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Contribution to the knowledge of the Afrotropical *Evonima* Walker, 1865 generic complex with description of two new genera and two new species (Lepidoptera: Nolidae, Nolinae)

Gy. M. László

Abstract

The generic assignment of the African taxa of the genus *Evonima* Walker, 1865 is revised. Based on diagnostic characters of the male genitalia structure, a new genus *Vansonima* László, gen. n. is erected for *E. littoralis* (van Son, 1933) and *E. ruhija* Hacker, 2012. A further new genus, *Laetonima* László, gen. n. is established for two undescribed species reminiscent externally of *Evonima*, which are also described here as new to science: *L. smithi* László, sp. n. and *L. camerunica* László. sp. n. Consequently, *E. westafricana* Hacker, 2012 is the only known true *Evonima* species occurring in Africa. The female genitalia of *E. westafricana* is described and illustrated here for the first time. New distribution records of *E. westafricana* and *V. littoralis abyssinica* (Hacker, 2012) are provided together with 14 colour and 9 black and white figures.
KEY WORDS: Lepidoptera, Nolidae, Nolinae, new combination, new record, West Africa, Cameroon, Zambia, Afrotropical region.

Contribución al conocimiento del complejo genérico afrotropical de *Evonima* Walker, 1865, con la descripción de dos nuevos géneros y dos nuevas especies (Lepidoptera: Nolidae, Nolinae)

Resumen

Se revisa la asignación genérica de las taxas africanas del género *Evonima* Walker, 1865. Basándose sobre el diagnóstico de los caracteres de la genitalia del macho, se describe un nuevo género *Vansonima* László, gen. n., para *E. littoralis* (van Son, 1933) y *E. ruhija* Hacker, 2012. Se establece un nuevo género, *Laetonima* László, gen. n., para dos especies no descritas, parecidas externamente a *Evonima*, las cuales se describen aquí como nuevas para la Ciencia: *L. smithi* László, sp. n. y *L. camerunica* László. sp. n. Consecuentemente, *E. westafricana* Hacker, 2012 sólo se conoce como la verdadera especie de *Evonima* que se encuentra en África. Aquí se describe e ilustra, por primera vez, la genitalia de la hembra de *E. westafricana*. Se proporcionan nuevos registros en la distribución de *E. westafricana* y *V. littoralis abyssinica* (Hacker, 2012) junto con 14 figuras en color y 9 en blanco y negro.
PALABRAS CLAVE: Lepidoptera, Nolidae, Nolinae, nueva combinación, nuevo registro, oeste de África, Camerún, Zambia, región Afrotropical.

Introduction

The genus *Evonima* Walker, 1865 was established for the Oriental species *E. aperta* Walker, 1865 described from Java and widely distributed in Indochina and the Indonesian Archipelago (figs 1, 2, 15, 21). The genus is rather species rich in South East Asia numbering 18 species (HU *et al.*, 2020). Until

2012 the genus had not been recorded from Africa, when Hacker discovered a new *Evonima* species from Ivory Coast and named it as *E. westafricana* (HACKER *et al.,* 2012) referring to the unexpected occurrence of an *Evonima* in West Africa. *E. westafricana* is indeed similar externally to *E. aperta*, furthermore the male genitalia share the common diagnostic characters, namely the elongate, relatively broad valva with more or less parallel dorsal and ventral margins, the long, straight, rod-like harpe erected in the medial plate of valva, extending slightly over the ventral margin of valva, and the simple, tubular aedeagus lacking carina and cornuti of vesica (figs 15, 16). It is worth noting that all Oriental *Evonima* species share the same structure of male genitalia without noticeable differences, therefore all taxa are distinguished based largely on external morphology.

In their monograph HACKER *et al.* (2012) assigned the South African *Poecilonola littoralis* van Son, 1933 to *Evonima* following the synonymy of the two genera established by POOLE (1989). Nevertheless, they disregarded the fundamental differences between the male genitalia of *E. littoralis* and all other *Evonima*. In the same work, Hacker described a further new *Evonima* species (*E. ruhija* Hacker, 2012) from Uganda based on its habitus undoubtedly reminiscent of *Evonima,* although its genital morphology proved to be strikingly different, standing closer to that of *E. littoralis*. Taking into consideration the constant genitalia configuration in all true *Evonima* species and the extent of fundamental morphological differences between the male genitalia of any sensu stricto *Evonima* species and *E. littoralis* and *E. ruhija*, erecting a distinct genus for the latter two species is well justified and the new genus is described here (*Vansonima* László, gen. n.).

In the course of the identification of the Nolini material housed in the collection of ANHRT, a series of further peculiar specimens somewhat reminiscent of *V. littoralis* have been found from Zambia and Cameroon. The dissection of the specimens revealed that the externally confusingly similar specimens from Zambia and Cameroon belong to two clearly different species and that they belong to an *Evonima*-related but well distinguished, undescribed genus. The new genus (*Laetonima* László, gen. n.) and the two new species are described in this present paper (*L. smithi* László, sp. n. and *L. camerunica* László, sp. n.).

Material and methods

The genital apparatuses were dissected, stained with Eosin red and mounted in Euparal on microscope slides applying standard methods of preparation (LAFONTAINE & MIKKOLA, 1987). Photos of adults were taken using either a Nikon D700 SLR camera equipped with Nikkor AF-S Micro 105 mm lens or a Nikon D90 SLR camera equipped with Nikkor AF Micro 60 mm lens. Genitalia were photographed using a Canon EOS 700D camera mounted on either a Leitz Diaplan or a Lacerta compound microscope.

Abbreviations of the depositories used:

ANHRT - African Natural History Research Trust, Leominster, United Kingdom
HNHM - Hungarian Natural History Museum, Budapest, Hungary
NHMUK (formerly BMNH) - The Natural History Museum, London, United Kingdom
MWM/ZSM - Museum Witt in the Bavarian State Collection of Zoology, Munich, Germany
NHMO - Natural History Museum, Oslo, Norway
TMSA - Ditsong Museum of Natural History (Transvaal Museum), Pretoria, South Africa
LGN, LGNA - genitalia slides of Nolidae prepared by Gyula M. László

Systematics

Genus *Evonima* Walker, 1865
Evonima Walker, 1865. *List Lep. B. M.,* **32**: 505
Type-species: *Evonima aperta* Walker, 1865. *List Lep. B. M.,* **32**: 506, by original designation.

Evonima westafricana Hacker, 2012 (figs 3-6, 16, 22)
Evonima westafricana Hacker, 2012. *Esperiana,* **17**: 218

Type locality: Ivory Coast, Man. Holotype male, in coll. ZSM.

Material examined: Ivory Coast, 1 ♂, 1171 m, Mt. Tonkoui Peak, 07º27'15.2"N, 07º38'12.5"W, 1-8-XI-2015, Light Trap, M. Aristophanous, P. Moretto, E. Ruzzier leg., ANHRT:2017.16, slide No. LGNA 231 (ANHRT). Liberia: 1 ♂, 883 m, Lofa County, Wologizi Mts, Ridge Camp 2, 8º07'20.79"N, 9º56'50.75"W, 22-31-XI-2018, Cold Cathode UV Light Trap (8W), Sz., Sáfián, G. Simonics leg., ANHRT:2018.43 (ANHRT); 1 ♂, Grassfield, Nimba, VIII-IX-1967, A. Forbes-Watson (NHMUK). GABON: 4 ♂♂, 430 m, Mikongo (Rougier), Monts de Cristal (Secondary Forest), 0º29'47"N, 11º10'42"E, 28-VII-12-VIII-2019, LepiLED and Actinic Light Trap, J.-L. Albert, M. Aristophanous, J. Bie Mba, V. Dérozier, P. Moretto leg., ANHRT:2019.17, slide No.: LGNA 997 (ANHRT). Nigeria, 1 ♂, 1 ♀, Oyo State, Gambari Forest, 3-IX-1977, M. A. Cornes; 1 ♀, same site and collector, 23-XII-1978 (NHMUK). Sierra Leone, 1 ♂, B0, Apr. 1969, R. J. Revell, Brit. Mus. 1970-5 (NHMUK). Ghana, 1 ♀, Bunso Arboretum, 6º15'58.03"N, 0º27'45.72"W, 13-14-IX-2010, leg. Sz. Sáfián, slide No.: LGNA 989 (HNHM).

Remark: The species was described from a single male specimen (HACKER *et al.,* 2012). As a result of extensive lepidopterological surveys by the ANHRT in West Africa and the thorough examination of the mixed Heterocera accessions of the NHMUK and HNHM, further specimens of this otherwise rare species have been located and examined allowing for a clearer picture of its distribution. Furthermore, among the examined specimens the earlier unknown female has also been found and its genitalia are illustrated and described here for the first time. *E. westafricana* is the only true *Evonima* species found hitherto in the Afrotropics with the same ground plan of the genitalia morphology as that of its Oriental congeners.

Description of the female genitalia (fig. 22): Papillae anales short, apically rounded, rather quadrangular; apophyses relatively short, thin, posterior and anterior ones are of the same length; 8th tergite very short, ribbon-like; ostium bursae narrow, shallow cup shaped, anthrum very short, heavily sclerotized; ductus bursae short, narrow, membranous; cervix bursae rather heavily sclerotized, forming a small, semi-globular lateral protrusion; corpus bursae elongate, distal half gradually tapered into a tubular distal section, proximal half ovoidal; signum bursae represented by a longitudinally elongate, narrow, scobinated plate.

Genus *Vansonima* László, gen. n. (figs 7-10, 17, 18)
Type species: *Poecilonola littoralis* van Son, 1933
Ann. Transv. Mus., **15**: 201, pl. 8, fig. 6; here designated. Type locality: Natal, Durban

Diagnosis: The external similarity of the species of the new genus suggests a close relationship with *Evonima*, but according to their genitalia morphology they belong to a well separated distinct lineage. As the generally rather diverse coloration and wing pattern of the members of the *Evonima* generic complex do not play a role in generic level delineation, the only distinctive external character of *Vansonima* that is worth mentioning is the considerably more elongate forewing in comparison with that of the other genera of the complex.

The definitive differences between the new genus and *Evonima* are expressed in the configuration of the male genitalia: the valva of *Vansonima* is markedly shorter and broader than that of *Evonima* with a conspicuous, heavily sclerotized, elongate area covered densely with fine setae near the distal end of the ventral margin, a feature that is absent in *Evonima*. In addition, the origin and the shape of the harpe is structurally different in the two genera: in *Vansonima* the short, rounded, somewhat thumb- or finger-like harpe of *Vansonima* originates from a sclerotized medio-distal plate of the valva and connected to the costal margin; whereas the conspicuously elongate, straight, rod-like harpe of *Evonima* projects from the medio-basal membranous area of the valva and connected to the sacculus by a narrow sclerotized slat (cf. figs 15-18). The generic level separation of *Vansonima* and *Evonima* is also supported by the remarkably different configuration of their female genitalia structures, namely the

considerably larger and more robust, heavily sclerotized, strongly modified, goblet-shaped ostium bursae of *Vansonima* compared to the small, simple, narrow V-shaped ostium bursae of *Evonima*, as well as the lack of a conspicuous, heavily sclerotized rounded protrusion of the cervix bursae while it is a common feature in all true *Evonima* species. It is also worth noting the absence of the signum bursae in *Vansonima*, which is present in *Evonima* (cf. figs 21, 22 and p. 220/G in HACKER *et al.,* 2012).

Description of the adult (figs 7-10): Forewing length 8-11 mm. Antenna fasciculate in males, filiform in females. Head relatively large, labial palps medium long, slightly curved dorsad; frons and vertex white or pale greyish; compound eyes moderately large, globular. Thorax whitish or greyish, abdomen brownish. Intraspecific variability limited, all known specimens are rather similar in coloration without noticeable alterations in wing pattern. Sexual dimorphism negligible. Forewing relatively long and narrow, triangular, apically rounded. Forewing ground colour dark greyish with brownish suffusion medially, basal area bright white or pale grey, apical area with a creamy whitish or pale orange-brown dash. Transverse lines poorly visible except postmedial line, which is sharply defined by whitish or pale brownish scales; cilia long, brownish grey. Hindwing pale whitish grey in basal half, gradually darkening towards termen; cilia pale greyish brown. Underside of forewing dark graphite grey in the dorsal two-thirds, pale greyish white in the ventral third; hindwing pale whitish grey with a somewhat darker graphite grey band along dorsal margin; traces of pattern undetectable.

Male genitalia (figs 17, 18): Uncus robust, medially dilated, apically rounded. Tegumen short and narrow. Valva short, relatively broad, apically quadrangular with a conspicuous, heavily sclerotized, elongate subapical area covered densely by minute setae on the ventral margin; costal margin straight, widely sclerotized and scobinated with a rounded smooth-surfaced plate projecting towards the medial plate of valva, serving as a base to the rather short and broad, finger-like harpe; sacculus short and broad, weakly sclerotized; vinculum long and narrow, apically rounded. Aedeagus tubular, relatively short and thin, medially S-curved, coecum penis short and rounded, heavily sclerotized, carinal process absent; vesica with dense scobination.

Female genitalia: As the author of this present paper could not locate a female specimen of *V. littoralis* during his study of the collections of ANHRT, NHMUK and HNHM, the female copulatory organ is not illustrated here. HACKER *et al.* (2012: 220) however, illustrated the female genitalia of *V. littoralis abyssinica* (Hacker, 2012). Based on this illustration, the main distinctive characters of the female genitalia of *Vansonima* can be established as follows: papillae anales pointed, apophyses short and thin, posterior apophysis twice as long as the anterior one; 8th tergite short, medially slightly laced with concave distal and proximal margins; ostium bursae very broad and long, heavily sclerotized, goblet shaped; ductus bursae medium long, distal quarter sclerotized, proximal three-quarters membranous, anterior section with two well-developed bulges; corpus bursae ovoid, without signum bursae.

Etymology: *Vansonima* is a portmanteau word combining the surname of the renowned South African lepidopterist Georges van Son (1898-1967) and the name of the allied genus *Evonima*. Dr van Son was one of the pioneers of African Lepidoptera taxonomy having described numerous Nolidae taxa among others.

Vansonima littoralis littoralis (van Son, 1933), **comb. n.** (figs 7, 8, 17)
Poecilonola littoralis van Son, 1933. *Ann. Transv. Mus*., **15**: 201, pl. 8, fig. 6

Type locality: Natal, Durban. Holotype, male in coll. TMSA.

Material examined: Mozambique, 2 ♂♂, 22 m, Maputo Special Reserve, West Gate, Sand Forest, 26º30'14.2"S, 32º42'59.6"E, 30-V-9-VI-2017 MV and Actinic Light Trap, M. Aristophanous, G. László, W. Miles, A. Vetina leg., ANHRT:2017.26; 1 ♂, same site, 21-22-II-2018, Actinic Light Trap, G. László, J. Mulvaney, L. Smith leg., ANHRT:2018.2 (ANHRT). South Africa, 1 ♂, Durban, G. F. Leigh leg. (NHMUK).

Vansonima littoralis abyssinica (Hacker, 2012), **comb. n.** (figs 9, 10, 18)
Evonima littoralis abyssinica Hacker, 2012. *Esperiana*, **17**: 220

Type locality: Ethiopia, Southern Prov., Mago NP. Holotype, male, in coll. H. Hacker/ZSM.

Material examined: ZAMBIA, 2 ♂♂, 1566 m, Senka Hill, Mukulizi Forest Reserve, Muchinga Province, 09º05'43"S, 32º05'06"E, 1-6-V-2019, MV Light Trap, V. Dérozier, G. László, W. Miles leg., ANHRT:2019.12, slide No.: LGNA 956 (ANHRT).

Remark: *V. littoralis abyssinica* was described from Ethiopia. It is distinguished by its darker coloration and smaller whitish basal area of forewing from the nominate subspecies occurring in Southern Africa (HACKER *et al.,* 2012), without noticeable differences between the male genitalia of the two subspecies. Surprisingly, the specimens collected in NE Zambia (at Mukulizi Forest Reserve, adjacent to the Tanzanian border) agree in external features with those of ssp. *abyssinica*. It is highly likely that the northern subspecies of *littoralis* has an extensive distribution from southern Ethiopia throughout Kenya and Tanzania with the NE Zambian specimens possibly representing its southernmost populations. HACKER (2014) referred two further records of *V. littoralis* from North Mozambique (Pemba) and the Democratic Republic of Congo (Lubumbashi) considering them to be the nominotypical subspecies. Although these specimens have not been examined as part of this present paper, based on the relatively short distance between Mukulizi Forest in NE Zambia and Lubumbashi in SE Congo, the specimens from the latter locality presumably belong to ssp. *abyssinica* rather than to ssp. *littoralis*. Regarding the specimen from Pemba (North Mozambique), its subspecific assignment cannot be demonstrated without thorough examination of the specimen although it is likely that the specimen may be a northern example of the nominate taxon distributed in lowland woodland/thicket habitats along the south-east African coast.

Vansonima littoralis madagassialis (Hacker, 2014), **comb. n.**
Evonima littoralis madagassialis Hacker, 2014. *Esperiana*, **19**: 142

Type locality: Madagascar, Diego Suarez. Holotype, female in coll. NHMUK.

Remark: *Vansonima littoralis madagassialis* was described based on a single female specimen. The author of the present paper could not locate further specimens during his work in the collections of ANHRT, NHMUK, ZSM and HNHM. As the female of the nominate subspecies of *V. littoralis* is still unknown, the taxonomic rank of the Madagascan taxon cannot be verified. The female genitalia illustrated by HACKER (2014: 220) differ markedly from those of *V. littoralis abyssinica* (HACKER *et al.,* 2012: 220) and thus it cannot be ruled out that the Madagascarian taxon is a bona species distinct from *V. littoralis*. To clarify the taxonomic position of *V. littoralis madagassialis*, examination of further material is necessary.

Vansonima ruhija (Hacker, 2012), **comb. n.**
Evonima ruhija Hacker, 2012. *Esperiana*, **17**: 221

Type locality: Uganda, Kabale District, Ruhija. Holotype, ♂, in coll. L. Aarvik/NHMO.

Remark: *Vansonima ruhija* was described from a single specimen; a second specimen collected in Uganda, Western Region later illustrated by HACKER (2014). No further specimens were located in the collections of ANHRT, NHMUK, ZSM and HNHM. The male genitalia of *V. ruhija* were illustrated in fairly good quality in HACKER *et al.* (2012: 221) and though they differ markedly from those of *V. littoralis*, the ground plan suggests a closer relationship to *Vansonima* than to *Evonima*. Therefore, *V. ruhija* is treated here tentatively as the fourth taxon of *Vansonima* until further material becomes available for more thorough studies.

Genus *Laetonima* László, gen. n. (figs 11-14, 19, 20, 23)
Type species: *Laetonima smithi* László, sp. n.; here designated

Diagnosis: The new genus is the third member of the *Evonima* generic complex in Sub-Saharan Africa, distinguished from the other two allied genera by the following characters: the external habitus of *Laetonima* is undoubtedly reminiscent of *Evonima* and *Vansonima* due to its rather variegated coloration, but the species belonging to *Laetonima* have the most extensive whitish basal area of the

forewing that is narrowly fused with a gradually dilated, oblique white band at the tornus, a character which is unique in this generic complex.

In the male genitalia features, *Laetonima* differs from *Evonima* by its considerably narrower valva and its much more robust, heavily sclerotized harpe, which is fused with the saccular process forming a large, trapezoidal or triangular apical saccular lobe, where the dorsal membranous and ventral sclerotized parts of the valva are divided by a narrow medial incision rendering the valva bilobate, whereas the harpe of *Evonima* is conspicuously elongate, straight, rod-like, projecting from the medio-basal membranous area of the valva and connected to the sacculus by a narrow sclerotized slat only, leaving the valval plate undivided. The distinctive characters between *Laetonima* and *Vansonima* are expressed by the much narrower and more elongate uncus and valva in the new genus compared to those of *Vansonima*, and by the fundamentally different origin and configuration of the harpe. In *Laetonima*, the harpe is conspicuously enlarged and fused with the saccular process forming a large, trapezoidal or triangular apical lobe of the sacculus with a narrow incision between the membranous dorsal and sclerotized ventral parts of the valva; the harpe in *Vansonima* the harpe is short, broadly rounded, thumb- or finger-like, originating from a sclerotized medio-distal plate of the valva connected to the dorsal margin only, without conjunction to the sacculus.

Description of the adult (figs 11-14): Forewing length 7.5-8.5 mm in males, 10.5 mm in female. Antenna fasciculate in males, filiform in females. Head relatively large, labial palps medium long, almost straight, inner surface creamy white, lateral and dorsal surface pale brown; frons and vertex bright white; compound eyes moderately large, globular. Thorax, tegulae and collar uniformly bright white, abdomen pale grey. Intraspecific variability limited, all known specimens are rather similar in coloration without noticeable alterations in wing pattern. Sexual dimorphism is moderately expressed in size and hindwing coloration: females considerably larger than males, with uniformly dark grey hindwing, whereas male hindwing white with greyish margin. Forewing relatively short and broad, somewhat triangular, apically rounded. Forewing ground colour greyish brown with an extensive, rounded, bright white basal area, a pale graphite grey postmedian area, a red-brown apical area and with a conspicuous bright white angular dash near tornus. Sub-basal and basal lines deleted; antemedial line fine, dark brown, rather dentate, running along the outer margin of white basal area; medial line interrupted, diffuse, shadow-like, consisting of pale greyish patches; orbicular stigma poorly visible, small and rounded, with raised brownish grey scales; postmedial line fine, interrupted, consisting of diffuse groups of blackish scales, medially angled; subterminal line diffuse, interrupted, shadow-like, consisting of dark red-brown patches in the dorsal half and greyish ones in the ventral half of forewing; terminal line very fine, poorly visible; cilia grey with admixture of blackish scales. Hindwing bright white in basal half, gradually darkening towards outer margin in males, pale grey basally and noticeably darker graphite grey distally in females; cilia creamy white in males, pale graphite grey in females. Underside of forewing dark graphite grey in the dorsal two-thirds, whitish along the ventral margin; underside of hindwing as the upperside, without traces of pattern.

Male genitalia (figs 19, 20): Uncus long and slender, apically pointed and claw-shaped (hooked); tegumen very narrow, elongate; transtillae thin ribbon-like, medially fused; valva medium long, relatively narrow, costal margin heavily sclerotized, apical section of valva broadly rounded, membranous, dorsal half of valva divided from enlarged harpe-sacculus complex; sacculus medium long, rather broad, heavily sclerotized, saccular process more heavily sclerotized fused with harpe, forming a large apical lobe of sacculus; vinculum short and narrow V-shaped. Aedeagus tubular, relatively short and narrow, caecum penis medium long, apically rounded, carinal process short, triangular, weakly sclerotized; vesica without cornuti.

Female genitalia (fig. 23): Ovipositor conical, papillae anales short, quadrangular, apophyses posteriores relatively long, narrow, apophyses anteriores short; 8th tergite relatively long, distal margin evenly concave, proximal margin straight; ostium bursae weakly sclerotized, short and narrow, somewhat cup-shaped, ductus bursae membranous, very short, slightly tapered anteriorly, cervix bursae membranous, unmodified; tubular distal half of corpus bursae narrow, gradually slightly dilated

anteriorly, dilated proximal half of corpus bursae ovoid; signum bursae represented by a poorly visible, very narrow, longitudinal, remarkably finely scobinated area.

Etymology: *Laetonima* is a portmanteau word combining the Latin adjective *"laetus*" meaning colourful and the name of the allied genus *Evonima*. The name refers to the unusually variegated forewing pattern of the species of the genus.

***Laetonima smithi* László, sp. n.** (figs 11, 12, 19, 23)

Holotype: ♂, Zambia, 1460 m, Mutinondo Wilderness Area, Northern Province, 12º27'06"S, 31º17'30"E, 17-20-V-2019, MV Light Trap, V. Dérozier, M. Imakando, G. László, W. Miles leg., ANHRT:2019.12", unique number: ANHRTUK 00100992, slide No.: LGNA 959 (ANHRT). Paratypes: Zambia, 3 ♂♂, 1 ♀, 1566 m, Senka Hill, Mukulizi Forest Reserve, Muchinga Province, 09º05'43"S, 32º05'06"E, 1-6-V-2019, Actinic and MV Light Trap, V. Dérozier, G. László, W. Miles leg., ANHRT:2019.12, unique numbers: ANHRTUK 00082269, 00082336, 00134752, 00134753, slide Nos: LGNA 958 (male), LGNA 960 (female); 1 ♂, 1280 m, Kalungu, North of Isoka, Muchinga Province, 0940'52"S, 3242'50"E, 30-IV-1-V-2019, Actinic Light Trap, V. Dérozier, G. László, W. Miles leg., ANHRT:2019.12, unique number: ANHRTUK 00136148 (ANHRT). 1 ♂, Mbala, 11-12-VI-1974, Locust Control Centre; 1 ♂, same site, 13-14-III-1974, B.M. 1975-92 (NHMUK).

Diagnosis: The diagnostic characters between the new species and the species of *Evonima* and *Vansonima* are discussed under the diagnosis of the new genus *Laetonima*. The distinctive features of the two, known species of the new genus *Laetonima* are given under the diagnosis of the secondly described new species, *L. camerunica*.

Description of the adult (figs 11, 12): The description of the external morphology of the adults of the new species is given under the description of the new genus *Laetonima*.

Male genitalia (fig. 19): Uncus long and slender, apically pointed and claw-like; tegumen very narrow, elongate; transtillae narrow, ribbon like, medially fused; valva medium long, relatively broad and heavily sclerotized basally, narrow and membranous in distal half, apical section of valva slightly dilated and broadly rounded, costal margin heavily sclerotized; dorsal half of valva divided by a short, narrow incision from the enlarged harpe-sacculus complex; sacculus long, very broad, heavily sclerotized, saccular process more heavily sclerotized, fused with harpe, forming a large, more or less trapezoidal apical lobe of sacculus covered by fine scobination; vinculum short and narrow V-shaped. Aedeagus tubular, relatively short and narrow, caecum penis medium long, apically rounded, carina process short, triangular, weakly sclerotized; vesica without cornuti.

Female genitalia (Fig. 23): The description of the female genitalia of the new species is given under the description of the new genus *Laetonima*.

Etymology: The new species is dedicated to Mr Richard Smith, founder and director of the African Natural History Research Trust, whose efforts in maintaining a research institute and museum, as well as organising extensive entomological surveys in numerous Sub-Saharan countries have and will result in an immense contribution to the knowledge of the taxonomy, biogeography and phylogeny of Afrotropical insects.

Remark: Hacker illustrated two female specimens of *L. smithi* from Malawi and Zimbabwe misidentified as *Meganola angola* (Bethune-Baker, 1911) (HACKER, 2014: 169). The illustrated specimens have the noticeably larger white basal area and the lack of a whitish apical area of the forewing, as well as the much shorter forewing and are undoubtedly *L. smithi*. Hacker did not illustrate however, the male specimen from Nigeria he referred to as *M. angolana*, only its male genitalia which belongs to true *M. angolana*. Had he illustrated the Nigerian male specimen, he would probably have realized that it is not conspecific with the females from Zimbabwe and Malawi.

***Laetonima camerunica* László, sp. n.** (figs 13, 14, 20)

Holotype: ♂, Cameroon, 900 m, North Region, Wack (La Falaise), 07º40'16.5"N, 13º33'18.4"E,

2-21-X-2018, Cold Cathode UV Light Trap, Sz. Sáfián, G. Simonics leg., ANHRT:2018.36", unique number: ANHRTUK 00070218, slide No.: LGNA 957 (ANHRT). Paratype: ♂, with the same data as the holotype, unique number: ANHRTUK 00058483 (ANHRT).

Diagnosis: *L. camerunica* is an allopatric cryptic sister species of *L. smithi* with no detectable external differences between the two taxa. The distinctive characters however, are clearly expressed in the configuration of the harpe-saccular complex of the male genitalia as follows: the dorso-apical process of the harpe-saccular lobe complex of *L. camerunica* is conspicuously more elongate, covered densely by fine, but sharp cornuti apically, whereas the fused harpe-saccular lobe is shorter, more trapezoidal and without cornuti at apex in *L. smithi*.

Description of the adult (figs 13, 14): The external characters of *L. camerunica* are identical with those of *L. smithi* and are given in the description of the new genus *Laetonima*.

Male genitalia (fig. 20): Uncus long and narrow, apically pointed and claw-like; tegumen very narrow, elongate; transtillae narrow, ribbon like, medially fused; valva medium long, relatively broad at base, heavily sclerotized in ventral half, membranous in dorsal half, apically slightly dilated and, broadly rounded, costal margin heavily sclerotized; dorsal half of valva divided by a long, narrow incision from the enlarged harpe-sacculus complex; sacculus very long, rather broad, heavily sclerotized, saccular process more heavily sclerotized, fused with harpe, forming a large, triangular (shark-tail-shaped) apical lobe of sacculus covered densely by short but robust spines apically; vinculum short and narrow V-shaped. Aedeagus tubular, relatively short and narrow, caecum penis medium long, apically rounded, carina process short, triangular, weakly sclerotized; vesica without cornuti.

Female unknown.

Etymology: The new species is named after the country of its type locality, Cameroon.

Discussion

Through the examination of extensive materials found in the collections of ANHRT, HNHM and NHMUK, a new taxonomic concept of the Afrotropical *Evonima* generic complex has been established with the description of two new genera and two new species.

Following the thorough examination of genitalia morphology of *Evonima* species recently collected in different parts of Sub-Saharan Africa, it became clear that the original concept of HACKER *et al.* (2012) and HACKER (2014), namely that all species reminiscent of the Oriental *Evonima* are considered to be true *Evonima*, required revision. The fundamental morphological differences found in the male genitalia of the examined specimens lead to the conclusion that there are three distinct lineages in the Afrotropics. The only true Afrotropical *Evonima* is *Evonima westafricana* Hacker, 2012 apparently widely distributed in West Africa as the new records suggest. A further lineage within the complex with remarkably different male genitalia configuration distributed in Southern and Eastern Africa is the genus *Vansonima* with two valid species, *V. littoralis* (van Son, 1933) and *V. ruhija* (Hacker, 2012), where the former is subdivided into 3 subspecies (*V. littoralis littoralis* (van Son, 1933), known from Southeast Africa; *V. littoralis abyssinica* (Hacker, 2012), distributed in Eastern and Southern Central Africa; and *V. littoralis madagassialis* (Hacker, 2014) known from Madagascar. A third lineage described here as *Laetonima* consists of two allopatric sister species, one from Southern Central Africa (*L. smithi* László, sp. n.) and the other from Central Africa (Cameroon) (*L. camerunica* László, sp. n.).

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The author is grateful to the following persons for their assistance during the course of the preparation of this present paper: Dr Alberto Zilli and Mr Geoff Martin (NHMUK, London, UK) for kindly facilitating access to the Nolini type and accession material of the NHMUK; Dr László Ronkay and Dr Balázs Tóth for the opportunity to examine African Nolini material of the HNHM; Dr Hitoshi

Takano (ANHRT) for the linguistic corrections of the manuscript. My special thanks go to the following co-operative partners in Zambia for the diverse administrative and technical assistance provided during the field work as well as for issuing the research and export permits: Ms Rhoda Kachali (Department of National Parks and Wildlife - ZAWA, Lusaka), Ms Claire Mateke and Ms Martha Imakando (Livingstone Museum, Livingstone). Scientific Research in Côte d'Ivoire was authorised by the Ministère de l'Enseignement Supérieur et de la Recherche Scientifique. The Office Ivoirien des Parcs et Réserves (OIPR) and the Société de Développement des Forêts (SODEFOR) are thanked for authorising access to protected forests and providing export permits. Scientific research in Gabon was authorised by the Centre National de la Recherche Scientifique (CENAREST), and in collaboration with the Université des Sciences et Techniques de Masuku (USTM). ANHRT is indebted to Monsieur Le Ministre des Eaux et Forêts du Gabon, le Professeur Lee White. Rougier Gabon is thanked for allowing access to concession forest. The Author declares that to the best of his knowledge he conforms to the national regulations and meets with the conditions and requirements of International Conventions concerning collecting/export and handling of the specimens presented in this Article.

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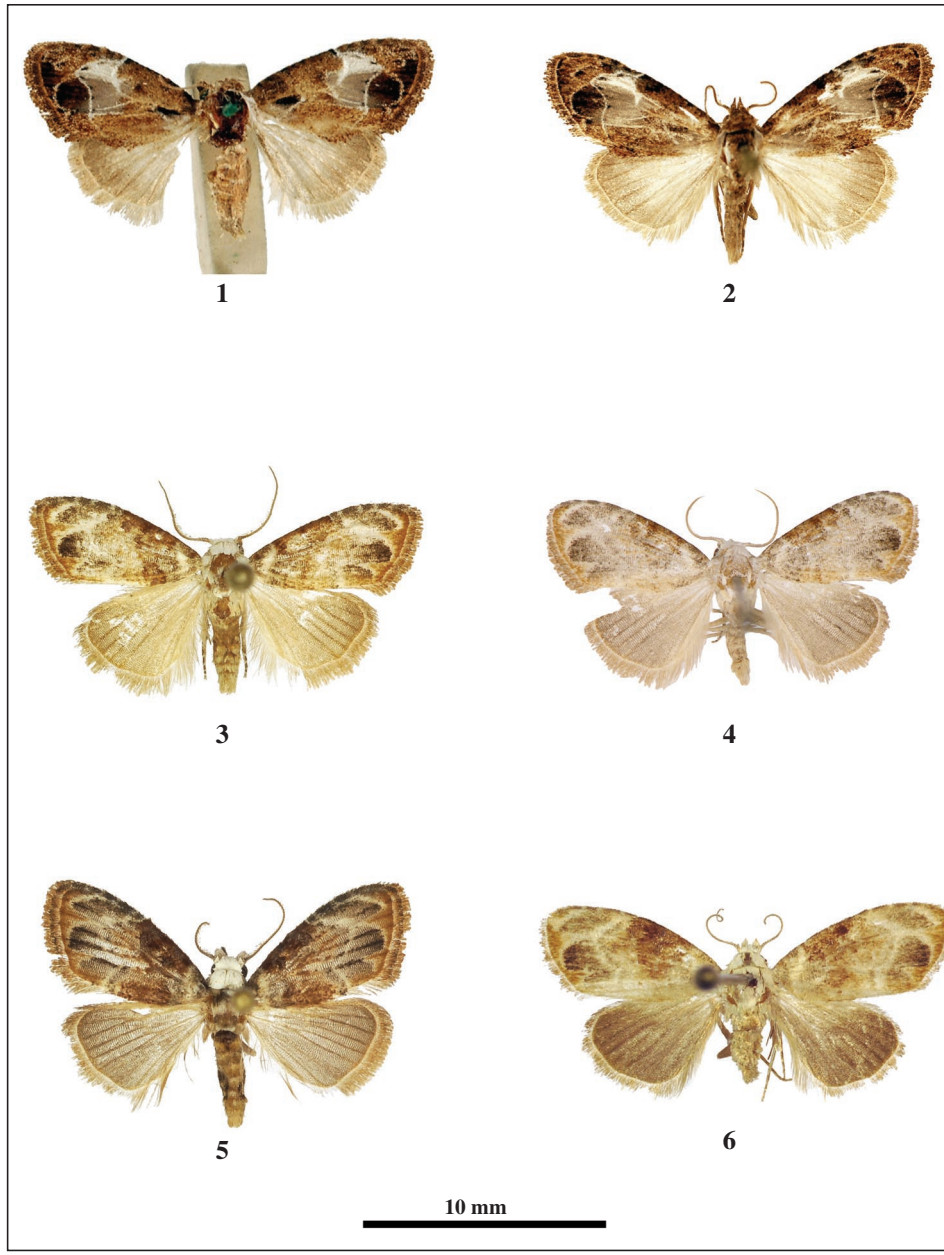
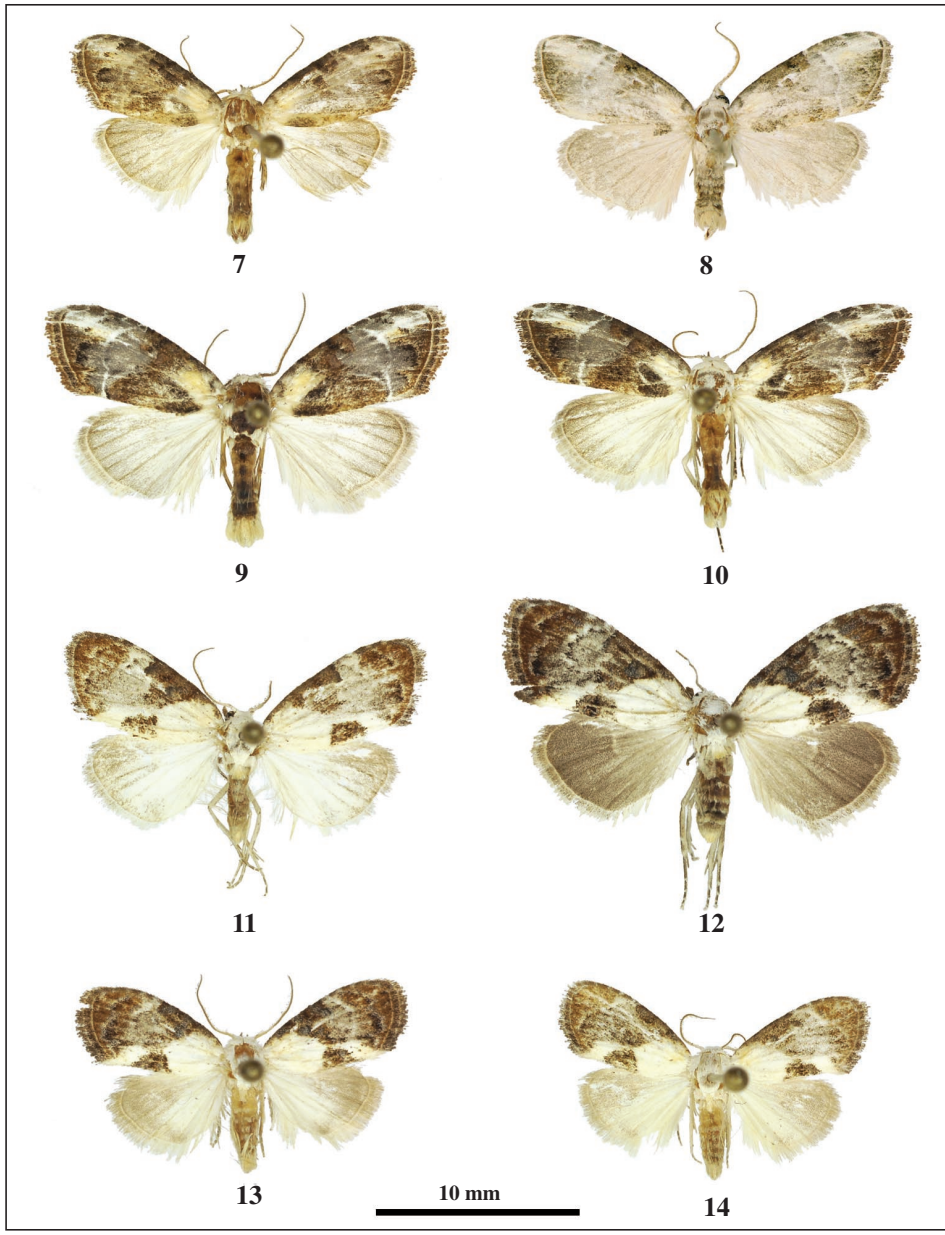
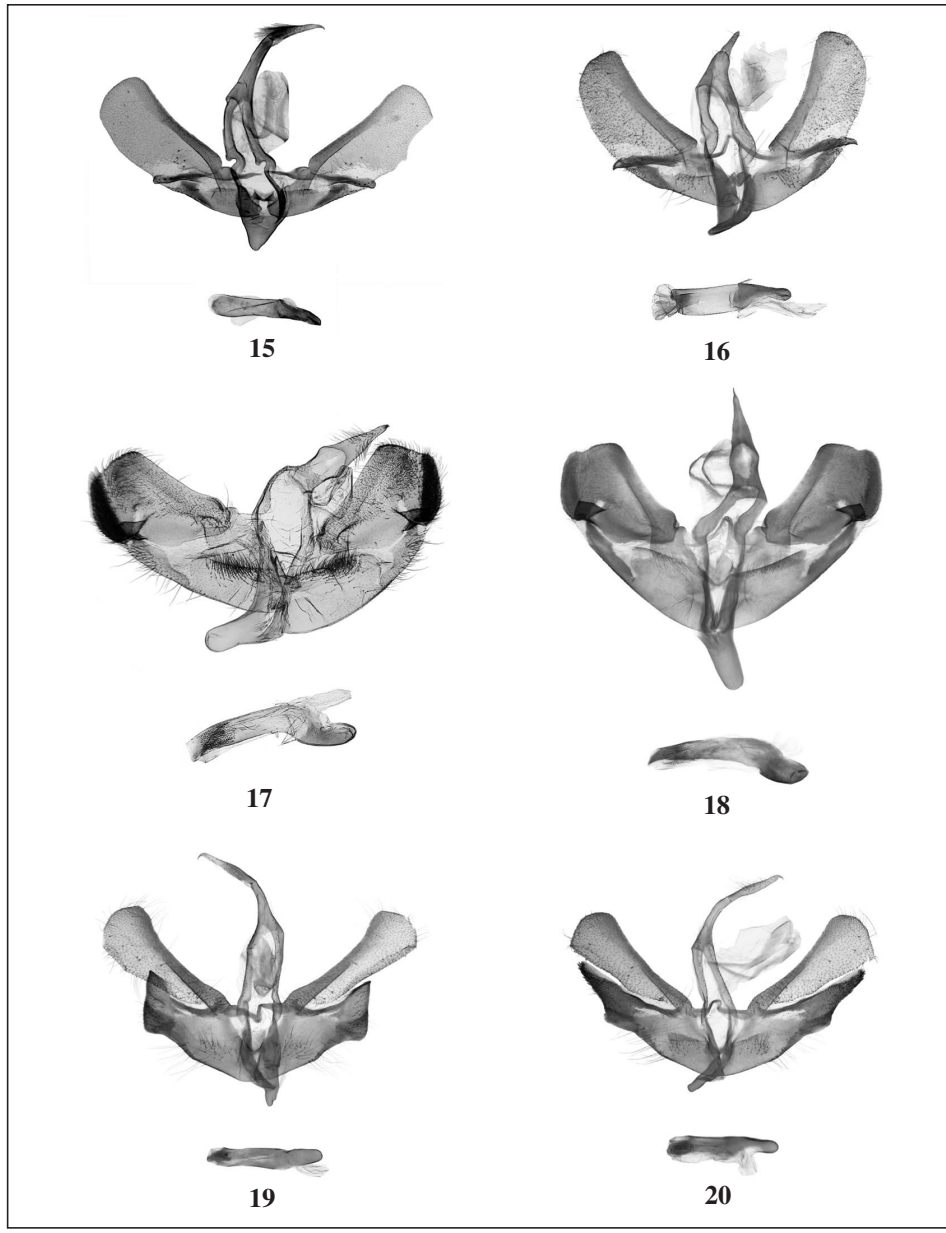


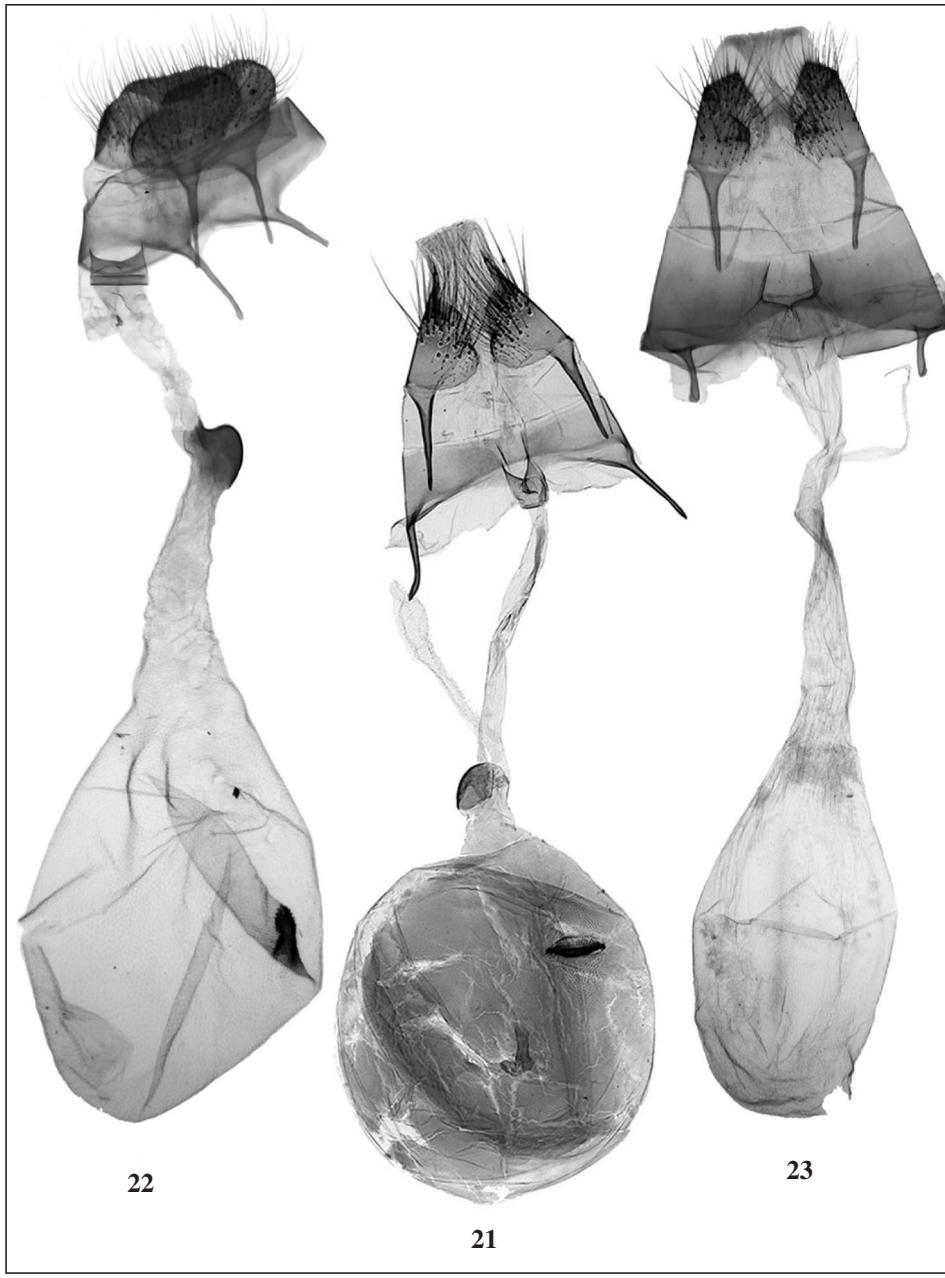
Figures 1-6.– Adults. **1.** *Evonima aperta* Walker, 1865, syntype, ♀, Indonesia, Java (NHMUK); **2.** *E. aperta* Walker, 1865, ♂, Thailand (MWM/ZSM); **3.** *E. westafricana* Hacker, 2012, ♂, Liberia (ANHRT); **4.** *E. westafricana* Hacker, 2012, ♂, Ivory Coast (ANHRT); **5.** *E. westafricana* Hacker, 2012, ♂, Gabon (ANHRT); **6.** *E. westafricana* Hacker, 2012, ♀, Ghana (HNHM).



Figures 7-14.– Adults (all in coll. ANHRT). **7.** *Vansonima littoralis littoralis* (van Son, 1933), ♂, Mozambique; **8.** *V. littoralis littoralis* (van Son, 1933), ♂, Mozambique; **9.** *V. littoralis abyssinica* (Hacker, 2012), ♂, Zambia; **10.** *V. littoralis abyssinica* (Hacker, 2012), ♂, Zambia; **11.** *Laetonima smithi* László, sp. n., holotype, ♂, Zambia; **12.** *L. smithi* László, sp. n., paratype, ♀, Zambia; **13.** *L. camerunica* László, sp. n., holotype, ♂, Cameroon (ANHRT); **14.** *L. camerunica* László, sp. n., paratype, ♂, Cameroon.



Figures 15-20.– Male genitalia. **15.** *Evonima aperta* (Walker, 1865), LGN 396, Thailand (MWM/ZSM); **16.** *E. westafricana* Hacker, 2012, LGNA 997, Gabon (ANHRT); **17.** *Vansonima littoralis littoralis* (van Son, 1933), LGNA 387, Mozambique (ANHRT); **18.** *V. littoralis abyssinica* (Hacker, 2012), LGNA 956, Zambia (ANHRT); **19.** *Laetonima smithi* László, sp. n., holotype, LGNA 959, Zambia (ANHRT); **20.** *L. camerunica* László, sp. n., holotype, LGNA 957, Cameroon (ANHRT).



Figures 21-23.– Female genitalia. **21.** *Evonima aperta* Walker, 1865, LGN 395, Thailand (MWM/ZSM); **22.** *E. westafricana* Hacker, 2012, LGNA 989, Ghana (HNHM); **23.** *Laetonima smithi* László, sp. n., paratype, LGNA 960, Zambia (ANHRT).

REVISIÓN DE PUBLICACIONES
BOOK REVIEWS

W. Back
Guide to the Butterflies of the Palaearctic Region: Pieridae IV
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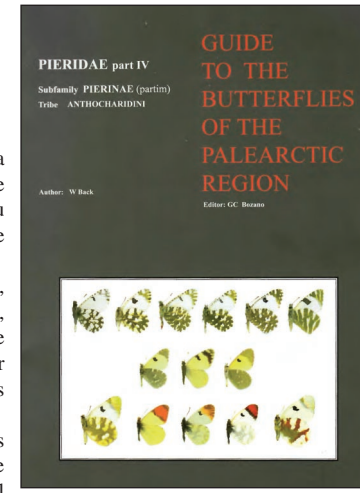

Tenemos en nuestras manos, la cuarta entrega de la familia Pieridae Swainson, [1820] 1820-21, que trata la subfamilia Pierinae Swainson, [1820] 1820-21 y, dentro de esta subfamilia, la tribu Anthocharidini Scudder, 1889, que forma parte de esta interesante serie sobre los Rhopalocera de la Región Paleártica.

En este fascículo, se tratan los géneros *Anthocharis* Boisduval, Rambur, Duméril & Graslin, [1833] 1832-37, *Iberochloe* Back, Knebelsberger & Miller, 2008 (que nosotros consideramos sinonimia de *Euchloe* Hübner, [1819] 1816), *Euchloe* Hübner, [1819] 1816 (por error se indica [1919]), *Elphinstonia* Klots, 1930 (que nosotros consideramos sinonimia de *Euchloe* Hübner, [1819] 1816) y *Zegris* Boisduval, 1836.

Se presentan fotografías a todo color de los adultos y de las principales subespecies consideradas como válidas en este trabajo, e igualmente, de todas las especies aparecen dibujos de la genitalia del macho, desafortunadamente no de la hembra, orugas y crisálidas, así como algún otro detalle anatómico que pueda permitir aclarar dudas como palpos, antenas, venación alar, etc.

Es muy interesante el tratamiento que hace de las distancias genéticas del género *Euchloe* y del género *Zegris*, así como del complejo de especies presentes en las Islas Canarias del género *Euchloe*, con las especies *E. hesperidium* Rothschild, 1913, *E. eversi* Stamm, 1964, *E. grancanariensis* Acosta y *E. charlonia* (Donzel, 1842) (si bien esta especie la considera en el género *Elphinstonia*).

Finaliza la obra con un bibliografía específica, si bien no considera dos obras fundamentales españolas como *Fauna Ibérica. Lepidoptera, Papilionoidea* (2013) y el *Catálogo sistemático y sinonímico de los Lepidoptera de la Península Ibérica, de Ceuta, de Melilla y de las Islas Azores, Baleares, Canarias, Madeira y Salvajes* (2014).

La calidad no ha decaído en este nuevo fascículo de esta interesante serie, que sin duda alguna poco a poco se va considerando como un clásico y, por lo tanto, no puede faltar en ninguna biblioteca especializada, por otra parte, queremos felicitar a la Editorial por la excelente labor realizada y la calidad de la impresión de la serie.

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Review of the Genus *Orygocera* Walsingham, 1897 from the Mascarenes with description of a new species (Lepidoptera: Depressariidae, Stenomatinae)

M. Bippus

Abstract

The species of the genus *Orygocera* Walsingham, 1897 in the Mascarene islands are reviewed. One new species *Orygocera albanix* Bippus, sp. n. is described. One subspecies, *Orygocera amphitricha reunionensis* Viette, 1991 is found to be a junior synonym of the nominal species *Orygocera amphitricha amphitricha* (Meyrick, 1910). Hostplants are recorded for one species and larval stages are illustrated for the first time of this genus.
KEY WORDS: Lepidoptera, Depressariidae, Stenomatinae, *Orygocera,* Mascarenes, Réunion, Mauritius, France.

Revisión del género *Orygocera* Walsingham, 1897 de las Mascareñas con descripción de una nueva especie (Lepidoptera: Depressariidae, Stenomatinae)

Resumen

Se revisan las especies del género *Orygocera* Walsingham, 1897 en las islas Mascareñas. Se describe una nueva especie *Orygocera albanix* Bippus, sp. n.. Una subspecies, *Orygocera amphitricha reunionensis* Viette, 1991 es encontrada como nueva sinonimia de la especie nominal *Orygocera amphitricha amphitricha* (Meyrick, 1910). Se registra por primera vez, la planta nutricia para una de las especie y la larva se ilustra por primera vez de este género.
PALABRAS CLAVE: Lepidoptera, Depressariidae, Stenomatinae, *Orygocera,* Mascareñas, Reunión, Mauricio, Francia.

Introduction

The species of the genus *Orygocera* Walsingham, 1897 in the Mascarene islands are reviewed. One new species *Orygocera albanix* Bippus, sp. n. is described. One subspecies, *Orygocera amphitricha reunionensis* Viette, 1991 is found to be a junior synonym of the nominal species *Orygocera amphitricha amphitricha* (Meyrick, 1910) and the hostplants are recorded for one species and larval stages are illustrated for the first time for this genus.

Systematic part

***Orygocera albanix* Bippus, sp. n.** (Figs 1-3)

Holotype: ♂, Réunion, La Possession, alt. 400 m (20º 55’ 37”S/ 55º 21’ 45”E), 06-II-2016 in Naturalis Biodiversity Center, RMNH.INS 1108923. Paratype: 3 ♂♂, same locality, 03-II-2014 (gen. prep. RE-1205, Fig. 3) (Naturalis Biodiversity Center), 03-VII-2017 (coll. M. Bippus) and 23-IV-2018 (Naturalis Biodiversity Center).

Description: Wing length: 9.0-9.5 mm, wing span: 20-21mm. Head, shoulders light pinkish-brownish. Antennae and abdomen creamish brownish-grey. Palpi whitish-ochreous irrorated crimson-purplish. Forewings elongate, rather broad, costa gently arched, apex obtuse, termen straight, snow-white, costa suffused light violet-crimson near base, dorsum crimson-purplish at base, two connected triangular blotches of the same colour at 1/2 and 3/4 not reaching 1/3, an obliqe snow-white fascia near termen.

Male genitalia: Broad tegumen with a small, hooked uncus. Valvae narrowed at base, distally delated and bilobed. Short and broad saccus. Aedeagus curved, without cornuti, little about half length of the genitalia.

Biology: unknown.

Distribution: Réunion.

Etymology: I use to attribute a nickname to unnamed or unrecognized species and this species received the German nickname "Schneewittchen" , meaning "snow-white" in English and *albanix* in Latin.

Orygocera amphitricha (Meyrick, 1910) (Figs 4-9)
Epiphractis amphitricha Meyrick, 1910. *Trans. Ent. Soc. London*, **78**(2): 373
LT: Les Mares, Mauritius
Orygocera amphitricha reunionensis Viette, 1988, **syn. n.**
Orygocera amphitricha reunionensis Viette, 1988. *L'Entomologiste*, **44**(3): 175
LT: Reunion

Description: Wingspan: 22 mm. Forewings pinky-brownish to dark-crimson brownish.

Examined material: 16 specimens ex-larvae, 33 specimens collected at light, mostly in La Possession, alt. 400 m, 20º 55' 37"S/55º 21' 45"E in the months of I, II, III, IV, VI, VII, IX, X, XI, XII but some additional specimens on light also in Sainte-Suzanne, alt. 700 m, 17-VI-2014, 21-XI-2015, 22-XII-2015, St. Philippe, alt. 250 m, 20-XI-2014, 13-VI-2015 and Takamaka, 09-I-2016. Twelve specimens were added to the collections of the BMNH, six specimens in Naturalis Biodiverity Centre, Leiden.

Viette described this subspecies *reunionensis* from a female taken in Sainte-Suzanne, 15-III-1986 (leg. Ch. Guillermet) based only on differences in colouration compared to a series of specimens he had captured in the forest of Macchabée (Macabé), Mauritius in II-1964 in the company of J. Vinson and R. Mamet (GUILLERMET, 2011). He stated that the specimen from Réunion had a clearer, more rosy colouration while the Mauritian specimens are reddish-brown.

Actually I find both colourations also in Réunion and the darker, brownish-crimson colouration is even more frequent (85-90%) than the lighter coloured specimens (10-15%) that I find in months and places with high humidity levels.

I consider this difference as a normal variability of the nominal species and therefore consider the subspecies *Oyrgocera amphitricha reunionensis* Viette, 1988 as a junior synonym of *Orygocera amphitricha amphitricha* (Meyrick, 1910).

Biology: A total of 16 specimens were bred from larvae that were collected on *Syzygium cymosum* (Lam.) DC. and *Syzygium cumini* (L.) Skeels (Myrtaceae). The larvae stick two opposite leaves together and feed inside their hide. Although most were found on fresh, green leaves, they also can feed on older, brownish leaves as long as these stay humid. The larvae are very agil and try to escape in lateral movements when their hide is opened. Months of eclosure: 2014: IV, V, XI, XII and 2015: I, II, IX, XII. Pupal stage: 12-14 days. Hostplants: *Syzygium cymosum* (Lam.) DC. and *Syzygium cumini* (L.) Skeels (Myrtaceae).

Distribution: Mauritius and Réunion. Localities of collection: La Montagne, alt. 800 m (*Syzygium cymosum*) and La Possession, Rav. Malheur, alt. 400 to 550 m (*Syzygium cumini*).

Orygocera tryphoxantha (Meyrick, 1930) (Figs 10-12)
Epiphractis tryphoxantha Meyrick, 1930. *Trans. Ent. Soc. London*, **78**: 318
LT: Mauritius

This species was described by MEYRICK (1930) after a female of 20 mm wingspan. His description is perfect, I have nothing to add to his words.

Citation of MEYRICK (1930): "Female, 20 mm. Head, palpi, thorax crimson-grey, face tinged whitish. Fore-wings elongate, rather dilated, costa gently arched, apex obtuse, termen nearly straight, somewhat oblique, yellow; costa suffused crimson-grey towards base, then narrowly white to apex; dorsum slenderly crimson-fuscous towards base, remainder occupied by two connected triangular fuscous-crimson blotches not reaching half across wing, first including some whitish suffusion: cilia rosy-whitish. Hindwings grey-whitish, becoming light grey towards apex; cilia grey-whitish. 1 ex."

Examined material: 1 ♂, Réunion, Possession, alt. 400 m, 20º 55' 37"S/ 55º 21' 45"E, 09-XII-2015, gen.prep. RE-2290 in coll. M. Bippus.

Biology: unknown

Distribution: Mauritus and Réunion.

Remarks: No images of *Orygocera tryphoxantha* Meyrick, 1930 had been published but Meyrick's description fits to my specimen at all points. He is actually the only entomologist whose descriptions are almost perfect and from which I can recongnize some species.

The holotype is housed in the MNHN, Musée National d'Histoire Naturelle, Paris (VIETTE, 1951).

There seems to exist another junior synonym of this species described from Réunion *Orygocera anderesi* Viette, 1991. It is not the first time that I noticed that Viette did not take account of the species described earlier by Meyrick, even if the types are housed in the MNHN. Unfortunately, the MNHN also did not reply to my e-mail requests from 2014, January 2017 and December 2017 if a picture of the type of *O. tryphoxantha* is available, or not.

I consider *Orygocera anderesi* Viette, 1991 as a junior synonym of *Orygocera tryphoxantha* (Meyrick, 1930) but I am not in the position to place it under synonymy as I have not seen the holotypes.

Orygocera lenobapta Meyrick, 1924 (Figs 13-14)
Orygocera lenobapta Meyrick, 1924. *Trans. Ent. Soc. London*, **78**(2): 553
LT: Rodriguez Island

MEYRICK (1924) described this species as follows: *"Orygocera lenobapta*, n. sp. male/female 18-22 (mm). Head whitish-ochreous, in male more or less tinged or suffused fuscous-purplish. Palpi whitish-ochreous irroratod crimson-purplish, terminal joint 2/3-4/5. Thorax pale ochreous, often tinged or suffused ferruginous or fuscous-purplish. Fore-wings apex obtuse, termen rather obliquely rounded; 9 curved and approximated at base to 8; pale ochreous, in female tinged whitish and variably sprinkled ferruginous, in male wholle suffused fuscous-purplish or purple-brown; markings cloudy, indistinct or sometimes little apparent, in female ferruginous or red-brown, in male dark purple-fuscous, indicating when well-developed a streak along dorsum, enclosing a short pale basal streak, and small subtriangular pale antemedian and praetornal spots, and oblique streaks crossing disc at 1/3 and 2/3, latter bent in beneath to touch apex of praetornal spot: cilia in female reddish-brown, in male fuscous-purpblish. Hind-wings in male grey, in female ochreous-whitish posteriorly suffused dull rosy; cilia male grey, female ochreous-whitish. 22 ex."

The types in BMNH are labelled, Male: *Orygocera lenobapta* Meyr. ♂, Type + Paratypes; NHMUK010304537. Female: *Orygocera lenobapta* Meyr. ♀, Type + Paratypes; NHMUK010304538. The additional labels are the same for both specimens, reading: pres. by Cambridge University Museum B.M. 1924-238; Rodriguez Id., VIII-XI-1918, H. P. Thomasset and H. J. Shell Coll. (Note: Both types are labelled : "H.T.").

Distribution: Rodrigues

Remarks

Following species of other genera and families had been recorded in Réunion, I will try to illustrate some in future publications during revisions of their respective families:

Blastobasidae: *Blastobasis inana* (Butler, 1881) (new for Africa).

Choreutidae: *Brenthia leptocosma* Meyrick, 1916 (also in Mauritius).

Euteliidae: *Atacira mima* (Prout, 1925).

Gelechiidae: *Anarsia citromitra* Meyrick, 1921 (also in Mauritius); *Stegasta variana* Meyrick, 1904; *Thiotricha tenuis* (Walsingham, 1891) (also in Mauritius).

Glyphipterigidae: *Glyphipterix madagascariensis* Viette, 1951.

Gracillariidae: *Acrocercops macrochalca* Meyrick, 1910; *Caloptilia xanthochiria* Vari, 1961; *Dialectica pyramidota* (Meyrick, 1918).

Momphidae: *Ithome lassula* Hodges, 1962 (new for Africa, also in Mauritius); *Gisilia sclerodes* (Meyrick, 1909) (also in Mauritius).

Oecophoridae: *Cenarchis vesana* Meyrick, 1924 (also in Mauritius); *Metachanda astrapias* (Meyrick, 1887).

Phycitinae: *Balinskyia monstrosa* (Balinsky, 1994).

Tineidae: *Amphixystis fragosa* (Meyrick, 1910).

Tortricidae: *Brachiolia amblopis* (Meyrick, 1911); *Cosmetra spiculifera* (Meyrick, 1913) (also in Mauritus); *Cosmorrhyncha acrocosma* (Meyrick, 1908) (also in Mauritius); *Leguminivora anthracotis* (Meyrick, 1913) (also in Mauritius and Madagascar).

New for the fauna of Mauritius was recorded:

Gelechiidae: *Dichomeris hortulana* (Meyrick, 1918) (also in Mayotte).

