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SHILAP

REVISTA DE LEPIDOPTEROLOGIA

Madrid
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E.T.S. de Ingeniería Agronómica,
Alimentación y Biosistemas
Universidad Politécnica de Madrid
Avenida Puerta de Hierro, 2
E - 28040 Madrid
ESPAÑA / *SPAIN*

© SHILAP
Apartado de correos, 331
E - 28080 Madrid
ESPAÑA / *SPAIN*
E-mail: avives1954@outlook.es / avives1954@outlook.com
E-mail: avives1954@gmail.com
https://shilap.org

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SHILAP REVISTA DE LEPIDOPTEROLOGIA

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Contribución al conocimiento de los Noctuidae de la vertiente asturiana del Parque Nacional de los Picos de Europa (Asturias, España) (Insecta: Lepidoptera)

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

Resumen

Se aportan los datos faunísticos de 129 especies de la familia Noctuidae del Parque Nacional de los Picos de Europa (Asturias), de las que 108 pertenecen a la subfamilia Noctuinae. Esta fauna se caracteriza por presentar una influencia euroasiática, con una proporción del 48,1%, que alcanza el 64,3% en los elementos de amplía distribución si se le añaden los elementos holárticos (7,0%), paleárticos (4,6%) y cosmopolitas y tropicales (4,6%). Entre los taxones que se citan por primera vez en el área de estudio destaca el endemismo *Allophyes alfaroi*, que supone solamente el 0,8% del total. Se citan 38 nuevas especies para el catálogo lepidopterológico asturiano, entre ellas *Agrochola circellaris, Agrochola macilenta, Amphipyra berbera, Apamea anceps, Apamea remissa, Chersotis cuprea*, *Dichagyris nigrescens, Mesapamea secalella, Stilbia anomala* y *Xestia kermesina*, que amplían de este modo su distribución, y *Standfussiana dalmata*, especie que solamente es conocida en la mitad oriental de la Península Ibérica.
PALABRAS CLAVE: Lepidoptera, Noctuidae, faunística, nuevos datos, Picos de Europa, Asturias, España.

Contribution to the knowledge of the family Noctuidae from the "Picos de Europa" National Park (Asturias, Spain) (Insecta: Lepidoptera)

Abstract

The Noctuidae moth fauna from the "Picos de Europa" National Park (Asturias, Spain) includes 129 species mainly belonging to the subfamily Noctuinae with 108 species. Biogeographically, the Euroasiatic elements (48.1%) are corologically the most important, reaching 64.3% of wide range elements if Holarctic (7.0%), Palearctic (4.6%), and Cosmopolitan and Tropical species (4.6) are added. Among those taxa which are documented in the study area for the first time, the Iberian endemism *Allophyes alfaroi* (0.8%) is highlighted. In addition, other interesting species are those that expand their known distribution in the Iberian Peninsula as *Agrochola circellaris, Agrochola macilenta, Amphipyra berbera, Apamea anceps, Apamea remissa, Chersotis cuprea*, *Dichagyris nigrescens, Mesapamea secalella, Stilbia anomala* and *Xestia kermesina* as well as *Standfussiana dalmata* only known from Eastern half of the Iberian Peninsula.
KEY WORDS: Lepidoptera, Noctuidae, faunistics, new records, Picos de Europa, Asturias, Spain.

Introducción

El Parque Nacional Picos de los Europa está situado en la parte central de la Cordillera Cantábrica compartiendo áreas que pertenecen a tres regiones españolas: Asturias, Cantabria y Castilla y León. El

Parque Nacional de los Picos de Europa está dominado por tres macizos montañosos formados fundamentalmente por materiales calcáreos, con alturas que varían entre los 75 m (río Deva) y los 2.646 m de altitud (Torre Cerredo, Macizo Central).

El estudio de la superfamilia Noctuoidea de Asturias se realizó durante los años 70 y 80 del siglo XX (VEGA, 1974a, b, 1979; HURLÉ, 1979, 1980; [GUERRA-MARTÍN, E.], [1981]; CALLE, 1980; LANDEIRA, 1980; TORRE, 1988; entre otros), lo que permitió citar 154 especies, de las cuales, 14 pertenecen a la familia Notodontidae, 49 a Erebidae, una a Euteliidae, dos a Nolidae y 88 a Noctuidae. Recientemente, los muestreos en el Parque Natural de Somiedo y en el sector asturiano del Parque Nacional de los Picos de Europa (ORTIZ *et al.,* 2016a, 2017) han permitido elevar el total de especies a un total de 234.

La mayor parte de los estudios realizados en el Parque Nacional de los Picos de Europa se han centrado en los Rhopalocera, de los que se conocen 125 especies (VERHULST *et al.,* 2005), siendo esta zona considerada particularmente rica en especies amenazadas a nivel europeo, por lo que ha sido designada como área prioritaria para la conservación (VAN SWAAY & WARREN, 2003). En el caso de los noctuidos, el Parque Nacional de los Picos de Europa ha sido desigualmente estudiado dependiendo de la localización administrativa del área en cuestión. Así, la parte correspondiente a la provincia de León, que incluye las cuadrículas UTM 30TUN37, 30TUN38, 30TUN47 y 30TUN48, ha sido ampliamente estudiada por MANCEÑIDO *et al.* (2009), MANCEÑIDO & GONZÁLEZ-ESTÉBANEZ (2015, 2016) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012), mientras que la zona de la vertiente cántabra solo fue estudiada por CALLE (1980) y CALLE & SAZ (1981). El área asturiana del parque ha sido solamente estudiada en CALLE (1980), donde se citaron 54 especies de la localidad de Puente Poncebos con referencias a algunas formas descritas en AGENJO (1940), y recientemente, en GUERRERO *et al.* (2016) y ORTIZ *et al.* (2016a).

El objetivo de este trabajo es aportar nuevos datos sobre la fauna de la familia Noctuidae presente en el sector asturiano del Parque Nacional de los Picos de Europa y añadir nuevas especies al catálogo de los noctuidos de Asturias.

Material y métodos

Los muestreos se realizaron en el municipio de Cabrales (UTM 30TUN58), en las localidades de Tielve (670 m), Sotres (1.050 m) y el Collado de Pandébano (1.160 m), entre agosto de 2010 y octubre de 2011 de forma esporádica y, puntualmente, en una pradera en los alrededores de Sotres a finales de julio y principios de septiembre de 2010, a 1.280 m. Además, se realizó un muestreo final en la pista Sotres-Áliva en agosto de 2012 a 1.040 m (Figura 1). Todos estos muestreos se han realizado para obtener ejemplares para la secuenciación del gen COI (citocromo oxidasa I) dentro del proyecto del Plan Nacional I+D+i (2008-2011). Estos muestreos se realizaron con trampas de luz negra y actínica de 15 vatios (tipo Heath), excepto los realizados puntualmente en el alumbrado público de las localidades mencionadas.

El material estudiado se encuentra depositado en la colección del Laboratorio de Biología Animal del Departamento de Zoología y Antropología Física de la Universidad de Murcia.

La nomenclatura y la ordenación sistemática de los taxones en sus correspondientes categorías taxonómicas se ha hecho de acuerdo con la propuesta de KARSHOLT & van NIEUKERKEN (2017). El análisis biogeográfico se ha realizado utilizando los corotipos generales propuestos en CALLE (1982), actualizados con los criterios biogeográficos de VARGA (2010), considerando el elemento atlanto-mediterráneo para los taxones que se distribuyen por la Europa atlántica e incluyendo aquellos restringidos al Mediterráneo occidental.

En la relación de especies se indica la toponimia distintiva, fecha de captura y número de ejemplares para cada taxón.

Figura 1.– Mapa de situación de la localidad de Sotres en el Parque Nacional de los Picos de Europa.

Resultados

Se capturaron 2.992 ejemplares en total, identificando 129 especies de las que 108 pertenecen a la subfamilia Noctuinae, ocho a Plusiinae, cuatro a Acronictinae, tres a Amphipyrinae, y una sola especie a las subfamilias Eustrotiinae, Pantheinae, Oncocnemidinae, Psaphidinae, Heliothinae y Bryophilinae, respectivamente.

La distribución de las especies en cada una de las subfamilias se presenta en la Tabla I. La proporción de los diferentes elementos biogeográficos que componen la fauna del Parque Nacional de los Picos de Europa se muestra en la Tabla II. A continuación, se listan en orden sistemático dichas especies.

NOCTUIDAE
PLUSIINAE
ABROSTOLINI

Abrostola tripartita (Hufnagel, 1766)
Material estudiado: Pandébano, 1 ex., 23-V-2011; Sotres, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por MANCEÑIDO & GONZALEZ-ESTÉBANEZ (2016).
Elemento eurosiberiano.

Abrostola asclepiadis ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 3 ex. 27-VI-2011; Tielve, 3 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

PLUSIINI
AUTOPLUSIINA

Diachrysia chrysitis (Linnaeus, 1758)
Material estudiado: Sotres, 1 ex., 31-VII-2010; 2 ex., 18-VIII-2012.
Citada en los Picos de Europa por MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

EUCHALCINA

Polychrysia moneta (Fabricius, 1787)
Material estudiado: Pandébano, 1 ex., 18-VIII-2012.
Citada en los Picos de Europa por MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

PLUSIINA

Autographa gamma (Linnaeus, 1758)
Material estudiado: Pandébano, 5 ex., 23-V-2011; Sotres, 4 ex., 31-VII-2010; 1 ex., 27-VI-2011; Tielve, 4 ex., 23-V-2011; 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980), MANCEÑIDO *et al.* (2009) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento cosmopolita.

Autographa jota (Linnaeus, 1758)
Material estudiado: Sotres, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980) y MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Autographa pulchrina (Haworth, 1809)
Material estudiado: Pandébano, 4 ex., 27-VI-2011; Sotres, 4 ex., 31-VII-2010; 6 ex., 27-VI-2011, Tielve, 2 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980) y MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Autographa bractea ([Denis & Schiffermuller], 1775)
Material estudiado: Sotres, 1 ex., 31-VII-2010.
Citada en los Picos de Europa por OLIVER (1997) y MANCEÑIDO *et al.* (2009).
Elemento paleártico.

EUSTROTIINAE

Deltote (Protodeltote) pygarga (Hufnagel, 1766)
Material estudiado: Tielve, 2 ex., 23-V-2011; 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

ACRONICTINAE

Acronicta (Triaena) psi (Linnaeus, 1758)
Material estudiado: Sotres, 1 ex., 31-VII-2010; Tielve, 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Acronicta (Vimina) euphorbiae ([Denis & Schiffermüller], 1775)

Material estudiado: Pista Sotres-Áliva, 4 ex., 18-VIII-2012; Pandébano, 3 ex., 23-V-2011; 1 ex., 27-VI-2011, Sotres; 1 ex., 27-VI-2011; Tielve, 1 ex., 23-V-2011.

Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Acronicta (Vimina) rumicis (Linnaeus, 1758)

Material estudiado: Sotres, 1 ex., 31-VII-2010.

Citada en los Picos de Europa por CALLE (1980).

Elemento paleártico.

Craniophora ligustri ([Denis & Schiffermüller], 1775)

Material estudiado: Tielve, 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980), CALLE & SAZ (1981) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

PANTHEINAE

Colocasia coryli (Linnaeus, 1758)

Material estudiado: Pandébano, 2 ex., 23-V-2011; 2 ex., 18-VIII-2012; Sotres, 2 ex., 23-V-2011.

Elemento eurosiberiano.

ONCOCNEMIDINAE

Stilbia anomala (Haworth, 1812)

Material estudiado: Sotres, 1 ex., 9-IX-2010.

Elemento atlanto-mediterráneo.

AMPHIPYRINAE

Amphipyra (Amphipyra) pyramidea (Linnaeus, 1758)

Material estudiado: Sotres, 1 ex., 9-IX-2010.

Elemento eurosiberiano.

Amphipyra (Amphipyra) berbera Rungs, 1949

Material estudiado: Pandébano, 1 ex., 27-VI-2011.

Elemento eurosiberiano.

Amphipyra (Amphipyra) tragopoginis (Clerck, 1759)

Material estudiado: Pandébano, 1 ex., 27-VI-2011; Sotres, 2 ex., 31-VII-2010; 1 ex., 9-IX-2010.

Citada en los Picos de Europa por CALLE (1980).

Elemento holártico.

PSAPHIDINAE
PSAPHIDINI

Allophyes alfaroi Agenjo, 1951
Material estudiado: Pandébano, 2 ex., 31-X-2011.
Elemento endémico.

HELIOTHINAE

Helicoverpa armigera (Hübner, [1808])
Material estudiado: Pandébano, 1 ex., 23-V-2011; 7 ex., 27-VI-2011; Sotres, 1 ex., 31-VII-2010; 1 ex., 27-VI-2011; Tielve, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento tropical.

BRYOPHILINAE

Bryophila (Bryophila) domestica (Hufnagel, 1766)
Material estudiado: Pandébano, 1 ex., 18-VIII-2012.
Elemento asiático-mediterráneo.

NOCTUINAE
CARADRININI
CARADRININA

Hoplodrina octogenaria (Goeze, 1781)
Material estudiado: Pandébano, 7 ex., 27-VI-2011; Sotres, 8 ex., 31-VII-2010; Tielve, 3 ex., 27-VI-2011.
Citada en los Picos de Europa por MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Hoplodrina blanda ([Denis & Schiffermüller], 1775)
Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Sotres, 6 ex., 31-VII-2010; 1 ex., 9-IX-2010; 13 ex., 18-VIII-2012.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

Hoplodrina respersa ([Denis & Schiffermüller], 1775)
Material estudiado: Sotres, 4 ex., 31-VII-2010; 1 ex., 27-VI-2011; Tielve, 12 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

Hoplodrina ambigua ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 9-IX-2010; Sotres, 2 ex. 9-IX-2010; Tielve, 1 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

Charanyca (Rusina) ferruginea (Esper, 1785)
Material estudiado: Pandébano, 1 ex., 23-V-2011; 10 ex., 27-VI-2011; Sotres, 1 ex., 31-VII-2010; 21 ex., 3-V-2011; 5 ex., 27-VI-2011; Tielve, 13 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

ATHETINA

Athetis (Hydrillula) pallustris (Hübner, [1808])
Material estudiado: Pandébano, 3 ex., 23-V-2011; Tielve, 2 ex., 23-V-2011.
Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento eurosiberiano.

DYPTERYGIINI

Trachea atriplicis (Linnaeus, 1758)
Material estudiado: Sotres, 1 ex., 31-VII-2010.
Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

Thalpophila vitalba (Freyer, 1834)
Material estudiado: Pista Sotres-Áliva, 3 ex., 18-VIII-2012; Pandébano, 2 ex., 18-VIII-2012; Sotres, 5 ex., 18-VIII-2012.
Elemento atlanto-mediterráneo.

PHLOGOPHORINI

Phlogophora meticulosa (Linnaeus, 1758)
Material estudiado: Pandébano, 2 ex., 23-V-2011; 1 ex., 31-X-2011; Sotres, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento asiático-mediterráneo.

Euplexia lucipara (Linnaeus, 1758)
Material estudiado: Sotres, 2 ex., 31-VII-2010; Tielve, 1 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento holártico.

Auchmis detersa (Esper, 1787)
Material estudiado: Pandébano, 1 ex., 27-VI-2011; Sotres, 1 ex., 31-VII-2010.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

APAMEINI

Luperina testacea ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 9-IX-2010; 1 ex., 18-VIII-2012; Sotres, 20 ex., 9-IX-2010; 14 ex., 18-VIII-2012.
Elemento asiático-mediterráneo.

Luperina nickerlii (Freyer, 1845)
Material estudiado: Sotres, 1 ex., 9-IX-2010.
Elemento atlanto-mediterráneo.

Apamea remissa (Hübner, [1809])
Material estudiado: Pandébano, 1 ex., 23-V-2011; 1 ex., 27-VI-2011.
Elemento eurosiberiano.

Apamea crenata (Hufnagel, 1766)
Material estudiado: Pandébano, 4 ex., 23-V-2011; Sotres, 4 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

Apamea anceps ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 23-V-2011.
Elemento atlanto-mediterráneo.

Apamea sordens (Hufnagel, 1766)
Material estudiado: Pandébano, 5 ex., 23-V-2011; Sotres, 3 ex., 23-V-2011; Tielve, 2 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento holártico.

Apamea illyria Freyer, 1846
Material estudiado: Pandébano, 3 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento eurosiberiano.

Apamea monoglypha (Hufnagel, 1766)
Material estudiado: Pandébano, 1 ex., 23-V-2011; 73 ex., 27-VI-2011; Sotres, 49 ex., 31-VII-2010; 2 ex., 23-V-2011; 14 ex., 27-VI-2011; Tielve, 2 ex., 23-V-2011; 12 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980), CALLE & SAZ (1981) y MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Apamea furva ([Denis & Schiffermüller], 1775)
Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Sotres, 1 ex., 31-VII-2010; 1 ex., 18-VIII-2012.
Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

Apamea platinea (Treitschke, 1825)
Material estudiado: Tielve, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

Mesapamea secalis (Linnaeus, 1758)
Citada en los Picos de Europa por CALLE (1980).
Material estudiado: Sotres, 4 ex., 31-VII-2010.
Elemento eurosiberiano.

Mesapamea secalella (Remm, 1983)
Material estudiado: Sotres, 1 ex., 31-VII-2010.

Elemento eurosiberiano.

Oligia strigilis (Linnaeus, 1758)

Material estudiado: Pandébano, 3 ex., 23-V-2011; 1 ex., 27-VI-2011; Sotres, 1 ex., 27-VI-2011; Tielve, 2 ex., 23-V-2011.

Citada en los Picos de Europa por CALLE (1980).

Elemento eurosiberiano.

Oligia latruncula ([Denis & Schiffermüller], 1775)

Material estudiado: Pandébano, 5 ex., 27-VI-2011; Sotres, 3 ex., 31-VII-2010.

Citada en los Picos de Europa por CALLE (1980).

Elemento eurosiberiano.

Oligia versicolor (Borkhausen, 1792)

Material estudiado: Sotres, 5 ex., 31-VII-2010; 1 ex., 23-V-2011.

Citada en los Picos de Europa por MANCEÑIDO *et al.* (2009).

Elemento eurosiberiano.

EPISEMINI

Leucochlaena (Leucochlaena) oditis (Hübner, [1822])

Material estudiado: Tielve, 1 ex., 9-IX-2010.

Elemento atlanto-mediterráneo.

XYLENINI
XYLENINA

Brachylomia viminalis (Fabricius, 1776)

Material estudiado: Pandébano, ex., 18-VIII-2012; Sotres, 1 ex., 31-VII-2010; 1 ex., 27-VI-2011.

Elemento eurosiberiano.

Agrochola (Sunira) circellaris (Hufnagel, 1766)

Material estudiado: Pandébano, 1 ex., 31-X-2011.

Elemento holártico.

Agrochola (Anchoscelis) helvola (Linnaeus, 1758)

Material estudiado: Pandébano, 1 ex., 31-X-2011.

Elemento eurosiberiano.

Agrochola (Leptologia) macilenta (Hübner, [1809])

Material estudiado: Pandébano, 6 ex., 31-X-2011.

Elemento eurosiberiano.

Conistra (Conistra) vaccinii (Linnaeus, 1761)

Material estudiado: Pandébano, 1 ex., 31-X-2011.

Elemento eurosiberiano.

COSMIINA

Atethmia centrago (Haworth, 1809)

Material estudiado: Sotres, 1 ex., 9-IX-2010.

Elemento asiático-mediterráneo.

Cosmia (Calymnia) trapezina (Linnaeus, 1758)
Material estudiado: Pandébano, 2 ex., 18-VIII-2012; Sotres, 5 ex., 18-VIII-2012.
Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento asiático-mediterráneo.

ANTITYPINA

Antitype chi (Linnaeus, 1758)
Material estudiado: Pandébano, 1 ex., 9-IX-2010.
Elemento eurosiberiano.

Polymixis (Polymixis) xanthomista (Hübner, [1819])
Material estudiado: Sotres, 1 ex., 9-IX-2010.
Elemento atlanto-mediterráneo.

Polymixis (Polymixis) *flavicincta* ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 31-X-2011.
Elemento atlanto-mediterráneo.

Polymixis (Polymixis) dubia (Duponchel, 1836)
Material estudiado: Sotres, 2 ex., 9-IX-2010.
Citada en los Picos de Europa por CALLE (1980) y MANCEÑIDO & GONZÁLEZ-ESTÉBANEZ (2015).
Elemento atlanto-mediterráneo.

Mniotype adusta (Esper, 1790)
Material estudiado: Pandébano, 4 ex., 23-V-2011; 7 ex., 27-VI-2011; Sotres, 1 ex., 31-VII-2010; 8 ex., 23-V-2011; 3 ex., 27-VI-2011; Tielve, 2 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento eurosiberiano.

ORTHOSIINI

Orthosia (*Orthosia*) *incerta* (Hufnagel, 1766)
Material estudiado: Pandébano, 1 ex., 23-V-2011.
Elemento eurosiberiano.

