

The Castniinae at the Zoologisches Forschungsmuseum Alexander Koenig, Bonn (Lepidoptera: Castniidae)

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Abstract. The material of 13 taxa belonging to the Castniidae (Lepidoptera) deposited at the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, has been studied. A brief comment on the origin of the collection is given. General comments on biology and distribution are presented for each one of the taxa treated herein.

Resumen. Se estudiaron ejemplares de 13 taxones pertenecientes a Castniidae (Lepidoptera) depositados en el Zoologisches Forschungsmuseum Alexander Koenig en Bonn. Se incluye un breve comentario sobre el origen de esta colección. Se presentan también comentarios generales sobre la biología y distribución de los taxones mencionados.

Zusammenfassung. Die Castniidae (Lepidoptera) der Sammlung des Zoologischen Forschungsmuseums Alexander Koenig, Bonn, werden untersucht. Sie gehören 13 Taxa an, deren Biologie und Verbreitung beschrieben werden. Die Herkunft der Sammlung wird kurz erörtert.

Key words. Lepidoptera, Castniidae, Castniinae, South America, Europe, Neotropic Region, Palaearctic Region, introduced species, distribution, food plants.

Introduction

Castniidae is a Pantropical family with three groups distributed in the Malay Peninsula (Tasciniinae), Australia (Castniinae, Castniini, Synemonina) and Central and South America (Castniinae, Castniini, Castniina). The Neotropical Castniinae is a small subfamily with slightly over 80 species (LAMAS 1995) that can be found from México to Chile and Argentina. Their adults are diurnal or crepuscular, some are cryptic, few have cryptically coloured forewings but brightly coloured hind wings and many are members of various possibly mimetic rings (MILLER 1986).

Many of the species are particularly rare, some are endemic and several have reduced geographic range, and it is highly possible that some populations could have become extinct, at least in a few localities, due to either modification or destruction of their habitat (LAMAS 1993, GONZÁLEZ 1999, 2004, RODRÍGUEZ & ROJAS-SUÁREZ 1995). Their larvae are borers of the plant-families Arecaceae, Bromeliaceae, Musaceae, Heliconiaceae, Orchidaceae and Poaceae, and they are commonly known as “Giant Butterfly Moths” (GONZÁLEZ & FERNÁNDEZ YÉPEZ 1993, GONZÁLEZ & COCK 2004, MILLER 1987). Due to the boring behavior of the larvae, some species have become pests of a few economically important crops (GONZÁLEZ & COCK 2004).

These last few years the family has become of interest, especially in Europe, because of the introduction from South America of *Paysandisia archon* (BURMEISTER, 1880) (Figs 14, 15) which is becoming a relevant pest of palms along the coast from the British isles to Italy (SARTO 2002, 2003).

The larger part of the material reported here belongs to the Cologne Zoo Insect Collection (CZIC) which has become part of the ZFMK collections since 2004, as a permanent loan. The Cologne Zoo Insect Collection was built up by MATTHIAS FORST, Bonn, since 1961, as part of the newly erected insectarium of the zoo. FORST united several important private collections purchased before to a single collection of high scientific value. He later became head of the insectarium. Before he went to Cologne Zoo, FORST worked at the Lepidoptera Section of the ZFMK as a technician (1950–1961). During this time he met K. H. LÜLING who was head and curator of the Ichthyology Section (1954–1978). LÜLING made 14 research expeditions to South America (Peru, Brazil, Argentina) to study the fish-fauna (BUSSE 1987). He collected not only fishes for the ZFMK collections, but also many other groups, including insects. A number of the Castniinae mentioned below were collected by him, too. Most of

them he donated to MATTHIAS FORST who later put them into the CZIC.

The material of the Cologne zoo was previously studied by the first author in 1995. Most of the specimens are from Brazil and Peru. The ZFMK Collection of Castniidae was enhanced by the subsequent addition provided by the Cologne Zoo Collection, and even though it is unfortunate that not all specimens bear detailed data, the sample at ZFMK clearly shows the diversity of the family in South America. The data found in the labels is in some cases complemented with information added by us and included within brackets.

