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TROPICAL LEPIDOPTERA RESEARCH

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Front Cover Photo - *Turuptiana obliqua* (Erebidae, Arctiinae), from Costa Rica. Photo courtesy Dan Janzen.
Back Cover Photo - *Munona robpuschendorfi* **sp. n.** (Erebidae, Arctiinae), from Costa Rica. Photo courtesy Dan Janzen.

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17 new species hiding in 10 long-named gaudy tropical moths (Lepidoptera: Erebidae, Arctiinae)

Bernardo A. Espinoza[1], Daniel H. Janzen[2] and Winnie Hallwachs[3]

[1] Departamento de Historia Natural, Museo Nacional de Costa Rica (MNCR), 749-1000, San José, Costa Rica. bespinoza@museocostarica.go.cr;
[2] Department of Biology, University of Pennsylvania, Philadelphia, PA 19104, USA. djanzen@sas.upenn.edu;
[3] Department of Biology, University of Pennsylvania, Philadelphia, PA 19104, USA. whallwac@sas.upenn.edu

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Abstract: Neotropical arctiine moths (Erebidae) are generally brilliantly colored and therefore believed to be aposematic, in light of the of the frequent occurrence of glands that produce unpleasant chemicals as a defense mechanism when attacked, and many species were described by the earliest taxonomists. They therefore hardly seem good candidates for the discovery of cryptic species. However, when we DNA barcoded all Arctiinae found to date by the Lepidoptera inventory of Área de Conservación Guanacaste (ACG) in northwestern Costa Rica, 17 additional new species were found in 9 genera, as follows (all authored by Espinoza): *Munona carolinepalmerae*, **sp. n.**, *Munona robpuschendorfi*, **sp. n.**, *Amaxia rocioecheverriae*, **sp. n.**, *Amaxia josealfredohernandezi*, **sp. n.**, *Amaxia alejandraloriae*, **sp. n.**, *Amaxia brendacasperae*, **sp. n.**, *Baritius angelagonzalezae*, **sp. n.**, *Baritius maribellealvarezae*, **sp. n.**, *Baritius martajimenezae*, **sp. n.**, *Pareuchaetes abbysmutnyae*, **sp. n.**, *Pareuchaetes georgegormani*, **sp. n.**, *Symphlebia janecheverriae*, **sp. n.**, *Kirrostola stevearonsoni*, **sp. n.**, *Pelochyta timrichi*, **sp. n.**, *Pelochyta amyeaderae*, **sp. n.**, *Ochrodota melaniamunozae*, **sp. n.**, *Turuptiana annesmithae*, **sp. n.**. These species were uncovered within 10 putative species collectively bearing species names for about 240 years. We recognize and describe these new species as part of an effort to provide greater taxonomic resolution to facilitate ecological, behavioral and microgeographic analyses of these conspicuous animals in support of their conservation in the wild.

Key words: Moths, caterpillars, biodiversity inventory

INTRODUCTION

Beginning in 1978, the first 26 years of biodiversity inventory of the Arctiinae (Erebidae) of Costa Rica were focused on morphology-based species-level identifications in the very species-rich and specimen-rich national collections developed at Instituto Nacional de Biodiversidad (INBio), and then transferred to Costa Rica's Museo Nacional in 2015. However, beginning in 2004, identifications have been complemented by DNA barcoding of reared adults and long series of specimens from Área de Conservación Guanacaste (ACG) in northwestern Costa Rica (http://www.acguanacaste.ac.cr). This new source of taxonomic information has allowed the definition of several groups of cryptic species hidden in this speciose subfamily of gaudy moths. Many of the common species of Arctiinae that were supposed to be "very well known" by workers on the group are in fact part of some of these complexes of cryptic species revealed initially by DNA barcoding, and then substantiated by more detailed morphological analysis than is usual in biodiversity inventory identification protocols.

The first ten cases of cryptic species discovered here were quite unexpected. In some of them, like *Munona*, a very small genus previously known only by its type-species *M. iridiscens*, Schaus, 1894, and in which we describe two new species, the only effective way to identify species is by comparative dissection of the genitalia (Figs. 7i-p), or, within ACG, by examining whether the moth is from rain forest or dry forest (as also occurs with *Symphlebia tessellata* and *S. janecheverriae*, n. sp.), or by their DNA barcodes. As well as the two newly described species, the supposedly well-known *M. iridiscens*, described by W. Schaus from Venezuela, also needs DNA barcoding and dissection to be reliably identified. All three species show no external phenotypic differences at all to correctly sort them apart, and series from different regions that have been determined as "*M. iridiscens*", in major collections such as the USNM and NHMUK, are probably mixed and will need to be studied to properly clarify true species diversity.

In other cases, we found external morphological characteristics that separate species, once we knew by their barcodes and their genitalia that they were different. For example, in *Turuptiana*, although we had enough elements to easily discriminate one species from the other, the main problem consisted of determining the identity of *T. obliqua* (Walker, 1869) described from "[C. America]" (Watson & Goodger, 1986) and more recently "Central or South America" (Vincent & Laguerre, 2014). The holotype specimen of *T. obliqua* is in such a very bad state of preservation (Fig. 11m) that dissection of the specimen was not possible, but morphological study as well as examination and dissection of more samples of this species deposited at the AMNH and NHMUK finally allowed us to confidently assign the name *T. obliqua* to one of our species and to describe *T. annesmithae*, sp. n.

As in the previous examples, *Pelochyta* species were particularly challenging to identify, since the genus is very complex and in need of a thorough revision. It contains 30 named species (Vincent & Laguerre, 2014), and potentially

a significant number of additional undescribed taxa that will likely be revealed when DNA barcodes can be extracted from more samples from different localities in the Americas. In this case, the study of phenotypically similar species allowed us to determine those which required examination in greater detail. Such cases were those where similarities in adult morphology between our species and described species suggested the existence of complexes of cryptic species, such as the "*Pelochyta affinis*" complex treated in this work. That complex includes *P. affinis*, Rothschild, 1909, described from Ecuador, and which is sufficiently morphologically distinct from others in this complex to make dissection of the type specimen (Figs 11a-c) unnecessary for confident identification. As further examples of cryptic species complexes, the type specimens of *P. umbrata*, Hampson, 1901, described from Bolivia, and *P. cinerea* Walker, 1855, described from Venezuela, were examined and dissected (Figs 11d-g, 11h-k) because of their similarity to Costa Rican species, and the genitalia of their respective types confirmed the differences found in the barcodes of the new Costa Rican species. Overall, the ten cases of cryptic species explored here represent only a small part of the large list of Costa Rican cryptic species that we have exposed by combining DNA barcoding with subsequent morphological and microgeographic data.

MATERIALS AND METHODS

The great bulk of the specimens examined for this paper come from the ongoing inventory of the Lepidoptera of Área de Conservación Guanacaste (ACG) through rearing wild-caught caterpillars and light-trapping adults (Janzen *et al.*, 2009; Janzen & Hallwachs, 2016), and also by comparison with samples collected by the Costa Rican national biodiversity inventory begun by INBio in 1989 and housed today in the Museo Nacional de Costa Rica. Photographs of adults and genitalia were taken with a Nikon CoolPix 4500, using a super-micro lens. The following type specimens, deposited at the NHMUK and relevant to this work, were dissected: *Amaxia apyga*, Hampson 1901, *Amaxia osmophora*, Hampson, 1901, *Halysidota grandis* (Rothschild, 1909), *Pelochyta cinerea* (Walker, 1855), *Pelochyta umbrata*, Hampson, 1901. Closely related species and other supplementary material in the respective genera, deposited at the MNCR, USNM and AMNH, were examined as part of this study. Genitalia were prepared following procedures detailed by Lafontaine (2004). Sequencing of the COI DNA barcoding gene region was carried out at the Canadian Center for DNA barcoding in the Biodiversity Institute of Ontario at the University of Guelph, Ontario, Canada. Resulting barcode sequences were aligned and downloaded from BOLD and a distance-tree analysis was performed using MEGA4 (Tamura *et al*., 2007) with the Neighbor-joining method and default parameters. Measurements of wing lengths were taken with a 6-inch stainlees steel digital caliper with fractional & decimal display. Some details of ACG natural history information can be accessed through the ACG Lepidoptera inventory web site (http://janzen.sas.upenn.edu/caterpillars/database.lasso). All localities of all samples collected inside and outside of ACG are listed in Appendix 1. DNA barcodes for all specimens from ACG, and from other localities in Costa Rica, listed in Appendix 1, are available in BOLD (http://www.boldsystems.org). Holotypes will be deposited in the Lepidoptera collections of MNCR-A, and representative paratype specimens will be deposited at USNM, NHMUK and MNHN.

Repository abbreviations

MNCR-A: Museo Nacional de Costa Rica, San José, Costa Rica (formerly the INBio collection in Santo Domingo de Heredia, Costa Rica)
USNM: National Museum of Natural History, Smithsonian Inst., Washington, D.C.
NHMUK: National History Museum, London, UK (historically BMNH)
MNHN: Muséum National d' Histoire Natural, Paris, France
CNC: Canadian National Collection of Insects, Ottawa, Canada

RESULTS

Munona iridescens complex.

Munona iridescens Schaus, 1894

TYPE LOCALITY: Venezuela, Aroa.
TYPE SPECIMEN: Lectotype male. (Watson, 1971, pl. 63b). Deposited USNM.
Type dissection: Arct. gen. slide no. AW361 (Watson, 1971, Pl. 194a,b).

Munona carolinepalmerae Espinoza, **sp. n.**

Figures 2e, 7a-d

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Alajuela Province, Sector Rincón Rain Forest, Estación Botarrama, Manta Loma, 200 m, 10/28/2008, H. Cambronero & F. Quesada, lat long 10.95897 -85.28527; Voucher 08-SRNP-107549, GenBank accession: JQ552763, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. This species is distinguished from *M. robpuschendorfi* **sp. n.** by the shape of its transtilla, which is strongly sclerotized, with lateral prominences covered by short and thick spines and by the juxta having two heavily sclerotized patches of short and thick spines on the posterior portion. It is distinguished from *Munona iridescens*, described by W. Schaus in 1894 from Aroa, Venezuela, by the patches of spines on the juxta, which are longer, grouped, and pointed, as well as the longer spines on the lateral prominences of the transtilla present in *M. iridescens*. The lectotype male of *M. iridescens* (Type No. 11097; Arctiidae genitalia slide no. AW361, deposited at the USNM), was examined several times by B. Espinoza between 1998 and 2007.

Description. Adult male (Fig. 2e). Forewing length 22.4-25.0 mm (n = 7). *Munona carolinepalmerae* has the head, thorax, abdomen and wings pale yellow, its labial palpi short, with the segments 1 and 2 spotted laterally with black and the distal segment very small and almost totally black; the antennae are bipectinate, with the flagellum yellow basally and pale yellow distally, and reaching only half the length of forewings (10.8 mm); the tegulae with a greyish yellow stripe; the eucoxae yellow; the forelegs with yellow femora and large bright dark brown distal patchs; midlegs and hindlegs with yellow on the

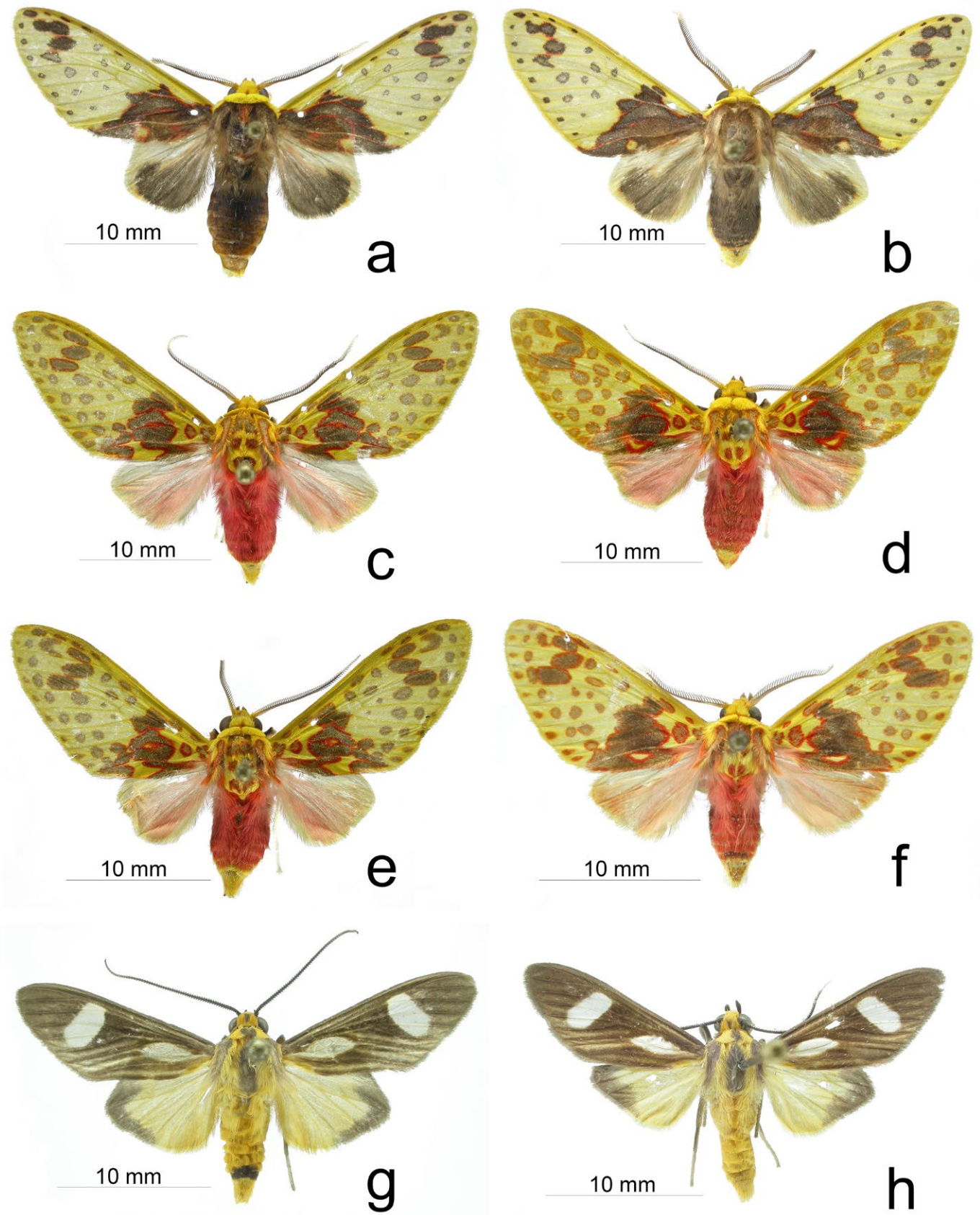

Figure 1a-h. a, *Amaxia apyga* Hampson, 1901, ♂, adult dorsal, 10-SRNP-112569, **b**, *Amaxia rocioecheverriae* sp. n., ♂, holotype, adult dorsal, 08-SRNP-102359, **c**, *Amaxia osmophora* Hampson, 1901, ♂, adult dorsal, 08-SRNP-101635, **d**, *Amaxia josealfredohernandezi* sp. n., ♂, holotype, adult dorsal, 09-SRNP-107029, **e**, *Amaxia alejandraloriae* sp. n., ♂, holotype, adult dorsal, 08-SRNP-105195, **f**, *Amaxia brendacasperae* sp. n., ♂, holotype, adult dorsal, INB0004166127, **g**, *Kirrostola metaxantha* (Schaus, 1905), ♂, INB0004073358, **h**, *Kirrostola stevearonsoni* sp. n., ♂, paratype, adult dorsal, INB0003457197.

proximal surface of femora and a small bright dark brown distal patch. The forewings are semihyaline, with greyish yellow veins, the base of wings with a tiny yellow spot on the origin of cubital and anal veins. The hindwings are semihyaline.

GENITALIA: (08-SRNP-102335), (Figs 7a-d) Uncus short, triangular, with the tip slightly curved downward and flattened dorso-ventrally. The valvae are sclerotized, short and straight, very wide at the base and with a rounded tip, with the costal margin slightly lobed in the middle, the saccular margin lobed in the middle and a very short, rounded and membranous lobe arising externally at the tip. Juxta sclerotized, well defined, convex, very broad, rounded on the middle, acute anteriorly and with two heavily sclerotized patches of short and thick spines on the posterior portion. Transtilla strongly sclerotized, with lateral prominences densely covered by short and thick spines. Saccus very short and square in ventral view. Aedeagus straight and thick; vesica lobed, with four diverticula, one basally, two in the middle and one apically; two patches of tiny and strongly sclerotized spines, one oval laterally on the base and the other elongate located in the middle of the left diverticulum.

Etymology. This rain forest species, *Munona carolinepalmerae,* is named in honor of Dr. Caroline V. Palmer of The Village, Buckland Monachorum, Devon, UK, in recognition of her residence (at times) in very wet environments.

Munona robpuschendorfi Espinoza, **sp. n.**
Figures 2f, 7e-h

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Guanacaste Province, Sector Horizontes, Mirador Saltillo, 141 m, 10/26/2011, H. Cambronero & S. Rios; lat long 10.73137, -85.60075; Voucher 11-SRNP-105170, GenBank accession: KX037923, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. *Munona robpuschendorfi* can be separated from *M. carolinepalmerae* by having the uncus narrow in the middle, instead of being triangular as in *M. carolinepalmerae*. Additionally, the tip of the valvae in *M. carolinepalmerae* does not reach the tip of the uncus, while it does in *M. robpuschendorfi.* The shape of its transtilla (Fig. 7e), which has very long lateral prominences densely covered by elongate and thick spines, and the juxta (Fig. 7f) with two heavily sclerotized patches of long and thick spines on its posterior portion, are distincive. It is also distinguished from *M. iridiscens* by the much longer spines on the lateral prominences of the transtilla and its juxta with two patches of long and thick spines on the posterior portion that curves outward laterally, instead of the two slightly shorter and straight patches of spines on the juxta shown by *M. iridiscens.* The lectotype male of *M. iridescens* (Type No. 11097; Arctiidae genitalia slide no. AW361, deposited at the USNM), was examined several times by B. Espinoza between 1998 and 2007.

Description. Adult male (Fig. 2f). Forewing length 20.8-23.1 mm (n = 13). The adults of this species have the same wing pattern as *M. carolinepalmerae*.

GENITALIA: (08-SRNP-105721), (Figs 7e-h). The uncus is short, narrow in the middle and with the tip pointed and slightly extended laterally. The valvae are wider at the base and slightly curved inward and rounded at the tip, with the costal and saccular margin lobed near the middle, and with very small and membranous lobes externally near the tip. The juxta is sclerotized, well defined, convex, broad, slightly constricted in the middle, acute anteriorly and with two heavily sclerotized patches of long and thick spines on the posterior portion. The transtilla is strongly sclerotized, with very long lateral prominences densely covered by elongate and thick spines. The aedeagus has large lobes on the vesica and three patches of sclerotized spines, one small and laterally at the base of the vesica, sparsely covered by tiny spines, and two on the distal portion one each lobe, one patch large in size, oval and with longer spines and the other irregular in shape and with very tiny spines.

Etymology. *Munona robpuschendorfi* is named in honor of Dr. Robert Puschendorf of The Village, Buckland Monachorum, Devon, UK, in recognition of his fascination (at times) with ACG dry forest.

Remarks. These two taxa, *M. carolinepalmerae* **sp. n.** and *M. robpuschendorfi* **sp. n**., are impossible to distinguish by adult morphology, and may only be identified by the male genitalia as well as by differences in their DNA barcodes, which diverge by 4.1%, and lastly by local geographic distribution, with *M. carolinepalmerae* coming from the ACG rain forest, while *M. robpuschendorfi* comes from the adjoining ACG dry forest. As indicated above in each case, these Costa Rica species used to be commonly identified in different collections and by different taxonomic experts as *Munona iridescens* Schaus 1894, but as we discuss here, examination of the type of *M. iridescens* confirms that identification is incorrect.

***Amaxia apyga* complex.**

Amaxia apyga Hampson, 1901
Figures 1a, 4a-d, 10a-d

TYPE LOCALITY: Costa Rica, Candelaria Mts.
TYPE SPECIMEN: Holotype male. Figures 10a-b. Deposited NHMUK.
Type dissection: BMNH Arct. slide no. 6410. Figures 10c-d.

