

# Types of Castniidae (Lepidoptera) in the McGuire Center for Lepidoptera and Biodiversity (Gainesville, Florida)

## *Les types de Castniidae (Lépidoptères) du McGuire Center for Lepidoptera and Biodiversity (Gainesville, Floride)*

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*Giant Butterfly-moths*  
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### MOTS-CLÉS

*Castniidae*  
*Lépidoptères*  
*inventaire*  
*types*  
*McGuire Center*

### PALABRAS CLAVE

*Castnias*  
*Taladradores gigantes*  
*inventario*  
*tipos*  
*Centro McGuire*

**Summary:** A list of types of Castniidae housed in the McGuire Center for Lepidoptera and Biodiversity, Gainesville, Florida, USA is provided. The specimens belonging to ten species, as well as details on current taxonomic status, type localities, known distribution, and general comments on the mentioned species, are also included. Holotypes and some representative paratypes are figured.

**Résumé :** Une liste des types de Castniidae conservés au McGuire Center for Lepidoptera and Biodiversity, Gainesville, Floride, Etats-Unis est donnée. Les spécimens appartenant à dix espèces, ainsi que des détails sur le statut taxinomique actuel, les localités types, la distribution connue, et des commentaires généraux sur les espèces mentionnées, sont également inclus. Des holotypes et quelques paratypes représentatifs sont figurés.

**Resumen :** Se proporciona una lista de los tipos de Castniidae alojados en el Centro McGuire para Lepidóptera y Biodiversidad, Gainesville, Florida, EE. UU. Se incluyen los ejemplares pertenecientes a diez especies, así como detalles sobre su estado taxonómico actual, localidades tipo, distribución conocida y comentarios generales sobre las especies mencionadas. Se incluyen fotografías de los holotipos y algunos paratipos representativos.

## Introduction

Biological collections preserved in numerous museums of natural history around the world have been at the front line of research on biodiversity (Buerki *et al.*, 2015). There is little doubt that such collections preserve critical information about biodiversity in time and space, and are relevant in the study of taxonomy, evolution, conservation, and even sustainable livelihoods (Drew *et al.*, 2017). Unfortunately, it appears that fewer specimens are being added to them in recent years (Rohwer *et*

*al.*, 2022). However, this new age of technology, with its highly developed computing systems, and the advances in molecular techniques, has been helping Museums to go over possible shortcomings, allowing researchers worldwide easy access to relevant material for their investigations (Buerki *et al.*, 2015; Drew *et al.*, 2017).

The McGuire Center for Lepidoptera and Biodiversity (MGCL) is currently housing the Lepidoptera specimens of the Florida Museum of Natural History. The nucleus of this collection is the Lepidoptera collection once housed

at the Allyn Museum which was transferred from Sarasota, Florida when the MGCL opened in 2004. Lepidoptera collections from other Florida institutions, such as the University of Florida, and the Florida State Collection of Arthropods, were also added. Other collections, not only from Florida, but other States, as well as from other regions of the world have followed. Those include the very important addition of the William and Nadine McGuire collection. Today, the McGuire Center has one of the world's largest collections of Lepidoptera, with over 10 million specimens of butterflies and moths, complemented by a very important and thorough collection of literature related to Lepidoptera and associated fields (MGCL 2023a, b).

Besides many vouchers associated with a large number of publications, the MGCL houses over 1,360 primary types of Lepidoptera, as well as allotypes and paratypes, many from the times in which Lee D. and Jacqueline Y. Miller were leading researchers at the Allyn Museum (Miller, 2010). Since its foundation, the MGCL has been working steadily to form one of the largest Lepidoptera molecular collections in the world (Cho *et al.*, 2016).

Among its many Lepidoptera holdings, we find the Castniidae collection. Research associated with this group started early in the 1970s while many of the specimens were at the Allyn Museum and has continued over the next decades (Miller, 1972, 1976, 1980, 1986, 1995, 2007, 2008; Miller & Sourakov, 2009; Miller *et al.*, 2012; González *et al.*, 2019). Some of those references are somehow a pillar to the growing number of research publications in the group in the latest years. Several publications have dealt with Castniidae types from a few museums, providing light not only on the relevance of such museums and collections but clarifying information on the whereabouts, characteristics, and even the systematics and biology or ecology of such specimens (Mielke & Casagrande, 1986, 1988a, 1988b, 1999; Lamas, 1995b; Rodríguez-Ramírez *et al.*, 2020).

### Material and methods

The Castniidae specimens preserved in the Lepidoptera collection at the McGuire Center for Lepidoptera & Biodiversity (MGCL) were revised, studied, cataloged, and photographed.

Information for each taxon includes original name, author, year, including sex, and original

label information and publication where described. The different labels included with each specimen are indicated by a slash “/”. If the first label indicates the taxon described and the author's name, it is not included because such information is already presented for each taxon. A semi-colon “;” separates the set of labels from one specimen to the next. Also included is the type status, and type locality, as well as the known distribution of each species. Current status, including references related to status changes, are also provided. Additions to the label information might be added in brackets. Any remarks are also included in brackets. Some general comments are also provided.

Taxa are listed alphabetically. The classification mainly follows Moraes & Duarte (2014), with modifications based on Miller (1995, 2008), Lamas (1995a), García Díaz & Turrent Carriles, (2022), González *et al.* (2019), Worthy *et al.* (2019), and Costa *et al.* (2023).

All images were taken using a StackShot automated focus stacking macro rail with a camera Canon EOS 7D and a Canon EF-S 60 mm f/2.8 USM Macro lens.

References to each publication associated with the species discussed can be found in the References section.