Orthosia (*Monima*) *cerasi* (Fabricius, 1775)
Material estudiado: Pandébano, 1 ex., 23-V-2011.
Elemento eurosiberiano.

THOLERINI

Tholera decimalis (Poda, 1761)
Material estudiado: Pandébano, 28 ex., 9-IX-2010; Sotres, 5 ex., 9-IX-2010; Tielve, 5 ex., 9-IX-2010.
Citada en los Picos de Europa por OLIVER (1997) y SÁNCHEZ-EGUIALDE (1999).
Elemento eurosiberiano.

HADENINI

Polia nebulosa (Hufnagel, 1766)

Material estudiado: Pandébano, 24 ex., 27-VI-2011; Sotres, 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y CALLE & SAZ (1981).

Elemento paleártico.

Pachetra sagittigera (Hufnagel, 1766)

Material estudiado: Pandébano, 1 ex.,23-V-2011; 1 ex., 27-VI-2011; Sotres, 2 ex., 27-VI-2011; Tielve, 2 ex., 23-V-2011.

Citada en los Picos de Europa por CALLE (1980), MANCEÑIDO *et al.* (2009) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Lacanobia (Lacanobia) w-latinum (Hufnagel, 1766)

Material estudiado: Pandébano, 2 ex., 23-V-2011; 6 ex., 27-VI-2011; Sotres, 1 ex., 23-V-2011; Tielve, 3 ex., 23-V-2011; 16 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980).

Elemento eurosiberiano.

Lacanobia (Diataraxia) oleracea (Linnaeus, 1758)

Material estudiado: Sotres, 3 ex., 31-VII-2010; 2 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980).

Elemento eurosiberiano.

Melanchra persicariae (Linnaeus, 1761)

Material estudiado: Pandébano, 4 ex., 27-VI-2011; Sotres, 10 ex., 31-VII-2010; Tielve, 3 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980), CALLE & SAZ (1981) y MANCEÑIDO *et al.* (2009).

Elemento eurosiberiano.

Ceramica pisi (Linnaeus, 1758)

Material estudiado: Pandébano, 3 ex., 23-V-2011; 14 ex., 27-VI-2011; Sotres, 5 ex., 31-VII-2010; 1 ex., 23-V-2011; 6 ex., 27-VI-2011; Tielve, 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Hada plebeja (Linnaeus, 1761)

Material estudiado: Pandébano, 2 ex., 23-V-2011; Sotres, 2 ex., 23-V-2011.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Sideridis (Aneda) rivularis (Fabricius, 1775)

Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Pandébano, 1 ex., 23-V-2011; 1 ex., 27-VI-2011; Sotres, 2 ex., 31-VII-2010; 1 ex., 27-VI-2011; 1 ex., 18-VIII-2012.

Citada en los Picos de Europa por CALLE (1980), CALLE & SAZ (1981) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Hadena (*Hadena*) *compta* ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 27-VI-2011; Sotres, 1 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE & SAZ (1981) y MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Hadena (*Hadena*) *confusa* (Hufnagel, 1766)
Material estudiado: Sotres, 2 ex., 23-V-2011; 1 ex., 27-VI-2011.
Elemento eurosiberiano.

Hadena (*Hadena*) *albimacula* (Borkhausen, 1792)
Material estudiado: Tielve, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

Hadena (*Hadena*) *filograna* (Esper, 1788)
Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Pandébano, 1 ex., 18-VIII-2012; Sotres, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento eurosiberiano.

Hadena (*Hadena*) *caesia* ([Denis & Schiffermüller], 1775)
Material estudiado: Sotres, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento eurosiberiano.

Hadena (*Anepia*) *perplexa* ([Denis & Schiffermüller], 1775)
Material estudiado: Sotres, 1 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento eurosiberiano.

LEUCANIINI

Mythimna (Mythimna) conigera ([Denis & Schiffermüller], 1775)
Material estudiado: Pista Sotres-Áliva, 3 ex., 18-VIII-2012; Pandébano, 1 ex., 27-VI-2011; 1 ex., 18-VIII-2012; Sotres, 23 ex., 31-VII-2010; 1 ex., 9-IX-2010; 1 ex., 18-VIII-2012.
Citada en los Picos de Europa por CALLE (1980) y MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Mythimna (Mythimna) impura (Hübner, [1808])
Material estudiado: Pandébano, 3 ex., 27-VI-2011; Sotres, 7 ex., 31-VII-2010; 2 ex., 27-VI-2011; 3 ex., 18-VIII-2012; Tielve, 2 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento holártico.

Mythimna (*Mythimna*) *vitellina* (Hübner, [1808])
Material estudiado: Pandébano, 16 ex., 9-IX-2010; 26 ex., 23-V-2011; 3 ex., 27-VI-2011; 1 ex., 31-X-2011; 1 ex., 18-VIII-2012; Sotres, 8 ex., 9-IX-2010; 8 ex., 23-V-2011; 1 ex., 27-VI-2011; Tielve, 48 ex., 23-V-2011; 7 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento asiático-mediterráneo.

Mythimna (Sablia) sicula (Treitschke, 1835)

Material estudiado: Tielve, 3 ex., 23-V-2011; 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento asiático-mediterráneo.

Mythimna (Hyphilare) albipuncta ([Denis & Schiffermüller], 1775)

Material estudiado: Pandébano, 1 ex., 9-IX-2010; 14 ex., 23-V-2011; 1 ex., 31-X-2011; Tielve, 21 ex., 3-V-2011; Sotres, 2 ex., 31-VII-2010; 5 ex., 9-IX-2010.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento asiático-mediterráneo.

Mythimna (Hyphilare) ferrago (Fabricius, 1787)

Material estudiado: Sotres, 25 ex., 31-VII-2010; 4 ex., 9-IX-2010; 6 ex., 18-VIII-2012; Tielve, 1 ex., 9-IX-2010.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Mythimna (Hyphilare) l-album (Linnaeus, 1767)

Material estudiado: Pandébano, 1 ex., 31-X-2011; Tielve, 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980).

Elemento eurosiberiano.

Leucania (*Acantholeucania*) *loreyi* (Duponchel, 1827)

Material estudiado: Pandébano, 1 ex., 31-X-2011.

Elemento tropical.

NOCTUINI

AGROTINA

Peridroma saucia (Hübner, [1808])

Material estudiado: Pandébano, 3 ex., 27-VI-2011; Sotres, 22 ex., 27-VI-2011; Tielve, 3 ex., 23-V-2011; 2 ex., 27-VI-2011.

Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento cosmopolita.

Dichagyris (Albocosta) musiva (Hübner, [1803])

Material estudiado: Pandébano, 1 ex., 9-IX-2010; Sotres, 2 ex., 9-IX-2010.

Elemento eurosiberiano.

Dichagyris (Dichagyris) nigrescens (Höfner, 1888)

Material estudiado: Tielve, 1 ex., 27-VI-2011.

Elemento asiático-mediterráneo.

Euxoa (Euxoa) decora ([Denis & Schiffermüller], 1775)
Material estudiado: Pista Sotres-Áliva, 4 ex., 18-VIII-2012; Sotres, 1 ex., 9-IX-2010.
Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento asiático-mediterráneo.

Agrotis bigramma (Esper, 1790)
Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Pandébano, 2 ex., 18-VIII-2012; Sotres, 1 ex., 9-IX-2010; Tielve, 2 ex., 9-IX-2010.
Elemento asiático-mediterráneo.

Agrotis chretieni (Dumont, 1903)
Material estudiado: Pandébano, 2 ex., 23-V-2011.
Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento atlanto-mediterráneo.

Agrotis cinerea ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 23-V-2011; Sotres, 7 ex., 23-V-2011.
Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento asiático-mediterráneo.

Agrotis simplonia (Geyer, [1832])
Material estudiado: Pandébano, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento atlanto-mediterráneo.

Agrotis exclamationis (Linnaeus, 1758)
Material estudiado: Pandébano, 2 ex., 23-V-2011; 7 ex., 27-VI-2011; Sotres, 1 ex., 31-VII-2010; 4 ex., 23-V-2011; Tielve, 1 ex., 23-V-2011; 7 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980), MANCEÑIDO *et al.* (2009) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento paleártico.

Agrotis segetum ([Denis & Schiffermüller], 1775)
Material estudiado: Pandébano, 1 ex., 23-V-2011; 1 ex., 27-VI-2011; Sotres, 1 ex., 9-IX-2010; 15 ex., 27-VI-2011; Tielve, 1 ex., 23-V-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento paleártico.

Agrotis trux (Hübner, [1824])
Material estudiado: Pandébano, 1 ex., 9-IX-2010; 1 ex., 27-VI-2011; Tielve, 2 ex., 9-IX-2010; Sotres, 3 ex., 9-IX-2010.
Elemento asiático-mediterráneo.

Agrotis puta (Hübner, [1803])
Material estudiado: Pandébano, 1 ex., 23-V-2011; Tielve, 1 ex., 9-IX-2010.
Elemento asiático-mediterráneo.

Agrotis ipsilon (Hufnagel, 1766)
Material estudiado: Pandébano, 1 ex., 9-IX-2010; 7 ex., 27-VI-2011; Sotres, 3 ex., 31-VII-2010; 1 ex., 27-VI-2011; Tielve, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).

Elemento cosmopolita.

NOCTUINA

Axylia putris (Linnaeus, 1761)

Material estudiado: Sotres, 1 ex., 27-VI-2011; Tielve, 1 ex., 27-VI-2011.

Elemento eurosiberiano.

Ochropleura plecta (Linnaeus, 1761)

Material estudiado: Pista Sotres-Áliva, 3 ex., 18-VIII-2012; Pandébano, 7 ex., 9-IX-2010; 211 ex., 3-V-2011; 12 ex., 27-VI-2011; 10 ex., 18-VIII-2012; Sotres, 7 ex., 31-VII-2010; 10 ex., 9-IX-2010; 2 ex., 27-VI-2011; 12 ex., 18-VIII-2012; Tielve, 1 ex., 9-IX-2010; 3 ex., 23-V-2011; 2 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980), MANCEÑIDO *et al.* (2009) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento holártico.

Ochropleura leucogaster (Freyer, 1831)

Material estudiado: Pandébano, 1 ex., 27-VI-2011; Sotres, 3 ex., 31-VII-2010.

Elemento tropical.

Diarsia brunnea ([Denis & Schiffermüller], 1775)

Material estudiado: Pandébano, 3 ex., 27-VI-2011; Sotres, 5 ex., 31-VII-2010.

Citada en los Picos de Europa por CALLE (1980).

Elemento paleártico.

Cerastis rubricosa ([Denis & Schiffermüller], 1775)

Material estudiado: Pandébano, 1 ex., 23-V-2011.

Citada en los Picos de Europa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Lycophotia porphyrea ([Denis & Schiffermüller], 1775)

Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Pandébano, 4 ex., 27-VI-2011; 4 ex., 18-VIII-2012; Sotres, 191 ex., 31-VII-2010; 2 ex., 27-VI-2011; 9 ex., 18-VIII-2012.

Citada en los Picos de Europa por CALLE (1980), CALLE & SAZ (1981) y MANCEÑIDO *et al.* (2009).

Elemento atlanto-mediterráneo.

Lycophotia erythrina (Herrich-Schäffer, 1852)

Material estudiado: Pandébano, 4 ex., 27-VI-2011; Sotres, 1 ex., 31-VII-2010; 1 ex., 27-VI-2011; Tielve, 1 ex., 23-V-2011; 31 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento atlanto-mediterráneo.

Chersotis oreina Dufay, 1984

Material estudiado: Pista Sotres-Áliva, 5 ex., 18-VIII-2012; Pandébano, 1 ex., 18-VIII-2012; Sotres, 13 ex., 31-VII-2010; 2 ex., 18-VIII-2012.

Elemento atlanto-mediterráneo.

Chersotis multangula (Hübner, [1803])

Material estudiado: Sotres, 2 ex., 27-VI-2011; Tielve, 2 ex., 27-VI-2011.

Elemento eurosiberiano.

Chersotis margaritacea (Villers, 1789)
Material estudiado: Pista Sotres-Áliva, 1 ex., 18-VIII-2012; Sotres, 1 ex., 31-VII-2010; 1 ex., 9-IX-2010.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

Chersotis cuprea ([Denis & Schiffermuller], 1775)
Material estudiado: Pandébano, 1 ex., 18-VIII-2012.
Elemento eurosiberiano.

Standfussiana dalmata (Staudinger, 1901)
Material estudiado: Sotres, 1 ex., 27-VI-2011.
Elemento atlanto-mediterráneo.

Noctua pronuba (Linnaeus, 1758)
Material estudiado: Pandébano, 6 ex., 9-IX-2010; 231 ex., 23-V-2011; 342 ex., 27-VI-2011; Sotres, 148 ex., 31-VII-2010; 18 ex., 9-IX-2010; 57 ex., 23-V-2011; 156 ex., 27-VI-2011; Tielve, 2 ex., 9-IX-2010; 169 ex., 23-V-2011; 181 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980), MANCEÑIDO *et al.* (2009) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).
Elemento eurosiberiano.

Noctua comes Hübner, [1813]
Material estudiado: Sotres, 5 ex., 31-VII-2010; Tielve, 1 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980).
Elemento asiático-mediterráneo.

Noctua fimbriata (Schreber, 1759)
Material estudiado: Pandébano, 1 ex., 9-IX-2010; 3 ex., 27-VI-2011; Sotres, 6 ex., 31-VII-2010; 3 ex., 27-VI-2011; 1 ex., 18-VIII-2012; Tielve, 6 ex., 27-VI-2011.
Citada en los Picos de Europa por CALLE (1980) y MANCEÑIDO *et al.* (2009).
Elemento eurosiberiano.

Noctua tirrenica Biebinger, Speidel & Hanigk, 1983
Material estudiado: Sotres, 1 ex., 31-VII-2010.
Elemento asiático-mediterráneo.

Noctua interposita (Hübner, 1790)
Material estudiado: Pandébano, 1 ex., 27-VI-2011.
Elemento asiático-mediterráneo.

Noctua interjecta Hübner, [1803]
Material estudiado: Sotres, 1 ex., 31-VII-2010; Tielve, 1 ex., 27-VI-2011.
Elemento atlanto-mediterráneo.

Noctua janthe (Borkhausen, 1792)
Material estudiado: Sotres, 7 ex., 9-IX-2010; Tielve, 1 ex., 9-IX-2010.
Elemento atlanto-mediterráneo.

Anaplectoides prasina ([Denis & Schiffermuller], 1775)
Material estudiado: Pandébano, 77 ex., 27-VI-2011; Sotres, 19 ex., 31-VII-2010; 14 ex., 27-VI-2011; Tielve, 3 ex., 27-VI-2011,
Citada en los Picos de Europa por CALLE (1980) y CALLE & SAZ (1981).

Elemento holártico.

Xestia (*Megasema*) *c-nigrum* (Linnaeus, 1758)

Material estudiado: Pandébano, 1 ex., 9-IX-2010; Sotres, 2 ex., 31-VII-2010; 2 ex., 9-IX-2010; 3 ex.,18-VIII-2012.

Citada en los Picos de Europa por CALLE (1980).

Elemento holártico.

Xestia (Megasema) ditrapezium ([Denis & Schiffermüller], 1775)

Material estudiado: Pandébano, 2 ex., 27-VI-2011; 3 ex., 18-VIII-2012; Sotres, 8 ex., 31-VII-2010; 1 ex., 9-IX-2010; 2 ex., 27-VI-2011; 3 ex., 18-VIII-2012; Tielve, 1 ex., 27-VI-2011.

Elemento holártico.

Xestia (Megasema) triangulum (Hufnagel, 1766)

Material estudiado: Pandébano, 2 ex., 27-VI-2011; Sotres, 6 ex., 31-VII-2010; Tielve, 2 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980).

Elemento eurosiberiano.

Xestia (Megasema) ashworthii (Doubleday, 1855)

Material estudiado: Pista Sotres-Áliva, 3 ex., 18-VIII-2012; Pandébano, 2 ex., 27-VI-2011; 1 ex., 18-VIII-2012; Sotres, 21 ex., 31-VII-2010; 2 ex., 18-VIII-2012; Tielve, 1 ex., 27-VI-2011.

Citada en los Picos de Europa por CALLE (1980) y MANCEÑIDO & GONZÁLEZ-ESTÉBANEZ (2015).

Elemento eurosiberiano.

Xestia (*Xestia*) *baja* ([Denis & Schiffermüller], 1775)

Material estudiado: Pandébano, 2 ex., 18-VIII-2012; Sotres, 6 ex., 31-VII-2010; 5 ex., 9-IX-2010; 8 ex., 18-VIII-2012.

Citada en los Picos de Europa por CALLE (1980) y GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012).

Elemento eurosiberiano.

Xestia (Xestia) stigmatica (Hübner, [1813])

Material estudiado: Pandébano, 1 ex., 9-IX-2010; 5 ex., 18-VIII-2012; Sotres, 5 ex., 31-VII-2010; 2 ex., 9-IX-2010; 4 ex., 18-VIII-2012.

Elemento eurosiberiano.

Xestia (Xestia) castanea (Esper, 1798)

Material estudiado: Sotres, 1 ex., 9-IX-2010.

Elemento asiático-mediterráneo.

Xestia (*Xestia*) *agathina* (Duponchel, 1827)

Material estudiado: Sotres, 4 ex., 9-IX-2010.

Elemento atlanto-mediterráneo.

Xestia (*Xestia*) *kermesina* (Mabille, 1869)

Material estudiado: Sotres, 1 ex., 9-IX-2010.

Elemento atlanto-mediterráneo.

Xestia (*Xestia*) *xanthographa* ([Denis & Schiffermüller], 1775)

Material estudiado: Pista Sotres-Áliva, 5 ex., 18-VIII-2012; Pandébano, 3 ex., 9-IX-2010; Sotres, 9 ex., 9-IX-2010; 3 ex., 18-VIII-2012; Tielve, 1 ex., 27-VI-2011; 6 ex., 9-IX-2010.

Elemento asiático-mediterráneo.

Eugnorisma (*Eugnorisma*) *glareosa* (Esper, 1788)
Material estudiado: Sotres, 1 ex., 9-IX-2010.
Elemento atlanto-mediterráneo.

Discusión

En total se aportan datos de 129 especies de la familia Noctuidae, de las que 108 están dentro de la subfamilia Noctuinae y las restantes se reparten entre las demás subfamilias (Tabla I). Estas 129 especies representarían el 20,6% del total de las 626 especies conocidas en esta familia dentro de la Península Ibérica (VIVES MORENO, 2014), lo que permite suponer que su número debería aumentar en los próximos estudios.

Tabla I.– Distribución del número de especies de la familia Noctuidae en cada uno de los taxones principales en el área de estudio.

Familias	Subfamilias	Nº de especies
Noctuidae		
	Plusiinae	8
	Eustrotiinae	1
	Acronictinae	4
	Pantheinae	1
	Oncocnemidinae	1
	Amphipyrinae	3
	Psaphidinae	1
	Heliothinae	1
	Bryophilinae	1
	Noctuinae	108
	Caradrinini	6
	Dypterigiiini	2
	Phlogophorini	3
	Apameini	15
	Episemini	1
	Xylenini	12
	Orthosiini	2
	Tholerini	1
	Hadenini	14
	Leucaniini	8
	Noctuini	44
	TOTAL	**129**

En el presente trabajo se aportan 46 nuevas especies al catálogo de Noctuidae del Parque Nacional de los Picos de Europa, de las que 38 son nuevas para la fauna asturiana. Las especies que son citadas como nuevas para Asturias y nos permite ampliar su distribución conocida en la Península Ibérica son: *Colocasia coryli*, *Stilbia anomala*, *Amphipyra pyramidea*, *Amphipyra berbera*, *Thalpophila vitalba*, *Luperina nickerlii*, *Apamea remissa*, *Apamea anceps*, *Leucochlaena oditis*, *Agrochola circellaris*, *Agrochola helvola*, *Agrochola macilenta*, *Conistra vaccinii*, *Polymixis flavicincta*, *Orthosia incerta*, *Orthosia cerasi*, *Hadena confusa*, *Leucania loreyi*, *Dichagyris nigrescens*, *Agrotis bigramma*, *Agrotis trux, Agrotis puta*, *Chersotis oreina*, *Chersotis cuprea*, *Standfussiana dalmata*, *Noctua tirrenica*, *Xestia castanea*, *Xestia agathina* y *Xestia kermesina*.

Además, hay nueve especies también que son nuevas para la fauna de Asturias, aunque anteriormente hayan sido citadas en la zona cántabra del Parque Nacional de los Picos de Europa en CALLE

(1980) y OLIVER (1997) y en la parte leonesa por GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO (2012) y MANCEÑIDO & GONZALEZ-ESTÉBANEZ (2015), como son *Autographa bractea*, *Acronicta euphorbiae*, *Helicoverpa armigera*, *Apamea crenata*, *Apamea sordens*, *Apamea illyria*, *Polymixis dubia*, *Mythimna l-album* y *Agrotis simplonia*.