Abbreviations

ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn

CZIC: Cologne Zoo Insect Collection

Species list

Eupalamides cyparissias conspicua (ROTHSCHILD, 1919) (Fig. 1)

This species is known as a pest of different palms (Arecaceae), but most especially Coconut (*Cocos nucifera*) and Oil Palm (*Elaeis guineensis*) (MILLER 1986). Its life history has been studied in detail

(KORYTKOWSKI & RUIZ 1980a, 1980b, RUIZ & KORYTKOWSKI 1980). It is crepuscular and has a restricted flight period of less than two hours at dusk, but during the rest of the day adults can be found resting at the top of shaded palms (MILLER 1986). This subspecies is known from Eastern Peru and Bolivia. The nominate subspecies occurs in the Guyana, French Guyana and Surinam region of South America.

Material examined. 1 ♂, Buenavista, 450 m, Bolivia (CZIC); 1 ♀, Tingo María, Peru, 14.VI.1966 K. H. LÜLING (CZIC).

Amauta cacica procera (BOISDUVAL, [1875]) (Fig. 2)

This genus exhibits a slight sexual dimorphism that can be easily noticed by the enlargement of wing markings, particularly in the hind wings of females. This subspecies was originally described from Guatemala but has a distribution that easily reaches Panamá. It is the only Central American species in the genus (LAMAS 1995, MILLER 1986). *Amauta cacica cacica* (HERRICH-SCHÄFFER, [1854]) was described from material collected in the central mountainous range of Colombia.

Material examined. 1 ♂, Panamá (CZIC).

Hista fabricii boisduvalii (WALKER, 1854) (Fig. 3)

This is a very interesting Castniidae which is sympatric with *H. hegemon* (KOLLAR, 1839) in southern Brazil, however *H. fabricii boisduvalii* normally flies later in the day than *H. hegemon* (MILLER 1986). They have a flight pattern that somehow resembles that of some hawk moths (Sphingidae). Slight sexual dimorphism is also noted in the species of this genus, and in this species the forewing markings may be somehow outlined by whitish overscaling.

Material examined. 1 ♂, Obidos [Brazil] (CZIC) [this is probably a false locality, as the species is only known from Eastern Brazil, not from the

Amazon]. The nominate subspecies is known from the south east of the country.

Imara pallasia (ESCHSCHOLTZ, 1821) (Fig. 7)

This species is restricted to southeastern Brazil and it is sympatric with *Imara satrapes* (KOLLAR, 1839). Both species are found along cloud forests. *Imara pallasia* has been observed hilltopping with a couple of *Morpho* species, as well as some Nymphalidae, and appears to be a visual mimic of *Parides ascanius* (CRAMER, 1775) (Papilionidae) (MILLER 1986).

Material examined. 1 ♂, [Rio de] Janeiro, Brazil (CZIC).

Synpalamides phalaris (FABRICIUS, 1793) (Fig. 12)

Commonly distributed in southern Brazil, some populations reach Paraguay. The specimen at the ZFMK collection is particularly interesting since it was collected in Argentina, very possibly from the north. Unfortunately, no more data is included in the label. This is a species that highly possibly attacks terrestrial and epiphytic bromeliads (Bromeliaceae) in its geographic range.

Material examined. 1 ♂, Argentina (ZFMK).