Abbreviations of collections where type material of the species mentioned herein are deposited (other than in the MGCL) are as follows:

**AME** Allyn Museum of Entomology, Sarasota, Florida, USA (now in MGCL).

**AMNH** American Museum of Natural History, New York, N.Y., USA.

**CADF** Alberto Díaz Francés Collection, Mexico, D.F., Mexico.

**CMG** Marilou Gadou Collection, El Limón, Aragua (now in MIZA).

**GBSC** Gordon B. Small Collection, USA (now in NMNH).

**INIA-CENIAP** Entomology Collection, National Institute of Agricultural Research, Maracay, Aragua, Venezuela.

**MBC** Michael Büche Collection, Tingo María, Peru.

**MIZA** Museo del Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela, Maracay, Aragua, Venezuela.

**MJSC** Mark J. Simon Collection, Gainesville, Florida, USA.

**NHMUK** Natural History Museum, London, UK.

**NMNH** National Museum of Natural History, Washington, D.C., USA.

**UGCA** Georgia Museum of Natural History, University of Georgia Collection of Arthropods, Athens, Georgia, USA.

## Type specimens of Castniidae in the MGCL

### *Athis axaqua* González and Fernández Yépez, 1992 (Plate 1, figs. A & B)

**Type material (label information):** PARATYPE: ♂, Venezuela, Aragua, El Limón, 450 m, 10-x-1953, R. Bandres, ex larva en Bromeliaceae/Paratype / UF FLMNH MGCL 1138177.

**Type locality:** Gardens of the Agricultural Zoology Institute, Agronomy School, Central University of Venezuela (Instituto de Zoología Agrícola, Facultad de Agronomía, Universidad Central de Venezuela) and the Entomology Department of National Center of Agricultural Research CENIAP (now National Institute of Agricultural Research INIA – CENIAP), entrance of El Limón, Maracay, Venezuela.

**Current Status:** Valid species.

**Distribution:** The species is known from the southern slopes of the Northern-Central Cordillera of Venezuela, and other regions in Northern Venezuela.

**Other Type material:** Holotype, allotype, and five paratypes are housed at the entomological collection “Francisco Fernández Yépez” of the Agricultural Zoology Institute, Agronomy School (MIZA), Maracay, Aragua; Five paratypes are housed in the entomology collection of the National Institute of Agricultural Research (INIA – CENIAP), Maracay, Aragua; There is one paratype in each of the following collections: AMNH, CMG, NHMUK, NMNH, UGCA (González & Fernández Yépez, 1992)

**Comments:** Lamas (1995a) considers it as a subspecies of *A. palatinus* (Cramer). They are certainly closely related, but morphology, including genitalia comparison, has been used to separate them (González, 2004).

### *Castnia allyni* J.Y. Miller, 1976 (Plate 1, figs. C & D)

**Type material (label information):** PARATYPE: ♂, [Brasil], Paraná, Iguassu, 28.ix.[19]21, UF FLMNH MGCL 1138193.

**Type locality:** Iguassu, Paraná, Brazil.

**Current Status:** Synonym of *Synpalamides*

*rubrophalaris* (Houlbert, 1917) (Lamas 1995a); previously considered a synonym of *S. rubrophalaris gristi* (Joicey & Talbot, 1925) (Miller, 1995).

**Distribution:** Even though the material was described from Paraná, Brazil, the species *S. rubrophalaris* has been reported from Brazil, Colombia, Venezuela, and Paraguay.

**Other Type material:** Holotype and two paratypes are in the NHMUK.

**Comments:** Even though Miller (1976) describes the species in *Castnia* s.l., she mentions that “the forewing pattern and genitalia place this new species in the basically Brazilian (sic) complex *Synpalamides*.”

### *Castnia escalantei* J.Y. Miller, 1976 (Plate 1, figs. E & F)

**Type material (label information):** HOLOTYPE: ♂, Mexico, Guerr[er]o, Acahuizotla, viii-1978, A. Diaz Frances / A.C. Allyn Acc. 1978-40/ Slide No M-2543 Jacqueline Y. Miller / MGCL/FLMNH Specimen no. 47923 / UF FLMNH MGCL 1138166; PARATYPES: ♀, [Mexico], G[ue]r[rer]o, Acahuizotla, ix.[19]63 / A.C. Allyn Acc. 1973-48 / MGCL/FLMNH Specimen no. 43202 / UF FLMNH MGCL 1138195; ♀, [Mexico], G[ue]r[rer]o, Acahuizotla, 5.[19]58 / A.C. Allyn Acc. 1973-48 / Slide No M-3028 Jacqueline Y. Miller / Slide No M-3063-0 legmount Jacqueline Y. Miller / MGCL/FLMNH Specimen no. 43204 / UF FLMNH MGCL 1138196; ♀, [Mexico], G[ue]r[rer]o, Acahuizotla, 5.[19]58 / A.C. Allyn Acc. 1973-48, 26 / MGCL/FLMNH Specimen no. 43205 / UF FLMNH MGCL 1138197; ♂, K.I. Wilson / Slide No. M-3066-0 legmount Jacqueline Y. Miller / DNA voucher LEP-79405 / UF FLMNH MGCL 1097699 / MGCL/FLMNH Specimen no. 43203 / UF FLMNH MGCL 1138201.

**Type locality:** Acahuizotla, Guerrero. However, the type material included specimens found in Mexcala, and an area between Río Balsas to Iguala, Guerrero, and Rancho Viejo and Tepoztlán, Guerrero.