De todas ellas, destacan aquellas especies que presentan una distribución principalmente en la mitad septentrional, aunque se conocen pocas citas en el noroeste de la península. Algunas especies como *Dichagyris nigrescens, Chersotis cuprea, Amphipyra berbera* y *Agrochola macilenta* han sido citadas solamente en la provincia de León (YELA & SUAREZ, 1985; MANCEÑIDO *et al.,* 2009; GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO, 2012; MAGRO & JAMBRINA, 2014; MANCEÑIDO & GONZALEZ-ESTÉBANEZ, 2015). Otras especies han sido citadas, además de en León (op. cit.), en otras provincias limítrofes como *Stilbia anomala* y *Agrochola circellaris,* conocidas también de Pontevedra (PINO, 2013), y *Xestia kermesina*, citadas además en Palencia (JUBETE, 2015) y Zamora (JAMBRINA *et al.,* 2003; MAGRO & JAMBRINA, 2014), mientras que *Apamea anceps* solamente se conocía en Asturias por un punto de captura en los mapas de CALLE (1982) y *Apamea remissa*, una especie rara pero ampliamente citada en Lugo (TORRE, 1988; PINO, 2009; FERNÁNDEZ-VIDAL, 2011; ORTIZ *et al.,* 2016b; RUBIO *et al.,* 2016) y con una sola cita antigua en Cantabria (AGENJO, 1969).

Finalmente, se confirma la presencia en Asturias de *Dichagyris musiva, Noctua interposita, Brachylomia viminalis* y *Antitype chi*, cuatro especies consideradas como muy raras, recientemente citadas en el Parque Natural de Somiedo en ORTIZ *et al.* (2017), y que previamente habían sido citadas en León (e. g.: SUAREZ, 1984; GONZÁLEZ-ESTÉBANEZ & MANCEÑIDO, 2012; MAGRO & JAMBRINA, 2014), como es el caso de *Dichagyris musiva* y *Noctua interposita,* y en otras provincias de Galicia como *Brachylomia viminalis,* citada en Lugo (ORTIZ *et al.,* 2016b) y Orense (PINO, 2013) y *Antitype chi* en Orense (PINO, 2013).

Entre todas las especies destaca la captura de *Standfussiana dalmata* al ampliar notablemente su distribución ya que es una especie localizada principalmente por la mitad oriental y por el sur de la Península Ibérica, y cuya cita más próxima está en Palencia (JUBETE *et al.,* 2017).

Desde el punto de vista corológico, los elementos de amplia distribución son los más abundantes y suponen el 64,3% de las especies capturadas en el nuestro estudio, acorde con la posición geográfica del parque natural en la región eurosiberiana, mientras que los elementos mediterráneos son los menos representados en la muestra, con el 34,9% del total (Tabla II). Solamente se ha capturado una especie considerada como endémica de la Península Ibérica, *Allophyes alfaroi,* que supone solamente el 0,8% del total de especies.

Tabla II.– Corotipos de la familia Noctuidae en el Parque Nacional de los Picos de Europa.

Corotipos	**n**	**%**	**% clases principales**
Euroasiático	62	48,1	64,3
Paleártico	6	4,6	
Holártico	9	7,0	
Tropical	3	2,3	
Cosmopolita	3	2,3	
Atlanto-mediterráneo	19	14,7	34,9
Asiático-mediterráneo	26	20,2	
Endémico o Ibérico	1	0,8	0,8
Total	129	100	100

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(2008-2011) titulado *Barcoding y taxonomía basada en el ADN de coleópteros carábidos y tenebriónidos, lepidópteros noctuidos e himenópteros ápidos de la península ibérica (Insecta, Coleoptera, Lepidoptera Noctuidae e Hymenoptera Apidae)* y por la Fundación Séneca-Agencia de Ciencia y Tecnología de Murcia (Ref. 19908/GERM/15).

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J. J. G.
Departamento de Zoología y Antropología Física
Área de Biología Animal
Facultad de Veterinaria
Universidad de Murcia
Campus de Espinardo
Apartado 4021
E-30071 Murcia
ESPAÑA / *SPAIN*
E-mail: juanjogf@um.es
https://orcid.org/0000-0002-9645-5266

R. M. R.
Departamento de Zoología y Antropología Física
Área de Biología Animal
Facultad de Veterinaria
Universidad de Murcia
Campus de Espinardo
Apartado 4021
E-30071 Murcia
ESPAÑA / *SPAIN*
E-mail: rmrubio@um.es
https://orcid.org/0000-0002-0109-7874

M. G.
Gran Vía Escultor Salzillo, 7
E-30004 Murcia
ESPAÑA / *SPAIN*
E-mail: manuel.garre@fripozo.com
https://orcid.org/0000-0002-5846-8621

*A. S. O.
Departamento de Zoología y Antropología Física
Área de Biología Animal
Facultad de Veterinaria
Universidad de Murcia
Campus de Espinardo
Apartado 4021
E-30071 Murcia
ESPAÑA / *SPAIN*
E-mail: aortiz@um.es
https://orcid.org/0000-0002-3877-6096

*Autor para la correspondencia / *Corresponding author*

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Pterophoridae of the Great Ussuri Island (Khabarovsk suburbs), Russia (Lepidoptera: Pterophoroidea)

P. Ya. Ustjuzhanin, V. V. Dubatolov & A. N. Streltzov

Abstract

12 Pterophoridae species are recorded from the Great Ussuri Island in the Ussuri delta (Khabarovsk suburbs); most of them prefer mesophytous meadows. Two species, *Agdistis adactyla* (Hübner, [1823]) and *Hellinsia inulae* (Zeller, 1852) prefer dryer localities and are not known east from Khabarovsk.
KEY WORDS: Lepidoptera, Pterophoroidea, Pterophoridae, new data, Khabarovsk region, Russia.

Pterophoridae de la Gran Isla Bolshoy Ussuriysky (suburbios de Khabarovsk), Rusia (Lepidoptera: Pterophoroidea)

Resumen

Se registran 12 especies de Pterophoridae de la Gran Isla Bolshoy Ussuriysky (suburbios de Khabarovsk), en el delta del Ussuri; la mayoría de ellos prefieren praderas mesófitas. Dos especies, *Agdistis adactyla* (Hübner, [1823]) y *Hellinsia inulae* (Zeller, 1852) prefieren localidades secas y no eran conocidas del este de Khabarovsk.
PALABRAS CLAVE: Lepidoptera, Pterophoroidea, Pterophoridae, nuevos datos, Khabarovsk, Rusia.

Introduction

The Great Ussuri Island is located in the river Ussuri delta between the river Amur and the river duct formed by the confluence of the river Ussuri and Kazakevichevo branch of the river Amur. The western part (about 1/3) of this island is now a territory of China (named Hēixiāzi Dao), the other part is Russian territory. Different types of meadows from wet flood to xerophytous ones cover the island. Forests (*Salix* sp., *Alnus glutinosa* (L.) Gertn., *Populus* sp., *Quercus* sp., *Ulmus* sp., *Maackia* sp., *Crataegus monogyna* Jacq., *Prunus padus* L.) are scarce and form narrow bands, named "ryolka". There are several small lakes, narrow river branches and artificial ditches across the island. This island is located a few kilometers to south from Great Khekhtsyr Nature Reserve.

The lepidopteran fauna of the Great Ussuri Island is poorly known. Butterflies were well studied by E. Novomodnyi: KOSHKIN & NOVOMODNYI (2008). The second author, V. Dubatolov, searched moths in different landscapes of the island in 2012-2014, and 2016 using light traps DUBATOLOV (2012). The most interesting records of macromoths were published in different articles concerning Macroheterocera of the Great Khekhtsyr Nature Reserve: DUBATOLOV *et al*. (2013, 2014); VASILENKO *et al*. (2014). Most surprising was discovering the species that prefer South Siberian steppes and xerophytous meadows, like *Eogystia sibirica* (Alpheráky, 1895) (Cossidae), *Mythimna albiradiosa* (Eversmann, 1852) (Noctuidae), and some micros, like *Elethyia taishanensis* (Caradja,

1937) (Crambidae); these findings were first for the Khabarovsk Province. The present article contains information about plume-moths of the Great Ussuri Island.

Five species of casebearer moths (Coleophoridae) from the Great Ussuri Island were noted for the first time in the Far East and one species (*Casignetella graminicolella* Heinemann, 1876) - in the Asian part of Russia (ANIKIN, 2015).

List of collecting localities

GUI-1: 48º 24.33' N, 134º 53' E, mesophytous meadow with solitary willow bushes, one side is fringed by reeds.
GUI-1-5: 48º 23.56' N, 134º 52.65' E, mesophytous meadow with single willow bushes.
GUI-2: 48º 23.35' N, 134º 52.38' E, xerophytous meadow with scarce poplars, along the road on embankment.
GUI-3: 48º 22.59' N, 134º 50.48' E, mesophytous meadow at the border between willow bushes and meadow with reeds.
GUI-4: 48º 22.215' N, 134º 49.41' E, xerophytous meadow with scarce poplars, along the road on embankment.
GUI-5: 48º 21.845' N, 134º 48.58' E, forest edge near a wide mesophytous meadow.
ryolka: 48º 24.78' N, 134º 53.56' E, open forest edge near a wide mesophytous meadow.

An annotated list of Pterophoridae of the Great Ussuri island (Khabarovsk suburbs)

Agdistis adactyla (Hübner, [1823])
Material: 1 ♀, 23-24-VII-2012, GUI-1; 1 specimen, 28-29-VII-2016, GUI-1-5.
Distribution: Temperate belt of the Palearctic.

Gillmeria pallidactyla (Haworth, 1811)
Material: 4 specimens, 2-3-VII-2013, GUI-1.
Distribution: Temperate belt of the Palearctic, North America.

Cnaemidophorus rhododactylus ([Denis et Schiffermüller], 1775)
Material: 1 ♂, 2-3-VII-2013, GUI-5.
Distribution: Temperate belt of the Palearctic, North America.

Capperia (?) *jozana* (Matsumura, 1931)
Material: 1 ♀, 18-19-VI-2012, GUI-3; 1 ♂, 28-29-VIII-2012, GUI-1; 1 ♂, 2-3-VII-2013, GUI-4; 1 ♀, 15-16-VIII-2016, "ryolka".
Distribution: Southern regions of the Russian Far East (?); Japan.
Remarks: Status of the species is dubious. Morphological distinguishing characters from *C. trichodactyla* ([Denis et Schiffermüller], 1775) are insignificant. Additional investigations are needed to resolve taxonomic problems in the species group "*trichodactyla*", including DNA comparison.

Fuscoptilia emarginata (Snellen, 1884)
Material: 2 specimens, 5-6-VIII-2013, GUI-4; 5 specimens, 28-29-VII-2016, GUI-1-5; 2 ♂♂, 15-16-VIII-2016, "ryolka".
Distribution: Baikal Region, Transbaikalia, southern regions of the Russian Far East; Mongolia, China, Korea, Japan.

Oidaematophorus iwatensis (Matsumura, 1931)
Material: 1 ♂, 1 specimen 4-5-VII-2012, GUI-1.

Distribution: Southern regions of the Russian Far East; North-Eastern China (Dunbei, or Manchuria), Japan.

Hellinsia albidactyla (Yano, 1963)

Material: 2 ♀♀, 18-19-VI-2012, GUI-3; 1 ♂, 8-9-VI-2013, GUI-5; 1 ♂, 19-20-VII-2016, GUI-1; 1 ♂, 15-16-VIII-2016, "ryolka".

Distribution: Southern regions of the Russian Far East; China, Korea, Japan.

Hellinsia didactylites (Strom, 1783)

Material: 2 ♂♂, 23-24-VII-2012, GUI-1; 1 ♂, 28-29-VII-2016, "ryolka".

Distribution: Europe, the Caucasus, Kazakhstan, Middle Asia, Siberia, southern regions of the Russian Far East; North China (Shaanxi, Jilin).

Hellinsia inulae (Zeller, 1852)

Material: 4 ♂♂, 2 ♀♀, 2-3-VII-2012, GUI-2; 2 ♂♂, 18-19-VI-2012, GUI-1; 1 ♂, 7-8-VIII-2012, GUI-1; 17 specimens, 28-29-VIII-2012, GUI-1; 1 ♂, 2-3-VII-2013, GUI-5.

Distribution: North Africa, Europe, Kazakhstan, Middle Asia, South Siberia, southern regions of the Russian Far East; Mongolia, China (Xinjiang, Shandong).

Hellinsia lienigiana (Zeller, 1852)

Material: 1 ♂, 7-8-VIII-2012, GUI-1; 1 ♂, 8-9-VI-2013, GUI-5; 1 ♂, 1 ♀, 5-6-VIII-2013, GUI-4.

Distribution: North Africa, Europe, Transcaucasia (Armenia), Iran, India, South Siberia, southern regions of the Russian Far East; China (Shaanxi, Zhejiang, Fujian, Jiangxi, Shandong, Hunan, Guizhou, Taiwan), Korea, Japan, New Guinea, North and Central America.

Hellinsia nigridactyla (Yano, 1961)

Material: 1 ♂, 18-19.vi.2012, GUI-3; 5 ♂♂, 4 ♀♀, 15-16-VIII-2016, "ryolka"; 1 ♂, 2-3-VII-2013, GUI-5; 1 specimen, 5-6-VIII-2013, GUI-5.

Distribution: Eastern Transbaikalia, southern regions of the Russian Far East; China, Japan.

Emmelia argoteles (Meyrick, 1922)

Material: 1 ♂, 1 ♀, 19-20-VII-2016, GUI-1; 32 specimens, 28-29-VII-2016, "ryolka".

Distribution: Transbaikalia, southern regions of the Russian Far East; China, Japan.

Conclusion

12 Pterophoridae species have been found in the Great Ussuri Island; but this number is not probably full. At least, 21 Pterophoridae species are known to occur in the Great Khekhtsyr Nature Reserve (a few km south from the Great Ussuri Island), 18 of them were mentioned by USTJUZHANIN & KOVTUNOVICH (2007), and 3 species were collected later: *Gillmeria stenoptiloides* (Filipjev, 1927), *Hellinsia distincta* (Herrich-Schäffer, 1855) (SE angle of the Nature Reserve and the neighbouring bog), *H. nigridactyla* (river Chirki valley). One species from the Great Ussuri Island, *H. albidactyla* is still not known from the Great Khekhtsyr Nature Reserve.

In general, the most part of the Pterophoridae species from the Great Ussuri Island prefers mesophytous meadows. Only few of them prefer open xerophytous biotopes, like *Agdistis adactyla*, *Hellinsia inulae*; they are not known in more eastern places.

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*P. U.
Altai State University
Lenina, 61
RUS-656049 Barnaul
RUSIA / *RUSSIA*
E-mail: petrust@mail.ru
https://orcid.org/0000-0002-5222-2241

y / *and*

Biological Institute
Tomsk State University
Lenina Prospekt, 36
RUS-634050 Tomsk
RUSIA / *RUSSIA*

V. D.
Federal State Institution "Zapovednoe Priamurye"
Bychikha village
Yubileinaya street, 8
RUS-680502- Khabarovskii Raion, Khabarovskii Krai
RUSIA / *RUSSIA*
E-mail: vvdubat@mail.ru
https://orcid.org/0000-0001-7687-2102

y / *and*

Institute of Systematics and Ecology of Animals
Siberian Branch of Russian Academy of Sciences
Frunze str.,11
RUS-630091 Novosibirsk
RUSIA / *RUSSIA*

A. S.
Herzen State Pedagogical University of Russia
Moika Emb., 48
RUS-191186 Saint-Petersburg
RUSIA / *RUSSIA*
E-mail: streltzov@mail.ru
https://orcid.org/0000-0002-5658-8515

*Autor para la correspondencia / *Corresponding author*

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Vadimas Volkova, gen. n., a new genus of Megalopygidae (Insecta: Lepidoptera)

Ju. S. Volkova

Summary

A new Neotropical genus of Megalopygidae, *Vadimas* Volkova, gen. n., is described. Two newly described species are included: the type species *Vadimas zolotuhini* Volkova, sp. n. (Ecuador) and *V. radogast* Volkovas, sp. n. (Colombia). The diagnosis of the genus and a list of generic autapomorphies are given.
KEY WORDS: Insecta, Lepidoptera, Megalopygidae, *Vadimas*, new species, taxonomy, systematics, Neotropical.

***Vadimas* Volkova, gen. n., un nuevo género de Megalopygidae (Insecta: Lepidoptera)**

Resumen

Se describe un nuevo género Neotropical de Megalopygidae, *Vadimas* Volkova, gen. n. Se incluyen dos nuevas especies tipo descritas: *Vadimas zolotuhini* Volkova, sp. n. (Ecuador) y *V. radogast* Volkovas, sp. n. (Colombia). Se dan la diagnosis del género y una lista de autapomorfías.
PALABRAS CLAVE: Insecta, Lepidoptera, Megalopygidae, *Vadimas*, nuevas especies, taxonomía, sistemática, Neotropical.

Introduction

Megalopygidae is a family of mostly Neotropical moths with only few species penetrating the Nearctic zone, poorly investigated taxonomically. System of this family has not been actually developed so far, the species composition is not analyzed as well as a status of some taxa and score of genera are not identified. As a result, a taxonomic scheme of the family is incomprehensible, and many genera look therefore polyphyletic. The only modern article dealing with biology and phylogeny of Megalopygidae is a publication of EPSTEIN (1996). However, this work does not contain taxonomic revisions. In the current classification the family includes two subfamilies and 23 genera (HEPPNER, 1995). The aim of the present study is to describe a new genus and two new species of Megalopygidae.

Material and Methods

All the specimens listed in this paper, including the holotypes, are deposited in the Museum Witt, Munich, Germany (MWM) - later it will be assigned into Bavarian State Collection of Zoology, Munich, Germany. Further abbreviation used is: GU - genitalia slide number. For the holotypes the label data are listed in their original spelling.

The genitalia preparations illustrated here were made using standard dissecting techniques and

mounted in Euparal on glass slides. Letters “GU” combined with a number refer to genitalia slide number. Photographs of adult specimens and male genitalia were taken by a Nikon D-750 camera, and the photo of mouthparts was made at the Natural History Museum, University of Oslo (Norway) using Axio Cam color 506 Camera mounted on a compound microscope Zeiss Axio Imager M2. Genetics studies conducted at the University of Guelph, Ottawa, Canada personally by Dr. Reza Zahiri.

Taxonomy

***Vadimas* Volkova, gen. n.** (Figs 1-12)

Type species: *Vadimas zolotuhini* Volkova, sp. n., here designated.

Description: Medium sized moths, wingspan 30-37 mm in males and 48-52 mm in females; length of forewing 19-22 and 26-29 mm, correspondingly (Figs 1-6). Head with raised hairs. Antennae bipectinate in male and filiform in female. Galea almost completely reduced to non-functioning short lobes fused basally. Labial palpi strongly reduced, probably not functioning, consisting of 2-3 small fused segments, with apical segment strongly reduced; maxillary palpi completely reduced (Fig. 9). Forewing ground color dark grey or black, wing pattern strongly modified and consists of golden elongated teardrop tracery and golden clear spot on discal vein; medial stem in the R-Cu cell of female and veins of both sexes also covered with golden scales. Hindwing monochromatic dark, slightly protruded apically, with undulating wing margin. Wing scales narrow and slightly raised, making the wing translucent, especially in females. Veins black, clearly visible and contrasting with wing membrane, and they divide fore wing pattern onto separate teardrop strokes.

Venation (Fig. 10): Forewing. Sc almost parallel to wing margin and joins costal margin above the branching of radial sector. Small oblong tongue-shaped process with unknown function lies basally between costal and subcostal veins; it may be covered with androconial scales. R1 free, diverging from apex of R-Cu cell. Other veins of radial stem and M1 extend from common stem. R2 and R3 almost parallel, R4 and R5 forming fork. Medial stem in R-Cu cell reduced almost completely (better developed in females) and visible only in its outer third. M1 diverges from basal quarter of radial stem. M2 and M3 on common branch originating in postero-apical corner of R-Cu cell. Both Cu veins present, clearly visible, almost parallel to each other. A1 strongly reduced and represented by thin fold. A2 and A3 well developed and making anastomosis in most of their length, forming fork apically; A3 distally of the anastomosis forms thin and poorly visible crease. No additional cells present.

Hindwing: Frenulum unpaired curved. Radial vein clearly visible along its entire length and joins costal margin just behind Sc. Medial stem in R-Cu cell strongly reduced and visible as membranous fold slightly thickened caudally. Veins M1, M2 and M3 nearly parallel to each other and clearly visible. Ñu1 forming acute angle with M3; Cu2 parallel to Cu1. A1 hardly noticeable and almost completely reduced forming thin membranous fold. A2 well visible basally but weaker and then membranous toward wing margin. A3 substantially shortened and visible only in basal part.

All legs with the joint and equal in size apical spurs which are shorter on the hind legs. Spur formula 2:2:2. Fore leg epiphysis absent.

