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Variación temporal del ensamblaje de mariposas asociadas a la Cuenca de la Calaboza, Yopal, Casanare, Colombia (Lepidoptera: Papilionoidea)

P. Urbano, O. Mahecha-J., E. Suárez, V. Izquierdo & V. Díaz-S.

Resumen

La variación estacional puede afectar tanto a la estructura del hábitat como a la disponibilidad de recursos, lo que puede generar diferentes respuestas de las especies animales como las mariposas. Por tal razón, se planteó evaluar el efecto de la variación temporal en el ensamblaje de mariposas en la cuenca de la Calaboza, Casanare, Colombia, teniendo dos épocas de muestreo: Bajas lluvias y altas lluvias y empleando métodos de recolecta activos y pasivos planteados para el estudio de mariposas. Se logró evidenciar una variación en la composición, abundancia y riqueza de mariposas a lo largo del muestreo, en donde la familia Nymphalidae presentó mayor diversidad tanto para la época de altas y bajas lluvias seguido de Pieridae. Por su parte, Lycaenidae y Riodinidae presentaron los menores valores de abundancia y riqueza en ambas épocas de muestreo. Se observó una variación en la composición de las especies de mariposas por época de muestreo, en donde *Pyrgus orcus* (Stoll, 1780), *Memphis ambrosia* (Druce, 1874), *Eresia clara* (Linnaeus, 1758), *Cissia tiessa* (Doubleday, 1848), *Euptoieta claudia* (Cramer, 1775), *Taygetis rufomarginata* (Staudinger, 1888), *Aphrissa statira* (Cramer, 1777), *Melete polyhymnia* (Felder & Felder, 1865) y *Hypoleria ocalea* (Doubleday, 1847), fueron exclusivas de época de bajas lluvias, mientras que *Pyrgus oileus* (Linnaeus, 1767), *Eueides lybia* (Fabricius, 1775), *Itaballia demophile* (Linnaeus, 1763), *Dircenna dero* (Hübner, 1823), *Hamadryas arinome* (Lucas, 1853), *Taygetis andromeda* (Butler, 1877), *Eunica malvina* (Bates, 1864), *Posttaygetis penelea* (Cramer, 1777), entre otras, fueron especies exclusivas de la época de Altas Lluvias. Se evidenció que especies como *Historis acheronta* (Fabricius, 1775) y *Heliconius erato* (Linnaeus, 1758) fueron co-dominantes, tanto para la época de bajas como de altas lluvias. Estos resultados, indican que a nivel de cuenca existen condiciones ecosistémicas que soportan los requerimientos biológicos para la supervivencia de la comunidad de mariposas, a pesar de la especificidad en la presencia de algunas especies por época climática, se reporta una alta diversidad de especies en el área de estudio importantes para el equilibrio ecosistémico, por lo que la Calaboza se convierte en un área de importancia para conservación a nivel de piedemonte en la región de la Orinoquia colombiana.
PALABRAS CLAVE: Lepidoptera, Papilionoidea, Piedemonte, comunidad, diversidad, conservación, Colombia.

Temporal variation of the assemblages of butterflies associated with the La Calaboza, Yopal, Casanare, Colombia (Lepidoptera: Papilionoidea)

Abstract

Temporal variation can affect the structure of the habitat and the availability of resources, which can generate different responses of animal species such as butterflies. For this reason, we were proposed to evaluate the effect of the temporal variation in the assembly of butterflies in the Calaboza, Casanare, Colombia, having two sampling periods: Low Rains and High Rains and using active and passive collection methods proposed for the study of butterflies. It was possible to show a variation in the composition, abundance and richness of butterflies throughout the sampling, where the Nymphalidae family presented greater diversity for both the High and Low Rainy seasons

followed by Pieridae family. On the other hand, Lycaenidae and Riodinidae presented the lowest values of abundance and wealth in both sampling seasons. A variation in the composition of the butterflies species was observed by sampling period, where *Pyrgus orcus* (Stoll, 1780), *Memphis ambrosia* (Druce, 1874), *Eresia clara* (Linnaeus, 1758), *Cissia tiessa* (Doubleday, 1848), *Euptoieta claudia* (Cramer, 1775), *Taygetis rufomarginata* (Staudinger, 1888), *Aphrissa statira* (Cramer, 1777), *Melete polyhymnia* (Felder & Felder, 1865) and *Hypoleria ocalea* (Doubleday, 1847), were exclusive of low rains period, while *Pyrgus oileus* (Linnaeus, 1767), *Eueides lybia* (Fabricius, 1775), *Itaballia demophile* (Linnaeus, 1763), *Dircenna dero* (Hübner, 1823), *Hamadryas arinome* (Lucas, 1853), *Taygetis andromeda* (Butler, 1877), *Eunica malvina* (Bates, 1864), *Posttaygetis penelea* (Cramer, 1777), among others, were exclusive species of the High Rainy season. We were evidenced that species such as *Historis acheronta* (Fabricius, 1775) and *Heliconius erato* (Linnaeus, 1758) were co-dominant for both the Low season and the High Rainy season. These results indicate that there are ecosystem conditions that support the biological requirements for the survival of the butterflies' community, despite the specific nature of the presence of some species by climate season; a high diversity of species is reported. Important study area for the ecosystem equilibrium, so the Calaboza becomes an area of importance for conservation at piedmont level in the region of the Colombian Orinoquia.
KEY WORDS: Lepidoptera, Papilionoidea, Piedmont, community, diversity, conservation, Colombia.

Introducción

En el Neotrópico, Colombia es considerado uno de los países más megadiversos con una gran variedad de especies tanto de animales como de vegetales (ANDRADE-C., 2011; URBANO *et al*., 2014; MAHECHA-J. & DÍAZ-S., 2015). No obstante, esta biodiversidad está siendo amenazada constantemente por los altos niveles de deforestación dado los crecientes eventos de transformación de los ecosistemas naturales (VAN DERHAMMEN & ANDRADE, 2003; RUDAS *et al*., 2007; MAHECHA-JIMÉNEZ *et al*., 2011; URBANO *et al*., 2014).

Los eventos de transformación están relacionados a procesos de colonización y ampliación de la frontera agrícola, minera y ganadera (SANTOS & TELLERIA, 2006; URBANO *et al*., 2014). Estos procesos han contribuido a la perdida de alrededor del 40% de la cobertura original del país, en donde la región andina ha sido la más afectada en términos de pérdida de biodiversidad en todos sus niveles: Riqueza de Especies, Ecosistémico y Genético (ANDRADE-C., 2011; URBANO *et al*., 2014). En este orden de ideas, la intrusión de especies foráneas o exóticas y la sobre-explotación de los recursos naturales han contribuido en gran parte a la pérdida de diversidad biológica en varias regiones geográficas de Colombia (BAPTISTE *et al.,* 2010), en espacial ocasionando la pérdida de especies endémicas y la disminución de grupos taxonómicos sensibles a cambios ambientales, como los son los Lepidoptera (MAHECHA-JIMÉNEZ *et al*., 2011; TINAJERO & RODRÍGUEZ-ESTRELLA, 2012; URBANO *et al*., 2014;).

Estudios han demostrado que las mariposas son muy sensibles a la fluctuación de variables ambientales como la temperatura, la estacionalidad, humedad relativa y radiación solar, entre otros (BROWN, 1991; MAHECHA-JIMÉNEZ *et al*., 2011; MAHECHA-J. & DÍAZ-S., 2015). Esta sensibilidad obedece a una respuesta comportamental y ecológica frente a las perturbaciones del hábitat generados por eventos antrópicos (GUERRA-SERRUDO & LEDEZMA-ARIAS, 2008; URBANO *et al*., 2014). Además, la sensibilidad de las mariposas a cambios ambientales y del paisaje, está relacionado con su ciclo de vida por las fuertes asociaciones de sus estados larvales a grupos particulares de plantas (GREENEY *et al.,* 2009). Por lo anterior, las mariposas son considerados bioindicadores del estado de conservación del ecosistema, y al mismo tiempo, por presentar variabilidad espacio- temporal, por lo que suelen ser usados como modelos en estudios sobre variación temporal (FAGUA *et al*., 1999; GONZÁLEZ-VALDIVIA *et al*., 2011; URBANO *et al.*, 2014; MAHECHA-J. & DÍAZ-S., 2015; ISERHARD *et al.,* 2017).

La variación estacional o temporal puede afectar tanto a la estructura del hábitat como a la disponibilidad de recursos, lo que puede generar diferentes respuestas de las especies de mariposas y de otros grupos de animales como las aves (CODESIDO & BILENCA, 2004). Por ejemplo, algunas de estas respuestas pueden ser los cambios en la composición específica del ensamblaje de mariposas y las variaciones en abundancia de sus poblaciones (CODESIDO & BILENCA, 2004). A su vez, la actividad estacional de los insectos es un fenómeno que ha sido registrado muchas veces en ecosistemas tropicales donde hay una clara alternancia de una época seca y una húmeda (WOLDA, 1978; JIMÉNEZ-SÁNCHEZ *et*

al., 2009). Sin embargo, esta estacionalidad puede variar según el grupo taxonómico que se esté estudiando y en general cada patrón representa una solución diferente de cada especie a las limitaciones locales en las condiciones bióticas y abióticas limitantes para cada especie (PESCADOR *et al*., 2002; JIMÉNEZ-SÁNCHEZ *et al.,* 2009; ISERHARD *et al.,* 2017), dando lugar a una gran variedad de patrones temporales o estacionales de diversidad (KATO *et al*., 1995; JIMÉNEZ-SÁNCHEZ *et al.,* 2009).

Sin embargo, aún hacen falta estudios sobre varios temas biológicos, como por ejemplo en diversidad, biogeografía, sistemática, entre otros, concernientes a las mariposas en muchas regiones de Colombia, principalmente en aquellas áreas como el piedemonte y sabanas inundables de la Orinoquia, las cuales en los últimos años, han sido afectados por diferentes procesos antrópicos que ha llevado a la fragmentación del hábitat, como por ejemplo, actividades de minería, agricultura, ganadería extensiva, etc. (URBANO *et al*., 2014), además, la carencia de estudios sobre diversidad en la zona origina un desconocimiento de cómo diversos grupos animales, como las mariposas, responden a cambios ambientales y cómo estos cambios pueden afectar la estructura de los diferentes ensamblajes presentes en estas áreas del país, ejemplo de estos cambios ambientales tiene que ver con el conocimiento de los patrones de diversidad temporal, la cual permite una mejor comprensión de la ocurrencia y distribución de las especies en una comunidad, igualmente, la variación temporal influye en la fluctuación y modificación de las comunidades a través del tiempo permitiendo describir con precisión los patrones que dan forma a la diversidad y distribución de la fauna en un área determinada (ISERHARD *et al.,* 2017). Por lo anterior, el objetivo del presente estudio fue determinar la variación temporal del ensamblaje de mariposas asociadas a la Cuenca de la Calaboza, Yopal, Casanare, Colombia. Además, de aportar al conocimiento de las especies de mariposas del departamento de Casanare.

Materiales y Métodos

Área de estudio

El estudio se realizó en la cuenca la Calaboza del municipio de Yopal Casanare, la cual comprende un ecosistema de bosque húmedo tropical sobre el piedemonte llanero de la cordillera oriental de Colombia (ROMERO *et al.,* 2004). Esta cuenca presenta una altitud que va desde los 350 msnm hasta los 970 msnm y una precipitación media anual de 2.100 a 4.200 mm con un periodo de altas lluvias entre los meses de abril a octubre y un periodo de bajas lluvias entre los meses de noviembre a marzo. La topografía de la cuenca es típica de piedemonte llanero la cual está conformada, por diferentes tipos de suelos que se han originado gracias a la interacción que existe entré factores tales como la vegetación, el clima y la formación geológica de las rocas, causando dicha interacción suelos compuestos de hierro y aluminio, lo cual ostenta de superficies acidas al territorio. Está ubicada a 5 km al norte del casco urbano del municipio de Yopal (N: 5º 37’ 09”; W: 72º 41’ 81”) y tiene un área de 345 hectáreas donde predominan zonas abiertas de pastizales naturales e intervenidos y relictos boscosos sobre el margen del cuerpo de agua (Figura 1).

Fase de Campo

La fase de campo se llevó acabo en los meses de V-VII-2016, que correspondió a la época de lluvia, y del mes XI-XII-2016 y I-2017, la cual consistió a la época de bajas lluvias. Para la recolección de los ejemplares se realizaron 6 salidas de campo de 5 días/mes cada una, en donde se utilizaron trampas Van Someren Rydon (VSR) en transectos de 300 metros cada uno sobre el margen del caudal, tanto en la cuenca alta como media y baja, sobre dichos transectos se colocaron 7 trampas distanciadas 50 metros una de la otra, las cueles se revisaron diariamente para el registro de ejemplares recolectados por trampa y por transecto. Las trampas fueron cebadas con fruta fermentada y excremento humano. Adicionalmente, se establecieron transectos paralelos en áreas abiertas o pastizales adyacentes, en los cuales se aplicó la metodología de captura con red lepidopterológica (jama) durante los 4 días por mes y logrando una intensidad de 132 horas/hombre por muestreo mensual.

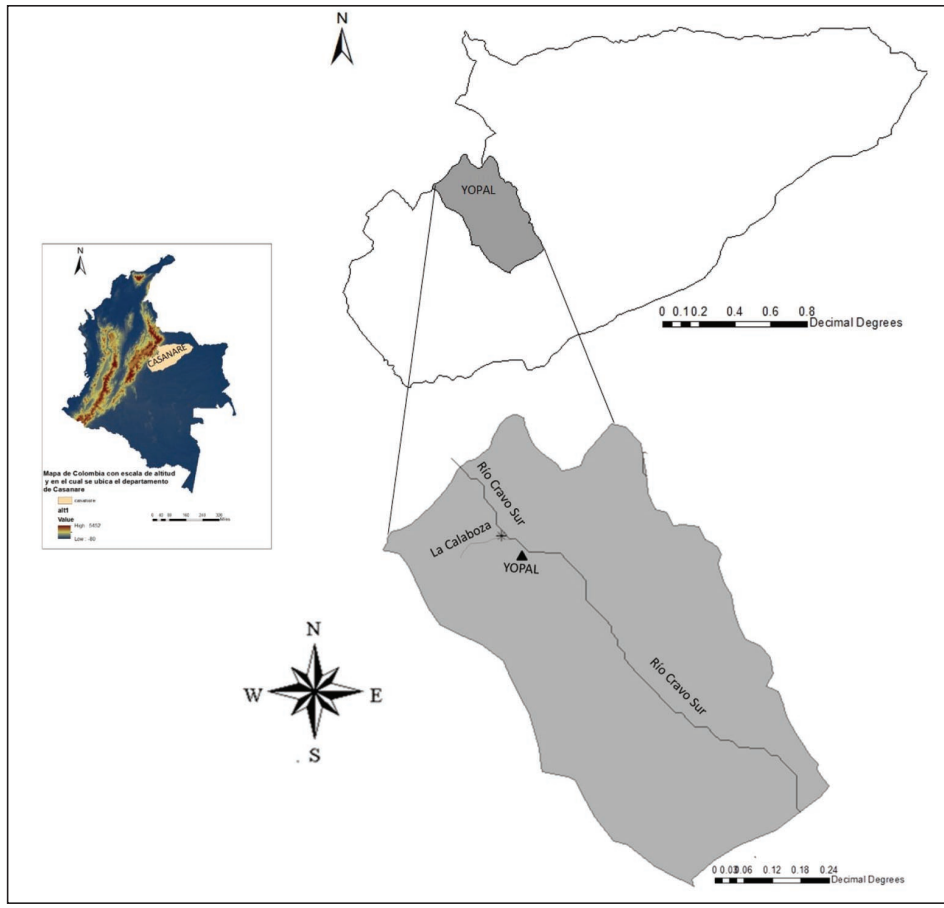

Figura 1.– Ubicación geográfica de la Quebrada La Calaboza, en el municipio de Yopal Casanare, Colombia. El asterisco indica el delta de la quebrada sobre el rio Cravo Sur y la ubicación de la Cabecera Municipal de Yopal.

Determinación Taxonómica

Los individuos recolectados fueron procesados siguiendo el protocolo de ANDRADE-C *et al.* (2013) y fueron depositados en la colección de referencia de la Fundación Universitaria Internacional del Trópico Americano (Unitrópico) en Colombia. Se analizaron caracteres morfológicos como patrones alares, patrones de coloración y genitales del macho. Para la determinación taxonómica se utilizaron las claves de LECROM *et al.* (2002, 2004) y NEILD (1996, 2008). Adicionalmente, se contó con la colaboración de especialistas en algunos grupos de mariposas y su identificación fue contrastada con la lista para Lepidoptera neotropicales de LAMAS (2004) y la base de datos de WARREN *et al*. (2013).

Análisis de Datos

Se obtuvieron los índices de diversidad alfa y beta en términos de números equivalentes o números de Hill para la época de bajas lluvias y de altas lluvias. Estos números se calcularon en tres órdenes de diversi-

dad; la diversidad en orden H0 (riqueza de especies), la diversidad H1 (exponencial del índice de Shannon) y la diversidad H2 (el inverso del índice de Simpson) (JOST, 2006; MORENO *et al.,* 2011; CASAS-PINILLA *et al*., 2017). Se estimó la riqueza del muestreo por medio de los estimadores no paramétricos de Chao1, el cual analiza la riqueza cuando se obtiene la abundancia a partir de las especies observadas con una y dos muestras (singletons y doubletons) (MORENO, 2001; MAHECHA-JIMÉNEZ *et al*., 2011). Además, se realizó una curva de acumulación de especies y una curva de rarefacción utilizando los sitios de muestreo como variable independiente y como variable dependiente las especies recolectadas (MAHECHA-JIMÉNEZ *et al.,* 2011; URBANO *et al.*, 2014; ISERHARD *et al.,* 2017). Los patrones de abundancia de las especies se estimaron a partir de una matriz de abundancias, donde se estableció la curva de rangos de abundancias para el ensamblaje de mariposas, y de esta forma poder conocer que especies son más dominantes y cuales son raras (singletons y doubletons) en la muestra. Finalmente, se realizó una prueba de U-Mann Whitney (Test de Kolmogorov-Smirnov: p-value= 0.0002) para determinar la significancia entre la variación temporal de altas y bajas lluvias (ZAR, 1996). Todos los análisis se precisaron bajo un nivel de significancia del 95% (p>0,05) y se realizaron utilizando los programas Biodiversity Pro (MCALEECE *et al*., 1997) y SPSS (Statistical Productand Service Solutions Statistics) versión 17.0. (IBM, 2008).

Resultados

Se recolectaron 698 individuos, 6 familias, 15 subfamilias y 96 especies en ambas épocas (Apéndice I). En donde la familia Nymphalidae fue la más diversa tanto para la época de altas y bajas lluvias seguido de la familia Pieridae. Por su parte, las familias menos diversas fueron Papilionidae, Hesperidae, Lycaenidae y Riodinidae, siendo Lycaenidae y Riodinidae las familias que presentaron los menores valores de abundancia y riqueza en ambas épocas de muestreo (Figuras 2 y 3).

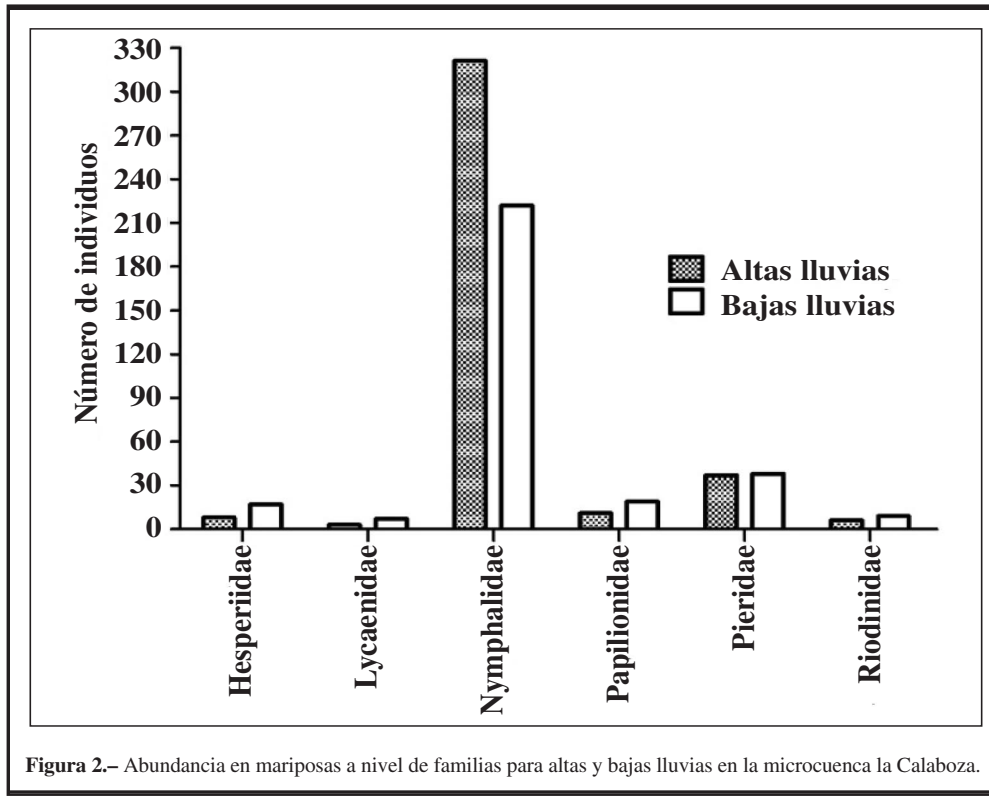

Figura 2.– Abundancia en mariposas a nivel de familias para altas y bajas lluvias en la microcuenca la Calaboza.

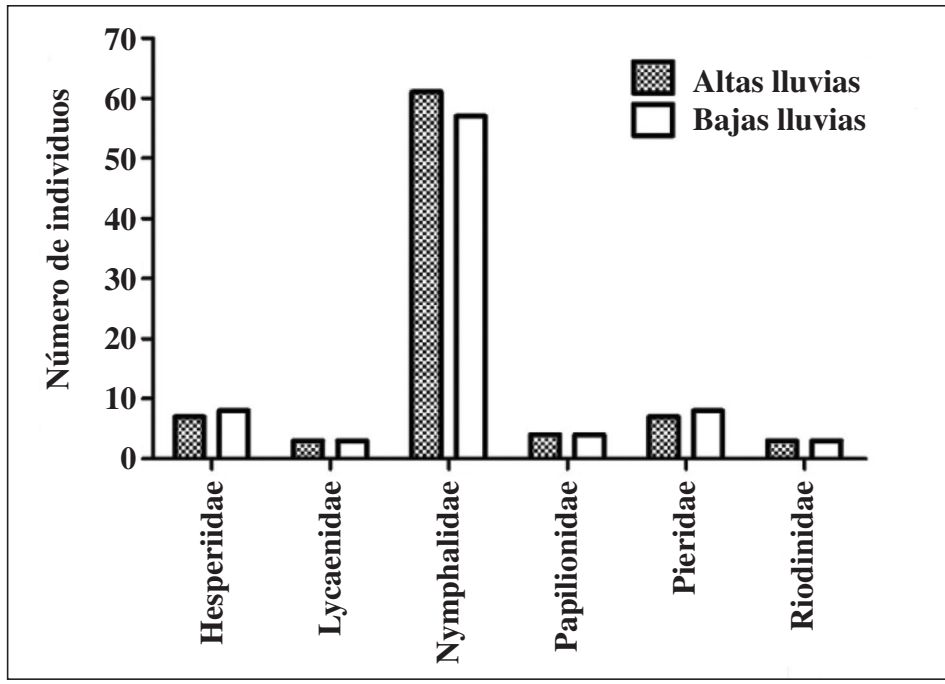

Figura 3.– Riqueza de especies por familia de mariposas presentes en la microcuenca la Calaboza, Casanare, Colombia.

En cuanto a las subfamilias, Biblidinae y Nymphalinae (Nymphalidae) presentaron mayor riqueza y abundancia durante el estudio; subfamilias como Hesperiinae (Hesperiidae), Danaiinae (Nymphalidae) y Pierinae (Pieridae) fueron las menos representativas en la muestra tanto para la época de baja y alta lluvias (Figuras 4 y 5). Por su parte, en época de altas lluvias se recolectaron 386 individuos y 312 en bajas lluvias, aunque no se observaron diferencias significativas en términos de abundancia por época de muestreo en las subfamilias (U-Mann-Whitney: p= 0.236)

Además, se observó una variación en la composición de las especies de mariposas en ambas épocas de muestreo, por ejemplo: *Pyrgus orcus* (Stoll, 1780), *Memphis ambrosia* (Druce, 1874), *Eresia clara* (Linnaeus, 1758), *Cissia tiessa* (Doubleday, 1848), *Quasimellana* sp., *Euptoieta claudia* (Cramer, 1775), *Taygetis rufomarginata* (Staudinger, 1888), *Aphrissa statira* (Cramer, 1777), *Melete polyhymnia* (Felder & Felder, 1865) y *Hypoleria ocalea* (Doubleday, 1847) sólo se encontraron en la época de bajas lluvias, para un total de 11 especies exclusivas para la época de baja lluvias. Por su parte, se observaron 13 especies de mariposas únicas para la época de alta lluvias: *Pyrgus oileus* (Linnaeus, 1767), *Eueides lybia* (Fabricius, 1775), *Itaballia demophile* (Linnaeus, 1763), *Dircenna dero* (Hübner, 1823), *Hamadryas arinome* (Lucas, 1853), *Taygetis andromeda* (Butler, 1877), *Eunica malvina* (Bates, 1864), *Posttaygetis penelea* (Cramer, 1777), *Smyrna blomfildia* (Fabricius, 1781), *Dircenna dero* (Hübner, 1823), *Prepona laertes* (Hübner, 1811), *Pyrrhogyra crameri* (Aurivillius, 1882) y *Hamadryas laodamia* (Cramer, 1777) (Apéndice I).

Por otro lado, se observó que la mayoría de especies de mariposas (72 especies) se presentaron tanto para la época de baja y altas lluvias, tales como: *Urbanus dorantes* (Stoll, 1790), *Hamadryas feronia* (Linnaeus, 1758), *Dynamine racidula* (Hewitson, 1852), *Dryas iulia* (Fabricius, 1775), *Marpesia petreus* (Cramer, 1776), *Fountainea ryphea* (Cramer, 1775), *Historis odius* (Fabricius, 1775), *Siproeta*

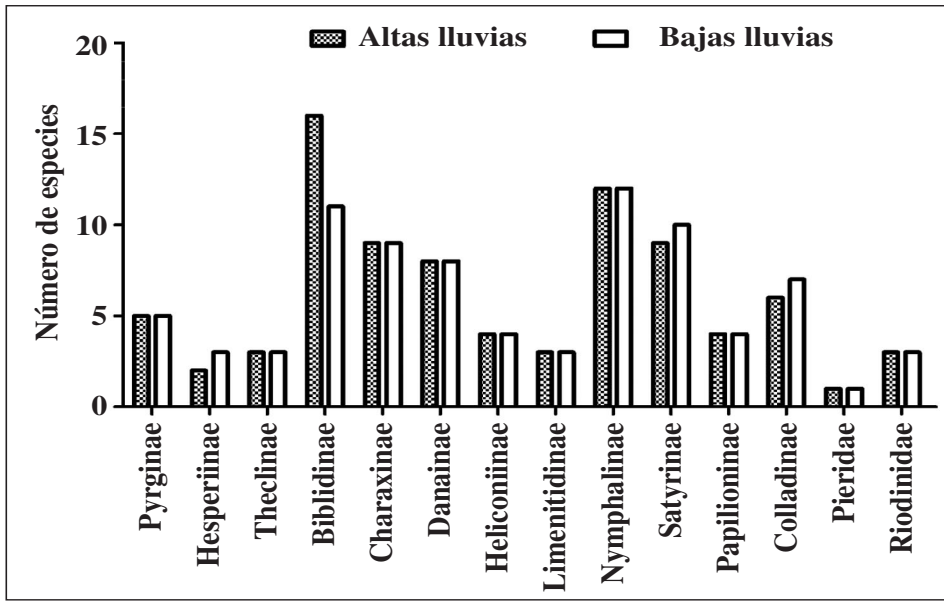

Figura 4.– Riqueza de especies por subfamilia de mariposas diurnas presentes en la microcuenca la Calaboza, Casanare, Colombia.

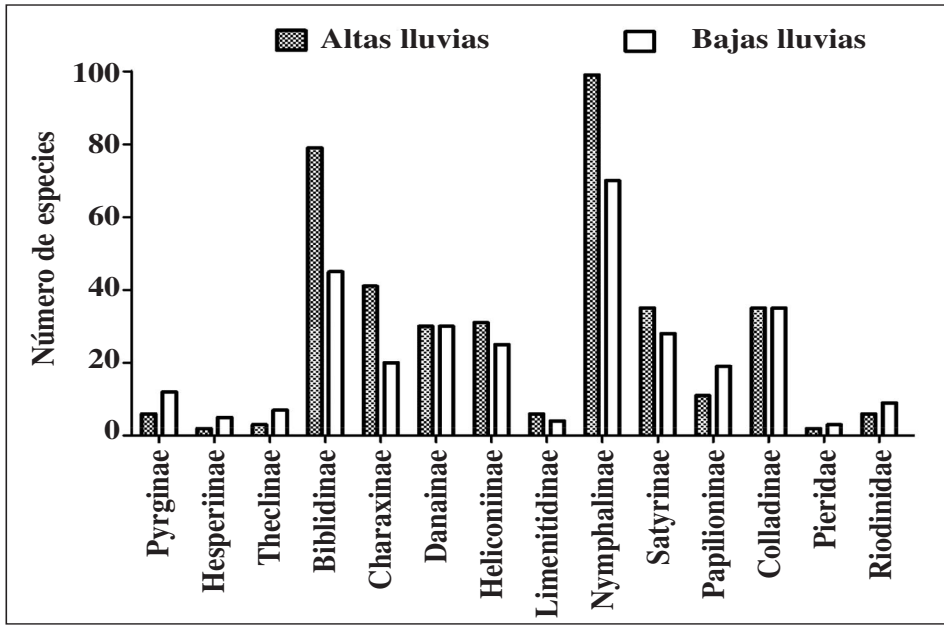

Figura 5.– Abundancia de mariposas a nivel de subfamilias para la época de altas y bajas lluvias.

epaphus (Latreille, 1813), *Taygetis laches* (Fabricius, 1793), entre otras (Apéndice I). También, se observó que para ambas épocas hay una dominancia de algunas especies de mariposas en la muestra, como se puede constatar con los resultados de los rangos de abundancia (Figura 6), en donde la especie *Historis acheronta* (Fabricius, 1775) y *Heliconius erato* (Linnaeus, 1758) fueron las especies co-dominantes, tanto para época de baja y alta lluvias (Apéndice II).

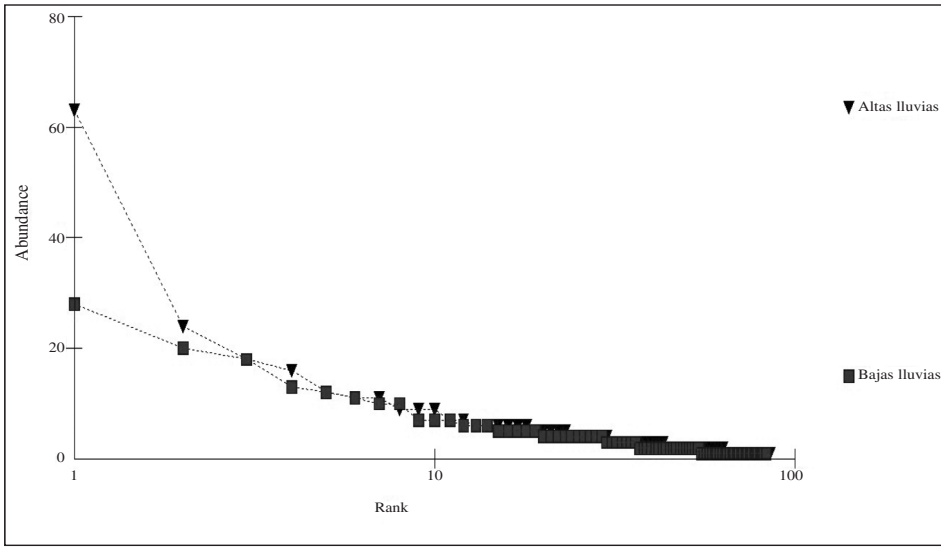

Figura 6.– Rangos de abundancia de especies en cada época de muestreo.

Según los estimativos de diversidad, se puede inferir que el valor del estimativo de los Números de Hill de orden H0 y H1 es mayor para la época de Bajas Lluvias, lo que significa que hay una mayor riqueza y diversidad en esta época en comparación con la época de Altas Lluvias, presentándose una mayor dominancia según el orden H2 en la época de Altas Lluvias (Tabla I). No obstante, el valor del orden H0 presenta valores más altos en relación con el orden H1 y H2, indicando que este ensamblaje presenta algunas especies abundantes y un gran número de especies raras para cada punto, lo que se corrobora con los resultados de los rangos de abundancias de especies (Figura 6).

Tabla I.– Estimativos de Diversidad basado en Número de Hill o de especies efectivas para cada época de muestreo.

Estimativo	Altas Lluvias	Bajas Lluvias
Hill's Number H0	83	86
Hill's Number H1	24.211	38.292
Hill's Number H2	16.321	8.974
Chao1	98.95	130.22

Al observar la curva de rarefacción se puede inferir que la riqueza esperada a partir de la observada aún es alta, lo que, a su vez, permite evidenciar que el esfuerzo de muestreo no fue suficiente, ya que la curva no se vuelve asintótica para ambas muestras (Figura 7). Lo anterior es corroborado por el estimativo no paramétrico de Chao1 (Tabla I), puesto que el valor estimado es mayor que el observado, lo que sugiere que con un mayor tiempo de muestreo se podrá obtener una mayor riqueza de mariposas para ambas épocas de muestreo, especialmente para la época de bajas lluvias.

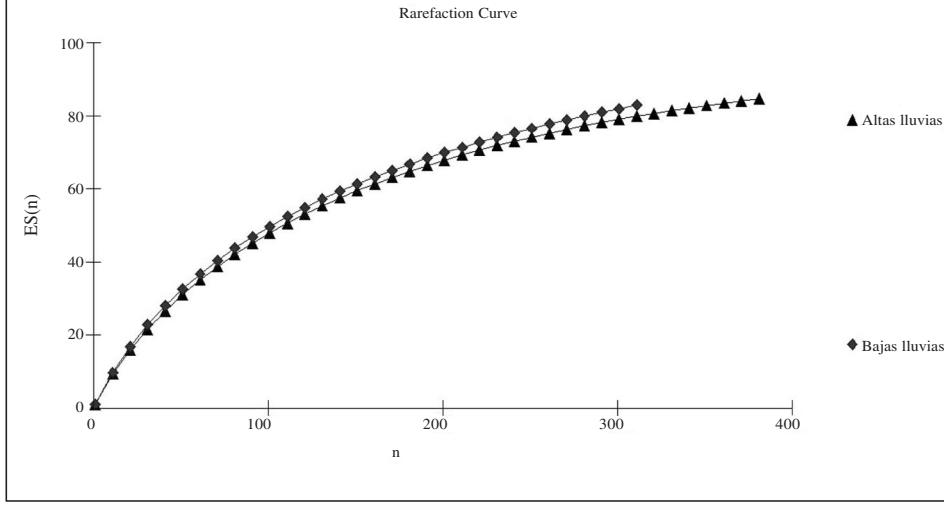

Figura 7.– Curva de rarefacción para los periodos de alta y bajas lluvias.

En cuanto a la curva de acumulación de especies (Figura 8), se observa que para ambas épocas de muestreo el esfuerzo de muestreo y la representatividad del mismo está entre un 80.6%-83.8%, por lo que la diversidad registrada para cada una de las muestras estuvo bien representada en el estudio a pesar de no llegar a un 100% de efectividad. Lo que perite inferir que, al igual que con la riqueza esperada, con un mayor tiempo de muestreo se podría llegar a obtener una mayor representatividad de especies de mariposas en el área de estudio según las épocas de muestreo.

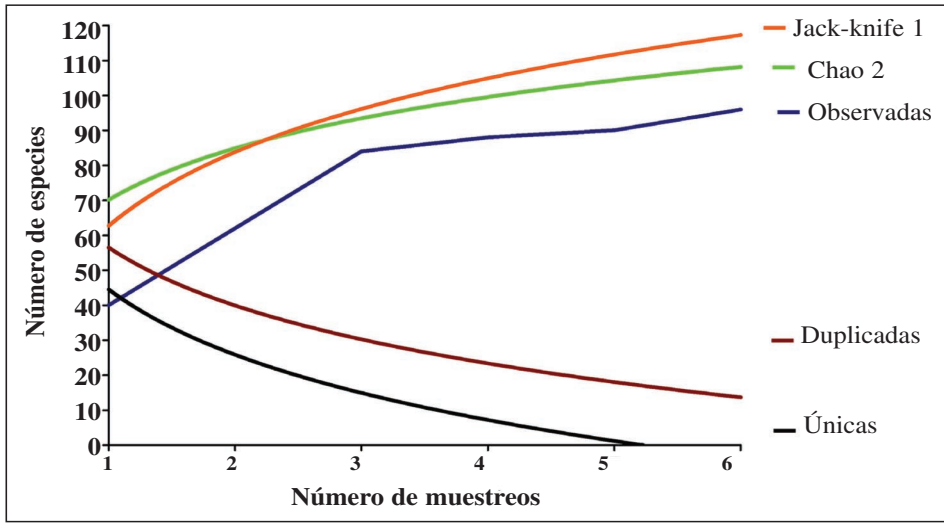

Figura 8.– Curva de acumulación de especies en la microcuenca la Calaboza, Casanare, Colombia.

Discusión

El patrón de actividad estacional registrado para la mayoría de las especies de mariposas y su relación con la precipitación (baja y altas lluvias), es un patrón que ha sido documentado también para otros grupos de insectos, como Coleópteros (PESCADOR *et al*., 2002; NOGUERA *et al*., 2007; JIMÉNEZ-SÁNCHEZ *et al*., 2009; MAHECHA-JIMÉNEZ *et al*., 2011; ISERHARD *et al.,* 2017). Este patrón parece estar relacionado a la época reproductiva y a la disponibilidad de recursos en el hábitat (JIMÉNEZ-SÁNCHEZ *et al*., 2009). Por lo tanto, la actividad reproductiva de las especies de mariposas y otros grupos de insectos que mantienen una estrecha relación con las plantas como posibles hospederas o de refugio, estaría sincronizada con el tiempo de mayor disponibilidad de recursos para el desarrollo de sus larvas (JIMÉNEZ-SÁNCHEZ *et al*., 2009; URBANO *et al*., 2014; RIBEIRO *et al*., 2016).

Sin embargo, también se presentaron especies como *Historis acheronta* (Fabricius, 1775), *Heliconius erato* (Linnaeus, 1758), *Urbanus proteus* (Linnaeus, 1758), *Dynamine racidula* (Hewitson, 1852), entre otras, las cuales estuvieron activas durante ambas épocas de muestreo y que aparentemente no siguen el patrón estacional de otras especies que sólo se presentaron en alguna época de muestreo, como *Pyrrhogyra crameri* (Aurivillius, 1882) y *Cissia tiessa* (Doubleday, 1848) (Apéndice I). Esta posible falta de estacionalidad de estas especies puede ser explicada por las preferencias de hábitat y los recursos alimenticios que estas especies explotan y que pueden versen afectadas por las condiciones de humedad visto desde una escala local (JIMÉNEZ-SÁNCHEZ *et al*., 2009). Es posible que las especies de mariposas que se presentaron únicamente tanto para la época de lluvias y de bajas lluvias, podrían ser consideradas univoltinas y esta es una posible explicación de que estén presentes sólo en alguna época del año, como sucede en coleópteros estafilínidos (JIMÉNEZ-SÁNCHEZ *et al*., 2009). No obstante, lo anterior no puede probarse en este estudio, aunque datos de MAHECHA-JIMÉNEZ *et al*., (2011) en mariposas Pronophilina y en especies de coleópteros de la familia Lampyridae y otros grupos de insectos con requerimientos de hábitat similares, parecen apoyar esta hipótesis (ZARAGOZA-CABALLERO *et al*., 2003; JIMÉNEZ-SÁNCHEZ *et al*., 2009).

Por otra parte, se ha demostrado que, a una escala local, variables ambientales como la altitud, la pendiente, la insolación y la capacidad de retención de agua del suelo, entre otras, pueden explicar cambios en la estructura y composición de la vegetación (DURÁN *et al*., 2002; JIMÉNEZ-SÁNCHEZ *et al*., 2009; MAHECHA-JIMÉNEZ *et al*., 2011; CASAS-PINILLA *et al*., 2017), lo que probablemente también afectaría la comunidad heterótrofa presente. En el caso de la región de estudio, la topografía es muy irregular y ello probablemente afecta las variables ambientales mencionadas anteriormente y origina una gran variedad de microhábitats con diferencias en estructura y composición de especies de flora y fauna (JIMÉNEZ-SÁNCHEZ *et al*., 2009; NAUJOKAITIS-LEWIS & FORTIN, 2016), lo que ocasiona una variación en la representatividad de las especies de mariposas en ambas épocas de muestreo, generando especies dominantes y especies raras en ciertas épocas del año.

A su vez, SHAPIRO *et al*. (2003) y ISERHARD *et al.* (2017) demostraron que la distribución temporal y diversidad de mariposas exhibe una gran variación entre diferentes épocas del año en relación con la fenología y la estacionalidad de estos insectos, por lo que la riqueza de especies y abundancia baja observada en algunas familias de mariposas como Lycaenidae y Riodinidae fueron probablemente debido a estas diferencias. Además, la dinámica en la estacionalidad afectará directamente a la biología de los inmaduros y mariposas adultas (ISERHARD *et al.,* 2017). Estas dinámicas pueden explicarse por la extinción local, recolonización y/o por la migración a otros sitios o regiones en latitudes más bajas con mayor y más constante temperatura y con condiciones climáticas más favorables (ISERHARD *et al.,* 2017). No obstante, los períodos muestreados en el presente estudio posiblemente no son suficientes para comprobar estos cambios en la dinámica poblacional de las especies de mariposas en el área de estudio.

El empleo de los datos obtenidos en los estudios de variación temporal son fundamental para las estrategias de conservación, ya que esta información permite saber si las especies de mariposas están desapareciendo o si simplemente están migrando a otras zonas geográficas con condiciones abióticas y bióticas más favorables y si la planificación de la conservación está siendo efectiva por parte de las entidades gubernamentales encargadas de los procesos de conservación en el país (MAGURRAN, 2011; ISERHARD *et al.,* 2017). La política pública también se beneficia de cierta manera, con la incorporación de información cien-

tífica relacionada con el mantenimiento de hábitats y la integridad de los biomas y su fauna asociada en el proceso de toma de decisiones para la conservación de especies y ecosistemas. Finalmente, este estudio aporta al conocimiento de cómo la variación temporal afecta a los ensamblajes de mariposas en la Orinoquía colombiana, como también contribuyendo a la composición de las especies de la región del Casanare en Colombia.

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Apéndice I.– Composición y Abundancia de Mariposas Papilionoidea en cada época de muestreo en la cueca Colosal, Casanare, Colombia. El *0* representa ausencia y *1* presencia de la especie por época de muestreo.

ESPECIES	PERIODO DE MUESTREO		INDIVIDUOS POR ESPECIE
	ALTAS LLUVIAS	BAJAS LLUVIAS	
HESPERIIDAE			
Hesperiinae			
Atalopedes sp.	1	1	2
Pelopidas sp.	1	1	2
Quasimellana sp.	0	1	3
Pyrginae			
Heliopetes sp.	1	1	2
Pyrgus orcus (Stoll, 1780)	0	1	4
Pyrgus oileus (Linnaeus, 1767)	1	0	2
Urbanus dorantes (Stoll, 1790)	1	1	5
Urbanus proteus (Linnaeus, 1758)	1	1	2
Urbanus teleus (Hübner, 1821)	1	1	3
LYCAENIDAE			
Theclinae			
Calycopis sp.	1	1	2
Ministrymon sp.	1	1	5
Pseudolycaena damo (Druce, 1875)	1	1	3
NYMPHALIDAE			
Biblidinae			
Biblis hyperia (Cramer, 1779)	1	1	5
Callicore pitheas (Latreille, 1813)	1	1	20
Callicore cyllene (Doubleday, 1847)	1	1	6
Diaethria clymena marchalii (Guérin-Méneville, 1844)	1	1	6
Dynamine racidula (Hewitson, 1852)	1	1	4
Eunica malvina (Bates, 1864)	1	0	2
Eunica pusilla (Bates, 1864)	1	0	3
Hamadryas feronia (Linnaeus, 1758)	1	1	23
Hamadryas amphinome (Linnaeus, 1767)	1	1	13
Hamadryas arinome (Lucas, 1853)	1	0	16
Hamadryas laodamia (Cramer, 1777)	1	0	5
Marpesia petreus (Cramer, 1776)	1	1	4
Nica flavilla (Godart, 1824)	1	1	7
Pyrrhogyra crameri (Aurivillius, 1882)	1	0	3
Pyrrhogyra neaerea (Linnaeus, 1758)	1	1	3
Temenis laothoe (Cramer, 1777)	1	1	4
Charaxinae			
Agrias amydon (Hewitson, 1854)	1	1	4
Archaeoprepona demophoon (Hübner, 1814)	1	1	8
Consul fabius (Cramer, 1776)	1	1	6
Fountainea ryphea (Cramer, 1775)	1	1	7
Hypna clytemnestra (Cramer, 1777)	1	1	6
Memphis glaucone (Felder & Felder, 1862)	1	1	4

Memphis ambrosia (Druce, 1874)	0	1	1
Prepona laertes (Hübner, 1811)	1	0	6
Siderone galanthis (Cramer, 1775)	1	1	13
Zaretis ellops (Ménétriés, 1855)	1	1	6
Danaiinae			
Ceratinia tutia (Hewitson, 1852)	1	1	5
Danaus plexippus (Linnaeus, 1758)	1	1	7
Dircenna dero (Hübner, 1823)	1	0	2
Hypoleria ocalea (Doubleday, 1847)	0	1	4
Ithomia iphianassa (Doubleday, 1847)	1	1	4
Lycorea halia cleobae (Godart, 1819)	1	1	4
Mechanitis polymnia (Linnaeus, 1758)	1	1	22
Melinaea marsaeus (Hewitson, 1860)	1	1	4
Tithorea harmonia (Cramer, 1777)	1	1	8
Heliconiinae			
Dryas iulia (Fabricius, 1775)	1	1	4
Eueides lybia (Fabricius, 1775)	1	0	1
Euptoieta claudia poasina (Cramer, 1775)	0	1	1
Heliconius erato (Linnaeus, 1758)	1	1	44
Heliconius sara (Fabricius, 1793)	1	1	6
Limenitidinae			
Adelpha cocala (Cramer, 1779)	1	1	4
Adelpha alala (Hewitson, 1847)	1	1	4
Adelpha iphiclus (Linnaeus, 1758)	1	1	2
Nymphalinae			
Anartia jatrophae (Linnaeus, 1763)	1	1	12
Anartia amathea (Linnaeus, 1758)	1	1	17
Chlosyne lacinia (Geyer, 1837)	1	1	2
Chlosyne hippodrome (Geyer, 1837)	1	1	5
Colobura dirce (Linnaeus, 1758)	1	1	2
Eresia clara (Linnaeus, 1758)	0	1	2
Historis odius (Fabricius, 1775)	1	1	12
Historis acheronta (Fabricius, 1775)	1	1	91
Junonia evarete (Cramer, 1779)	1	1	5
Pycina zamba (Doubleday, 1849)	1	1	7
Siproeta stelenes biplagiata (Fruhstorfer, 1907)	1	1	9
Siproeta epaphus (Latreille, 1813)	1	1	3
Smyrna blomfildia (Fabricius, 1781)	1	0	2
Satyrinae			
Caligo illioneus (Cramer, 1775)	1	1	9
Catoblepia amphirhoe (Hübner, 1825)	1	1	2
Cissia tiessa (Doubleday, 1848)	0	1	2
Morpho menelaus (Linnaeus, 1758)	1	1	23
Morpho helenor (Cramer, 1776)	1	1	3
Opsiphanes quiteria (Stoll, 1780)	1	1	4
Pierella lamia (Sulzer, 1776)	1	1	5
Posttaygetis penelea (Cramer, 1777)	1	0	1

Taygetis laches (Fabricius, 1793)	1	1	8
Taygetis sp.	0	1	1
Taygetis rufomarginata (Staudinger, 1888)	0	1	2
Taygetis andromeda (Butler, 1877)	1	0	3
PAPILIONIDAE			
Papilioninae			
Battus polydamas (Linnaeus, 1758)	1	1	10
Heraclides thoas (Linneaus, 1771)	1	1	7
Parides eurimedes (Stoll, 1782)	1	1	7
Parides erithalion (Boisduval, 1836)	1	1	6
PIERIDAE			
Coliadinae			
Anteos clorinde (Godart, 1824)	1	1	5
Aphrissa statira (Cramer, 1777)	0	1	1
Eurema xantachlora (Kollar, 1850)	1	1	10
Eurema daira (Godart, 1819)	1	1	2
Eurema elathea (Cramer, 1777)	1	1	21
Phoebis philea (Linnaeus, 1763)	1	1	8
Phoebis sennae marcellina (Cramer, 1777)	1	1	23
Pierinae			
Itaballia demophile (Linnaeus, 1763)	1	0	2
Melete polyhymnia (Felder & Felder, 1865)	0	1	3
RIODINIDAE			
Riodininae			
Ancyluris aulestes (Cramer, 1777)	1	1	8
Rethus sp.	1	1	4
Riodina lysippoides (Berg, 1882)	1	1	3
TOTAL INDIVIDUOS			**698**

Apéndice II.– Rango de Abundancias de especies para la época de muestreo de Altas y Bajas Lluvias.

Especie	Altas Lluvias	Especie	Bajas Lluvias
Historis acheronta (Fabricius, 1775)	63	*Historis acheronta* (Fabricius, 1775)	28
Heliconius erato (Linnaeus, 1758)	24	*Heliconius erato* (Linnaeus, 1758)	20
Morpho menelaus (Linnaeus, 1758)	18	*Hamadryas feronia* (Linnaeus, 1758)	18
Hamadryas arinome (Lucas, 1853)	16	*Mechanitis polymnia* (Linnaeus, 1758)	13
Hamadryas amphinome (Linnaeus, 1767)	12	*Phoebis sennae marcellina* (Cramer, 1777)	12
Eurema elathea (Cramer, 1777)	11	*Callicore pitheas* (Latreille, 1813)	11
Phoebis sennae marcellina (Cramer, 1777)	11	*Anartia amathea* (Linnaeus, 1758)	10
Callicore pitheas (Latreille, 1813)	9	*Eurema elathea* (Cramer, 1777)	10
Siderone galanthis (Cramer, 1775)	9	*Siproeta stelenes biplagiata* (Fruhstorfer, 1907)	7
Mechanitis polymnia (Linnaeus, 1758)	9	*Taygetis laches* (Fabricius, 1793)	7
Anartia amathea (Linnaeus, 1758)	7	*Battus polydamas* (Linnaeus, 1758)	7
Historis odius (Fabricius, 1775)	7	*Danaus plexippus* (Linnaeus, 1758)	6
Nica flavilla (Godart, 1824)	6	*Anartia jatrophae* (Linnaeus, 1763)	6
Fountainea ryphea (Cramer, 1775)	6	*Phoebis philea* (Linnaeus, 1763)	6
Prepona laertes (Hübner, 1811)	6	*Morpho menelaus* (Linnaeus, 1758)	5
Tithorea harmonia (Cramer, 1777)	6	*Historis odius* (Fabricius, 1775)	5
Anartia jatrophae (Linnaeus, 1763)	6	*Pycina zamba* (Doubleday, 1849)	5
Eurema xantachlora (Kollar, 1850)	6	*Parides eurimedes* (Stoll, 1782)	5
Callicore cyllene (Doubleday, 1847)	5	*Ancyluris aulestes* (Cramer, 1777)	5
Hamadryas feronia (Linnaeus, 1758)	5	*Pyrgus orcus* (Stoll, 1780)	4
Hamadryas laodamia (Cramer,1777)	5	*Urbanus dorantes* (Stoll, 1790)	4
Consul fabius (Cramer, 1776)	5	*Ministrymon sp.*	4
Caligo illioneus (Cramer, 1775)	5	*Biblis hyperia* (Cramer, 1779)	4
Archaeoprepona demophoon (Hübner, 1814)	4	*Archaeoprepona demophoon* (Hübner, 1814)	4
Hypna clytemnestra (Cramer, 1777)	4	*Siderone galanthis* (Cramer, 1775)	4
Ceratinia tutia (Hewitson, 1852)	4	*Hypoleria ocalea* (Doubleday, 1847)	4
Heliconius sara (Fabricius, 1793)	4	*Caligo illioneus* (Cramer, 1775)	4
Chlosyne hippodrome (Geyer, 1837)	4	*Parides erithalion* (Boisduval, 1836)	4
Heraclides thoas (Linneaus, 1771)	4	*Eurema xantachlora* (Kollar, 1850)	4
Anteos clorinde (Godart, 1824)	4	*Quasimellana sp.*	3
Diaethria clymena marchalii (Guérin-Méneville, 1844)	3	*Diaethria clymena marchalii* (Guérin-Méneville, 1844)	3
Dynamine racidula (Hewitson, 1852)	3	*Memphis glaucone* (Felder & Felder, 1862)	3
Eunica pusilla (Bates, 1864)	3	*Zaretis ellops* (Ménétriés, 1855)	3
Pyrrhogyra crameri (Aurivillius, 1882)	3	*Junonia evarete* (Cramer, 1779)	3
Agrias amydon (Hewitson, 1854)	3	*Heraclides thoas* (Linneaus, 1771)	3
Zaretis ellops (Ménétriés, 1855)	3	*Melete polyhymnia* (Felder & Felder, 1865)	3
Lycorea halia cleobae (Godart, 1819)	3	*Urbanus teleus* (Hübner, 1821)	2
Ithomia iphianassa (Doubleday, 1847)	3	*Pseudolycaena damo* (Druce, 1875)	2
Adelpha cocala (Cramer, 1779)	3	*Marpesia petreus* (Cramer, 1776)	2
Pierella lamia (Sulzer, 1776)	3	*Temenis laothoe* (Cramer, 1777)	2
Taygetis andromeda (Butler, 1877)	3	*Hypna clytemnestra* (Cramer, 1777)	2
Battus polydamas (Linnaeus, 1758)	3	*Melinaea marsaeus* (Hewitson, 1860)	2
Ancyluris aulestes (Cramer, 1777)	3	*Tithorea harmonia* (Cramer, 1777)	2
Pyrgus oileus (Linnaeus, 1767)	2	*Dryas iulia* (Fabricius, 1775)	2
Eunica malvina (Bates, 1864)	2	*Heliconius sara* (Fabricius, 1793)	2
Marpesia petreus (Cramer, 1776)	2	*Adelpha alala* (Hewitson, 1847)	2
Pyrrhogyra neaerea (Linnaeus, 1758)	2	*Morpho helenor* (Cramer, 1776)	2
Temenis laothoe (Cramer, 1777)	2	*Opsiphanes quiteria* (Stoll, 1780)	2
Dircenna dero (Hübner, 1823)	2	*Eresia clara* (Linnaeus, 1758)	2

Melinaea marsaeus (Hewitson, 1860)	2	*Cissia tiessa* (Doubleday, 1848)	2
Dryas iulia (Fabricius, 1775)	2	*Pierella lamia* (Sulzer, 1776)	2
Adelpha alala (Hewitson, 1847)	2	*Taygetis rufomarginata* (Staudinger, 1888)	2
Opsiphanes quiteria (Stoll, 1780)	2	*Rethus sp.*	2
Junonia evarete (Cramer, 1779)	2	*Riodina lysippoides* (Berg, 1882)	2
Pycina zamba (Doubleday, 1849)	2	*Atalopedes sp.*	1
Siproeta stelenes biplagiata (Fruhstorfer, 1907)	2	*Pelopidas sp.*	1
Siproeta epaphus (Latreille, 1813)	2	*Heliopetes arsalte* (Billberg, 1820)	1
Smyrna blomfildia (Fabricius, 1781)	2	*Urbanus proteus* (Linnaeus, 1758)	1
Parides eurimedes (Stoll, 1782)	2	*Calycopis isobeo* (Scudder, 1876)	1
Parides erithalion (Boisduval, 1836)	2	*Callicore cyllene* (Doubleday, 1847)	1
Phoebis philea (Linnaeus, 1763)	2	*Dynamine racidula* (Hewitson, 1852)	1
Itaballia demophile (Linnaeus, 1763)	2	*Hamadryas amphinome* (Linnaeus, 1767)	1
Rethus sp.	2	*Nica flavilla* (Godart, 1824)	1
Atalopedes sp.	1	*Pyrrhogyra neaerea* (Linnaeus, 1758)	1
Pelopidas sp.	1	*Agrias amydon* (Hewitson, 1854)	1
Heliopetes arsalte (Billberg, 1820)	1	*Consul fabius* (Cramer, 1776)	1
Urbanus dorantes (Stoll, 1790)	1	*Fountainea ryphea* (Cramer, 1775)	1
Urbanus proteus (Linnaeus, 1758)	1	*Memphis ambrosia* (Druce, 1874)	1
Urbanus teleus (Hübner, 1821)	1	*Lycorea halia cleobae* (Godart, 1819)	1
Calycopis isobeo (Scudder, 1876)	1	*Ceratinia tutia* (Hewitson, 1852)	1
Ministrymon sp.	1	*Ithomia iphianassa* (Doubleday, 1847)	1
Pseudolycaena damo (Druce, 1875)	1	*Euptoieta claudia poasina* (Cramer, 1775)	1
Biblis hyperia (Cramer, 1779)	1	*Adelpha cocala* (Cramer, 1779)	1
Memphis glaucone (Felder & Felder, 1862)	1	*Adelpha iphiclus* (Linnaeus, 1758)	1
Danaus plexippus (Linnaeus, 1758)	1	*Catoblepia amphirhoe* (Hübner, 1825)	1
Eueides lybia (Fabricius, 1775)	1	*Chlosyne lacinia* (Geyer, 1837)	1
Adelpha iphiclus (Linnaeus, 1758)	1	*Chlosyne hippodrome* (Geyer, 1837)	1
Catoblepia amphirhoe (Hübner, 1825)	1	*Colobura dirce* (Linnaeus, 1758)	1
Morpho helenor (Cramer, 1776)	1	*Siproeta epaphus* (Latreille, 1813)	1
Chlosyne lacinia (Geyer, 1837)	1	*Taygetis sp.*	1
Colobura dirce (Linnaeus, 1758)	1	*Anteos clorinde* (Godart, 1824)	1
Posttaygetis penelea (Cramer, 1777)	1	*Aphrissa statira* (Cramer, 1777)	1
Taygetis laches (Fabricius, 1793)	1	*Eurema daira* (Godart, 1819)	1
Eurema daira (Godart, 1819)	1	*Pyrgus oileus* (Linnaeus, 1767)	0
Riodina lysippoides (Berg, 1882)	1	*Eunica malvina* (Bates, 1864)	0
Quasimellana sp.	0	*Eunica pusilla* (Bates, 1864)	0
Pyrgus orcus (Stoll, 1780)	0	*Hamadryas arinome* (Lucas, 1853)	0
Memphis ambrosia (Druce, 1874)	0	*Hamadryas laodamia* (Cramer, 1777)	0
Hypoleria ocalea (Doubleday, 1847)	0	*Pyrrhogyra crameri* (Aurivillius, 1882)	0
Euptoieta claudia poasina (Cramer, 1775)	0	*Prepona laertes* (Hübner, 1811)	0
Eresia clara (Linnaeus, 1758)	0	*Dircenna dero* (Hübner, 1823)	0
Cissia tiessa (Doubleday, 1848)	0	*Eueides lybia* (Fabricius, 1775)	0
Taygetis sp.	0	*Smyrna blomfildia* (Fabricius, 1781)	0
Taygetis rufomarginata (Staudinger, 1888)	0	*Posttaygetis penelea* (Cramer, 1777)	0
Aphrissa statira (Cramer, 1777)	0	*Taygetis andromeda* (Butler, 1877)	0
Melete polyhymnia (Felder & Felder, 1865)	0	*Itaballia demophile* (Linnaeus, 1763)	0

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New and interesting Portuguese Lepidoptera records from 2017 (Insecta: Lepidoptera)

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Abstract

24 species are added to the Portuguese Lepidoptera fauna and two species deleted, mainly as a result of fieldwork undertaken by the authors and others in 2017. In addition, second and third records for the country, new province records and new food-plant data for a number of species are included. A summary of recent papers affecting the Portuguese fauna is added.
KEY WORDS: Insecta, Lepidoptera, distribution, Portugal.