**Current status:** Synonym of *Escalantiana escalantei* (J.Y. Miller, 2019) (González *et al.*, 2019). Miller (1986) provided the supportive documentation for the description of the new genus *Escalantiana*, which was finally described in 2019, and included *E. escalantei* (J.Y. Miller, 1976), *E. chelone* (Hopffer, 1857) and *E. estherae* (= *Mexicastnia estherae*) (J.Y. Miller, 1976) (González *et al.*, 2019).

**Distribution:** States of Chihuahua, Guerrero, Jalisco, México, Morelos, and Puebla, Mexico

(Miller, 1976; García Díaz & Turrent Carriles, 2023).

**Other type material:** Two paratypes were deposited in each the CADF, and the AMNH; one each in the IBUNAM and the NHMUK (Miller, 1976).

**Comments:** Miller (1976) mentions that "... it is obvious that the two species, *escalantei*, and *chelone*, are close relatives, ..." Later, based on their similitudes, she proposes that *escalantei*, *chelone*, and *estherae* should be included in *Escalantiana* (Miller, 1986). This genus was definitively established in 2019 (González *et al.*, 2019).

***Castnia estherae* J.Y. Miller, 1976**  
(Plate 1, figs. G & H)

**Type material (label information):** HOLOTYPE: ♀, [Mexico], Mich[oacán], Purúa, iv-13-[19]65/Slide No 3040 Jacqueline Y. Miller / MGCL/FLMNH Specimen no. 47924; UF FLMNH MGCL 1138165.

**Type locality:** Purúa, Michoacán, Mexico.

**Current status:** Synonym of *Mexicastnia estherae* (J.Y. Miller, 1976) (García Díaz & Turrent Carriles, 2022).

**Distribution:** Guerrero and Michoacán, Mexico.

**Other type material:** Described from only one specimen.

**Comments:** Although the species was originally associated with *E. escalantei* and *E. chelone*, morphological and genitalic differences were enough to separate it from them and even place it in a newly described genus (González *et al.*, 2019, García Díaz & Turrent Carriles, 2022).

***Castnia fernandesi* González, 1992**  
(Plate 1, figs. I & J)

**Type material (label information):** [Allotype] ♀, Venezuela, [Amazonas State], Mt. Duida, 31-i-1929 / Ac. 29500 Tate No 661 / genitalia vial M-7919 Jacqueline Y. Miller / Slide No M-7118 ♀ append. Jacqueline Y. Miller / UF FLMNH MGCL 1138175.

**Type locality:** Amazonas State, southwestern Pantepui, Venezuela.

**Current status:** Synonym of *Zegara fernandesi* (González, 1992) (Miller, 2008; Costa *et al.*, 2023).

**Other type material:** The Holotype and one paratype are housed in MIZA.

**Distribution:** Western Pantepui and surrounding lowland forests of Amazonas State, Venezuela.

**Comments:** Moraes & Duarte (2014) place the species in the genus *Prometheus*, however, based on research in preparation, it is here placed in the genus *Zegara* as established by Miller (2008). Type specimens were collected from two different tepuis, the author originally thought they were visitors from the lowland forest (González, 2005; Costa *et al.*, 2023). However, subsequent findings in at least three tepuis in Amazonas state, Venezuela, corroborate that this is a western Pantepui species (Costa *et al.*, 2023).

***Castnia flavimaculata* J.Y. Miller, 1972**  
(Plate 2, figs. A & B)

**Type material (label information):** HOLOTYPE: ♂, Mexico, Morelos, Tepoztlán, vi. 1972 A. Diaz Frances / A.C. Allyn Acc. 1972-50 / MGCL/FLMNH Specimen no. 47925 / UF FLMNH MGCL 1138164; PARATYPES: ♂, Mexico, Morelos, Jul[y] [19]66 A. D[íaz] F[rancés] / A.C. Allyn Acc. 1969-20 / Slide No. M-2341 Jacqueline Y. Miller / Allyn Museum photo No. 091872 A 1-2 / MGCL/FLMNH Specimen no. 43322 / UF FLMNH MGCL 1138216; ♂, Mexico, Morelos, Tepoztlán, 15.v.1965 A. Diaz Frances / A.C. Allyn Acc. 1972-53 / MGCL/FLMNH Specimen no. 43323 / UF FLMNH MGCL 1138217; ♂, Mexico, Morelos, Tepoztlán, vi.1966 A. Diaz Frances / A.C. Allyn Acc. 1972-53 / MGCL/FLMNH Specimen no. 43324 / UF FLMNH MGCL 1138218.

**Type locality:** Tepoztlán, Morelos, Mexico. Several paratypes were also collected in Acahuizotla, Guerrero, Mexico.

**Current status:** Synonym of *Athis flavimaculata* (J.Y. Miller, 1976) (Miller, 1995; Lamas, 1995a).

**Distribution:** Mexican States of Guerrero, Jalisco, México, Michoacán, and Morelos.

**Other type material:** Nine male and two female paratypes were deposited in CADF (Miller, 1976)

**Comments:** All type specimens were collected by Alberto Díaz Francés. According to Miller (1972), he collected "a number of these specimens ... mostly from northern Morelos, between Mexico City and Cuernavaca. Apparently, this species lives along the escarpment in this area."

