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A catalogue of the Castniidae (Lepidoptera) in the California Academy of Sciences, with general and historical comments

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Abstract: A catalogue of the Castniidae (Lepidoptera) in the California Academy of Sciences, with general and historical comments. The material representing 168 specimens with 46 species and subspecies belonging to the Castniidae (Lepidoptera) deposited in the California Academy of Sciences was studied. A brief comment on the history of Academy is provided, as well as general comments on natural history, distribution and other details for each mentioned species and subspecies.

Key words: Lepidoptera, Giant Butterfly moths, Castniidae, California Academy of Sciences, Biodiversity, Neotopics.

INTRODUCTION

The California Academy of Sciences is the oldest scientific organization in the western United States of America and one of the largest natural history museums in the world (ARNAUD 1979; GUNDER 1929). It was founded in April 1853 as “The California Academy of Natural Sciences” (ESSIG 1931, LEVITON & ALDRICH 1997, WILLIAMS 2007), just three years after California joined the United States (LEVITON & ALDRICH 1997). By 1868, the name was changed to simply “California Academy of Sciences”, with the aim of promoting science in a wider sense (GUNDER 1929, LEVITON & ALDRICH 1997). The organization was set to promote the study and research of several disciplines within the natural sciences, focusing on the flora, fauna, and history of California, but very soon, its scope broadened; today it has become a modern institution that brings the latest advances in scientific research to the public in an “engaging, educational and inspiring way”.

Even though the first insects and arachnids for the Academy were received in 1854, it was not until 1862 that the Department of Entomology was established. Hans Hermann Behr (1818–1904), a German-born medical doctor, accomplished entomologist, and botanist,

whose “greatest love was the study of Lepidoptera”, was appointed as curator, a position he held intermittently for 24 years until his death (ARNAUD 1979, ESSIG 1931, GUNDER 1929, LEVITON & ALDRICH 1997, MALLIS 1971). During the periods in which he was not acting as curator, the position was occupied by other members of the Academy including Edward S. Clark [1870–1900; very active in various departments of the Academy (LEVITON & ALDRICH 1997)], George W. Dunn [1814–1905; “an avid collector of insects, plants, shells, insects, anything else he could sell” (ESSIG 1931)], Henry Edwards [1830–1891; tragedian and entomologist who collected plants, shells and various insect groups, had one of the best collections of butterflies of his time and described several Western Lepidoptera (ESSIG 1931)], Carl Fuchs [1839–1914; engraver who was interested in the study of insects, and particularly Coleoptera, since his youth. He organized the California Entomological Club, later renamed the Pacific Coast Entomological Society in 1901, and became its first president, a position he held until 1907 (BLAISDEL *et al.* 1918, ESSIG 1931)], L. Edgard Ricksecker [1841–1913; engineer and entomologist, dedicated to the study of Coleoptera and very well known for collecting west coast beetles, mainly from California (ANONYMOUS 1913, FALL 1913)], and Richard Harper Stretch [1837–1926; draper, miner, geologist and entomologist who was particularly interested in moths in the families Zygaenidae and Bombycidae (ESSIG 1931, MALLIS 1971, STRETCH 1926, 2008)]. Since 1905, the curatorial staff has included renowned researchers, such as Edwin C. Van Dyke [1869–1952; a medical doctor who became one of the most respected professors of entomology at the University of California Berkeley. He was highly engaged in the study of beetles, but published on other insect orders as well (ESSIG 1953, MALLIS 1971)], Carl Fuchs (see above), Edward P. Van Duzee [1861–1940; librarian and self-taught entomologist, considered by many as one of the greatest hemipterists of his time (MALLIS 1971)]

By 1900, the Academy’s insect collection had grown to about 50,000 specimens through donations and Academy expeditions (ARNAUD 1979, ESSIG 1931). It contained numerous insects collected in southern California by Walter E. Bryant (1861–1905) and Gustav Augustus Eisen (1847–1940), Behr’s collection of Lepidoptera, including many types, Harald Gerhard Schött’s (1861–1933) collection of Collembola, including many Californian species, Fuchs’ Coleoptera collection, and insects provided by many members of the Academy (ESSIG 1931). The fire that followed the 1906 earthquake destroyed most of these collections, except for 264 types of Coleoptera [described by the well-known coleopterist George Henry Horn (1840–1897)], Hemiptera [described by Phillip Reese Uhler (1835–1913)], and Hymenoptera [described by Charles L. Fox (1869–1928)], which were rescued by museum employees (ESSIG 1931, GUNDER 1929, MALLIS 1971). All of Behr’s collection, including his Lepidoptera types, were lost (ESSIG 1931, MALLIS 1971), but fortunately, several duplicate paratypes had been sent to Herman Strecker (1836–1901) in Reading, Pennsylvania (BOONE, pers. comm. 2018). By 1908, the Department of Zoology of the Field Museum of Natural History in Chicago, Illinois, would acquire the Strecker Collection, which included Behr’s duplicate paratypes (ESSIG 1931, GONZÁLEZ *et al.* 2010).

The types saved from the fire, together with some 4,000 insects collected during a Galapagos expedition led by the entomologist Francis Xavier Williams (1882–1967), who had not returned to San Francisco by the time of the earthquake, became the nucleus of the Academy’s new insect collection (ARNAUD 1970, ESSIG 1931, LEVITON & ALDRICH 1997).

Today, there are several curators in entomology. Many full-time, part-time and temporary employees have worked over the last 70 years. The entomological collection has improved largely by donations made by many enthusiastic members and friends of the Academy.

Among the thousands of insects held at the Academy, we found a very nice and well-preserved collection of Castniidae (Lepidoptera), containing 168 specimens with 46 species and subspecies. This castniid collection was formed by specimens brought in by some of the institution's employees, with additions obtained from collections donated by members or friends of the Academy. Unfortunately, as frequently happens in many holdings of this family, several specimens have no or very incomplete information about the sites and dates of their collection.

Castniidae is a diverse family, which, even though it is key to clearly understanding the higher classification of the Lepidoptera, still has a limited state of knowledge (MILLER & SOURAKOV 2009, MORAES & DUARTE 2014, WORTHY *et al.* 2017). The family includes the southeast Asian genus *Tascina* (Tascininae), the endemic Australian genus *Synemon* (Castniinae: Synemonini), and the Neotropical Castniinae (Castniini), composed of almost 90 species in 16–18 genera (DOUGLAS 2008, EDWARDS *et al.* 1999, FUKUDA 2000, MORAES & DUARTE 2014). Even though the family has been somewhat popular among certain collectors, it is not easy to find good series with detailed and trustworthy information in institutional or private collections (GONZÁLEZ *et al.* 2013c, MILLER & SOUKAROV 2009, MORAES *et al.* 2010, WORTHY *et al.* 2017). However, interest in the family has grown over the last years (GONZÁLEZ & STÜNNING 2007, LAMAS 1993, 2004, RÍOS & GONZÁLEZ 2011, VINCIGUERRA 2011), and several researchers have published checklists, regional lists, species accounts, and new taxa, with lists of specimens also contained in many museums worldwide (COCK & GONZÁLEZ 2012, DOMAGALA *et al.* 2017a,b, GONZÁLEZ *et al.* 2010, GONZÁLEZ *et al.* 2013a,b,c,d, GONZÁLEZ *et al.* 2017, GONZÁLEZ & COCK 2004, GONZÁLEZ & HERNÁNDEZ-BAZ 2012, GONZÁLEZ & SALAZAR 2003, GONZÁLEZ & WORTHY 2017, HERNÁNDEZ-BAZ *et al.* 2012, LAMAS 1995a,b, LÓPEZ & PORION 2012, MILLER 1995, 2000, 2007, 2008, MILLER & SOURAKOV 2009, PENCO 2011, PORION 2004, RÍOS & GONZÁLEZ 2011, RÍOS *et al.* 2015, SALAZAR 1999, SALAZAR *et al.* 2013, VINCIGUERRA 2011, VINCIGUERRA *et al.* 2011). More importantly, quite a few recent works have shed light on the taxonomy and interrelations of several species of the group, synonymizing some genera and species and clarifying aspects of their biology and phylogenetic arrangements (ALBERTONI *et al.* 2012, GONZÁLEZ & COCK 2004, GONZÁLEZ & WORTHY 2017, GONZÁLEZ *et al.* 2013b,c, 2017, LAMAS 1995a, MILLER 1995, 2007, 2008, MORAES & DUARTE 2009, 2014, MORAES *et al.* 2010, 2011, SILVA-BRANDÃO *et al.* 2013, WORTHY *et al.* 2017).