Sexual dimorphisms: Females are larger than males, abdomen apically with hair pillow formed by densely packed hair-like scales. Female antennae pale grey, male antennae completely black. Female forewings more elongate than in male. Strokes of golden scales in female monochromatic, in male centered with black scales. Female thorax black with admixture of pale gray scales, male thorax monochrome black. Female abdomen with admixture of reddish or brownish scales.

Male genitalia (Figs 11, 13): Uncus slender, delicate, conical, with small hook on dorsal side. Gnatos absent. Tegumen band-shaped, without modifications. Valves divided into elongate slender clavate cucullus and rudimentary saccular part fused annularly at base. Vinculum with two distal finger-shaped processes, one on each side. Saccus weakly expressed, represented by small plate.

Aedeagus short, wide, with caudal opening of vesica. Vesica without lobes, bag-shaped basally and with conical elongated apical part. Cornuti absent. Pregenital segments unmodified.

Female genitalia (Figs 12, 14): Papillae anales rounded, with protruding triangular irregular tips, densely covered with short setae. Fore apophysis stronger and slightly longer that hind one. Ostium rounded, located in segment center. Area around ostium lobate. Caudal setae of segment VIII strongly modified into clavate spines. Ductus bursae membranous, broad, gradually passing into large, ovoid bursa without additional area of sclerotization.

Diagnosis: Accordingly to the structure of the genitalia (presence of a hook-shaped appendage on uncus and finger-like processes of the vinculum), *Vadimas* resembles *Megalopyge* Hübner, [1820], but differs by some important characters. In *Vadimas* the cucullar part of the valves is very elongate and slender. The uncus is triangular, hooked on the dorsal side, which is not fused with the tegumen, while in *Megalopyge* the uncus is rudimentary and bears a strong ventral hook fused with tegumen, completely or partially (VOLKOVA, ZOLOTUHIN & KURSHAKOV, 2017). In addition, there are some significant differences in the structure of the aedeagus, which is small in *Vadimas*, with tapered apical bag-shaped vesica, not lobed apically. The aedeagus of *Megalopyge* often bears single or multiple cornuti or numerous spines forming scobinate fields. The vesica of *Megalopyge* is quite complex, usually with 2-4 distinct lobes (Fig. 15). Finally, none of known *Megalopyge* species possess golden scales on wings. The habitus of *Megalopyge lanata* (Stoll, [1780]), a typical species of the genus *Megalopyge*, is largely different from *Vadimas*. *M. lanata* more powerful, large (wingspan from 50 to 90 mm), has a typical wing pattern with admixture of pink and gray scales, as well as a large belly with a ring pattern (Figs 7-8).

The following diagnostic characters (probably apomorphies) can be listed for *Vadimas*: galea and labial palpi strongly reduced; sacculus partially reduced and fused annularly at base; cucullar part of valves elongate and slender; wing pattern strongly modified from the typical medial scheme; glossy metallic (golden) scales present. The function of the oblong tongue-shaped process of the forewing is unclear, but it has not been recorded in any other genera of this phylogenetic lineage. Clavate scales on the caudal margin of the female abdominal segment VIII are not typical of any other known genus and maybe also an autapomorphia or synapomorphy of several closely related groups.

According to the overall structure of the genitalia of both sexes, the genus *Vadimas* is placed in the subfamily Megalopyginae.

Distribution: The genus is here reported from Colombia and Ecuador. It may be restricted to highlands, as all the specimens were collected above 2750 m and most of them - at the altitude of about 3000 m. Two species included in this genus are described below. In addition, among the examined specimens there was a single female from Peru that certainly belongs to *Vadimas* but cannot be attributed to any of the two species because of a distinctly different wing pattern. The Peruvian specimen remains undescribed and unidentified until a male specimen becomes available.

Etymology: This genus is named in honor of Prof. Dr. Vadim V. Zolotuhin, in gratitude for his invaluable assistance and support. Gender masculine.

***Vadimas zolotuhini* Volkova, sp. n.** (Figs 1-3, 11-12)

Type matherial Holotype: 1 ♂, Ecuador, Carchi prov., El Angel Ecol. Reserv., road Tulcan-El Chical, 3300 m, 0º48’46” N 78º00’40” W, 14-XI-2012, V. Sinyaev leg. (MWM, GU 29947).

Paratypes: 22 ♂♂, 1 ♀, Ecuador, Carchi prov., El Angel Ecol. Reserv., road Tulcan-El Chical, 3300 m., 0º48’46” N 78º00’40” W, 14-XI-2012, V. Sinyaev leg.; 18 ♂♂, Carchi prov., El Ángel Ecol. Reserv., road Tulcan-El Chical, 3320 m., 0º46’14” N 78º03’27” W, 9-11-XI-2012, V. Sinyaev leg.; 9 ♂♂, Carchi prov., El Ángel Ecol. Reserv., road Tulcan-El Chical, 2785 m., 0º45’31” N 78º01’40” W, 7-8-XI-2012, V. Sinyaev leg.; 7 ♂♂, Carchi prov., El Moran, 2940 m., 0º45’50” N 78º02’38” W, 1-3-V-2012, V. Sinyaev & R. Brechlin leg.; 2 ♂♂, Lova prov., 5 km S Saraguro, 3065 m., 3º40’01” S 79º15’17” W, 8-9-II-2012, V. Sinyaev and R. Brechlin leg.; 1 ♂, Lova prov., 6 km S Saraguro, 3065 m., 3º40’01” S 79º15’17” W, 20-II-2012, V. Sinyaev and R. Brechlin leg.; 1 ♂, Lova prov., 10 km SW

Saraguro, 3164 m., 3º41’32” S 79º17’42” W, 19-II-2012, V. Sinyaev and R. Brechlin leg.; 1 ♂, Napo prov., Papallacta, Río San Pedro, 3010 m., 0º22’56” S 78º07’27” W, 4-XI-2011, V. Sinyaev and O. Romanov leg.; 1 ♂, Esmeraldas prov., 2,8 km W Lita, 2750 m., 0º52’48” N 78º29’36” W, 30-IV-2012, V. Sinyaev and R. Brechlin leg.; 1 ♂, Pichincha prov., Guagua Pichincha, 3676 m., 0º06’20” S 78º34’19” W, 21-X-2011, V. Sinyaev and O. Romanov leg.; 1 ♂, Road Loja-Zamora., 2700 m., 3º58’45” S 79º08’28” W, 22-II-2012, V. Sinyaev and R. Brechlin leg; 2 ♂♂, Pichincha prov., old road Quito to Santo Domingo, 32 km., 2750 m., 0º17’15” S 78º40’20” W, 13-14-III-2013, A. Käch and R. Brechlin leg. 1 ♀, Ecuador, Pichincha prov., old road Quito to Santo Domingo, 32 km., 2750 m., 0º17’15” S 78º40’20” W, 13-14-III-2013, A. Käch and R. Brechlin leg. (MWM, GU 29948) (all in MWM).

Description (Figs 1-3): Wingspan 30-36 mm in males; 48-52 mm in females. Female forewings with touch of golden scales on basal expansion of anal stem. Male hindwings semitransparent, fringed with black scales. Female hindwings black with cilia of gold and gray scales. Head, abdomen and antennae the genus description above.

Male genitalia (Fig. 11): Uncus and saccular part of valva as in the genus description. Cucullus clavate, long and slender, slightly darkened in comparison to sacculus and densely covered with setae. Vinculum with two small saber-shaped processes fused basally.

Female genitalia (Fig. 12): As in the genus description. Clavate scales larger and more numerous than in *V. radogast*.

Biology: Adults were collected in October-November and in February-May. The species is confined to Andean montane forests where moths were collected at the altitudes from 2750 to 3300 m.

Distribution: Ecuador: from the North-Central regions (Esmeraldas and Carchi provinces) to the Central (Napo and Pichincha provinces) and South (Loja province). Probably, the species distribution is interrelated to the position of the Andes, represented in this region by two parallel ridges - the Eastern and Western Cordilleras.

Diagnosis: *Vadimas zolotuhini* can be differentiated from its only congener, *V. radogast*, by male hind wing having black ground color and narrower wing scales making the wing almost transparent in central field, by more pronounced golden pattern by the slenderer uncus, by cucullus of valves shorter and thicker, and by vincular processes saber-shaped. The height, size and shape of the papillae anales, clavate spines and apophyses are different from *V. radogast* as illustrated in Figs. 13, 14.

Vadimas radogast **Volkova, sp. n.** (Figs 4-6, 13-14)

Type material: Holotype 1 ♂, Colombia, Tolima, Nevado del Tolima, 2850 m, 04º36’20” N 75º19’36” W, 8-11-XII-2013, V. Sinyaev leg. (MWM, GU 29950).

Paratype: 1 ♂, Colombia, Tolima, Nevado del Tolima, 2850 m, 04º36’20” N 75º19’36” W, 8-11-XII-2013, V. Sinyaev leg. (all in MWM); 1 ♀, Tolima, Nevado del Tolima, 2850 m, 04º36’20” N 75º19’36” W, 8-11-XII-2013, V. Sinyaev leg. (MWM, GU 29949).

Description (Figs 4-6): Wingspan 34-37 mm in males, 49 mm in the only female examined. Forewings coloration dark grey, wing pattern is complex, net–teardrop shaped and composed by golden scales. Hindwing dark gray, with narrow fringe of gold scales, without transparent fields. Male head and abdomen black. Antennae pale grey.

Male genitalia (Fig. 13): Uncus more powerful and broader than in *V. zolotuhini*, not expanded basally, with a more powerful spike-shaped process on dorsal side. Saccular part of valva and vinculum as in the genus description. Cucullar part clavate, slightly slendered apically, densely covered with setae. Vinculum with two small tongue-shaped processes fused basally.

Female genitalia (Fig. 14): Papillae anales large and triangular. Fore apophysis stronger and longer that the hind one. Clavate scales less numerous than in *V. zolotuhini*.

Biology: Presumably winter fliers. The species was collected in montane Andean forest at the altitude of 2850 m in the first half of December.

Distribution: So far known only from the type locality.

Diagnosis: *Vadimas radogast* differs from *V. zolotuhini* in forewings having a dark grey (not black) ground color with complex net–teardrop shaped golden pattern; in cucullar part of valve longer and slenderer, in vinculum processes tongue-shaped and uncus more powerful, not expanded basally. Hind wings of the males are semitransparent but without any distinct hyaline fields. In female genitalia the papillae anales are of triangular form.

Discussion: According to molecular genetic analysis undertaken, the genus *Vadimas* forms own cluster on the phylogenetic tree. The species *Vadimas zolotuhini* differs from the *V. radogast* by ca. 6%, which confirms the independence of these two taxa. Data from our molecular genetic studies can be found on the BOLD website The species of *Megalopyge* have no frenulum hence it is present in *Vadimas* spp. This may indicate that *Vadimas* is a more primitive group. This fact forces us to review the whole system of the family Megalopygidae and clarify the status of subfamilies and generic groups. This problem is planned to be solved in the course of further research.

Etymology: The species is named after Radogast, the ancient pagan Slavic God of fertility, sunlight and the healing power. The species name is a noun in apposition.

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Ju. S. V.
Ulyanovsk State University
Universitetskaya naberezhnaya, 1
RUS-432063 Ulyanovsk
RUSIA / *RUSSIA*
E-mail: Beeme7@mail.ru
https://orcid.org/0000-0002-4014-3140

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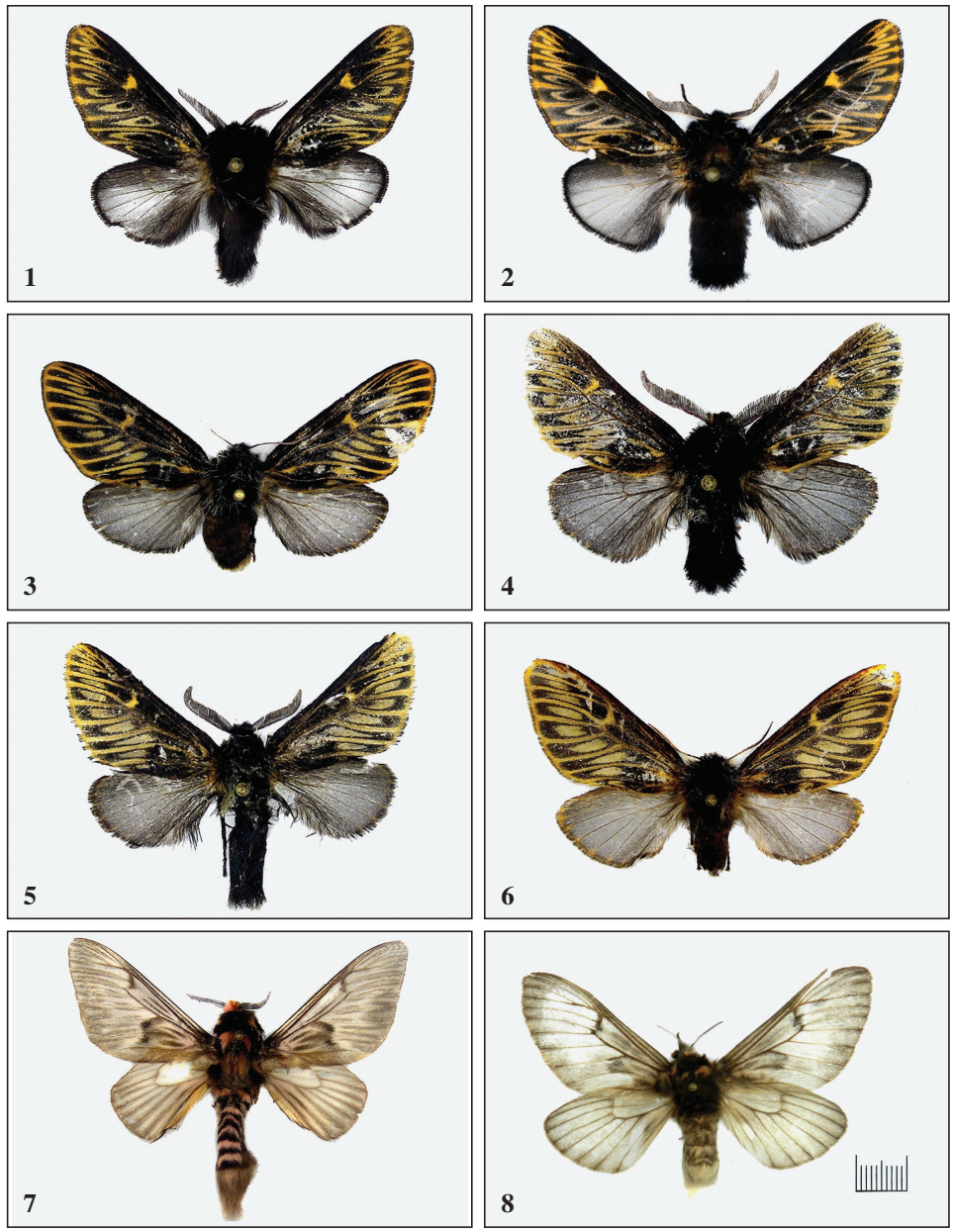
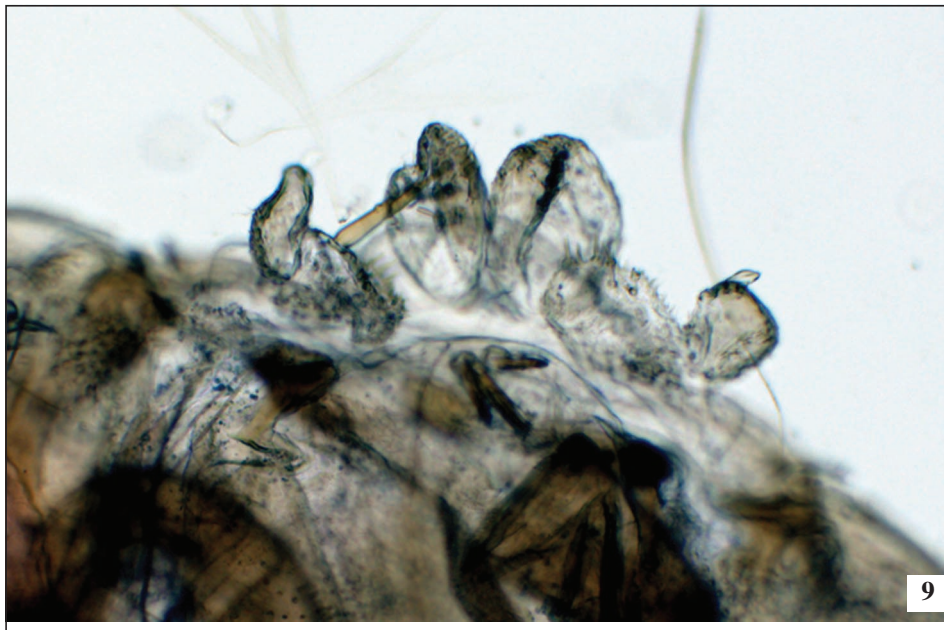
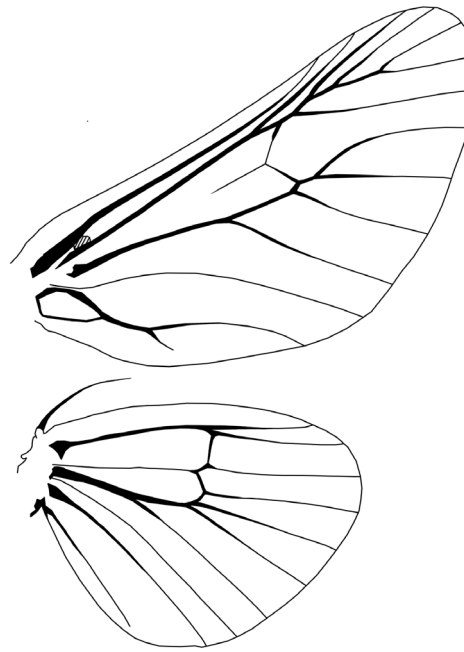
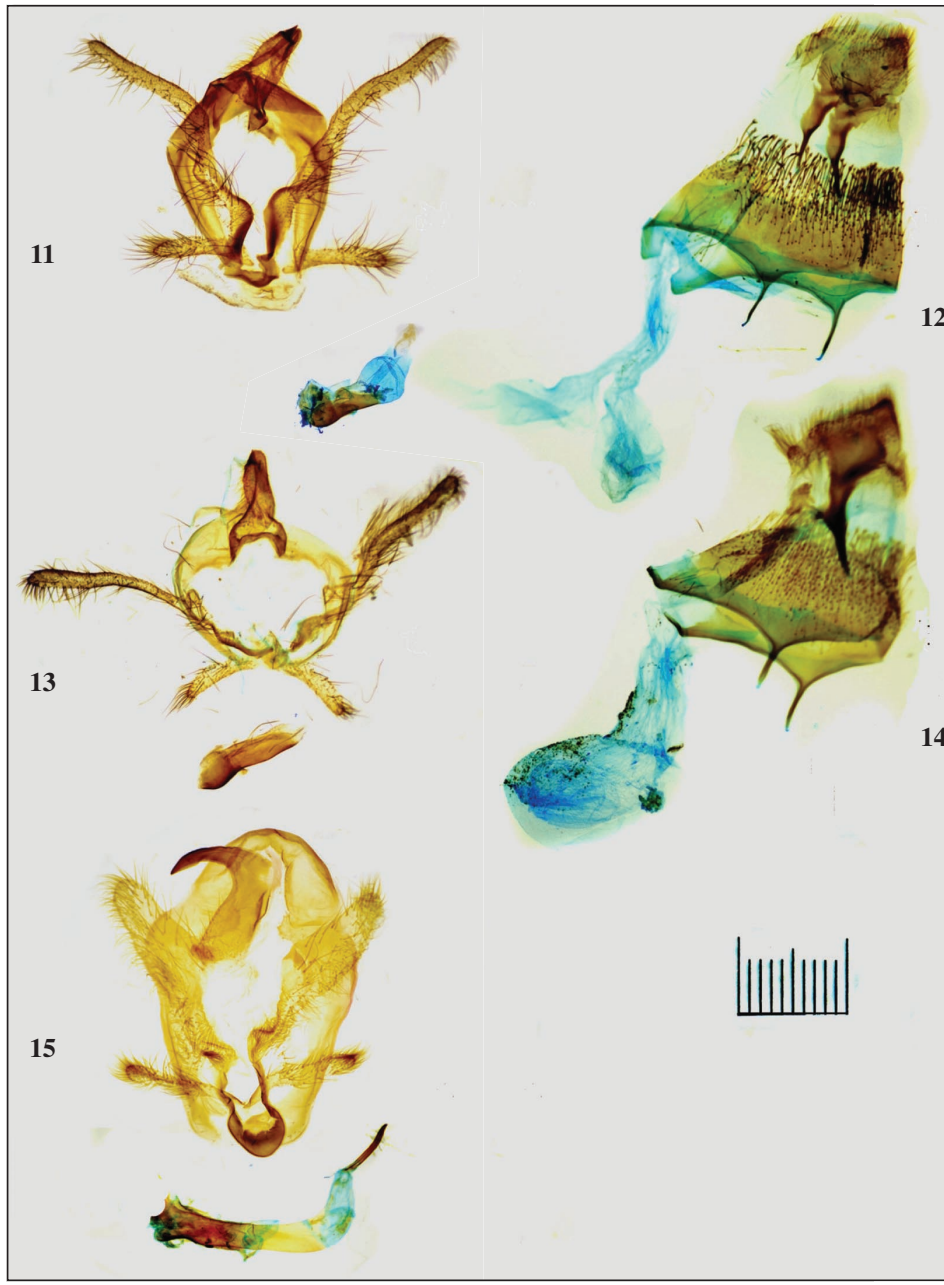


Figures 1-8.– Habitus of *Vadimas* and *Megalopyge*: **1.** *Vadimas zolotuhini* Volkova, sp. n. (male, holotype); **2.** *V. zolotuhini* Volkova, sp. n. (male, paratype); **3.** *V. zolotuhini* Volkova, sp. n. (female, paratype); **4.** *V. radogast* Volkova, sp. n. (male, holotype); **5.** *V. radogast* Volkova, sp. n. (male, paratype); **6.** *V. radogast* Volkova, sp. n. (female, paratype); **7.** *Megalopyge lanata* (Stoll) (male, MWM); **8.** *M. lanata* (Stoll) (female, MWM). Scale bar 1 cm.