***Castnia inca dincadu* J.Y. Miller, 1972**  
(Plate 2, figs. C & D)

**Type material (label information):** HOLOTYPE: ♂, [Panama]. Canal Zone, Piña, 23.v.1970. H. L. King / A.C. Allyn Acc. 1970-45 / Allyn Museum Photo No091872 A, 3-4 / Slide No M-2227, ♂



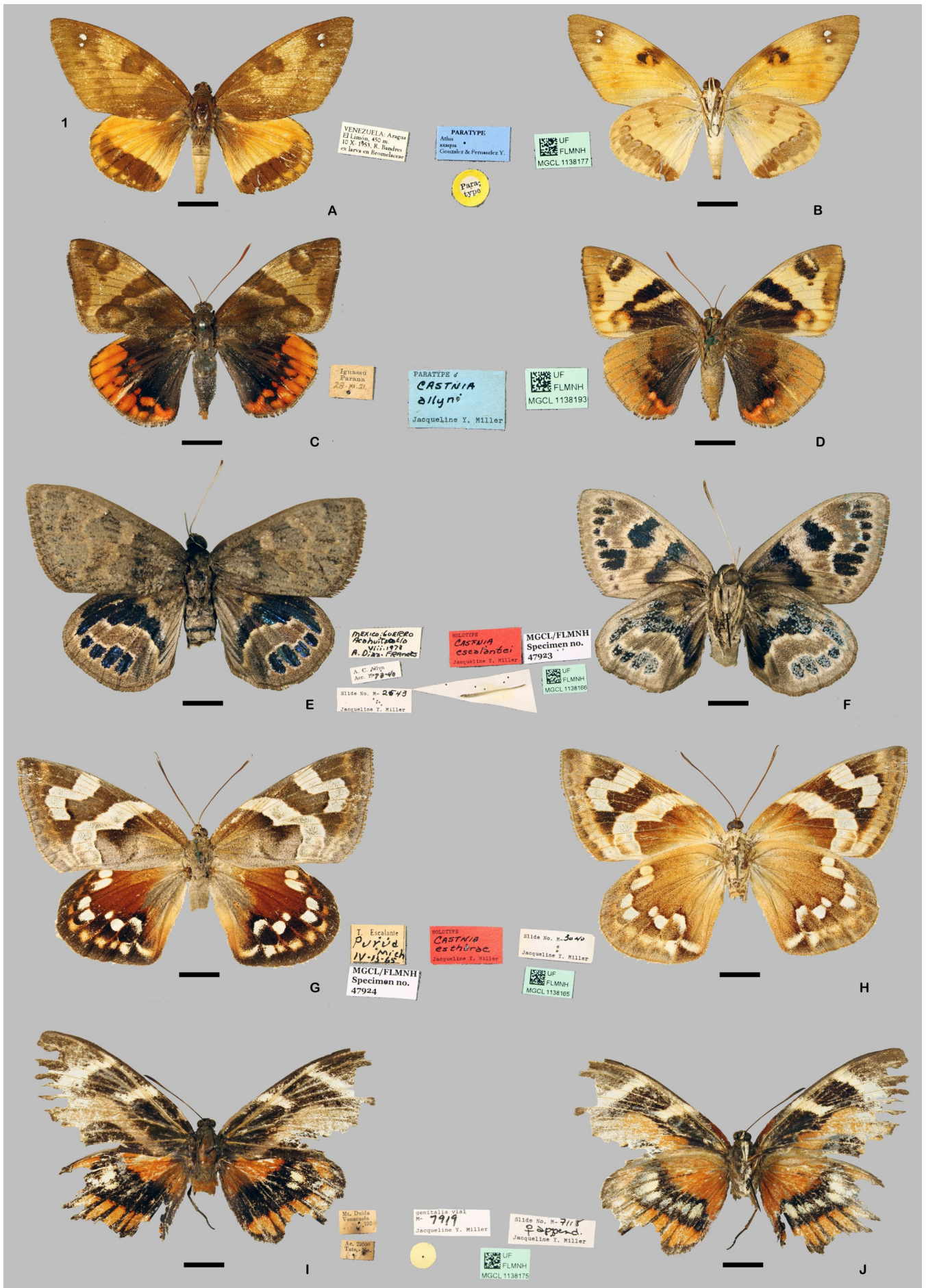


Plate 1. Figs. A & B. ♂, *Athis axaqua*, Venezuela (Paratype: *Athis axaqua*); Figs. C & D. ♂, *Synalamides rubrophalaris*, Brazil (Paratype: *Castnia allyni*); Figs. E & F. ♂, *Escalantiana escalantei*, Mexico (Holotype: *Castnia escalantei*); Figs. G & H. ♀, *Mexicastnia estherae*, Mexico (Holotype: *Castnia estherae*); Figs. I & J. ♀, *Zegara fernandesi*, Venezuela (Allotype: *Castnia fernandesi*).

genitalia, Jacqueline Y. Miller / MGCL/FLMNH Specimen N° 47926 / UF FLMNH MGCL 1138163; PARATYPES: ♂, [Panama]. Canal Zone, Piña, 23.v.1970. H. L. King / A.C. Allyn Acc. 1970-45 / Slide No M-2228, ♂ genitalia Jacqueline Y. Miller / UF FLMNH MGCL 1138219; ♂, [Panama], Canal Zone, Piña, 23.v.1970. H. L. King / A.C. Allyn Acc. 1970-45 / Slide No M-2346 Jacqueline Y. Miller / UF FLMNH MGCL 1138220; ♂, [Panama]. Canal Zone, Piña, 23.v.1970. H. L. King / A.C. Allyn Acc. 1970-45 / UF FLMNH MGCL 1138221; ♂, [Panama]. Canal Zone, Piña, 23.v.1970. H. L. King / A.C. Allyn Acc. 1970-45 / UF FLMNH MGCL 1138222; ♂, [Panama]. Canal Zone, Piña, 23.v.1970. H. L. King, A.C. Allyn Acc. 1970-45, UF FLMNH MGCL 1138223.

**Type locality:** Piña, Canal Zone, Panama.

**Current status:** Synonym of *Athis inca dincadu* (J.Y. Miller, 1972) (Miller, 1995; Lamas, 1995a).

**Distribution:** Canal Zone, Panama.

**Other type material:** None.

**Comments:** This is a quite distinctive subspecies within the *A. inca* complex, and remarkably, all type specimens were collected in a single day (Miller, 1972).