Novos e interessantes registos portugueses de Lepidoptera em 2017 (Insecta: Lepidoptera)

Resumo

Como resultado do trabalho de campo desenvolvido pelos autores e outros, principalmente no ano de 2017, são adicionadas 24 espécies de Lepidoptera à fauna de Portugal e duas são retiradas da lista nacional. Adicionalmente, são apresentados segundos e terceiros registos de espécies previamente conhecidas, bem como novas plantas alimentícias para algumas espécies. Amplia-se ainda a distribuição geográfica de várias espécies, indicando-se novas regiões de ocorrência. Finalmente, é apresentado um sumário dos mais recentes trabalhos relevantes para a fauna portuguesa.
PALAVRAS CHAVE: Insecta, Lepidoptera, distribuição geográfica, Portugal.

Nuevas e interesantes citas portuguesas de Lepidoptera en 2017 (Insecta: Lepidoptera)

Resumen

Con el trabajo de campo efectuado por los autores y otros, principalmente durante el año de 2017, se añaden 24 especies de Lepidoptera a la fauna de Portugal y se eliminan dos especies de la lista nacional. Además, se muestran segundos y terceros registros de especies ya conocidas del país y también nuevas plantas nutricias de algunas otras especies. Se amplía la distribución geográfica de varias especies, teniendo como base registros en nuevas provincias. Finalmente, se presenta un resumen de los más recientes trabajos que son relevantes para la fauna portuguesa.
PALABRAS CLAVE: Insecta, Lepidoptera, distribución geográfica, Portugal.

Introduction

This paper is the twelfth in the series of annual summaries of new knowledge of Portuguese Lepidoptera. It gives records of species of Lepidoptera added to the Portuguese fauna in 2017, together

with new province records not included in the checklist (CORLEY, 2015). Additional data includes new information on larval food-plants within the country and second and third records of species for the country, which are only indicated when they are not in new provinces. Papers published in 2017 and part of 2018 that relate to the Portuguese Lepidoptera fauna are listed and briefly summarised. Finally, an Appendix lists nomenclatural changes together with the new species for Portugal, with numbers indicating their correct position in the checklist; new genera for Portugal have author and year of publication given.

24 species new for Portugal are listed below, of which two are new for the Iberian Peninsula. Two species are removed from the Portuguese list. A few of the new species listed here have been previously listed for Portugal, but the records were rejected in CORLEY (2015), as being erroneous or unsubstantiated.

In CORLEY *et al*. (2018) the number of Lepidoptera species recognised from Portugal was 2657. With the current paper and other papers mentioned herein, this total has risen to 2688, an increase of 100 species since the publication of CORLEY (2015).

Material and Methods

Most species were captured at light in traps of various kinds, often over or beside a white sheet. For specimens not taken at light, the means of capture is given. Specimens are retained in the collections of the original recorders, unless otherwise stated. However, a few records are based only on photographic evidence.

The order and nomenclature of families and species has been revised in accordance with the new Portuguese list (CORLEY, 2015). The nomenclature of plant names follows the EURO+MED PLANT-BASE (2006) where possible.

The entry for species new for Portugal concludes with a summary of the known European distribution, and available information on the larval food-plant, given in square brackets if the information comes from outside Portugal.

Localities with UTM squares and altitude: (District in brackets)

The map below shows the 10x10 km UTM grid squares from which records cited in this paper were made.

Abreiro station (Vila Flor)	PF4478	170 m
Albergaria, Serra da Estrela (Manteigas)	PE2165	1500 m
Almograve, 2 km S. of, (Odemira)	NB1764	55 m
Alto dos Moinhos (Lisboa)	MC8488	90 m
Ansião, 2 km E. of,	NE5019	250 m
Assureira, Castro Laboreiro (Melgaço)	NG6950	780 m
Bobal (Mondim de Basto)	NF9784	850 m
Bombarral	MD8646	50 m
Cabecico da Vinha, Freixiosa (Miranda do Douro)	QF2489	600 m
Cântaro Raso, road tunnel, Serra da Estrela, (Covilhã)	PE1964	1710 m
Carrapateira (Vila do Bispo)	NB0806	25 m
Carrazedo, 1 km S.W. of, (Bragança)	PG7425	890 m
Casais do Porto, Louriçal (Pombal)	NE2229	20 m
Chão de Couce (Ansião)	NE5218	270 m
Corte do Gago (Castro Marim)	PB2828	180 m
Corte Sines (Mértola)	PB2175	115 m
Corticeiro de Cima (Cantanhede)	NE2875	55 m
Cova da Lua, 1.5 km E of, (Bragança)	PG8039	790 m

Covão do Vidual, Serra da Estrela (Seia)	PE1570	1480 m
Crastinha, São Pedro do Moel (Marinha Grande)	NE0208	80 m
Cruzinha, Mexilhoeira Grande (Portimão)	NB3411	20 m
Dine (Vinhais)	PG7141	740 m
Esteiramantens (Tavira)	PB1009	75 m
Estevais (Torre de Moncorvo)	PF6267	450 m
Figueiró do Campo (Soure)	NE3644	35 m
França, 5 km west of, (Bragança)	PG8441	750 m
Freixiel (Vila Flor)	PF4975	455 m
Herdade de Pulo de Lobo (Mértola)	PB1985	130 m
Hospital São Teotónio (Viseu)	NF9200	475 m
Lagoa de São José, Mata do Urso, Cariço (Pombal)	NE1128	45 m
Madalena (Vila Nova de Gaia)	NF2950	25 m
Mértola	PB1866	55 m
Mértola, 1 km S of, by R. Guadiana	PB1765	50 m
Midões (Barcelos)	NF3495	90 m
Moinho do Alferes, Ribeira de Vascão (Mértola)	PB1451	95 m
Moinhos de Paneiro (Santiago de Cacém)	NB2795	210 m
Monte Barata (Castelo Branco)	PD4496	230 m
Monte Velho (Santiago de Cacém)	NC1613	10 m
Moura da Serra, Mata da Margaraça (Arganil)	NE9252	900 m
Pampilhosa do Botão (Mealhada)	NE4964	90 m
Parque Biológico de Gaia (Vila Nova de Gaia)	NF3650	110 m
Pêra (Albufeira)	NB5808	35 m
Picão (Castro Daire)	NF8833	950 m
Poço do Inferno, Serra da Estrela (Manteigas)	PE2570	1100 m
Ponta da Galhofa, Vila Nova de Milfontes (Odemira)	NB1777	48 m
Ponte da Carba, Celas (Vinhais)	PG7222	710 m
Praia da Mareta, Sagres (Vila do Bispo)	NA0595	10 m
Praia das Furnas, Vila Nova de Milfontes (Odemira)	NB1974	7 m
Praia de Galé, Melides (Grândola)	NC1927	30 m
Ponte de Jugais, Lapa dos Dinheiros (Seia)	PE1071	570 m
Praia de Mindelo (Vila do Conde)	NF2274	5 m
Praia do Malhão (Odemira)	NB1782	22 m
Praia do Pedrogão (Leiria)	NE0317	8 m
Pulo do Lobo, east side (Serpa)	PB2085	130 m
Quintã (Vila Real)	NF9572	719 m
Quinta da Serra, Serra da Boa Viagem (Figueira da Foz)	NE0848	100 m
Quinta das Valsas, Monte Barata (Castelo Branco)	PD4597	240 m
Quinta do Canal, Bizorreiro (Figueira da Foz)	NE1639	3 m
Repeses (Viseu)	NE9099	470 m
Ribeira Angueira, below Castelo de Algoso (Vimioso)	QF0192	335 m
Ribeira de Pragueira, Lagoa Comprida (Seia)	PE1468	1610 m
Ribeira de Torgal (Odemira)	NB3366	18 m
Ribeira de Vale Cova, Corte de Gafo de Cima (Mértola)	PB1572	125 m
Ribeira do Mosteiro (Freixo de Espada á Cinta)	PF7647	190 m
Ribeiro da Azenha (Fundão)	PE3351	490 m
Rossão, Gosende (Castro Daire)	NF8936	1030 m
Salema camping (Vila do Bispo)	NB1503	60 m
Santa Luzia, Tua valley (Carrazeda de Ansiães)	PF3571	300 m
São Lourenço (Carrazeda de Ansiães)	PF3572	290 m
São Miguel, Lousada	NF6373	260 m
Sargaçal (Lagos)	NB2710	30 m

Segura, praia fluvial (Idanha-a-Nova)	PE7310	180 m
Sobral da Adiça (Moura)	PC5111	190 m
Torre, zone adjacent to, (Seia)	PE1666	1800 m
Torres Vedras	MD7726	100 m
Vairão (Vila do Conde)	NF2775	95 m
Vale de Zêzere, 5 km S.W. of Manteigas	PE2267	1100 m
Valongo	NF4159	200 m

Recorders

Paula Banza	Edmundo Jesus
Helder Cardoso	José Lemos
Ricardo Cardoso	Eduardo Marabuto
Gonçalo de Carvalho	Vanessa Mata
Martin Corley	Rebecca Mateus
Andrew Cunningham	João Nunes
Agostinho Fernandes	Pedro Pires
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Sónia Ferreira	Jorge Rosete
Ana Rita Gonçalves	Carlos Silva
Darinka Gonzalez	Peder Skou
David Grundy	Pedro Sousa
Valter Jacinto	Ana Valadares

Abbreviations and symbols

coll.	collection
comm.	communicated by
conf.	confirmed by
det.	determined by
*	New for Portugal, i.e. not listed for Portugal in CORLEY (2015).
(*)	New for Portugal since record in CORLEY (2015) was erroneous.
**	New for the Iberian Peninsula.

Provinces:

ALG	Algarve
BA	Beira Alta
BAL	Baixo Alentejo
BB	Beira Baixa
BL	Beira Litoral
DL	Douro Litoral
E	Estremadura
M	Minho
TM	Trás-os-Montes

List of families and species

NEPTICULIDAE

Stigmella glutinosae (Stainton, 1858)

TM: Ponte da Carba, 14-X-2017, leafmine on *Alnus glutinosa*, reared, Nunes, det. Corley.

Stigmella paradoxa (Frey, 1858)
BA: Ponte de Jugais, 25-VII-2017, leafmine on *Crataegus monogyna*, Nunes.

Zimmermannia liguricella (Klimesch, 1953)
BL: Lagoa de São José, 11-VII-2017, Rosete, det. Corley.

OPOSTEGIDAE

Opostegoides menthinella (Mann, 1855)
BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus.

MEESSIIDAE

* *Infurcitinea minuscula* Gozmány, 1960
BL: Ansião, 17-VII-2017, Rosete, det. Corley. Previously known only from holotype male from Chiclana, Cádiz. Spain. Larva unknown.

Infurcitinea karadaghica Zagulajev, 1979
BL: Lagoa de São José, 11-VII-2017, Rosete, det. Corley. Previously recorded in Beira Litoral, Beira Alta and Trás-os-Montes, but all previous records were in montane localities.

Novotinea muricolella (Fuchs, 1879)
BL: Ansião, 20-V-2017, Rosete, det. Corley; BA: Ribeira de Pragueira, 23-VII-2017, Corley and Nunes.

TINEIDAE

Morophaga morella (Duponchel, 1838)
TM: Estevais, 17-VII-2017, Corley and Nunes.

Nemapogon variatella (Clemens, 1859)
BL: Corticeiro de Cima, 1-IX-2017, Rosete, det. Corley.

Nemapogon agenjoi Petersen, 1959
BAL: Ribeira de Torgal, 13-V-2017, Nunes, Silva and Jesus, det. Corley.

Elatobia fuliginosella (Lienig & Zeller, 1846)
BA: Vale de Zêzere, 10-IX-2017, Rosete.

Tinea trinotella Thunberg, 1794
BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus; E: Crastinha, São Pedro do Moel, 25-II-2017, Rosete; BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Ateliotum petrinella (Herrich-Schäffer, 1854)
TM: França, 18-VII-2017, Corley and Nunes.

BUCCULATRICIDAE

Bucculatrix alaternella Constant, 1890
BAL: Ribeira de Vale Cova, larval signs on *Rhamnus alaternus*, 28-III-2017, Corley.

GRACILLARIIDAE

Parectopa ononidis (Zeller, 1839)
BL: Ansião, 10-VI-2017, Rosete.

Caloptilia cuculipennella (Hübner, 1796)
BL: Lagoa de São José, 28-VII-2017, Rosete, det. Corley.

Caloptilia alchimiella (Scopoli, 1763)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Aspilapteryx tringipennella (Zeller, 1839)
BL: Quinta da Serra, larva on *Plantago lagopus*, 11-V-2017, Nunes.

Povolnya leucapennella (Stephens, 1835)
TM: Santa Luzia, 14-VII-2017, Corley, S. Ferreira and Mateus.

* *Metriochroa latifoliella* (Millière, 1886)
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete, det. Corley. Spain, France, Italy, Greece and larger Mediterranean islands. [Larva mining *Olea*, *Phillyrea*].

Phyllonorycter roboris (Zeller, 1839)
TM: Ponte da Carba, leafmine on *Quercus pyrenaica*, 18-X-2017, Nunes.

Phyllonorycter messaniella (Zeller, 1846)
BA: Picão, leafmine on *Quercus robur*, reared 7-VI-2017, Rosete.

Phyllonorycter mespilella (Hübner, 1805)
BAL: Moinhos de Paneiro, leafmine on *Pyrus*, 13-V-2017, Nunes; BL: Casais do Porto, leafmine on *Cydonia oblonga*, 17-XII-2017, Rosete.

Phyllonorycter klemannella (Fabricius, 1781)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

* *Cameraria ohridella* Deschka & Dimić, 1986
BA: Hospital São Teotónio, leafmines on *Aesculus hippocastanum*, 8-IX-2017, Pires. All Europe except most Mediterranean islands.

* *Phyllocnistis xenia* Hering, 1936
ALG: Esteiramantens, leafmines on *Populus alba*, X-1993, Corley. Published under name of *P. labyrinthella* (CARVALHO & CORLEY, 1995), but that species feeds on *Populus tremula*. The error was repeated in CORLEY (2015), where *xenia* is erroneously given as a synonym of *labyrinthella*.

Delete *Phyllocnistis labyrinthella* (Bjerkander, 1790)

The published Portuguese record (CARVALHO & CORLEY, 1995; CORLEY, 2015) refers to *P. xenia*.

YPONOMEUTIDAE

Paradoxus osyridellus Millière, 1869
BAL: Moinhos de Paneiro, 12-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Cedestis subfasciella (Stephens, 1834)
E: Crastinha, São Pedro do Moel, 9-XII-2016, Rosete.

GLYPHIPTERIGIDAE

Glyphipteryx fuscoviridella (Haworth, 1828)
BL: Moura da Serra, 15-V-2016, Rosete.

ARGYRESTHIIDAE

Argyresthia spinosella Stainton, 1849
BAL: Moinhos de Paneiro, 12-V-2017, Marabuto, Nunes, Silva and Jesus, det. Corley.

LYONETIIDAE

Phyllobrostis fregenella Hartig, 1941
DL: Valongo, leafmine on *Daphne gnidium*, 12-III-2017, reared, Nunes.

PRAYDIDAE

Distagmos ledereri Herrich-Schäffer, 1854
BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus.

DOUGLASIIDAE

Tinagma balteolella (Fischer von Röslerstamm, 1841)
BB: Segura, praia fluvial, 30-III-2017, Corley, Mata and S. Ferreira; TM: Vale do Porco, 24-IV-2016, Nunes, det. Corley

AUTOSTICHIDAE

Symmoca tofosella Rebel, 1893
TM: Abreiro station, 16-VII-2017, Corley and Nunes.

Symmoca uniformella Rebel, 1900
BAL: Moinho de Alferes, 27-III-2017, Corley and S. Ferreira; Ribeira de Vale Cova, 28-III-2017, Corley and S. Ferreira.

Symmocoides don (Gozmány, 1963)
TM: Estevais, 17-VII-2017, Corley and Nunes.

OECOPHORIDAE

Goidanichiana jourdheuillella (Ragonot, 1875)
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Kasyniana griseosericeella (Ragonot, 1879)
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete.

Batia lambdella (Donovan, 1793)
DL: Praia de Mindelo, 30-VI-2017, Nunes, Silva and Jesus.

Alabonia herculeella Walsingham, 1903
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

* *Pleurota andalusica* Back, 1973
ALG: Porto do Lagos, 22-V-2001, Corley; Ludo, 22-V-2002, Corley; TM: Santa Luzia, 14-VII-2017, Corley, S. Ferreira and Mateus. Algarve records of *P. protasella* Staudinger, 1883 in MONTEIRO & CARVALHO (1984) and CARVALHO & CORLEY (1995) almost certainly belong to *P. andalusica*. Spain. Food-plant unknown.

Pleurota gallicella Huemer & Luquet, 1995
BAL: Ribeira de Torgal, 13-V-2017, Marabuto, Nunes, Silva and Jesus.

DEPRESSARIIDAE

Agonopterix rotundella (Douglas, 1846)
TM: Abreiro station, 16-VII-2017, Corley and Nunes.

Agonopterix scopariella (Heinemann, 1870)
E: Crastinha, São Pedro do Moel, 25-II-2017, Rosete.

Agonopterix rutana (Fabricius, 1794)
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

Agonopterix yeatiana (Fabricius, 1781)
BA: Repeses, at street light, 6-VI-2017, Rosete.

Depressaria depressana (Fabricius, 1775)
ALG: Lagos, 1-VI-2016, Valadares, det. Corley.

Ethmia terminella Fletcher, 1938
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

CARCINIDAE

Carcina quercana (Fabricius, 1775)
DL: Vairão, larva on *Tilia*, 14-VII-2017, Corley.

COSMOPTERIGIDAE

Coccidiphila danilevskyi Sinev, 1997
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete.

Eteobalea dohrnii (Zeller, 1847)
BAL: Praia das Furnas, 15-V-2017, Grundy.

Vulcaniella fiordalisa (Petry, 1904)
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete; DL: Praia de Mindelo, 30-VI-2017, Nunes, Silva and Jesus.

GELECHIIDAE

Syncopacma polychromella (Rebel, 1902)
BAL: Mértola, 1 km S. of, 9-V-2017, Grundy.

Pseudosophronia exustellus (Zeller, 1847)
E: Bombarral, 12-VIII-2017, H. Cardoso, det. Corley from photo.

Neofaculta ericetella (Geyer, 1832)
BAL: Ribeira de Vale Cova, 28-III-2017, Corley and S. Ferreira;

Aristotelia ericinella (Zeller, 1839)
BAL: Ribeira de Torgal, 13-V-2017, Marabuto, Nunes, Silva and Jesus.

Isophrictis meridionella (Herrich-Schäffer, 1854)
ALG: Salema camping, 19-IV-2017, Skou, det. Karsholt.

Metzneria torosulella (Rebel, 1893)
BAL: Ribeira de Vale Cova, 28-III-2017, Corley and S. Ferreira; BL: Ansião, 13-V-2017, Rosete.

Metzneria tristella Rebel, 1901
BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Eulamprotes immaculatella (Douglas, 1850)
BA: Vale de Zêzere, 10-IX-2017, Rosete, det. Corley.

Mirificarma interrupta (Curtis, 1827)
E: Crastinha, São Pedro do Moel, 25-II-2017, Rosete.

* *Gelechia scotinella* Herrich-Schäffer, 1854
TM: Dine, 19-VII-2017, Corley and Nunes.

Scrobipalpa vasconiella (Rössler, 1877)
BA: Poço do Inferno, 24-VII-2017, Corley and Nunes.

Ephysteris promptella (Staudinger, 1859)
BL: Lagoa de São José, 1-VIII-2017, Rosete, det. Corley.

Caryocolum arenbergeri Huemer, 1989
TM: Estevais, 17-VII-2017, Corley and Nunes.

ELACHISTIDAE

Perittia piperatella (Staudinger, 1859)
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira; E: Crastinha, São Pedro do Moel, 25-II-2017, Rosete.

** *Elachista agelensis* Traugott-Olsen, 1996
M: Assureira, 27-VII-2011, Corley, det. Kaila; TM: França, 31-VIII-2016, Corley, det. Kaila. France, Italy, Austria, Czech Republic. Food-plant unknown.

* *Elachista heringi* Rebel, 1899
TM: Rio Angueira, Castelo de Algoso, 16-VI-2015, Corley, det. Kaila. Spain, France, Italy, Austria, Czech Republic, Slovakia, Hungary, Romania. [Larva on *Stipa pennata*].

** *Elachista distigmatella* Frey, 1859

TM: Carrazedo, 19-VI-2015, Corley, det. Kaila. France, Switzerland, Germany, Denmark, Sweden, Czech Republic, Poland, Lithuania. [Larva on *Festuca trachyphylla*].

* *Elachista obliquella* Stainton, 1854

BL: Ansião, 3-VII-2017, Rosete, det. Corley. Most of Europe, absent from far north, Balkan countries, and Mediterranean islands. [Larva on various Poaceae].

COLEOPHORIDAE

Coleophora conyzae Zeller, 1868

BAL: Moinhos de Paneiro, 12-V-2017, Marabuto, Nunes, Silva and Jesus, det. Corley.

Coleophora perplexella Toll, 1960

BB: Segura, praia fluvial, 30-III-2017, Corley, Mata and S. Ferreira.

Coleophora gredosella Baldizzone, 1985

BB: Cântaro Raso, disturbed from *Solidago virgaurea*, 23-VII-2017, Nunes, det. Corley.

* *Coleophora turbatella* Toll, 1944

BA: Torre, 25-VII-2016, Rosete. Spain. [Food-plant unknown].

Coleophora semicinerea Staudinger, 1859

BAL: Ribeira de Vale Cova, 28-III-2017, Corley and S. Ferreira; BL: Figueiró do Campo, 20-IV-2017, I. Ferreira, det. Corley; BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Coleophora pennella (Denis & Schiffermüller, 1775)

BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

Coleophora insulicola Toll, 1942

BAL: Moinhos de Paneiro, 12-V-2017, Marabuto, Nunes, Silva and Jesus, det. Corley; BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Coleophora adelogrammella Zeller, 1849

BA: Vale de Zêzere, 10-IX-2017, Rosete, det. Corley.

Coleophora agenjoi Toll, 1960

BB: Cântaro Raso, by road tunnel, resting on *Dianthus lusitanus* by day, 23-VII-2017, Nunes and Corley.

BATRACHEDRIDAE

Batrachedra praeangusta (Haworth, 1828)

BA: Poço do Inferno, 24-VII-2017, Corley.

SCYTHRIDIDAE

Scythris subseliniella (Heinemann, 1876)

TM: Bobal, 3-VI-2017, Nunes, Silva and Jesus, det. Corley.

Scythris grandipennis (Haworth, 1828)
TM: Estevais, 17-VII-2017, Corley and Nunes.

BLASTOBASIDAE

Blastobasis decolorella (Wollaston, 1858)
DL: Madalena, larva on dead flowers of *Castanea sativa*, 13-VIII-2017, adult 1-IX-2017, Nunes.

Tecmerium spermophagia Walsingham, 1907
BL: Lagoa de São José, 28-VII-2017, Rosete, det. Corley.

STATHMOPODIDAE

Neomariania partinicensis (Rebel, 1937)
Second and third records. ALG: Lagos, 24-VIII-2016, Valadares, conf. Corley; BL: Quinta do Canal, flying at sunset, 22-VII-2017, Corley and Rosete.

MOMPHIDAE

Mompha miscella (Denis & Schiffermüller, 1775)
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete.

* *Mompha langiella* (Hübner, 1796)
TM: França, 18-VII-2017, Corley, Nunes and S. Ferreira. Most of Europe, absent from most northern and southern regions and Mediterranean islands. [Larva on *Circaea* and *Epilobium*].

Mompha propinquella (Stainton, 1851)
Third record. TM: França, 18-VII-2017, Corley and Nunes.

Mompha subbistrigella (Haworth, 1828)
BA: Poço do Inferno, 24-VII-2017, Corley and Nunes; TM: Freixiel, 15-VII-2017, Corley and Nunes.

Mompha epilobiella (Denis & Schiffermüller, 1775)
BL: Quinta do Canal, 5-VII-2017, Rosete, det. Corley.

PTEROLONCHIDAE

Pterolonche inspersa Staudinger, 1859
ALG: Carrapateira, 17-V-2017, Grundy.

PTEROPHORIDAE

Agdistis adactyla (Hübner, 1819)
Delete record from Beira Litoral (CORLEY *et al*., 2015) which belongs to *A. heydeni* (Zeller, 1852). In GIELIS (1996) the illustrations of female genitalia of *A. adactyla* and *A. heydeni* are transposed. Other records are based on male genitalia and are unaffected.

Delete *Agdistis bifurcatus* Agenjo, 1952

All Portuguese records (CARVALHO & CORLEY, 1995; CORLEY *et al*., 2012a) belong to *A.*

glaseri. In GIELIS (1996) the illustrations of female genitalia of *A. bifurcatus* and *A. glaseri* are transposed.

* *Agdistis glaseri* Arenberger, 1978

ALG: Praia Verde, 20-IV-1992, Corley; Castro Marim, 18-V-2003, Corley; Cabo de São Vicente, 27-X-2010, Corley; Carrapateira, 28-X-2010, Corley. Spain. [Food-plant unknown].

Marasmarcha lunaedactyla (Haworth, 1811)

BAL: Pulo do Lobo, east side, 19-V-2017, Grundy.

Merrifieldia tridactyla (Linnaeus, 1758)

BL: Chão de Couce, 18-IV-2017, Rosete, det. Corley.

EPERMENIIDAE

Epermenia aequidentellus (Hofmann, 1867)

BB: Cântaro Raso, by road tunnel, larvae on *Angelica major*, 23-VII-2017, Nunes and Corley.

* *Epermenia ochreomaculella* (Millière, 1854)

TM: Freixiosa, 18-VI-2015, Corley; Ponta da Carba, 23-VII-2016, Pires, Gonçalves, Silva and Jesus, det. Corley. Spain, France, Switzerland, Italy, Croatia, Macedonia, Bulgaria, Albania, Greece, Ukraine. [Food-plant unknown].

TORTRICIDAE

Pandemis cerasana (Hübner, 1786)

TM: Bobal, larva on *Quercus robur*, 3-VI-2017, Nunes, det. Corley.

Aphelia peramplana (Hübner, 1825)

TM: Ribeira do Mosteiro, 31-III-2017, Corley, Mata and S. Ferreira.

Clepsis unicolorana (Duponchel, 1835)

BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus.

* *Clepsis coriacanus* (Rebel, 1894)

E: Alto dos Moinhos, 13-X-2014, Marabuto; Torres Vedras, 17-III-2016, Rosete; BL: Louriçal, 26-VII-2017, Rosete. An adventive species, originally from Canary Islands, first recorded in Europe in Gibraltar in 2006. Spain, Germany, England. [Larva polyphagous].

* *Clepsis peritana* (Clemens, 1860)

ALG: Corte do Gago, 20-V-2017, Jacinto; Pêra, 23-XII-2017, Cunningham, det. Corley. (Fig. 1). An adventive species, originally from North America, first recorded in Spain in 1998. Spain, Denmark. [Larva polyphagous, mainly on dead plant material, but also on buds and young leaves].

Cnephasia delnoyana Groenen & Schreurs, 2012

BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira; BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Cnephasia stephensiana (Doubleday, 1849)

TM: Bobal, 3-VI-2017, larva on *Halimium*, reared, Nunes, det. Corley.

Cnephasia communana (Herrich-Schäffer, 1851)
DL: Praia de Mindelo, 24-IV-2017, Nunes, Silva and Jesus, det. Corley.

Acleris hyemana (Haworth, 1811)
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete.

Phtheochroa simoniana (Staudinger, 1859)
BB: Monte Barata, 29-III-207, Corley, Mata and S. Ferreira.

Phtheochroa rugosana (Hübner, 1799)
DL: Praia de Mindelo, 30-VI-2017, Nunes, Silva and Jesus, det. Corley.

Cochylimorpha peucedana (Ragonot, 1889)
BAL: Monte Velho, larva on *Santolina impressa*, 14-V-2017, reared, Nunes, det. Corley.

Cochylimorpha decolorella (Zeller, 1839)
DL: Praia de Mindelo, 24-IV-2017, Nunes, Silva and Jesus, det. Corley.

Aethes languidana (Mann, 1855)
BAL: Ribeira de Vale Cova, 28-III-2017, Corley and S. Ferreira.

Cochylidia heydeniana (Herrich-Schäffer, 1851)
BL: Quinta da Serra, larva 12-V-2017 in shoots of *Dittrichia viscosa*, reared, Nunes, det. Goodey.

Argyroploce unedana Baixeras, 2002
BL: Lagoa de São José, 1-VIII-2017, Rosete, det. Corley.

Lobesia botrana (Denis & Schiffermüller, 1775)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

* *Lobesia reliquana* (Hübner, 1825)
DL: Parque Biológico de Gaia, larva on *Rubus*, 17-IX-2017, reared 23-IV-2018, Nunes, det. Corley. (Fig. 2). Nearly all Europe, absent from parts of Balkans and Mediterranean islands. [Larva on *Quercus*, *Betula*, *Carpinus*, *Cornus sanguinea* and *Prunus spinosa*].

Endothenia marginana (Haworth, 1811)
BL: Corticeiro de Cima, 1-IX-2017, Rosete.

Ancylis obtusana (Haworth, 1811)
TM: Dine, 19-VII-2017, Corley and Nunes.

Ancylis apicella (Denis & Schiffermüller, 1775)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Eucosma cana (Haworth, 1811)
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

Notocelia incarnatana (Hübner, 1800)
DL: Praia de Mindelo, 30-VI-2017, Nunes, Silva and Jesus, det. Corley.

Pseudococcyx tessulatana (Staudinger, 1871)
TM: Estevais, 17-VII-2017, Corley and Nunes.

Retinia resinella (Linnaeus, 1758)
BAL: Praia do Malhão, 12-V-2017, Marabuto, Nunes, Silva and Jesus, conf. Corley. (Fig. 3).

Dichrorampha letarfensis Gibeaux, 1983
BB: Segura, praia fluvial, 30-III-2017, Corley, Mata and S. Ferreira.

Grapholita janthinana (Duponchel, 1843)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Pammene splendidulana (Guenée, 1845)
BAL: Moinhos de Paneiro, larva on *Quercus suber*, 14-V-2017, Nunes.

BRACHODIDAE

Brachodes gaditana (Rambur, 1866)
BL: Ansião, 3-VII-2017, Rosete.

COSSIDAE

Cossus cossus (Linnaeus, 1758)
BAL: Mértola, 1 km S. of, 9-V-2017, Grundy.

SESIIDAE

Chamaesphecia aerifrons (Zeller, 1847)
BA: Rossão, by day, 7-VI-2017, Rosete.

EPIPYROPIDAE

Ommatissopyrops lusitanicus Bivar de Sousa & Quartau, 1998
BAL: Ribeira de Torgal, 13-V-2017, Marabuto, Nunes, Silva and Jesus, det. Corley.

LIMACODIDAE

Hoyosia codeti (Oberthür, 1883)
BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus.

PYRALIDAE

Galleria mellonella (Linnaeus, 1758)
TM: Santa Luzia, 14-VII-2017, Corley, S. Ferreira and Mateus.

Hypsopygia incarnatalis (Zeller, 1847)
BL: Lagoa de São José, 28-VII-2017, Rosete.

Stemmatophora combustalis (Fischer von Röslerstamm, 1842)
BAL: Corte Sines, 8-V-2017, Grundy.

Hypsotropa vazquezi Gastón, Macià, Ylla & Huertas, 2016

BL: Ansião, 23-VII-2016, Rosete, det. Corley; BB: Monte Barata, 3-VI-2017, Lemos, comm. Nunes, det. Corley.

H. vulneratella was recently excluded from the Iberian fauna, see GASTÓN *et al*. (2016), with previous Portuguese records, all from Algarve, being assumed without examination to belong to the newly described *H. vazquezi* Gastón, Macià, Ylla & Huertas, 2016. The identity of Algarve records remains unconfirmed, but their assumption is likely to be correct.

Oncocera semirubella (Scopoli, 1763)

BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

* *Gymnancyla hornigii* (Lederer, 1852)

ALG: Praia da Mareta, Sagres, 5-IX-2017, Pires, det. Corley. Middle and southern Europe from Spain, France and Germany eastwards, absent from north and north-west Europe and Mediterranean islands. [Larva on *Atriplex* and *Chenopodium*].

Asalebria geminella (Eversmann, 1844)

BAL: Mértola, 1 km S. of, 9-V-2017, Grundy.

Epischnia illotella Zeller, 1839

BL: Pampilhosa do Botão, 29-VI-2017, Jesus, det. Corley.

Psorosa dahliella (Treitschke, 1832)

DL: São Miguel, Lousada, 7-VII-2017, R. Cardoso, det. Corley.

Acrobasis bithynella Zeller, 1848

BL: Porto de Mós, larva on *Cistus albidus*, 22-III-2017, adult 1-IX-2017, Nunes, det. Corley.

Acrobasis romanella (Millière, 1870)

BAL: Mértola, 27-III-2017, Corley.

Acrobasis advenella (Zincken, 1818)

DL: Valongo, larva on *Crataegus monogyna*, 17-IV-2017, reared, Nunes.

Metallostichodes nigrocyanella (Constant, 1865)

BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

(*) *Ancylosis sareptalla* (Herrich-Schäffer, 1861)

BL: Lagoa de São José, 27-VI-2017, Rosete, det. Corley. (Fig. 4). An earlier record of this species was rejected, see CORLEY *et al*. (2016). Southern Europe, extending north to Czech Republic. Larva unknown.

Ancylosis oblitella (Zeller, 1848)

DL: Praia de Mindelo, 26-V-2017, Nunes, Silva and Jesus, det. Corley.

Homoeosoma nimbella (Duponchel, 1837)

BAL: Moinhos de Paneiro, 12-V-2017, Marabuto, Nunes, Silva and Jesus, det. Corley.

Phycitodes bentinkella (Pierce, 1937)

BA: Poço do Inferno, 24-VII-2017, Corley and Nunes.

Phycitodes inquinatella (Ragonot, 1887)
TM: Dine, 19-VII-2017, Corley and Nunes.

CRAMBIDAE

Sitochroa palealis (Denis & Schiffermüller, 1775)
BAL: Ponta da Galhofa, 14-V-2017, Grundy.

Agrotera nemoralis (Scopoli, 1763)
DL: Madalena, larva on *Castanea sativa*, 6-VIII-2017, Nunes.

Cydalima perspectalis (Walker, 1859)
Third record. M: Midões, 16-VIII-2017, Carvalho, comm. Marabuto.

Dolicharthria aetnealis (Duponchel, 1833)
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

Anarpia incertalis (Duponchel, 1832)
BA: Albergaria, 24-VII-2017, Corley, Nunes and S. Ferreira.

Mesocrambus carectellus (Zeller, 1847)
BB: Monte Barata, 3-VI-2017, Lemos, comm. Nunes, det. Corley.

* *Hyperlais siccalis* (Guenée, 1854)
BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus; BL: Praia do Pedrogão, 17-VI-2017, Rosete. (Fig. 5). Spain, France. [Food-plant unknown].

DREPANIDAE

Thyatira batis (Linnaeus, 1758)
BB: Segura, praia fluvial, 30-III-2017, Corley, Mata and S. Ferreira.

LASIOCAMPIDAE

Trichiura ilicis (Rambur, 1866)
BB: Monte Barata, 29-III-2017, Corley, Mata and S. Ferreira.

GEOMETRIDAE

Idaea lusohispanica Herbulot, 1991
BAL: Mértola, 1 km S. of, 9-V-2017, Grundy.

Idaea nigrolineata (Chrétien, 1911)
Second and third records. TM: São Lourenço, 14-VII-2017, Corley and Nunes; Freixiel, 15-VII-2017, Corley, Nunes, S. Ferreira and Mateus.

Idaea incisaria (Staudinger, 1892)
BAL: Praia das Furnas, 15-V-2017, Grundy.

Idaea elongaria (Rambur, 1833)
BA: Poço do Inferno, 24-VII-2017, Corley and Nunes.

Idaea obsoletaria (Rambur, 1835)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Idaea robiginata (Staudinger, 1863)
BA: Picão, 22-VI-2017, Rosete.

Idaea lutulentaria (Staudinger, 1892)
BL: Ansião, 10-VI-2017, Rosete.

Idaea politaria (Hübner, 1799)
ALG: Sargaçal, 19-VI-2017, Valadares.

Idaea manicaria (Herrich-Schäffer, 1851)
Second and third records. BAL: Sobral da Adiça, 5-VI-2008, Corley, Marabuto and Rodrigues; Pulo do Lobo, eastern side, 19-V-2017, Grundy.

Idaea subsaturata (Guenée, 1858)
BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Idaea aversata (Linnaeus, 1758)
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Idaea deversaria (Herrich-Schäffer, 1847)
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Catarhoe basochesiata (Duponchel, 1831)
BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Euphyia frustata (Treitschke, 1828)
BA: Covão do Vidual, 23-VII-2017, Corley and Nunes.

Anticlea derivata (Denis & Schiffermüller, 1775)
ALG: Corte do Gago, 28-II-2017, Jacinto.

Nebula ibericata (Staudinger, 1871)
BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Perizoma flavofasciata (Thunberg, 1792)
TM: Ribeira do Mosteiro, 31-III-2017, Corley, Mata and S. Ferreira.

Eupithecia dodoneata Guenée, 1858
BB: Ribeiro da Azenha, 16-IV-2017, Sousa, det. Corley.

Eupithecia massiliata Millière, 1865
BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Eupithecia scopariata (Rambur, 1833)
BAL: Almograve, 16-V-2017, Grundy.

Eupithecia innotata (Hufnagel, 1767)
TM: Santa Luzia, 14-VII-2017, Corley, S. Ferreira and Mateus.

Itame vincularia (Hübner, 1813)
BAL: Mértola, 1 km S. of, 9-V-2017, Grundy.

Petrophora chlorosata (Scopoli, 1763)
BAL: Praia do Malhão, 12-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Perigune narbonea (Linnaeus, 1767)
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

* *Ecleora solieraria* (Rambur, 1834)
BAL: Mértola, 1 km S. of, 9-V-2017, Grundy. (Fig. 6). Spain, France. [Larva on *Juniperus* and *Cupressus*].

Hypomecis punctinalis (Scopoli, 1763)
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

* *Tephronia espaniola* Schawerda, 1931
TM: Dine, 19-VII-2017, Corley, Nunes, S. Ferreira and Mateus. France, Spain. [Larva on lichens].

Cabera pusaria (Linnaeus, 1758)
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Comibaena bajularia (Denis & Schiffermüller, 1775)
ALG: Sargaçal, 23-V-2017, Valadares.

Phaiogramma etruscaria (Zeller, 1849)
BL: Praia do Pedrogão, 17-VI-2017, Rosete.

NOTODONTIDAE

Dicranura ulmi (Denis & Schiffermüller, 1775)
BB: Segura, praia fluvial, 30-III-2017, Corley, Mata and S. Ferreira.

Drymonia ruficornis (Hufnagel, 1766)
BB: Ribeiro da Azenha, 16-IV-2017, Sousa, det. Corley.

Peridea anceps (Goeze, 1781)
BB: Monte Barata, 29-III-2017, Corley, Mata and S. Ferreira.

EUTELIIDAE

Eutelia adulatrix (Hübner, 1813)
BAL: Praia das Furnas, 15-V-2017, Grundy.

EREBIDAE

Lymantria monacha (Linnaeus, 1758)
BAL: Ribeira de Torgal, 13-V-2017, larva, Grundy, Marabuto and Nunes.

Orgyia aurolimbata Guenée, 1835
TM: Freixiel, 15-VII-2017, Corley, Nunes, S. Ferreira and Mateus.

* *Thumatha senex* (Hübner, 1808)
TM: Cova da Lua, in actinic trap, 19-VII-2017, Corley, S. Ferreira and Mateus. All Europe except some Balkan countries and Mediterranean islands. [Larva on lichens].

Schrankia costaestrigalis (Stephens, 1834)
BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Eublemma parva (Hübner, 1808)
BL: Ilha da Murraceira, 14-VI-2017, Rosete.

Catocala mariana Rambur, 1858
BAL: Praia do Malhão, 12-V-2017, Marabuto, Grundy, Nunes, Silva and Jesus.

Clytie illunaris (Hübner, 1813)
BAL: Herdade do Pulo do Lobo, 11-V-2017, Grundy.

NOCTUIDAE

Acronicta psi (Linnaeus, 1758)
BAL: Ribeira de Torgal, larva, 13-V-2017, Grundy.

Craniophora ligustri (Denis & Schiffermüller, 1775)
DL: Praia de Mindelo, 26-V-2017, Nunes, Silva and Jesus.

* *Cucullia santolinae* Rambur, 1834
BAL: Lagoa de Santo André, larva on *Santolina impressa*, 14-V-2017, reared, Nunes. (Figs. 7, 8). Spain, France, Italy, Greece, Corsica, Sicily.

Calophasia almoravida Graslin, 1863
ALG: Cruzinha, 5-V-2017, Grundy and Banza.

Lophoterges millierei (Staudinger, 1871)
BL: Ansião, 20-V-2017, Rosete.

Bryonycta pineti (Staudinger, 1859)
BAL: Corte Sines, 8-V-2017, Grundy; BA: Poço do Inferno, 24-VII-2017, Corley and Nunes.

Callopistria juventina (Stoll, 1782)
BAL: Moinhos de Paneiro, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus; BA: Ponte de Jugais, 25-VII-2017, Corley and Nunes.

Callopistria latreillei (Duponchel, 1827)
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

Bryophila raptricula (Denis & Schiffermüller, 1775)
BA: Poço do Inferno, 24-VII-2017, Corley and Nunes.

Polyphaenis sericata (Esper, 1787)
BAL: Herdade do Pulo do Lobo, 11-V-2017, Grundy.

Photedes minima (Haworth, 1809)
TM: Quintã, 13-VII-2016, Fernandes and Gonzalez, det. Corley.

Oligia versicolor (Borkhausen, 1792)
TM: França, 18-VII-2017, Corley and Nunes.

Agrochola meridionalis (Staudinger, 1871)
ALG: Sargaçal, 5-XII-2017, Valadares, conf. Corley.

Lacanobia thalassina (Hufnagel, 1766)
DL: Vairão, 31-V-2017, S. Ferreira, det. Corley.

Hadena magnolii (Boisduval, 1829)
BAL: Ribeira de Torgal, 13-V-2017, Grundy, Marabuto, Nunes, Silva and Jesus.

Hadena sancta (Staudinger, 1859)
E: Crastinha, São Pedro do Moel, 24-IV-2017, Rosete; BB: Quinta das Valsas, 29-III-2017, Corley, Mata and S. Ferreira.

Hadena silenides (Staudinger, 1895)
BB: Segura, praia fluvial, 30-III-2017, Corley, Mata and S. Ferreira.

Euxoa oranaria (Bang-Haas, 1906)
BAL: Ponta da Galhofa, 14-V-2017, Grundy.

NOLIDAE

Nola cicatricalis (Treitschke, 1835)
BAL: Moinhos de Paneiro, 13-V-2017, Marabuto, Nunes, Silva and Jesus.

Nola subchlamydula Staudinger, 1871
BAL: Moinho do Alferes, 25-III-2017, Corley and S. Ferreira.

Recent literature affecting the Portuguese Lepidoptera fauna

ANON (2017). The International Commission on Zoological Nomenclature has finally made a decision regarding the proposal to conserve *Maculinea* Eecke, 1915 over *Phengaris* Doherty, 1891. It has rejected the proposed conservation of *Maculinea*. The Portuguese species therefore becomes *Phengaris alcon* (Denis & Schiffermüller, 1775).

ARNSCHEID & WEIDLICH (2017) provide a new treatment of European Psychidae. Portuguese records of *Typhonia ciliaris* are referred to *T. melana* (Frivaldszky, 1837); *Brevantennia* is treated as a subgenus of *Dahlica*, with the Portuguese species *D. estrela* (Arnscheid, 2012). In the Distribution Catalogue, *Narycia duplicella* is omitted for Portugal, *Dahlica triquetrella* is given as present in Portugal but explicitly rejected in the main text and the Portuguese *Typhonia* species is still listed as *T. ciliaris*.

BUCHNER *et al*. (2017) include a new species *Agonopterix carduncelli* Corley, 2017 with holotype and paratypes from Portugal.

CORLEY (2017) describes a new species, *Chrysoclista soniae* from Serra da Estrela based on the specimen treated as *C. splendida* Karsholt, 1997 in CORLEY (2015).

CORLEY (2018) describes a new species, *Cacochroa rosetella* from Beira Litoral.

CORLEY & BUCHNER (2018) describe *Depressaria villosae* with holotype from Trás-os-Montes. This replaces *D. pimpinellae* Zeller, 1839 which was previously misidentified in Portugal.

CORLEY & FERREIRA (2017) describe the hitherto unknown female of *Isotrias penedana* Trematerra, 2013.

CORLEY *et al*. (2017a) record *Borkhausenia crimnodes* Meyrick, 1912 from Beira Litoral, new to Europe. This is a southern hemisphere species now established in Portugal.

CORLEY *et al*. (2018) add 32 species to the Portuguese fauna.

GASTÓN *et al*. (2017) describe a new species *Clepsis razowskii* which appears to have a wide distribution in the Iberian Peninsula. It has been overlooked as *C. consimilana* until now. The distribution of the two species in Portugal requires investigation.

GLOBIZ (NUSS *et al*., 2003-2017), the online inventory of Pyraloidea, transfers the species formerly placed in *Pleuroptya* Meyrick, 1890 to genus *Patania* Moore, 1888. This follows ROSE & SINGH (1989) who resurrected the forgotten genus *Patania* and transferred eight Indian species into it. Their paper left considerable uncertainty as to whether all *Pleuroptya* species should be placed in *Patania*, so the Portuguese species were left in *Pleuroptya* in CORLEY (2015). The Portuguese species of *Patania* are *ruralis* (Scopoli, 1763) and *balteata* (Fabricius, 1798). The latter species was given as *Pleuroptya crocealis* (Duponchel, 1834) in CORLEY (2015) following the view of LERAUT (2012) that *crocealis* showed genitalia differences from *balteata*. More recently SLAMKA (2013) concluded that *crocealis* should be treated as a junior synonym of *balteata* as supposed genitalia differences were not significant.

HACKER *et al*. (2012) split eastern and western Mediterranean populations of *Nola chlamitulalis* (Hübner, 1813) into separate species. *N. infantula* Kitt, 1926 replaces *N. chlamitulalis* in the west.

HASLBERGER & SEGERER (2016) discuss the status of *Aporophyla lutulenta* and *A. lueneburgensis*, following work on barcodes, concluding that they are separate species. This conclusion is the opposite of that of ORHANT (2012) which was followed by CORLEY (2015), but it appears that ORHANT's work was flawed as he did not have true *lutulenta* available. The conclusion in CORLEY (2015) must therefore be reversed, with Portuguese material referred to *A. lueneburgensis*.

HUERTAS-DIONISIO *et al*. (2017) in describing the life histories of three *Sciota* species, point out that *S. rungsi* Leraut, 2002 is a junior synonym of *S. elegiella* (Zerny, 1928).

KAILA (2011) placed *Urodeta* in family Elachistidae. This was overlooked by CORLEY (2015).

LAŠTŮVKA & LAŠTŮVKA (2017) add *Coleophora gredosella* Baldizzone, 1985, *Coleophora changaica* Reznik, 1975 and *Brachodes laeta* (Staudinger, 1863) to the Portuguese fauna.

MARABUTO (2018) adds *Polyommatus celina* (Austaut, 1879) to the Portuguese list with useful comments on its status and identification; he also gives fuller data on several species previously listed for Portugal for the first time from Serpa in various earlier papers.

REGIER *et al*., (2014) raise the subfamilies Dryadaulinae and Meessiinae of the Tineidae to family level as Dryadaulidae and Meessiidae.

TABELL (2017) describes *Coleophora septembra* with paratypes from Trás-os-Montes and Beira Alta.

Appendix: Changes to the Portuguese fauna list

Species added to the Portuguese fauna listed in this and other papers are summarised here, each with a number indicating their placement in the checklist (CORLEY, 2015). New genera for the Portuguese fauna show the author and year of publication of the genus.

Name changes due to changes at genus level or to new synonymy are given, with each species retaining its list number. In a case where a new name is provided for a previously misidentified species, the new species retains the number of the misidentified species. Thus *Nola infantula* Kitt, 1926 replaces *Nola chlamitulalis* (Hübner, 1813) which HACKER *et al*. (2012) show to be absent from western Europe, but the new species retains the number 2577 in the checklist.

Dahlica Enderlein, 1912 (*Brevantennia* Sieder, 1953)
0114 *estrela* (Arnscheid, 2012)
0121 *Typhonia melana* (Frivaldszky, 1837) (*ciliaris auct. nec* Ochsenheimer, 1810)
0154.1 *Infurcitinea minuscula* Gozmány, 1960

Metriochroa Busck, 1900
0240.1 *latifoliella* (Millière, 1886)
Cameraria Chapman, 1902
0295.1 *ohridella* Deschka & Dimić, 1986
0409.1 *Borkhausenia crimnodes* Meyrick, 1912
0425.1 *Pleurota andalusica* Back, 1973
0444.1 *Agonopterix carduncelli* Corley, 2017
0475 *Depressaria villosae* Corley & Buchner, 2018 (*pimpinellae auct. nec* Zeller, 1839)
Cacochroa Heinemann, 1854
0479.1 *rosetella* Corley, 2018
0648.1 *Gelechia scotinella* Herrich-Schäffer, 1854
0719.1 *Elachista agelensis* Traugott-Olsen, 1996
0719.2 *Elachista heringi* Rebel, 1899
0722.1 *Elachista distigmatella* Frey, 1859
0725.1 *Elachista obliquella* Stainton, 1854
0747 *Chrysoclista soniae* Corley, 2017 (*splendida auct. nec* Karsholt, 1997)
0778.1 *Coleophora gredosella* Baldizzone, 1985
0779.1 *Coleophora septembra* Tabell, 2017
0800.1 *Coleophora changaica* Reznik, 1975
0816.1 *Coleophora turbatella* Toll, 1944
0902.1 *Mompha langiella* (Hübner, 1796)
0931 *Agdistis glaseri* Arenberger, 1978 (*bifurcatus auct. nec* Agenjo, 1952)
0969.1 *Epermenia ochreomaculella* (Millière, 1854)
1006.1 *Clepsis razowskii* (Gastón, Vives & Revilla, 2017)
1007.1 *Clepsis coriacanus* (Rebel, 1894)
1007.2 *Clepsis peritana* (Clemens, 1860)
1106.2 *Lobesia reliquana* (Hübner, 1825)
1212.2 *Brachodes laeta* (Staudinger, 1863)
Phengaris Doherty, 1891 (*Maculinea* Eecke, 1915)
1398 *alcon* (Denis & Schiffermüller, 1775)
1405.1 *Polyommatus celina* (Austaut, 1879)
1455 *Sciota elegiella* (Zerny, 1928) (*rungsi* Leraut, 2002)
1461.1 *Gymnancyla hornigii* (Lederer, 1852)
1526.1 *Ancylosis sareptalla* (Herrich-Schäffer, 1861)
Patania Moore, 1888 (*Pleuroptya* Meyrick, 1890)
1583 *ruralis* (Scopoli, 1763)
1584 *balteata* (Fabricius, 1798) (*crocealis* Duponchel, 1834)
1679.1 *Hyperlais siccalis* (Guenée, 1854)
Ecleora Wehrli, 1941
2003.1 *solieraria* (Rambur, 1834)
2022.1 *Tephronia espaniola* Schawerda, 1931
Thumatha Walker, 1866
2133.1 *senex* (Hübner, 1808)
2253.1 *Cucullia santolinae* Rambur, 1834
2433 *Aporophyla lueneburgensis* (Freyer, 1848) (*lutulenta auct. nec* Denis & Schiffermüller, 1775)
2577 *Nola infantula* Kitt, 1926 (*chlamitulalis auct. nec* Hübner, 1813)

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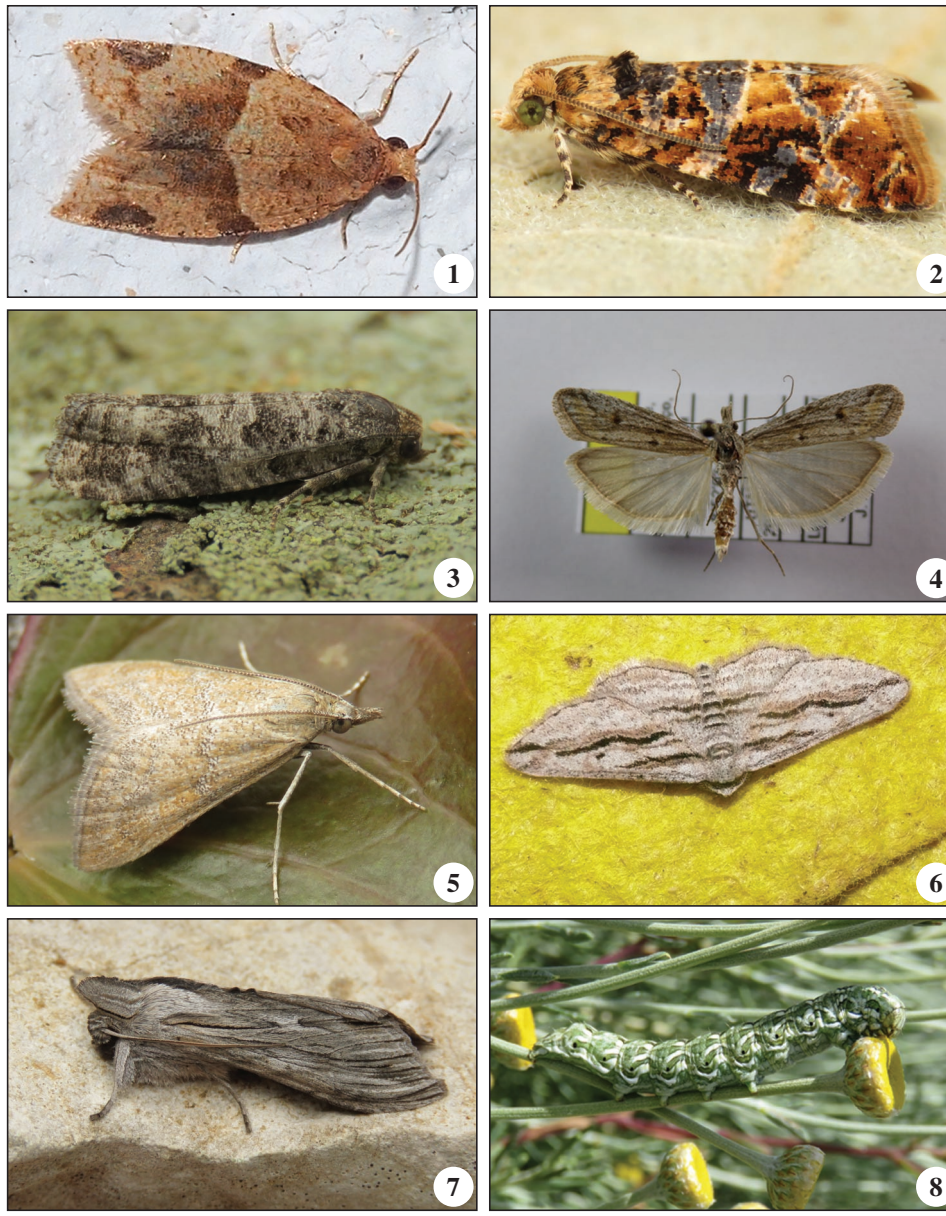

Figures 1-8.– 1. *Clepsis peritana* (Clemens, 1860), Corte do Gago (V. Jacinto). **2.** *Lobesia reliquana* (Hübner, 1825), Gaia (J. Nunes). **3.** *Retinia resinella* (Linnaeus, 1758), (J. Nunes). **4.** *Ancylosis sareptalla* (Herrich-Schäffer, 1861), Lagoa de São José (J. Rosete). **5.** *Hyperlais siccalis* (Guenée, 1854) (J. Nunes). **6.** *Ecleora solieraria* (Rambur, 1834), Mértola (D. Grundy). **7.** *Cucullia santolinae* Rambur, 1834 (J. Nunes). **8.** *Cucullia santolinae* Rambur, 1834, larva on *Santolina impressa* (J. Nunes).