MATERIAL AND METHODS

We present this annotated list due to the relevance of the Academy's collection. In naming genera, we mostly followed MORAES & DUARTE (2014) (for Castniinae: Castniini) (with exceptions) and EDWARDS (1996) (for Castniinae: Synemonini), but ordered them phylogenetically, somehow following LAMAS (1995a) and MILLER (1995), however, species/subspecies are listed alphabetically. After the name of each species/subspecies, we included a general comment about the species/subspecies and/or the examined specimen(s). The 'Material examined' section contains the sex of every studied specimen, as well as the data contained in each of its labels. Comments, additions, or corrections to such data are added within brackets. A final section termed 'Additional comments' appears for several listed species and includes historical information or detail about the species, specimens, its collector(s) or provenance.

RESULTS

Annotated list of species and label information of examined specimens of Castniidae hosted in the insect collection of the California Academy of Sciences

Castniidae BLANCHARD, 1840

Castniinae BLANCHARD, 1840

Castniini BLANCHARD, 1840

Eupalamides cyparissias amazonensis (HOULBERT, 1917) (Fig. 1)

A widespread species along the Amazon basin, from Northern Brazil, Colombia, and Peru (GONZÁLEZ *et al.* 2010, 2013c, HERNÁNDEZ-BAZ *et al.* 2012). This particular subspecies is common in the high jungle zone of the Amazon Basin, east of the Andes, in Peru, where all the Academy specimens come from.

Material examined: 1♂, Peru, Monson Valley, Tingo Maria, IX-18-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, Peru, Monson Valley, Tingo Maria, IX-23-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, Peru, Monson Valley, Tingo Maria, XI-29-1954, E.I. Schlinger & E.S. Ross collectors; 3♂♂, 1♀, Peru, Monson Valley, Tingo Maria, X-15-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, *Castnia daedalus* Cr. Coll. T.W. Davies, Peru, Monson Valley, Tingo Maria, Peru, S[outh].A[merica]. 15-23-XII-1964, M. Rojas leg., Thomas W. Davies Collection Donated to the California Academy of Sciences 1987; 1♀, Peru, Monson Valley, Tingo Maria, XI-2-1954, E.I. Schlinger & E.S. Ross collectors; 1♀, Peru, Monson Valley, Tingo Maria, XII-18-1954, E.I. Schlinger & E.S. Ross collectors; 1♀, Peru, Monson Valley, Tingo Maria, IX-23-1954, E.I. Schlinger & E.S. Ross collectors; 1♀, *Castnia daedalus* Cr. Coll. T.W. Davies, Peru, Monson Valley, Tingo Maria, Peru, S[outh].A[merica]. Sept. 20, 1964, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Additional comments: Most of the Academy specimens were collected in Peru by Evert Irving Schlinger (1928–2014) and Edward S. Ross (1915–2016). Schlinger was a well-known entomologist and philanthropist associated with the Department of Entomological Sciences of the University of California, Berkeley, while Ross was a highly recognized entomologist, a pioneering nature and insects/arthropods photographer, the world's authority on web-spinners (Embiidina) and curator emeritus of the Academy.

The remaining specimens, as well as many other castniid species in the Academy collection (see “Material examined” sections of species above and below) were originally part of the collection of Thomas W. Davies (1915–1990), who was a curatorial assistant at the Academy and a charter member of the Entomologists' Society from 1967 to 1990 (ANONYMOUS 1993, ARNAUD 1993). A self-taught Entomologist, he became an authority in Lepidoptera and as such he was hired by the Academy from 1966 to 1990 (ARNAUD 1993). He undertook field research not only in the US but abroad, including many tropical countries. Between 1965 and 1990 specimens from his collection were either given to the Academy or purchased from him (ARNAUD 1993).

Amauta cacica (HERRICH-SCHÄFFER, [1854]) (Fig. 3)

This is one of the five large species recognized in this genus which is distributed from Guatemala throughout Central America and down to South America (LAMAS 1995a, MILLER 1995, MILLER & SOURAKOV 2009). There is a clearly inadequate knowledge of this species also other species and subspecies in this genus (GONZÁLEZ *et al.* 2013c, MILLER & SOURAKOV 2009, MILLER *et al.* 2012).



Figs. 1–14. Selection of Castniidae deposited in the Entomology collection of the California Academy of Sciences, San Francisco, California, USA. 1. *Eupalamides cyparissias amazonensis* (HOULBERT, 1917); ♂ Tingo María, Peru. 2. *Corybantes pylades* (STOLL, 1782); ♂, Manaus, Brazil. 3. *Amauta cacica* (HERRICH-SCHÄFFER, [1854]); ♂ Muzo, Colombia. 4. *Castnius pelasgus* CRAMER, [1779]; ♂ Peru?/Brasil?. 5. *Synpalamides fabricii* (SWAINSON, 1823); ♂ Santa Catarina, Brasil. 6. *Imara acraeoides* (GUERIN, [1832]); ♂ Santa Catarina, Brasil. 7. *Geyeria decussata* (GODART, [1824]); ♂ Santa Catarina, Brasil. 8. *Castnia invaria volitans* LAMAS, 1995; ♂ Amazonas, Brasil. 9. *Synpalamides orestes* (FABRICIUS, 1793); ♂ Rio de Janeiro, Brasil. 10. *Telchin diva* (BUTLER, 1870); ♂ Chiapas, Mexico. 11. *Castnia eudesmia* GRAY, 1838; ♂ Valparaiso, Chile. 12. *Synemon collecta* SWINHOE, 1892; ♀ Greta, New South Wales, Australia. 13. *Synemon parthenoides* FELDER, 1874; ♂ South Australia. 14. *Prometheus zagraea* (FELDER, 1874); ♂ Muzo, Colombia. Scale bar: 10 mm.

Material examined: 1♂, 98. *Lr.[?] immaculata* HDGR.[?], 488, British Guiana 240, Koebele Collection; 2♂♂, *Amauta cacica* BSD. Muzo [Colombia], E.P. Reed Collection; 1♀, Colombia, *Castnia cacica* Colombia, Col. Dr. Reed Valparaiso, E.P. Reed Collection, *Castnia prucera*[sic] (BOISDUVAL) ♀.

Additional comments: Four of the specimens were collected in Colombia, two of them are from Muzo. However, according to its label, one of the specimens was found in British Guiana, a country where this particular species has never been found before. In the label, it is identified as “*Lr. immaculata*”, a name that, as far as we know, has not been associated with any Castniidae. Thus, we believe this particular specimen has been mislabeled.

***Amauta papilionaris amethystina* (HOULBERT, 1917)**

This beautiful subspecies is commonly found from Central America to Northern South America, specifically in Panama, Colombia, Venezuela, Ecuador and Brazil (APOLINAR 1945, GONZÁLEZ 1998, GONZÁLEZ & SALAZAR 2003, HOULBERT 1917, 1918, MILLER 1986). According to MILLER (1986), the subspecies is “subtly different from the nominate species”, they probably represent either sexual dimorphism or local geographic variations. Thus, a thorough morphological/molecular study will shed light on this issue. This is the northernmost subspecies of *A. papilionaris* we know from Central America.

Material examined: 1♂, Costa Rica, Provincia de Limón, Limón, .19 [possibly during the 1950's, (ZAKHAROFF, pers. comm. 2018)], Nicholas Zakharoff, Gift to C.A.S.