Oecophoridae: *Metachanda thaleropis* Meyrick, 1911

Acknowledgements

I am grateful to Dr. David Lees of BMNH for providing the images of the types of *Orygocera lenobapta* and for giving his permission to publish these and to the referees of this article.

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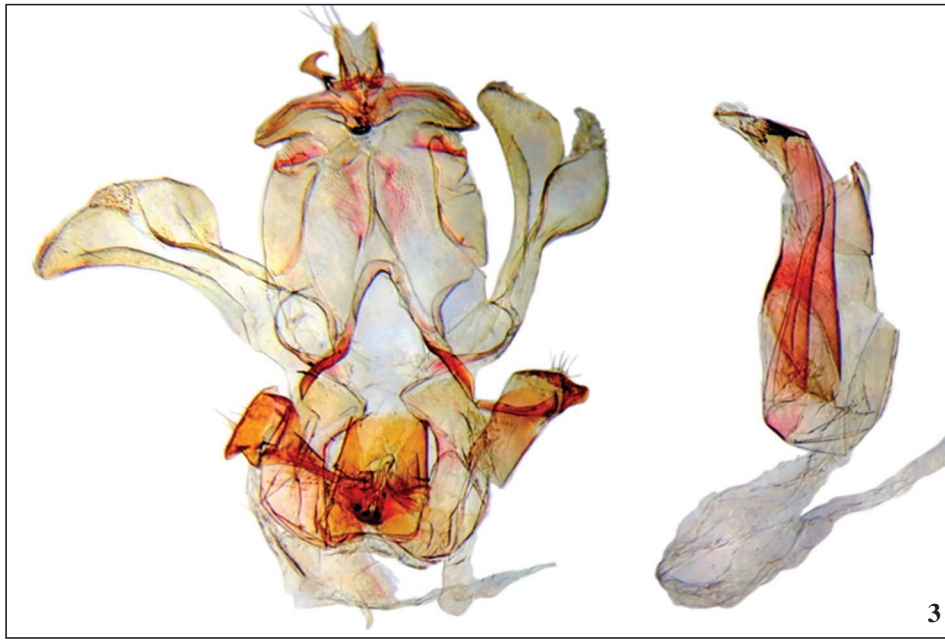
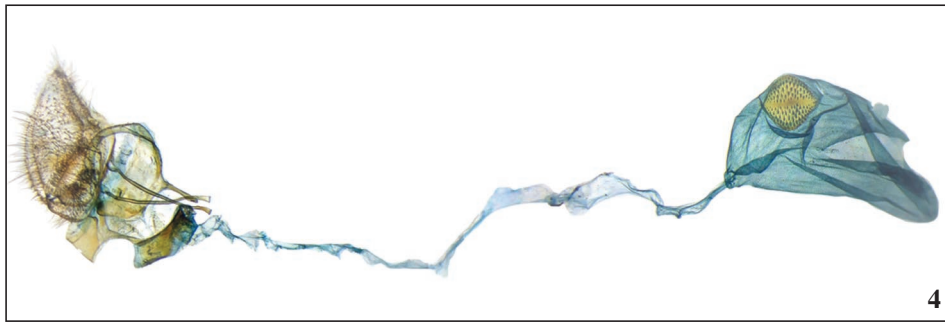
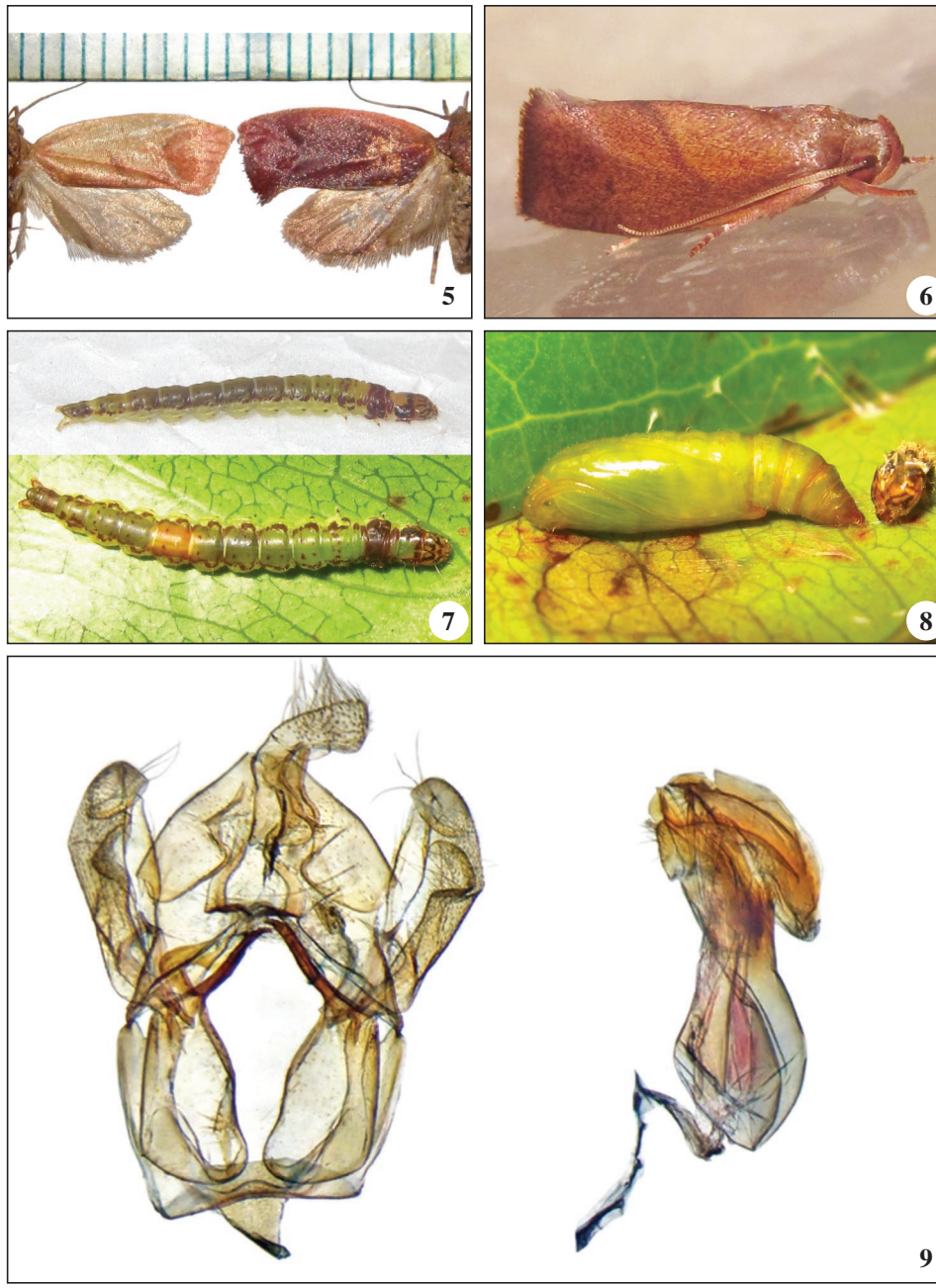
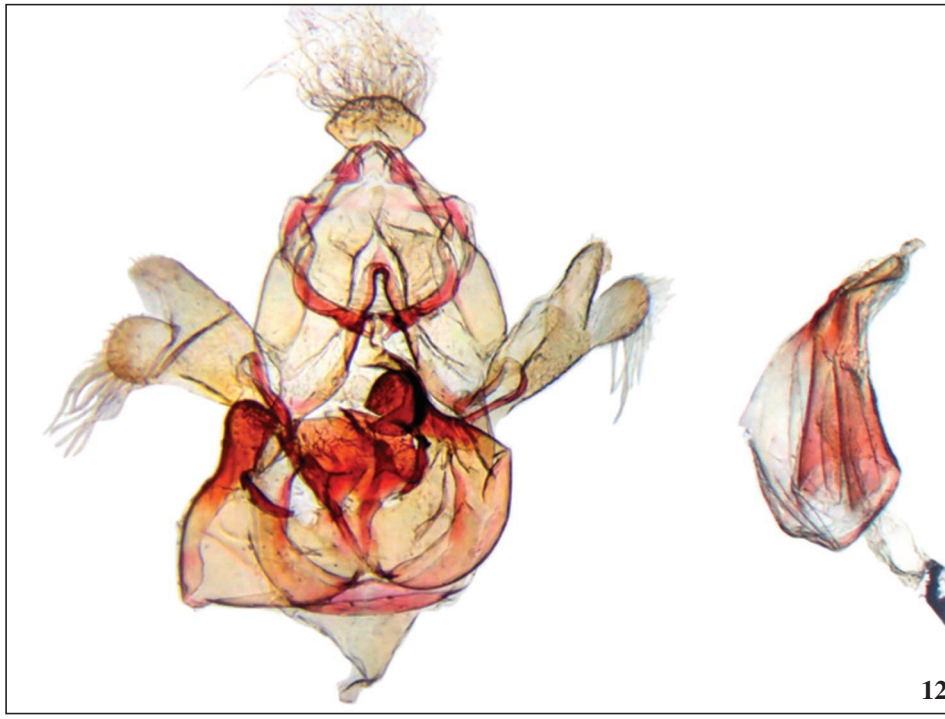




Figs 1-4.– 1. *Orygocera albanix*. **2.** *Orygocera albanix*. **3.** *Orygocera albanix,* male genitalia. **4.** *Orygocera amphitricha*, female genialia.



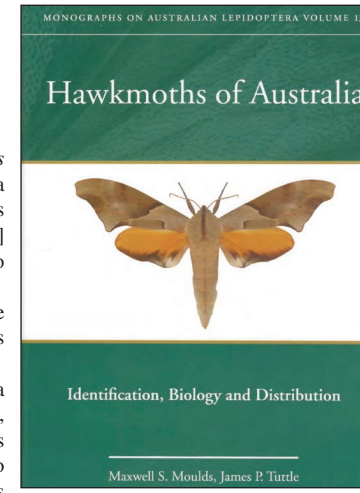
Figs 5-9.– 5. *Orygocera amphitricha*. **6.** *Orygocera amphitricha*. **7.** *Orygocera amphitricha*, larvae. **8.** *Orygocera amphitricha*, pupae. **9.** *Orygocera amphitricha*, male genitalia.



Figs 10-14.- *Orygocera tryphoxantha*. **11.** *Orygocera tryphoxantha*. **12.** *Orygocera tryphoxantha*, male genitalia. **13.** *Orygocera lenobapta,* female type. **14.** *Orygocera lenobapta*, male type (Figures 13 and14 David Lees, BMNH, London).

REVISIÓN DE PUBLICACIONES
BOOK REVIEWS

M. S. Moulds, J. P. Tuttle & D. A. Lane
Hawkmoths of Australia. Identification, Biology and Distribution
414 páginas
Formato: 30,0 x 21'5 cm
CSIRO Publishing, Clayton South, VIC, 2020
ISBN: 978-1-486-30281-9



Aparece un nuevo volumen 13 de la ya clásica serie *Monographs on Australian Lepidoptera*, en este caso se trata la revisión de la familia Sphingidae Latreille, [1802] 1803, considerando tres subfamilias Smerinthinae Grote & Robinson, 1865, Sphinginae Latreille, [1802] 1803 y Macroglossinae Harris, 1839, divididas en ocho tribus y cinco subtribus, con 87 especies distribuidos en 31 géneros.

Este trabajo aumenta su importancia, si tenemos en cuenta que se describe un género nuevo *Chelacnema*, se establecen siete nuevas sinonimias y se dan doce nuevas combinaciones.

Después de los Agradecimientos, Introducción, nos hablan sobre la organización y presentación, revisión histórica, estructura y función, como se colectan y conservan, un interesante capítulo sobre los estados inmaturos y la biología, sobre la clasificación y nomenclatura, seguido de la especies de la fauna australiana, un adendum, un glosario, dos apéndices, uno de ellos dedicado a los parásitos y finalizando con una bibliografía específica.

Ya dentro de la parte taxonómica de los Sphingidae, de cada uno de los géneros considerados, nos dan las reseñas sinonímicas y una clave dicotómica de todas y cada una de las especies consideradas, incluidas las larvas y las pupas.

De cada especie nos da las referencias bibliográficas, sobre el material examinado, su distribución y biología, diagnosis, descripción del macho y de la hembra, así como fotografías, a lo largo de 92 planchas, de los principales parásitos, de las larvas, de las pupas y de los adultos a todo color, finalizando con la genitalia de los machos, desafortunadamente, faltan las de las hembras.

No podemos terminar estas líneas, sin felicitar al autor, por tan detallado trabajo sobre la fauna australiana, así como al CSIRO que continúa patrocinando tan importante y esencial obra, por lo que recomendamos vivamente su adquisición y no pudiendo faltar en cualquier biblioteca que se precie, sobre todo para aquellos interesados en esta magnífica fauna.

El precio de este libro es de 220 dólares australianos y los interesados deben dirigirse a:

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Estudio preliminar de los Macroheterocera del Parque Natural Sierra María-Los Vélez (Almería, España) (Insecta: Lepidoptera)

M. Garre, R. M. Rubio, J. J. Guerrero & A. S. Ortiz

Resumen

Se han identificado, hasta el momento, 70 especies pertenecientes a las familias Cossidae, Limacodidae, Lasiocampidae, Saturniidae, Sphingidae, Drepanidae, Notodontidae, Nolidae y Erebidae en el Parque Natural Sierra María-Los Vélez (Almería, España). Los elementos de distribución mediterránea son mayoritarios (65,7%) e incluyen 3 endemismos ibéricos. El corotipo euroasiático está relativamente bien representado con un 17,1%. Las estrategias fenológicas de las especies son principalmente bivoltina (48,6%) y univoltina (45,7%) frente a la polivoltina del resto de especies (5,7%). Los taxones que se citan por primera vez en la provincia de Almería son 20 especies.
PALABRAS CLAVE: Insecta, Lepidoptera, Parque Natural Sierra María-Los Vélez, Almería, España.

Preliminary study of the Macroheterocera from the "Sierra María-Los Vélez" Natural Park (Almeria, Spain) (Insecta: Lepidoptera)

Abstract

Seventy species belonging to the families Cossidae, Limacodidae, Lasiocampidae, Saturniidae, Sphingidae, Drepanidae, Notodontidae, Nolidae and Erebidae have been recorded from the "Sierra María-Los Vélez" Natural Park (Almeria, Spain). Biogeographically, the Mediterranean elements (65.7%) are dominants, including three Iberian endemisms. The Euriasiatic ones are relatively well represented (17.1%). The phenological strategies of the species are mainly bivoltine (48.6%) and univoltine (45.7%) compared to those of the polyvoltines ones (5.7%). Those species which are documented in the Almeria province for the first time are 20.
KEY WORDS: Insecta, Lepidoptera, "Sierra María-Los Vélez" Natural Park, Almeria, Spain.

Introducción

El Parque Natural Sierra María-Los Vélez es un espacio natural montañoso situado en el extremo norte de la provincia de Almería, en el sudeste de la península ibérica, conformado por un conjunto de sierras entre las que destacan la Sierra del Gigante, Sierra Larga, Sierra del Maimón, Serrata de Guadalupe y el macizo de la Sierra de María que, con el Pico María de 2.045 m, supone la mayor altitud del Parque Natural. Una descripción más detallada del área de estudio puede consultarse en GARRE *et al*. (2012). La fauna lepidopterológica ha sido estudiada en las familias Zygaenidae, Hesperiidae, Papilionidae, Pieridae, Lycaenidae y Nymphalidae (GARRE *et al*., 2012), Geometridae (GARRE *et al*., 2016) y Noctuidae (GARRE *et al*., 2019), mientras que de las familias tratadas en esta contribución solo se dispone de algunas citas bibliográficas aisladas en AISTLEITNER & AISTLEITNER (1998), IBÁÑEZ *et al*. (2008) y ORTIZ *et al.* (2010, 2016).

El objetivo de este estudio es presentar el catálogo sistemático de las especies de las familias Cossidae, Limacodidae, Lasiocampidae, Saturniidae, Sphingidae, Drepanidae, Notodontidae, Nolidae y Erebidae del Parque Natural Sierra María-Los Vélez, realizar su análisis biogeográfico y fenológico y destacar las especies más interesantes.

Material y métodos

El estudio de campo se ha realizado mediante 59 muestreos nocturnos en diversas localidades del Parque Natural Sierra María-Los Vélez durante el período comprendido entre la segunda quincena de mayo de 2010 y la primera quincena de mayo de 2012. Los muestreos han sido hechos utilizando trampas de luz negra y actínica de 6 vatios (tipo Heath), además de contar con alguna captura u observación en el entorno urbano de la población de María.

Tabla I.– Relación de localidades muestreadas en el Parque Natural Sierra María-Los Vélez.

Nº	Localidad	Municipio	Altitud (m.s.n.m.)	U.T.M.
1	Cañada del Panizo	Vélez-Blanco	1.050	30SWG77
2	Cerro Carreta	Vélez-Blanco	1.100	30SWG77
3	Barranco del Peral	Vélez-Blanco	1.180	30SWG77
4	Sierra del Maimón	Vélez-Blanco	1.260	30SWG77
5	Río Claro	Vélez-Blanco	1.090	30SWG77
6	Umbría de la Virgen (Sierra María)	María	1.410	30SWG77
7	Morrón Primero (Sierra María)	María	1.450	30SWG77
8	Centro urbano	María	1.200	30SWG77

En la Tabla I se pueden consultar las localidades muestreadas, agrupadas por municipios, con la altitud sobre el nivel del mar y la coordenada UTM. La descripción del hábitat de estas localidades es:

Estaciones 1-4. Situadas en el dominio del encinar manchego del piso mesomediterráneo con ombrotipo seco, donde el dosel arbóreo está representado por encinas aisladas, pinos carrascos y rodenos de repoblación. En los claros prosperan algunos arbustos esclerófilos (coscojas, enebros, espinos negros), matorrales heliófilos y pastizales vivaces, más o menos próximos a cultivos de almendros de secano.

Estación 5. Localizada en el entorno de un bosque ripario de chopos, álamos y sauces, que generan un ambiente nemoral, donde el sotobosque está compuesto por arbustos espinosos, como zarzas y rosas, juncales y herbazales esciófilos.

Estaciones 6 y 7. Se ubican en el dominio del encinar bético del piso supramediterráneo con ombrotipo subhúmedo, donde el estrato arbóreo está representado por encinas aisladas, algunas especies caducifolias mesófilas (arces, quejigos, mostajos) y pinos rodenos y carrascos de repoblación. En los claros se presentan diversas comunidades seriales, en particular, espinares caducifolios (agracejos, majuelos, guillomos, artos, rosas), piornales, matorrales pulviniformes y lastonares.

Estación 8. Se encuentra en un entorno urbano dentro del área de estudio.

El material estudiado se encuentra depositado en la colección del Laboratorio de Biología Animal del Departamento de Zoología y Antropología Física de la Universidad de Murcia. Además, se ha consultado la colección entomológica de la Estación Experimental de Zonas Áridas (EEZA) en Almería y la colección particular de D. Francisco Arcas.

La relación de especies estudiadas se puede consultar en el Apéndice, ordenadas sistemáticamente e indicando, para cada taxón, la toponimia distintiva, fecha de captura u observación, número de ejemplares, corotipo, fenología y fuentes bibliográficas conocidas. Las especies que se citan por vez primera para la provincia de Almería están marcadas con un asterisco (*). Asimismo, se indica el periodo de vuelo (en meses y numeración romana) confirmado en base a los datos observados y a las referencias bibliográficas específicas, mientras que la agrupación de las especies en las diferentes familias y su distribución mensual durante los dos periodos de muestreo se presentan en la Tabla II y Figura 1. La no-

menclatura de las especies y la ordenación en sus correspondientes categorías taxonómicas se ha realizado según la clasificación propuesta por VIVES MORENO (2014) con algunas modificaciones. El análisis biogeográfico se ha realizado utilizando los corotipos generales propuestos en CALLE (1982) y actualizados con los criterios biogeográficos de VARGA (2010). El número de especies y la proporción de cada uno de los corotipos se presentan en la Tabla III.

Tabla III.– Distribución de las especies de Macroheterocera en las diferentes categorías biogeográficas o corotipos en el Parque Natural Sierra María-Los Vélez.

Elemento faunístico	nº especies	%	% clases principales
Paleártico	7	10,0%	
Euroasiático	12	17,1%	
Cosmopolita	1	1,4%	34,3%
Holártico	1	1,4%	
Tropical	3	4,3%	
Atlanto-mediterráneo	18	25,7%	61,4%
Asiático-mediterráneo	25	35,7%	
Endémico	3	4,3%	4,3%
TOTAL	**70**	**100,0%**	**100,0%**

En relación con el voltinismo o número de generaciones anuales, la clasificación de las especies se ha realizado en base a referencias bibliográficas generalistas (PÉREZ-DE GREGORIO *et al.,* 2001; GOATER *et al.,* 2003; LERAUT, 2006, 2019; ROBINEAU, 2007; FIBIGER *et al.,* 2010; YLLA *et al.*, 2010; WITT & RONKAY, 2011). En cuanto a las características de la distribución, biología y hábitat de cada taxón (Figura 2), se puede inferir que una misma especie puede tener ciclos vitales diferentes dependiendo de su localización latitudinal. En tal caso, se ha considerado la fenología más coherente con la posición geográfica del Parque Natural Sierra María-Los Vélez en el continente europeo y su condición de territorio de media y alta montaña.

Resultados y discusión

El estudio realizado en el Parque Natural Sierra María-Los Vélez de las familias Cossidae, Limacodidae, Lasiocampidae, Saturniidae, Sphingidae, Drepanidae, Notodontidae, Nolidae y Erebidae ha permitido identificar 70 especies, siendo las familias Erebidae y Sphingidae con 35 y 9 especies, respectivamente, las más numerosas. El resto de las familias estudiadas aporta un número inferior de representantes (Tabla II). Del total de especies catalogadas, 20 son citadas por primera vez en la provincia de Almería.

Tabla II.– Número de especies en vuelo de las diferentes familias de Macroheterocera en el Parque Natural Sierra María-Los Vélez en cada uno de los meses del período comprendido entre la segunda quincena de mayo de 2010 y la primera quincena de mayo de 2012.

Familia (nº especies)	E	F	M	A	M	J	J	A	S	O	N	D
Cossidae (1)	0	0	0	0	0	1	1	0	0	0	0	0
Limacodidae (1)	0	0	0	0	0	1	0	0	0	0	0	0
Drepanidae (2)	0	0	0	0	2	1	1	1	1	1	1	0
Lasiocampidae (7)	0	1	1	3	2	3	3	3	2	1	1	1
Saturniidae (1)	0	0	0	0	1	0	0	0	0	0	0	0
Sphingidae (9)	0	0	1	1	4	4	4	4	2	0	0	0
Notodontidae (7)	0	0	0	2	5	4	5	3	1	0	0	0
Erebidae (35)	0	1	2	6	10	20	21	23	15	7	2	0
Nolidae (7)	0	2	2	3	3	4	2	2	2	0	0	0
TOTAL (70)	**0**	**4**	**6**	**15**	**27**	**38**	**37**	**36**	**23**	**9**	**4**	**1**

En relación con la fenología de las especies del presente trabajo (Tabla II, Figura 1), se observa un incremento gradual de los imagos en vuelo desde el inicio del año, alcanzando un máximo en junio, para acabar descendiendo más sostenidamente en el segundo semestre anual, lo que parece ajustarse a un esquema propio de un territorio de media y alta montaña (Figura 1). La familia Erebidae, que es la que más especies incluye, es la que determina esta distribución fenológica, aunque el resto de las familias de Macroheterocera estudiadas, que presentan un menor número de especies, siguen el mismo patrón de vuelo.

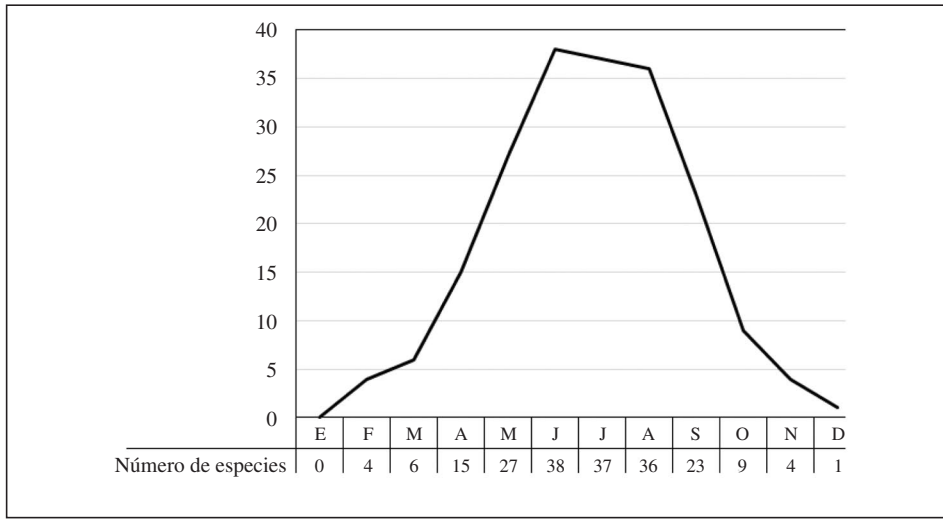

Figura 1.– Esquema fenológico de los Macroheterocera en el Parque Natural Sierra María-Los Vélez durante el período comprendido entre la segunda quincena de mayo de 2010 y la primera quincena de mayo de 2012.

La agrupación de los taxones de Macroheterocera estudiados en función de su ciclo vital muestra que el 45,7% son univoltinos, el 48,6% bivoltinos y el 5,7% polivoltinos (Figura 2). Estos resultados difieren de los calculados para las familias Noctuidae (GARRE *et al.,* 2019) y Geometridae (GARRE *et al.,* 2016) en los que las especies univoltinas son mayoritarias (74,1% y 56,8%, respectivamente) mientras que las especies bivoltinas son mayoritarias en el resto de Macroheterocera (48,6%).

Entre las siete especies pertenecientes a la familia Lasiocampidae destaca *Poecilocampa populi* (Linnaeus, 1758), ejemplar que debe adscribirse a la forma *flavescens* Spuler, 1908*,* que es una especie de vuelo muy tardío y extendida en la región eurosiberiana de la península. Las colonias más próximas se han citado en Sierra Nevada (PÉREZ-LÓPEZ, 1993) aunque también ha sido capturada en Albacete y Murcia (ORTIZ *et al.,* 2010; LENCINA *et al.,* 2011).

De la familia Saturniidae solamente se conoce en la provincia de Almería, hasta el momento, la cita de *Graellsia isabelae* (Graells, 1849) en el Parque Natural Sierra María-Los Vélez de IBÁÑEZ *et al.* (2008), con lo que se completa junto con las colonias de Albacete, Granada, Jaén y Murcia un importante núcleo poblacional circunscrito a las sierras prebéticas.

La mayoría de las especies pertenecientes a la familia Sphingidae se caracterizan por tener una amplia distribución peninsular, donde *Hemaris tityus* (Linnaeus, 1758), siempre rara y localizada, solamente es conocida en Almería de Sierra Nevada (MUÑOZ SARIOT, 2014). Los ejemplares estudiados en el presente estudio se encuentran depositados en la colección entomológica de la EEZA.

Entre los Notodontidae destaca un endemismo ibérico asociado a los hábitats forestales como es *Cerura iberica* (Templado & Ortiz, 1961). Mientras, entre las siete especies de la familia Nolidae, destaca *Nycteola siculana* (Fuchs, 1899), localizada solamente en Murcia (referencias en CALLE *et al.,* 2007) en el sureste ibérico.

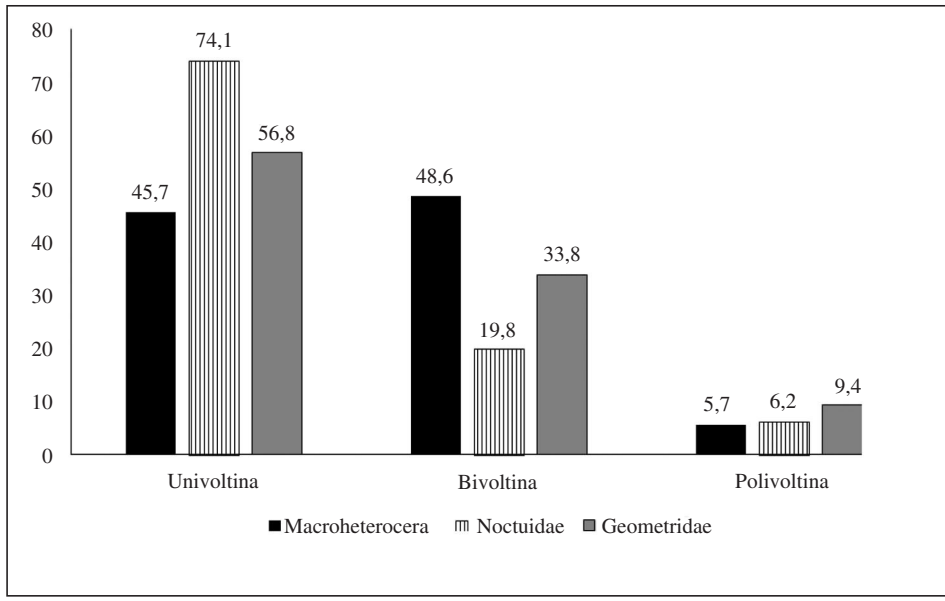

Figura 2.– Proporción de especies distribuidas en las diferentes clases de ciclo biológico de los Macroheterocera comparadas con las familias Noctuidae y Geometridae (GARRE *et al.*, 2016, 2019) en el Parque Natural Sierra María-Los Vélez.

Finalmente, la familia Erebidae, con una amplia distribución en todo el territorio peninsular, incluye dos endemismos ibéricos: *Phytometra sanctiflorentis* (Boisduval, 1834) y *Ocnogyna zoraida* (Rambur, 1833). Entre todas las especies de esta familia destaca la presencia de *Dysauxes servula* (Berce, 1862), que es una especie rara y localizada (PÉREZ DE-GREGORIO *et al.,* 2001), así como *Eilema interpositella* Strand, 1920, caracterizada por vivir en los hábitats semidesérticos del sureste peninsular situados en altitudes inferiores a los 1.000 m (WITT & RONKAY, 2011), aunque se ha capturado en zonas boscosas mesófilas en altitudes superiores a los 1.400 m en el Parque Natural Sierra María-Los Vélez.

Biogeográficamente, los elementos de distribución mediterránea son mayoritarios (61,4%), lo que resulta coherente con la posición de este espacio natural en el sur del continente europeo, destacando el corotipo asiático-mediterráneo (35,7%) que predomina sobre el atlanto-mediterráneo (25,7%) (Tabla III), mientras que el endemismo ibérico, con el 4,3%, aporta tres especies. Los corotipos de amplia distribución suman un porcentaje del 34,3%, que es superior al calculado para la familia Noctuidae (30,9%) (GARRE *et al.*, 2019) y para la familia Geometridae (18,7%) (GARRE *et al.,* 2016). Estas diferencias se pueden explicar por la participación, en este heterogéneo conjunto de familias, de algunas cuyos representantes muestran una gran capacidad de dispersión y un amplio rango de distribución, como es el caso de las familias Sphingidae y Notodontidae.

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APÉNDICE

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Elemento holártico. Univoltina. Imagos: VI-VII.

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LIMACODINAE

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Elemento atlanto-mediterráneo. Univoltina. Imagos: II-IV.

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LASIOCAMPINAE

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Elemento euroasiático. Univoltina. Imagos: VIII-X.

Macrothylacia digramma Meade-Waldo, 1905
Material estudiado: Río Claro, 4-V-2011, 1 ♂; 26-IV-2012, 1 ♂; Sierra del Maimón, 18-V-2011, 1 ♂.
Elemento atlanto-mediterráneo. Univoltina. Imagos: IV-V.
Citas bibliográficas: AISTLEITNER & AISTLEITNER (1998).

**Pachypasa limosa* (Serres, 1826)
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Elemento atlanto-mediterráneo. Univoltina. Imagos: VI-VII.

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Material estudiado: Umbría de la Virgen, 1-VIII-2010, 1 ex.
Elemento euroasiático. Univoltina. Imagos: VI-IX.

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Elemento atlanto-mediterráneo. Bivoltina. Imagos: IV-VIII.
Citas bibliográficas: AISTLEITNER & AISTLEITNER (1998).

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SATURNIINAE

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Citas bibliográficas: IBAÑEZ *et al.* (2008).

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SMERINTHINAE

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Elemento euroasiático. Bivoltina. Imagos: IV-VIII.

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Material estudiado: Río Claro, 23-V-2011, 1 ♂.
Elemento paleártico. Bivoltina. Imagos: V.

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Material estudiado: Umbría de la Virgen, 18-VII-2010, 1 ex.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: VI-VIII.

Acherontia atropos (Linnaeus, 1758)
Material estudiado: Umbría de la Virgen, 12-IX-2010, 1 ex.
Elemento tropical. Bivoltina. Imagos: IX.

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Material estudiado: María, 15-VIII-1953, 2 ex. (A. Cobos leg.).
Elemento paleártico. Bivoltina. Imagos: VIII.

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Material estudiado: Cañada del Panizo, 19-III-2011, 1 ex.
Elemento paleártico. Bivoltina. Imagos: III.

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Material estudiado: Río Claro, 9-V-2011, 1 ♂; Sierra del Maimón, 18-V-2011, 1 ♂.
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Hyles (Danneria) livornica (Esper, 1780)
Material estudiado: Cañada del Panizo, 4-V-2012, 1 ♂; Morrón Primero, 4-VII-2010, 1 ♀.
Elemento cosmopolita. Bivoltina. Imagos: V-VII.

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Material estudiado: Centro urbano de María, 6-IX-2010, 1 ex.
Elemento tropical. Bivoltina. Imagos: IX.

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DREPANINAE

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Material estudiado: Morrón Primero, 26-V-2010, 1 ♂.

Elemento asiático-mediterráneo. Bivoltina. Imagos: V-XI.

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Tethea (Tethea) ocularis (Linnaeus, 1767)
Material estudiado: Río Claro, 4-V-2011, 1 ♂; 23-V-2011, 1 ♀; 4-V-2012, 1 ♀.
Elemento euroasiático. Bivoltina. Imagos: V.
Citas bibliográficas: ORTIZ *et al.* (2016).

NOTODONTIDAE
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Material estudiado: Barranco del Peral, 9-IV-2011, 1 ♂; Río Claro, 26-IV-2012, 1 ♂.
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Material estudiado: Umbría de la Virgen, 17-V-2010, 1 ♂; 10-V-2012, 1 ♂.
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Material estudiado: Río Claro, 22-VII-2011, 2 ♀♀; 22-IV-2012, 2 ♂♂; 26-IV-2012, 1 ♀; 4-V-2012, 1 ♀.
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Traumatocampa pityocampa ([Denis & Schiffermüller], 1775)
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NOLINAE

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Elemento atlanto-mediterráneo. Bivoltina. Imagos: II-V, VIII-IX.

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Meganola togatulalis (Hübner, 1796)
Material estudiado: Morrón Primero, 1-VIII-2010, 1 ♂; 10-VII-2011, 1 ♂; Umbría de la Virgen, 12-IX-2010, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: VI-IX.

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Material estudiado: Morrón Primero, 1-VII-2011, 1 ♂.
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**Nycteola revayana* (Scopoli, 1772)
Material estudiado: Morrón Primero, 26-VI-2011, 1 ♀.
Elemento euroasiático. Bivoltina. Imagos: VI.

**Nycteola columbana* (Turner, 1925)
Material estudiado: Barranco del Peral, 22-IV-2012, 1 ♂; Cañada del Panizo, 27-II-2011, 1 ♂; 9-IV-2011, 1 ♂; Río Claro, 1-IV-2012, 1 ♂; 10-V-2012, 1 ♀.
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Material estudiado: Río Claro, 22-IV-2012, 1 ♂.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: IV.

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Material estudiado: Cañada del Panizo, 9-V-2011, 1 ♂; Umbría de la Virgen, 6-VI-2010, 1 ♂.
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Elemento atlanto-mediterráneo. Univoltina. Imagos: VIII-IX.

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Material estudiado: Sierra del Maimón, 11-IX-2011, 1 ♂.
Elemento paleártico. Bivoltina. Imagos: VIII-IX.

Utetheisa pulchella (Linnaeus, 1758)
Material estudiado: Centro urbano de María, 17-X-2010, 1 ex.
Elemento tropical. Polivoltina. Imagos: X.

Eilema interpositella Strand, 1920
Material estudiado: Morrón Primero, 12-IX-2010, 1 ♂; Umbría de la Virgen, 6-IX-2010, 1 ♂.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: V-IX.

**Eilema uniola* (Rambur, 1858)
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Elemento asiático-mediterráneo. Bivoltina. Imagos: V-VI, IX-XI.

Eilema complana (Linneus, 1758)
Material estudiado: Morrón Primero, 18-VII-2010, 1 ♀; 10-VII-2011, 1 ♀; 22-VII-2011, 1 ♀.
Elemento paleártico. Univoltina. Imagos: VII-VIII.

**Dysauxes servula* (Berce, 1862)
Material estudiado: Morrón Primero, 18-VIII-2011, 1 ♂.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: VIII.

TOXOCAMPINAE

Lygephila (Lygephila) craccae ([Denis & Schiffermüller], 1775)
Material estudiado: Umbría de la Virgen, 18-VII-2010, 1 ♂.
Elemento euroasiático. Bivoltina. Imagos: VI-XI.

Autophila (Autophila) dilucida (Hübner, [1808])
Material estudiado: Cañada del Panizo, 27-II-2011, 1 ♂; Cerro Carreta, 27-II-2011, 1 ♂; 19-III-2011, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: II-VII.

BOLETOBIINAE

Phytometra sanctiflorentis (Boisduval, 1834)
Material estudiado: Cañada del Panizo, 9-IV-2011, 2 ♂♂.
Elemento endémico. Univoltina. Imagos: IV-VII.

Raparna conicephala (Staudinger, 1870)
Material estudiado: Barranco del Peral, 18-V-2011, 1 ♂; Cañada del Panizo, 23-V-2011, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: V-IX.

Odice pergrata (Rambur, 1858)
Material estudiado: Umbría de la Virgen, 18-VII-2010, 1 ex.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: VII, IX.

Odice jucunda (Hübner, [1813])
Material estudiado: Río Claro, 1-VII-2011, 1 ♂.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: VII-IX.

Eublemma candidana (Fabricius, 1794)
Material estudiado: Umbría de la Virgen, 4-VII-2010, 1 ♀.
Elemento asiático-mediterráneo. Univoltina. Imagos: VI-IX.

Eublemma parva (Hübner, [1808])
Material estudiado: Morrón Primero, 18-VII-2010, 1 ♀.
Elemento asiático-mediterráneo. Polivoltina. Imagos: VI-IX.

Eublemma ostrina (Hübner, [1808])
Material estudiado: Cañada del Panizo, 1-IV-2011, 1 ♂.
Elemento asiático-mediterráneo. Polivoltina. Imagos: III-VIII, X.

**Eublemma purpurina* ([Denis & Schiffermüller], 1775)
Material estudiado: Umbría de la Virgen, 4-VII-2010, 1 ♂; 26-VI-2011, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: VI-VIII.

Eublemma amoena (Hübner, [1803])
Material estudiado: Cañada del Panizo, 11-IX-2011, 1 ♀; Río Claro, 11-IX-2011, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: IX.

Eublemma pura (Hübner, [1813])
Material estudiado: Umbría de la Virgen, 18-VII-2010, 1 ♂.
Elemento atlanto-mediterráneo. Bivoltina. Imagos: VI-VIII.

Eublemma polygramma (Duponchel, [1842])
Material estudiado: Cañada del Panizo, 18-VI-2011, 1 ♂; Morrón Primero, 6-VI-2010, 1 ♀; Río Claro, 1-VII-2011, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: V-VIII.

Rhypagla lacernaria (Hübner, [1813])
Material estudiado: Morrón Primero, 6-VI-2010, 2 ♂♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: VI-X.

Metachrostis velox (Hübner, [1813])
Material estudiado: Umbría de la Virgen, 26-VIII-2011, 1 ♂.
Elemento asiático-mediterráneo. Polivoltina. Imagos: VIII.

EREBINAE

**Drasteria cailino* (Lefèbvre, 1827)
Material estudiado: Río Claro, 1-VII-2011, 1 ♀.
Elemento asiático-mediterráneo. Bivoltina. Imagos: VI-VII.

Catocala nymphaea (Esper, 1787)
Material estudiado: Umbría de la Virgen, 18-VII-2010, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: VII-VIII.

Catocala conversa (Esper, 1787)
Material estudiado: Río Claro, 1-VII-2011; Umbría de la Virgen, 18-VII-2010, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: VI-VIII.

Catocala nymphagoga (Esper, 1787)
Material estudiado: Morrón Primero, 1-VII-2011, 1 ♂; 22-VII-2011, 1 ♀.
Elemento asiático-mediterráneo. Univoltina. Imagos: VI-VIII.

Catocala conjuncta (Esper, 1787)

Material estudiado: Sierra del Maimón, 18-IX-2011, 2 ex.

Elemento asiático-mediterráneo. Univoltina. Imagos: VII-IX.

Citas bibliográficas: ORTIZ *et al.* (2010).

**Catocala puerpera* (Giorna, 1791)

Material estudiado: Río Claro, 9-X-2011, 1 ♂.

Elemento asiático-mediterráneo. Univoltina. Imagos: X.

Minucia lunaris ([Denis & Schiffermüller], 1775)

Material estudiado: La Alfaguara (María), 30SWG67, 1.300 m, 9-VI-1992, 1 ♂ (F. Arcas leg.); Río Claro, 22-IV-2012, 1 ♂; Umbría de la Virgen, 26-IV-2012, 1 ♀; 10-V-2012, 1 ♂.

Elemento asiático-mediterráneo. Univoltina. Imagos: IV-VI.

Dysgonia algira (Linnaeus, 1767)

Material estudiado: Río Claro, 10-VI-2011, 1 ♂; 26-VI-2011, 1 ♀.

Elemento asiático-mediterráneo. Bivoltina. Imagos: VI, VIII.

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Estados inmaturos de Lepidoptera (LX). *Nemapogon granella* (Linnaeus, 1758) en Barcelona, España (Lepidoptera: Tineidae, Nemapogoninae)

M. Huertas-Dionisio

Resumen

Se describen e ilustran los estados inmaturos de *Nemapogon granella* (Linnaeus, 1758), que vuela en Barcelona (España), así como una muestra de las alas, su ciclo biológico y la distribución.
PALABRAS CLAVE: Lepidoptera, Tineidae, Nemapogoninae*, Nemapogon granella,* estados inmaturos, Barcelona, España.

Immature stages of Lepidoptera (LX). *Nemapogon granella* **(Linnaeus, 1758) in Barcelona, Spain (Lepidoptera: Tineidae, Nemapogoninae)**

Abstract

The Immature stages of *Nemapogon granella* (Linnaeus, 1758), from Barcelona (Spain), are described and illustrated, as well as a sample of wings patterns, their biological cycle and distribution.
KEY WORDS: Lepidoptera, Tineidae, Nemapogoninae, *Nemapogon granella,* immature stages, Barcelona, Spain.

Introducción

A *Nemapogon granella* (Linnaeus, 1758) se la denomina "polilla de los granos", debe su nombre al encontrarse por primera vez en los graneros de maíz (LINNAEUS, 1758), desde entonces se ha extendido por muchos lugares, quizás debido a alimentarse de una gran variedad de productos. Se la ha encontrado alimentándose de residuos vegetales, frutas secas, granos de cereales, arándanos secos, madera podrida, corchos, harina, legumbres secas, cornezuelo, hongos secos y tallos de alcachofa (GRABE, 1942). En los hongos de los árboles, a menudo sobre *Trametes versicolor* (L. Fr.) Quél.*,* que crecen en viejos árboles de madera dura, más que al aire libre, vive en casas, en las existencias almacenadas de granos, harina y champiñones secos (SCHÜTZE, 1931). Diversa variedad de hongos y otros productos (HINTON, 1956; JAWORSKI *et al*., 2014; (GAEDIKE, 2015). También de productos de confitería, encuadernaciones de libros y en quesos (ZAGULAJEV, 1964; CARTER, 1984). También ataca al corcho de las botellas de vino en las bodegas. (SARTO I MONTEYS, 2002; TREMATERRA & LUCCHI, 2014). Con toda la variedad de alimentos, es raro que no aparezca en más lugares de los citados en diversos trabajos. Hemos tenido la suerte de que D. Alfonso López, un amigo que en su viaje a Barcelona en 2019, compró en una tienda una bolsa de papel con la etiqueta ilegible, en la que le afirmaron que contenía hongos secos deshidratados, que guardó en su casa de Huelva. En el mes de junio de 2019, cuando iba a usar su contenido, observó que los trozos de hongos estaban deteriorados y orugas en su interior (fig. 22), en vez de tirarlo a la basura me preguntó si me interesaba, accedí a

recogerlo para saber a qué especie pertenecía y cuál fue mi sorpresa después de hacerle la genitalia a los adultos de que eran de *N. granella*. Como se completaron los datos del huevo, larva, crisálida y adultos, se ha decidido darlo a conocer en este trabajo.

Material y métodos

El contenido de la bolsa de papel con los restos del hongo, se vertió en una caja de plástico transparente de 17 x 17 x 10 cm., para facilitar su estudio y para poder separar en principio los adultos (que estaban muy pasados), y las orugas, en pequeños botes individuales también transparentes, para poder observar su comportamiento. Algunos de los adultos pusieron huevos y cuando murieron se le hizo la genitalia, siguiendo a ROBINSON (1976). El andropigio y ginopigio se ha descrito y figurado en PETERSEN (1957) y GAEDIKE (2015). Entre los restos que quedaban se observaron orugas y crisálidas, algunas se sacrificaron y otras se dejaron para la obtención de adultos frescos, que imaginaron en julio. Al observar que había cierta variación en el dibujo de las alas delanteras, gris con manchas negras y las posteriores grises, representamos en este trabajo a tres machos y dos hembras obtenidos ex larvas (figs 1-5) y el andropigio (fig. 6). DUFRANE (1955) describe un macho, algo estropeado, cuyas alas anteriores son de color negro uniforme, excepto algunas escamas blanco grisáceo en la costa hacia la raíz del ala y hacia la franja, denominándola *nigra* f. nov., posiblemente sea una forma melánica. Las sinonimias en VIVES MORENO (1986, 2014) y GAEDIKE (2015).

Estados inmaturos

La oruga ha sido descrita, limitándose solo a su longitud, la cápsula cefálica, las uñas de las patas ventrales y los espiráculos por HINTON (1956) y más someramente el huevo, la larva y la crisálida por CARTER (1984), también el dibujo de la crisálida por ZIMMERMAN (1978). En este trabajo ampliaremos la descripción de sus estados inmaturos. El huevo es blanco amarillento y ovalado, datos que coincide con Carter, pero también es subelíptico, de 0,45 x 0,30-0,25 mm (fig.21). La oruga de última edad (figs 7 y 8) mide de 7 a 7,50 mm de longitud (según Hinton puede llegar a 9 mm), blanca con tonalidad amarillenta, con pináculos que portan setas rubias a translúcidas (fig.9). Espiráculos muy pequeños, subelípticos a circulares, blanco con el peritrema oscuro, los del protórax dentro de una zona abultada. Tabula (zona del protórax que incluye las setas L1, L2 y L3) subtriangular (fig. 15). Patas torácicas translúcidas (según Carter pardo claro), las ventrales del color del cuerpo, portando (de forma oval) de 17 a 20 ganchos castaños (fig.13) (Hinton señala de 19 a 21) y las patas anales entre 6 a 8 (fig.14). La cápsula cefálica (fig.10) mide de 0,71 a 0,75 mm de ancho, castaño claro con la zona superior del epicráneo más oscura (según Hinton es variable, de café oscura o rojiza, a amarillo pálido y según Carter, pardusca). En las antenas, la antacoria translúcida con una mancha amarillo claro; el artejo medio pardo claro, y los artejos basal y terminal translúcidos. El escudo protorácico (fig.11) translúcido con dos manchas pardo claro en la zona posterior (variable en extensión), a veces extendida a la zona anterior. El escudo anal (en la figura 12 con el noveno urito) blanco amarillento, con la seta D1 cerca del borde, entre las setas SD1 y SD2.

La crisálida (figs 16, 17 y 18), mide 5,50 mm de longitud, según PATOCKA & TURCANI (2005) mide de 5 a 7 mm; color pardo claro brillante, con la zona superior de la cabeza redondeada. Maxilares aproximadamente iguales en longitud al palpo labial, en *Nemapogon nevadella* (Caradja, 1920) es más corto. Las antenas llegan hasta el final de las alas, abriéndose éstas en su extremo, sobresaliendo las patas metatorácicas. El dorso del mesotórax, metatórax y uritos abdominales, con depresiones circulares muy pequeñas, apenas perceptibles, este detalle también lo presenta la crisálida de *N. nevadella,* que al ser tan imperceptibles, no se ha señalado en los dibujos del anterior trabajo HUERTAS-DIONISIO & BERNABÉ-RUIZ (2020). Los uritos 1

y 2 sin espinas; en los uritos 3 a 7 se aprecia una doble hilera de espinas muy pequeñas castaño oscuro, las de la zona anterior llegan hasta los espiráculos, y las de la zona posterior son más cortas; en los uritos 8 y 9 solo tiene una hilera de espinas de mayor tamaño. En la zona ventral y entre la depresión genital y anal, tiene una espina a cada lado ligeramente curvada, de color castaño (figs 19-20). Pasa a crisálida en un ligero capullo dentro de su material alimenticio, sacando medio cuerpo fuera cuando sale el adulto.

Quetotaxia

La quetotaxia de la oruga ha sido señalada por HINTON (1956) y comentada en el trabajo HUERTAS-DIONISIO & BERNABÉ-RUIZ (2020), en el que se consideró la distribución de las setas L1, L2 y L3 en *N. nevadella,* detalles que sirve también para *N. granella.* En esta última (fig.15), se aprecia que la seta SD2 del escudo protorácico, está más cerca de las setas XD2 y SD1 que en *nevadella,* y que la seta L3 del protórax forma con L1 y L2 un triángulo equilátero. En el mesotórax el grupo de setas D1 y D2 está alineado con el grupo SD1 y SD2. En los uritos abdominales 1 a 8, las setas D1 y D2 están en paralelo con el eje dorsal, a diferencia de las mismas setas en *nevadella,* que no están en paralelo. En el 8º urito la seta L2 está a la misma altura que el espiráculo. En el 9º urito la seta L2 está más cerca de la seta SD1 que en *nevadella.* La seta D1 del escudo anal (fig.12) está cerca del borde y aproximadamente a la misma distancia de SD1 y SD2, mientras que esa misma seta está en *nevadella* más cerca de SD1.

Ciclo biológico y distribución

Según SPULER (1910) vuela desde abril hasta agosto; SCHÜTZE (1931) en dos generaciones de junio hasta noviembre; JAWORSKI *et al*. (2014) ha obtenido ejemplares ex larvas en febrero y marzo, y también en junio; GAEDIKE & FALCK (2019) lo han citado de Tenerife (Islas Canarias) en marzo de 2010 y HILL (2002) refiere que el número de generaciones por año varía de 1 a 4 según el clima. Con estos datos, es posible que tenga diversas generaciones solapadas de febrero a noviembre, a excepción del invierno (noviembre-diciembre a enero-febrero) que la pase en diapausa en la fase de oruga. En principio se describió de Europa, distribuyéndose por Asia y América (Holártica) (PETERSEN & GAEDIKE, 1992); citada de Europa y Marruecos (PETERSEN, 1957), de África septentrional (PETERSEN, 1960), de Hawái (ZIMMERMAN, 1978), con citas más concretas de Corea, Japón, China, Rusia y Australia (LEE *et al.*, 2018). Siendo una especie que se distribuye por todo el mundo (Cosmopolita) (GAEDIKE, 2015). En la Península Ibérica ha sido citada de Bilbao (Vizcaya) una pareja (T. Seebold leg.), de Portugal de Licoreira y Singeverga (T. Monteiro leg.) (PETERSEN, 1960), de Baleña (Barcelona) junio 1943, Villarrubia (PETERSEN, 1964) y de Sierra Nevada (Granada), Barcelona y Vizcaya (PETERSEN & GAEDIKE, 1992).

Discusión

Es curioso que algunas especies de Lepidoptera, en este caso la protagonista de este trabajo *Nemapogon granella,* se extiendan por todo el mundo, posiblemente debido a su variedad de alimentos, y sin embargo otras del mismo género son más locales o con un área continental. El material para realizar este trabajo se localizó en Barcelona, donde ya estaba citada (PETERSEN, 1964; PETERSEN & GAEDIKE, 1992), aunque la bolsa conteniendo los hongos deshidratados fue trasladada a Huelva para su estudio, el origen fue Barcelona, de aquí el titulo del trabajo, pero posiblemente, debido a la etiqueta ilegible y muy deteriorada, el origen de la bolsa fuera algún país extranjero, detalle no descartado, ya que por lo que hemos visto es cosmopolita y una de las formas de extenderse por el mundo es la del desecho de productos contaminados.

Agradecimiento

A D. Alfonso López por su amabilidad en cederme la bolsa con los restos de los hongos deshidratados, ya que sabía mi interés por las orugas de Lepidoptera.

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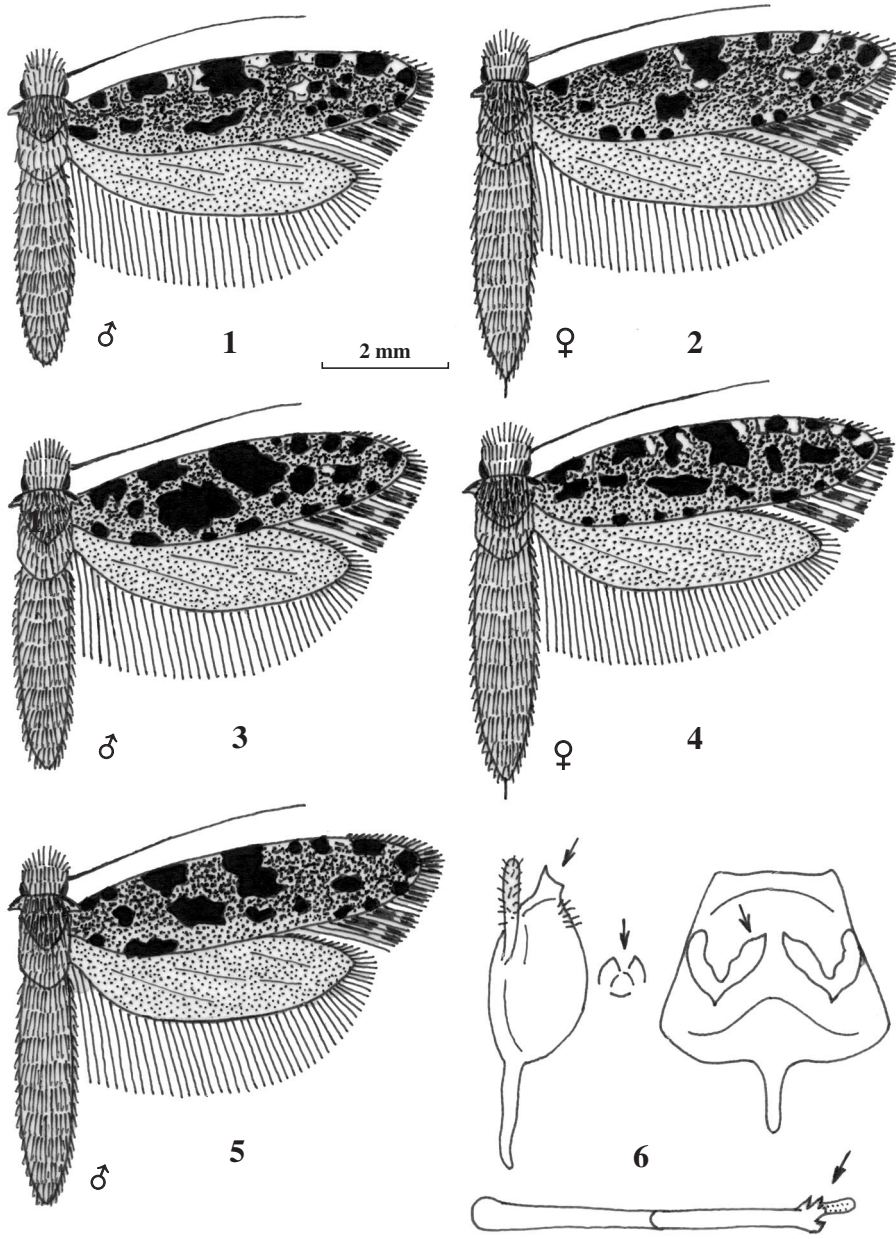
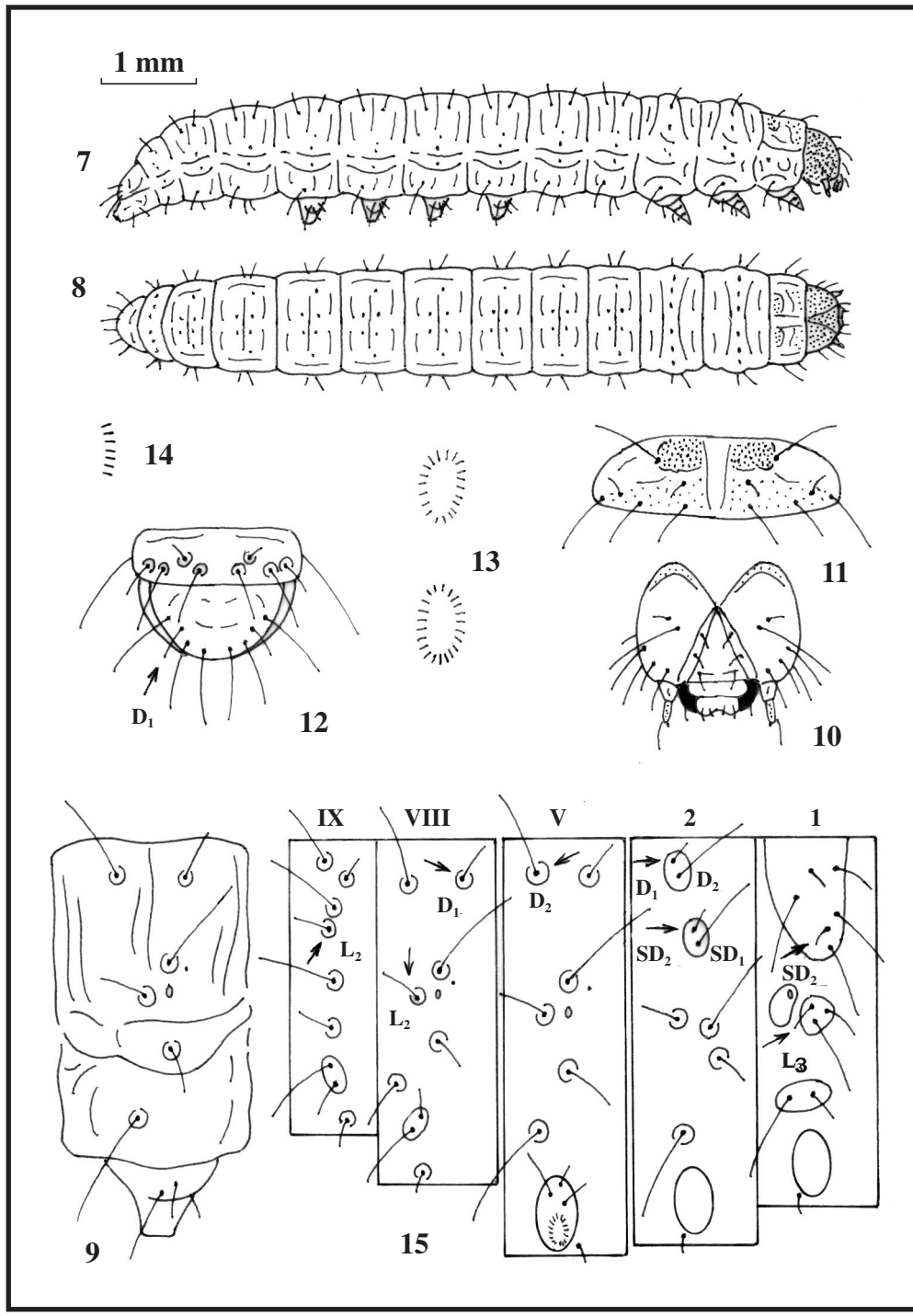
Nemapogon granella

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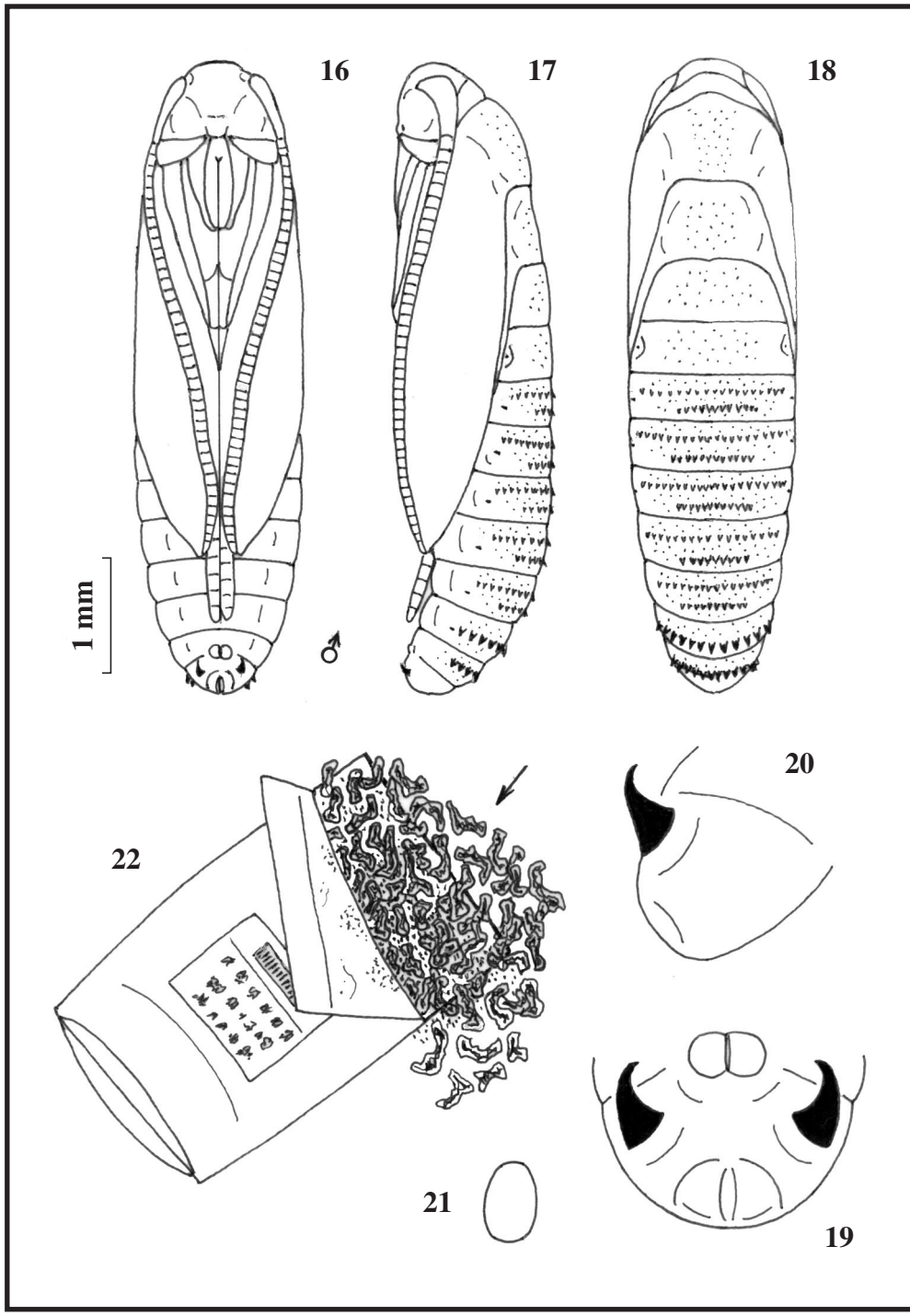
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New species of Zeuzerinae from the Democratic Republic of São Tomé and Príncipe (Lepidoptera: Cossidae)

R. V. Yakovlev & Gy. M. László

Abstract

Present paper contains the description of a new species, *Pseudozeuzera caminhai* Yakovlev & László, sp. n. collected in São Tomé. The new species' closest relative is the Equatorial-African species, *P. stenlii* Yakovlev, 2009, from which it differs in the male genital structure.
KEY WORDS: Lepidoptera, Cossidae, *Pseudozeuzera*, new species, taxonomy, São Tomé and Príncipe.