***Insigniicastnia taisae* J.Y. Miller, 2007**  
(Plate 2, figs. E & F)

**Type material (label information):** HOLOTYPE: ♂, Ecuador, Esm[erald]as, San Lorenzo, 150 m, ii-[20]06 / M. Simon colln. MGCL Accession #2006-8 / MGCL/FLMNH Specimen no. 47982 / UF FLMNH MGCL 1138162; PARATYPES: ♂, Ecuador, Esm[erald]as, San Lorenzo, 150 m, ii-[20]06 / M. Simon colln. MGCL Accession #2006-8 / UF FLMNH MCL 1138176; ♂, Ecuador, Esm[erald]as, San Lorenzo, 150 m, ii-[20]06 / M. Simon colln. MGCL Accession #2006-8 / UF FLMNH MGCL 1097611 / DNA voucher LEP-79396 / UF FLMNH MCL 1138210.

**Type locality:** San Francisco, 26 km. north of the road San Lorenzo-Ibarra, northern Esmeraldas Province, Ecuador at 150 m above sea level.

**Current status:** Synonym of *Insigniicastnia bogota* (Strand, 1912) (Worthy *et al.*, 2019)

**Distribution:** Southern Colombia to Esmeraldas province, Ecuador.

**Other type material:** Four paratypes are in MJSC.

**Comments:** Strand (1912) described *Castnia bogota* (= *I. bogota*) from a single male in Niepelt's collection, from an unknown site in

Southern Colombia, all other known specimens come from Esmeraldas (Worthy *et al.*, 2019). The type material was described based only on males, and their collector "collected representative specimens over two years in the hope ... to obtain a female" which had not happened by the time of the description (Miller, 2007). They were quite distinctive, that were placed in the new genus *Insigniicastnia* (Miller, 2007). Years later two females of the species, quite different from the males, were found and described (Worthy *et al.*, 2019).

***Mirocastnia smalli* J.Y. Miller, 1980**  
(Plate 2, figs. G, H, I & J)

**Type material (label information):** HOLOTYPE: ♂, Panama, Panama, Cerro Jefe, ca. 900m. iii-11-1977, G.B. Small / 111078 6,7 / Gordon Small Collection / MGCL/FLMNH Specimen no. 47927 / UF FLMNH MGCL 1138161; PARATYPES: ♀, Panama, P[ana]ma, Cerro Campana, 2500', 2July[19]70 Coll. G. B. Small / 111078 8,9 / Gordon R. Small Collection / Allyn Museum photo No. 091076-2/3 / genitalia vial no. M-3640 Jacqueline Y. Miller / UF FLMNH MGCL 1138199; ♀, Panama, Panama, Cerro Jefe, 900m, 11.iii.1977 G.B. Small / genitalia vial no. M-3802 Jacqueline Y. Miller / Allyn Museum Acc. 1977-14 / UF FLMNH MGCL 1138203; ♀, Panama, Panama, Cerro Jefe, 900m, 13.v.1977 G.B. Small / genitalia vial no. M-3995 Jacqueline Y. Miller / Allyn Museum Acc. 1977-14 / UF FLMNH MGCL 1138204; ♀, Panama, Panama, Cerro Jefe, ca. 900m iii-14-1977, in cop.[ula], G.B. Small / Gordon Small Collection / UF FLMNH MGCL 1138208; ♂, Panamá, Chiriquí, Cerro Colorado, 1450m. 9.viii.1979 G.B. Small/ A.C. Allyn Acc. 1972-49 /UF FLMNH MGCL 1138198; ♂, Panama, Panama, Cerro Jefe, 900m, iii-22-1977 G.B. Small / Gordon Small Collection / UF FLMNH MGCL 1138202; ♂, Panama, Cerro Jefe, 21.v.1977, G.B. Small / genitalia vial no. M-3803 Jacqueline Y. Miller / Slide no. M-3951 append. Jacqueline Y. Miller/ Allyn Museum Acc. 1977-15, UF FLMNH MGCL 1138205; ♂, Panamá, Chiriquí, Cerro Colorado, 1450m. 26.vi.1979, G.B. Small/ UF FLMNH MGCL 1138206; ♂, Panamá, Chiriquí, Cerro Colorado, 1450m. 10.viii.1979, G.B. Small/ UF FLMNH MGCL 1138207; ♂, Panamá, Chiriquí, Cerro Colorado, 1450m. 10.viii.1979, G.B. Small/ DNA voucher LEP-79424 / UF FLMNH MGCL 1097963 / UF FLMNH MGCL 1138209.

**Type locality:** Area near the top of Cerro Jefe (980m.), a semi-cloud forest habitat, northeast of Panama City, Panama (Miller, 1980).



**Current status:** Valid species.

**Distribution:** Cerro jefe, northeast of Panama City, Panama.

**Other type material:** Six male and three female paratypes are deposited in GBSC.

**Comments:** Three quite close species distributed from Central America to South America, are currently in the genus *Mirocastnia*, explicitly proposed for them (Miller, 1980).