Figures 9-10.– 9. Mouthparts of *Vadimas zolotuhini* Volkova, sp. n. **10.** Wing venation of *Vadimas zolotuhini* Volkova, sp. n.



Figures 11-15.– Genitalia of Megalopygidae. **11.** *Vadimas zolotuhini* Volkova, sp. n. (male, holotype); **12.** *V. zolotuhini* Volkova, sp. n. (female, paratype); **13.** *V. radogast* Volkova, sp. n. (male, holotype); **14.** *V. radogast* Volkova, sp. n. (female, paratype); **15.** *Megalopyge lanata* (Stoll, [1780]).

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Molecular evaluation of the phylogenetic position of *Loxostege ayhanana* Kemal & Koçak, 2017 from East Turkey (Lepidoptera: Crambidae, Pyraustinae)

S. Kizildağ

Abstract

Very few molecular studies on the phylogeny of the *Loxostege* Hübner, [1825] have been performed because molecular data of this highly crowded group are extremely scarce. In the present study, the mitochondrial cytochrome oxidase I gene of *Loxostege ayhanana* Kemal & Koçak, 2017 was firstly sequenced from East Turkey. The phylogenetic trees constructed using neighbor-joining, maximum likelihood and Bayesian inference methods yielded essentially similar topologies. The genus *Loxostege* was not depicted as a monophyletic clade when evaluated within the Pyraustinae. The molecular characterization and phylogenetic position of *L. ayhanana*, which was described by KEMAL & KOÇAK (2017) as a morphological new species, has been firstly identified and supported by molecular phylogenetic analyses in the present study.
KEY WORDS: Lepidoptera, Crambidae, Pyraustinae, *Loxostege ayhanana*, phylogeny, Turkey.

Evolución molecular de la posición filogenética de *Loxostege ayhanana* Kemal & Koçak, 2017 del este de Turquía (Lepidoptera: Crambidae, Pyraustinae)

Resumen

Pocos los estudios moleculares sobre la filogenia de *Loxostege* Hübner, [1825] han sido realizados porque los datos moleculares de este grupo altamente confusos son sumamente escasos. En el estudio actual, el gen mitocondrial citocromo oxidasa I (COI) de *Loxostege ayhanana* Kemal & Koçak, 2017 fue ordenado en serie, en primer lugar, del este de Turquía. El árbol filogenético construido usando el método "neighbor-joining" asociando la probabilidad máxima y la inferencia Bayesiana, produjeron topologías esencialmente similares. El género *Loxostege* no describe un clado monofilético cuando lo valoramos dentro de los Pyraustinae. La caracterización molecular y la posición filogenética de *L. ayhanana*, fue descrita por KEMAL & KOÇAK (2017) como una nueva clase morfológica, en primer lugar, ha sido identificado y sostenido por los análisis de filogenéticos moleculares en el estudio actual.
PALABRAS CLAVE: Lepidoptera, Crambidae, Pyraustinae, *Loxostege ayhanana*, filogenia, Turquía.

Introduction

Loxostege Hübner, [1825] is one of the largest genera in Pyraustinae and shows the most diverse life history adaptations. For *Loxostege*, more than 85 species have been described by traditional morphological methods worldwide (SCHOLTENS & SOLIS, 2015; TRANKNER *et al.*, 2009). In recent years, using traditional morphological methods as well as molecular techniques has become one of the most important developments in Lepidoptera taxonomy and systematics (CHEN *et al.*,

2019; HAUSMANN *et al.*, 2011; SERAPHIM *et al.*, 2018; ZOU *et al.*, 2016). According to other molecular markers, the mitochondrial cytochrome oxidase subunit 1 (COI) gene is the most preferred marker in taxonomy, classification and revision of Lepidoptera. (BUCHNER *et al.*, 2018; KEMAL *et al.*, 2018). Since the mtCOI gene has been used in Lepidoptera molecular systematics, it has been controversial. Because the COI gene is rapidly evolving and it is thought that it cannot fully reflect the phylogeny due to the possibility of high homoplasy due to the rapid saturation of the third codon positions (SOUZA *et al.*, 2016). In contrast, there are numerous studies supporting large-scale datasets that most of the phylogenetic signals are in the third codon position. In addition, the mtCOI gene has significant potential to identify a single species and characterize species boundaries. The variation rate among species is low but the different nucleotide substitution ratios show a higher correlation in determining genetic distances than in other genes (KÄLERSJÖ *et al.*, 1999; RACH *et al.*, 2017).

A better understanding of *Loxostege* phylogeny requires an expansion of the taxon and genome samplings from different geographical locations. In recent years, complete or nearly complete mtCOI gene (658bp) from some *Loxostege* species which are obtained only North America, west Europa and China have been sequenced (CHEN *et al.*, 2019). Since they are serious economic pest of both crops and weeds worldwide, the molecular aspects of *Loxostege sticticalis* (Linnaeus, 1761), *L. cereralis* (Zeller, 1872), *L. allectalis* (Grote, 1877) and *L. commixtalis* (Walker, 1866) within the genus have been studied. However, the phylogenetic relationship of *Loxostege* based on mtCOI sequences has not been discussed comprehensively. Although it is represented by 10 species (*Loxostege aeruginalis* (Hübner, 1796), *L. bicoloralis* (Warren, 1892), *L. clathralis* (Hübner, [1813]), *L. mucosalis* (Herrich-Schäffer, 1848), *L. peltalis* (Eversmann, 1842), *L. peltaloides* (Rebel, 1932), *L. sticticalis* (Linnaeus, 1761), *L. turbidalis* (Treitschke, 1829), *L. wagneri* (Zerny, 1929) and *L. ayhanana* Kemal & Koçak, 2017) (KEMAL & KOÇAK, 2017) in Turkey, there have been almost no significant information regarding molecular of *Loxostege*.

The molecular barcoding of *L. ayhanana* from East Turkey was presented for first time in this study, while the phylogenetic relationships of this species with other species in the genus *Loxostege* were elucidated based on their COI gene. Here, the phylogenetic tree was created at the genera in the subfamily Pyraustinae and the relations of these genera at the molecular taxonomy level were evaluated.

Methods

Loxostege ayhanana specimen (paratype/Lep-Pyr022) was used from Centre for Entomological Studies Ankara (Cesa) Collection for this study (Fig. 1). Total gDNA was extracted from femur part of legs using RED Extract-N-Amp Tissue PCR Kit (Sigma, St. Louis, MO, USA) according to manufacturer instructions and KEMAL *et al.* (2018). The dry legs of individual specimen were washed three times in 100 µL of fresh ethanol (70%). LepF1: ATTCAACCAATCATAAAGATATTGG and LepR1: TAAACTTCTGGATGTCCAAAAAATCA primers (HEBERT *et al.*, 2004) were used for the PCR amplification of mtDNA COI gene. Cycling parameters for PCR amplifications were as follows: Initial denaturation at 94ºC for 2 min, 5 cycles of 94ºC for 30 sec, annealing at 45ºC for 40 sec, and extension at 72ºC for 1 min, 35 cycles of 94ºC for 30 sec, annealing at 51ºC for 40 sec, and extension at 72ºC for 1 min, final extension at 72ºC for 10 min. PCR products were electrophoresed in 1% TAE agarose gels, stained with GelRed, and visualized under UV light. The PCR products were sequenced bi-directionally Macrogen (Netherlands) with LepF1 and LepR1 primers in order to decrease the occurrence of sequencing error by commercial companies. Obtained the sequences were aligned by CodonCode Aligner Programs and their quality was checked and the sequence has been deposited in GenBank (https://www.ncbi.nlm.nih.gov/) with accession number MK883478. Other additional sequences were downloaded from the NCBI/GenBank database and Boldsystem (http://www.boldsystems.org/index.php). Multiple sequence alignments were performed with the ClustalW algorithm implemented in MEGA 7.0 software (TAMURA *et al.*, 2013).

Fig. 1.– *L. ayhanana* Kemal & Koçak, 2017, from Van Province, Bahçesaray, Upper Mukus Valley 1840 m , 23-VI-2016, M. Kemal leg (paratype) used for DNA barcoding.

A total of 160 taxa were employed for phylogenetic analysis, including used *Udea ferrugalis* (Hübner, 1796), *Mecyna asinalis* (Hübner, [1819]) and *Metasia carnealis* (Treitschke, 1829) as outgroup taxa. Sequence divergences between selected sequences were calculated using the Kimura 2-Parameter distance model (KIMURA, 1980) and neighbour-joining (NJ) tree was constructed in the program MEGA 7. Maximum-likelihood (ML) bootstrapping analyses were carried out with 1000 replicates using RA × ML Blackbox with the settings described by STAMATAKIS *et al.* (2008). ML analyses were conducted online using the CIPRES Portal v.3.3 (http://www.phylo.org/). A Bayesian inference (BI) analysis was performed using MrBayes 3.2.6 (RONQUIST & HUELSENBECK, 2003) using the Markov chain Monte Carlo algorithm. The program JModeltest v.2.1.7 (POSADA, 2008) selected the F81 evolutionary model as the best model according to the akaike information criterion for Bayesian inference. The program was run for 10,000,000 generations, with a sample frequency of 100 and a burn-in of 25000.

Results

The existing mtCOI (658bp) DNA barcodes of 27 genera in the subfamily Pyraustinae were used in phylogenetic analyses. ML, NJ, and BI analyses generated similar tree topologies, and three supported values on the NJ tree were shown in Figure 2. The molecular phylogenetic relationships show that the *Loxostege* comprises five main groups: Group A was contained fourteen species of *Loxostege*. In the Group B was only located *Loxostege albiceralis* (Grote, 1878) and had as sister positions with *Arenochroa flavalis* (Fernald, 1894) and *Xanthostege plana* (Grote, 1883) in same clade. Group C, which including *L. ayhanana*, is a sister to this clade.

The base frequencies were A = 31.6%, C = 14.4%, G = 14.9%, and T = 39.1% for the presented

specimen. The sequence character analysis indicated that the GC frequency (29.3%) was apparently lower than the AT frequency (70.7%), which is consistent with the features of the mitochondrial genome for Lepidoptera.

In our phylogenetic tree, it was found that *L. ayhanana* is more closely related to five species than the other species of the genus even though three support values are low. As the NJ tree shows, *L. aeruginalis* (Hübner, 1796) branches as sister group with the *L. virescalis* (Guenée, 1854)-*L. turbidalis* (Treitschke, 1829)-*L. comptalis* (Freyer, 1848) clade, and *L. deliblatica* (Szent-Iványi & Uhrik-Meszáros, 1942) had a basal position. *L. ayhanana* formed a sister taxon to the branch comprising the above five congeners (Fig. 2). In addition, *L. questoralis* (Barnes & McDunnough, 1914), *L. immerens* (Harvey, 1875) and *L. frustalis* (Zeller, 1852) were showed as a sister group with the presented taxon and were located in Group C. *L. nudalis* in the group D was located within the clade consisted from the *Achrya* species. Similarly, *L. sticticalis* (Linnaeus, 1761) in the Group E had a sister position with the populations of *Perispasta caeculalis* (Zeller, 1875), *Pagyda sounanalis* (Legrand, 1966) and *Hahncappsia mellinialis* (Druce, 1899).

The genetic distances between these species with *L. ayhanana* are as follows: *L. ayhanana* and *L. virescalis* (Guenée, 1854) populations have the closest genetic distance 4.83%-5.00%. The second closest was *L. deliblatica* (Szent-Iványi & Uhrik-Meszáros, 1942) with genetic distance 4.99%. It has range 5.17-5.52% with *L. turbidalis* (Treitschke, 1829) populations, and has range 6.00-6.35% with *L. aeruginalis* (Hübner, 1796) populations. *L. ayhanana* has 6.55% genetic distance with *L. comptalis* (Freyer, 1848). The genetic distance between the *L. sticticalis* (Linnaeus, 1761) populations and the *L. ayhanana* was 7.43-7.61%.

Discussion and conclusions

The present work is the first detailed study of the phylogenetic position of the genus *Loxostege* in the subfamily. Although *Loxostege* contains numerous species of this genus in the world, including important species for biological and evolutionary studies as well as many species of economic importance, the diversity and relationships of these species are far from being well understood.

The genus *Loxostege* was not monophyletic taxon according to three support values in molecular phylogenetic analyses and had five distinct lineages (Fig. 2). Although monophyletic groups are generally formed among the different populations of species in presented tree, the monophyly of some species (*L. egregialis* (Munroe, 1976), *L. oberthuralis* (Fernald, 1894) and *L. internationalis* (Munroe, 1976)) should be questioned because of their settlements.

In the numerous studies were reported that only morphological data were unable to give unequivocal answers, but the combined analyses (morphological and molecular analyses) have given a robust phylogenetic estimate for Lepidoptera in recent years (CHEN *et al.*, 2019; MALYSH, 2013; TRANKNER *et al.*, 2009; WAHLBERG *et al.*, 2005). In addition, it is emphasized that morphologically defined species should be supported with molecular analyses for species delimination or phylogenetic position (KEMAL *et al.*, 2019; RAJPOOT *et al.*, 2016). Therefore, for the first time in this study, the molecular evaluation of *L. ayhanana* in the genus was performed using the mtCOI sequence.

One of the factors in favouring the COI gene as an advantageous barcode gene is the apparent distinction power between species in Lepidoptera systematics. In addition, it has characteristic variations in which the distance between species and intraspecies does not coincide. So, the barcoding aperture of COI has been accepted as the most transparent point in the accuracy and reliability of barcode sequences. (MEYER & PAULAY, 2005; RACH *et al.*, 2017). It is a common view for many researchers that a large number of molecular data is needed and that morphological, ecological and molecular synergy will reflect a correct taxonomic and higher level systematic study (KEMAL *et al.*, 2019; RAJPOOT *et al.*, 2016; TRANKNER *et al.*, 2009; WAHLBERG *et al.*, 2005).

The morphologically described *L. ayhanana* species is a typical member of the genus *Loxostege* (KEMAL & KOÇAK, 2017). The monophyly of *L. ayhanana*, which is a distinct species, also supported with the phylogenetic analysis and its genetic distance.

L. nudalis populations in the Boldsystem are in the *Achyra* clade in our phylogenetic tree (Fig. 2).

It is appropriate to change the name of this taxon to *Achrya nudalis* (Hübner, 1796). Also *L. sierralis* was identified by MUNROE (1976) with its four subspecies have been recognized. *L. sierralis internationalis*, *L. sierralis sierralis* and *L. sierralis sanpetealis* have been barcoded (658bp) and *L. sierralis tularealis* has no barcode record available hitherto in Genbank/Boldsystem. The barcode records of these three subspecies in the Boldsystem is given at the species level. In the phylogenetic tree presented in this study, it was shown for the first time that these three populations were different from *L. sierralis* at species level. The maximum genetic distance between *L. sierralis* and *L. internationalis* according to the Kimura 2 parameter is 3.70% and between *L. sierralis* and *L. sanpetealis* is 3.30%. There are three independent species.

After a year of the description of *L. ayhanana* from Turkey, another population has been reported from Crimea (SAVCHUK & KAJGORODOVA, 2018). However, in the present study, we did not have the opportunity to compare these two populations in a molecular level because the mtCOI data of Crimean population is not yet available. Clearly, mtCOI gene sequences for more species of *Loxostege* from more geographic locations require in order to elucidate the phylogeny of the genus.

In the submitted phylogenetic tree, the support values are relatively low thus multiple genes based on more extensive sampling along with new sinapomorphic morphological data are recommended for to overcome the low resolution of single gene analysis. In the present study, as there are the only mtCOI gene sequences of these taxa in the databank (Boldsystem and GenBank), phylogeny estimates were evaluated based on a single barcode. The kinds of some genera do not have molecular barcodes yet, while some genera do not have any molecular data of their type species. Most of the data was obtained from Neotropical and European samples. The phylogeny of this very rich subfamily can be enlightened. With numerous new records obtaining from different geographies. The relationships within the taxa are tried to resolve with this study, an initial one for future studies.

In the presented phylogenetic study, includes *L. ayhanana*, as well as the type species of the genus is *L. aeruginalis* (Hübner, 1796) and four valid species (*L. deliblatica*, *L. comptalis*, *L. turbidalis* and *L. virescalis*) in same clade. According to these results, it has been supported that *L. ayhanana*, which was previously defined morphologically new species, was an independent species by differentiating it from other species of *Loxostege* by molecular analyses.

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S. K.
Van Yïzüncü Yıl University
Faculty of Science
Department of Biology
Tusba, Van 65080
TURQUÍA / *TURKEY*
E-mail: sibelkizildag@yyu.edu.tr
https://orcid.org/0000-0003-0182-5154

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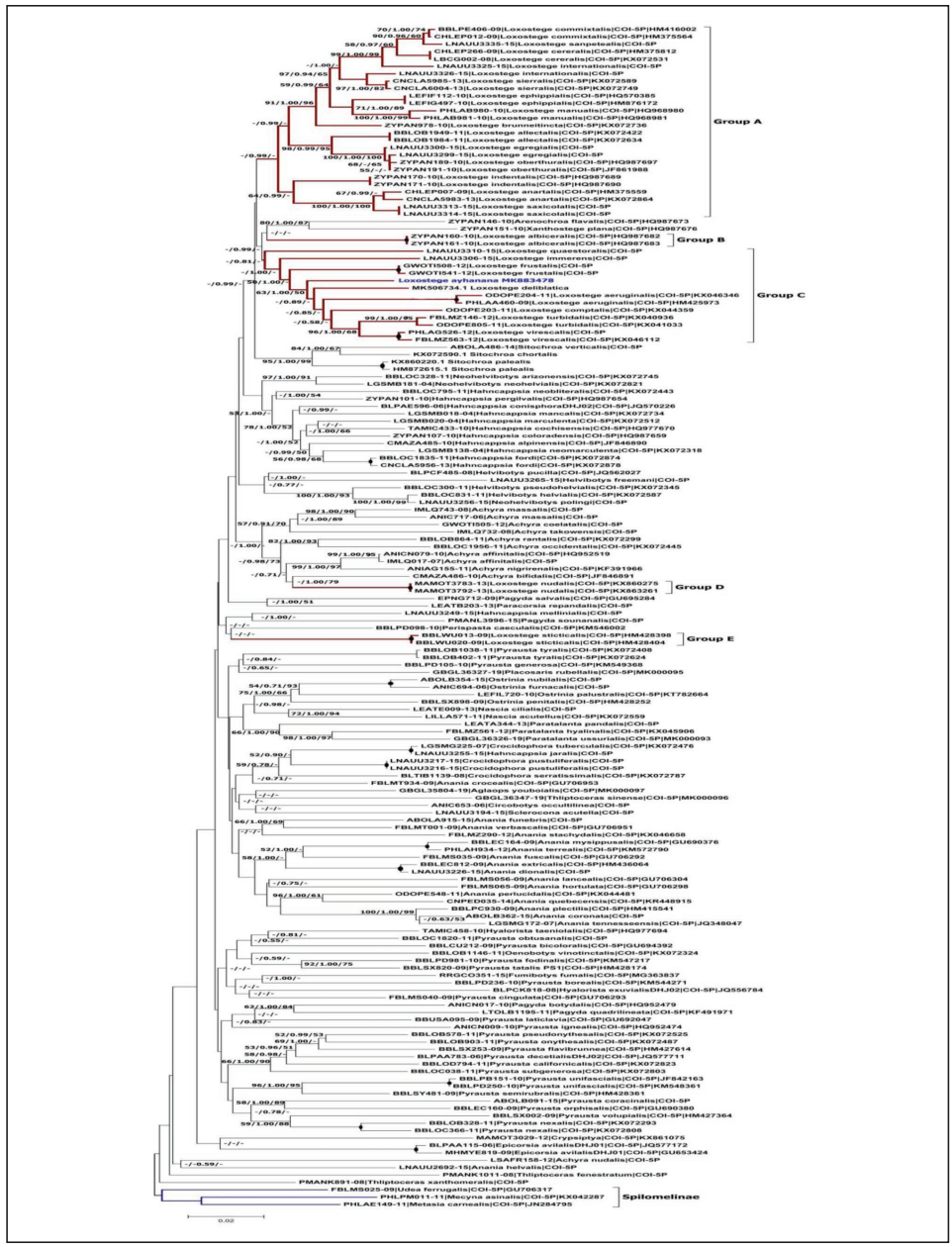

Fig. 2.– NJ, BI and ML analyses based on mtCOI gene sequences of Pyraustinae and some Spilomelinae populations. Numbers at the nodes indicate the NJ bootstrap values, the BI posterior probability and the ML bootstrap values. Fully supported (100/1.00) branches are marked with filled circles. A dash indicates a value less than 0.50 or 50%. Bar, 2 substitutions per 100 nucleotide positions.