Nueva especie de Zeuzerinae de la República Democrática de Santo Tomé y Príncipe (Lepidoptera: Cossidae)

Resumen

El presente trabajo contiene la descripción de una nueva especie, *Pseudozeuzera caminhai* Yakovlev & László, sp. n. colectada en Santo Tomé. La nueva especie es relativamente próxima a la especie Afroecuatorial, *P. stenlii* Yakovlev, 2009, de la que se separa en la estructura de la genitalia del macho.
PALABRAS CLAVE: Lepidoptera, Cossidae, *Pseudozeuzera*, nueva especie, taxonomía, Santo Tomé y Príncipe.

Introduction

Cossidae are a family of primitive ditrise Lepidoptera, including over 1200 valid species (VAN NIEUKERKEN *et al*., 2011). The Cossidae of the Afrotropics are still insufficiently studied, though some African genera have recently been revised: *Arctiocossus* Felder, 1874 (type species - *Arctiocossus antargyreus* Felder, 1874); *Camellocossus* Yakovlev, 2011 (type species - *Cossus abyssinica* Hampson, 1910); *Parolophonotus* Schoorl, 1990 (type species - *Zeuzera auroguttata* Herrich-Schäffer, [1854]), *Pseudozeuzera* Schoorl, 1990 (type species - *Duomitus biatra* Hampson, 1910), *Eburgemellus* Schoorl, 1990 (type species - *Xyleutes geminatus* Gaede, 1930), *Alophonotus* Schoorl, 1990 (type species - *Chalcidica* (*Duomitus*) *rauana* Strand, 1909), and *Meharia* Chrétien, 1915 (type species) (YAKOVLEV *et al*., 2013; YAKOVLEV, 2014; MEY, 2015; YAKOVLEV & WITT, 2017a, b, 2018a, b, c).

The genus *Pseudozeuzera* Schoorl, 1990 includes two species: *P. biatra* (Hampson, 1910) (type locality - S. Nigeria, Old Calabar [Calabar city]) and *P. stenlii* Yakovlev, 2009 (type locality - Congo, Kibali-Ituri, Nia-Nia). *P. biatra* is widely distributed in Sierra Leone, Nigeria, Ghana, Uganda, Cameroon, Togo, Central African Republic, Congo and Gabon, whereas *P. stenlii* - in Congo, Ghana, Cote d'Ivoire and Uganda (YAKOVLEV & WITT, 2018a).

During the examination of the materials deposited in the museum of African Natural History Research Trust (Leominster, G. B.) we found one male specimen belonging to the genus *Pseudozeuzera* collected recently in São Tomé island, which is proved to be a species new to science.

Material and methods

The collected material is deposited in the collection of African Natural History Research Trust, Leominster (ANHRT). The genitalia were dissected and stained with Eosin red and mounted in Euparal on microscope slides applying standard methods of preparation (LAFONTAINE & MIKKOLA, 1987). The adults were photographed using a Nikon D700 camera equipped with Nikkor AF-S Micro 105 mm lens. The genitalia preparations were photographed using a Tucsen H series digital microscope camera mounted on a Nikon SMZ1500 stereomicroscope.

Taxonomic part

DESCRIPTION OF NEW SPECIES

Pseudozeuzera caminhai Yakovlev & László, sp. n. (Figs 1-2)

Material: Holotype, ♂, SÃO TOMÉ, Ponta Furada, 186 m, 0º14'01.8"N / 6º28'15.5"E, 24-X-2016, MV light trap, Turner, C. R., Tasane, T. leg., Trip Ref: ST-001 (ANHRT - 021). Accession number: ANHRT:2017.21. Specimen unique number: ANHRTUK00052292. Slide number: ANHRT-00042.

Description: Length of forewing 32 mm. Antenna goblet-like, proximal half bipectinate, rami long (3-4 times longer than antenna rod diameter), distal half filiform, without rami; frons, dorsal side of thorax and abdomen covered with admixture of very fine black and white scales. Forewing elongate, apically relatively pointed. Wings of holotype rather worn, pattern mostly erased. Forewing with grey costal margin, with a series of small semicircular dark spots along it; wide black streak with blurred edges in cubital cell; and black reticulated pattern in postdiscal area of forewing. Hindwing relatively narrow, with wide black filling between veins and greyish brown anal margin.

Male genitalia. Uncus very wide, domed, slightly tapered apically; tegumen medium wide, rather short; gnathos arms thin, long, medially fused; valva rather short and wide, leaf-like, costal margin strongly dilated in the basal third of valva, then almost straight towards apex, ventral margin slightly arcuate in its basal third, then almost straight, valva apex broadly rounded; juxta forked, with two relatively wide leaf-like lateral processi; saccus semicircular, medium sized. Phallus very thick, and short, robust armed with a rod-like massive cornutus laterally; everted vesica very thick and domed at base, gradually tapered posteriorly, rather short, without cornuti.

Female unknown.

Etymology: The species is named after the first governor of the islands São Tomé and Príncipe Álvaro de Caminha (?-28 April 1499).

Diagnosis: The new species is the closest relative of *P. stenlii*, from which it is easily distinguishable by the following features of the male genitalia:

1. The valve in *P. caminhai* is significantly wider than in *P. stenlii,*
2. The uncus in *P. caminhai* is larger than in *P. stenlii,*
3. In *P. caminhai* the cornutus of phallus is large, single, while in the phallus of *P. stenlii* there are two large cornuti - one of them is rod-like, being analogous to that of *P. caminhai*, and the second one, erected parallely to it is ribbon-like.

Discussion

By the discovery of *P. caminhai*, the species number of the Carpenter moths currently known from the territory of the island state of the Democratic Republic of São Tomé and Príncipe has been increased to two: *Eulophonotus nigrodiscalis* Yakovlev, 2011 and *P. caminhai* sp. n.; both species are endemic to São Tomé island. The Cossidae fauna of the other large island of the Gulf of Guinea, island

of Bioko (previously, Fernando Póo) counts a single endemic species *Gumilevia timorum* Yakovlev, 2011, according to our current knowledge.

Acknowledgements

The senior author is indebted to Mr Richard Smith (ANHRT, Leominster) for the opportunity to study the Cossidae material of the collection of African Natural History Research Trust; in addition to Mr Geoff Martin and Mr Alessandro Giusti (NHM, London) for their kind assistence provided during examining of Cossidae type material in the Natural History Museum. Our special thanks go to Mr Arlindo de Carvalho (General Directorate for the Environment) for granting ANHRT team the necessary permits for insect sampling in São Tomé and Príncipe.

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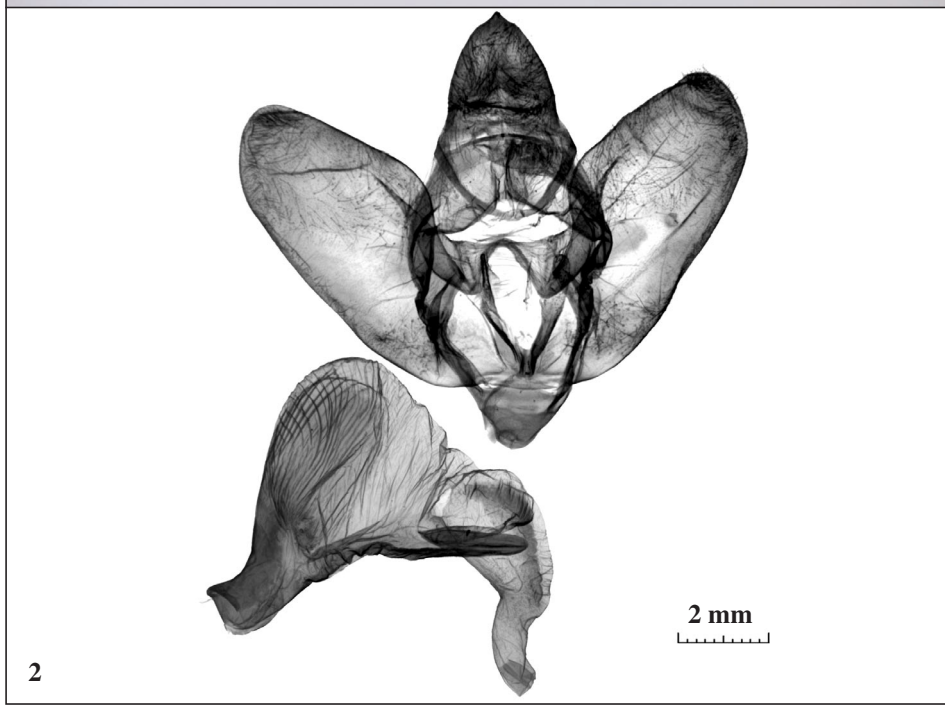

Figures 1-2.– 1. *Pseudozeuzera caminhai* Yakovlev & László, sp. n., holotype. **2.** *Pseudozeuzera caminhai* Yakovlev & László, sp. n., male genitalia (slide number: ANHRT-00042).

REVISIÓN DE PUBLICACIONES
BOOK REVIEWS

H. H. Hacker
Moths of Africa. Systematic and Illustrated Catalogue of the Heterocera of Africa. Volume 1. Biogeography Boletobiinae (Erebinae)
815 páginas
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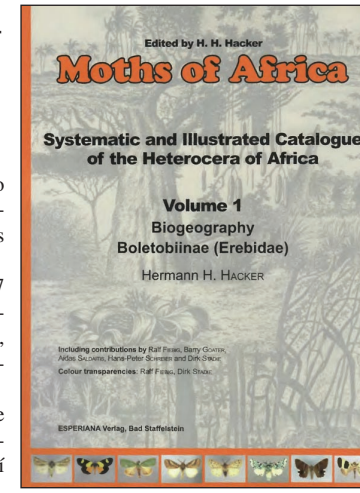

Aparece el primer volumen 1 de esta nueva serie que bajo el título *Moths of Africa*, pretende estudiar la interesante fauna africana continental, incluida la fauna del norte de África. la isla de Madagascar y las islas adyacentes.

En este volumen se trata la subfamilia Boletobiinae Guénee, 1857 (no [1958]), dentro de los Erebidae Leach, [1815], dividida en cuatro tribus a saber: Boletobiini Guenée, 1857, Phytometrini Hampson, 1913, Araeoperonini Fibiger, 2005 y Eublemmini Forbes, 1954, con 675 especies.

Este trabajo aumenta su importancia, si tenemos en cuenta que se describen cuatro géneros; *Raparnodes* Hacker, 2019, *Gesoniodes* Hacker, 2019, *Foedindecora* Hacker, 2019 e *Hypersada* Hacker, 2019, así como 266 especies y siete subespecies nuevos para la Ciencia.

Después de la Introducción, nos hablan sobre la investigación histórica, material y métodos, geomorfología, con un interesante capítulo sobre la biogeografía con las consideraciones seguidas en este trabajo y acompañado de numerosas fotografías.

Ya dentro de la parte taxonómica de los Boletobiinae, de cada uno de los géneros considerados, nos dan las reseñas sinonímicas y notas aclaratorias sobre la especie tipo, la genitalia y la referencia bibliográfica. De cada especie nos da las referencias bibliográficas, sobre el material examinado, su distribución, bionomía, diagnosis y descripción, genitalia, así como fotografía de la genitalia del macho y de la hembra en 92 planchas, seguidas con 58 planchas a todo color, de los adultos, finalizando con una bibliografía específica y un índice.

No podemos terminar estas líneas, sin felicitar al autor, por tan detallado trabajo sobre la fauna africana, así como a ESPERIANA que apoya tan importante y esencial obra, que deseamos tenga una larga vida y pueda completar este importante obra, por lo que recomendamos vivamente su adquisición y no pudiendo faltar en cualquier biblioteca que se precie, sobre todo para aquellos interesados en esta magnífica fauna.

El precio de este libro es de 162 dólares australianos y los interesados deben dirigirse a:

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First report of *Ophiusa disjungens* (Walker, 1858) on *Acacia mangium* Willd. (Fabaceae), and damage and notes of its biology on *Eucalyptus* (Myrtaceae) commercial plantations in Sumatra, Indonesia (Lepidoptera: Erebidae)

Raimon, A. Laksamana, N. G. H. B. Sinulingga, I. A. Ferlianda, M. N. Samosir, S. B. Pane, S. K. Kkadan, W. de S. Tavares, M. Tarigan & A. Duran

Abstract

Acacia mangium Willd. (Fabaceae), *Eucalyptus pellita* F. Muell. and *Eucalyptus grandis* W. Hill ex Maiden (Myrtaceae) are largely planted in Sumatra, Indonesia, where they are used as a raw material to produce commodities such as paper, pulp and viscose. *Acacia* and *Eucalyptus* are attacked by several species of defoliating Coleoptera and Lepidoptera in Sumatra. The objectives of this study were to report, for the first time, the guava moth, *Ophiusa disjungens* (Walker, 1858) on *A. mangium*, and damage and notes of its biology on *Eucalyptus* commercial plantations in Sumatra. *Ophiusa disjungens* on six- and seven-month-old *A. mangium* had an average of three larvae per tree in two commercial stands in Peranap Sector, Riau, Sumatra, on April 2018. The incidence of caterpillars and/or fresh damage (defoliation) of this pest on one-, three- to seven-, nine-, and 10-month old *E. pellita* and *E. grandis* ∞ *E. pellita* ranged 4.0–80.2% within 18 commercial stands in Sei Kebaro Sector, Riau, on April 2020. Caterpillars reared in a laboratory had period from pupa to adult (mean ± SD) of 25.5 ± 4.5 days. *Ophiusa disjungens* is reported for the first time on *A. mangium*, and incidence of its caterpillars and/or damage (defoliation) on *Eucalyptus* is up to 80.2% in Sumatra.
KEY WORDS: Lepidoptera, Erebidae, *Ophiusa disjungens*, damage, defoliation, *Acacia mangium*, Fabaceae, *Eucalyptus*, Myrtaceae, Sumatra, Indonesia.

Primer registro de *Ophiusa disjungens* (Walker, 1858) sobre *Acacia mangium* Willd. (Fabaceae), y daños y notas de su biología sobre plantaciones comerciales de *Eucalyptus* (Myrtaceae) en Sumatra, Indonesia (Lepidoptera: Erebidae)

Resumen

Acacia mangium Willd. (Fabaceae), *Eucalyptus pellita* F. Muell. y *Eucalyptus grandis* W. Hill ex Maiden (Myrtaceae) están plantadas en gran parte de Sumatra, Indonesia, donde son usadas como materia prima para producir productos primarios como el papel, la pulpa y las fibras textiles. *Acacia* y *Eucalyptus* son atacadas por algunas especies defoliadores de Coleoptera y Lepidoptera en Sumatra. El objetivo de este estudio era informar, por primera vez, de *Ophiusa disjungens* (Walker, 1858) sobre *A. mangium* y notas sobre su biología y daños en

plantaciones comerciales de *Eucalyptus* en Sumatra. *Ophiusa disjungens* sobre *A. mangium* en seis o siete meses, tenía un promedio de tres larvas por árbol en dos puestos comerciales en el sector de Peranap, Riau, Sumatra, en abril de 2018. El índice de orugas y/o de daños recientes (defoliación) de esta plaga sobre uno, tres a siete, nueve y diez meses *E. pellita* y *E. grandis* ∞ *E. pellita* se extendían 4.0-80.2% dentro de 18 puestos de comerciales en el sector en Sei Kebaro, Riau, en abril de 2020. Las orugas criadas en un laboratorio tenían el período de crisálida a adulto (representa ± SD) de 25.5 ± 4.5 días. *Ophiusa disjungens* se registra, por primera vez, sobre *A. mangium* y el índice de sus orugas y/o daños (defoliación) sobre *Eucalyptus* es de 80.2% en Sumatra.
PALABRAS CLAVE: Lepidoptera, Erebidae, *Ophiusa disjungens*, daños, defoliación, *Acacia mangium*, Fabaceae, *Eucalyptus*, Myrtaceae, Sumatra, Indonesia.

Introduction

Acacia mangium Willd. (Fabaceae) is endemic to four environmentally-similar regions, northeastern Queensland (Australia), southwestern Papua New Guinea, Papua, and eastern Maluku Islands (SILVA *et al.,* 2020). *Eucalyptus grandis* W. Hill ex Maiden is endemic to coastal areas and sub-coastal ranges from Newcastle in New South Wales northwards to west of Daintree in Queensland, while *Eucalyptus pellita* F. Muell. (Myrtaceae) to northeastern Queensland (LI *et al.,* 2016; MENUCELLI *et al.,* 2019; ARISANDI *et al.,* 2019). *Acacia* and *Eucalyptus* are largely planted in Sumatra, Indonesia where they are used as a raw material to produce commodities such as paper, pulp and viscose (WIBISONO *et al.,* 2015; RONG *et al.,* 2016; NAWAWI *et al.,* 2017).

Acacia and *Eucalyptus* commercial plantations are attacked by several species of coleopterans and lepidopterans in Riau, Sumatra. *Acacia* species have been recently recorded as attacked by beetles of *Altica* sp., *Aulacophora* spp. (Chrysomelidae), *Aulonogria* sp. (Lagriidae) (TAVARES *et al.,* 2020a), *Glycyphana nicobarica* Janson, 1887 (Scarabaeidae) (SINULINGGA *et al.,* 2020), *Myllocerus scapularis* Roelofs, 1880 (Curculionidae), *Rhytiphora bankii* (Fabricius, 1775) (Cerambycidae) (SIRAIT *et al.,* 2020), and *Scotaeus* sp. (Tenebrionidae) (TAVARES *et al.,* 2020b), and caterpillars of *Parasa pastoralis* Butler, 1885 (Limacodidae) (SUKA *et al.,* 2020) and *Spodoptera* spp. (Noctuidae) (SULISTYONO *et al.,* 2020; KHAN *et al.,* 2020). *Auletobius* sp. (Rhynchitidae) (TAVARES *et al.,* 2020b) and caterpillars of *Polyphagozerra coffeae* Nietner, 1861 (Cossidae) (TAVARES *et al.,* 2020c; TACHI *et al.,* 2020) and *Strepsicrates semicanella* (Walker, 1866) (Tortricidae) (KKADAN *et al.,* 2020) were, at a recent time, recorded as pests of *Eucalyptus* species in Riau.

Ophiusa disjungens (Walker, 1858) (Erebidae), known as guava moth, has its caterpillars seen at daytime resting on branches and petioles of its host plants. They camouflage assembling a plant twig leading difficult to be detected, but drop onto the ground as soon as they feel threated (CHEW, 2020). The caterpillar has two pairs of undeveloped prolegs leading them to move in a looper fashion. The caterpillar pupates in a loose coccoon on ground litter (HERBISON-EVANS & CROSSLEY, 2020). *Ophiusa disjungens* incidence can be assessed by observing its caterpillars as well as damage (defoliation) and frass produced by them. The objectives of this study were to report, for the first time, *O. disjungens* on *A. mangium*, and damage and notes on its biology on *Eucalyptus* commercial plantations in Sumatra.

Material and methods

Report of *O. disjungens* on *A. mangium*

Monitoring results recorded two commercial stands of *A. mangium* (Table 1) severely infested by caterpillars, along with eggs and damage (defoliation) by *O. disjungens* in Peranap Sector (0º35'N x 102º01'E, 38 m above sea level), Riau on 24 and 25-IV-2018. Fifty trees were randomly selected within each stand and monitored for incidence of living caterpillars and/or fresh damage (defoliation) of *O. disjungens*.

Table 1.– Planting date, size and rotation of *Acacia mangium* (Fabaceae) commercial stands recorded as infested by *Ophiusa disjungens* (Wlk.) (Erebidae) in Peranap Sector, Riau, Sumatra, Indonesia on 24-25-IV-2018.

Compartments	Planting date	Size (ha)	Rotation
1	X-2017	27.5	3rd
2	XI-2017	15.7	2nd

MONITORING OF *O. DISJUNGENS* ON *EUCALYPTUS*

Eighteen commercial stands of *Eucalyptus* (Table 2), out of 19 monitored, were recorded as infested by caterpillars of *O. disjungens* in Sei Kebaro Sector (100º10'N x 100º24'E, 178 m above sea level), Riau. Caterpillars were seen along with damage (defoliation) they caused.

Table 2.– Planting date, size (ha), rotation, and incidence (%) of *Eucalyptus* (Myrtaceae) commercial stands recorded as infested by *Ophiusa disjungens* (Wlk.) (Erebidae) in Sei Kebaro Sector, Riau, Sumatra, Indonesia on 6-III to 4-IV-2020.

Estate	Stand	Planting date	Size	Rotation	Plant species	Monitoring date	Incidence
A	1	I-2020	29.4	4th	*pellita*	24-III	22.8
	2	II-2020	11.7		*grandis* x *pellita*		15.2
	3		46.7			2-IV	58.1
B	1	XII-2019	38.8		*pellita*	6-III	4.0
	2		32.8		*grandis* x *pellita*	2-IV	8.3
	3		18.5		*pellita*		18.0
C	1	X-2019	21.2	5th	*grandis* x *pellita*	4-IV	16.9
	2	VII-2019	30.0			9-III	13.6
	3	X-2019	12.0		*pellita*	30-III	13.7
	4		15.0		*grandis* x *pellita*	16-III	16.2
	5	VII-2019	34.9		*pellita*	20-III	43.3
	6	X-2019	30.5		*grandis* x *pellita*	27-III	7.6
	7	VII-2019	41.3		*pellita*	31-III	73.6
	8		20.0			2-IV	60.3
	9	IX-2019	23.2		*grandis* x *pellita*	23-III	65.9
	10	X-2019	37.8		*pellita*	18-III	31.9
	11	VII-2019	25.4			13-III	4.2
	12	X-2019	34.1		*grandis* x *pellita*	24-IIII	80.2

Stands were assessed once for severity (S) and incidence (I). Severity of the damage (defoliation) on *Eucalyptus* trees by caterpillars was calculated based on scoring: 0= healthy branches (no injury or living caterpillars), 1= 1-25% of branches with living caterpillars or injury, 2= 26-50% of braches with living caterpillars or injury, and 3= >50% of branches with living caterpillars or injury. Four lateral branches, from the middle third *Eucalyptus* crown, were examined per tree. The following formula was utilized: S= [(0 × number of trees in a plot with caterpillars or injury equal to 0) + (1 x number of trees in a plot with caterpillars or injury equal to 1) + (2 x number of trees in a plot with caterpillars or injury equal to 2) + (3 × number of trees in a plot with caterpillars or injury equal to 3) ÷ (3 x total number of living trees in the plot)] x 100. Result of S in a plot was obtained with the average number of S from the trees sampled in this plot. Severity data were used to calculate the I of caterpillars on *Eucalyptus* using the following formula: I= [(number of infested trees) ÷ (total number of living trees in the plot)] x 100. Infested trees were those scored as 1, 2 or 3 according to S results. A total of 1.5% of the trees per stand was monitored.

IDENTIFICATION OF *O. DISJUNGENS*

One, 10 and three caterpillars, without realizing their age, were collected manually from Logas

South (01º59'N x 98º59'E, 70 m above sea level), Peranap and Sei Kebaro Sectors, respectively, placed in 1-Kg plastic bags and taken to the Entomology Laboratory of the PT. Riau Andalan Pulp and Paper (RAPP) in Pangkalan Kerinci, Riau. They were transferred to 2-Kg plastic containers as soon as they reached the laboratory and reared on the foliage of *E. grandis* x *E. pellita* as a food until turned into adults in an environmentally-controlled room at 26 ± 2º C, 75 ± 15% RH and 14:10 (L:D) h photoperiod. Moths obtained from the reared caterpillars were killed, pinned and identified by comparing their external morphology with descriptions provided by HAMPSON (1894), CHEW (2020), HERBISON-EVANS & CROSSLEY (2020), and HOLLOWAY (2005).

Morphometry and notes on biology

Morphometry and parameter on the biology of *O. disjungens* were evaluated with individuals obtained from Logas South and Sei Kebaro Sectors. The length and width (cm) of pupae and adults were measured using a ruler.

Results

Report of *O. disjungens* on *A. mangium*

An average of three caterpillars per tree was found in Peranap Sector (figs 1-2). *Ophiusa disjungens* caterpillars were recorded along with its eggs as well as caterpillars of tussock moth (Lepidoptera), adults and nymphs of *Helopeltis theivora* Waterhouse, 1886 (Hemiptera: Miridae), adults of pintail beetle (Mordellidae: Mordellinae), and adults of comb-clawed beetle (Tenebrionidae: Alleculinae).

Monitoring of *O. disjungens* on *Eucalyptus*

Incidence of *O. disjungens* on *Eucalyptus*, in Sei Kebaro Sector, varied from 15.2 to 58.1%, 4.0 to 18.0% and 4.2 to 80.2% in the Estates A, B and C, respectively. *Ophiusa disjungens* attacked *E. pellita* and *E. grandis* × *E. pellita* (fig. 3) and its caterpillars occurred along with adults and nymphs of *H. theivora*.

Identification of *O. disjungens*

Moths obtained from caterpillars, recovered from Logas South (*N*= 1), Peranap (*N*= 10) and Sei Kebaro (*N*= 2) Sectors, were all *O. disjungens* (fig. 4). *Ophiusa disjungens* differs, slightly, from its most similar species, *Ophiusa discriminans* (Walker, 1858), based on the external morphology analysis. The first lacks a black patch at the end of the abdomen and has a much larger black sub-terminal patch on the hindwing.

Morphometry and notes on biology

The length and width (mean ± SD) of pupa (*N*= 3) were 3.13 ± 0.04 and 0.88 ± 0.01 cm, respectively. The forewing and hindwing length were 6.5 ± 0.5 and 4.5 ± 0.1 cm (*N*= 2), respectively. The period from pupa to adult was 25.5 ± 4.5 days (*N*= 2).

Discussion

Ophiusa disjungens reported to low altitudes ranging 38-178 m in the current study differs from its collection to a mountain peak at 1,618 m in Bukit Retak, Brunei (HOLLOWAY, 2005).

Acacia crassicarpa as a host plant of *O. disjungens* increases the number of known plant genus

recorded to this insect to five. Common guava, *Psidium guajava* L. (Myrtaceae), native to the Caribbean, Central America and South America (GEORGE *et al.,* 2017), is recorded as an *O. disjungens* host in Japan (SUGI, 1987). *Eucalyptus* and possibly other Myrtaceae were added by COMMON (1990) to Australia and ROBINSON *et al.* (2001) to Asia. There is also a record of *Styphelia* (Ericaceae), a genus endemic to Australia and Pacific Islands (PUENTE-LELIÈVRE *et al.,* 2016), from Guam (SWEZEY, 1946; HOLLOWAY, 1979). The caterpillar also feeds on the turpentine tree, *Syncarpia glomulifera* (Sm.) Nied. in/endemic to Australia (HERBISON-EVANS & CROSSLEY, 2020). The adult *O. disjungens* was recorded as a fruit-piercing moth of soft-skinned fruits in China (WU, 1981) and as *O. indiscriminata* in Thailand (BÄNZIGER, 1982).

Ophiusa disjungens recorded in Riau in the actual study has its typical form found in Australia (New South Wales and Queensland States), Lesser Sundas, New Caledonia, and Norfolk. The subspecies *indiscriminata* is found in the Oriental tropics and *tongaensis* in Fiji, Samoa, Tonga, and Vanuatu. The species also occurs in Southeast Asia and the south Pacific, including Borneo, Sri Lanka (HERBISON-EVANS & CROSSLEY, 2020), Guam (HOLLOWAY, 2005), Japan and Thailand (CHEW, 2020).

The forewing lenght of *O. disjungens* from Logas South and Sei Kebaro Sectors was slightly longer than of specimens from Brisbane, Queensland, 5.0 cm. The period from pupa to adult was within the range reported from Brisbane as being three to four weeks (CHEW, 2020).

The severe damage (defoliation) of *Eucalyptus* by *O. disjungens* in Sei Kebaro Sector is opposite to the minor damage of oilseed crops caused by the castor caterpillars, *Ophiusa melicerta* (Drury, 1773) in Bangladesh (BISWAS & DAS, 2011). *Ophiusa* moths were sporadic fruit-piercing pests of citrus, *Citrus* (Rutaceae) in South Africa during the 2013-2015 growing seasons (GODDARD *et al.,* 2019).

Ophiusa disjungens is reported for the first time on *A. mangium*, and incidence of its caterpillars and/or damage (defoliation) on *Eucalyptus* commercial plantations is up to 80.2% in Sumatra. The period from pupa to adult (mean ± SD) is recorded as 25.5 ± 4.5 days.

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Figs 1-4.– Caterpillar of *Ophiusa disjungens* (Wlk.) (Erebidae). **1.** Damage (defoliation) caused by this species on *Acacia mangium* (Fabaceae). **2.** In Peranap Sector, Riau, Sumatra, Indonesia. **3-4.** Caterpillar of *Ophiusa disjungens* (Erebidae) on *Eucalyptus* (Myrtaceae). **3.** In Sei Kebaro Sector, Riau, Sumatra, Indonesia. **4.** Adult female.

REVISIÓN DE PUBLICACIONES
BOOK REVIEWS

Z. Varga, G. Ronkay, P. Gyulai, A. Kiss & L. Ronkay
A Taxonomic Atlas of the Eurasian and North African Noctuoidea. Noctuinae III. Poliina
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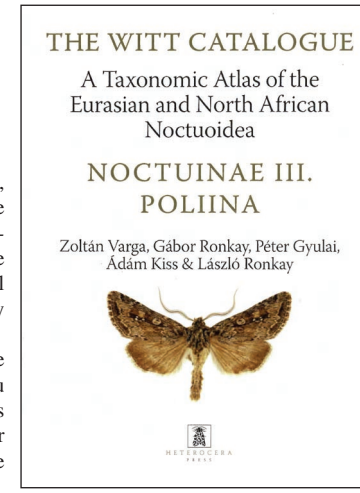

Tenemos ante nosotros un nuevo volumen (el décimo de la serie), que bajo la denominación general *"The Witt Catalogue*", pretende realizar una revisión de la mítica obra del Dr. Albert Seitz *"Die Gross-Schmetterlinge der Erde*" en lo que se refiere a la fauna que está presente en Eurasia y en el norte de África, con un proyecto que comenzó en el año 2008 y que pretende publicarse a lo largo de unos 25 años y abarcando unos 60 volúmenes.

En este caso se trata de la tercera parte de la subfamilia Noctuinae Latreille, 1813, de la tribu Hadenini Guenée, 1837 y de la subtribu Poliina Hampson, 1903, teniendo en cuenta las aportaciones sistemáticas y taxonómicas que nos plantean los autores, en nada tienen que envidiar a los volúmenes anteriores, por la gran cantidad de datos científicos que podemos encontrar.

Después del Índice, Prefacio y los Agradecimientos, nos presentan un resumen de los principales Cambios Nomenclaturales que se encuentran en esta obra, describiéndose como nuevas: 10 especies, 4 subespecies, se establecen 8 nuevas sinonimias y 8 nuevas combinaciones, así como la designación de 13 Lectotipos.

Ya entrando en la parte más importante del libro, se estudian 83 especies, agrupadas en 5 géneros y 5 subgéneros. De cada uno de estos taxones, nos dan las referencias bibliográficas, la diagnosis tanto del adulto como de la genitalia, así como la distribución conocida. Todas las especies consideradas están fotografiadas a todo color, primero aumentadas de tamaño y luego a tamaño natural, encontrándose representados muchos tipos, especies y subespecies destacadas.

Sin lugar a duda las 114 láminas en blanco y negro que representan las microfotografías de las genitalias de los machos y de las hembras, son una valiosa aportación científica que aumentan más si cabe la importancia de esta obra que finaliza con una detallada y extensa bibliografía y de un índice.

No podemos terminar estas líneas, sin felicitar a los autores por este nuevo e importante trabajo científico, así como a la Editorial por esta excelente edición, siendo un libro que no puede faltar en cualquier biblioteca que se precie.

El precio de este libro es de 147 euros más gastos de envío y los interesados deben dirigirse a:

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Designation of lectotypes for some Spanish and other western European *Melitaea* taxa, some with mixed syntypic series of *M. phoebe* ([Denis & Schiffermüller], 1775) and *M. ornata* Christoph, 1893 (Lepidoptera: Nymphalidae)

P. J. C. Russell, L. Bartolozzi, R. L. Hawkins, W. J. Tennent & T. Léger

Abstract

Morphological characters of value in distinguishing *Melitaea phoebe* from *M. ornata* are exemplified from photographs of specimens from sympatric and partially synchronic populations in North Macedonia and Italy. Subspecies described as belonging to *M. phoebe* by several authors from specimens taken in Spain and other Western European countries are examined and their identities reviewed. Those which are shown to be subspecies of *M. ornata* are figured together with identification labels attached to the specimens. Where syntypes have been identified, lectotypes and paralectotypes are designated where appropriate. Some subspecies which are genuinely *M. phoebe* are commented upon. Eleven syntypes of *M. phoebe occitanica* are examined and found to comprise both *M. phoebe* and *M. ornata*; a *phoebe* lectotype is designated and its Type Locality is restricted to Barcelona, Spain. Lectotypes are also designated for the names *bethunebakeri*, *ornatiformis*, *emipunica* and *punicata*. Original identifications predate the separation of these two species and exemplify difficulties previous researchers had in separating them. *M. ornata pseudornata* is sunk in synomymy with *M. ornata bethunebakeri*. It is noted that some historic and often worn specimens are extremely difficult to identify with certainty.

KEY WORDS: Lepidoptera, Nymphalidae, *Melitaea*, *Melitaea phoebe*, *Melitaea ornata*, Spain, Europe.

Designación de lectotipos de *Melitaea* taxa de algunas españolas y otras del oeste europeo, algunas con series sintípicas mezcladas de *M. phoebe* ([Denis & Schiffermüller], 1775) y *M. ornata* Christoph, 1893 (Lepidoptera: Nymphalidae)

Resumen

Se proporcionan caracteres morfológicos de especímenes fotografiados para distinguir *Melitaea phoebe* de *M. ornata* a partir de poblaciones simpátricas y parcialmente sincrónica del norte de Macedonia y de Italia. Se examinan y se revisan sus identidades, las subespecies aceptadas descritas de *M. phoebe* sobre la base de ejemplares capturados en España y otros países de Europa occidental. Se presentan imágenes de aquellas que resultan ser subespecies de *M. ornata*, junto con las etiquetas de los ejemplares. Cuando los sintipos han sido identificados, se han designado los lectotipos y paralectotipos, cuando era necesario. Se comentan las subespecies que pueden adscribirse genuinamente a *M. phoebe*. Se han examinado once sintipos de *M. phoebe occitanica*, encontrándose que corresponden tanto a *M. phoebe* como a *M. ornata*; se designa un lectotipo de *phoebe* cuya localidad tipo es Barcelona, España. Se designan igualmente lectotipos para los nombres *bethunebakeri*, *ornatiformis*, *emipunica* y *punicata*. Las identificaciones originales preceden a la separación de estas dos especies y sirven para ejemplificar las dificultades que investigadores anteriores han tenido para separarlas. *M. ornata pseudornata* se designa como

sinonimia de *M. ornata bethunebakeri*. Se hace notar que algunos ejemplares históricos y frecuentemente en mal estado son extremadamente difíciles de identificar con seguridad.
PALABRAS CLAVE: Lepidoptera, Nymphalidae, *Melitaea*, *Melitaea phoebe*, *Melitaea ornata*, España, Europa.

Introduction

Melitaea ornata Christoph, 1893 [Type Locality (TL): *Circa* "Guberli", promontorium uralensium australium (near Guberlya, Orenburg Province, Russian Federation)] was convincingly separated from *Melitaea phoebe* ([Denis & Schiffermüller], 1775) [TL: environs of Vienna, Austria] simultaneously by RUSSELL *et al.* (2005) and VARGA *et al*. (2005), using the names *emipunica* and *ogygia*, respectively. Type material of *phoebe* was considered lost, and a neotype was designated from a specimen reared from ova laid by a female taken from the type locality (TENNENT & RUSSELL, 2010). Syntypes of taxa collected in Western Europe and named as subspecies of *M. phoebe* are present in various European museums; many of these have recently been properly associated with *M. ornata* (TÓTH & VARGA, 2011; RUSSELL & TENNENT, 2016), without formal designation of lectotypes where appropriate. This is remedied in this paper.

GARCÍA-BARROS *et al.* (2013) rejected subspecific divisions of *M. phoebe* in Spain because of its "seasonal variability"; however, this is re-examined in the light of the recent discovery of *M. ornata* in Spain by SÁNCHEZ-MESA & MUÑOZ-SARIOT (2017a), who found it to be distributed in Granada, Jaén and Albacete. Some primary types of Spanish *Melitaea* subspecies, nominally of *M. phoebe*, are examined here in order to reassess their identity. The syntypic series of a number of *M. phoebe* subspecies have been assessed and found to contain both species. In general infrasubspecific names, quadrinomials and those of varieties and aberrations have not been investigated, except where there is a comment to be made about them. Synonymic names relating to *M. ornata* are in accordance with RUSSELL & TENNENT (2016).

Separation of *M. ornata* from *M. phoebe* based on adult morphology

The identification of these two species from museum material can be problematic, as full-proof identification ideally requires an examination of the late instar larvae (RUSSELL *et al*., 2007: 159 [figures]). However, forewing shape, detailed pattern of the submarginal markings of the ventral wing surfaces and the shape of the tips of the antenna usually provide a good indication (cf TÓTH & VARGA, 2011: appendix) particularly when there are several syntypes available from the same population. Details of the habitat where they were captured are also of value. *M. phoebe* prefers relatively moist mesophilous conditions, whereas *M. ornata* is usually found in hot dry biotopes (RUSSELL *et al*., 2007). Figures 1-4 illustrate the undersides of specimens from two sympatric and partially synchronic populations of *M. phoebe* and *M. ornata* from North Macedonia and Italy demonstrate the following differences: forewing apices of males tend to be acute in *M. phoebe* but more rounded in *M. ornata* (females of both species tend to be rounded); the black submarginal markings on the undersides of the wings tend to be linear arches touching the intervening veins in *M. phoebe* but more triangular in shape and not meeting these veins in *M. ornata*; tips of the antennae are club-shaped and more pointed in *M. phoebe* but foreshortened and spatulate in *M. ornata*.

Designations of lectotypes, in chronological order

Melitaea phoebe v. *occitanica* Staudinger, 1871; the Type Locality (TL) is disputed: originally Staudinger gave "It." (= Italy) but this was an error (recte "Iberia", HIGGINS, 1941: 336). The syntypic series present in the Zoologisches Museum der Humboldt Universität, Museum für Naturkunde, Berlin comprises 11 specimens (5 ♂♂ and 6 ♀♀) from three different localities. All specimens have the label "Origin" on their pins but Staudinger did not specify a holotype. The syntypes are from three widely spread Spanish collecting locations: "Barcelona" (3 ♂♂ and 3 ♀♀), "Granada" (1 ♂ and 2 ♀♀) and "San

Ildefonso", Segovia (1 ♂ and 1 ♀). This has resulted in two different authors suggesting limiting the Type Locality to two different locations: firstly, FRUHSTORFER (1916: 82 (A) (2):1) suggested it should be "Andalusia" and this was accepted by HIGGINS (1941: 336); secondly, VERITY (1928: 163) suggested "Barcelona" and this was accepted by VAN OORSCHOT & COUTSIS (2014: 60), who figured a specimen from Barcelona. The issue arises that the specimens from Barcelona are *M. phoebe* but those from Granada are *M. ornata*, and the female from San Ildefonso (specimen c2e3b8) is *M. ornata*, with foreshortened antenna and submarginal markings not touching the intervening veins, whilst the identity of the San Ildefonso male is questionable with specific characteristics not well defined. However, the locality at an altitude of c. 1200 m in the Sierra de Guadarrama, where it is hot and dry in the summer, is indicative of univoltine *M. ornata*.

The name *occitanica* has been in common use by lepidopterists for almost 150 years to represent the form of *M. phoebe* found in the Iberian Peninsula. Thus, in order to preserve this stability, a male specimen of *M. phoebe* from Barcelona is here designated as lectotype for *M. phoebe* v. *occitanica* Staudinger, 1871 (Figs 5a, b) and labelled accordingly (Fig. 5c). The labels on the pin of the lectotype are as follows: on pink paper with black surround "Origin"; on white paper handwritten in black "Barcelona"; on white paper printed in black "ex coll." and handwritten in black "3/11"/ printed "Staudinger"; on white paper printed in black: "http://coll.mfn-/berlin.de/u/ /c2e41c"; on purple-bordered white circle printed: "LECTO-/ TYPE"; on white paper printed in black: "LECTOTYPE/ *Melitaea phoebe* v. *occitanica*/ Staudinger, 1871/ designated by Peter Russell, 2019".

Remaining syntypes from Barcelona are hereby designated as paralectotypes and have had the following labels added to their pins: on circular pale blue-bordered white paper printed in black: "PARA-/ LECTO-/ TYPE"; on white paper printed in black: "PARALECTOTYPE/ *Melitaea phoebe* v. *occitanica*/ Staudinger, 1871/ designated by Peter Russell, 2019".

We hereby limit the Type Locality for *M. phoebe* v. *occitanica* to "Barcelona", Spain.

In order to demonstrate the different specific identifications we also here figure a male syntype from Granada (Figs 6a, b) and a female from San Ildefonso (Figs 7a, b), which clearly show the characteristic morphology of *M. ornata*. The three syntypes from Granada and the two from San Ildefonso are here designated as paralectotypes and have had the following labels added to their pins: pale blue-bordered on circular white paper printed in black: "PARA-/ LECTO-/ TYPE"; on white paper printed in black: "PARALECTOTYPE/ *Melitaea phoebe* v. *occitanica*/ Staudinger, 1871/ designated by Peter Russell, 2019/ ("misident. Recte:/ *Melitaea ornata* Christoph, 1893") (Fig. 6c, 7c).

Melitaea phoebe ogygia Fruhstorfer, 1908 [TL: Greece, Poros Island]; name used by VARGA (1967) for Hungarian populations of what proved later to be *M. ornata*. According to BERNARDI & DE LESSE (1951: 140), a single female "holotype" is present in the Museum National d'Histoire Naturelle de Paris (MNHNP) (Figs 8a, b). Fruhstorfer did not routinely designate holotypes but since there is only one specimen it can be regarded as the holotype. From the photograph (Fig. 8b) of the underside of this specimen, it can be seen that it has centrally thickened triangular black submarginal markings not touching the intervening veins on both fore- and hindwings and also foreshortened tips to the antenna (spatulate). Thus *ogygia* is *M. ornata* and not *M. phoebe* as described originally by Fruhstorfer, a suitable label has been attached (Fig. 8c).

Melitaea phoebe ab. *totila* Stauder, 1914 [TL: Italy, Calabria, Cosenza, Mt. Cocuzzo] was described as an aberration ("Ich benenne diese Aberration Forma *totila*, ab. nov."), thus Stauder's 1914 name *totila*, although it has been given subspecific status by TÓTH & VARGA (2011) has no status in nomenclature. The whereabouts of the specimen is not known but its geographic source, south of the known distribution of *M. phoebe* in Italy, suggests it is an aberration of *M. ornata* (RUSSELL & TENNENT, 2016: note 92; RUSSELL, 2018: 258). VERITY (1938: 152 and Tav. 43: figs 68, 69) considered this to equate to *M. phoebe phoebina* Turati, 1921 (see below); however his illustrations appear significantly paler than Stauder's much darker melanic female (STAUDER, 1914: 373, fig. 1).

Melitaea phoebe narenta Fruhstorfer, 1917(a) [TL: Bosnia and Herzegovina, Herzegovina, Jablanica] was described from five females in the "Leonhard collection" (Leonhard does not appear to

be in any list of entomologists and thus was presumably an amateur butterfly collector) and a pair of "Types" in Fruhstorfer's collection (FRUHSTORFER, 1916: 1) in the MNHN, Paris (MNHNP). BERNARDI & DE LESSE (1951: 141) reported only a single male "holotype" in Fruhstorfer's collection but both a male and a female are present in the collection, thus there appear to be two syntypes. A further "paratype" (i.e. a syntype) was reported as being in the Natural History Museum, London (VAN OORSCHOT & COUTSIS (2014: 61).

Jablanica lies on the Neretva River at an elevation of c. 200 m; VAN OORSCHOT & COUTSIS (2014: 61) unfortunately misconstrued this as Mount Jablanica, which is on the North Macedonia/Albania border and mostly above 2000 m. The true locality, adjacent to both the Neretva River and Jablanica Lake, suggests a humid biotope typical of *M. phoebe*; however prior to the building of the dam in 1954, the habitat was more xerophilous. On close inspection of the photographs of the undersides of the two specimens it was concluded that they belonged to *M. phoebe* as described by Fruhstorfer and in agreement with VAN OORSCHOT & COUTSIS (2014: 61) and RUSSELL & TENNENT (2016: note 55).

Melitaea phoebe gerinia Fruhstorfer, 1917 [TL: Portugal, Lissabon {Lisbon}]; BERNARDI & DE LESSE (1951: 141) reported that there were no specimens of this subspecies in Fruhstorfer's collection in MNHNP. However, Rodolphe Rougeri found a male specimen there. From photographs of the underside it can be concluded that, despite the somewhat triangular shape of the submarginal black markings, they touched the intervening veins, the antennal tips were club shaped and not spatulate and the forewing apices appeared more acute than rounded. This specimen is correctly identified as *M. phoebe*, as described by Fruhstorfer and in agreement with VAN OORSCHOT & COUTSIS (2014: 61) and RUSSELL & TENNENT (2016: note 39).

Melitaea phoebe guevara Fruhstorfer, 1917 [TL: Spain, Castilien, (Cuenca mont.)] was described from three males in the "Leonhard collection". There is a significant statement in the description given by FRUHSTORFER (1917: 19), who said that this subspecies bore a close relationship to both subspecies *ogygia* from Greece and *telona* from "Palästina" (considered to be near Jerusalem, Israel [HIGGINS, 1941: 335]). Both are morphologically very similar and were considered to be *M. ornata* (RUSSELL & TENNENT, 2016: notes 59 and 91); however, TÓTH *et al*. (2014) suggested that *M. telona* may be a fourth species in this group. HIGGINS (1941: 349) suggested a similarity between *guevara* and subspecies *bethunebakeri* (see below). A "holotype" male and two male "paratypes" (i.e. three syntypes) were recognised by BERNARDI & DE LESSE (1951: 141). HESSELBARTH *et al*. (1995: 1030/1031 stated that they should be considered more correctly as lectotype and paralectotypes, with which the present authors agree. An inspection of the Fruhstorfer collection in MNHNP by RR revealed that there are three male specimens present, two of which have "PARATYPE" labels attached (presumably, since they were the first to mention "paratypes", by BERNARDI & DE LESSE, 1951: 141) but the third specimen has no "type" label. The question arose: was this third specimen one of the syntypes with the "HOLOTYPE" label missing? A close inspection of the wing and antenna morphology from high quality photographs (Figs 9a, b, 10a, b, 11a, b) indicated that the specimens all belong the same species, *M. ornata*, in contrast to VAN OORSCHOT & COUTSIS (2014: 61), based on studies of genitalia, and RUSSELL & TENNENT (2016: 48, note 41), who both considered, prior to the confirmation of the presence of *M. ornata* in Spain, that all Iberian subspecies were of *M. phoebe*.

Inspection of the labels (Figs 9c, 10c, 11c) revealed no indication that any of the specimens had originated from the Leonhard collection. The location labels were similar in all respects, being handwritten as follows: "Castilien [underlined with printed dots]/ Cuenca/ mont./ 1900 Korb". Conversely, the identification labels, also handwritten, were not all the same: the two specimens with "PARATYPE" labels were handwritten as follows: "*M. phoebe/ guevara* Fruhst.", whereas the label of the "non-type" specimen was written in a different hand as follows: "*Melitaea phoebe*/ ssp. *guevara* Frhst./ 1917 (*Soc. Ent.* p. 19)". Although it is possible that this is the specimen observed by BERNARDI & DE LESSE (1958), it cannot be assumed that this is their presumed 'holotype'. Since it is possible that the specimen with the "HOLOTYPE" label may turn up in the future, it was considered

unwise to designate a lectotype under these circumstances. We here formally identify the three available syntypes as *Melitaea ornata guevara* Fruhstorfer, 1917, **comb. n.**

Melitaea phoebe emipunica Verity 1919 [TL: Italy, Sicily, Palermo]: there are four male and one female specimens present in the Museo Zoologico de "La Specola" dell'Università, Firenza, Italy (cf. RUSSELL & BARTOLOZZI, 2019: Fig. 1). The male, which was figured by VERITY (1950: 152; Tav. 43: fig. 63) and given more accurate locality data: "San Martino della Scala m. 800 (Monreale Palermo); 5 V", is here designated as the lectotype of *Melitaea phoebe emipunica* (Figs 12a, b). The squat triangular submarginal black markings barely touching the black intervening veins (Fig. 12b) clearly place the taxon *emipunica* with *M. ornata*. *M. phoebe* has not so far been proven to occur in Sicily (RUSSELL, 2018: 258). The labels on the pin (Fig. 12c) are as follows: black print on yellow paper "Monreale (San Martino)m. 800/ PALERMO ISOLA di SICILIA/ 6 Maggio 1919 Querci"; black print on white paper "Ex coll. R. Verity"; black print on pink paper "Syntypus"; printed on yellow paper "FIGURATO DA/ R. VERITY FARF. D. IT./ TAV. 43 (hand-written)/ FIG. 63 (hand-written)"; Black print on red paper *"Melitaea ornata/ emipunica* Verity 1919/ LECTOTYPUS/ P. RUSSELL & L. BARTOLOZZI 2019". Both VAN OORSCHOT & COUTSIS (2014) and RUSSELL & TENNENT (2016) agreed with this determination.

Melitaea phoebe phoebina Turati, 1920 [TL: Italy, Calabria, Aspromonte, 1400 m]; this form was described on page 222 and the uppersides figured on tav. II figs 4 ♂♂ and 5 ♀♀, from which it appears to be a fairly heavily marked form, hence Verity's suggestion that the ab. *totila* of Stauder (see above) equated to this subspecies. The undersides were not figured by Turati but the forewing apices appear rounded as in *M. ornata*. According to CONCI & POGGI (1996) the collection of E. Turati is in the Museo Regionale di Scienze Naturali, Torino, Italy, (MRSN). NEKRUTENKO (1993: 129) listed the type material of Turati in this museum and referring to this subspecies stated that there were two female syntypes from the Aspromonte Mountains in the Province of Reggio Calabria, Italy and identified them as *Melitaea phoebe*, being unaware of the specific separation of *M. ornata*.

Unfortunately, the entomology collections in the Turin Museum are not currently accessible for administrative reasons and it has not been possible to inspect type material. However, it is possible to make a speculative identification, based on current knowledge of the distributions of the two species. Based on the collecting locality, this subspecies is almost certainly *M. ornata* as *M. phoebe* sensu strictu has not been recorded this far south in peninsular Italy; its limit appears to be Calabria, Cosenza, Monte Martinelli (RUSSELL & PATEMAN, 2011), where *M. ornata* also occurs. Six males and one female of this subspecies are present in the Rothschild collection in the Natural History Museum London (Russell and Tennent, pers obs.). This taxon was not considered by VAN OORSCHOT & COUTSIS (2014) but RUSSELL & TENNENT (2016: 51, note 67) suggested it was *M. ornata* because of its location in southern peninsular Italy.

Melitaea phoebe rostagnoi Turati 1920 (223 and Tav. II, figs 10-12) [TL: Italy, Roma, Monte Autore]; from the figure 10, the male forewing apices appear distinctly acute as in *M. phoebe*. NEKRUTENKO (1993: 129) listed the Type material of Turati in the Museo Regionale di Scienze Naturali, Torino, Italy, (MRSN) and referring to this subspecies stated that there were two male and three female syntypes from Monte Autore, Province of Rome, Italy; he identified them as *Melitaea phoebe*, a conclusion with which we cannot argue.

In view of the current long-term closure of the museum we cannot be sure of their identity, but *M. phoebe* seems most likely. No specimen of *M. ornata* has been observed in peninsular Italy north of San Marco Catola, Foggia, Apulia, Italy (c. 41º 30' N.) (CAGNETTA 2016: 246). Similarly the aberration *sterlineata* Turati, 1921: (Fig. 12), with an almost unmarked discal area of the forewing and from the same locality, is most likely *M. phoebe*; VAN OORSCHOT & COUTSIS (2014: 61) and RUSSELL & TENNENT (2016: 52, note 75) agreed with this determination.

Melitaea phoebe punicata Ragusa, 1921 [TL: Italy, Sicily, Palermo District]. Apparently the Sicilian Macrolepidoptera collection of É. E. Ragusa was sold to Walter, Lord Rothschild (HORN *et al.*, 1990). There are nine males and five females in his collection at NHM, London, UK. (Russell and Tennent, pers. obs.); no indication that the material was syntypic was present on any of the data labels.

According to GREGORI (1926) another part of the butterfly collection of Énrico Ragusa was in the Instituto di Zoologia, Universita di Napoli, Portici, Italy (ZIUP); at our request Roberta Improta made a thorough search of the Naples Museum collections but was unable to find any of Ragusa's *M. phoebe* specimens (see Acknowledgements). From the NHM specimens, which are clearly *M. ornata*, a male captured by Ragusa in the District of Palermo is herewith designated as a lectotype. The specific characters of *ornata* are clearly visible in the photographs of the lectotype (Figs 13a, b). *M. phoebe* has not been reported from Sicily (RUSSELL, 2018). The labels on the pin of the lectotype (Fig. 13c) are as follows: on beige paper, part printed part handwritten "Prov. Palermo/ Local. V[all] Corta/ Data 10.5.[1]917/ Coll. E. Ragusa"; on beige paper, printed "Sicily,/ coll. E. Ragusa"; on purple-bordered circular white paper printed "LECTO-/TYPE"; on beige paper printed "Rothschild/ Bequest/ B.M. 1939-1."; on white paper printed "LECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019".

We here designate the remaining 13 syntypes as paralectotypes, of which six have the following labels: on beige paper, printed "Sicilien"/ hand written "Ficuzza/ 5"/ printed "Geo.C.Kr."; on beige paper printed "Sicily/ coll. E. Ragusa"; on beige paper printed "Rothschild/ Bequest/ B.M.1939-1."; white circle with blue surround printed "PARA-/LECTO-/ TYPE"; on white paper printed "PARALECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019", 4 have the following labels: on beige paper with black surround handwritten: "M. Cuccio/ 30.4.[1]916"; on beige paper printed: "Sicily/ coll. E. Ragusa"; on beige paper printed "Rothschild/ Bequest/ B.M.1939-1."; white circle with blue surround printed "PARA-/LECTO-/ TYPE"; on white paper printed "PARALECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019" and finally three have the following labels: on beige paper printed: "Sicily/ coll. E. Ragusa"; on beige paper printed "Rothschild/ Bequest/ B.M.1939-1."; white circle with blue surround printed "PARA-/LECTO-/ TYPE"; on white paper printed "PARALECTOTYPE/ *Melitaea phoebe* forma/ *punicata* Ragusa, 1919/ Designated by Russell/ & Tennent, 2019". We here formally identify all 14 specimens as *Melitaea ornata punicata* Ragusa, 1921.

M. phoebe bethunebakeri Sagarra, 1926 [TL: Spain: Andalucía, Granada, Sierra Nevada]. According to MACIÀ *et al*. (2017) there is a solitary male syntype in the Museo de Ciencias Naturales de Barcelona [MZB], Spain; there are three Syntypes in the Museum of Comparative Zoology, Harvard University. PR and RLH hereby designate one of these syntypes from Harvard as a lectotype (Figs 14a, b). All three specimens have the same data (Fig. 14c); from the high-quality photograph of the underside of this specimen (Fig. 14b) it can be seen that it exhibits the morphological traits of *M. ornata*, although some of the centrally thickened submarginal markings on the ventral surface touch the intervening veins. The remaining three syntypes are here designated as paralectotypes.

The labels (Fig. 14c) on the pin of the lectotype are as follows: on white paper printed: "ANDALUCIA 1600 m./ Sierra Nevada/21.6.25 Romei"; on red paper printed: "M.C.Z/ Paratype" /handwritten: "25800"; on white paper printed: "AG Weeks/ Collection"; on red paper handwritten: "*M. phoebe/ bethune-bakeri* Sag./ type series Querci"; on white paper printed: "MCZ-ENT/ 00112412"; on red paper printed: "LECTOTYPE/ *Melitaea phoebe*/ *bethunebakeri*/ Sagarra, 1926/ Designated Russell & Hawkins, 2019"; on white paper printed: "*Melitaea ornata bethunebakeri* Sagarra, 1926/ Determined Russell & Hawkins, 2019".

The labels on the paralectotype in Barcelona are as follows: on beige paper printed in black "ANDALUCIA 1600 m./ Sierra Nevada/ 21[handwritten].6.25 Romei; on white paper printed "73-4028/ MZB; on white paper printed "509"; on white paper handwritten *"Bethune/ bakeri*"; on white paper double edged in black, printed "*Melitaea phoebe Bethune-/bakeri* Sagarra, 1926/ black line/ *Melitaea phoebe* (Goeze,/ 1779)/ R. Macià rev. 2015"; on white paper with black surround, printed in red "PARALECTOTYPE"/ printed in black *"Melitaea phoebe*/ *bethunebakeri*/ Sagarra, 1926/ Designated Russell / & Hawkins"; on white paper with black surround printed in black *"Melitaea ornata/ bethunebakeri*/ Sagarra, 1926/ Determined Russell/ and Hawkins, 2019."

The labels on the two paralectotypes in Harvard are as follows: on white paper printed: "ANDALUCIA 1600 m./ Sierra Nevada/21 [handwritten].6.25 Romei"; on red paper printed: "M.C.Z/

Paratype"/handwritten: "25800"; on white paper printed: "AG Weeks/ Collection"; on white paper printed: *"Melitaea ornata bethunebakeri* Sagarra, 1926/ Determined Russell & Hawkins, 2019"; on red paper handwritten: *"M. phoebe/ bethune-bakeri* Sag./ type series Querci"; on red paper printed: "PARALECTOTYPE/ *Melitaea phoebe/ bethunebakeri/* Sagarra, 1926/ Designated Russell and Hawkins, 2019".

There is a pair of specimens in the Rothschild collection at the NHM in London (pers obs.) which may have been part of the syntype series, due to the similarity of their labels, and which can be identified clearly as *M. ornata*. Also MANLEY & ALLCARD (1970: plate 10, figs 1-4) figured two pairs of this subspecies from Sierra de Alfacar and Sierra Nevada, Granada, taken between 14 and 29 June 1959 at *circa* 1100-1650 m; the two figured undersides show the typical characters of *M. ornata*.

It has been brought to the first author's attention that a new subspecies for those *M. ornata* from various locations in Spain had been created - *Melitaea ornata baetica*, Muñoz-Sariot & Sánchez-Mesa, 2019. This name was changed later (cf MUÑOZ-SARIOT & SÁNCHEZ-MESA, 2019a and b) to *M. ornata pseudornata* Muñoz-Sariot & Sánchez-Mesa, 2019; the name *baetica* was preoccupied by *Melitaea baetica* Rambur, 1858, a synonym for what is now known as *Euphydryas desfontainii* (Godart, 1819). The holotype of *M. ornata pseudornata* [TL: Quéntar, Sierra Nevada, Granada, 1300 m, emerged 29-V-2018, from larva collected on 15-IV-2018] bears a remarkable resemblance to the lectotype of *bethunebakeri* designated above (Figs 14a, b), which also originated from the Sierra Nevada, 1600 m in 1925 (Fig. 14c): apart from the rather more acute forewing apices, which can be variable, of the taxon *pseudornata*, the antennal and wing morphology of both the holotype of *pseudornata* and the lectotype of *bethunebakeri* are almost identical. The subspecies *Melitaea ornata pseudornata* Muñoz-Sariot & Sánchez-Mesa, 2019 is hereby placed in synonymy with *M. ornata bethunebakeri* Sagarra, 1926, **comb. n.** and **syn. n.**

Melitaea phoebe galliaemontium Verity, 1928 [TL: Mont-Dore, Puy-de-Dôme, France]. This is a name given by Verity to an unnamed race described but not named by FRUHSTORFER (1918: 42). This was a small race with part of the forewings and all of hindwings covered in a greenish suffusion. HIGGINS (1941: 340) mistakenly gave the description of these specimens as being covered in black suffusion; this actually applied to the previous description of *crassenigra* Verity, 1928, given to specimens from Gironde, Lozère and Pyrénées Orientales (VERITY, 1928: 162). There were no specimens of this subspecies extant in Verity's collection in Florence in the early 1980's (KUDRNA, 1983) and thus no further comment can be made; the name was included here simply to correct the description given by Higgins and to confirm that the problem of identity is insoluble until further samples are collected from the Mont-Dore area. This taxon was not considered by VAN OORSCHOT & COUTSIS (2014) but RUSSELL & TENNENT (2016: 47, note 38) considered it to be *M. phoebe*, based on its location.

Melitaea phoebe malvida Gaede, 1930 [TL: Bosnia & Herzegovina, Bosnia, Maklen (also spelt Makljen) Pass]; Gaede described (page 207) this subspecies and figured the upperside (Plate 13, d5). Gaede attributed this name to Fruhstorfer, but without a date; like HIGGINS (1941: 340) the present authors were unable to find any original description by Fruhstorfer. This subspecies was not mentioned by VAN OORSCHOT & COUTSIS (2014). The specimen figured and the description by Gaede indicated that the apices of the forewings were quite acute, indicating that this subspecies belongs to *M. phoebe*, as described. Gaede also indicated an association with the subspecies *narenta* Fruhstorfer, 1917, from Herzegovina (see above), also identified here as *M. phoebe*. No indication of the precise location or date of capture was provided, making for difficulties in finding this subspecies at the location given, which has a maximum elevation of 1123 m (Yugoslav Coast, Lascelles, scale 1:300,000, dated 1988/9). Until such time as further specimens become available, this identification requires confirmation.

Melitaea phoebe f. *ornatiformis* Sagarra, 1931 [TL: Spain, Castilla-La Mancha, Cuenca, Villacabras]; the only two known specimens of this subspecies, a male and a female, were considered to be "types" by SAGARRA (1931: 114), who stated that they were taken by Querci on 24 August 1928. These two specimens are housed in the Museo de Ciencias Naturales de Barcelona [now MZB],

Spain and were designated as "Holotype" male and "Paratype" female by MACIÀ *et al*. (2017: 175) but no labels were attached to the specimens indicating this action. From high quality photographs (Figs 15a, b) provided to the authors by Masó (see acknowledgements), both specimens were identified as *M. ornata*. A "holotype" label was added subsequently to the pin of the male and an "allotype" label to that of the female.