***Zegara polymorpha* J.Y. Miller 2008**  
(Plate 2, figs. K, L, M & N)

**Type material (label information):** HOLOTYPE: ♂, Colombia, Boyacá, Otanche, 700-1000 m, x-[20]07 / M. Simon colln. MGCL Accession #2008-35 / leg removed for DNA J.Y. Miller, Sample 0102 / genitalia vial M-7016 Jacqueline Y. Miller / genitalia vial M-8009, Jacqueline Y. Miller / MGCL/FLMNH Specimen no. 136012 / UF FLMNH MGCL 1138160; PARATYPES: ♀, Colombia, Boyacá, Otanche, 700-1000 m, x-[20]07 / genitalia vial M-7920 Jacqueline Y. Miller / genitalia vial M-8008 Jacqueline Y. Miller / J.Y. Miller colln., MGCL Accession #2008-34 / UF FLMNH MGCL 1138192; ♀, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138214; ♂, Colombia, Boyacá, Otanche, 700-1000 m, ii-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138178; ♂, Colombia, Boyacá, Otanche, 700-1000 m, x-[20]07 / M. Simon colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138179; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / genitalia vial M-8010 Jacqueline Y. Miller / genitalia vial M-8016 Jacqueline Y. Miller / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138180; ♂, Colombia, Boyacá, Otanche, 700-1000 m, ii-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138181; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138182; ♂, Colombia, Boyacá, Otanche, 700-1000 m, x-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138183; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138184; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / J.Y. Miller colln., MGCL Accession #2008-35, UF FLMNH MGCL 1138185; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08, J.Y. Miller colln., MGCL Accession #2008-

-34, UF FLMNH MGCL 1138186; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / J.Y. Miller colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138187; ♂, Colombia, Boyacá, Otanche, 700-1000 m, x-[20]07 / J.Y. Miller colln., MGCL Accession #2008-35 / UF FLMNH MGCL 1138188; ♂, Colombia, Boyacá, Otanche, 700-1000 m, x-[20]07 / J.Y. Miller colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138189; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 /genitalia vial M-8011 Jacqueline Y. Miller / J.Y. Miller colln. MGCL Accession #2008-34 / UF FLMNH MGCL 1138190; ♀, Colombia, Boyacá, Otanche, 700-1000 m, xii-[20]07 / M. Simon colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138191; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / M. Simon colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138211; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / M. Simon colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138212; ♂, Colombia, Boyacá, Otanche, 700-1000 m, xii-[20]07, M. Simon colln. MGCL Accession #2008-35 / UF FLMNH MGCL 1138213; ♂, Colombia, Boyacá, Otanche, 700-1000 m, vi-[20]08 / J.Y. Miller colln. MGCL Accession #2008-34 /UF FLMNH MGCL 1097829 / DNA voucher LEP-79411 / UF FLMNH MGCL 1138215.

**Type locality:** Otanche, Boyacá, Colombia.

**Current status:** Valid species.

**Distribution:** Otanche region, Boyacá, Colombia

**Other type material:** Three male and two female paratypes are deposited in MJSC. Five male and four female paratypes are in MBC.

**Comments:** This species, as its name indicates, is highly polymorphic. It appears to be closely related to *Z. fernandezi* (Miller, 2008; Costa *et al.*, 2023). Even though both species (*polymorpha* and *fernandezi*) share characteristics with other species in the genus, they are so distinctive that further analysis might end up separating them as a different group.

## Conclusion

Museums play a crucial role in studying biodiversity through their collections of biological specimens. Advancements in technology have helped museums overcome the decline in the number of specimens being added to these collections. The McGuire Center for Lepidoptera and Biodiversity has an extensive collection of butterfly and moth specimens. These include a significant Castniidae collection that contains Holotypes