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Pest species *Cydalima perspectalis* (Walker, 1859) new to the Maltese Islands (Lepidoptera: Crambidae)

J. Agius

Abstract

Cydalima perspectalis (Walker, 1859) is reported for the first time from the Maltese Islands. Distribution, habits of the adult and larval host plant are included. A Maltese name is proposed for this new record.
KEY WORDS: Lepidoptera, Crambidae, *Cydalima*, *Cydalima perspectalis*, Malta.

Cydalima perspectalis **(Walker, 1859) especie plaga, nueva para Malta (Lepidoptera: Crambidae)**

Resumen

Se registra por primera vez, para Malta, a *Cydalima perspectalis* (Walker, 1859). Se incluye la distribución, hábitat del adulto y planta nutricia. Se propone un nombre maltés, para el nuevo registro.
KEY WORDS: Lepidoptera, Crambidae, *Cydalima*, *Cydalima perspectalis*, Malta.

Introduction

The superfamily Pyraloidea is composed of about 16,000 described species worldwide (HEPPNER, 1991) with 914 species recorded from Europe (NUSS *et al*.,2004). On the Maltese Islands around 140 species have been recorded so far with the latest addition being *Bocchoris bleusei* (Oberthür, 1887) (CATANIA, 2018)

Material

MALTA: 1 ♂, Zurrieq, 5-V-2018, at light, leg. J. Agius.

Distribution

The genus *Cydalima* Lederer, 1863 is represented by 9 species all native to Asia. *Cydalima perspectalis* (Walker, 1859) is native to India, China, Korea, Japan and the Russian Far East. It was recorded for the first time in Europe from Germany during 2006. Following this discovery, it was further recorded in Switzerland and the Netherlands during 2007 (MALLY & NUSS, 2010). In 2008, it was recorded from Great Britain, France and Austria (KENIS *et al*., 2013) and by 2018 it has spread throughout Europe, from Spain to Turkey and Russia.

Cydalima perspectalis (Walker, 1859), MALTA, Zurrieq.

Discussion

In normal jargon *C. perspectalis* is referred to as the Box Tree Moth as the larvae are notorious pests of Box trees from the genus *Buxus*. This species is so invasive on *Buxus* trees that certain countries such as the United Kingdom have developed an online recording scheme to monitor its distribution (available from https://www.ebts.org/2016/05/box-tree-moths-plague).

One of the major problems with eradicating this species is that the larvae are toxic to most European predators hence *C. perspectalis* cannot be easily controlled. Observed larval parasitism was less than 1% and represented by a single tachinid parasitoid, *Pseudoperichaeta nigrolineata* (Walker, 1853) while no egg or pupal parasitoids were found (KENIS *et al*., 2013). However, pheromone traps and insecticides are commonly used in *Buxus* infested areas to control the invasion.

In Malta, several species of alien organisms have been established during the last decade and the Lepidoptera is no exception. Even though in Malta there are no native *Buxus* trees, it is in actual fact a common imported ornamental genera so there is a high possibility that this species establishes itself in Malta as well. Considering that *C. perspectalis* is not a strong flier, it is being assumed that the presence of this species in Malta is the result of *Buxus* importation. In fact, it was confirmed that a garden centre in Qormi had just imported fresh Box trees whilst another garden centre at Burmarrad confirmed that during the week starting 14th May 2018 they were expecting fresh consignments. Worst still, it has been noted that in Georgia, apart from *Buxus* tress, *C. perspectalis* attacks *Rubus* sp. as well (MATSIAKH, 2016). In Malta *Rubus ulmifolius* Schott 1818 is native and quite widespread so it will not come as a surprise if more specimens of *C. perspectalis* are recorded in the future.

With a wingspan of 42mm, *C. perspectalis* qualifies as the largest Pyraloidea species recorded from the Maltese Islands so far. The species is new to the Maltese lepidopterofauna. I propose the Maltese name Sidalima tal-Buxus, after its hostplant.

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Una especie nueva del género *Bracca* Hübner, [1820] de Sulawesi, Indonesia (Lepidoptera: Geometridae, Ennominae, Boarmiini)

A. Expósito-Hermosa

Resumen

Se describe *Bracca mariarosae* Expósito, sp. n. de Sulawesi, Indonesia. Se ilustra el adulto y la genitalia del macho y de la hembra.
PALABRAS CLAVE: Lepidoptera, Geometridae, Ennominae, Boarmiini, *Bracca,* especie nueva, Sulawesi, Indonesia.

A new species of the genus *Bracca* Hübner, [1820] from Sulawesi, Indonesia (Lepidoptera: Geometridae, Ennominae, Boarmiini)

Abstract

Bracca mariarosae Expósito, sp. n. from Sulawesi is described. The adult and the genitalia of the male and female are illustrated.
KEY WORDS: Lepidoptera, Geometridae, Ennominae, Boarmiini, *Bracca,* new specie, Sulawesi, Indonesia.

Introducción

El género *Bracca* Hübner, [1820], al que pertenece la especie nueva, ha sido conveniente estudiado por HOLLOWAY (1994: 171-173). PARSONS *et al.* (1999: 91-93) incluyen una extensa relación de sinónimos y especies del mismo. Las nuevas aportaciones, para el género se pueden estudiar en SOMMERER & STÜNING (1997), STÜNING (2005) y STÜNING *et al*. (2017).

La especie nueva se incluye en el árbol filogenético correspondiente a las especies *B. olafhenkeli* Stüning, 2005*, B. annawatyae* Stüning, Hafriani & Fahri, 2017 y *B. miroquinhae* Stüning, Hafriani & Fahri, 2017. Todas las especies del citado árbol son endémicas de Sulawesi, Indonesia.

Taxonomía

***Bracca mariarosae* Expósito, sp. n.** (Figs. 1-6)

Holotipo ♂ (Figs. 1-2): Norte Toraja regency. Pulu-Pulu area. S. Sulawesi. VII-2017 Indonesia. (colector localr), depositado en la colección de Andrés Expósito Hermosa, Móstoles, Madrid (España).

Paratipos 1 ♂ y 2 ♀♀: 1 ♀ (Figs. 3-4), Norte Toraja regency. Pulu-Pulu area. S. Sulawesi, Indonesia, VII-2017, colector local; Genitalia AEH 3290 (Fig 6); en colección Andrés Expósito Hermosa. 1 ♂, Norte Toraja regency. Pulu-Pulu area. S. Sulawesi, Indonesia, VII-2017, colector local; Genitalia AEH 3273 (Fig. 5); en colección Andrés Expósito Hermosa. 1 ♀, Sulawesi, Pulu Pulu, 2000 m, X-1995, de-

positado en la colección de Katsumi Yazaki, Tokyo, Japón [no se ha estudiado su morfología interna]
Descripción (Figs. 1-4): Cabeza, tórax y abdomen cubiertos regularmente por escamas negras. En la cabeza: palpos cortos con escamas en su base de color ocre. Larga espiritrompa. Vertex con escamas de color ocre. Antenas ciliadas (filiformes): los cilios en los machos más largos que en las hembras que son muy cortos. Tegulas de color ocre con unos pequeños dibujos rectangulares de tono negro. La parte distal del abdomen es de un tono ocre anaranjado algo más desarrollado en los machos.

Expansión alar de los machos y de las hembras de 65-70 mm; longitud del ala anterior de 33-34 mm. En las alas anteriores predomina el fondo de color blanco. Las manchas redondeadas negras se hallan rodeadas de escamas de tono ocre apagado. En las alas posteriores se acentúa el fondo blanco al reducirse mucho las citadas escamas de tono ocre. En el reverso desaparecen totalmente las escamas de color ocre, lo que le proporciona un claro contraste entre los tonos blancos y negros. En el diseño alar de las anteriores destaca la casi continua banda mediana que rodea al punto discal. En las posteriores la mancha láctea de la zona inferior del termen es más estrecha que en las otras especies del árbol y no llega a invadir el tornus. Como es distintivo en los ♂♂: fovea visible de color blanco, casi translúcido, destacando menos que en otras especies de tonalidades oscuras.

Genitalia ♂ (Fig. 5): La base del uncus está perfectamente separada del tegumen, con muesca circular en el centro. Tegumen con protuberancias laterales. El sacculus con solo una espina, como en *B. annawatyae* Stüning, Hafriani & Fahri, 2017 pero más larga. Su base es redondeada, más robusta y tendiendo al estrangulamiento en su zona central. El lóbulo de la costa es alargado y estrecho. El proceso entre la costa y el sacculus (ampulla) es ancho, más largo y con una guarnición de espinas más abundante. Juxta con forma de "X" con los brazos más gruesos y equilibrados. Aedeagus delgado con su zona proximal redondeada y la distal (vesica) acabada en un proceso con forma de espina. Coremata con forma de piña (racimo).

Genitalia ♀ (Fig. 6): Papilas anales más gruesas que en *B. annawatyae*, apófisis posteriores más largas y gruesas como en las anteriores acabadas en procesos redondeados. Antrum con forma trapecioidal invertida. Pequeño colliculum rectangular. Fino ductus seminalis en la zona lateral izquierda. Bursa copulatrix piriforme, con un proceso longitudinal vertical dotado de unas cincuenta escamas paralelas sin que su parte superior llegue a invadir la zona del ductus bursae. El signum semicircular, fondo oscuro continúo y sin ningún dibujo en su interior; su periferia está dotada de cuatro gruesas púas; no se observa ninguna más como sucede en *B. annawatyae* (STÜNING *et al.*, 2017).

Diagnosis

La especie nueva se separa inmediatamente del resto de taxones, con los que se ha comparado, por su distintiva morfología externa: importantes diferencias en su diseño alar y especialmente en el fondo de sus alas de color blanco. Asimismo, la morfología interna ofrece buenos caracteres diferenciadores, entre otros, por su determinante signum. Por todo ello, el autor ha considerado necesario el describir este taxón como especie nueva.

Distribución

Endemismo de la isla de Sulawesi (Celebes), Pulu-Pulu, INDONESIA.

Etimología

Se dedica esta especie nueva a María Rosa Aparicio Gutiérrez esposa del autor.

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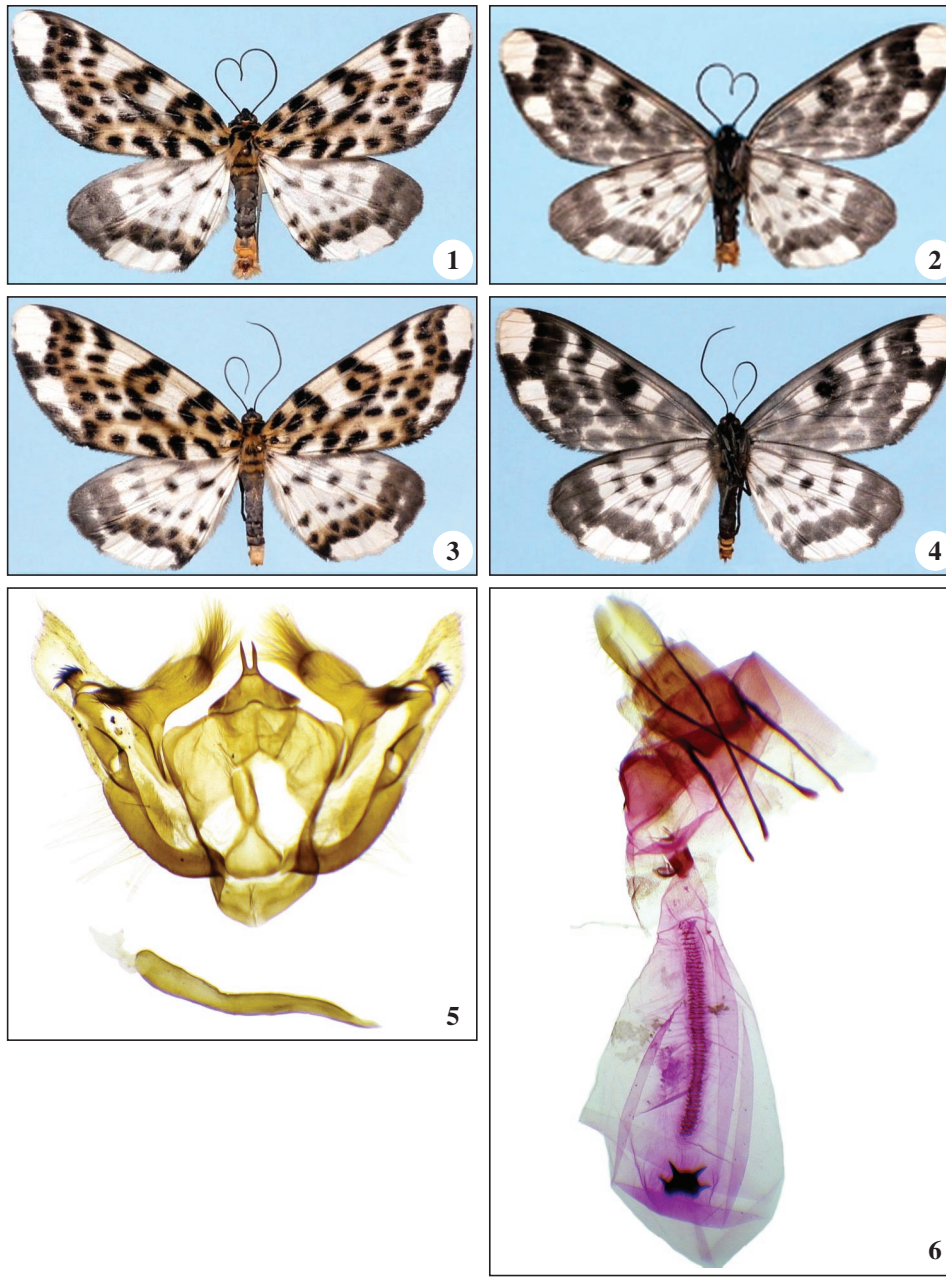

Figs 1-6.– 1. Holotipo ♂ anverso. **2.** reverso. **3.** Paratipo ♀, anverso. **4.** reverso. **5.** Genitalia macho preparación AEH 3273. **6.** Genitalia hembra preparación AEH 3290.

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Primera cita de *Cydalima perspectalis* (Walker, 1859) para Madrid, España (Lepidoptera: Crambidae, Spilomelinae)

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Resumen

La polilla del boj *Cydalima perspectalis* (Walker, 1859), es una especie invasora cuya rápida expansión desde su origen en el este de Asia está causando graves daños en distintas especies del género *Buxus* L. en países del este y del centro de Europa. En este documento informamos sobre un nuevo avistamiento de esta especie en Madrid, España.
PALABRAS CLAVE: Lepidoptera, Crambidae, Spilomelinae, *Cydalima perspectalis*, nueva cita, Madrid, España.

First record of *Cydalima perspectalis* (Walker, 1859) for Madrid, Spain (Lepidoptera: Crambidae, Spilomelinae)

Abstract

The box tree moth *Cydalima perspectalis* (Walker, 1859), is an invasive species whose rapid spreading from its origin in Eastern Asia is causing severe damages in different plants species from the genus *Buxus* L. in Eastern and Central European countries. In this document we report on a new sighting of this species in Madrid, Spain.
KEY WORDS: Lepidoptera, Crambidae, Spilomelinae, *Cydalima perspectalis*, first record, Madrid, Spain.

Introducción

La polilla del boj *Cydalima perspectalis* (Walker, 1859) es una especie invasora proveniente del este de Asia que, en el 2007 fue introducida en Alemania (KRÜGER, 2008), probablemente debido a la importación de semillas de boj con huevos o larvas de ésta, y desde entonces ha ido extendiéndose por el resto de Europa. Ha sido citada en 25 países (EPPO, 2018), desde el este como Turquía o Ucrania, hasta el suroeste como España, Francia y Portugal (Tabla I).

En España, se ha citado oficialmente en Galicia (OTERO *et al.*, 2014; PÉREZ & PÉREZ, 2014), Cantabria (VIVES MORENO, 2014) y en Cataluña (DINCÃ *et al.*, 2017), también hemos podido encontrar en Internet, concretamente en "Biodiversidad Virtual", fotografías de ejemplares procedentes de Asturias (2016), Barcelona (2016), Cantabria (2013), Gerona (2017), Guipúzcoa (2018), Navarra (2015), Pontevedra (2015) y Vizcaya (2018). Debido a la idoneidad ambiental de España para la presencia de especies de *Buxus*, su planta huésped, se ha estimado que *C. perspectalis* se seguirá dispersando por ésta (NACAMBO *et al.*, 2014), incluso pudiendo llegar a las islas Baleares, donde está presente la especie endémica *B. balearica* Lam. (BRUA, 2013). DINCÃ *et al.* (2017) sugieren un monitoreo urgente de la polilla para prevenir daños en las poblaciones de *B. balearica* Lam.

En la distribución de esta especie, también se han indicado las siguientes plantas nutricias:

Euonymus japonicus Thunb. o *Ilex purpurea* Hassk. (MARUYAMA & SHINKAJI, 1987, 1991, 1993; MARUYAMA, 1993) y también en *Murraya paniculata* (L.) Jack (WANG, 2008).

Tabla I.– Referencias y años de descubrimiento de *Cydalima perspectalis* en Europa.

Año	País	Referencia
2006	Alemania	KRÜGER, 2008
2007	Suiza	BILLEN, 2007
	Holanda	MUUS *et al.*, 2009
2008	Austria	RODELAND, 2009
	Francia	FELDTRAUER *et al*., 2009
	Irlanda y Reino Unido	MITCHELL, 2009
	Slovenia	SELJAK, 2012
2010	Bélgica	CASTEELS *et al.*, 2011
	Liechtenstein	SLAMKA, 2010
2011	Hungría	SÁFIÁN *et al.*, 2011; SZABOLCS *et al.*, 2011
	Italia	GRIFFO *et al.*, 2012; TANTARDINI *et al.*, 2012
	República Checa	ŠUMPICH, 2011
	Rumanía	SZÉKELY, 2011
	Turquía	HIZAL *et al.*, 2011
2012	Croacia	KOREN & ČRNE, 2011
2013	Eslovaquia	PASTORÁLIS *et al.*, 2013
	España	VIVES MORENO, 2014
	Grecia	STRACHINIS *et al.*, 2015
2014	Bosnia & Herzegovina	OSTOJIĆ *et al.*, 2015
	Bulgaria	PENCHEVÀ & YOVKOVA, 2016
	Georgia	MATSIAKH *et al.*, 2018
	Montenegro	HRNČIĆ & RADONJIĆ, 2014
	Serbia	GLAVENDEKIĆ, 2014; OSTOJIĆ *et al*., 2015
2018	Malta	AGIUS, 2018

En Europa, esta especie supone una plaga para diferentes especies y variedades cultivadas de Buxaceae, especialmente para *Buxus sempervirens* L. comúnmente llamado boj, debido a que las larvas se alimentan de las hojas, defoliando las plantas; aunque en algunos casos, pueden alimentarse de la parte leñosa de la planta, llegando a secarla (LEUTHARDT & BAUR, 2013; BELLA, 2013). El boj es una especie ornamental muy usada históricamente en los setos de jardines públicos y privados en Europa, debido a su morfología, color y gran resistencia al recorte y a los mordiscos de animales fitófagos (CEBALLOS & RUIZ DE LA TORRE, 1979; BAILLÈRES *et al.*, 1997; BERNAL *et al.*, 2013). Por estos motivos se encuentran especies y variedades cultivadas de *Buxus* L. distribuidos por gran parte de los jardines europeos, siendo éste un foco de dispersión para *C. perspectalis*. Además, al ser de interés ornamental, el comercio con esta planta está propiciando su expansión desde Asia a Europa y entre los propios países europeos (LEUTHARDT & BAUR, 2013).

Las larvas de *C. perspectalis* son de color verde y presentan líneas negras con puntos blanquecinos y sedas en su cuerpo, mientras que la cabeza es negra (BELLA, 2013). El adulto presenta varios fenotipos y el más común es fácilmente reconocible puesto que presenta una franja marrón a lo largo del margen de las alas, con una característica mancha blanca en forma de lúnula en la célula discoidal (MALLY & NUSS, 2010; BELLA, 2013). Es necesario seguir estudiando su biología para poder conocerla en detalle y así establecer medidas eficaces para combatir la plaga.

Las larvas se alimentan de la planta hospedadora para pasar el invierno en diapausa. Se ha observado que las larvas entran en diapausa en diferentes "instars" atendiendo a su distribución (SHE & FENG, 2006; NACAMBO *et al.*, 2014), lo que les ha permitido sobrevivir a los inviernos en zonas

extremas como Rusia. Estas diferencias también se han observado en los tiempos de la pupación y su fenología, que podría ser debido a que existen diferentes biotipos geográficos con diferentes respuestas de desarrollo (MARUYAMA & SHINKAJI, 1993). En Europa central se han citado de dos a tres generaciones por año (VAN DER STRATEN & MUUS, 2009; LEUTHARDT & BAUR, 2013; NACAMBO, 2014; TÜSKE & MARCZALI, 2016).

Desde su descripción original en el norte de China, como *Phakellura perspectalis* Walker, 1859, ha sido incluida en diferentes géneros como *Palpita* Hübner, [1808], *Diaphania* Hübner, [1818], *Glyphodes* Guenée, 1854 y *Neoglyphodes* Streltzov, 2008. Sin embargo, recientes análisis filogenéticos indicaron que los géneros *Palpita* (= *Phakellura* Guilding, 1830), *Diaphania* y *Glyphodes* son monofiléticos junto a *Cydalima* Lederer, 1863 (MALLY & NUSS, 2010).

Resultados y Discusión

Material estudiado: MADRID, Real Jardín Botánico, CSIC, 3 ♂ ♂, 660 m, 14-VIII-2018; 1 ♂, 27-IX- 2018 (figura 1). Los cuatro ejemplares acudieron a una trampa con feromonas tipo "unitrap".

Figura 1.– *Cydalima perspectalis* (Wlk.), Real Jardín Botánico, CSIC, Madrid, 27-IX-2018.

C. perspectalis es una especie introducida en la Península Ibérica septentrional, pero no había sido citada en la zona central (OTERO *et al.*, 2014; PÉREZ & PÉREZ, 2014; VIVES MORENO, 2014; DINCÃ *et al.*, 2017) por lo que no resulta extraña su distribución por el resto de la misma, sin lugar a duda, por una actividad antrópica, como ha ocurrido en el resto de Europa, con la distribución de la propia planta o por condiciones ambientales favorables como sugieren algunos autores NACAMBO *et al*. (2014). Sin embargo, la distribución natural del boj no favorece la dispersión de esta especie hacia el centro peninsular, ya que sólo puede llegar por determinadas zonas del norte y el este. El boj presente en el centro de la ciudad de Madrid, donde fueron encontrados los ejemplares, corresponde a zonas ajardinadas. A pesar de que no podamos afirmar que la especie haya llegado en semillas o plantones de

boj importados, es muy posible que ésta, haya sido su vía de entrada debido al limitado número de individuos y la zona donde han sido encontrados.

Es preciso seguir muestreando para llevar a cabo un seguimiento de la especie en este punto y otros de la Península Ibérica para estudiar su dispersión y evaluar posibles zonas en peligro, como sugiere BRUA (2014).

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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*

Solicitud de autorización para recoger lepidópteros con fines científicos en España

Las solicitudes cumplirán las siguientes condiciones:

1.– Estar al día en el pago de la cuota anual de la Sociedad, antes de solicitar los permisos.

2.– Enviar un correo electrónico al Secretario General de SHILAP con todos los datos personales, incluyendo nombre, apellidos, dirección, DNI o número de pasaporte, número de teléfono (con código del país y prefijo) y correo electrónico. Estos datos serán enviados al Secretario General con un mínimo de 45 días de antelación al período de captura previsto.

3.– Se detallará el área donde se desea capturar el material (provincia y/o región), el período de tiempo (días, meses o todo el año); método de captura que se desea emplear (manga entomológica, grupo electrógeno, etc.), material que se desea recoger (especies, géneros, familias, y/o superfamilias) y cualquier otro dato que se desee añadir.

4.– Todos los socios de SHILAP que soliciten estos permisos para recoger Lepidoptera en España con fines científicos, serán incluidos en el Proyecto de Investigación Científica creado por la Sociedad y denominado: *"Faúnula Lepidopterológica Ibérica, Baleárica y región Macaronésica"*.

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.

6.– Es obligatorio publicar en *SHILAP Revista de lepidopterología,* las nuevas especies o subespecies que se descubran y remitir a SHILAP **una parte del material TIPO**, para su posterior incorporación a la colección de Lepidoptera del Museo Nacional de Ciencias Naturales en Madrid, España.

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8.– Conocer los fines científicos de SHILAP y comprometerse a pagar los gastos de participación en este Proyecto Científico, que la Junta Directiva considere en cada momento.

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Applications must abide by the following conditions:

1.– The Society's annual fee must be paid before applying for the permits.

2.– To send an electronic mail the General Secretary of SHILAP, with all the personal data, including name, surname, address, ID card number or Passport number, telephone number (with country code and prefix) and electronic mail address. These data must reach the General Secretary at least 45 days in advance of the foreseen collecting activity.

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"*.

5.– In order to contribute to this Scientific Project, it is requested to send to SHILAP, **either a copy by electronic mail (e-mail), with the listing of materials collected in EXCEL** (- only in this format, please), indicating the Family, Subfamily, Tribe, name of the species (genera, species, author's name and year), town, UTM (1 X 1) or GPS coordinates, province, dates of capture, collector and numbers of males and females captured (**only 5 specimens per taxon and locality, maximum**). Please, use only the *"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)". This list is necessary for this Scientific Project of SHILAP and for new authorizations.

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7.– All members are kindly reminded of the obligation to be duly authorized for collecting Lepidoptera, with scientific purposes, in Spain and that it is forbidden all type of commercial activity, with the captured material.

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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Noctuid moths of xerothermic habitats in the Chorna Hora Botanical Reserve in Transcarpathia (Ukraine) (Lepidoptera: Nolidae, Erebidae, Noctuidae)

J. Nowacki, R. Wąsala & P. Zydlik

Abstract

The paper presents the results of a survey, carried out in 2009-2017, of the Noctuoidea fauna of xerothermic ecosystems on the slopes of the Chorna Hora mountain in Ukrainian Transcarpathia. Among the total of 299 noctuid species recorded, 96 are new to the Chorna Hora. The survey has shown unequivocally that this region plays a major role in the preservation of noctuid biodiversity in both Ukraine and Europe as a whole. It supports a series of stenotopic species with Pontic, Mediterranean and Pannonian distributions, regarded as rare and threatened with extinction in Ukraine and central Europe. They include *C. communimacula*, *N. siculana*, *C. xeranthemi*, *V. oleagina*, *C. platyptera*, *C. opalina*, *A. caliginosa*, *C. latreillei*, *C. kadenii*, *A. gluteosa*, *M. maura*, *P. sericata*, *E. glaucina*, *T. sulphurago*, *A. humilis*, *A. lutulenta*, *L. literosa*, *P. extrema*, *C. multangula*, *E. cos*, *D. nigrescens* and *D. forcipula.*
KEY WORDS: Lepidoptera, Noctuoidea, Nolidae, Erebidae, Noctuidae, Chorna Hora Botanical Reserve, fauna, Transcarpathia, Ukraine.

Noctuidos de los hábitats xerotérmicos en la Reserva Botánica Chorna Hora en Transcarpática (Ucrania) (Lepidoptera: Nolidae, Erebidae, Noctuidae)

Resumen

El trabajo presenta los resultados de una exploración de la fauna de Noctuoidea de los ecosistemas de xerotérmicos sobre las pistas de la montaña Chorna Hora en la Transcarpática ucraniana, realizados entre 2009-2017. Entre el total de 299 especies de noctuideos registrados, 96 son nuevos para el Chorna Hora. La exploración ha demostrado rotundamente que esta región tiene un papel muy importante en la preservación de la biodiversidad de noctuideos, tanto en Ucrania como en Europa como un todo. Soporta una serie de especies estenotópicas, distribuidas por el Ponto, mediterráneas y Panonia, consideradas como infrecuentes y en peligro de extinción en Ucrania y Europa central. Se incluyen: *C. communimacula*, *N. siculana*, *C. xeranthemi*, *V. oleagina*, *C. platyptera*, *C. opalina*, *A. caliginosa*, *C. latreillei*, *C. kadenii*, *A. gluteosa*, *M. maura*, *P. sericata*, *E. glaucina*, *T. sulphurago*, *A. humilis*, *A. lutulenta*, *L. literosa*, *P. extrema*, *C. multangula*, *E. cos*, *D. nigrescens* y *D. forcipula.*
PALABRAS CLAVE: Lepidoptera, Nolidae, Erebidae, Noctuidae, Reserva Botánica Chorna Hora, fauna, Transcarpática, Ucrania.

Introduction

In the history of entomological studies in Europe, the Lepidoptera are among the orders of insects that have most often been caught and described. Even though there was a conspicuous increase in the intensity of research into numerous lepidopteran families, including the superfamily Noctuoidea, in the late 20th century, the present-day state of knowledge of noctuid distributions in Ukraine remains far from satisfactory (KLYUCHKO, 2006). Especially glaring is the disproportion among the various

regions of Ukraine where faunistic studies of noctuids have been carried out, not to mention the fact that a great deal of information is outdated and requires confirmation. At the turn of the 19th century, the noctuids of Eastern Galicia [the name given to that region when it was part of the Austro-Hungarian Empire] now the Ukrainian oblasts [administrative divisions] of Lviv (Lwów, Lvov, Lemberg), Ivano-Frankivsk (Stanisławów, Stanislau) and Ternopil (Tarnopol) - were relatively well researched. Fieldwork in this region had been initiated by Prof. Maksymilian Nowicki in the mid-19th century and was subsequently pursued with great intensity by a plethora of Polish lepidopterologists: Adamczewski, Brunicki, Garbowski, Kaucki, Klemensiewicz, Kremky, Romaniszyn, Schille and Stökl - more or less without interruption until the outbreak of the Second World War in 1939 (ROMANISZYN & SCHILLE, 1929). The second half of the 20th century witnessed a distinct upsurge in surveys of noctuid distributions in Ukraine, the results of which were published in numerous papers and regional monographs dealing exclusively with noctuids. Apart from western Ukraine, the noctuids of Crimea were also fairly well researched. Some recent papers summarise the current state of research into Noctuoidea in Ukraine (KLYUCHKO, 2006; KLYUCHKO *et al.,* 2001).

Even though faunistic studies of butterflies and moths in Ukraine have been carried out for more than 200 years, Transcarpathia is one of the less thoroughly surveyed regions as far as noctuids are concerned (KLYUCHKO, 2006), particularly on and around the Chorna Hora [Black Mountain]. The noctuid fauna of this area was practically unknown before the end of the 20th century. Information on the occurrence of a considerable number of noctuid species in Transcarpathia, including a certain number recorded earlier on the Chorna Hora, can be found in GERYAK (2010, 2013), GERYAK *et al.* (2014), KLYUCHKO (1963), NOWACKI & BIDYCZAK (2009) and NOWACKI *et al.* (2010). The first of these papers is a checklist summarising everything that was then known about the distribution of Noctuoidea in the whole of Transcarpathia. It lists as many as 414 species of noctuids recorded in this region since the beginning of the 20th century. However, many of them were not recorded in the Chorna Hora Botanical Reserve, neither were they confirmed in surveys carried out at the turn of the 20th century in Transcarpathia.

With its well-insolated, south-east, south and south-west facing slopes, the Chorna Hora mountain supports a number of unique habitats. Here we find rather large areas of xerothermic rock swards and forest steppe, which elsewhere in western Ukraine exist only in small patches, often far distant from one another. Such habitats support stenotopic species of plants and animals, including lepidopterans.

The hypothesis underlying the present paper states that the xerothermic slopes of the Chorna Hora, lying in the Carpathian foothills, constitute a northern refuge of xerothermic species of Noctuoidea characteristic of the Pannonian Plain and also Mediterranean regions.

To test this hypothesis, the authors carried out faunistic and ecological surveys from 2009 to 2017 with the aim of establishing the structure of the noctuid assemblages of the Chorna Hora mountain in Transcarpathia (Ukraine).

Study area

The study area covered the Chorna Hora (alt. 565 m), which lies at the south-western end of the short Tupy range. Separated from the main part of this range by an extensive depression, it lies in the north-eastern part of the Transcarpathian Lowland in Ukraine.

According to KONDRACKI (1989) physiographic system, the study area lies in the Carpathian Region, straddling the border between the Eastern Carpathian and the Pannonian Basin provinces. It makes up the Tupy mesoregion, which in turn lies in the Inner Eastern Carpathian sub-province, with the slopes of the Chorna Hora merging into the Transcarpathian Plain macroregion, which itself is part of the Great Hungarian Plain sub-province. The Chorna Hora is an isolated island of volcanic origin, the gentle southern and western slopes of which merge directly into the flat lands of the Transcarpathian Plain. Only the eastern slopes, bordered by the River Tisa, are precipitous in places; there are a number of quarries there. The mountain is largely covered by woodland ecosystems,

predominantly deciduous forests with oaks, but on the xerothermic slopes they take the form of forest steppes (GERENCZUK, 1981).

The actual study area was the Chorna Hora Botanical Reserve (823 ha), a designated area of the Carpathian Biosphere Reserve, situated near the town of Vynohradiv in Transcarpathia (Figs. 1, 2).

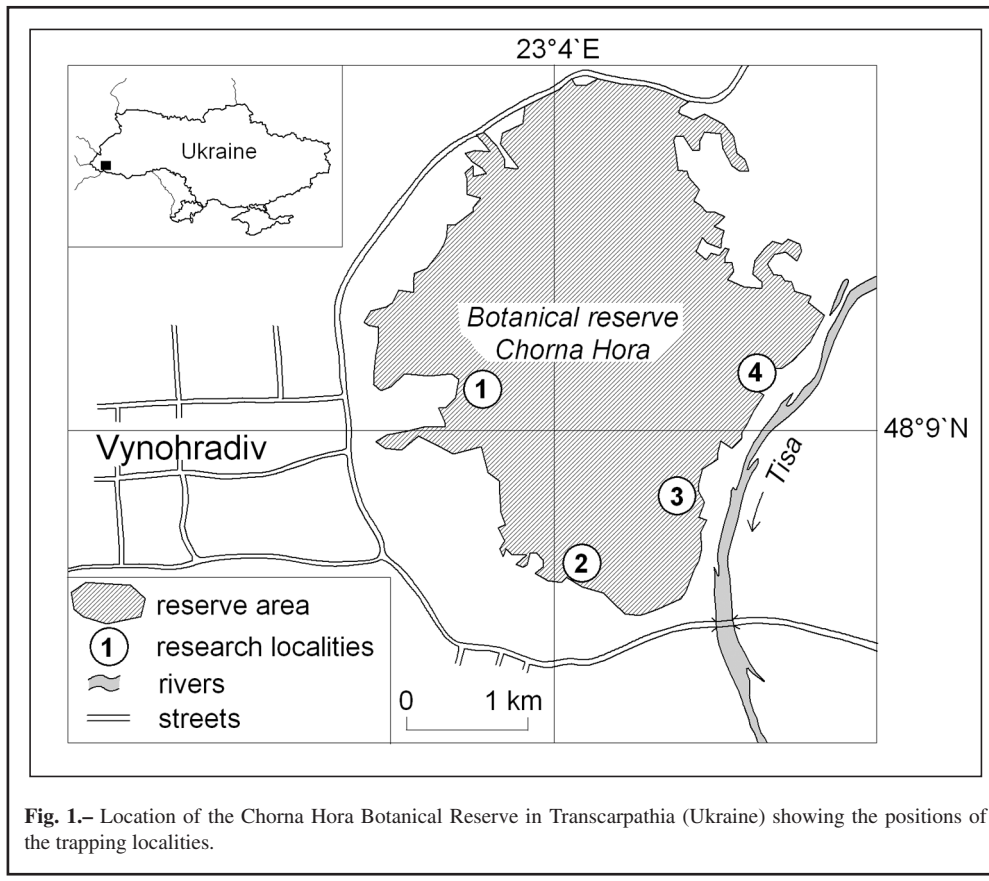

Fig. 1.– Location of the Chorna Hora Botanical Reserve in Transcarpathia (Ukraine) showing the positions of the trapping localities.

The geological formations of the Chorna Hora are dominated by andesites, liparites and tuff, which emerge here and there on its slopes as rocky outcrops. The surface of the mountain is covered in brown earths of varying thickness. From its foot at an altitude of ca 120 m there spreads an extensive plain, covered with different types of soil depending on the substrate: chernozems, alluvial soils and brown earths.

The area's climate resembles that of the warm parts of the Pannonian Plain. However, it differs fundamentally from that of other, adjacent parts of Transcarpathia in that it has the largest number of days with very warm, rainless weather compared with the Carpathian regions to the north. The microclimate of the Chorna Hora's southern slopes is among the warmest in the whole of Ukraine. The mean annual air temperature is 9.9º C, the mean for January is 3º C and for July it is 21º C. Annual precipitation is ca 750 mm (GERENCZUK, 1981).

This specific combination of geology and climate has produced a highly characteristic, largely stenotopic vegetation found nowhere else in Ukraine. Very interesting and diverse xerothermic forest steppe communities grow on the strongly insolated south and south-east facing slopes of the Chorna

Hora (Figs. 3, 4); similarly fascinating are the xerothermic swards growing on the steep sides of the numerous rocky outcrops (Figs. 5, 6, 7). In addition, much of this mountain is covered by oak-hornbeam, oak and beech woodland, while there are riparian woodlands on the banks of the Tisa. The Transcarpathian Plain, which surrounds the mountain, is mostly treeless; much of it is farmed. The plant associations of this area can be ordered in accordance with their habitat requirements. Starting with the wettest habitats, they are:

Communities of emergent vegetation growing mainly around ponds and drainage channels in the immediate neighbourhood of the south-western slopes of the Chorna Hora.

Mown meadow communities with a large proportion of herbaceous vegetation, lying mostly in the broad valley of the Tisa, some distance to the south of the Chorna Hora.

Communities of riparian woodland and willow scrub, abundant on the moist soils of the Tisa valley, periodically inundated when water levels in the river are high.

Broad-leaved woodland communities of the class *Querco-Fagetea*, which cover large swathes of the Chorna Hora's slopes, particularly those with an easterly, northerly and westerly exposure. They mostly take the form of oak-hornbeam, oak or mixed woodlands.

Farmland communities of the classes *Secalietea* and *Chenopodietea*, as well as wasteland communities of the classes *Artemisietea, Plantaginetea* and *Epilobietea angustifolii*, patches of which are found around human habitations, roadsides and felled areas in woodland.

Xerothermic sward communities on the steep slopes and rocky outcrops exposed to the south, south-west and south-east.

Forest steppe communities growing on gentler slopes exposed to the south, south-west and south-east.

Noctuid moths were systematically trapped at four localities (Fig. 1): Chorna Hora 1: situated on the strongly insolated, south-western slope of the mountain with large numbers of rocky fragments strewn over the ground. The immediate environment consists of forest steppe with numerous patches of xerothermic rock sward rich in herbaceous plants.

Chorna Hora 2: situated on the southern slope of the mountain, mostly covered with transformed ecosystems consisting of allotment gardens in the form of small vineyards and orchards. In this environment, above the cliff of a disused quarry, there are small patches of xerothermic rock sward and forest steppe.

Chona Hora 3: situated on the south-eastern slope of the Chorna Hora. Much of this locality consists of a precipitous slope dropping down to the Tisa valley, and in places, the cliff-like walls of disused quarries. In the immediate vicinity there are xerothermic rock swards, while above there is forest steppe. Down in the Tisa valley there are riparian woodlands and willow scrub.

Chorna Hora 4: situated on the eastern slope of the mountain, at the foot of which there are transformed ecosystems consisting of recreational/allotment gardens with fruit trees. Immediately adjacent are meadow communities covering the gentler slopes of the Chorna Hora and deciduous woodland. A short distance away there are xerothermic rock sward and forest steppe environments on the precipitous rocky slopes, and communities of riparian woodland and willow scrub in the Tisa valley.

Research methods

Noctuid moths were caught in these localities from 2009 until 2017. Because of the diversity of habitats there, they were trapped with a variety of techniques, though mainly using light traps. Moths were attracted at night to a Skinner trap equipped with a 250 W mercury vapour bulb, and to 500 W bulbs of the same kind, powered by a portable generator, illuminating a white screen. Moreover, in 2016 and 2017, moths were caught using a number of portable traps equipped with black lights (TL 6W/08 - Philips) (Fig. 7), which were deployed each night in many different ecosystems. Moths were also attracted to wine ropes, i.e. lengths of thick string soaked in fruit juice mixed with wine, which were then hung on tree branches and bushes in the various plant communities, well away from any light sources. Finally, in the evenings, moths were netted on sight from flowering plants.

From the research material we were able to establish the total number of species for each locality and to identify stenotopic species occurring only in xerothermic rock sward and forest steppe communities. In order to define the similarity and the degree of transformation of these xerothermic ecosystems, similarity indices were calculated using Jaccard's formula (KREBS, 2001) and compared on the basis of characteristic species:

$$J = \frac{j}{a + b + j} x100$$

where *j* - the number of characteristic species occurring at both localities, *a, b* - the number of characteristic species occurring at each locality.

The Shannon-Wiener biological diversity indices *H'* (KREBS, 2001) were also calculated and compared for the species characteristic of a particular locality:

$$H' = -\sum(pi \log pi),$$

where *pi* stands for the proportion of the *i*-th species in the assemblage.

Results

Our survey on the Chorna Hora mountain in Transcarpathia (Ukraine) yielded a total of 299 species of moth from the families Erebidae, Nolidae and Noctuidae. If we add a further 10 species, recorded in this area by GERYAK (2010), that we failed to record during our survey, the number of species from the Chorna Hora rises to 309. Table 1 lists all the noctuid species recorded in the study area in accordance with the systematic arrangement of KARSHOLT & NIEUKERKEN (2013).

Table 1.– Systematic list of noctuids (Erebidae, Nolidae, Noctuidae) recorded in the Chorna Hora Botanical Reserve near Vynohradiv in Transcarpathia (Ukraine) in 2009-2017. * Species discussed individually; **flight period (the Roman numeral indicates the month, the Arabic one the ten-day period in a month (1-early-1-10, 2-mid-11-20, 3-late-21-30); ***abundance on a 4-point scale: a - occasional (1-5 exx.), b - single (6-25 exx.), c - infrequent (26-100 exx.), d - abundant (over 100 exx.).

Gatunek Species*	Chorna Hora 1	Chorna Hora 2	Chorna Hora 3	Chorna Hora 4	Flight period**	Abundance***
	1	2	3	4	5	6
EREBIDAE: HERMINIINAE						
Idia calvaria ([D. & Schiff.])	X	X	X	X	V(3)-VI (3), VII(2)-VIII(3)	b
Paracolax tristalis (F.)	X	X	X	X	V(3)-VII(3), VIII(2)-IX(1-2)	b
Macrochilo cribrumalis (Hb.)	X				VIII(1)	a
Herminia tarsicrinalis (Kn.)		X	X	X	V(3)-VI(3), IX(2)	c
Herminia tarsipennalis (Trti.)	X	X	X	X	VI(2)-IX(1) (two generations)	b
Herminia grisealis ([D. & Schiff.])	X	X	X	X	V(3)-VIII(3) (two generations)	c
Zanclognatha lunalis (Scop.)		X	X		VI(3)-VII(3)	b
Polypogon tentacularia (L.)		X		X	V(3)-VIII(2) (two generations)	b
Pechipogo strigillata (L.)		X			VII(2-3)	c

HYPENINAE						
Hypena proboscidalis (L.)		X	X	X	V(3)- VIII(3) (two generations)	c
Hypena rostralis (L.)			X	X	III(3), VII(2)-IX(2)	b
RIVULINAE						
Rivula sericealis (Scop.)	X	X	X	X	V(2)-VI(3), VII(2)-IX(3)	c
SCOLIOPTERYGINAE						
Scoliopteryx libatrix (L.)			X	X	III(3)-VI(2), VII(2), X(1)	b
HYPENODINAE						
Schrankia costaestrigalis (Stph.)			X	X	VI(2), VII(3)-VIII(1)	a
Schrankia taenialis (Hb.)				X	IX(2)	a
EUBLEMMINAE						
Calymma communimacula ([D. & Schiff.]) *		X			VII(3)	a
Eublemma purpurina ([D. & Schiff.])	X	X	X	X	V(3)-VI(3), VII(3)-VIII(3)	b
BOLETOBINAE						
Parascotia fuliginaria (L.)			X	X	VII(3)-VIII(1)	b
AVENTIINAE						
Laspeyria flexula ([D. & Schiff.])	X	X	X	X	VI(2), VII(2)-VIII(3)	c
PHYTOMETRINAE						
Phytometra viridaria (Cl.)	X	X		X	VI(3)-VII(2), VIII(1-3)	b
Colobochyla salicalis ([D. & Schiff.])	X	X	X	X	V(3)-VII(2) (two generations)	c
Trisateles emortualis ([D. & Schiff.])		X	X	X	VI(3), VII(3)-VIII(3)	b
EREBINAE, CATOCALINI						
Catocala fraxini (L.)				X	IX(2)-X(2)	b
Catocala sponsa (L.)	X		X		VII(3)-VIII(1)	b
Catocala promissa ([D. & Schiff.])	X	X	X	X	VI(2)-VIII(3)	c
Catocala nupta (L.)	X	X	X	X	VIII(2)-X(3)	b
Catocala elocata (Esp.)		X	X	X	VIII(2)-X(2)	a
Catocala electa (View.)	X		X	X	VII(2)-VIII(3)	b
Catocala fulminea (Scop.)	X	X	X	X	VI(2)-VII(2)	c
Catocala hymenaea ([D. & Schiff.])	X	X	X		VII(1)-VIII(3)	b
Minucia lunaris ([D. & Schiff.])	X	X	X		IV(3)-VI(1)	b
Dysgonia algira (L.)	X	X	X	X	V(2)-IX(3) (two generations)	c
Catephia alchymista ([D. & Schiff.])	X	X	X		V(3) - VII(3)	b
Lygephila pastinum (Tr.)	X	X	X		V(3)-VIII(2) (two generations)	b
Lygephila viciae (Hb.)	X	X	X	X	V(3)-X(3) (two generations)	c
Lygephila craccae ([D. & Schiff.])	X	X	X	X	V(3)-IX(3) (two generations)	b
Euclidia mi (Cl.)	X		X		V(3)	a
Euclidia glyphica (L.)	X		X	X	V(3), VII(2)-VIII(1)	b
NOLIDAE: NOLINAE						
Meganola strigula ([D. & Schiff.])	X	X	X		V(3)-VI(2), VIII(2-3)	b
Meganola albula ([D. & Schiff.])		X	X	X	VI(2)-VII (3), VIII(2)-IX(2)	b
Nola cuculatella (L.)	X			X	VII(3)-VIII(1)	a
Meganola confusalis (H.-S.)	X	X	X	X	V(3)-VIII(1) (two generations)	b
Nola aerugula (Hb.)	X		X	X	VI(3)-VII(3), VIII(2-3)	b
Nola chlamitulalis (Hb.)					GERYAK (2010)	
EARIADINAE						
Earias clorana (L.)	X	X	X	X	V(3)-VIII(3) (two generations)	c

Earias vernana (F.)		X	X	X	VII(2-3)	b
CHLOEPHORINAE						
Nycteola revayana (Scop.)	X		X		VI(2), VII(3)	a
Nycteola degenerana (Hb.)			X		III(3)	a
Nycteola siculana (Fchs.) *			X	X	III(3), VI(2)	a
Nycteola asiatica (Krul.)	X	X	X	X	VI(1)-X(3) (two generations)	c
Bena bicolorana (Fuessly)	X	X	X	X	V(3)-VIII(2) (two generations)	c
Pseudoips prasinana (L.)	X	X	X	X	V(3)-VII(3)	b
NOCTUIDAE: PLUSIINAE						
Diachrysia chrysitis (L.)	X	X	X	X	V(2)-IX(3) (two generations)	c
Diachrysia stenochrysis (Warr.)	X	X	X	X	V(2)-IX(2) (two generations)	c
Diachrysia chryson (Esp.) *		X		X	VII(2)-VIII(2)	a
Macdunnoughia confusa (Stph.)	X	X	X	X	V(1)-IX(2) (two generations)	b
Plusia festucae (L.)			X		VII(1-3)	a
*Plusia putnami (*Grt.)				X	VII(2)	a
Autographa gamma (L.)	X	X	X	X	V(3)-X(3) (two generations)	d
Autographa pulchrina (Hw.)	X			X	VII(2)	b
Autographa jota (L.)				X	VII(2)	a
Abrostola tripartita (Hfn.)	X	X	X	X	VI(3)-IX(2) (two generations)	b
Abrostola asclepiadis ([D. & Schiff.])	X	X	X	X	V(2)-VIII(2) (two generations)	c
Abrostola triplasia (L.)	X	X	X	X	V(2)-VI(2)	b
EUSTROTIINAE						
Deltote pygarga (Hfn.)	X	X	X	X	VI(2)-VIII(3)	c
Deltote uncula (Cl.)	X				VII(3)	a
Deltote bankiana (F.)	X	X	X	X	V(2)-VIII(2) (two generations)	c
Acontia lucida (Hfn.)		X	X		VII(2-3)	a
Acontia trabealis (Scop.)	X	X	X	X	V(3)-VIII(3) (two generations)	c
Aedia funesta (Esp.)	X	X	X	X	V(1)-VIII(3) (two generations)	c
Aedia leucomelas (L.) *	X		X	X	V(3)-IX(3) (two generations)	c
PANTHEINAE						
Colocasia coryli (L.)	X	X	X	X	III(3)-VIII(3) (two generations)	d
DILOBINAE						
Diloba caeruleocephala (L.)	X	X	X	X	X(1-3)	b
ACRONICTINAE						
Moma alpium (Osbck.)	X	X	X	X	V(3)-VIII(1) (two generations)	c
Acronicta alni (L.)		X	X	X	VI(3)-VII(3)	b
Acronicta cuspis (Hb.)					GERYAK (2013)	
Acronicta tridens ([D. & Schiff.])	X	X	X		VI(3)-VIII(1)	a
Acronicta psi (L.)	X	X	X	X	VI(2)-VIII(3) (two generations)	c
Acronicta aceris (L.)	X	X			V(3), VII(3)	a
Acronicta leporina (L.)	X	X	X	X	VII(2)-VIII(1)	c
Acronicta megacephala ([D. & Schiff.])	X	X	X	X	VI(2)-VIII(3) (two generations)	c
Acronicta strigosa ([D. & Schiff.])		X		X	VII(2)-VIII(1)	b
Acronicta auricoma ([D. & Schiff.])		X	X	X	V(1)-VIII(1) (two generations)	b
Acronicta rumicis (L.)	X	X	X	X	V(1)-IX(3) (two generations)	d
Craniophora ligustri ([D. & Schiff.])	X	X	X	X	IV(3)-VIII(3) (two generations)	d
Simyra albovenosa (Gze.)					GERYAK (2010)	

METOPONIINAE						
Tyta luctuosa ([D. & Schiff.])	X	X	X	X	V(2)-VIII(3) (two generations)	c
CUCULLIINAE						
Cucullia fraudatrix (Ev.)					GERYAK (2010)	
Cucullia absinthii (L.)					GERYAK (2010)	
Cucullia artemisiae (Hfn.)					GERYAK (2010)	
Cucullia xeranthemi (B.) *	X				VI(1)	a
Cucullia lactucae ([D. & Schiff.])			X		VII(3)	a
Cucullia umbratica (L.)		X	X	X	V(3)-VII(2), VIII(1-3)	b
Cucullia chamomillae ([D. & Schiff.])					GERYAK (2013)	
Cucullia tanaceti ([D. & Schiff.])					GERYAK (2010)	
Shargacucullia lychnitis (Rbr.)		X		X	V(3)-VI(2)	a
Shargacucullia verbasci (L.)			X	X	IV(2)-V(3)	a
AMPHIPYRINAE						
Amphipyra pyramidea (L.)	X	X	X	X	VI(3)-X(3)	c
Amphipyra berbera Rngs.	X	X	X	X	VI(3)- X(3)	c
Amphipyra livida ([D. & Schiff.])		X	X	X	VII(2)-X(3)	b
Amphipyra tragopoginis (Cl.)	X	X	X	X	VI(3)-X(3)	c
PSAPHIDINAE						
Asteroscopus sphinx (Hfn.)		X	X	X	X(2-3)	b
Brachionycha nubeculosa (Esp.)			X		III(3)	a
Allophyes oxyacanthae (L.)	X	X	X	X	X(2-3)	d
Valeria oleagina ([D. & Schiff.]) *	X	X	X	X	III(3)-IV(2)	c
ONCOCNEMIDINAE						
Calophasia lunula (Hfn.)	X	X	X		V(1)-IX(1) (two generations)	b
Calophasia platyptera (Esp.) *	X	X			VI(3)-VIII(1)	a
Calophasia opalina (Esp.) *		X			VII(3)	a
CONDICINAE						
Acosmetia caliginosa (Hb.)		X			V(3)-VI(2)	a
Eucarta amethystina (Hb.)	X	X	X	X	V(3)- VIII(2) (two generations)	c
Eucarta virgo (Tr.)	X	X	X	X	V(2)-VIII(1) (two generations)	c
HELIOTHINAE						
Protoschinia scutosa ([D. & Schiff.])					GERYAK (2010)	
Heliothis viriplaca (Hfn.)	X	X	X	X	VII(2-3), VIII(1)	c
Heliothis adaucta (Butl.)	X			X	V(3)-VII(3) (two generations)	b
Heliothis ononis ([D. & Schiff.])	X				VI(2)	a
Heliothis peltigera ([D. & Schiff.])		X		X	VI(3)-VII(3)	a
Helicoverpa armigera (Hb.)	X	X	X	X	VI(2)-IX(3) (two generations)	d
Pyrrhia umbra (Hfn.)	X	X	X	X	VI(1)-IX(2) (two generations)	c
ERIOPINAE						
Callopistria juventina (Stll.)	X	X	X	X	VI(2)-VIII(2)	b
Callopistria latreillei (Dup.) *		X		X	VII(3), IX(2)	a
BRYOPHILINAE						
Cryphia fraudatricula (Hb.)	X	X			V(3)-VI(2)	a
Cryphia algae (F.)	X	X	X	X	VII(2-3), VIII(1-3)	d
Bryophila raptricula ([D. & Schiff.])	X	X	X	X	VI(3)-VIII(3) (two generations)	c
XYLENINAE						