The data labels on the pins providing the location and date of capture (Fig. 15c) are old pre-printed labels (both specimens), with data reading: "? (obscured, if ever present). 8.1926" but this has been over-written, presumably by Querci himself, as "24 June 1928". The authors SAGARRA (1931: 114), MANLEY & ALLCARD (1970:40) and MACIÀ, CABALLERO-LÓPEZ, & MASÓ (2017: 175) considered that the original printed month, "8", (but not the printed year) indicated the date of capture. If the date on the printed label was correct, why would it have been over-written by Querci? The present authors consider that the date of capture was in fact the explicitly added, over-written date, "24 June 1928". This fits better with the usual univoltinity of *M. ornata*, both sexes of which would be expected to be on the wing at an elevation of 1200 m in June (RUSSELL & PATEMAN, 2011). The labels on the pin of the holotype (Fig. 15c) are as follows: on white paper with black surround printed in black "73-4026/ MZB"; on beige paper printed in black "NUEVA CASTILLA (Cuenca)/ Villacabras 1200 m./ [?].8.1926, [over-written by hand] 24 June 1928 Querci"; on white paper with double black surround printed *"Melitaea phoebe/ ornatiformis* Sagarra,/ 1930"/ black line/ "*Melitaea phoebe* (Goeze,/ 1779)/ R. Macià rev. 2015"; on red paper with black surround printed "MZB/ HOLOTYPE/ *Melitaea phoebe/ ornatiformis*/ Sagarra, 1931"; on white paper with black surround printed "*Melitaea ornata/ ornatiformis*/ Sagarra, 1931/ Determined Russell,/ 2019. We here formally identify the two specimens as *Melitaea ornata ornatiformis* Sagarra, 1931, **comb. n.**

It is of interest to note that there is a pair of *Melitaea* specimens in the Rothschild collection in the NHM in London with the same printed data labels. One is a female with a locality "Reillo 1000 m", similarly over-written, again presumably by the captor - Querci, with the same date, "24 June 1928". The other is a male, likewise captured by Querci, and is labelled "Huelamo 1200 m", with a date of "6. 8. 1928": the day "6" is handwritten, the month "8" printed and unaltered and the year has the printed "1926" with the "6" overwritten by an "8". It is probable that this specimen may be *M. phoebe* but it is acknowledged that it could represent a second brood *M. ornata*. This illustrates the difficulty in identifying museum material of these two species when dates of capture, which can be of significance, are unclear, being overwritten in faded ink on preprinted labels.

Melitaea phoebe ogygia postogygia Verity, 1938 [TL: uncertain - three syntypes from two different localities in Greece: Salonica (= Thessalonica), Macedonia @ 1000 ft. (= *circa* 300 m) and Olympus, bordering Thessaly/Macedonia @ 2500 ft. (= *circa* 750 m)]. Although the name *postogygia* has no formal nomenclatural standing as part of a quadrinomial, it is considered here because of its association with the names *ogygia* and *nigrogygia*, which are associated with *M. ornata* (cf above, and RUSSELL & BARTOLOZZI, 2019). Verity's description (1938: (16)) indicated that the name was proposed for a second generation of "*M. phoebe ogygia*". This is unusual: *M. ornata* is generally univoltine (RUSSELL & PATEMAN, 2011), although second generations occur when rearing the species in the U.K., if the larvae are exposed to very wet conditions (RUSSELL & PATEMAN, 2013).

Examination of the photographs of the three syntypes and their associated labels revealed that the two syntypic males from Salonica, taken 12 and 13 August 1936 are almost certainly *M. ornata* (Figs 16a, b, c); whereas a female from Olympus taken on "Aug[ust]. 17, 1935", is *M. phoebe* (Figs 17a, b & c). All three specimens were captured by Romei. These identifications, admittedly based only on antenna and wing morphology, were agreed by John Coutsis and Jim Pateman. (See Acknowledgements). The designation of a lectotype in this case is not relevant because the name *postogygia* is part of a quadrinomial (infrasubspecific) and thus not nomenclaturally significant.

Melitaea phoebe mod. *nimbula* Higgins, 1941 [TL: Asturian Mountains 4000 ft. (example illustrated by HIGGINS [Plate 14, fig. 12] from Espinama, Picos de Europa, Spain, June 30 '[19]35). In the NHM, London, there are 10 males and 2 females in the Lionel Higgins collection, captured on 30-VI-1935, the elevation is not given on the data labels but HIGGINS (1941: 337) stated that they were

taken at 4000 ft. (= *circa* 1225 m). The rather acute forewing apices, club shaped antenna and black submarginal markings in some but not all specimens touching the intervening veins suggest that they are *M. phoebe* and not *M. ornata* (Figs 18a, b). The labels on the pin of the holotype are shown in Fig. 18c. This name was overlooked by VAN OORSCHOT & COUTSIS (2014) but RUSSELL & TENNENT (2016: 50, note 58) suggested it was *M. phoebe*. The subspecies is included here to demonstrate that submarginal markings can be confusing. We do not regard our identification as conclusive, since the holotype and some of the syntypes exhibit some characters of *M. ornata* and this population would benefit from further study.

Melitaea phoebe race *subtusca* Verity, 1952 [TL: France, Var, La Sainte Baume, Nans-les-Pins, 300 m], the syntypic series consists of seven specimens (4 ♂♂ and 3 ♀♀) from the Type Locality taken between 24 May 1926 and 24 May 1936 and held in the Museo Zoologico de "La Specola" dell'Università, Firenza, Italy. From an examination of the photographs of the undersides of all seven specimens, it would appear that they include both *M. phoebe* and *M. ornata*. A syntype of each species is illustrated for comparison: one male has morphological characters tending towards those of *M. ornata* (Figs 19a, b); another male has characters closely resembling *M. phoebe* (Figs 20a & b). Both are labelled as having been taken on the same day, 24 May 1926 (Figs 19c, 20c), but handwriting on the data labels suggests by different collectors; this raises the possibility that they were captured some distance apart. The only indication of who captured another of the specimens is a label "23-V-[19]33 Nans (Var) Foulquier leg.''; he must have been accompanied by another collector because there is another label dated 'Nans 23 Mai [19]33' again in a different hand! These two simultaneous captures by different collectors could suggest that the two specimens captured on each occasion (24 May 1926 and 23 May 1933) were taken some distance apart but with the nearest location reference for the data labels both being 'Nans'. It is unsurprising that Gédéon Foulquier (1855-1941) collected on the Massif de la St. Baume since he lived in Marseille, just to the south of the mountain ridge. Currently, it is not possible to reliably place *subtusca* with either species.

The following *Melitaea* subspecies described by Fruhstorfer from damp Alpine regions, based on photographs of the syntypes are all *M. phoebe*, as originally described: *koios* (1908b), *virgilia* (1917a), *sylleion* (1917a), *minoa* (1917a), and *rovia* (1919).

Additional subspecies described by Verity and present in the La Specola Museum in Florence, from France, Switzerland and Italy were all examined and confirmed to be *Melitaea phoebe*: *monilata* (1919), *tusca* (1919), *crassenigra* (1928), *subcorythallia* (1928), *suboccitanica* (1928), and *medioastricta* (1950). The following available names were not considered because of a lack of surviving specimens in what remains of Verity's collection in Florence: *monilataeformis* (1919), *aethereaeformis* (1919), *nigroalternans* (1919) and *postnarenta* (1939).

Conclusions and discussion

Close examination of type material is critical in establishing the distribution of both *Melitaea phoebe* and *M. ornata*. Prior to the recognition of *M. ornata* and the subsequent realisation that the species is quite widespread in Europe, all of the many subspecific taxa described in this group were routinely associated with *M. phoebe*.

Until recently all material from Spain was considered by all authors, including RUSSELL & TENNENT (2016), to be *Melitaea phoebe*. The presence of *M. ornata* in Spain was predicted by TÓTH *et al.* (2012: 249) but it was not until five years later, when SÁNCHEZ-MESA & MUÑOZ-SARIOT (2017a) published the finding of larvae with red/brown head capsules, that the presence of this species in Spain was confirmed. Our examinations suggest that *M. ornata* was not in fact a recent arrival in Spain but had been recorded a century ago, unknowingly, by FRUHSTORFER (1917) as *M. phoebe guevara* and by SAGARRA (1926, 1931) as *M. phoebe bethunebakeri* and *M. phoebe ornatiformis* (respectively).

From a study of recent literature, it has been possible to identify tentatively some figured specimens. The pair of specimens figured by GÓMEZ-BUSTILLO & FERNÁNDEZ-RUBIO (1974, II:

197) appear to be *M. ornata*, but no indication of locality was given. GÓMEZ-BUSTILLO (1974: 188) recorded subspecies *guevara* (i.e. *M. ornata*) from the Province of Santander in northeast Spain. ROBERT *et al.* (1983: 62, Plate 9, figs (13)-(15)) made no mention of any subspecies occurring in the Province of Alicante but the underside of the specimen they figured from Bocairente-Alcoy (actually in Valencia Province) at 900 m appears to also be *M. ornata*. GÓMEZ DE AIZPÚRUA *et al*. (1983: 67), in their study of the butterflies of Madrid Province, mentioned that subspecies *guevara* occurred in the south and *ornatiformis* (i.e. *M. ornata*) in the east and north of the Province. Specimens figured by GARCÍA-BARROS *et al.* (2013: 1209, figs 143I, 143J), presumed to be *M. phoebe*, are in fact typical examples of *M. ornata*. García-Barros (pers comm.) provided details of the localities of the two specimens as follows: Spain, Madrid, San Sebastián de los Reyes, Dehesa de Viñuelas, 22-V-1980 (male) and Spain, Ávila, Candeleda (Sierra de Gredos), 1-VI-1986, J. Martín and J. L. Viejo leg. (female). These latter references together with the locations of the museum material given above indicate a far wider distribution of *M. ornata* in Spain, perhaps throughout most of the country, than that suggested by SÁNCHEZ-MESA & MUÑOZ-SARIOT (2017).

Unfortunately VERITY (1950/51) did not provide many figures of the ventral surface of his Italian subspecies and more recently VILLA *et al*. (2009) recognised neither *M. ornata* nor any subspecies of *M. phoebe* in Italy. Subspecies described from Sicily (*punicata* Ragusa, 1921), and southern peninsular Italy (*phoebina* Turati, 1921) are *M. ornata* and, so far as the authors are aware, *M. phoebe* does not occur south of Monte Martinelli, San Fili, Cosenza, Calabria (RUSSELL *et al*., 2011). BALLETTO *et al*. (2014) were the first Italian authors to recognise the presence of *M. ornata* in Italy. The currently known distributions given for *M. phoebe* and *M. ornata* were correct (*M. phoebe* in the north and *M. ornata* in the south, including Sicily) but no subspecies of *M. phoebe* were mentioned and the only two Italian names related to *M. ornata* given were *emipunica* Verity, 1919 and ab. *totila* Stauder, 1914. However, having said this, caution needs to be taken as *M. phoebe* may yet be discovered in southern Calabria or even Sicily.

According to KUDRNA (1983) some of Verity's material in the Museo Zoologico de "La Specola" dell'Università, Firenze, Italy was lost to pests prior to his cataloguing of Verity's material and there are no specimens extant for two-thirds of names proposed by Verity. It has not been possible to examine and identify to which species many of his subspecific names, associated with *M. phoebe* by Verity, actually belong. Many of his names relate to 'sottorazza' (subraces), second generations of a race already named or aberrations (VERITY, 1950/51: 147-157), a status not covered by the ICZN Code, and even if specimens were present, most have not been considered in this study, unless there was some point to be made, for example the syntypic series of *"M. phoebe ogygia postogygia*" containing both species.

NEKRUTENKO (1993: 129) suggested that both taxa described by Turati (*phoebina* and *rostagnoi*) were "infrasubspecific" and referenced HIGGINS (1941: 341-342); however, the latter paper provides no evidence for this suggestion. The most recent distribution atlas of European butterflies (KUDRNA *et al.*, 2015) made no mention of *M. ornata*. Other recent books on European butterflies failed to recognise *M. ornata* as a separate species, for example LERAUT (2016: 992) treated *M. ornata* as synonymous with *M. phoebe*. For the record, Leraut also confusingly referred (p. 994) to both *M. phoebe* and *M. arduinna* (Esper, 1783) as "Freyer's Fritillary". The most recent checklist of European butterflies by WIEMERS *et al*. (2018), however, included *M. ornata* and gave an up to date European distribution.

Difficulties associated with separating historic material of *M. phoebe* and *M. ornata* has been pointed out previously (RUSSELL *et. al.*, 2007). Particular problems arise when the two species are sympatric and partially synchronic, as hybrids between the two species can occur (RUSSELL *et al.*, 2014; VAN OORSCHOT & COUTSIS, 2014), making positive identification of individual museum specimens extremely difficult and sometimes impossible. This was the situation with Verity's material from Nans-les-Pins, on the Massif de la Sainte Baume, and also Higgins' material from the Asturian Mountains; it appeared that both species were present within the syntype series, together with other specimens which were impossible to classify with any degree of certainty. It is of interest that both *M.*

ornata and *M. phoebe* have been recorded previously, but not simultaneously, from near Fayence, Var (RUSSELL *et al.*, 2007), which lies at approximately the same elevation (350m) and only some 80 km to the northeast of Nans-les-Pins. These two localities represent the only known sites for *M. ornata* in France. Those specimens whose identity is uncertain could be identified from molecular analysis although it is noted that the CO1 gene is the same in western populations of both *M. phoebe* and *M. ornata* (WAHLBERG & ZIMMERMANN, 2000; LENEVEU *et al*., 2009).

It is most unfortunate that the collections in the Museo Regionale di Scienze Naturali, Torino, Italy, are at the moment not available for inspection as they are the only source of the types of Turati's *Melitaea* material. Until they can be examined we assume that the currently reported Italian distributions of *M. phoebe* and *M. ornata* are correct. This will hopefully be resolved when the museum re-opens.

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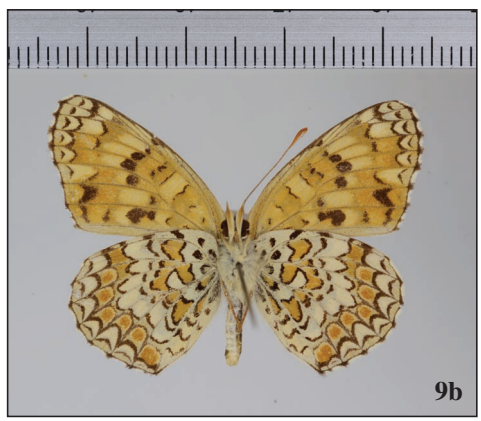
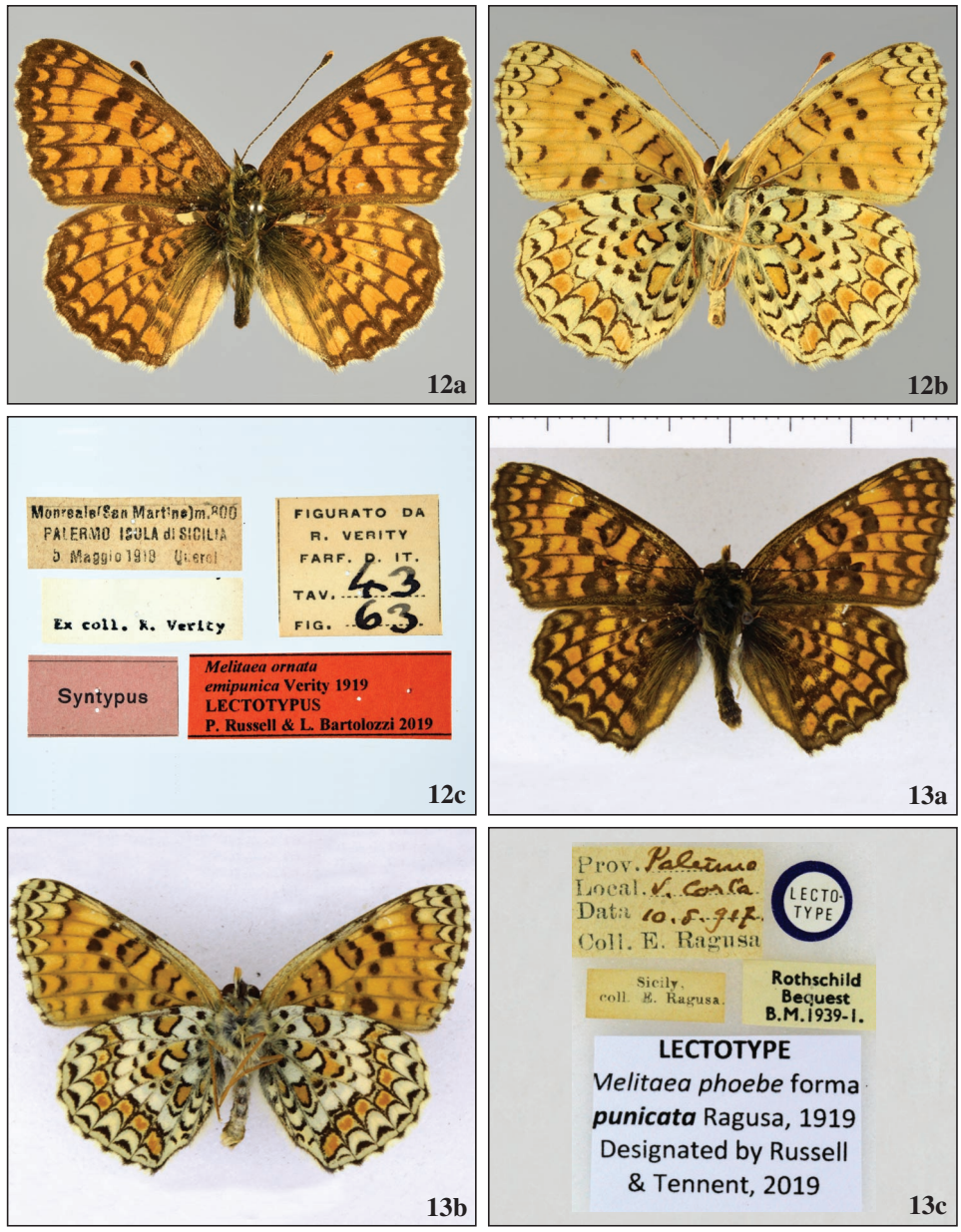
Figs 1-5.– 1. *Melitaea phoebe* male underside, Republic of North Macedonia, Skopje, Kriva Palanka, *c.* 650 m, 9 June 2013. © P. Russell. **2.** *Melitaea ornata* male underside, Republic of North Macedonia, Skopje, Suva Planina, *c.* 1000 m, 8 June 2013. © P. Russell. **3.** *Melitaea phoebe* female underside, Italy, Calabria, Cosenza, San Fili, Monte Martinelli, 880 m, 10 June 2007. © P. Russell. **4.** *Melitaea ornata* female underside, Italy, Calabria, Cosenza, San Fili, Monte Martinelli, 600 m, 3 June 1913 (Stauder Leg.) © W. J. Tennent. **5A, B & C.** *Melitaea phoebe occitanica* Staudinger, 1871, lectotype male Barcelona, Spain. © T. Léger. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

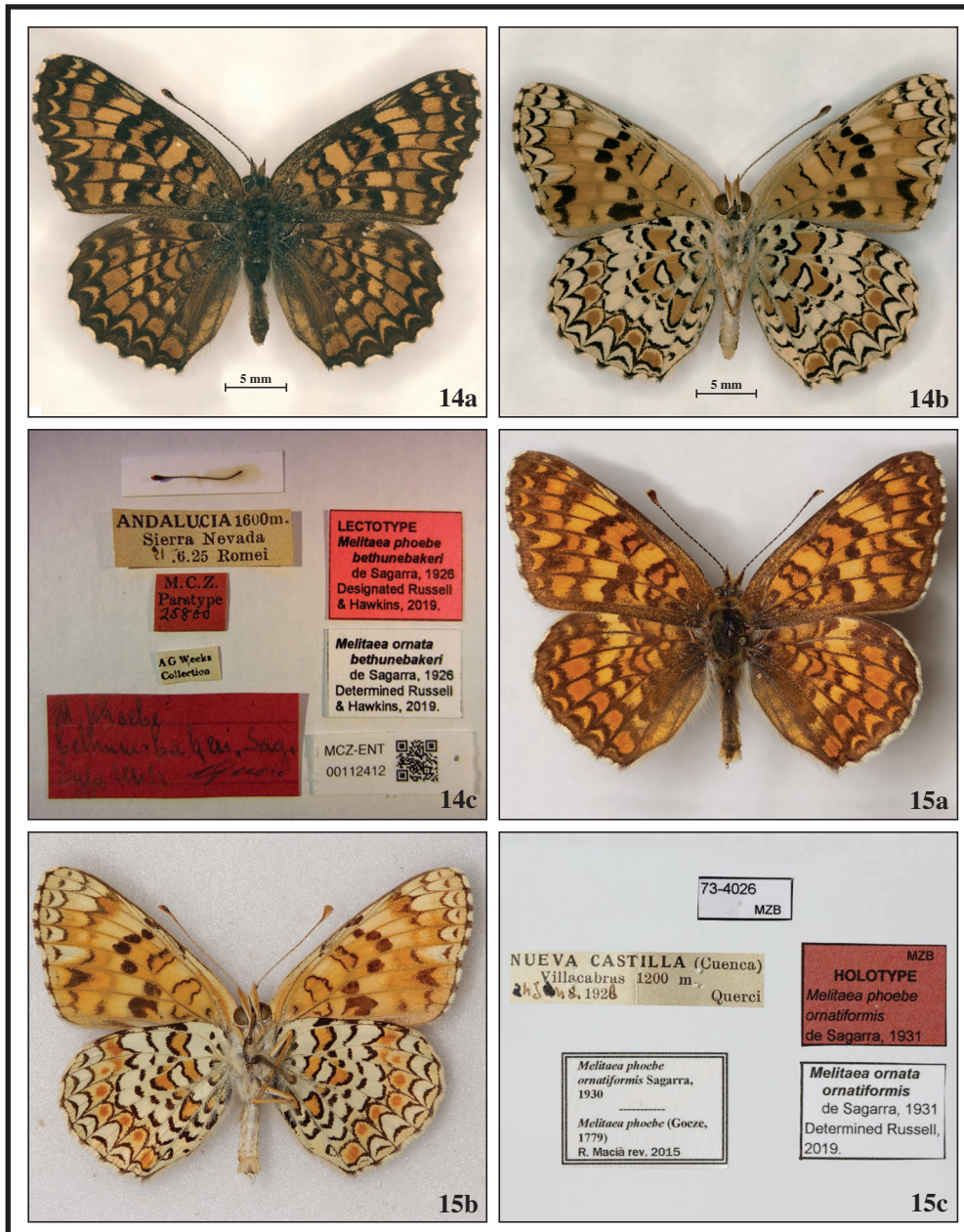


Figs 8-9.– 8A, B. & C. *Melitaea phoebe ogygia* Fruhstorfer, 1908, female lectotype, Greece, Poros, 14 June 1909, misidentified *M. ornata*. © R. Rougeri. **9A, B & C.** *Melitaea phoebe guevara* Fruhstorfer, 1917, male paralectotype, Spain, Castilien, Cuenca Mont., 1900 Korb, misidentified *M. ornata*. © R. Rougeri. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

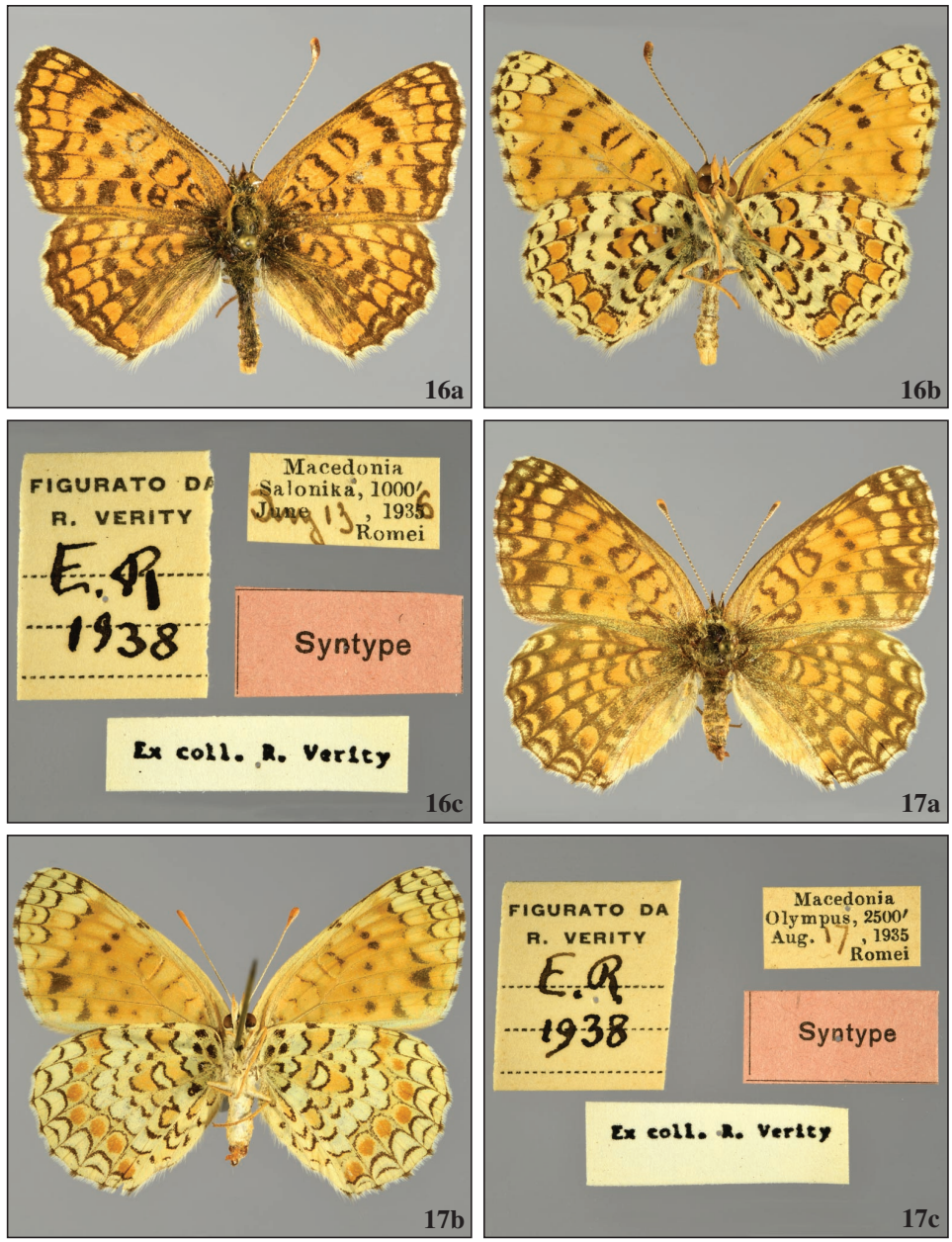
Figs 10-11.– 10A, B & C. *Melitaea phoebe guevara* Fruhstorfer, 1917, male paralectotype, Spain, Castilien, Cuenca Mont., 1900 Korb, misidentified *M. ornata*. © R. Rougeri. **11A, B & C.** *Melitaea phoebe guevara* Fruhstorfer, 1917, male, 'non-type specimen' Spain, Castilien, Cuenca Mont., 1900 Korb, misidentified *M. ornata*. © R. Rougeri. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



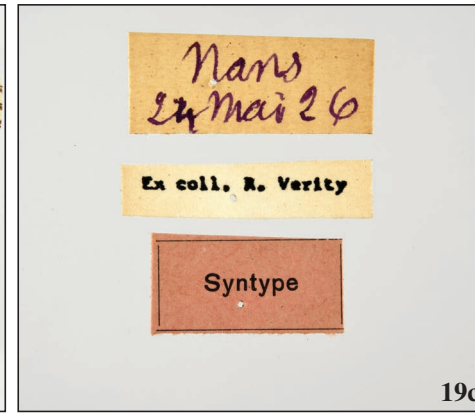
Figs 12-13.– 12A, B & C. *Melitaea phoebe emipunica* Verity, 1919, male lectotype, designated Russell & Bartolozzi, 2019, Italy, Sicily, Palermo, Monreale, 800 m, 6 May 1918, Querci leg., misidentified *M. ornata*. © S. Bambi. **13A, B & C.** *Melitaea phoebe punicata* Ragusa, 1921, male lectotype, designated Russell & Tennent, 2019, Italy, Palermo, Valle Corta, 10 May, [1]917, Ragusa leg., misidentified *M. ornata*. © W. J. Tennent. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



Figs 14-15.– 14A, B & C. *Melitaea phoebe bethunebakeri* de Sagarra, 1926, male lectotype, designated Russell & Hawkins, 2019, Spain, Andalucia, Sierra Nevada, 1600m, 21 June 1925, Romei leg., misidentified *M. ornata*. © R. Hawkins. **15A, B & C.** *Melitaea phoebe ornatiformis* de Sagarra, 1931, male holotype, Cuenca, Spein, misidentified *M. ornata*. © G. Masó [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



Figs 16-17.– 16A, B & C. *Melitaea phoebe ogygia postogygia* Verity, 1938, male syntype, Thessalonika, Greece, misidentified *M. ornata*. © S. Bambi. **17A, B & C.** *Melitaea phoebe ogygia postogygia* Verity, 1938, female syntype, Olymbos, Greece. © S. Bambi. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].



Figs– 18-19.– 18A, B & C. *Melitaea phoebe nimbula* Higgins, 1941, male holotype, Asturian Mountains, Spain. © W. J. Tennent. **19A, B & C.** *Melitaea phoebe subtusca* Verity, 1952, male syntype Nans les Pins, Var, France, 24 May 1926. © S. Bambi. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

Fig. 20A, B & C.– *Melitaea phoebe subtusca* Verity, 1952, male syntype Nans les Pins, Var, France, 24 May 1926, misidentified *M. ornata*. © S. Bambi. [A = upperside (dorsal surface), B = underside (ventral surface), C = labels on specimen's pin].

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Ceuroma Yakovlev, Naydenov & Penco, gen. n. - new Genus of Neotropical Zeuzerinae (Lepidoptera: Cossidae)

R. V. Yakovlev, A. E. Naydenov & F. C. Penco

Abstract

The article describes a new genus of Cossidae (Lepidoptera) from South America, *Ceuroma* Yakovlev, Naydenov & Penco, gen. n. (Type species *Cossus mucoreus* Herrich-Schäffer, [1853]). The new genus is mostly close to the Neotropical genus *Allocryptobia* Viette, 1951; a detailed diagnosis is given. The apomorphic feature of the new genus is the presence of two small clasper or harpe in the middle third on the abdominal edge of the valve. The distribution map is provided and 12 figures.
KEY WORDS: Lepidoptera, Cossidae, *Ceuroma*, *Allocryptobia*, fauna, taxonomy, Neotropical.

***Ceuroma* Yakovlev, Naydenov & Penco, gen. n. – género nuevo de Zeuzerinae Neotropical (Lepidoptera: Cossidae)**

Resumen

El artículo describe un género nuevo de Cossidae (Lepidoptera) de Suramérica, *Ceuroma* Yakovlev, Naydenov & Penco, gen. n. (Especie tipo *Cossus mucoreus* Herrich-Schäffer, [1853]). El género nuevo está próximo al género Neotropical *Allocryptobia* Viette, 1951; se da una detallada diagnosis. La característica apomórfica del género nuevo es la presencia de dos pequeños clásper o harpa en el tercio medio sobre el borde abdominal de la valva. Se proporciona un mapa de distribución y 12 figuras.
PALABRAS CLAVE: Lepidoptera, Cossidae, *Ceuroma*, *Allocryptobia*, fauna, taxonomía, Neotropical.

Introduction

Cossidae (Lepidoptera) is a family of primitive Ditrysian Lepidoptera with a worldwide distribution except for high latitudes. The representatives inhabiting the Neotropics are still poorly studied. The subfamily Zeuzerinae (type genus *Zeuzera* Latreille, 1804) is relatively well studied. In the recent years, a series of new species and genera have been described, the taxonomic position of several species and generic group taxa has been clarified (SCHOORL 1990; PENCO *et al.*, 2016; NAYDENOV *et al.* 2019, 2020; YAKOVLEV *et al.*, 2016, 2017, 2019a; 2020). In particular, the poorly studied Neotropical genus *Allocryptobia* Viette, 1951 (YAKOVLEV *et al.*, 2019b) was redescribed. Originally, the genus *Cryptobia* was established for *Cryptobia musae* Herrich-Schäffer, [1854] (type locality: Rio Grande) with the second species *Cossus mucoreus* Herrich-Schäffer, [1853] (type locality: Brasil) added later (HERRICH-SCHÄFFER, 1850-1858). However, the name *Cryptobia* Herrich-Schäffer, [1854] appears to be a junior homonym of *Cryptobia* Leidy, 1846 (Kinetoplastida, Cryptobiidae) (LEIDY, 1846), and *Allocryptobia* was proposed as an objective replacement name (VIETTE, 1951: 38). YAKOVLEV *et al.* (2019b) redescribed the genus *Allocryptobia*, indicated the

lectotypes *Cryptobia musae* and *Cossus mucoreus*. *C. mucoreus* was provisionally assigned to the genus *Allocryptobia*, as at that moment the authors did not have the materials from NHMUK. Later, these materials were examined (including the unique known male from Venezuela), and it was established that the males of *C. mucoreus* significantly differ from the males of *C. musae*, which allows to allocate for them a monotypic genus. Its illustrated description and diagnosis is given below.

Material and methods

Male genitalia were mounted in euparal on slides following LAFONTAINE (2004) examined with an Olympus SZX16 microscope. The images were taken with the Olympus SZX16 camera. Images of imago were taken by the digital camera of Apple iPhone 7, illuminated in Lightbox. The images were processed using CorelDraw software.

Abbreviations used in the text:

NHMUK	Natural History Museum (London, United Kingdom)
MNHN	Muséum National d'Histoire Naturelle (Paris, France)
USNM	United States National Museum of Natural History (Smithsonian Institution) (Washington, USA)
ZISP	Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia)
ZSM	Zoologische Staatssammlung (Munich, Germany).

Taxonomy part

Ceuroma Yakovlev, Naydenov & Penco, gen. n.

Type species: *Cryptobia mucoreus* Herrich-Schäffer, [1853] (Figs 1-4, 8, 10, 12)

Description. 1 ♂, Big size (fore wing length of male from Venezuela 22 mm). Antenna basally bipectinate, distal half simple filiform. Thorax and abdomen densely covered with dark brown scales. Fore wing long, narrow, relatively sharp apically, brown, poorly noticeable longitudinal dark brown lines and strokes postdiscally between veins; poorly expressed dark brown strokes throughout wing area. Hind wing short, apically sharp, coal-black, outer edge semi-transparent.

Male genitalia: Uncus elongated, apically slightly narrowing, semicircular, with small bulge; tegumen robust; gnathos arms thin, belt-like, not fused; valve lanceolate, relatively wide, slightly narrowing to apex, costal edge slightly curved, abdominal edge with notch in basal third; two small mastoid harpes equal in size on abdominal edge(in middle third); juxta robust, with two belt-like long lateral processes directed dorsally; saccus semicircular, wide; phallus short (shorter than valve), thick, basally very wide, big finger-like cornutus in vesica.

Female: Big size. Length of fore wing 24-28 mm. Antenna filiform, fore wing elongated, light-brown, with pattern of dark brown strokes and thin longitudinal lines between veins postdiscally. Hind wing bright-orange with relatively wide black rim, black reticulated pattern at anal angle.

Female genitalia: Ovipositor very long, ostium poorly submerged, cup-like; ductus thick, of medium length; bursa oval, with small stellate signum on lateral surface, ductus seminalis thin, departs from top of bursa; anterior apophyses significantly shorter than posterior ones; transverse oblique cuts on lateral surface of ovipositor; papillae anales semicircular.

Composition: The genus is monotypic, includes one species, *C. mucorea* (H.-S.).

Diagnosis: The new genus is mostly close to South-American *Allocryptobia* (Figs 6-7, 9, 11), from which it clearly differs in a series of features: pronounced sexual dimorphism, very narrow fore wing, semi-transparent outer edge on the male hind wing, bright-orange hind wing in females, two small harpes in middle third of the abdominal edge of the valve (this feature is apomorphic for the new genus).

Distribution: Brazil, Venezuela, Peru, Paraguay?

Etymology: "Ceuroma" is an anagram of the species name "mucorea".

Ceuroma mucorea (Herrich-Schäffer, [1853]), **comb. n.**

Cossus mucoreus Herrich-Schäffer, [1853] 1850-1858. *Samml. Aussereur. Schmett*., **1**: 58, pl. [9], fig. 39 LT: [Brasil]

Material examined: Lectotype, ♀, [Brasil] (ZISP); 1 ♂, 1 ♀, VENEZUELA: Valencia (BMNH); 3 ♀♀, PERU: Chanchamayo, 1000-1500 m. (BMNH); 1 ♀, BRAZIL (BMNH); 1 ♀, Caracas, Berg Avila, P. Cor. Vogl, 19-22-VII-[19]31 (ZSM); 1 ♀, (paralectotype) Porto Cabello (MNHN).

Besides, we have at our disposal a photo of the holotype of *Cryptobia phobifera* Dyar, 1940 (Fig. 5) from Paraguay: Villa Rica, III-1922, Jorgensen (USNM). Its synonymy with *C. mucorea* remains doubtful, as the finding is very far from the basic habitat (Fig. 12).

Discussion

Having the harpes on the abdominal edge of the valve, the genus *Ceuroma* belongs to the generic group of the Zeuzerinae subfamily, which includes South-American genera: *Brypoctia* Schoorl, 1990 (type species *Xyleutes strigifer* Dyar, 1910), *Morpheis* Hübner, [1820] (type species *Phalaena pyracmon* Cramer, 1782) and the group of Australian species combined by KALLIES & HILTON (2012) into the *"Sympycnodes digitata* group". Additionally, the same feature is found in the Central-African genus *Acosma* Yakovlev, 2011 (type species *Acosma gurkoi* Yakovlev, 2011), revised later (YAKOVLEV, 2019).

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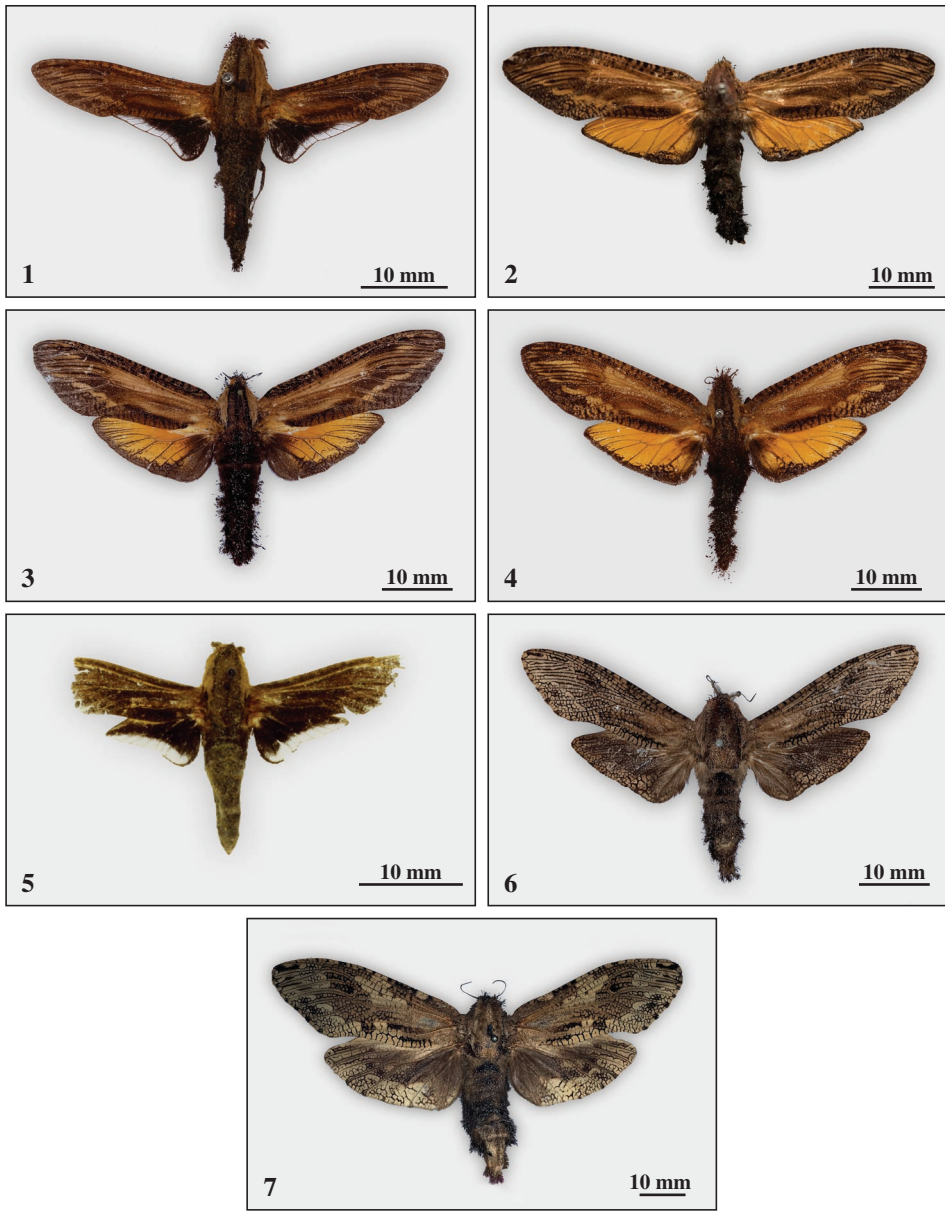
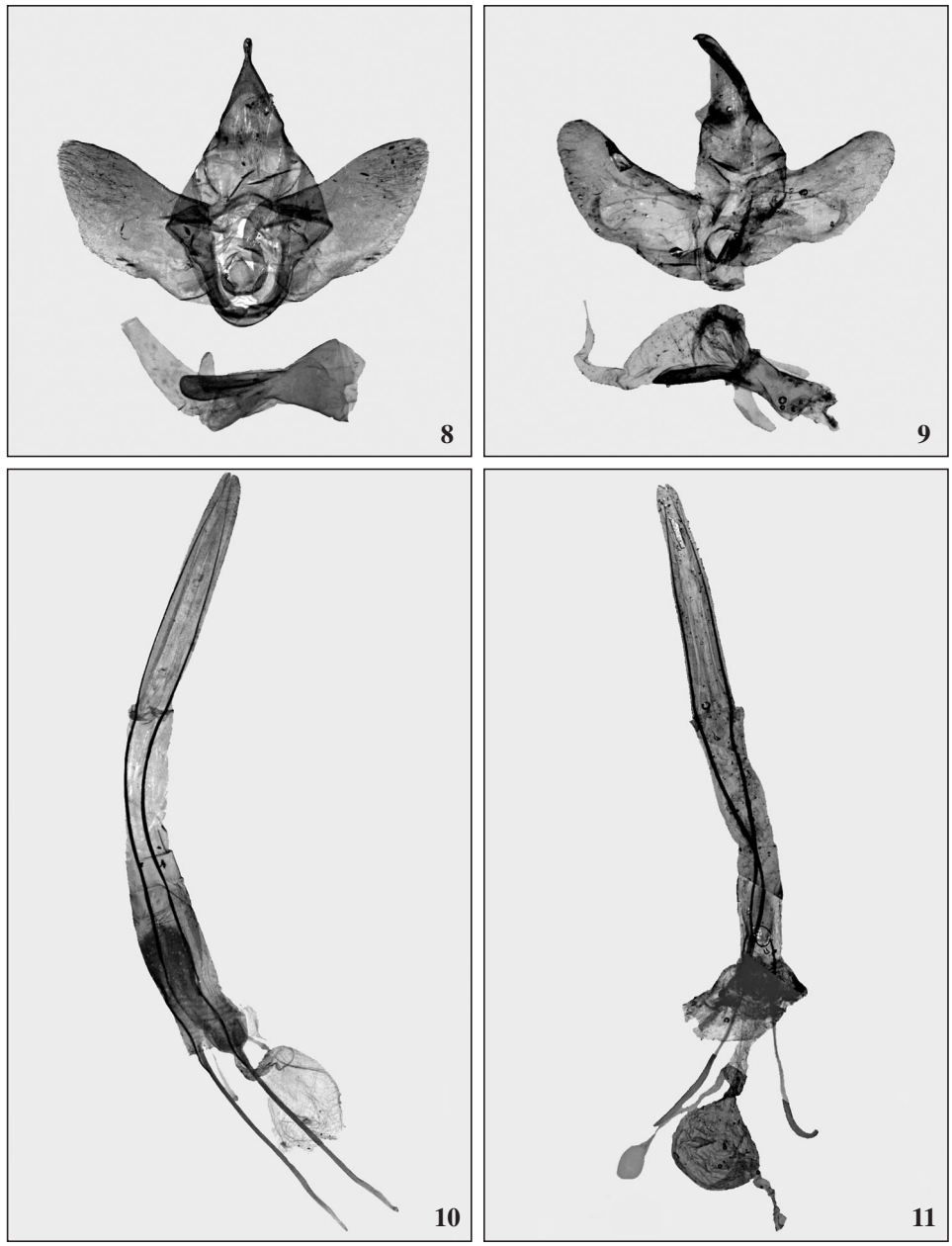


Figs 1-7.– Cossidae (Zeuzerinae), adults: **1.** *Ceuroma mucorea* (H.-S.), male, Venezuela: Valencia (NHMUK individual number 012832491); **2.** *C. mucorea* (H.-S.), ♀, Porto Cabello (MNHN); **3.** *C. mucorea* (H.-S.), ♀, (lectotype), [Brasil], (ZISP); **4.** *C. mucorea* (H.-S.), ♀, Venezuela: Valencia (NHMUK individual number 012832548); **5.** *C. mucorea* (H.-S.)?, ♂ (holotype of *Cryptobia phobifera* Dyar), Paraguay: Villa Rica, III-1922 (Jorgensen) (USNM); **6.** *Allocryptobia musae* (H.-S.), ♂, paralectotype (ZISP); **7.** *Allocryptobia musae* (H.-S.), ♀, lectotype (ZISP).



Figs 8-11.– Male genitalia: **8.** *Ceuroma mucorea* (H.-S.), Venezuela (slide NHMUK 010315522); **9.** *Allocryptobia musae* (H.-S.), Panama (coll. R. Yakovlev, Barnaul). **10-11.–** Female genitalia: **10.** *Ceuroma mucorea* (H.-S.), Venezuela (slide NHMUK 010315561); **11.** *Allocryptobia musae* (H.-S.), Colombia (coll. R. Yakovlev, Barnaul).

Fig. 12.– Map of distribution of *Ceuroma mucorea* (H.-S.).

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Description of *Pima karatauensis* Tsvetkov, sp. n. from Kazakhstan (Lepidoptera: Pyralidae, Phycitinae)

E. V. Tsvetkov

Abstract

Pima karatauensis Tsvetkov, sp. n. is described from Turkestan Province of Kazakhstan. Male and female genitalia of this species and also habitus of imago are illustrated. The description is based on material collected by the author in Karatau Mts. in 2019.
KEY WORDS: Lepidoptera, Pyralidae, Phycitinae, *Pima*, new species, Kazakhstan.

Descripción de *Pima karatauensis* Tsvetkov, sp. n. de Kazajistán (Lepidoptera: Pyralidae, Phycitinae)

Resumen

Se describe de la provincia de Turkestán de Kazajistán a *Pima karatauensis* Tsvetkov, sp. n.. Male and female genitalia of this species and also habitus of imago are illustrated. The description is based on material collected by the author in Karatau Mts. in 2019.
PALABRAS CLAVE: Lepidoptera, Pyralidae, Phycitinae, *Pima*, nueva especie, Kazajistán.

Introduction

World fauna of the genus *Pima* Hulst, 1888 consists of 24 species. Nine of them inhabit the New World (HEINRICH, 1956; NEUNZIG, 2003), two species are present in East Africa (JOANNIS, 1927) and 14 species inhabit the Palaearctic (AMSEL, 1954; ROESLER, 1973, 1990; VIVES MORENO & GASTÓN 2017; SLAMKA, 2019) including one Holarctic species.

Pima representatives occur in south regions. Their habitats are often arid open places and semi-deserts but one species, *P. boisduvaliella* (Guenée, 1845), inhabits also temperate zone of the Palaearctic from Europe to Russian Far East (SINEV *et al*., 2019). Among the hostplants Fabaceae are known for *P. boisduvaliella* and *P. leucoloma* (Herrich-Schäffer, 1849), also Fabaceae are supposed for other species of the genus (SLAMKA, 2019).

Central Asian fauna of the genus *Pima* is weakly studied and it arouses interest due to variety of xerothermic open habitats and the number of endemic for this area Lepidoptera species. *P. christophori* Ragonot, 1887 and *P. tabulella* (Ragonot, 1893) are known from Turkmenistan (KUZNETSOV, 1960; SLAMKA, 2019). Also *P. boisduvaliella* and *P. tabulella* were reported for Kyrgyzstan by SLAMKA (2019).

Two *Pima* species were collected in 2019 during expedition of the author to southern part of Kazakhstan. Among them *P. boisduvaliella* (Guenée, 1845) which is typical for mountain places of the country from altitude 600-700 m. Another collected species turned to be undescribed. Its series

were taken in Karatau Mts. in two localities about 100 km distant from each other. The specimens were attracted to light using fluorescent lamp (85 W, 6400 K). The genitalia of all collected specimens were dissected and the genitalia drawings were made on the base of the photographs.

***Pima karatauensis* Tsvetkov, sp. n.** (figs 1-7)

Type material: Holotype ♀, Kazakhstan, Turkestan Province, Karatau Mts., 3 km NE vill. Baizhansai, N 43º 08' 17", E 69º 56' 29", 29-VI-2019, leg. E. Tsvetkov. Paratypes (2 ♂♂, 8 ♀♀): the same locality as for holotype, 1 ♂, 5 ♀♀, 29-30-VI-2019, leg. E. Tsvetkov; Kazakhstan, Turkestan Province, Karatau Mts., 6 km NE vill. Ashisai, 43º 36' 11", E 68º 57' 22", 1 ♂, 3 ♀♀, 24-VI-2019, leg. E. Tsvetkov. Type material is deposited in the collection of Zoological Institute, St Petersburg (ZISP).

Imago: Frons convex semispherical. Vertex flat depressed. Chaetosemata present behind ocelli (whitish scales). Proboscis well developed. Labial palps long, pointed ahead, about 2.5 diameters of eye. First joint bent, second joint 1.5 times as long as the first, third joint thin and slightly shorter than the second. Maxillary palps extremely small with rounded joints. Antennae nearly 3/5 of the forewing. Scape about 2.5 times as long as wide, flattened dorsoventrally and narrowed at its ends. Dorsal side of flagellum finely chequered (whitish and grey scales). Cilia 1/3-1/4 of antenna diameter in males and much shorter in females. Base of male flagellum slightly sinuate, first six flagellomeres bear chitinous apical projections dorsally. Projections on first and sixth flagellomeres very small, projections on flagellomeres 2-5 as short vanes. Frons, vertex, scape, pedicel and labial palps covered by grey scales. Labial palps and frons often with addition of white. Maxillary palps in whitish scales. Thorax ochreous from dorsal side, abdomen ochreous-grey. Legs bicoloured: dark grey ventrally, whitish with slight creamy tinge dorsally.

Wings (fig. 1): Venation corresponds to venation within the genus *Pima* Hulst, 1888. Forewing 10-12 mm, elongate triangular with sharply rounded apex. Sexual dimorphism is not expressed in appearance. Forewing ochreous, postdiscal area greyish with ochreous streaky pattern along M and Cu veins; apical area and area along dorsum grey. White costal streak broad basally, narrowing towards apex and not reaching it, fading after R_3 branching. Costal edge dark grey. Blackish discal spot indistinct. Small white spot located at the dorsum. Trace of postmedial oblique white line present. Fringe brown, brownish scales white tipped. Underside of the forewing dark brown. Hindwing light brown, thin marginal line dark brown; fringe whitish with brown basal line. Hindwing underside light brown with broad darker area along costa.

Male genitalia (figs 2-6): Uncus rounded, elongate ladle like. Anal tube well sclerotized, conically tapering. Gnathos elongate with flat trapezoidal portion in its cranial 1/3. Distal (apical) 1/3 as hooked up and pointed thin process. Gnathos branches relatively narrow, very slightly sinuate, abruptly broadening at their ends. Tegumen with well sclerotized rather broad side portions, bears semicircular vanes on the sides. Valva elongate (costal arm nearly 1.2 of vinculum), narrowing from base to apex. Sacculus short and narrow with angulate apex, heavily sclerotized along the edge. Ventral edge of valva almost straight, rounded apically. Costal arm strong, gradually narrowing from the base to apex. Apex of the arm broadened, it is triangular and slightly bifid. Nearly triangular well sclerotized clasper present at the base of costal arm. Cucullus covered by long and fine setae. Clasper covered by shorter setae. Sacculus with strong setae arranged in a narrow strip along the edge. Sacculus free of setae between this strip and clasper. Juxta wide, its anterior edge widely rounded, posterior edge biangulate. Side lobes of juxta flat club like, apically covered by fine setae. Aedeagus cylindrical with bent proximal part (fig. 2). Vesica with two large cornuti at distal end of aedeagus (figs 2, 5, 6) and finely granulated membranous wrapping in proximal 1/2. Right (on figs 5, 6) cornutus on angulate base. Sclerotized side margins of eight sternum form side lobes. The lobes narrow at the base, broadening posteriorly and have large membranous distal portion. Anterior margin of eight strernum well sclerotized with small protrusion in the centre. Culcita as a pair of long and dense scale tufts.

Female genitalia (fig. 7): Papillae analis small triangular, membranous, densely covered by setae. Posterior apophyses thin, not much longer than anterior apophyses and nearly twice as long as papillae analis; slightly bent and expanded in 1/3 at junction with papillae analis. Anterior apophyses broadened basally, more strong than posterior apophyses. Eighth tergum broad, posterior margin straight, anterior margin strongly convex. Antrum broad and flat, well sclerotized and folded on the edges. Ductus bursae long ribbon-like, covered with fine mosaic structures, gradually broadening to corpus bursae in cranial 1/3. Corpus bursae elongate ovoid membranous with large well sclerotized area adjacent to ductus. Protrusion of this sclerite on the left side is rather weak. Heavily sclerotized narrow bent portion of the sclerite (located posteriorly) finely dentate from the inner side. Posterior portion of corpus bursae slug-like, densely covered by numerous fine spines from the inner side, ending in ductus seminalis. Middle part of bursa copulatrix wrinkly from ventral side (a large area in longitudinal wrinkles and folds on membranous and also sclerotized parts of the surface). Rather weak sclerotized hump present on corpus bursae dorsally on the right side.

Diagnosis: *Pima boisduvaliella* and *P. tabulella* show more uniform pattern of the forewing lacking the remains of postmedial line; ochreous color usually predominates on the forewing. In male genitalia of *P. karatauensis* the shape of cornuti in vesica is characteristic: wide base of one cornutus (right cornutus on figs 5, 6) is angulate with stepped ledge from one side. In other *Pima* species the base of right cornutus is narrowing smoothly towards apex and not angulate; see, for example, cornuti in *P. boisduvaliella* (fig. 8). In female genitalia of *P. karatauensis* ductus bursae gradually broadening to corpus bursae in cranial 1/3. Protrusion of the sclerite on the left side of corpus bursae (at the ductus) is weak, not abrupt as in *P. boisduvaliella*, *P. tabulella* (Ragonot, 1893) and *P. yllai* Slamka, 2019. The structure of corpus bursae is similar to *Pima tricolorella* Falck, Karsholt & Slamka, 2019 and *Pima vilhelmseni* Slamka, 2019. But in *P. karatauensis* corpus bursae is oriented with strong deviation from the direction of the ductus bursae in contrary to the compared species.

Etymology: The name "*karatauensis*" is connected with place (Karatau Mts.) the type material comes from.

Biology: In Karatau Mts. *P. karatauensis* inhabits open mountain valleys at the altitudes 800-900 m. The species occurred sympatrically with *P. boisduvaliella* in one of the localities.

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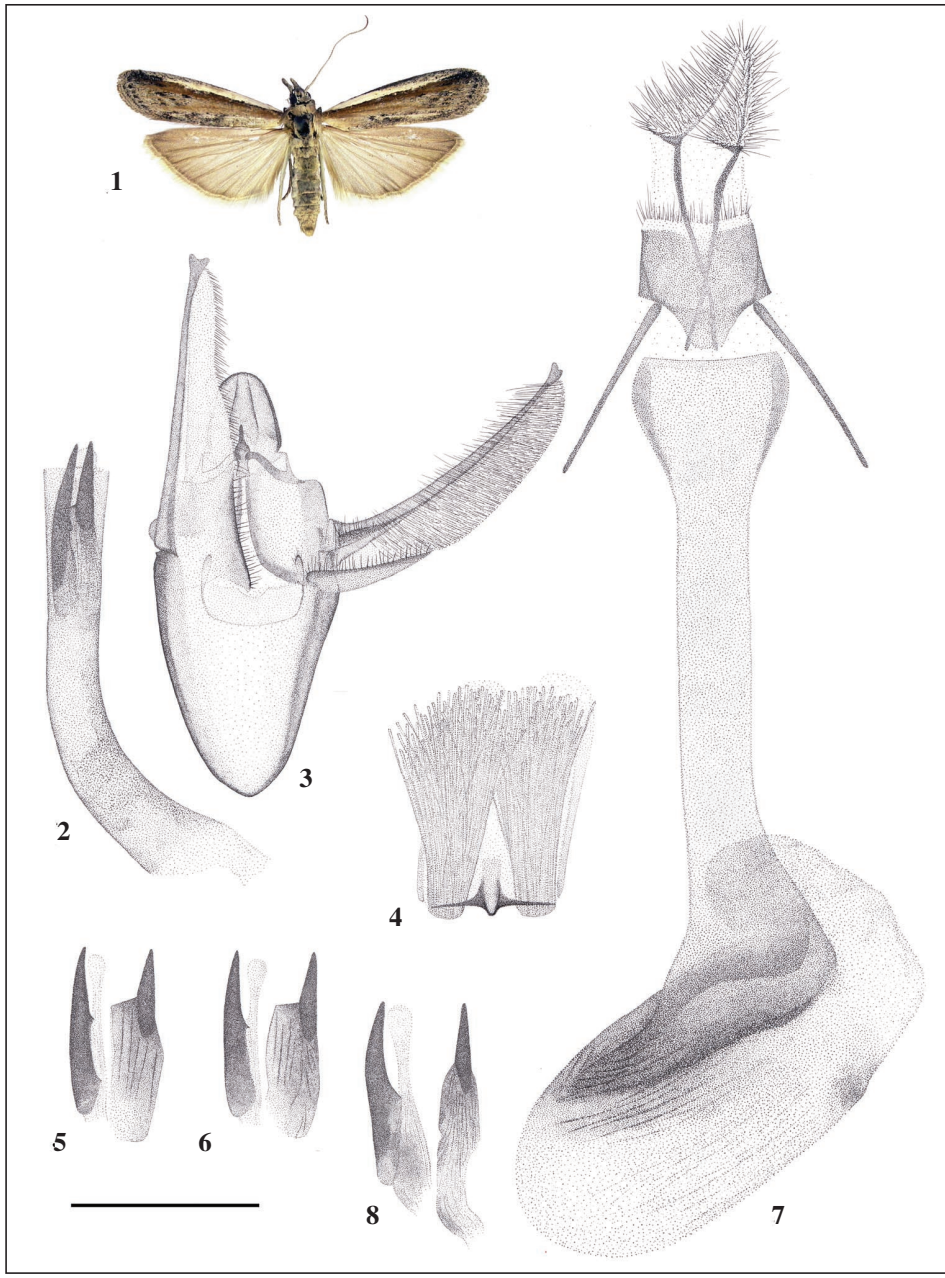

Figs 1-8.– 1. *Pima karatauensis* Tsvetkov, sp. n., holotype; **2-7.** Idem, genitalia (scale 1 mm); **2.** aedeagus; **3.** male genitalia (aedeagus removed); **4.** eighth sternum (male); **5, 6.** male cornuti of different paratype specimens; **7.** female genitalia; **8.** *Pima boisduvaliella* (Guenée, 1845), male cornuti (scale 1mm).

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    Article to collective volume:

    REBEL, H., 1901.- Famil. Pyralidae-Micropterygidae. 2 Theil.- *In* O. STAUDINGER & H. REBEL. *Catalog der Lepidopteren des palaearctischen Faunengebietes*: 368 pp. R. Friedlander & Sohn, Berlin.

    Book:

    HIGGINS, L. O., 1975.- *The Classification of European Butterflies*: 320 pp. Collins, London.

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New data on Tineidae and Meessiidae from the Canary Islands, Spain (Lepidoptera: Tineoidea)

P. Falck, R. Gaedike & A. Vives Moreno

Abstract

The list of Tineidae and Meessiidae from the Canary Islands is updated. Two species are described: *Rhodobates carsteni* Falck, Gaedike & Vives, sp. n. (Spain: Lanzarote) and *Tinea laurisilvaella* Falck, Gaedike & Vives, sp. n. (Spain: La Gomera, Gran Canaria, Tenerife, Portugal: Madeira). The female genitalia of *Infurcitinea canaricola* Gaedike, 2019 (Spain: La Palma) is described, hitherto only known from one male. Two species are recorded for the first time from the Canary Islands: *Nemapogon variatella* (Clemens, 1860) (Tenerife) and *Elatobia fuliginosella* (Lienig & Zeller, 1846) (Tenerife) and one species *Tinea trinotella* Thunberg, 1794 is removed from the list. Adults and genitalia of the new species and *I. canaricola* are illustrated. The taxonomic results are supported by DNA barcodes from sequencing of the 658 bp fragment of the mitochondrial COI gene.
KEY WORDS: Lepidoptera, Tineoidea, new species, Canary Islands (Spain), Madeira (Portugal).

Nuevos datos sobre Tineidae y Meessiidae de las Islas Canarias, España (Lepidoptera: Tineoidea)

Resumen

Se actualiza la lista de Tineidae y Meessiidae de las Islas Canarias. Se describen dos especies: *Rhodobates carsteni* Falck, Gaedike & Vives, sp. n. (Spain: Lanzarote) y *Tinea laurisilvaella* Falck, Gaedike & Vives, sp. n. (Spain: La Gomera, Gran Canaria, Tenerife, Portugal: Madeira). Se describe la hembra de *Infurcitinea canaricola* Gaedike, 2019 (Spain: La Palma), sólo se conocía de un macho. Por primera vez, se registran dos especies nuevas de las Islas Canarias: *Nemapogon variatella* (Clemens, 1860) (Tenerife) y *Elatobia fuliginosella* (Lienig & Zeller, 1846) (Tenerife) y se remueve una especie de la lista *Tinea trinotella* Thunberg, 1794. Se ilustra el adulto y la genitalia de la nueva especie *I. canaricola*. Los resultados taxonómicos son respaldados por el código de barras de ADN de la secuencia del fragmento de 658 pb del gen mitocondrial COI.
PALABRAS CLAVE: Lepidoptera, Tineoidea, nuevas especies, Islas Canarias (España), Madeira (Portugal).

Introduction

Based on recent field work and especially on DNA barcoding of several specimens of Tineidae we are able to make an update of the checklist of the Tineidae fauna from the Canary Islands (GAEDIKE & FALCK, 2019). We record two species as new to the Canary Islands: *Nemapogon variatella* (Clemens, 1860) and *Elatobia fuliginosella* (Lienig & Zeller, 1846), describe the female genitalia of *Infurcitinea canaricola* Gaedike, 2019 hitherto only known from the holotype and describe two new species of the genus *Rhodobates* and *Tinea.* The genus *Rhodobates* Ragonot, 1895 (Hapsiferinae, Tineidae) comprises medium sized moths with broad fore and hindwings. It is known from 19 species in the Palaeartic region and two species from East and South Africa (GAEDIKE, 2015: 20). Two species and one subspecies

Rhodobates canariensis Petersen & Gaedike, 1979, *Rhodobates pinkeri pinkeri* Petersen, 1987 and *Rhodobates pinkeri gomerae* Petersen, 1987 were hitherto recorded in this family from the Canary Islands (VIVES MORENO, 2014: 71). The genus *Tinea* Linnaeus, 1758 (Tineinae, Tineidae) comprises small to medium sized, mostly unicolourous moths, forewing often with a hyaline stripe at the base. It includes about 70 species worldwide (GAEDIKE, 2019a: 52-53) and 16 species from Europe. Seven species have been recorded from the Canary Islands (GAEDIKE & FALCK; 2019: 515).