REVISION DE PUBLICACIONES
BOOK REVIEWS

G. Baldizzone
Fauna d'Italia. Lepidoptera Coleophoridae
XVII + 907 páginas
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Tenemos en nuestras manos la que podemos considerar como la obra cumbre de nuestro estimado colega el Dr. Giorgio Baldizzone, mundialmente conocido por su casi total dedicación al estudio de los Coleophoridae con la descripción de numerosas especies nuevas y digno sucesor del polaco Dr. Segiusz Toll (1893-1961) al que podemos considerar como el pionero del estudio de esta familia y del que destacamos, entre otras, su obra inconclusa "*Materialien zur Kenntnis der paläarktischen Arten der Familie Coleophoridae (Lepidoptera)*".

La presente obra está escrita en italiano y abarca la totalidad de la fauna italiana conocida de esta familia con un total de 283 especies que se encuentran reflejadas en 49 láminas con dibujos perfectamente realizados a todo color de cada una de ellas. Igualmente en 93 láminas, nos presenta 282 microfotografías de la genitalia del macho y de la hembra y en 33 láminas los dibujos de los sacos larvarios de 249 especies, todos en blanco y negro.

Después de una introducción y los agradecimientos, entramos en la parte general de la obra donde nos da la diagnosis de la familia, la morfología, el aparato genital, el huevo, la larva, la pupa y el saco larvario, la ecología, distribución geográfica, el actual conocimiento de la familia en Italia y como colectar las diferentes especies, montaje, preparación e identificación.

Ya dentro de la parte más importante del libro, nos presenta una clave para separar los dos géneros presentes en Italia, a saber *Augasma* Herrich-Schäffer, 1853 y *Coleophora* Hübner, 1822 y dentro de cada especie, nos da la referencia bibliográfica original y las principales sinonimias, donde se encuentra en la literatura, la localidad tipo, en algunos casos con la designación del Lectotypus, la descripción del adulto, de la genitalia del macho y de la hembra, características identificativas, sobre sus plantas nutricias y finalizando con su ecología y etología.

La obra termina con una detallada bibliografía con 510 referencias consideradas en el libro, un índice alfabético y cinco láminas con 29 fotografías a todo color, de adultos y sacos larvarios en vivo.

No podemos terminar estas líneas, sin felicitar al autor por este excelente y detallado trabajo bien realizado, que sin duda será un libro de referencia para todo aquel interesado en esta maravillosa familia, así como a la Editorial que no ha escatimado en medios para mantener el gran nivel de calidad necesaria para este tipo de trabajos, recomendando vivamente su adquisición, no pudiendo faltar en cualquier biblioteca que se precie.

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A. Vives Moreno
E-mail: avives1954@outlook.es
https://orcid.org/0000-0003-3772-2747

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New faunistic records of moths from the Iberian Peninsula (Insecta: Lepidoptera)

A. Laštůvka & Z. Laštůvka

Abstract

New records of Nepticulidae, Prodoxidae, Yponomeutidae, Lypusidae, Coleophoridae, Momphidae, and 16 other families for Portugal and Spain are presented. *Lampronia rupella* ([Denis & Schiffermüller], 1775), *Euhyponomeutoides albithoracellus* Gaj, 1954, *Agnoea nonscriptella* Corley, 2014, *Coleophora lutipennella* (Zeller, 1838), *C. laricella* (Hübner, [1817]), *C. violacea* (Ström, 1783), and *Mompha conturbatella* (Hübner, [1819]) are new for Spain, and *Bohemannia pulverosella* (Stainton, 1840) is new for Portugal. *Lampronia rupella*, *Euhyponomeutoides albithoracellus*, *Coleophora lutipennella*, *C. laricella*, and *Mompha conturbatella* are new for the Iberian Peninsula. Other faunistic records are given of 48 species (61 new records in all).
KEY WORDS: Insecta, Lepidoptera, new records, Iberian Peninsula.

Nuevos registros de Lepidoptera de la Península Ibérica (Insecta: Lepidoptera)

Resumen

Se mencionan nuevos registros de Nepticulidae, Prodoxidae, Yponomeutidae, Lypusidae, Coleophoridae, Momphidae y otras 16 familias para Portugal y España. *Lampronia rupella* ([Denis & Schiffermüller], 1775), *Euhyponomeutoides albithoracellus* Gaj, 1954, *Agnoea nonscriptella* Corley, 2014, *Coleophora lutipennella* (Zeller, 1838), *C. laricella* (Hübner, [1817]), *C. violacea* (Ström, 1783) y *Mompha conturbatella* (Hübner, [1819]) son nuevas para España, *Bohemannia pulverosella* (Stainton, 1840) es nueva para Portugal. *Lampronia rupella*, *Euhyponomeutoides albithoracellus*, *Coleophora lutipennella*, *C. laricella* y *Mompha conturbatella* son nuevas para la Península Ibérica. Se dan otras citas faunísticas para 48 especies (61 citas nuevas en total).
PALABRAS CLAVE: Insecta, Lepidoptera, nuevos registros, Península Ibérica.

Introduction

The long-term investigations of the small moths in the Iberian Peninsula performed by the authors brought new faunistic records for the whole peninsula, for individual countries or areas. The new records are presented in this contribution, supplementing the publications by VAN NIEUKERKEN *et al.* (2004, 2010), LAŠTŮVKA & LAŠTŮVKA (2007, 2008, 2009, 2011, 2014a, b, c, 2015, 2017, 2019), many works by M. Corley and his collaborators, e.g. CORLEY (2014), CORLEY *et al.* (2006, 2009, 2016, 2018), including summarizing lists by VIVES MORENO (1994, 2014) and CORLEY (2015). The discoveries of five species new for the Iberian Peninsula, seven species new for Spain, one for Portugal and 61 new faunistic records of species from 22 families are given here.

Material and methods

The presented records are mostly the results of the authors' (AL & ZL) three week long visit to the Iberian Peninsula from 8th to 29th June 2019, some species were recorded during the visits in 2017 and 2018. Similarly as in previous years (LAŠTŮVKA & LAŠTŮVKA, 2017, 2019), attention was paid only to northern regions of the Iberian Peninsula, from Gerona in Spain to Trás-os-Montes in Portugal. The moths were mostly collected at light (UV lamp 125 W, fluorescent tubes 8 and 20 W). Some species were beaten from their host plants by day, and empty mines or mines with larvae were found in some mining species. The determination was performed by the authors except for *Coleophora* species identified by Ignác Richter (Prievidza, SK). The mining and other small moths are deposited in the collection of the first, material of Sesiidae in the collection of the second author. Therefore collectors and the collection are not repeated for the individual species.

New Iberian or country records

NEPTICULIDAE

Bohemannia pulverosella (Stainton, 1840)

PT: Trás-os-Montes, São Martinho, mines with larvae on *Malus domestica* Borkh., 15-VI-2019.

Species with European distribution, known in southern, western and central Europe, up to southern Scandinavia to the north (LAŠTŮVKA & LAŠTŮVKA, 1997; VAN NIEUKERKEN, 2013). Larvae develop characteristic mines on *Malus* spp. in one generation in June and July, adults are on the wing in May and June. In the Iberian Peninsula the species was recorded in the Spanish provinces Gerona and Lérida (LAŠTŮVKA & LAŠTŮVKA, 2008, 2019). **New species for Portugal** (Fig. 1).

PRODOXIDAE

Lampronia rupella ([Denis & Schiffermüller], 1775)

ES: Lérida, Valle de Arán, Tredós, 1 ♀, 24-VI-2019.

Western Palearctic up to Central Asiatic species, distributed throughout Europe, with exception of Denmark, The Netherlands, United Kingdom, and the Iberian Peninsula (DE PRINS & JANSEN, 2012; VAN NIEUKERKEN, 2013). It inhabits wet deciduous forests with a rich herb undergrowth, mostly at higher altitudes. Plants of the genera *Adenostyles, Cirsium, Cicerbita*, and *Homogyne* (all Asteraceae) are mentioned as hostplants (e.g. RAZOWSKI, 1978; DE PRINS & JANSEN, 2012). Adults are active by day, they are on the wing in one generation in June and July. **New species for Spain and the Iberian Peninsula** (Fig. 2).

YPONOMEUTIDAE

Euhyponomeutoides albithoracellus Gaj, 1954

ES: Lérida, Valle de Arán, Tredós, 1 ♀, 24-VI-2019.

European species, known locally from central and northern Europe, France and Romania (AGASSIZ 2013). It lives in mixed or coniferous forests at higher altitudes. Larvae develop on *Ribes* spp., adults are on the wing in one generation in June and July (CHRÉTIEN, 1899; FRIESE 1960). **New species for Spain and the Iberian Peninsula** (Fig. 3).

LYPUSIDAE

Agnoea nonscriptella Corley, 2014

ES: Soria, Villaciervos, 1 ♂, 12-VI-2019.

Species described after one male from Portugal - Trás-os-Montes and so far known only from the type locality (CORLEY, 2014). The (second) specimen collected in the province of Soria corresponds to the holotype both in external and genitalia morphology, only the central dark spot of the forewing is slightly indicated. Female and preimaginal stages remain unknown. **New species for Spain** (Figs 4, 9).

COLEOPHORIDAE

Coleophora lutipennella (Zeller, 1838)

ES: Gerona, Rocabruna, 1 ♂, 1 ♀, 26-VI-2018.

West Palearctic species, distributed almost throughout Europe (VAN DER WOLF & BALDIZZONE, 2013), but its occurrence in Spain is insufficiently documented (cf. VAN DER WOLF & BALDIZZONE, 2013; VIVES MORENO, 2014). Also the existing Portuguese records are probably based on misdeterminations (CORLEY, 2015). Larvae mine leaves of *Quercus* species and *Castanea sativa*, adults are on the wing from June to August (e.g. EMMET *et al*., 1996). **First concrete records of this species from Spain and probably from the whole Iberian Peninsula** (Figs 5, 10, 11).

Coleophora laricella (Hübner, [1817])

ES: Lérida, Xerallo, 2 ♂♂, 24-VI-2018.

Species with autochthonous distribution in northern and central Europe, and in northern parts of southern Europe (VAN DER WOLF & BALDIZZONE, 2013). Larvae mine leaves of *Larix* species, usually *Larix decidua* Mill. in Europe, adults are on the wing from May to July (e.g. EMMET *et al*., 1996). The record of two males in northern parts of the province Lérida is very interesting due to the absence of the host plant in a wide area. Occurrence would be possible on *Larix* in ornamental plantings somewhere around. **New species for Spain and the Iberian Peninsula** (Fig. 6, 12).

Coleophora violacea (Ström, 1783)

ES: Huesca, Chía, 1 ♂, 20-VI-2018.

West Palearctic species, known in nearly the whole of Europe, with exception of the Balkan countries and Spain (VAN DER WOLF & BALDIZZONE, 2013). In the Iberian Peninsula recorded in Portugal - Douro Litoral (CORLEY *et al*., 2009). Larvae are polyphagous on many species of trees, shrubs and herbs, they are fully grown already in autumn. Adults are on the wing from the end of May to the beginning of July (e.g. EMMET *et al*., 1996). **New species for Spain** (Figs 7, 13).

MOMPHIDAE

Mompha conturbatella (Hübner, [1819])

ES: Lérida, Valle de Arán, Tredós, larvae on *Epilobium angustifolium* L., 24-VI-2019, 1 ♀ ex larva, 10-VII-2019.

Holarctic species, in Europe known from nearly the whole area, with exception of the Iberian Peninsula and some Balkan countries (KOSTER & SINEV, 2013). Larvae live between spun top leaves of *Epilobium* species in May and June, adults are on the wing in one generation from June to May of the next year (KOSTER & SINEV, 2003). **New species for Spain and the Iberian Peninsula** (Fig. 8).

Other faunistic records

MICROPTERIGIDAE

Micropterix aglaella (Duponchel, [1840])
ES: Gerona, Rocabruna, 7 ♂♂, 2 ♀♀, 9-VI-2019; Lérida, Xerallo, 1 ♂, 25-VI-2019.

Micropterix ibericella Caradja, 1920
ES: Huesca, Espes-Alins, 2 ♀♀, 15-VI-2017.

Micropterix herminiella Corley, 2007
ES: Orense, La Vilavieja, 1 ♂, 20-VI-2017.

Micropterix tunbergella (Fabricius, 1787)
ES: Gerona, Rocabruna, 1 ♂, 9-VI-2019; Huesca, Espes-Alins, 1 ♂, 1 ♀, 15-VI-2017, 1 ♂, 22-VI-2018.

NEPTICULIDAE

Stigmella rolandi van Nieukerken, 1990
ES: Soria, Aldehuella de Calatañazor, 1 ♂, 13-VI-2019.
Other Spanish records see VAN NIEUKERKEN *et al*. (2004), LAŠTŮVKA & LAŠTŮVKA (2011).

Stigmella nylandriella (Tengström, 1848)
ES: Huesca, Cerler, 2050 m, 2 ♂♂, 22-VI-2019.
Second Iberian record, known from the province Lérida, Valle de Arán (LAŠTŮVKA & LAŠTŮVKA, 2019).

Stigmella samiatella (Zeller, 1839)
ES: Lérida, Xerallo, 1 ♂, 25-VI-2019.
Other Spanish records see VAN NIEUKERKEN *et al*. (2004).

Stigmella roborella (Johansson, 1971)
ES: Lérida, Cherallo (Xerallo), 1 ♂, 25-VI-2019.
Other Spanish records see VAN NIEUKERKEN *et al*. (2004), LAŠTŮVKA & LAŠTŮVKA (2014b, 2015, 2019).

Zimmermannia hispanica (van Nieukerken, 1985)
ES: Soria, La Seca, 1 ♀, 19-VI-2019.
Species widespread in the Iberian Peninsula, other Spanish records see VAN NIEUKERKEN *et al*. (2004, 2010).

OPOSTEGIDAE

Opostegoides menthinella (Mann, 1855)
ES: Soria, La Seca, 1 ♀, 19-VI-2019; PT: Trás-os-Montes, São Martinho, 1 ♂, 14-VI-2019.
Species common both in Spain (VAN NIEUKERKEN *et al*., 2004) and Portugal (CORLEY, 2015; CORLEY *et al*., 2018).

Pseudopostega chalcopepla (Walsingham, 1908)
ES: Huesca, Castejón de Monegros, 1 ♀, 10-VI-2019.

Species widespread in the Iberian Peninsula, other records from Spain see VAN NIEUKERKEN *et al*. (2004).

INCURVARIIDAE

Incurvaria oehlmanniella (Hübner, 1796)
ES: Lérida, Valle de Arán, Tredós, 1 ♂, 24-VI-2019.

TISCHERIIDAE

Tischeria dodonaea Stainton, 1858
ES: Soria, La Seca, 1 ♀, 19-VI-2019.
Second Spanish record, known from the province of Barcelona (LAŠTŮVKA & LAŠTŮVKA, 2015).

BUCCULATRICIDAE

Bucculatrix alaternella Constant, 1890
ES: Gerona, Rocabruna, 1 ♀, 9-VI-2019.
Other Spanish records see LAŠTŮVKA & LAŠTŮVKA (2009).

GRACILLARIIDAE

Caloptilia cuculipennella (Hübner, 1796)
ES: Huesca, Castejon de Monegros, larvae on *Phillyrea angustifolia* L., 10-VI-2019, 1 ♀, ex larva, VI-2019; larva known on *Fraxinus, Jasminum, Ligustrum,* and *Syringa* (DE PRINS & DE PRINS, 2019), *Phillyrea angustifolia* L., is a new host plant of this species.

Aspilapteryx limosella (Duponchel, 1843)
ES: Soria, La Seca, 1 ♀, 19-VI-2019.

Acrocercops cocciferella (Chrétien, 1910)
ES: Huesca, Castejón de Monegros, 1 ♂, 1 ♀, 10-VI-2019.

Phyllonorycter salictella (Zeller, 1846)
ES: Soria, Villaciervos, 1 ♀, 12-VI-2019.
Other Spanish records see LAŠTŮVKA & LAŠTŮVKA (2014b).

Phyllonorycter endryella (Mann, 1855)
ES: Soria, Aldehuella de Calatañazor, 2 ♂♂, 13-VI-2019.
Other Spanish records see LAŠTŮVKA & LAŠTŮVKA (2007, 2014a, b).

Phyllonorycter insignitella (Zeller, 1846)
ES: Soria, La Seca, 1 ♀, 19-VI-2019.
Other Spanish records see LAŠTŮVKA & LAŠTŮVKA (2014b).

Phyllonorycter phyllocytisi (M. Hering, 1936)
ES: Lérida, Cherallo (Xerallo), 5 ♀♀, 25-VI-2019.

Phyllonorycter trifasciella (Haworth, 1828)
ES: Cádiz, Algodonales, Juncales, 2 ♀♀, 22-VI-2011; Soria, La Seca, 1 ♀, 19-VI-2019.

Triberta helianthemella (Herrich-Schäffer, 1861)
ES: Soria, La Seca, 1 ♂, 19-VI-2019.
Other Spanish records see LAŠTŮVKA & LAŠTŮVKA (2014a).

Phyllocnistis labyrinthella (Bjerkander, 1790)
ES: Lérida, Valle de Arán, Tredós, 1 ♂, 24-VI-2019.

YPONOMEUTIDAE

Kessleria saxifragae (Stainton, 1868)
ES: León, Viadangos de Arbas, larvae on *Saxifraga paniculata* Mill., 16-VI-2019, 1 ♀, ex larva VII-2019.

PLUTELLIDAE

Rhigognostis senilella (Zetterstedt, 1839)
ES: Lérida, Valle de Arán, Tredós, 1 ♀, 24-VI-2019.
Second Iberian record, known from the province of Huesca (LAŠTŮVKA & LAŠTŮVKA, 2019).

Eidophasia syenitella (Herrich-Schäffer, 1851)
ES: Lérida, Cherallo (Xerallo), 1 ♀, 25-VI-2019.

GLYPHIPTERIGIDAE

Glyphipterix simpliciella (Stephens, 1834)
ES: Lérida, Valle de Arán, Tredós, 1 ♀, 24-VI-2019; Soria, La Seca, 1 ♂, 9-VI-2019, Villaciervos, 1 ♂, 1 ♀, 12-VI-2019.

ARGYRESTHIIDAE

Argyresthia goedartella (Linnaeus, 1758)
ES: Oviedo, Puerto de la Farrapona, 2 ♀♀, 21-VI-2017.

Argyresthia brockeella (Hübner, [1813])
ES: Gerona, Rocabruna, 1 ♂, 1 ♀, 11-VI-2017.

Argyresthia retinella Zeller, 1839
ES: Gerona, Rocabruna, 2 ♀♀, 11-VI-2017; Huesca, Espes-Alins, 1 ♂, 15-VI-2017.

Argyresthia glaucinella Zeller, 1839
ES: Gerona, Rocabruna, 1 ♂, 2 ♀♀, 11-VI-2017.

Argyresthia bonnetella (Linnaeus, 1758)
ES: Lérida, Sarroca de Bellera, 1 ♂, 26-VI-2017.

Argyresthia conjugella Zeller, 1839
ES: Huesca, Cerler, 2 ♂♂, 3 ♀♀, 22-VI-2019; Lérida, Valle de Arán, Tredós, 2 ♂♂, 24-VI-2019; Oviedo, Puerto de la Farrapona, 1 ♀, 21-VI-2017.

HELIODINIDAE

Heliodines roesella (Linnaeus, 1758)
ES: León, Torrestio, 2 ♂♂, 1 ♀, 16-VI-2019 (cf. LAŠTŮVKA & LAŠTŮVKA, 2019).

BEDELLIIDAE

Bedellia somnulentella (Zeller, 1847)
ES: Soria, Aldehuella de Calatañazor, 1 ♀, 13-VI-2019.

DOUGLASIIDAE

Klimeschia transversella (Zeller, 1839)
ES: Gerona, Rocabruna, 1 ♂, 11-VI-2017.

Tinagma ocnerostomella (Stainton, 1850)
ES: León, Viadangos de Arbas, 1 ♀, 16-VI-2019; Soria, Aldehuella de Calatañazor, 1 ♂, 19-VI-2018, 1 ♂, 13-VI-2019, La Seca, 1 ♀, 19-VI-2019, Villaciervos, 1 ♀, 14-VI-2018.