Caradrina morpheus (Hfn.)	X	X	X	X	V(3)-VII(3)	c
Caradrina kadenii (Fr.) *	X		X	X	V(3)-VI(3), VIII(1)-IX(3)	b
Paradrina selini (B.)		X		X	V(3), VIII(1)	a
Paradrina clavipalpis (Scop.)	X	X	X	X	V(3)-IX(3) (two generations)	c
Hoplodrina octogenaria (Gze.)	X	X	X	X	VI(2)-VIII(2)	d
Hoplodrina blanda ([D. & Schiff.])	X	X	X	X	VI(3)-VIII(1)	b
Hoplodrina superstes (O.)				X	VII(2)–VIII(1)	a
Hoplodrina respersa ([D. & Schiff.])	X	X	X	X	V(3)-VII(2)	c
Hoplodrina ambigua ([D. & Schiff.])	X	X	X	X	V(3)-IX(3) (two generations)	d
Chilodes maritima (Tsch.)	X				VIII(1-3)	a
Athetis gluteosa (Tr.)		X	X	X	V(3), VII(3)- VIII(1)	b
Athetis furvula (Hb.)				X	VII(3)-VIII(1)	a
Athetis lepigone (Möschl.)					GERYAK (2010)	
Athetis pallustris (Hb.)	X				VIII(2)	a
Charanyca trigrammica (Hfn.)	X	X	X	X	V(3)-VI(2)	c
Charanyca ferruginea (Esp.)	X	X	X		V(3)-VII(3)	c
Spodoptera exigua (Hb.)				X	IX(2)	a
Dypterygia scabriuscula (L.)	X	X	X	X	V(1)-VIII(2) (two generations)	d
Mormo maura (L.) *		X	X	X	VII(3)-VIII(3)	a
Polyphaenis sericata (Esp.)	X	X	X	X	VI(2)-VII(3)	c
Thalpophila matura (Hfn.)	X	X	X		VIII(2-3)	b
Trachea atriplicis (L.)	X	X	X	X	V(2)-IX(3) (two generations)	c
Euplexia lucipara (L.)	X	X	X	X	V(2)-VIII(1)	d
Phlogophora meticulosa (L.)	X	X	X	X	VI(3)-X(3)	b
Actinotia polyodon (Cl.)	X	X	X	X	V(2)-VIII(2) (two generations)	d
Chloantha hyperici ([D. & Schiff.])	X	X	X	X	III(3)- IX(3) (two generations)	c
Elaphria venustula (Hb.)	X	X	X	X	V(2)-VIII(3) (two generations)	c
Pseudeustrotia candidula ([D. & Schiff.])		X	X		V(2)-VIII(3) (two generations)	b
Episema glaucina (Esp.) *	X		X	X	IX(2-3)	b
Ipimorpha retusa (L.)	X	X	X	X	VI(3)-VII(2)	c
Ipimorpha subtusa ([D. & Schiff.])	X	X	X	X	VI(2)-VIII(3)	b
Cosmia diffinis (L.)	X	X	X		VI(3)-VII(3)	b
Cosmia affinis (L.)	X		X		VII(2)-IX(2)	b
Cosmia pyralina ([D. & Schiff.])	X	X	X	X	VI(2)-VII(2)	c
Cosmia trapezina (L.)	X	X	X	X	VI(2)-VIII(3)	d
Atethmia centrago (Hw.) *		X	X	X	IX(2-3)	b
Xanthia togata (Esp.)			X		IX(3)	a
Xanthia icteritia (Hfn.)	X	X	X	X	IX(2)-X(3)	c
Xanthia gilvago ([D. & Schiff.])		X	X	X	IX(2)-X(2)	b
Xanthia ocellaris (Borkh.)			X	X	IX(2)-X(2)	a
Tiliacea sulphurago ([D. & Schiff.])	X	X	X	X	VII(3)-IX(3)	b
Tiliacea aurago ([D. & Schiff.])	X	X	X	X	IX(2)-X(3)	c
Tiliacea citrago (L.)		X	X		IX(2-3)	b
Agrochola lychnidis ([D. & Schiff.])	X	X	X	X	X(1-3)	c
Agrochola circellaris (Hfn.)	X	X	X	X	IX(2)-X(3)	d
Agrochola lota (Cl.)	X	X	X	X	X(2-3)	b
Agrochola macilenta (Hb.)	X	X	X	X	IX(2)-X(3)	c

Agrochola nitida ([D. & Schiff.])			X	X	IX(2)-X(3)	a
Agrochola helvola (L.)	X	X	X	X	X(2-3)	d
Agrochola humilis ([D. & Schiff.]) *	X	X	X	X	IX(3)-X(3)	b
Agrochola litura (L.)	X	X	X	X	IX(2)-X(3)	b
Agrochola laevis (Hb.)	X	X	X	X	IX(2)-X(3)	c
Eupsilia transversa (Hfn.)	X	X	X	X	III(3)-IV(2), IX(2)-X(3)	c
Conistra vaccinii (L.)	X	X	X	X	III(3)-IV(2), IX(2)-X(3)	c
Conistra ligula (Esp.)		X	X		III(3), X(2-3)	a
Conistra rubiginosa (Scop.)	X		X		III(3)	a
Conistra rubiginea ([D. & Schiff.])	X	X	X	X	III(3)-IV(2), IX(2)-X(3)	c
Conistra erythrocephala ([D. & Schiff.])	X	X	X	X	III(3), IX(2)-X(3)	c
Brachylomia viminalis (F.)				X	VI(3)	a
Lithophane socia (Hfn.)		X	X	X	III(3)-IV(2)	b
Lithophane ornitopus (Hfn.)	X	X	X	X	IV(2), IX(2)-X(3)	c
Lithophane furcifera (Hfn.)			X	X	III(3), X(3)	a
Atypha pulmonaris (Esp.)			X	X	VI(2)-VII(3)	a
Parastichtis suspecta (Hb.)	X	X	X	X	VI(1-3)	c
Apterogenum ypsillon ([D. & Schiff.])		X	X	X	VI(1)-VII(3)	c
Aporophyla lutulenta ([D. & Schiff.]) *		X			X(1-2)	b
Griposia aprilina (L.)	X	X	X	X	X(1-3)	c
Dichonia convergens ([D. & Schiff.])	X	X	X	X	X(2-3)	d
Antitype chi (L.)			X	X	IX(2-3)	a
Mesogona acetosellae ([D. & Schiff.])	X		X		IX(2-3)	a
Ammoconia caecimacula ([D. & Schiff.])	X	X	X	X	IX(2)-X(3)	c
Mniotype satura ([D. & Schiff.])	X		X	X	IX(2-3)	b
Apamea monoglypha (Hfn.)	X	X	X	X	VI(3)-VIII(2)	c
Apamea syriaca (Osth.) *	X	X	X	X	VI(1-3)	b
Apamea lithoxylaea ([D. & Schiff.])			X	X	VI(2)	a
Apamea crenata (Hfn.)			X	X	VI(3)	a
Apamea epomidion (Hw.)		X	X		VI(3)-VII(3)	b
Apamea remissa (Hb.)		X	X	X	VI(2)-VII(3)	b
Apamea unanimis (Hb.) *			X		VII(3)	a
Apamea anceps ([D. & Schiff.])	X	X	X		V(3)	b
Apamea sordens (Hfn.)		X	X	X	V(2)-VI(3)	b
Apamea scolopacina (Esp.)	X	X	X	X	VI(3)-VIII(2)	c
Lateroligia ophiogramma (Esp.)				X	VII(2)	a
Oligia strigilis (L.)	X	X	X	X	V(2)-VI(3)	c
Oligia latruncula ([D. & Schiff.])	X	X	X	X	V(2)-VI(3)	c
Oligia versicolor (Borkh.)	X	X	X	X	V(3)-VII(2)	b
Mesoligia furuncula ([D. & Schiff.])	X	X	X	X	VI(2)-VIII(3)	c
Litoligia literosa (Hw.) *	X		X		VI(2-3)	b
Mesapamea secalis (L.)	X	X	X	X	VI(2)-VIII(3)	c
Mesapamea secalella Rm.	X	X	X	X	VI(2)-VIII(3)	b
Amphipoea oculea (L.)	X	X	X		VII(2)-VIII(3)	b
Amphipoea fucosa (Fr.)				X	VIII(1)	a
Hydraecia micacea (Esp.)		X	X	X	VII(1)-VIII(1)	c
Hydraecia ultima (Holst)			X		VII(3)	a

Gortyna flavago ([D. & Schiff.])			X	X	VIII(2)-IX(2)	b
Calamia tridens (Hfn.)	X	X			VII(3)	a
Rhizedra lutosa (Hbn.)			X		IX(2-3)	a
Nonagria typhae (Thnbg.)	X				VIII(1)	b
Capsula sparganii (Esp.)	X				VIII(1)	a
Lenisa geminipuncta (Hw.)	X				VII(1)	a
Photedes extrema (Hb.) *			X	X	V(3)-VI(3)	b
Photedes fluxa (Hb.)	X	X			VI(2-3), VIII(1)	b
HADENINAE						
Anarta trifolii (Hfn.)	X	X	X	X	V(1)-IX(2) (two generations)	d
Lacanobia w-latinum (Hfn.)	X	X	X	X	V(2)-VI(3), VIII(1)	c
Lacanobia splendens (Hb.)	X		X	X	VI(2), VII(2)-VIII(1)	c
Lacanobia oleracea (L.)	X	X	X	X	IV(3)-VIII(3) (two generations)	d
Lacanobia thalassina (Hfn.)	X	X	X	X	V(2)-VIII(3) (two generations)	d
Lacanobia contigua ([D. & Schiff.])	X	X	X	X	V(3)-VIII(3) (two generations)	c
Lacanobia suasa ([D. & Schiff.])	X	X	X	X	V(1)-VII(3)	c
Hada plebeja (L.)		X			V(2)	a
Hecatera dysodea ([D. & Schiff.])		X	X		VI(3)-VIII(1)	b
Hecatera bicolorata (Hfn.)	X	X	X	X	V(1)-VIII(2) (two generations)	c
Hadena compta ([D. & Schiff.])	X		X	X	V(3)-VII(3)	b
Hadena confusa (Hfn.)		X			V(2)-VI(2)	a
Hadena albimacula (Borkh.) *	X				V(3)	a
Hadena capsincola (D & Schiff)	X	X	X	X	V(3)-VI(2), VII(2)-IX(2)	c
Hadena perplexa ([D. & Schiff.])	X	X	X		V(2)-VI(3)	b
Sideridis reticulata (Gze.)	X				VII(1-2)	a
Sideridis rivularis (F.)	X	X	X	X	V(1)-VIII(2) (two generations)	c
Sideridis turbida (Esp.)		X	X	X	VII(2)-VIII(1)	b
Conisania luteago ([D. & Schiff.])	X	X	X	X	VI(2)-VII(3)	b
Melanchra persicariae (L.)	X	X	X	X	VI(3)-VII(3)	c
Ceramica pisi (L.)			X		VII(3)	a
Mamestra brassicae (L.)	X	X	X	X	V(3)-IX(3) (two generations)	c
Polia bombycina (Hfn.)			X	X	VII(2-3)	b
Polia nebulosa (Hfn.)	X	X	X	X	V(3)-VII(2)	c
Pachetra sagittigera (Hfn.)				X	V(3)	a
Mythimna turca (L.)	X	X	X	X	V(1)-VIII(3) (two generations)	d
Mythimna conigera ([D. & Schiff.])	X	X			VI(2) – VII(3)	a
Mythimna ferrago (F.)	X	X	X	X	VI(2)-IX(3) (two generations)	c
Mythimna albipuncta ([D. & Schiff.])	X	X	X	X	V(2)-X(3) (two generations)	d
Mythimna vitellina (Hb.)	X	X	X	X	V(3)-IX(2) (two generations)	b
Mythimna pudorina ([D. & Schiff.])	X	X	X	X	VI(2-3)	c
Mythimna pallens (L.)	X	X	X	X	V(2)-VIII(2) (two generations)	c
Mythimna l-album (L.)	X	X	X	X	V(3)-IX(3) (two generations)	d
Leucania obsoleta (Hb.)	X		X	X	V(3)-VIII(1) (two generations)	b
Leucania comma (L.)				X	VI(3)	a
Orthosia incerta (Hfn.)	X		X	X	III(3)-IV(3)	c
Orthosia gothica (L.)	X	X	X	X	III(3)-IV(3)	d
Orthosia cruda ([D. & Schiff.])	X	X	X	X	III(3)-IV(2)	d

Orthosia miniosa ([D. & Schiff.])	X	X	X	X	III(3)-IV(2)	c
Orthosia populeti (F.)		X	X		III(3)	b
Orthosia cerasi (F.)	X	X	X	X	III(3)-IV(2)	c
Orthosia gracilis ([D. & Schiff.])	X	X	X	X	III(3)-IV(2)	b
Orthosia munda ([D. & Schiff.])	X	X	X	X	III(3)-IV(2)	b
Egira conspicillaris (L.)	X		X	X	III(3)-IV(3)	b
Cerapteryx graminis (L.)	X	X			VII(2-3)	a
Tholera cespitis ([D. & Schiff.])	X	X	X	X	IX(2-3)	b
Tholera decimalis (Poda)	X	X	X	X	IX(2-3)	b
NOCTUINAE						
Axylia putris (L.)	X	X	X	X	V(2)-VIII(3) (two generations)	d
Ochropleura plecta (L.)	X	X	X	X	V(2)-IX(3) (two generations)	c
Diarsia brunnea ([D. & Schiff.])		X	X		VII(3)	b
Noctua pronuba (L.)	X	X	X	X	V(3)-X(3)	d
Noctua orbona (Hfn.)	X	X	X	X	VI(2)-IX(3)	c
Noctua interposita (Hb.)	X	X	X	X	VI(2)-VIII(3)	c
Noctua comes (Hb.)	X	X	X	X	VI(2)-X(3)	c
Noctua fimbriata (Schreb.)	X	X	X	X	VI(2)-IX(2)	d
Noctua janthina ([D. & Schiff.])	X	X	X	X	VI(3)-IX(2)	c
Noctua janthe (Borkh.)	X	X	X	X	VII(1)-VIII(3)	c
Noctua interjecta (Hb.) *	X	X	X	X	VII(2)-VIII(3)	c
Epilecta linogrisea ([D. & Schiff.])	X	X	X	X	VI(3)-VIII(3)	b
Lycophotia porphyrea ([D. & Schiff.])			X		VI(3)	a
Chersotis multangula (Hb.) *			X		VI(3)-VII(3)	b
Xestia c-nigrum (L.)	X	X	X	X	VI(1)-X(3) (two generations)	d
Xestia ditrapezium ([D. & Schiff.])	X	X	X	X	VI(3)-VII(3)	c
Xestia triangulum (Hfn.)	X	X	X	X	VI(1)-VII(3)	b
Xestia baja ([D. & Schiff.])	X	X	X	X	VII(2)-VIII(3)	d
Xestia stigmatica (Hb.)				X	VIII(3)	a
Xestia xanthographa ([D. & Schiff.])	X	X	X	X	VIII(2)-IX(3)	c
Eugraphe sigma ([D. & Schiff.])		X	X		VI(3)	a
Cerastis rubricosa ([D. & Schiff.])	X	X	X	X	III(3)-IV(2)	c
Cerastis leucographa ([D. & Schiff.])			X		III(3)	a
Anaplectoides prasina ([D. & Schiff.])		X	X	X	VI(3)-VII(3)	c
Peridroma saucia (Hb.)		X	X	X	VI(3)-VII(3)	b
Euxoa cos (Hb.) *	X	X	X	X	VIII(1-3)	c
Euxoa nigricans (L.)			X		VIII(3)	a
Euxoa tritici (L.)		X	X		VI(3)-VIII(3)	b
Euxoa obelisca ([D. & Schiff.])			X		VIII(3)	a
Dichagyris nigrescens (Höfn.) *			X		VI(3)	a
Dichagyris forcipula ([D. & Schiff.]) *		X	X		VI(3)	b
Agrotis bigramma (Esp.)		X	X		VIII(2-3)	b
Agrotis ipsilon (Hfn.)	X	X	X	X	V(3)-X(3) (two generations)	c
Agrotis exclamationis (L.)	X	X	X	X	V(1)-VIII(3)	d
Agrotis clavis (Hfn.)			X		V(3)-VI(3)	a
Agrotis segetum ([D. & Schiff.])	X	X	X	X	VI(2)-IX(3) (two generations)	d
Agrotis cinerea ([D. & Schiff.])				X	V(1)	a

FAUNISTIC ANALYSIS

Ninety-six of the noctuid species recorded during this survey were new to the Chorna Hora. Also, worth noting is the discovery of two species new to Ukraine - *C. platyptera* and *C. latreillei* (NOWACKI *et al.,* 2010) - and 17 new to Transcarpathia. Among those noctuids occurring in the ecosystems unique to the Chorna Hora are species that are faunistically valuable in both Ukraine and Europe as a whole. They are mostly stenotopic species that are rare or local in Ukraine. Forty-two such species were recorded on the Chorna Hora, i.e. 14% of the overall number of noctuids found in the survey area. They are: *I. calvaria*, *M. cribrumalis*, *S. costaestrigalis*, *S. taenialis*, *C. communimacula*, *D. algira*, *N. siculana*, *D. chryson*, *A. leucomelas*, *C. xeranthemi*, *V. oleagina*, *C. platyptera*, *C. opalina*, *A. caliginosa*, *H. ononis*, *C. latreillei*, *C. kadenii*, *H. superstes*, *H. respersa*, *A. gluteosa*, *M. maura*, *P. sericata*, *E. glaucina*, *A. centrago*, *T. sulphurago*, *A. humilis*, *A. lutulenta*, *D. convergens*, *M. acetosellae*, *A. syriaca*, *A. unanimis*, *L. literosa*, *H. ultima*, *P. extrema*, *H. albimacula*, *N. interjecta*, *E. linogrisea*, *L. porphyrea*, *C. multangula*, *E. cos*, *D. nigrescens* and *D. forcipula.* The following of these species are deserving of special mention.

Calymma communimacula ([D. & Schiff.])

Locality 2: 28-VII-2009, 3 exx., trapped at light in a xerothermic sward environment that has become waste ground.

A Ponto-Mediterranean species, local in south-central Europe (NOWACKI, 1998). Very rare in Ukraine, with records at just single localities in the eastern, southern and central parts of the country (KLYUCHKO *et al.,* 2001). New to Transcarpathia (NOWACKI *et al.,* 2010).

Nycteola siculana (Fchs.)

Locality 3: 28-III-2017, 1 ex., locality 4: 13-VI-2013, 1 ex., trapped at light in a scrubby environment in the Tisa valley.

A European species, local in southern, western and central Europe (NOWACKI, 1998). Not recorded in Ukraine before the 21st century; very rare, with records of just single specimens, mostly in Transcarpathia (GERYAK *et al.,* 2014).

Diachrysia chryson (Esp.)

Locality 2: 12-VIII-2009, 1 ex., locality 4: 12-VII-2010, 1 ex., trapped at light in scrubby habitats.

A Euroasiatic species, local in central Europe (NOWACKI, 1998). Rare in Ukraine; only records of single specimens, mainly from the Carpathian Mts. and Transcarpathia (KLYUCHKO *et al.,* 2001; GERYAK 2010).

Aedia leucomelas (L.)

Locality 1: 3-VIII-2010, 3 exx., 22-VIII-2010, 2 exx., locality 3: 23-VI-2009, 5 exx., 20-VI-2017, 6 exx., 23-IX-2017, 3 exx., locality 4: 22-VI-2009, 3 exx., 23-VI-2009, 8 exx., 12-VII-2010, 7 exx., 15-IX-2009, 4 exx., 2-5-VIII-2016, 7 exx., caught at light in scrubby forest steppe and xerothermic sward environments.

A Palaeotropical-Eurasiatic species, local in central Europe to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Very rare in Ukraine: hitherto recorded only in Crimea (KLYUCHKO *et al.,* 2001) and at a few localities in Transcarpathia (GERYAK, 2010; NOWACKI, 2009).

Cucullia xeranthemi (B.)

Locality 1: 5-VI-2010, 1 ex., trapped at light in a xerothermic sward habitat.

A Ponto-Turkestanian species, local in central Europe to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Very rare in Ukraine: records to date only from the east of the country (KLYUCHKO *et al.,* 2001) and a few new localities in Transcarpathia and western Ukraine (GERYAK, 2010).

Valeria oleagina ([D. & Schiff.])

Locality 1: 29-III-2017, 14 exx., locality 2: 30-III-2017, 3 exx., locality 3: 28-III-2017, 17 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, local in central Europe to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Very rare in Ukraine: for a long time, its only known locality was near Lviv (GARBOWSKI, 1892). The first Ukrainian record for more than 100 years, a new one for Transcarpathia, comes from Dovhe and Khust (NOWACKI & BIDYCZAK, 2009). In recent years trapped at a few other localities in Transcarpathia (GERYAK, 2010).

Calophasia platyptera (Esp.)

Locality 1: 21-VI-2017, 1 ex., locality 2: 3-VIII-2016, 1 ex., trapped at light in a xerothermic sward habitat.

A Ponto-Mediterranean species, local in south-central Europe to the south of the Alps, Sudetens and Carpathians, and also on the Pannonian Plain (NOWACKI, 1998; VARGA *et al.,* 2005). New to Ukrainian Transcarpathia.

Calophasia opalina (Esp.)

Locality 2: 21-VII-2017, 1 ex., trapped at light in a xerothermic sward habitat.

A Ponto-Mediterranean-Turkestanian species, local in south-central Europe to the south of the Alps, Sudetens and Carpathians; also, on the Pannonian Plain (NOWACKI, 1998; VARGA *et al.,* 2005). In Ukraine, local and rare at a number of localities in eastern parts of the country (KLYUCHKO *et al.,* 2001). New to Transcarpathia.

Heliothis ononis ([D. & Schiff.])

Locality 1: 13-VI-2010, 1 ex., trapped at light in a xerothermic sward habitat.

A Holarctic species, occurring in the steppe zone of Europe, with a range extending as far west as Austria, Switzerland and France (NOWACKI, 1998). Local and rare in Ukraine: records from single localities all over the country (KLYUCHKO *et al.,* 2001). New to Transcarpathia.

Callopistria latreillei (Dup.)

Locality 2: 28-VII-2009, 1 ex, locality 4: 16-IX-2009, 1 ex., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, occurring only in south-central Europe in Austria, Hungary and Romania (NOWACKI, 1998; RAKOSY, 1997; VARGA *et al.,* 2005). The present records from Transcarpathia are also the first for Ukraine (NOWACKI *et al.,* 2010).

Caradrina kadenii (Fr.)

Locality 1: 21-VI-2017, 3 exx., 4-VIII-2016, 2 ex., locality 3: 3-VIII-2016, 3 exx., 28-V-2017, 1 ex. 20-VI-2017, 4 exx., 21-VII-2017, 1 ex., 23-IX-2017, 2 exx., locality 4: 22-VI-2009, 1 ex., 13-VI-2013, 3 ex., 5-VIII-2016, 2 ex., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, local in south-central Europe to the south of the Alps, Sudetens and Carpathians; also, on the Pannonian Plain (NOWACKI, 1998; VARGA *et al.,* 2005). Local and rare in Ukraine: records from just single localities, mainly in eastern parts of the country (KLYUCHKO *et al.,* 2001). New to Transcarpathia (NOWACKI & BIDYCZAK, 2009).

Mormo maura (L.)

Locality 2: 25-VII-2017, 1 ex., locality 3: 21-VIII-2017, 2 exx., locality 4: 20-VIII-2017, 1 ex., trapped on wine ropes deployed by the banks of the River Tisa, and also at light in scrubby forest steppe.

A Ponto-Mediterranean species, local in central Europe (NOWACKI, 1998). Local and rare in Ukraine: records from single localities, mainly in Crimea and the Roztocze Upland (KLYUCHKO *et al.,* 2001). Recent records from a few other localities in Transcarpathia (GERYAK, 2010).

Polyphaenis sericata (Esp.)

Locality 1: 28-VI-2010, 2 exx., 5-VII-2010, 4 exx., 21-VI-2017, 6 exx., locality 2: 21-VI-2017, 3 exx., locality 3: 23-VI-2009, 3 exx., 13-VII-2010 3 exx., 20-VI-2017, 6 exx., locality 4: 22-VI-2009, 3 exx., 23-VI-2009, 5 exx., 26-VI-2009, 4 exx., 12-VII-2010 14 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, local in south-central Europe to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Earlier Ukrainian records only from Crimea and the Odessa region (KLYUCHKO *et al.,* 2001; KLYUCHKO, 2006). The present survey revealed this species as new to Transcarpathia (NOWACKI & BIDYCZAK, 2009); also confirmed at many other localities in this region (GERYAK, 2010).

Episema glaucina (Esp.)

Locality 1: 22-IX-2017, 2 exx., locality 3: 23-25-IX-2017, 7 exx., locality 4: 16-IX-2009, 2 exx., trapped at light in forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, local in south-central Europe to the south of the Alps, Sudetens and Carpathians; also, on the Pannonian Plain (NOWACKI, 1998; VARGA *et al.,* 2005). Local and rare in Ukraine at single localities, mainly in eastern parts of the country and in Crimea (KLYUCHKO *et al.,* 2001). New to Transcarpathia (NOWACKI & BIDYCZAK, 2009).

Atethmia centrago (Hw.)

Locality 2: 25-IX-2017 1 ex., locality 3: 23-25-IX-2017, 3 exx., locality 4: 16-IX-2009, 4 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Holo-Mediterranean-Turkestanian species, local in central Europe (NOWACKI, 1998). Local and rare in Ukraine at single localities, mainly in eastern parts of the country and in Crimea (KLYUCHKO *et al.,* 2001). The earlier record for Transcarpathia from the Berehov area was the first for this region (GERYAK, 2010).

Agrochola humilis ([D. & Schiff.])

Locality 1: 20-X-2016, 2 exx., locality 2: 10-X-2009 1 ex., locality 3: 19-21-X-2016, 3 exx., locality 4: 10-14-X-2010, 3 exx., trapped at light in forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, local in south-central Europe to the south of the Alps, Sudetens and Carpathians; also, on the Pannonian Plain (NOWACKI, 1998, VARGA *et al.,* 2005). Local and rare in Ukraine at single localities in Crimea (KLYUCHKO *et al.,* 2001). Recent records from a few other localities in Transcarpathia (GERYAK, 2010).

Aporophyla lutulenta ([D. & Schiff.])

Locality 2: 10-X-2009, 2 exx., trapped at light in scrubby forest steppe environments.

A Ponto-Mediterranean species, local in south- and east-central Europe to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Local and rare in Ukraine at single localities in Crimea (KLYUCHKO *et al.,* 2001). Recently recorded at a few other localities in Transcarpathia (GERYAK, 2010).

Apamea syriaca (Osth.)

Locality 1: 5-VI-2010, 2 exx., 21-VI-2017, 3 exx., locality 2: 16-VI-2009, 1 ex., 22-VI-2009, 2 exx., 21-VI-2017, 3 exx., locality 3: 23-VI-2009, 1 ex., 20-VI-2017, 6 exx., locality locality 4: 23-VI-2009, 3 exx., 20-VI-2017, 3 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Ponto-Mediterranean species, local in south-central Europe (NOWACKI, 1998). Local and rare in Ukraine at single localities in eastern parts of the country and in Crimea (KLYUCHKO *et al.,* 2001). New to Transcarpathia (NOWACKI & BIDYCZAK, 2009); confirmed at many other localities in this region (GERYAK, 2010).

Apamea unanimis (Hb.)

Locality 3: 21-VII-2017, 1 ex., trapped at light in riparian woodland in the Tisa valley.

A Eurasiatic species occurring throughout central Europe (NOWACKI, 1998). Local and rare in Ukraine at single localities, mainly in western parts of the country, including Transcarpathia (GERYAK, 2010; KLYUCHKO *et al.,* 2001).

Litoligia literosa (Hw.)

Locality 1: 17-VI-2010, 1 ex., 23-VI-2010, 2 exx., locality 3: 26-VI-2009, 2 exx., 20-VI-2017, 3 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Eurasiatic species occurring throughout central Europe (NOWACKI, 1998). Local and rare in Ukraine, recorded at single localities all over the country (KLYUCHKO *et al.,* 2001). This survey revealed it as new to Transcarpathia.

Photedes extrema (Hb.)

Locality 3: 29-V-2017, 2 ex., 4: 23-VI-2009, 1 ex., 13-VI-2013, 5 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

A Eurasiatic species occurring throughout central Europe (NOWACKI, 1998). Very rare, first recorded in Ukraine only recently. Known only from Belgorod Dnestrovskiy near Odessa (KLYUCHKO *et al.,* 2004) and the Desnjano-Starogytskiy National Park (KLYUCHKO *et al.,* 2004a). This survey showed it to be new to Transcarpathia (NOWACKI & BIDYCZAK, 2009); confirmed at many other localities in this region (GERYAK, 2010).

Hadena albimacula (Borkh.)

Locality 1: 30-V-2017, 1 ex., trapped at light in a scrubby forest steppe and xerothermic sward environment.

A Eurasiatic species, local throughout central Europe (NOWACKI, 1998). Local and rare in Ukraine, records from single localities all over the country (KLYUCHKO *et al.,* 2001). The earlier record for Transcarpathia from the Berehov area was the first for this region (GERYAK, 2010).

Noctua interjecta (Hb.)

Locality 1: 4-VIII-2016, 3 exx., 25-VII-2017, 2 exx., locality 2: 26-VII-2017, 4 exx., locality 3: 3-5-VIII-2016, 11 exx., 24-26-VII-2017, 9 exx., locality 4: 12-VII-2010, 2 exx., 2-5-VIII-2016, 12 exx., trapped at light in scrubby forest steppe and xerothermic sward environments.

An Atlantic-Mediterranean species occurring locally in the southern and eastern parts of central Europe as the subspecies *Noctua interjecta* (Hb.), which is rapidly expanding its range north-westwards (BÁLINT *et al.,* 2016). No records in Ukraine before the end of the 20th century (KLYUCHKO *et al.,* 2001). Earlier Transcarpathian records only from the Luh nad Tisa area near Rakhiv were the first for this region (GERYAK, 2010).

Chersotis multangula (Hb.)

Locality 3: 23-VI-2009, 1 ex., 13-VII-2010, 2 exx., 20-23-VI-2017, 16 exx., trapped at light in xerothermic sward habitats and in scrubby forest steppe, mostly lying above the Tisa valley.

A Holo-Mediterranean-Iranian species, local in south-central Europe, mainly to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Local and very rare in Ukraine at single localities in the eastern part of the country in Crimea and in the west in the Dniestr valley (KLYUCHKO *et al.,* 2001). New to Transcarpathia (NOWACKI & BIDYCZAK, 2009).

Euxoa cos (Hb.)

Locality 1: 19-VIII-2017, 7 exx., locality 2: 19-VIII-2017, 5 exx., locality 3: 4-VIII-2016, 1 ex., 24-28-VIII-2016, 25 exx., 18-20-VIII-2017, 35 exx., locality 4: 20-VIII-2017, 8 exx., trapped at light in

xerothermic sward habitats and in scrubby forest steppe. This species was in fact recorded at all four localities, and its Chorna Hora population is very numerous.

A Ponto-Mediterranean species, very local and rare in south-central Europe only to the south of the Alps, Sudetens and Carpathians (RAKOSY, 1997). Recently recorded at Ortelec in the Sãlaj region of Romania (BÁLINT *et al.,* 2016). Previous records from Ukraine showed it to be very rare at single localities only in Crimea (KLYUCHKO *et al.,* 2001). New to Transcarpathia. This is the northernmost known locality of this species.

Dichagyris nigrescens (Höfn.)

Locality 3: 20-VI-2017, 3 exx., trapped at light in xerothermic sward habitats on the upper slopes of the Chorna Hora.

A Ponto-Mediterranean species, very local and rare in south-central Europe only to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Early 20th century records from Ukraine showed it to be very rare at single localities only in the western part of the country in the Podole region in the Dniestr valley (KLYUCHKO *et al.,* 2001). A species new to Transcarpathia.

Dichagyris forcipula ([D. & Schiff.])

Locality 2: 21-VI-2017, 2 exx., locality 3: 20-23-VI-2017, 17 exx., trapped at light in xerothermic sward habitats mainly on the upper slopes of the Chorna Hora.

A Ponto-Mediterranean species, very local and rare in south-central Europe only to the south of the Alps, Sudetens and Carpathians (NOWACKI, 1998). Local and very rare in Ukraine at single localities, mainly in the eastern part of the country in Crimea and in the west in the Dniestr valley (KLYUCHKO *et al.,* 2001). New to Transcarpathia.

Ecological analysis

Carried out in the Chorna Hora Botanical Reserve in Ukrainian Transcarpathia, this survey yielded a total of 299 species of noctuids, trapped in various numbers at the four localities (Table 1). It is important to note that the number of species found in each assemblage is not a direct indicator of the biodiversity or even the natural value of these ecosystems. In line with our research hypothesis, the presence of species unique to xerothermic sward and forest steppe ecosystems is of far greater significance and much more meaningful: this is why the Chorna Hora is such a high-ranking European refuge for xerothermic noctuid moths. Our survey yielded 32 such species from the whole of the study area, which were trapped in various numbers at the four localities (Table 2).

Table 2.– Species of Noctuoidea unique to xerothermic swards and forest steppes, recorded at the four localities in the Chorna Hora Botanical Reserve in Transcarpathia (Ukraine) in 2009-2017. The Shannon-Wiener index H' has been calculated for each locality.

Species	**Chorna Hora - 1**	**Chorna Hora - 2**	**Locality Chorna Hora - 3**	**Chorna Hora - 4**	**Total**
C. communimacula ([D. & Schiff.])	-	3	-	-	3
E. purpurina ([D. & Schiff.])	3	5	7	5	20
C. hymenaea ([D. & Schiff.])	3	2	5	-	10
Dysgonia algira (L.)	14	15	29	23	81
A. asclepiadis ([D. & Schiff.])	3	5	12	6	26
A. lucida (Hfn.)	-	1	3	-	4
A. funesta (Esp.)	7	11	24	19	61
A. leucomelas (L.)	5	-	14	27	46

C. xeranthemi (B.)	1	-	-	-	1
V. oleagina ([D. & Schiff.])	14	1	17	3	35
C. platyptera (Esp.)	1	1	-	-	2
C. opalina (Esp.)	-	1	-	-	1
H. ononis ([D. & Schiff.])	1	-	-	-	1
C. latreillei (Dup.)	-	1	-	1	2
C. kadenii (Fr.)	5	-	11	6	22
H. superstes (O.)	-	-	-	2	2
H. respersa ([D. & Schiff.])	13	7	33	12	65
Athetis furvula (Hb.)	-	-	-	2	2
P. sericata (Esp.)	12	3	12	26	53
C. hyperici ([D. & Schiff.])	8	13	26	16	63
E glaucina (Esp.)	2	-	7	2	11
T. sulphurago ([D. & Schiff.])	3	2	2	4	11
A. humilis ([D. & Schiff.])	2	1	3	3	9
Mesogona acetosellae ([D. & Schiff.])	1	-	1	-	2
A. caecimacula ([D. & Schiff.])	5	4	11	7	27
A. syriaca (Osth.)	5	6	7	6	24
H. albimacula (Borkh.)	1	-	-	-	1
C. multangula (Hb.)	-	-	19	-	19
E. cos	7	5	61	8	81
D. forcipula ([D. & Schiff.])	-	2	17	-	19
D. nigrescens ([D. & Schiff.])	-	-	3	-	3
A. bigramma (Esp.)	-	4	17	-	21
Total number of species	22	21	23	19	32
Total number of individuals	116	95	341	178	730
Shannon-Wiener index H'	2.79	2.66	2.80	2.58	2.91

As regards the number of species unique to the xerothermic sward and forest steppe ecosystems on the Chorna Hora, the most typical of our trapping localities was No. 3, where 23 species of this group were trapped. Comparative analysis of the number of species and Jaccard's similarity indices of characteristic species (see Table 3) among the various assemblages of Noctuoidea at the four localities enabled the order of localities with similar values of these indices to be established.

Table 3.– Jaccard's similarity indices for species unique to xerothermic sward and forest steppe ecosystems, recorded at four localities in the Chorna Hora Botanical Reserve in Transcarpathia (Ukraine) in 2009-2017, among the various assemblages of Noctuoidea at all four localities.

Locality	**1**	**2**	**3**	**4**
1	x	53.6	66.7	64
2		x	63	53.8
3			x	61.5
4				x

The closest as regards similarity is locality Chorna Hora-1 (similarity index 66.7 and 22 characteristic species); the next in order are Chorna Hora-2 (similarity index 63.0 and 21 characteristic species) and Chorna Hora-4 (similarity index 61.5 and 19 characteristic species) (Tables 2, 3).

Similar results were obtained from a comparison of the biodiversity of xerothermic noctuids occurring at the four localities using the Shannon-Wiener biodiversity index H'. If this index for the entire assemblage of xerothermic noctuids in the Chorna Hora Botanical Reserve took a value of 2.91, then for the various trapping localities, the assemblage at Chorna Hora-3 took the highest value of H' = 2.80; the other values in decreasing order were Chorna Hora-1 (H' = 2.79), Chorna Hora-2 (H' = 2.66) and Chorna Hora-4 (H' = 2.58).

Summary of results

Large, natural xerothermic rock sward and forest steppe ecosystems are unique in central Europe. Human activities have already substantially transformed the majority of such habitats. This survey (2009-2017) of the Noctuoidea of the xerothermic ecosystems on the slopes of the Chorna Hora mountain in Ukrainian Transcarpathia, an isolated enclave of the Carpathian Biosphere Reserve, has enabled a good many species of these moths to be added to the local faunistic checklist.

We recorded a total of 299 noctuid species on the Chorna Hora. If we include another 10 species found earlier by GERYAK (2010), this number rises to 309 - 46% of all noctuids ever recorded in Ukraine. The number of species recorded during the present survey is by no means final. This is suggested by the many interesting ecosystems that are found on the slopes of the Chorna Hora and the species richness of this group of moths in adjacent areas of western Ukraine. For comparison, a total of 414 species of noctuids have been recorded from the whole of Transcarpathia (GERYAK, 2010; GERYAK, 2013; KLYUCHKO, 2006; NOWACKI & BIDYCZAK, 2009, NOWACKI *et al.,* 2010). It should be borne in mind that this number relates to all the ecosystems in Transcarpathia and includes a good number of species that are found only in montane ecosystems, including alpine species. The present survey revealed 96 species new to the Chorna Hora; it also yielded two species new to Ukraine and 17 new to Transcarpathia.

Analysis of the research material enabled this noctuid fauna to be characterised with respect to its assemblages in the various plant communities in the Chorna Hora reserve. In line with our research hypothesis, we paid special attention to the noctuid species composition of the xerothermic habitats: these consist mainly of xerothermic sward communities on the steep slopes and rocky outcrops and of forest steppe communities covering the gentler slopes exposed to the south, south-west and south-east. Qualitative analysis shows that these ecosystems support the largest number of stenotopic species, some of which are of great faunistic value. Thirty-three of the noctuid species recorded on the Chorna Hora can be classified as xerothermic specialists: most of them occur in highly specific, usually natural ecosystems.

In conclusion, we can state that our survey has shown the Chorna Hora mountain in Ukrainian Transcarpathia, with its numerous xerothermic sward and forest steppe ecosystems,

is an important refuge for xerothermic noctuids and is of prime significance for the conservation of the biodiversity of Ukraine in particular and Europe in general.

Acknowledgements

Here we would like to extend our cordial gratitude to everyone, whose disinterested contributions helped us in various ways to produce this paper. We thank Prof. Dr Vitaliy P. Fedorenko for inviting us to conduct this survey in Transcarpathia and the Management of the "Carpathian Biosphere Reserve" for permission to carry out research in the Chorna Hora Botanical Reserve. A word of thanks must also go to those people who helped to organise and carry out the fieldwork by participating in the acquisition of the research material, namely, Marek Bunalski, Roman Bidychak, Jarosław Iwaniszyniec, Krzysztof Pałka and Paweł Sienkiewicz. Special thanks are due to Peter Senn for translating the Polish parts and editing the English parts of the manuscript.

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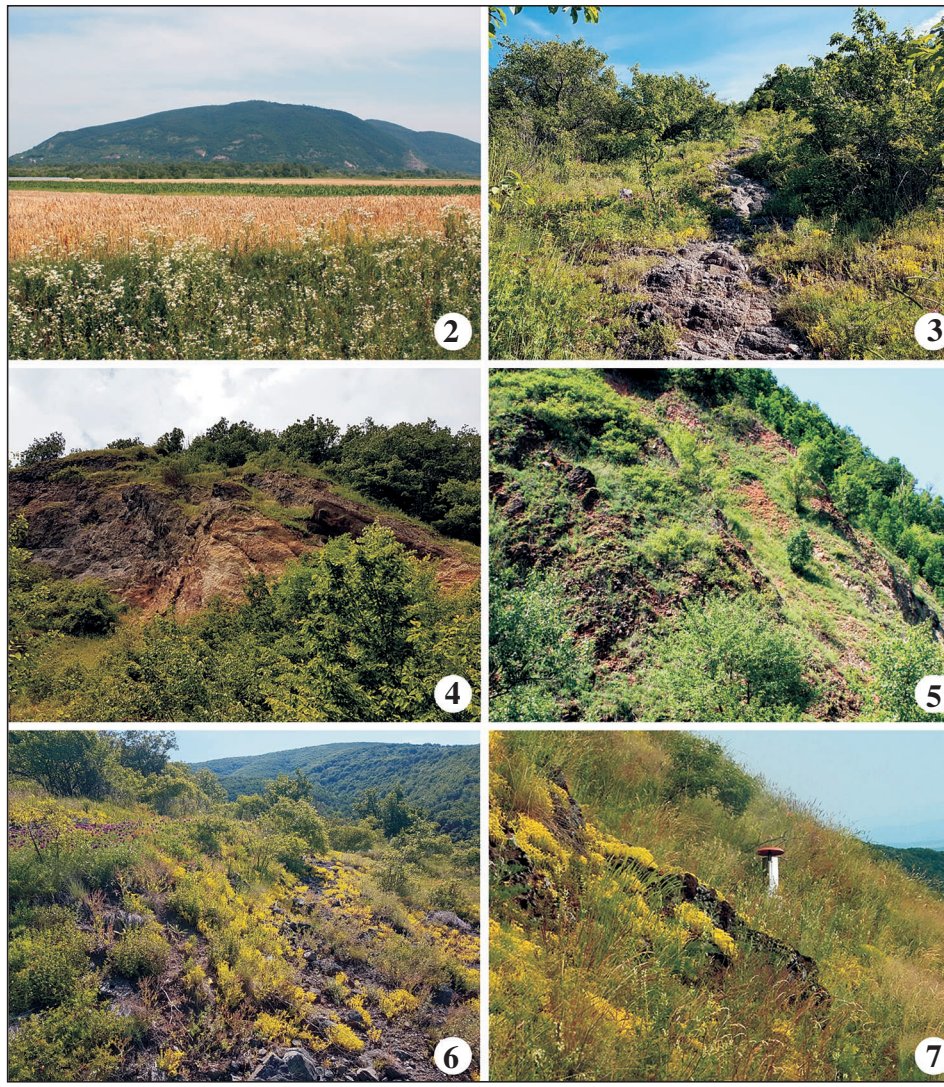

Figs 2-7.– 2. View from the Transcarpathian Lowland of the southern slopes of the Chorna Hora. **3-4.** Forest steppe habitats with patches of xerothermic rock sward on the slopes of the Chorna Hora. **5-6.** Xerothermic rock sward habitats on the slopes of the Chorna Hora. **7.** Patch of xerothermic sward on the south-eastern slope of the Chorna Hora; the light trap can be seen.

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Agathodes designalis (Guenée, 1854) from Gibraltar - an adventive species new to Europe (Lepidoptera: Crambidae, Spilomelinae)

C. E. Perez, R. M. Guillem & M. R. Honey

Abstract

Agathodes designalis (Guenée**,** 1854) is recorded for the first time in Europe, from Gibraltar.
KEY WORDS: Lepidoptera, Crambidae, Spilomelinae, *Agathodes designalis*, Gibraltar.

Agathodes designalis **(Guenée, 1854) de Gibraltar - una especie advenediza nueva para Europa (Lepidoptera: Crambidae, Spilomelinae)**

Resumen

Agathodes designalis (Guenée, 1854) se cita por primera vez en Europa, de Gibraltar.
PALABRAS CLAVE: Lepidoptera, Crambidae, Spilomelinae, *Agathodes designalis*, Gibraltar.

Introduction

Worldwide, there are sixteen species of the genus *Agathodes* Guenée, 1854 (Lepidoptera: Crambidae), distributed primarily in India, South-east Asia, sub-Saharan Africa, Australia, South and Central America, with isolated species on islands such as Japan, Madagascar, Samoa and São Tomé (NUSS *et al*., 2017). *Agathodes designalis* (Guenée, 1854) normally occurs throughout South and Central America (SOURAKOV, 2012). It also occurs in North America, having become established in the eastern United States from South Carolina to Florida and west to Arizona and Texas (SOURAKOV, 2011). The species is commonly known as the *Erythrina* leaf-roller, because the larvae feed on the genus *Erythrina* L. (Fabaceae), feeding on flowers during the spring and then on the leaves in the summer and autumn (SOURAKOV, 2013). Until now, the species has not been recorded from Europe.

The UK Overseas Territory of Gibraltar sits on the eastern end of the Strait of Gibraltar at the southern end of the Iberian Peninsula, bordering Spain. We hereby record the presence of *Agathodes designalis* in Gibraltar, providing the first records of the species for Europe and the Palaearctic.

Material and methods

Moth trapping takes place in the Gibraltar Botanic Gardens on a nightly basis, using a Rothamsted trap. This effort is occasionally augmented by using a 125W MV Robinson moth trap.

During an intense campaign of moth trapping at the site with the Robinson trap in the spring and summer of 2017, a rather colourful (male) crambid of the genus *Agathodes* was captured on 9-VI-2017 (Figure 1). Unable to identify the species, a photograph was sent to one of the authors (MRH), a former curator and now Scientific Associate of the Natural History Museum, London, for identification. After

consulting the genus *Agathodes* in the collections in the Museum, the conclusion was that this was a specimen of *Agathodes designalis* (Guenée, 1854).

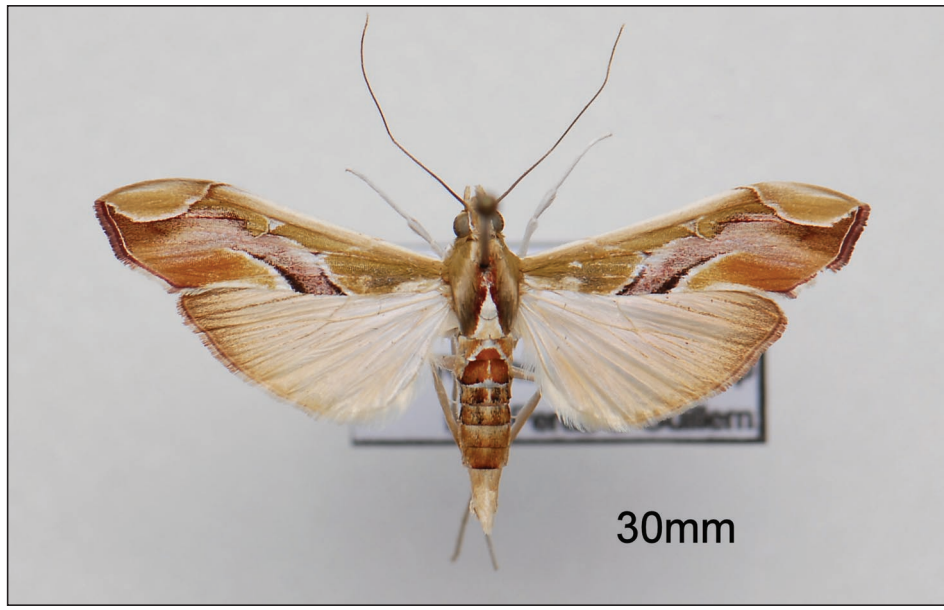

Figure 1.– Adult of *Agathodes designalis* (Guenée, 1854), Gibraltar Botanic Gardens, Gibraltar.

A further three specimens of this moth were trapped on the 4-VII-2017, 12-VII-2017 and 23-VIII-2017 (all males). All were captured with the Robinson trap, where catches are normally larger and more diverse than is usual with a Rothamsted trap.

Discussion

This was an unexpected find, with four individuals captured during a period of 45 days. Although not numerous, the first and last captures were fresh specimens and this, together with the distribution of records, suggests that the species may have established itself in the Gibraltar Botanic Gardens. There are three species of *Erythrina* growing outdoors in the gardens: one *Erythrina crista-galli* L., one *Erythrina humeana* Spreng. and several large *Erythrina lysistemon* Hutch. In addition, the closely related *Erythrina caffra* Thunb. is used around Gibraltar as an ornamental plant in landscaping, including close to the Botanic Gardens. Despite searching the flowers and leaves of some of the trees in the Botanic Gardens, no larvae were found near ground level, although some of the canopies were inaccessible. The *E. crista-galli* had been purchased from a garden centre in Malaga province (Spain) in 2005, whereas the others had been grown from seed that had been sourced from South Africa in the late 1990s. Thus, only the *E. crista-galli* may have been responsible for introducing the moths, but this seems unlikely given the twelve years that had elapsed between the tree's importation and the moth's detection. Other possibilities include importation with other *Erythrina* species in Gibraltar or ship-assisted passage from the Americas, with a fecund female making landfall and establishing itself in the Botanic Gardens. The latter is quite possible given the volume of marine traffic through the Strait of Gibraltar. A further search for larvae will be conducted in 2018.

HEPPNER (2007: 282), also mentions Oleander, *Nerium oleander* L., as a food plant for *Agathodes* in Florida, along with several other plants. This species is frequently used in landscaping throughout Gibraltar but we have not yet checked plants for signs of larvae. If the species favours this plant then *Agathodes designalis* could soon spread throughout Spain, as the plant is commonly found both in a naturalized/wild state along river-beds and in ornamental landscaping. It is also possible that the moth may have arrived to Gibraltar with the *E. crista-galli* from Spain so it might also be useful to check *Erythrina* and *Nerium* plants in southern Spain.

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We are grateful to Dr Keith Bensusan (Gibraltar Botanic Gardens) for his comments on the manuscript. MRH thanks the Trustees of the Natural History Museum, London, for permission to examine the collections in the NHMUK.

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Pterophoridae of the South Africa National Park Namaqua (Lepidoptera: Pterophoridae)

V. N. Kovtunovich & P. Ya.Ustjuzhanin

Abstract

In the present study, we review the Pterophoridae family of Namaqua National Park (Republic of South Africa). We list 38 species of 5 genera; 4 of them are listed for the first time for Namaqua National Park; new synonyms are established for 3 species: *Agdistis swierstri* Kovtunovich & Ustjuzhanin, 2009a = *Agdistis eberti* Arenberger, 2009, syn. n.; *Agdistis mostovskii* Kovtunovich & Ustjuzhanin, 2010a = *Agdistis rastri* Arenberger, 2010, syn. n.; *Agdistis dazdraperma* Kovtunovich & Ustjuzhanin, 2009 = *Agdistis swakopi* Arenberger, 2009, syn. n.
KEY WORDS: Lepidoptera, Pterophoridae, Namaqua National Park, new synonyms, new data, South Africa.

Pterophoridae del sudafricano Parque Nacional de Namaqua (Lepidoptera: Pterophoridae)

Resumen

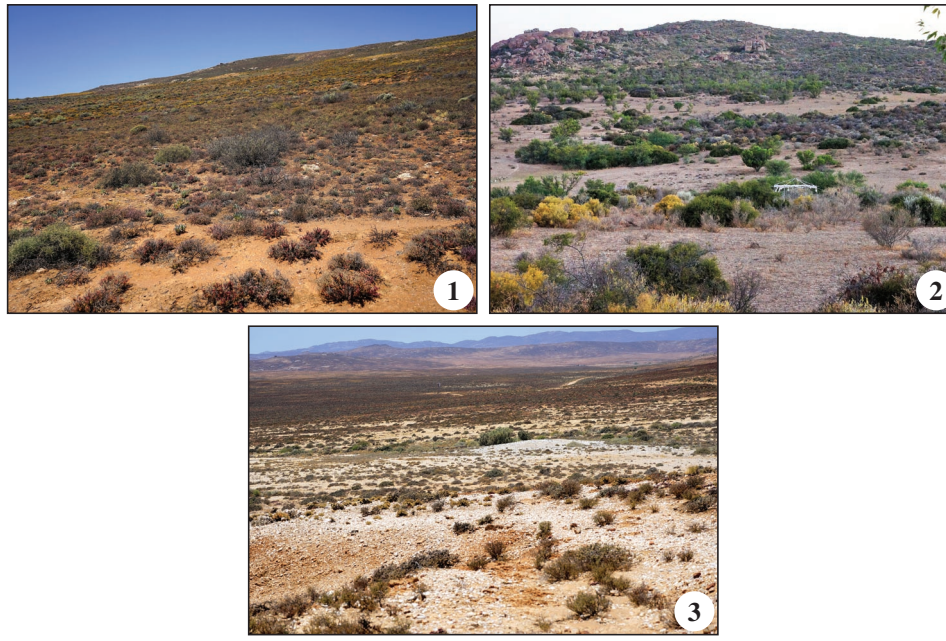
En el presente estudio, revisamos la familia Pterophoridae del Parque Nacional de Namaqua (República de Sudáfrica). Se de una lista de 38 especies de 5 géneros; 4 de ellos los son por primera vez para el Parque Nacional Namaqua; se establecen nuevas sinonimias para 3 especies: *Agdistis swierstri* Kovtunovich & Ustjuzhanin, 2009a = *Agdistis eberti* Arenberger, 2009, syn. n.; *Agdistis mostovskii* Kovtunovich & Ustjuzhanin, 2010a = *Agdistis rastri* Arenberger, 2010, syn. n.; *Agdistis dazdraperma* Kovtunovich & Ustjuzhanin, 2009 = *Agdistis swakopi* Arenberger, 2009, syn. n.
PALABRAS CLAVE: Lepidoptera, Pterophoridae, Parque Nacional Namaqua, nuevas sinonimias, nuevos datos, Sudáfrica.

Introduction

Namaqua National Park (Figs. 1-3) is situated in the Northern Cape province, near the border of the Republic of South Africa with Namibia. It is located in about 495 km North of Cape Town and 22 km North-west of Kamieskroon. The park is a part of Namaqualand, on its territory of 55000 km^2, located within the semiarid Karoo biome there is a great concentration of biodiversity of flora and fauna. Over 5000 plant species are met there, about 40% of them are endemics.

The Pterophoridae fauna of the national park is very peculiar. Specimens of the genus *Agdistis* are predominating here, and their variety impresses the imagination. Only according to our research, in the period from 2007 to 2017, 18 new species of this genus were described, which are among the already known 32 species. The caterpillars feed on plants of the families Frankeniaceae, Tamaricàceae, etc. The first data on the plume moths of the genus *Agdistis* from Namaqua National Park were published by ARENBERGER (1986, 1996). Many species of the genus *Agdistis* are numerous and often endemic on the dry territory of Namaqua, which can't be said about the representatives of the other genera which

are rare and few in number here. However, two species, *Crassuncus hawkingi* and *Crassuncus koperbergi* were found and described only from the territory of Namaqua Ustjuzhanin (KOVTUNOVICH, 2016).



Figures 1-3.– Namaqua National Park. Biotopes. Foto E. Tarasov. **1.** Namaqua National Park. December 2016. **2.** Namaqua National Park: Skilpad. December 2016. **3.** Namaqua National Park: Soebatsfontein. December 2016.

Annotated list of species

Agdistis clara Arenberger, 1986
Agdistis clara Arenberger, 1986: 189. Type locality: Kalkfontein, Botswana.
Distribution: Botswana, South Africa, Namibia.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis cretifera Meyrick, 1909
Agdistis cretifera Meyrick 1909: 367. Type locality: Worcester, South Africa.
Distribution: Rep. South Africa, Namibia.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis criocephala Meyrick, 1909
Agdistis criocephala Meyrick, 1909: 349. Type locality: Troe Troe, South Africa.
Distribution: Rep. South Africa; Namibia.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis dentalis Arenberger, 1986
Agdistis dentalis Arenberger, 1986: 191. Type locality: Namaqualand, Nr. Garies, Northern Cape, South Africa.
Distribution: South Africa.