Diagnosis. *Amaxia apyga* is easy to separate from *A. rocioecheverriae* **sp. n.** by examining the capsule of its male genitalia (Figs 4a-d, 10c-d), which is not strongly ornamented, and shows an elongate and thin uncus from base to apex, with the tip curved downward ventrally, as well as by having the saccus short and V-shaped.

Description. Adult male (Fig. 1a). Forewing length 15.1-17.0 mm (n = 7). *Amaxia apyga* was described by Hampson (1901); in general terms it has a bright yellow ground color on its head, patagia and forewings. The thorax and abdomen are brown dorsally and white ventrally. The forewings have a large brown

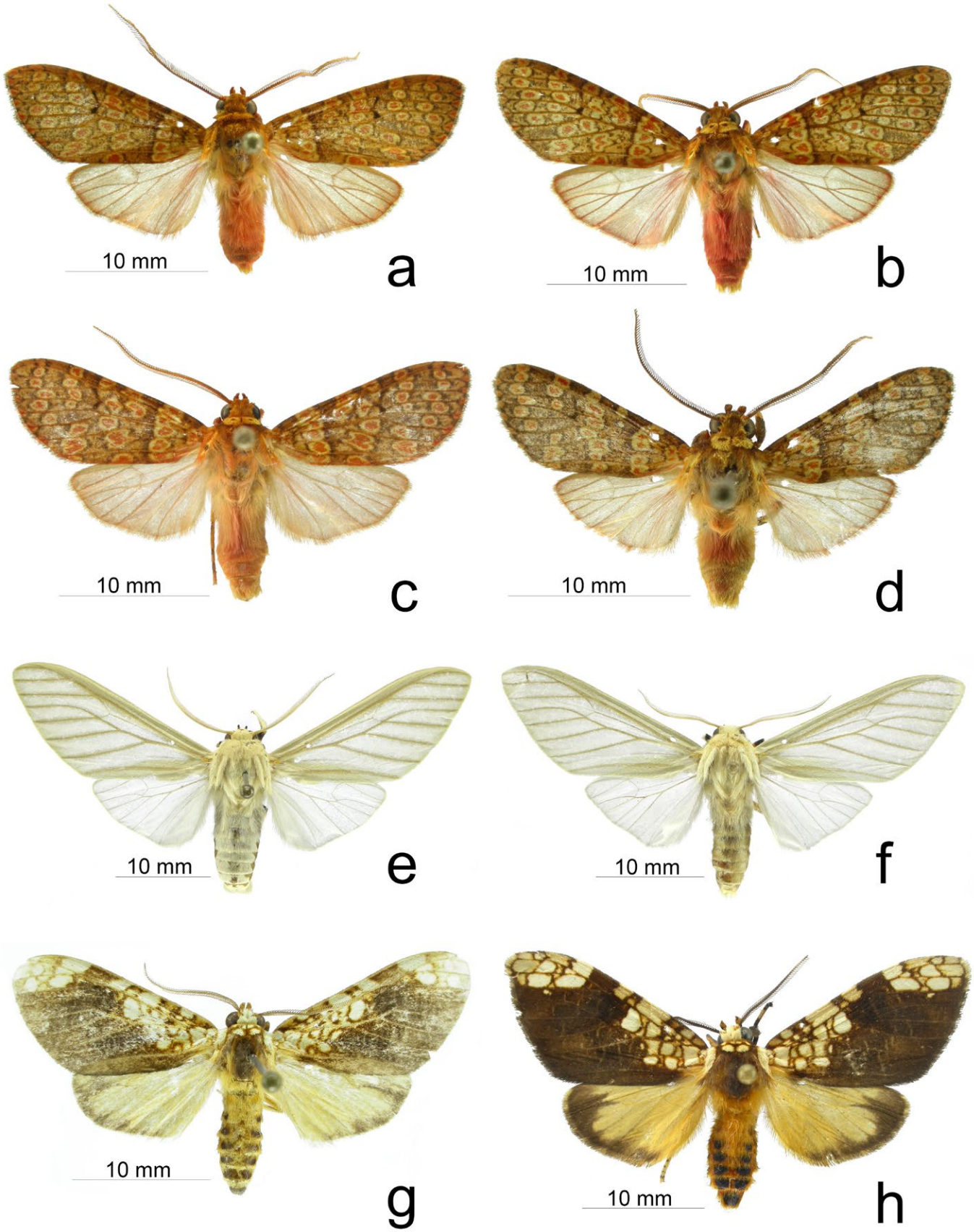

Figure 2a-h. a, *Baritius grandis* (Rothschild, 1909), ♂, adult dorsal, 07-SRNP-103132, **b**, *Baritius angelagonzalezae* sp. n., ♂, holotype, adult dorsal, 08-SRNP-101152, **c**, *Baritius martajimenezae* sp. n., ♂, holotype, adult dorsal, INB0003520560, **d**, *Baritius maribellealvarezae* sp. n., ♂, holotype, adult dorsal, 10-SRNP-107156, **e**, *Munona carolinepalmerae* sp. n., ♂, holotype, adult dorsal, 08-SRNP-107549, **f**, *Munona robpuschendorfi* sp. n., ♂, holotype, adult dorsal, 11-SRNP-105170, **g**, *Ochrodota marina* Schaus, 1910, ♂, adult dorsal, 09-SRNP-107411, **h**, *Ochrodota melaniamunozae* sp. n., ♂, holotype, adult dorsal, 04-SRNP-35826.

patch edged with crimson on the basal and medial area that extends below the costal margin to the basal half of discal cell, covering the anal margin and reaching the tornus; the veins into it are marked with some crimson. The medial and post-medial area have small rounded spots and two large brown patches on the apex and a small yellow patch edged with crimson on the middle of the posterior margin. The hindwings are brown, with the costal margin strongly lobed and light creamy white, the distal margins are bright yellow, with an oval androconial patch present on the distal half of the discal cell.

GENITALIA: (INBIOCRI000615466), (Figs 4a-d) The uncus is elongate and thin from base to the apex, with the tip curved downward ventrally. The valvae are sclerotized, elongate, with the basal half wider and the distal half thin, slightly curved downward and with a patch of long bristles on the tip; a membranous, elongate and round-tipped lobe arises medially on the outer surface. The juxta is sclerotized, elongate, convex and a little bit wider anteriorly. The saccus is short and V-shaped; The aedeagus is elongate, thin but wider and curved downward ventrally in the anterior portion; the vesica is short, oval, with two lobes, one small on its left side and the other elongate on its right side, and with a small and slightly crenulate horn-like cornutus on top of it.

Amaxia rocioecheverriae Espinoza, **sp. n.**
Figures 1b, 4e-f

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Alajuela Province, Sector Rincón Rain Forest, Jabalina, Manta Pizote, 288 m, 6/6/2008, S. Rios & R. Franco, lat long 10.97325, -85.31542; Voucher 08-SRNP-102359, GenBank accession: JQ558120, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. This species is slightly smaller than *A. apyga*, and the tip of its uncus is very distinctive, being expanded laterally to form a triangle, instead of the elongate, thin and downward curved uncus of *A. apyga*.

Description. Adult male (Fig. 1b). Forewing length 14.8-16.6 mm (n = 7). Apart from the size of the adult, which is a little smaller in *A. rocioecheverriae*, there is no other difference in the external adult morphology that can be used to separate this species apart from *A. apyga*.

GENITALIA: (INBIOCRI0003447822), (Figs 4e-h). The uncus is elongate and thin from base to the apex, with the tip expanded laterally, triangular and slightly curved downward ventrally. The valvae are sclerotized, very wide on the basal half and very thin on the distal half, which is strongly curved downward ventrally and curved inward dorsally; with a patch of long bristles on the tip and the ventral margin with a right-angle medially, where an elongate and membranous lobe arises on the outer surface. The juxta is sclerotized, elongate and well defined, strongly convex, wider anteriorly and acute posteriorly; the annellus is sclerotized and expanded laterally. The saccus is slightly elongate, U-shaped and curved upward dorsally. The aedeagus is simple, elongate, very thin, with the anterior end wider and curved downward ventrally. The vesica is very short and oval, with two lobes, one small on its left side and the other larger on its right side, and with a very small lobate cornutus that is slightly crenulate arising dorsally.

Etymology. *Amaxia rocioecheverriae* is named in honor of Srta. Rocio Echeverri of San Jose and Liberia, Costa Rica, in recognition of her dedication to the Costa Rican NGO ProParques, which is in turn dedicated to improving the National Parks of Costa Rica and their Conservation Areas.

Remarks. *Amaxia apyga* Hampson, 1901 and *A. rocioecheverriae* **sp. n.**, are very similar and adult markings are of no use in identifying these two species. Here, we found extreme variations in the male genitalia of *A. rocioecheverriae*, in which there are five different genitalia morphs, as displayed by the uncus and other genitalia structures, with the uncus ranging from triangular to pointed. The valvae are also medially variable in thickness. In order to characterize and illustrate this species we chose one of the most abundant forms to be represented by the holotype. In their DNA barcodes, these two species are 5.1% different. We fully recognize that each of these 5 genitalia morphs could represent a different species within "*A. rocioechevrriae*", but that these species have not been separated long enough to differ in their barcodes. Since all 36 specimens examined were light-trapped, we cannot speculate as to whether there are ecological or behavioral characteristics that correlate with each of the 6 morphs. Only such correlations or a deep exploration of the genome will indicate if *A. rocioecheverriae* is exceptionally variable, which we doubt, or a strongly speciose complex.

Amaxia osmophora **complex.**

Amaxia osmophora Hampson, 1901
Figures 1c, 5a-d, 10e-h

TYPE LOCALITY: Costa Rica, Candelaria Mts.
TYPE SPECIMEN: Holotype male. Figures 10e-f. Deposited NHMUK.
Type dissection: BMNH Arct. slide no. 6411. Figures 10g-h.

Diagnosis. *Amaxia osmophora* shares similar structures in the genitalia with *A. alejandraloriae* **sp. n.**, but *A. osmophora* has a slightly denser patch of bristles on the tip of the valvae, a V-shaped saccus and the vesica with a large patch of scobinate cornuti (Figs 5a-c, 10g-h).

Description. Adult male (Fig. 1c). Forewing length 16.2-17.0 mm (n = 7). This species has the head, thorax and forewings with bright yellow ground color. The abdomen is crimson dorsally, with the last tergum yellow. The patagia and thorax have reddish brown spots. The forewings have brown spots edged with red, a large brown irregular patch edged with red on the post-basal area and three elongate brown patches edged with red near the apex. The legs are white. The forelegs have brown femora and bright yellow tibiae and tarsi.

GENITALIA: (08-SRNP-101635), (Figs 5a-d) The uncus is elongate, very thin from base to the apex and with the tip curved

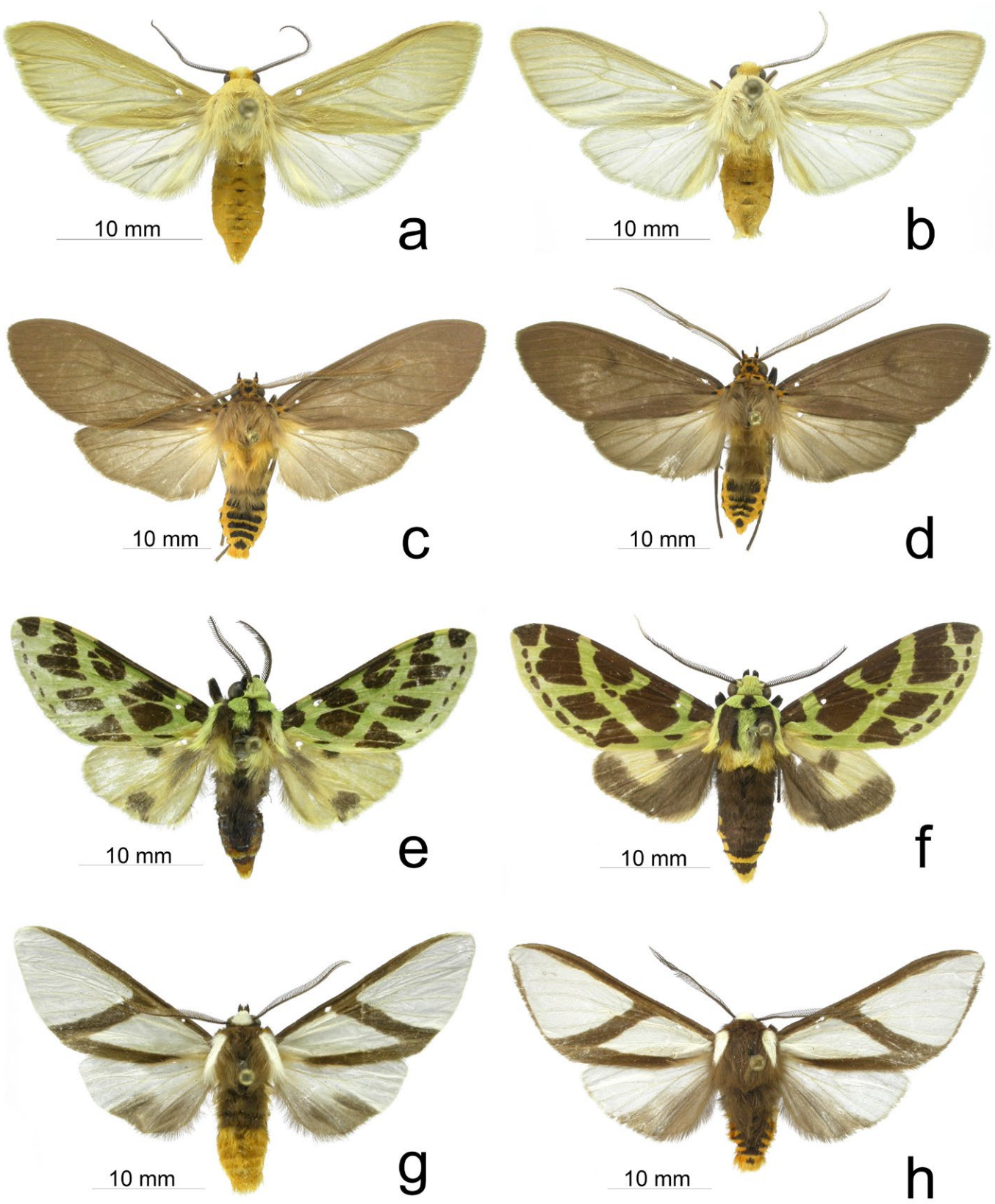

Figure 3a-h. a, *Pareuchaetes abbysmutnyae* sp. n., ♂, holotype, adult dorsal, 09-SRNP-109701, **b**, *Pareuchaetes georgegormani* sp. n., ♂, holotype, adult dorsal, 07-SRNP-102869, **c**, *Pelochyta timrichi* sp. n., ♂, holotype, adult dorsal, 10-SRNP-114539, **d**, *Pelochyta amyeaderae* sp. n., ♂, holotype, adult dorsal, 07-SRNP-103155, **e**, *Symphlebia tessellata* Schaus, 1910, ♂, adult dorsal, 10-SRNP-108598, **f**, *Symphlebia janecheverriae* sp. n., ♂, holotype, adult dorsal, 09-SRNP-105243, **g**, *Turuptiana obliqua* (Walker, 1869), ♂, adult dorsal, INB0003448093, **h**, *Turuptiana annesmithae* sp. n., ♂, holotype, adult dorsal, INB0003171105.

downward ventrally. The valvae are sclerotized, elongate, slightly asymmetrical, with the left one a little bit shorter, with the basal portion wider and the distal half very thin, slightly curved downward and with a patch of short bristles on the tip; a short and sclerotized lobe arises medially on the ventral margin and a membranous and round-tipped lobe arises medially on the outer surface, which has a rounded tip. The juxta is sclerotized, strongly convex and posteriorly prominent. The saccus is short and V-shaped. The aedeagus is short, with the anterior end curved downward ventrally; the vesica is short, with three lobes, two of them on the left side and one on the right side, and a large patch of scobinate cornuti that increased in size ventrally.

Amaxia josealfredohernandezi Espinoza, **sp. n.**
Figures. 1d, 5i-l

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Alajuela Province, Sector Rincón Rain Forest, Potrero Chaves, 433 m, 8/18/2009, R. Franco & S. Rios, lat long 10.93868, -85.32167; Voucher 09-SRNP-107029, GenBank accession: GU699072 (dissected), Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. *A. josealfredohernandezi* is easy to distinguish from the other three species of the *A. osmophora* complex by having the internal margin of the valvae strongly serrate (Figs 5i-j), a condition that is present only in this species.

Description. Adult male (Fig. 1d). Forewing length 15.1-16.8 mm (n = 9). This species, although sharing almost the same pattern on the forewings as *A. osmophora*, can be distinguished by its intense dark brown irregular patch, edged with red on the post-basal area, which also has a strong purple iridescence. The hindwings have a slightly stronger rose tint than in *A. osmophora*.

GENITALIA: (09-SRNP-107029, H-T), (Figs 5i-l). The uncus is elongate, very thin from the base to the apex, with the tip curved downward ventrally. The valvae are sclerotized, slightly asymmetrical, with the left one a little bit shorter and rounded at the tip, with the basal portion wider and the distal half flattened dorso-ventrally, slightly curved upward dorsally and with the internal margin serrate; a membranous and elongate lobe with a rounded tip arises medially on the outer surface. The juxta is sclerotized, strongly convex and posteriorly prominent and rounded. The anellus is partially sclerotized, with two lateral crenulate plates. The saccus is reduced and V-shaped. The aedeagus is elongate, with the anterior end slightly curved downward ventrally; the vesica is short, projecting downward ventrally, with three lobes very well defined, one basally on the right side, which is partially covered by a patch of small and sparse spines that increases considerably in size as it extends distally, and two lobes on the distal portion, one of which is covered by a large crenulate patch.

Etymology. *Amaxia josealfredohernandezi* is named in honor of Sr. José Alfredo Hernández of Alajuela, Costa Rica, a member of the CONAGEBIO team, in recognition of his enthusiasm for understanding GDFCF and ACG in their efforts to do conservation through biodiversity development.

Amaxia alejandraloriae Espinoza, **sp. n.**
Figures 1e, 5e-h

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Alajuela Province, Sector Pitilla, Estacion Quica, 487 m, 8/29/2008, S. Rios & R. Franco, lat long 10.99679, -85.39695; Voucher 08-SRNP-105195, GenBank accession: JQ550717 (dissected), Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. Although this is the closest species to *A. osmophora*, in terms of its adult wing pattern and genitalia, *A. alejandraloriae* can be distinguished by having a less dense patch of bristles on the tip of the valvae, a U-shaped saccus and the vesica with a reduced patch of scobinate cornuti (Figs 5e-f), compared with that of *A. osmophora*.

Description. Adult male (Fig. 1e). Forewing length 15.8-17.1 mm (n = 7). This is the closest species to *A. osmophora* and we have been unable to find any external characters to separate them.

GENITALIA: (08-SRNP-105195), (Figs 5e-h) The uncus is elongate, very thin from base to the apex and with the tip curved downward ventrally. The valvae are sclerotized, elongate, slightly asymmetrical, with the left one a little bit shorter, with the basal portion wider and the distal half very thin, straight in lateral view, slightly curved inward dorso-ventrally and with a patch of very short bristles on the tips; a short and sclerotized lobe arises medially on the ventral margin and a membranous and elongate lobe arises medially on the outer surface, which has a rounded tip. The juxta is sclerotized, strongly convex and posteriorly prominent. The saccus is short and U-shaped. The aedeagus is short, with the anterior end curved downward ventrally; the vesica is short, with three small lobes, one of them ventrally on the base and other two distally on the left side and a patch of small and sparse spines ventrally.

Etymology. *Amaxia alejandraloriae* is named in honor of Sra. Alejandra Loria Martínez of Cartago, Costa Rica, a member of the CONAGEBIO team, in recognition of her enthusiasm for understanding the archaeological development of Costa Rica.