Material and methods

Almost all the specimens were attracted to artificial light, and a few specimens were reared from dead wood overgrown with fungus. Label data are listed in a standardized way under each species, with the islands in alphabetic sequence, and the records in chronological order. Data on holotypes are cited literally from their labels.

A part of the material was subjected to DNA barcoding (sequencing of the 658 bp fragment of the mitochondrial COI gene) for detection of genetically distinct taxa and for obtaining molecular data for new species. The K2P divergences between the examined taxa were calculated using analytic tools in BOLD systems. To examine how isolated the Canary Island populations are from European populations of *Tinea trinotella* Thunberg, 1794 we calculated the pairwise F_{st} value between a group comprising the three Canary Island specimens CILEP001-19, CILEP212-19, and CILEP213-19 (CILEP099-19 had to be omitted due to too much missing data), and a group comprising 12 of the public available sequences from European specimens on BOLD in Arlequin 3.5.2.2 (EXCOFFIER *et al*., 2005) with 10,000 permutations to test for statistical significance.

The photographs of specimens were taken with Canon EOS700D camera. Those of the genitalia by using a Soptop CX40T Trinocular microscope and a Toup Tek P10500A-E3 / E3ISPM05000KPA-E3 / 5.0MP USB3 camera.

Abbreviations used

coll. H. Roweck	Hartmut Roweck, Kiel, Germany
coll. A. Werno	Andreas Werno, Nunkirchen, Germany
GP	Genitalia preparation
MNCN	Collection of Antonio Vives, Museo Nacional de Ciencias Naturales, Madrid, Spain
PF	Collection of Per Falck, Neksø, Denmark
RG	Reinhard Gaedike, Bonn, Germany
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
ZMUC	Zoological Museum, Natural History Museum of Denmark, Copenhagen, Denmark

Results

MEESSIIDAE

Infurcitinea canaricola Gaedike, 2019 (Fig. 2)
Infurcitinea canaricola Gaedike, 2019. *SHILAP Revta. lepid*., **47**(185): 79
LT: Arafo, Tenerife, Spain

Material examined: SPAIN, La Palma. La Galga, 400 m, 1 ♂, 2 ♀♀, 17-23-I-2019, larvae in dead wood, leg. P. Falck, Genitalia slides 3035PF, 3038PF, 9726RG, DNA sample Lepid Phyl 0101PF, 0102PF (PF).

The specimens were reared from a piece of dead wood overgrown with fungi, growing in the dark part of a Laurisilva Forest. *I. canaricola* is hitherto only known from the male holotype "ES (Spain), Tenerife, Arafo, e. l., 29-IV-2010, leg. J. Hilszczánski" (GAEDIKE, 2019b: 79). This enables us to describe the female genitalia.

Genitalia ♂ (Fig. 7)

Genitalia ♀ (Fig. 8): Anterior apophysis not forked, slightly longer than posterior apophysis, ostium surrounded with nearly invisible rounded sclerotizations.

Remarks: The female genitalia structure is not clearly distinguishable from that of *I. toechophila* (Walsingham, 1908). In the paper with the original description of *I. canaricola* (GAEDIKE, 2019b: 85) a mistake in numbering of the illustrations occurred (see GAEDIKE, 2019c: 436).

TINEIDAE
HAPSIFERINAE

***Rhodobates carsteni* Falck, Gaedike & Vives, sp. n.** (Figs 3-4)

Material examined: Holotype ♂, "SPAIN, Lanzarote, Mojón Blanco, Orzola, 20 m, 21-X-10-XI-2019, leg. P. Falck" (ZMUC). Paratypes: SPAIN, Lanzarote, El Bosquecillo, 600 m, 2 ♂♂, 6-XI-2018, leg. B. Skule & C. Hviid, Genitalia slide 2972PF (ZMUC); 0.8 km S. Concil, 1.4 km N. Tias, 240 m, 1 ♂, 2-8-XI-2018, leg. B. Skule & C. Hviid, (ZMUC); Mojón Blanco, Orzola, 20 m, 23 ♂♂, 2 ♀♀, 21-X-10-XI-2019, leg. P. Falck, Genitalia slides 3246PF, 3247PF, 3251PF, 3254PF, 3256PF, DNA samples Lepid Phyl 0304PF, 0305PF, 0312PF (PF, MNCN, SDEI).

Description: Wingspan 13-15 mm (male), 16 mm (female). Head brush grey brown with white tips; labial palpus cream colored, laterally grey brown, segment 2 with two lateral bristles, ventrally with long erect scales, segment 3 directed upwards; antenna (male) almost as long as forewing, dark grey brown, scape ventrally whitish colored, female antenna a little shorter. Thorax pale creamy, overlaid with some darker scales; tegulae nearly complete dark brown. Forewing pale creamy to grey, with a pattern of dark grey brown scales, costa with approximately 8-10 short dark stripes, from base to about ½ and beyond the cell an irregularly black streak; in the middle at the end of cell a distinct creamy white patch, surrounded towards dorsum by a dark, nearly black band; fringes with two thin darker scale-lines. Hindwing light grey. Abdomen brown.

Genitalia ♂ (Figs 9, 9a, 9b): Uncus distally notched, laterally each arm with more or less triangular tip, the edges more strongly sclerotized; gnathos arms fused, distal edge laterally each with triangular process, in the middle with two smaller pointed tips, the entire edge strongly sclerotized; valva as long as uncus-tegumen complex, parallel sided, costal edge somewhat curved upwards, ventral edge from last third to apex sickled-shaped narrowed, apex blunt, sacculus broad, distally angular; phallus clearly longer than the valva, straight, apically S-shaped, with 6-10 minute cornuti.

Genitalia ♀ (Fig. 10): Sternite VIII with broad excavation, ostium funnel-shaped, distal edge of tergite VIII wave-shaped; the area around ostium with numerous sclerotizations.

DNA barcodes (Fig. 1): We obtained full length DNA barcodes from three specimens from the island of Lanzarote. The barcodes fall in Barcode Index Number (BIN): BOLD AEC3591. The intraspecific distance is 0%. The distance to nearest neighbor *R. pinkeri* is 6.58 %, with the Barcode index number (BIN) BOLD:AEC4072.

Diagnosis: *R. carsteni* resembles *R. pinkeri* and *R. canariensis*. It can be distinguished by its smaller average size, the long antenna and the labial palpus with only two long bristles (4-5 bristles in the other Canarian and West Palaearctic *Rhodobates* species), and the forewing pattern with the creamy white patch towards dorsum surrounded by a black band. In the male genitalia it differs from *R. canariensis* and *R. pinkeri* in the shape of gnathos arms with the lateral processes and the two pointed tips; sacculus distally angular shaped; apex of phallus clearly S-shaped. In *R. canariensis* the gnathos arms are broadly fused, distally in the middle only with a weak notch; sacculus broad tapering distally; phallus weakly S-shaped. In *R. pinkeri* the gnathos arms are broadly fused, distally with a deep rounded notch; sacculus tapering, almost pointed distally; phallus clearly S-shaped. The clearly S-shaped phallus of *R. carsteni* separates it from the two other West Palaearctic species *R. friedeli* Petersen, 1987 and *R. unicolor* (Staudinger, 1871). The female genitalia are not clearly distinguishable.

Biology: Unknown. The specimens were all collected in late October to mid-November at light. The type-locality is a dry, sandy area near the coast.

Distribution: Only known from a few scattered localities in Lanzarote, Spain.

Etymology: The species is named after one of the collectors of the first known specimens, the Danish lepidopterologist Carsten Hviid.

Remarks: In the paper by GAEDIKE & FALCK (2019) some specimens from Lanzarote of this new species were erroneously identified as *R. pinkeri pinkeri* Petersen, 1987.

According to VIVES MORENO (2014), this species should be placed after *Rhodobates pinkeri* Petersen, 1987.

NEMAPOGONINAE

Nemapogon variatella (Clemens, 1860)
Tinea variatella Clemens, 1960. *Proc. Acad. nat. Sci. Phil*., **11**: 257
LT: [Philadelphia], USA

Material examined: SPAIN, Tenerife, Santa Cruz, 1 ♂, 1 ♀, 12-III-2019, leg N. Savenkov (coll. H. Roweck); Aguamansa, 1050 m, 4 ♂♂, 2 ♀♀, 21-V-3-VI-2019, leg. P. Falck, Genitalia slide 3032PF (PF), ibidem, 1 ♂, 13-26-VIII-2019, leg. P. Falck (PF). **New to the Canary Islands.**

Two of the specimens from Aguamansa were collected flying actively in the afternoon sunshine, the other specimens were reared from a fungus growing on a stem of *Erica arborea* L. *N. variatella* is widespread in Europe, outside Europe from Northern Africa, from Middle to Far East, introduced into Central and South America (GAEDIKE, 2015: 66).

TINEINAE

Elatobia fuliginosella (Lienig & Zeller, 1846)
Tinea fuliginosella Lienig & Zeller, 1846. *Isis von Oken*, **1846**: 273
LT: Livonia [Estonia, Latvia]

Material examined: SPAIN, Tenerife, Las Manchas, 1050 m, 1 ♂, 21-V-3-VI-2019, leg. P. Falck (PF); Aguamansa, 1050 m, 1 ♀, 13-26-VIII-2019, leg. P. Falck (PF). **New to the Canary Islands.**

Both specimens were attracted to light in the lower part of the pine forest. *E. fuliginosella* is widely distributed in Europe and outside Europe known from Morocco, Tunisia, Turkey, through to Siberia the Far East and in the Nearctic region (GAEDIKE, 2019a: 48).

Tinea laurisilvaella **Falck, Gaedike & Vives, sp. n.** (Figs 5-6)

Material examined: Holotype ♂, SPAIN, Tenerife, Barranco Ruiz, leg. R. Pinker, Genitalia slide 1997RG (SDEI) [in GAEDIKE, 2019a figured as figure 243e under the name *T. trinotella* Thunberg, 1794]. Paratypes: SPAIN, La Gomera, El Cedro, 1000 m, 1 ♀, 24-VII-1984, leg. P. Olsen, B. Skule & P. Stadel (ZMUC); Gran Canaria, Los Tilos de Moya, 500 m, 1 ♀, 11-24-VI-2018 leg P. Falck, ibidem 1 ♂, 4-23-III-2019, leg. P. Falck, Genitalia slides 2978PF, 3046PF, DNA sample Lepid Phyl 0001PF, 0100PF (PF); Tenerife, El Bebedero, La Vinca 58, 1 ♂, 27-III-2010, leg. A. Werno (coll. A. Werno); Las Mercedes, 750 m, 2 ♂♂, 1 ♀, 21-V-3-VI-2019, leg. P. Falck, DNA samples Lepid Phyl 0213PF, 0214PF (PF); Aguamansa, 1050 m, 1 ♂, 1 ♀, 13-26-VIII-2019, leg P. Falck (PF, MNCN). PORTUGAL, Madeira, Pousada, Serra d'Agua, 660 m, 1 ♂, 31-VII-1975 leg. N. L. Wolff (ZMUC); SW. Porto do Moniz, Santa Madalena, Pico Alto, 600 m, 1 ♀, 9-VII-1991, leg. M. Meyer (coll. A. Werno); N. Pto. Encumeada, Lamaceiros, 900 m, 1 ♀, 11-VII-1991, leg. M. Meyer, Genitalia slide 2978PF (ZMUC); Funchal, 4.5 km N. of Santo Antonio, 50 m, 30-IV-3-V-2009, leg. C. Hviid (ZMUC).

Description: Wingspan 12.5-18.5 mm. Head brush and frons yellow brown; labial palpus yellowish white, segment 2 laterally dark brown and bristled; antenna dark brown. Thorax off-white, tegulae off-white, basally dark brown. Forewing off-white, with heavy suffusion of black in the apical third, costa

black in the basal half; at 1/3 below cell a distinct black spot, at dorsum well before tornus a minute black spot; fringe and fringe-line dark grey. Hindwing dark grey. Abdomen dark grey.

Variation: In some specimens from Madeira the black suffusion of the forewing is very pronounced (Fig. 6).

Genitalia ♂ (Figs 11, 11a): Uncus basally broad, narrower to the rounded tip, lobes are fused to form a hook-like structure; saccus narrow and short; gnathos elongate, appressed in mid-line; valva longer than uncus-tegumen-complex, apodemes long, costal edge straight after ½ obliquely narrower, ventral edge almost straight, towards apex rounded, apex rounded; phallus straight, as long as valva, base rounded tapering towards apex.

Genitalia ♀ (Fig. 12): Posterior apophysis about three times longer than segment VIII, anterior apophysis about 2/3 the length of the posterior apophysis; segment VIII with a deep narrow U-shaped emargination; ostium covered with minute spines; ductus bursae distally with a more sclerotized ring; corpus bursae ovoid.

DNA barcodes (Fig. 1): We obtained full-length DNA barcodes from two specimens from the island of Tenerife; and DNA barcode fragments of 637 bp and 523 bp from two specimens from the island of Gran Canaria; from one specimen from the island of Madeira barcoding failed twice. All barcodes fall within Barcode Index Number (BIN) BOLD: ADT6529. The intraspecific distance is 0 - 0.81% (mean 0.46%, n=4) with the largest distance between specimens from Tenerife and Gran Canaria. The distance between the Tenerife specimens is 0,15%, and the Gran Canaria specimens 0%. The distance to nearest neighbor *T. trinotella* is 2.87%, with the Barcode index number (BIN) BOLD: AAD5562. The pairwise F_{ST} between Canary Island specimens and European specimens is 0.84756 (statistically significant, $p < 0.05$). As the F_{ST} value ranges between 0.0 and 1.0 with the former indicating no isolation and full inbreeding, and the latter indicating full isolation and no inbreeding (MEIRMANS & HEDRICK, 2011), the result indicates a high degree of isolations, and support separate species status for the Canary Island populations.

Diagnosis: *Tinea laurisilvaella* resembles *T. trinotella.* It can be distinguished by the off-white ground-color and the blackish apical third of the forewing; lack of the minute black spot at 1/3 above the cell and lack of the distinct black spot at the end of the cell. In the male and the female genitalia there are no clear differences.

Biology: Unknown. The specimens were collected from late April to late August at light.

Distribution: Known from Spain (La Gomera, Gran Canaria, Tenerife) and Portugal (Madeira).

Etymology: The species is named after the Laurisilva Forest, where most of the specimens are collected.

Remarks: For many years the identity of *Tinea trinotella* Thunberg, 1794 from the Canary Islands has been questioned. REBEL (1906: 40) mentions a worn specimen from Tenerife (Güimar) collected by W. White in 1906, identified as *Tinea lapella* Hübner, [1799] 1796: 252, nec [Denis & Schiffermüller], 1775: 142 (homonym), and he describes the specimen as "weicht von typischen Stücken Mitteleuropas nur dadurch ab, daß die Flügel mehr grau als braun gefärbt erscheinen. Der schwarze Fleck in der Falte der Vorderflügel ist sehr groß und deutlich, jener am Schlusse der Mittelzelle fehlt" and later "Trotzdem dürfte vielleicht eine davon verschiedene Art vorliegen." Also WALSINGHAM (1908: 1025) examined the specimen and concluded "I examined Mr. White's specimen and do not think it is *lapella* Hb., the wings seem broader, and there is no spot at the end of the cell, the color also looks wrong". Walsingham did not collect the species himself and "was unable to compare it with European specimens"; that is probably why he did not describe the species as new. In later works (KLIMESCH, 1980: 98; GAEDIKE & KARSHOLT, 2001: 172; GAEDIKE, 2019: 243) on the Tineidae from The Canary Islands and Madeira the species was treated as *T. trinotella* because of the similarity in the genitalia.

We describe *T. laurisilvaella* sp. n. based on the constant difference in the adult morphology and the distinct barcode. *T. trinotella* should be removed from the list of Canary Island Lepidoptera and replaced by *T. laurisilvaella*.

According to VIVES MORENO (2014), this species should be placed after *Tinea trinotella* Thunberg, 1794.

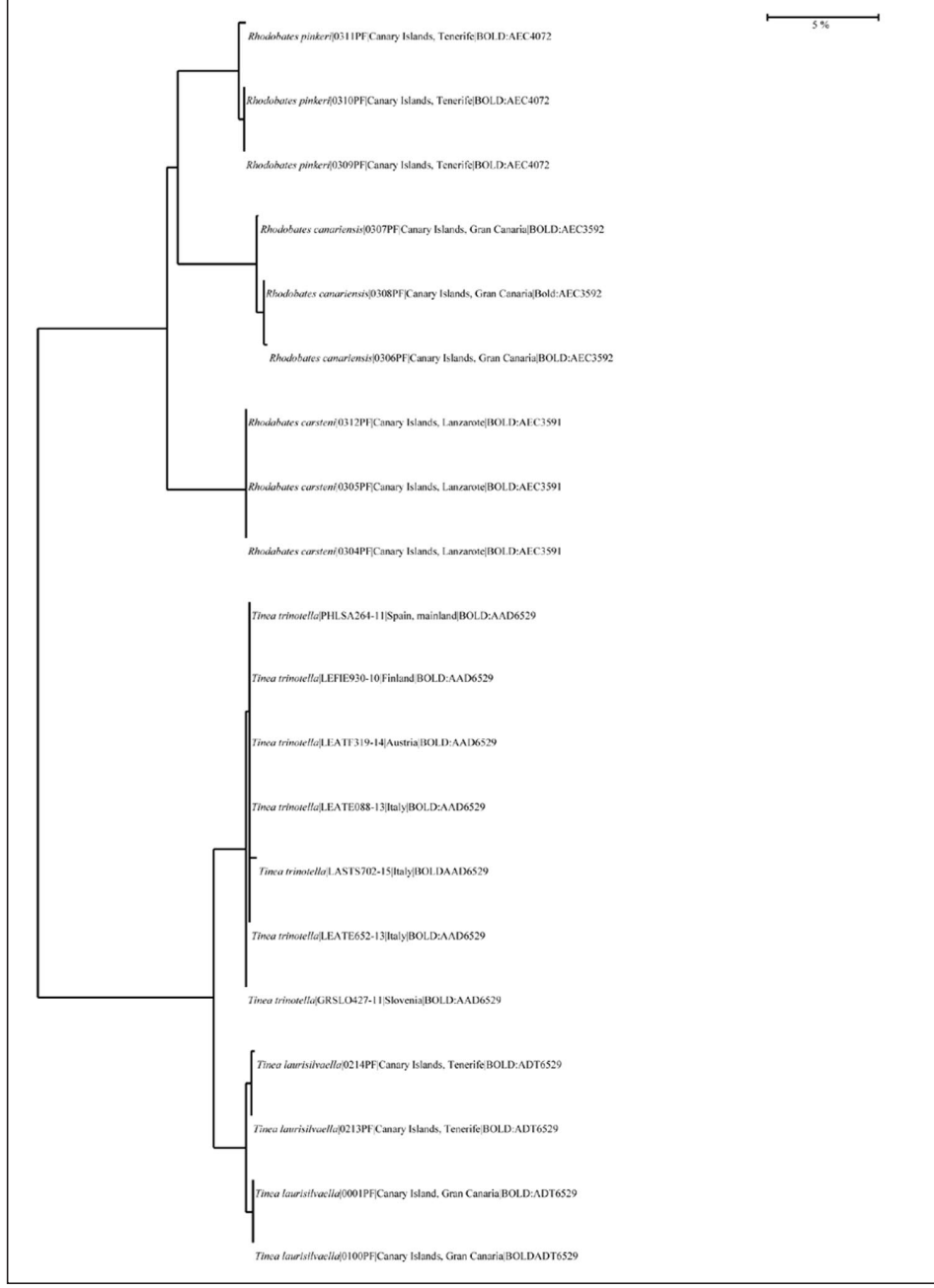

Fig. 1.– Neighbor Joining tree of DNA barcodes of three specimens of *Rhodobates* and two species of *Tinea*.

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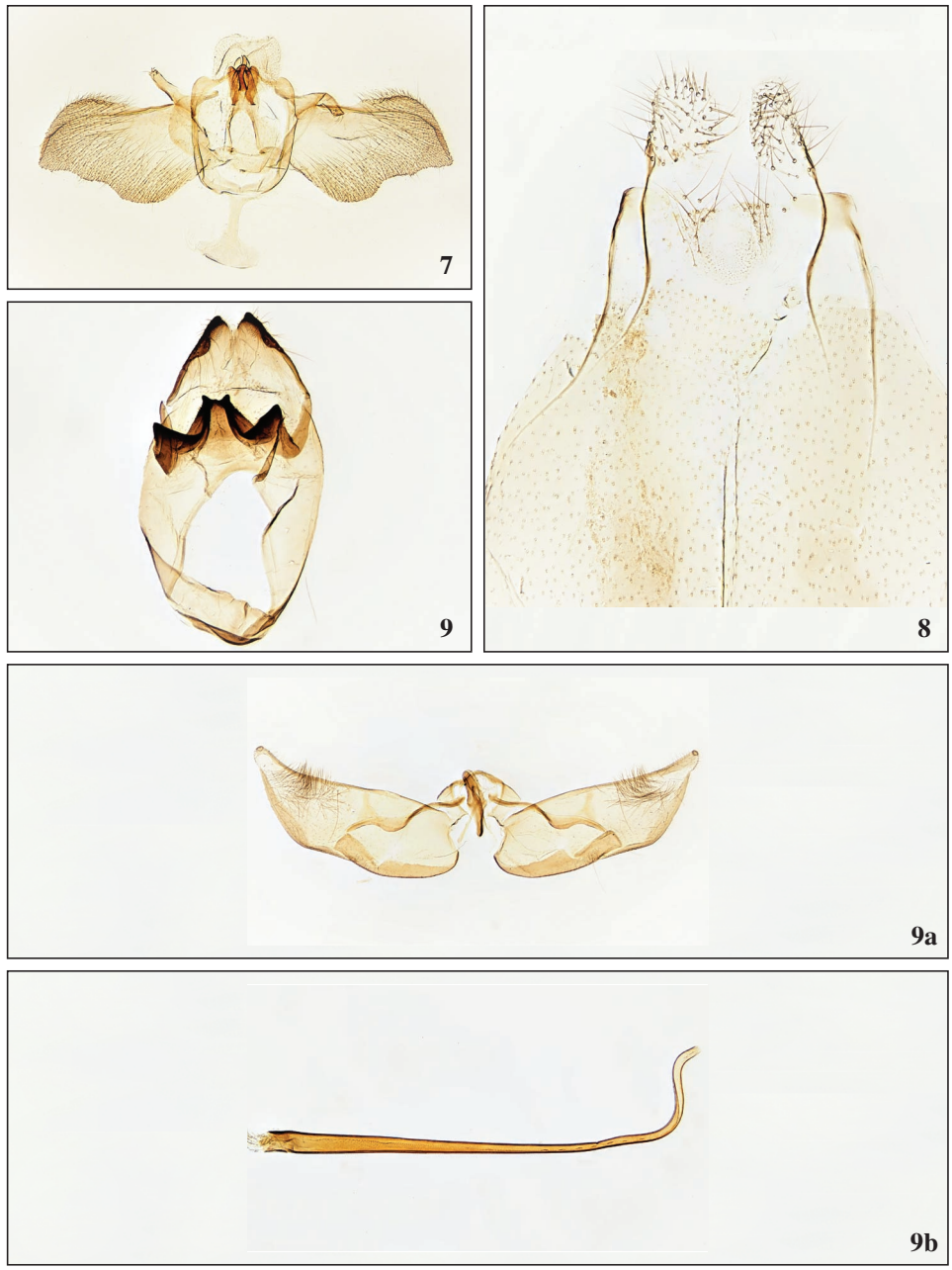
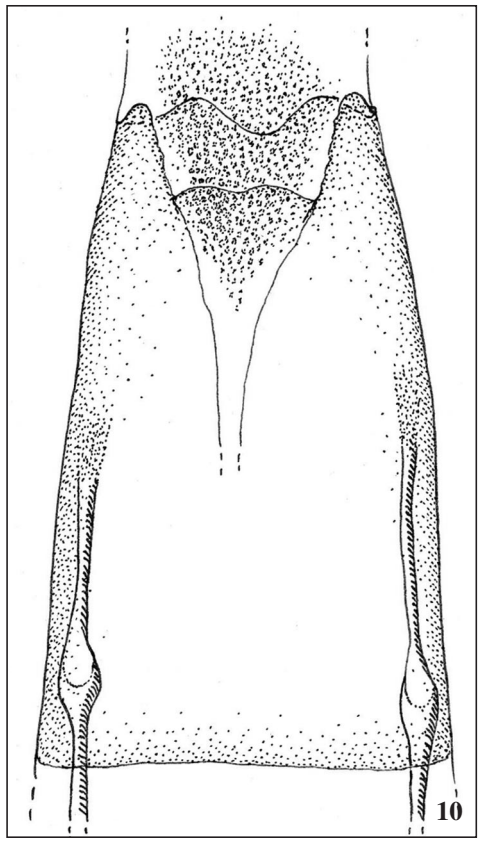
Figs 2-6.– 2. *Infurcitinea canaricola* Gaedike, 2019, ♀, La Palma, 9.5 mm. **3.** *Rhodobates carsteni* Falck, Gaedike & Vives, sp. n., ♂, Lanzarote, 15 mm. **4.** *Rhodobates carsteni* Falck, Gaedike & Vives, sp. n., ♂, Lanzarote, 15 mm (light specimen). **5.** *Tinea laurisilvaella* Falck, Gaedike & Vives, sp. n., ♂, Tenerife, 18.5 mm. **6.** *Tinea laurisilvaella* Falck, Gaedike & Vives, sp. n., ♀, Madeira, 18.5 mm. (dark specimen).



Figs 7-9.– 7. *Infurcitinea canaricola* Gaedike, 2019, ♂, La Palma, GP3035PF. **8.** *Infurcitinea canaricola* Gaedike, 2019, ♀, La Palma, GP3038PF. **9.** *Rhodobates carsteni* Falck, Gaedike & Vives, sp. n., ♂, Lanzarote, uncus-tegumen complex, GP3247PF. **9a.**Valva-saccus complex, GP3247PF. **9b.** Phallus, GP3251PF.



Figs 10-12.– 10. *Rhodobates carsteni* Falck, Gaedike & Vives, sp. n., ♀, Lanzarote, GP9765RG. **11.** *Tinea laurisilvaella* Falck, Gaedike & Vives, sp. n., ♂, Gran Canaria, uncus-tegumen complex, GP3046PF. **11a.** Valva-saccus complex and phallus, GP3046PF. **12.** *Tinea laurisilvaella* Falck, Gaedike & Vives, sp. n., ♀, Gran Canaria, GP2978PF.

COMITÉ PARA LA PROTECCIÓN DE LA NATURALEZA, PROYECTO DE INVESTIGACIÓN CIENTÍFICA DE SHILAP / *COMMITTEE FOR THE PROTECTION OF NATURE, PROJECT OF SCIENTIFIC INVESTIGATION OF SHILAP*

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5.– Con el fin de contribuir con este Proyecto Científico, se ruega remitan a SHILAP, **o una copia por correo electrónico (e-mail), con el listado del material recogido en EXCEL,** sólo en este formato, indicando la Familia, Subfamilia, Tribu, nombre de la especie (género, especie, autor y año), localidad, coordenadas UTM (1 X 1) o GPS, provincia, fecha de captura, colector y número de machos y hembras capturados (**sólo 5 ejemplares por taxón y localidad, máximo**). Por favor, utilice sólo el *"Catálogo sistemático y sinonímico de los Lepidoptera de la Península Ibérica, de Ceuta, de Melilla y de las islas Azores, Baleares, Canarias, Madeira y Salvajes (Insecta: Lepidoptera)*" (A. VIVES MORENO, 2014)". Esta lista es necesaria para este Proyecto Científico de SHILAP y para nuevas autorizaciones.

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3.– The collecting area to be visited by the applicant should also be detailed (province and/or region), expected dates (days, months, or the whole year), collecting method (entomological net, generator, etc.), taxonomical groups of interest to be collected (species, genera, families and/or superfamilies); any other data the applicant wishes to add.

4.– All members of SHILAP who apply for these permits to collect Lepidoptera in Spain with scientific purposes, will be included in the Scientific Investigation Project created by the Society and called: *"Lepidopterological Fauna of the Iberian Peninsula, Balearic Islands and Macaronesian region"*.

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8.– To know about the scientific aims of SHILAP and to commit to pay the expenses of participation in this Scientific Project, that the Board of Directors considers at any given moment.

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Three new species of the genus *Psychonoctua* Grote, 1865 from Argentina and the Caribbean Islands (Lepidoptera: Cossidae, Zeuzerinae)

R. V. Yakovlev, F. C. Penco & A. E. Naydenov

Abstract

The paper describes three new species, *Psychonoctua cracens* Yakovlev, Penco & Naydenov, sp. n. (type locality-Cayman), *P. ravida* Yakovlev, Penco & Naydenov, sp. n. (type locality-Barbados), and *P. diiorioi* Yakovlev, Penco & Naydenov, sp. n. (type locality-NW Argentina), with nine figures.
KEY WORDS: Lepidoptera, Cossidae, Zeuzerinae, *Psychonoctua*, new species, fauna, taxonomy, Neotropical.

Tres especies nuevas del género *Psychonoctua* Grote, 1865 de Argentina las islas del Caribe (Lepidoptera: Cossidae, Zeuzerinae)

Resumen

En este trabajo describen tres especies nuevas, *Psychonoctua cracens* Yakovlev, Penco & Naydenov, sp. n. (localidad tipo-Caimán), *P. ravida* Yakovlev, Penco & Naydenov, sp. n. (localidad tipo-Barbados), and *P. diiorioi* Yakovlev, Penco & Naydenov, sp. n. (localidad tipo NW Argentina), con nueve figuras.
PALABRAS CLAVE: Lepidoptera, Cossidae, Zeuzerinae, *Psychonoctua*, especies nuevas, fauna, taxonomía, Neotropical.

Introduction

The Cossidae of South and Central America are studied very poorly. New data on Cossidae taxonomy were obtained in the recent decades. Significant results were published on taxonomy of the subfamily Zeuzerinae (type genus *Zeuzera* Latreille, 1804). In particular, several new genera and species were described (SCHOORL 1990; NAYDENOV *et al.,* 2019; YAKOVLEV *et al.,* 2017, 2019a, 2020). Several poorly studied genera were redescribed (PENCO *et al.*, 2016; YAKOVLEV *et al.*, 2016, 2019b; NAYDENOV *et al.,* 2020) including the genus *Psychonoctua* Grote, 1865. The genus was described for *P. personalis* Grote, 1865 (Figs 1, 5, 9) from Cuba (GROTE, 1865). Later, a series of species from Central America and Caribbean region were described (SCHAUS, 1901, 1911; HAMPSON, 1904; BARNES & MCDUNNOUGH, 1910; DYAR, 1914, 1918, 1925, 1937; LINDSEY, 1926), which are now considered to belong to the genus *Psychonoctua* (SCHOORL, 1990: 127). In the course of examination of the specimens deposited in the museums and recent collections in Argentina, we have identified three new species of the genus *Psychonoctua*, which are described below.

Material and methods

Male genitalia were mounted in euparal on slides following LAFONTAINE (2004) and

examined with an Olympus SZX16 microscope. The images were taken with the Olympus SZX16 camera. Images of imago were taken by the digital camera of Apple iPhone 7, illuminated in Lightbox. The images were processed using CorelDraw software.

Abbreviations used in the text:

MACN - Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina
NHMUK - British Museum of Natural History, London, United Kingdom
ZISP - Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia

Descriptions of new species

***Psychonoctua cracens* Yakovlev, Penco & Naydenov, sp. n.** (Figs 1, 2, 7)

Material: Holotype 1 ♂, 17-IV-26-VIII-1938. CAYMAN ISLANDS, Oxf. Un. Caymans. Biol. Exped. Coll. By. C. B. Lewis, G. H. Thompson. 22-V-1938, Cayman Brac. N coast of, Stakes Bay. Light trap A., B. M. 1967-147, Slide NHMUK010315486, individual number NHMUK 012832453 (NHMUK). Paratypes: 6 ♂♂, same locality (NHMUK).

Description: Length of fore wing 17 mm. Antenna bipectinate, distally not pectinate. Fore wing light-yellow, with mottled pattern of brown spots and transverse strokes throughout wing area (almost no spots in discal area), discal spot bright, S-shaped wide brown band postdiscally, fringe light-yellow. Hind wing light-yellow without pattern, fringe light-yellow.

Male genitalia: Uncus long, thin, poorly widened apically; gnathos arms thin, short, not fused; valve narrow, lanceolate, tapered to apex, costal edge slightly curved, abdominal edge with two poorly expressed semicircular cuts in basal and middle thirds; juxta with two long leaf-like lateral processes directed dorsally; saccus semicircular, small; phallus robust, slightly shorter than valve, poorly curved in middle third, with longitudinal folding in distal third, long finger-like cornutus in lateral surface of vesica.

Female unknown.

Diagnosis: The new species significantly differs externally from the known representatives of the genus by its mottled pattern of the fore wing, the uncus poorly widened apically, and the two poorly expressed semicircular cuts in the basal and middle thirds on the abdominal edge of the valve.

Distribution: Cayman Islands.

Etymology: *Cracens* (lat.) slim, graceful.

***Psychonoctua ravida* Yakovlev, Penco & Naydenov, sp. n.** (Figs 1, 4, 8)

Material: Holotype 1 ♂, BARBADOS, R. E. Frampton. 93-195, Slide NHMUK010315480, individual number NHMUK 012832447 (NHMUK).

Description: Length of fore wing 18 mm. Antenna bipectinate, distally not pectinate. Fore wing grey-yellow, with pattern of brown spots. Submarginally, band of individual brown spots; postdiscally, brown strokes from costa to M_1; discal spot C-shaped, brown; in discal area, wide oblique brown stroke from costa to medial trunk; fringe mottled (brown at veins, light-yellow between veins). Hind wing light-yellow, without pattern, fringe mottled (brown at veins, light-yellow between veins).

Male genitalia: Uncus long, slightly narrowing in middle third, apically sharp; gnathos arms thin, short, not fused; valve narrow, long, lanceolate, poorly narrowing to apex, costal edge practically even, poorly expressed semicircular cut in basal third of abdominal edge; juxta with two long, leaf-like lateral processes directed dorsally; saccus semicircular, relatively massive; phallus robust, slightly shorter than valve, poorly curved in middle third, long finger-like cornutus in lateral surface of vesica.

Female unknown.

Diagnosis: The new species differs from the known species externally: in the brown bands and strokes in submarginal, postdiscal and discal areas of the fore wing, and in the male genital structure: the narrow elongated valve with almost even costa.

Distribution: Barbados.

Etymology: *Ravidus* [lat.] - greyish, grey-yellow.

***Psychonoctua diiorioi* Yakovlev, Penco & Naydenov, sp. n.** (Figs 1, 5, 9)

Material: Holotype 1 ♂, NW ARGENTINA, Jujuy Prov., 25 km NE Palma Sola, 23º48'53.7" S 0641º12'44.7" W, H-454 m, 23-X-2019, leg. R. V. Yakovlev, Genital preparation nº174, coll. A. E. Naydenov (ZISP). Paratype: 1 ♂, [ARGENTINA], Chaco, Depto. Chacabuco, Charata, 08-I-1992, coll. O. Di Iorio, Prep. Gen. FCP Nº14. (MACN).

Description: Length of fore wing 12 mm. Antenna bipectinate, distally not pectinate. Fore wing brownish-grey, with pattern of brown thin undulated transverse lines, discal spot shaped as wide brown transverse stroke from costa to Cu-trunk, oblique wide brown band basally, fringe mottled (brown at veins, light-yellow between veins). Hind wing light-yellow, without pattern, fringe white.

Male genitalia: Uncus elongated, edges even, apically sharp; gnathos arms thin, short, not fused; valve relatively wide, poorly narrowing to apex, apically semicircular, costal and abdominal edge almost even; juxta with two long leaf-like lateral processes directed dorsally; saccus semicircular, relatively massive; phallus robust, short, twice shorter than valve, large finger-like cornutus in lateral surface of vesica.

Female unknown.

Diagnosis: The new species significantly differs from the known species of the genus in several features: a small size, the discal spot shaped as a wide brown transverse stroke from the costa to Cu-trunk, the basal oblique wide brown band, the wide valve with almost even costal and abdominal edges and a very short phallus.

Distribution: Argentina (Chaco and Jujuy Provinces).

Etymology: The new species is named after Osvaldo Di Iorio, one of the most prolific and passionate entomologist of Argentina, who recently died in 2016.

Discussion

Currently, there are nine known taxa of the species group, the status of which is still not clear; they are widely distributed on the islands of the Caribbean sea and are locally found in the continental regions of South America (French Guiana, Brazil (Amazonas Prov.), Colombia, Central (Panama) and North America (Mexico, south of the USA - Arizona) (SCHOORL, 1990; DONAHUE, 1995). Taking into account the description of *P. diiorioi*, the range of the genus is significantly extended south, to the north regions of Argentina.

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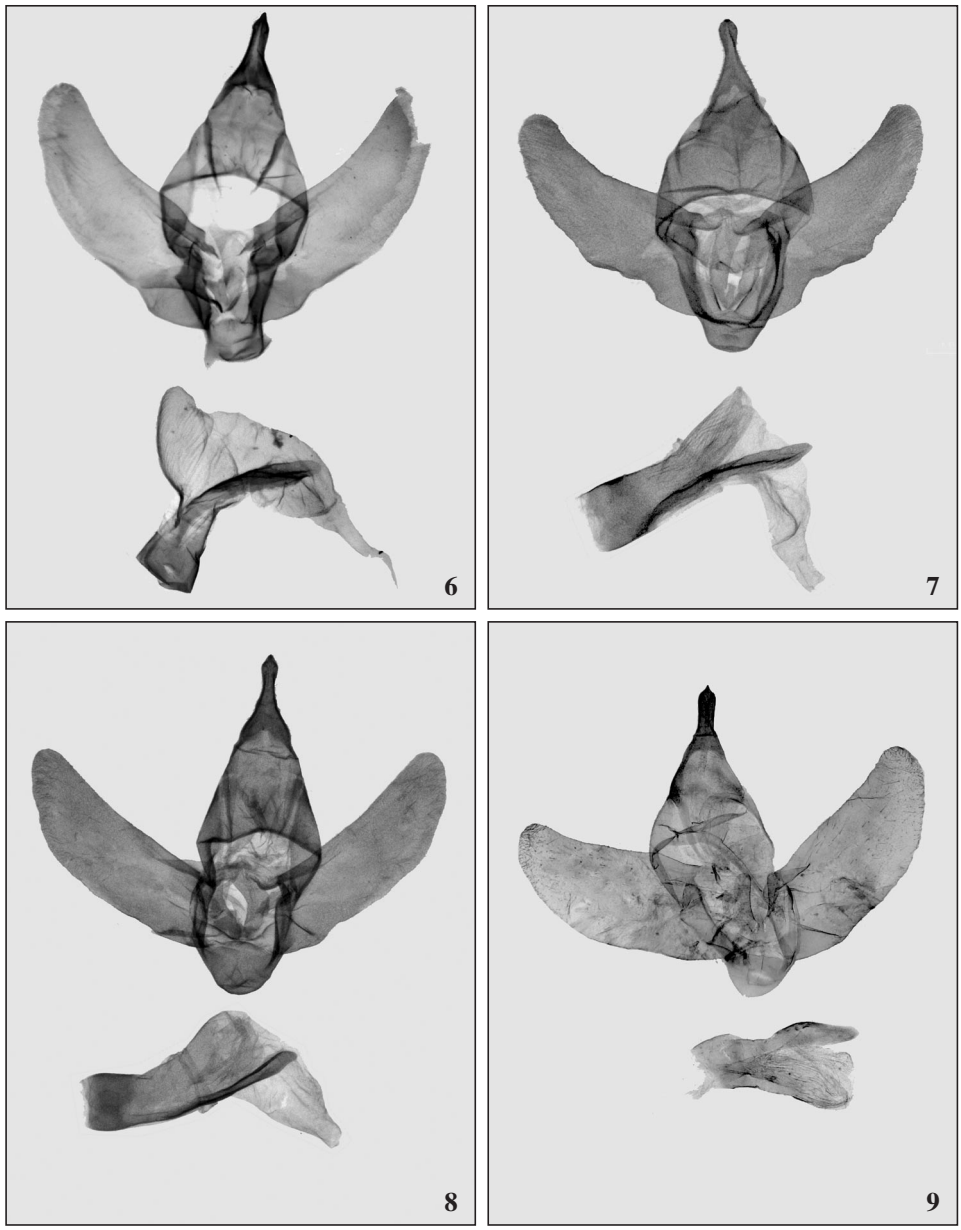
Figs 1-5.– Zeuzerinae, adults. **1.** Distributional map of *Psychonoctua personalis, P. cracens, P. ravida* and *P. diiorioi*. **2.** *Psychonoctua personalis* Grote, male, Cuba, Prov. Holguin (MWM); **3.** *P. cracens* Yakovlev, Penco & Naydenov, sp. n., male, holotype, Cayman Is. (NHMUK individual number 012832453); **4.** *P. ravida* Yakovlev, Penco & Naydenov, sp. n., male, holotype, Barbados (NHMUK individual number 012832447); **5.** *P. diiorioi* Yakovlev, Penco & Naydenov, sp. n., male, holotype, NW Argentina, Jujuy Prov. (ZISP).



Figs 6-9.– Zeuzerinae, male genitalia. **6.** *Psychonoctua personalis* Grote, male, Cuba, Prov. Holguin (GenPrHeterocera MWM: 28.557); **7.** *P. cracens* Yakovlev, Penco & Naydenov, sp. n., male, holotype, Cayman Is. (slide NHMUK 010315486); **8.** *P. ravida* Yakovlev, Penco & Naydenov, sp. n., male, holotype, Barbados (slide NHMUK 010315480); **9.** *P. diiorioi* Yakovlev, Penco & Naydenov, sp. n., male, holotype, NW Argentina, Jujuy Prov. (ZISP, Genital preparation nº 174, A. E. Naydenov).

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Scopula villumi Falck & Hausmann, sp. n. from Tenerife, Canary Islands, Spain (Lepidoptera: Geometridae, Sterrhinae)

P. Falck & A. Hausmann

Abstract

Scopula villumi Falck & Hausmann, sp. n. is described, based on specimens from Tenerife, Canary Islands (Spain). Adults, male and female genitalia are figured. DNA barcodes (COI) are analyzed. A differential analysis from the closest related species, *Scopula rufomixtaria* (Graslin, 1863), and from the Canary Island congener *S. asellaria* (Herrich-Schäffer, 1847) is given.
KEY WORDS: Lepidoptera, Geometridae, Sterrhinae, *Scopula*, new species, Tenerife, Canary Islands, Spain.

Scopula villumi **Falck & Hausmann, sp. n. de Tenerife, Islas Canarias, España (Lepidoptera: Geometridae, Sterrhinae)**

Resumen

Se describe *Scopula villumi* Falck & Hausmann, sp. n., basada sobre especímenes de Tenerife, Islas Canarias (España). Se figuran adultos y genitalia del macho y de la hembra. Se analiza el ADN código de barras genético (COI). Se da un análisis diferencial de las especies relativamente próximas, *Scopula rufomixtaria* (Graslin, 1863) y de su congénere en las Islas Canarias *S. asellaria* (Herrich-Schäffer, 1847).
PALABRAS CLAVE: Lepidoptera, Geometridae, Sterrhinae, *Scopula*, especie nueva, Tenerife, Islas Canarias, España.

Introduction

The Macroheterocera of the Canary Islands are considered well-known. The most comprehensive studies of the Macroheterocera of the Canary Island are those published by REBEL & ROGENHOFER (1894), REBEL (1896-1938) and PINKER (1960-1978). Further information can be found in scattered publications in various entomological journals.

Checklists of the Lepidoptera of the Canary Islands have been published by BÁEZ (2010) and VIVES MORENO (2014). In the present paper we refer to the latter. BACALLADO *et al.* (2005) updated the inventory of Canarian representants of the subfamily Sterrhinae (Lepidoptera: Geometridae), recording 18 species. In the most recent checklist (VIVES MORENO, 2014) three species are added: *Idaea nigra* Hausmann & Bläsius, 2007, *Idaea laevigata* (Scopoli, 1763) (VIVES MORENO, 2014, with comment on page 797) and *Scopula imitaria* (Hübner, [1799]), the last without any comments.

During field work in Tenerife in 2019, the first author collected some specimens of an unknown *Scopula* (*Glossotrophia*) species. It could easily be separated from *Scopula guancharia* (Alphéraky, 1889) and *Scopula asellaria* (Herrich-Schäffer, 1847), both species quite commonly occurring in the

Canary Islands, by the three black spots on the forewing costa, and by the black, large and diffuse discal spots. Review of relevant literature revealed another specimen most likely belonging to this unknown *Scopula* species (BACALLADO & PINKER, 1982: 4, lám. II, fig. 11). The authors hesitated to describe the new species, because of the lack of specimens.

Material and methods

All the specimens south of Aguamansa were attracted to an 8 Watt super actinic light. Data of the holotype is cited literally from the label.

Three specimens were subjected to DNA barcoding (sequencing of the 658 bp "barcode" fragment of the mitochondrial COI gene). The genetic distances (minimum pairwise distances) were calculated using the analytic tools in the Barcode of Life Data Systems (BOLD; cf. RATMNASINGHAM & HEBERT, 2007). Genetic clusters are presented with their barcode index number (BIN; cf. RATNASINGHAM & HEBERT, 2013). Molecular data are accessible in the public dataset DS-VILLUMI on BOLD (https://dx.doi.org/10.5883/DS-VILLUMI).

The photographs of adult specimens were taken with Canon EOS700D camera, photographs of the genitalia by using a Soptop CX40T Trinocular microscope and a Toup Tek P10500A-E3 / E3ISPM05000KPA-E3 / 5.0MP USB3 camera.

Abbreviations used

PF Collection of Per Falck, Neksø, Denmark
MNCN Collection of Antonio Vives, Museo Nacional de Ciencias Naturales, Madrid, Spain
MCNT Museo de Ciencias Naturales de Tenerife
ZSM Collection Zoologische Staatssammlung München, Germany

Results

Scopula villumi Falck & Hausmann, sp. n.

Holotype ♂: SPAIN, Tenerife, 8 km. s. Aguamansa, 1700 m, 21-V-3-VI-2019, leg. P. Falck" (ZSM). Paratypes: SPAIN, Tenerife, La Fortaleza, 2050 m, 1 ♂, VII-1976, leg. J. Bacallado (MCNT); Villaflor, Las Lajas, 1800 m, 1 ♂ (abdomen missing). 24-IV-1998, leg. K. Larsen (coll. P. Skou); 8 km. s. Aguamansa, 1700 m, 4 ♂♂, 3 ♀♀, 21-V-3-VI-2019, leg. P. Falck. Genitalia slides 3065PF, 3279PF, 3285PF, 3286PF. DNA sample IDs BC ZSM Lep 106874, BC ZSM Lep 106875, BC ZSM Lep 106876 (PF, MNCN).

Description (Figs 1-3): Wingspan ♂ and ♀ 22-26 mm. Apex of forewing pointed; ground colour of wings whitish, often with strong sand coloured tinge, and strongly suffused with blackish-brown scales; transverse lines diffuse, postmedial line and subterminal line better marked, on the forewing costa three diffuse black spots; discal spots large and diffuse; fringe dots conspicuous. Underside of the wings uniform dark grey. Proboscis very long (approx. 10 mm). Labial palpus short, sandy coloured, dorso-laterally brownish. Frons dark brown. Vertex, collar and thorax sandy coloured, the last with few black scales. Antennae of ♂ filiform, ciliate-fasciculate, length of cilia about 1.6-2.0 times width of flagellum. Hindtibia of ♂ without pencil, and without spurs.

Male genitalia (Figs 4, 4a): Uncus broad, sub-triangular. Socii long and slender. Saccus rounded, sub-triangular. Anellus with inner ring modified to a conical tube; lateral process of anellus short and rounded. Valvula slender, apex rounded; fibula broad, strongly sclerotized. Aedeagus straight and slender. Sternum A8 (Fig. 4b) basally with a short, broad and rounded projection; cerata symmetrical, short, straight and pointed. So far, no polymorphism in cerata length has been observed (n=4) (cf. HAUSMANN, 1999).

Female genitalia (Figs 5, 5a): Posterior apophysis twice as long as anterior apophysis. Antrum

narrow, laterally strongly sclerotized, posteriorly dilated, covered with a barrel-shaped, posteriorly distinctly concave, large sclerite. Ductus bursae narrow, almost with parallel sides. Corpus bursae oval, signum with laterally pointed spines. Lamella antevaginalis strongly sclerotized, sub-triangular anteriorly pointed and bent medially, corrugated.

Molecular diagnosis: BIN: BOLD:AEB8999. Maximum intraspecific variation 0.16 %, corresponding to one base pair (n=3). Diverging (minimum pairwise distance) by 2.7% from the genetically closest neighbour, the Moroccan populations of *S. rufomixtaria* (Graslin, 1863), by 2.9% from the Spanish populations of *S. rufomixtaria*.

Differential diagnosis: *Scopula villumi* Falck & Hausmann, sp. n. can be distinguished from *S. rufomixtaria* (Graslin, 1863) and *S. asellaria* (Herrich-Schäffer, 1847) by the pointed forewing, the three black costal spots on the forewing, and the large, diffuse discal spots. In the male genitalia it differs from *S. rufomixtaria* by the broader base of fibula, the more straight aedeagus, the shorter and sub-triangular base of sternum A8 and by the shorter and straight cerata. From *S. asellaria* it differs by the longer proboscis, in genitalia by the broader and more rounded lateral processus of anellus, longer, socii, longer projection at the base of sternum A8, and the longer and pointed cerata . In the female genitalia it differs from *S. rufomixtaria* and *S. asellaria* by the sub-triangular lamella antevaginalis.

Biology: The early stages are unknown. The specimens were collected at light from late April to July.

Distribution: Known only from a few localities in Tenerife at altitudes between 1700 m and 2050 m. The species is most likely an endemic species.

Etymology: The species is named after the first author's grandson Villum.

Acknowledgements

We are grateful to Peder Skou (Denmark) and Dr Juan José Bacallado (Tenerife, Spain), for loan of specimens included in the paratype series. We are moreover grateful to Dr Antonio Vives (Madrid, Spain), for translating the abstract into Spanish, for editing our manuscript, and for his kind help with obtaining permission to collect Lepidoptera in the Canary Islands into the Scientific Project of SHILAP.

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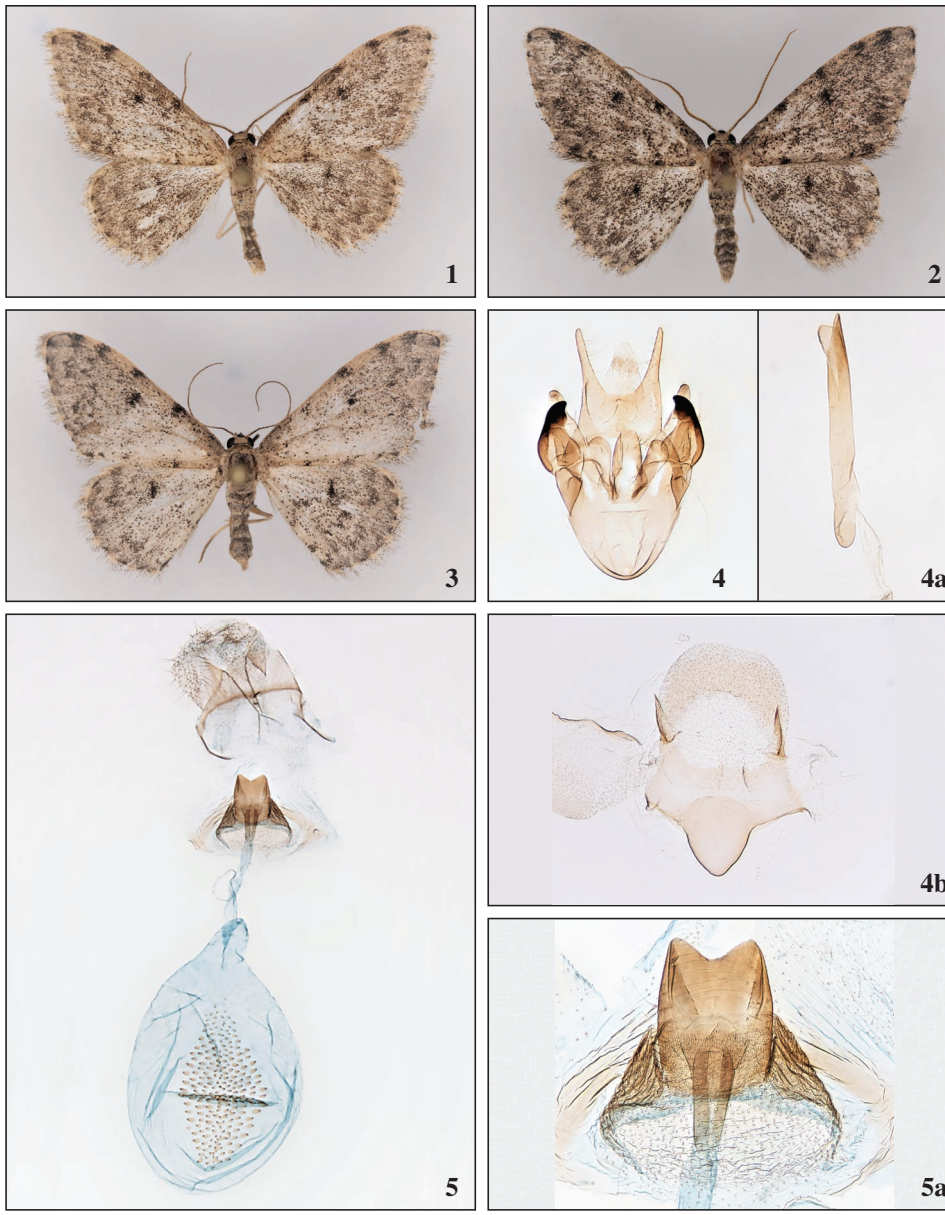

Figs 1-5.– 1. *Scopula villumi* Falck & Hausmann, sp. n., ♂, Tenerife, 22.5 mm. **2.** *Scopula villumi* Falck & Hausmann, sp. n., ♂, dark specimen, Tenerife, 22 mm. **3.** *Scopula villumi* Falck & Hausmann, sp. n., ♀, Tenerife, 26 mm. **4.** *Scopula villumi* Falck & Hausmann, sp. n., ♂, genitalia slide 3065PF **4a.** Aedeagus, genitalia slide 3065PF. **4b.** Sternum A8, genitalia slide 3279PF. **5.** *Scopula villumi* Falck & Hausmann, sp. n., ♀, genitalia slide 3286PF. **5a.** Antrum-complex and lamella antevaginalis in details, 3286PF.

NOTICIAS GENERALES / *GENERAL NEWS*

CORRECCIÓN / *CORRECTION*.– The genus name *Canaria* Larsen, 2020 was published in *SHILAP Revta. lepid.*, **48**(190): 326, for a new genus of Tortricidae from the Canary Islands. Unfortunately, the name is a homonym of *Canaria* Partington, 1835 (*Brit. Cyclop. N. H*., **1**(12): 704. Aves). I had examined that no other genus of Lepidoptera was named "*Canaria*", but I was not aware that the principles of homonymy concerns the whole regnum of animalia. As it is necessary with a replacement name, I will give the new genus the name ***Kanaria* Larsen, 2020** as a *nomen novum* according to the article 60.3 in the International Code of Zoological Nomenclature (ICZN, 1999). The new name covers the same meaning and the spelling originates from the Danish language. The name *Kanaria* is tested at the GBIF dataset facilities for homonymy (GBIF, 2020).

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PARTINGTON, C. F., 1835.– *The British Cyclopaedia of Natural History: with a popular view of their habits, economy, and structure*, **1**: XVII + 796 pp., Orr & Smith, London.– **DETALLES / *DETAILS*:** Knud Larsen; Røntoftevej, 33; DK-2870 Dyssegard; DINAMARCA / *DENMARK* (E-mail: knud.torts@gmail.com).

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On the biology, ecology and early stages of *Rhagades* (*Wiegelia*) *predotae* (Naufock, 1930) (Lepidoptera: Zygaenidae, Procridinae)

K. A. Efetov & G. M. Tarmann

Abstract

The full life-cycle of *Rhagades* (*Wiegelia*) *predotae* (Naufock, 1930) is described for the first time. The DNA-barcode of this species is provided. *Prunus ramburii* Boiss. as the larval host-plant is mentioned.
KEY WORDS: Lepidoptera, Zygaenidae, Procridinae, *Rhagades predotae*, early stages, biology, DNA-barcode, Spain.

Sobre la biología, ecología y primeros estadios de *Rhagades* (*Wiegelia*) *predotae* (Naufock, 1930) (Lepidoptera: Zygaenidae, Procridinae)

Resumen

Se describe, por primera vez, el ciclo de vida completo de *Rhagades* (*Wiegelia*) *predotae* (Naufock, 1930). Se proporciona el AND-código de barras de esta especie. Se menciona la planta nutricia *Prunus ramburii* Boiss.
PALABRAS CLAVE: Lepidoptera, Zygaenidae, Procridinae, *Rhagades predotae*, primeros estadios, biología, ADN código de barras, España.

Introduction

The lepidopterous family Zygaenidae is represented by five subfamilies and more than 1000 species distributed in all zoogeographical regions (EFETOV, 1997a, 1997b, 1998a, 1999, 2000, 2001a, 2001b, 2006, 2010, 2018; EFETOV *et al*., 2014a; EFETOV & TARMANN, 1999, 2013a, 2016b, 2017a, 2017b; MOLLET & TARMANN, 2018; TARMANN, 1994; TARMANN & COCK, 2019; TARMANN & DROUET, 2015). A lot of information has been obtained on this family during the last decades (EFETOV 1996a, 1998b, 1998c; EFETOV *et al*., 2004, 2011b, 2015a, 2019b; EFETOV & KNYAZEV, 2014; EFETOV & SAVCHUK, 2009, 2013; KNYAZEV *et al*., 2015; NAZARI *et al*., 2019; NAZAROV & EFETOV, 1993). However, even in the Western Europe some species of Zygaenidae are still poorly investigated. For example, *Rhagades predotae* (Naufock, 1930), an endemic species of Spain (Fig. 12), was hitherto only known from a few specimens (DUTREIX & ESSAYAN, 1991; FERNÁNDEZ-RUBIO, 1995, 2005; FERNÁNDEZ-RUBIO & CUÑARRO-LARREA, 1996; VIVES MORENO & HUERTAS-DIONISIO, 1985). *Rh. predotae* belongs to the subgenus *Wiegelia* Efetov & Tarmann, 1995. The closest species is *Rh.* (*W.*) *amasina* (Herrich- Schäffer, 1851) (Figs 13, 15). One more *Rhagades* species is present in Spain, viz. *Rh*. (*Rhagades*) *pruni* ([Denis & Schiffermüller], 1775) (Figs 12-14).

There is only one publication with the description of the adult larva of *Rh. predotae* (VIVES MORENO & HUERTAS-DIONISIO, 1985). All other larval stages were unknown. To learn more

about its biology and ecology and to discover its full life-cycle and habits in nature G. M. Tarmann has already tried to find this species in July1979 together with the late M. R. Gómez Bustillo in Noguera (province of Teruel) and Uña (province of Cuenca), but without success. In July 1980 during a second trip to the same localities three males were observed at Uña at sunset, but no females could be found. Then in June 2002 the authors of this paper made another attempt in Spain to obtain eggs or larvae of *Rh. predotae*. However, in this year only the larvae of *Aglaope infausta* L. were abundant on *Prunus* and we could not find any stages of *Rh. predotae*. Finally, success came in 2018. The basis of this result was the use of the new sex attractant created by the first author in the Crimean Federal University (EFETOV *et al*., 2019a).

Sex pheromones and attractants are an efficient tool for studying Zygaenidae. In recent years application of the sex attractants has allowed us to gather rich information on the distribution and phenology of many species (CAN *et al*., 2019; CAN-CENGIZ *et al*., 2018; EFETOV *et al*., 2010, 2011a, 2014b, 2015b; RAZOV *et al*., 2017; SUBCHEV *et al*., 2010, 2012, 2013, 2016; VRENOZI *et al*., 2019). The first author with his team synthesized a series of new sex attractants 'EFETOV-2': enantiomers of 2-butyl 2-dodecenoate and their mixtures (EFETOV *et al*., 2014c, 2016, 2018, 2019a). These attractants were applied by us during field work in 2018.

On 10 July 2018 we arrived at the locality Cuenca, 2 km NE of Huélamo, at an altitude of 1222 meters. This is a place with flowery meadows surrounded by bushes of *Prunus*, *Crataegus* and *Rosa* (Fig. 1). At first we tried to move the branches of the *Prunus* bushes by shaking and beating them to disturb possible specimens of *Rhagades predotae* and force them to come out. But this was without success. However, at 20.38 hours, at the moment when the sun was descending behind the mountains, in the first evening twilight, one male came suddenly out of a bush of *Prunus* and approached the lure with the attractant EFETOV-S-S-2 (S-enantiomer) that was fixed on the hat of the second author. This was the only specimen seen that day. We spent the whole next day (11 July 2018) in the same place. We also set up three traps with sticky layers and attractants EFETOV-2 (racemic mixture of R- and S-enantiomers), EFETOV-S-S-2 and a control trap without attractant. On this day four male specimens of *Rh. predotae* were attracted to EFETOV-S-S-2 attached to the hats of the authors, one at 11.30 and three between 20.40 and 20.47 at the time of sunset. On the 12 July 2018 we checked the traps. All of them were empty. However, from 20.20 to 20.30, again at sunset, we once more observed four males attracted to the lures of EFETOV-S-S-2 on the hats of the authors. As we realised that with this method we only could obtain males and that no females were found during the whole day either on the wing or in the vegetation, we decided to look for another place. We arrived after sunset at a flat plain three kilometres to the North-East of Huélamo, at an elevation of 1225 meters. As we could not see well enough in the darkness we turned the car around. However, suddenly, K. A. Efetov saw a specimen flying near the car. We went out and from 21.00 to 21.35 we found 18 males flying along the roadside in the upcoming darkness. The temperature at that time was still 23 degrees with a cloudless sky and no wind. In the morning of 13 July 2018 we returned to this place and found many small bushes of the Spanish endemic species *Prunus ramburii* Boiss. growing just along the roadside with their branches almost creeping along the ground (Fig. 2). We carefully checked the leaves of these plants and found 16 egg batches (Fig. 3) of *Rh. predotae* with egg numbers ranging from 5 to 100 (mean number 30). We also found one female beside an egg cluster. This specimen did not lay any eggs during the next few days in captivity. At 12.00 we also found one male and we observed that both the female and the male dropped to the ground when disturbed. Now it was clear why shaking the bushes was never successful. At 20.00 we returned to the same place and set up three attractants: EFETOV-2, EFETOV-S-2 (R-enantiomer) and EFETOV-S-S-2 on stones about 10 cm above the soil at a distance from each other of ca 10 meters (EFETOV *et al*., 2019a). On this day sunset was at 20.45 (the time when the sun disappeared behind the mountain). Between 20.44 and 21.07 four males of *Rh. predotae* came to the attractant EFETOV-S-S-2, showing sexual activity by running around the lure, trembling their wings, turning their abdomens with exposed genitalia. No specimens were attracted to EFETOV-2 and EFETOV-S-2. Thus it became clear that EFETOV-S-S-2 is the attractant of *Rh. predotae* resembling the natural female sex pheromone of this species. It is interesting to know that no specimens were found in the sticky traps including those with EFETOV-S-S-2.

Beginning from 22 July 2019 first instar larvae emerged from the eggs and this was the material on the basis of which the early stages of the species were studied. It should be noted that most of the eggs were parasitized by small hymenopterous egg parasites.

Description of the early stages of *Rhagades predotae*

Ovum: Oval, length 0.7 mm, breadth 0.5 mm, height 0.4 mm, pale yellow. Egg batch (Fig. 3) consists of one layer, eggs touch one another. The number of eggs in the batches varies from 5 to 100 (mean number is 30). Duration of egg stage 13 days.