Agdistis dicksoni Kovtunovich & Ustjuzhanin, 2009
Agdistis dicksoni Kovtunovich & Ustjuzhanin, 2009a: 42. Type locality: 5 km SE of Springbok, Koperberg farm, Northern Cape, South Africa.
Distribution: South Africa: Western and Northern Cape.

Agdistis eberti Arenberger, 2009
Agdistis eberti Arenberger, 2009: 20. Type locality: Richtersveld, Koeroegabvlakte, South Africa.
Agdistis swierstri Kovtunovich & Ustjuzhanin, 2009a: 217. Type locality: 80 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa, **syn. n.**
Distribution: South Africa: Northern Cape.
Notes: Indicated for Namaqua N. P., as *Agdistis swierstri* (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis endrodyi Kovtunovich & Ustjuzhanin, 2009
Agdistis endrodyi Kovtunovich & Ustjuzhanin, 2009a: 42. Type locality: Seweputs farm, Western Cape, South Africa.
Distribution: South Africa: Western and Northern Cape.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis furcata Arenberger, 1996
Agdistis furcata Arenberger, 1996: 177. Type locality: Namaqualand, Mesklip 18 km. S. of Springbok, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis gibberipenis Arenberger, 1996
Agdistis gibberipennis Arenberger, 1996: 176. Type locality: Namaqualand, Mesklip 18 km. S. of Springbok, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis gornostaevi Kovtunovich & Ustjuzhanin, 2010
Agdistis gornostaevi Kovtunovich & Ustjuzhanin, 2010: 134. Type locality: 10 km S. of Laingsburg, Western Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2010a).

Agdistis insolitus Kovtunovich & Ustjuzhanin, 2010
Agdistis insolitus Kovtunovich & Ustjuzhanin, 2010b: 298. Type locality: 80 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.
Notes: Indicated for Namaqua N. P. (KOVTUNOVICH & USTJUZHANIN, 2010b).

Agdistis jansei Kovtunovich & Ustjuzhanin, 2009
Agdistis jansei Kovtunovich & Ustjuzhanin, 2009a: 41. Type locality: 9 km South of Springbok, Northern Cape, Rep. South Africa.
Distribution: South Africa: Northern Cape, Western Cape, Free State, Mpumalanga.

Agdistis karischi Arenberger, 1996
Agdistis karischi Arenberger, 1996: 177. Type locality: Hondeklipbaai, Namaqualand, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis kaunda Kovtunovich & Ustjuzhanin, 2015
Agdistis kaunda Kovtunovich & Ustjuzhanin, 2015: 143. Type locality: Springbok, Kopperberg farm, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis krooni Kovtunovich & Ustjuzhanin, 2009
Agdistis krooni Kovtunovich & Ustjuzhanin, 2009a: 42. Type locality: Numees Mine, Richtersveld, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis kruegeri Kovtunovich & Ustjuzhanin, 2009
Agdistis kruegeri Kovtunovich & Ustjuzhanin, 2009a: 43. Type locality: 80 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape, Eastern Cape, KwaZulu-Natal.

Agdistis lomholdti Gielis, 1990
Agdistis lomholdti Gielis, 1990: 114. Type locality: Namibia, Gobabeb.
Distribution: South Africa: Northern Cape, Western Cape; Namibia.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis malleana Arenberger, 1988
Agdistis malleana Arenberger, 1988: 20. Type locality: Western Cape, South Africa.
Distribution: South Africa: Western Cape, Eastern Cape, Northern Cape; Swaziland.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis meyi Arenberger, 2008
Agdistis meyi Arenberger, 2008: 33. Type locality: Helskloof Gate, Numees Mine, Richtersveld, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape; Zimbabwe.
Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2009a).

Agdistis myburgi Kovtunovich & Ustjuzhanin, 2009
Agdistis myburgi Kovtunovich & Ustjuzhanin, 2009b: 217. Type locality: 5 km SE of Springbok, Koperberg farm, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis namaqua Kovtunovich & Ustjuzhanin, 2010
Agdistis namaqua Kovtunovich & Ustjuzhanin, 2010b: 250. Type locality: 40 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis nikolaii Kovtunovich & Ustjuzhanin, 2010
Agdistis nikolaii Kovtunovich & Ustjuzhanin, 2010b: 249. Type locality: 40 km SW of Springbok, Namaqua N. P., History Prison, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis prisoner Kovtunovich & Ustjuzhanin, 2010
Agdistis prisoner Kovtunovich & Ustjuzhanin, 2010b: 250. Type locality: 5 km SE of Springbok, Koperberg farm, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.

Agdistis pseudomeyi Kovtunovich & Ustjuzhanin, 2015
Agdistis pseudomeyi Kovtunovich & Ustjuzhanin, 2015: 560. Type locality: 80 km SW of Springbok, Namaqua National Park, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.

Agdistis quagga Arenberger, 2009
Agdistis quagga Arenberger, 2009: 21. Type locality: Quaggafontain, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis rastri Arenberger, 2010
Agdistis rastri Arenberger, 2010: 76. Type locality: Farm Windhoek, Kamieskroon, Northern Cape, South Africa.
Agdistis mostovskii Kovtunovich & Ustjuzhanin, 2010a: 133. Type locality: 10 km S. of Laingsburg, Western Cape, South Africa, **syn. n**.
Distribution: South Africa: Northern Cape, Western Cape.
Notes: Indicated for Namaqua N. P., as *Agdistis mostovskii* (KOVTUNOVICH & USTJUZHANIN, 2010a).

Agdistis sergeii Kovtunovich & Ustjuzhanin, 2015
Agdistis sergeii Kovtunovich & Ustjuzhanin, 2015: 556. Type locality: 80 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis springbok Kovtunovich & Ustjuzhanin, 2010
Agdistis springbok Kovtunovich & Ustjuzhanin, 2010b: 298. Type locality: 5 km SE of Springbok, Koperberg farm, Northern Cape, South Africa.
Distribution: South Africa: Northern Cape.

Agdistis swakopi Arenberger, 2009
Agdistis swakopi Arenberger, 2009: 19. Type locality: 10 km E Swakopmund, Namibia.
Agdistis dazdraperma Kovtunovich & Ustjuzhanin, 2009b: 217. Type locality: 80 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa, **syn. n.**
Distribution: Namibia, Rep. South Africa: Northern Cape.
Notes: Indicated for Namaqua N. P., as *Agdistis dazdraperma* (KOVTUNOVICH & USTJUZHANIN, 2009b).

Agdistis streltzovi Kovtunovich & Ustjuzhanin, 2010
Agdistis streltzovi Kovtunovich & Ustjuzhanin, 2010b: 251. Type locality: 40 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.

Agdistis vansoni Kovtunovich & Ustjuzhanin, 2015
Agdistis vansoni Kovtunovich & Ustjuzhanin, 2015: 139. Type locality: 40 km SW of Springbok, Namaqua N. P., Northern Cape, South Africa.
Distribution: South Africa: Northern Cape, Western Cape.

Agdistis violaceus Kovtunovich & Ustjuzhanin, 2010
Agdistis violaceus Kovtunovich & Ustjuzhanin, 2010a: 133-134. Type locality: 10 km S of Laingsburg, Western Cape, South Africa.

Distribution: South Africa: Northern Cape, Western Cape.

Notes: Indicated for Namaqua N. P., (KOVTUNOVICH & USTJUZHANIN, 2010a).

Stenodacma wahlbergi (Zeller, 1851)
Pterophorus wahlbergi Zeller, 1851: 346. Type locality: South Africa.

Distribution: South Africa, Cameroon, Swaziland, Zimbabwe, Tanzania, Kenya, Ghana, Madagascar, Comoros, Reunion Isl., Rodriguez Isl., Mauritius, Seychelles, St. Helena Isl., Saudi Arabia, Iran, Pakistan.

Notes: Given for Namaqua N. P., for the first time, on the materials of the expedition of 2017: 1 ♀, South Africa, Northern Cape, Namaqua N. P., Skilpad, 30º 09'S, 017º 47'E, 250 m, 30-VIII-2-IX-2017, leg. V. Kovtunovich and P. Udovichenko.

Megalorhipida festus (Meyrick, 1920)
Trichoptilus festus Meyrick, 1920: 273. Type locality: Cape Town, South Africa.
Trichoptilus animosus Meyrick, 1921: 49. Type locality: KwaZulu-Natal, South Africa.

Distribution: South Africa: Northern Cape, Western Cape, KwaZulu-Natal; Kenya.

Notes: Given for Namaqua N. P., for the first time, on the materials of the expedition in 2017: 2 ex., South Africa, Northern Cape, 5 km SE Springbok, Koperberg farm, 29º 42'S, 017º 42'E, 760 m, 30-XII-2016 - 1-I-2017, leg. V. Kovtunovich and P. Ustjuzhanin; 2 ♀♀, 2 ♂♂, South Africa, Northern Cape, Namaqua N. P., Skilpad, 30º 09'S, 017º 47'E, 250 m, 30-VIII - 2-IX-2017, leg. V. Kovtunovich and P. Udovichenko.

Megalorhipida subtilis (Rebel, 1907)
Trichoptilis subtilis Rebel, 1907: 114. Type locality: Jemen.
Trichoptilis maceratus Meyrick, 1909: 2. Type locality: Rietfontein, South Africa.

Distribution: South Africa, Jemen, Socotra, Swaziland, Malawi, Mozambique, Zimbabwe.

Notes: Given for Namaqua N. P., for the first time, on the materials of the expedition in January 2017: 1 ♂, South Africa, Northern Cape, 5 km SE Springbok, Koperberg farm, 29º 42'S, 017º 42'E, 760 m, 30-XII-2016 - 1-I-2017, leg. V. Kovtunovich and P. Ustjuzhanin.

Marasmarcha corniculata (Meyrick, 1913)
Platyptilia corniculata Meyrick, 1913: 267. Type locality: Three Sisters, Northern Cape, South Africa.

Distribution: South Africa, Kenya.

Notes: Given for Namaqua N. P., for the first time, on the materials of the expedition in autumn 2017: 2 ♀♀, 1 ♀ South Africa, Northern Cape, Namaqua N. P., Skilpad, 30º 09'S, 017º 47'E, 250 m, 30-VIII - 2-IX-2017, leg. V. Kovtunovich and P. Udovichenko.

Crassuncus hawkingi Ustjuzhanin & Kovtunovich, 2016
Crassuncus hawkingi Ustjuzhanin & Kovtunovich, 2016:169. Type locality: Namaqua N. P., South Africa.

Distribution: South Africa: Northern Cape, Western Cape.

Crassuncus koperbergi Ustjuzhanin & Kovtunovich, 2016
Crassuncus koperbergi Ustjuzhanin & Kovtunovich, 2016: 167. Type locality: 5 km SE of Springbok, South Africa.

Distribution: South Africa: Northern Cape.

Discussion

As a result of our study, 38 Pterophoridae species have been indicated on the territory of Namaqua National Park. Most of them belong to the genus *Agdistis* (32 species), which is explained by their ability to the extreme adaptation in the severe arid biocenoses. Despite many years of our research in this region (seven expeditions have been carried out), the data on the Pterophoridae fauna of this region will be undoubtedly supplemented with species new to the region, as well as new to science.

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Contribución al conocimiento de los Macroheterocera del Parque Natural Cabo de Gata-Níjar (Almería, España) (Insecta: Lepidoptera)

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

Resumen

Las familias Cossidae, Limacodidae, Drepanidae, Lasiocampidae, Sphingidae, Notodontidae, Nolidae, Erebidae y Euteliidae están representadas por 70 especies en el Parque Natural Cabo de Gata-Níjar (Almería, sureste de España). Los corotipos asiático-mediterráneo y atlanto-mediterráneo son mayoritarios (67,1%), de los cuales, tres son endemismos ibéricos. Se aportan y confirman nuevos datos para las familias Geometridae y Noctuidae. Del total de especies estudiadas, 12 son nuevas para la provincia de Almería y 22 para el territorio del parque natural y su entorno.
PALABRAS CLAVE: Insecta, Lepidoptera, Parque Natural Cabo de Gata-Níjar, Almería, España.

Contribution to the knowledge of the Macroheterocera from the Cabo de Gata-Níjar Natural Park (Almeria, Spain) (Insecta: Lepidoptera)

Abstract

The families Cossidae, Limacodidae, Drepanidae, Lasiocampidae, Sphingidae, Notodontidae, Nolidae, Erebidae and Euteliidae are represented in the Cabo de Gata-Níjar Natural Park (Almeria, southern Spain) by 70 species. The Mediterranean-Asiatic and Atlanto-Mediterranean corotypes are predominant (67.1%), including three Iberian endemisms. New records for the families Geometridae and Noctuidae are presented. The study contributes with twelve new records for Almeria province and twenty-two new records for the park and its surrounding area.
KEY WORDS: Insecta, Lepidoptera, Cabo de Gata-Níjar Natural Park, Almeria, Spain.

Introducción

El Parque Natural Cabo de Gata-Níjar es un espacio natural costero situado en el sureste de la Península Ibérica de gran interés entomológico por su situación geográfica y por sus excepcionales valores paisajísticos, geológicos y botánicos derivados de su particular clima seco y cálido. Una descripción más detallada del área de estudio puede consultarse en GARRE *et al*. (2016). Su fauna lepidopterológica ha sido recientemente estudiada para las familias Geometridae (GARRE *et al*., 2016), Pyralidae y Crambidae (GARRE *et al*., 2018a) y Noctuidae (s. s.) (GARRE *et al*., 2018b), mientras que el conocimiento del resto de las familias de Macroheterocera resulta insuficiente y limitado, a excepción de las citas aparecidas en los trabajos de HACKER & WOLF (1982, 1983) y KRAUS (1997, 1999, 2000).

El objetivo de este trabajo es ofrecer un catálogo sistemático de las especies de las familias Limacodidae, Cossidae, Lasiocampidae, Sphingidae, Drepanidae, Notodontidae, Nolidae, Erebidae y Euteliidae presentes en el P. N. Cabo de Gata-Níjar, realizar un sucinto análisis biogeográfico y fenológico y destacar las especies más interesantes. Asimismo, se aportan nuevos datos de las familias Geometridae y Noctuidae (s. s.).

Material y métodos

Se presentan los resultados de los 54 muestreos nocturnos realizados en varias localidades del Parque Natural Cabo de Gata-Níjar, a los que se suma la localidad limítrofe de la Rambla de la Granatilla, durante el período comprendido entre la segunda quincena de mayo de 2012 y la primera quincena de mayo de 2014. Además, se han considerado otros muestreos esporádicos efectuados en años anteriores en parajes colindantes del municipio de Mojácar y los realizados con posterioridad al mencionado período de muestreo sistemático. La totalidad de las localidades estudiadas se ordenan por municipios en la Tabla I. Todos los muestreos se han realizado utilizando trampas de luz negra y actínica de 6 vatios (tipo Heath). Las nueve primeras localidades se muestrearon periódicamente y tienen las siguientes características: Estaciones 1-3: se localizan en el ámbito de los arenales y saladares litorales, colonizados por una flora con apetencias ecológicas estrictas y adaptadas a medios muy especializados. Estaciones 4-6: se ubican en el dominio de la serie fitosociológica del cornical, encontrándose la comunidad cabeza de serie, en general, muy bien conservada y con una alta diversidad florística. Estaciones 7-8: se sitúan en el dominio de la serie del lentisco, representada principalmente por sus etapas seriales (espartales y tomillares). Estación 9: se halla en el entorno de los retamares edafoxerófilos.

Tabla I.– Relación de las localidades muestreadas.

Nº	Localidad	Municipio	Altitud (m.s.n.m.)	U.T.M.
1	Salinas de Cabo de Gata	Almería	3	30SWF66
2	Rambla de Morales	Almería	3	30SWF67
3	Playa del Charco	Almería	3	30SWF67
4	Río Alías	Carboneras	8	30SWF99
5	El Saladero	Carboneras	25	30SWF99
6	El Algarrobico	Carboneras	35	30SWF99
7	Cañada del Madroñal	Níjar	190	30SWF87
8	Cerro de la Cruz	Níjar	220	30SWF87
9	Rambla de la Granatilla	Mojácar	90	30SWG90
10	Rambla de Jayón	Níjar	210	30SWF88
11	Rambla de Macenas	Mojácar	120	30SWG90
12	Rambla de Alfaix	Mojácar	70	30SXG00
13	El Pueblo Indalo	Mojácar	15	30SXG00

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 referencias bibliográficas. Las especies que se citan por vez primera para la provincia de Almería están marcadas con un asterisco (*) y con dos asteriscos (**) para el territorio del Parque Natural de Cabo de Gata-Níjar. Además, se indica el período de vuelo (en meses y numeración romana) que ha sido confirmado en base a las capturas, observaciones y fuentes bibliográficas específicas. En relación a las citas bibliográficas se han seleccionado las

referidas expresamente al ámbito del parque natural, aunque se han incluido las pertenecientes a algunas localidades limítrofes (Sierra de Cabrera, Carboneras, Retamar, Mojácar y El Alquián).

La nomenclatura y ordenación de los taxones en sus correspondientes categorías taxonómicas se ha basado principalmente en el trabajo de VIVES MORENO (2014). Los datos biogeográficos (Tabla II) y fenológicos (Tabla III, Figura 1) se han obtenido básicamente de las obras de carácter general (PÉREZ-DE GREGORIO *et al.,* 2001; GOATER *et al.,* 2003; LERAUT, 2006; ROBINEAU, 2007; FIBIGER *et al.,* 2010; YLLA *et al.*, 2010; WITT & RONKAY, 2011).

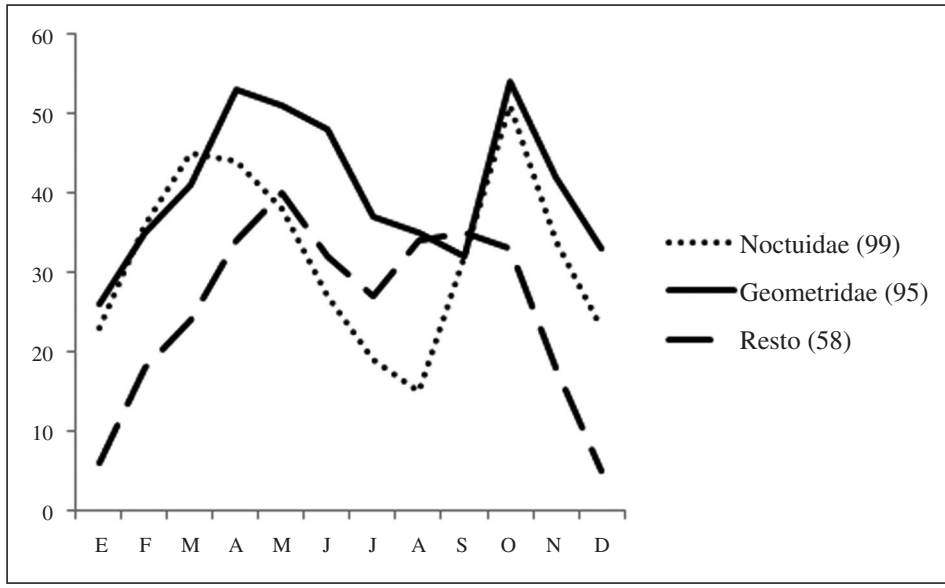

Figura 1.– Esquema comparativo de la fenología de las especies de Macroheterocera en el Parque Natural Cabo de Gata-Níjar entre mayo de 2012 y mayo de 2014.

Resultados y discusión

La fauna de Macroheterocera del Parque Natural de Cabo de Gata-Níjar está compuesta, hasta el momento, por 70 especies y se halla repartida entre las familias Cossidae (3), Limacodidae (1), Lasiocampidae (4), Sphingidae (8), Drepanidae (1), Notodontidae (3), Nolidae (6), Erebidae (43) y Euteliidae (1), de las que 10 son nuevas para la provincia de Almería y 19 para el territorio del Parque Natural y su entorno más próximo. Si se incluyen las familias Geometridae y Noctuidae, las aportaciones se incrementan hasta 12 y 22 especies respectivamente.

Biogeográficamente, y asumiendo la heterogeneidad del conjunto de las familias de Lepidoptera estudiadas, las especies de distribución mediterránea, incluidos los endemismos, son mayoritarias (67,1%), predominando ligeramente el corotipo asiático-mediterráneo sobre el atlanto-mediterráneo. Los endemismos ibéricos representan el 4,3% del total con tres especies y entre los corotipos de distribución amplia destacan las especies tropicales (17,1%) (Tabla II). Probablemente, el relativamente bajo porcentaje de elementos de distribución mediterránea es similar al que presentan los Noctuidae (64,9%) (GARRE *et al.,* 2018b), pero muy inferior al correspondiente a los Geometridae (83,7%) (GARRE *et al.,* 2016), debido a que las familias consideradas poseen una gran capacidad de vuelo y un amplio rango de distribución por Europa.

Tabla II.– Distribución de las especies de Macroheterocera en las diferentes categorías biogeográficas o corotipos en el Parque Natural de Cabo de Gata-Níjar (excluidos Geometridae y Noctuidae).

Elemento faunístico	nº especies	%	% clases principales
Paleártico	4	5,7	32,9
Euroasiático	3	4,3	
Cosmopolita	4	5,7	
Tropical	12	17,1	
Atlanto-mediterráneo	17	24,3	62,9
Asiático-mediterráneo	27	38,6	
Endémico	3	4,3	4,3
TOTAL	70	100	100

Con respecto a las especies más relevantes de este espacio natural destaca el cósido *Wiltshirocossus aries*, citado inicialmente como *Lamellocossus turatii* Krüger, 1934 por LAJONQUIERE (1963), conocido de los biotopos costeros del sureste peninsular (Almería, Granada y Murcia) (REDONDO *et al.,* 2010) y en los saladares del interior de Albacete (LENCINA *et al.*, 2011); y también el endemismo *Eremocossus almeriana*, confinado en parajes áridos y semiáridos de Alicante, Almería y Murcia (REDONDO *et al.,* 2010). En la familia Lasiocampidae, *Lasiocampa serrula* se encuentra muy localizada en arenales y saladares del litoral mediterráneo y atlántico del sur peninsular, aunque recientemente se ha encontrado en saladares del interior de Albacete (LENCINA *et al.*, 2011) y *Streblote panda* es una especie restringida a la franja litoral que se extiende desde Cataluña hasta el sur de Portugal (PÉREZ-DE GREGORIO *et al.*, 2001). En la familia Sphingidae es destacable la presencia de *Hyles nicaea*, citada de las costas mediterránea y suratlántica de la península, e *Hippotion osiris* que es una especie tropical que cuenta con unas pocas citas en Andalucía (PÉREZ-DE GREGORIO *et al.*, 2001).

Resulta muy interesante la captura de un ejemplar nuevo del Notodontidae endémico *Cerura iberica* en un entorno extremadamente árido situado a nivel del mar, ya que es un taxón asociado a biotopos boscosos en los que predominan especies de los géneros *Populus* y *Salix* (LERAUT, 2006). En la familia Nolidae, se confirma la presencia en el área de estudio de *Garella nilotica*, previamente citada por MAGRO (2013) y conocida principalmente a lo largo de la costa andaluza.

Dentro de la familia Erebidae destaca el Lymantriinae *Ocneria atlantica* por ser una especie distribuida en parajes con abundancia de lentisco (*Pistacia lenticus* L.) en la mitad sur de la Península Ibérica. En relación a los Arctiinae, es interesante la captura de *Pelosia plumosa*, ya que es la cita más meridional en la costa mediterránea peninsular y que previamente se conocía solo en la costa de Huelva (PÉREZ-DE GREGORIO *et al.*, 2001). Otros Erebidae relevantes son *Eublemma albida,* elemento de distribución atlanto-mediterránea, sólo citado en la Península Ibérica en Almería y Cádiz por FIBIGER *et al.* (2010); *Pandesma robusta*, conocida principalmente de los hábitats costeros que se extienden desde Alicante hasta Málaga; y el endemismo *Phytometra sanctiflorentis*, ampliamente distribuido por casi la totalidad del territorio peninsular y citada por KRAUSS (1997, 2000) en el área de estudio como *Phytometra luna* Zerny, 1927. Algunas especies como *Eilema complana* y *Eilema sororcula* deben ser revisadas y confirmadas en el área de estudio porque *Eilema complana,* citada por KRAUS (2000), es un taxón que puede confundirse con la abundantísima *E. caniola* y que es típica de los parajes montañosos en el sureste peninsular y no se conoce en los biotopos termo-xerófilos costeros (YLLA *et al.,* 2010), mientras que *Eilema sororcula* es una especie con claras apetencias mesófilas y silvícolas (YLLA *et al.,* 2010).

Por otro lado, la revisión del material estudiado de las familias Geometridae y Noctuidae (s. s.) publicadas por GARRE *et al.* (2016, 2018b), así como el estudio de las especies capturadas en otros muestreos realizados posteriormente, han permitido añadir un nuevo Geometridae, *Comsoptera jourdanaria,* y confirmar la presencia en el área de estudio de *Antilurga alhambrata* y *Eupithecia*

senorita, endemismo que erróneamente fue citado como *E. distinctaria* Herrich-Schäffer, 1848 en GARRE *et al.* (2016). Además, se suman al catálogo los tres Noctuidae *Heliothis nubigera, Rhizedra lutosa* y *Apamea arabs* y se confirma la presencia de *Cryphia pallida*, *Bryophila microglossa, Saragossa seeboldi, Agrotis lasserrei* y *A. boetica*.

Desde el punto de vista de la fenología de las especies de cada una de las familias (Tabla III), se observa que los periodos de vuelo con mayor número de taxones corresponden principalmente a los meses de abril-mayo y agosto-septiembre (Figura 1). Este tipo de comportamiento está condicionado por la climatología de este territorio costero del sur de Europa, con inviernos cálidos y veranos tórridos, donde la abundancia específica en la primavera y el otoño debería contrastar con una fuerte reducción de efectivos durante la diapausa estival, lo que coincide con los anteriormente presentados para las familias Geometridae y Noctuidae en GARRE *et al.* (2016, 2018b) (Tabla III, Figura 1). La única familia bien representada en el área de estudio que tiene especies que vuelan a lo largo de todo el año, pero con un esquema fenológico diferente, es Erebidae, que se caracteriza por incluir numerosas especies con vuelo estival.

Tabla III.– Esquema fenológico de los imagos en vuelo de las diferentes familias de Macroheterocera en el Parque Natural de Cabo de Gata-Níjar durante el período comprendido entre mayo de 2012 y mayo de 2014. Los números que componen la tabla se refieren a número de especies. Los datos de Geometridae y Noctuidae a partir de GARRE *et al.* (2016, 2018b).

Familia	**E**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Cossidae (3)	0	1	2	3	3	1	0	0	0	0	0	0
Limacodidae (1)	0	0	0	1	1	0	0	0	1	0	0	0
Drepanidae (1)	1	1	1	1	1	1	1	1	0	1	1	1
Lasiocampidae (4)	1	1	1	2	1	2	2	1	2	3	1	0
Sphingidae (5)	0	0	1	3	3	1	1	3	3	2	1	0
Notodontidae (3)	0	0	1	0	0	0	0	1	2	2	0	0
Erebidae (36)	2	13	15	20	27	23	22	25	23	22	12	2
Nolidae (4)	2	2	2	3	3	3	1	3	3	3	3	2
Euteliidae (1)	0	0	1	1	1	1	0	0	1	0	0	0
TOTAL (58)	**6**	**18**	**24**	**34**	**40**	**32**	**27**	**34**	**35**	**33**	**18**	**5**
Noctuidae (99)	**23**	**36**	**45**	**44**	**38**	**27**	**19**	**15**	**32**	**51**	**34**	**23**
Geometridae (95)	**26**	**35**	**41**	**53**	**51**	**48**	**37**	**35**	**32**	**54**	**42**	**33**

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APÉNDICE

COSSIDAE
COSSINAE

Wiltshirocossus aries (Püngeler, 1902)
Material estudiado: Rambla de Morales, 24-III-2014, 1 ♂; 22-IV-2014, 1 ♀.
Citas bibliográficas: LAJONQUIERE (1963), GÓMEZ-BUSTILLO & FERNÁNDEZ-RUBIO (1976), GÓMEZ-BUSTILLO (1977), BLUM (1988), KRAUS (1997), FUENTES (1998).
Elemento asiático-mediterráneo. Univoltina. Imagos: II-V.

****Eremocossus almeriana*** (Freina & Witt, 1990)
Material estudiado: Cerro de la Cruz, 17-IV-2014, 1 ♂; Rambla de la Granatilla, 27-IV-2011, 1 ♂; 3-VI-2012, 1 ♂; Rambla de Morales, 10-V-2013, 1 ♂; 22-IV-2014, 3 ♂♂; 2-V-2014, 1 ♂.
Elemento endémico. Univoltina. Imagos: IV-VI.

****Dyspessa ululula*** (Borkhausen, 1790)
Material estudiado: Cañada del Madroñal, 17-III-2014, 1 ♂; Rambla de la Granatilla, 10-IV-2012, 2 ♂♂; Río Alías, 16-III-2013, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: III-V.

LIMACODIDAE
LIMACODINAE

Hoyosia codeti (Oberthür, 1883)
Material estudiado: Rambla de Macenas, 24-IX-2012, 1 ♂.
Citas bibliográficas: ORTIZ *et al*. (2010).
Elemento atlanto-mediterráneo. Univoltina. Imagos: IV-V, IX.

LASIOCAMPIDAE
POECILOCAMPINAE

Trichiura (Achnocampa) ilicis (Rambur, 1858)
Material estudiado: El Saladero, 27-I-2013, 1 ♂, 1 ♀; 4-II-2013, 1 ♂.
Elemento atlanto-mediterráneo. Univoltina. Imagos: I-IV.

LASIOCAMPINAE

****Lasiocampa trifolii*** ([Denis & Schiffermüller], 1775)
Material estudiado: El Saladero, 10-IX-2012, 1 ♂.
Elemento euroasiático. Univoltina. Imagos: V-XI.

Lasiocampa serrula (Guenée, 1858)
Material estudiado: Playa del Charco, 19-X-2013, 2 ♂♂; Rambla de Morales, 19-X-2013, 2 ♂♂.
Citas bibliográficas: KRAUS (1997), MAGRO (2013).
Elemento atlanto-mediterráneo. Univoltina. Imagos: IX-X.

Streblote panda Hübner, [1820]
Material estudiado: Cerro de la Cruz, 17-IV-2014, 1 ♀; El Algarrobico, 1-VII-2012, 1 ♂.
Citas bibliográficas: MAGRO (2013).
Elemento atlanto-mediterráneo. Polivoltina. Imagos: IV, VI-VII, X.

SPHINGIDAE
SPHINGINAE

****Agrius convolvuli** (Linnaeus, 1758)
Material estudiado: El Algarrobico, 24-IX-2012, 1 ♂.
Elemento cosmopolita. Bivoltina. Imagos: VIII-X.

Acherontia atropos (Linnaeus, 1758)
Material estudiado: El Algarrobico, 24-IX-2012, 1 ex.
Citas bibliográficas: KRAUS (1997), HACKER & WOLF (1982).
Elemento tropical. Bivoltina. Imagos: IV, VIII-IX.

MACROGLOSSINAE

****Macroglossum stellatarum** (Linnaeus, 1758)
Material estudiado: El Saladero, 24-IX-2012, 1 ♂.
Elemento paleártico. Bivoltina. Imagos: V, IX-XI.

Hyles (Hyles) euphorbiae (Linnaeus, 1758)
Material estudiado: Playa del Charco, 24-III-2014, 1 ♂; Rambla de Morales, 24-III-2014, 1 ♂.
Citas bibliográficas: AGENJO (1952, 1968).
Elemento paleártico. Bivoltina. Imagos: III-V, VIII.

Hyles (Hyles) nicaea (Prunner, 1798)
Citas bibliográficas: HACKER & WOLF (1982).
Elemento asiático-mediterráneo. Bivoltina. Imagos: IX.

****Hyles (Danneria) livornica** (Esper, 1780)
Material estudiado: Rambla de la Granatilla, 6-IV-2010, 1 ♂.
Elemento cosmopolita. Bivoltina. Imagos: IV-VII.

****Hippotion celerio** (Linnaeus, 1758)
Material estudiado: Cerro de la Cruz, 4-IV-2015, 1 ♂.
Elemento tropical. Bivoltina. Imagos: IV.

Hippotion osiris (Dalman, 1823)
Citas bibliográficas: PÉREZ-DE GREGORIO *et al.* (2001).
Elemento tropical. Bivoltina.

DREPANIDAE
DREPANINAE

Watsonalla uncinula (Borkhausen, 1790)
Material estudiado: El Algarrobico, 8-I-2013, 1 ♂; El Saladero, 20-XI-2012, 1 ♂; Rambla de la Granatilla, 20-III-2010, 1 ♂.
Citas bibliográficas: ORTIZ *et al*. (2010).
Elemento asiático-mediterráneo. Bivoltina. Imagos: I-VIII, X-XII.

GEOMETRIDAE
LARENTIINAE

Antilurga alhambrata (Staudinger, 1859)
Material estudiado: Cañada del Madroñal, 31-X-2016, 1 ♂.
Citas bibliográficas: KRAUS (1997, 1999), GARRE *et al*. (2016).
Elemento atlanto-mediterráneo.

****Eupithecia senorita** Mironov, 2003
Citas bibliográficas: KRAUS (1999), GARRE *et al*. (2016) como *E. distinctaria* Herrich-Schäffer, 1848.

Elemento endémico.

ENNOMINAE

****Comsoptera jourdanaria*** (Serres, 1826)
Material estudiado: Rambla de Morales, 17-X-2015, 1 ♀.
Elemento atlanto-mediterráneo. Univoltina. Imagos: X-XI.

NOTODONTIDAE
CERURINAE

Cerura (Cerura) iberica (Templado & Ortiz, 1966)
Material estudiado: El Saladero, 3-III-2014, 1 ♂.
Elemento endémico. Univoltina. Imagos: III.

THAUMETOPOEINAE

****Traumatocampa pityocampa*** ([Denis & Schiffermüller], 1775)
Material estudiado: El Saladero, 16-IX-2013, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: VIII-X.

Helianthocampa herculeana (Rambur, 1840)
Material estudiado: El Saladero, 7-X-2012, 2 ♂♂.
Citas bibliográficas: HACKER & WOLF (1982), KRAUS (1997, 1999), FUENTES (2000a).
Elemento asiático-mediterráneo. Bivoltina. Imagos: IX-X.

NOLIDAE
NOLINAE

Nola thymula Millière, 1867
Material estudiado: Cerro de la Cruz, 16-II-2014, 1 ♂; El Algarrobico, 10-IX-2012, 1 ♂.
Citas bibliográficas: HACKER & WOLF (1982), OROZCO (1988), KRAUS (1997, 2000).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: I-VI, VIII-XII.

Nola chlamitulalis (Hübner, [1813])
Citas bibliográficas: KRAUS (1997, 2000).
Elemento asiático-mediterráneo. Bivoltina. Imagos: III, V.

Nola subchlamydula Staudinger, 1871
Material estudiado: Cerro de la Cruz, 17-III-2014, 1 ♂; El Saladero, 27-I-2013, 1 ♂; Rambla de la Granatilla, 20-III-2010, 1 ♂.
Citas bibliográficas: KRAUS (1997, 2000).
Elemento asiático-mediterráneo. Bivoltina. Imagos: I-VI.

Meganola togatulalis (Hübner, 1796)
Material estudiado: El Saladero, 31-VII-2012, 1 ♂; Rambla de la Granatilla, 16-VIII-2010, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: VI-X.

CHLOEPHORINAE

Garella nilotica (Rogenhofer, 1882)
Material estudiado: Rambla de Morales, 8-XI-2014, 1 ♀.
Citas bibliográficas: MAGRO (2013).
Elemento cosmopolita. Polivoltina. Imagos: X-XI.

Earias insulana (Boisduval, 1833)

Material estudiado: El Algarrobico, 20-V-2012, 1 ♂; 24-IX-2012, 1 ♀; El Saladero, 10-IX-2012, 2 ♂♂; 20-XI-2013, 1 ♀.

Citas bibliográficas: HACKER & WOLF (1982), KRAUS (1997), DANTART & CERVELLÓ (2008).

Elemento tropical. Polivoltina. Imagos: IV-V, VIII-XII.

EREBIDAE

RIVULINAE

Zebeeba falsalis (Herrich-Schäffer, 1839)

Material estudiado: El Saladero, 6-IV-2014, 1 ♂; Rambla de la Granatilla, 20-III-2010, 1 ♂; 23-VIII-2010, 1 ♂; 10-IV-2012, 1 ♀.

Citas bibliográficas: HACKER & WOLF (1983), MUÑOZ (1992), KRAUS (1997, 2000).

Elemento asiático-mediterráneo. Bivoltina. Imagos: II-XII.

HYPENINAE

Hypena (Ophiuche) lividalis (Hübner, 1790)

Material estudiado: El Saladero, 17-II-2013, 1 ♂; 10-III-2013, 1 ♂.

Citas bibliográficas: HACKER & WOLF (1983), KRAUS (2000).

Elemento cosmopolita. Bivoltina. Imagos: II-III, IX.

LYMANTRIINAE

****Ocneria (Ocneria) atlantica*** (Rambur, 1842)

Material estudiado: El Algarrobico, 20-V-2012, 1 ♀; 16-IX-2013, 1 ♀; El Saladero, 20-V-2012, 1 ♀; 10-IX-2012, 1 ♂; 1-VI-2013, 1 ♀; 6-IV-2014, 1 ♂; Rambla de la Granatilla, 9-VI-2009, 1 ♂; 20-V-2012, 1 ♂.

Elemento atlanto-mediterráneo. Bivoltina. Imagos: II-X.

Ocneria (Ocneria) rubea ([Denis & Schiffermüller], 1775)

Material estudiado: El Algarrobico, 3-VI-2012, 1 ♀; El Saladero, 19-V-2013, 1 ♂; Rambla de la Granatilla, 17-VIII-2010, 2 ♀♀; 20-VIII-2010, 1 ♂.

Elemento atlanto-mediterráneo. Univoltina. Imagos: V-X.

Albarracina warionis (Oberthür, 1881)

Material estudiado: El Algarrobico, 10-IX-2012, 1 ♂, 1 ♀; El Saladero, 20-V-2012, 2 ♂♂; 16-IX-2013, 1 ♂; Río Alías, 1-VII-2012, 1 ♂, 1 ♀.

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

Elemento asiático-mediterráneo. Polivoltina. Imagos: V-VII, IX-XI.

ARCTIINAE

Cymbalophora pudica (Esper, 1785)

Material estudiado: El Algarrobico, 24-IX-2012, 1 ♂.

Citas bibliográficas: MACIÀ & YLLA (2003a), MAGRO (2013).

Elemento atlanto-mediterráneo. Univoltina. Imagos: VIII-X.

Coscinia cribraria (Linnaeus, 1758)

Material estudiado: El Saladero, 10-IX-2012, 1 ♂, 1 ♀; Rambla de la Granatilla, 23-VIII-2010, 1 ♀; 10-IX-2012, 1 ♀.

Citas bibliográficas: HACKER & WOLF (1982), FUENTES (2000b), MACIÀ & YLLA (2003a).

Elemento paleártico. Bivoltina. Imagos: VIII-XI.

Utetheisa pulchella (Linnaeus, 1758)

Material estudiado: El Algarrobico, 3-VI-2012, 1 ♂; Río Alías, 1-VII-2012, 1 ♂.

Citas bibliográficas: MUÑOZ (1992), MACIÀ & YLLA (2003a), MAGRO (2013).
Elemento tropical. Bivoltina. Imagos: V-XI.

Paidia rica (Freyer, 1858)
Material estudiado: El Algarrobico, 3-VI-2012, 1 ♂; 10-IX-2012, 1 ♂; El Saladero, 16-IX-2013, 1 ♀; Rambla de la Granatilla, 8-VI-2009, 1 ♂, 2 ♀♀; 17-X-2012, 1 ♂; Río Alías, 1-VI-2013, 1 ♀.
Citas bibliográficas: HACKER & WOLF (1982), FUENTES (2000b), MACIÀ & YLLA (2003a).
Elemento atlanto-mediterráneo. Univoltina. Imagos: V-X.

**Pelosia plumosa* (Mabille, 1900)
Material estudiado: Rambla de Morales, 2-V-2014, 1 ♀.
Elemento tropical. Bivoltina. Imagos: V.

Apaidia mesogona (Godart, 1824)
Citas bibliográficas: KRAUS (1997, 2000), FUENTES (2000b).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: IV.

Eilema interpositella Strand, 1920
Material estudiado: Río Alías, 16-III-2013, 1 ♂.
Citas bibliográficas: MACIÀ & YLLA (1998, 2003a, b).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: II-X.

Eilema caniola (Hübner, [1808])
Material estudiado: El Algarrobico, 16-III-2013, 1 ♂.
Citas bibliográficas: MACIÀ & YLLA (2003a).
Elemento asiático-mediterráneo. Bivoltina. Imagos: II-XI.

Eilema complana (Linnaeus, 1758)
Citas bibliográficas: KRAUS (2000).
Elemento paleártico. Univoltina. Imagos: V.

Eilema sororcula (Hüfnagel, 1766)
Citas bibliográficas: AGENJO (1964), FUENTES (2000b), PÉREZ-DE GREGORIO *et al.* (2001).
Elemento euroasiático. Univoltina. Imagos: VIII.

HERMINIINAE

Nodaria nodosalis (Herrich-Schäffer, 1851)
Material estudiado: El Algarrobico, 10-III-2013, 1 ♂; 2-IV-2013, 1 ♂; El Saladero, 6-IV-2014, 1 ♂.
Citas bibliográficas: KRAUS (1997, 2000).
Elemento tropical. Bivoltina. Imagos: III-V, VIII, XI.

**Polypogon plumigeralis* (Hübner, [1825])
Material estudiado: El Pueblo Indalo, 26-IV-2011, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: IV.

TOXOCAMPINAE

***Lygephila (Lygephila) craccae* ([Denis & Schiffermüller], 1775)
Material estudiado: Rambla de Alfaix, 2-V-2009, 1 ♀.
Elemento euroasiático. Polivoltina. Imagos: II-VIII.

**Tathorhynchus exsiccata* (Lereder, 1855)
Material estudiado: Río Alías, 15-II-2015, 1 ♂.
Elemento tropical. Polivoltina. Imagos: II.

Autophila (Autophila) dilucida (Hübner, [1808])
Material estudiado: Cañada del Madroñal, 16-II-2014, 1 ♂; Río Alías, 17-II-2013, 1 ♀.
Citas bibliográficas: ORTIZ *et al*. (2010).
Elemento asiático-mediterráneo. Univoltina. Imagos: II-VII, X-XI.

Autophila (Cheirophanes) cataphanes (Hübner, [1813])
Material estudiado: El Algarrobico, 4-II-2013, 1 ♂; El Saladero, 2-V-2013, 1 ♂.
Citas bibliográficas: KRAUS (2000).
Elemento atlanto-mediterráneo. Univoltina. Imagos: II-V.

BOLETOBIINAE

Phytometra sanctiflorentis (Boisduval, 1834)
Material estudiado: Rambla de la Granatilla, 27-IV-2011, 2 ♂♂; 3-III-2014, 1 ♂.
Citas bibliográficas: KRAUS (1997, 2000).
Elemento endémico. Univoltina. Imagos: III-V, IX.

Raparna conicephala (Staudinger, 1870)
Material estudiado: El Algarrobico, 31-VII-2012, 1 ♂; Rambla de la Granatilla, 18-VIII-2010, 1 ♂.
Citas bibliográficas: KRAUS (1997, 2000).
Elemento asiático-mediterráneo. Bivoltina. Imagos: II, IV-X.

Odice pergrata (Rambur, 1858)
Material estudiado: Rambla de la Granatilla, 2-VIII-2012, 1 ♂; Rambla de Morales, 22-IV-2014, 1 ♂; Salinas de Cabo de Gata, 10-V-2013, 1 ♂.
Citas bibliográficas: ORTIZ *et al.* (2010).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: IV-X.

Odice jucunda (Hübner, [1813])
Material estudiado: El Saladero, 3-VIII-2012, 1 ♂.
Citas bibliográficas: ORTIZ *et al.* (2010).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: IV-IX.

***Eublemma candidana* (Fabricius, 1794)
Material estudiado: Rambla de la Granatilla, 8-VI-2009, 1 ♂; 17-VI-2012, 1 ♂; Río Alías, 1-VI-2013, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: V-VIII.

***Eublemma parva* (Hübner, [1808])
Material estudiado: Rambla de Alfaix, 12-VIII-2008, 1 ♂.
Elemento asiático-mediterráneo. Polivoltina. Imagos: I-III, VI-XI.

Eublemma cochylioides (Guenée, 1852)
Material estudiado: El Algarrobico, 31-VII-2012, 1 ♂; El Saladero, 10-IX-2012, 1 ♂; Rambla de la Granatilla, 9-VI-2009, 1 ♂; 7-IV-2010, 1 ♂; Río Alías, 2-V-2013, 1 ♂.
Citas bibliográficas: HACKER & WOLF (1983), MUÑOZ (1992), KRAUS (1997, 2000), YLLA & MACIÀ (2003), FIBIGER *et al.* (2010), MAGRO (2013).
Elemento tropical. Bivoltina. Imagos: II-XI.

Eublemma ostrina (Hübner, [1808])
Material estudiado: El Algarrobico, 1-VIII-2012, 1 ♂; 1-IX-2013, 1 ♂; Rambla de la Granatilla, 6-IV-2010, 1 ♂; Río Alías, 5-V-2013, 1 ♂.
Citas bibliográficas: HACKER & WOLF (1983), KRAUS (1997, 2000), MAGRO (2013).
Elemento asiático-mediterráneo. Polivoltina. Imagos: I-XII.

**Eublemma amoena* (Hübner, [1803])

Material estudiado: El Saladero, 5-VII-2014, 1 ♀.
Elemento asiático-mediterráneo. Bivoltina. Imagos: VII.

Eublemma albida (Duponchel, 1843)
Citas bibliográficas: FIBIGER *et al.* (2010).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: VII.

Eublemma pura (Hübner, [1813])
Material estudiado: El Algarrobico, 17-VI-2012, 1 ♂.
Citas bibliográficas: AGENJO (1964), HACKER & WOLF (1983).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: IV-X.

****Eublemma polygramma*** (Duponchel, 1842)
Material estudiado: Río Alías, 19-V-2013, 1 ♀.
Elemento asiático-mediterráneo. Bivoltina. Imagos: IV-VI.

****Eublemma scitula*** (Rambur, 1833)
Material estudiado: El Algarrobico, 3-VI-2012, 1 ♀; Río Alías, 8-V-2014, 1 ♀.
Elemento tropical. Polivoltina. Imagos: V-VI, VIII.

Rhypagla lacernaria (Hübner, [1813])
Material estudiado: El Algarrobico, 17-X-2012, 1 ♂; El Saladero, 7-X-2012, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: V, X.

****Metachrostis velox*** (Hübner, [1813])
Material estudiado: Rambla de la Granatilla, 7-IV-2010, 1 ♂; 10-IX-2012, 1 ♂; Río Alías, 1-IX-2013, 1 ♂.
Elemento asiático-mediterráneo. Polivoltina. Imagos: IV, VII-X.

EREBINAE

Pandesma robusta (Walker, 1858)
Material estudiado: El Algarrobico, 1-IX-2013, 1 ♂; El Saladero, 7-X-2012, 1 ♀; 17-X-2012, 1 ♂, 1 ♀; 2-XI-2012, 2 ♂♂.
Citas bibliográficas: GOATER *et al.* (2003).
Elemento tropical. Bivoltina: Imagos: VIII-XI.

****Catocala nymphaea*** (Esper, 1787)
Material estudiado: El Saladero, 17-VI-2012, 1 ex.
Elemento asiático-mediterráneo. Univoltina. Imagos: VI.

Catocala conversa (Esper, 1787)
Material estudiado: El Saladero, 1-IX-2013, 1 ♂.
Elemento asiático-mediterráneo. Univoltina. Imagos: V-VII.

****Catocala conjuncta*** (Esper, 1787)
Material estudiado: El Saladero, 8-VII-2013, 1 ♀.
Elemento asiático-mediterráneo. Univoltina. Imagos: VIII-IX.

****Ophiusa tirhaca*** (Cramer, 1777)
Material estudiado: El Algarrobico, 20-V-2012, 1 ♂; El Saladero, 16-IX-2013, 1 ♂; 5-X-2013, 1 ♀; 20-XI-2013, 1 ♂.
Elemento tropical. Bivoltina. Imagos: II-V, VII-XI.

Clytie (Clytie) illunaris (Hübner, [1813])
Material estudiado: El Algarrobico, 8-VIII-2012, 1 ♂; Rambla de la Granatilla, 17-VIII-2010, 2 ♂♂; 18-VIII-2010, 1 ♂; Rambla de Morales, 10-V-2013, 2 ♀♀.

Citas bibliográficas: KRAUS (1997, 2000).
Elemento atlanto-mediterráneo. Bivoltina. Imagos: III-VIII, X.

Dysgonia algira (Linnaeus, 1767)
Citas bibliográficas: KRAUS (1997, 2000).
Elemento asiático-mediterráneo. Bivoltina. Imagos: IV.

EUTELIIDAE

****Eutelia adulatrix*** (Hübner, [1813])
Material estudiado: El Saladero, 2-IV-2013, 1 ♂; 16-IV-2013, 4 ♂♂; 2-V-2013, 1 ♂; 19-V-2013, 1 ♂.
Elemento asiático-mediterráneo. Bivoltina. Imagos: III-VI, IX.

NOCTUIDAE

****Heliothis nubigera*** Herrich-Schäffer, 1851
Material estudiado: Cerro de la Cruz, 4-IV-2015, 1 ♂.
Elemento tropical. Bivoltina. Imagos: IV.

Cryphia (Euthales) pallida (Bethune-Baker, 1894)
Material estudiado: Rambla de Jayón, 22-VIII-2016, 1 ♂; 23-VIII-2016, 1 ♂.
Cita bibliográfica: HACKER & WOLF (1983), GARRE *et al*., (2018b).
Elemento atlanto-mediterráneo.

Bryophila (Moureia) microglossa (Rambur, 1858)
Material estudiado: Rambla de Morales, 9-X-2016, 1 ♀.
Citas bibliográficas: KRAUS (1997, 2000), GARRE *et al*., (2018b).
Elemento atlanto-mediterráneo.

Rhizedra lutosa (Hübner, [1803])
Material estudiado: Rambla de Morales, 17-X-2015, 3 ♂♂; 9-XI-2015, 3 ♂♂.
Elemento euroasiático. Univoltina. Imagos: X-XI.

Apamea arabs Oberthür, 1881
Material estudiado: Cañada del Madroñal, 27-IV-2016, 1 ♂.
Elemento atlanto-mediterráneo. Univoltina. Imagos: IV.

Saragossa seeboldi Staudinger, 1900
Material estudiado: Rambla de Morales, 17-X-2015, 2 ♂♂.
Citas bibliográficas: KRAUS (1997, 2000), MAGRO (2013), GARRE *et al*., (2018b).
Elemento atlanto-mediterráneo.

Agrotis lasserrei (Oberthür, 1881)
Material estudiado: Cañada del Madroñal, 31-X-2016, 1 ♂.
Citas bibliográficas: KRAUS (1997, 2000), MAGRO (2013), GARRE *et al*., (2018b).
Elemento asiático-mediterráneo.

Agrotis boetica (Rambur 1837)
Material estudiado: Playa del Charco, 8-XI-2014, 1 ♂; Rambla de Morales, 8-XI-2014, 1 ♂; 17-X-2015, 1 ♂; 9-XI-2015, 1 ♂.
Citas bibliográficas: KRAUS (1997, 2000), MAGRO (2013), GARRE *et al*., (en prensa).
Elemento atlanto-mediterráneo.

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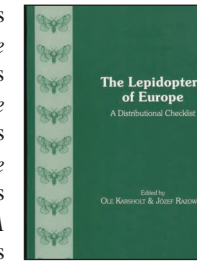

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Erpis Walker, 1863 a new record to the fauna of China (Lepidoptera: Crambidae)

W. C. Li

Abstract

The genus *Erpis* Walker, 1863 known originally from Sarawak of Malaysia is recorded from China for the first time. This genus contains a single species *Erpis macularis* Walker, 1863. It is redescribed in detail herein based on the specimen collected from Yunnan, southwestern China. The adult, tympanal organ and male genitalia are illustrated.
KEY WORDS: Lepidoptera, Crambidae, *Erpis macularis*, new record, redescription, China.

***Erpis* Walker, 1863 un nuevo registro para la fauna de China (Lepidoptera: Crambidae)**

Resumen

Se registra por primera vez para China el género *Erpis* Walker, 1863 conocido originalmente de Sarawak en Malaysia. Este género contiene una sola especie *Erpis macularis* Walker, 1863. Se redescribe en detalle basándose sobre el espécimen colectado en Yunnan, sudoeste de China. Se ilustran el adulto, órgano timpánico y genitalia del macho.
PALABRAS CLAVE: Lepidoptera, Crambidae, *Erpis macularis*, nuevo registro, redescripción, China.

Introduction

The *Erpis*, a genus of the subfamily Cybalomiinae Marion, 1955 (NUSS *et al*., 2018), was established with *Erpis macularis* Walker, 1863 as the type (WALKER, 1863). At present, the genus only contains the single species, which has compact labial palpi and is often mistaken for a member of the Arctiidae (Lithosiinae), and the thick wing scaling enhances this impression (ROBINSON *et al*., 1994). However, it is can be confirmed definitely as a Crambidae member, by using the morphological characters of tympanal organ and male genitalia.

In the present work, the genus *Erpis* is recorded from China for the first time. The redescription in detail of *E. macularis* Walker is given. The adult, tympanal organ and male genitalia are illustrated. The studied specimen is deposited in the Insect Museum, Jiangxi Agricultural University, Nanchang, China (JXAUM).

Erpis Walker, 1863

Erpis Walker, 1863: 133. Type species: *Erpis macularis* Walker, 1863, by monotypy.

Erpis macularis Walker, 1863 (Figs. 1-4)

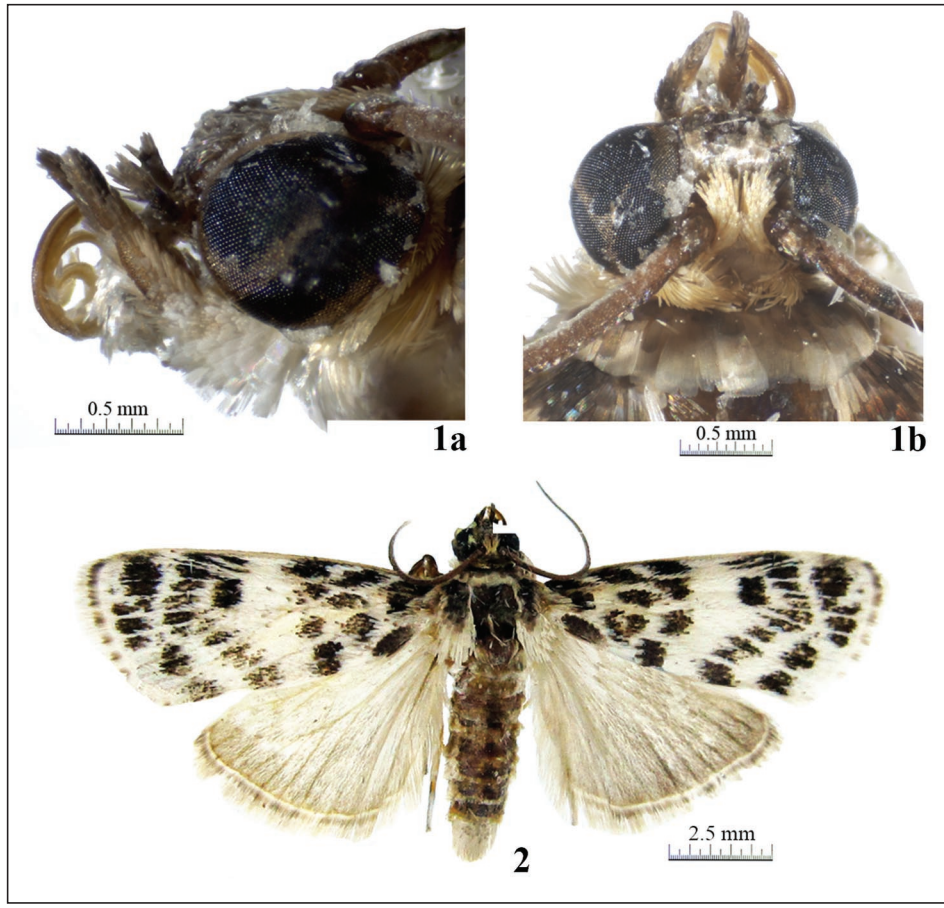
Erpis macularis Walker, 1863. *List spec. Lepidop. insects coll. Brit. Mus.*, **27**: 133; Robinson *et al*., 1994: 171, plate 29, fig. 1.