Amaxia brendacasperae Espinoza, **sp. n.**
Figures 1f, 5m-p

Holotype. ♂: COSTA RICA. Prov. Alajuela. San Ramón. Est. Biol. Villa Blanca. 1115 m, R. Rojas, 8-10 AGO 2008, lat long 10.201361, -84.485101. Tp. Luz Mercurio. #94534; Voucher INB0004166127; GenBank accession: KU905043 (dissected), Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. Among the four species found in this complex, this is the only one easily distinguished by the shape of the outer margin of forewing, which is slightly rounded (Fig. 1f), whereas in the other three species this margin is straight. The species may also be distinguished by the large postbasal

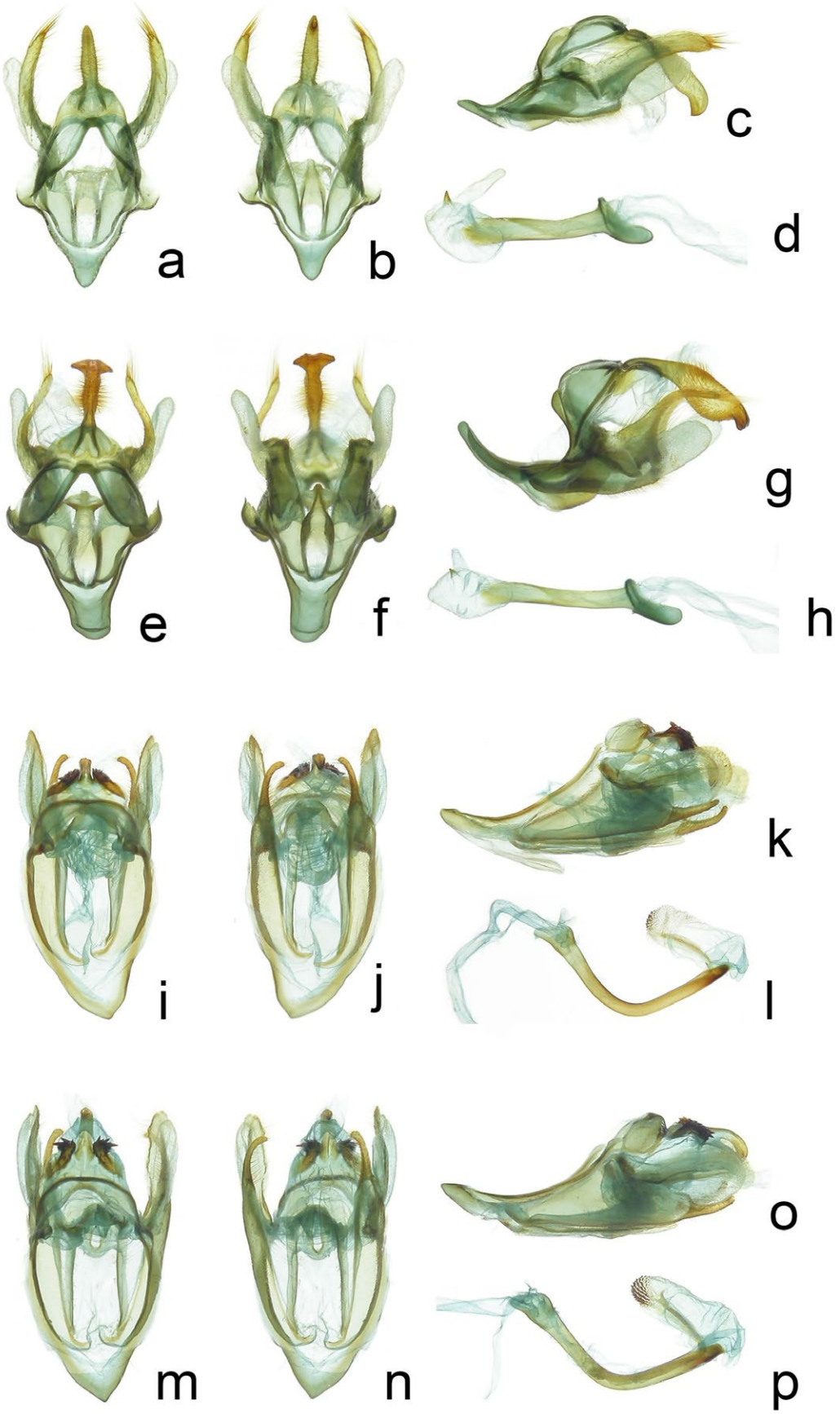

Figure 4a-p. Male genitalia. **a**, *Amaxia apyga* Hampson, 1901, INBIOCRI000615466, dorsal, **b**, ventral, **c**, lateral, **d**, aedeagus, **e**, *Amaxia rocioecheverriae* sp. n., INB0003447822, paratype, dorsal, **f**, ventral, **g**, lateral, **h**, aedeagus, **i**, *Kirrostola metaxantha* (Schaus, 1905), INB0004073358, dorsal, **j**, ventral, **k**, lateral, **l**, aedeagus, **m**, *Kirrostola stevearonsoni* sp. n., INB0003457197, paratype, dorsal, **n**, ventral, **o**, lateral, **p**, aedeagus.

patch and three elongate patches in the subapical area of the forewings marked with intense dark brown, combined with a purple surface iridescence.

Description. Adult male (Fig. 1f). Forewing length 14.6-17.4 mm (n = 10). *Amaxia brendacasperae* is very similar to the other members of this species complex except as described in the Diagnosis.

GENITALIA: (INB0004301863), (Figs 5m-p) The uncus is elongate and very thin from the base to the apex and with the tip curved downward ventrally. The valvae are sclerotized, elongate, with the basal portion wider and the distal half thin and straight in lateral view, the tip is slightly curved inward dorso-ventrally and with a patch of elongate and thick bristles; a short and sclerotized triangular projection arises medially on the ventral margin, followed by a lobulate and flattened short projection that goes inward, and a membranous, elongate and rounded tip lobe arises medially on the outer surface. The juxta is sclerotized, strongly convex and cylindrical. The saccus is very short and acute. The aedeagus is short, with the anterior end curved downward ventrally; the vesica is short, with three lobes, two of them basally, of which one is on the ventral surface and the other on the dorsal surface; the third lobe is located distally on the left side and it is covered by a large crenulate patch; ventro-laterally there is a large patch of short and strongly sclerotized spines.

Etymology. *Amaxia brendacasperae* is named in honor of Dr. Brenda Casper of Philadelphia, PA, USA in recognition of her enthusiasm for supporting GDFCF and ACG in the Biology Department of the campus of the University of Pennsylvania.

Remarks. *Amaxia osmophora*, Hampson, 1901, *A. josealfredohernandezi* **sp. n.**, *A. alejandraloriae* **sp. n.** and *A. brendacasperae* **sp. n.**, belong to a cryptic species group in which it is hard to distinguish each species apart using external characters. All four share very similar markings, with the exception of *A. brendacasperae* that can be easily determined by some characters, but the other three species require genitalia dissection and DNA sequence data for identification. In the case of *A. josealfredohernandezi*, the female has not been associated. It is relevant to mention here that *Amaxia pardalis* Walker 1855, described from Brazil, Ega, has been associated with these Costa Rican species because it shares similar adult markings with this complex, but after revision of non-type material dissected of that species (Arct. Gen. Prep. 4285, NHMUK), we are confident that *A. pardalis* is not present in CR. In terms of genetic distance, these four *Amaxia* species differ from each other by 5.44% to 7.84%.

***Baritius grandis* complex**

Baritius grandis (Rothschild, 1909)
Figures 2a, 6a-d, 10i-l

TYPE LOCALITY: Peru, La Oroya, R. Inambari, 3100 ft.
TYPE SPECIMEN: Syntype male. Deposited NHMUK.
Type dissection: BMNH Arct. slide 6411. Figures 10i-l.

Material examined: See Appendix 1.

Diagnosis. *B. grandis* can be recognized by uncus, which bears a dorsal crested protuberance and is serrate in its distal half, and by the rounded lobe on the vesica, which is covered by a large patch of short and thick spines (Figs 6a-d, 10i-l).

Description. Adult male (Fig. 2a). Forewing length 14.2-15.8 mm (n=5). The head, thorax and forewings have a yellowish brown ground color. The forewings are speckled with dark brown, the base with two crimson spots edges with yellow, the postbasal area with a transverse series of crimson spots edged with yellow, the medial and postmedial area with crimson spots edged with yellow, the postmedial area with a transverse series of 6 crimson spots edged with yellow, the distal margin of discal cell is dark brown, and the marginal area has a row of very small crimson spots. The tornus area and beyond it near the apex shows a very faint iridescence. The hindwings are semihyaline pink, with the costal and anal margin yellow, and the ventral surface is yellowish.

GENITALIA: (08-SRNP-103907), (Figs 6a-d). The uncus is elongate, acute distally, with a crested protuberance dorsally and the distal half serrate. The valvae are sclerotized, broad from base to the apex, with a short lobe slightly curved inward distally on the costal margin and the tips acute and strongly curved inward; the transtilla is strongly sclerotized, with two long and thin lateral processes which curves upward dorsally and inward, and slightly serrate ventrally. The juxta is sclerotized, convex, with the posterior portion prominent and with a rounded edge, the middle and anterior portion consist of two elongate plates, which are parallel to each other. The saccus is absent. The aedeagus is sclerotized, thick and slightly curved downward ventrally on both anterior and posterior portion. The vesica is short, with a small patch of short and thick spines distally and one lobe arising laterally on the right and covered by a large patch of short and thick spines.

Baritius angelagonzalezae Espinoza, **sp. n.**
Figures 2b, 6e-h

Holotype. ♂: COSTA RICA, Área de Conservación Guanacaste, Alajuela Province, Sector Rincón Rain Forest, Jabalina, Manta Pizote, 288 m, 3/29/2008, F. Quesada & R. Franco, lat long 10.97325, -85.31542; Voucher 08-SRNP-101152, GenBank Accession: JQ557001, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. *B. angelagonzalezae* can be distinguished by the two long and thin lateral processes on the transtilla, which are densely covered by tiny spines ventrally, and by the two basal lobes on the vesica, which are covered by tiny and thick spines on the dorsal surface (Figs 6e-h).

Description. Adult male (Fig. 2b). Forewing length 14.8-15.3 mm (n=6). Adults of this species can be easily confused with those of *B. grandis* and *B. martajimenezae* since both species share a similar forewing pattern and adult size. The only external difference is in the crimson spots on the FW, which are

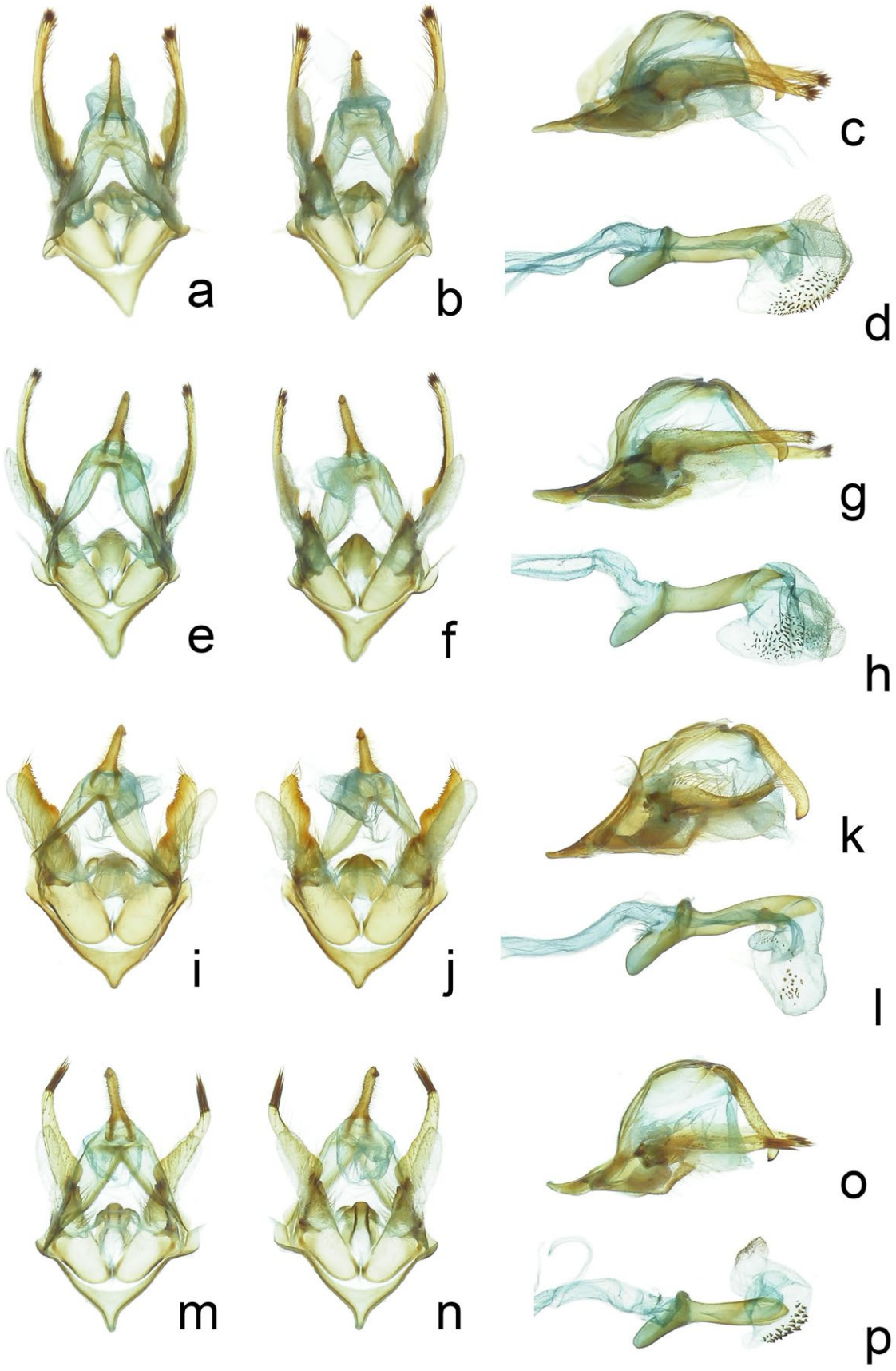

Figure 5a-p. Male genitalia. **a**, *Amaxia osmophora* Hampson, 1901, 08-SRNP-101635, dorsal, **b**, ventral, **c**, lateral, **d**, eadeagus, **e**, *Amaxia alejandraloriae* sp. n., 08-SRNP-105195, holotype, dorsal, **f**, ventral, **g**, lateral, **h**, aedeagus, **i**, *Amaxia josealfredohernandezi* sp. n., 09-SRNP-107029, holotype, dorsal, **j**, ventral, **k**, lateral **l**, aedeagus, **m**, *Amaxia brendacasperae* sp. n., INB0004301863, paratype, dorsal, **n**, ventral, **o**, lateral, **p**, aedeagus.

a little bit smaller in *B. angelagonzalezae*.

GENITALIA: (08-SRNP-105208), (Figs 6e-h). The uncus is elongate, dorsally narrow and knife-shaped, acute distally and slightly curved downward ventrally. The valvae are sclerotized, broad from base to apex, with a short lobe slightly curved inward distally on the costal margin and the tip rounded and curved inward. The transtilla is strongly sclerotized, with two long and thin lateral processes curved upward and inward dorsally, and densely covered by tiny spines ventrally. The juxta is sclerotized, convex, with the posterior portion prominent and slightly extending laterally, narrow on the middle and wider on the anterior portion. The saccus is absent. The aedeagus is sclerotized, very thick and curved downward ventrally on both ends. The vesica is short, with two basal lobes arising dorsally, one of them small and rounded, the other elongate and curved downward, both lobes widely covered by tiny and thick spines on the dorsal surface.

Etymology. *Baritius angelagonzalezae* is named in honor of Sra. Angela González Grau of Heredia, Costa Rica, a member of the CONAGEBIO team, in recognition of her enthusiasm for understanding GDFCF and ACG in their efforts to do conservation through biodiversity development.

Baritius maribellealvarezae Espinoza, **sp. n.**
Figures 2d, 6m-p

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Alajuela Province, Sector Rincón Rain Forest, Manta Hugo, 491 m, 3/15/2009, H. Cambronero & F. Quesada, lat long 10.88110, -85.26770; Voucher 10-SRNP-107156, GenBank accession: HQ556669, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. *B. maribellealvarezae* can be recognized by its adult size, with this species being notably much smaller than *B. grandis*, *B. angelagonzalezae* and *B. martajimenezae*. (Fig. 2d). Although all four species share similar markings, this species has a darker ground color on the head, thorax and forewings, and the yellow on the patagia is brightest, while the patagia are yellow-orange in the other three species. The hindwings are semihyaline pale pink.

Description. Adult male (Fig. 2d). Forewing length 11.6-12.9 mm (n=4). This species is similar to the other members of this complex except as described under Diagnosis.

GENITALIA: (06-SRNP-109237), (Figs 6m-p). The uncus is elongate, with the base slightly wider and triangular, flattened laterally, slightly bulky at the middle and curved outward laterally at the tip. The valvae are asymmetrical, very broad basally and medially, with the distal portion thin, flattened dorso-ventrally and strongly curved upward dorsally, with the tips rounded and with a small flattened projection arising transversely on the dorsal surface; the costal margin has a long and thin projection arising medially, slightly curved inward, which is longer in the right valve. The transtilla is strongly sclerotized, with two lateral projections, one very short on the left side, curved downward ventrally and another very long arising on the right side, elliptic leaf-shaped. The juxta is sclerotized and slightly prominent posteriorly. The saccus is absent. The aedeagus is sclerotized and curved to the right on the posterior portion. The vesica is very short, with two lobes, one elongate and very slightly crenulate on the distal portion and the other short and covered by short and thick spines.

Etymology. *Baritius maribellealvarezae* is named in honor of Sra. Maribelle Álvarez Mora, of Cartago, Costa Rica, a member of the CONAGEBIO team, in recognition of her enthusiasm for understanding GDFCF and ACG in their efforts to do conservation through biodiversity development.

Baritius martajimenezae Espinoza, **sp. n.**
Figures 2c, 6i-l

Holotype. ♂: COSTA RICA. Prov. Cartago, Paraíso, Parque Nacional Tapantí, Sector La Represa, del Puente del Río Porras 300m SE, 1660m, JUL 2002, R. Delgado, Trampa de Luz. #70690, lat long 9.695214, -83.781156; Voucher INB0003520560. GenBank accession: KX069245. Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. The adult of *B. martajimenezae* is externally identical to that of *B. grandis*, but *B. martajimenezae* has a very characteristically shaped uncus, which has two dorsal horns, one basally flattened dorso-ventrally and the second one shorter on the distal half (Fig. 6k).

Description. Adult male (Fig. 2c). Forewing length 14.2-14.3 mm (n=5). *B. martajimenezae* is similar in wing pattern and size to *B. grandis* and *B. angelagonzalezae*, but the forewings show a more intense reddish tone in this species, while this condition tends to be more brownish in the others of this complex.

GENITALIA: (INB0003416955), (Figs 6i-l). The uncus is elongate, thin from base to apex, with a pointed tip, which curves downward ventrally and with two dorsal horns, one basally flattened dorso-ventrally and one shorter on the distal half. The valvae are elongate, broad from base to apex, rounded on the tip, strongly curved inward and concave on its inner surface and with basal patches of long scales on the outer surface. The transtilla is strongly sclerotized, with two long lateral asymmetrical projections, which are flattened laterally, serrate on their ventral margin and curved downward ventrally at the tips. The juxta is sclerotized, elongate, strongly convex, with the posterior portion prominent and slightly expanded laterally. The saccus is absent. The aedeagus is elongate and curved downward ventrally on the anterior end; the vesica is short, nut-shaped, with four small basal lobes and three patches of short and very thick spines.

Etymology. *Baritius martajimenezae* is named in honor of Sra. Marta Liliana Jiménez Fernández of San Jose, Costa Rica, a member of the CONAGEBIO team, in recognition of her enthusiasm for understanding GDFCF and ACG in their efforts to do conservation through biodiversity development.