Tinagma balteolella (Fischer von Röslerstamm, [1841])
ES: Gerona, Rocabruna, 1 ♂, 9-VI-2019; León, Viadangos de Arbas, 1 ♀, 17-VI-2019.
Second and third Spanish records, known from the province of Almería (VIVES MORENO & GASTÓN, 2017).

MOMPHIDAE

Mompha raschkiella (Zeller, 1839)
ES: Lérida, Valle de Arán, Tredós, 1 ♂, 24-VI-2019.
Second Iberian record, known from the province of Gerona, Valter 2000 (LAŠTŮVKA & LAŠTŮVKA, 2019).

MILLIERIIDAE

Millieria dolosalis (Heydenreich, 1851)
PT: Trás-os-Montes, São Martinho, 1 ♂, 15-VI-2019.

SCHRECKENSTEINIIDAE

Schreckensteinia festaliella (Hübner, [1819])
ES: Lérida, Valle de Arán, Tredós, 1 ♀, 24-VI-2019.

EPERMENIIDAE

Epermenia aequidentella (Hofmann, 1867)
ES: León, Viadangos de Arbas, 1 ♀, 16-VI-2019.

Epermenia pontificella (Hübner, 1796)
ES: Soria, Aldehuella de Calatañazor, 1 ♂, 18-VI-2019.

Epermenia ochreomaculella (Millière, 1854)
ES: Soria, Aldehuella de Calatañazor, 1 ♂, 1 ♀, 18-VI-2019.

Ochromolopis ictella (Hübner, [1813])
ES: Soria, Aldehuella de Calatañazor, 1 ♂, 13-VI-2019.

SESIIDAE

Paranthrene insolita polonica Schnaider, [1939]
ES: León, Carrocera, 1 ♂, 18-VI-2019.
Other records see LAŠTŮVKA & LAŠTŮVKA (2014c, 2015, 2019).

Synanthedon codeti (Oberthür, 1881)
ES: Soria, La Seca, 3 ♂♂, 19-VI-2019.
Other Spanish records are summarized by LAŠTŮVKA & LAŠTŮVKA (2014c).

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A. L.
Slavíčkova, 15
CZ-796 01 Prostějov
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: aleslastuvkaento@seznam.cz
https://orcid.org/0000-0002-1342-2080

*Z. L.
Department of Zoology, Fisheries, Hydrobiology and Apiculture
Mendel University
Zemědělská, 1
CZ-613 00 Brno
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: last@mendelu.cz
https://orcid.org/0000-0002-3872-6830

*Autor para la correspondencia / *Corresponding author*

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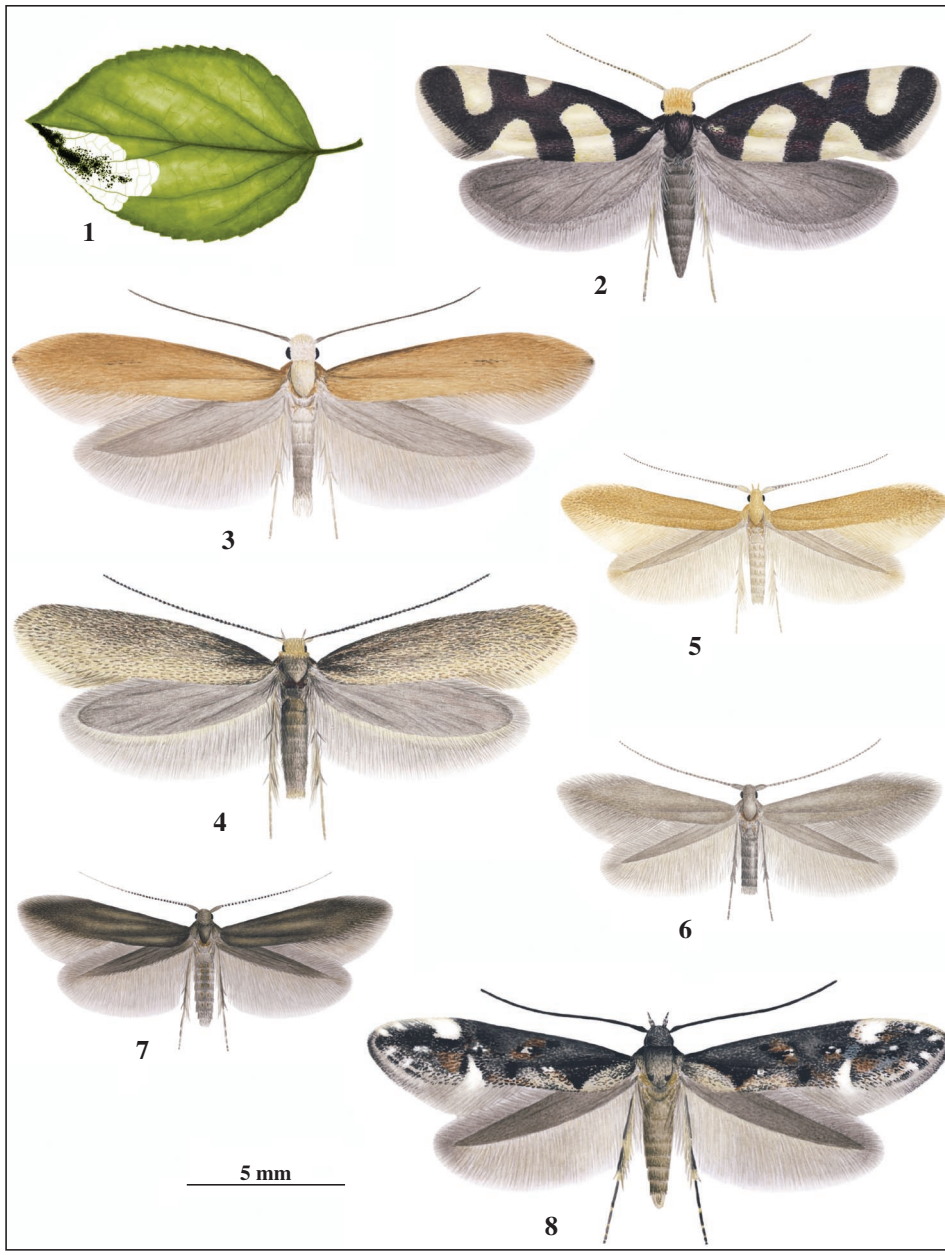
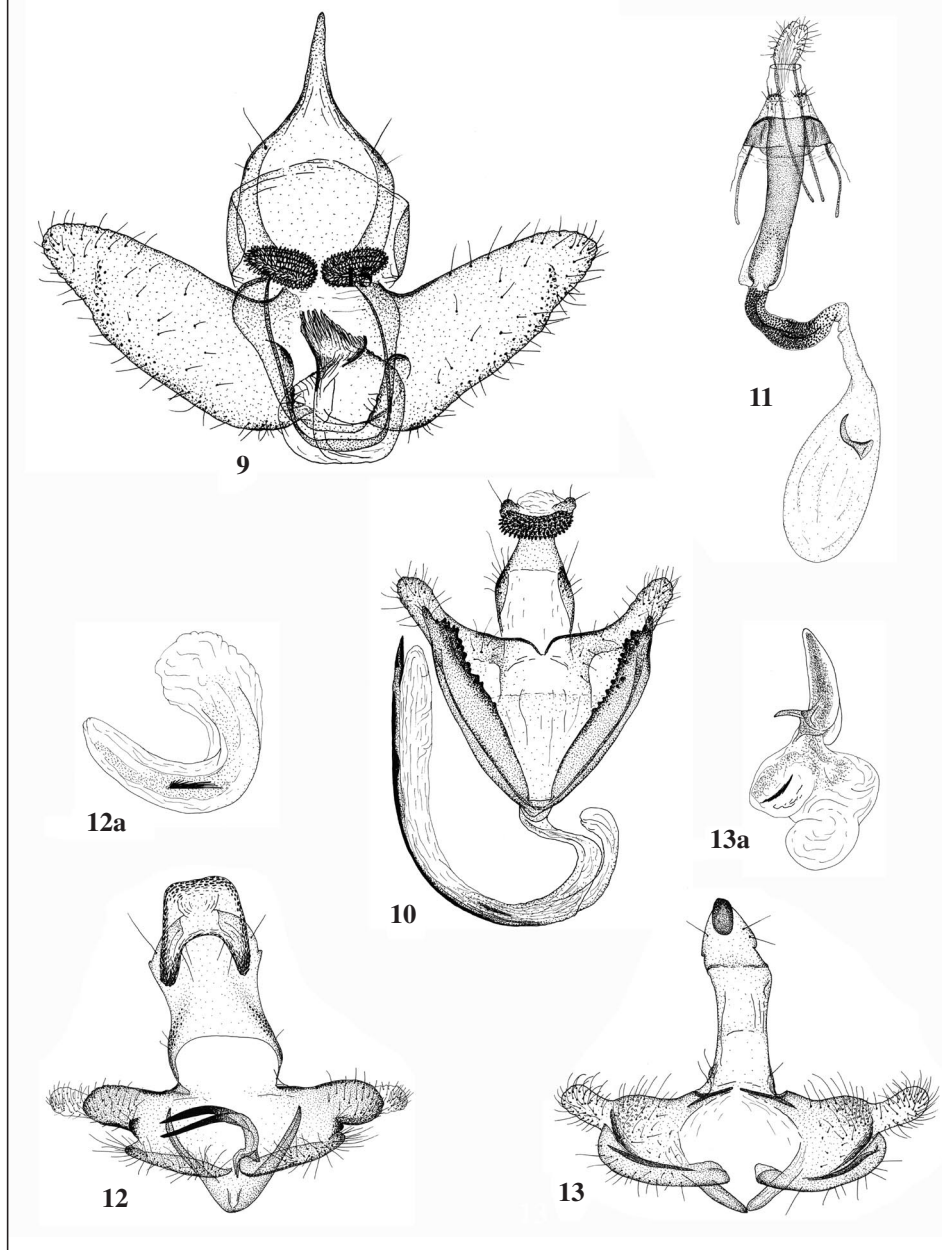


Figs 1-8.– Adults. **1.** *Bohemannia pulverosella* (Stainton), mine on *Malus domestica*. **2.** *Lampronia rupella* ([Denis & Schiffermüller]), female. **3.** *Euhyponomeutoides albithoracellus* Gaj. **4.** *Agnoea nonscriptella* Corley. **5.** *Coleophora lutipennella* (Zeller). **6.** *C. laricella* (Hübner). **7.** *C. violacea* (Ström). **8.** *Mompha conturbatella* (Hübner).



Figs 9-13.– Genitalia. **9.** *Agnoea nonscriptella* Corley, male. **10-11.** *Coleophora lutipennella* (Zeller), male and female. **12.** *C. laricella* (Hübner), male, **12a.** aedeagus. **13.** *C. violacea* (Ström), male, **13a.** aedeagus.

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Lepidoptera invernales y nuevos datos de la fauna del Parque Natural de la Serranía de Cuenca (Cuenca, España) (Insecta: Lepidoptera)

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

Resumen

Se aportan datos sobre la presencia de 23 especies de Lepidoptera de las familias Sesiidae, Drepanidae, Lasiocampidae, Geometridae, Notodontidae y Noctuidae en el Parque Natural de la Serranía de Cuenca, lo que eleva hasta las 759 el número de especies conocidas. Once especies de Geometridae y Noctuidae son nuevas para la provincia de Cuenca. Se confirma la presencia de *Leucania loreyi* (Duponchel, 1827) y del endemismo ibérico *Dyscia distinctaria* (A. Bang-Haas, 1910).
PALABRAS CLAVE: Insecta, Lepidoptera, faunística, Serranía de Cuenca, Cuenca, España.

Wintry Lepidoptera and new records for the fauna from the "Serranía de Cuenca" Natural Park (Cuenca, Spain) (Insecta: Lepidoptera)

Abstract

Twenty-three species of Lepidoptera belonging to the families Sesiidae, Drepanidae, Lasiocampidae, Geometridae, Notodontidae and Noctuidae in the "Serranía de Cuenca" Natural Park are studied, which increases the number of known species up to 759. Eleven Geometridae and Noctuidae species are new records in Cuenca province. *Leucania loreyi* (Duponchel, 1827) and the Iberian endemism *Dyscia distinctaria* (A. Bang-Haas, 1910) are confirmed in the studied area.
KEY WORDS: Insecta, Lepidoptera, faunistics, "Serranía de Cuenca", Cuenca, Spain.

Introducción

Recientemente, en GARRE *et al.* (2016) se ha publicado el resultado de más de 20 años de estudio de los Macrolepidoptera en el Parque Natural de la Serranía de Cuenca. En la citada publicación se aportaron datos de 737 especies, de las cuales, 24 se citaban por primera vez en el área de estudio:

Familia Cossidae	*Cossus cossus* (Linnaeus, 1758)
Familia Drepanidae	*Watsonalla binaria* (Hüfnagel, 1767)
	Cymatophorina diluta ([Denis & Schiffermüller], 1775)
Familia Lasiocampidae	*Trichiura (Achnocampa) ilicis* (Rambur, 1858)
Familia Geometridae	*Compsoptera jourdanaria* (Serres, 1826)
	Idaea luteolaria (Constant, 1863)

	Idaea lusohispanica Herbulot, 1991
	Idaea sardoniata (Homberg, 1912)
	Idaea carvalhoi Herbulot, 1979
	Xanthorhoe skoui Viidalepp & Hausmann, 2003
	Perizoma bifaciata (Haworth, 1809)
	Gymnoscelis rufifasciata (Haworth, 1809)
	Eupithecia inturbata (Hübner, [1817])
Familia Erebidae	*Parascotia lorai* Agenjo, 1967
	Ophiusa tirhaca (Cramer, 1777)
Familia Noctuidae	*Hoplodrina octogenaria* (Goeze, 1781)
	Atethmia algirica (Culot, 1917)
	Dicycla oo (Linnaeus, 1758)
	Scotochrosta pulla ([Denis & Schiffermüller], 1775)
	Aporophyla (Phylapora) canescens (Duponchel, [1827])
	Polymixis (Eumichtis) lichenea (Hübner, [1813])
	Hadena (Hadena) filograma (Esper, 1788)
	Leucania (Acantholeucania) loreyi (Duponchel, 1827)
	Xestia (Xestia) kermesina (Mabille, 1869)

El objetivo del presente artículo es aportar nuevos datos sobre la fauna de Lepidoptera de la Serranía de Cuenca, principalmente, en base a los muestreos realizados al comienzo de la primavera y a finales de otoño.

Material y métodos

Los resultados han sido obtenidos del muestreo realizado en cuatro localidades del Parque Natural de la Serranía de Cuenca y zonas limítrofes (Tabla I), mediante la utilización de trampas de luz negra y actínica de 6 y 15 vatios (tipo Heath).

Tabla I.– Relación de las localidades muestreadas.

Localidad	**Municipio**	**UTM (10x10)**	**Altitud (m)**	**Hábitat**
Manantial de Baños	Cuenca	30TWK85	1.015	Bosque ripario y mixto de quejigo y pino silvestre
Dehesa de Huélamo	Huélamo	30TWK96	1.290	Matorral medio y bajo, bosque mixto de quejigo, pino salgareño y silvestre
La Poza (piscifactoría)	Uña	30TWK85	1.165	Bosque ripario y mixto de quejigo y pino salgareño
Laguna de Uña	Uña	30TWK85	1.130	Bosque ripario
Río Júcar	Villalba de la Sierra	30TWK85	1.280	Bosque ripario

El material estudiado se encuentra depositado en la colección del Laboratorio de Biología Animal del Departamento de Zoología y Antropología Física de la Universidad de Murcia.

Así mismo, se ha revisado nueva bibliografía destacando el estudio realizado por KRAUS (1999).

La nomenclatura y la ordenación de los taxones en sus correspondientes categorías se ha realizado de acuerdo con DE JONG (2014) y VIVES MORENO (2014), con algunas modificaciones, indicando para cada taxón la toponimia distintiva, fecha de captura y número de ejemplares. Se ha llevado a cabo el estudio de la genitalia para la determinación de aquellas especies que presentan dificultades para su correcta identificación.

Resultados

En total se aportan los datos de 23 especies de Lepidoptera: Sesiidae (1), Drepanidae (1), Lasiocampidae (1), Geometridae (10), Notodontidae (1) y Noctuidae (9).

SESIIDAE

Synanthedon andrenaeformis (Laspeyres, 1801)
Cita bibliográfica: KRAUS (1999).

DREPANIDAE
THYATIRINAE

Polyploca ridens (Fabricius, 1787)
Material estudiado: Manantial de Baños, 30-III-2019, 1 ex.

LASIOCAMPIDAE

Trichiura (Trichiura) castiliana Spuler, 1908
Cita bibliográfica: KRAUS (1999).

GEOMETRIDAE
ENNOMINAE

Dyscia distinctaria (A. Bang-Haas, 1910)
Material estudiado: Manantial de Baños, 1-III-2019, 2 ex.; 1-III-2019, 1 ex.

Apocheima hispidaria ([Denis & Schiffermüller], 1775)
Material estudiado: Dehesa de Huélamo, 1-III-2019, 1 ex.; Laguna de Uña, 30-III-2019, 1 ex.

Phigalia pilosaria ([Denis & Schiffermüller], 1775)
Material estudiado: Manantial de Baños, 1-III-2019, 1 ex.

Chemerina caliginearia (Rambur, 1833)
Material estudiado: Dehesa de Huélamo, 1-III-2019, 1 ex.; Manantial de Baños, 1-III-2019, 2 ex.

Agriopis marginaria (Fabricius, [1777])
Material estudiado: Dehesa de Huélamo, 1-III-2019, 2 ex.; Manantial de Baños, 1-III-2019, 3 ex.; 30-III-2019, 1 ex.; La Poza, 1-III-2019, 3 ex.

Agriopis leucophaearia ([Denis & Schiffermüller], 1775)
Material estudiado: Dehesa de Huélamo, 1-III-2019, 2 ex.

Erannis defoliaria (Clerck, 1759)
Material estudiado: Dehesa de Huélamo, 4-XII-2018, 1 ex.

ALSOPHILINAE

Alsophila aescularia ([Denis & Schiffermüller], 1775)
Material estudiado: Dehesa de Huélamo, 1-III-2019, 1 ex.; 30-III-2019, 1 ex.; Manantial de Baños, 1-III-2019, 1 ex.

LARENTIINAE

Operophtera brumata (Linnaeus, 1758)
Material estudiado: Dehesa de Huélamo, 4-XII-2018, 1 ex.; Laguna de Uña, 4-XII-2018, 1 ex.; Manantial de Baños, 4-XII-2018, 3 ex.

Eupithecia vulgata (Haworth, 1809)
Material estudiado: La Poza, 10-VI-2017, 1 ex.; Laguna de Uña, 9-VI-2017, 1 ex.

NOTODONTIDAE
NOTODONTINAE

Drymonia ruficornis (Hüfnagel, 1766)
Material estudiado: Manantial de Baños, 30-III-2019, 1 ex.

NOCTUIDAE
NOCTUINAE

Conistra (Conistra) ligula (Esper, 1791)
Material estudiado: Laguna de Uña, 4-XII-2018, 1 ex.; Manantial de Baños, 30-III-2019, 3 ex.; La Poza, 30-III-2019, 1 ex.

Conistra (Conistra) alicia Lajonquière, 1939
Material estudiado: Laguna de Uña, 4-XII-2018, 1 ex.; La Poza, 1-III-2019, 3 ex.

Conistra (Conistra) rubiginosa (Scopoli, 1763)
Material estudiado: Dehesa de Huélamo, 1-III-2019, 1 ex.; Laguna de Uña, 4-XII-2018, 1 ex.; Manantial de Baños, 1-III-2019, 4 ex.; 30-III-2019, 1 ex.; La Poza, 1-III-2019, 3 ex.; 30-III-2019, 1 ex.

Conistra (Conistra) gallica (Lederer, 1857)
Material estudiado: Laguna de Uña, 4-XII-2018, 1 ex.

Conistra (Peperina) torrida (Lederer, 1855)
Material estudiado: Laguna de Uña, 4-XII-2018, 1 ex.; Manantial de Baños, 1-III-2019, 2 ex.

Conistra (Dasycampa) erythrocephala ([Denis & Schiffermüller], 1775)
Material estudiado: Laguna de Uña, 4-XII-2018, 1 ex.

Aporophyla (Phylapora) nigra (Haworth, 1809)
Material estudiado: Manantial de Baños, 5-X-2018, 2 ex.

Hadena (Hadena) wehrlii (Draudt, 1934)
Material estudiado: Río Júcar, Villalba de la Sierra, 13-VI-2012, 1 ex.

Leucania (Acantholeucania) loreyi (Duponchel, 1827)
Material estudiado: La Poza, 10-VI-2017, 1 ex.