Type locality: Malaysia, Sarawak.

Type deposition: Natural History Museum, London.

Material examined: 1 ♂, CHINA, Yunan Province: Xishuangbanna, Mengla, Bubang [101º 34'E, 21º 36'N], ca. 700 m, 20-VIII-2014, leg. Weichun Li, prep. gen. LW17011.

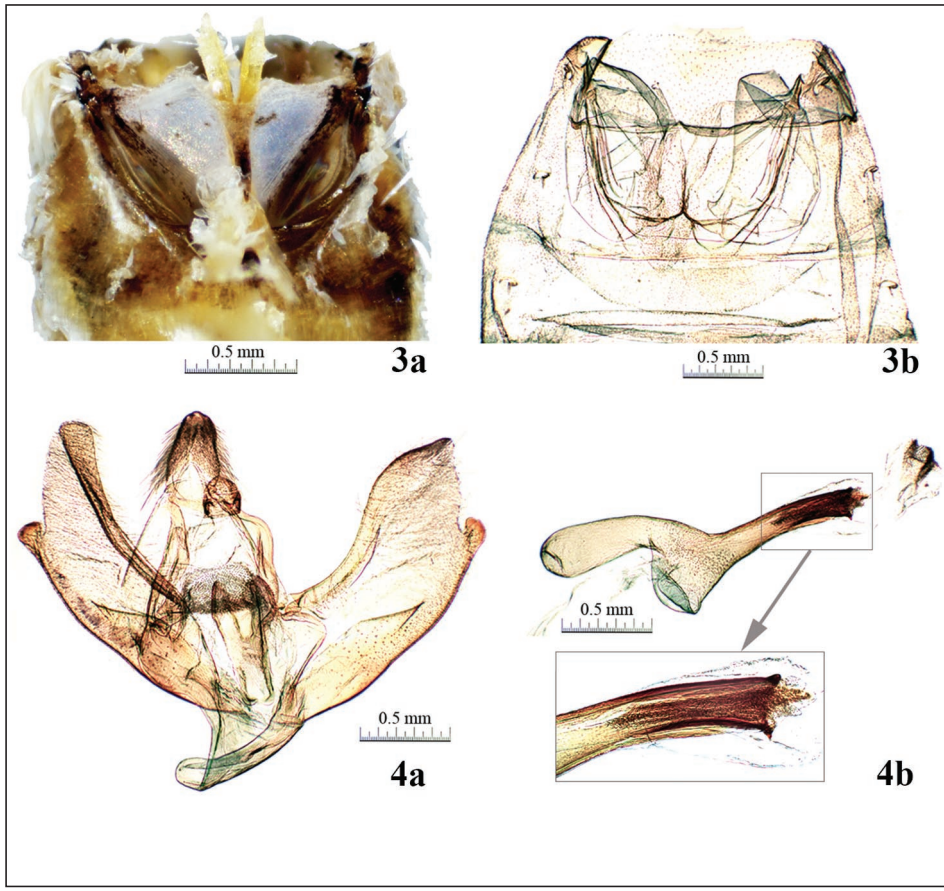
Redescription Adult (Figs. 1-2): Forewing length 8.5 mm. Frons and vertex pale brown mixed with white; two clusters of pale yellow scales between antennae. Labial and maxillary palpi upright, reaching beyond vertex, pale brown; basally ventral side of labial palpi densely covered with white scales. Antenna brown. Forewing ground colour white, decorated with black stigmata; base with two stigmata, costal one crescent-shaped, dorsal ovate; two lines of ovate stigmata between base and middle area, inner line consisted with three stigmata, and outer one having four stigmata; distal discoidal stigma nearly rectangular; postmedian and subterminal lines composed of stripe-like stigmata, and outcurve at about costal two fifths; fringe white mixed with pale brown. Hindwing greyish white, sparsely with pale brown scales; fringe concolourous with forewing. Abdomen brown mixed with black, distally white.



Figs. 1-2.– *Erpis macularis* Walker, **1a.** lateral view of head; **1b.** dorsal view of head; **2.** adult.

Tympanal organ (Fig. 3): Bulla tympani slightly concave on inner margin. Pons tympani divided into two branches at base. Saccus tympani extending to posterior slide of second tergite. Venula secunda reduced.

Male genitalia (Fig. 4): Uncus basal broad, distal half gently narrowed towards rounded apical tip. Gnathos ovate. Tegumen broad, about twice length of uncus. Valva with equal width at basal two thirds, distal part narrowed towards blunted rounded apex. Costa strongly sclerotized, reaching end of valva, concave near middle. Sacculus well-sclerotized, bearing triangular protuberance near middle, ending with ovate projection, reaching about distal one-third of valva. Juxta Y-shaped, distal half incised in V-shape. Saccus well-developed, basally broad and gradually becoming narrowed towards blunted rounded tip. Phallus nearly as long as valva, medial part curved and having sac-shaped protuberance, distal part densely covered with tiny spines, apical tip armed with two small spine-like projections; ductus ejaculatorius arising from base of sac-shaped protuberance.



Figs. 3-4.– *Erpis macularis* Walker, **3a.** tympanal organ before preparation; **3b,** tympanal organ after preparation; **4a,** ventral view of male genitalia and phallus removed; **4b.** phallus.

Female: Unavailable.

Biology: Only known the adults have been collected at light.

Distribution: China (Yunnan); Brunei, Indonesia, Malaysia.
Remarks: This species is recorded from China for the first time.

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Redescription of the genus *Alophonotus* Schoorl, 1990 based on the morphology of male and female genitalia (Lepidoptera: Cossidae)

R. V. Yakovlev & T. J. Witt

Abstract

Based on the study of male and female genitalia and the external habitus of *Chalcidica* (*Duomitus*) *rauana* Strand, 1909, the type species of the genus *Alophonotus* Schoorl, 1990, the genus *Alophonotus* is redescribed. Images of the type female, male genitalia, a new generic diagnosis, and a distribution map are given. *Alophonotus rauana* is indicated for the moth fauna of Cameroon, Ethiopia, Nigeria, and Uganda for the first time.
KEY WORDS: Lepidoptera, Cossidae, *Alophonotus*, fauna, Africa.

Redescripción del género *Alophonotus* Schoorl, 1990 basado sobre la morfología de la genitalia del macho y de la hembra (Lepidoptera: Cossidae)

Resumen

Se redescribe el género *Alophonotus* basado en el studio de la genitalia del macho y de la hembra y en la morfología externa de *Chalcidica* (*Duomitus*) *rauana* Strand, 1909, la especie tipo del género *Alophonotus* Schoorl, 1990. Se da el imago del tipo de la hembra, de la genitalia del macho, una nueva diagnosis genérica y un mapa de distribución. Se indica, por primera vez, *Alophonotus rauana* para la fauna de Camerún, Etiopía, Nigeria y Uganda.
PALABRAS CLAVE: Lepidoptera, Cossidae, *Alophonotus*, fauna, África.

Introduction

Carpenter moths (Lepidoptera, Cossidae) of Africa are relatively poorly studied. In particular, there are no morphological descriptions for a several genera, such as *Alophonotus* Schoorl, 1990, which was established for *Chalcidica* (*Duomitus*) *rauana* Strand, 1909. Unfortunately, SCHOORL (1990: 135-136, 140-142) did not provide descriptions of the genitalia for the genus described by him. He identified the following apomorphies of the thorax and wing venation: “Fringes short, R1 proximal to areole”. Having examined the holotype female and additional material from various African localities t, we give a detailed morphological description of male and female of the genus *Alophonotus* and summarize its distribution.

Material and methods

Material from the following collections were studied:

AMNH - American Museum of Natural History (New York, USA)
CMNH - Carnegie Museum of Natural History (Pittsburg, USA)

MNKB - Museum für Naturkunde, Leibniz Institut für Evolution und Biodiversitatsforschung, (Berlin, Germany)
MRAC - Museum Royal of Central Africa (Tervuren, Belgium)
MSW - collection of Manfred Ströhle (Weiden, Germany)
MWM - Museum of Thomas Witt (Munich, Germany)
RMM - collection of Raymond Murphy (Mzuzu, Malawi)
RYB - collection of Roman Yakovlev (Barnaul, Russia)

Genitalia slides were examined with a Zeiss Stemi 2000 C microscope and images were taken with the Olympus XC 50 camera.

Results

Genus *Alophonotus* Schoorl, 1990

Schoorl, 1990: 135-136.
Type species: *Chalcidica* (*Duomitus*) *rauana* Strand, 1909 (by monotypy)

Male redescription (figs. 1-8): Medium size, wingspan 40-56 mm. Antennae bipectinate in proximal half, simple in distal half, orange. Thorax covered with orange scales with three grey longitudinal lines from above, tegula orange, with two big round grey spots. Abdomen orange, with longitudinal dashed grey band dorsally and segments with round grey spots laterally. Fore wing narrow, grey, with pattern of small round orange spots uniformly distributed over the entire wing surface, apex sharp. Hind wing short, of the same pattern (but orange spots smaller than those on the fore wing).

Male genitalia (fig. 6): Uncus thick at base, sharply narrowing in medium third, distal third thin with sharp, beak like apex; gnathos arms ribbon-like, short, not fused; valves narrow, lanceolate, smoothly narrowing to apices, edges even; juxta robust, saddle-like, with wide leaf-like lateral processes directed dorsally; saccus poorly expressed, semi-circular; phallus robust, equal to valve in length, sharply bent in basal third; big spindle-like cornutus (1/2 of phallus) in vesica.

Female (figs. 1, 2, 5): Slightly bigger than male, wingspan 45-68 mm. Antennae simple, wings slightly wider than those of male, pattern on body and wings the same as in male.

Female genitalia: Papillae analis tapered, apophyses posterior 2,8 longer then apophyses anterior, ostium poorly submerged, bursa bag-like, without signa, small bag-like bulla stretching from bursa on long membranous ductus.

Diagnosis: *Alophonotus* clearly differs from the other genera of African Zeuzerinae Boisduval [1828] by the specific spotty pattern on the wings, poorly expressed sexual dimorphism, the uncus of the male genitalia sharply narrowing in the medium third, the poorly expressed saccus and the juxta with relatively short leaf-like lateral processes. SCHOORL (1990: 141) included the genus *Alophonotus* in "Section 2A - part 1" together with several Paleotropical and Neotropical genera: *Morpheis* Hübner, [1820] (type species - *Phalaena pyracmon* Cramer, 1782), *Xyleutes* Hübner, [1820] (type species - *Phalaena* (*Noctua*) *strix* Linnaeus, 1758), *Chalcidica* Hübner, [1820] (type species - *Phalaena* (*Bombyx*) *minea* Cramer, 1779), *Bergaris* Schoorl, 1990 (type species - *Xyleutes malayica* Roepke, 1957), *Rapdalus* Schoorl, 1990 (type species - *Zeuzera pardicolor* Moore, 1879); *Rugigegat* Schoorl, 1990 (type species - *Zeuzera nigra* Moore, 1877). The legitimacy of this association will be confirmed or refuted after a complete morphological and molecular genetic study of all Zeuzerinae genera.

Taxonomical notes: In the entomological collection of CMNH, we have found one male from Congo, marked as "holotype". There is no species determination on the labels. Probably, this specimen is one of non-described taxa, marked for the subsequent description by H. Clench. This specimen is not a considered a type and was incorrrectly accepted as the holotype of *A. rauana* (YAKOVLEV, 2011).

The genus currently is considered monotypic including only, *A. rauanus* , described from Tanzania (STRAND, 1909) based on the unique female. Later, Holland (1920) described from Congo (also based on a female) *Callocossus langi* Holland, 1920, which was synonymized by GAEDE (1930).

Alophonotus rauanus (Strand, 1909)
Chalcidica (*Duomitus*) *rauana* Strand, 1909: 130.
Type locality: DO Afrika [Tanzania], Kilimanjaro.
Type material (holotype female) in MNKB, examined.
= *Callocossus langi* Holland, 1920: 318–319.
Type locality: Faradje [Congo].
Type material (holotype female) in AMNH, examined.

Distribution: Angola, Ethiopia (new record), Cameroon (new record), Congo, Kenya, Malawi, Nigeria (new record), S. Africa, Ruanda (new record), Senegal, Sierra Leone, Southern Sudan, Tanzania, Uganda, Zambia, Zimbabwe (SCHOORL 1990; VÁRI ET AL., 2002; YAKOVLEV, 2011; 2014; YAKOVLEV, LENZ, 2013; YAKOVLEV, MURPHY, 2013; GOFF, 2018) (fig. 8).

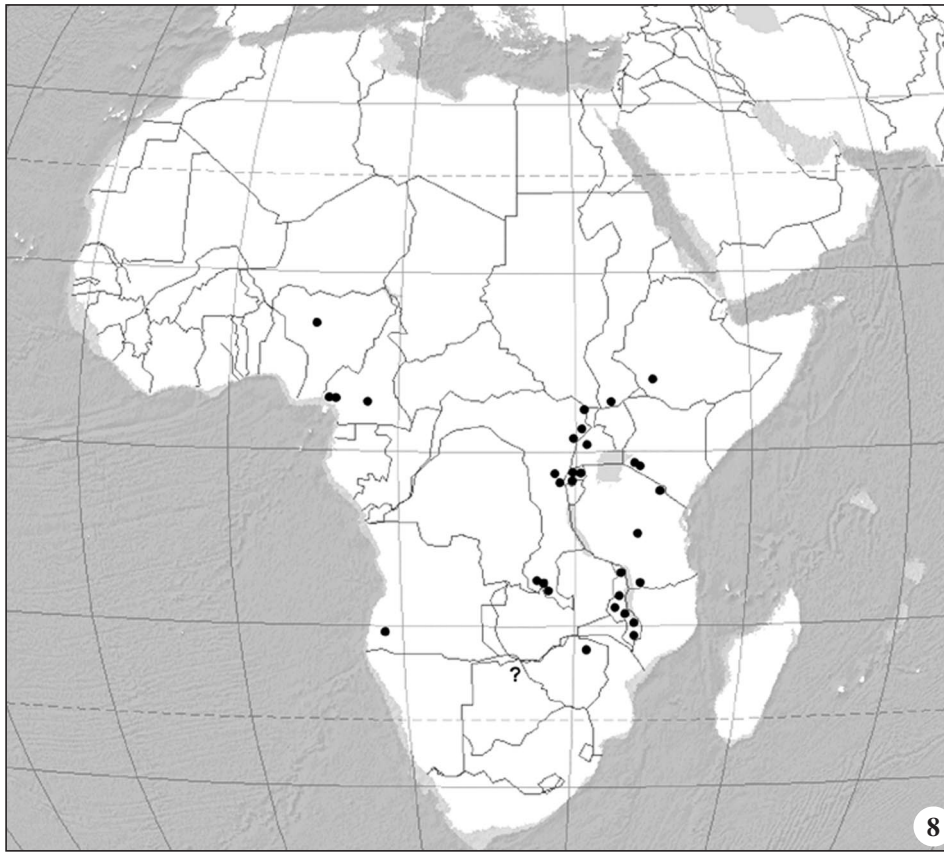

Fig. 8.– 8. Map of distribution of *Alophonotus rauanus.*

Material examined: 1 ♀ (holotype of *Chalcidica* (*Duomitus*) *rauana*), D. O. Africa, Rau Fl., Kilimandjaro, Mitte XI-1904, C. Uhlig S. G. (MNKB); 1 ♀ (holotype of *Callocossus langi*), Faradje, Congo, 29º 40' E; 3º 40' N, 3-IX-1912, coll. Lang & Chapin (AMNH); 1 ♂ ("holotype"), Congo Belge, Elisabethville, 17-III-1949, Ch. Seydel (CMNH); 1 ♂, Nkhorongo Mzuzu, Mzimba distr., 1375 m, N. Malawi, 8-III-2000, R. J. Murphy leg. (RMM); 1 ♂, lake Kazuni, Vwaza marsh game reserve, Rumphii distr., N. Malawi, 11-III-2010, leg. R. J. Murphy (RMM); 1 ♂, same locality, 5-IV-1997 (RMM); 1 ♂, same locality, 7-IV-1999 (RMM); 1 ♂, Mughese FR, Chitipa distr., N. Malawi, 8-18-VI-2002, leg. R. Murphy (RMM); 1 ♂, Dzalanyama forest, Lilongwe distr., C. Malawi, 21-27-III-2003, leg. R. Murphy (RMM); 7 ♂♂, S. Malawi, Mangochi District, 25 km E Mangochi, Manizimu Forest Reserve, Uzuzu Hill, 14º 24' 46" S 35º 22' 42" E, h 1010 m, 17-18-IV-2011, leg. R. Yakovlev (RYB); 1 ♂, Angola, Huila Prov., 10 km SW Cacula, 04-06-XI-2011, leg. P. Schüle (MSW); 3 ♂♂, Uganda, Itwara fst., Kyenjojo, I-2003 (MSW); 1 ♂, Kivu, Mwera, 3-IV-1957, R. P. de Caters (MRAC); 1 ♂, Elisabethville, III-1912, Miss Agric (MRAC); 1 ♂, Ruanda, Kisenyi, 21-IV-1957, Dr. M. Fontaine (MRAC); 1 ♂, Elisabethville, 17-II-1959, Ch. Seydel (MRAC); 1 ♂, Kivu, Rwankwi, 11-XI-1947, J. V. Leroy (MRAC); 1 ♂, Kibale, Iture, Nioka, 25-IV-1954, J. Hecq (MRAC); 1 ♂, Ruanda, Astrida, 10-X-1961, Allaerts (MRAC); 1 ♂, Kivu, Kagna, 3-V-1958, J. Hecq (MRAC); 2 ♂♂, Cameroun, Eloumden, 27-28-10-1992, Th. Bouyer (MRAC); 1 ♂, Cameroun, Mt. Kanu, 22-IV-1992, Th. Bouyer (MRAC); 1 ♂, Cameroon, Buea, 12-VI-1992, Rec. K. Maes (MRAC); 1 ♂, Katanga, Zilo, II-1969, Rec. V. Allard (MRAC); 2 ♂♂, Congo Belge, P. N. A., Secteur Nord, Ihumbia, affl.dr. Semliki, 920 m, 6-XI-1956, P. Vanschytbroeck (MRAC); 1 ♂, Lubumbashi, XII-1975, J. Thiry (MRAC); 2 ♂♂, Tanzania, Iringa Prov., Udzungava NP, campsite, 2400 m, 29-I-2005 (MWM); 1 ♂, Tanzania, Nord Mitomoni, South Tanz, 11º 28' S / 35º 18' E, 25-V-2010, leg. T. N. Chance & J. Cave (MWM); 1 ♂, N. Nigeria, Kadena, 4-X-1970, leg. Dr. Politzar (MWM); 14 ♂♂, 3 ♀♀, South Sudan, East Equatorial State, Akotos province, Lolibai Mts., 1300 m, 15-VIII-10-IX-2010, leg. Vladimir Gurko (MWM); 1 ♂, Kenya, Transmara, Lolgorien, 2000 m, IV-2000 (MWM); 4 ♂♂, Kenya, Transmara, Kilgoris, 1-15-XII-1996, leg. Dr. Politzar (MWM); 1 ♂, N. Zambia, Mutinodro, 1390 m, Miombe, 26-XII-2010, 12º 23.30' S, 31º 19.23' E, leg. J. Lenz (RYB); 1 ♂, Ethiopia, Godiam Prov., Mangushi vill., H - 900 m, 4-6-VIII-2017, O. Legezin leg. (RYB).

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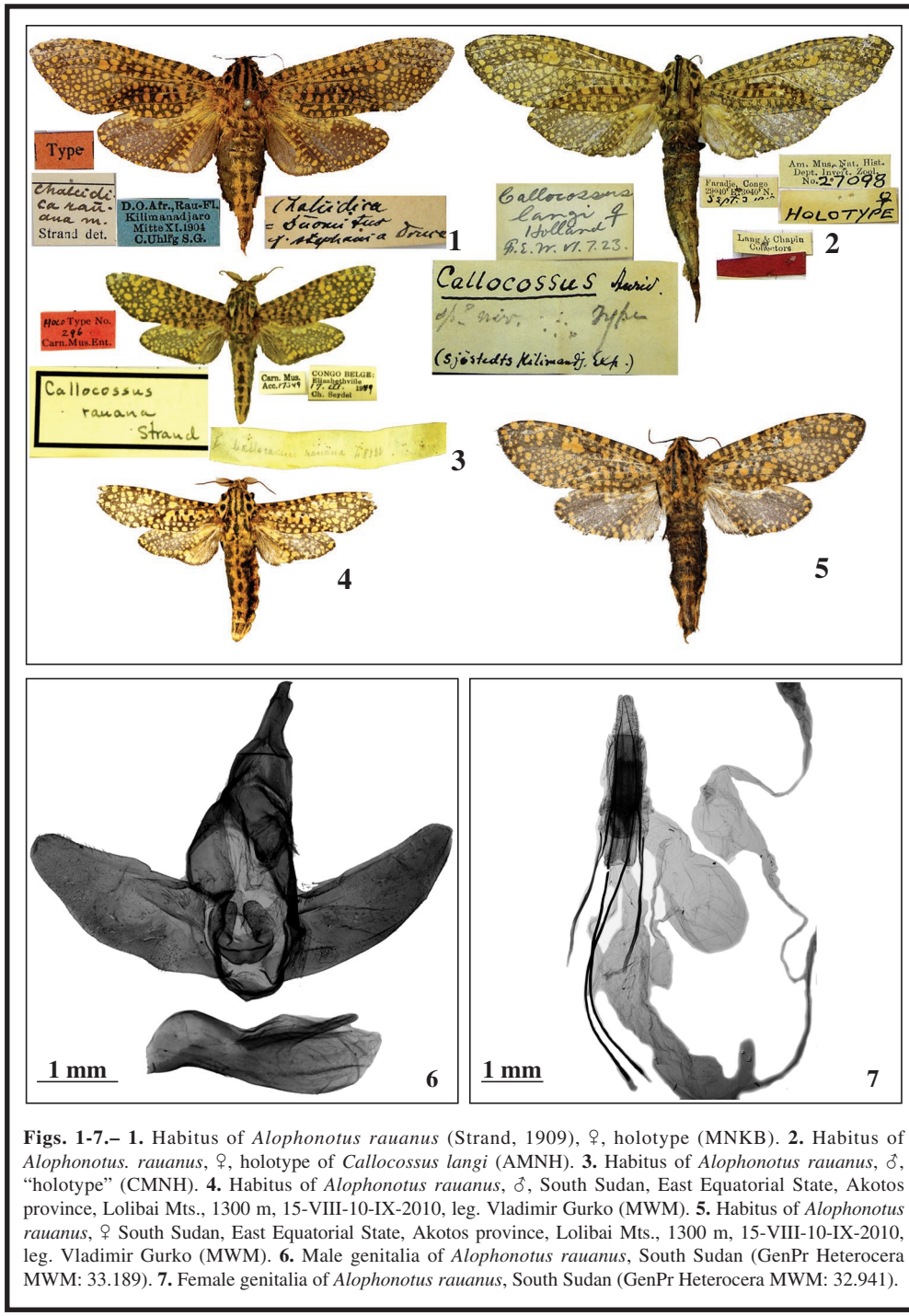

Figs. 1-7.– 1. Habitus of *Alophonotus rauanus* (Strand, 1909), ♀, holotype (MNKB). **2.** Habitus of *Alophonotus. rauanus*, ♀, holotype of *Callocossus langi* (AMNH). **3.** Habitus of *Alophonotus rauanus*, ♂, "holotype" (CMNH). **4.** Habitus of *Alophonotus rauanus*, ♂, South Sudan, East Equatorial State, Akotos province, Lolibai Mts., 1300 m, 15-VIII-10-IX-2010, leg. Vladimir Gurko (MWM). **5.** Habitus of *Alophonotus rauanus*, ♀ South Sudan, East Equatorial State, Akotos province, Lolibai Mts., 1300 m, 15-VIII-10-IX-2010, leg. Vladimir Gurko (MWM). **6.** Male genitalia of *Alophonotus rauanus*, South Sudan (GenPr Heterocera MWM: 33.189). **7.** Female genitalia of *Alophonotus rauanus*, South Sudan (GenPr Heterocera MWM: 32.941).

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On the butterflies of genus *Precis* Hübner, 1819 known in Angola, with description of a new species (Lepidoptera: Nymphalidae, Nymphalinae)

L. F. Mendes, A. Bivar-de-Sousa, S. Vasconcelos & L. F. Lopes

Abstract

Angolan samples of butterflies of genus *Precis* Hübner, 1819 are studied. One new species, *P. larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes, sp. n., is described from the Moxico, Cuanza Norte and Huambo provinces. *P. rauana* is reported as a faunistic novelty to the country based on specimens from the Uige province. New data are presented relatively to the remaining species of the genus already known for Angola.
KEY WORDS: Lepidoptera, Nymphalidae, Nymphalinae, *Precis*, new species, faunistic, new data, Angola.

Sobre las mariposas del genero *Precis* Hübner, 1819 conocidas en Angola y descripción de una nueva especie (Lepidoptera: Nymphalidae, Nymphalinae)

Resumen

Se estudian unas muestras de mariposas angolanas del género *Precis* Hübner, 1819. Se describe una especie nueva, *P. larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes, sp. n., de las provincias de Moxico, Cuanza Norte y Huambo. Se apunta *P. rauana* como una novedad faunística para el país basándose en ejemplares de la provincia de Uige. Se presentan nuevos datos con relación a las otras especies del género ya conocidas de Angola.
PALABRAS CLAVE: Lepidoptera, Nymphalidae, Nymphalinae, *Precis*, nueva especie, faunística, nuevos datos, Angola.

Sobre as borboletas do género *Precis* Hübner, 1819 conhecidas em Angola e descrição de uma espécie nova (Lepidoptera: Nymphalidae, Nymphalinae)

Resumo

Estudam-se amostras angolanas de borboletas do género *Precis* Hübner, 1819. Descreve-se uma espécie nova, *P. larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes sp. n. das províncias do Moxico, Cuanza Norte e Huambo. *P. rauana* é referida como uma novidade faunística com base em exemplares da província do Uige. Apresentam-se novos dados relativos às outras espécies do género já conhecidas de Angola.
PALAVRAS CHAVE: Lepidoptera, Nymphalidae, Nymphalinae, *Precis*, espécie nova, faunística, novos dados, Angola.

Introduction

Butterflies of the genus *Precis* Hübner, 1819 - the Commodores - occur exclusively in Africa and after WILLIAMS (2007b) 14 species are today known in the Afrotropical and 2 in the Madagascan Region - he reinforces the *incerta sedis* status of *Precis permagna* Martin, 1920, described from

Celebes, and notes that, if valid, it will correspond to a species of *Junonia*. Indeed, *Precis* and *Junonia* Hübner, 1819 were for long and by several authors (KIELLAND, 1970; D'ABRERA, 2004) considered synonymous but LARSEN (2005) and WILLIAMS (2007a) among others stress they differ in the male genitalia, in the caterpillars host-plants, in the geographical distribution, and in the existence of seasonal forms: *Junonia* extends to almost all the Zoogeographic Regions except for Antarctica, while *Precis* is restricted to Africa. *Junonia* caterpillars feed mostly on Acanthaceae though their known host-plants belong to ca twenty Dicotyledonous different families, but *Precis* caterpillars feed almost exclusively on Lamiaceae. And, opposite to *Junonia*, most of the *Precis* species are strongly seasonally dimorphic with dry season forms (DSF) and usually very different wet season forms (WSF); these later ones are often active on hilltops while the DSF rest on rocks or on protected banks - in populated places, even in building eaves - where they may diapause for as much as half a year. Further, WAHLBERG *et al.* (2005) demonstrate the complete independence of the two genera under the genetic point of view.

Besides the description of one new species from the Moxico, Cuanza Norte and Huambo provinces, and the reference of *P. rauana* as a faunistic novelty from Angola, in the Uige, the present contribution deals with the study of several other samples of *Precis* species already known for Angola which were obtained in almost all its provinces, what in many cases substantially enlarges their previous known range in the country, viz.: Bengo, Benguela, Bié, Huambo, Huila, Cuando-Cubango, Cuanza Norte, Cuanza Sul, Luanda, Lunda Norte, Lunda Sul, Malanje, Moxico and Uige, as well as the Cabinda Territory. The faunistic novelty and the new species described ahead added to the eight species of *Precis* previously known for Angola, increase to ten the number of taxa known in the country, what corresponds to ca 70 % of all the species of the genus currently noticed for continental sub-Saharan Africa.

Material and methods

The ca 400 *Precis* specimens studied are in their majority deposited in the Lisbon University' National Museum of Natural History and Science (MUHNAC in the text), which today stores several zoological collections till now dispersed, as follows: of the Centro de Zoologia - Instituto de Investigação Científica Tropical (CZ), extinct in 2016; of the second co-author (BS); of J. Passos de Carvalho (PC); of Carneiro Mendes (CM, long ago acquired by the CZ); of Pessoa Guerreiro (PG) offered also to the CZ; and of Mário Macedo (MM) offered to the MUHNAC. Two further collections were also studied, namely that of António Figueira (AF), now in the Oporto University' Natural History Museum, and the private collection of Nozolino de Azevedo (NA), not deposited in any institution. All the lepidopterological series hitherto deposited in the Zoological and Anthropological / Bocage' Museum (MB), the "ancestor" of the zoological part of the MUHNAC, were lost during the 28th March 1978 fire that almost completely burned its assets, most of them prior to any study could be performed.

The names of the localities presented ahead are those that were originally assigned to each species and the registration numbers are the original ones of the collections they integrate previous to their deposit in the MUHNAC.

The following abbreviations will appear also along the text: AS+RC - Collected by Artur Serrano and Ruben Capela; CDA: Offered to the CZ by the Dundo Museum, Companhia dos Diamantes de Angola (before, Diamang), Lunda; DRC: Democratic Republic of Congo, former Zaire; E - East, Eastern; EAU - Collected by the Missão de Estudos Apícolas do Ultramar of the CZ; ex - unsexed specimen; FW - Forewing; HW - Hindwing; M_1, M_2 and M_3 - First, second and third median veins; N - North, Northern; nn - not numbered sample; S - South, Southern; SE - South-eastern; SW - South-western; W - West, Western; WL - Forewing length.

The WL is measured along the FW costa from its apex to the anterior wing insertion in the thorax.

The samples reported by MONARD (1956), as in the La Chaux-de-Fonds Museum, near Neuchatel, Switzerland were not re-examined; they were collected by the Swiss Scientific Missions

(1928-1929 and 1932-1933) coordinated by himself. The same must be stated about the collection studied by LADEIRO (1956), deposited in the Coimbra' University Science Museum, Portugal.

BACELAR (1958b) assigns the samples she studied were deposited in the MB and noted as "Western Portuguese Africa"; they are reported as obtained by José de Anchieta and Francisco Newton but this last collector developed his field-work especially in the Guinea Gulf Islands; since only two *Precis* species are known in São Tomé e Príncipe, we assumed that the remaining data concern Angolan unknown localities; if still existed the 1978, none of them "survived" the MB fire. For true, the two first co-authors of the present contribution were already linked to the MB that year, and no information was retained about any African *Precis* samples.

The Cabinda collection said to be deposited (BACELAR, 1958a) in the Forest Service of Angola (in Luanda?) and that of the Bié, reported to be (BACELAR, 1961) in the São Bento College-Lyceum in Luso, Moxico are considered lost as none recent data confirms its present existence; so, none data could be rectified.

In 1995 and 2013 no insect series included the Angolan Natural History Museum collection, in Luanda, visited then by the senior co-author.

None contribution is known, further, relatively to the Nymphalidae specimens deposited in the Dundo Museum (Lunda Norte) as the only paper produced on the Angolan butterflies preserved in this institution is that of CARVALHO (1962), and deals exclusively with the Papilionidae. The second co-author visited this museum in 1965 and the first one integrated a zoological mission to this institution in 1995 but the time revealed too short to any precise analyses of the lepidopterans series; the collections were, then, in good condition. Recent information points to this institution clear recuperation but no details are known concerning its entomological collection. None of the authors had the chance to visit the other large entomological collection known to exist in Angola, that of the Huambo's Agronomical Institute (the Instituto de Investigação Agronómica de Angola, IIAA) maintained mainly by J. Passos de Carvalho during colonial times; recent news about its current condition, communicated by Luis Ceríaco, informed that it remains in quite good condition.

Most of the known host-plants references are based in WILLIAMS (2007b) and SAVELA (2010).

The administrative provinces and the approximate coordinates of the localities where or close to which the studied and the previously reported *Precis* specimens were collected, are alphabetically ordered in Table 1 based in CRAWFORD-CABRAL & MESQUITELA (1986), MENDES *et al.* (2013) and in the JIU/GGA (1948-1963a, b) maps.

Table I.– Administrative provinces and approximate coordinates of the Angolan localities from where or close to which *Precis* samples were studied in the present contribution and previously reported - Long: Longitude; Lat: Latitude; Alt: Altitude in meters above sea level; Map: Number of the aerophotogrammetric maps of Angola, scale 1:100 000 (see MENDES *et al*., 2013). Localities which names were modified after independence - recovered name - or incorrectly spelt are set out for their actual denomination as: "See: …". The "Four corners area", from where GARDINER (2004) registers several species corresponds to a region in the extreme SE Cuando-Cubango and so, no precise coordinates can be pointed. The Bulla mission was impossible to trace, as it is neither considered in the USBGN (1956), nor in the recent lists of collecting localities in Angola (CRAWFORD-CABRAL & MESQUITELA, 1986; MENDES *et al.*, 2013), nor even in the JIU/GGA (1948-1963a, b) maps, though it shall be SE of the Lucusse town. Otherwise, "Malanje / Rio Cuanza" corresponds to an immense fluvial corridor since the river is the NW limit of the Kwanza Norte province, it crosses N to SE the Malanje province, and constitutes its S limit with the Bié, along ca 500 km. so it remains impossible to locate accurately; the same must be considered relatively to the "Malanje / Rio Lucala", while probably close to the Lucala town.

Locality	Province	Long.	Lat.	Alt.	Map
Amboiva	Cuanza Sul	11º 32' S	14º 44' E	1250	208
Béu	Uige	06º 14' S	15º 29' E	900	23
Bimbe	Huambo	11º 49' S	15º 59' E	1780	210
Bimbi	See: Bimbe	—	—	—	—
Buco Zau	Cabinda	04º 46' S	12º 34' E	50	3

Bulla (mission)	Moxico	?	?	?	?
Caala	Huambo	12º 51’ S	15º 33’ E	1750	256
Calombe / Luso	Moxico	11º 50’ S	19º 55’ E	1360	218
Calulo	Cuanza Sul	09º 59’ S	14º 54’ E	990	128
Caluquembe	Huila	13º 47’ S	14º 41’ E	1700	297
Cameia	Moxico	11º 43’ S	20º 48’ E	1140	220
Camenhe	Huambo	13º 17’ S	15º 27’ E	1750	279
Ceilunga	Bié	12º 17’ S	17º 01’ E	1690	235
Cela	Cuanza Sul	11º 22’ S	15º 07’ E	1330	187
Chiaca	Cabinda	04º 52’ S	12º 34’ E	120	3
Chianga	Huambo	12º 44’ S	15º 50’ E	1740	256
Chilunda	Huila	14º 28’ S	15º 30’ E	1450	320
(Roça) Chitonde	Cuanza Sul	11º 46’ S	14º 07’ E	900	207
Cristo Rei, Lubango	Huila	14º 56’ S	13º 31’ E	2100	336
Cubango	Huila	14º 23’ S	16º 17’ E	1450	321
Cuima	See: Quima	—	—	—	—
Cuíto	Bié	12º 23’ S	16º 57’ E	1450	234
Cunjo to Amboiva	Cuanza Sul	11º 25’ S	14º 45’ E	1700	186
Dalatando	Cuanza Norte	09º 18’ S	14º 55’ E	790	110
Damba	Uige	06º 40’ S	15º 08’ E	1110	33
Dongo	Huila	14º 36’ S	15º 43’ E	1460	340
Dundo	Lunda Norte	07º 22’ S	20º 50’ E	1470	51
Ebanga	Benguela	12º 44’ S	14º 44’ E	1350	254
Elendé	Huambo	12º 44’ S	15º 09’ E	1700	255
Estação Zootécnica	Huila	14º 55’ S	13º 16’ E	2280	335
Four corners area	Cuando-Cubango	?	?	?	?
Funda	Luanda	08º 50’ S	13º 33’ E	<50	90
Ganda	Benguela	13º 02’ S	14º 38’ E	1260	278
Golungo Alto	Cuanza Norte	09º 08’ S	14º 46’ E	630	110
Henrique de Carvalho	See: Saurimo	—	—	—	—
Huambo	Huambo	12º 46’ S	15º 44’ E	1650	256
Humpata	Huila	15º 01’ S	13º 23’ E	1940	355
Kalukembé	See: Caluquembe	—	—	—	—
Kinglês	Malanje	09º 23’ S	16º 07’ E	1120	113
(Fazenda) Klein	Cuanza Sul	10º 02’ S	14º 54’ E	1040	147
Kuvangu	See: Cubango	—	—	—	—
Lago Dilolo	Moxico	11º 30’ S	22º 01’ E	1100	223
Lago Muginatema	Moxico	11º 47’ S	23º 38’ E	1260	226
Lago 28 de Maio	See: L. Muginatema	—	—	—	—
Lagoa do Gima	Cabinda	05º 20’ S	12º 20’ E	120	5
Longa	Cuando-Cubango	14º 36’ S	18º 29’ E	1380	345
Luau	Moxico	10º 42’ S	22º 14’ E	1100	180
Luena	Moxico	11º 47’ S	19º 55’ E	1300	218
Lumeje	Moxico	11º 33’ S	20º 47’ E	1150	220
Luso	See: Luena	—	—	—	—
Malange	See: Malanje	—	—	—	—
Malanje / Rio Cuanza	Malanje	?	?	?	?
Malanje / Rio Lucala	Malanje	?	?	?	?
Mukoti	Huila	14º 12’ S	15º 48’ E	1430	320

Mumbué / Chitembo	Bié	13º 49' S	17º 19' E	1550	303
Muquitixe	Cuanza Sul	10º 25' S	14º 57' E	1240	147
Ndongo	See: Dongo	—	—	—	—
Negage	Uige	07º 46' S	15º 16' E	1260	59
Nova Lisboa	See: Huambo	—	—	—	—
Osi	See: Osse	—	—	—	—
Osse	Huila	15º 05' S	15º 25' E	1190	359
Panguila, Morro da Cal	Bengo	08º 42' S	13º 27' E	<50	89
Quima	Huambo	13º 23' S	15º 30' E	1580	279
Quiminha	Bengo	08º 58' S	13º 47' E	120	90
Quingles	See: Kinglês	—	—	—	—
Sacaála	See: Caála	—	—	—	—
Salazar	See: Dalatando	—	—	—	—
Sangevé	See: Sangueve	—	—	—	—
Sangueve	Huila	13º 53' S	15º 50' E	1640	300
Satchijamba / Chitembo	Bié	13º 45' S	17º 10' E	1580	303
Saurimo	Lunda Sul	09º 39' S	20º 24' E	1070	139
Silva Porto	See: Cuito	—	—	—	—
(Fazenda) Stª Cruz	Moxico	11º 46' S	20º 06' E	1280	219
Teixeira de Sousa	See: Luau	—	—	—	—
Tentativa	Bengo	08º 36' S	13º 36' E	<50	90
Tombole	Cuando-Cubango	14º 33' S	15º 32' E	1400	342
Tumbolé	See: Tombole	—	—	—	—
Tundavala	Huila	14º 50' S	13º 24' E	2200	335
Tyitunda	See: Chilunda	—	—	—	—
Vila Luso	See: Luena	—	—	—	—
Xa-Sengue	Lunda Norte	10º 27' S	18º3 1' E	1300	155

Taxonomic study

Precis octavia sesamus Trimen, 1883 (Figs. 1-4)

Material examined: BENGO: Panguila, Morro da Cal, VII-1957, 1 ♀ (CZ-2853). Quiminha, XII-1970, 1 ex (AF-NY690052). Tentativa, VIII-1971, 1 ex (AF-NY690054); IX-1971, 1 ex (AF-NY690056); XII-1971, 1 ex (AF-NY690058); II-1973, 2 ex (AF-NY690060, AF-NY690061). BIÉ: Mumbué / Chitembo, IV-2014, AS+RC 1 ♂ (BS-33359). Silva Porto, X-1957, EAU, 1 ♂ (CZ-2941). HUAMBO: Camenhe, XI-2015, AS+RC 1 ♂ (BS-34982). Chianga, II-1971, 1 ♂ (PC); I-1972, 1 ♂ (PC); III-1972, 1 ♂ (PC); IV-1972, 1 ♂ (PC); VII-1972, 3 ♂♂ (PC); III-1975, 1 ♂ (PC); V-1975, 1 ♂ (PC); VI-1975, 2 ♂♂ (PC); VII-1979, 1 ♂ (PC). Nova Lisboa, II-1964, 1 ♂ (NA); III-1964, 6 ♂♂, 1 ♀ (NA); IV-1964, 5 ♂♂, 2 ♀♀ (NA); V-1964, 4 ♂♂, 2 ♀♀ (NA); VI-1964, 3 ♂♂, 2 ♀♀ (NA); VII-1964, 2 ♂♂ (NA); XII-1964, 2 ♂♂ (NA); I-1965, 1 ♂, 1 ♀ (NA); III-1965, 1 ♂ (NA); IV-1965, 1 ♂, 1 ♀ (NA); V-1965, 1 ♂ (NA); VI-1965, 1 ♂ (NA); XII-1965, 1 ♀ (NA); I-1966, 1 ♂ (NA); II-1966, 1 ♂, 1 ♀ (NA); III-1966, 1 ♂ (NA); V-1967, 1 ♂, 1 ♀ (NA); VI-1967, 5 ♂♂, 1 ♀ (NA); VIII-1967, 1 ♂ (NA); I-1970, 2 ♂♂ (NA); II-1970, 9 ♂♂, 5 ♀♀ (NA); III-1970, 2 ♂♂, 1 ♀ (NA); IV-1970, 1 ♂ (NA); V-1970, 9 ♂♂, 7 ♀♀ (NA); VI-1970, 4 ♂♂ (NA); ?-1970, MM, 2 ♂♂, 1 ♀ (MUHNAC-5166-5168); I-1971, 14 ♂♂, 3 ♀♀ (NA); II-1971, 1 ♂, 1 ♀ (NA); III-1971, 1 ♀ (NA); I-1072, 1 ♂ (PC). Sacaála / Nova Lisboa, VII-1958, 3 ♀♀ (CZ-3053, CZ-3057). HUILA: Tundavala, VIII-1972, 1 ex (AF-NY5690059). CUANDO-CUBANGO: Longa, III-1960, 1 ♂ (CM). CUANZA NORTE: Golungo Alto?-1962, MM, 1 ♂ (MUHNAC-17331). CUANZA SUL: Amboiva, I-1963, 2 ♂♂ (BS-17092, BS-17093). Cela, VIII-1970, 1 ex (AF-NY590051). Fazenda Klein / Calulo, XII-2015, AS+RC 1♀ (BS-34983). Muquitixe, IV-1974,

1♂ (PC). Roça Chitonde, XI-1971, 1 ex (AF-NY590057). Cunjo to Amboiva, I/1963, 1 ♂ (BS-17094). LUANDA: Funda, XII-1969, 1 ex (AF-NY690050); XII-1970, 1 ex (AF-NY690053). MALANJE: Kinglês (Lombe to Calandula), XI-2015, AS+RC 1 ♀ (BS-34984). MOXICO: Calombe / Luso, XII-1962, EAU, 1 ♀ (CZ-3326). Lago 28 de Maio (Alto Zambeze), VII-1959, 1 ♀ (CZ-3205). Lumeje, II-1965, 1 ♂ (BS-17084); IV-1965, 19 ♂♂, 1 ♀ (BS-17069 to BS-17082, BS-17086 to BS-17091); V-1965, 1 ♀ (BS-17083). Teixeira de Sousa, III-1965, 1 ♀ (BS-17085). Vila Luso, EAU, IX-1957, 4 ♀♀ (CZ-2881, CZ-2883, CZ-2890); VI-1972, 1 ♀ (BS-17248). Further, the PC collection integrates 9 non-labelled Angolan ♂.

DRUCE (1875) informs that the species occurs in the country; BACELAR (1958b, as *P. o.* f. *natalensis* Str. and as *P. octavia* f. *amestris* - synonym correspondent to the WSF), assigns "Angola" and later (BACELAR, 1961) reports the Bié province without details; LADEIRO (1956, as *P. sesamus*) registers Bulla (Moxico), Bimbe, and (as *P. natalensis*) Malanje / Rio Lucala and Xa-Sengue; MONARD (1956) assigns Kalukembé and Kuvangu (DSF) and Kalukembé, Tyitunda, Sangevé and Ebanga (WSF, as *P. octavia natalensis*) plus Tumbolé, Bimbi and Elendé; GARDINER (2004, sub *Junonia*) adds the "Four corners area"; and WILLIS (2009) points material from the Estação Zootécnica da Huila and the Cristo Rei.

The species ranges from Angola, DRC, Uganda and Kenya to South Africa (Limpopo, Mpumalanga, North West Province, Gauteng, KwaZulu-Natal, Eastern Cape), Botswana and Namibia - AURIVILLIUS (1928), ACKERY *et al*. (1995), D'ABRERA (2004), WILLIAMS (2007b).

The Gaudy Commodore is known in damp woody areas with stones and in forest edges and the known host-plants belong to genera *Coloeus*, *Iboza*, *Plectranthus*, *Pycnostachis*, *Rabdosiella*, *Solenostemom* (Lamiaceae) and *Eriosema* (Fabaceae).

P. octavia is the commonest and widest distributed *Precis* in Angola being one of the most seasonally dimorphic species in the country. DSF and WSF co-exist at least in Lumeje (in April) and Huambo (in March and July) and in the Huambo the imagos fly all the year around, though they are more abundant in the middle rains. The name f. *sesamus* is often applied to the DSF and the name f. *natalensis* to the WSF. After COLLINS (2015), intermediate forms are known.

Precis ceryne ceryne (Boisduval, 1847) (Figs. 5-8)

Material examined: BIÉ: Ceilunga, IV-1072, 1 ♂ (PC). Mumbué / Chitendo, II/2014, AS+RC 1 ♂ (BS-34804). HUAMBO: Chianga, I-1972, 1 ♂ (PC); III-1972, 1 ♂ (PC); V-1972, 2 ♂♂ (PC); VII-1972, 1 ♂ (PC); III-1975, 1 ♂ (PC). Nova Lisboa, IV-1064, 2 ♂♂, 2 ♀♀ (NA); V-1964, 2 ♂♂, 2 ♀♀ (NA); VI-1964, 1 ♂ (NA); V-1965, 2 ♂♂ (NA); V-1966, 2 ♂♂ (NA); V-1967, 1 ♂ (NA); V-1968, 1 ♂ (PC); IV-1970, 1 ♀ (NA); V-1970, 1 ♀ (NA); ?-1970, MM, 1 ♂ (MUHNAC-5163); V-1972, 2 ♂♂ (PC). CUANZA SUL: Cela, III-1971, 1 ♂ (PC); III-1974, 1 ♂ (PC). MOXICO: Lago Dilolo, IX-1958, EAU, 2 ♂♂ (CZ-3075), 1 ♂ (CZ-3076), 1 ♂ 1ex (CZ-3078). Lumeje, IV-1965, 3 ♂♂ (BS-17516-17518); V-1965, 6 ♂♂ (BS-17520-17525). Teixeira de Sousa, III-1965, 1 ♂ (BS-17515). UIGE: Damba, VI-1962, 1 ♂ (BS-17513). Negage, III-1973, 2 ex (AF-NY690001-690002). The PC collection integrates also one non-labelled ♂.

DRUCE (1875), AURIVILLIUS (1928), BACELAR (1958b), FOX (1968) and LARSEN (2005) point the species for Angola though no precise locality is assigned. BACELAR (1961) registers the Bié province upon material said to have been deposited in the Luso's São Bento College-Lyceum, MONARD (1956) reported Kuvangu, Mukoti, Sangevé, Bimbi and Elendé and BACELAR (1958a) assigns Chiaca.

The species is known to fly in Angola, DRC, Kenya, Uganda, Swaziland, South Africa (Limpopo, Mpumalanga, North West Province, Gauteng, KwaZulu-Natal and Eastern Cape) and Ethiopia.

The Marsh Commodore occurs in swampy and marshy high areas and the known host-plants are species of *Coloeus*, *Platostema*, *Plectranthus*, *Pycnostachis* (Lamiaceae) and *Scabiosa* (Dipsacaceae).

One re-examined male from Buco Zau deposited in the CZ and identified by BACELAR (1956) as *P. ceryne* is, for true, a specimen of *Precis pelarga* (see ahead); the Chiaca material registered later (BACELAR, 1958a) is almost certainly lost as happened with the whole MB collection in the 1978 fire

(BACELAR, 1958b); their identification was never rectified, implying that the real presence of the species in Cabinda remains uncertain. The same must be stated about the Bié province and the (also disappeared?) only specimen assigned from there (BACELAR, 1961). The DSF is often known as f. *tukuoa* and the WSF as f. *ceryne*.

Precis antilope (Feisthamel, 1850) (Figs. 9-12)

Material examined: BENGO: Tentativa, VIII-1971, 1 ex (AF-NY68920). HUAMBO: Chianga, V-1072, 1 ♂ (PC); II-1975, 1 ♂ (PC). Nova Lisboa, V-1964, 1 ♂ (NA); V-1965, 1 ♂ (NA); V-1967, 1 ♂ (NA); I-1970, 1 ♀ (NA); V-1970, 5 ♂♂ (NA). Quima, XI-2015, AS+RC 1 ♂ (BS-34981). CUANZA SUL: Muquitixe, II-1971, 1 ♂ (PC). LUNDA SUL: Henrique de Carvalho, VIII-1962, 1♀ (BS-17694); IX-1963, MM, 1♂ (MUHNAC-17322). Two DSF ♂ with no locality and no date - numbered as 76 and 77 - integrates, further, the PC collection.

MONARD (1956) points the species to Osi and Ndongo. BACELAR (1961) assigns the Bié province unknown locality - upon material said to be in the Luso Lyceum. GARDINER (2004, sub *Junonia*) notices the Angolan "Four corners area".

P. antilope flies along almost all the Sub-Saharan Africa and SW Arabia.

The Darker Commodore occurs in sub-arid bush, savanna and Brachystegia wood, though it sometimes enters forest; the caterpillars are known in *Platostema* and *Plectrantum* species (Lamiaceae).

The studied samples were obtained all along the year. After BRAUN (2013) the species flies in Swaziland from December to March (rains and beginning of the dry season) while WILLIAMS (2007b) reports December to July for South Africa. The DSF and the WSF are often known, respectively, as f. *antilope* and f. *simia*.

Precis pelarga (Fabricius, 1775) (Figs. 13-16)

Material examined: BENGUELA: Ganda, VII-1956, 1 ♂ (PC). BIÉ: Satchijamba / Chitembo, XI/2014, AS+RC 1 ♀ (BS-33457); XI/2015 1 ♂ (BS-34980). CABINDA: Pathway to Lagoa do Gima, III-1972, 1 ♀ (PG-0151). CUANZA NORTE: Golungo Alto, ?-1962, MM, 2 ♂♂, 2 ♀♀ (MUHNAC-17325, 17327, 17329). CUANZA SUL: Calulo, III-1972, 1 ♂ (BS-17264). Fazenda Klein / Calulo, XII-2015, AS+RC 1 ♂ (BS-34985). Roça Chitonde, III-1972, 1 ♂ (BS-17261). LUNDA NORTE: Dundo, V-1946, CDA, 1 ♂ (CZ-803). MOXICO: Cameia, VIII-1958, EAU, 1 ♂ (CZ-3064). Fazenda Santa Cruz / Luso, X-1958, EAU, 1 ♂ (CZ-3037). Lumeje, V-1965, 1♂ (BS-17519). UIGE: Damba, VI-1962, 1 ♂ (BS-17512); VII-1962, 1 ♂ (BS-17514). The following NA samples obtained in Nova Lisboa, all representatives of the WSF, are also considered to enter the present species despite their genitalias could not be rectified: III-1964, 2 ♂♂, 1 ♀; IV-1964, 2 ♂♂, 1 ♀; V-1964, 8 ♂♂, 6 ♀♀; VI-1964, 2 ♂♂, 2 ♀♀; VII-1964, 1 ♂; IV-1965, 2 ♀♀; V-1965, 3 ♂♂, 1 ♀; V-1967, 1 ♂, 1 ♀; VIII-1967, 1 ♀; II-1970, 2 ♀♀; IV-1970, 1 ♂, 2 ♀♀; V-1970, 3 ♂♂, 3 ♀♀; VI-1970, 3 ♂♂, 1 ♀; II-1971, 1 ♂,1 ♀; III-1971, 1 ♂.

The species was noticed to Angola only once, for Malange / Rio Cuanza LADEIRO (1956).

The species known range extends from Senegal to Angola and to Ethiopia and BERGER (1981) reports relatively to the DRC that it occurs "pratiquement partout, mais moins abondant au Shaba".

The Fashion Commodore flies in forest, in dense Guinea savanna as well as in deciduous and *Brachystegia* woods; it may appear also in degraded biotopes as suburban gardens and the caterpillars feed usually on *Plectranthus* and *Solenostomum* (Lamiaceae) though they are also known on cacao - *Theobroma cacao* (Malvaceae).

The PG specimen from near the Lagoa do Gima was misidentified by its collector as *Precis tugela trimeni* - handmade label, never published.

LARSEN (1996) considers, due to their similarity, that *P. pelarga* includes two subspecies, *P. pelarga actia* (see next taxon) and *P. pelarga pelarga*, and notes that in Kenya they will interbreed but after KIELLAND (1990) they occur sympatrically in Tanzania and so, they certainly deserve a specific status; RICHARDSON (2013) based on Zambian populations, accepts also they shall belong to two independent species, and points morphological dissimilarities in the FWD dark maculation and in the

male genitalia though he considered that there is a lot of variation and some specimens are extremely difficult to identify.

P. pelarga and *P. actia* are considered as independent species; the studied individuals of the present species, almost all of the WSF (only the badly preserved Cameia male is a DSF), show the FW black dot in space 3 more or less eccentric (centred in *P. actia*) and only 2 spines exist at the valves apical area (3-4 spines in *P. actia*); further, no intermediate forms were ever observed. The DSF and the WSF are often known, respectively, as f. *leodice* and f. *pelarga*.

Precis actia Distant, 1880 (Figs. 17-18)

Material examined: CUANZA NORTE: Golungo Alto, ?-1962, MM, 2 ♂♂ (MUHNAC-17328, 17330). MOXICO: Lumeje, IV-1965, 3 ♂♂ (BS-17678/17680); V-1965, 5 ♂♂ (BS-17681/17685); VI-1965, 1 ♀ (BS-17686). Vila Luso, IX-1957, EAU, 1 ♀ (CZ-2881).

AURIVILLIUS (1928) assigns the species to Angola without details and BACELAR (1961) reports *P. actia* from an unknown locality in the Bié province upon 3 disappeared and never rectified said to have been deposited in the Luso college.

After AURIVILLIUS (1928), *P. actia* ranges from Angola to Nyasaland (today Malawi), Kenya and Tanzania; BERGER (1981) points Angola, Zambia, Zaire, Tanzania, Burundi, Rwanda, Uganda et Kenya and assigns its occurrence in the DRC as being rare in the Mongala and Kivu but common on the Kwango, Kasai, Sankuru, Lualaba and Haut-Shaba; and ACKERY *et al*. (1995), and WILLIAMS (2007b), detail W Mozambique, Zimbabwe, N Zambia, S DRC, Angola, Rwanda, Burundi, Malawi, Tanzania, Uganda and Kenya. No precise localities in Angola were ever reported.

Otherwise, KIELLAND (1990) doesn't consider *P. actia* to be present in Angola, reporting Zimbabwe, Zambia, S. Zaire, Malawi and Tanzania, D'ABRERA (2004), points Zimbabwe, Zambia, Shaba province of southern Zaire, Mozambique and Tanzania, and RICHARDSON (2013), notices Kenya and the DRC to Zimbabwe. As just noted relatively to the previous species, LARSEN (1996) considers the present taxon at the subspecies level, as *P. pelarga actia* Distant, 1880 and states that in Kenya they would interbreed with *P. pelarga pelarga* (Fabricius, 1775).

The Air Commodore is known mainly for Brachystegia woods and savanna, though it may also enter forest; the reported host-plants are *Platostema* spp. (Lamiaceae). The DSF is often known as f. *actia* and the WSF as f. *furcata* and none representative of f. *furcata* was observed in Angola. Further, intermediate forms between *P. pelarga* and *P. actia* were never seen in the country, not even close to Lumeje where both species were collected simultaneously in May 1965.