Additional comments: This specimen was collected by Mr. Nicholas Zakharoff, an amateur Entomologist who studied Entomology “for about a year until his first son was born forcing him to quit and find a more profitable job” (ZAKHAROFF, pers. comm. 2018). He visited the Academy for the first time in 1959 and was friends with the amateur lepidopterist/herpetologist Alexandre C. Chnéour (sometimes spelled Schneeur) (1884–1977) (ARNAUD 1996) and Paul Arnaud jr. (curator emeritus of the Academy) (ZAKHAROFF pers. comm. 2018). Over the years, Mr. Zakharoff has donated several specimens in different Lepidoptera families, some quite unique, to the Academy.

Additional comments: The genus *Amauta* is currently under review and some of the species/subspecies will be necessarily relocated taxonomically (WORTHY & GONZÁLEZ, in prep.).

***Corybantes pylades* (STOLL, 1782) (Fig. 2)**

This is a morphologically variable genus with four species, of which the type species (*C. pylades*) is particularly unique and clearly different from the others in the group (MILLER 1986). This large and beautiful species shows a slight sexual dimorphism that can be noticed by the subtle color shade differences between males and females (MILLER 1986). It is distributed in Brazil along the Amazon basin, reaching Surinam and French Guiana but is not necessarily common as specimens are scarce in collections (MOSS 1945, MILLER 1986). Even though STRAND (1913) mentions that the species lives in Bananas (*Musa* spp.: Musaceae), other authors have discarded such observation and confirm that the species larvae feed on palms of several genera (Arecaceae: *Astrocaryum* sp., *Attalea* sp., *Euterpe* sp., *Maximiliana* sp., *Orbignya* sp., *Scheelea* sp.) (BÉNÉLUZ & GALLARD 2012, MILLER 1986, MOSS 1945). Most Castniidae lay eggs which are fusiform or in layman terms “wheat or rice shaped” (ANGULO 1998, MILLER 1986). However, the eggs of *C. pylades* are “perfect spheres, about twice the size of the eggs of Sphingidae” (MILLER 1986).

Material examined: 1♂, *Castnia pylades*, Manaos, [Brazil], Col. Dr. Reed Valparaiso, *pylades*, ♂, III – [19]32, Manaos, E.P. Reed Collection.

Additional comments: Dr. Edwyn Pastor (E.P.) Reed (1880-1966), was a Chilean medical doctor and naturalist, son of the British Entomologist Edwyn C. Reed (1841-1910) and brother of the Chilean ornithologist Carlos Samuel Reed (1888-1949) (CORTÉS 1968, ETCHEVERRY 1993, REED 2013, RUIZ PEREIRA 1940). He was known as “El General” (The General) because of his vigor and enthusiasm “for recounting stories or using expletives acquired from officers of American and English ships docked in Valparaíso, with whom he has a long and wide acquaintance” (GOODSPEED 1941). Reed inherited a passion for Entomology and Botany from his father, but he was also interested in everything related to Biology and Natural History, as well as Philosophy, Theosophy, Publicity and even sports (CORTÉS 1968, RUIZ PEREIRA 1940). He wrote many scientific articles on insects and marine organisms and collected a multitude of living things which allowed him to convert his house in a Museum (CORTÉS 1968, ETCHEVERRY 1993, GAJARDO TOBAR 1966a, b, RUIZ PEREIRA 1940). He exchanged many insects with entomologists and Museums worldwide (CORTÉS 1968). After his death, a good part of his arthropod collection was bought by the municipality of Viña del Mar to be deposited in what will become the Archeology and History Museum Francisco Fonck (CORTÉS 1968, ETCHEVERRY 1993, FIGUEROA COX, pers. comm. 2018).

Athis inca (WALKER, 1854)

This highly variable species is the most common of the *inca* complex members and it is found from southern Mexico, and along Central America down to Panamá (GONZÁLEZ & HERNÁNDEZ-BAZ 2012, GONZÁLEZ *et al.* 2008, MILLER 1972, 1986). Two subspecies of *A. inca* (*inca* & *orizabensis*) appears to be sympatric at least in the states of Veracruz and Puebla, where intermediate phenotypes can be found (GONZÁLEZ *et al.* 2008). MILLER (1972) did a thorough morphological comparison of these and other subspecies in the group, clarifying their differences. However, some specimens have been found to share characteristics of both subspecies, indicating that *A. i. inca* and *A. i. orizabensis* are either possibly two species that are producing natural hybrids or they are just part of a larger cline of the species (GONZÁLEZ *et al.* 2008).

Material examined: 1♂, El Salvador, Quezaltepeque, VII - 1 - 1963, D.Q. Cavagnaro & M. E. Irwin collectors; 1♂, El Salvador, Usulután, 50', VII - 12 - 1963, D.Q. Cavagnaro & M.E. Irwin collectors; 1♂, [No date; No locality], Robert G. Wind Collection, California Academy of Sciences accession 1976, Donald Patterson Donor; 1♂, Cerros tres Pices[sic], Chiapas, Mexico, 10 - Mayo - 1969, Bob Wind Coll., Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987; 1♀, El Ocote, Chiapas, Mexico, 12 - July - 1969, Bob Wind Coll., Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Additional comments: Some specimens came from the Thomas W. Davies collection. However, a couple was part of the Robert G. Wind Collection. Bob Wind (1912–1975), established a business selling several types of biological supplies, including butterflies, moths, and beetles (ARNAUD & DAVIES 1976). Besides being a dealer, he was also an accomplished Lepidopterist and published several papers in which he described few species and subspecies of butterflies (ARNAUD & DAVIES 1976).

Athis inca dincadu (MILLER, 1972)

This is a very interesting subspecies which is quite different from other subspecies in the group (GONZÁLEZ *et al.* 2010, MILLER 1972). It was originally described from Panamá's Canal

Zone, however, specimens have been also found in Colombia, like this one in the Academy's collection (GONZÁLEZ *et al.* 2010, MILLER 1972, SALAZAR *et al.* 2013).

Material examined: 1♂, *Aciloa inca* Wlk., Muzo, E.P. Reed Collection.

Yagra fonscolombe (GODART, [1824])

Frequently found in southeastern Brazil and Northeastern Argentina, this species is suspected to be in Paraguay, at least along the border areas with the above-mentioned countries (RÍOS & GONZÁLEZ 2011). The genus has been thoroughly studied by MORAES *et al.* (2011) and it comprises only two species. This particular species exhibits minor, but distinctive, sexual dimorphism, and the females are slightly larger than the males (MORAES *et al.* 2011).

Material examined: 1♂, Brasil, Sta. Catarina, Jan.[uary] 9, 1965, Coll. T.W. Davies, Thomas W. Davies Collection, Donated to the California Academy of Sciences, 1987. *Castnia fonscolombe* GODT.; 1♂, Rio de Janeiro, Brasil, April 1929, *Castnia fonscolombe* GODT.; 1♂, 493. 1 *Japyx*, from Brasilia, [Brazil], 100, 493, 1439, [no date], R.H. Stretch Collection.

Additional comments: One of the specimens was originally in the Stretch collection. Richard H. Stretch was a very interesting man who dedicated a good part of his life to engineering and mining projects (STRETCH 1926, 2008, OLSON, pers. comm. 2018). As an entomologist, Stretch was interested in Lepidoptera and published the monumental work "Illustrations of Zygaenidae and Bombycidae of North America" containing many color plates with his drawings of moths, but he also published other reports and notes on several Lepidoptera (ESSIG 1931, MALLIS 1971, STRETCH 1875). He was the first to give a detailed account on what would become a highly destructive pest in California's citrus groves, the cottony cushion scale *Icerya purchasi* MASKELL, 1879 (Hemiptera: Monophlebidae) which he found in 1872 for the first time in California (ESSIG 1931, HAGEN & FRANZ 1973). He was in contact with several entomologists worldwide, but after the death of his good friend, the entomologist Henry Edwards (see Introduction above) Stretch lost interest in insects and dedicated entirely to engineering (MALLIS 1971, STRETCH 1926). His insect collection, supposedly with some 250,000 specimens at the moment of his death, included many types, was bought by friends and donated to the American Museum of Natural History, New York (ESSIG 1931). However, before he died many of his insects, including several Castniidae, had been already donated to the Academy.