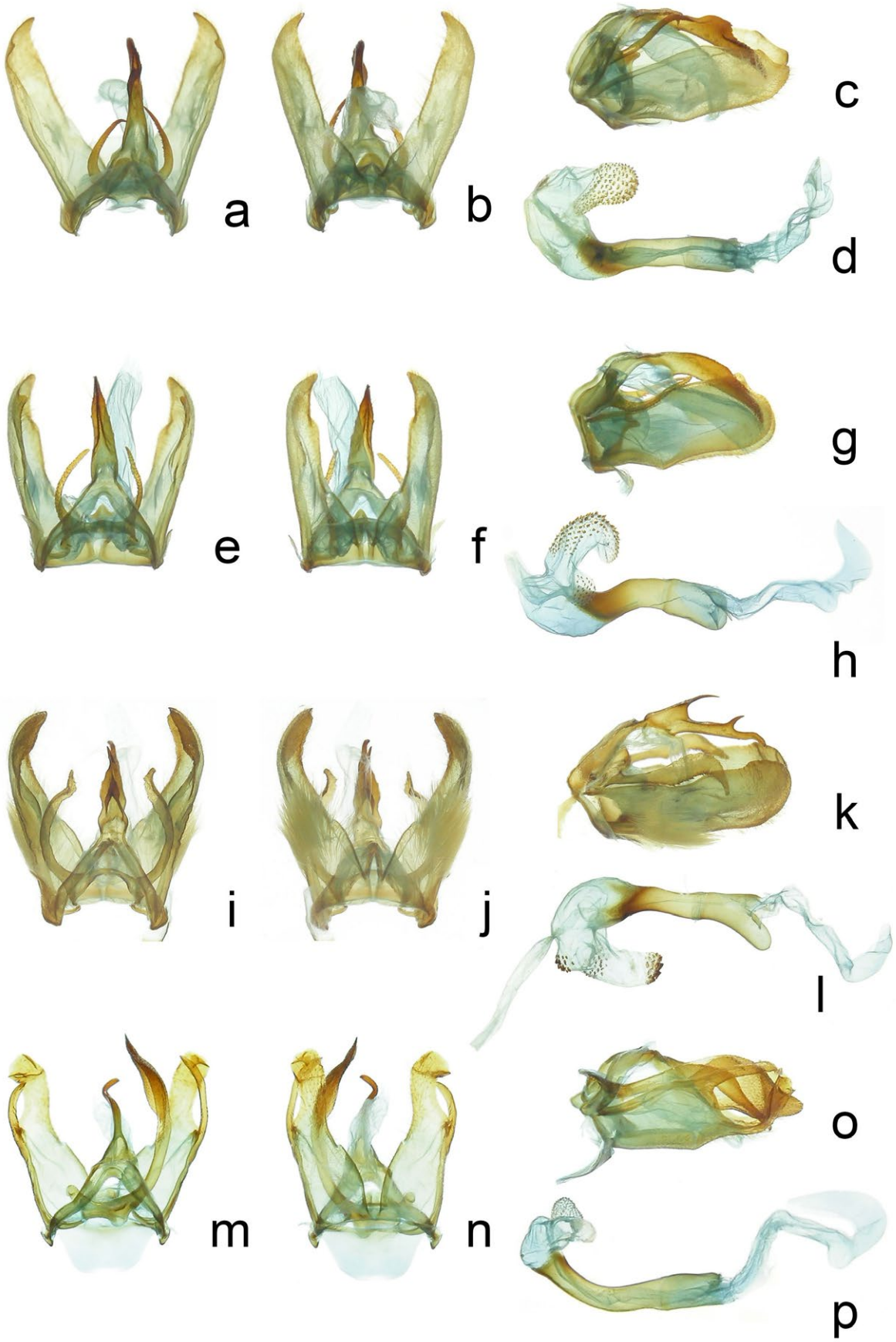

Figure 6a-p. Male genitalia. **a**, *Baritius grandis* (Rothschild, 1909), dorsal, **b**, ventral, c, lateral, **d**, aedeagus, **e**, *Baritius angelagonzalezae* sp. n., 08-SRNP-105208, paratype, dorsal, **f**, ventral, **g**, lateral, **h**, aedeagus, **i**, *Baritius martajimenezae* sp. n., INB0003416955, paratype, dorsal, **j**, ventral, **k**, lateral, **l**, aedeagus, **m**, *Baritius maribellealvarezae* sp. n., 06-SRNP-109237, paratype, dorsal, **n**, ventral, **o**, lateral, **p**, aedeagus.

Remarks. No less complex than the other cases of this study is *Baritius*. This group of cryptic species used to be identified as *B. grandis* (Rothschild, 1909), described from Peru, Ecuador and Costa Rica, and *B. sannionis* (Rothschild, 1909), described from Peru and Brazil. After examination of DNA sequences and dissections of several samples, as well as comparison with the type genitalia of *B. grandis* (BMNH Arct. slide no. 6416), it was possible to determine, in the first instance, true Costa Rican *B. grandis*, and therefore the presence of two additional similar entities, which are here named *Baritius angelagonzalezae* **sp. n.** and *Baritius martajimenezae* **sp. n.** Certainly, in terms of the large geographic distance, it might seem likely that *B. grandis* from southeastern Peru is not conspecific with what we identified as *B. grandis* from Costa Rica, but no differences between specimens from these locations were found in terms of external and internal morphology, and with no DNA sequences available for *B. grandis* from Peru, the simplest solution is to assume that Costa Rican and Peruvian specimens are conspecific. In the case of *B. sannionis*, we examined genitalia preparations of Peruvian *B. sannionis* (Reference: M. Laguerre, EPV0098, Peru, La Oroya [an additional specimen of the type series], *Baritius sannionis*, slide 2830) and were able to confirm that the species present in Costa Rica belongs to a different taxon, named here as *Baritius maribellealvarezae* **sp. n.** The barcode distance between the species involved in this cryptic species complex ranges from 4.09% to 5.57%.

***Pareuchaetes insulata* complex.**

Pareuchaetes insulata Walker, 1855

TYPE LOCALITY: Jamaica
TYPE SPECIMEN: Syntype male. Figures 10e-f. Deposited NHMUK. Type dissection: BMNH Arct. genitalia slide no. 961. Figure 10o.

Pareuchaetes misantlensis Rego Barros, 1956

TYPE LOCALITY: Mexico, Mixantla.
TYPE SPECIMEN: Holotype male, no. 66.254. Deposited MNRJ.
Suppl. specimen dissected: BMNH Arct. genitalia slide no. 2812. Figure 10p.

Pareuchaetes abbysmutnyae Espinoza, **sp. n.**
Figures 3a, 8a-d

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Alajuela Province, Sector Mundo Nuevo, Manta Cañon, 700 m, 10/17/2009, H. Cambronero & F. Quesada, lat long 10.77042, -85.37254; Voucher 09-SRNP-109701. GenBank Accession: HM411310. Deposited MNCR. **Paratypes.** See Appendix 1.

Diagnosis. *P. abbysmutnyae* can be separated from *P. georgegormani* **sp. n.** by the yellow on the forewings, which is slightly darker in this species, and also by the two elongate, spoon-shaped processes, distally on the tegumen that project posteriorly over the uncus (Figs a-c). This species differs from *P. insulata*, described by Walker in 1855 from Jamaica, in the shape of the two processes distally on the tegumen, which are only elongate in that species. The holotype male of *P. insulata* is deposited in the NHMUK collection, London, and its genitalia were examined (BMNH Arctiidae genitalia slide no. 961 (Fig. 10o)).

Description. Adult male (Fig. 3a). Forewing length 14.6-15.8 mm (n=5). The head, thorax and forewings are light yellow. The vertex of the head is yellow, the antennae are bipectinate and gray; the palpi are short, yellow basally and gray distally; the coxae are yellow; the legs are light yellow and gray; the middle and posterior legs are gray on the tibiae and tarsi. The abdomen is yellow dorsally, with a series of black dorsal spots on terga 2 to 7; ventrally it is light yellow and ventro-laterally with a series of black spots between segments 2 to 7. The hindwings are semihyaline pale yellow.

GENITALIA: (06-SRNP-100699), (Figs 8a-d). The uncus is short, broad basally, pointed distally and slightly curved downward ventrally. Distally on the tegumen, above the uncus and behind its base, arise two elongate, spoon-shaped processes, slightly longer than the uncus, that project posteriorly. The valvae are very short, broad basally and thin distally, with very long and thin processes, slightly curved outward that arise basally on the ventral margin, which are longer than the length of the valvae. The transtilla is sclerotized and broad. The anellus is slightly sclerotized. The juxta is sclerotized, slightly convex and not well defined in shape. The vinculum is extended; the saccus is short and V-shaped. The aedeagus is sclerotized and thick; the vesica is short and partially covered by a large crenulate patch; basally on its left side there is a small lobe and beyond it there is a large spine-like cornutus.

Etymology. *Pareuchaetes abbysmutnyae* is named in honor of Mrs. Abby Cohen Smutny of Washington, D.C., USA, in recognition of her extreme effort and dedication in aiding the conservation of Sector Santa Elena of ACG.

Pareuchaetes georgegormani Espinoza, **sp. n.**
Figures 3b, 8e-h

Holotype. ♂: Costa Rica, Guanacaste, Área de Conservación Guanacaste, Sector Trocha ICE, Buena Vista, 850 m, 4/18/2007, F. Quesada & R. Franco, lat long 10.81156, -85.39746. Voucher 07-SRNP-102869, GenBank accession: JQ566158, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. *P. georgegormani* **sp. n.** and *P. abbysmutnyae* **sp. n.** can be separated by the yellow coloration on the forewings, which is lighter in *P. georgegormani*. Also, *P. georgegormani* has the two elongate processes above the uncus that are simple in shape, very slightly curved inward distally and with a rounded tip. This species differs from *P. insulata* by the shape of these two elongate processes above the uncus, which are straight and parallel to each other in *P. insulata,* while they are slightly curved inward distally in *P. georgegormani*. Apart from the above, *P. insulata* has only one cornutus, formed as a single spine, while *P. georgegormani* has two cornuti, one on the left lobe of the vesica, forming a double spine, and the other on the right lobe, which is sclerotized and concave. This last characteristic also distinguishes *P. georgegormani* from *P. misantlensis* Rego Barros, 1956, described from Mexico;

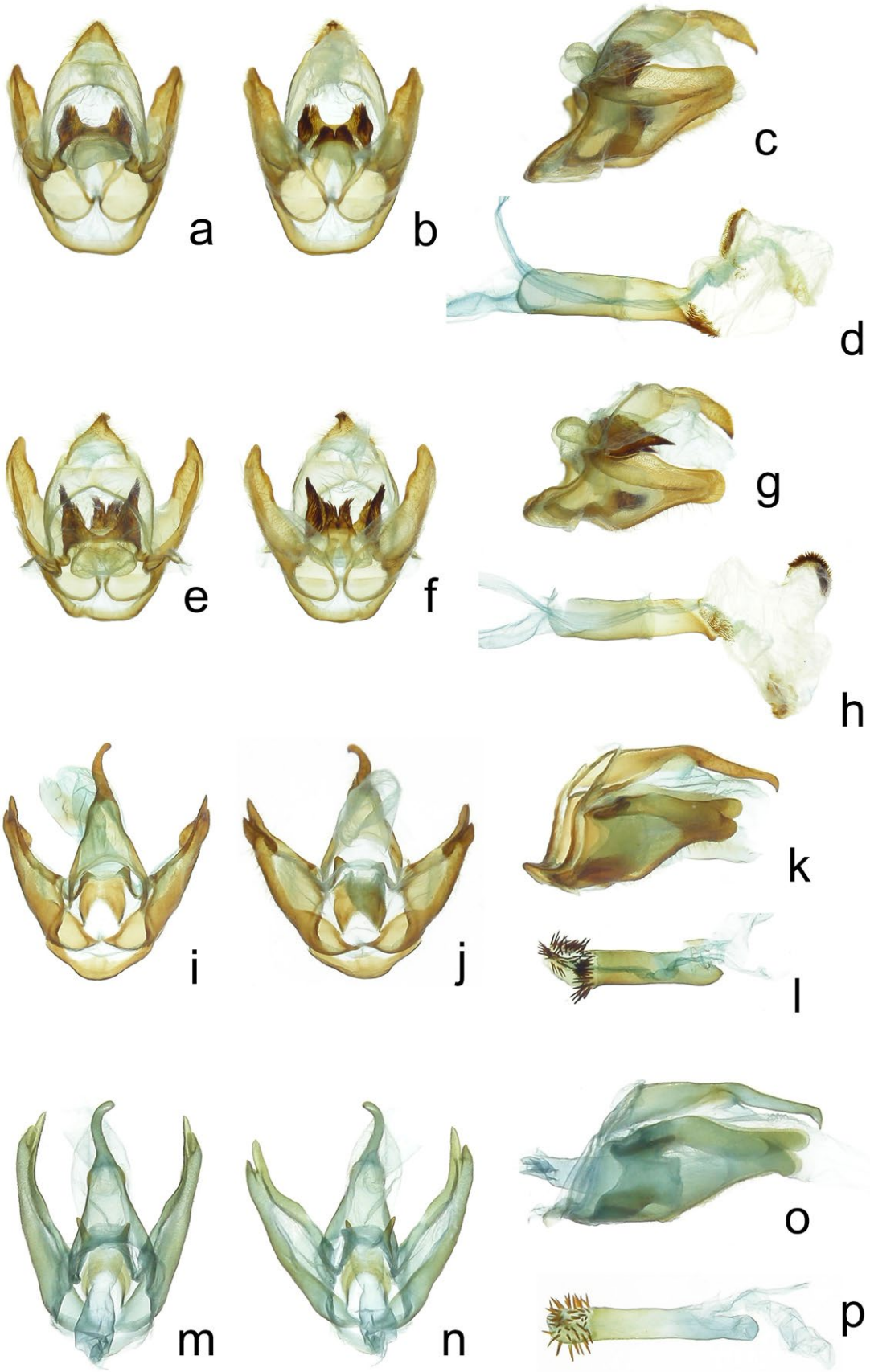

Figure 7a-p. Male genitalia. **a**, *Munona carolinepalmerae* sp. n., 08-SRNP-102335, paratype, dorsal, **b**, ventral, **c**, lateral, **d**, aedeagus, **e**, *Munona robpuschendorfi* sp. n., 08-SRNP-105721, paratype, dorsal, **f**, ventral, **g**, lateral, **h**, aedeagus, **i**, *Ochrodota marina* Schaus, 1910, 09-SRNP-107411, dorsal, **j**, ventral, **k**, lateral, **l**, aedeagus, **m**, *Ochrodota melaniamunozae* sp. n., INBIOCRI001081224, paratype, dorsal, **n**, ventral, **o**, lateral, **p**, aedeagus.

although both species otherwise share very similar structures in the male genitalia, in *P. misantlensis* the second, concave cornutus is absent (Fig. 10p). The holotype male of *P. insulata* deposited in the NHMUK (Arct. genitalia slide no. 961 (Fig. 10o)), and a specimen of *P. misantlensis* (BMNH Arct. genitalia slide no. 2812 (Fig. 10p)), in the NHMUK, were dissected and examined. In the case of the latter taxon, the specimen examined was previously dissected and identified as *P. misantlensis* in the NHMUK collection, and it was examined and compared for this study with Rego Barros's original description, which includes a figure of the male genitalia (Rego Barros, 1956, figs. 62-66).

Description. Adult male (Fig. 3b). Forewing length 14.7-16.0 mm (n=5). The adults of *P. georgegormani* differ from those of *P. abbysmutnyae* by having a paler yellow ground color on the forewings, which are also semihyaline, and the legs are pale yellow with less gray when compared with those of *P. abbysmutnyae.*

GENITALIA: (07-SRNP-102873), (Figs 8e-h). The uncus is short, thin from base to apex, with a pointed and slightly curved downward tip. Distally on the tegumen, above the uncus and behind its base, arise two elongate processes, very slightly longer than the uncus, that project posteriorly. The valvae are very broad on the basal half, with the ventral margin strongly lobed, the distal half thin and with a rounded and flattened tip; the outer surface has a membranous basal area, from where a short lobe arises. The transtilla and anellus are slightly sclerotized. The juxta is slightly sclerotized posteriorly in the join with the anellus. The saccus is very short and U-shaped. The aedeagus is sclerotized; the vesica is short, with two small ventro-lateral lobes and two cornuti, one on the left lobe, which is a double spine, and a second cornutus on the right lobe, not well defined in shape but sclerotized and concave.

Etymology. *Pareuchaetes georgegormani* is named in honor of Dr. George Gorman of Berkeley, CA, USA, in recognition of his decades of assistance with GDFCF and ACG accounting and financial investments.

Remarks. *Pareuchaetes abbysmutnyae* **sp. n.** and *P. georgegormani* **sp. n.** represent one more case that has been commonly misidentified everywhere as a widespread species, in this case *Pareuchaetes insulata* Walker, 1855, and this is because previously there was no indication of the existence of a cryptic group sharing the *P. insulata* phenotype. Knowing that *P. insulata* was described from Jamaica suggests the possibility of the complex containing more than one species on the continent. In addition to the above, *Pareuchaetes misantlensis* Rego-Barros, 1956, described from Mexico, plays an important role in the taxonomy of this complex. Although it has not been clearly characterized, this species is another member of the *P. insulata* complex. However, after having compared the male genitalia of the two Costa Rican entities with images of the genitalia of true *P. insulata* (Arctiidae genitalia slide 961, NHMUK) and *P. misantlensis (*Arctiidae genitalia slide 2812, NHMUK) it was possible to determine that none of the Costa Rican species belonged to either *P. insulata* or to *P. misantlensis,* as we discuss in the respective species descriptions. In relation to the genetic divergence between these two Costa Rican species, *P. abbysmutnyae* differs from *P. georgegormani* by 7.56%.

***Symphlebia tessellata* complex.**

Symphlebia tessellata (Schaus, 1910)
Figures 3e, 9a-d

TYPE LOCALITY: Costa Rica, Cartago, El Sitio.
TYPE SPECIMEN: Lectotype male, type no. 16884 (Watson, 1971, Pl. 6b), deposited USNM.
Type dissection: Arctiidae genitalia slide no. AW42 (Watson, 1971, Pl. 88e-f)

Diagnosis. This species is distinguished from *S. janecheverriae* **sp. n.** by having smaller dark brown patches on the forewings and by the larger lobe on the vesica, which is very slightly crenulate (Figs 3e, 9d).

Description. Adult male (Fig. 3e). Forewing length 17.8-19.9 mm (n=6). The head, thorax and forewings are light green with dark brown patches. The forewings are covered by dark brown patches and a subterminal series of tiny dark brown spots. The hindwings are light yellow with irregular dark brown patches. The abdomen is dark brown with lateral yellow patches, the tip is yellow and with dark brown on each of the last two terga; ventrally it is light yellow, with the last sternum dark brown.

GENITALIA: (10-SRNP-108598), (Figs 9a-d). The uncus is elongate, thin, slightly wider before the apex in lateral view and with a pointed and curved downward tip. The valvae are elongate, the basal half not very broad and the distal half thin, with a patch of thick spines apically, the costal margin is strongly lobed basally and straight to the tip, the ventral margin has a small medial lobe projected posteriorly and a membranous lobe arising medially on the outer surface. The juxta is sclerotized, slightly crenulate and convex. The saccus is short and V-shaped. The aedeagus is sclerotized; the vesica is very short, projected downward ventrally, with 6 small lobes and the larger lobe very slightly crenulated.

Symphlebia janecheverriae Espinoza, **sp. n.**
Figures 3f, 9e-h

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Guanacaste Province, Sector del Oro, Bosque Aguirre, 571 m, 6/20/2009, R. Franco & S. Rios, lat long 11.00404, -85.44125; Voucher 09-SRNP-105243. GenBank accession: GU699835, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. *S. janecheverriae* can be distinguished from *S. tessellata* by having much larger dark brown patches on forewings and a large patch of tiny spines on the larger lobe of the vesica (Figs 3f, 9h).