Larva: First instar. Length of body 1.1-1.3 mm, breadth 0.5 mm. Body at first uniform yellowish white; head capsule brown, first thoracic segment with oval brown sclerotized dorsal plate (in some specimens the plate is not sclerotized medially forming two lateral sclerotized parts), thoracic legs brown (but lighter than head capsule), anal comb brown with 11 setae. Three days later light brown mediodorsal, dorsolateral and lateral lines appear on the body. The setal formula of the first abdominal segment is: D: 5-7*d*, 1*l*; SD: 3*d*, 1*l*; L: 0*d*, 2*l* (the terminology of the setae follows EFETOV *et al*. (2006) and EFETOV & HAYASHI (2008): D = dorsal setae, SD = subdorsal setae, L = lateral setae, *l* = light, hair-like setae, *d* = dark, stronger sclerotized setae). The combination of a few dark and one light subdorsal setae is typical for the genus *Rhagades* Wallengren, 1863 (EFETOV, 2001c) and is considered to represent an autapomorphy of the genus (EFETOV, 2004).

The larvae were reared on the leaves of *Prunus cerasifera* Ehrh. The first instar larva does not leaf-mine. It feeds on the parenchyma, at first forming a small round pit, later, by moving forward, forming an irregular short groove. Most of the first instar larvae prepare for moulting sitting on the surface of the leaves after they have spun a silky 'carpet' to fix their prolegs; only one larva moved into a fold of a leaf and additionally to the 'carpet' spun a few silk threads over the fold. Duration of L1: 5-6 days.

Second instar. Length of body 1.5-1.6 mm. Body yellowish white with brown mediodorsal, dorsolateral, lateral and basal lines; head capsule, dorsal part of the first thoracic segment, thoracic legs and anal comb brown. Number of the setae increased, the setal formula of the first abdominal segment is: D: 10–11*d*, 2*l*; SD: 7*d*, 3*l*; L: 0*d*, 2*l*. Among the three light subdorsal setae one is longer than the two others; moreover, the light setae are situated more laterally than the dark ones.

The larvae feed on the parenchyma of the leaves but leave the epidermis from one side untouched and do not create holes; the feeding marks look like white spots (Fig. 4). Some of the second instar larvae produce small cocoons inside which they moult. Duration of L2: 4-5 days.

Third instar. Length of body 2.5-3.0 mm. Body of the same colour as in the second instar, but the lines became darker. Number of the setae increased, the formula of the dorsal setae of the first abdominal segment is approximately 23*d*, 4*l*; among the four light dorsal setae two are longer than the two others.

The larvae feed on the parenchyma of the leaves but also a few holes appeared. Half of the third instar larvae moult in light cocoons. Duration of L3: 5 days.

Fourth instar. Length of body 3.5-4.0 mm. The colour of the body and verrucae became whitish grey; the lines are brown. Number of the setae increased, the formula of the dorsal setae of the first abdominal segment is approximately 25*d*, 6-7*l*; among light dorsal setae two are longer than others.

The larvae feed on the parenchyma and also create holes in the leaves. Half of the fourth instar larvae moult in light cocoons. Duration of L4: 6-7 days.

Fifth instar. Length of body 4.2-4.8 mm. The colour of the body whitish grey, but verrucae became yellowish grey, ventral surface and prolegs light yellow; the lines are brown (as in L3 and L4); head capsule, dorsal plate of the first thoracic segment, thoracic legs and anal comb dark brown (as in L3-L4). Number of setae increased, the formula of the dorsal setae of the first abdominal segment is approximately 27-28*d*, 7-9*l*; among light dorsal setae two are longer than others.

The larvae feed on the parenchyma and also create holes in the leaves (the total areas of the white

spots and the holes on the leaves are nearly equal). Half of the fifth instar larvae moult in cocoons. Duration of L5: 6-8 days.

SIXTH INSTAR. Length of body 4.5 mm (not longer than fifth instar). The colour of the verrucae whitish brown, ventral surface and prolegs light brown; the lines became darker, dark brown; head capsule, dorsal plate of the first thoracic segment, thoracic legs and anal comb dark brown. The formula of the dorsal setae of the first abdominal segment is approximately 30*d*, 5-6*l*; among light dorsal setae two are longer than others.

Between the end of August and beginning of October most of the larvae were sitting inside cocoons, then they came out and continued to feed, but not much (only few small feeding marks appeared). Duration of L6: 54-56 days (end of August - mid of October).

SEVENTH INSTAR. Length of body 4.0 mm (less than sixth instar). The larvae become darker (than the sixth instar), colour of verrucae brown, ventral surface and prolegs orange brown; the lines blackish brown; head capsule, dorsal plate of the first thoracic segment, thoracic legs and anal comb dark brown. Number of light setae on the dorsal verruca of the first abdominal segment is 8, all other setae are short and dark.

At first the larvae are still feeding but not too much, then they stop and most of them spend the winter in their cocoons (hibernacula). The larvae start feeding again in the beginning of April producing holes in the leaves and also start to feed at the margins of the leaves. Preparing for moulting the larvae sit in groups together inside a common silk network construction (like a "blanket"). Duration of L7: 6 months with hibernation (mid of October - mid of April).

EIGHTH INSTAR. Length of body 6.0-6.5 mm. Verrucae brown; cervical part of first thoracic segment, ventral surface of body and prolegs orange; lines blackish brown; head capsule, dorsal plates of the first thoracic and last abdominal segments, thoracic legs and anal comb blackish brown. Now there are three types of setae on the dorsal verrucae, viz. short brown with darker apices and two types of long white setae: simple and plumose, the latter with short lateral bristles extending from the central stem (see EFETOV, 2001c, fig. 94); these white plumose setae are situated on the anterior, lateral and posterior parts of the verruca (forming a lateral semicircle). Moreover, there are four types of setae on the subdorsal verrucae, in addition to the three types of setae mentioned before there are also light orange plumose setae forming two groups that are situated on the dorsoanterior and dorsoposterior parts of the verruca (on the first abdominal segment subdorsal verruca has respectively 4-5 anterior and 1-3 posterior orange setae). Thus, the plumose setae (white and orange) appear in eighth instar for the first time.

Larvae actively feed. Moulting takes place under silk "blanket". Duration of L8: 15 days.

NINTH INSTAR. Length of body 7.5-8.0 mm. Verrucae dark greyish brown; cervical part of first thoracic segment, ventral surface of body and prolegs orange; mediodorsal and dorsolateral lines blackish brown; head capsule, dorsal plates of the first thoracic and last abdominal segments, thoracic legs and anal comb blackish brown. There are three types of setae on the dorsal verrucae. First type: short, spine-like, brown, not plumose, with darker apices; these setae are situated on the central and medial parts of the verruca. Second type: long, hair-like, white, not plumose; these setae are situated on the anterior and posterior parts of the verruca. Third type: long, hair-like, plumose, white; these setae are situated on the anterior, lateral and posterior parts of the verruca. There are four types of setae on the subdorsal verrucae. First type: short, spine-like, brown, not plumose, with darker apices; these setae are situated on the central part of the verruca. Second type: long, hair-like, white, not plumose; these setae are situated on the inferior part of the verruca. Third type: long, hair-like, orange, plumose; these setae are situated on the dorsoanterior and dorsoposterior parts of the verruca, their number increased comparing with eighth instar (on the first abdominal segment subdorsal verruca has 8-12 such setae). Fourth type: long, hair-like, white, plumose. Lateral and subventral verrucae have only two types of setae: short, spine-like, brown, not plumose, with darker apices and long, hair-like, white, not plumose.

Larvae actively feed. Before moulting some larvae gather together in a corner of the rearing box

producing over themselves a common, not dense, silk network construction, like a "blanket" (Fig. 5). Duration of L9: 9-12 days.

TENTH INSTAR (FULLY GROWN LARVA) (Fig. 6). Length of body 11.0-11.5 mm. Colour of the body and setae as in ninth instar. Each of dorsal and subdorsal verrucae with one of the other long, hair-like, white, not plumose setae extremely long (4-5 times longer than the short, spine-like, brown setae). Number of orange plumose setae of subdorsal verrucae increased (16-19 on the verruca of the first abdominal segment). Second and seventh abdominal segments with greyish white everting lateral bulbs ("glands") situated betweeen subdorsal and lateral verrucae under the spiracle like in some other species of the Zygaenidae (EFETOV & TARMANN, 2004). Dorsal sclerotized plate of the last abdominal segment arch-shaped. Anal comb narrow with high base and 9-12 processes.

Larvae feed on the leaves of *Prunus cerasifera* Ehrh. eating the whole leaf except central vein. Duration of L10: 18 days.

Cocoon: Length 12.5-13.5 mm. Spindle-shaped, white, constructed of loosely spun silk, semitransparent with a few white particles on the surface.

Pupa (Fig. 7): Length 8.3-8.5 mm. Head, thorax, wings and abdomen smooth, shiny; head, thorax and wings brown, abdomen yellowish light brown; proboscis well developed, its tip reaches distal margin of forewing and not extending beyond end of abdomen. Dorsally last abdominal segment and distal margin of penultimate segment with short light brown setae, their length 0.2 mm. Duration of pupal stage: 11-13 days. The imagines emerge during the morning.

Adults (Figs 8-10): Moths with yellow well developed proboscis which they use for feeding (Fig. 11). When the females attract the males, the posture of the female (Fig. 10) is such that the dorsal parts of the abdominal tergites are exposed between the wings. Before copulation the male shows sexual behavior with the antennae moving up and down, the wings trembling, and the abdomen bending with opened valvae.

Male genitalia with long uncus: half length of the aedeagus (in *Rhagades amasina* the uncus is short: 4-5 times shorter than aedeagus). The vesica with only one cornutus (in *Rh. amasina* with three cornuti) (EFETOV, 2001c, plate 1, fig. 2; plate 2, fig. 3).

Female genitalia with characteristic structure named "praebursa" which is present in many species of Procridinae (ALBERTI, 1954; EFETOV, 1996b; EFETOV & TARMANN, 2013b, 2014a, 2014b, 2016a) and is the strongly dilated distal part of the ductus bursae between the antrum and the corpus bursae. In *Rh. predotae* the praebursa has no spines (in *Rh. amasina* it has a series of heavily sclerotized spines) (EFETOV, 2001c, plate 27, figs 2, 3).

DNA barcode

DNA barcode (COI gene sequence) (EFETOV *et al*., 2019c) of the male specimen of *Rh. predotae* (Spain, Cuenca, vic. Uña, 1300 m, 15-16-VII-1980, G. M. Tarmann leg.) is listed below.

Genbank number HQ987489:

**********TAAGTCTATTAATTCGAGCAGAATT
AGGTACTCCAGGATCTCTAATTGGAGATGATCAAATTTATAATACTATTGTAACAGCTCATGC
TTTTATTATAATTTTTTTTATAGTAATACCTATTATAATTGGAGGATTTGGAAATTGATTAGTAC
CCTTAATATTAGGAGCTCCTGATATAGCCTTTCCTCGTATAAATAATATAAGATTTTGACTATTA
CCCCCATCATTAATTCTTTTAATTTCAAGAAGAATTGTAGAAAATGGAGCAGGAACTGGATG
AACTGTATATCCCCCCCTTTCTTCCAATATTGCTCACAGAGGAAGATCTGTTGATTTAGTAAT
TTTTTCTCTTCATTTAGCTGGAATCTCTTCAATTTTAGGTGCAATTAATTTTATCACTACTATTA
TTAATATACGACCTAATGGTATATTTTTTGATCAAATGCCATTATTCGTATGAGCAGTAGGAAT
TACTGCTCTTTTATTATTACTTTCACTTCCAGTATTAGCAGGAGCAATTACTATACTTTTAACA
GACCGAAATATTAATACTTCTTTTTTTGATCCAGCAGGGGGAGGAGACCCTATTCTTTATCAA
CATTTATTT

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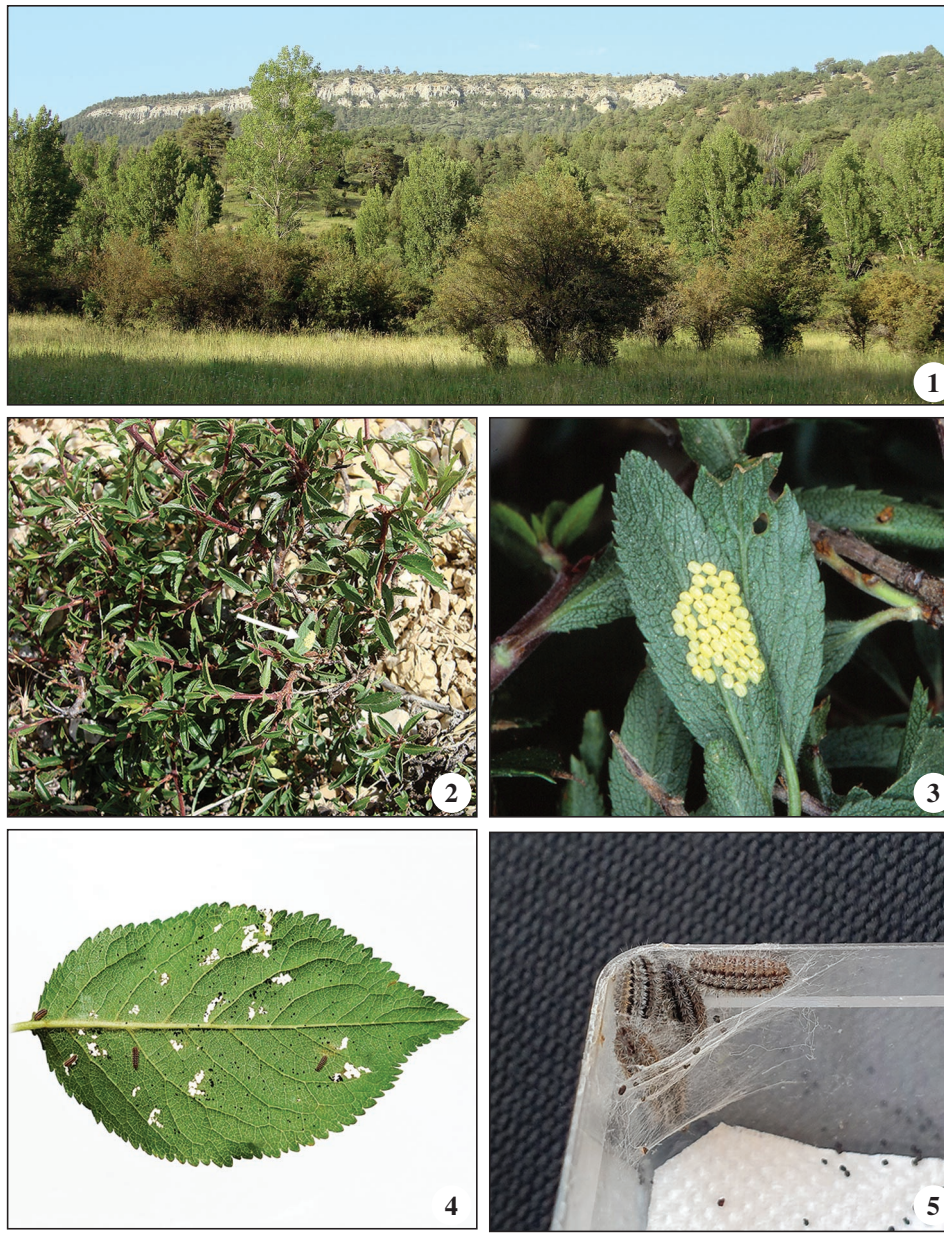
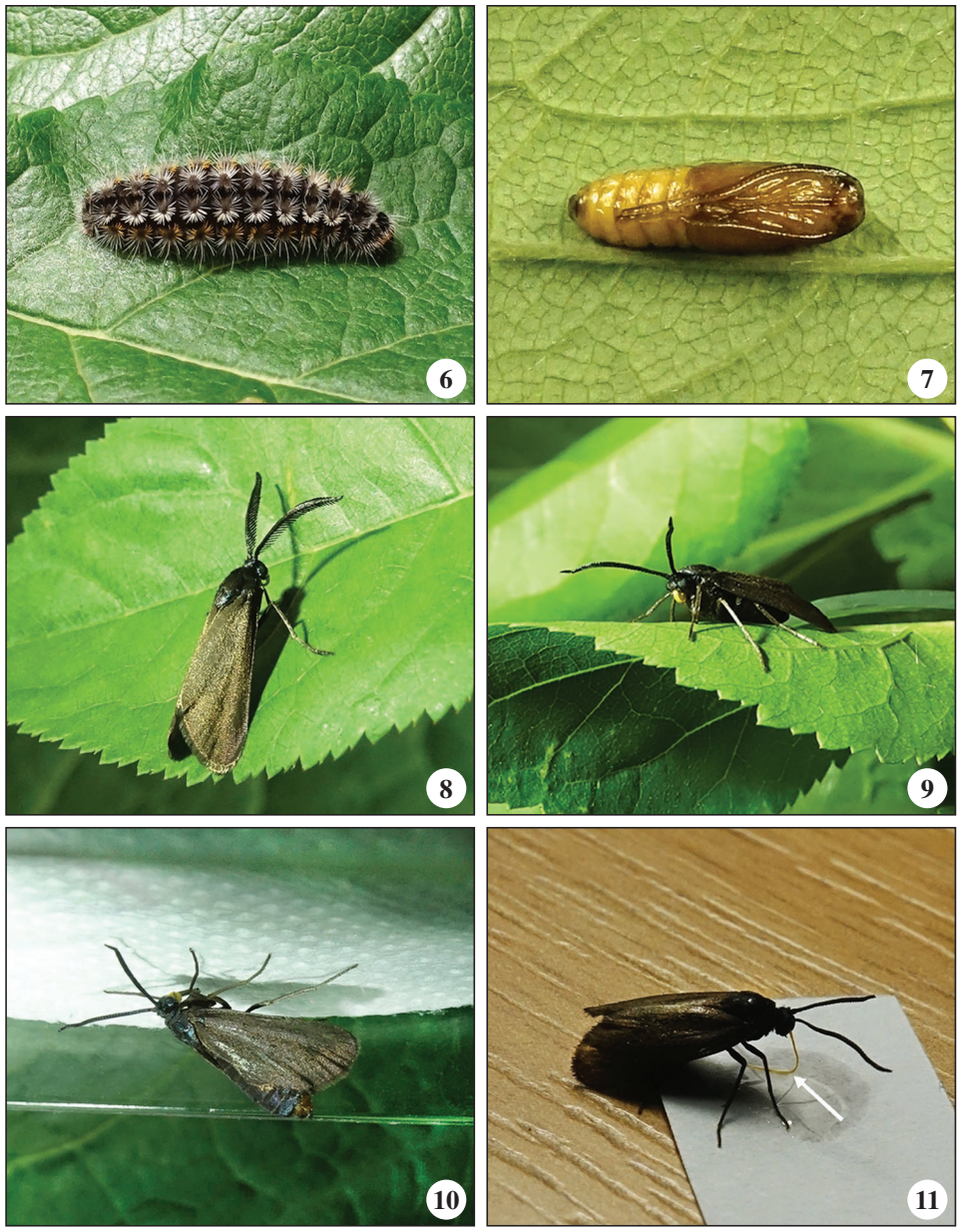
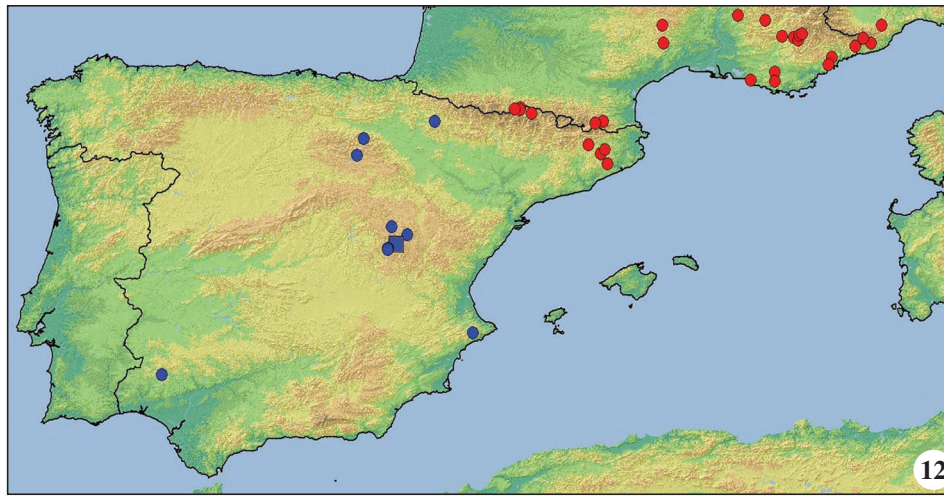
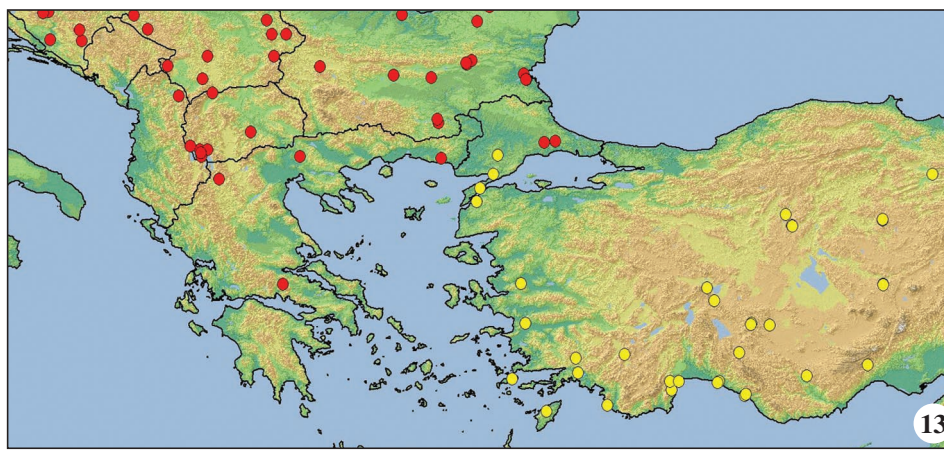


Figures 1-5.– Biology of *Rhagades predotae*. **1.** Habitat of *Rh. predotae* at Spain, Castilla-La Mancha, Cuenca Province, NE of Huélamo, 1222 m. **2.** *Prunus ramburii* Boiss., the larval host-plant. Eggs are shown by white arrow. **3.** Eggs on a leaf of the host-plant. **4.** Second instar larvae and feeding marks on the leaf of *Prunus cerasifera* Ehrh. (in captivity). **5.** Four ninth instar larvae preparing for moulting inside a common silk network construction.



Figures 6-11.– Biology of *Rhagades predotae*. **6.** Fully grown (tenth instar) larva. **7.** Pupa (ventral view). **8.** Freshly emerged male, reared from egg (Spain, Cuenca Province, NE of Huélamo). **9.** Freshly emerged female, reared from egg (Spain, Cuenca Province, NE of Huélamo), yellow proboscis is visible. **10.** Virgin female in calling position waiting for male. **11.** Female feeding from a solution of sucrose in captivity, the well-developed functionally active yellow proboscis is visible.





Figures 12-15.– 12. Distribution of *Rhagades predotae* (blue) and *Rhagades pruni* (red) on Iberian Peninsula (square shows locality vic. Huélamo).**13.** Distribution of *Rhagades pruni* (red) and *Rhagades amasina* (yellow) on Southern Balkans, Aegean Islands and Western Anatolia. **14.** Fully grown larva of *Rh. pruni* (after EFETOV, 2001c). **5.** Fully grown larva of *Rh. amasina* (after EFETOV, 2001c).

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Una nueva especie del género *Tridrepana* Swinhoe, 1895 de las islas de Samar, Leyte y Panay (Filipinas) (Lepidoptera: Drepanidae, Drepaninae)

A. Expósito-Hermosa

Resumen

Se describe *Tridrepana yazakii* Expósito, sp. n., con ejemplares de las islas de Samar, Leyte y Panay (Filipinas). Se proporcionan imágenes del adulto y de la genitalia del macho. Se ofrece un análisis diferencial con respecto a la especie relativamente próxima *Tridrepana spatulata* Watson, 1957.
PALABRAS CLAVE: Lepidoptera, Drepanidae, Drepaninae, *Tridrepana*, especie nueva, Samar, Leyte, Panay, Filipinas.

A new species of the genus *Tridrepana* Swinhoe, 1895 from the Samar, Leyte and Panay Islands (Philippines) (Lepidoptera: Drepanidae, Drepaninae)

Abstract

It is described *Tridrepana yazakii* Expósito, sp. n., with exemplars from the Samar, Leyte and Panay Islands (Philippines). Images of the adult and genitalia of the male are provided. Differential analysis with respect to the relatively close species *Tridrepana spatulata* Watson, 1957, is offered.
KEY WORDS: Lepidoptera, Drepanidae, Drepaninae, *Tridrepana*, new species, Samar, Leyte, Panay, Philippines.

Introducción

La subfamilia Drepaninae fue revisada últimamente de las Filipinas por YAZAKI (2012) con un registro de siete especies para el género *Tridrepana* Swinhoe, 1895.

Al estudiar material del género *Tridrepana* de las Filipinas, se ha podido seleccionar una serie de quince ejemplares que tienen significativas diferencias, tanto en su morfología externa como en la interna, con respecto a las especies ya descritas del género, por lo que seguidamente se procede a describirla como una especie nueva.

Abreviaturas usadas

AEH Colección de Andrés Expósito Hermosa, Móstoles, Madrid (España).

Resultados

Tridrepana yazakii Expósito, sp. n.

Holotipo ♂: FILIPINAS, Monte Capote, 600 m, Isla de Samar X-2005, (preparación de genitalia

AEH3384), colector local. Paratipos: FILIPINAS, Monte Capote, 600 m, Isla de Samar, 9 ♂♂, IV-2001 (preparación de genitalia AEH3386); 1 ♂, IV-2006, Monte Madja, Isla de Panay, 3 ♂♂, IV-2006 (preparación de genitalia AEH3381), colector local. Monte Balocanue, 600 m, Isla de Leyte, 1 ♂, 23-30-IX-2003 (preparación de genitalia AEH3398), colector local. Todos los ejemplares y preparaciones de genitalia quedan depositados en la colección del autor AEH.

Descripción macho (Figs 1-2): Expansión alar de los machos de 24-26 mm. Antenas bipectinadas dos/tercios desde la base y filiforme un/tercio en su segmento distal. Vertex ocre-rojizo. Facies semejante a *Tridrepana albonotata* (Moore, 1879), pero con las manchas discales, de color blanco-nacarado, de ambas alas con forma alargada-transversal; este caracter diferencia facílmente a la especie nueva de la *T. albonota* que las ostenta con delineación más redondeada. Asimismo, las citadas manchas nacaradas se hallan rodeadas de escamas de color marrón-rojizo. Además, la mancha nacarada discal falta en *T. fulvata* (Snellen, 1876) y *T. spatulata* Watson, 1957 sustituida por una mancha circular de escamas marrones. Fondo de alas de color ocre-rojizo con pequeño espolvoreado de escamas marrón-rojizo. Falta la banda mediana más oscura de las alas anteriores de *T. albonotata* (Moore, 1879). También se aprecia en la especie nueva una línea de pequeños trazos en el área terminal paralela al termen en ambas alas. Ápice de las alas anteriores falcatadas, pero la zona del termen no tan agudo como en otras especies de *Tridrepana*. También existen las dos manchas oscuras y circulares típicas del genero; el resto del área proximal es menos oscuro. Las demás partes del anverso son del mismo color que el fondo de las alas. El reverso de ambas alas tiene un tono bastante más apagado y este es muy uniforme; solo se ven algunas tenues manchas, por transparencia del anverso. El cuerpo del reverso es del mismo tono pero las patas presentan escamas rojizas y presencia de anillos en el abdomen

Genitalia de los machos (Figs 3-4): Uncus bifurcado semejante a *Tridrepana spatulata* Watson, 1957, pero con el perímetro interior redondeado y sin la escotadura. Saccus más alargado y menos grueso que en *T. spatulata* Watson, 1957. Valvas anchas con incisión central y acabada en forma de pico romo en el área distal. Costa convexa. Sacculus con un pequeño proceso cerca del vinculum. Socius vestigial. Anellus con tres procesos diferenciadores: el superior más reducido, el central mayor y ambos rectangulares; el inferior con forma de cono invertido. (Figs 3a, 4a): La vesica del aedeagus con cornuti interior y exterior presentes; este último más perceptible. (Fig. 4b): Octavo esternito de forma trapezoidal, lado superior con una profunda curvatura en su zona central y el de la base más amplio con dos brazos laterales. El octavo tergito con forma de triángulo isósceles y lados curvos.

Hembra desconocida.

Distribución: Solo se la conoce de las Islas de Samar, Leyte y Panay, en Filipinas.

Etimología: Se dedica esta especie nueva a Katsumi Yazaki y se la denomina *yazakii*.

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A Katsumi Yazaki por su colaboración y al Dr. Antonio Vives por su siempre muy apreciada ayuda.

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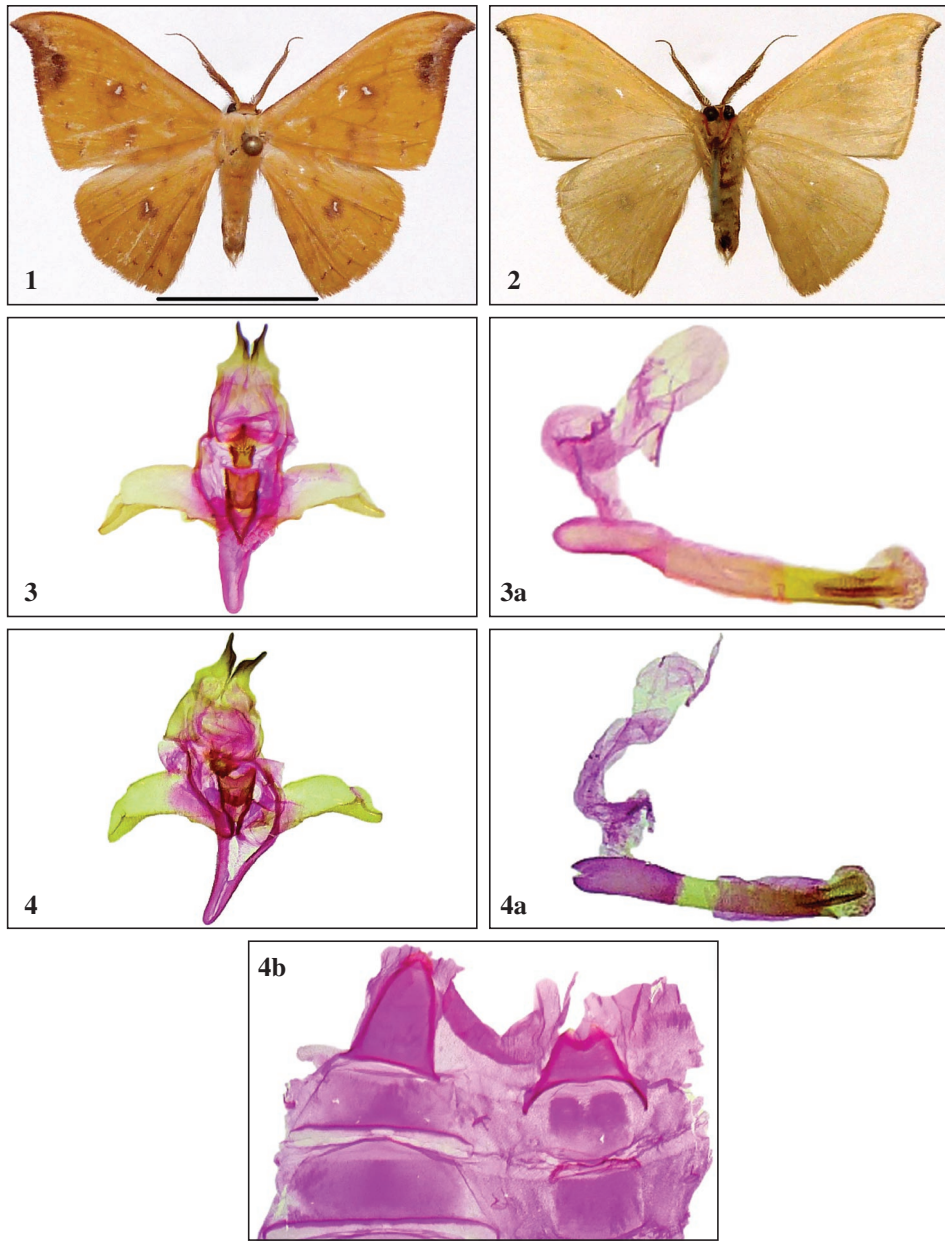

Figs 1-4.– 1. *Tridrepana yazakii* Expósito, sp. n., paratipo, anverso.– Monte Capote, Isla de Samar, IV-2006; **2.** Reverso, Monte Capote, Isla de Samar, IV-2006; **3.** Holotipo, Monte Capote, Isla de Samar, X-2005; **3a.** aedeagus (preparación de genitalia AEH3384); **4.** Paratipo, Monte Madja, Isla de Panay, IV-2006; **4a.** aedeagus; **4b.** parte distal de los últimos segmentos abdominales (preparación de genitalia AEH3381). (Escala 1 cm).

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Nuevas aportaciones al conocimiento de los Geometridae y Noctuoidea de la Sierra del Taibilla y de la Reserva Natural de la Sierra de las Cabras (Albacete-Murcia, España) (Insecta: Lepidoptera)

J. J. Guerrero, R. M. Rubio, M. Garre & A. S. Ortiz

Resumen

Se actualiza el catálogo de los Geometridae y Noctuoidea de la Sierra del Taibilla y de la Reserva Natural de la Sierra de las Cabras (Albacete-Murcia, España). Se añaden 84 nuevos registros repartidos entre las familias Geometridae (47 especies), Euteliidae (1), Notodontidae (1), Erebidae (13), Nolidae (5) y Noctuidae (17). Se discute la eliminación o la reidentificación de determinados taxones que incrementan el catálogo faunístico hasta las 207 especies en la familia Geometridae y hasta las 329 especies en la superfamilia Noctuoidea, entre las que destacan las especies endémicas *Charissa assoi* (Redondo & Gastón, 1997), *Idaea alicantaria* (Reisser, 1963), *Idaea dromikos* Hausmann, 2004, *Scopula concinnaria* (Duponchel, 1842), *Colostygia hilariata* (Pinker, 1954) y *Hadena exspectata* Hacker, 1996. Así mismo, dieciocho especies son nuevas citas para la provincia de Albacete y cuatro para la Región de Murcia.
PALABRAS CLAVE: Insecta, Lepidoptera, faunística, Sierra del Taibilla, Sierra de las Cabras, Albacete, Murcia, España.

New records to Geometridae and Noctuoidea moth fauna from the "Sierra del Taibilla" and the "Sierra de las Cabras" Natural Reserve (Albacete-Murcia, Spain) (Insecta: Lepidoptera)

Summary

The catalog of the Geometridae and Noctuoidea moth from the "Sierra del Taibilla" and the Natural Reserve of the "Sierra de las Cabras" (Albacete-Murcia, Spain) is updated. Eighty-four new records are added among Geometridae (47 species), Euteliidae (1), Notodontidae (1), Erebidae (13), Nolidae (5) and Noctuidae (17). Deletion and reidentification of certain taxa that increase the faunistic catalog are discussed increasing the number of species up to 207 in the family Geometridae and up to 329 species in the Superfamily Noctuoidea. New records are given of the endemic species *Charissa assoi* (Redondo & Gastón, 1997), *Idaea alicantaria* (Reisser, 1963), *Idaea dromikos* Hausmann, 2004, *Scopula concinnaria* (Duponchel, 1842), *Colostygia hilariata* (Pinker, 1954) and *Hadena exspectata* Hacker, 1996. Likewise, eighteen species are new records for the province of Albacete and four for the Murcia Region.
KEY WORDS: Insecta, Lepidoptera, faunistic, Sierra del Taibilla, Sierra de las Cabras, Albacete, Murcia, Spain.

Introducción

La fauna de Macrolepidoptera de la Sierra del Taibilla y de la Reserva Natural de la Sierra de las

Cabras ha sido estudiada en detalle en los últimos años, particularmente las familias Geometridae (GUERRERO *et al.*, 2010), Notodontidae, Erebidae y Nolidae (GUERRERO *et al.*, 2011) y Noctuidae (GUERRERO *et al.*, 2018).

La Sierra del Taibilla y la Reserva Natural de la Sierra de las Cabras abarca una superficie de casi 22.000 hectáreas, situadas en el suroeste de la provincia de Albacete y en el noroeste de la provincia de Murcia (Figura 1). Detalles más concretos sobre las características del área de estudio pueden consultarse en GUERRERO *et al.* (2010).

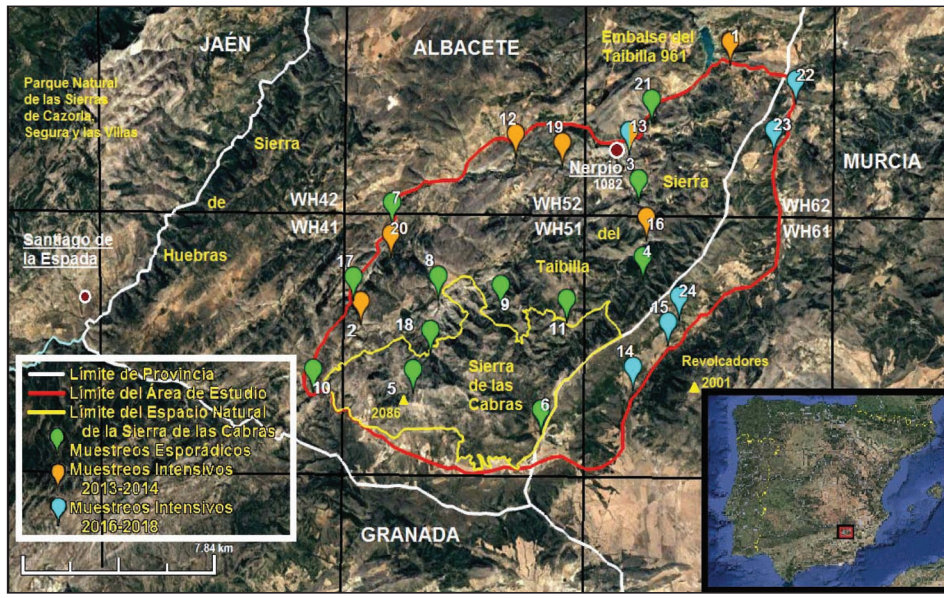

Figura 1.– Mapa de localidades muestreadas en la Sierra del Taibilla y Sierra de las Cabras. (Modificado de Google Earth 2019).

El objetivo del presente trabajo es aportar nuevos registros al catálogo sistemático de las especies de la familia Geometridae y la superfamilia Noctuoidea presentes en la Sierra del Taibilla y en el área protegida de la sierra de las Cabras, destacando las especies más interesantes, y aportar nuevos datos para la fauna lepidopterológica de las provincias de Albacete y Murcia.

Material y método

En el presente trabajo se ha incluido información de los muestreos realizados en el área de estudio de forma esporádica desde el 2013 hasta 2019 y, de forma sistemática, durante los periodos 2013-2014 y 2016-2018, donde los muestreos fueron quincenales en las distintas estaciones seleccionadas. Las localidades muestreadas identificadas con su toponimia, coordenadas U.T.M. 10x10 km, altitud y colectores están situadas en los municipios de Nerpio (Albacete) y Moratalla (Murcia), y pueden consultarse en la Tabla I y Figura 1.

Los muestreos esporádicos se realizaron utilizando trampas con lámparas de vapor mercurio de 125 vatios y con tubos de luz negra de 18 y 36 vatios. Los muestreos sistemáticos de las campañas 2013-2014 y 2016-2018 se realizaron con tubos de luz actínica y negra de 15 vatios. Además, de forma eventual, se utilizaron trampas con atrayente a base de melazas y fruta, y se visitó una cueva en varias

ocasiones para censar especies lucífugas. También se incluyen datos de las colecciones de Aquilino Albaladejo, Francisco Arcas y Juan Francisco Sánchez.

Tabla I.– Lista de localidades muestreadas en la sierra del Taibilla y la sierra de las Cabras. Abreviaturas: ARC: F. Arcas; GUE: J. J. Guerrero; SAN: J. F. Sánchez.

Toponimia	Municipio	Nº	U.T.M.	Altitud (m)	Colectores
Arroyo Blanco, Embalse del Taibilla.	Nerpio	1	30SWH62	960	GUE
Arroyo del Toñido, Las Cañadas.	Nerpio	2	30SWH51	1.420	GUE
Arroyo del Toril, Molinos de la Fuente.	Nerpio	3	30SWH62	1.170	GUE
Barranco de la Gitana.	Nerpio	4	30SWH61	1.440	GUE
Cima de la Sierra de las Cabras.	Nerpio	5	30SWH51	2.060	GUE
Encinar, Las Cañadas	Nerpio	20	30SWH51	1.540	GUE
Fuente de la Zorra, Cortijo Nuevo.	Nerpio	7	30SWH51	1.250	GUE
Fuente de los Arenalejos.	Nerpio	8	30SWH51	1.420	GUE
Hoya Cela, Prado de las Yeguas.	Nerpio	9	30SWH51	1.550	GUE
Hoya del Espino de Arriba.	Nerpio	10	30SWH41	1.560	GUE
Hoya Mala, Torcal de la Cabaña.	Nerpio	11	30SWH51	1.740	GUE
Los Enebros, Lomas del Río.	Nerpio	12	30SWH52	1.130	GUE
Nerpio, Núcleo urbano	Nerpio	13	30SWH62	1.140	GUE
Plantón del Covacho	Nerpio	19	30SWH52	1.105	GUE, ARC, SAN
Río de las Acedas.	Nerpio	16	30SWH61	1.320	GUE
Royo de los Ciruelos, Las Cañadas.	Nerpio	17	30SWH51	1.370	GUE
Talón, Majal Alonso. Sª de las Cabras.	Nerpio	18	30SWH51	1.640	GUE
Zarzalar, Río Taibilla	Nerpio	21	30SWH62	1.030	GUE
Arroyo Blanco, Moratalla	Moratalla	22	30SWH62	1.030	GUE
El Mosquito, Cañada de la Cruz.	Moratalla	6	30SWH51	1.540	GUE
Fuente de los Almeces	Moratalla	23	30SWH62	1.100	GUE
Puerto Alto, Cañada de la Cruz.	Moratalla	14	30SWH61	1.435	GUE
Puerto Hondo, Cañada de la Cruz.	Moratalla	15	30SWH61	1.410	GUE
Umbría de las Víboras	Moratalla	24	30SWH61	1.415	GUE

Los ejemplares están depositados en la colección del Laboratorio de Biología Animal del Departamento de Zoología y Antropología Física de la Universidad de Murcia. El estudio de la genitalia, en los casos requeridos, se ha realizado según procedimientos estándares (HAUSMANN, 2001), aunque con pequeñas modificaciones.

La nomenclatura y la ordenación sistemática de los taxones en sus correspondientes categorías taxonómicas se ha hecho de acuerdo con MÜLLER *et al.* (2019) y KARSHOLT & VAN NIEUKERKEN (2020). El análisis biogeográfico se ha realizado utilizando los corotipos generales propuestos en CALLE (1982) actualizados con los criterios biogeográficos de VARGA (2010), considerando el elemento atlanto-mediterráneo para los taxones que se distribuyen por la Europa atlántica y también aquellos restringidos al Mediterráneo occidental.

Resultados y discusión

La lista de las nuevas especies estudiadas en la Sierra del Taibilla y en la Reserva Natural de la Sierra de las Cabras puede consultarse en el Apéndice, donde se detalla la toponimia distintiva, la fecha de captura y el número de ejemplares estudiados.

Se han registrado 84 especies nuevas para el área de estudio, 47 de las cuales son nuevas para la familia Geometridae, incrementando el censo en esta familia hasta las 207 especies. Así mismo, se ha

registrado una especie de Euteliidae, familia no representada hasta ahora en el área de estudio. También se suman 13 nuevas especies de Erebidae, una especie de Notodontidae y cinco especies de Nolidae, con lo que el censo aumenta hasta las 72 especies de Erebidae, 9 de Notodontidae y 10 de Nolidae. Finalmente, la familia Noctuidae se ha visto incrementada en 17 nuevas especies, alcanzando esta familia las 237 especies en el área de estudio.

En el presente trabajo se citan 18 especies por primera vez para la provincia de Albacete que no habían sido citadas previamente en LENCINA *et al*. (2008, 2009, 2011, 2014, 2015), ARCAS & SÁNCHEZ (2018), GUERRERO *et al*. (2018) y ARCAS *et al.* (2019) y que se destacan en el apéndice con un asterisco (*): *Alsophila aescularia*, *Charissa assoi*, *Agriopis marginaria*, *Idaea dromikos*, *Scopula concinnaria*, *Epirrhoe sandosaria*, *Eupithecia laquaearia*, *E. pantellata*, *E. dodoneata*, *E. variotrigata*, *E. vulgata*, *Coscinia chrysocephala, Pechipogo simplicicornis*, *Nola tutulella*, *Tholera decimalis*, *Hadena exspectata*, *Euxoa nigricans* y *Dichagyris mansoura*. Por otra parte, hay cuatro especies que son citadas por primera vez para la fauna lepidopterológica de la provincia de Murcia (ORTIZ *et al.*, 2016) y se destacan con dos asteriscos (**) en el apéndice: *Colostygia hilariata*, *Lygephila lusoria*, *Omia cymbalariae* y *Euxoa conspicua*.

La publicación de nuevas revisiones taxónomicas en algunas de las familias y los estudios moleculares de determinados taxones han permitido reconsiderar las identificaciones de algunas de las especies publicadas anteriormente.

De esta forma, se han revisado los ejemplares disponibles en la colección que habían sido identificados como *Coscinia cribraria* (Linnaeus, 1758) y entre ellos se han encontrado individuos de *Coscinia chrysocephala*, anteriormente considerada como subespecie de *C. cribraria* y cuyo estatus taxonómico ha sido modificado recientemente por MACIÀ *et al.* (2019). Ambas especies son simpátricas en la área de estudio.

La reidentificación de algunos especímenes ha permitido modificar el catálogo lepidopterológico del área de estudio eliminando del mismo a *Crocallis auberti* Oberthür, 1883, que fue citada previamente en LENCINA *et al.* (2009) y GUERRERO *et al.* (2010) y que se corresponde con un macho de *Crocallis dardoinaria* Donzel, 1840, Albadalejo col. Por otro lado, varios de los ejemplares citados como *Eupithecia innotata* en ORTIZ *et al.* (2009) y GUERRERO *et al.* (2010) han sido reidentificados como *Eupithecia ochridata*, ya que ambas especies coexisten en el área de estudio. Así mismo, se ha eliminado del listado *Hadena luteocincta* (Rambur, 1834), que ha sido identificada como *Hadena wehrlii* (Draudt, 1934).

Otra especie que ha sido eliminada del catálogo es, según ORTIZ *et al.* (2016), *Parascotia fuliginaria* (Linnaeus, 1761), que fue citada en CALLE *et al.* (2007). Sin embargo, *Euxoa conspicua*, especie previamente citada para la provincia de Murcia en CALLE *et al*. (2000) y que se eliminó del censo de Murcia en una revisión posterior (ORTIZ *et al*., 2016) por tratarse de un ejemplar de *Euxoa powelli* (Oberthür, 1912), ve ahora confirmada su presencia.

De entre todas las especies estudiadas destacan algunas que están ampliamente distribuidas en la mitad norte peninsular pero que son poco conocidas en el tercio sur, como los Geometridae *Odontognophos margaritata* solamente citada en Sierra Nevada (KRAUS, 1999) y Albacete (LENCINA *et al.*, 2009); *Selenia lunularia* e *Idaea dromikos* ambas citadas en el Algarve (Portugal) (CORLEY *et al.*, 2015) y además en Albacete (LENCINA *et al.*, 2009) y Málaga (HAUSMANN, 2004; MORENO, 2016), respectivamente. En Granada se citaron *Alsophila aescularia* (RIBBE, 1912) y *Scopula concinnaria* (RIBBE, 1912; REISSER, 1927; COOKE, 1931; LAJONQUIÈRE, 1965b; HAUSMANN, 2004; REDONDO *et al.*, 2009), también *Triphosa sabaudiata* y *Eupithecia graphata hesperia*, ambas en Sierra Nevada (WEHRLI, 1926, 1927; LAJONQUIÈRE, 1965a; MIRONOV, 2003; REDONDO *et al.*, 2009). Entre los Noctuoidea es significativa la presencia del Erebidae *Pechipogo simplicicornis*, citado solamente en Málaga y Cádiz (FIBIGER *et al.*, 2010) y los Noctuidae *Atethmia algirica* en Jaén (LENCINA & ALBERT, 2017) y Granada (MORENTE-BENÍTEZ & PÉREZ-LÓPEZ, 2014; ALBALADEJO *et al*., 2018) y *Tholera decimalis* en Granada (ORTIZ *et al.*, 2010; MORENTE-BENÍTEZ & PÉREZ-LÓPEZ, 2014; ALBALADEJO *et al*., 2018).

Algunas especies estudiadas se caracterizan por tener una distribución restringida en la península

ibérica como *Idaea nigrolineata* que es una especie asociada a hábitats termófilos en Málaga (HAUSMANN, 2004; REDONDO *et al.*, 2009; MORENO, 2016; MORENO, *et al.,* 2016), Murcia (ORTIZ *et al.*, 2010) y Huesca (REDONDO, 1990; REDONDO & GASTÓN, 1999; REDONDO *et al.*, 2009) e *Idaea gelbrechti*, especie iberomagrebí distribuida localmente en los sistemas béticos (GUERRERO *et al.*, 2012). Otras especies que amplían su distribución son *Hadena exspectata*, conocida anteriormente como *Hadena archaica* Hacker, 1996 en Sierra Nevada (HACKER *et al.*, 2002) y como subespecie de *Hadena vulcanica* (Turati, 1907) en Teruel (KRAUS, 2000; HACKER *et al.*, 2002; DE VRIEZE, 2003) y *Dichagyris mansoura,* que con esta cita amplía su distribución meridional, ya que es conocida principalmente en el centro y norte peninsular (CALLE, 1982; KRAUS, 2000; CIFUENTES, 2001; MAGRO & JAMBRINA, 2014; etc.). Entre las especies citadas en el presente estudio destacan los endemismos *Charissa assoi, Idaea alicantaria*, *I. dromikos*, *Scopula concinnaria*, *Colostygia hilariata* y *Hadena exspectata.*

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Apéndice

Lista de especies por orden sistemático con las localidades y número de ejemplares capturados u observados por orden alfabético. Se especifica colector en aquellas localidades con más de uno. Un asterisco (*) delante del nombre indica las especies que son nuevas citas para la fauna lepidopterológica de Albacete, mientras que dos asteriscos (**) resaltan las nuevas especies citadas para la Región de Murcia.

GEOMETRIDAE
GEOMETRINAE

Hemistola chrysoprasaria (Esper, 1795)

Material estudiado: Los Enebros, 20-VI-2014, 2 ex.; Plantón del Covacho, 7-VI-2014, 1 ex.; 20-VI-2014, 2 ex.

Elemento paleártico.

Phaiogramma faustinata (Millière, 1868)

Material estudiado: Nerpio, Núcleo urbano, 8-IX-2016, 1 ♀.

Elemento asiático-mediterráneo.

Microloxia herbaria (Hübner, [1813])

Material estudiado: Arroyo Blanco, 26-VII-2013, 1 ex.; Arroyo Blanco, Moratalla, 4-VIII-2016, 1 ex.; 7-IX-2016, 1 ex.; 18-VIII-2017, 1 ex.; Fuente de los Almeces, 6-VIII-2018, 1 ex.; Nerpio, Núcleo urbano, 24-IX-2013, 1 ex.; 3-VII-2016, 1 ex.; 8-IX-2016, 2 ex.; 24-IX-2016, 1 ex.; 28-VIII-2019, 1 ex.; Plantón del Covacho, 24-VIII-2015, 1 ♂; Puerto Alto, 24-VII-2016, 2 ex.; Puerto Alto, 7-IX-2016, 1 ex.

Elemento asiático-mediterráneo.

ENNOMINAE

Odontognophos margaritata (Zerny, 1927)

Material estudiado: Arroyo Blanco, 24-IX-2013, 5 ex.; 13-IX-2014, 2 ex.; Arroyo del Toñido, 24-IX-2013, 1 ex.; 21-IX-2018, 1 ex.; Los Enebros, 13-IX-2014, 1 ex.; Nerpio, Núcleo urbano, 24-IX-2013, 1 ex.; 6-X-2014, 1 ex.; 16-IX-2018, 1 ex.; Plantón del Covacho, 24-IX-2013, 3 ex.; Río de las Acedas, 6-IX-2013, 1 ex.; 13-IX-2014, 2 ex.; Zarzalar, 6-IX-2018, 2 ex.; 21-IX-2018, 4 ex.; 1-X-2018, 1 ex.

Elemento asiático-mediterráneo.

Acanthovalva inconspicuaria (Hübner, [1819])

Material estudiado: Fuente de los Almeces, 7-IX-2016, 1 ex.

Elemento tropical.

Selenia lunularia (Hübner, [1788])

Material estudiado: Arroyo del Toñido, 11-VI-2010, 1 ex.

Elemento asiático-mediterráneo.

*****_Alsophila aescularia_ ([Denis & Schiffermüller], 1775)

Material estudiado: Arroyo del Toñido, 26-III-2011, 1 ♂; 11-III-2014, 1 ♂; Encinar, 21-III-2013, 1 ♂.

Elemento atlanto-mediterráneo.

*_Charissa assoi_ (Redondo & Gastón, 1997)

Material estudiado: Arroyo Blanco, 20-VI-2014, 1 ex.; Arroyo del Toñido, 26-VII-2013, 2 ♂♂; 6-IX-2013, 3 ♂♂; 24-VIII-2015, 1 ♂, 1 ♀; Encinar, 26-VII-2013, 1 ♂; Fuente de las Cañadas, 21-VI-2019, 1 ♂; Fuente de los Almeces, 4-VIII-2016, 1 ♂; 7-IX-2016, 1 ♂; Los Enebros, 21-IX-2018, 1 ♂; Plantón del Covacho, 6-IX-2013, 1 ♂; 21-IX-2018, 1 ♂; 25-VIII-2019, 2 ex.; Zarzalar, 18-VII-2018, 2 ♂♂; 1-VIII-2018, 1 ♂, 13-VIII-2018, 2 ex.; 27-VIII-2018, 7 ex., 1 ♂; 16-IX-2018, 3 ex., 1 ♀; 21-IX-2018, 2 ♂♂.

Elemento endémico.

Dyscia lentiscaria (Donzel, 1837)

Material estudiado: Arroyo Blanco, Moratalla, 21-IV-2018, 1 ♂; Arroyo del Toñido, 18-IV-2014, 1 ♂; Encinar, 9-V-2013, 1 ♂; 18-IV-2014, 1 ex.; Fuente de los Almeces, 6-V-2017, 1 ♂; Nerpio, Núcleo urbano, 21-III-2013, 1 ♂; 9-V-2013, 2 ex.; 18-IV-2014, 11 ♂♂; 20-IV-2018, 1 ex.; 16-IV-2019, 19 ♂♂; 12-V-2019, 3 ♂♂; Plantón del Covacho, 18-IV-2014, 2 ♂♂; 16-IV-2019, 2 ex.; Puerto Hondo, 6-V-2017, 1 ♂; 20-IV-2018, 2 ex.; Río de las Acedas, 26-III-2011, 9 ♂♂; 21-III-2013, 1 ♂; 12-IV-2013, 3 ex.; 9-V-2013, 1 ♂; 23-V-2013, 1 ex.; 18-IV-2014, 2 ♂♂; Puerto Alto, 11-V-2018, 1 ♂; Umbría de las Víboras, 11-V-2018, 5 ♂♂.

Elemento atlanto-mediterráneo.

Menophra abruptaria (Thunberg, 1792)

Material estudiado: Nerpio, Núcleo urbano, 12-V-2019, 1 ♂.

Elemento asiático-mediterráneo.

Dasypteroma thaumasia Staudinger, 1892

Material estudiado: Arroyo Blanco, 6-IX-2013, 2 ♂♂; 24-IX-2013, 1 ♂; Arroyo del Toñido, 6-IX-2013, 9 ♂♂; 24-IX-2013, 1 ♂; 21-VIII-2014, 1 ♂; 13-IX-2014, 3 ♂♂; Encinar, 13-IX-2014, 3 ♂♂; 16-IX-2018, 3 ♂♂; Fuente de los Almeces, 7-IX-2016, 3 ♂♂; Nerpio, Núcleo urbano, 6-IX-2013, 2 ♂♂; 17-IX-2015, 2 ♂♂; 16-IX-2018, 1 ♂; 19-IX-2019, 1 ex.; Plantón del Covacho, 16-IX-2018, 1 ♂; Puerto Alto, 7-IX-2016, 1 ♂; 24-IX-2016, 1 ♂; 13-IX-2017, 25 ♂♂; Puerto Hondo, 7-IX-2016, 2 ♂♂; 13-IX-2017, 1 ♂; Río de las Acedas, 6-IX-2013, 16 ♂♂; 24-IX-2013, 1 ♂; 13-IX-2014, 1 ♂; 24-VIII-2015, 1 ♂; Zarzalar, 16-IX-2018, 8 ♂♂; 21-IX-2018, 2 ♂♂.

Elemento atlanto-mediterráneo.

Erannis defoliaria (Clerck, 1759)

Material estudiado: Encinar, 3-XII-2018, 1 ♂; 1-XII-2019, 2 ex.

Elemento paleártico.

**Agriopis marginaria* (Fabricius, 1777)

Material estudiado: Encinar, 12-IV-2013, 2 ♂♂.

Elemento asiático-mediterráneo.

Sardocyrnia fortunaria (Vázquez, 1905)

Material estudiado: Arroyo Blanco, 24-IX-2013, 1 ex.; 22-V-2014, 1 ex.; 7-VI-2014, 2 ex.; Fuente de los Almeces, 28-V-2017, 3 ex.; Río de las Acedas, 20-VI-2014, 1 ex.

Elemento atlanto-mediterráneo.

STERRHINAE

Anthometra plumularia Boisduval, 1849

Material estudiado: Encinar, 17-VII-2018, 1 ex.; Fuente de las Cañadas, 9-VII-2013, 1 ex.; 5-VII-2014, 2 ex.; Fuente de los Almeces, 3-VII-2016, 1 ex.

Elemento atlanto-mediterráneo.

Idaea alicantaria (Reisser, 1963)

Material estudiado: Nerpio, Núcleo urbano, 23-VI-2017, 1 ♀.

Elemento endémico.

Idaea nigrolineata (Chrétien, 1911)

Material estudiado: Arroyo Blanco, Moratalla, 4-VIII-2016, 1 ex.

Elemento atlanto-mediterráneo.

Idaea filicata (Hübner, [1799])

Material estudiado: Nerpio, Núcleo urbano, 1-X-2018, 1 ♂.

Elemento asiático-mediterráneo.

Idaea blaesii Lenz & Hausmann, 1992
Material estudiado: Arroyo Blanco, 7-VIII-2014, 1 ♂.
Elemento atlanto-mediterráneo.

Idaea subsaturata (Guenée, 1858)
Material estudiado: Nerpio, Núcleo urbano, 30-VII-2018, 1 ex.; 3-VIII-2019, 1 ex.
Elemento atlanto-mediterráneo.

Idaea infirmaria (Rambur, 1833)
Material estudiado: Arroyo Blanco, 7-VIII-2014, 2 ex.; Arroyo Blanco, Moratalla, 24-VII-2016, 1 ex.; 4-VIII-2016, 1 ex.; 6-VIII-2018, 1 ex.; Fuente de los Almeces, 4-VIII-2016, 1 ex.; 24-VI-2017, 1 ex.; Nerpio, Núcleo urbano, 30-VII-2018, 1 ex.; Río de las Acedas, 26-VII-2013, 2 ex.; 22-VII-2014, 2 ex.; 7-VIII-2014, 4 ex.; Puerto Alto, 4-VIII-2016, 1 ex.
Elemento atlanto-mediterráneo.

**Idaea dromikos* Hausmann, 2004
Material estudiado: Arroyo del Toñido, 21-VIII-2014, 1 ex., 1 ♂.
Elemento endémico.

Idaea gelbrechti Hausmann, 2003
Material estudiado: Arroyo del Toñido, 26-VII-2013, 1 ♂; 22-VII-2014, 1 ex.; 21-VIII-2014, 1 ♂; Plantón del Covacho, 19-VII-2018, 2 ex.; Puerto Alto, 22-VII-2017, 1 ♂; 6-VIII-2018, 1 ♂; 1-VIII-2019, 1 ex.
Cita bibliográfica: GUERRERO *et al.* (2012).
Elemento atlanto-mediterráneo.

Cinglis andalusiaria Wagner, 1935
Material estudiado: Arroyo Blanco, 22-VII-2014, 1 ex.; Fuente de los Almeces, 22-VII-2017, 1 ex.; Zarzalar, 1-VIII-2018, 1 ex.; 27-VIII-2018, 1 ex.
Elemento atlanto-mediterráneo.

**Scopula concinnaria* (Duponchel, 1842)
Material estudiado: Encinar, 17-VII-2018, 1 ♀; Nerpio, Núcleo urbano, 7-VI-2014, 1 ex.; 21-VI-2019, 1 ♀.
Elemento endémico.

Scopula emutaria (Hübner, [1809])
Material estudiado: Arroyo Blanco, 25-VI-2013, 1 ex.; Arroyo Blanco, Moratalla, 27-VI-2017, 1 ex.; Fuente de los Almeces, 28-V-2017, 1 ex.
Elemento atlanto-mediterráneo.

Scopula rufomixtaria (Graslin, 1863)
Material estudiado: Encinar, 17-VII-2018, 1 ♂.
Elemento atlanto-mediterráneo.

Lythria sanguinaria (Duponchel, 1842)
Material estudiado: Arroyo del Toñido, 12-VI-2010, 4 ex.; 9-V-2013, 2 ex.; 25-VI-2013, 2 ex.; 22-V-2014, 20 ex.; 16-IV-2019, 1 ex.; 1-VI-2019, 2 ♂♂, 1 ♀.
Elemento atlanto-mediterráneo.

LARENTIINAE

Aplocera plagiata (Linnaeus, 1758)
Material estudiado: Encinar, 16-IX-2018, 1 ex.; Nerpio, Núcleo urbano, 24-IX-2013, 2 ex.; 7-VI-2014, 1 ex.; 14-V-2016, 1 ex.; Fuente de las Cañadas, 22-V-2014, 1 ex.; Plantón del Covacho, 24-IX-2013, 1 ♂; 1-VI-2019, 1 ♂; Puerto Hondo, 16-VI-2018, 1 ♂.
Cita bibliográfica: ORTIZ *et al.* (2016).
Elemento euroasiático.

Lithostege griseata ([Denis & Schiffermüller], 1775)
Material estudiado: Nerpio, Núcleo urbano, 18-IV-2014, 1 ex.
Elemento euroasiático.

**Epirrhoe sandosaria* (Herrich-Schäffer, 1852)
Material estudiado: Arroyo Blanco, 12-X-2012, 6 ex.; 24-IX-2013, 1 ex.
Elemento atlanto-mediterráneo.

***Colostygia hilariata* (Pinker, 1954)
Material estudiado: Puerto Hondo, 7-IX-2016, 1 ♂.
Elemento endémico.

Nebula ibericata (Staudinger, 1871)
Material estudiado: Arroyo Blanco, 12-IV-2013, 2 ex.; 11-III-2014, 1 ex.; 18-IV-2014, 2 ex.; Nerpio, Núcleo urbano, 24-IX-2016, 1 ♀.
Elemento atlanto-mediterráneo.

Triphosa sabaudiata (Duponchel, [1831])
Material estudiado: Arroyo del Toñido, 26-III-2011, 1 ex.; Fuente de los Arenalejos, 13-X-2012, 6 ex.; 24-IX-2013, 21 ex.; 22-VII-2014, 5 ex.
Elemento asiático-mediterráneo.