Castnia invaria penelope SCHAUFUSS, 1870 (Fig. 6)

Even though the nominate subspecies is found in South East Brazil and was originally described from Rio de Janeiro (WALKER 1854; HOULBERT 1918), the subspecies *C. invaria penelope* appears to be widely spread in Brazil, south of the Amazon, reaching Argentina, Bolivia and Paraguay. This subspecies is highly variable and several "colour" morphs commonly occur together in many sites (JORDAN 1906). Like other subspecies, it is a common pest of pineapples [*Ananas comosus* (L.) MERR.] and other terrestrial Bromeliaceae (*Aechmea* sp., *Bromelia* spp.) along its geographic distribution (GONZÁLEZ 2003, GONZÁLEZ & FERNÁN-

DEZ YÉPEZ 1993, MILLER 1986, PASTRANA 2004). The only specimen of this subspecies at the ZFMK collection clearly resembles the "white form" originally described by DRUCE (1893) as "*Castnia endelechia*", but listed as one of the various morphs of the species presented by JORDAN (1906) and recognized as a synonym of *C. invaria penelope* according to LAMAS (1995).

Material examined. 1 ♂, Brazil (ZFMK).

Castnia invaria volitans LAMAS, 1995 (Fig. 5)

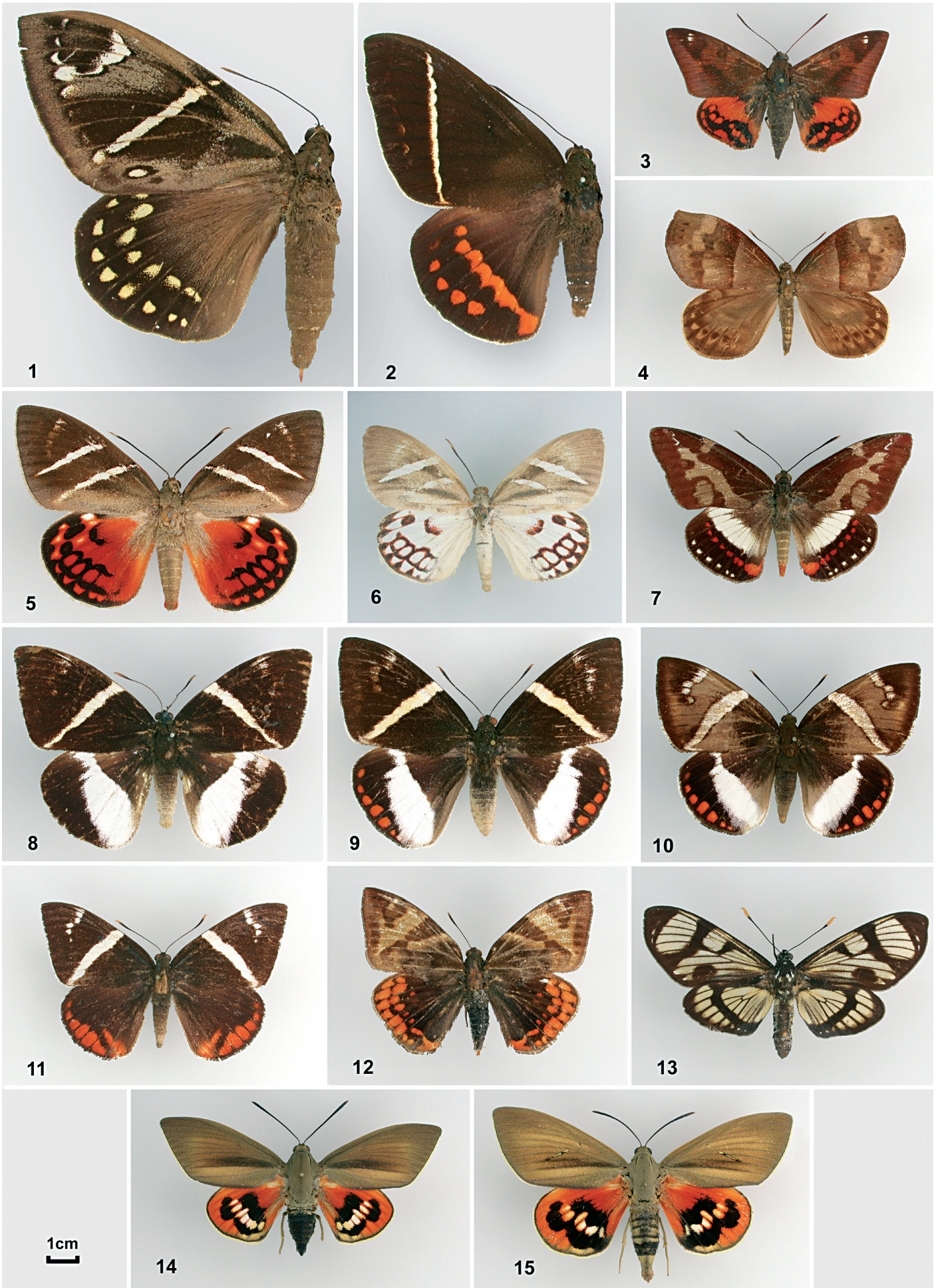
This subspecies is only found in the northern South America, north of the Amazon and can be collected from the Guianas to Venezuela and even reaches eastern Colombia. This name was introduced to replace *Papilio icarus* CRAMER, [1775], which was a junior primary homonym of *P. icarus* ROTTEMBURG, 1775 (Lycaenidae; LAMAS 1995). Like the other subspecies it also attacks Bromeliaceae and it is considered a pest of pineapples (*Ananas comosus*) also. Even though this subspecies is somehow variable, the first author has never seen an extreme variation as the "white form" found in *C. invaria penelope*. However, a complete review of the whole group is needed to clearly establish the validity of the various subspecies.