Description. Adult male (Fig. 3f). Forewing length 18.6-19.2 mm (n=8). The head is dark brown, the frons and vertex of

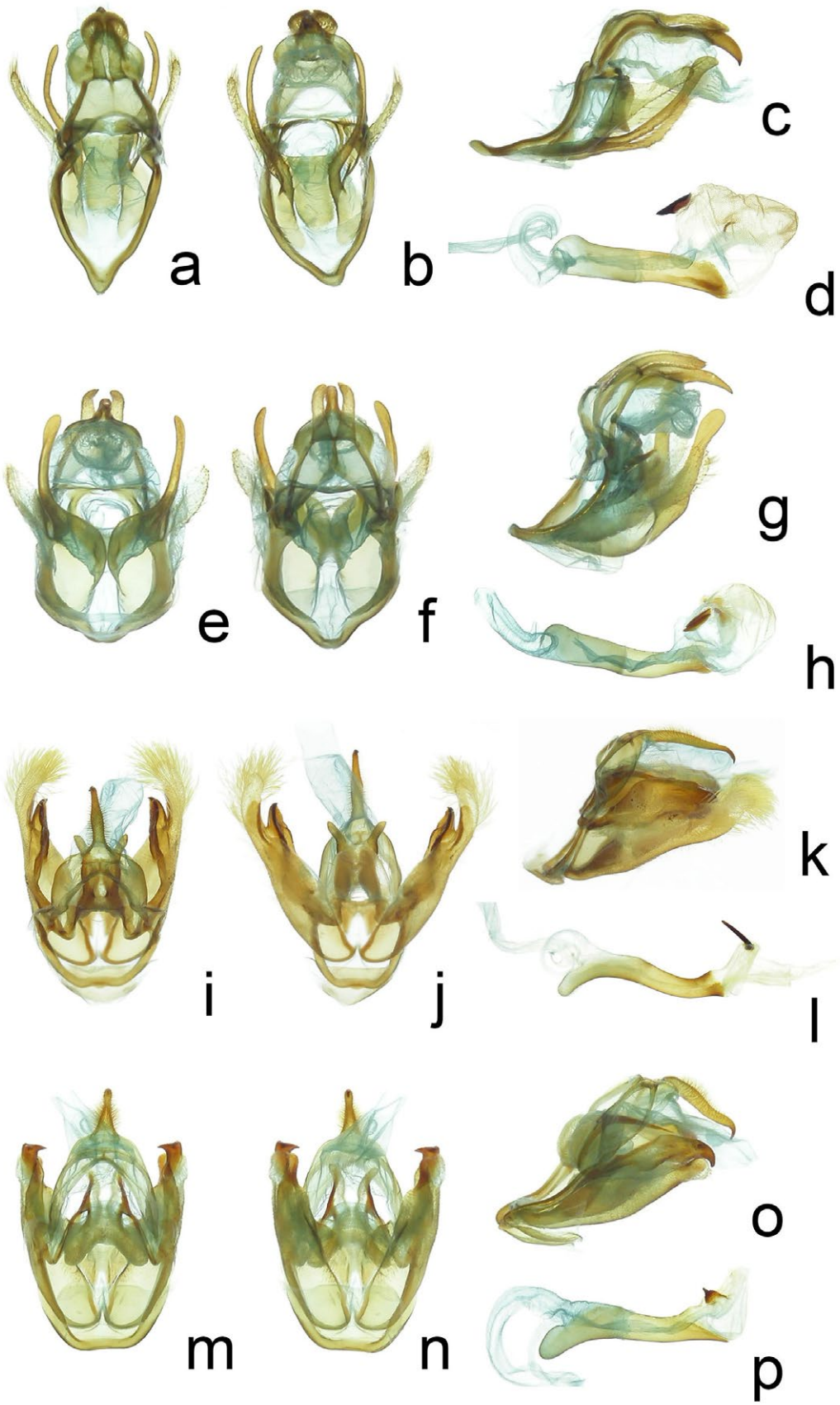

Figure 8a-p. Male genitalia. **a**, *Pareuchaetes abbysmutnyae* sp. n., 06-SRNP-100699, paratype, dorsal, **b**, ventral, **c**, lateral, **d**, aedeagus, **e**, *Pareuchaetes georgegormani* sp. n., 07-SRNP-102873, paratype, dorsal, **f**, ventral, **g**, lateral, **h**, aedeagus, **i**, *Pelochyta timrichi* sp. n., 10-SRNP-103699, paratype, dorsal, **j**, ventral, **k**, lateral, **l**, aedeagus, **m**, *Pelochyta amyeaderae* sp. n., 07-SRNP-107675, paratype, dorsal, **n**, ventral, **o**, lateral, **p**, aedeagus.

head are light green. The antennae are bipectinate, dark brown with the tip white and the scape pale green. The thorax is light green, with three large and elongate dark brown patches and with some yellow posteriorly; ventrally it is yellow with two large dark brown patches on the anterior coxae; the middle and posterior coxae are pale yellow and the legs are dark brown. The abdomen is dark brown dorsally, with some dorso-lateral yellow patches distally; ventrally it is striped with yellow and dark brown. The forewings are light green in ground color, covered by large dark brown patches and with a subterminal series of small and elongate dark brown spots. The hindwings are pale yellow, with the anal and outer margin dark brown and a dark brown spot on the distal end of the discal cell.

GENITALIA: (07-SRNP-109314), (Figs 9e-h). The uncus is elongate, thin, slightly wider before the apex in lateral view and with a pointed and curved downward tip. The valvae are elongate, with the basal half not very broad and the distal half thin, and with a patch of thick spines apically; its costal margin is strongly lobed along the basal half, the ventral margin has a small medial lobe projected posteriorly and a membranous lobe arising medially on the outer surface. The juxta is sclerotized, slightly crenulate and convex. The saccus has an open U-shape. The aedeagus is sclerotized; the vesica is very short, with 7 lobes, one of them elongate, sclerotized and partially covered by a large patch of tiny spines.

Etymology. *Symphlebia janecheverriae* is named in honor of Sra. Jane Echeverri of San José and Liberia, Costa Rica, in recognition of her dedication to the Echeverri family which in turn has done so very much for ACG and Costa Rican wildland conservation.

Remarks. In the *S. tessellata* complex it was less difficult to identify the presence of two cryptic species because the clues were more evident, with the observed variation in external phenotype being significant, and before preparing genitalia dissections and examining DNA sequences it was therefore expected that cryptic species might be discovered. Those preliminary suspicions were confirmed by genetic sequence analysis. In this case, it was found that the very well known species *Symphlebia tessellata* (Schaus, 1910) (lectotype male, adult and genitalia illustrated in Watson, 1971: 91), has an unrecognized sibling species described here as *Symphlebia janecheverriae* **sp. n.,** and the two are genetically different by 3.32%.

***Kirrostola metaxantha* complex.**

Kirrostola metaxantha (Schaus, 1905)
Figures 1g, 4i-l

TYPE LOCALITY: Costa Rica, Tuis.
TYPE SPECIMEN: Holotype female, Type No. 8605 (Watson 1971, Pl. 33a), deposited USNM.
Type dissection: Arctiidae genitalia slide no. AW250 (Watson, 1971, Pl. 238a-b).
Specimen sequenced: ♂, 09-SRNP-103001, GenBank accession: GU697577.

Diagnosis. *K. metaxantha* is readily recognized by the dark brown patch distally on the abdomen, on the 7th tergum (Fig. 1g).

Description. Adult male (Fig. 1g). Forewing length 13.4-14.2 mm (n=8). The head, thorax and abdomen are orange-yellow; the palpi, patagia and tegulae have brownish gray patches. The coxae are gray and the legs creamy white and gray. The abdomen has a dark brown patch on tergum 7th. The forewings are greyish brown, with two large elongate creamy white patches and striped with light brown on the basal half; ventrally there is an androconian patch on the overlapping area of the wings. The hindwings are orange-yellow, with grayish brown in the apical area.

GENITALIA: (INB0004073358), (Figs 4i-l). The uncus is very short, thin, curved downward ventrally and with the tip very slightly thicker in lateral view; on the tegumen there are two strongly sclerotized lateral processes arising inward and covered by very thick and short spines. The valvae are broad basally and acute distally, with the tip curved inward and with a broad and membranous lobe arising on the costal margin. The transtilla is slightly sclerotized. The juxta consists of an elongate, flattened, transparent and forked plate, attached to the aedeagus by a folding membrane, that also connects the valvae on their internal surface. The saccus has an open U-shape. The aedeagus is long, thin and strongly curved upward dorsally on its posterior end. The vesica is elongate, with 5 distinctive short lobes ventrally on its base, and distally covered by a small patch of very short and thick spines that decrease in size anteriorly.

Kirrostola stevearonsoni Espinoza, **sp. n.**
Figures 1h, 4m-p

Holotype. ♂: Costa Rica, Puntarenas Prov., Sirena, Corcovado Nat. Pk., Osa Penin., 1 m, 10-19 Aug 1980. D. H. Janzen & W. Hallwachs, lat long 8.480171, -83.591289; Voucher INB0003505951. Specimen not sequenced, Deposited MNCR.
INB0003351071, ♀, (sequenced) GenBank accession: KX037926, (P-T)
Paratypes. See Appendix 1.

Diagnosis. *Kirrostola stevearonsoni* is recognized by the absence of the dark brown patch distally on the abdomen, that is present in *K. metaxantha* (Fig. 1h). Although this species shares very similar structures of the genitalia with *K. metaxantha*, slight differences were observed in the two processes with spines on the tegumen, which are slightly less sclerotized and with the spines slightly less thicker in *K. stevearonsoni.* Also, the patch of spines on the vesica is denser in *K. stevearonsoni* compared with that of *K. metaxantha*.

Description. Adult male (Fig. 1h). Forewing length 12.2-13.3 mm (n=5). The adults of this species share the same external markings as those of *K. metaxantha*, except as described in the Diagnosis.

GENITALIA: (INB0003457197), (Figs 4m, n, o, p). The uncus is very short, thin, curved downward ventrally and

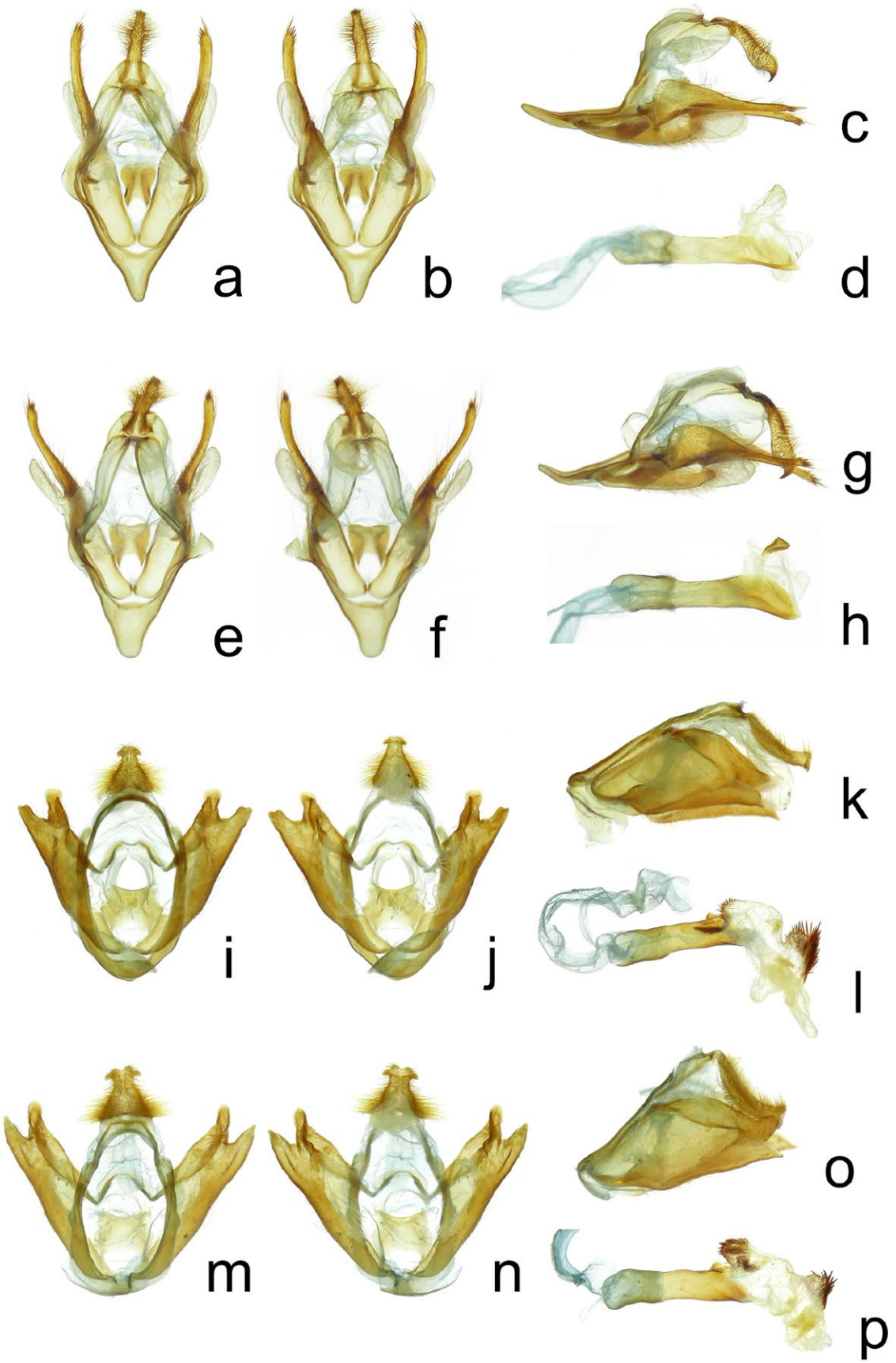

Figure 9a-p. Male genitalia. **a**, *Symphlebia tessellata* Schaus, 1910, 10-SRNP-108598, dorsal, **b**, ventral, **c**, lateral, **d**, aedeagus, **e**, *Symphlebia janecheverriae* sp. n., 07-SRNP-109314, paratype, dorsal, **f**, ventral, **g**, lateral, **h**, aedeagus, **i**, *Turuptiana obliqua* (Walker, 1869), INB0003457075, dorsal, **j**, ventral, **k**, lateral, **l**, aedeagus, **m**, *Turuptiana annesmithae* sp. n., INBIOCRI000626597, paratype, dorsal, **n**, ventral, **o**, lateral, **p**, aedeagus.

with the tip slightly thicker in lateral view; laterally on the tegumen there are two strongly sclerotized processes, arising inward and covered by short and thick spines. The valvae are broad basally and acute distally, with the tip curved inward, and with a broad and membranous lobe arising on its costal margin. The transtilla is sclerotized. The juxta consists of an elongate, flattened, transparent and forked plate, attached to the aedeagus by a folding membrane, that also connects the valvae on their internal surface. The saccus has an open V-shape. The aedeagus is long, thin and strongly curved upward dorsally on its posterior end. The vesica is elongate, with 5 distinctive short lobes ventrally on its base and distally covered by a large patch of short and very thick spines.

Etymology. *Kirrostola stevearonsoni* is named in honor of Mr. Steve Aronson of San José in recognition of his formation of, and dedication, to the Costa Rican NGO ProParques, in turn dedicated to improving the National Parks of Costa Rica and their Conservation Áreas.

Remarks. As previously described, *Kirrostola metaxantha* (Schaus, 1905) (holotype female and genitalia illustrated in Watson, 1971:59), recently removed from *Glaucostola* (Laguerre 2015), shows a remarkably different abdominal color pattern in comparison with samples from Costa Rica, and this was the first indication of the presence of another unknown cryptic species. Behind this species was hidden a second new taxon described here as *K. stevearonsoni* **sp. n.** This second new species is not known from the ACG area, but from other localities of Costa Rica (localities listed in Appendix 1). Here, it is worth mentioning that although the presence or absence of the dark brown patch distally on the abdomen is the most obvious difference between the two species, they both show a similar intra-specific variation in the extent of the dark brown pattern on hindwings. The genetic divergence between these two taxa is 3.64%.

Pelochyta affinis/*P. umbrata* complex.

Pelochyta affinis, Rothschild, 1909.
TYPE LOCALITY: Ecuador, Lita.
TYPE SPECIMEN: Syntype male (labeled TYPE). Deposited NHMUK. Figures 11a-c.

Pelochyta umbrata, Hampson 1901.
TYPE LOCALITY: Bolivia, Chaco.
TYPE SPECIMEN: Holotype male. Deposited NHMUK.
Type dissection: BMNH Arct. genitalia slide no. 6412. Figures 11d-g.

Pelochyta cinerea (Walker, 1855).
TYPE LOCALITY: Brazil, Venezuela.
TYPE SPECIMEN: Syntype male. Deposited NHMUK.
Type dissection: BMNH Arct. genitalia slide no. 6414. Figures 11h-k.

Pelochyta timrichi Espinoza, **sp. n.**
Figures 3c, 8i-l

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Guanacaste Province, Sector Pailas, Palmeras, 1368 m, 10/7/2010, S. Rios & R. Franco, lat long 10.81067, -85.34700; Voucher 10-SRNP-114539, GenBank accession: HQ933665, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. This species differs from *P. amyeaderae* **sp. n.** by its slightly lighter forewing ground color, as well as its transtilla, which has two sclerotized, long and thin lateral projections, curved outward laterally on the distal portion, and the valvae which have their ventral margin ending on an elongate and membranous lobe. *Pelochyta timrichi* is typically found mixed in collections with *Pelochyta affinis* Rothschild, 1909 described from Lita, Ecuador, but the true *P. affinis* clearly differs in its adult markings (Fig. 11b-c); it has the abdomen yellowish-brown and densely hairy on the basal half, with two small irregular dark brown patches on the last segments, as well as a darker ground color on the hindwings, with a pale yellow basal area. These characters clearly differentiate *P. timrichi* from *P. amyeaderae* and *P. affinis*, and we therefore considered it unnecessary to dissect the syntype specimen of *P. affinis*. In relation to *P. umbrata* Hampson, 1901 and *P. cinerea* (Walker, 1855), considered here as close relatives of *P. timrichi* by sharing similar adult markings, dissection of the *P. umbrata* holotype and *P. cinerea* syntype respectively confirmed the absence of either of these two taxa among examined material from Costa Rica.

Description. Adult male (Fig.3c). Forewing length 23.1-24.7 mm (n=5). The head is yellowish-brown with black spots on the palpi, front, vertex of head and on the scape; the patagia and tegulae are brown, with some yellowish-brown on the base and black rounded spots. The thorax is brown dorsally and yellowish-orange ventrally. There are two black rounded spots on the anterior coxae and two very small black spots on the posterior coxae; the legs are brown. The abdomen is yellowish-orange, with large elongate black patches on terga 3 to 8, pairs of lateral black spots on each segment from base to apex and two black patches on sterna 3 and 4. The forewings are brown color, with yellowish-brown basally and three black spots on it, and with the veins slightly darker. The hindwings are light brown.

GENITALIA: (10-SRNP-103699), (Figs 8i-l). The uncus is elongate, acute and with the tip curved downward ventrally. The valvae are very broad, strongly sclerotized apically, with the costal margin lobed medially and the ventral margin longer and ending on a membranous lobe. The transtilla is sclerotized, with two thin lateral projections curved outward laterally on the distal portion, and below it with a double lobe-shaped membranous structure, which is granular-surfaced. The juxta is sclerotized, broad, convex and W-shaped anteriorly. The saccus is absent. The aedeagus is sclerotized, with the anterior portion curved downward ventrally; the vesica is very short, elongate, with a basal lobe arising on the right and a large pointed cornutus on the dorsal surface.

Etymology. *Pelochyta timrichi* is named in honor of Mr. Tim Rich, of Oakland, California, USA, in recognition of his dedication to helping GDFCF and ACG invest and care for its financial resources.

Figure 10a-p. Type figures. **a**, *Amaxia apyga* Hampson, 1901, holotype labels, **b**, dorsal view of male holotype specimen, **c**, ventral view of male holotype genitalia capsule, **d**, lateral view of holotype edeagus, **e**, *Amaxia osmophora* Hampson, 1901, holotype labels, **f**, dorsal view of male holotype specimen, **g**, ventral view of male holotype genitalia capsule, **h**, ventral view of holotype edeagus, **i**, *Baritius grandis* (Rothschild, 1909), male syntype, dorsal view of male genitalia capsule, **j**, ventral view of male syntype genitalia capsule, **k**, lateral view male syntype genitalia capsule, **l**, dorsal view of male syntype aedeagus, **m**, *Pareuchaetes insulata* (Walker, 1855), syntype labels, **n**, dorsal view of male syntype specimen, **o**, syntype male genitalia, **p**, *Pareuchaetes misantlensis* Rego Barros, 1956, holotype male genitalia.