Perizoma flavosparsata (Wagner, 1926)
Material estudiado: Encinar, 13-IX-2014, 1 ♀; Nerpio, Núcleo urbano, 8-IX-2016, 1 ex.
Elemento atlanto-mediterráneo.

**Eupithecia laquaearia* Herrich-Schäffer, 1848
Material estudiado: Encinar, 21-VI-2019, 1 ♀; Nerpio, Núcleo urbano, 12-V-2019, 2 ♀♀; Plantón del Covacho, 1-VIII-2019, 1 ♀.
Elemento paleártico.

**Eupithecia pantellata* Millière, 1875
Material estudiado: Arroyo del Toñido, 23-V-2013, 1 ex.
Elemento atlanto-mediterráneo.

Eupithecia alliaria Staudinger, 1870
Material estudiado: Arroyo del Toñido, 26-VII-2013, 1 ex.
Elemento asiático-mediterráneo.

**Eupithecia dodoneata* Guenée, 1858
Material estudiado: Encinar, 1-VI-2019, 1 ♀.
Nota: REDONDO *et al*. (2009) sitúan su presencia en el suroeste de la provincia de Albacete, aunque no indican ningún dato adicional.
Elemento euroasiático.

Eupithecia innotata (Hufnagel, 1767)
Material estudiado: Nerpio, Núcleo urbano, 16-IV-2019, 5 ♀♀.
Elemento euroasiático.

Eupithecia ochridata Schütze & Pinker, 1968
Material estudiado: Arroyo Blanco, 6-X-2014, 1 ♀; Arroyo Blanco, Moratalla, 7-X-2016, 2 ♂♂; Arroyo del Toñido, 23-V-2013, 1 ♀; 1-VI-2019, 1 ♀; Fuente de los Almeces, 7-X-2016, 2 ♂♂; 24-IX-2016, 1 ♂; Plantón del Covacho, 1-VI-2019, 1 ♀.
Nota: Algunos de los ejemplares de la localidad de Moratalla con fecha de captura anterior a 2010 fueron cita-

dos como *Eupithecia innotata* en ORTIZ *et al.* (2009) y referenciados en GUERRERO *et al.* (2010), pero posteriormente fueron identificados como *E. ochridata* en ORTIZ *et al.* (2016).

Elemento euroasiático.

Eupithecia graphata (Treitschke, 1828)

Material estudiado: Plantón del Covacho, 7-VI-2014, 1 ♀.

Elemento asiático-mediterráneo.

Eupithecia irriguata (Hübner, [1813])

Material estudiado: Los Enebros, 9-V-2013, 3 ex.; Umbría de las Víboras, 11-V-2018, 1 ex.

Elemento euroasiático.

Eupithecia distinctaria Herrich-Schäffer, 1848

Material estudiado: Puerto Hondo, 11-VI-2016, 1 ♀.

Elemento asiático-mediterráneo.

**Eupithecia variostrigata* Alphéraky, 1876

Material estudiado: Arroyo Blanco, 12-X-2012, 4 ex.; 24-IX-2013, 4 ex.; 6-X-2014, 22 ex., 2 ♂♂; Arroyo Blanco, Moratalla, 24-IX-2016, 1 ex.; 7-X-2016, 9 ex.; Fuente de los Almeces, 24-IX-2016, 4 ex.; 7-X-2016, 13 ex.; 13-X-2018, 1 ex.; Los Enebros, 21-IX-2018, 2 ex.; Nerpio, Núcleo urbano, 24-IX-2013, 1 ex.; 7-X-2016, 2 ex.; 13-X-2018, 1 ex.; Plantón del Covacho, 24-IX-2013, 1 ♂; 6-X-2014, 15 ex., 1 ♂; 1-X-2018, 1 ♂; Puerto Alto, 7-X-2016, 1 ex.; Zarzalar, 1-X-2018, 1 ex.

Elemento asiático-mediterráneo.

Eupithecia gratiosata Herrich-Schäffer, 1861

Material estudiado: Nerpio, Núcleo urbano, 21-VI-2019, 1 ex.

Elemento asiático-mediterráneo.

**Eupithecia vulgata* (Haworth, 1809)

Material estudiado: Arroyo del Toñido, 7-VI-2014, 1 ♀. Puerto Alto, 16-VI-2018, 1 ♀.

Elemento paleártico.

NOCTUOIDEA

NOTODONTIDAE

THAUMETOPOEINAE

Thaumetopoea pinivora (Treitschke, 1834)

Material estudiado: Arroyo Blanco, 6-IX-2013, 3 ♂♂; 24-IX-2013, 1 ♂; 13-IX-2014, 2 ♂♂; Arroyo del Toñido, 6-IX-2013, 1 ♂; Nerpio, Núcleo urbano, 6-IX-2013, 3 ♂♂; 13-IX-2014, 2 ♂♂; 14-IX-2015, 1 ♂; 16-IX-2018, 1 ♂; Plantón del Covacho, 6-IX-2013, 1 ♂; 16-IX-2018, 1 ♂.

Elemento atlanto-mediterráneo.

EREBIDAE

HYPENINAE

Hypena obsitalis (Hübner, [1813])

Material estudiado: Fuente de los Arenalejos, 24-IX-2013, 1 ex.; Nerpio, Núcleo urbano, 12-V-2019, 1 ex.; Puerto Hondo, 11-V-2018, 1 ex.; Zarzalar, 16-IX-2018, 1 ex.

Elemento asiático-mediterráneo.

LYMANTRIIDAE

Euproctis chrysorrhoea (Linnaeus, 1758)

Material estudiado: Arroyo Blanco, 5-VII-2014, 1 ♂.

Elemento paleártico.

ARCTIINAE

**Coscinia chrysocephala* (Hübner, [1810])

Material estudiado: Arroyo Blanco, 7-VI-2014, 1 ex.; 20-VI-2014, 1 ex.; Plantón del Covacho, 20-VI-2014, 1 ex.

Elemento atlanto-mediterráneo.

Utetheisa pulchella (Linnaeus, 1758)

Material estudiado: Arroyo Blanco, 6-IX-2013, 3 ex.; 24-IX-2013, 2 ex.; 24-X-2013, 2 ex.; Nerpio, Núcleo urbano, 24-IX-2013, 1 ex.; 24-X-2013, 2 ex.; 7-XI-2013, 1 ex.

Elemento cosmopolita.

HERMINIINAE

**Pechipogo simplicicornis* (Zerny, 1935)

Material estudiado: Arroyo del Toñido, 7-VIII-2014, 1 ♀; Nerpio, Núcleo urbano, 27-VIII-2018, 1 ex.; Plantón del Covacho, 21-VIII-2014, 1 ♂; 24-VIII-2015, 1 ♂; 1-VIII-2019, 1 ♀.

Elemento asiático-mediterráneo.

Polypogon plumigeralis (Hübner, [1825])

Material estudiado: Arroyo Blanco, 25-VIII-2005, 1 ex.; Plantón del Covacho, 24-VIII-2015, 1 ♀.

Elemento euroasiático.

EREBINAE

Zethes insularis Rambur, 1833

Material estudiado: Nerpio, Núcleo urbano, 16-VIII-2018, 1 ex.; 25-VIII-2019, 1 ex.

Elemento asiático-mediterráneo.

Catocala puerpera (Girona, 1791)

Material estudiado: Zarzalar, 9-VIII-2018, 1 ex.

Elemento asiático-mediterráneo.

Ophiusa tirhaca (Cramer, 1773)

Material estudiado: Fuente de los Almeces, 13-X-2018, 1 ex.

Elemento tropical.

Clytie illunaris (Hübner, [1813])

Material estudiado: Arroyo Blanco, 6-IX-2013, 1 ex.; Arroyo Blanco, Moratalla, 27-V-2017, 1 ex.; 18-VIII-2017, 1 ex.; Fuente de los Almeces, 18-VIII-2017, 2 ex.; 6-VIII-2018, 1 ex.; Zarzalar, 18-VII-2018, 2 ex.

Elemento atlanto-mediterráneo.

***Lygephila lusoria* (Linnaeus, 1758)

Material estudiado: Puerto Alto, 16-VII-2018, 1 ♂; Puerto Hondo, 24-VI-2017, 1 ♂, 1 ♀; Umbría de las Víboras, 16-VI-2018, 1 ♂; 16-VII- 2018, 2 ♂♂, 2 ♀♀.

Elemento atlanto-mediterráneo.

Autophila dilucida (Hübner, [1808])

Material estudiado: Arroyo Blanco, 26-III-2011, 1 ex.; 9-VII-2013, 1 ex.; Fuente de los Almeces, 20-IV-2018, 1 ex.; Los Enebros, 26-III-2011, 1 ex.; Nerpio, Núcleo urbano, 16-VI-2018, 1 ex.; Puerto Hondo, 24-VI-2017, 1 ex.

Elemento asiático-mediterráneo.

Apopestes spectrum (Esper, 1787)

Material estudiado: Fuente de los Arenalejos, 13-X-2012, 1 ex.; 24-IX-2013, 2 ex.; 22-VII-2014, 2 ex.

Elemento asiático-mediterráneo.

EUTELIIDAE
EUTELIINAE

Eutelia adulatrix (Hübner, [1813])
Material estudiado: Nerpio, Núcleo urbano, 16-IX-2015, 1 ex.; 2-VIII-2018, 1 ex.; 19-IX-2019, 1 ex.
Elemento asiático-mediterráneo.

NOLIDAE
NOLINAE

Nola subchlamydula Staudinger, 1871
Material estudiado: Encinar, 17-VII-2018, 1 ♀; Fuente de los Almeces, 24-VI-2017, 1 ex.; Puerto Alto, 24-VI-2017, 3 ex.; 16-VII-2018, 1 ex.; Umbría de las Víboras, 16-VI-2018, 1 ex.
Elemento asiático-mediterráneo.

**Nola tutulella* Zerny, 1927
Material estudiado: Plantón del Covacho, 7-VI-2014, 1 ♂; 19-VII-2018, 1 ♂; Río de las Acedas, 5-VII-2014, 1 ♂, 1♀.
Elemento atlanto-mediterráneo.

CHLOEPHORINAE

Nycteola siculana (Fuchs, 1899)
Material estudiado: Arroyo Blanco, Moratalla, 7-IX-2016, 1 ♂; Nerpio, Núcleo urbano, 7-VI-2014, 1 ex.; 16-IV-2019, 1 ♂.
Elemento euroasiático.

Earias albovenosana (Oberthür, 1917)
Material estudiado: Arroyo Blanco, 7-VI-2014, 1 ex.; Nerpio, Núcleo urbano, 21-VII-2017, 1 ex.; 12-V-2019, 1 ex.; 21-VI-2019, 1 ex.; Zarzalar, 18-VII-2018, 1 ex.
Elemento atlanto-mediterráneo.

Earias insulana (Boisduval, 1833)
Material estudiado: Nerpio, Núcleo urbano, 14-IX-2015, 1 ex.; 16-VI-2018, 1 ex.; Puerto Alto, 24-IX-2016, 1 ex.
Elemento tropical.

NOCTUIDAE
EUSTROTIINAE

Pseudozarba bipartita (Herrich-Schäffer, 1850)
Material estudiado: Arroyo Blanco, Moratalla, 4-VIII-2016, 1 ex.; 6-VIII-2018, 1 ex.; Nerpio, Núcleo urbano, 8-IX-2016, 2 ex.; 27-VIII-2018, 3 ex.; 21-IX-2018, 1 ex.; 25-VIII-2019, 1 ex.; 28-VIII-2019, 2 ex.; Puerto Hondo, 4-VIII-2016, 2 ex.; 16-VI-2018, 1 ex.; Puerto Alto, 4-VIII-2016, 1 ex.; 7-IX-2016, 2 ex.
Elemento atlanto-mediterráneo.

ACONTIINAE

Metopoceras (*Tritomoceras*) *khalildja* Oberthür, 1884
Material estudiado: Arroyo Blanco, Moratalla, 21-IV-2018, 1 ex.
Elemento atlanto-mediterráneo.

ONCOCNEMIDINAE

Stilbia andalusiaca Staudinger, 1892
Material estudiado: Nerpio, Núcleo urbano, 19-IX-2019, 2 ♂♂.

Elemento atlanto-mediterráneo.

****Omia cymbalariae*** (Hübner, [1809])
Material estudiado: Umbría de las Víboras, 12-V-2018, 1 ex.
Elemento atlanto-mediterráneo.

PSAPHIDINAE

Meganephria bimaculosa (Linnaeus, 1767)
Material estudiado: Plantón del Covacho, 23-IX-2017, 1 ♂ (Arcas leg.).
Elemento asiático-mediterráneo.

NOCTUINAE

Gortyna xanthenes Germar, 1842
Material estudiado: Nerpio, Núcleo urbano, 7-X-2016, 1 ♂.
Elemento atlanto-mediterráneo.

Nonagria typhae (Thunberg, 1784)
Material estudiado: Arroyo Blanco, Moratalla, 22-VII-2017, 1 ex.; Fuente de los Almeces, 6-VIII-2018, 1 ex.
Elemento euroasiático.

Atethmia algirica (Culot, 1917)
Material estudiado: Nerpio, Núcleo urbano, 21-IX-2018, 1 ♀.
Elemento atlanto-mediterráneo.

Dryobotodes (Dichonioxa) tenebrosa (Esper, 1789)
Material estudiado: Puerto Alto, 7-X-2016, 1 ex.
Elemento atlanto-mediterráneo.

Tholera decimalis (Poda, 1761)
Material estudiado: Plantón del Covacho, 16-IX-2017, 1 ♂ (Sánchez leg.).
Elemento euroasiático.

Hadena (*Hadena*) *albimacula* (Borkhausen, 1792)
Material estudiado: Puerto Hondo, 16-VI-2018, 1 ex.
Elemento euroasiático.

Hadena (Hadena) exspectata Hacker, 1996
Material estudiado: Plantón del Covacho, 19-VII-2018, 1 ♀.
Elemento endémico.

Mythimna (Hyphilare) algirica (Oberthür, 1918)
Material estudiado: Arroyo Blanco, Moratalla, 23-VIII-2016, 3 ex.; 24-IX-2016, 1 ♂; 18-VIII-2017, 2 ♂♂; 13-IX-2017, 1 ♂; 13-X-2018, 1 ♂; Fuente de los Almeces, 13-X-2018, 1 ♂.
Elemento atlanto-mediterráneo.

Dichagyris (Stenosomides) mansoura (Chrétien, 1911)
Material estudiado: Encinar, 19-IX-2019, 2 ♂♂; Nerpio, Núcleo urbano, 17-IX-2015, 1 ex.; 8-IX-2016, 1 ex.; 16-IX-2018, 2 ex.; Río de las Acedas, 24-VIII-2015, 1 ex.
Elemento asiático-mediterráneo.

****Euxoa (Euxoa) conspicua*** (Hübner, [1824])
Material estudiado: Puerto Alto, 13-IX-2017, 1 ♀; Puerto Alto, 11-VI-2016, 1 ex.

Nota: Esta especie fue citada para la provincia de Murcia en CALLE *et al*. (2000). En una revisión posterior (ORTIZ *et al*., 2016) se eliminó del censo de Murcia por tratarse de un ejemplar de *Euxoa powelli* (Oberthür, 1912).

Elemento euroasiático.

**Euxoa (Euxoa) nigricans* (Linnaeus, 1761)

Material estudiado: Arroyo del Toñido, 3-VIII-2019, 1 ex.

Elemento euroasiático.

Noctua janthina [Denis & Schiffermüller], 1775

Material estudiado: Nerpio, Núcleo urbano, 18-VIII-2017, 1 ex.; 11-IX-2017, 1 ex.; 30-VII-2018, 1 ex.; 27-VIII-2018, 1 ex.; Plantón del Covacho, 1-VIII-2019, 1 ex.; Puerto Alto, 18-VIII-2017, 1 ex.

Elemento asiático-mediterráneo.

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Descripción de cuatro nuevas especies y otras citas de interés para la fauna de Lepidoptera de España (Insecta: Lepidoptera)

J. Gastón & A. Vives Moreno

Resumen

Se describen cuatro nuevas especies descubiertas en España: *Agnoea (Agnoea) revillai* Gastón & Vives, sp. n., *Symmoca requenai* Gastón & Vives, sp. n., *Symmoca redondoi* Gastón & Vives, sp. n. y *Megacraspedus carolustertius* Gastón & Vives, sp. n. Se introduce un cambio taxonómico con *Symmoca degregorioi* Requena, 2007, que es una sinonimia nueva de *Symmoca nigromaculella* Ragonot, 1875. *Symmoca revoluta* Gozmány, 1985 se cita por primera vez para España. También se cita por primera vez para España y para Europa la especie *Mirificarma scissella* (Chrétien, 1915). Se describen las hembras de *Agnoea (Agnoea) xanthosoma* (Rebel, 1900) y *Symmoca senora* Gozmány, 1977. Se presentan fotografías de los adultos y de su genitalia.
PALABRAS CLAVE: Insecta, Lepidoptera, nuevas especies, nuevas citas, España.

Description of four new species and other records of interest for the Lepidoptera fauna of Spain (Insecta: Lepidoptera)

Abstract

Four new species discovered in Spain are described: *Agnoea (Agnoea) revillai* Gastón & Vives, sp. n., *Symmoca requenai* Gastón & Vives, sp. n., *Symmoca redondoi* Gastón & Vives, sp. n. and *Megacraspedus carolustertius* Gastón & Vives, sp. n. A taxonomic change is introduced with *Symmoca degregorioi* Requena, 2007 which is a new synonymy of *Symmoca nigromaculella* Ragonot, 1875. *Symmoca revoluta* Gozmány, 1985 is cited for the first time for Spain. The species *Mirificarma scissella* (Chrétien, 1915) is also cited for the first time for Spain and Europe. Females of *Agnoea (Agnoea) xanthosoma* (Rebel, 1900) and *Symmoca senora* Gozmány, 1977 are described. Photographs of the adults and genitalia are present.
KEY WORDS: Insecta, Lepidoptera, new species, new records, Spain.

Introducción

Como continuación al trabajo iniciado sobre la fauna de Lepidoptera de España (GASTÓN & VIVES MORENO, 2020), se proporcionan nuevos datos que amplían y enriquecen la biodiversidad de la fauna de España. El material estudiado procede igualmente de colecciones particulares y también de los fondos del Museo Nacional de Ciencias Naturales de Madrid (MNCN) y del Museo de Ciencias Naturales de Barcelona (MCNB), abarcando varias familias como Autostichidae, Lypusidae y Gelechiidae.

Material y métodos

El material utilizado para el estudio se ha obtenido mediante muestreos nocturnos y diurnos, con trampas de luz actínica distribuidas en los biotopos apropiados y disponiendo de las autorizaciones de las diferentes regiones afectadas. Para su identificación nos hemos basado en el examen comparativo de los caracteres morfológicos externos y, sobre todo, en el análisis de la estructura genital de los ejempla-

res. La preparación de los órganos genitales se ha efectuado siguiendo a ROBINSON (1976), con modificaciones. Se han utilizado los microscopios Leica DMLB, Leica MZAPO, NIKON Eclipse E400 y las cámaras digital Leica DFC550, NIKON D3100 y SONY á100 DSLR-A100K con objetivo AF 100 MACRO 1:2,8 (32), e igualmente para el retoque fotográfico, el programa de Adobe Photoshop ©.

Abreviaturas

AV	Antonio Vives
ER	Emili Requena
JG	Javier Gastón
LG	László Gozmány
RA	Ramón Agenjo
MCNB	Museo de Ciencias Naturales de Barcelona, Barcelona, España
MNCN	Museo Nacional de Ciencias Naturales, Madrid, España
NHMW	Naturhistorische Museum Wien, Wien, Austria
ZMUC	Zoologisk Museum, University of Copenhagen, Copenhagen, Denmark
prep. gen.	preparación de genitalia

Resultados

LYPUSIDAE

Para el estatus actual de la familia Lypusidae Herrich-Schäffer, 1857 (*KorrespBl. zool.-min. Ver. Regensburg*, **11**: 58), se ha seguido a HEIKKILÄ & KAILA (2019) y dentro de la misma, hemos considerado dos subfamilias Lypusinae y Chimabachinae Heinemann, 1870 (*Schmett. Dtl. Schweitz,* (2)**2**(1): 130).

Hemos estudiado el género *Agnoea* Walsingham, 1907 (*Proc. U. S. Nat. Mus*., **33**(1567): 200. Especie tipo *Blastobasis evanescens* Walsingham, 1901), que tiene una distribución Paleártica y, actualmente, está dividido en dos subgéneros *Agnoea,* con diecisiete especies y *Tubuliferodes* Toll, 1956 (*Ann. Zool. Warsawa*, **16**: 185), con tres especies (SINEV & LVOVSKY, 2014).

El género *Agnoea* fue originalmente incluido en los Blastobasidae (WALSINGHAM, 1907), después transferido a los Oecophoridae (FLETCHER, 1929 lo pasa a sinonimia del género *Borkhausenia* Hübner, [1825] 1816) y últimamente a los Lypusidae (SINEV, 2014), que es lo que seguimos.

Las especies que actualmente se incluyen en el género *Agnoea*, han sido situadas en otros géneros a lo largo del tiempo y que han pasado a considerarse sinonimias de este, a saber: *Pseudatemelia* Rebel, 1910 (*Verh. zool.-bot. Ges. Wien*, **60**: 29, especie tipo *Pseudatemelia aeneella* Rebel, 1910, por monotipia); *Tubulifera* Spuler, 1910 (*Schmett. Eur*., **2**: 345, especie tipo *Tinea flavifrontella* [Denis & Schiffermüller], 1775, por monotipia, es una homonimia de *Tubulifera* Zopf, 1885 *in* Schenk, (Protozooa), *Handb. Botanik*, **3**(2): 173); *Tubuliferola* Strand, 1917 (*Int. ent. Z*., **10**: 137, especie tipo *Tinea flavifrontella* [Denis & Schiffermüller], 1775, por monotipia, nombre de reemplazo para *Tubulifera* Spuler, 1910) y *Tubuliferodes* Toll, 1956 (*Annls zool., Warsz*., **16**: 185, especie tipo *Tubuliferola josephinae* Toll, 1956, por monotipia) que consideramos como un subgénero válido ([DENIS & SCHIFFERMÜLLER], 1775; DOUBLEDAY, 1859; STAUDINGER, 1859; REBEL, 1900; TOLL, 1956; JÄCKH, 1959, 1972; VIVES MORENO, 1986; CORLEY, 2014, GASTÓN & VIVES MORENO, 2020).

El género *Agnoea*, está ampliamente representado en la Península Ibérica (VIVES MORENO, 2014, con modificaciones) y actualmente cuenta con once especies presentes en España (E.) y cuatro en Portugal (P.), a saber:

(E.) *Agnoea (Agnoea) flavifrontella* ([Denis & Schiffermüller], 1775). *Ank. syst. Wienergegend*: 143
(E.) *Agnoea (Agnoea) subochrella* (Doubleday, 1859). *Syn. List Brit. Butterflies & Moths*: 31
(E.P.) *Agnoea (Agnoea) nonscriptella* Corley, 2014. *Entomologist's Rec. J. Var.*, **126**: 242

= *monscriptella;* Vives, 2014. *Cat. sis. sin. Lep. Pen. Iber*.: 119, *lapsus calami*
(E.P.) *Agnoea (Agnoea) filiella* (Staudinger, 1859). *Stett. ent. Ztg*., **20**: 247
= *blidella* Chrétien, 1915. *Ann. Soc. Ent. Fr*., **84**: 244
(E.) *Agnoea (Agnoea) detrimentella* (Staudinger, 1859). *Stett. ent. Ztg*., **20**: 247
(E.) ***Agnoea (Agnoea) revillai* Gastón & Vives, sp. n.**
(E.P.) *Agnoea (Agnoea) amparoella* (Vives, 1986). *SHILAP Revta. lepid*., **13**(52): 254-255
(E.P.) *Agnoea (Agnoea) xanthosoma* (Rebel, 1901). *Dt. ent. Ztschr. Iris*, **13**: 174
(E.) *Agnoea (Agnoea) emarella* Gastón & Vives, 2020. *SHILAP Revta. lepid*., **48**(190): 311
(E.) *Agnoea (Agnoea) lvovskyi* Gastón & Vives, 2020. *SHILAP Revta. lepid*., **48**(190): 312
(E.) *Agnoea (Tubeliferodes) josephinae* (Toll, 1956). *Annls zool., Warsz*., **16**(13): 185

En este trabajo descubrimos una nueva especie para la fauna de España, lo que representa un aumento de casi el 5,00% y llegado a este punto, podríamos considerar que la Península Ibérica podría ser el punto de origen de este género, ya que posee el 52,38% de todas las especies conocidas, incluyendo la nueva descrita a continuación.

Agnoea (Agnoea) revillai Gastón & Vives, sp. n.

Material estudiado: Holotypus, 1 ♂, ESPAÑA, Burgos, El Ribero, a 750 m, 28-IV-1980, J. Gastón leg. prep. gen. 7977JG, depositado en el Museo Nacional de Ciencias Naturales (MNCN), en Madrid, España.

Descripción del macho (fig. 1): Envergadura, 14 mm, (n = 1). Cabeza bien desarrollada y con pelos escamiformes ocre claros y compactos en la frente y más desordenados en la zona alta del epicráneo en forma de penacho. Collar capital con los pelos ocres entremezclados con blancos. Palpos labiales bien desarrollados con el segundo segmento ampliamente forrado de largos pelos escamiformes de color ocre salpicados de otros de color blanco, y del doble de tamaño que el tercer segmento que es corto, afilado con pelos cortos de color ocre, ligeramente curvado en su extremo hacia arriba. Antenas filiformes recubiertas de pequeñas cerdas de color ocre oscuro. Escapo pequeño. Tórax recubierto de escamas de color gris oscuro uniforme lo mismo que las tégulas. Abdomen recubierto de las mismas escamas que el tórax. Alas anteriores con una geometría típica del género, con la costa ligeramente convexa, sobre todo en su parte basal junto al tórax y también junto al ápice que es fuertemente apuntado. Margen externo muy angulado, tanto que se confunde con el margen interno. El margen interno también presenta una ligera curvatura, en este caso cóncava. El color de fondo de las alas delanteras es gris muy oscuro y uniforme. Dispone de dos manchas oculares casi negras alineadas en la zona discal y postdiscal, que se presentan rodeadas por un fino anillo de escamas algo más claras. Fimbrias de color gris oscuro. Alas posteriores de color gris más claro que las anteriores y sin manchas.

Genitalia del macho (fig. 24): Uncus piramidal apuntado, con el extremo ligeramente redondeado y escindido. Gnathos muy significativo, como el resto del género, con los brazos cortos y provisto en su extremo de una estructura globular compuesta por infinidad de celdillas y pelos interpuestos lo que le confieren (como el resto de las especies del género) una textura y una imagen semejante a una esponja de geometría esférica y de un tamaño algo superior a la mitad de la anchura del tegumen. Valvas cortas y muy anchas, con el extremo (cucullus) redondeado y mostrando tendencias a pequeños pliegues periféricos que tienden a introducirse en la valva en el contacto del sacculus. Sacculus poco apreciable, aunque algo más esclerotizado que el resto de la valva. Transtilla muy ancha y corta. Juxta muy apreciable, rectangular, esclerotizada y bilobular, con dos proyecciones laterales de buen tamaño con forma de lágrima. Saccus muy corto y redondeado. Aedeagus de mediano tamaño, cilíndrico con el ápex troncocónico muy apuntado y el coecum penis redondeado. Presenta junto al ápex dos gruesos cornuti situados de forma simétrica a ambos lados de la base del ápex.

Descripción de la hembra: Desconocida.

Biología: No se conocen los estados inmaduros ni las plantas nutricias. El único imago conocido se capturó mediante mangueo en las horas centrales del día, en el piso bioclimático montano-eurosiberiano (RIVAS-MARTÍNEZ, 1987) y a una altitud aproximada de 750 m sobre el nivel del mar.

Distribución: Únicamente se conoce la especie de la localidad tipo.

Detalles: Siguiendo a VIVES MORENO (2014), debería colocarse detrás de *Agnoea (Agnoea) detrimentella* (Staudinger, 1859) (figs 2, 26).

Etimología: Dedicamos esta nueva especie a nuestro colega Txema Revilla (Vizcaya, España), entusiasta colaborador en innumerables muestreos de los biotopos españoles y americanos.

Agnoea (Agnoea) xanthosoma (Rebel, 1901) (figs 3, 4, 25, 41)
Borkhausenia (Oecophora) xanthosoma (B.-Haas i. l.) Rebel, 1901. *Dt. Ent. Z. Iris*, **13**(2): 175
LT: St. Ildefonso (Castilien), [Segovia], ESPAÑA

Material estudiado: ESPAÑA, Álava, Berganzo, a 500 m, 1 ♂, 20-VI-1997, Tx. Revilla leg. y coll., prep. gen. 7911JG; Ávila, Solana de Ávila, a 1.350 m, 1 ♂, 19-VI-2004, J. Gastón leg. y coll., prep. gen. 7779JG; Barcelona, Collbató, a 400 m, 1 ♀, 7-VI-2019, Tx. Revilla leg. y coll., prep. gen. 7913JG; 1 ♂, Idem, prep. gen. 7906JG; Burgos, Cuevas de San Clemente, a 1.030 m, 1 ♂, 2-VI-2001, J. Gastón leg. y coll., prep. gen. 7780JG; Murcia, La Perdiz, Sierra Espuña, a 1.100 m, 1 ♂, 10-V-1978, J. Calle leg., prep. gen. 698AV; Segovia, San Ildefonso, a 1.193 m, 2 ♂♂, 21-VI, O. Staudinger leg. (NHMV); 2 ♂♂, 1 ♀, San Ildefonso, a 1.193 m, VII-[19]02, T. Seebold coll., prep. gen. (MNCN); Teruel, El Parrizal, Beceite, a 600 m, 1 ♀, 21-V-1999, J. Gastón leg. y coll., prep. gen. 7789JG; Valencia, El Saler, a 13 m., 2 ♂♂, 4-IV-1983, prep. gen. 3372AV; 6 ♂♂, 29-IV-1983, prep. gen. 2247AV; 1 ♂, 7-IV-1984, J. Baixeras leg. Zaragoza, M[on]tes. Castejón, 500 m, 5-V-1995, J. Gastón leg., prep. gen. 7790JG, Aguarón, a 750 m, 1 ♀, 13-VI-1998, J. Gastón leg. y coll., prep. gen. 7792JG.

Descripción de la hembra (fig. 4): Envergadura, 18,6 mm, (n = 5). La morfología de las hembras no difiere esencialmente de la de los machos.

Genitalia de la hembra (fig. 41): Papilas anales de pequeño tamaño, poco esclerotizadas. Apófisis posteriores bien desarrolladas alcanzando el borde inferior esclerotizado del 8º segmento. Este, es alargado y membranoso en su parte superior y bien esclerotizado en su tercio inferior. Apófisis anteriores pequeñas. Ostium ligeramente esclerotizado. Antrum rectangular. Ductus bursae membranoso, básicamente cilíndrico. Bursa esférica, membranosa con un signum prácticamente imperceptible por su falta de esclerotización.

Biología: No se conocen los estados inmaduros ni las plantas nutricias y por los datos de que disponemos, hemos comprobado que vuela desde el mes de abril hasta el mes de julio, en una única generación y entre los 1.350 metros de Solana de Ávila (Ávila) y los 13 metros de El Saler (Valencia).

Distribución: Según nuestros datos, la especie se conoce de España y Portugal. Hasta la fecha, la especie se ha localizado en las provincias españolas de Álava, Ávila, Barcelona, Burgos, Murcia, Segovia, Teruel, Valencia y Zaragoza, dentro del piso bioclimático mesomediterráneo (RIVAS-MARTÍNEZ, 1987).

Detalles: El volumen 13 de la publicación *Deutsche Entomologische Zeitschrift Iris*, fechado en 1900, se publicó en dos fascículos y como podemos ver en la página III, el fascículo I que incluye las páginas de la 1 a la 160 y las láminas de la I a la IV, fue publicado el 15 de agosto de 1900 y el segundo fascículo que incluye las páginas de la 161 a la 362 y las láminas de la V a la VIII, fue publicado el 20 de febrero de 1901, de ahí que la **fecha correcta de publicación de esta especie sería el año 1901** y no el 1900, como se ha venido considerando hasta ahora.

AUTOSTICHIDAE

Symmoca revoluta Gozmány, 1985 (figs 5, 6, 7, 8, 30, 42)
Symmoca revoluta Gozmány, 1985. *Boll. Mus. Reg. Sci. Nat. Torino*, **3**(1): 243-245; fig. 5
LT: Odeleite, [Algarve], PORTUGAL

Material estudiado: ESPAÑA, Ávila, Puerto de Castilla, a 1.185 m, 1 ♂, 17-VIII-2001, J. Gastón leg. y coll., prep. gen. 7012JG; Cáceres, Pasarón de la Vera, a 1 ♂, a 596 m., 27-VI-1997, A. Expósito leg. (prep. gen. 4062AV); Huelva, Monte Blanco, Almendrales, 1 ♀, 24-VIII-2006, M. Huertas leg. (prep. gen. 3976AV); Toledo, Quintos de Mora, a 900 m, 2 ♂♂, 13-IX-2020, A Vives leg. (prep. gen.

305AV, 4063AV). PORTUGAL, [ALGARVE], Odeleite, 1-IX-1975, T. Monteiro leg., prep. gen. 1235AV, holotypus, coll. A. Vives / Museo Nacional de Ciencias Naturales, Madrid (España).

Biología: Se desconoce y según nuestros datos, la época de vuelo abarca desde el mes de agosto y hasta el mes de octubre. También se ha citado de PORTUGAL, concretamente del ALGARVE, Odeleite, 1-IX-1979, T. Monteiro leg., Alportel, 1-X-1993, 1-IX-1996, M. F. V. Corley leg. y del Vale do Lobo, a 180 m, 12-VIII-1997, M. Bolton, leg. (CORLEY *et al*., 2000: 269).

Distribución: España y Portugal.

Detalles: Por error, la especie se citó por primera vez para España de tres localidades de la comarca de Anoia, en la provincia de Barcelona (España) (REQUENA, 2005). Hemos contactado con el autor y hemos podido estudiar parte de este material y se ha comprobado que dichos ejemplares no pertenecen a la especie *Symmoca revoluta* Gozmány, 1985, por lo que las citas, ahora reseñadas, serían **las primeras para la fauna de España**.

Symmoca requenai Gastón & Vives, sp. n.

Material estudiado: Holotypus, 1 ♂, ESPAÑA, GRANADA, B[arran]co, El Espartal, Baza, a 750 m, 26-VI-2018, J. Gastón leg., prep. gen. 8004JG, depositado en el Museo Nacional de Ciencias Naturales, en Madrid (MNCN). Paratypus, 5 ♂♂ y 3 ♀♀. ALMERÍA, Sierra de Gádor, a 2.020 m, 1 ♂, 1 ♀, 31-VII-2019, J. Gastón leg. y coll., prep. gen. 8000JG y 8003JG; GRANADA, Barranco de El Espartal, Baza, a 750 m, 2 ♂♂, 26-VI-2018, J. Gastón leg. y coll.; 1 ♂, Idem, prep. gen. 8002JG; 2 ♀♀, Idem, prep. gen. 8006JG y 8009JG; 1 ♂ Barranco de El Espartal, Baza, a 750 m, 15-IX-2000, J. Gastón leg. y coll., prep. gen. 7019JG.

Descripción del macho (fig. 10): Envergadura 14,17 mm, (n = 6). Cabeza bien desarrollada con pelos escamiformes de color beige muy claros y compactos en la frente y en la zona alta del epicráneo. Palpos labiales bien desarrollados con el segundo segmento dirigido hacia el frente y bien cubierto de una densa capa de pelos de color beige claro excepto en su extremo, que son casi blancos. El tercer segmento, que se encuentra recubierto de pelos escamiformes muy cortos y compactos, es delgado y forma un ángulo casi recto con el anterior, dirigiéndose claramente hacia arriba. Antenas filiformes recubiertas de pequeñas cerdas de color ocre muy oscuro, excepto el escapo, en el que las escamas son de color beige muy claro. Tórax y tégulas recubiertas de escamas de color beige claro salteadas ligeramente con escamas oscuras. Abdomen recubierto de las mismas escamas que el tórax. En el primer par de patas, tanto el fémur como la tibia están recubiertos de pelos de color ocre oscuro, mientras que en el tarso son escamas oscuras las emplazadas en la base de los segmentos y muy claras (casi blancas) en sus extremos. En el segundo par de patas los pelos oscuros están ligeramente salteados por pelos claros y presentan un par de espolones en el extremo de la tibia, junto a la articulación del tarso. El tercer par de patas es similar al segundo, con la única diferencia (además del tamaño y de la profusión de largos pelos en la tibia) de la existencia de un par de grandes epífisis situadas en el último tercio de la tibia. Alas anteriores con una geometría típica del género, con la costa casi recta o ligeramente convexa, sobre todo en su parte apical que es redondeado. Margen externo levemente angulado. El margen interno también presenta una ligera curvatura, en este caso cóncava. El color de fondo de las alas anteriores es gris ocráceo salpicado de escamas amarillentas. Destacan sobre el fondo tres bandas de máculas formadas por escamas oscuras; zona basal: mancha sobre la costa en el entronque con el tórax que se desvanece hacia el margen interno del ala; zona post-basal o antemediana: mancha oscura, estrecha y alargada sobre la costa; 2 manchas oculares alineadas con la anterior y dirigidas en oblicuo hacia el margen interno del ala, sin llegar a alcanzarlo. La mancha más próxima a la situada en la costa puede llegar a fundirse con ésta; zona postdiscal o postmediana: mancha oscura, ligeramente trapezoidal apoyada sobre la costa del ala; 2 manchas oculares alineadas y paralelas a las ubicadas en la zona post-basal, alcanzando claramente el margen interno del ala. Mancha difusa oscura en la zona apical, junto a la costa que se desvanece hacia el tornus del ala. Entre las manchas oscuras de las zonas post-discal y apical, junto a la costa se presenta una zona de escamas blanquecinas. Las fimbrias son de color gris ocráceo. Las alas

posteriores, semi-ovaladas, son de color uniforme gris claro, sin manchas. Las fimbrias son del mismo color que las de las alas anteriores, aunque ligeramente más oscuras.

Genitalia del macho (fig. 27): Uncus y tegumen similares a las especies del género. Gnathos fuerte y arqueado. Valvas de anchura uniforme, alargadas y con el ápice redondeado. Sacculus subrectangular de una longitud algo mayor que 1/3 de la de la valva, acabado en forma digitiforme con ligera curva hacia el interior de la valva y con un plegamiento en la zona media paralelo a las bandas. Transtilla ligeramente apuntada hacia el interior. Lóbulos piramidales bien desarrollados. Apéndice de la base de las valvas de tamaño medio (aproximadamente 1/3 de la longitud de las valvas), cilíndrico, de grosor uniforme y extremo ligeramente redondeado. Saccus triangular y corto. Aedeagus corto y grueso (tanto como las valvas), con el coecum muy redondeado y el praephallus con membrana esclerotizada. Cornuti compuesto por un grupo de 4 gruesas espinas de gran tamaño a las que se acoplan por su parte anterior una docena y media de otras espinas de menor tamaño, formando todas ellas una única agrupación.

Descripción de la hembra (fig. 9): Envergadura 14,00 mm, (n = 3). La morfología de las hembras no difiere esencialmente de la de los machos, la principal diferencia (aunque no constante), estriba en el color algo más oscuro de las escamas del fondo de las alas superiores.

Genitalia de la hembra (fig. 43): Papilas anales de tamaño medio, poco esclerotizadas. Apófisis posteriores bien desarrolladas superando el borde inferior esclerotizado del 8º segmento. Este, presenta sendas bandas verticales esclerotizadas. Apófisis anteriores menores que los posteriores, con una longitud que alcanza hasta la mitad del ductus bursae. Ostium de forma trapezoidal muy esclerotizado, con una marcada escotadura en su extremo distal. Antrum de una longitud ligeramente superior al ostium, levemente troncocónico, algo constreñido en su contacto con el mismo y esclerotizado en su parte basal. Ductus bursae globular con pequeños pliegues en su superficie y muy esclerotizado. Bursa esférica, membranosa, con un signum muy esclerotizado en forma de placa ovoidal de bordes irregulares con una espina afilada en su extremo y otra muy pequeña, casi imperceptible, en su parte central.

Biología: No se conocen los estados inmaduros ni las plantas nutricias de las orugas. Se han capturado ejemplares en Baza (Granada) en cotas que oscilan entre los 700 m, llegando hasta los 2.020 m, de la Sierra de Gádor (Almería), volando desde el mes junio hasta el mes de septiembre, por lo que podría deducirse que tiene una sola generación.

Distribución: La especie se ha localizado hasta la fecha en las provincias españolas de Almería y Granada, dentro del piso bioclimático mesomediterráneo (RIVAS-MARTÍNEZ, 1987).

Detalles: Siguiendo a VIVES MORENO (2014), debería colocarse detrás de *Symmoca tofosella* Rebel, 1893, con quien presenta similitudes tanto en su morfología externa (figs 11, 12), como en la estructura de su genitalia del macho y de la hembra (figs 28, 29, 44). El andropigio se diferencia de ésta última sobre todo en el tamaño y forma del apéndice de la base de la valva, más corto y cilíndrico en *S. requenai* Gastón & Vives, sp. n., así como en los cornuti del aedeagus cuya disposición y tamaño difiere claramente en ambas especies. En el ginopigio, la diferencia con *S. tofosella*, se localiza fundamentalmente en el ostium, cuya escotadura superior es diferente. El antrum más corto y menos cilíndrico en *S. requenai* y con un apreciable estrechamiento en su contacto con el ostium, detalle que falta en *S. tofosella*.

Etimología: Se dedica la especie a nuestro colega Emili Requena (Barcelona, España), a quien agradecemos su colaboración en el desarrollo del presente trabajo.

Symmoca senora Gozmány, 1977 (figs 14, 15)
Symmoca senora Gozmány, 1977. *Acta zool. Hung.,* **23**: 87-88, fig. 1
LT: La Garrofa, Almería, ESPAÑA

Material estudiado: ESPAÑA, Granada, La Sagra, Huéscar, a 1.350 m, 1 ♀, 13-VIII-1999, J. Gastón leg. y coll., prep. gen. 7065JG.

Descripción de la hembra (fig. 4): Envergadura, 14 mm, (n = 1). La morfología de las hembras no difiere de la de los machos.

Genitalia de la hembra (fig. 45): Papilas anales de tamaño medio, poco esclerotizadas con su extremo redondeado. Apófisis posteriores bien desarrolladas alcanzando la parte central del antrum. Apó-

fisis anteriores ligeramente inferiores en tamaño a las posteriores, ambas de pequeño tamaño, llegando hasta el encuentro del antrum con el ductus bursae. Ostium muy ancho con una escotadura en forma de U muy abierta y provisto de placa antevaginal bien desarrollada, estrecha y esclerotizada. Antrum cilíndrico, grueso, levemente esclerotizado en su parte posterior y con un estrechamiento en su contacto con el ductus bursae. Ductus bursae membranoso provisto de una zona bulbar en su parte superior, de buen tamaño y levemente arrugado longitudinalmente. Bursa esférica, membranosa y provista de un signum con forma de placa que recuerda la huella de la pisada de un pie humano, casi desprovisto de espinas excepto en una de sus caras donde se aprecian tres situadas en el borde y dispuestas de manera trapezoidal.

Detalles: Hasta ahora, la genitalia de la hembra era desconocida (GOZMÁNY, 1977; GOZMÁNY, 2008). La estructura genital de la hembra es similar a *Symmoca dodecatella* Staudinger, 1859 (fig. 46) y *Symmoca redondoi* Gastón & Vives, sp. n. (fig. 47), diferenciándose de la primera sobre todo en la escotadura con acusada forma de V que presenta esta especie en el ostium y que en el caso de *S. senora* adquiere la forma de una U abierta. El signum de la bursa diferencia a *S. senora* de las otras dos especies del grupo, así como también la anchura de la placa antevaginalis, presentándose más estrecha en *S. senora*.

Symmoca redondoi Gastón & Vives, sp. n.

Material estudiado: Holotypus, 1 ♂, ESPAÑA, Teruel, Tramacastilla (Sierra de Albarracín), a 1.265 m, 19-VI-1993, J. Gastón leg., prep. gen. 8097JG, depositado en el Museo Nacional de Ciencias Naturales, en Madrid (MNCN). Paratypus 14 ♂♂ , 1 ♀: Castellón, Oropesa del Mar, a 33 m, 1 ♂, 6-IV-1977, A. García leg., prep. gen. ER1386; Teruel, Puerto de Bronchales, Sierra de Albarracín, a 1.440 m, 1 ♂, 15-VII-2018, J. J. Pérez De-Gregorio & E. Requena leg.; 2 ♂♂ Idem., prep. gen. 8087JG y ER3044; 1 ♀, Idem, prep. gen. 8090JG; Bronchales, a 1.550 m, 2 ♂♂, 22-23-VI-2008, J. J. Pérez De-Gregorio & M. Bravo leg., prep. gen. ER1474 y ER1572; Tramacastilla, Sierra de Albarracín, a 1.265 m, 2 ♂♂, 19-VI-1993, J. Gastón leg., prep. gen. 8093JG y 8094JG; Idem, 2 ♂♂, 26-V-1995, J. Gastón leg., prep. gen. 6990JG y 8096JG; Idem, 1 ♂, 26-V-2001, J. Gastón leg.; Idem, 1 ♂, 26-V-2001, J. Gastón leg., prep. gen. 8095JG; El Parrizal, Beceite, a 600 m, 21-V-1999, J. Gastón leg., prep. gen. 7017JG; Zaragoza, Aguarón, a 750 m, 1 ♂, 13-VI-1998, J. Gastón leg.; Idem, 1 ♂, prep. gen. 6992JG.

Descripción del macho (fig. 18): Envergadura 18,15 mm, (n = 14). Cabeza bien desarrollada con pelos escamiformes de color beige muy claros (casi blancos), y compactos en la frente y en la zona alta del epicráneo. Palpos labiales bien desarrollados con el segundo segmento dirigido hacia el frente y bien cubierto de una densa capa de pelos de color ocre. El tercer segmento, que se encuentra recubierto de pelos escamiformes muy cortos de color blanquecino, es delgado, afilado y levemente arqueado hacia la parte superior. Antenas filiformes recubiertas de pequeñas cerdas de color ocre muy oscuro. Tórax y tégulas recubiertas de escamas de color beige. Abdomen recubierto de las mismas escamas que el tórax. En los dos primeros pares de patas, tanto el fémur como la tibia están recubiertos de pelos de color ocre oscuro. El tercer par de patas, muy desarrollado, está recubierto de escamas beige muy claras, casi blancas. Alas anteriores con una geometría típica del género, con el margen costal casi recto o ligeramente convexo, sobre todo en su parte apical que es redondeado. Margen externo levemente angulado. El margen interno también presenta una ligera curvatura, en este caso cóncava. El color de fondo de las alas anteriores es beige grisáceo, salpicado levemente por escamas de color ocre. Destacan cuatro pequeñas máculas de color marrón muy oscuro, dos en la zona post-basal dispuestas en dirección oblicua, y otras dos en la zona postdiscal, estas alineadas en vertical y más juntas que las otras. En el margen costal se aprecian con nitidez dos máculas alargadas de tamaño medio, situadas en las terminaciones de las venas R1 y Costal. En el margen interno (entre las terminaciones de las venas Anal y Cu2), se desarrolla de forma poco significativa una pequeña mácula, que en ocasiones es poco apreciable. En la zona marginal, entre los interespacios de las venas Cu1 hasta R4-5, se manifiestan con claridad seis pequeñas máculas de color marrón oscuro. Las fimbrias son de color beige claro. Las alas posteriores,

semi-ovaladas, son de color uniforme gris claro, sin manchas. Las fimbrias son del mismo color que las de las alas anteriores.

Genitalia del macho (figs 37, 38): Uncus y tegumen similares a las especies del género. Gnathos fuerte, con forma de L, y poco arqueado. Valvas estrechas en su base y tendentes a engrosar hacia el ápice (que es redondeado), lo que les confiere una forma de lágrima o maza. Sacculus subrectangular, grueso, de una longitud algo mayor que 1/3 de la de la valva, acabado en forma de gancho con una acusada curva hacia el interior de esta, donde se remata con una punta delgada y afilada. Transtilla provista de lóbulos cilíndricos bien desarrollados. Apéndice de la base de las valvas de tamaño medio (aproximadamente 1/4 de la longitud de las valvas), cilíndrico, de grosor uniforme y extremo ligeramente redondeado. Saccus triangular y extremadamente corto. Aedeagus cilíndrico, de mediano tamaño y grueso, con el coecum muy redondeado y el praephallus con membrana esclerotizada. En su parte distal dispone de dos grupos de cornuti situados en paralelo y compuestos por multitud de espinas bien esclerotizadas.

Descripción de la hembra (fig. 19): Envergadura 19,00 mm, (n = 1). La morfología de las hembras no difiere esencialmente de la de los machos, exceptuando una menor intensidad en las máculas de las alas, sobre todo las dos circulares situadas a ambos lados de la celda, lo que confiere al conjunto un tono casi uniforme de color beige.

Genitalia de la hembra (fig. 47): Papilas anales de tamaño medio, medianamente esclerotizadas. Apófisis posteriores de mucha longitud, superando el antrum y llegando a la parte posterior del ductus bursae. Apófisis anteriores tan largas como las posteriores, con una longitud que supera la mitad del ductus bursae. Ostium muy ancho y con el borde ligeramente curvado en una escotadura cóncava y provisto de una placa antevaginal muy ancha y de la misma longitud que el ostium. Antrum ancho y corto sensiblemente rectangular y ligeramente esclerotizado. Ductus bursae membranoso y globular en su parte posterior, con pequeños pliegues en su superficie. Bursa esférica, membranosa, con un signum muy esclerotizado en forma de placa ovoidal de bordes espinosos y dos espinas más en su parte central.

Biología: No se conocen los estados inmaduros ni las plantas que sustentan a las orugas. Hasta el momento únicamente se conocen ejemplares que vuelan desde el mes de mayo hasta el mes de julio.

Distribución: La especie se ha localizado hasta la fecha en las provincias de Castellón, Teruel y Zaragoza, dentro del piso bioclimático supramediterráneo (RIVAS-MARTÍNEZ, 1987).

Detalles: Siguiendo a VIVES MORENO (2014), debería colocarse entre *Symmoca senora* Gozmány, 1977 y *Symmoca dodecatella* Staudinger, 1859, con quienes presenta similitudes tanto en su morfología externa (figs 14, 15, 16, 17), como en la estructura de la genitalia del macho y de la hembra (figs 35, 36, 39, 40, 45, 46). Los andropigios se diferencian de ambas sobre todo en el tamaño y forma del apéndice de la base de las valvas, más desarrollado y cilíndrico en *S. redondoi* Gastón & Vives, sp. n. El aedeagus de *S. redondoi*, es más grueso y tosco que en las otras dos especies, y los grupos de cornuti son más potentes. En el ginopigio, la diferencia con las dos especies citadas se centra en la placa esclerotizada que forma el signum de la bursa, y en menor medida (aunque también), en la geometría del antrum.

Etimología: Dedicamos esta nueva especie a nuestro colega Víctor Redondo (Zaragoza, España), con quien hemos compartido experiencias de campo y laboratorio.

Symmoca nigromaculella Ragonot, 1875 (figs 20, 21, 31, 32)
Symmoca nigromaculella Ragonot, 1875. *Bull. Soc. ent. Fr.*, **1875**: CXCIV
LT: Coimbra, PORTUGAL
= *Symmoca singevergella* Amsel, 1959. *Anais Fac. Ciénc. Porto*, **41**: 9, pl. I, fig. 1, pl. II, fig. 5
LT: Montalegre, PORTUGAL
= *Symmoca degregorioi* Requena, 2006. *Butll. Soc. Cat. Lep.*, 97: 6-8, figs 1-2, **syn. n.**
LT: Cool de les Masies, Muntanyes de Prades (Prades, Baix Camp), [Tarragona], ESPAÑA

Material examinado: ESPAÑA, Ávila, La Plataforma, Sierra de Gredos, a 1.800 m, 1 ♀, 10-VIII-2001, J. Gastón leg. y coll., prep. gen. 7009JG; Idem, 2 ♂♂, 16-VIII-1993, J. Gastón leg. y coll.; Idem, 1 ♂, 16-VIII-1993, J. Gastón leg. y coll., prep. gen. 6994JG; Burgos, La Vid, a 950 m, 1 ♂, 5-VIII-

2000, J. Gastón leg. y coll., prep. gen. 7005JG; Herrera, Ircío, a 500 m, 1 ♂, 23-VII-1993, J. Gastón leg. y coll; MADRID, Cercedilla, a 1.460 m, 1 ♂, VIII, prep. gen. 2842LG [57811]; El Escorial, a 920 m, 3 ♂♂, VIII-1924; Villar del Olmo, a 675 m, 1 ♀, 6-VIII-1980, A. Vives leg., prep. gen. 1159AV; PALENCIA, Velilla del Río Carrión, a 1.200 m, 1 ♂, 8-VII-2011, J. Gastón leg. y coll.; Idem, prep. gen. 7010JG; PONTEVEDRA, Moscoso, a 190 m, 1 ♂, 30-VI-1974, R. Outerelo leg., prep. gen. 1460AV; SEGOVIA, Arcones, a 1.212 m, 1 ♂, 22-VII-2018, J. Gastón leg. y coll., prep. gen. 7011JG; San Ildefonso, a 1.193 m, VIII-1931, 1 ♂, VIII-1931, M. Bohigas leg., prep. gen. 54662aRA; San Rafael, a 1.300 m, 1 ♂, VIII-1093, I. Bolivar leg. (prep. gen. 54662bRA; SORIA, Calatañazor, a 1.100 m, 7 ♂♂, 25-VII-2020, J. Gastón leg. y coll.; ZARAGOZA, Torralba de los Frailes, a 1.100 m, 1 ♂, 25-VII-1997, J. Gastón leg. y coll.; Idem, 1 ♀, 17-VIII-1998, J. Gastón leg. y coll.; Idem, 1 ♀, 24-VII-1998, J. Gastón leg. y coll.; Idem, 1 ♂, 6-VIII-1999, J. Gastón leg. y coll.; Idem, 1 ♂, 6-VIII-1999, J. Gastón leg. y coll., prep. gen. 7000JG. PORTUGAL, DOURO LITORAL, Azagães [Oliveira de Azemeis], 1 ♀.

Distribución: Por la información que disponemos, esta especie se distribuye por España y Portugal.

Detalles: Después de estudiar el material tipo de *Symmoca degregorioi* Requena, 2006, (figs 21,31), hemos llegado a la conclusión de que se trata de una nueva sinonimia de *Symmoca nigromaculella* Ragonot, 1875, **syn. n.**

GELECHIIDAE

Megacraspedus carolustertius Gastón & Vives, sp. n.

Material estudiado: Holotypus, 1 ♂, ESPAÑA, TERUEL, Teruel, a 935 m, (sin datos de fecha), B. Muñoz leg., prep. gen. 2093AV, depositado en la colección A. Vives / Museo Nacional de Ciencias Naturales, Madrid (España).

Descripción del macho (fig. 23): Envergadura, 15 mm (n=1). Cabeza bien desarrollada con pelos escamiformes de color beige muy claros (casi blancos), y compactos en la frente y en la zona alta del epicráneo. Palpos labiales bien desarrollados, con el segundo segmento dirigido hacia el frente y bien cubierto, por su parte inferior, de una densa capa de pelos que son de color ocre muy claros en la parte superior y ocre-amarillentos salpicados de ocre más oscuro, en su parte inferior. El tercer segmento, que se encuentra recubierto de pelos escamiformes muy cortos de color blanquecino, es delgado, afilado y forma un ángulo de 90º con el segundo segmento y se dirige hacia la parte superior. Antenas filiformes recubiertas de pequeñas cerdas de color ocre muy oscuro. Tórax y tégulas recubiertas de escamas de color beige muy claras, iguales que la cabeza. Abdomen recubierto de las mismas escamas que el tórax. Los tres pares de patas, tanto el fémur como la tibia están recubiertos de pelos de color ocre muy claro, aunque se observan ligeras salpicaduras de escamas de ocre oscuro. Alas anteriores con una geometría típica del género, con el margen costal acusadamente convexo y el ápex sumamente apuntado. Margen externo angulado, tanto que se confunde con el margen interno. El color de fondo de las alas anteriores es beige amarillento, muy claro, salpicado levemente (de forma apenas perceptible) por escamas de color ocre más oscuro. Destacan cuatro pequeñas máculas de color marrón muy oscuro, tres de ellas alineadas con la vena R5 y una cuarta, más gruesa, formada por la agrupación de 8 a 10 escamas muy oscuras, que se sitúan por debajo del inicio de la celda, sobre la vena CuA1. Es destacable reseñar la existencia de sendas bandas de escamas más amarillas que el resto del fondo del ala, situadas, aunque de forma poco perceptible, sobre las venas R5 y CuA1, que las recorren desde la base del ala hasta los márgenes de esta. Las fimbrias están muy desarrolladas y son de color beige claro. Las alas posteriores, con la geometría típica de la familia, son de color ocre-grisáceo uniforme. Las fimbrias son del mismo color que las de las alas anteriores.

Genitalia del macho (fig. 33): Uncus de base ancha, corto y con el ápex muy redondeado. Tegumen, ancho y corto. Gnathos potente y altamente esclerotizado, ancho con el extremo levemente apuntado. Valvas gruesas en general, sobre todo en su base, con el cucullus muy redondeado. Área sacular con un pequeño pliegue. Saccus muy ancho, con el extremo levemente apuntado y casi redondeado, sin

nervio central esclerotizado. Aedeagus con el coecum bulboso, muy redondeado, que se reduce bruscamente en la parte central del mismo hasta el ápex, formando una especie de pico de pato. En su zona terminal presenta una pequeña placa esclerotizada poco perceptible con uno de sus bordes recubierto de tres a cuatro pequeñas espinas.

Hembra: Desconocida

Biología: Desconocida.

Distribución: Sólo conocida de la localidad tipo.

Detalles: Siguiendo a VIVES MORENO (2014), debería colocarse detrás de *Megacraspedus ribbeella* (Caradja, 1920).

Etimología: Dedicamos esta nueva especie a Su Majestad Carlos III Rey de España (1716-1788). También conocido, entre otros, como el Rey ilustrado que desde la más temprana edad sintió un gran interés en el estudio de la Historia Natural, como podemos verle, con diez años en el cuadro del retratista francés Jean Ranc (1674-1785), estudiando Botánica. Por Real Decreto de 17 de octubre de 1771 se creó el Real Gabinete de Historia Natural (hoy Museo Nacional de Ciencias Naturales) y en 1774 ordenó el traslado, a su ubicación actual, del Real Jardín Botánico fundado por su hermano Su Majestad Fernando VI Rey de España (1713-1759). También en 1786, ordenó a su arquitecto Juan de Villanueva (l739-1811), la construcción del edificio que albergaría el Real Jardín Botánico (1774-1781) y el Real Gabinete de Historia Natural (1786-1819), que no vio terminar, y por orden de Su Majestad Fernando VII Rey de España (1784-1833) pasó a albergar la colección de pinturas reales y se denominó Museo Real de Pinturas, hoy es la sede del Museo Nacional de El Prado, una de las mayores pinacotecas del mundo. También ordenó la construcción del Real Observatorio de Madrid cuyos trabajos comenzarían en 1790 y finalizaría en 1854. Todos estos edificios formarían el conjunto conoció como la Colina de las Ciencias.

Mirificarma scissella (Chrétien, 1915) (figs 22, 34)
Gelechia scissella Chrétien, 1915. *Ann. Soc. Ent. Fr.*, **84**: 319
LT: Biskra, ARGELIA

Material estudiado: ESPAÑA, Granada, Olivar, a 670 m, 1 ♂, 10-V-2010, J. Gastón leg. y coll., prep. gen. 7994JG.

Biología: Se desconoce. Los adultos vuelan en los meses de abril y mayo (PITKIN, 1984).

Distribución: Por los datos que disponemos, esta especie se encuentra en Argelia y ahora también en España, concretamente en las provincias de Almería y Granada, por lo que resultaría **nueva para la fauna de España y de Europa**.

Detalles: Esta especie se encuentra representada en HUEMER & KARSHOLT (1999), pero identificada como *Mirificarma cytisella* (Treitschke, 1833) en la lámina de la página 206, figura 92c, pero, realmente, se corresponde con la especie de Chrétien, concretamente se trata de una hembra capturada de Almería, Cabo de Gata, San José, 4-V-1994, Lingenhöle leg. (ZMUC). Siguiendo a VIVES MORENO (2014), debería de colocarse delante de *Mirificarma denotata* Pitkin, 1984.