Material examined. 1 ♂, French Guiana (CZIC).

Castniomera atymnius (DALMAN, 1824) (Fig. 8)

This species is a common pest of bananas (*Musa* spp.; Musaceae). The nominate subspecies is distributed in Eastern Brazil. It is quite normal that this species is somehow overlooked and confused with the sympatric *Telchin licus* (DRURY, 1773) (GONZÁLEZ & COCK 2004). According to a research carried out in Panamá, ESQUIVEL (1981) "demonstrated" that this and *T. licus* were the same species. LAMAS (1995) also mentions his suspicions that this could be the case. However, ESQUIVEL's conclusion has been discarded since it is actually very doubtful

Figs 1–15. (right side) Adults (upperside) of Castniidae. 1. *Eupalamides cyparissias conspicua* (ROTHSCHILD, 1919), ♀ (Peru). 2. *Amauta cacica procera* (BOISDUVAL, [1875]), ♂ (Panama). 3. *Hista fabricii boisduvalii* (WALKER, 1854), ♂ (Brazil). 4. *Ceretes marcelserres* (GODART, [1824]), ♂ (no locality data). 5. *Castnia invaria volitans* LAMAS, 1995, ♂ (French Guiana). 6. *Castnia invaria Penelope* SCHAUFUSS, 1870, ♂ (Brazil). 7. *Imara pallasia* (ESCHSCHOLTZ, 1821), ♂ (Brazil). 8. *Castniomera atymnius* (DALMAN, 1824), ♂ (Brazil). 9. *Telchin licus* (DRURY, 1773), ♂ (Brazil?). 10. *Telchin licus* "licoidella" (STRAND, 1913), ♂ (Peru). 11. *Telchin syphax* (FABRICIUS, 1775), ♂ (French Guiana). 12. *Synpalamides phalaris* (FABRICIUS, 1793), ♂ (Argentina). 13. *Gazera heliconioides micha* (H. DRUCE, 1896), ♂ (Brazil). 14. *Paysandisia archon* (BURMEISTER, 1880), ♂ (Spain). 15. *Paysandisia archon* (BURMEISTER, 1880), ♀ (Spain). All figures are about 2/3 of natural size.