Pelochyta amyeaderae Espinoza, **sp. n.**
Figures 3d, 8m-p

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Guanacaste Province, Sector Pitilla, Estación Pitilla, 675 m, 5/16/2007, F. Quesada & S. Rios, lat long 10.98931, -85.42581; Voucher 07-SRNP-103155, GenBank accession: JQ566423, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. This species differs from *P. timrichi* **sp. n.** by its slightly darker forewing ground color and the more strongly marked veins. The transtilla has two long and thin lateral projections, partially sclerotized on the outer surface; the tips of the valvae have their dorsal section curved downward and with two short and pointed processes that extend inward and the vesica is very small. *Pelochyta amyeaderae* was first wrongly identified in the MNCR collection as *Pelochyta umbrata* Hampson, 1901, originally described from Bolivia, but that species is very different in terms of the tip of the valvae, which is bifurcate and with the costal end rounded; the two transtilla processes are strongly sclerotized, slightly curved downward and inward ventrally, and the aedeagus has the vesica elongate dorso-ventrally and with two patches of thick spines, one on its ventral side and one on its dorsal side (Figs 11d-g).

Description. Adult male (Fig. 3d). Forewing length 22.3-25.2 mm (n=5). *P. amyeaderae* is similar to *P. timrichi* in its markings, but *P. amyeaderae* has the thorax darker than in *P. timrichi*, the two black spots on the posterior coxae are bigger in this species, and its legs are dark brown. The forewings are dark brown, with strongly marked venation, and the hindwings are light brown.

GENITALIA: (07-SRNP-107675), (Figs 8m-p). The uncus is acute, elongate and with the tip curved downward ventrally. The valvae are broad from base to the apex, with the tips divided in two portions, the dorsal section curved downward, with two short and pointed processes that goes inward, and the ventral section truncated and with the outer surface membranous. The transtilla is laterally sclerotized, with two long and thin lateral projections partially sclerotized on the outer surface. Arising opposite to the transtilla processes, there is a double lobe-shaped membranous structure, very slightly granulated. The juxta is sclerotized, very broad, convex anteriorly and projecting laterally to the aedeagus. The saccus is absent. The aedeagus is sclerotized, thick and with the anterior portion slightly curved downward ventrally; The vesica is very small, with a strongly sclerotized cornuti on its dorsum basally, which is crenulate and with a short and very thick spine.

Etymology. *Pelochyta amyeaderae* is named in honor of Mrs. Amy Eader, of Philadelphia, Pennsylvania, USA, in recognition of her dedication to helping GDFCF and ACG have a stable and secure home and operating base in the Department of Biology at the University of Pennsylvania in Philadelphia.

Remarks. *Pelochyta timrichi* **sp. n.** and *P. amyeaderae* **sp. n.** are very difficult to separate by adult morphology; the forewing ground color serves to distinguish the two species if the specimens are in good condition, but if not, then it may be necessary to resort to examination of the genitalia for determining each species. Previously, these two taxa were respectively identified as *Pelochyta affinis* Rothschild, 1909, described from Ecuador, and as *Pelochyta umbrata* Hampson 1901, described from Bolivia, but morphological study of the syntype specimen of *P. affinis* and the holotype of *P. umbrata* confidently excludes the presence of these species in Costa Rica. The syntype of *Pelochyta cinerea* (Walker, 1855), described from Venezuela, was also dissected (Figs 11h-k), considering phenotypic similarities shared by that species with the two Costa Rica species, and that allowed us once more to confirm the absence of that species in Costa Rica. The genetic divergence between the two new cryptic species is 3.45%. Some evidence suggests the possibility of a third species hidden in this complex, living in other habitats outside of ACG, but the current lack of information makes it impossible to clarify the taxonomy further at this time.

Ochrodota marina complex.

Ochrodota marina Schaus, 1910
Figures 2g, 7i-l

TYPE LOCALITY: Costa Rica, Sixaola River.
TYPE SPECIMEN: Lectotype male, Type No. 16919Watson 1971, Pl. 18a). Deposited USNM.
Type dissection: Arctiidae genitalia slide no. AW262 (Watson, 1971, Pl. 108e-f).
Material examined: See Appendix 1.
Specimen sequenced: ♂, 09-SRNP-107411, GenBank Accession: HM407815 (dissected).

Diagnosis. This species is distinguished from *O. melaniamunozae* sp. n. by its smaller adult size, the narrow sub-terminal band on the hindwings and the two short, triangular projections on the transtilla (Figs 2g, 7i-j).

Description. Adult male (Fig. 2g). Forewing length 14.7-16.4 mm (n=8). The head and thorax are yellowish-brown. The palpi are elongate, upturned with dark brown laterally, the vertex of head is creamy-white, the antennae are dark brown, the patagia and tegulae are creamy-white and edged with yellowish-brown. The anterior coxae are yellow, the middle and posterior coxae are pale yellow; the legs are pale yellow with dark brown patches. The abdomen is yellow and has subdorsal series of dark brown patches on segments 3 to 8; ventrally it is pale yellow with a series of dark brown patches on segments 2 to 5. The forewings are dark brown ground color; the basal, sub-basal and apical areas have creamy-white patches edged with yellowish brown. The hindwings are light yellow with a narrow dark brown sub-terminal band.

GENITALIA: (09-SRNP-107411), (Figs 7i-l) The uncus is thin, elongate, curved to the right in dorsal view, with the tip pointed and slightly curved downward ventrally. The valvae are broad on the basal half and thin on the distal half, with the tip divided in two short processes with a rounded end; the ventral process has a small and flattened prominence on the inner surface. The length of the valvae is shorter compared with the length of the uncus. The transtilla is sclerotized, with two short, triangular projections. The juxta is convex, sclerotized but not well defined in shape. The saccus is reduced. The aedeagus is thick; the vesica is very short, covered by a dense patch of thick and strong spines.

Ochrodota melaniamunozae Espinoza, **sp. n.**
Figures 2h, 7m-p

Holotype. ♂: Costa Rica, Área de Conservación Guanacaste, Guanacaste Province, Sector Cacao, Sendero Circular, 1185 m, 10/06/2004, Harry Ramirez, lat long 10.92714, -85.46683; Voucher 04-SRNP-35826, GenBank accession: GU336016, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. This species can be distinguished from *O. marina* by its noticeably greater adult size and the wider sub-terminal band on the hindwings, as well as the two short, horn-like projections on the transtilla, which are triangular in *O. marina* (Figs 2h, 7m-n).

Description. Adult male (Fig. 2h). Forewing length 17.6-18.4 mm (n=5). Aside from the similarities shared with *O. marina*, adults of *O. melaniamunozae* are noticeably larger in size. This species has a large, elongate iridescent patch on the post-medial area of the forewings, a wider dark brown sub-terminal band on the hindwings, the abdomen has a sub-dorsal series of black patches on segments 4 to 8 and a lateral series of small black spots on segments 4 to 7.

GENITALIA: (INBIOCRI001081224), (Figs 7m-p). The uncus is thin, elongate, curved to the right in dorsal view, with the

Figure 11a-n. Type figures. **a**, *Pelochyta affinis* Rothschild, 1909, syntype labels, **b**, dorsal view of male syntype specimen, **c**, ventral view of syntype specimen, **d**, *Pelochyta umbrata* Hampson, 1901, dorsal view of male holotype genitalia capsule, **e**, dorsal view of male holotype genitalia capsule, **f**, lateral view of male holotype genitalia capsule, **g**, lateral view of male syntype aedeagus, **h**, *Pelochyta cinerea* (Walker, 1855), dorsal view of male syntype genitalia capsule, **i**, ventral view of male syntype genitalia capsule, **j**, lateral view of male syntype genitalia capsule, **k**, lateral view of syntype aedeagus, **l**, *Turuptiana obliqua* (Walker, 1869), holotype labels, **m**, dorsal view of male holotype specimen, **n**, close up of exposed genitalia of male holotype.

tip pointed and slightly curved downward ventrally. The valvae are broad on the basal half and thin on the distal half, with the tip divided in two short processes with a rounded end, the ventral process is very slightly curved inward and downward ventrally, and the length of the valvae is almost the length of the uncus. The transtilla is sclerotized, with two short, horn-like projections. The juxta is convex, partially sclerotized on the anterior portion and not well defined in shape. The saccus is absent. The aedeagus is slightly sclerotized in the anterior portion; the vesica is reduced in size and covered by a patch of thick and strong spines.

Etymology. *Ochrodota melaniamunozae* is named in honor of Mrs. Melania Muñoz Garcia of San Jose, Costa Rica, a member of the CONAGEBIO team, in recognition of her enthusiasm for understanding GDFCF and ACG in their efforts to do conservation through biodiversity development.

Remarks. As as in the previous cases**,** *Ochrodota marina* Schaus, 1910, and *O. melaniamunozae* **sp. n.** are included in this work by virtue of the high level of crypsis shared by them. The very few samples available in the collection of Museo Nacional de Costa Rica made it initially difficult to characterize both species, but after obtaining more samples collected and reared from ACG, it was possible to determine both the true *O. marina* (lectotype male, adult and genitalia illustrated in

Watson, 1971:56) and the hidden new species *Ochrodota melaniamunozae*. Somewhat suspicious variation in some of the male genitalia structures, mainly in the saccus, apex of valvae and vesica of a single specimen from Moravia de Chirripo in Cartago province, suggests that there may be a third species involved in this complex, but that hypothesis requires a larger sample size to test. The genetic divergence between these two species is 2%.

***Turuptiana obliqua* complex.**

Turuptiana obliqua (Walker, 1869)
Figures 3g, 9i-l, 11l-n

TYPE LOCALITY: [Central América]
TYPE SPECIMEN: Holotype male. Figure 11l-n. Deposited NHMUK.
Material examined: See Appendix 1.
Specimen sequenced: ♂, 09-SRNP-107733, GenBank asseccion: HM409099.

Diagnosis. *T. obliqua* can be distinguished from *T. annesmithae* **sp. n.** by its totally white tegulae, and by the color of the abdomen, which is yellow-orange with the basal half dark brown (Figs 3g, 11m).

Description. Adult male (Fig. 3g). Forewing length 19.3-20.6 mm (n=7). The head is dark brown with white on the frons and vertex of head; the antennae are bipectinate and dark brown; the tegulae are white; the thorax is dark brown dorsally and yellow-orange ventrally. The legs are dark brown with yellow on femora. The abdomen is yellow-orange, with the basal half of dorsum dark brown. The forewings are white, with dark brown bands along costal and posterior margins and with a transverse dark brown band from the middle of costal margin to the tornus. The hindwings are white with an irregular dark brown patch on the anal area and tornus.

GENITALIA: (INB0003457075), (Figs 9i-l). The uncus is short, densely covered by strong bristles, the tip is truncated, with very fine and protruding edges that project laterally. The valvae are very broad, moderately short, with a shorter length when compared with the uncus length, the ventral margin is slightly lobed near the base; the tip is bifurcate, with the portion of the costal end rounded and flattened dorso-ventrally, the portion of the ventral end is pointed. The transtilla is slightly sclerotized laterally and membranous on the above. The juxta is sclerotized, convex and slightly membranous on the anterior portion. The saccus is absent. The aedeagus is thick and with a small protuberance ventrally on the distal portion; the vesica is moderately short, with four lobes, one on the basal portion, partially covered by a patch of small and thin spines, and three lobes on the distal portion, one of which is covered by a large patch of long and thick spines.

Turuptiana annesmithae Espinoza, **sp. n.**
Figures 3h, 9m-p

Holotype. ♂: COSTA RICA, Prov. Cartago, Paraíso, P.N. Tapantí-Macizo de la Muerte, Del Mirador 0.3 km N, 0.1 km S. 1350 m. FEB 2000. L. Chavarría. de Luz, lat long 9.73635, -83.780628, #57538; Voucher INB0003171105, GenBank accession: KU905041, Deposited MNCR.
Paratypes. See Appendix 1.

Diagnosis. This species can be distinguished from *T. obliqua* by its tegulae, which are white with dark brown edges, instead of the entirely white tegulae in *T. obliqua*, and also by the dark brown patch on the abdomen, which runs from the base to the apex (Fig. 3h). Additional differences are observed in the male genitalia (Figs. 9j-p), particularly in the size and shape of the uncus tip and in the longer length of the valvae in relation to the uncus length in *T. annesmithae*.

Description. Adult male (Fig. 3h). Forewing length 21.2 -22.2 mm (n=7). *Turuptiana annesmithae* has similar markings to *T. obliqua*, but *T. annesmithae* has the white color on tegulae reduced and not reaching the tips, which are dark brown; the dark brown patch on dorsum of the abdomen runs from the base to the apex, becoming reduced in width distally, and the terga are ringed with dark brown.

GENITALIA: (INBIOCRI000626597), (Figs 9m-p). In its genitalia, *T. annesmithae* shares very similar structures with *T. obliqua*, but the main differences in this species are in the size and shape of the uncus tip, which is wider and with the edges strongly projected laterally and rounded; the valvae are as in *T. obliqua,* but longer, being a little longer than the length of the uncus; the aedeagus is also similar but it has the basal lobe on the vesica almost totally covered by a large patch of thick spines.

Etymology. *Turuptiana annesmithae* is named in honor of Mrs. Anne Smith of Arlington, Virginia, USA, in recognition of her extreme effort and dedication in aiding the conservation of Sector Santa Elena of ACG.

Remarks. *Turuptiana obliqua* (Walker, 1869) was reviewed after finding two clearly different coloration patterns on the abdomen. The first problem with the identification of this species was the unknown type locality, which is not specified in the original description, nor on the labels of the holotype specimen, deposited at the NHMUK, London, and in Watson & Goodger (1986) the type locality is indicated only as "[C. America]", probably based on the large series of samples available in the British Museum, collected from different areas of Central America. The two forms present in Costa Rica were the first indication of the potential for two species to be hidden within *T. obliqua*. Dissection of the male genitalia showed some more differences between both phenotypes, and subsequent DNA sequence analysis fully confirmed the two entities, which show a genetic difference of 2.02%. Determining which species represented *T. obliqua* required the examination of many samples, mainly from Mexico (NHMUK), but also one specimen available from Ecuador (AMNH). The holotype specimen is in a very bad condition and genitalia dissection was not possible, so for genitalia comparison it was necessary to examine samples of dissected supplementary material from Mexico, Jalapa, Gen. Slide No. 231 (AMNH), Mexico,

Coatepec, Gen. Slide No. 3109 (NHMUK) and also one specimen from Ecuador, Napo (Gen. Slide No. 232, AMNH), which closely match the holotype of *T. obliqua* in terms of the tegulae coloration. Also, images of a female syntype of *Turuptiana perfecta* Edward, 1884, from Jalapa, Mexico, which was designated as a synonym of *T. obliqua* by Watson & Goodger (1986) and deposited in the AMNH, were examined to verify the adult markings of that species.

The final determination of *T. obliqua* and *T. annesmithae* **sp. n.** was possible only after discovering consistent differences in the color pattern of the tegulae. The holotype specimen of *T. obliqua*, despite its poor condition, the syntype of *T. perfecta* (Syn. of *T. obliqua* according to Watson & Goodger (1986)) and supplementary specimens examined for this work, could all be confidently determined as having entirely white tegulae, while in *T. annesmithae* the tegulae are white with brown edges.

DISCUSSION

After several years of research, collecting information and examining many samples of Arctiinae from all over Costa Rica, we observed phenotypic variation in many of the species that are apparently widely distributed throughout the country. Earlier observations of the life cycles of many of the ACG species (to be described elsewhere) provided us with new indications of likely taxonomic complexity in several groups of species, in which finding morphological characters to separate species in adults was almost impossible. To date, these complexes of cryptic species were unrecognized and had been treated in each case as a single species.

In addition to subtle external phenotypic differences observed among related species, we also found slight differences in the genitalia in some cases. Finally, DNA barcoding provided definitive conclusions about the true taxonomic diversity for many of these complexes of species. The high level of cryptic diversity observed in these first ten cases examined was unexpected, and in fact, in some of these cryptic complexes, there is no way to distinguish the species by the adult patterns and they may be identified only by the genitalia, and, of course, differences in their DNA barcodes. In some of these cases, the local geographic distribution can also be used to determine the species; in ACG, for example, many species of Arctiinae are restricted to the dry forest, while many others are restricted to the rain forest, as observed in other groups of Lepidoptera.

In regards to the females associated with each of the species treated in this work, after finding no sexual dimorphism individually in each species, and no substantial differences on their genitalia, we decided not to illustrate them here. We hope that, with further study in the future, it might be possible to identify morphological characters that enable correct association of males and females in these cryptic species, but at present, the easiest and most reliable way to associate them with their males is by their DNA barcode sequences.

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Appendix 1. List of specimens, paratypes designated and supplementary samples examined as well as locality information.