Imara acraeoides (GUERIN, [1832]) (Fig. 6)

Interesting species widely distributed in South East Brazil but found also in Northern Argentina and Paraguay (PENCO 2011, RÍOS & GONZÁLEZ 2011). It resembles several Acraeini (Nymphalidae) hence its name (MORAES & DUARTE 2014, RÍOS & GONZÁLEZ 2011).

Material examined: 1♂, Brasil, Sta. Catarina, 1-XII-1966, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia acraeoides*[sic].

Additional comments: According to LAMAS (1995a), this species (as *Riechia acraeoides*) was considered in the tribe Gazerini. However, MORAES & DUARTE (2014) phylogenetic arrangement include the species in the genus *Imara*, a Castniini. For this work, we are following the latter phylogenetic approach.

Imara pallasia (ESCHSCHOLTZ, 1821)

This species is commonly found within cloud forest ecosystems in South-Eastern Brasil

where it lives sympatrically with the congeneric *I. satrapes* (KOLLAR, 1839) (GONZÁLEZ & STÜNNING 2007, GONZÁLEZ *et al.* 2010, 2013a, b). MILLER (1986) mentions that the species seems to be a visual mimic of *Parides ascanius* (CRAMER, 1775) (Papilionidae), and also that some specimens have been seen hill topping with some *Morpho* spp. (Nymphalidae).

Material examined: 1♂, Brasil, Sta. Catarina, 16-XII-1964, Coll. T.W. Davies, *Castnia pallasia* ESCH., Thomas W. Davies Collection donated to the California Academy of Sciences 1987; 1♀, S. America, *C. ardalus*, *C. pallasia* ESCH. ♀, *Castnia pallasia* EXCH., R.H. Stretch Collection, *Castnia pallasia* ESCH. JWD; 1♂, 496. 1 *Pallasia*, 60, S. America, 496, 1435, R.H. Stretch Collection; 1♀, Brasil, Sta. Catarina, March 1966, Coll. T.W. Davies, *Castnia umbratula* STRAND, Thomas W. Davies Collection donated to the California Academy of Sciences 1987.

Synpalamides escalantei (MILLER, 1976)

This large species is endemic to Mexico it is distributed mainly in some southern states (Guerrero, Michoacán, and Morelos) even though some specimens are known from Chihuahua (MILLER 1976, 1986). The species seems to be a close relative of *S. chelone* (HOPFFER, 1856) whose larvae are found boring *Agave* spp. (Agavaceae) plants and are traditionally consumed by the natives of the region where it is found, however, not much is known about their ecology and biology (GONZÁLEZ 2008, HOPFFER 1856, MILLER 1976, 1986, 2000, RAMOS-ELORDUY *et al.* 2011).

Material examined: 1♀, Mexico, *Castnia* sp., R.H. Stretch Collection.

Additional comments: Both Mexican species *escalantei* and *chelone* are close to *Castnia estherae* MILLER, and they certainly differ from the Brazilian species of *Synpalamides* (MILLER 1986). At the moment of writing this note, the three of them are being thoroughly studied with the intention of clarifying their taxonomic status (J.M. GONZÁLEZ, B. LÓPEZ G., J.P. HUERTA & J.Y. MILLER, in prep.)

Synpalamides fabricii (SWAINSON, 1823) (Fig. 5)

The species is of common occurrence in Southeast Brazil and was previously included in the genus *Hista* until recently when the genus was synonymized under *Synpalamides* (MORAES & DUARTE 2014, MORAES *et al.* 2010). Few subspecies were originally described based on slight geographical variations, however, their validity was questioned and were all synonymized under *fabricii* (MORAES *et al.* 2010).

Material examined: 1♂, Amazons[sic], [Brasil], *Castnia boisduvalii* WKR.; 1♂, Amazons, 1446, R.H. Stretch Collection; 1♂, Brasil, Sta. Catarina, Sept. 25, 1965, Coll. T.W. Davies, Thomas W. Davies Collection donated to the California Academy of Sciences 1987, *Castnia boisduvali*[sic] WKR.

Synpalamides orestes (FABRICIUS, 1793) (Fig. 9)

This is a species typically found in Southeastern Brazil but is quite uncommon in collections worldwide (GONZÁLEZ *et al.* 2010, MILLER 1986). As far as we know, the only specimen known from a locality different than the typical one is deposited at the Natural History Museum, London (BMNH) (HOULBERT 1918). It was supposedly collected in “Venezuela” and was part of Johan Becker’s (1788-1859) collection, however that specimen was probably mislabeled (GONZÁLEZ *et al.* 2010).

Material examined: 1♂, 492. 1 *Orestes*, Brasilia, 40, 1428, 492, R.H. Stretch Collection;

1♂, *C. orestes* [no date, no locality], R.H. Stretch Collection; 1♂, Theresop. [Teresópolis, Rio de Janeiro, Brasil], 11-3-08, Coll. J. Arp.

Synpalamides phalaris (FABRICIUS, 1793)

Highly variable species that is widely distributed in southern South America along South East Brazil, Uruguay, and Paraguay (GONZÁLEZ *et al.* 2010). However, at least two specimens have been reported from the island of Trinidad (GONZÁLEZ & COCK 2004). The species is known for attacking plants of *Guzmania* spp. and *Bromelia* spp. (Bromeliaceae) and very possibly attacks other genera in the family (MILLER 1986, RÍOS & GONZÁLEZ 2011).

Material examined: 1♂, Brasil, Sta. Catarina, 12-XII-1966, Coll. T.W. Davies, *Castnia mygdon* DALM., Thomas W. Davies Collection donated to the California Academy of Sciences 1987; 1♂, Rio [de Janeiro, Brasil], *C. phalaris* FABRICIUS[sic]; 1♂, Paraná, *C. mygdon* DALM., E.P. Reed Collection; 1♂, Mygdon, [No data], R.H. Stretch Collection; 1♂, Parana, *Castnia phalaris* F., R.H. Stretch Collection; 1♂, Venezuela, 1434, R.H. Stretch Collection.

Additional comments: Among the few specimens of this species at the Academy, there is one that came from the R.H. Stretch collection bearing a handwritten (R.H. Stretch writing?) label stating “Venezuela” as collecting location. After revising many insect collections worldwide and reviewing the available literature, this was the first specimen of this species supposedly collected in that South American country, and at first, we doubted its origin. However, we certainly knew of at least two specimens of the species that were collected from the nearby island of Trinidad (GONZÁLEZ & COCK 2004). A few years later, in 2017, a specimen of this species with detailed locality data was found in the Orinoco Delta, in Venezuela, confirming its presence in this northern South American country (GONZÁLEZ & WORTHY 2017).

As for the provenance of the Academy specimen, it is quite possible that Stretch bought it or traded it from someone. As far as we know he did collecting trips to Mexico and Central America, but he never traveled south of Panama (ESSIG 1931, MALLIS 1971, STRETCH 1926, 2008, OLSON, pers. comm. 2018). Since the species has a South American distribution it is quite certain that Stretch collected neither this nor the other two specimens of this species that came from his collection.

Synpalamides zerinthia (GRAY, 1838)

This species appears to be restricted to South East Brazil, however, based on WESTWOOD (1877), some authors mention Bolivia as a collecting locality also (HOULBERT 1918, STRAND 1913). This large species is poorly represented in Museums, which might probably mean that local population numbers are low (MILLER 1986). It might be associated to lowland tropical wet forests, but since the known collected specimens are so scarce, it is not much that can be said about the biology/ecology of the species (GONZÁLEZ *et al.* 2010, MILLER 1986).

Material examined: 1♂, 5. 1 *Langsdorfii*, Brasilia 150, 495, 1438, R.H. Stretch Collection.

Haemonides cronida cronida (HERRICH-SCHÄFFER, [1854])

Beautiful medium-sized species that seem to be in some sort of mimetic ring involving potential models such as *Perrhybris lorena* (HEWITSON, 1852) (Pieridae) and similar species in the genus (MILLER 1986). It is found along the Amazon and Orinoco basins, with specimens known from Brazil, French Guiana and south-east Venezuela (BÉNÉLUZ & GALLARD 2012, GONZÁLEZ 1998, MILLER 1986, WORTHY *et al.* 2017).

