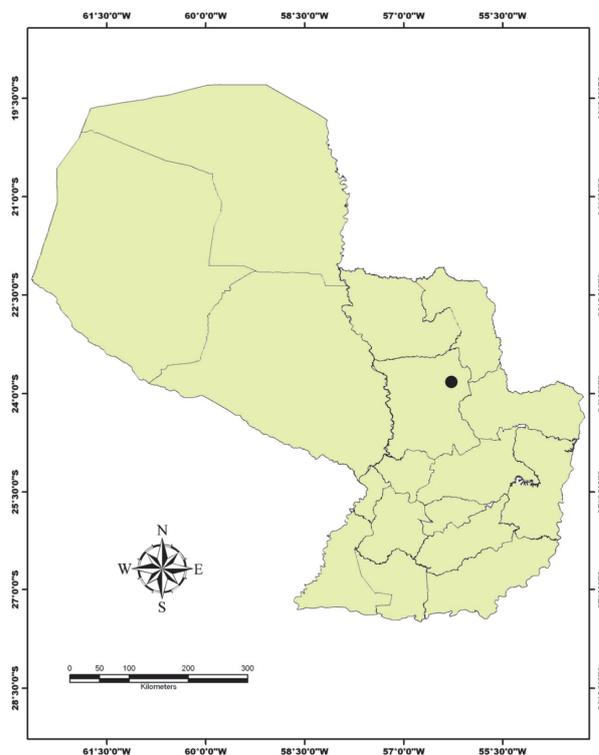
**Key words:** Lepidoptera, Castniidae, *Castnia invaria*, *Ceretes marcelserres*, *Eupalamides geron*, *Gazera heliconioides*, *Geyeria uruguayana*, distribución, Reserva Natural Laguna Blanca, Paraguay.

The Castniidae are a small family of often large, day flying moths with clubbed antennae, some species being occasionally mistaken for butterflies. The greatest diversity occurs in the Neotropics, where all species belong to the subfamily Castniinae (Scoble, 1995). Despite containing several charismatic species, the low density at which they occur means that Castniidae are typically rare in collections and they are thus often overlooked by researchers (Miller, 1986). However there has been a recent increase in interest in Paraguayan Castniidae thanks to a series of publications that have brought the family to the attention of the national research community (Ríos & González, 2011; González *et al.*, 2013; Ríos Díaz *et al.*, 2015). Renewed collecting activity of this traditionally overlooked group has now begun to fill in some of the gaps in our knowledge.

Here we report the results of an inventory of the family at the Reserva Natural Laguna Blanca, departamento San Pedro (S 23° 48', W 56° 17') which took place between October 2010 and March 2015. This reserve is of particular interest because of its location at the interface of the Paraguayan Cerrado and Atlantic Forest zones. Furthermore, few Castniid specimens have previously been reported from San Pedro department, meaning that important distribution gaps in our knowledge are also filled.

### Study site

The RNLB (Fig. 1) is a small 804 ha reserve consisting of over 400 ha of near pristine cerrado, a patch of degraded Atlantic Forest and some semi-deciduous transitional humid-dry gallery forest. The Reserve is based around the Laguna



**Figure 1.** Map showing the location of Reserva Natural Laguna Blanca, Departamento San Pedro, Paraguay.

Blanca lake of 157 ha. A basic review of the area and its floral composition is provided by Guyra Paraguay (2008).



**Figure 2.** *Castnia invaria penelope* Schaufuss, 1870 red morph. CZPLT-694. (Photo S. Harrison). **Figure 3.** *Castnia invaria penelope* Schaufuss, 1870 white morph. CZPLT-1866. (Photo S. Harrison). **Figure 4.** *Gazera heliconioides micha* (H. Druce, 1896). CZPLT-2530. (Photo S. Harrison). **Figure 5.** *Geyeria uruguayana* (Burmeister, 1880). CZPLT-217. (Photo S. Harrison). **Figure 6.** *Eupalamides geron* (Kollar, 1839) CZPLT-1510. (Photo S. Harrison). **Figure 7.** *Ceretes marcelserres* (Godart, [1824]) (Photo J.P. Brouard).

Broadly speaking cerrado habitat can be split into four categories or "ecotopes": campo limpio (grassy field), campo sucio (grassy and bushy fields with scattered trees), cerrado sensu stricto (bushy fields without grass) and cerradón (cerrado dry forest). These ecotopes represent observable trends in habitat types and are not associated with any specific floral communities, which may vary greatly in any given ecotope from one area to another (Eiten, 1972, 1978). The four main

cerrado ecotopes are present at RNLB and grow on a predominantly sandy substrate.