Species/voucher	Sex	Locality information
***Munona carolinepalmerae*, Espinoza, sp. n.**		
Paratypes:		
08-SRNP-102335	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Jabalina, Manta Pizote, 288m., 6/6/2008. S.Rios&R.Franco. 10.97325, -85.31542.
07-SRNP-110350	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe (melina), 391m., 11/10/2007. F.Quesada&R.Franco. 10.89560, -85.29558.
07-SRNP-110349	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe (melina), 391m., 11/10/2007. F.Quesada&R.Franco. 10.89560, -85.29558.
08-SRNP-107548	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Loma, 200m., 10/28/2008. H.Cambronero&F.Quesada. 10.95897, -85.28527.
09-SRNP-108653	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Corral, 141m., 9/19/2009. F.Quesada&H.Cambronero. 10.95924, -85.28339.
08-SRNP-107023	♂	Guanacaste Prov., ACG, Sector Pitilla, Estacion Quica, 487m., 9/29/2008. R.Franco&H.Cambronero. 10.99679, -85.39695.
09-SRNP-107016	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Potrero Chaves, 433m., 8/18/2009. R.Franco&S.Rios. 10.93868, -85.32167.
08-SRNP-106724	♀	Guanacaste Prov., ACG, Sector Pitilla, Estacion Quica, 487m., 9/29/2008. S.Rios&R.Franco. 10.99679, -85.39695
08-SRNP-106286	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Porton, 147m., 9/27/2008. F.Quesada. 10.96048, -85.28237.
***Munona robpuschendorfi*, Espinoza, sp. n.**		
Paratypes:		
08-SRNP-105721	♂	Guanacaste Prov., ACG, Sector Santa Elena, Manta Calera, 342m., 8/31/2008. S.Rios&R.Franco. 10.86576, -85.65112.
06-SRNP-104850	♂	Guanacaste Prov., ACG, Sector Santa Elena, Mirador Rio Cuajiniquil, 242m., 5/27/2006.S. Rios&F.Quesada. 10.89842, -85.61879.
07-SRNP-108703	♂	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 9/10/2007. S.Rios&H.Cambronero. 10.88449, -85.47306.
07-SRNP-105347	♂	Guanacaste Prov., ACG, Sector Santa Elena, Mirador Rio Cuajiniquil, 242m., 6/14/2007. R.Franco&F.Quesada. 10.89842, -85.61879.
06-SRNP-104170	♀	Guanacaste Prov., ACG, Sector Santa Elena, La Angostura, 300m., 5/25/2006. S.Rios&F.Quesada. 10.85592, -85.67017.
06-SRNP-104851	♀	Guanacaste Prov., ACG, Sector Santa Elena, Mirador Rio Cuajiniquil, 242m., 5/27/2006. S.Rios&F.Quesada. 10.89842, -85.61879.
06-SRNP-104169	♀	Guanacaste Prov., ACG, Sector Santa Elena, La Angostura, 300m., 5/25/2006. S.Rios&F.Quesada. 10.85592, -85.67017.
08-SRNP-104383	♀	Guanacaste Prov., ACG, Sector Mundo Nuevo, La Perla (Tajo), 394m., 7/4/2008. H.Cambronero&F.Quesada. 10.76734, -85.43014.
09-SRNP-104641	♀	Guanacaste Prov., ACG, Sector Santa Elena, La Angostura, 300m., 5/25/2009. S.Rios& R.Franco. 10.85592, -85.67017.
***Amaxia apyga*, Hampson, 1901**		
Material examined:		
10-SRNP-112569	♂	Guanacaste Prov.,ACG, Sector Cacao, Toma de Agua, 1160m., 8/10/2010. S.Rios&F.Quesada. 10.92956, -85.46512.
INBIOCRI000615466	♂	Guanacaste Prov., Sector Cacao, Toma de Agua, 1160m., 8/10/2010. S.Rios&F.Quesada. 10.92956, -85.46512.
06-SRNP-109203	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,11/21/2006. F.Quesada&H.Cambronero. 10.88009, -85.38887.
07-SRNP-112465	♂	Guanacaste Prov., ACG, Sector Santa Rosa, Sendero los Patos, 251m., 12/8/2007. H.Cambronero&S.Rios. 10.82097, -85.63323.
07-SRNP-107588	♂	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
06-SRNP-106412	♂	Guanacaste Prov., ACG, Hotel Boriquen, Canopy Tours, 700m., 8/29/2006. H.Cambronero&F.Quesada. 10.81262, -85.40248.
07-SRNP-106564	♂	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 8/10/2007. H.Cambronero&F.Quesada. 10.88449, -85.47306.
11-SRNP-104231	♀	Guanacaste Prov., ACG, Sector Orosi, Casa Rafa, 579m., 6/4/2011. H.Cambronero & R.Franco. 10.95884, -85.49539.
08-SRNP-104203	♀	Guanacaste Prov., ACG, Sector Del Oro, Bosque Aguirre, 571m., 7/3/2008. S.Rios&F.Quesada. 11.00404, -85.44125.
10-SRNP-113382	♀	Guanacaste Prov., ACG, Sector Pailas, Manta Copelares, 1478m., 9/7/2010. S.Rios&R.Franco. 10.81692, -85.34679.
11-SRNP-104459	♀	Guanacaste Prov., ACG, Sector Santa Elena, La Angostura, 300m., 9/27/2011. H.Cambronero&R.Franco. 10.85592, -85.67017.
07-SRNP-107582	♀	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
***Amaxia rocioecheverriae*, Espinoza, sp. n.**		
Paratypes:		
06-SRNP-109960	♂	Alajuela Prov.,ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,12/21/2006. R.Franco&H.Cambronero. 10.88009, -85.38887.
06-SRNP-108980	♂	Guanacaste Prov., ACG, Sector Del Oro, Serrano, 585m., 11/20/2006. H.Cambronero&S.Rios. 11.00023, -85.45621.
07-SRNP-101765	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/17/2007. R.Franco&F.Quesada. 10.98931, -85.42581.
08-SRNP-107014	♂	Guanacaste Prov., Sector Pitilla, Estacion Quica, 487m., 9/29/2008. S.Rios&R.Franco. 10.99679, -85.39695
08-SRNP-105571	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Jabalina, Manta Pizote, 288m., 8/30/2008. R.Franco&F.Quesada. 10.97325, -85.31542.
08-SRNP-102358	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Jabalina, Manta Pizote, 288m., 6/6/2008. S.Rios&R.Franco. 10.97325, -85.31542.
08-SRNP-105767	♀	Guanacaste Prov., ACG, Sector Santa Elena, Manta Calera, 342m., 8/31/2008. S.Rios&R.Franco. 10.86576, -85.65112.
07-SRNP-107062	♀	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 8/11/2007. R.Franco&S.Rios. 10.88449, -85.47306.
07-SRNP-107064	♀	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 8/11/2007. R.Franco&S.Rios. 10.88449, -85.47306.
07-SRNP-112468	♀	Guanacaste Prov., ACG, Sector Santa Rosa, Sendero los Patos, 251m., 12/8/2007. H.Cambronero&S.Rios. 10.82097, -85.63323.
***Amaxia osmophora*, Hampson 1901**		
Material examined:		
08-SRNP-101635	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 5/30/2008. H.Cambronero&F.Quesada. 10.98931, -85.42581.
INB0004078547	♂	Cartago Prov., Turrialba. M.N. Guayabo. Est. Guayabo. 1100-1200m. 7-8 MAY 2007. M. Moraga, J. A. Azofeifa, R. González, E. Navarro. 9.97216, -83.692198. Tp. Luz, #91200
07-SRNP-102340	♂	Guanacaste Prov., ACG, Sector Pitilla, Pasmompa, 400m., 3/19/2007. R.Franco&S.Rios. 11.02666, -85.41026.
07-SRNP-101429	♂	Guanacaste Prov., ACG, Sector Pitilla, Pasmompa, 400m., 2/18/2007. R.Franco&S.Rios. 11.02666, -85.41026.
08-SRNP-108437	♂	Guanacaste Prov., ACG, Sector Santa Maria, Manta Potrero, 817m., 11/28/2008. R.Franco & F.Quesada. 10.76213, -85.30354.
08-SRNP-102818	♂	Guanacaste Prov., ACG, Sector Del Oro, Bosque Aguirre, 571m., 6/7/2008. S.Rios&F.Quesada. 11.00404, -85.44125.
10-SRNP-109421	♂	Guanacaste Prov., ACG, Sector Pailas, Manta Mona, 1055m., 6/14/2010. F.Quesada&R.Franco. 10.79235, -85.34891.
INB0004107102	♂	Limón Prov., Talamanca. P.N. La Amistad. Laguna Doroteri. 800m. 27 JUL 2007. A. Solis, M. Moraga. 9.610239, -83.267651. Tp. de Luz. #92331.
INB0004078547	♂	Cartago Prov., Turrialba. M.N. Guayabo. Est. Guayabo. 1100-1200m. 7-8 MAY 2007. M. Moraga, J. A. Azofeifa, R. González, E. Navarro. 9.97216, -83.692198. Tp. Luz. #91200
INB0004123754	♂	Limón Prov., Z.P. Río Banano. Rancho 3. 800m. 3 NOV 2007. M. Moraga. 9.825566, -83.163612. Tp. de Luz. #92831.
INB0004117227	♂	Limón Prov., Z.P. Río Banano. Campamento Base. 1300m. 25-27 OCT 2007. M. Moraga, B. Gamboa. 9.814604, -83.17007. Tp. de Luz. #92599
INB0003935194	♂	Cartago Prov., Pejibaye, Reserva Biol. Copal, 1040m, 3 - 7 ABR 2005, J.Azofeifa, B. Gamboa, D.Briceño, M.Moraga, J.Gutiérrez, Y.Cárdenas. 9.783407, -83.751929. Tp. Luz, #80025
INB0004078548	♂	Cartago Prov., Turrialba. M.N. Guayabo. Est. Guayabo. 1100-1200m. 7-8 MAY 2007. M. Moraga, J. A. Azofeifa, R. González, E. Navarro. 9.97216, -83.692198. Tp. Luz. #91200
INB0004078542	♂	Cartago Prov., Turrialba. M.N. Guayabo. Est. Guayabo. 1100-1200m. 7-8 MAY 2007. M. Moraga, J. A. Azofeifa, R. González, E. Navarro. 9.97216, -83.692198. Tp. Luz. #91200
***Amaxia josealfredohernandezi*, Espinoza, sp. n.**		
Paratypes:		
07-SRNP-102423	♂	Guanacaste Prov., ACG, Sector Pitilla, Colocho, 390m., 3/19/2007. H.Cambronero&F.Quesada. 11.02560, -85.41224.
08-SRNP-107826	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Loma, 200m., 10/29/2008. S.Rios&R.Franco. 10.95897, -85.28527.

Species/voucher	Sex	Locality information
***Amaxia josealfredohernandezi*, Espinoza, sp. n., continued**		
Paratypes:		
08-SRNP-106689	♂	Guanacaste Prov., ACG, Sector Pitilla, Estacion Quica, 487m., 9/28/2008. S.Rios&R.Franco. 10.99679, -85.39695.
09-SRNP-107030	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Protrero Chaves, 433m., 10/29/2008. R.Franco&S.Rios. 10.93868, -85.32167.
09-SRNP-107419	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Casa Leiva, 454m., 8/19/2009. R.Franco&S.Rios. 10.94314, -85.31808.
INB0003520967	♂	Cartago Prov., Turrialba, P.N. Barbilla, Estación Barbilla, 500m, JUL 2002, L. Chavarría, 9.981348, -83.454259. Trampa de Luz. #70677
INB0003433585	♂	Alajuela Prov., Guatuso, P.N.Volcán Tenorio, Sector El Pilón, 700 - 800m, FEB 2002, G. Rodriguez, 10.704603, -84.992304. Trampa de Luz. #66979
INB0004223527	♂	Heredia Prov., Sarapiquí. Est. Biol. La Tirimbina, Mirador. 167m. 22 JUL 2009. I. Chacón. 10.416556, -84.120167. Tp. Luz. #97466
***Amaxia alejandraloriae*, Espinoza, sp. n.**		
Paratypes:		
06-SRNP-106411	♂	Guanacaste Prov., ACG, Hotel Boriquen, Canopy Tours, 700m., 8/29/2006. H.Cambronero&F.Quesada. 10.81262, -85.40248.
08-SRNP-103340	♂	Guanacaste Prov., ACG, Hotel Boriquen, Canopy Tours, 700m., 6/11/2008. H.Cambronero&F.Quesada. 10.81262, -85.40248.
10-SRNP-105174	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 725m., 2/12/2010. R.Franco&H.Cambronero. 10.86627, -85.32605.
10-SRNP-106637	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Manta Hugo, 491m., 3/13/2009. F.Quesada&S.Rios. 10.88110, -85.26770.
10-SRNP-114839	♂	Guanacaste Prov., ACG, Sector Santa Maria, Estacion Santa Maria, 832m., 11/3/2010. F.Quesada&S.Rios. 10.76461, -85.30321.
10-SRNP-115469	♂	Guanacaste Prov., ACG, Sector Santa Maria, Estacion Santa Maria, 832m., 11/5/2010. F.Quesada&S.Rios. 10.76461, -85.30321.
08-SRNP-108439	♀	Guanacaste Prov., ACG, Sector Santa Maria, Manta Potrero, 817m., 11/28/2008. R.Franco & F.Quesada. 10.76213, -85.30354.
09-SRNP-110398	♀	Guanacaste Prov., ACG, Sector Del Oro, Serrano, 585m., 11/15/2009. R.Franco&S.Rios. 11.00023, -85.45621.
10-SRNP-111961	♀	Guanacaste Prov., ACG, Sector Cacao, Laboratorio 1150m., 8/8/2010. H.Cambronero&R.Franco. 10.92691, -85.46822.
***Amaxia brendacasperae*, Espinoza, sp. n.**		
Paratypes:		
INB0004166130	♂	Alajuela Prov., San Ramón. Est. Biol. Villa Blanca. 1115m. 8-10 AGO 2008. R. Rojas. 10.201361, -84.485101. Tp. Luz Mercurio. #94534.
INB0004301863	♂	Alajuela Prov., San Ramón. Est. Biol. Villa Blanca. 1115m. 27 OCT 2011. M. Gutiérrez. 10.201361, -84.485101. Tp. Luz Mercurio. #103055.
INB0004264151	♂	Cartago Prov., Paraíso. P.N. Tapantí-Macizo de La Muerte. La Represa, camino al tunel de Río Humo y sector de la Quebrada. 1750m. 8-10 SEP 2010. B. Espinoza. 9.709221, -83.781127. Tp. de Luz. #99954.
INB0004264134	♂	Cartago Prov., Paraíso. P.N. Tapantí-Macizo de La Muerte. Send. Oropéndula, Mirador Sendero Circular Oeste. 1600m. 8-10 SEP 2010. B. Espinoza. 9.71735, -83.772916. Tp. de Luz. #99953
INB0004264077	♀	Cartago Prov., Paraíso. P.N. Tapantí-Macizo de La Muerte. Camino principal, del portón del ICE 3.5 km siguiendo hacia Río Humo. 1650m. 8-10 SEP 2010. B. Espinoza. 9.720517, -83.777771. Tp. Luz. #99952
INB0003171028	♂	Cartago Prov., Paraíso, P.N. Tapantí-Macizo de la Muerte, Estación Quebrada Segundo. 1200m. FEB 2000. L. Chavarría.9.761676, -83.786507. Tp de Luz. #57537
INB0003520656	♂	Cartago Prov., P.N. Tapantí - Macizo de La Muerte, del Mirador 300m NO., 1380m, JUL 2002, R. Delgado, 9.73635, -83.780628. Tp de Luz, #70692
INB0003116502	♂	Cartago Prov., Paraíso, P.N. Tapantí-Macizo de La Muerte, del Río Porras 0.300Km S.E. 1600m. NOV 2000. R. Delgado. 9.695215, -83.782067. Tp de Luz. #60870
INB0003116392	♂	Cartago Prov., Paraíso, P.N. Tapantí-Macizo de La Muerte. Estación Quebrada Segundo. 1300m. NOV 2000. R. Delgado. 9.762583, -83.788328. Tp de Luz. #60869
INB0003447430	♂	Cartago Prov., Tapanti, Rio Grande de Orosi, Cartago Prov. Costa Rica. 1300-1400 m., 9 Apr 1984 DH Janzen & W. Hallwachs. 9.775254, -83.795598.
***Baritius grandis*, (Rothschild, 1909)**		
Material examined:		
07-SRNP-103132	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 5/16/2007. F.Quesada&S.Rios. 10.98931, -85.42581.
08-SRNP-103907	♂	Guanacaste Prov., ACG, Sector Del Oro, Bosque Aguirre, 571m., 7/2/2008. R.Franco&S.Rios. 11.00404, -85.44125.
11-SRNP-102473	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 4/4/2011. R.Franco&F.Quesada. 10.98931, -85.42581.
06-SRNP-101966	♂	Costa Rica, Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/1/2006. S.Rios&R.Franco. 10.98931, -85.42581.
08-SRNP-101633	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 5/30/2008. H.Cambronero&F.Quesada. 10.98931, -85.42581.
07-SRNP-107646	♀	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
07-SRNP-103133	♀	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 5/16/2007. F.Quesada&S.Rios. 10.98931, -85.42581.
06-SRNP-101967	♀	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/1/2006. S.Rios&R.Franco. 10.98931, -85.42581.
10-SRNP-105711	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 725m., 2/14/2010. R.Franco&H.Cambronero. 10.86627, -85.32605.
11-SRNP-102474	♀	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 4/4/2011. R.Franco&F.Quesada. 10.98931, -85.42581.
***Baritius angelagonzalezae*, Espinoza, sp. n.**		
Paratypes:		
08-SRNP-105208	♂	Guanacaste Prov., ACG, Sector Pitilla, Estacion Quica, 487m., 8/29/2008. S.Rios & R.Franco. 10.99679, -85.39695.
06-SRNP-109469	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,11/22/2006. R.Franco&S.Rios. 10.88009, -85.38887.
06-SRNP-109238	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,11/21/2006. F.Quesada&H.Cambronero. 10.88009, -85.38887.
08-SRNP-105566	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Jabalina, Manta Pizote, 288m., 8/30/2008. R.Franco&F.Quesada. 10.97325, -85.31542.
08-SRNP-101151	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Jabalina, Manta Pizote, 288m., 3/29/2008. F.Quesada&R.Franco. 10.97325, -85.31542.
10-SRNP-112926	♀	Guanacaste Prov., ACG, Sector Pailas, Manta Rio Blanco, 790m., 9/6/2010. S.Rios&R.Franco. 10.77464, -85.35001.
10-SRNP-113838	♀	Guanacaste Prov., ACG, Sector Pailas, Manta Rio Blanco, 790m., 9/6/2010. S.Rios&R.Franco. 10.77464, -85.35001.
07-SRNP-107647	♀	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
07-SRNP-114014	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe, 391m., 12/11/2007. R.Franco&H.Cambronero. 10.90082, -85.2764.
09-SRNP-107727	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Protrero Chaves, 433m., 8/19/2009. F.Quesada&H.Cambronero. 10.93868, -85.32167.
***Baritius maribellealvarezae*, Espinoza, sp. n.**		
Paratypes:		
06-SRNP-109237	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,11/21/2006. F.Quesada&H.Cambronero. 10.88009, -85.38887.
06-SRNP-103667	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,4/29/2006. H.Cambronero&S.Rios. 10.88009, -85.38887.
07-SRNP-113876	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe, 391m., 12/11/2007. S.Rios&H.Cambronero. 10.90082, -85.2764.
11-SRNP-101939	♀	Guanacaste Prov., ACG, Sector Pitilla, Sendero Memo, 774m., 4/2/2011. R.Franco&F.Quesada. 10.98518, -85.42811.
08-SRNP-103908	♀	Guanacaste Prov., ACG, Sector Del Oro, Bosque Aguirre, 571m., 7/2/2008. R.Franco&S.Rios. 11.00404, -85.44125.
06-SRNP-108966	♀	Guanacaste Prov., ACG, Sector Del Oro, Serrano, 585m., 11/20/2006. H.Cambronero&S.Rios. 11.00023, -85.45621.
06-SRNP-109470	♀	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 11/22/2006. R.Franco&S.Rios. 10.88009, -85.38887.
07-SRNP-101780	♀	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/17/2007. R.Franco&F.Quesada. 10.98931, -85.42581.
07-SRNP-110375	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe (melina), 391m., 11/10/2007. F.Quesada&R.Franco. 10.89560, -85.29558.
***Baritius martajimenezae*, Espinoza, sp. n.**		
Paratypes:		
INB0003416955	♂	Cartago Prov., R.F. Río Pacuare, Turrialba, P.N. Barbilla, Estación Barbilla, 500m, ENE 2002, L. Chavarría, 9.981348 -83.454259, Trampa de Luz. #66503