Precis sinuata sinuata Plötz, 1880 (Figs. 19-20)

Material examined: CABINDA: Buco Zau, V-1952, collected during the day, 1 ♀ (CZ-nn). MOXICO: Teixeira de Sousa, III-1965, 1 ♂ (BS-17526).

Only the re-examined Cabinda female assigned by BACELAR (1956) was previously known in Angola, where the species is, with no doubt, rare.

After ACKERY *et al*. (1995) and WILLIAMS (1997b) *P. sinuata* ranges from Sierra Leone to Cameroon, São Tomé, DRC, Rwanda, Burundi and part of East Africa, what means that the BACELAR (1956) species reference to Angola was unknown for them. *P. sinuata hecqui* Berger is known from the E DRC (Kivu), Uganda, Ruanda and Burundi (BERGER, 1981) and LARSEN (1996) points also it occurs in W Kenya.

The Wide-banded Commodore occurs in forest, forest margin, and woodland in hilly countries. LARSEN (2005) suggests that the host-plants may be the same as for *Precis tugela* and WILLIAMS (1997b) assigns *Platostoma* sp. (Lamiaceae). The DSF is often named f. *sinuata* and the WSF - the only one seen from Angola - is named f. *pelargoides*.

Precis rauana silvicola Schultze, 1916 (Figs. 21-22)

Material examined: UIGE: Béu, I-1962, 1 ♀ (BS-17527); II-1962, 1 ♂ (BS-17528) - both specimen representatives of the WSF.

The Montane Commodore is new to Angola, which seems to constitute its southernmost limit. It flies in forest, submontane forest, clearings and forest roads.

The subspecies was reported (D'ABRERA, 1980, 2004, ACKERY *et al.*, 1995, both as *P. rauana omissa* Rothschild, 1918) from Cameroon and W DRC; they point the nominate subspecies ranges in W Kenya and E Uganda and a third one, *P. rauana osborni* Holland, 1920, in W Uganda and E DRC. LARSEN (2005) assigns that the westernmost subspecies occurs from E Nigeria, Cameroon and Gabon to the DRC (Ubangi, Uele, Mai-Ndombe, Sankuru) and W Uganda - none of them consider Angola. The known host-plants are species of *Platostema* and of *Plectranthus* (Lamiaceae).

ACKERY *et al.* (1995) suggest that *Precis silvicola* Schultze, 1916 (considered under *Junonia*) shall correspond to a senior synonym of *P. rauana omissa* Rothschild, 1918, despite this one was described two years later. LARSEN (2005), correctly, notes that the name *P. rauana omissa* Rothschild, 1918 though commonly used for this subspecies, is not valid as it falls in the synonymy of *P. rauana silvicola* Schultz, 1916; he considers further, that *P. rauana osborni*, which he accepts as a morph not as a subspecies, is a synonym of the nominate subspecies. Previously, he recognized *Precis rauana kakamega* Carcasson, 1961 as another subjective synonym of the nominate subspecies, concluding that *P. rauana* remains known only by the nominate subspecies and by the present one (LARSEN, 1996).

***Precis larseni* Mendes, Bivar-de-Sousa, Vasconcelos & Lopes, sp. n.** (Figs. 23-32)

Material examined: Holotype: MOXICO: Lumeje, IV-1965, 1 ♂ DSF (BS-17687). Paratypes: HUAMBO: Chianga, V-1972, 1 ♂ DSF (PC); VII-1975, 1♂ DSF (PC). CUANZA NORTE: Golungo Alto, ?-1962, MM, 2 ♂♂, 1 ♀ DSF (MUHNAC-17324, 17328, 17330). MOXICO: As for the holotype, 1 ♂, 1 ♀ DSF (BS-17688-17689), 1 ♂ WSF (BS-17690); V-1965, 1 ♂ DSF (BS-17691); VIII-1965, 1 ♂ DSF (BS-17692). Teixeira de Sousa, II-1965, 1 ♂ WSF (BS-17693). All the types in the MUHNAC. Non-type material: HUAMBO: Nova Lisboa, IV-1964, 1 ♂, 4 ♀♀ (NA); V-1964, 1 ♂ (NA); VI-1964, 1 ♂, 1 ♀ (NA); VI-1965, 1 ♂, 1 ♀ (NA-); V-1970, 1 ♀ (NA).

Description: WL: ♂: 27-28.5 mm (DSF) and 23-29 mm (WSF); ♀: 30 mm (DSF). DSF with the FW clearly produced and acute at the level of M_1; in the WSF the apex is less angulated and much shorter. Wings margins dark brown and narrow. Post-discal light band wide, orange-ochreous in both, DSF and WSF, more or less, clearly angulated externally at level of the FW space M_2-M_3, its most apical area never strongly narrowed. V variable but always with a conspicuous dark line prolonged from the middle of the FW M_1 - rarely from the wing apex - to the extreme of the HW tail. Male genitalia (Figs. 29-32) typical to a *Precis* species due to the elongation of the saccus - much longer than the tegumen and uncus combined and to the valves shape, not gradually narrowed to the apex but with a quite visible bottleneck; there are two apical, sharp, similarly developed spines somewhat curved, the dorsal one oriented outwards and the ventral one inwards; the uncus is short and wide, almost parallel-sided and slightly shorter than the tegumen, with a wide apical indentation, the juxta well developed and the edeagus poorly arched, with conspicuous lateral teeth and not suddenly pointed apically.

Derivatio nominis: The new species is named after the recently deceased Danish entomologist Torben Bjørn Larsen (1944-2015) whose contribution towards the knowledge of the Afrotropical butterflies and skippers is quite unique. His short permanence with us in Lisbon the 2010 was a stimulus for the continuation of our research on the African Papilionoidea, mainly on those from Angola.

Discussion / Morphology: The seasonal dimorphism and the individual variability known in the *Precis* species already stressed by a number of authors (MCLEOD, 2007, relatively to *P. octavia*) make more difficult the diagnosis of *P. larseni* sp. n. relatively to *P. tugela*, eventually its most similar known species. However: (i) in the DSF, the FW acute apex at the level of M_1 is much longer in *P. tugela*; (ii) the blackish brown margin of the four wings is narrower in *P. larseni* sp. n., especially in the FW; (iii) the light post-discal band is always orange ochreous - no pinkish nor violaceous tint exist

- and it is wider in the new species; besides, it is externally much more clearly angulated at the level of the FW space M_2-M_3; and (iv) relatively to the male genitalia, the main differences concern the saccus length, the valves shape, especially in what the size of the two apical spines and their orientation are concerned, as well as the clearly less arched edeagus in *P. larseni* sp. n. - especially noticeable when compared with that of *P. tugela* (VAN SON, 1979: Fig. 81), the large spines and it's not especially acute terminal part.

Discussion / Taxonomy and geographical distribution: *P. tugela* Trimen, 1879 is, as just discussed, the species that under the morphological point of view shall be the closest relatively to *P. larseni* sp. n. It is known by several subspecies, though not all the authors agree with their validity.

Described from Natal, South Africa (TRIMEN, 1879) *P. tugela* nominate subspecies is known from southern, central-eastern and eastern Africa, from South Africa (Natal, Transvaal) to E DRC and Ethiopia; in the south-eastern Zimbabwe, it was assigned from Umtali (now, Mutare) to Mount Selinda (DICKSON & KROON, 1978). WILLIAMS (2007b) and WOODHALL (2005, sub *Junonia*) detail its occurrence in Swaziland and in South Africa – Limpopo Mpumalanga and KwaZulu-Natal; BRAUN (2013) simply points it ranges along E and S Africa, from Ethiopia to South Africa.

P. tugela aurorina (Butler, 1893) was described from Malawi (BUTLER, 1894) and reported further from Kenya, Tanzania and Ethiopia (D'ABRERA, 2004, sub *Junonia*). With base on the Kenyan fauna, LARSEN (1996) considers however it must be faced as a seasonal form - "a Kenyan wet-season form of a monotypical species"; DICKSON & KROON (1978), WOODHALL (2005) and WILLIS & WOODHALL (2010) - all sub *Junonia* - state the same based on the fauna of South African, though WILLIAMS (2007b) recovers its validity at the subspecies level.

P. tugela pyriformis (Butler, 1896), described from the Ruwenzori, (BUTLER, 1896) remains known from W Uganda, DRC (Kivu, Shaba, Lomami, Lualaba), Ruanda, Burundi and Zambia (ACKERY *et al*., 1995, sub *Junonia*) and BERGER (1981) details relatively to the DRC, the Central Kivu, Haut-Shaba, Haut-Lomami and Lualaba. Its presence in Zambia is noticed by WILLIAMS (2007b) who points several localities to which we now add the approximate latitude and longitude: Ikelenge (11º14'S; 24º16'E), Mwinilunga (11º 44'S; 24º 24'E), Solwezi (12º 11'S; 26º 23'E), Mufulira (12º 30'S; 28º 12'E), Danger Hill (indeterminate but ca 20 miles north from Mpika: 11º 50'S; 31º 30'E), and Kasama (10º 10'S; 31º 11'E); they all are in or close to Brachystegia wood areas (WILD & GRANDVAUX-BARBOSA, 1968).

P. tugela piryformis is, so, the known subspecies geographically closer to *Precis larseni* n. sp. We even hypothesize that part of the westernmost Zambian samples identified as *P. tugela piryformis* may belong to the species just described; indeed, the samples from Ikelenge and Mwinilunga were collected quite close to the northern part of the Moxico's Cazombo salient and that of Solwezi is also part of the Zambian North-western Province; all the remaining ones came from clearly eastwards, east from the Cooperbelt and from the Northern Provinces. The same must be stated relatively to BERGER (1981) *P. tugela pyriformis* from the Haut-Shaba and eventually from the S Haut Lomami provinces of DRC - the southernmost part of the former Katanga; indeed, these Zambian and Congolese samples are closer under the geographical point of view to Angola than from the remaining samples of *P. tugela pyriformis* known from those countries.

Biotope: The studied representatives of the new species were all obtained above 1000 m altitude in areas with "miombo" - mixed savanna with trees, *Brachystegia* woods and open forest margin (GRANDVAUX-BARBOSA, 1970; WILD & GRANDVAUX-BARBOSA, 1968). The African Leaf Commodore, Eared Commodore or African Leaf Butterfly, *Precis tugela*, was reported by LARSEN (1996) in Kenya to forest clearings and along roads but also in more open areas including agricultural fields and KIELLAND (1990) stressed it is common in Tanzania in forests and forest margins and that it may fly from 350 to 2500 m alt. (*P. tugela aurorina*) or from 800 to 2000 m alt. (*P. tugela piryformis*). WILLIS & WOODHALL (2010, sub *Junonia*) reports the nominate *Precis tugela* to occur in the afromontane forests of the South African eastern escarpment.

Known host-plants: The caterpillars remain non-described and the host-plants unknown.

Relatively to the probably close *P. tugela* WOODHALL (2005, as *Junonia*) reports *Englerastrum scandens* and *Plectranthus* sp. (Lamiaceae).

Precis coelestina Dewitz, 1879 (Figs. 33-34)

Material examined: UIGE: Damba, VII-1962, 2 ♂♂ (BS-17697, 17699); Id., VIII-1965, 1 ♂ (BS-17698).

The species flies along most of the inter-tropical Africa: Guinea, Sierra Leone, Nigeria, Cameroon, Central African Republic, Angola, DRC (Kinshasa, Kasai, Sankuru and Lualaba), Uganda, W Kenya, S Sudan, W Ethiopia and Somalia. After ACKERY *et al*. (1955) it was described from Angola as "Guinea, aus dem 10º S.B. zwischen 17 und 22º O.L. von Greenw". AURIVILLIUS (1928) and LARSEN (2005) notice also Angola though without precise location, a country from where it shall be quite uncommon.

The Ocellated Commodore is known to fly on secondary forest, forest margins and clearings in hilly country and the caterpillars' host-plants remain unknown.

Precis archesia (Cramer, 1779) (Figs. 35-42)

Material examined: BIÉ: Silva Porto, X-1957, 1 ♀ (CZ-2941); X-1974, 1 ♂ (PC). HUAMBO: Chianga, I-1972, 1 ♂ (PC); III-1972, 1 ♂ (PC); IV-1972, 1 ♂ (PC); V-1072, 3 ♂♂, 1 ♀ (PC); VII-1972, 2 ♂♂ (PC); IV-1973, 1 ♂ (PC); II-1975, 1 ♂ (PC); V-1974, 1 ♂ (PC); VI-1075, 1 ♂ (PC). Nova Lisboa, IV-1964, 3 ♂♂ (NA); IV-1956, 2 ♀♀ (NA); V-1965, 3 ♂♂, 1 ♀ (NA); VI-1965, 2 ♂♂, 1 ♀ (NA); III-1970, 1 ♂ (NA); ?-1970, 2 ♂♂, MM, (MUHNAC-5169, 5172). HUILA: Humpata, I-1975, 1 ♂ (PC). Tundavala, VIII-1970, 1ex (AF-NY689050). CUANZA NORTE: Salazar, III-1975, 1♂ (PC). MOXICO: Lumeje, IV-1965, 6 ♂♂, 1 ♀ (BS-17700-17701, 17703-17707); V-1965, 1 ♀ (BS-17708). Teixeira de Sousa, II-1965, 1 ♂ (BS-17702). Vila Luso, IX-1957, EAU, 1 ♂ (CZ-2883). UIGE: Damba, XI-1961, 2 ♂♂ (BS-17695-17696). One non-labelled WSF ♂ with the number 1038 integrates, further, the PC collection.

DRUCE (1875) reports the species from Banana / Angola, a locality which is actually in the right margin of the River Zaire mouth, today DRC, not Angola. AURIVILLIUS (1928) assigns Angola, BACELAR (1961) the Bié province and GARDINER (2004, sub *Junonia*) the Angolan "Four corners area"; WILLIS (2009) is the only one to point a precise location in Angola, the Estação Zootécnica (the Zoo-technical Research Station) in the edge of the Huila province escarpment.

The subspecies is known from Angola, Botswana, Zambia, S DRC, Kenya, Swaziland and South Africa (Limpopo, North-west province, Gauteng, KwaZulu-Natal, Eastern Cape and Western Cape).

The Garden Inspector or Garden Commodore flies in rocky areas in grassland and savanna, *Brachystegia* woodland and other forested edges; the known host-plants are species of *Plectranthus*, *Pycnostachys*, *Rabdosiella* and *Solenostomum* (Lamiaceae).

The sample obtained in April 1965 in the Lumeje integrates representatives of the WSF - their majority - but also of the DSF and the two seasonal forms were obtained simultaneously in Chianga, the July 1972. Despite considered by WILLIAMS (2007b) as including two subspecies, the nominate one and *P. archesia ugandensis* (McLeod, 1980) from Sudan and Uganda, it is here considered a monotypical species according with LARSEN (1996) among others. The DSF is often nominated f. *archesia* and the WSF f. *pelasgis*.

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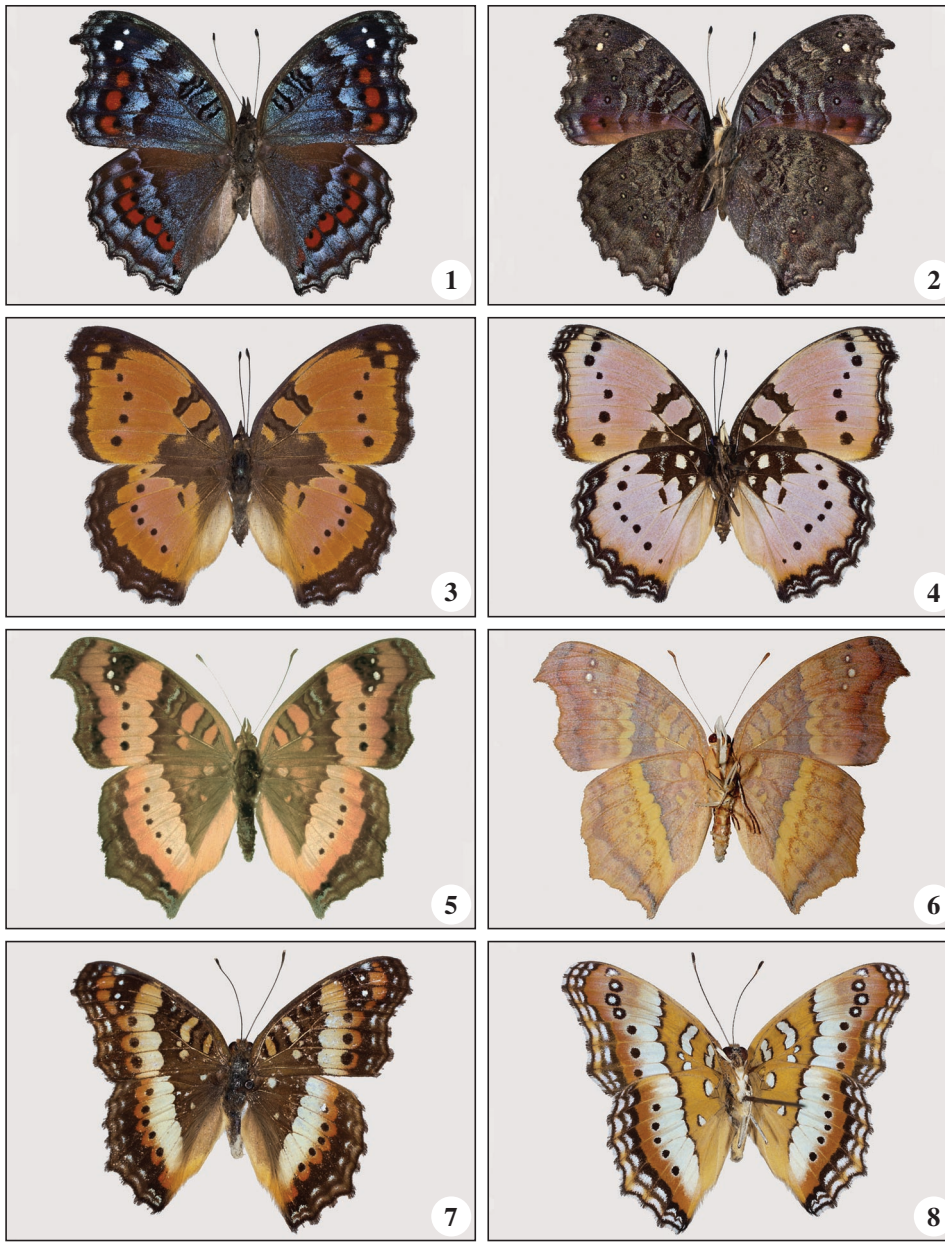
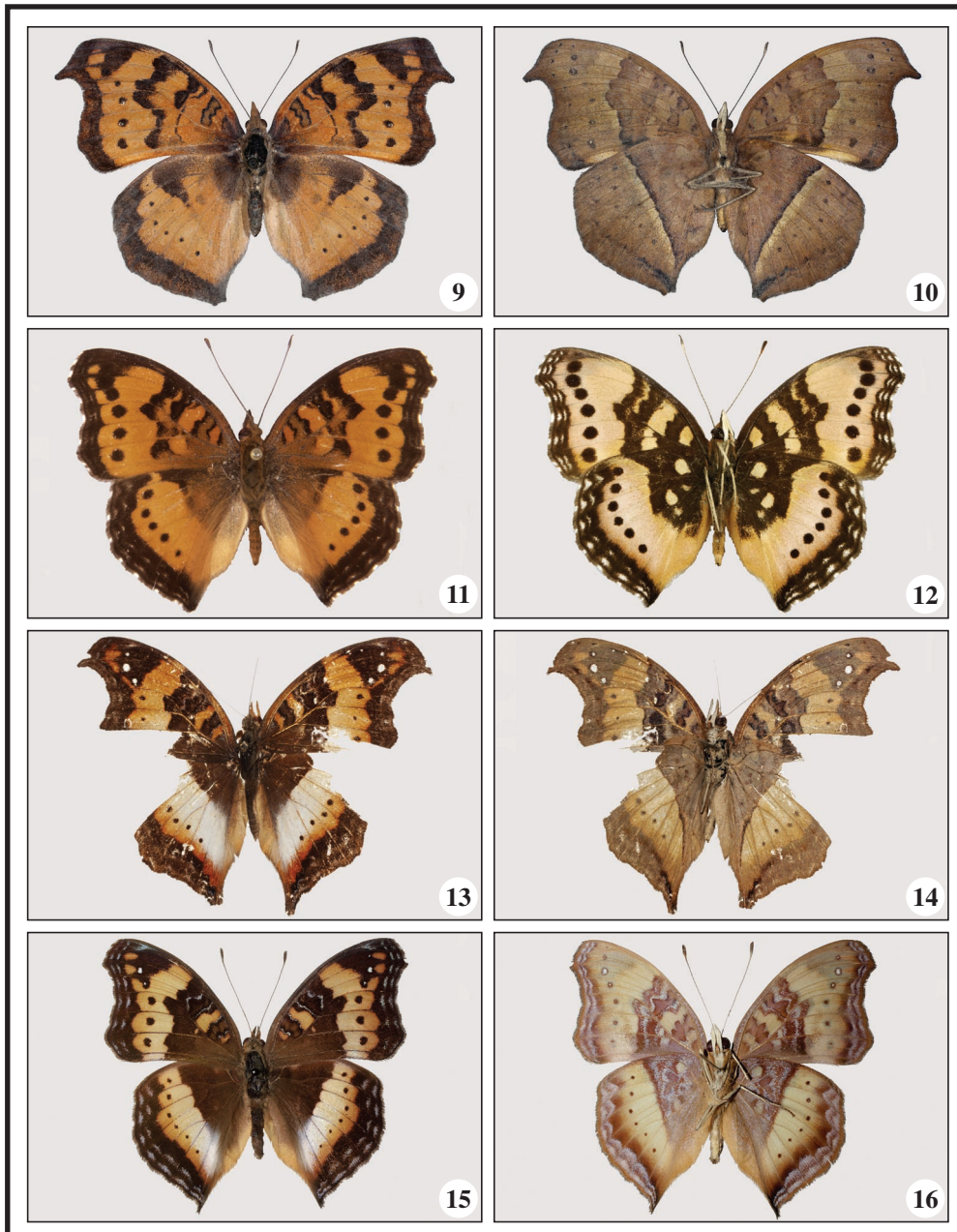
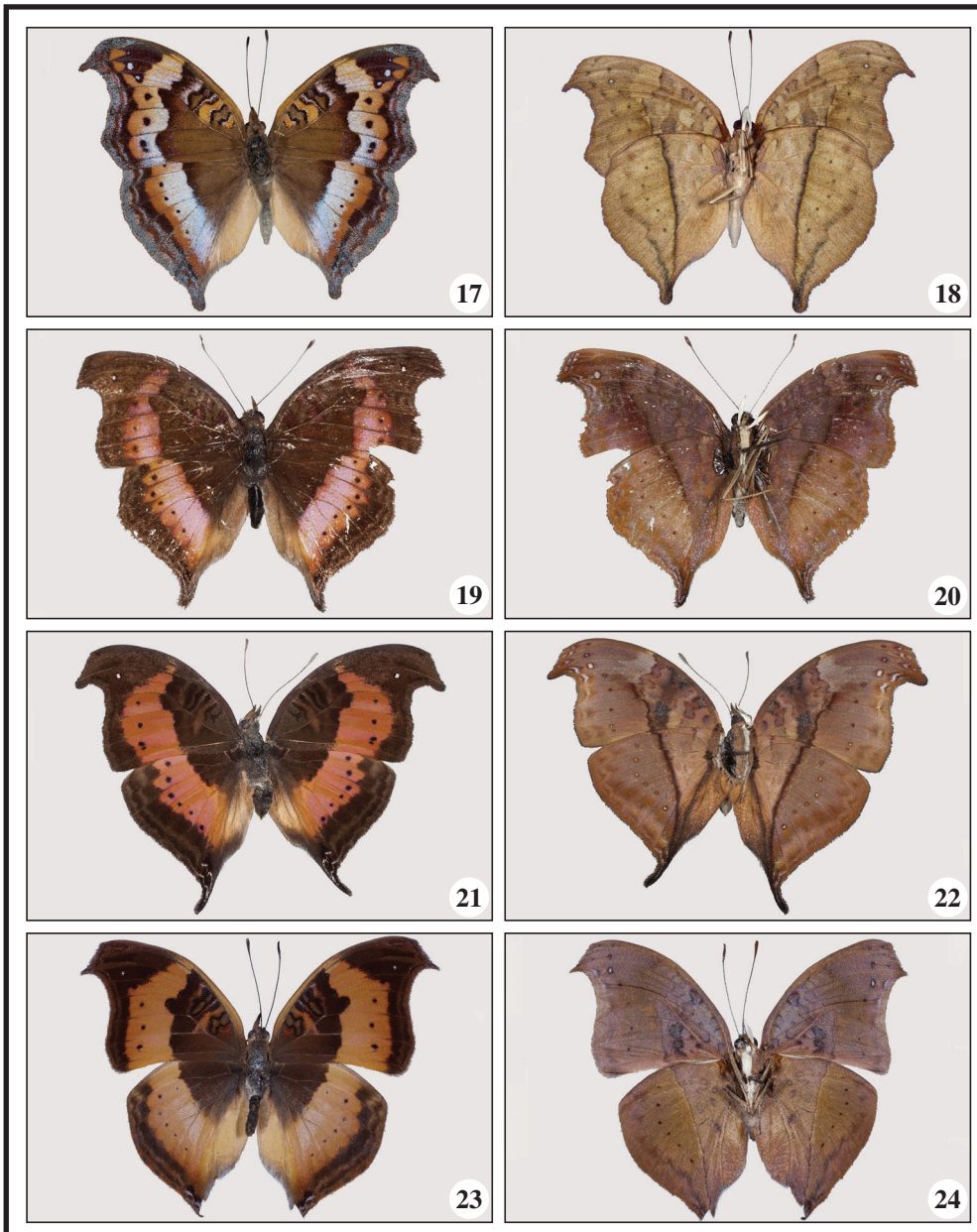


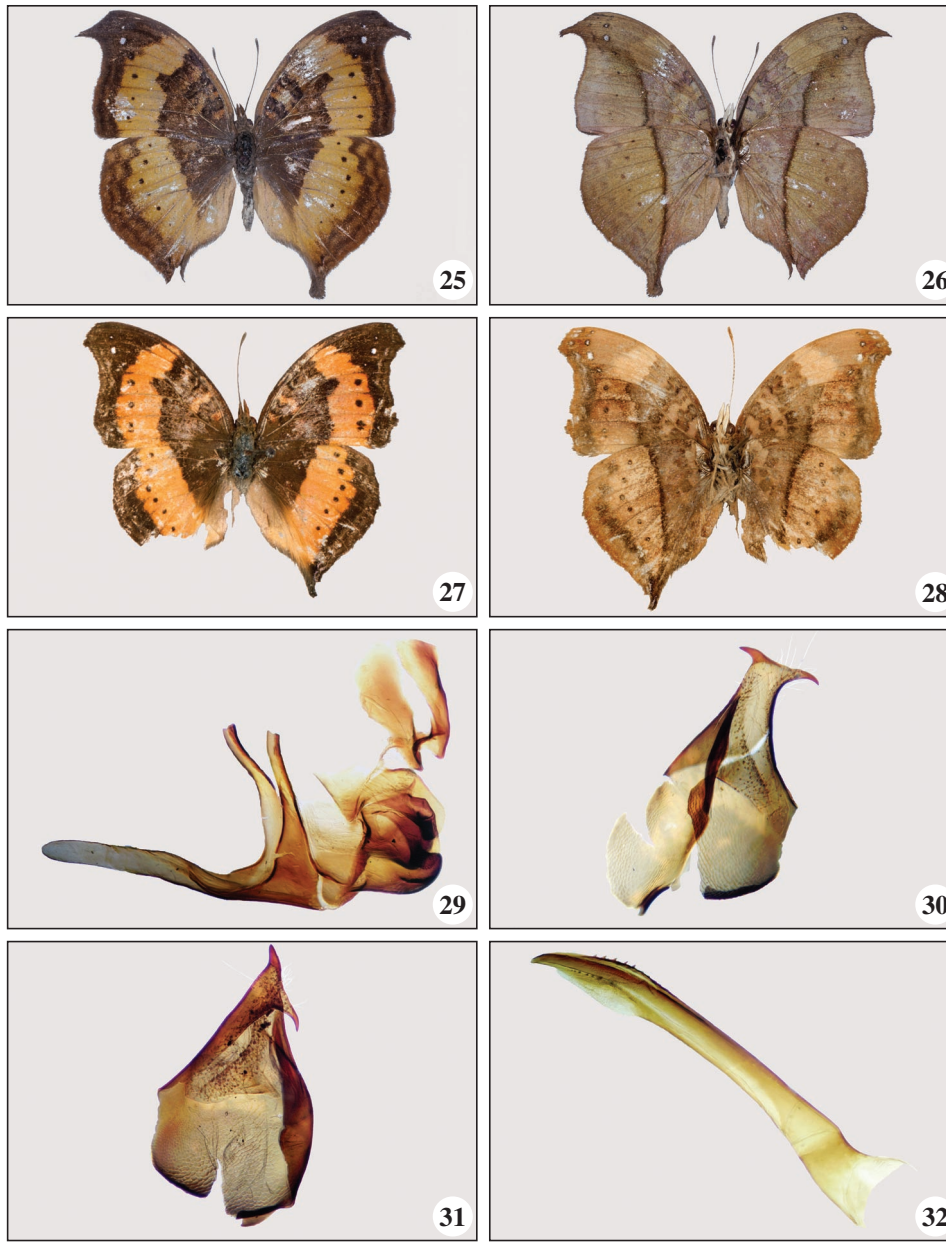
Figs. 1-8.– 1-4. *Precis octavia sesamus* Trimen, 1883. **1.** ♂ (BS-17076), DSF (f. *sesamus*) from Lumeje, dorsal. **2.** Id, ventral. **3.** ♂ (BS-17074), WSF (f. *natalensis*) from Lumeje, dorsal. **4.** Id, ventral. **5-8.** *Precis ceryne ceryne* (Boisduval, 1847). **5.** ♂ (BS-17521), DSF (f. *tukuoa*) from Lumeje, dorsal. **6.** Id., ventral. **7.** ♂ (BS-17515), WSF (f. *ceryne*), from Teixeira de Sousa, dorsal. **8.** Id, ventral.



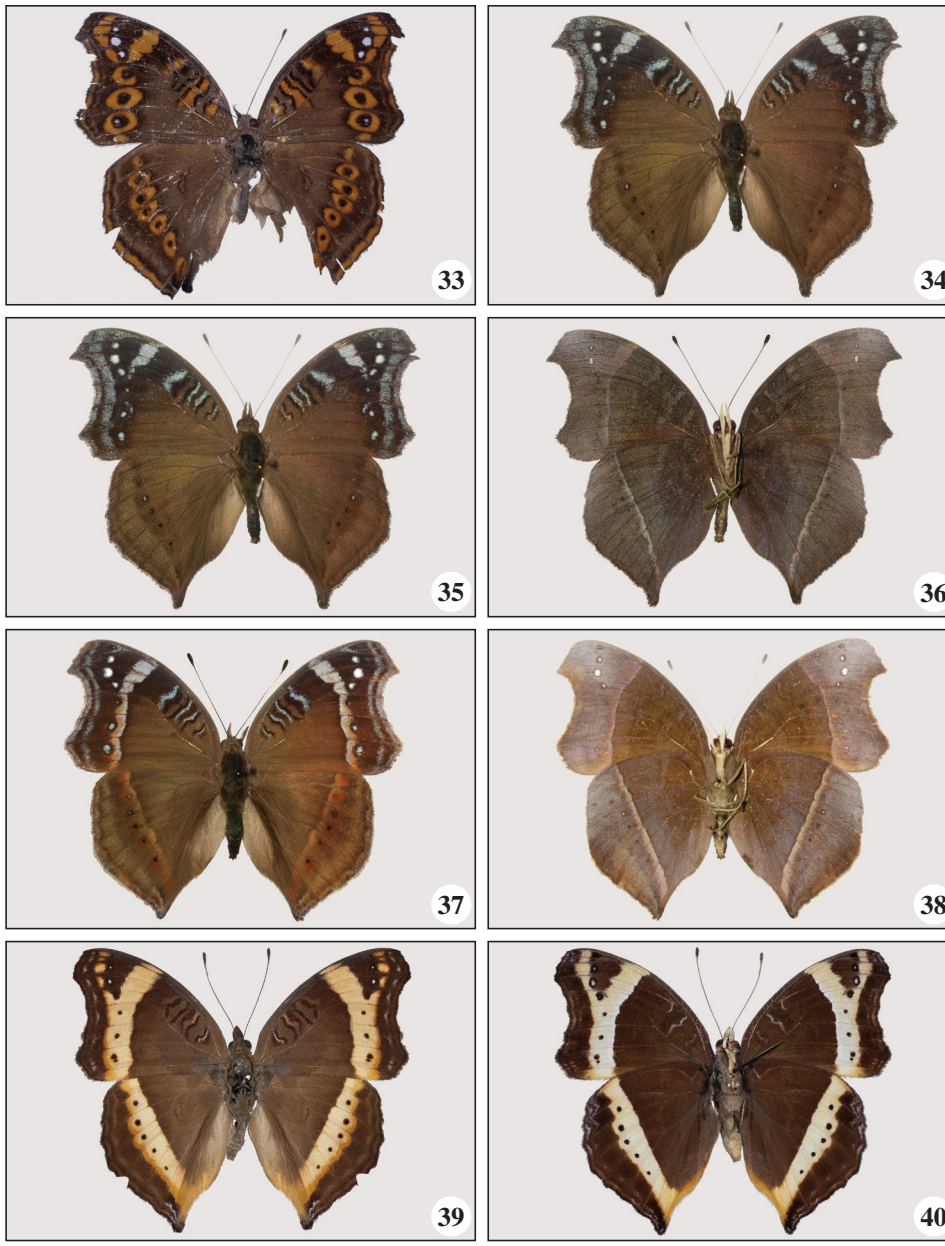
Figs. 9-16.– 9-12. *Precis antilope* (Feisthamel, 1850). **9.** (♂ - BS-17694), DSF (f. *antilope*) from Henrique de Carvalho, dorsal. **10.** Id, ventral. **11.** (♂ -CZ-2206), WSF (f. *simia*) from Chianga, dorsal. **12.** Id, ventral. **13-16.–** *Precis pelarga* (Fabricius, 1775). **13.** (♂ - CZ-3064), DSF (f. *leodice*) from Cameia, dorsal. **14.** Id, ventral. **15.** (♂ -CZ-3037), WSF (f. *pelarga*) from Stª Cruz / Luso, dorsal. **16.** Id, ventral.



Figs. 17-24.– 17-18. *Precis actia* Distant, 1880. **17.** (♂ - BS-17684), DSF (f. *furcata*) from Lumeje, dorsal. **18.** Id, ventral. **19-20.** *Precis sinuata* Plötz, 1880. **19.** (♂ - BS-175326), WSF (f. *pelargoides*) from Teixeira de Sousa, dorsal. **20.** Id, ventral. **21-22.** *Precis rauana silvicola* Schultze, 1916. **21.** (♂ - BS-17527) from Béu, dorsal. **22.** Id, ventral. **23-34.** *Precis larseni* Mendes, Bivar-de-Sousa & Vasconcelos sp. n. **23.** (♂ holotype - BS-17687), DSF from Béu, dorsal. **24**. Id, ventral.



Figs. 25-32.– *Precis larseni* Mendes, Bivar-de-Sousa & Vasconcelos sp. n. **23.** (♂ holotype - BS-17687), DSF from Béu, dorsal. **24**. Id, ventral. **25.** (♀ paratype - BS-17688), DSF from Lumeje, dorsal. **26.** Id, ventral. **27.** (♂ paratype - BS-17690) from Teixeira de Sousa, WSF, dorsal. **28.** Id, ventral. **29.** Male genitalia: saccus, part of vinculum, juxta and uncus. **30.** Id, valva. 31. The other valva. **32.** Id, edeagus.



Figs 33-40.– 33-34. *Precis coelestina* Dewitz, 1879. **33.** (♂ - BS-17697) from Damba, dorsal. **34.** Id, ventral. **35-40.** *Precis archesia archesia* (Cramer, 1779). **35.** (♂ - NA-nn), DSF (f. *archesia*) from Huambo, dorsal. **36.** Id, ventral. **37.** (& - BS-17700), DSF (f. *archesia*) from Lumeje, dorsal. **38.** Id, ventral. **39.** (♂ - BS-17705), WSF (f. *pelasgis*) from Lumeje, dorsal: **40.** Id, ventral.

Figs. 41-42.– *Precis archesia archesia* (Cramer, 1779). **41.** (♀ - BS-17708), WSF (f. *pelasgis*) from Lumeje, dorsal. **42.** Id, ventral.

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Description of *Pseudoinsalebria* Slamka, Ylla & Macià, gen. n. and *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n., a closely related species to *Pseudoinsalebria albipunctella* (Chrétien, 1911) (Lepidoptera: Pyralidae, Phycitinae)

F. Slamka, J. Ylla & R. Macià

Abstract

A new genus of Phycitinae - *Pseudoinsalebria* Slamka, Ylla & Macià, gen. n., and a new species - *Pseudoinsalebria iberica* Slamka, Ylla & Macià sp. n., are described from the south of Spain. The genus *Pseudoinsalebria* differs from the related genera *Insalebria* Filipjev, 1924 and *Selagia* Hübner, [1825] 1816 by external characters and also by male and female genitalia. *Pseudoinsalebria iberica* differs from the closely related *P. albipunctella* (Chrétien, 1911) by the forewing markings and by male and female genitalia. Photographs of the adults and figures of the genitalia of both species are provided.
KEY WORDS: Lepidoptera, Pyralidae, Phycitinae, *Pseudoinsalebria*, new genus, *Pseudoinsalebria iberica*, new species, Spain.

Descripción de *Pseudoinsalebria* Slamka, Ylla & Macià, gen. n. y *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n., especie muy próxima a *Pseudoinsalebria albipunctella* (Chrétien, 1911) (Lepidoptera: Pyralidae, Phycitinae)

Resumen

Se describe un nuevo género, *Pseudoinsalebria* Slamka, Ylla & Macià, gen. n. y una nueva especie de Phycitinae, *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n., del sur de España. El género *Pseudoinsalebria* se diferencia de los géneros afines *Insalebria* Filipjev, 1924 y *Selagia* Hübner, [1825] 1816 a través de los caracteres externos, así como por la comparación de los genitalia del macho y de la hembra. *Pseudoinsalebria iberica* difiere de la especie próxima *P. albipunctella* (Chrétien, 1911) por los dibujos de las alas anteriores y por la estructura de los genitalia. Se presentan fotografías de los adultos y de los genitalia de ambos sexos.
PALABRAS CLAVE: Lepidoptera, Pyralidae, Phycitinae, *Pseudoinsalebria*, nuevo género, *Pseudoinsalebria iberica*, nueva especie, España.

Introduction

LERAUT (2014) placed the species *Selagia albipunctella* Chrétien, 1911 in the genus *Laristania* Amsel, 1951, which, according to our investigations is incorrect; see the diagnosis section. *Pseudoinsalebria* gen. n. is established on the basis of the shape of juxta in the male genitalia, which seems to be unique as it has not yet been observed in subfamily Phycitinae. *Pseudoinsalebria iberica*

sp. n. is described from the south-eastern Spain. This species was formerly overlooked and considered as *Selagia albipunctella* Chretién, 1911, which was described from Algeria. LERAUT (2014) mentioned it as *"Laristania" albipunctella* from South Spain and North Africa; the figure of male genitalia is correct, but in the text it is confused with *Epischnia albella* Amsel, 1954 (see Remarks at *P. iberica*), which makes the situation even more complicated. VIVES MORENO (2014), also includes it in the same genus, *Laristania.*

Currently the genus *Pseudoinsalebria* includes two species: *P. albipunctella* and the species newly described here as *P. iberica.*

Material and methods

The majority of the specimens were collected with the help of the usual entomological light traps (actinic and mercury vapour bulbs, mainly). Other specimens were found in coll. ZMUC.

The holotype is deposited in the MNCN. The paratypes in coll. ZMUC, coll. NMPC, coll MCNB, coll. J. Ylla and coll. F. Slamka. The genitalia of holotype and the paratypes were permanently mounted in Euparal or Entellan, while others were stored in Glycerine in plastic tubes. The photographs of genitalia were taken by binocular microscope using a Nikon camera.

Abbreviations

coll. - Collection
gen. prep. nr. - genital preparation number
MCNB - Museu de Ciències Naturals de Barcelona, Spain
MGAB - National Museum of Natural History "Grigore Antipa", Bucharest, Romania (coll. A. Caradja)
MNCN - Museo Nacional de Ciencias Naturales, Madrid, Spain
NMPC - National Museum Prague, Czech Republic
ZMUC - Zoological Museum University of Copenhagen, Denmark

Pseudoinsalebria Slamka, Ylla & Macià, gen. n.

Type species: *Selagia albipunctella* Chrétien, 1911 by original designation.

= *Laristania* sensu Leraut, 2014

Diagnosis: *Pseudoinsalebria* is characterized by the unique shape of the juxta in the male genitalia of the type species (Fig. 6). It is very large, well sclerotized and more or less follows the shape of vinculum. In the aedeagus, the base of the main strong cornutus is situated in an oval sclerotized capsule. In the female the ductus bursae is strongly sclerotized, being interrupted by a membranous part in the middle. No signum is evident.

The genus *Pseudoinsalebria* is apparently closely related to *Insalebria* Filipjev, 1924. In *Insalebria* the juxta has a different shape, small, spatulate and with two lateral lobes. In the aedeagus there is only one free, single, strong cornutus. In the female of *I. serraticornella* (Zeller, 1839) the ductus is sclerotized only in its terminal part near ostium, being membranous in the other part. In *I. kozhantshikovi*, Filipjev, 1924 the ductus has a similar shape as in *P. albipunctella*, but in the first mentioned species a large and strong sclerotized signum is evident (cf. SINEV, 1990: 426, Fig. 18). In the genus *Selagia* Hübner, [1825] 1816, only *S. spadicella* (Hübner, 1796), has similar genitalia but the juxta is small and there are two cornuti in the aedeagus, whereas the female has the base of the ductus a different shape and an oval, sclerotized signum in the bursa copulatrix.

Next genus - *Laristania* combined with *albipunctella* (LERAUT, 2014: 312) is incorrect, because the male genitalia of type species *Laristania sardzella* Amsel, 1951 is quite different (cf. AMSEL, 1951: 560, Fig. 18).

Male genitalia (Fig. 4): Uncus apically rounded; gnathos short and narrow, ending in a spine-shaped point; tegumen short; valva narrow, sacculus sclerotized sparsely covered by short hairs, costal arm strong and pointed at apex; juxta very large at base with small lateral lobes, sparsely covered by fine setae. The juxta is well sclerotized, with its apical part triangular and generally following more or less the shape of vinculum. Vinculum long, U-shaped, strongly sclerotized. Aedeagus robust, cylindrical, with a main strong cornutus with its base situated in an oval sclerotized capsule. Culcita placed on sternite VIII, W-shaped, ventrally with paired long scale tufts.

Female genitalia (Fig. 5): Papillae anales small, triangular, apophyses long, posteriors about 1/4 longer than anterior apophyses; tergite VIII short; ostium well sclerotized with two laterally curved long spikes. Ductus bursae strong sclerotized, in the middle interrupted by a membranous zone. Bursa copulatrix membranous, oval shaped, sclerotized on only about 1/3 of its area near the the origin of the ductus seminalis.Signum absent.

Etymology: The name *Pseudoinsalebria* is a combination of pseudos (Greek), meaning an absence of truth or accuracy and *"insalebria*" (Latin), meaning even, not rugged.

***Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n.** (Figs. 1-2)

= *Selagia albipunctella* sensu Ylla, Macià & Huertas Dionisio, 2008
= *Laristania albipunctella* sensu Palm, 2012
= *Laristania albipunctella* sensu Vives Moreno, 2014
= *Epischnia albella* sensu Leraut, 2014: 317, Fig. 113a - male genitalia - misidentification of *Pseudoinsalebria albipunctella* (Chrétien, 1911)

Fig. 8.– Distribution map of *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n.

Material examined: Holotype ♂, SPAIN: Almería, Tabernas, 425 m, 30S WF59, J. Ylla leg., 21-IV-2001, N-2001-06, gen. prep. nr. 1632 ♂ F. Slamka. Deposited in the MNCN, Madrid, Spain.

Paratypes: 1 ♀, [Spain], Tabernas (Almería), 1-VI-2003, 438 m, 30SWF59, J. Ylla leg., gen. prep. nr. 1633 ♀ F. Slamka, (coll. J. Ylla); 2 ♂♂, Tabernas (Almería), 400 m, J. Ylla leg., 29-IV-1995 (coll. MCNB and coll. J. Ylla); 1 ♂, Tabernas (Almería), 400 m, 30SWF59, J. Ylla leg., 29-IV-1995 (coll. J. Ylla); 2 ♂♂, 1 ♀, Tabernas (Almería), 425 m, 30SWF59, J. Ylla leg., 21-IV-[20]01, gen. prep. nr. 3362 ♂, 3411 ♂, 3366 ♀ (coll. J. Ylla); 1 ♀, Tabernas (Almería), 460 m, 30S WF59, J. Ylla leg., 16-V-2013, gen. prep. nr. 4596♀ (coll. J. Ylla); 1 ♂, Hispania, Almería, Mini Holywood, 230 m, 4-8-V-1994, leg. F. Schepler, gen. prep. nr. 1832 ♂ (in glycerine) F. Slamka; 1 ♂, Spain, Prov. Almeria, 2 km SW of Tabernas, Rambla de Tabernas, 350 m, 18-IV-2001, B. Skule & P. Skou leg., gen. prep. nr. 1833 ♂ F. Slamka; 1 ♂, 2 ♀♀, Spain, Prov. Murcia, 2 km S. of Bolnuevo, 5 m, 28-30-IV-2000, Peder Skou leg. (all coll. ZMUC). 4 ♂♂, 3 ♀♀, Spain, Almería, Tabernas env., Aghuilla Salada, 420 m, 2-3-V-2008, J. Šumpich leg. (research collection of J. Šumpich, coll. NMPC and coll. F. Slamka); 1 ♂, Los Yesos, Sierra de los Filabres (Almería), 625 m, 30SWG60, J. Ylla leg, 30-IV-1995, gen. prep. nr. 1658 ♂ (coll. J. Ylla); 2 ♂♂, Monte Alfaro, Sierra Alhamilla (Almería), 278 m, 30SWF58, J. Ylla leg., 29-III-2008, gen. prep. nr. 4594 ♂, 4595 ♂ (coll. J. Ylla).

Description: Male (Fig. 1). Wingspan males 25,0-28,6 mm (n=13), females 22,0-25,0 mm (n=9). Holotype 28,6 mm. Frons and vertex with creamy, brownish-tipped scales. Antenna filiform about 2/3 length of forewing, dorsally with brown/pale brown scales, ventrally with dark brown/brown scales. Cilia very short (approx. 1/6 diameter of antenna). Labial palpus long and straight (approx. 4 x diameter of the eye) with creamy, brownish-tipped scales, the last segment pointing down. Thorax, and tegulae with creamy, brownish-tipped scales, mesothorax creamy coloured. Abdomen creamy with suffusion of ochreous and pale brownish scales. Forewings narrow, generally greyish with admixture of creamy scales; veins dark coloured, especially radial and anal veins; costa always paler up to postmedial line; discoidal spot dark brown, always well visible and located in a creamy/whitish longitudinal streak. Just above this discoidal spot there is another small brownish spot, more or less indistinct; ante-medial line weakly developed, sometimes consisting of dark transverse line on costa and two arrow-shaped dots. On medial and anal vein; post-medial line creamy often undeveloped; marginal line dark, weakly interrupted, fringes with creamy, brownish-tipped scales. Hindwing pale brownish; marginal bands blurry, darker than central part of wing; fringes pale ochreous even whitish.

Female (Fig. 2): Externally similar to male, generally smaller, antennae filiform and thinner (about 1/2 - 2/3 of male antenna), with very short cilia.

Male genitalia (Fig. 4): Uncus apically rounded or conical; gnathos short and narrow, ending in spine-shaped point; tegumen short; valva narrow, sacculus sclerotized sparsely covered by short hairs, costal arm strong and pointed at apex; juxta very large at base with small lateral lobes which are sparsely covered by fine setae, apical part of juxta is rounded sometimes with small notch in the middle, well sclerotized and following more or less the shape of the vinculum (Fig. 4b). Vinculum long, U-shaped, strongly sclerotized. Aedeagus robust, cylindrical, with the base of the main, strong cornutus situated in an oval sclerotized capsule; there is another small cornutus long, narrow and slightly bent, terminally wider and apically rounded (Fig. 4a). Culcita placed on sternite VIII, W-shaped with a paired long scale tufts ventrally (Fig. 4c).

Female genitalia (Fig. 5): Papillae anales small and triangular, apophyses long, posterior ones about⁄longer than anterior ones; tergite VIII short; ostium well sclerotized with two laterally straight long spikes (Fig. 5a), with lateral projections at its base. Ductus bursae strong sclerotized, interrupted in the middle by a membranous part. Bursa copulatrix membranous, oval, its sclerotization is only of 1/4 of area near tube seminalis. Signum absent.

Diagnosis: *P. iberica* is closely related to *P. albipunctella* differing by external characters of the wings. In *P. iberica* (Figs. 1, 2) the forewing is less uniformly greyish and the discoidal dark brown spot is always well visible in a creamy white longitudinal streak.The hindwing is pale brownish with

marginal bands and apex blurry and darker than the central part of the wing. In *P. albipunctella* (Fig. 3) the hind wings are whitish.

The male genitalia are differing as follows: in *P. iberica* (Fig. 4) the aedeagus has a second long and slender cornutus which is terminally wider and rounded apically lying alongside the first big and strong cornutus, whereas *P. albipunctella* has only one big cornutus (Fig. 6).

In the female genitalia of *P. iberica* the ostium area has two laterally straight long spikes with lateral projections at its base (Fig. 5a). In *P. albipunctella* (Fig. 7a) these spikes are longer and slightly curved with indistinctly developed distal projections. In *P. iberica* the sclerotized part of the ductus bursae is proximally slightly bent at the inner side (Fig. 5b) whereas in *P. albipunctella* the sclerified part of the ductus bursae is longer and bent at 90-100 degrees (Fig. 7b).

Biology: Moths were collected from April to June, in semi-desert-like biotopes, with a vegetation very similar to that present in many areas of Algeria, Morocco and Tunisia. They are active by night and are attracted to light. The early stages and the larval foodplant are unknown; *P. albipunctella* is listed on *Limonium pruinosum* (L.) Chaz. (Plumbaginaceae) (CHRÉTIEN, 1911). *P. iberica*, is probably associated with many of the species that inhabit the same xerothermophilic habitat and is thought to be strongly stenochorous.

Distribution: So far known only from the south of Spain, in the provinces Almería and Murcia (Fig. 8).

Etymology: The species name *iberica*, (from Iberia), refers to the territory of the distribution of the new species.

Remarks: Specimens listed from Spain (LERAUT, 2014; PALM, 2012; VIVES MORENO, 2014; YLLA *et al*., 2008) belong to the new species *P. iberica*. The female genitalia of *P. albipunctella* were compared with Paralectotype of *Selagia albipunctella* (gen. prep. nr. 4949, U. Roesler, coll. MGAB).

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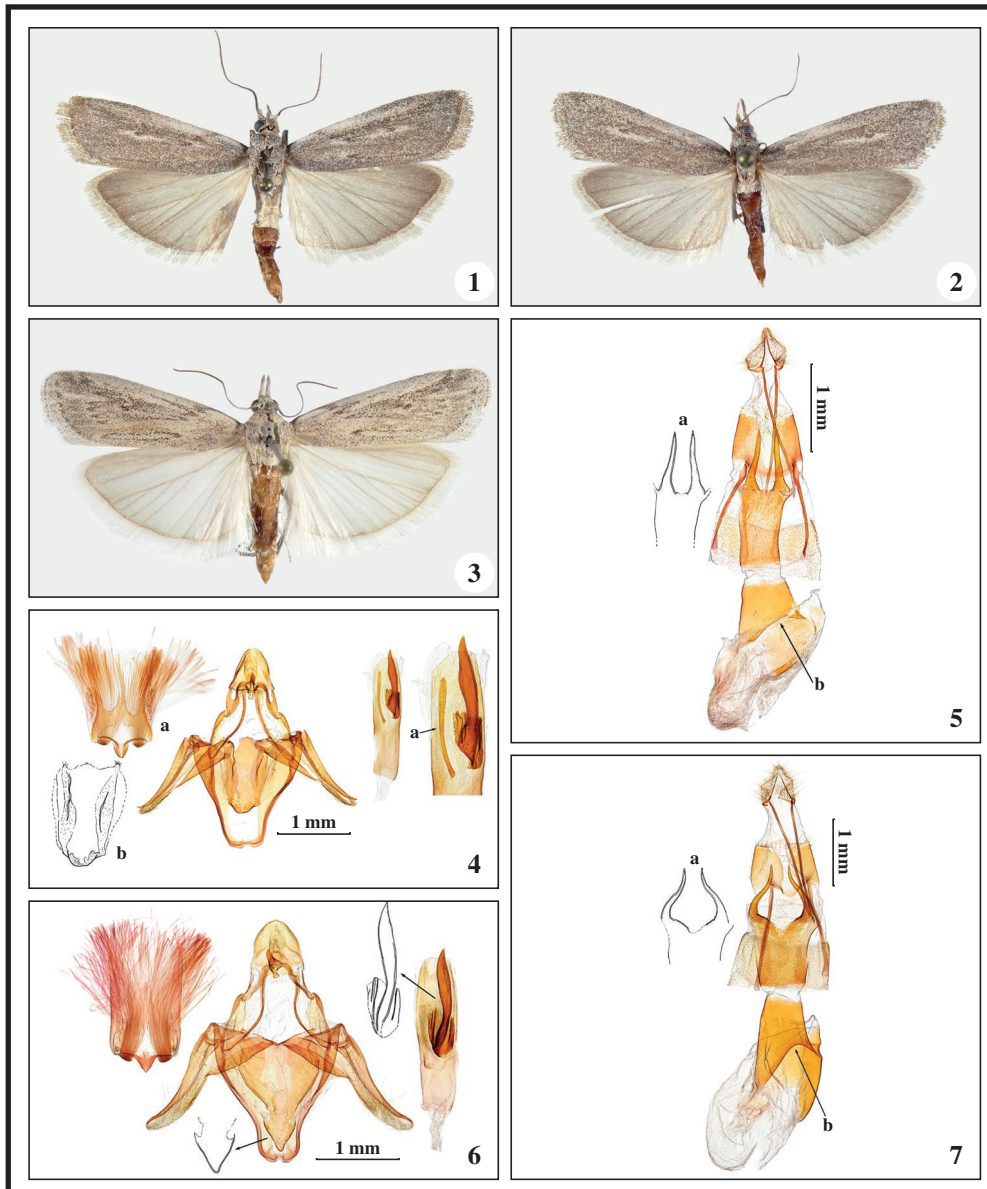

Figs. 1-7.– 1. *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. nov., Holotype ♂, Spain, Almería, Tabernas (coll. MNCN). **2.** *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n., Paratype ♀, Spain, Almería, Tabernas (coll. J. Ylla). **3.** *Pseudoinsalebria albipunctella* (Chrétien, 1911). ♂, Morocco, Erfoud / Rissani area (coll. ZMUC). **4.** *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. n., Holotype ♂, Spain, Almería, Tabernas (coll. MNCN), **a.** additional cornutus; **b.** shape of juxta; **c.** culcita. **5.** *Pseudoinsalebria iberica* Slamka, Ylla & Macià, sp. nov., Paratype ♀, Spain, Almería, Tabernas, (coll. J. Ylla), **a.** - shape of ostium; **b.** - inner edge of ductus. **6.** *Pseudoinsalebria albipunctella* (Chrétien, 1911). ♂, Morocco, Erfoud / Rissani area, (coll. ZMUC). **7.** *Pseudoinsalebria albipunctella* (Chrétien, 1911). ♀, Morocco, Erfoud / Rissani area (coll. ZMUC); **a.** - shape of ostium; **b.** - inner edge of ductus.

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Faunistic records of *Agonopterix* and *Depressaria* from continental Spain, and updated checklist (Lepidoptera: Depressariidae)

P. Buchner & J. Šumpich

Abstract

The paper summarizes the faunistic data of *Agonopterix* Hübner, [1825] and *Depressaria* Haworth, 1811 species from Spain partly based on our own research and partly on collection vouchers obtained from colleagues. In total, four species are new for the Iberian Peninsula, namely *A. flurii* Sonderegger, 2013, *A. hippomarathri* (Nickerl, 1864) *Depressaria floridella* Mann, 1864 and *Depressaria pseudobadiella* Nel, 2011, and one more for the Spanish fauna: *Depressaria cinderella* Corley, 2002 The photographs of adults of these taxa and their genitalia are presented. Beside them, the records of *A. carduncelli* Corley, 2017, *A. kuznetzovi* Lvovsky, 1983, and *A. selini* (Heinemann, 1870) are reported from Spain only for the second time. The following taxa are removed from the Spanish fauna: *Depressaria cervicella* Herrich-Schäffer, 1854, *Depressaria pimpinellae* Zeller, 1839 and *Depressaria tenebricosa* Zeller, 1854. An updated checklist of *Agonopterix* and *Depressaria* from the Spanish mainland is given.
KEY WORDS: Lepidoptera, Depressariidae, *Agonopterix*, *Depressaria*, new records, Iberian Peninsula, Spain.