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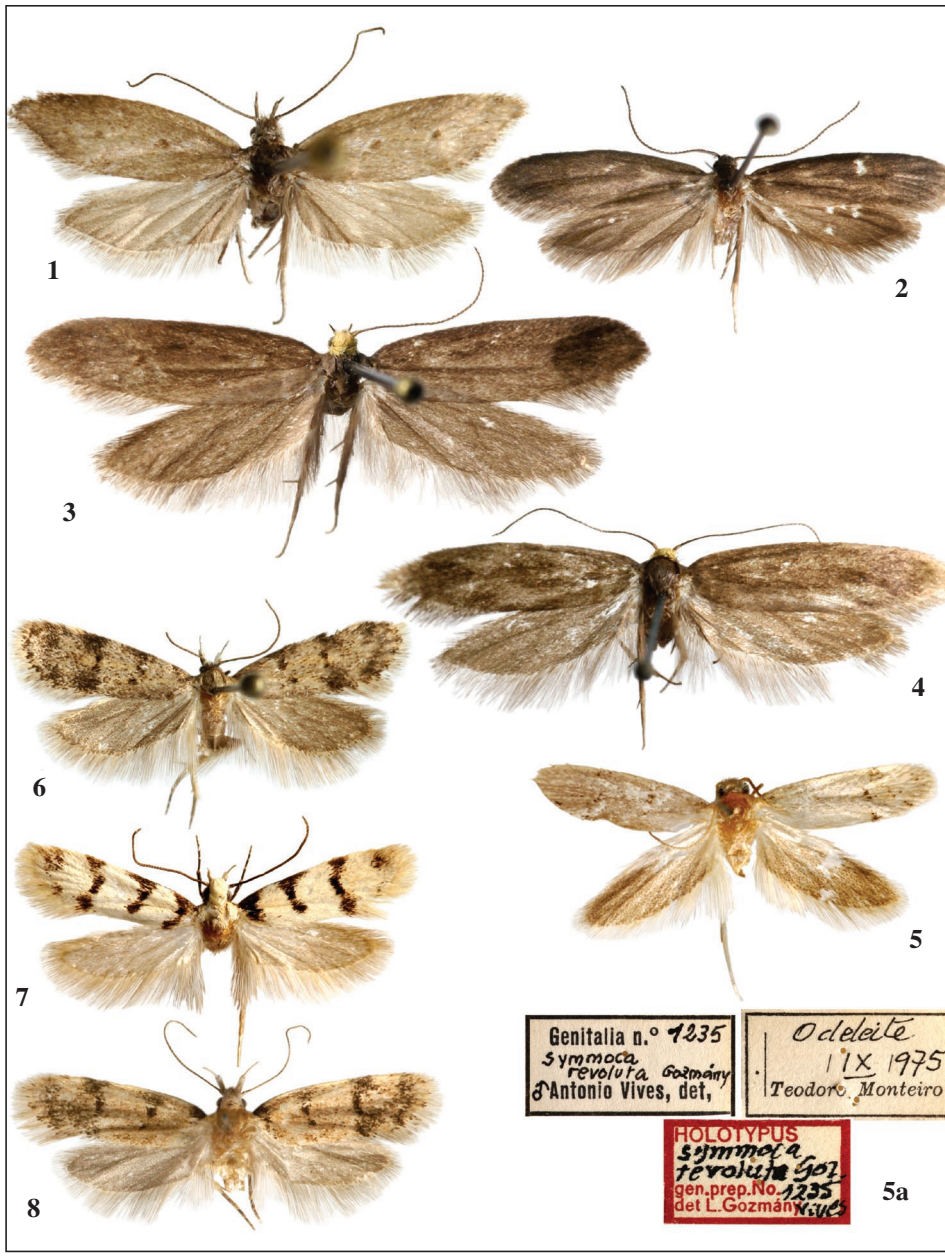
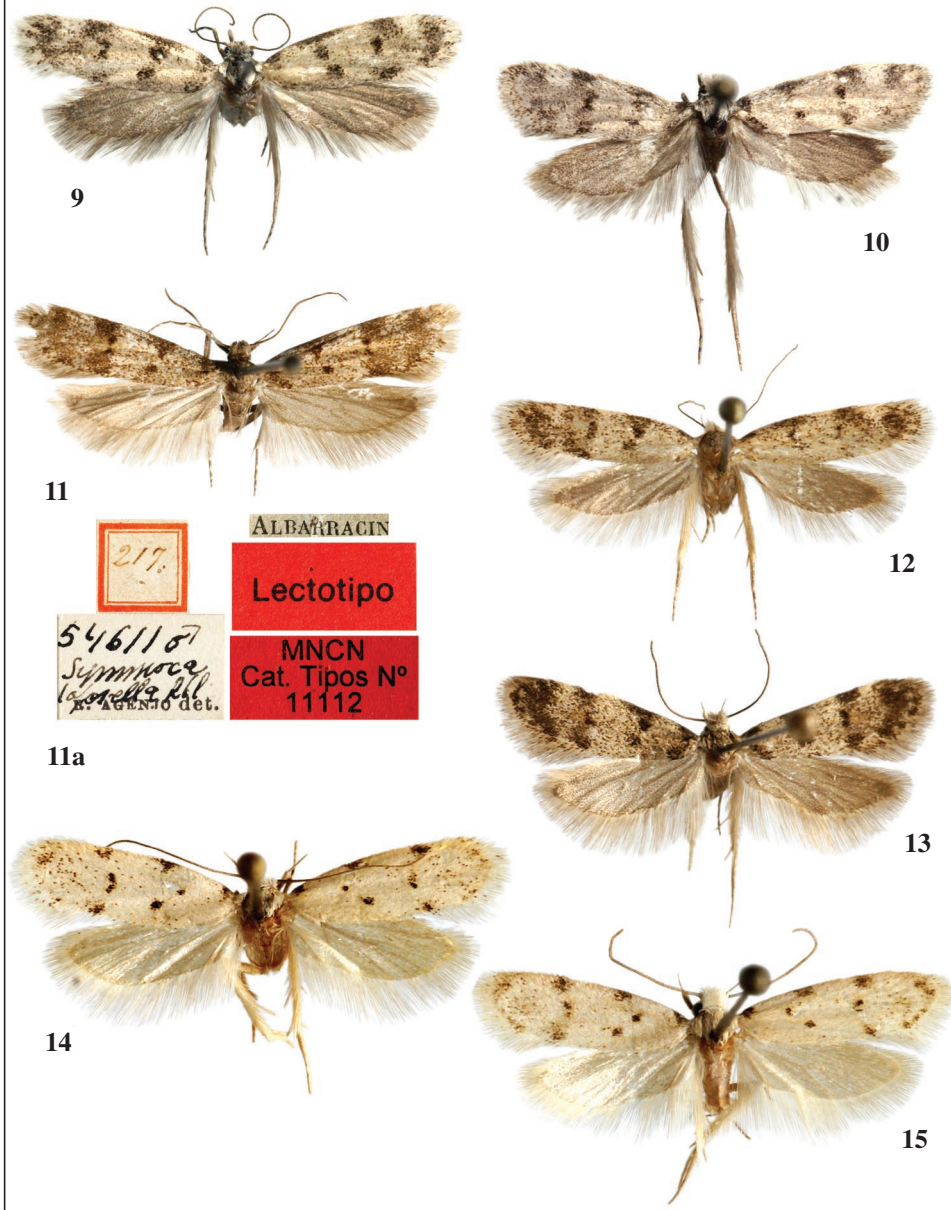
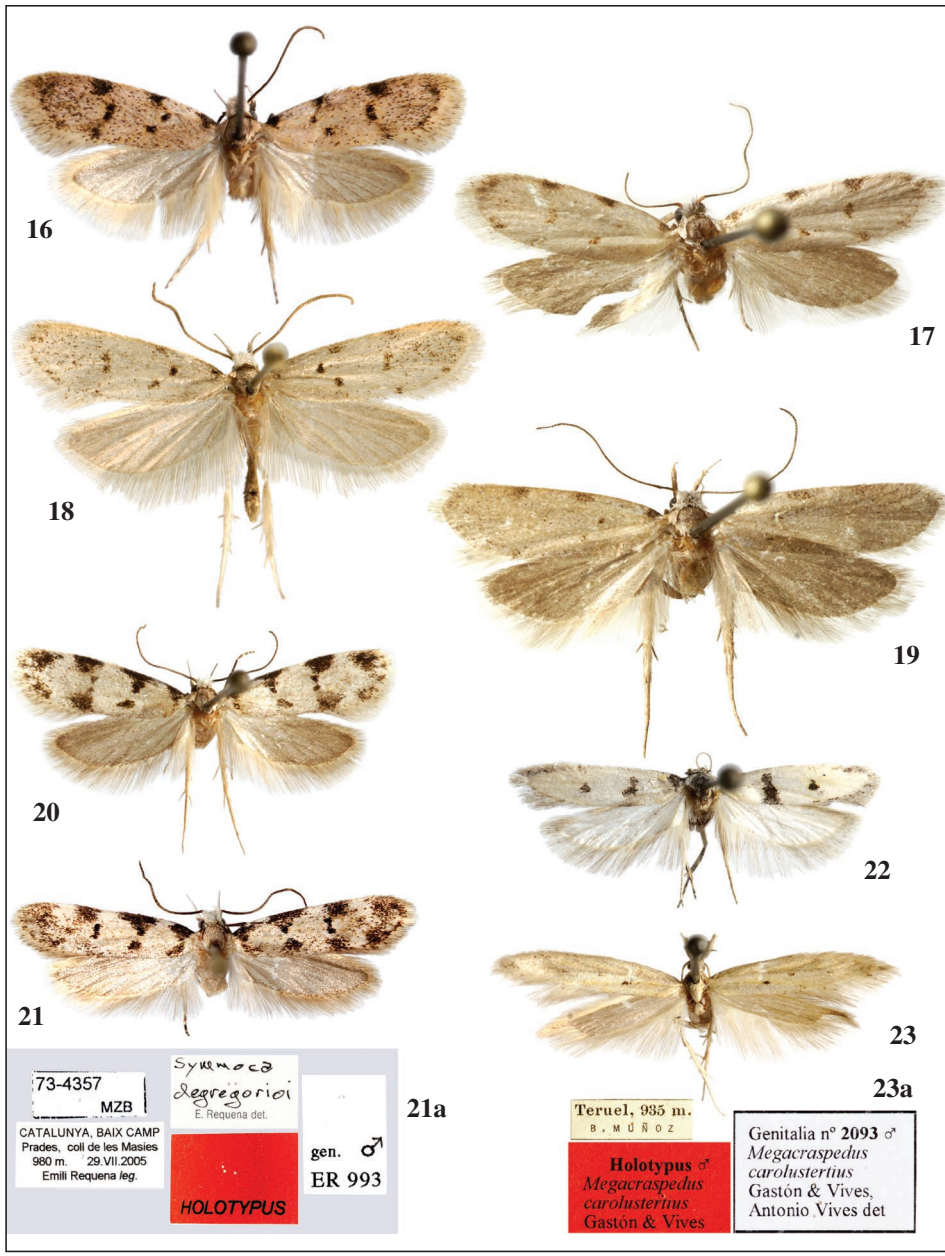


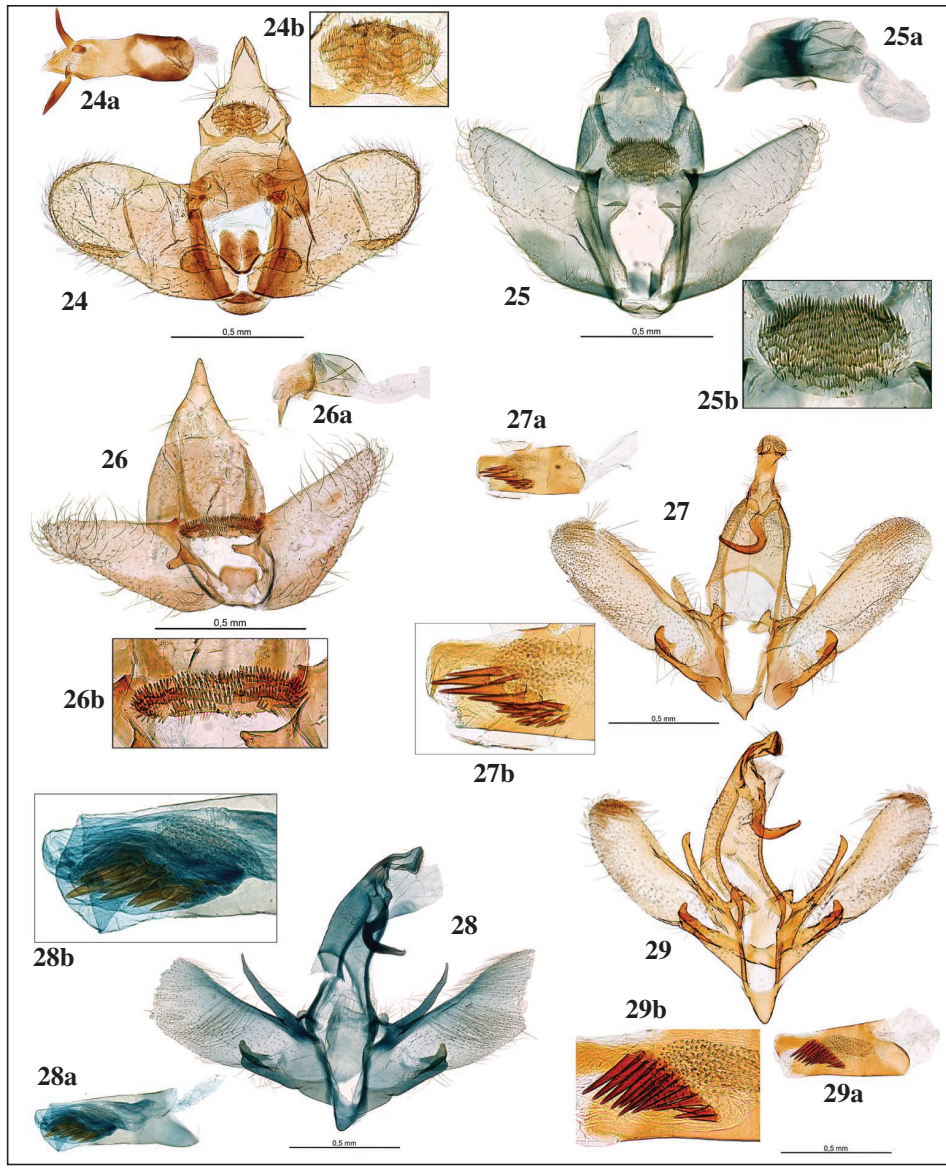
Figs 1-8.– Adulto: **1.** *Agnoea (Agnoea) revillai* Gastón & Vives, sp. n., ♂, holotypus. **2.** *Agnoea (Agnoea) detrimentella* (Staudinger, 1859), **3.** *Agnoea (Agnoea) xanthosoma* (Rebel, 1901), ♂. **4.** *Agnoea (Agnoea) xanthosoma* (Rebel, 1901), ♀. **5.** *Symmoca revoluta* Gozmány, 1985, ♂. **5a.** Idem, etiquetas del mismo. **6.** *Symmoca revoluta* Gozmány, 1985, ♂. **7.** Idem, ♂. **8.** Idem, ♀.



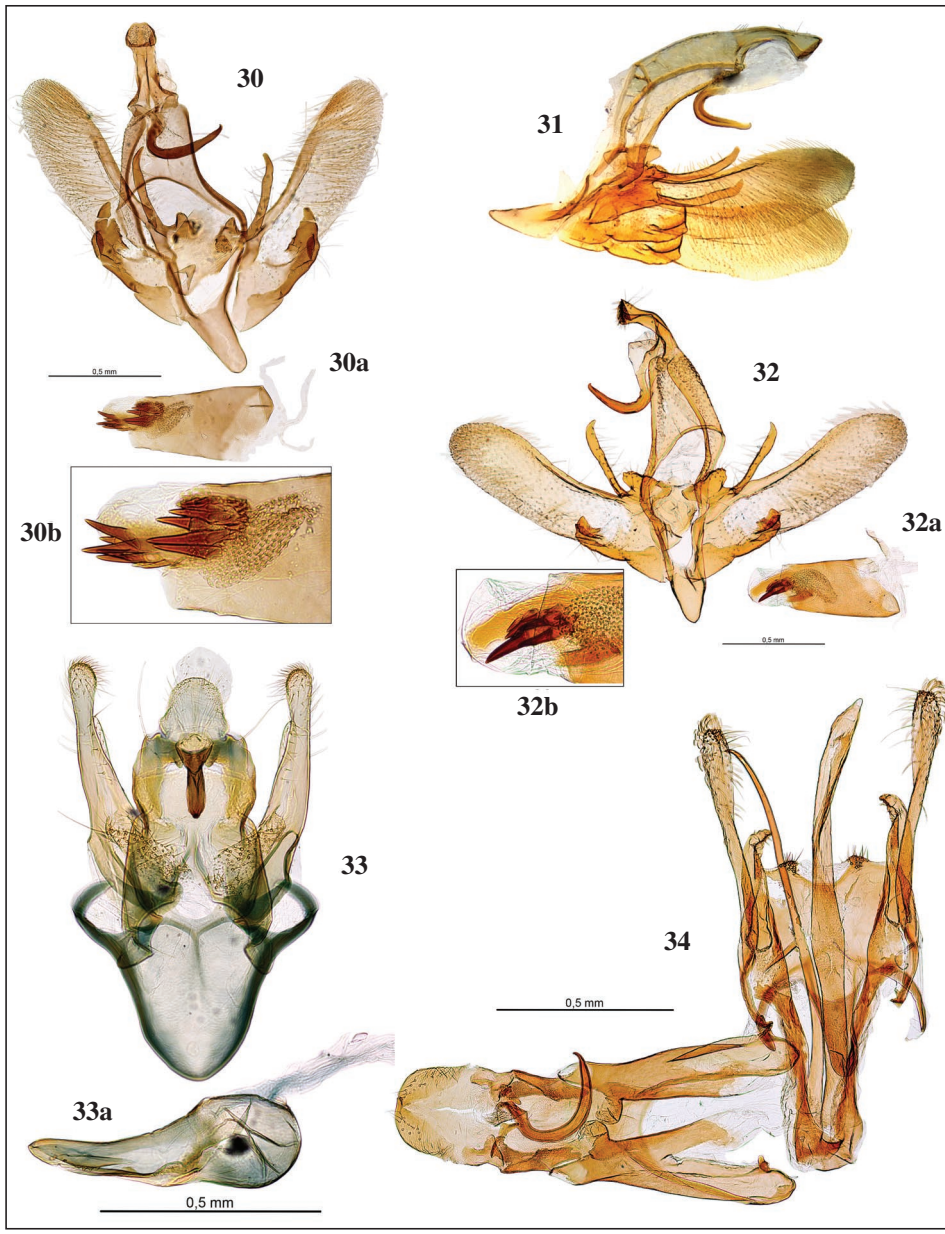
Figs 9-15.– Adulto: **9.** *Symmoca requenai* Gastón & Vives, sp. n., ♀, paratypus. **10.** *Symmoca requenai* Gastón & Vives, sp. n., ♂, holotypus. **11.** *Symmoca tofosella* Rebel, 1893, ♂, lectotypus. **11a.** Idem, etiquetas del mismo. **12.** *Symmoca tofosella* Rebel, 1893, ♀. **13.** Idem, ♂. **14.** *Symmoca senora* Gozmány, 1977, ♀. **15.** Idem, ♂.



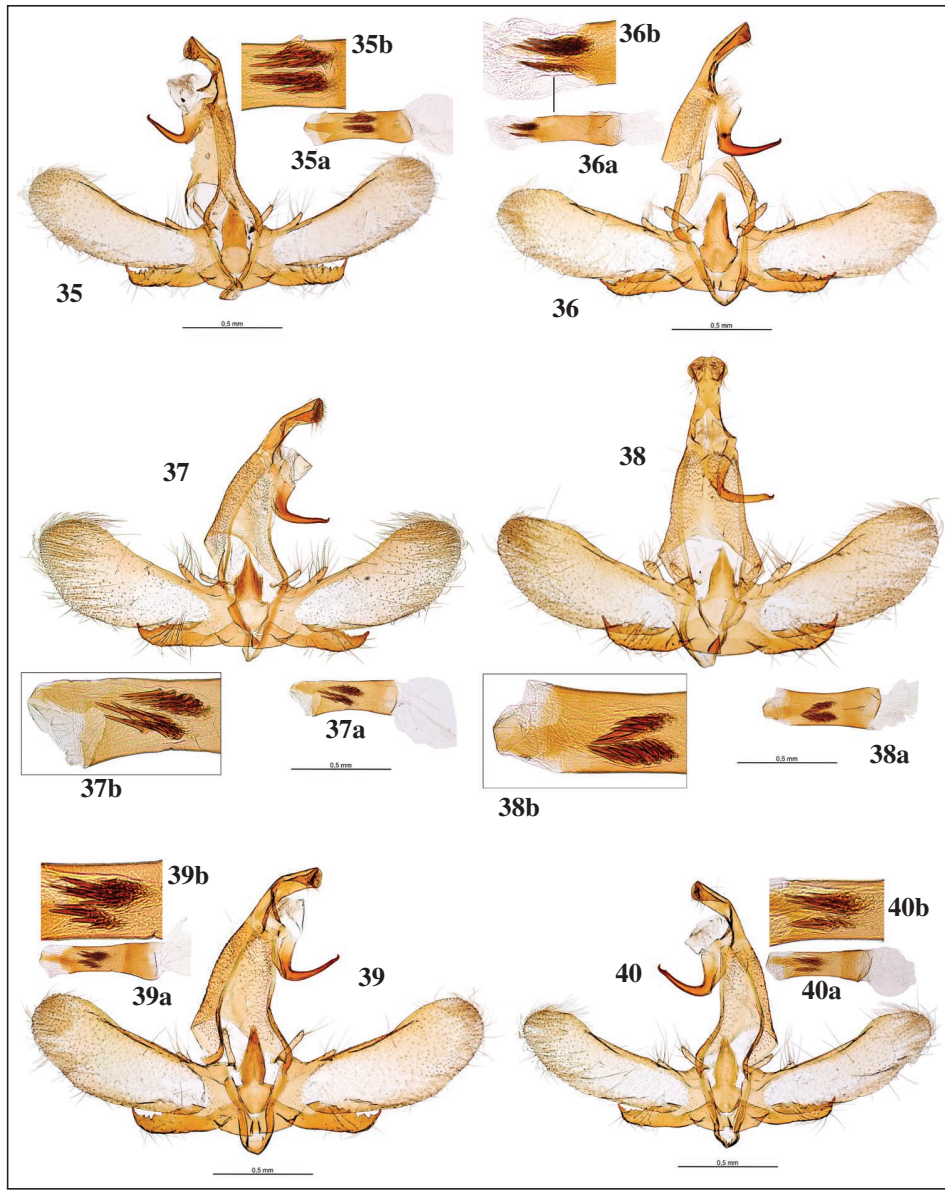
Figs 16-23.– Adulto: **16.** *Symmoca dodecatella* Staudinger, 1859, ♂. **17.** Idem, ♀. **18.** *Symmoca redondoi* Gastón & Vives, sp. n., ♂, holotypus. **19.** Idem, ♀, paratypus. **20.** *Symmoca nigromaculella* Ragonot, 1875, ♂. **21.** *Symmoca degregorioi* Requena, 2006, ♂, holotypus. **22.** *Mirificarma scissella* (Chrétien, 1915), ♂. **23.** *Megacraspedus carolustertius* Gastón & Vives, sp. n., ♂, holotypus.



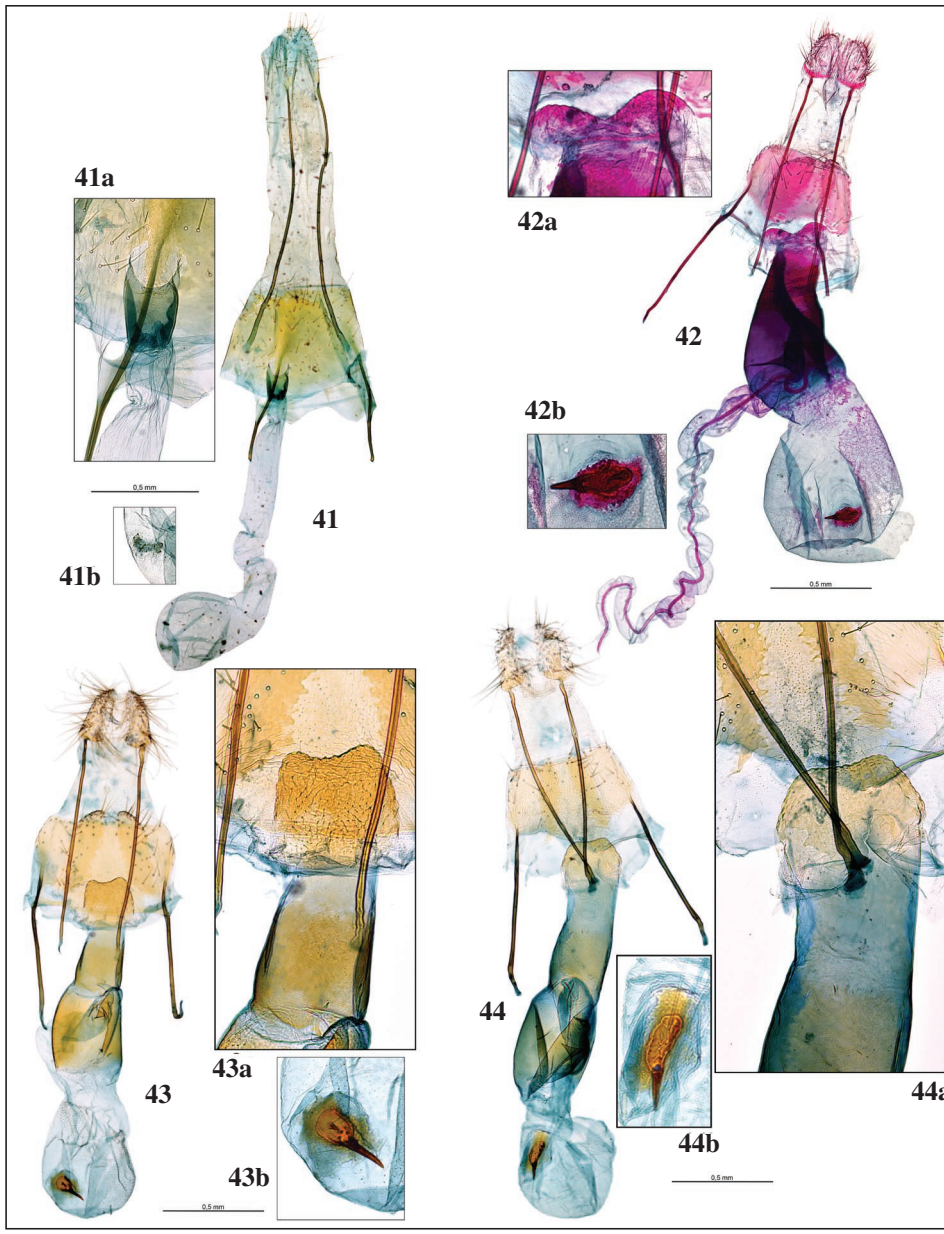
Figs 24-29.– Genitalia macho: **24.** *Agnoea (Agnoea) revillai* Gastón & Vives, sp. n., holotypus, prep. gen. 7977JG. **24a.** Idem, aedeagus. **24b.** Idem, detalles del gnathos. **25.** *Agnoea (Agnoea) xanthosoma* (Rebel, 1901), prep. gen. 57285AV. **25a.** Idem, aedeagus. **25b.** Idem, detalle del gnathos. **26.** *Agnoea (Agnoea) detrimentella* (Staudinger, 1859), prep. gen. 57023AV. **26a**. Idem, aedeagus. **26b.** Idem, detalle del Gnathos. **27.** *Symmoca requenai* Gastón & Vives, sp. n., holotypus, prep. gen. 8004JG. **27a.** Idem, aedeagus. **27b.** Idem, detalle del mismo. **28.** *Symmoca tofosella* Rebel, 1893, lectotypus, prep. gen. 54611RA (remontada por A. Vives en 1985). **28a.** Idem, aedeagus. **28b.** Idem, detalle del mismo. **29.** *Symmoca tofosella* Rebel, 1893, prep. gen. 7013JG. **29a.** Idem, aedeagus. **29b.** Idem, detalle del mismo.



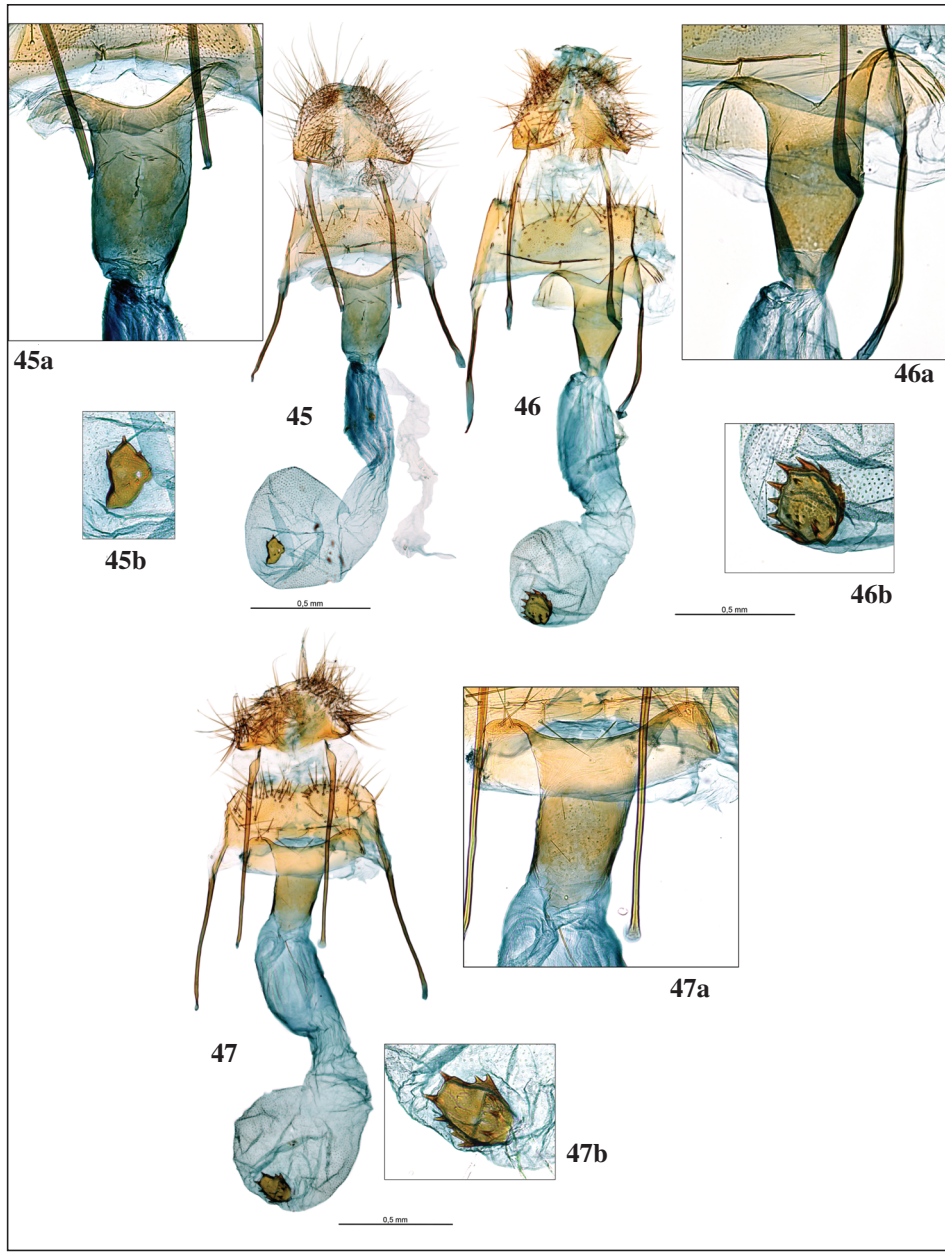
Figs 30-34.– Genitalia macho: **30.** *Symmoca revoluta* Gozmány, 1985, holotypus, prep. gen. 1235AV. **30a.** Idem, aedeagus. **30b.** Idem, detalle del mismo. **31.** *Symmoca degregorioi* Requena, 2006, holotypus, prep. gen. ER993. **32.** *Symmoca nigromaculella* Ragonot, 1875, ♂, prep. gen. 7016JG. **32a.** Idem, aedeagus. **32b.** Idem, detalle del mismo. **33.** *Megacraspedus carolustertius* Gastón & Vives, sp. n., holotypus, prep. gen. 2093AV. **33a.** Idem, aedeagus. **34.** *Mirificarma scissella* (Chrétien, 1915), prep. gen. 7994JG.



Figs 35-40.– Genitalia macho: **35.** *Symmoca senora* Gozmány, 1977, ♀, prep. gen. 7022JG. **35a**. Idem, aedeagus. **35b.** Idem, detalle del mismo. **36.** *Symmoca senora* Gozmány, 1977, prep. gen. 6997JG. **36a**. Idem, aedeagus. **36b.** Idem, detalle del mismo. **37.** *Symmoca redondoi* Gastón & Vives, sp. n., holotypus, prep. gen. 8097JG. **38.** *Symmoca redondoi* Gastón & Vives, sp. n., paratypus, prep. gen. 8095JG. **38a.** Idem, aedeagus. **38b.** Idem, detalle del mismo. **39.** *Symmoca dodecatella* Staudinger, 1859, prep. gen. 6995JG. **39a.** Idem, aedeagus. **39b.** Idem, detalle del mismo. **40.** *Symmoca dodecatella* Staudinger, 1859, prep. gen. 7031JG. **40a.** Idem, aedeagus. **40b.** Idem, detalle del mismo.



Figs 41-44.– Genitalia hembra: **41.** *Agnoea (Agnoea) xanthosoma* (Rebel, 1901), prep. gen. 57455AV. **41a.** Idem, detalle del ostium. **41b.** Idem, detalle del signum. **42.** *Symmoca revoluta* Gozmány, 1985, prep. gen. 3976AV. **42a.** Idem, detalle del ostium. **42b.** Idem, detalle del signum. **43.** *Symmoca requenai* Gastón & Vives, sp. n., paratypus, prep. gen. 8009JG. **44.** *Symmoca tofosella* Rebel, 1893, prep. gen. 7015JG. **44a.** Idem, detalle del ostium. **44b.** Idem, detalle del signum.



Figs 45-47.– Genitalia hembra:. **45.** *Symmoca senora* Gozmány, 1977, prep. gen. 7065JG. **45a.** Idem, detalle del ostium. **45b.** Idem, detalle del signum. **46.** *Symmoca dodecatella* Staudinger, 1859, prep. gen. 8089JG. **46a.** Idem, detalle del ostium. **46b.** Idem, detalle del signum. **47.** *Symmoca redondoi* Gastón & Vives, sp. n., paratypus, prep. gen. 8090JG. **47a.** Idem, detalle del ostium. **47b.** Idem, detalle sel signum.

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First external description of the female of *Stygioides italica* Mazzei & Yakovlev, 2016 (Lepidoptera: Cossidae)

M. Pinzari & M. Pinzari

Abstract

The female of *Stygioides italica* Mazzei & Yakovlev, 2016 is described for the first time.
KEY WORDS: Lepidoptera, Cossidae, *Stygioides italica*, Italy.

Primera descripción externa de la hembra de *Stygioides italica* Mazzei & Yakovlev, 2016 (Lepidoptera: Cossidae)

Resumen

Se describe por primera vez la hembra de *Stygioides italica* Mazzei & Yakovlev, 2016.
PALABRAS CLAVE: Lepidoptera, Cossidae, *Stygioides italica*, Italia.

Introduction

Stygioides colchica (Herrich-Schäffer, 1851) is given as present in Greece, southern Russia, Asia Minor, Armenia, Lebanon and Iran (FREINA & WITT, 1990; LINGENHÖLE *et al*., 2017; KARSHOLT, 2020). Illustrations of the moth can be found in literature (DANIEL, 1954-55; FREINA & WITT, 1990; BERTACCINI *et al*., 1997; LINGENHÖLE *et al.,* 2017) while only the genitalia of the male are illustrated in ZAGULYAEV (1987).

The presence in Italy has long been debated and sometimes questioned attributing the findings to occasional imports or errors (PARENZAN & PORCELLI, 2006; GRASSI *et al.,* 2007). Indeed, the numerous findings distributed in different Italian regions confirm the presence of *Stygioides colchica* in Italy and in our opinion they validate all the reports: Piedmont, two males from San Sebastiano Curone (AL), location Telecco, 12-V-2001, leg. Baldizzone (CABELLA & FIORI, 2010); Emilia Romagna, a male from Torriana (RN) (BERTACCINI *et al*., 1997); Lazio, two males from Villa Pamphili in Rome (TURATI, 1919) and one from Tivoli in the "Roman countryside" (DANNEHL, 1927; BERTACCINI *et al*., 1997); Abruzzo, a male from Campo Felice (AQ) (ZILLI *et al*., 1997); Apulia, a male from Brindisi (CURÒ, 1890); Calabria, a female from Aspromonte (RC) (BERTACCINI *et al*., 1997); Sicily, three specimens including two of the Madonie (RAGUSA, 1893).

More recently a male collected in central Italy in Campo Felice (Abruzzo) on a flower of Gymnadenia conopsea (L.) has been illustrated in GRASSI *et al*., (2007). In 2016, the same male was studied again and determined by MAZZEI & YAKOVLEV (2016) as a different species from *Stygioides colchica* and they described a new species *Stygioides italica* Mazzei & Yakovlev, 2016. In BERTACCINI *et al.* (1987) a female of *S. colchica* was reported and pictured but unfortunately the

specimen was in bad conditions; it was collected in Calabria on the Aspromonte (RC), 1700 m, on 31-V-1994. As concerns the biology of the *S. colchica*, the caterpillar lives perhaps on the roots of *Echium* sp (KORB, 1910) while the biology of *S. italica* is completely unknown.

In the context of an ongoing survey of the Lepidoptera fauna in central Italy the results of which are available in PINZARI (2019a, 2019b), PINZARI & PINZARI (2019a, 2019b) and PINZARI *et al.* (2018, 2019), we collected a fresh female specimen of *Stygioides italica* allowed us to describe it in detail.

Materials and methods

The female was collected in an anthropized area while walking fluttering on 3-VI-2020 around 5 p.m. in Aranova, Fiumicino (Rome), Lazio, Italy. The area is characterized by villas and businesses among gardens and meadows.

Results

Material examined: 1 ♀, Aranova, in the municipality of Fiumicino (RM), Lazio, Italia, 3-VI-2020, Manuela & Mario Pinzari leg.

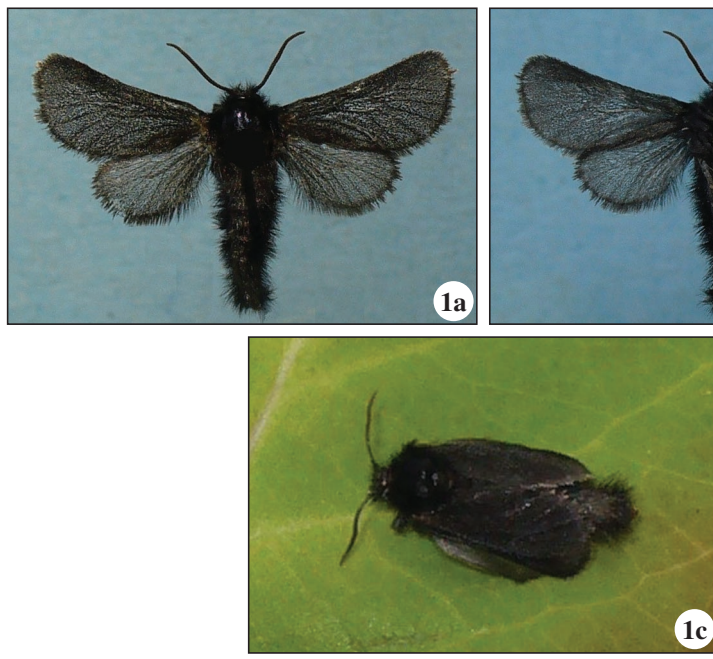

Fig. 1.– *Stygioides italica* Mazzei & Yakovlev, 2016 ♀, Manuela & Mario Pinzari leg. wingspan 15.5 mm: **a**) upperside; **b**) underside; **c**) live.

Descripion of the female of *Stygioides italica* Mazzei & Yakovlev, 2016

Wingspan. 15.5 mm. Background colour deep black. Head, thorax and abdomen. Comparing to the male, female is superiorly densely covered by short black hairs; these extend to up to half of the forewings and a third of the hindwings. Frons black; palps black; eyes black; Antennae short and

filiform. Forewing, rather acute apically, elongate, but less than male; fringe, black. Upperside with black scales. Scales, completely black, do not completely cover the wing surface that therefore appears overall a little transparent. Underside similar to upperside. Hindwings shorter than forewings, roundish; more transparent than forewings (fig. 1a). Underside similar to upperside.

On the lower part of the abdomen the hairs, shorter, and the legs are lead grey (fig. 1b).

Discussion and concluding remarks

All Italian specimens of *Stygioides* Bruand, 1853 have been attributed to *Stygioides colchyca* until MAZZEI & YAKOVLEV (2016) examined a male from central Italy. By this study they concluded that it was a new species, *Stygioides italica*. The authors do not take any position with respect to the other Italian finds, so we asked whether or not the other Italian findings also belong to *S. italica*.

The sex of most Italian finds is male or not known. We have not found in the literature any description of the female genitals of any *Stygioides* species. Then, we have taken as reference the figures and descriptions of the moths. To date, only one female has been collected in southern Italy and it was attributed to *S. colchica* (BERTACCINI *et al.,* 1997). In their opinion (pers. com. June 2020) our specimen could be a female of *S. italica*. The Italian specimen illustrated in table 12, figure 16, *op. cit*) is a female, however unfortunately it is in bad conditions, but its habitus is good enough to show that the hindwings are decidedly larger and longer than those of our specimen.

FREINA & WITT (1990) showed two females of *S. colchica* (Table 1, figs 4 and 5, *op. cit*.): the first with a wingspan of 11 mm and the second of 19 mm. Both are specimens from Kleinasien, westl. whose hindwings are small, in relation to forewings, like those of our specimen but in both moths, the abdomen is much longer.

LINGENHÖLE *et al.* (2017) illustrated (figs 3 and 9 *op. cit.*) two females of *Stygioides* species: the first is *S. persephone* (Reisser, 1962), from the south of Creta, and the second is *S. colchica* from Iran; in both specimens, the hindwings are proportionally longer than in our specimen.

All mentioned observations do not lead to any definitive conclusion that it would be advisable to wait for the capture of a male.

The deep, black colour background of wings and the scales, which are never brown even at the binocular, and the leaden grey colour of the lower abdomen and legs, tell us that it is a different species from *S. colchyca* and from the others known *Stygioides* species. The darker colour than the male can fall within the sexual dimorphism typical of the *Stygioides* genus. It is probably an extremely rare species and the wait for the capture of a male could be very long. Even *S. italica* was found in central Italy even if at much higher altitudes. In light of these considerations we think that it is the female of *S. italica*, excluding for now the possibility that it is a new species, and as such we have described it.

The findings of southern and central Italy, which validate those of Rome, indicate that at least in the central south of the Italian peninsula there is only *S. italica*.

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The Brazilian species of the genus *Eustema* Schaus, 1901, with description of a new genus and species (Lepidoptera: Notodontidae, Heterocampinae)

Vitor O. Becker

Abstract

Three species of *Eustema* Schaus, 1901 are recorded for Brazil: *E. argentata* Becker, sp. n., *E. dara* (Druce, 1894) and *E. opaca* Schaus, 1921; *E. rapana* Jones, 1908, originally assigned to the genus, is not congeneric with the other species; a new genus is proposed, *Rapanodonta* Becker, gen. n., to include it. *Eustema sericea* Schaus, 1910, is a new synonymy of E. *dara* (Druce, 1894). The larvae of *E. dara* and *E. opaca* feed on the leaves of *Roupala montana* and *Grevillea* sp. (Proteaceae).
KEY WORDS: Lepidoptera, Notodontidae, Heterocampinae, *Eustema*, new genus, new species, new synonymy, Brazil.

Las especies brasileñas del género *Eustema* Schaus, 1901, con la descripción de un género y una especie nuevos (Lepidoptera: Notodontidae, Heterocampinae)

Resumen

Tres especies de *Eustema* Schaus, 1901 se registran para Brazil: *E. argentata* Becker, sp. n., *E. dara* (Druce, 1894) y *E. opaca* Schaus, 1921; *E. rapana* Jones, 1908, originalmente asociada con este género, no es congenérica con las demás especies, se propone un nuevo género, *Rapanodonta* Becker, gen. n., para incluirla. *Eustema sericea* Schaus, 1910, es una nueva sinonimia de *E. dara* (Druce, 1894). Las orugas de *E. dara* y *E. opaca* se alimentan de las hojas de *Roupala montana* y *Grevillea* sp. (Proteaceae).
PALABRAS CLAVE: Lepidoptera, Notodontidae, Heterocampinae, *Eustema*, nuevo género, nueva especie, nueva sinonimia, Brasil.

Introduction

The genus *Eustema* Schaus, 1901 includes seven species (BECKER, 2014: 8), two of them from Brazil. A third species originally described from Mexico and Costa Rica, is recorded for the country for the first time. In order to place this species in the context of the genus, the type-material of the other species had to be examined and, as a result, it was found that one species is undescribed, one name is a synonym, and one of the species is not congeneric with the type-species of the genus, cannot be associated with any of the available ones, requiring a new genus to accommodate it.

Material and methods

This work is based on 51 specimens, 26 (10 genitalia preparations) in VOB, 6 in the CPAC, 12 in AMC, and 7 in DZUPR. Synoptic collections, representing all these species were taken to the NHMUK

and the USNM and were compared with the types deposited there. The type material of all species they were examined. The holotype of the new species is provisionally deposited in VOB, and will be transferred, together with the collection, to a Brazilian institution in the future. Genitalia were prepared following the methods described by ROBINSON (1976). Terms for morphological characters follow HODGES (1971).

Abbreviations

AMC = Alfred Moser collection, São Leopoldo, Rio Grande do Sul, Brazil
CPAC = Centro de Pesquisa Agropecuária dos Cerrados, Planaltina, DF Brazil
DF = Distrito Federal, Brazil
DZUPR = Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil
FW = Forewings
GO = Goiás State, Brazil
G. s. = genitalia slide
HW = Hind wings
MG = Minas Gerais State, Brazil
MT = Mato Grosso State, Brazil
NHMUK = Natural History Museum, United Kingdom
PR = Paraná State, Brazil
RO = Rondônia State, Brazil
RS = Rio Grande do Sul State, Brazil
SP = São Paulo State, Brazil
TS = Type-species
USNM = United States National Museum, Washington
VOB = Vitor O. Becker collection, Serra Bonita Reserve, Camacan, Bahia, Brazil

Results and discussion

The study of the material available revealed that the two species described from Mexico and Costa Rica are synonyms, and is recorded for the first time for Brazil, based on specimens reared from larvae and on specimens collected at light, and another one is undescribed. *E. rapana* Jones, 1908, originally described from Brazil, is not congeneric with the type-species of this genus and a new genus is proposed here to accommodate it.

Eustema Schaus, 1901
Eustema Schaus, 1901. *Trans. Ent. Soc. Lond.,* **1901**: 285
TS: *Stilpnotia dara* Druce, 1894. *Ann. Mag. Nat. Hist.,* (6) **13**: 355, by original designation.
= *Eustemides* Dyar, 1908. *Proc. U. S. Nat. Mus.,* **9**: 46.
TS: *Eustema carama* Druce, 1904. *Ann. Mag. Nat. Hist.,* (7) **13**: 352-363, by original designation [Synonymized by BECKER, 2014: 8].

Diagnosis: Medium size, mostly inconspicuos gray, with antenna pectinate throughout, not at basal half only, as a pattern for the family. They remind some large species of *Paracles* Walker, 1855 (Erebidae: Arctiinae). Male genitalia with uncus bifid, socii sharp-pointed, otherwise typical for the family. Female genitalia with ostium broad, conical; ductus bursae narrow, half-length as bursae diameter; corpus bursae oblong; signum a round plate.

Distribution: Southern Mexico to southern Brazil.

Eustema dara (Druce, 1894) (Figs 1-4, 10)
Stilpnotia (?) dara Druce, 1894. *Ann. Mag. Nat. Hist.,* (6) **13**: 355
Holotype ♀, MEXICO: Orizaba (NHMUK) [examined].

= *Eustema sericea* Schaus, 1910. *Ann. Mag. Nat. Hist.,* (8) **6**: 580

Lectotype ♂, COSTA RICA: El Sitio [de Avance], (Schaus) (USNM), designated by SCHINTLMEISTER, 2016: 481 [examined]. **Syn. n.**

Diagnosis: Gray, veins dark gray, abdomen dark fuscous, banded ochreous, to golden ochreous. Male genitalia with socii long, thin, parallel; gnathos long, widely curved, sharp pointed; aedeagus straight, cylindrical, with a strong, curved hook at tip.

Material studied: 14 ♂♂ (5 g. s. 4270, 4841, 5394, 5395, 5399), 11 ♀♀ (3 g. s. 5396-5398). BRAZIL: DF, Planaltina, 15º53'S - 47º42'W, 1100 m, 2 ♂♂, 28-IV, 29-IX-1976 (Becker 18458, 18468); Idem, 2 ♂♂, 2 ♀♀, 22-X-1977, 14-IV-1978, 3-XII-1982 (Becker) (CPAC 6158, 6944, 9527); MG, Pirapora, 500 m, 2 ♀♀, 29-X-1988 (Becker 59949); GO: Ilha do Bananal, Rio Javaré, 200 m, 1 ♀, 14-19-IX-1985 (Becker 64077); Idem, Alvorada do Norte, 415 m, 2 ♂♂, 2 ♀♀, 11-14-XI-2003 (Becker, Ferro & Emery, 135056); MT, Chapada dos Guimarães, 800 m, 1 ♀, 25-30-X-1997 (Becker 110686); SP, Ilha Solteira, 21º31'S - 51º19'W, 350 m, 1 ♀, 9-11-X-2001 (Becker 132907). NICARAGUA: Matagalpa, Sierra Negra, 13º00'N - 85º54'W, 1300 m, 4 ♂♂, 3 ♀♀, 26-VIII-2000 (Becker 126332) (VOB). PANAMA: Chiriqui, Boquete, 1500 m, 1 ♂, 5-6-V-2007 (Moser) (AMC).

Distribution: Southern Mexico to Central Brazil.

Food plants: Reared by the author on *Roupala montana* Aubl. and on *Grevillea* sp. (Proteaceae).

Remarks: The series from Nicaragua has the body dark fuscous, matching the type of *Eustema dara,* whereas the series from Brazil have the body golden ochreous, as the type of *E. sericea.* The genitalia of both sexes, of both forms, are identical.

Eustema opaca Schaus, 1921 (Figs 5-6)

Eustema opaca Schaus, 1921. *Proc. U. S. Nat. Mus.,* **59**: 384

Holotype ♂, BRAZIL: RJ, Nova Friburgo, 11-V-1913 (Arp) (USNM) [examined].

Diagnosis: Dark gray, abdomen golden ochreous, banded dark fuscous; FW with an ill-defined dark patch beyond cell, before the diffuse, grey postmedial band.

Material studied: 18 ♂♂ (2 g. s. 4207, 5393), 7 ♀♀. BRAZIL: PR, Quatro Barras, Banhado, 800 m, 1 ♂, 21-I-1971 (Becker 22863) (VOB); SP, Campos do Jordão, 22º46'S - 41º35'W, 1600 m, 2 ♂♂, 1 ♀, 23-27-I-2001 (Becker 130821) (VOB); DF, Planaltina, 15º53'S - 47º42'W, 1100 m, 1 ♀, 7-X-1976 (Becker) (CPAC 1448); RS, Morro Reuter, Faz. Padre Eterno, 29º32'S - 50º58'W, 500-600 m, 11 ♂♂, 2 ♀♀, 22-XII-1997, 18-XII-1999, 7-I-2000, 4-II-2002; 12-15-XI-2005, 26-27-X-2006, 5-6-XI-2011; 8-9-XI-2013; 4-8-XI-2016 (Moser); SC, São Bento do Sul, 26º19'S - 49º18'W, 600-800 m, 3 ♂♂, 1 ♀, 4-I-1999, II-1999, 8-12-VIII, 5-IX-2007 (Moser) (AMC, DZUPR).

Food plant: *Roupala montana* Aubl. (Proteaceae) (DINIZ *et al.,* 2013: 179).

Distribution: Southern and Central Brazil.

Remarks: The darker pattern and the diffuse, dark gray patch beyond cell, distinguish it from *E. dara,* the most similar.

***Eustema argentata* Becker, sp. n.** (Fig.7)

Material examined: Holotype ♀, BRAZIL: RO, Porto Velho, 180 m, 24-30-IV-1989 (Becker 62125, g. s. 5540) (VOB).

Diagnosis: FW silvery gray, with contrasting gray veins, and diffuse bands crossing from costa to dorsum and tornus; HW gray; abdomen pale ochreous.

Description: Female FW 22 mm (50 mm wingspan). Body dark fuscous. FW silvery gray, veins dark gray, base diffuse gray, three diffuse gray bands crossing wing: antemedial straight, postmedial curved, straight from costa to M3, bent inwards, joining antemedial on dorsum, subterminal ill-defined, interrupted on veins; cilia dark gray. HW dark gray, veins slightly contrasting. Genitalia (fig.): Lamella antevaginalis wide, basal margin round; ostium broad, conical; ductus bursae membranous; corpus bursae oblong, constricted at middle; signum a round plate.

Etymology: From the Latin *argentum* = silver; feminine.

Remarks: Related to *E. albifasciata* (Schaus, 1920) and *E. fassli* (Dognin, 1922), similar to the latter, which very likely is the female of the former.

Rapanodonta Becker, gen. n.

TS: *Eustema rapana* Jones, 1908. *Trans. Ent. Soc. Lond.,* **1908**: 169.

Diagnosis: Medium size; FW fuscous with a large, triangular, brown area from cell to dorsum. HW dark fuscous. Male genitalia with uncus a short-curved rod; socii thin bent distad, arms parallel, sharp pointed; sacculus with long, acute projection, at mid-way of internal edge.

Description: Male FW 25 mm (56 mm wingspan), female . Antenna half size as FW, bipectinate to near apex. Male genitalia with uncus a short, curved rod, with a groove towards apex; socii cylindrical to before apex, parallel; valva subrectangular, thin, semi membranous between costa and sacculus; costa slender, strongly sclerotized, rounded distad; apex with an indentation distad of sacculus; sacullus broad, strongly sclerotized, a long, curved, sharp-pointed expansion at base; juxta subrectangular; vinculum round. Aedeagus straight, nearly cylindrical, slightly tappering towards apex; vesica with small, spined cornutus. 8th sternite with basal margin broad triangular, distal margin strongly concave in the middle.

Etymology. A combination of two names: *rapana* and *Notodonta*; feminine.

Remarks: Similar to *Eustema* in wing venation, and shape of antenna. In *Rapanodonta* antenna longer, and male genitalia quite distinct.

Rapanodonta rapana (Jones, 1908), **comb. n.** (Figs 8-9)
Eustema rapana Jones, 1908. *Trans. Ent. Soc. Lond.,* **1908**: 169
Syntype ♂, [Brazil]: PR, Curitiba (Jones) (NHMUK), here designated [examined].

Diagnosis: The same as for the genus (see above).

Material studied: 2 ♂♂ (2 g. s., 4082, Moser), 1 ♀ (1 g. s. Moser). Brazil: RS, Pelotas, 10 m, 1 ♂, 8-VIII-1967 (Becker 1603) (VOB); Idem, São José dos Ausentes, Faz. Potreirinhos, 28º36'S - 49º58'W, 1200 m, 1 ♂, 5-7-XI-2004 (Moser); Idem, SC, Lages, 27º48'S - 50º24'W, 1150 m, 1 ♀, 1-IX-1999 (Moser) (AMC).

Remarks: Described from an unspecified number of males, of which, five were traced.

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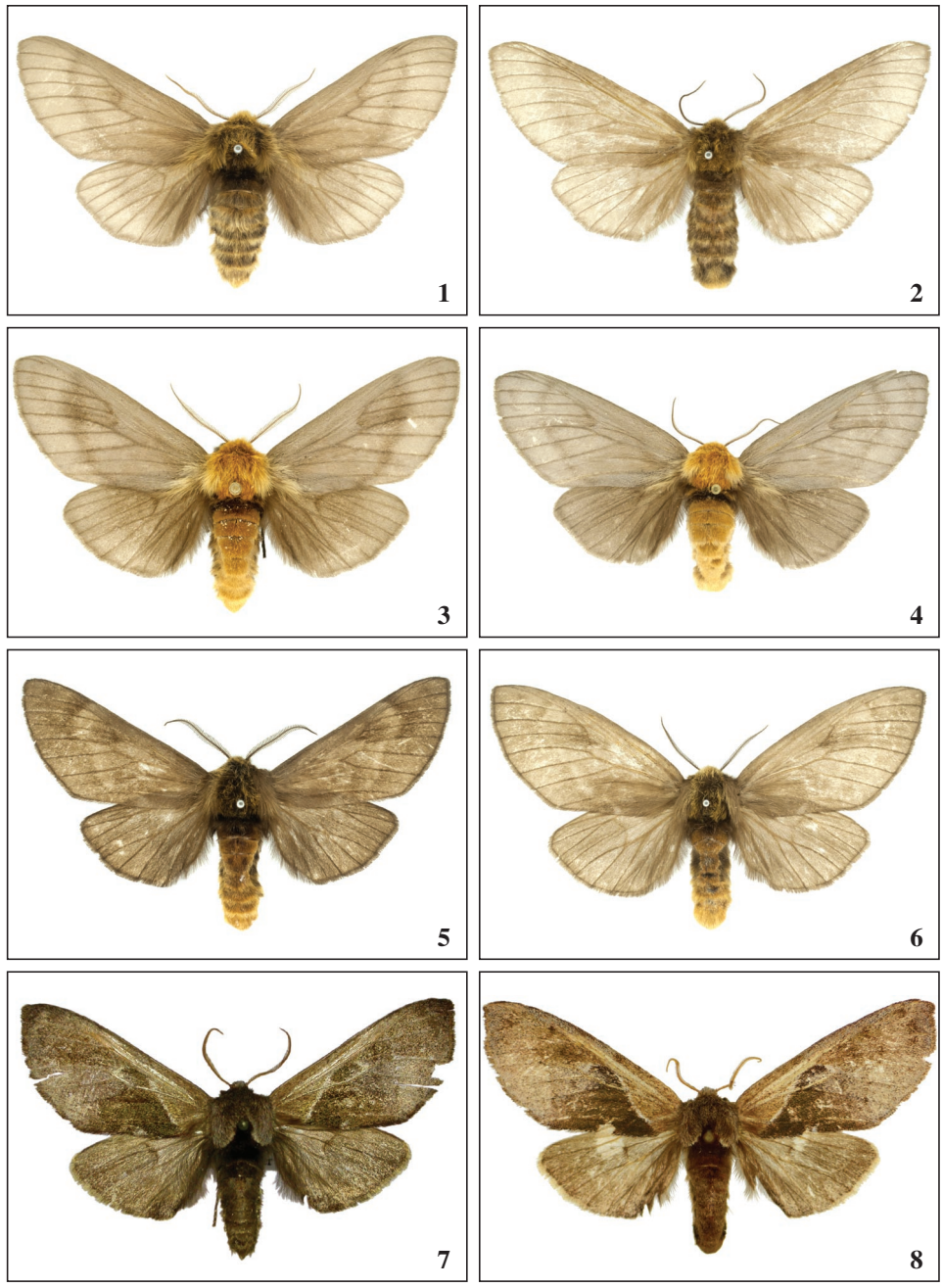
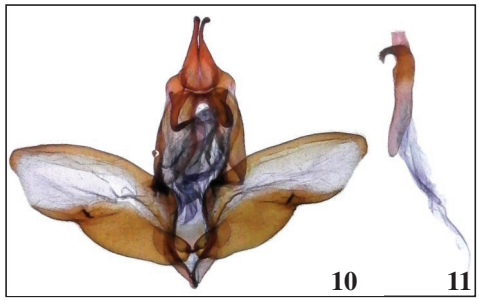
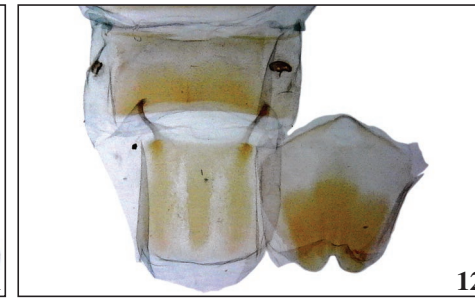
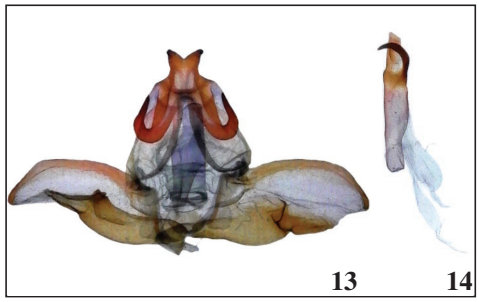
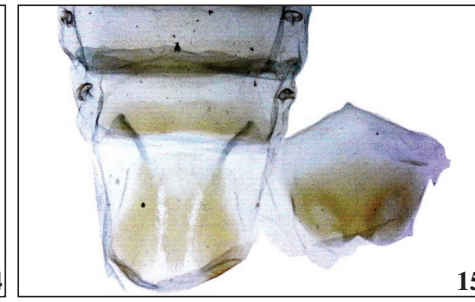


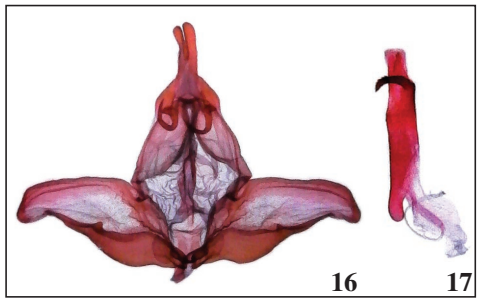
Figs 1-8.– Adults of *Eustema* species, dorsal view. **1-4.** *E. dara* (Druce)*:* **1.** ♂. **2.** ♀, Nicaragua. **3.** ♂. **4.** ♀, Brazil. **5-6.** *E. opaca* Schaus, Brazil: **5.** ♂. **6.** ♀. **7-8.** *Rapanodonta rapana* (Jones) (Brazil): **7.** ♂. **8.** ♀.

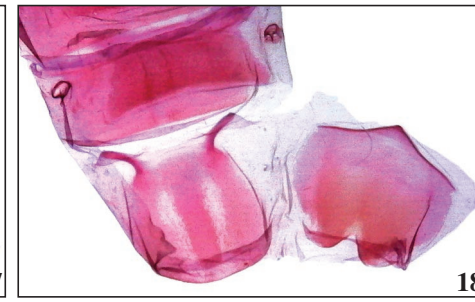




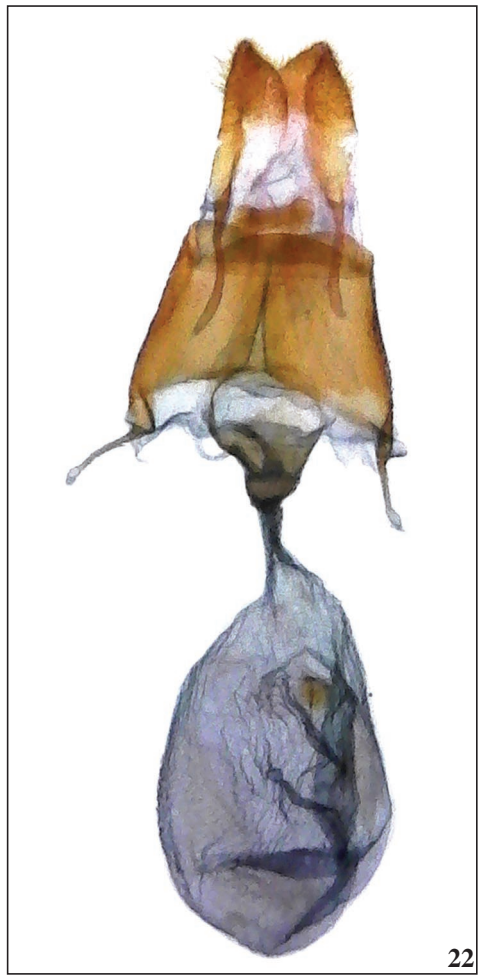


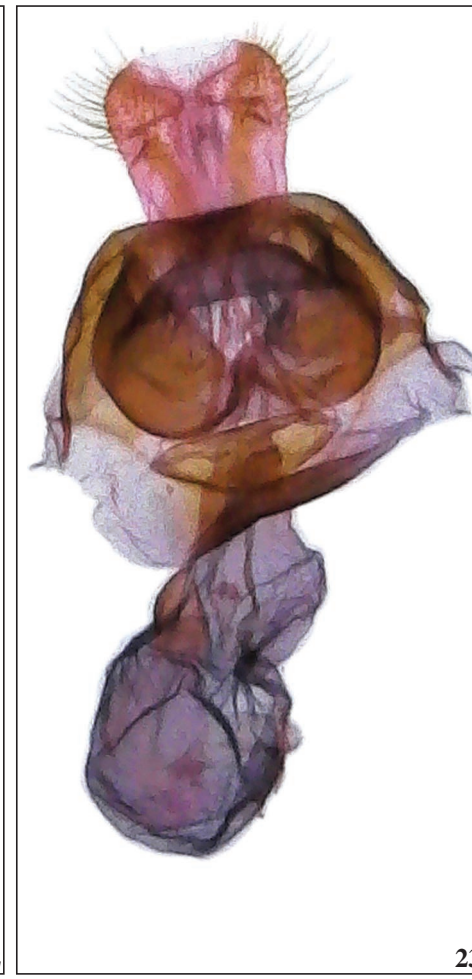






Figs 9-18.– 9. *Eustema argentata* Becker, sp. n., ♀ Holotype, Brazil. **10-18.** Genitalia (ventral view), and 8th abdominal segment of *Eustema* species: **10-12.** *E. dara*: **10.** ♂ genitalia, Nicaragua. **11.** aedeagus, lateral view, Nicaragua. **12.** 8th abdominal segment (left, tergite; right, sternite). **13-15.** *E. opaca*: **13.** ♂ genitalia. **14.** aedeagus, lateral view; **15.** 8th abdominal segment (left, sternite; right tergite). **16-18.** *E. dara* **16.** ♂ genitalia, Brazil. **17.** aedeagus, lateral view, Brazil. **18.** 8th abdominal segment (left, tergite; right, sternite).





Figs 19-21.– *Rapanodonta rapana*: **19.** ♂ genitalia, ventral view. **20.** aedeagus, lateral view. **21.** 8th abdominal segment (left, tergite; right, sternite). **22-23.– 22.** *Eustema dara* ♀ genitalia, Brazil; **23.** *E. argentata* Becker, sp. n., ♀ genitalia, holotype.