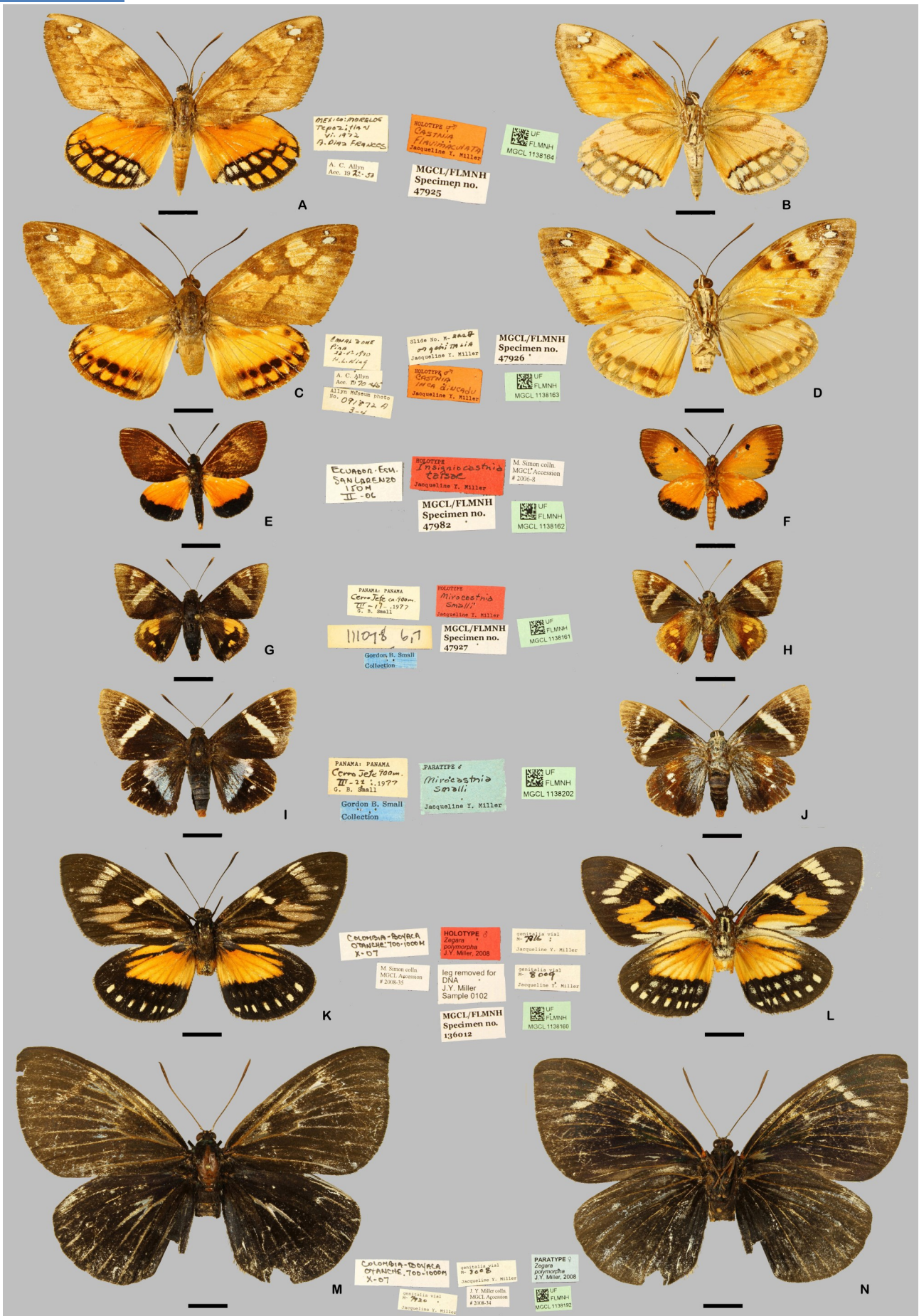


Plate 2. Figs. A & B. ♂, *Athis flavimaculata*, Mexico (Holotype: *Castnia flavimaculata*); Figs. C & D. ♂, *Athis inca dincadu*, Panama (Holotype: *Castnia inca dincadu*); Figs. E & F. ♀, *Insigniicastnia bogota*, Ecuador (Holotype: *Insigniicastnia taisae*); Figs. G & H. ♂, *Mirocastnia smalli*, Panama (Holotype: *Mirocastnia smalli*); Figs. I & J. ♀, *Mirocastnia smalli*, Panama (Paratype: *Mirocastnia smalli*) (Note: a ♂ symbol appears in the blue label, but this specimen is a female); Figs. K & L. ♂, *Zegara polymorpha*, Colombia (Holotype: *Zegara polymorpha*); Figs. M & N. ♀, *Zegara polymorpha*, Colombia (Paratype: *Zegara polymorpha*).



and Paratypes of ten taxa from this family. They are all presented herein, with comments and details the types housed in the MGCL and on origin, distribution and other relevant information.

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## References

- BUERKI S. & BAKER W.J., 2015. Collections-based research in the genomic era. *Biological Journal of the Linnean Society*, 117(1): 5-10. <https://doi.org/10.1111/bij.12721>
- CHO S., EPSTEIN S. W., MITTER K., HAMILTON C. A., PLOTKIN D., MITTER C. & KAWAHARA A.Y., 2015. Preserving and vouchering butterflies and moths for large-scale museum-based molecular research. *PeerJ*, 4: e2160 <https://doi.org/10.7717/peerj.2160>.
- COSTA M., GONZÁLEZ J.M., VILORIA A.L., NEILD A.F.E., CAMICO H., BENMESBAH M., ATTAL S. & WORTHY R., 2023. Lepidoptera from the Pantepui. Part XIII. Notes on *Zegara fernandezi* (González, 1992) (Castniidae Castniinae). *Antenor*, 10(1): 6-20.
- DREW J.A., MOREAU C.S. & STIASSNY M.L.J., 2017. Digitization of museum collections holds the potential to enhance researcher diversity. *Nature Ecology & Evolution*, 1: 1789- 1790. <https://doi.org/10.1038/s41559-017-0401-6>
- GARCÍA DÍAZ J.J. & TURRENT CARRILES A., 2022. Descripción de una nueva subespecie de *Escalantiana chelone* (Hopffer, 1856) y un nuevo género de Castniinae (Lepidoptera: Castniidae). *Revista de la Sociedad Mexicana de Lepidopterología, nueva serie*, 9(2): 113-142.
- GARCÍA DÍAZ J.J. & TURRENT CARRILES A., 2023. First record of *Escalantiana escalantei* (Miller, 1976) for the State of Mexico, Mexico (Lepidoptera: Castniidae: Castniinae). *Dugesiana*, 30(1): 51-55.
- GONZÁLEZ J. M., 2004. Castniinae (Lepidoptera: Castniidae) from Venezuela. VI. The genus *Athis*. Diagnosis and Comments. *Caribbean Journal of Science*, 40(3): 408-413.
- GONZÁLEZ J. M., 2005. *Los insectos de los tepuyes*. 137-139. In: Michelangeli, A., Tepuy: colosos de la Tierra. Fundación Terramar, Altholito C.A. publ., Caracas.
- GONZÁLEZ J. M. & FERNÁNDEZ YÉPEZ F., 1992. Descripción de una nueva especie de *Athis Hübner* de Venezuela (Lepidoptera: Castniidae: Castniinae). *Memoria de la Sociedad de Ciencias Naturales La Salle*, 52(137): 5-10.
- LAMAS G., 1995a. A critical review of J. Y. Miller's checklist of the Neotropical Castniidae (Lepidoptera). *Revista Peruana de Entomología*, 37: 73-87.
- LAMAS G., 1995b. Tipos de Castniidae en el Naturhistorisches Museum, de Viena (Insecta: Lepidoptera). *SHILAP Revista de Lepidopterología*, 23(91): 247-249.
- MGCL, 2023a. McGuire Center for Lepidoptera & Biodiversity. Florida Museum. Retrieved June 19, 2023, from <https://www.floridamuseum.ufl.edu/mcguire/collection/overview/>
- MGCL, 2023b. McGuire Center for Lepidoptera & Biodiversity. Florida Museum. Retrieved June 19, 2023, from <https://www.floridamuseum.ufl.edu/science/donation-of-lepidoptera-collection-will-boost-biodiversity-research/>
- MIELKE O.H.H. & CASAGRANDE M.M., 1986. Sobre os tipos de Lepidoptera depositados em Museu Brasileiros. VI. Castniidae, Cossidae, Sphingidae e Noctuidae, descritos por Benedito Raymundo [Da Silva]. *Revista Brasileira de Entomologia*, 30(2): 245-249.