(MILLER 1986, GONZÁLEZ & COCK 2004). He presents descriptions of larvae, pupae and imago of what he calls “*Castnia licus*” collected from sugar-cane (*Saccharum officinarum* L.) in Panama, but he appears to have copied the figures and descriptions presented by LARA (1964) from the most detailed morphological studies done with *Castniomera atymnius humboldti* (BOISDUVAL, [1875]) from Costa Rica. It is widely known that *Telchin licus* is frequently associated to sugar-cane. So what probably happened is that ESQUIVEL (1981) either studied *C. atymnius* collected in sugar-cane fields but thought it was the more common *T. licus*, or actually collected *T. licus* but used the descriptions and drawings of LARA (1964) thus creating the confusion. Efforts to locate ESQUIVEL’s (1981) vouchers to clarify the above statements had been unsuccessful.

There is no doubt that both species are sympatric and are known to attack some of the same host plants (MILLER 1986). But even though they share some similarities, especially when looking at colour and patterns of the fore wings, both species can be easily separated by morphological differences on their genitalia and the absence of a well-marked reddish-orange spot band in the lateral margin of the hindwings in *C. atymnius*. However, it is possible to find some specimens of *C. atymnius* with faint reddish markings in the hindwing above (GONZÁLEZ & COCK 2004; LAMAS, personal communication). Could this be evidence that these rare specimens are possibly natural hybrids of two closely related species or just transitional forms of a mainly dimorphic species? According to MILLER (1986) a concolourous and faint spot band may be found in *Castniomera*, while in *Telchin* such spots are always of contrasting colour. MILLER (1986, 1995) also clearly differentiates *atymnius* and *licus* based on genitalic features and even places them in two different genera (*Castniomera* and *Leucocastnia*, respectively). [The genus name *Leucocastnia* HOULBERT, 1918, is a junior objective synonym of *Telchin* HÜBNER, [1825] the oldest generic name for *Papilio licus* DRURY, 1773, but ignored by MILLER (1995) and other authors (LAMAS 1995)]. A present comparative study of *C. atymnius* and *T. licus* that includes morphological features, genitalia and DNA analysis seems to indicate that they are indeed two separate species, proving ESQUIVEL’s (1981) comments to be wrong (SARTO & GONZÁLEZ,

unpublished). However, they are still close and it is rather probable that one of the generic names (*Castniomera* HOULBERT, 1918) could be eventually synonymised.

Material examined. 1 ♂, Brazil, Esp[irito] Santo, Miss. Mus. Steyl (CZIC).

***Telchin licus* (DRURY, 1773) (Figs 9, 10)**

Also a widespread and variable species in South and Central America, this is known as a common pest of sugar-cane (*Saccharum officinarum* L.: Poaceae) and sometimes of bananas (*Musa* spp.: Musaceae). Even more than the previous species, the taxonomy of the few associated subspecies is very confusing and many specific and subspecific epithets have been described in this group (MILLER 1995). Even though various works have made some changes (GONZÁLEZ 2003, GONZÁLEZ & COCK 2005, LAMAS 1995, MILLER 1995), a detailed study to establish a clear taxonomy of the group is still absolutely necessary. Until a study of this kind says different we treat them as the same subspecies and do not acknowledge all the subspecies proposed by LAMAS (1995). The separation of subspecies presented by MILLER (1995) has some inconsistencies and the one proposed by LAMAS (1995) is based mainly on geographical distribution. If LAMAS (1995) is followed, some of the specimens at the ZFMK collection appears to be the nominate subspecies (*T. l. licus*), others the subspecies *T. l. albomaculata* (HOULBERT, 1917) (Fig. 9), and others what were once called “*C. licoides licoidella* (STRAND, 1913)” (Fig.10), now a synonym of *T. licus* (GONZÁLEZ 2003). According to G. LAMAS (personal communication) all the material from eastern Peru should be considered *T. l. albomaculata*. This then applies to all material at the ZFMK that was collected in Huallaga and Tingo María. Two specimens from Huallaga also resemble what is known as the form or subspecies “*licoidella*” originally described from northern Peru (LAMAS 1995). Even though LAMAS (personal communication) considers that “*licoidella*” could be a valid subspecies, because of the lacking of genitalic differences and the fact that specimens with such phenotypic characteristics are commonly found in typical “*licus*” populations, the “*licoidella*” form should not be considered a separate one (GONZÁLEZ 2003, GONZÁLEZ & COCK

2004, MILLER 1986, MILLER 1995). For the moment, we consider all the material at the ZFMK as the nominate subspecies.