Material examined: 1♂, Belem (Pará), Brazil, Sept. 10, 1968, J. Kesselring, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

***Castnia eudesmia* GRAY, 1838 (Fig. 11)**

This is the only Castniidae found in Chile, where it is considered endemic; however, some authors have suggested that it could be eventually found in Bolivia and Argentina, which seems improbable (GONZÁLEZ *et al.* 2013d, PENCO 2011). MORAES & DUARTE (2014) studied two specimens and one of them supposedly came from Ecuador, a highly improbable collecting location. The species is strictly associated with *Puya* plants (Bromeliaceae) found in dense formations called Chaguales (ANGULO & OLIVARES 2009, GONZÁLEZ *et al.* 2010, REED 1935, VINCIGUERRA *et al.* 2011).

Material examined: 2♂♂, 1♀, Angol, Chile, I-5-[19]51, Ross and Michelbacher Collectors; 1♂, Angol, Chile, I-29-[19]51, Ross and Michelbacher Collectors; 5♂♂, 2♀♀, Chile, E.P. Reed Collection, Valparaiso, [Chile]; 1♂, 1♀, *Castnia eudesmia*[sic] GR[a]Y, Valparaiso, Chile 10-II-[19]61, [Coll. ?]; 1♂, Chile, S[outh].A[merica]., 10 M[iles] W[est] Puren Prov.[ince] Malleco in Cordillera del Nahuelbuta, Jan.[uary] 9, 1961, Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia eudesmia* G.R. GRAY ♂; 1♂, Coll. T.W. Davies, Chile, Collipulti, 20 M[iles] S[outh] E[ast] Angol, Jan[uary] 10, 1961, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia eudesmia* G.R. GRAY ♂.

Additional comments: Edwyn P. Reed (1880–1966) was known to exchange insects with Museums all over the world (CORTÉS 1968, RUIZ PEREIRA 1940). We know of a lot of nine males, four females and four cocoons of this species donated by Reed to the American Museum of Natural History (AMNH), New York. The cocoons were collected by him in Valparaiso, Chile, in *Puya alpestris* (POEPP.) Gay (Bromeliaceae) plants in November 1935. REED (1935) comments on several aspects of the biology of the species and mentions that their larvae feed not only in *P. alpestris* but also in *P. chilensis* MOLINA, but never above the 1000 meters above sea level in the Valparaiso region.

The species has been frequently confused as *Castnia psittacus*, an incorrect name, based on a comment by Rudolph Philippi (1808–1904) who mentioned that *Castnia eudesmia* GRAY was actually *Papilio psittacus* MOLINA based on comments made by the Chilean naturalist, Juan Ignacio Molina (1740-1829) (GONZÁLEZ *et al.* 2010, MOLINA 1782, PHILIPPI 1867, URETA 1955, VINCIGUERRA *et al.* 2011). The combination *C. psittacus* has been recently invalidated, and *C. eudesmia* is the valid combination for this species (RAMOS-GONZÁLEZ *et al.* 2018).

***Castnia invaria volitans* LAMAS, 1995 (Fig. 8)**

A South American subspecies commonly found in the Orinoco River basin and north of the Amazon River, from Colombia, through Venezuela and east to the Guianas (GONZÁLEZ *et al.* 2010, 2013a, GONZÁLEZ & STÜNNING 2007).

Material examined: 1♂, *Castnia icarus*, Santarem, [Pará], Amazonas, Col. Dr. Reed Valparaiso, E.P. Reed Collection.

Additional comments: All of the specimens from E.P. Reed bear a small typewritten label stating that they are from the “E.P. Reed Collection”, but only a handful of them has an older and larger label that might have the details about the specimen and below it is type-written in capital letters “Col. Dr. Reed Valparaiso.”

***Telchin atymnius drucei* (SCHAUS, 1911)**

Telchin atymnius is quite variable in background coloration, and also in the shape, size, and colors of the bands. There is no doubt that a thorough study including a large series of the supposed subspecies is needed to provide the definitive taxonomic status of its subspecies. Curiously, several of the currently considered subspecies have a somehow limited geographic range, like this one. *Telchin a. drucei* is similar to *T. a. humboldti*, to which it might be eventually considered a synonym but it has a light brown-reddish color, tend to be smaller, and the postmedian band is absent from the costal margin to end discal cell (MILLER 1986, GONZÁLEZ & SALAZAR 2003, GONZÁLEZ *et al.* 2010). Specimens are frequently found from Costa Rica, but some have been found in Panama and might even reach northwestern South America (GONZÁLEZ & SALAZAR 2003, GONZÁLEZ *et al.* 2010).

Material examined: 1♂, Costa Rica, Puntarenas, 4mi[les], W[est]. Villa Nelly, 5 July 1965, H.G. Real, Herman G. Real Collection – 1988 Gift to the California Academy of Sciences, Herman G. Real Collection; 2♂, 1♀, Chiriqui, R.H. Stretch Collection; 1♂, Cen[tral]. America. 208, R.H. Stretch Collection; 1♂, Costa Rica, Provincia de Puntarenas, San Vito, Río Coto Brus, 16-14.VII.1982, Nicholas Zakharoff, Gift to C[alifornia]. A[cademy]. [of] S[ciences].; 1♂, Costa Rica, Provincia de Puntarenas, San Vito, Río Coto Brus, XII.1982, Nicholas Zakharoff, Gift to C[alifornia]. A[cademy]. [of] S[ciences].; 2♂♂, Costa Rica, Provincia de Puntarenas, (Cerro de) Las Cruces, 1.IX.1982, Nicholas Zakharoff, Gift to C[alifornia]. A[cademy]. [of] S[ciences].; 1♂, 1430, Panama, R.H. Stretch Collection; 1♂, Panama, Provincia de Chiriquí, Volcán, Lagunas, V.1983, Gift to C[alifornia]. A[cademy]. [of] S[ciences].

Additional comments: One of the specimens examined came from the Herman George Real (1938–1991) collection. Real was an entomologist interested mainly in Lepidoptera and he published a few papers dealing with Butterflies and Skippers (LAMAS 2014).

***Telchin atymnius ecuadorensis* (HOULBERT, 1917)**

Dark brown as the typical *atymnius*, and also covered with scales that give an iridescent violet hue (MILLER 1986). This subspecies is typically found in Ecuador, hence its name.

Material examined: 1♂, Coll. T.W. Davies, Ecuador, Cuenca, Feb. 10, 1966, Thomas W. Davies, Collection Donated to the California Academy of Sciences 1987; 1♂, Coll. T.W. Davies, Ecuador, Cuenca, Sept. 4, 1966, *Castnia atymnius* DALM. from M. Zappalorti.

Additional comments: One of the specimens was originally bought by T.W. Davies from Michael P. Zappalorti (1910–1994), “born in Buenos Aires, Argentina, he came to America via Ellis Island in 1922 with his parents and two older brothers. Collecting insects and butterflies was his lifelong hobby and was a charter member of the entomology club at the American Museum of Natural History in New York City. He had a stained-glass business and made a living making windows for churches and synagogues throughout the United States. At age 54, he opened his own butterfly museum at his home in Charleston, Staten Island. He had over 65,000 butterflies and 800 other insects in his private collection” (R. ZAPPALORTI, pers. comm. 2018). Today a collection of about 2,500 specimens of exotic and local butterflies and moths, which originally belonged to Mr. Zappalorti, can be admired at the Staten Island Museum in New York.

***Telchin atymnius futilis* (WALKER, 1856)**

A common Central American subspecies found north up to Mexico (GONZÁLEZ 2008, MILLER 1986, 2000, GONZÁLEZ *et al.* 2010). As it happens with other subspecies this might be

associated with Musaceae and certain Poaceae (ie. *Saccharum officinarum* L.) (GONZÁLEZ *et al.* 2010).