Species/voucher	Sex	Locality information
***Baritius martajimenezae*, Espinoza, sp. n., continued**		
Paratypes:		
INB0003386842	♂	Cartago Prov., Turrialba, R.F. Río Pacuare, P.N. Barbilla, Estac. Barbilla, 500m, OCT 2001, L. Chavarría, 9.981348, -83.454259. Trampa de Luz. #65236
INB0003448498	♂	San Jose Prov., Estacion Carrillo, Pk. Nac. Braulio Carrillo, 700 m. July 1984 coll. I. A. Chacon
INBIOCRI002114444	♂	Alajuela Prov., R.B. San Ramon, 800 m. 28 Nov- 3 Dic 1994, G. Carballo, 10.224969, -84.587984. # 3332
INB0003946496	♀	Puntarenas Prov., Osa, Ciudad Pto Cortés, Camino Alto Buena Vista, 850m, 7 JUN 2005, B. Gamboa, J. Gutiérrez, M. Moraga, J. Azofeifa, Y. Cárdenas, 9.022889, -83.496231 Tp Luz, #83465
***Pareuchaetes abbysmutnyae*, Espinoza, sp.n.**		
Paratypes:		
06-SRNP-100699	♂	Guanacaste Prov., ACG, Sector Santa Elena, Mirador Rio Cuajiniquil, 242m., 1/27/2006. F.Quesada&R.Franco. 10.89842, -85.61879.
10-SRNP-112589	♂	Guanacaste Prov., ACG, Sector Cacao, Toma de Agua, 1160m., 8/10/2010. S.Rios&F.Quesada. 10.92956, -85.46512.
07-SRNP-112992	♂	Guanacaste Prov., ACG, Sector Mundo Nuevo, La Perla (Tajo), 394m., 12/9/2007. H.Cambronero&F.Quesada. 10.76734, -85.43014.
07-SRNP-105326	♂	Guanacaste Prov., ACG, Sector Santa Elena, Mirador Rio Cuajiniquil, 242m., 6/14/2007. R.Franco&F.Quesada. 10.89842, -85.61879.
07-SRNP-104993	♀	Guanacaste Prov., ACG, Sector Santa Elena, La Angostura, 300m., 6/13/2007. S.Rios&F.Quesada. 10.85592, -85.67017.
08-SRNP-106472	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Loma, 200m., 9/27/2008. R.Franco&S.Rios. 10.95897, -85.28527.
08-SRNP-103656	♀	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 7/1/2008. H.Cambronero&S.Rios. 10.88449, -85.47306.
06-SRNP-102920	♀	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/3/2006. H.Cambronero&F.Quesada. 10.98931, -85.42581.
06-SRNP-105977	♀	Guanacaste Prov., ACG, Sector Santa Elena, La Angostura, 300m., 7/25/2006. R.Franco&H.Cambronero. 10.85592, -85.67017.
***Pareuchaetes georgegormani*, Espinoza, sp. n.**		
Paratypes:		
07-SRNP-102873	♂	Guanacaste Prov., ACG, Trocha ICE, Buena Vista, 850m., 4/18/2007. F.Quesada&R.Franco. 10.81156, -85.39746.
07-SRNP-113394	♂	Guanacaste Prov., ACG, Sector Mundo Nuevo, La Perla (Tajo), 394m., 12/10/2007. S.Rios& R.Franco. 10.76734, -85.43014.
07-SRNP-106582	♂	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 8/10/2007. H.Cambronero&F.Quesada. 10.88449, -85.47306.
09-SRNP-105387	♂	Guanacaste Prov., ACG, Sector Mundo Nuevo, Manta Cañon, 700m., 6/21/2009. F.Quesada&S.Rios. 10.77042, -85.37254.
08-SRNP-109127	♀	Guanacaste Prov., ACG, Sector Santa Rosa, Luces, 300m., 12/27/2008. R.Franco&S.Rios. 10.85362, -85.60942.
06-SRNP-100389	♀	Guanacaste Prov., ACG, Sector Santa Elena, Mirador Rio Cuajiniquil, 242m., 1/26/2006. R.Franco&F.Quesada. 10.89842, -85.61879.
07-SRNP-107599	♀	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
07-SRNP-112385	♀	Guanacaste Prov., ACG, Sector Santa Rosa, Sendero los Patos, 251m., 12/7/2007. F.Quesada. 10.82097, -85.63323.
07-SRNP-111253	♀	Guanacaste Prov., ACG, Sector Cacao, Estacion Gongora, 557m., 9/12/2007. R.Franco&S.Rios. 10.88449, -85.47306.
07-SRNP-113393	♀	Guanacaste Prov., ACG, Sector Mundo Nuevo, La Perla (Tajo), 394m., 12/10/2007. S.Rios& R.Franco. 10.76734, -85.43014.
***Symphlebia tessellata*, Schaus, 1910**		
Material examined:		
10-SRNP-110908	♂	Guanacaste Prov., ACG, Sector Cacao, Derrumbe, 1310m., 7/11/2010. R.Franco&F.Quesada. 10.93110, -85.46194.
10-SRNP-108598	♂	Guanacaste Prov., ACG, Sector Cacao, Derrumbe, 1310m., 5/14/2010. F.Quesada&S.Rios. 10.93110, -85.46194.
10-SRNP-112580	♂	Guanacaste Prov., ACG, Sector Cacao, Toma de Agua, 1160m., 8/10/2010. S.Rios&F.Quesada. 10.92956, -85.46512.
10-SRNP-110907	♂	Guanacaste Prov.,ACG, Sector Cacao, Derrumbe, 1310m., 7/11/2010. R.Franco&F.Quesada. 10.93110, -85.46194.
07-SRNP-101747	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/17/2007. R.Franco&F.Quesada. 10.98931, -85.42581.
11-SRNP-100748	♂	Guanacaste Prov., ACG, Sector Santa Maria, Manta Claro, 1610m., 2/3/2011. H.Cambronero&F.Quesada. 10.80345, -85.32621.
01-SRNP-7381	♀	Guanacaste Prov., ACG, Sector Cacao, Estacion Cacao, 1150m., 08/28/2001. Mariano Pereira. 10.92691, -85.46822.
99-SRNP-1481	♀	Guanacaste Prov., ACG, Sector Cacao, Toma de Agua, 1140m., 08/31/1999. Mariano Pereira. 10.92847, -85.46680.
***Symphlebia janecheverriae*, Espinoza, sp. n.**		
Paratypes:		
07-SRNP-109314	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe, 391m., 10/10/2007. S.Rios&H.Cambronero. 10.90082, -85.2764.
07-SRNP-100387	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 2/11/2007. R.Franco&F.Quesada. 10.98931, -85.42581.
09-SRNP-108330	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Casa Leiva, 454m., 9/17/2009. F.Quesada&R.Franco. 10.94314, -85.31808.
06-SRNP-102525	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 3/2/2006. R.Franco&F.Quesada. 10.98931, -85.42581.
08-SRNP-104942	♂	Guanacaste Prov., ACG, Sector Del Oro, Serrano, 585m., 8/1/2006. R.Franco&H.Cambronero. 11.00023, -85.45621.
09-SRNP-100575	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Rio Francia, 410m., 1/24/2009. R.Franco&S.Rios. 10.90425, -85.28651.
08-SRNP-107749	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Porton, 147m., 10/28/2008. H.Cambronero&F.Quesada. 10.96048, -85.28237.
01-SRNP-5837	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Sendero Guaca, 400m., 09/20/2001. Freyci Vargas . 10.90610, -85.28281.
09-SRNP-31979	♀	Guanacaste Prov., ACG, Sector Pitilla, Pasmompa, 400m., 6/17/2009. Dinia Martinez. 11.01926, -85.40997.
***Kirrostola metaxantha*, (Schaus, 1905)**		
Material examined:		
09-SRNP-103001	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Porton, 147m., 3/23/2009. R.Franco & S.Rios. 10.96048, -85.28237.
INB0004073358	♂	Alajuela Prov., Guatuso. Sitio Catarata Río Buenavista. 700-800m. 20 MAR 2007. J. A. Azofeifa. 10.706992, -84.983685. Tp. Luz. #91073
10-SRNP-104880	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 725m., 2/11/2010. S.Rios&F.Quesada. 10.86627, -85.32605.
08-SRNP-107755	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Botarrama, Manta Porton, 147m., 10/28/2008. R.Franco&S.Rios. 10.96048, -85.28237.
09-SRNP-107725	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Potrero Chaves, 433m., 8/19/2009. F.Quesada&H.Cambronero. 10.93868, -85.32167.
08-SRNP-101627	♂	Guanacaste Prov., ACG, Sector Pitilla,Estacion Pitilla, 675m., 5/30/2008. H.Cambronero&F.Quesada. 10.98931, -85.42581.
11-SRNP-103124	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 5/3/2011. S.Rios&H.Cambronero. 10.88009, -85.38887.
10-SRNP-104673	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 725m., 1/16/2010. S.Rios&F.Quesada. 10.86627, -85.32605.
08-SRNP-102078	♀	Guanacaste Prov., ACG, Sector Del Oro, Sendero Manta, 610m., 6/4/2008. H.Cambronero&R.Franco. 10.99689, -85.45679.
08-SRNP-102837	♀	Guanacaste Prov., ACG, Sector Del Oro, Bosque Aguirre, 571m., 6/7/2008. S.Rios&F.Quesada. 11.00404, -85.44125.
INB0004239193	♀	Alajuela Prov., San Ramón. Est. Biol. Villa Blanca. 1115m. 23-25 MAY 2009. R. Rojas. 10.201361, -84.485101. Tp. Luz Mercurio. #97135
***Kirrostola stevearonsoni*, Espinoza, sp. n.**		
Paratypes:		
INB0003457197	♂	Puntarenas Prov.,Sirena, Corcovado, Nat. Pk. Osa Peninsula. 1 May 1984. D.H. Janzen & W. Hallwachs. 8.453267, -83.575857. #57783
INB0003454213	♂	Puntarenas Prov., Sirena,Corcovado Nat. Pk., Osa Penin., 23 March 1984 DH Janzen & W. Hallwachs. 8.479267, -83.588565.
INB0003505952	♂	Puntarenas Prov., Sirena, Corcovado Nat. Pk., Osa Penin., 10-19 Aug 1980 D.H. Janzen & W. Hallwachs. 8.480171, -83.591289.
INBIOCRI001312002	♂	Puntarenas Prov., P. N. Manuel Antonio, 80 m, Quepos, May 1991, G. Varela. 9.387728, -84.132806.
INB0004183393	♀	Puntarenas Prov., Garabito. Fca. Queb. Bonita-Garabu. La Catarata. 50-100m. 25 NOV 2008. Zumbado, Hernández, Azofeifa, Moraga. 9.572767, -84.591568. Luz Mercurio. #95334
INB0004103560	♀	COSTA RICA. Prov. Puntarenas. Golfito. R.F. Golfo Dulce. Fila Pizota. 100-200m. 13 AGO 2007. J. A. Azofeifa. 8.512633, -83.404182. Tp. Luz. #92125
INB0003351071	♀	Puntarenas Prov., Golfito, Osa, P.N.Piedras Blancas, Sector El Tajo, 150m, 17- 25 APR 2001, M. Moraga. 8.669767, -83.198716. Luces, #64088

Species/voucher	Sex	Locality information
***Kirrostola stevearonsoni*, Espinoza, sp. n., continued**		
Paratypes:		
INB0004111071	♀	Puntarenas Prov., R.F. Golfo Dulce. P.N. Corcovado. Est. Agujas. 200-300m. 10-12 OCT 2007. J. A. Azofeifa. 8.536614, -83.425512. Tp. Luz. #92557
INB0004183282	♀	Puntarenas Prov., Garabito. Fca. Queb. Bonita-Garabu. La Fila. 100-150m. 23 NOV 2008. Zumbado, Hernández, Azofeifa, Moraga. 9.571849, -84.597058. Tp. Luz Mercurio. #95322
INB0003779496	♀	Puntarenas Prov., P.N. Corcovado, Sector La Leona, Cerro Puma, 100 - 300m, 23 - 27 SEP 2003, K. Caballero. 8.454816, -83.495034. Tp. de Luz. #75577
INBIOCRI001312062	♀	Puntarenas Prov., P. N. Manuel Antonio, 80 m, Quepos, May 1991, G. Varela. 9.387728, -84.132806.
***Pelochyta timrichi*, Espinoza, sp. n.**		
Paratypes:		
10-SRNP-103699	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Tunel, 708m., 1/12/2010. S.Rios. 10.86835, -85.32711.
06-SRNP-109472	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m.,11/22/2006. R.Franco&S.Rios. 10.88009, -85.38887.
06-SRNP-109471	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 11/22/2006. R.Franco&S.Rios. 10.88009, -85.38887.
07-SRNP-107674	♂	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
11-SRNP-100106	♀	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 719m., 1/4/2011. H.Cambronero&S.Rios. 10.86623, -85.32693.
07-SRNP-100379	♀	Guanacaste Prov., ACG, Sector Pitilla, Estacion Pitilla, 675m., 2/11/2007. R.Franco&F.Quesada. 10.98931, -85.42581.
10-SRNP-109032	♀	Guanacaste Prov., ACG, Sector Pailas, Manta Mona, 1055m., 6/13/2010. F.Quesada&S.Rios. 10.79235, -85.34891.
12-SRNP-102562	♀	Guanacaste Prov., ACG, Sector Pailas, Manta Laguna, 785m., 5/20/2012. S.Rios&R.Franco. 10.46237, -85.20438.
12-SRNP-102163	♀	Guanacaste Prov., ACG, Sector Pailas, Manta Rio Blanco, 790m., 5/19/2012. S.Rios&R.Franco. 10.77464, -85.35001.
***Pelochyta amyeaderae*, Espinoza, sp. n.**		
Paratypes:		
07-SRNP-107675	♂	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
07-SRNP-107678	♂	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
06-SRNP-109256	♂	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 11/21/2006. F.Quesada&H.Cambronero. 10.88009, -85.38887.
07-SRNP-103154	♂	Guanacaste Prov., ACG, Sector Pitilla, Estacion Pitilla, 675m., 5/16/2007. F.Quesada&S.Rios. 10.98931, -85.42581.
06-SRNP-109255	♀	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 11/21/2006. F.Quesada&H.Cambronero. 10.88009, -85.38887.
07-SRNP-107676	♀	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
06-SRNP-109473	♀	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 11/22/2006. R.Franco&S.Rios. 10.88009, -85.38887.
07-SRNP-107677	♀	Guanacaste Prov., ACG, Sector Cacao, Roca Verde, 835m., 8/12/2007. R.Franco&F.Quesada. 10.89354, -85.43603.
06-SRNP-109474	♀	Alajuela Prov., ACG, Sector San Cristobal, Estacion San Gerardo, 575m., 11/22/2006. R.Franco&S.Rios. 10.88009, -85.38887.
***Ochrodota marina*, Schaus, 1910**		
Material examined:		
09-SRNP-107411	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Casa Leiva, 454m., 8/19/2009. R.Franco&S.Rios. 10.94314, -85.31808.
07-SRNP-100947	♂	Guanacaste Prov., ACG, Sector Pitilla, Estacion Pitilla, 675m., 2/17/2007. S Rios&f Quesada. 10.98931, -85.42581.
07-SRNP-106328	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Estacion Caribe, 391m., 7/14/2007. S.Rios&H.Cambronero. 10.90082, -85.2764.
09-SRNP-100042	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Rio Negro, 329m., 1/23/2009. H.Cambronero&F.Quesada. 10.90403, -85.30316.
10-SRNP-107569	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Manta Hugo, 491m., 3/15/2009. H.Cambronero&F.Quesada. 10.88110, -85.26770.
07-SRNP-100946	♂	Guanacaste Prov., ACG, Sector Pitilla, Estacion Pitilla, 675m., 2/17/2007. S Rios&f Quesada. 10.98931, -85.42581.
INBIOCRI001362981	♂	Guanacaste Prov., Est. Pitilla, 700 m, 9 km S Sta. Cecilia, P.N. Guanacaste, Feb 1993, P. Rios, 10.992609, -85.429477.
INBIOCRI000666237	♂	Limon Prov., Est. Hitoy Cerere, Res. Biol. Hitoy Cerere, Rio Cerere, 200 m, G. Carballo Dic 1990. 9.671765, -83.027702.
07-SRNP-100531	♀	Guanacaste Prov., ACG, Sector Pitilla, Estacion Pitilla, 675m., 2/16/2007. F.Quesada&S.Rios. 10.98931, -85.42581.
Ochrodota melaniamunozae, Espinoza, sp. n.		
Paratypes:		
04-SRNP-35827	♂	Guanacaste Prov., ACG, Sector Cacao, Sendero Circular, 1185m., 10/06/2004. Harry Ramirez. 10.92714, -85.46683.
INBIOCRI001081224	♂	Guanacaste Prov., Derrumbe, Estac. Mengo 1400 m, W side Volcan Cacao, 5 Jun 1988. Janzen & Hallwachs. 10.933732, -85.461289.
INB0003509867	♂	Cartago Prov., Tapanti, Rio Grande de Orosi, 1300-1400 m., 17 Nov 1982 DH Janzen & W. Hallwachs. 9.775254, -83.795598.
INB0003509871	♂	Cartago Prov., Tapanti, Rio Grande de Orosi, 1300-1400 m., 17 Nov 1982 DH Janzen & W. Hallwachs. 9.775254, -83.795598.
09-SRNP-110875	♀	Guanacaste Prov., ACG, Sector Del Oro, Serrano, 585m., 11/17/2009. R.Franco&S.Rios. 11.00023, -85.45621.
INB0004049791	♀	Alajuela Prov., P.N. Volcán Tenorio. Falda Norte V. Tenorio 1, Los Quemados. 1200-1300m. 23 NOV 2006. J. A. Azofeifa. 10.682763, -85.008836. Tp. Luz. #90240
INB0004049768	♀	Alajuela Prov., P.N. Volcán Tenorio. Falda Norte V. Tenorio 1, Los Quemados. 1200-1300m. 23 NOV 2006. J. A. Azofeifa. 10.682763, -85.008836. Tp. Luz. #90240
04-SRNP-35818	♀	Guanacaste Prov., ACG, Sector Cacao, Sendero Circular, 1185m., 10/06/2004. Harry Ramirez. 10.92714, -85.46683.
04-SRNP-35819	♀	Guanacaste Prov., ACG, Sector Cacao, Sendero Circular, 1185m., 10/06/2004. Harry Ramirez. 10.92714, -85.46683.
***Turuptiana obliqua*, (Walker, 1869)**		
Material examined:		
09-SRNP-108167	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Casa Leiva, 454m., 9/17/2009. F.Quesada&R.Franco. 10.94314, -85.31808.
09-SRNP-107344	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Potrero Chaves, 433m., 8/19/2009. F.Quesada&H.Cambronero. 10.93868, -85.32167.
09-SRNP-107733	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Potrero Chaves, 433m., 8/19/2009. F.Quesada&H.Cambronero. 10.93868, -85.32167.
10-SRNP-104258	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 725m., 1/13/2010. H.Cambronero. 10.86627, -85.32605.
10-SRNP-104159	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Tunel, 708m., 1/13/2010. F.Quesada. 10.86835, -85.32711.
11-SRNP-100001	♂	Alajuela Prov., ACG, Sector Rincon Rain Forest, Albergue Oscar, Casa, 725m., 1/3/2011. H.Cambronero&F.Quesada. 10.86623, -85.32693.
INB0003448093	♂	Alajuela Prov., Fca. La Campana. El Ensayo, 7 Km NW Dos Rios, 700m 15-17 Mar 1986 DH Janzen & W.Hallwachs. 10.94834, -85.420173.
INB0003457075	♂	Alajuela Prov., Rio San Lorencito Res. For. de San Ramon, 5 Km N Col. Palmareña, 800m. 27 Jan. 1987 I. y A. Chacon. 10.219533, -84.600758.
07-SRNP-100519	♀	Guanacaste Prov., ACG, Sector Pitilla, Estacion Pitilla, 675m., 2/16/2007. F.Quesada&S.Rios. 10.98931, -85.42581.
INBIOCRI002133261	♀	Alajuela Prov., Sect. San Ramon de Dos Rios, 620m. 16 ENE-3 FEB 1995. C. Cano, 10.883267, -85.413544. #4396
INB0003416405	♀	Alajuela Prov., P.N. Volcán Tenorio, Sector el Pilon, Send. La Catarata, 700m, ENE 2002, G. Rodriguez, 10.702466, -84.990696. T. de Luz, #66497
***Turuptiana annesmithae*, Espinoza, sp. n.**		
Paratypes:		
INB0004033910	♂	Cartago Prov., P.N. Tapantí. Send Oropendula. 1200m. 26 SEP 2006. M. Moraga, B. Gamboa. 9.755344, -83.784695. Tp. Luz. #87176
INB0003449025	♂	San Jose Prov., Estacion Zurqui (el Tunel) Par.Nac.Braulio Carrillo, 1500m., I. y A. Chacon Feb. 1986. 10.063063, -84.011307.
INBIOCRI002453442	♂	Puntarenas Prov., Est. La Casona,R.B. Monteverde, 1520m. 3-24 ABR 1995. A. Azofeifa, 10.3043, -84.796204. #5288
INBIOCRI000626597	♂	Puntarenas Prov., Est. La Casona, Res. Biol. Monteverde, 1520m, E. Bello, Oct 1990, 10.298429, -84.792544.
INBIOCRI001768191	♂	Cartago Prov., P.N. Tapanti, 1300m. Abr 1994. G. Mora, 9.762583, -83.788328. # 2813
INBIOCRI002548929	♂	Puntarenas Prov., Est. La Casona, Monteverde. 1520m. 4-20 MAR 1997. K. Martinez. 10.3043, -84.796204. #45552
INB0003506744	♀	San Jose Prov., Estacion Zurqui (el Tunel) Par. Nac. Braulio Carrillo, 1500m. I. y A. Chacon Oct 1985. 10.063063, -84.011307.
INB0003512890	♀	San Jose Prov., Estacion Zurqui(el Tunel) Par. Nac. Braulio Carrillo, 1500m, I. y A. Chacon May 1986. 10.063063, -84.011307.
INBIOCRI002453434	♀	Puntarenas Prov., Est. La Casona,R.B. Monteverde, 1520m. 3-24 ABR 1995. A. Azofeifa, 10.3043, -84.796204. #5288
INBIOCRI002453434	♀	Puntarenas Prov., Est. La Casona,R.B. Monteverde, 1520m. 3-24 ABR 1995. A. Azofeifa, 10.3043, -84.796204. #5288

Munona robpuschendorfi **sp. n.**