Registros faunísticos de *Agonopterix* y *Depressaria* de España continental y una lista actualizada (Lepidoptera: Depressariidae)

Resumen

El artículo agrupa los datos faunísticos de las especies de *Agonopterix* Hübner, [1825] y *Depressaria* Haworth, 1811 de España, basados en parte en investigación original, así como en especímenes de colección obtenidos de colegas. En total, cinco especies son nuevas para la fauna española y la Península Ibérica, a saber, *A. flurii* Sonderegger, 2013, *A. hippomarathri* (Nickerl, 1864), *Depressaria cinderella* Corley, 2002, *Depressaria floridella* Mann, 1864 y *Depressaria pseudobadiella* Nel, 2011. Se presentan fotografías de los adultos de estos taxa y de su genitalia. Así mismo, *A. carduncelli* Corley, 2017, *A. kuznetzovi* Lvovsky, 1983 y *A. selini* (Heinemann, 1870) son registrados en España por segunda vez. Los siguientes taxa se descartan de la fauna española: *Depressaria cervicella* Herrich-Schäffer, 1854, *Depressaria pimpinellae* Zeller, 1839 y *Depressaria tenebricosa* Zeller, 1854. Se proporciona una lista actualizada de los *Agonopterix* y *Depressaria* de España peninsular.
PALABRAS CLAVE: Lepidoptera, Depressariidae, *Agonopterix*, *Depressaria*, nuevos registros, Península Ibérica, España.

Introduction

The genera *Agonopterix* Hübner, [1825] and *Depressaria* Haworth, 1811 comprise some conspicuous species which are clearly distinguishable but identification of many species remains difficult. In recent years the revision of some groups has lead to the description of new species, but in some groups revision is ongoing. The present paper is a continuation of work of the first author on one of the next volumes of Microlepidoptera of Europe, and summarizes the faunistic data from the Spanish mainland.

Material and methods

The trips were organized between the years 2003 and 2010. The material was collected at light, mainly at fluorescent tubes 8 W. Many records are obtained from museum and private collections, see the list of collections. The localities cited in the text are alphabetically listed in the following table. Other mentioned material originated from various private or museum collections.

Determination is based generally on genitalia preparation, and in some cased it had been confirmed by barcode. All mentioned sequences are accessible via the public dataset DS-DEEUR345 (for access, enter public data portal http://www.boldsystems.org/index.php/Public_BINSearch?searchtype=records and search for DS-DEEUR345).

Table 1.– B Alphabetical list of localities.

Locality	Spanish Region	Provinces and details of localities
Aguarón	Aragón	Zaragoza, vicinity of Aguarón
Albarracín	Aragón	Teruel, Sierra de Albarracín, vicinity of Albarracín city, 1100 m
Aldeaquemada	Andalucía	Jaén, vicinity of Aldeaquemada
Algodonales	Andalucía	Cádiz, vicinity of Algodonales
Aliaga	Aragón	Teruel, Sierra de San Just, vicinity of Aliagna
Alto del Calar del Gallinero	Andalucía	Almería, Sierra de los Filabres, Alto del Calar del Gallinero, 2000 m
Barjalí	Andalucía	Almería, Sierra de Gádor, vicinity of Barjalí
Boniches	Castilla-La Mancha	Cuenca, vicinity of Boniches
Borreda	Cataluña	Barcelona, vicinity of Borreda
Buenasbodas	Castilla-La Mancha	Toledo, vicinity of Buenasbodas
Bujaroloz	Aragón	Zaragoza, vicinity of Bujaroloz
Calar Alto	Andalucía	Almería, Sierra de los Filabres, Calar Alto, near Calar Alto Observatory, 2100 m
Candasnos	Aragón	Huesca, vicinity of Candasnos
Castejón de Monegros	Aragón	Zaragoza, Los Monegros, vicinity of Castejón de Monegros village, 570 m
Colativi	Andalucía	Almería, Sierra de Alhamilla, road from Turrillas to Colativi Hill, 1000 m
Colmenar de Oreja	Madrid	Madrid, Colmenar de Oreja, Valle de San Juan, 600 m
Cotiella	Aragón	Huesca, Aragonese Pyreneés, Cotiella, Refugio del Ibon de Plan
Diezma	Andalucía	Granada, vicinity of Diezma
Finestrat	Valencia	Alicante, Sierra de Orcheta, vicinity of Finestrat city
Jimera de Líbar	Andalucía	Málaga, vicinity of Jimera de Líbar
Jubrique	Andalucía	Málaga, vicinity of Jubrique
La Mancha	Castilla-La Mancha	Cuenca
La Sagra	Andalucía	Granada, vicinity of La Sagra
Las Hondanadas	Castilla-La Mancha	Cuenca, Sierra del Escornadero, Las Hondanadas, 1200 m
Lisara	Aragón	Huesca, Central Pyreneés, Bisaurin, vicinity of Lisara, Refugio Llano Lizara
Llaberia	Cataluña	Tarragona, Llaberia near Reus
Mediana	Aragón	Zaragoza, vicinity of Mediana village, 500 m
Monda	Andalucía	Málaga, vicinity of Monda
Monegrillo	Aragón	Zaragoza, Los Monegros, vicinity of Monegrillo village, 560 m
Montalbán	Aragón	Teruel, vicinity of Montalbán
Monteagudo de las Salinas	Castilla-La Mancha	Cuenca, Monteagudo de las Salinas, 1030 m
Moscardón	Aragón	Teruel, vicinity of Moscardón

Níjar	Andalucía	Almería, Sierra de Alhamilla, vicinity of Níjar, 560 m
Otívar	Andalucía	Granada, vicinity of Otívar
Páramo del Sil	Castilla y León	León, vicinity of Páramo del Sil
Pozondón	Aragón	Teruel, vicinity of Pozondón
Río de Baza	Andalucía	Granada, vicinity of Baza, Río Baza near Salazar village, 810 m
Riópar	Castilla-La Mancha	Albacete, vicinity of Riópar
Robledo del Mazo	Castilla-La Mancha	Toledo, vicinity of Robledo del Mazo
San Juan	Extremadura	Cáceres, vicinity of San Juan
Santa María de Oló	Cataluña	Barcelona, Santa María de Oló
Santa Pola	Valencia	Alicante, Santa Pola, 1 km South of Balsares, 50 m
Senés	Andalucía	Almería, Sierra de los Filabres, road Purchena-Senés, 1600 m
Sierra de Javalambre	Aragón	Teruel, Sierra de Javalambre, surroundings of Javalambre Ski station - Lapiaz, 1800-2000 m
Tabernas	Andalucía	Almería, vicinity of Tabernas, Rambla de Tabernas, 400 m
Torres de Albarracín	Aragón	Teruel, Sierra de Albarracín, Torres de Albarracín, 1100 m
Turrillas	Andalucía	Almería, Sierra de Alhamilla, vicinity of Turrillas, 1000 m
Ubegun	País Vasco	Guipúzcoa, vicinity of Ubegun
Valdovécar	Aragón	Teruel, Sierra de Albarracín, vicinity of Albarracín city, 1100 m
Vivel del Río Martín	Aragón	Teruel, vicinity of Vivel del Río Martín

Abbreviations used

DEEUR	"Depressariinae of Europe", prefix for a photo or genitalia slide made by P. Buchner
gen. prep.	genitalia preparation
MAYR	research collection of Toni Mayr, Feldkirch, Austria
NHMUK	The Natural History Museum, London, United Kingdom
NHMW	Naturhistorisches Museum Wien, Wien, Austria
NMPC	National Museum, Prague, Czech Republic
SCHMITZ	research collection of Willibald Schmitz, Bergisch Gladbach, Germany
SKYVA	research collection of Jan Skyva, Prague, Czech Republic
SRNKA	research collection of L'ubomír Srnka, Lehota pod Vtáčnikom, Slovakia
VIEHMANN	research collection of Joachim Viehmann, Bergisch Gladbach, Germany
ZMUC	Zoological Museum, University of Copenhagen, Denmark

Agonopterix carduncelli Corley, 2017 (figs 1-2)

ALMERÍA, Níjar, 13-14-VI-2007, 1 ♂, J. Šumpich leg., gen. prep. DEEUR 6142 P. Buchner (NMPC).

Remark: Recently described species from Portugal, Spain, Greece and Morocco (BUCHNER *et al.*, 2017). The larva feeds in the tips of shoots of *Carthamus caeruleus* (L.) C. The first record outside of the type series.

Agonopterix cnicella (Treitschke, 1832)

ALBACETE, Riópar, 27-28-VI-2001, 1 ♂, Z. Laštůvka leg. (NMPC); ALICANTE, Finestrat, 28-IX-2005, 2 ♂♂, J. Šumpich leg. (NMPC); ALMERÍA, Calar Alto, 11-VII-2004, 1 ♂, J. Procházka (SKYVA); BARCELONA, Santa María de Oló, 25-VI-2008, 1 ♂, Z. Laštůvka leg. (NMPC); GRANADA, Diezma, 17-VI-2007, 1 ♂, A. & Z. Laštůvka leg. (NMPC); HUESCA, Lisara, 9-VII-2012, 1 ♂, M. Dvořák leg. (NMPC); MADRID, Colmenar de Oreja, 12-13-X-2009, 1 ♂, J. Šumpich leg. (NMPC); TERUEL, Albarracín, 23-24-IX-2005, 4 ♂♂, J. Šumpich leg. (NMPC), 13-14-VII-2012, 1 ♂, M. Dvořák leg. (NMPC); ZARAGOZA, Monegrillo, 21-IX-2005, 1 ♂, J. Šumpich leg. (NMPC).

Agonopterix curvipunctosa (Haworth, 1811)

CUENCA, Monteagudo de las Salinas, 29-IV-2003, 1 ♀, 30-IV-1-V-2003, 1 ♂, J. Šumpich leg., gen. prep. DEEUR 6140 P. Buchner, Barcode TLMF Lep 23267 (NMPC).

Agonopterix flurii Sonderegger, 2013 (figs 3-4)

CUENCA, La Mancha, 17-V-2012, 1 ♂, T. Mayr leg., gen. prep. DEEUR 6799 P. Buchner, Barcode TLMF Lep 26330 (MAYR); TERUEL, Moscardón, 14-IX-2007, 1 ♂, J. Viehmann leg., gen. prep. DEEUR 1930 P. Buchner (SCHMITZ).

Remark: *A. flurii* was described from Valais in Switzerland (SONDEREGGER, 2013). It has since been recorded also from France (RYMARCZYK *et al.*, 2013), Turkey (BUCHNER, 2017), and Crimea (SAVCHUK & KAJGORODOVA, 2017). The larva feeds on *Centaurea scabiosa*. **New species for Iberian Peninsula and Spain.**

Agonopterix ciliella (Stainton, 1849)

GUIPÚZCOA, Ubegun, 15-VIII-1998, 1 ♂, J. Šumpich leg., gen. prep. J. Šumpich 18279 (NMPC).

Agonopterix hippomarathri (Nickerl, 1864) (figs 5-6)

CUENCA, Monteagudo de las Salinas, IX-2008, 1 ♂, L. Srnka leg., gen. prep. DEEUR 2179 P. Buchner, Barcode TLMF Lep 17679 (SRNKA); TERUEL, Albarracín, 7-VIII-2010, 1 ♂, J. Šumpich leg., gen. prep. J. Šumpich 18218 (NMPC).

Remark: It is widely distributed mainly in central Europe, recorded also in France, Greece, Sardinia, Corsica and Ukraine (LVOVSKY, 2013). Larva develops on *Seseli* sp., predominantly on *S. hippomarathrum* Jacq. **New species for Iberian Peninsula and Spain.**

Agonopterix kaekeritziana (Linnaeus, 1767)

GRANADA, Diezma, 17-VI-2007, 1 ♂, A. & Z. Laštůvka leg. (NMPC).

Agonopterix kuznetzovi Lvovsky, 1983 (figs 7-8)

ALMERÍA, Barjalí, 29-VII-2005, 1 ♂, V. Červenka leg., gen. prep. DEEUR 6215 P. Buchner, Barcode TLMF Lep 23314 (SKYVA).

Remark: *A. kuznetzovi* was described from Orenburg Region in Russia and one paratype originated also from Central Asia (?Kyzil-Asker') (LVOVSKY, 1983). In Great Britain it was known already before 1983 but only after its description the occurrence in this country was published (LANGMAID & PELHAM-CLINTON, 1984). In Great Britain it is very local and overlooked for a long time (EMMET & LANGMAID, 2002). Just recently it was found in Turkey (BUCHNER, 2017a), and in Spain (VIVES MORENO & GASTÓN, 2017). This Spanish record originates from Álava province in the Basque country (VIVES MORENO & GASTÓN, 2017). Our record was taken at the opposite side of Spain, in Andalucia, and it seems the species is generally distributed in Spain but also only overlooked. Larva feeds on *Serratula tinctoria* L. New province record, and the second from Iberian Peninsula.

Agonopterix liturosa (Haworth, 1811)

TERUEL, Vivel del Río Martín, 2-VII-2003, 1 ♂, Z. Laštůvka leg. (NMPC).

Agonopterix nervosa (Haworth, 1811)

ALMERÍA, Calar Alto, 27-VII-2005, 1 ♂, V. Červenka leg., gen. prep. DEEUR 6357 P. Buchner (SKYVA); MÁLAGA, Jubrique, 16-VI-2008, 1 ♀, Z. Laštůvka leg. (NMPC); TERUEL, Vivel del Río Martín, 24-VI-2001, 1 ♂, Z. Laštůvka leg. (NMPC).

Agonopterix rotundella (Douglas, 1846)

CUENCA, Monteagudo de las Salinas, 29-IV-2003 J. Šumpich leg., Barcode TLMF Lep 23269,

(NMPC); GRANADA, Diezma, 17-VI-2007, A. & Z. Laštůvka leg., Barcode TLMF Lep 23329) (NMPC; MÁLAGA, Monda, 26-VI-2004, Z. Laštůvka leg., Barcode TLMF Lep 23325 (NMPC).

Agonopterix nodiflorella (Millière, 1866)

ALMERÍA, Alto del Calar del Gallinero, 1-2-VIII-2010, 1 ♂, J. Šumpich leg. (NMPC); Colativi, 15-19.6.2007, 1 ♀, J. Šumpich leg. (NMPC); HUESCA, Cotiella, 9-VII-2013, 1 ♀, M. Dvořák leg. (NMPC); MÁLAGA, Jimera de Líbar, 23-VI-2005, 1 ♂, Z. Laštůvka leg. (NMPC); Monda, 16-VI-2010, 1 ♂, A. & Z. Laštůvka leg. (NMPC).

Agonopterix pallorella (Zeller, 1839)

CUENCA, Monteagudo de las Salinas, 25-IV-2005, 2 ♂♂, M. Dvořák leg., gen. prep. DEEUR 6145 P. Buchner (NMPC), 29-IV-2003, 1 ♀, J. Šumpich leg. (NMPC); TERUEL, Albarracín, 23-24-IX-2005, 1 ♂, J. Šumpich leg. (NMPC), 7-VIII-2010, 1 ♂, J. Šumpich leg. (NMPC); ZARAGOZA, Castejón de Monegros, 26-27-IV-2003, 1 ♀, J. Šumpich leg. (NMPC).

Agonopterix purpurea (Haworth, 1811)

CÁDIZ, Algodonales, 22-VI-2011, 1 ♂, A. & Z. Laštůvka leg. (NMPC); CUENCA, Monteagudo de las Salinas, 6-V-2008, 1 ♀, J. Šumpich leg. (NMPC).

Agonopterix rutana (Fabricius, 1794)

ALICANTE, Santa Pola, 27-IV-2008, 1 ♂, J. Šumpich leg. (NMPC); ALMERÍA, Senés, 16-VI-2007, 3 ♂♂, J. Šumpich leg. (NMPC); CUENCA, Las Hondanadas, 7-V-2008, 1 ♂, J. Šumpich leg. (NMPC); Montalbán, 15-VI-2003, 1 ♂, Z. Laštůvka leg. (NMPC); HUESCA, Candasnos, 10-VI-2011, 1 ♂, A. & Z. Laštůvka leg. (NMPC); TERUEL, Albarracín, 3-V-2003, 1 ♂, J. Šumpich leg. (NMPC), 13-VII-2012, 1 ♂, M. Dvořák leg. (NMPC); ZARAGOZA, Aguarón, 27-VI-2008, 1 ♂, A. & Z. Laštůvka leg. (NMPC).

Agonopterix scopariella (Heinemann, 1870)

ALBACETE, Riópar, 27-28-VI-2001, 1 ♂, Z. Laštůvka leg. (NMPC); ALICANTE, San Juan, 21-VI-2003, 2 ♂♂, 1 ♀, Z. Laštůvka leg. (NMPC); BARCELONA, Borreda, 28-VI-2016, 1 ♂, A. & Z. Laštůvka leg. (NMPC); CUENCA, Monteagudo de las Salinas, 6-V-2008, 1 ♀, J. Šumpich leg. (NMPC); HUESCA, Candasnos, 10-VI-2013, 1 ♀, A. & Z. Laštůvka leg. (NMPC); TERUEL, Albarracín, 7-VIII-2010, 1 ♀, J. Šumpich leg. (NMPC), 13-VII-2012, 1 ♂, 1 ♀, M. Dvořák leg. (NMPC); Vivel del Río Martín, 24-VI-2001, 1 ♂, Z. Laštůvka leg. (NMPC).

Agonopterix selini (Heinemann, 1870)

TERUEL, Sierra de Javalambre, 26-VII-2010, 1 ♂, M. Dvořák leg. (NMPC), 5-VIII-2010, 1 ♂, J. Šumpich leg., Barcode TLMF Lep 19169 (NMPC).

Remark: Verified records originate from central Europe (Austria, Czech Republic, Germany, Slovakia, Slovenia), Balkans, Finland, France, Italy, and Turkey (BUCHNER, 2017b). Only one record from Spain was available so far from Huesca (MURRIA-BELTRÁN *et al.,* 2004). We add additional records from Aragon, identification of one specimen is also confirmed by genetic data. The second records from the Iberian Peninsula.

Agonopterix subpropinquella (Stainton, 1849)

ALICANTE: Santa Pola, 27-IV-2008, 2 ♂♂, J. Šumpich leg. (NMPC); ALMERÍA, Níjar, 9-V-2005, 1 ♂, M. Dvořák leg. (NMPC).

Agonopterix umbellana (Fabricius, 1794)

TERUEL: Albarracín, 28-VII-2010, 1 ♀, J. Šumpich leg. (NMPC); Barjalí, 29-VII-2005, 1 ♂, V. Červenka leg. (SKYVA).

Depressaria absynthiella Herrich-Schäffer, 1865

ALMERÍA, Alto del Calar del Gallinero, 17-18-VI-2007, 3 ♂♂, J. Šumpich leg. (NMPC); HUESCA, Candasnos, 13-VI-2011, 1 ♂, A. & Z. Laštůvka leg. (NMPC); TERUEL, Sierra de Javalambre, 5-6-VIII-2010, 2 ♂♂, J. Šumpich leg. (NMPC); Vivel del Río Martín, 24-VI-2001, 1 ♂, 1 ♀, Z. Laštůvka leg. (NMPC).

Remark: In Spain probably widely distributed species, mainly in mountain areas. Apparently it was overlooked in the past because the occurrence was published only recently from Lérida in Cataluña (DANTART *et al*., 2010). The first records from Aragón and Andalucía.

Depressaria adustatella Turati, 1927

ALMERÍA, Calar Alto, 11-VII-2007, 1 ♂, J. Procházka leg. (SKYVA); MADRID, Colmenar de Oreja, 12-13-X-2009, 3 ♂♂, 5 ♀♀, J. Šumpich leg. (NMPC); ZARAGOZA, Castejón de Monegros, 23-V-1996, 1 ♂, J. Šumpich leg. (NMPC).

Depressaria albipunctella (Denis & Schiffermüller, 1775)

GRANADA, La Sagra, 21-VI-2009, 1 ♀, A. & Z. Laštůvka leg. (NMPC); HUESCA, Candasnos, 13-VI-2011, 1 ♂, A. & Z. Laštůvka leg. (NMPC); TERUEL, Torres de Albarracín, 4-V-2003, 1 ♂, J. Šumpich leg. (NMPC); TOLEDO, Robledo del Mazo, 19-VI-2002, 1 ♀, Z. Laštůvka leg. (NMPC).

Depressaria badiella (Hübner, 1796) (only females mentioned) (figs 12-13)

TERUEL: Albarracín, 23-24-IX-2005, 2 ♀♀, J. Šumpich leg. (NMPC); Pozondón, 18-X-2016, 1 ♀, J. Viehmann leg., gen. prep. DEEUR 6110 P. Buchner (SCHMITZ); TOLEDO, Buenasbodas, 16-VI-2004, 1 ♀, Z. Laštůvka leg., gen. prep. J. Šumpich 18277 (NMPC); ZARAGOZA, Mediana, 8-X-2008, 1 ♀, J. Procházka leg., gen. prep. J. Šumpich 18276 (SKYVA).

Depressaria pseudobadiella Nel, 2011(only females or barcoded specimens mentioned) (figs 9-11)

HUESCA, Candasnos, 30-V-2015, 1 ♂, J. Viehmann leg., Barcode TLMF Lep 19151 (SCHMITZ); TERUEL, Valdovécar, 3-X-2015, 1 ♀, J. Viehmann leg., gen. prep. DEEUR 4853 P. Buchner, Barcode TLMF Lep 23217 (SCHMITZ); ZARAGOZA, Bujaroloz, 19-X-2015, 1 ♂, J. Viehmann leg., Barcode TLMF Lep 23228 (SCHMITZ).

Remark: Recently described species from France (NEL, 2011). It is easily separable from *Depressaria badiella* (Hübner, 1796) based on female genitalia but inseparable based on male genitalia or external features. DNA-barcode seems to be helpful to separate these two taxa: sequencing of 15 specimens of *D. badiella* and 11 of *D. pseudobadiella* during preparatory work for "Microlepidoptera of Europe: Depressariinae" show these two taxa in clearly separated clusters, with 3 subclusters in each taxon. However, further research is necessary to be sure if barcode brings certain identification. **New species for Spain**.

Depressaria cinderella Corley, 2002 (figs 14-17)

JAÉN, Aldeaquemada, 20-VI-2013, 2 ♂♂, A. & Z. Laštůvka leg., gen. prep. J. Šumpich 18223 (NMPC); TOLEDO, Robledo del Mazo, 19-VI-2002, 1 ♂, Z. Laštůvka leg., gen. prep. J. Šumpich 18225 (NMPC).

Remark: Described from Portuguese material (CORLEY, 2002). In 2017 its occurrence was published also from Spain (Lendoño Goikoa in the País Vasco) (VIVES MORENO & GASTÓN, 2017) but this specimen belongs in fact to *Depressaria incognitella* Hannemann, 1990. With regard to this fact we bring the first records from Spain here. The larva feeds on *Conopodium.* **New species for Spain**.

Depressaria daucella (Denis & Schiffermüller, 1775)

ALICANTE: San Juan, 21-VI-2003, 1 ♂, Z. Laštůvka leg. (NMPC).

Depressaria discipunctella Herrich-Schäffer, 1854

ALMERÍA, Alto del Calar del Gallinero, 17-18-VI-2007, 2 ♂♂, J. Šumpich leg. (NMPC); GRANADA, Otívar, 14-VI-2004, 1 ♀, Z. Laštůvka leg., gen. prep. J. Šumpich 18278 (NMPC).

Remark: Before the description of *Depressaria junnilaineni* Buchner, 2017, it was not distinguished from *D. discipunctella* (BUCHNER, 2017c). Therefore older records of *D. discipunctella* are worth a critical check.

Depressaria junnilaineni Buchner, 2017

ALMERÍA: Níjar, 13-14-VI-2007, 1 ♂, M. Dvořák leg., gen. prep. J. Šumpich 18291 (NMPC).

Remark: The first record outside of the type series.

Depressaria douglasella Stainton, 1849

ALBACETE, Riópar, 27-28-VI-2001, 1 ♀, Z. Laštůvka leg., gen. prep. J. Šumpich 18289 (NMPC); ALMERÍA, Turrillas, 18-VI-2010, 1 ♀, A. & Z. Laštůvka leg., gen. prep. J. Šumpich 18290 (NMPC); Tabernas, 18-19-X-2009, 2 ♂♂, 1 ♀, J. Šumpich leg. (NMPC); BARCELONA, Santa María de Oló, 25-VI-2008, 1 ♀, Z. Laštůvka leg., gen. prep. J. Šumpich 18288 (NMPC); GRANADA: Río de Baza, 16-17-X-2009, 4 ♂♂, 1 ♀, J. Šumpich leg. (NMPC); TERUEL: Albarracín, 23-24-IX-2005, 4 ♀♀, J. Šumpich leg. (NMPC); ZARAGOZA, Castejón de Monegros, 20-IX-2005, 1 ♂, 1 ♀, J. Šumpich leg. (NMPC); Monegrillo, 21-IX-2005, 2 ♀♀, J. Šumpich leg. (NMPC).

Depressaria eryngiella Millière, 1881

ALMERÍA, Alto del Calar del Gallinero, 18-VI-2007, 1 ♂, J. Šumpich leg., gen. prep. DEEUR 6360 P. Buchner (NMPC); Níjar, 13-14-VI-2007, 1 ♀, J. Šumpich leg., gen. prep. J. Šumpich 18292 (NMPC); TERUEL, Aliaga, 27-V-2003, 1 ♀, J. Procházka leg., gen. prep. DEEUR 6216 P. Buchner (SKYVA).

Depressaria floridella Mann, 1864 (figs 18-19)

TERUEL: Albarracín, 26-VI-2001, Z. Laštůvka leg., gen. prep. J. Šumpich 18219 (NMPC); Moscardón, 26-VI-2016, 1 ♂, J. Viehmann leg., gen. prep. DEEUR 4782 P. Buchner (SCHMITZ); Albarracín, 25-VI-2016, 1 ♂, J. Viehmann leg., gen. prep. DEEUR 4791 P. Buchner (SCHMITZ); Valdovécar, 4-VIII-2007, 1 ♂, P. Skule and P. Skou leg., gen. prep. DEEUR 5383 P. Buchner (ZMUC).

Remark: The species was described from Turkey, and later it was found in Greece (HANNEMANN, 1988; LVOVSKY, 2013). Based on study of the type material deposited in NHMW material from the Czech Republic was correctly identified also (ŠUMPICH *et al.,* 2013). Later very old Bohemian material *D. floridella* from the second half of the 19th century was found in the Nickerl collection (NMPC), confirming that the species has been overlooked to date. Similarly, the first Slovakian record from 1976 was published only recently (PASTORALIS *et al.,* 2017). At present, its occurrence is known also from France (LIŠKA, 2015) and in preparing "Microlepidoptera of Europe: Depressariinae", specimens from Austria, Switzerland, Italy, Bulgaria, Ukraine, Azerbaijan, Russia and Georgia have been found. The bionomy was not hitherto described in detail but the larva develops on *Seseli sp.* (Apiaceae), e.g. *Seseli arenarium* (A. Lvovsky, pers. comm.). **New species for Iberian Peninsula and Spain.**

Depressaria olerella Zeller, 1854

TERUEL, Sierra de Javalambre, 6-VIII-2010, 1 ♂, M. Dvořák leg. (NMPC).

Remark: Widely distributed in central, northern and eastern Europe, very rare in western Europe. This species was first reported from Spain in Gerona in 2013 (DANTART & JUBANY, 2013). We add the first record from Aragon.

Depressaria peniculatella Turati, 1922

ALMERÍA: Tabernas, 18-19-X-2009, 1 ♂, 3 ♀♀, J. Šumpich leg. (NMPC); MADRID, Colmenar de Oreja, 12-13-X-2009, 1 ♂, M. Dvořák leg. (NMPC); ZARAGOZA, Castejón de Monegros, 22-IX-2009, 2 ♂♂, J. Šumpich leg. (NMPC).

Depressaria incognitella Hannemann, 1990

HUESCA, Lisara, 9-VII-2012, 1 ♂, 1 ♀, M. Dvořák leg., gen. prep. J. Šumpich 18224 (NMPC); TERUEL, Sierra de Javalambre, 15-VII-2012, 1 ♀, M. Dvořák leg. (NMPC).

Depressaria veneficella Zeller, 1847

TERUEL: Valdovecar, 4-VII-2004, 1 ♀, J. Procházka leg. (SKYVA); CUENCA: Monteagudo de las Salinas, 29-IV-2003, 1 ♀, J. Šumpich leg., gen. prep. J. Šumpich 18275 (NMPC).

Unconfirmed occurrence of *Agonopterix* Hübner, 1825 and *Depressaria* Haworth, 1811 in Spain

Some *Agonopterix* and *Depressaria* species which have been listed for the Spanish fauna do not have any reliable recent records. Here we discuss only taxa for which the occurrence in Spain can be assessed against the background of knowledge obtained from the study of these genera in the whole of Europe. Therefore further modification of the presented checklist may be needed in the future.

Depressaria cervicella Herrich-Schäffer, 1854 was first included in the catalogue of Spanish moths by Agenjo (1966), and later this information was taken up by other authors, see also the comment of REQUENA & DE-GREGORIO (2015). In the past some entomologists incorporated *Depressaria pyreneella* Šumpich, 2013 into series of *D. cervicella* (e.g. in NHMW by H. Zerny), and it is possible that today´s situation was created by such confusion (H. Zerny collected in Spain, and also was in contact with many colleagues at that time). At present we are inclined to think the occurrence of *D. cervicella* in the Iberian Peninsula is not reliable confirmed, and we are removing it from the Spanish checklist.

Depressaria genistella Walsingham, 1903 was removed from the list of Spanish fauna already by REQUENA & DE-GREGORIO (2015).

Depressaria pimpinellae Zeller, 1839. Recently revised taxon within whole Europe. Spanish records belong to the newly described *Depressaria villosae* Corley & Buchner, 2018.

Depressaria tenebricosa Zeller, 1854 is distributed in south-eastern Europe. All published records require revision (REQUENA & DE-GREGORIO, 2015). They most probably belong to *D. adustatella* which is widely distributed in the whole territory of Spain.

Update checklist of *Agonopterix* Hübner, 1825 and *Depressaria* Haworth, 1811

The presented list is based on the checklist of VIVES MORENO (2014). References are given only to species recorded after the publishing of the mentioned catalogue. The presented list is only provisional because some species groups require taxonomic revision, see also previous chapter.

Agonopterix ocellana (Fabricius, 1775)	
Agonopterix liturosa (Haworth, 1811)	
Agonopterix purpurea (Haworth, 1811)	
Agonopterix rutana (Fabricius, 1794)	
Agonopterix scopariella (Heinemann, 1870)	
Agonopterix atomella (Denis & Schiffermüller, 1775)	
Agonopterix carduella (Hübner, 1817)	
Agonopterix kuznetzovi Lvovsky, 1983	VIVES MORENO & GASTÓN (2017)
Agonopterix laterella (Denis & Schiffermüller, 1775)	
Agonopterix flurii Sonderegger, 2013	this paper
Agonopterix subpropinquella (Stainton, 1849)	
Agonopterix propinquella (Treitschke, 1835)	
Agonopterix arenella (Denis & Schiffermüller, 1775)	
Agonopterix perstrigella (Chrétien, 1925)	
Agonopterix heracliana (Linnaeus, 1758)	
Agonopterix ciliella (Stainton, 1849)	

Agonopterix vendettella (Chrétien, 1908)	
Agonopterix chironiella (Constant, 1893)	
Agonopterix thapsiella (Zeller, 1847)	
Agonopterix fruticosella (Walsingham, 1903)	
Agonopterix adspersella (Kollar, 1832)	
Agonopterix curvipunctosa (Haworth, 1811)	
Agonopterix capreolella (Zeller, 1839)	
Agonopterix rotundella (Douglas, 1846)	
Agonopterix nodiflorella (Millière, 1866)	
Agonopterix assimilella (Treitschke, 1832)	
Agonopterix carduncelli Corley, 2017	BUCHNER *et al.* (2017)
Agonopterix nanatella (Stainton, 1849)	
Agonopterix squamosa (Mann, 1864)	
Agonopterix straminella (Staudinger, 1859)	
Agonopterix aspersella (Constant, 1888)	
Agonopterix kaekeritziana (Linnaeus, 1767)	
Agonopterix pallorella (Zeller, 1839)	
Agonopterix umbellana (Fabricius, 1794)	
Agonopterix nervosa (Haworth, 1811)	
Agonopterix alstromeriana (Clerck, 1759)	
Agonopterix astrantiae (Heinemann, 1870)	VIVES MORENO & GASTÓN (2017)
Agonopterix cnicella (Treitschke, 1832)	
Agonopterix senecionis (Nickerl, 1864)	
Agonopterix yeatiana (Fabricius, 1781)	
Agonopterix hippomarathri (Nickerl, 1864)	this paper
Agonopterix selini (Heinemann, 1870)	
Agonopterix oinochroa (Turati, 1879)	
Agonopterix cachritis (Staudinger, 1859)	
Agonopterix ferulae (Zeller, 1847)	VIVES MORENO & GASTÓN (2017)
Depressaria radiella (Goeze, 1783)	
Depressaria villosae Corley & Buchner, 2018	CORLEY & BUCHNER (2018)
Depressaria libanotidella Schläger, 1849	
Depressaria badiella (Hübner, 1796)	
Depressaria pseudobadiella Nel, 2011	this paper
Depressaria corticinella Zeller, 1854	
Depressaria sarahae Gastón & Vives, 2017	GASTÓN & VIVES MORENO (2017)
Depressaria daucella (Denis & Schiffermüller, 1775)	
Depressaria ultimella Stainton, 1849	
Depressaria halophilella Chrétien, 1908	VIVES MORENO & GASTÓN (2017)
Depressaria velox Staudinger, 1859	
Depressaria pyreneella Šumpich, 2013	
Depressaria pulcherrimella Stainton, 1849	
Depressaria cinderella Corley, 2002	this paper
Depressaria sordidatella Tengström, 1848	
Depressaria floridella Mann, 1864	this paper
Depressaria douglasella Stainton, 1849	
Depressaria beckmanni Heinemann, 1870	
Depressaria krasnowodskella Hannemann, 1953	
Depressaria albipunctella (Denis & Schiffermüller, 1775)	
Depressaria olerella Zeller, 1854	
Depressaria incognitella Hannemann, 1990	

Depressaria hofmanni Stainton, 1861
Depressaria ululana Rössler, 1866
Depressaria adustatella Turati, 1927
Depressaria chaerophylli Zeller, 1839
Depressaria absynthiella Herrich-Schäffer, 1865
Depressaria marcella Rebel, 1901
Depressaria depressana (Fabricius, 1775)
Depressaria veneficella Zeller, 1847
Depressaria junnilaineni Buchner, 2017 BUCHNER (2017)
Depressaria discipunctella Herrich-Schäffer, 1854
Depressaria albarracinella Corley, 2017 BUCHNER *et al.* (2017)
Depressaria eryngiella Millière, 1881
Depressaria hirtipalpis Zeller, 1854
Depressaria erinaceella Staudinger, 1870
Depressaria peniculatella Turati, 1922

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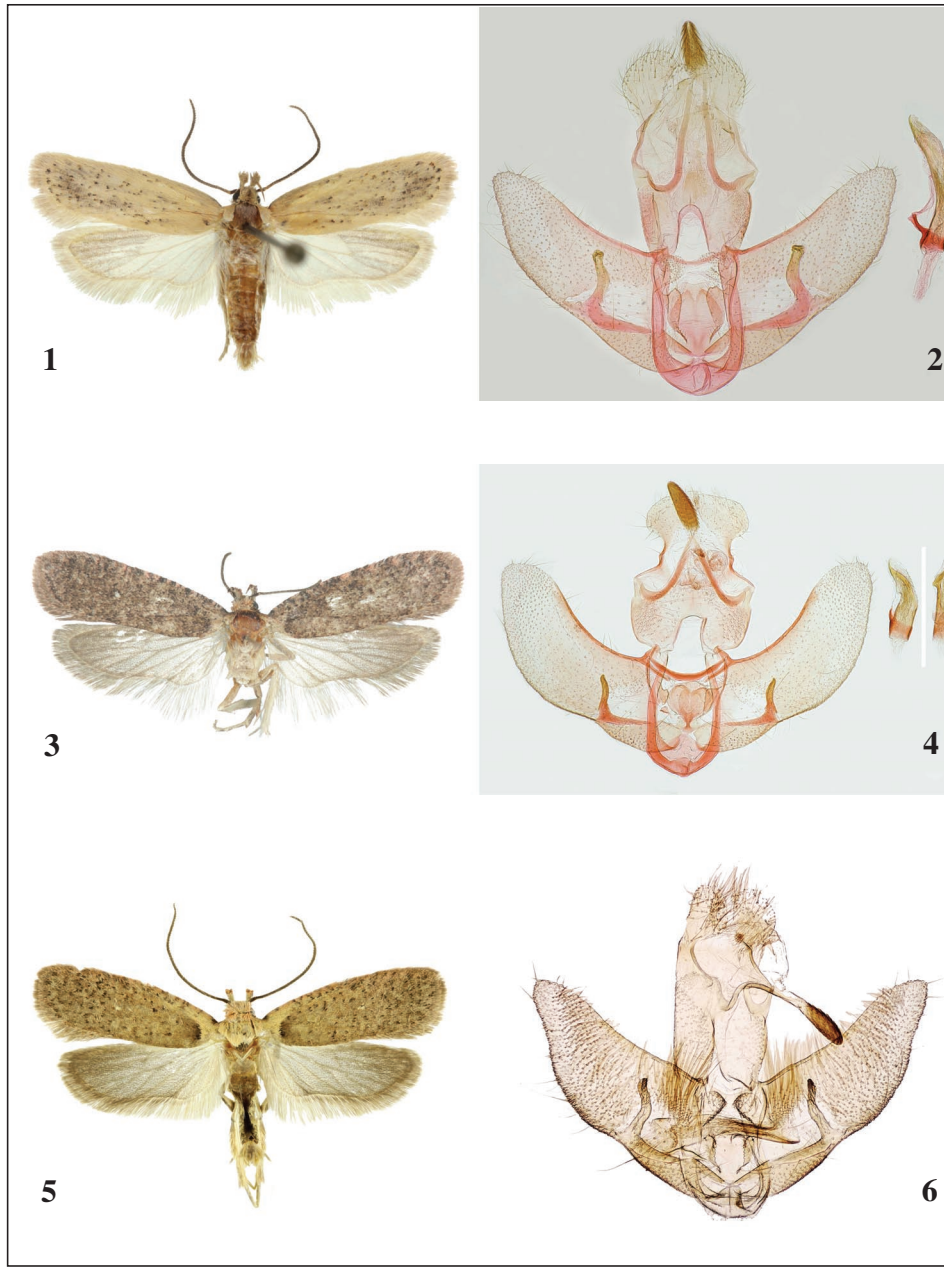
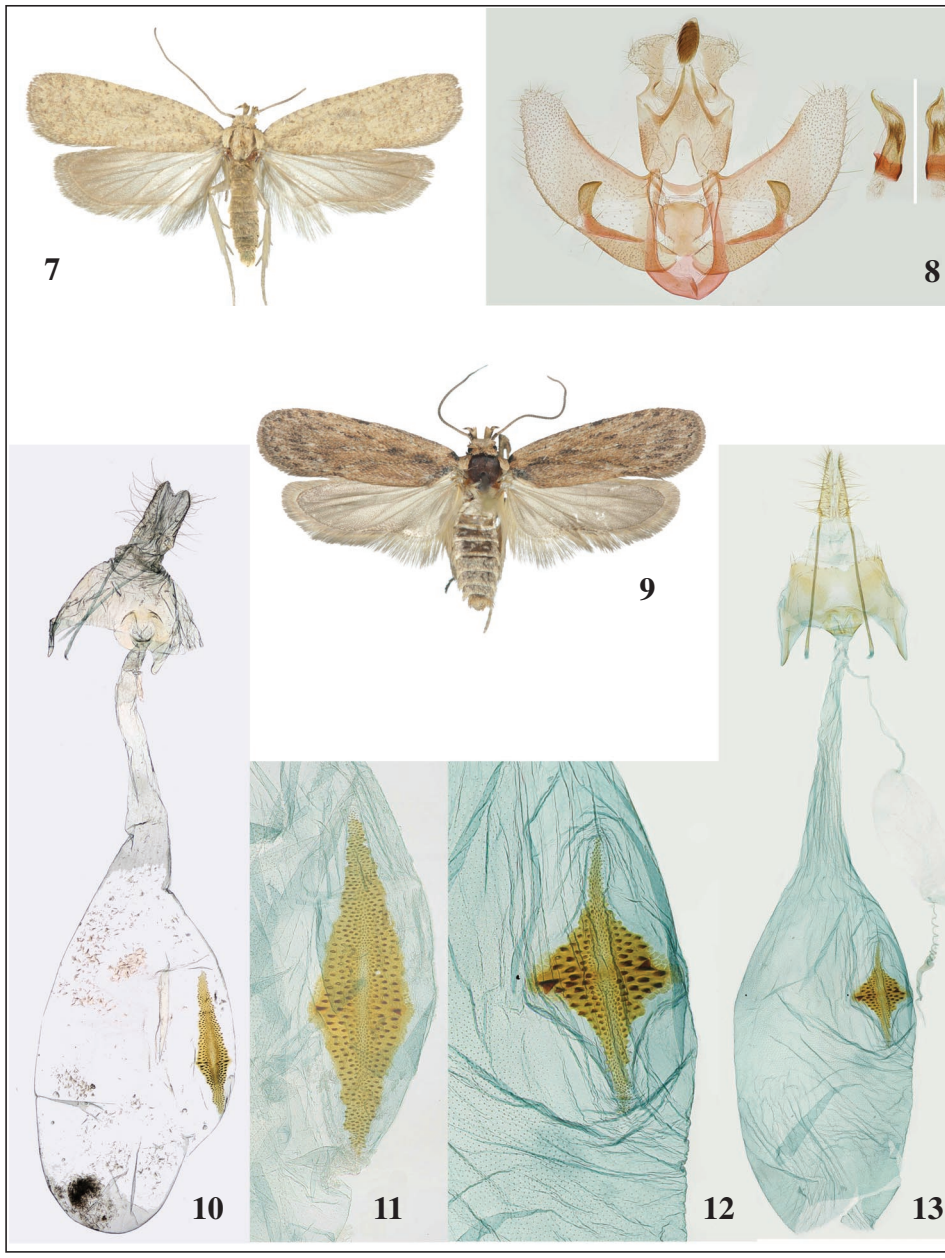
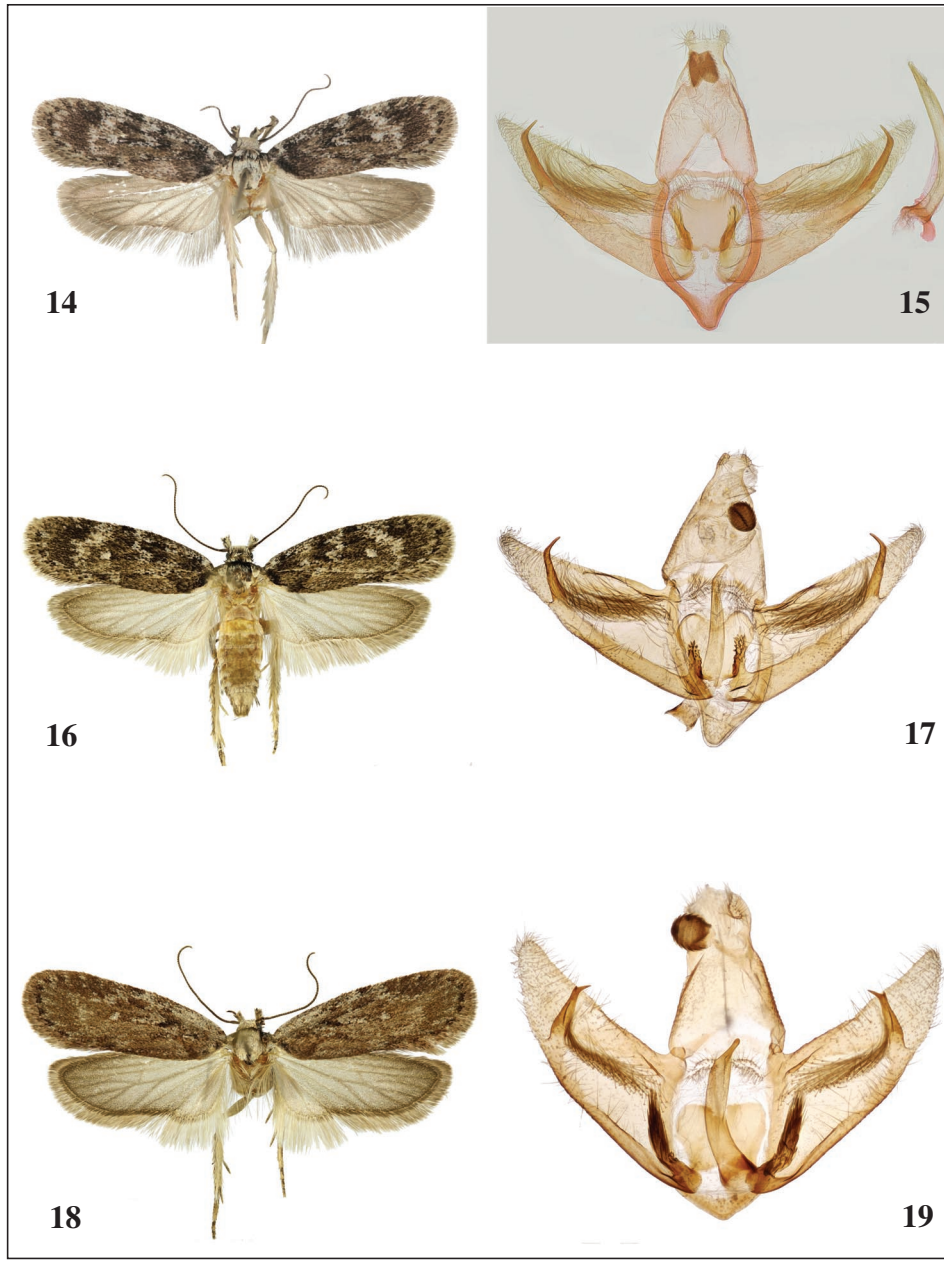


Figs 1-6.– Adult (left) and male genitalia (right). **1-2.** *Agonopterix carduncelli* Corley, 2017, Níjar, 14-VI-2007. **3-4.** *Agonopterix flurii* Sonderegger, 2013. **3.** Moscardón, 14-IX-2007. **4.** La Mancha, 17-V-2012. **5-6.** *Agonopterix hippomarathri* (Nickerl, 1864), Albarracín, 7-VIII-2010.



Figs 7-13.– Adult and genitalia. **7-8.** *Agonopterix kuznetzovi* Lvovsky, 1983, Barjalí, 29-VII-2005. **7.** Voucher specimen. **8.** Male genitalia. **9-11.** *Depressaria pseudobadiella* Nel, 2011. **9.** Adult, Candasnos, 30-V-2015. **10.** Female genitalia, Mediana, 8-10-2008. **11.** Signum, Valdovécar, 3-X-2015. **12-13.** *Depressaria badiella* (Hübner, 1796), female genitalia, Pozondón, 18-X-2016. **12.** Signum, enlarged. **13.** General view.



Figs 14-19.– Adult (left) and male genitalia (right). **14-17.** *Depressaria cinderella* Corley, 2002. **14-15.** Portugal, Alentejo, Portalegre, 05-VI-1996, Paratypus. **16-17.** Aldeaquemada, 20-VI-2013. **18-19.** *Depressaria floridella* Mann, 1864, Albarracín, 26-VI-2001.

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A new species of the genus *Platycerota* Hampson, 1893 from Myanmar (Burma) (Lepidoptera: Geometridae, Ennominae, Baptini)

A. Expósito-Hermosa

Abstract

Platycerota birmaniae Expósito, sp. n. from Myanmar. The adult and the genitalia of male and female are illustrated.
KEY WORDS: Lepidoptera, Geometridae, Ennominae, Baptini, *Platycerota,* new species, Myanmar (Burma).

Una nueva especie del género *Platycerota* Hampson, 1893 de Myanmar (Birmania) (Lepidoptera: Geometridae, Ennominae, Baptini)

Resumen

Se describe *Platycerota birmaniae* Expósito, sp. n. de Myanmar. Se ilustran el adulto y la genitalia del macho y de la hembra.
PALABRAS CLAVE: Lepidoptera, Geometridae, Ennominae, Baptini, *Platycerota,* nueva especie, Myanmar (Birmania).

Introduction

The genus *Platycerota* Hampson, 1893 was described from India, the type-species is *Ennomos*? s*pilotelaria* Walker, 1862. HOLLOWAY (1993: 80-82) studied the genus and included three species of Borneo. PARSONS *et al.* (1999: 764) included eight species in *Platycerota* and STÜNING (2000: 109-110) increased the number of species of the genus, establishing the synonymy *Platycerota* Hampson, 1893 (= *Crypsicometa* Warren, 1894). A thirteenth species of *Platycerota* is described below.

Taxonomy

***Platycerota birmaniae* Expósito, sp. n.** (Figs 1-5)

Material examined: Holotype ♂ with the slide AEH 3293. Paratype 1 ♀ with the slide AEH 3294. Paratype 2 ♀♀ (Figs 1-2) and Paratype 3 ♂♂ and Paratype 4 ♀♀. Data of all the specimens.- Route to Mt. Emaw Bum by Kanphant, 26º 09' 23.2"N, 98º 31' 16,4" E, 2358 m above sea level, 28-V-2006. Kachin State Province. Myanmar (Birmania) (Michael Langer, Stefan Naumann & Swen Löffer leg.). The type material is deposited in the collection of Andrés Expósito-Hermosa, Móstoles, Madrid (Spain).

Description (Figs 1-2): The wing span is 34-38 mm in males and 39-42 mm in females. The

dorsal part of the body is of the same colour as the ground colour of wings' upperside, the underside of body is concolorous with the underside of wings. Head: The palpi are short, vertex and base of the antennae with white scales, the antennae filiform in both sexes. The ground colour of specimens varies from orange-red to orange-off tone: numbers 172 and 192 of SÉGUY (1936), with sprinkling of black scales. The forewing with a curved basal line and another straight postmedian line of variable colour: inner part black and white or grey outside. The trace of the postmedian line can be continuous or discontinuous, but that of the basal line is always continuous. Forewing with a black apical point. There is no curved line in the area of the forewing apex. The tornus of forewing is smoothly rounded. Hindwings of the same colour, but the postmedian line is curved and the basal line is missing and the costal area is lighter colored. The underside of wings is the same colour as the front but more dull and the lines and apical point are missing. Hind tibia of both sexes with two pairs of spurs.

Male genitalia ♂ (Fig. 3): The distal part of uncus ends in a sharp point. The socii are roundish and a little pilose. The tegumen is of isosceles triangle shape. The costa of valva bears a characteristic central triangular dilation. The sacculus is without processes. The juxta is bilobed. The vinculum is short and the saccus with a slit in the center. The robust aedeagus with its proximal zone straight and its distal part with two small cornuti on the vesica and a larger cornutus having the form of a hook.

Female genitalia ♀ (Figs 4-5): The posterior apophyses are longer and thinner than the anterior ones that are thicker. The antrum with inverted triangular shape. The ductus bursae is very strongly sclerotized, long, the bursa copulatrix is spherical; there is a longitudinal fold in it with multiple spines that reaches the ductus bursae area. The signum (Fig. 5) with a circular crown with multiple barbs in its peripheral circle, the central area is lighter with some dark spots; the periphery of the signum with a series of concentric circles.

Distribution

Endemicity of Kachin State, MYANMAR (Burma).

Remarks

The new species has genitalic characters fitting with those of *Platycerota*, however the external appearance is alike *Eurychoria trajecta* Prout, 1932. The criterion of STÜNING (2000) has been maintained for *Platycerota* in this work.

Etymology

This species is called *birmaniae*, the name derived from the Birmania (Burma) in the genitive case.

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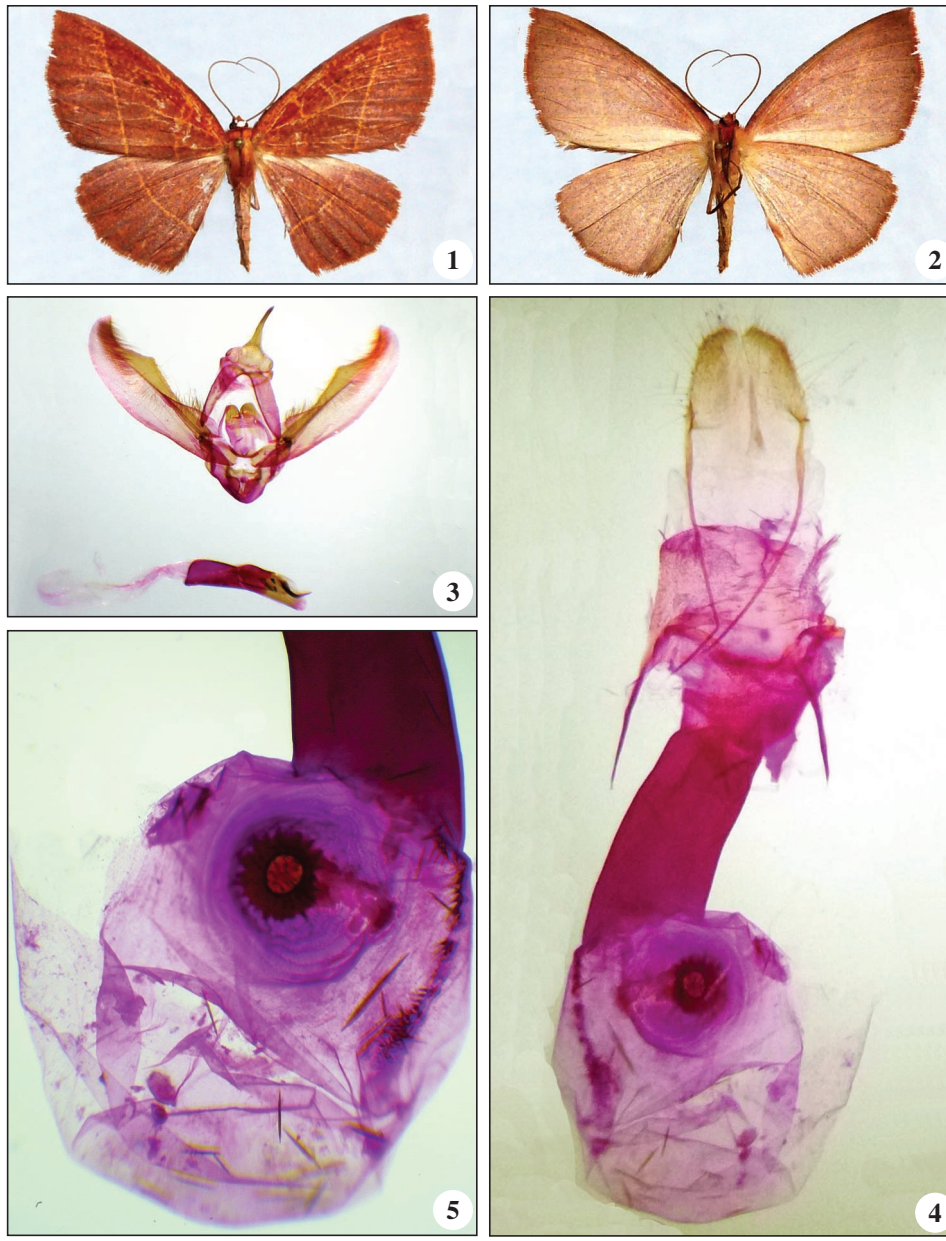

Figs. 1-5.– *Platycerota birmaniae* Expósito sp. n. **1.** Paratype 3, ♀ upperside of wings. **2.** Paratype 3, underside of wings. **3.** Holotype ♂ slide AEH 3293. **4.** Paratype 1, ♀ slide AEH 3294. **5.** Detail of the female genitalia with the signum enlarged; slide (dorsal view) AEH 3294. **Figs. 1-5**.– *Platycerota birmaniae* Expósito sp. n. **1.** Paratype 3, ♀ upperside of wings. **2.** Paratype 3, underside of wings. **3.** Holotype ♂ slide AEH 3293. **4.** Paratype 1, ♀ slide AEH 3294. **5.** Detail of the female genitalia with the signum enlarged; slide (dorsal view) AEH 3294.

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