Material examined: 1♂, Honduras, Prep.[-ared] By J.G. Grundel; 1♂, [No locality data], prep. By J.G. Grundel; 1♀, *Castnia* sp., Mexico 7-29-[19]53; 1♂, Tamahu A.V., V-14-[19]49, J. Lockhead, *Castnia atymnis*[sic]; 1♂, Tucuru A.V., [Guatemala], V-14-[19]49, J. Lockhead, *Castynia*[sic] *atymnis*[sic] ♀; 1♂, Tamahu, [Guatemala], V-15-[19]49, J. Lockhead, *Castynia*[sic] *atymnis*[sic] ♀.

***Telchin atymnius humboldti* (BOISDUVAL, [1875])**

A subspecies commonly found in parts of Costa Rica, Panama, Colombia, and Venezuela (CONSTANTINO 1998, MILLER 1986, SALAZAR 1999). As others in the species, it is frequently associated with bananas (*Musa paradisiaca* L.; Musaceae) and wild plantains (*Heliconia* sp.: Heliconiaceae) (CONSTANTINO 1998, GONZÁLEZ & FERNÁNDEZ YÉPEZ 1993, MILLER 1986).

Material examined: 1♂, Costa Rica, Cartago, Turrialba 2000, 15 July 1965, H.G. Real, H.G. Real Collector, Herman G. Real Collection, Herman G. Real Collection – 1988 Gift to the California Academy of Sciences; 1♂, 1♀, Costa Rica: Provincia de Limón, Limón, .19 [?], Nicholas Zakharoff, Gift to C[alifornia]. A[cademy]. [of] S[ciences]; 1♂, Panamá, Coco Solo, 1946-1947, R.E. Ludwig; 1♂, Panamá, Panamá, Cerro Campana, 1600' Aug. [19]65, H.G. Real; 1♂, H.G. Real Collector, Herman G. Real Collection, Herman G. Real Collection – 1988 Gift to the California Academy of Sciences; 1♂, 1431, Panamá, R.H. Stretch collector; 3♂♂, 1♀, Panama Zone, Pres. By J.E. Carey Collector; 1♀, Cerro Campana, Panamá, 2600', 14 July 1963; 1♂, 683, S. America, R.H. Stretch coll., *Castnia humboldti*; 1♂, S. America, R.H. Stretch collection.

***Telchin evalthe cuyabensis* LATHY, 1922**

Described originally from the river system Cuiabá-Corumbá in Matto Grosso state, Brazil. The main difference with a typical female of *T. evalthe evalthe* is the slightly wider subapical band of the forewing and that the discal band is equally wide at the anal angle as on the costa (LATHY 1922). A detailed study with enough specimens will probably end up telling us that this is nothing more than a geographical variation.

Material examined: 1♂, S.[outh] America, [Brasil?], R.B. Stretch Collection, *Castnia evalthe* F.

***Telchin evalthe evalthoides* (STRAND, 1913)**

Originally described from Bolivia, specimens have been found in the upper Amazon in many localities from Brazil, Ecuador, and Peru (STRAND 1913, HOULBERT 1918, GONZÁLEZ *et al.* 2013a). MILLER (1986) mentions that immatures of this and other subspecies of *T. evalthe* feed on terrestrial bromeliads (Bromeliaceae) (MILLER 1986, GONZÁLEZ *et al.* 2013a).

Material examined: 1♂, Peru, Departamento de Loreto, 1944. Pres.[ented] to Cal. Acad. Sci. by E.P. Reed; 1♀, *evalthoides* STRAND, Bolivia, E. P. Reed Collection, *Castnia evalthoides*, Bolivia, Col. Dr. Reed Valparaiso; 1♀, Satipo, Peru, Oct.[ober] 10, 1941, leg. P. Papryski, Coll. T. W. Davies, *Castnia evalthe evalthoides* STRAND, TWD, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

***Telchin evalthe tica* LAMAS, 1995.**

Proposed as a replacement name for *Xanthocastnia viryi intermedia* ROTHSCHILD 1919, described from Costa Rica (LAMAS 1995a). The subspecies appears to be found also in neighboring Panama.

Material examined: 1♂, El Llano, Panama, April 20, 1970, Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Telchin evalthe vicina (HOULBERT, 1917)

Described from Ecuador base on slightly different color variations with typical *T. evalthe evalthe* (HOULBERT 1917). It might be just a geographic variation of *T. evalthe evalthe*.

Material examined: 1♂, Ecuador, Provincia de Napo, 25 km E.[ast] of Puerto Napo, Selva Aliñahuí, 450m I-II 1991, Edward S. Ross, Cal. Acad. Sci. Coll.; 1♂, Ecuador, Provincia de Napo, 25 km E.[ast] of Puerto Napo, Selva Aliñahuí, 200m VIII-1991, Edward S. Ross, Cal. Acad. Sci. Coll.

Telchin evalthe wagneri BUCHECKER, [1880])

Not much is known of this Colombian subspecies, and specimens are quite rare in collections. It might be just a geographic variation, but only a large series will help discern its real status.

Material examined: 1♂, *Xanthocastnia evalthe* FB., Muzo, [Colombia], E.P. Reed Collection.

Telchin diva (BUTLER, 1870) (Fig. 10)

This is one of the most beautiful Castniidae, but even though many specimens are known from several insect collections, it is very poorly known (GONZÁLEZ *et al.* 2010, 2013a, VINCIGUERRA 2010). The species is distributed from Mexico down to all Central America and Colombia. Four easily distinguished subspecies are known (GONZÁLEZ 2013a, SALAZAR 1999, VINCIGUERRA 2010).

Material examined: 1♂, Escuintla, Chiapas, Mexico, April 10, 1962, Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987; 1♂, Escuintla, Chiapas, Mexico, 10 – June – 1955, Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987; 1♂, [No data]; 1♀, Costa Rica, Turrialba, 30 – VII – 1963, M. Irwin & D.Q. Cavagnaro.

Telchin licus (DRURY, 1773)

A highly variable species known as a pest of bananas (*Musa* spp.: Musaceae), *Heliconia* plants (Heliconiaceae) and sugarcane (*Saccharum officinarum* L.: Poaceae) (GONZÁLEZ & COCK 2004, GONZÁLEZ & FERNÁNDEZ YÉPEZ 1993, GONZÁLEZ & STÜNNING 2007, SANDOVAL *et al.* 2007).

Material examined: 1♂, “Lago Girauda”, Coll. J. Arp, Santarem, [Pará, Brasil], licoides, E.P. Reed Collection; 1♂, *Castnia licoides*, Santarem, [Para, Brasil], Col. Dr. Reed Valparaiso, E.P. Reed Collection; 1♂, Bolivia: M.F.: Remanso Iténez, 1-10.X.1973, Nick Zakharoff C.A.S. Accession; 1♀, Villavicencio, Colombia, Ocoa XI-1-[19]43, W. Hovanitz; 1♂, Paramaribo, Niedert, Guyana, *Castnia licoidella*, Dartel – Guinea, Col. Dr. Reed Valparaiso, E.P. Reed Collection; 1♂, Equador [Ecuador], Brown, Koebele Collection, *Castnia licus*; 1♂, Ecuador: Provincia de Napo, 25km E. of Puerto Napo, Selva Aliñahuí, 200m, VIII.1991. Edward S. Ross Cal. Acad. Sci. Coll.; 3♂♂, Ecuador: Provincia de Napo, Archidona N[orth]. of Tena, VIII.1983, Nicholas Zakharoff, Gift to C[alifornia]. A[cademy]. [of] S[ciences].; 1♂, Coll. T.W. Davies, Brasil, Obidos, Pará, June 1966, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia licus-licoides* BSD.; 1♂, Para, Brazil,

#5, L.S. Jr. U. Lot 546 Sub, 1959 Gift of Stanford Univ. Nat. Hist. Museum; 1♂, Brazil, R.H. Stretch Collection; 1♂, Brazil 636, R.H. Stretch Collection, *Castnia licus* DRURY; 1♂, 1437, [no locality], R.H. Stretch Collection; 2♂♂, Bahia, Brazil, D. Davies; 1♂, 1442, S. America, R.H. Stretch Collection; 1♂, Peru: Dept. Amazonas Olmos-Marañon Hwy., on Km 280, tropical forest. Alt. 300m. 20-I-1964, P.C. Hutchinson & J.K. Wright Collectors [this specimen is mounted in the resting position]; 2♂♂, [no data].