- MIELKE O.H.H. & CASAGRANDE M.M., 1988a. Sobre os tipos de Lepidoptera depositados em Museus Brasileiros. XVI. HesperIIDae, Satyridae, Lycaenidae, Riodinidae, Castniidae e Arctiidae descritos por Roberto Spitz. *Revista Brasileira de Entomologia*, 32(1): 3-6.
- MIELKE O.H.H. & CASAGRANDE M.M., 1988b. Sobre os tipos de Lepidoptera depositados em Museus Brasileiros. XVIII. Nymphalidae descritos por A.H. Fassl e Nymphalidae e Castniidae por J. Roeber. *Revista Brasileira de Entomologia*, 32(2): 107-109.
- MIELKE O.H.H. & CASAGRANDE M.M., 1999. Sobre os tipos de Lepidoptera depositados em Museus Brasileiros. XXV. Nymphalidae (Charaxinae) descrito por Mário Rosa (suplemento); Zygaenidae por A.M. da Costa Lima; Saturniidae (Hemileucinae) por A. Mabilde (suplemento), Castniidae por L. Pfeiffer e Arctiidae (Pericopinae) por Oscar Monte. *Revista Brasileira de Zoologia*, 16(Supl. 1): 227-231.
- MILLER J.Y., 1972. Review of the Central American *Castnia inca* complex (Castniidae). *Bulletin of the Allyn Museum*, 6: 1-13.
- MILLER J.Y., 1976. Studies in the Castniidae. II. Description of three species of *Castnia*, s.l. *Bulletin of the Allyn Museum*, 34: 1-13.
- MILLER J.Y., 1980. Studies in the Castniidae. III. *Mirocastnia*. *Bulletin of the Allyn Museum*, 60: 1-15.
- MILLER J.Y., 1986. *The taxonomy, phylogeny, and zoogeography of the Neotropical moth subfamily Castniinae (Lepidoptera, Castnioidea: Castniidae)*. Ph. D. Thesis, University of Florida, Gainesville, Florida, 571 pp.
- MILLER J.Y., 1995. *Castniidae*. 133-137, 176-177. In: Checklist: Part 2. Hyblaeoidea – Pyraloidea – Tortricoidea. In: Heppner, J.B., Atlas of Neotropical Lepidoptera. Association for tropical Lepidoptera & Scientific Publishers, Gainesville, Florida, U. S. A.
- MILLER J.Y., 2007. Studies in the Castniidae. IV. Description of a new genus, *Insigniocastnia*. *Bulletin of the Allyn Museum*, 145: 1-7.
- MILLER J.Y., 2008. Studies in the Castniidae. V. Description of a new species of *Zegara*. *Bulletin of the Allyn Museum*, 160: 1-13.
- MILLER J.Y., 2010. Lee Denmark Miller (1935-2008): His life and a brief history of the Allyn Museum of Entomology. *Journal of the Lepidopterists' Society*, 64(1): 38-49.
- MILLER J.Y., MATTHEWS D.L., WARREN A.D., SOLÍS M.A., HARVEY D.J., GENTILI-POOLE P., LEHMAN R., EMMEL, T.C. & COVELL C.V. JR., 2012. An Annotated List of the Lepidoptera of Honduras. *Insecta Mundi*, 205: 1-72.
- MILLER J.Y. & SOURAKOV A., 2009. Some observations on *Amauta cacica procera* (Boisduval) (Castniidae: Castniinae) in Costa Rica. *Tropical Lepidoptera Research*, 19(2), 113-114.
- MORAES S. & DUARTE M., 2014. Phylogeny of Neotropical Castniinae (Lepidoptera: Cossoidea: Castniidae): testing the hypothesis of the mimics as a monophyletic group and implications for the arrangement of the genera. *Zoological Journal of the Linnean Society*, 170(2), 362-399. <https://doi.org/10.1111/zoj.12102>
- RODRÍGUEZ-RAMÍREZ J., RÍOS S.D., MORAES S.S., PENCO F.C. & GONZÁLEZ J.M., 2020. Catálogo de los Castniidae (Lepidoptera) del Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires: descripción de tipos y notas generales e históricas. *Revista del Museo Argentino de Ciencias Naturales, nueva serie*, 22 (2): 173-190.
- ROHWER V.G., ROHWER Y. & DILLMAN C.B., 2022. Declining growth of natural history collections fails future generations. *PLoS Biology*, 20(4): e3001613. <https://doi.org/10.1371/journal.pbio.3001613>
- STRAND E., 1913. *Gattung: Castnia F.*: 7-17. In: Seitz, A. (Ed.), Die Gross-Schmetterlinge der Erde. Vol. 6. A. Kernen, Stuttgart.
- WORTHY R., GONZÁLEZ J.M. & RÍOS S.D., 2019. A review of the genus *Insigniocastnia* J.Y. Miller, 2007 (Lepidoptera: Castniidae) with notes on *Castnia amalthaea* H. Druce, 1890. *Zootaxa*, 4550(2): 277-288.