### Materials

All material studied is deposited at the Colección Zoológica Para La Tierra (CZPLT), based at Reserva Natural Laguna Blanca, San Pedro department, Paraguay or the Museo

Nacional de Historia Natural del Paraguay, San Lorenzo, Central department (MNHNPY). All specimens were collected within the reserve and its catchment area. A total of 15 specimens of four species are present in the collection, and one additional species is documented as present photographically. The nomenclature follows Lamas (1995).

***Castnia invaria penelope* Schaufuss, 1870** (Fig. 2-3)

MNHNPY (13 x 2011) Col. S. Ríos. White morph. • MNHNPY (13 x 2011) Col. S. Ríos. Red morph. • CZPLT 669 (13 x 2011) Col. S. Ríos. White morph. • MNHNPY (14 x 2011) Col. S. Ríos. White morph. • CZPLT 694 (17 xi 2011) Col. K. Atkinson. Red morph. • CZPLT 1866 (16 xi 2013) Col. J.P. Brouard. White morph. • CZPLT 2678 (4 xi 2014) Col. O. Petko. White morph. • CZPLT 2679 (4 xi 2014) Col. O. Petko. White morph. • CZPLT 2680 (4 xi 2014) Col. O. Petko. Red morph.

Common in areas of bromeliad growth on sandy soils, both open and forested. All specimens were collected between 10am and 12.20pm.

***Gazera heliconioides micha* (H. Druce, 1896)** (Fig. 4)

CZPLT 2375 (28 ix 2014) Col. J. Ayala. • CZPLT 2530 (24 x 2014) Col. O. Petko. • CZPLT 2681 (1 xi 2014) Col. O. Petko.

All specimens were collected by day on shady paths within Atlantic Forest undergrowth between 9.30 am and 5.30 pm.

***Geyeria uruguayana* (Burmeister, 1879)** (Fig. 5)

CZPLT 217 (31 x 2010) Col. K. Atkinson.

This specimen was previously published in González *et al.* (2013), representing a new country record. It was collected at 6.30pm in Cerrado habitat.

***Eupalamides geron* (Kollar, 1839)** (Fig. 6)

CZPLT 543 (12 ii 2012) Col. P. Smith. • CZPLT 1510 (6 v 2013) Col. J.P. Brouard.

Specimens were collected in sandy-soil, campo sucio Cerrado. CZPLT 543 was attracted to the lights of a vehicle after dark around 8pm. The species was previously considered endemic to Brazil (Mato Grosso, Goiás and São Paulo states) (Dias & Tangerini, 1991; Lamas, 1995) and these are the first records of this species from Paraguay.

***Ceretes marcelserres* (Godart, [1824])** (Fig. 7)

No specimens of this species have been collected in the reserve, but its presence was confirmed by a photograph of a male taken by J.P. Brouard on 12 December 2012. Recent Paraguayan and Argentinian records of this species were discussed by Ríos Díaz *et al.* (2015). The species is now known to occur in four Paraguayan departments, Alto Paraná, Guairá, Itapúa and San Pedro.

## Discussion

The presence of five species at Reserva Natural Laguna Blanca makes it (jointly with Sapucaí) the most biodiverse single locality in the country for this family and only just short of the total for the most biodiverse Paraguayan department for the family (Guairá, 6 species) (Ríos & González, 2011). Caution is required in interpreting this data as most members of this family occur at low density, and there has been little recent sampling effort aimed at procuring more specimens of this family. However, it is well known that several species of

Castniidae may be endangered or declining due to habitat destruction (Lamas, 1993; González, 2004) and the importance of the Laguna Blanca reserve for the conservation of this family in Paraguay seems beyond question.

The addition of *Eupalamides geron* to the national fauna means that 14 species of Castniidae are now documented as occurring in Paraguay. Ríos & González (2011) listed a further three species as of potential occurrence in Paraguay - *Castnia lecerfi* Dalla Torre, 1913, *Ceretes thais* (Drury, 1782) and *Yagra fonscolombe* (Godart, [1824]) - suggesting that the national inventory is still incomplete. More focus on this fascinating group will undoubtedly reveal more about their distribution and ecology in Paraguay.

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