Material examined. 3 ♂ no data (CZIC); 1 ♂, no data [Brazil?] (ZFMK); 2 ♂, Amazonas [Peru] (ZFMK); 1 ♂, Iquitos, Peru, 6.VIII.1959, LÜLING (CZIC); 1 ♂, Ob., Huallaga, N. Peru (CZIC); 1 ♀, Balsapuerto, Huallaga, Nord Peru, 1933 (CZIC); 1 ♂, Peru, Tingo María, am Huallaga, LÜLING leg. (CZIC); 1 ♂, Peru, Tingo María, 22.VI.1966, K. H. LÜLING (CZIC).

***Telchin syphax* (FABRICIUS, 1775) (Fig. 11)**

A widely distributed species from the lower Amazon to the Guiana and French Guiana region and up to Trinidad, but not known from north of the Orinoco River in the main land South America (GONZÁLEZ 1999, GONZÁLEZ & COCK 2004). Even though it is rather common in its distribution area, very little is known about the ecology and biology of the species. Even the foodplant is unknown.

Material examined. 1 ♂, French Guiana (CZIC).

***Ceretes marcelserres* (GODART, [1824]) (Fig. 4)**

This species belongs to the only genus of Castniidae that is markedly sexually dimorphic (MILLER 1986). Only two species are currently recognized in the genus (LAMAS 1995) and even though their males are slightly similar, their females are clearly distinctive. The female has a similar forewing configuration as the males, but the markings are reduced and even paler. Dorsally, the ground colour of the female hindwing is orange-fulvous. Even though a specimen of this species is known from Misiones, Argentina, it is normally distributed along the southeastern Brazilian coast (MILLER 1986). Early stages and host plants of this species are still unknown.

Material examined. 1 ♂, no data (ZFMK).

***Gazera heliconioides micha* (H. DRUCE, 1896) (Fig. 13)**

The species appears to be part of a mimetic ring that includes the genera *Lycorea* DOUBLEDAY, [1847] (Nymphalidae, Danaeinae), *Thyridia* HÜBNER, 1816 (Nymphalidae, Ithomiinae) and *Notophyson heliconides* (SWAINSON, 1833) (Arctiidae, Pericopinae) with which it shares similar

wing coloration (MILLER 1986). Even though it does not fly much, it will at almost any time of the day if disturbed. This particular subspecies was originally described from Paraguay but its distribution includes bordering areas of Brazil with that country. The nominate subspecies is found in the Amazon and eastern regions of Brazil. Early stages are unknown as well as its food plants.

Material examined. 1 ♂, Brazil (ZFMK).

Paysandisia archon (BURMEISTER, 1880) (Figs 14, 15)

This species, restricted in the Neotropics to northern Argentina, SE Brazil, Western Uruguay, and Paraguay (MILLER 1986, LAMAS, personal communication), was introduced from Argentina to Europe some time between 1985 and 1995; it became well established as reported by the year 2001 and has become a pest of palm species (Arecaceae) in various European countries (AGUILAR et al. 2001, SARTO 2002, 2003, SARTO & AGUILAR 2001), mainly along the coastal areas. The couple in the museum was donated recently by VICTOR SARTO I MONTEYS, Fundacio CReSA, Universitat Autònoma de Barcelona, Bellaterra, Spain.

Material examined. 1 ♂, Spain, Catalunya, Anglès (G), Selva, 31TDG74, 180 m, 20.V.2003, e.l. *Trachycarpus*, V. SARTO I MONTEYS leg.; 1 ♀, Spain, Girona, La Cellera de Ter, 30.VII.2001, e.l. *Trachycarpus*, U. AGUILAR leg.

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