***Telchin licus albomaculata* (HOULBERT, 1917)**

A clearly defined subspecies found in Amazônia, Brazil and close areas in Peru, can reach Colombia (APOLINAR 1945, GONZÁLEZ & SALAZAR 2003, SILVA-BRANDÃO *et al.* 2013, LAMAS 1995a). Morphologically similar to a typical *T. licus licus*, but is darker, almost black, with wing bands not as broad and whiter (GONZÁLEZ & SALAZAR 2003).

Material examined: 1♂, Brasil, Amazonas, Sao Paulo de Olivenca, 10 June 1965, Rec. From M. Zappalorti, Coll. of T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

***Telchin licus insularis* (HOULBERT, 1918)**

This is the most common and widespread castniid in Trinidad where it is known as the giant moth borer or large moth borer of sugarcane [*Saccharum officinarum* (Poaceae)] (DES VIGNES 1987). However, it has been reported in the island attacking *Paspalum virgatum* L. (Poaceae), *Heliconia bihai* (L.) L. (Heliconiaceae), *Musa* spp. (Musaceae) and highly possibly young *Roystonea oleraceae* (JACQ.) (Arecaceae) (GONZÁLEZ & COCK 2004).

Material examined: 1♂, Trinidad: Upper Arima Valley, 1100-1800' 11-III-[19]64, C.E. & E.S. Ross.

Additional comments: Based on specimens collected in Trinidad, HOULBERT (1918) named “form *insularis*” a “variety” of “*Castnia* (*Leucocastnia*) *licus*” having “no more than four reddish-orange spots” in the external margin of the hind wings, just as the specimen at the Academy. Similar specimens have been found in Venezuela and Colombia, and even though we still treat this form as a valid subspecies following LAMAS (1995a), MILLER (1986, 1995), GONZÁLEZ & COCK (2004), a detailed molecular analysis, as done with Brazilian subspecies, might show otherwise.

***Telchin licus vorax* LAMAS, 1995**

Distinguished by its particular large size, a greater extent of white on the hindwing bands and its common presence in Peru, it was known as the “*Race péruvienne*” of “*Castnia licoides*” by HOULBERT (1918) to be later named “*Castnia licoides peruviana*” by LATHY (1922). In the process of correcting the taxonomy LAMAS (1995) introduced the name *T. l. vorax* to replace Lathy’s name which was a junior primary homonym of *Castnia licus f. peruviana* which was established by STRAND (1913).

Material examined: 1♂, Peru: Monson Valley, Tingo Maria, X-8-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, Peru: Monson Valley, Tingo Maria, X-15-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, Peru: Monson Valley, Tingo Maria, XI-3-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, Peru: Monson Valley, Tingo Maria, XII-15-1954, E.I. Schlinger & E.S. Ross collectors; 1♂, Peru: Departamento de Madre de Dios, Puerto Maldonado, 4-X-1975, Nicholas Zakharoff, Cal. Acad. Sci. Coll.; 1♂, Peru: Departamento de Loreto, Loreto, 1944, *C. licus* DRU., Pres.[ented] to Cal. Acad. Sci. By E.P. Reed; 1♀, Chancham[ayo]. [Peru],

E.P. Reed Collection, *Castnia Licus*[sic]; 1♀, Peru: Departamento de Madre de Dios, Puerto Maldonado, 4-X-1975, Nicholas Zakharrow, Cal. Acad. Sci. Coll.; 1♀, Peru: Departamento de Madre de Dios, Puerto Maldonado, 20-IX-1975, Nicholas Zacharoff, Cal. Acad. Sci. Coll.; 1♀, Coll. T.W. Davies, Peru, Huanuco, Nov. 1965, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia licus* DRURY; 1♀, Coll. T.W. Davies, Peru: Monson Valley, Tingo Maria, Oct 15, 1964, leg. Mario Rojas, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia licus* (DRURY); 1♀, Coll. T.W. Davies, Peru: Monson Valley, Tingo Maria, Oct 26, 1964, leg. Mario Rojas, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987, *Castnia licus* (DRURY).

Additional comments: As mentioned above, E.P. Reed was known to exchange specimens with museums and collectors worldwide (CORTÉS 1968). While one of the specimens came from the E.P. Reed collection probably after his death, another specimen has a note that says that it was “presented” by the Chilean naturalist to the Academy. This might indicate that he probably visited the Academy years before he died and brought this and other specimens as gifts.

Geyeria decussata (GODART, [1824]) (Fig. 7)

Known from southeastern Brazil, especially along the coast, where it has been seen flying from November to March at noon time (GONZÁLEZ *et al.* 2010, MILLER 1986). Not much is known about its biology.

Material examined: 1♂, Brasil, Sta. Catarina, 18-XII-1965, Coll. T.W. Davies, *Castnia decussata* GODT., Thomas W. Davies Collection Donated to the California Academy of Sciences 1987; 1♀, Brasil, Sta. Catarina, Jan. 28, 1966, Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Gazerini HOULBERT, 1918

Castnius pelasgus CRAMER, [1779] (Fig. 4)

Very distinctive species with a ground color dark brown, almost black, with a blue-black iridescence (MILLER 1986). Even though it is apparently associated with Musaceae (*Musa* spp.), eggs are wheat seed-shaped, and it is probably bivoltine and flight late in the afternoon, not much else is known about its biology or ecology (MILLER 1986). It might be part of mimetic rings that include some Agaristinae and Pericopidae (MILLER 1986). The species is distributed in the Amazon basin.

Material examined: 1♂, S.[outh] America, [Peru?/Brazil?], 1432, *Castnia pelasgus* TW, R.H. Stretch Collection.

Additional comments: It is unfortunate that there are no more details about the provenance of this specimen. We believe it might have come from the Amazonas region of Brazil or Peru due to its resemblance with the type of “*Castnia fulvofasciata* HOULBERT, 1917”.

Prometheus cononia (WESTWOOD, 1877)

A species found typically in Ecuador, this specimen resembles the ssp. *amazonica* (STRAND, 1913) originally described from Peru. In our study, we keep it in the species rank and consider that a thorough morphological and genetical analysis will certainly reduce the many supposed subspecies.

Material examined: 1♂, Peru, Departamento de Loreto, Loreto, 1944, Pres.[ented] to Cal. Acad. Sci. by E.P. Reed.

Prometheus heliconioides (HERRICH-SCHÄFFER, [1853])

Easily recognized by a coloration pattern that resembles butterflies in the genera *Lycorea*, *Thyridia* and *Methona* (Nymphalidae), as well as the moth *Notophyson heliconides* (Erebidae), as they might interact as a possible mimetic ring (LAMAS 1973, MILLER 1986, RÍOS & GONZÁLEZ 2011). Species of this genus appear to be bivoltine and several subspecies have been described from different South American regions (MILLER 1986, GONZÁLEZ *et al.* 2013a, RÍOS & GONZÁLEZ 2011).

Material examined: 1♂, 1444, [No date; No locality], *Dysschema heliconiides*[sic], R.H. Stretch Collection.

Additional comments: As it is clear from its labels, Stretch or whoever traded the specimen with him, confused the specimens with the Erebidae *N. heliconides* (= *D. heliconides*).

Prometheus heliconioides obidona (ROTHSCHILD, 1919)

This subspecies is typically found in the region of Para, Brazil (LAMAS 1995a).

Material examined: 1♀, Brasil, Obidos, Pará, March 1966, Coll. T.W. Davies, *Castnia heliconioides* H. SCHAFF., Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Prometheus zagraea (FELDER, 1874) (Fig. 14)

This species is known from Colombia, Panama and Costa Rica (MILLER 1986, SALAZAR 1999). Immatures are basically unknown and females have been observed laying eggs at the base of the terrestrial bromeliad *Aechmea magdalenae* (Bromeliaceae) (MILLER 1986).

Material examined: 1♂, *Gazera cycna* Ww. Muzo, [Colombia], E.P. Reed Collection.

Prometheus zagraea salvina (WESTWOOD, 1877)

This subspecies is darker than typical *P. zagraea zagraea*, known from Panama, and its range might include part of Costa Rica (LAMAS 1995a). A detailed study might clarify if this is just a geographic variation of *P. zagraea zagraea* or a legitimate species.

Material examined: 1♂, Cerro Campana, Panama 2600', 7 July 1963, Sitting on leaf of tree, H.G. Real Collector, Acc# 80; 1♀, Cerro Campana, Panama, 2600', 8 July 1963, H.G. Real Collector; 1♀, Cerro Campana, Panama, 2606', 14 July 1963, H.G. real Collector.

Additional comments: Herman G. Real collected the only three specimens of this subspecies at the Academy. He was an avid collector of Lepidoptera associated to the academy, he was also a member of the Lepidopterists' society from 1971 to 1990, publishing a few papers and even describing some taxa (ANONYMOUS 1993, LAMAS 2014). Many of his specimens can be found all over the Academy's entomological collections.

Ceretes marcelserres (GODART, [1824])

This genus is particularly interesting because of its marked sexual dimorphism which is unique in the family (MILLER 1986, MORAES & DUARTE 2014, RÍOS *et al.* 2015). This species presents a wide distribution in middle-south South America including East Bolivia, Southeast Brazil, Mid-East Paraguay and North-East Argentina (RÍOS & GONZÁLEZ 2011, RÍOS *et al.* 2015, PENCO 2011).

Material examined: 1♂, Venezuela, 1426, R.H. Stretch Collection; 1♂, Venezuela, *Castnia marcelserres* GODT., R.H. Stretch Collection; 1♂, Braz.[il], Mato Grosso, barra do Tapirape, 17 – XII – 62, B. Malkin.

Additional comments: Two of the specimens in the Academy collection come from the R.H. Stretch collection and bear handwritten labels stating “Venezuela” as collecting location. It is the same handwriting as one of the *S. phalaris* specimens mentioned above. As far as we know and based on the many collections and Castniidae literature revised over the years, these specimens are the only ones supposedly collected in the Northern South America country. However, the typical geographic distribution of the species is along Mid-South South America and has never been recorded north of the Amazon River (PENCO 2011, RÍOS & GONZÁLEZ 2011, RÍOS *et al.* 2015). We are inclined to doubt that they are actually from Venezuela, and they might have been mislabeled. Since they are certainly South American in origin, and Stretch was never south of Panama (STRETCH 1926, OLSON, pers. comm. 2018) it is almost certain that he obtained them from another dealer or collector.

***Ceretes thais* (DRURY, 1782)**

A beautiful and sexually dimorphic species distributed in southern Brazil and can reach Bolivia and Argentina (MILLER 1986, RÍOS & GONZÁLEZ 2011). The species, and especially the males, is slightly similar to *C. marcelserres* (GONZÁLEZ *et al.* 2010). The ground color of the forewings is similar in males and females, but paler with reduced markings in the latter. The ground-color of females’ hindwings is orange-fulvous with two postmedian bands that are very dark, black, with additional extradiscal spot band (MILLER 1986, GONZÁLEZ *et al.* 2010, RÍOS & GONZÁLEZ 2011). Almost nothing is known about the biology and ecology of this species.

Material examined: 1♂, [No date; No Locality], *Castnia chremes*, R.H. Stretch Collection; 1♂, Rio, [Brazil], [Illegible] XII – 1970, *Castnia thais* ♂, DRURY, E.P. Reed Collection; 1♀, Paineiras, [Sao Paulo, Brazil], Coll. E. May-Rio, *Castnia thais* ♀, Col. Dr. Reed Valparaiso, E.P. Reed Collection.

***Paysandisia archon* (BURMEISTER, 1879)**

This species, originally restricted to northern Argentina, South-east Brazil, Western Uruguay, and Paraguay (MILLER 1986, SARTO I MONTEYS 2002), was introduced from Argentina to Europe between 1985 and 1995; it became well established as reported by the year 2001 and attacks numerous palm species (Arecaceae) in several European countries (AGUILAR *et al.* 2001, GONZÁLEZ & STÜNNING 2007, ISIDORO *et al.* 2017, SARTO I MONTEYS 2002, 2003, SARTO I MONTEYS & AGUILAR 2001, 2005, SARTO I MONTEYS *et al.* 2005), mainly along the coastal regions of the continent. Currently, there are no fully effective chemical or biological control methods against the spread and impact of the species in Europe.

Material examined: 1♀, Argentina, Buenos Aires, 8 – XII – 1961, Coll. T.W. Davies, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Synemonini COMMON, 1990

***Synemon collecta* SWINHOE, 1892 (Fig. 12)**

The striated sun-moth is found in Victoria, New South Wales, and Queensland where it feeds on *Austrodanthonia* spp. (Poaceae) (DOUGLAS 2003, 2008).

Material examined: 1♂, Queensland, R.H. Stretch Collection; 1♀, Queensland, R.H.

Stretch Collection, *Synemon* sp.; 1♀, Australia, Greta, N.[ew] S.[outh] W.[ales], 1951, J. Sedlacek.

Synemon jcaria FELDER, 1874

The Reddish-orange Sun-moth is found in Victoria, Australia, where it feeds on scented Mat-Rush, *Lomandra effusa* (LINDL.) EWART. (Asparagaceae) (DOUGLAS 2003, 2008, WILLIAMS & WILLIAMS 2013). The species is found in the vicinity of the food-plant of the immatures where males perch in prominent spots of their territory (WILLIAMS *et al.* 2016). Females are more difficult to spot and their flying period normally goes from January to March (WILLIAMS *et al.* 2016).

Material examined: 1♂, S.[outh] Australia, 1723, R.H. Stretch Collection, *Synemon* sp.

Synemon magnifica STRAND, 1911

The Magnificent sun moth is found mainly in New South Wells, Australia (COMMON & EDWARDS 1981). Its larvae feed on *Lepidosperma viscidum* R.BR. (Cyperaceae), and its life cycle might take two or even three years from egg to adult (COMMON 1974, COMMON & EDWARDS 1981).

Material examined: 1♂, Royal Nat. Park, N.[ew] S.[outh] W.[ales], Australia, 18 – January 1967, leg. L. van Raalte, Thomas W. Davies Collection Donated to the California Academy of Sciences 1987.

Synemon parthenoides FELDER, 1874 (Fig. 13)

Known as Orange-spotted Sunmoth or Link Moth, this species is found in Australia, including Victoria, Western and South Australia. Its larvae are known to feed on Black Rapier Sedge (*Lepidosperma carphoides* F. MUELL. ex BENTH.; Cyperaceae) (DOUGLAS 2008).

Material examined: 1♂, S.[outh] Australia, R.H. Stretch Collection, *Synemon* sp.; 1♀, 209a, R.H. Stretch Collection [no other data; South Australia?].

Synemon plana WALKER, 1854

The golden sun-moth is one of the species of this Australian genus whose life cycle is clearly understood as having a longevity of about one/two years and developing in plants of *Austrodanthonia* spp. (Poaceae) (EDWARDS 1993, CLARKE & O'DWYER 1999). Considerable efforts for conservation of the species have been done in several locations in Australia (CLARKE & O'DWYER 1999, O'DWYER & ATTIWILL 1999, RICHTER *et al.* 2013).

Material examined: 1♂, Victoria, 1750, R.H. Stretch Collection, *hesperoides*.

Additional comments: The female of this species was first described as *S. plana* and later the male was described as *S. hesperoides*. Males and females are very different in appearance with the female having reduced wings and bright orange hind wings. Most collections worldwide would frequently have them separated still and it is only in Australia where the biology is well-understood and they are recognized as both sexes of the one species (EDWARDS, pers. comm. 2018).

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