Discusión

Los estudios sobre la diversidad entomológica suelen realizarse principalmente durante los meses que comprenden las estaciones de la primavera y el verano, pudiendo adelantarse o retrasarse de-

pendiendo de la climatología. Generalmente, la actividad de los Lepidoptera Heterocera de hábito nocturno suele estar condicionada por diferentes y variados factores: latitud y altitud de las zonas muestreadas, las condiciones atmosféricas del área de estudio, como el comienzo y la finalización de las lluvias, la intensidad del frío durante los meses de otoño, los días con heladas o el deshielo y, sobre todo, las temperaturas nocturnas en el comienzo de la primavera porque limitan el vuelo de los Lepidoptera.

Durante los meses invernales únicamente las especies de Heterocera más especializadas son capaces de volar y completar su ciclo, entre ellas, los Geometridae de los géneros *Chesias, Lycia, Apochemia, Agriopis,* etc. y los Noctuidae de los géneros *Conistra, Agrochola*, *Orthosia*, etc., que solamente pueden ser observadas durante el invierno climatológico aprovechando las condiciones favorables del clima mediterráneo. La duración del ciclo biológico de estos insectos está condicionada por la temperatura, el fotoperiodo, las condiciones atmosféricas y, especialmente, por el ciclo de desarrollo de las plantas de las que se alimentan las orugas y los adultos.

La realización de los muestreos invernales suele ser complicada de organizar ya que la evolución de la climatología suele ser difícil de prever y el éxito no suele estar asegurado. Por este motivo, cuando se dan las condiciones necesarias para realizar los muestreos se pueden encontrar numerosas e interesantes especies que no vuelan en otras épocas del año.

En nuestro caso, el incremento del esfuerzo de muestreo durante los meses de noviembre y diciembre, junto con el inicio de la temporada de estudio a principios de marzo, ha permitido identificar 18 especies de cuatro familias de Macrolepidoptera que previamente no habían sido censadas en el área de estudio. Entre todas ellas son nuevas para la provincia de Cuenca los Geometridae *Dyscia distinctaria*, *Apocheima hispidaria, Phigalia pilosaria, Agriopis marginaria, Erannis defoliaria, Alsophila aescularia* y *Operophtera brumata* y los noctuidos *Conistra alicia, C. gallica* y *C. erythrocephala.*

Además, la realización de un muestreo puntual en el mes de junio permitió la captura del geométrido *Eupithecia vulgata,* registro nuevo para la provincia de Cuenca, y también confirmar la presencia del Noctuidae *Leucania loreyi*, citada anteriormente en GARRE *et al.* (2016).

La revisión de nueva bibliografía ha permitido conocer la presencia en el área de estudio del Sesiidae *Synanthedon andrenaeformis* y del Lasiocampidae *Trichiura castiliana* (KRAUS, 1999). Estos nuevos registros elevan el número de especies a 759, conocidas en el Parque Natural de la Serranía de Cuenca.

Agradecimiento

Agradecer a la Dirección del Parque Natural de la Serranía de Cuenca las facilidades ofrecidas para el desarrollo del trabajo. Este estudio ha sido financiado con el proyecto de la Fundación Séneca (Ref. 19908/GERM/15) de Murcia.

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J. J. G.
Departamento de Zoología y Antropología Física
Área de Biología Animal
Facultad de Veterinaria
Universidad de Murcia
Campus de Espinardo
Apartado 4021
E-30071 Murcia
ESPAÑA / *SPAIN*
E-mail: juanjogf@um.es
https://orcid.org/0000-0002-9645-5266

R. M. R
Departamento de Zoología y Antropología Física.
Área de Biología Animal
Facultad de Veterinaria
Universidad de Murcia
Campus de Espinardo
Apartado 4021
E-30071 Murcia
ESPAÑA / *SPAIN*
E-mail: rmrubio@um.es
https://orcid.org/0000-0002-0109-7874

M. G.
Gran Vía Escultor Salzillo, 7
E-30004 Murcia
ESPAÑA / *SPAIN*
E-mail: manuel.garre@fripozo.com
https://orcid.org/0000-0002-5846-8621

*A. S. O.
Departamento de Zoología y Antropología Física
Área de Biología Animal
Facultad de Veterinaria
Universidad de Murcia
Campus de Espinardo
Apartado 4021
E-30071 Murcia
ESPAÑA / *SPAIN*
E-mail: aortiz@um.es
https://orcid.org/0000-0002-3877-6096

*Autor para la correspondencia / *Corresponding author*

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Dos nuevos microlepidópteros para la Península Ibérica: *Epinotia cinereana* (Haworth, 1811) y *Denisia similella* (Hübner, 1796) (Lepidoptera: Tortricidae, Oecophoridae)

J. Gastón, V. Redondo & Tx. Revilla

Resumen

Se menciona por primera vez para la Península Ibérica a *Epinotia cinereana* (Haworth, 1811) y *Denisia similella* (Hübner, 1796), comparando la primera de ellas con la especie próxima *Epinotia nisella* (Clerck, 1759), presente en el ámbito del trabajo. Se ilustran los adultos y el aparato genital de ambas especies.
PALABRAS CLAVE: Lepidoptera, Tortricidae, Oecophoridae, *E. cinereana*, *D. similella*, nuevas especies, España.

Two new microlepidoptera for the Iberian Peninsula: *Epinotia cinereana* (Haworth, 1811) and *Denisia similella* (Hübner, 1796) (Lepidoptera: Tortricidae, Oecophoridae)

Abstract

Epinotia cinereana (Haworth, 1811) and *Denisia similella* (Hübner, 1796), are reported for the first time in the Iberian Peninsula, comparing the first one with the next species *Epinotia nisella* (Clerck, 1759), present in the work field. The adult and male genitalia of both species are illustrated.
KEY WORDS: Lepidoptera, Tortricidae, Oecophoridae, *E. cinereana*, *D. similella*, new species, Spain.

Introducción

Entre el material de Tortricidae Latreille, [1802]1803, que el primero de los autores estaba estudiando para un trabajo sobre esta familia en Aragón, se encontró un ejemplar que en principio podría adscribirse a la especie críptica *Epinotia nisella* (Clerck, 1759); un estudio más detallado del mismo dio como resultado que en realidad se trataba de la especie próxima *Epinotia cinereana* (Haworth, 1811).

Aunque *Epinotia cinereana* (Haworth, 1811), fue considerada especie válida durante el siglo XIX en Gran Bretaña, no fue incluida en el catálogo de STAUDINGER & REBEL (1901), ni tampoco mencionada por KENNEL (1921). PIERCE & METCALFE (1922), fueron pioneros en la utilización de los órganos genitales en taxonomía y documentaron las diferencias genitales entre ambas especies; esta idea fue abandonada por BRADLEY *et al.* (1979) quienes no vieron diferencias apreciables en el aparato genital, razón por la cual muchos autores como por ejemplo RAZOWSKI (2003) han considerado a *E. cinereana* como sinonimia de *E. nisella*.

MUTANEN *et al.* (2012) confirmaron en un riguroso trabajo la separación entre ambas especies tanto por el análisis de ADN como por las diferencias en las estructuras genitales.

Ambas especies tienen una distribución Holártica, encontrándose tanto en la región Neártica (Estados Unidos y Canadá) como en la Paleártica (Europa y Asia), aunque en estos momentos determinadas citas de *E. cinereana* podrían estar confundidas entre el material hasta ahora adscrito a *E. nisella.*

Denisia similella (Hübner, 1796), es un Oecophoridae que habita en el conjunto de Europa, desde el norte de Escandinavia hasta el sureste de Francia, incluyendo el Reino Unido e Irlanda, llegando por el este a los Urales, Siberia (Altai) y Kamtschatka, aunque no está presente en el área mediterránea (exceptuando la costa francesa), HANNEMANN (1997). Hasta el momento no se conocía de la Península Ibérica. Sus larvas se alimentan de hongos bajo la corteza o madera en descomposición de coníferas como *Abies alba* Mill., *Larix decidua* Mill., *Picea sp.* y *Pinus sp.* (Pinaceae), o incluso sobre especies de hoja caduca como *Betula sp.* (Betulaceae) o *Acer sp.* (Aceraceae). Los adultos vuelan por la noche desde junio hasta principios de agosto siendo normalmente traídos por la luz artificial.

Material y método

Los ejemplares estudiados se obtuvieron mediante muestreos de campo utilizando trampas de luz. Para su identificación nos hemos basado en el examen comparativo de los caracteres morfológicos externos y, sobre todo, en el análisis de la estructura genital de los ejemplares, consultándose a MUTANEN *et al.*, (2012) y NEL & HUEMER (2012).

La preparación de la genitalia se ha efectuado siguiendo a ROBINSON (1976), con modificaciones. Se han utilizado los microscopios NIKON Eclipse E400 y las cámaras digital NIKON D3100 y SONY α100 DSLR-A100K con objetivo AF 100 MACRO 1:2,8 (32), e igualmente para el retoque fotográfico, el programa de Adobe Photoshop ©.

Resultados

Epinotia cinereana (Haworth, 1811) (Fig. 4)
Tortrix cinereana Haworth, 1811. *Lep. Brit.,* **3**: 451
LT: [Gran Bretaña]

Material estudiado: HUESCA: Benasque 1.350 m, 1 ♂, 8-VIII-1998, J. Gastón leg. y coll., prep. gen. 6028JG (Fig. 2).

Epinotia nisella (Clerck, 1759) (Figs. 5-7)
Phalaena nisella Clerck, 1759. *Icones Insect.*, **1**: pl. 12, fig. 6
LT: [Suecia]

Material examinado: ESPAÑA. ÁLAVA: Monasterioguren, 500 m, 1 ♀, 15-VIII-1986, J. Gastón leg. y coll., prep. gen. 7564JG.; Puerto de Azáceta, 800 m, 1 ♀, 24-VIII-1984, J. Gastón leg. y coll., prep. gen. 7565JG. GERONA: Queralbs (El Ripollés), 1.100 m, 1 ♀, 6-VIII-2015, J. Ylla leg., prep. gen. JY4483. HUESCA: Canfranc, 1.275 m, 1 ♂, 16-VIII-1996, J. Gastón leg. y coll., prep. gen. 6120JG. (Fig. 3). LÉRIDA: Camping Bedura parc, La Bordeta, Valle de Arán, 850 m, 1 ♀, 18-VIII-1995, Tx. Revilla leg. y coll., prep. gen. 7566JG.; LÉRIDA: Canejan, San Juan de Toran, Valle de Arán, 1.035 m, 1 ♀, 10-IX-2010, A. Cervelló leg., prep. gen. JY3918.; VIZCAYA: Bilbao, 2 ♂♂, [VI-VII (SEEBOLD,1898)], prep. gen. 61657AV y 1 ♀, [VI (SEEBOLD,1898)], de la forma *decorana* (Hübner, [1819]), prep. gen 61667AV.

Material confirmado y determinado por Martin Corley: PORTUGAL. DOURO LITORAL: Carvalho de Rei, Serra do Marao; TRÁS-OS-MONTES: Moimenta, Prado Novo, 24-IX-2005, (CORLEY *et al.*, 2012); Estevais, 10-VII-2017, M. Corley & J. Nunes leg.; Vimioso, 3 Km, W. del Rio Maças, 30-VIII-2016, M. Corley, A. R. Gonçalves & V. Mata leg.

Citas bibliográficas no confirmadas: ESPAÑA: BARCELONA: La Garriga (CUNI Y MARTORELL, 1882); GERONA: San Privat de Bas (Garrotxa) (YLLA *et al.,* 2011); LA CORUÑA: Aranga, "Zona de Ocio de Ponte Aranga", 3-IX-2010 (registro fotográfico de Belén Amarante en Biodiversidad Virtual);

LÉRIDA: Pallars Sobirá, Mata de Valencia (DANTART *et al*., 2010). PORTUGAL. BEIRA ALTA: Trinta, São Romao (CORLEY *et al*., 2006); MINHO: Podre (CORLEY *et al*., 2014); Lama Grande, 1-IX-2016, M. Corley, A. R. Gonçalves & V. Mata leg.; Franca, Prado Novo, 1-VIII-2011, M. Corley leg.; Dine, 2-IX-2016, M. Corley, A. R. Gonçalves leg.

Sobre estas citas recopiladas en la bibliografía, cabría la posibilidad de que alguna de ellas pudiera adscribirse a *E cinereana*, una vez que se ejecutaran las correspondientes preparaciones de su genitalia, cosa que al día de hoy los autores desconocen.

A la vista de estos resultados, se puede afirmar que *E. nisella* se distribuye ampliamente por el tercio norte peninsular, dentro de la región biogeográfica eurosiberiana (RIVAS-MARTÍNEZ, 1987). Mapa de distribución en la Península Ibérica, figura 1.

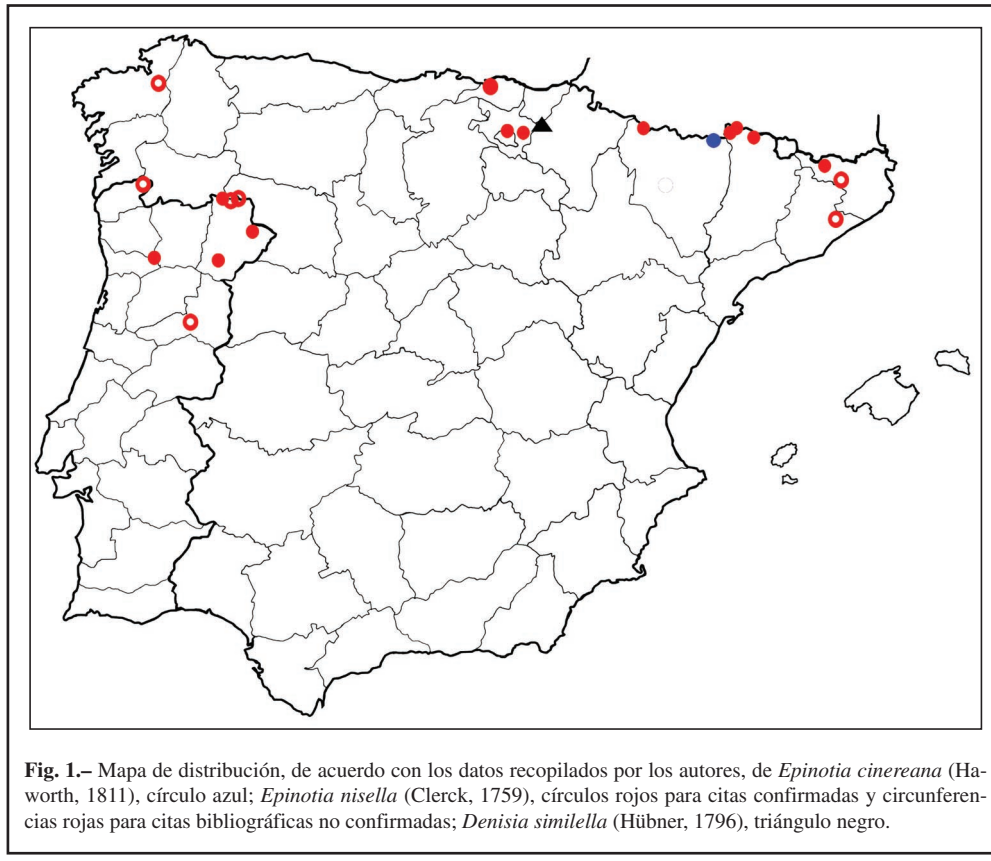

Fig. 1.– Mapa de distribución, de acuerdo con los datos recopilados por los autores, de *Epinotia cinereana* (Haworth, 1811), círculo azul; *Epinotia nisella* (Clerck, 1759), círculos rojos para citas confirmadas y circunferencias rojas para citas bibliográficas no confirmadas; *Denisia similella* (Hübner, 1796), triángulo negro.

Denisia similella (Hübner, 1796) (Fig. 8)
Sammlung eur. Schmett., Tineae: pl. 27, fig. 182
LT: [Europa]

Material examinado: NAVARRA: Puerto de Urbasa, "Las Santas", 900 m, 1 ♂, 16-VI-1985, J. Gastón leg. y coll., prep. gen. 7567JG. (Fig. 9)

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*J. G.
Amboto, 7-4ª-Dcha.
E-48993 Getxo (Vizcaya)
ESPAÑA / *SPAIN*
E-mail: fjgaston@yahoo.es
https://orcid.org/0000-0003-3382-3874

V. R.
Jerónimo Blancas, 8
E-50001 Zaragoza
ESPAÑA / *SPAIN*
E-mail: victor_veintemil@yahoo.es
https://orcid.org/0000-0003-3558-5048

T. R.
Simón Otxandategi, 122
E-48640 Berango (Vizcaya)
ESPAÑA / *SPAIN*
E-mail: txema.revilla@gmail.com
https://orcid.org/0000-0003-2057-0169

*Autor para la correspondencia / *Corresponding author*

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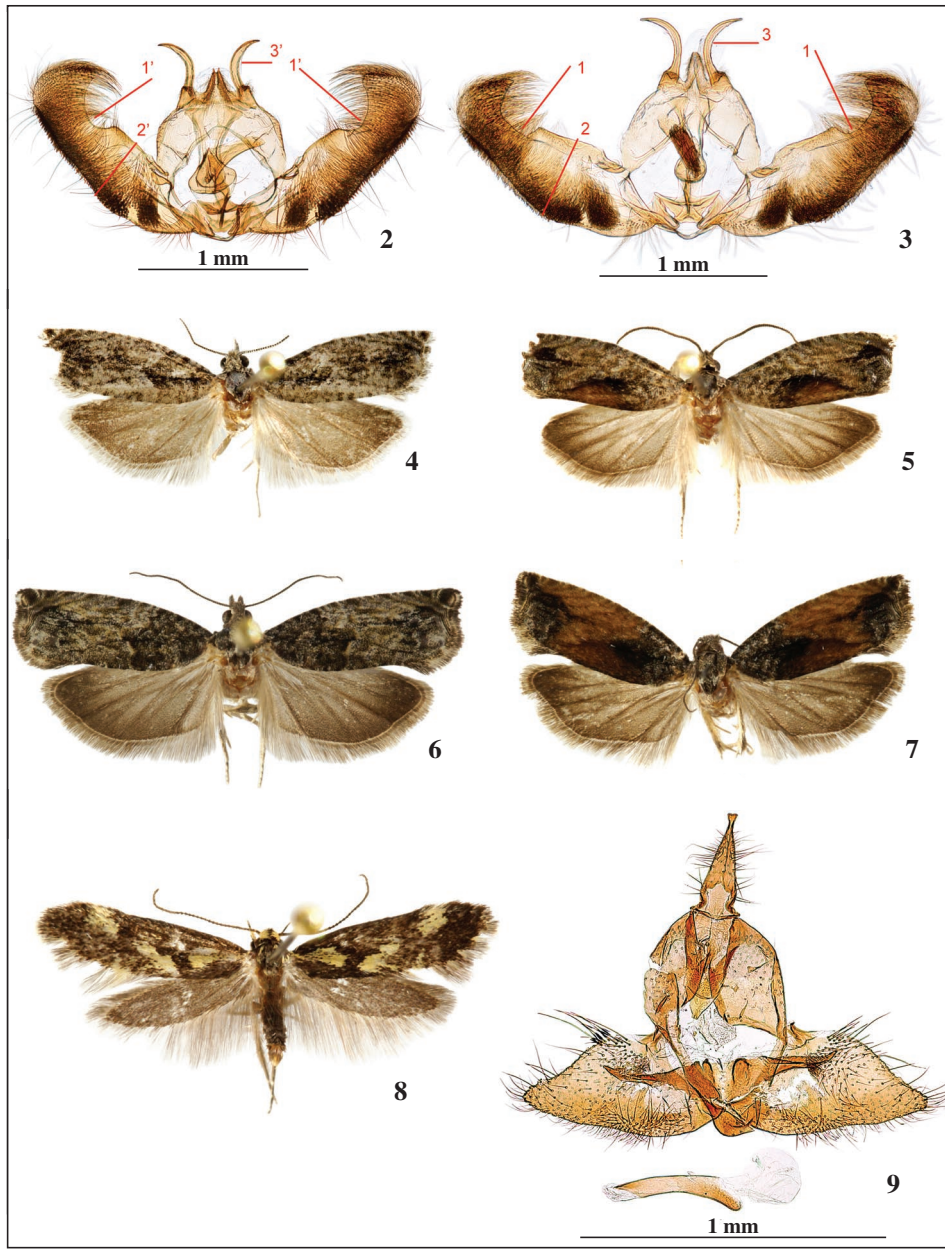

Figs. 2-9.– 2. Andropigio de *Epinotia cinereana* (Haworth, 1811) prep. gen. 6028JG. **3.** Andropigio de *Epinotia nisella* (Clerck, 1759) prep. gen. 6120JG. **4.** ♂ *Epinotia cinereana* (Haworth, 1811). **5.** ♂ *Epinotia nisella* (Clerck, 1759). **6.** ♀ *Epinotia nisella* (Clerck, 1759). **7.** ♀ *Epinotia nisella* (Clerck, 1759). **8.** ♂ *Denisia similella* (Hübner, 1796). **9.** Andropigio de *Denisia similella* (Hübner, 1796) prep. gen. 7567JG.

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Contribution to the knowledge of the genus *Corematura* Butler, 1876 in Peru, with the report of a new synonym (Lepidoptera: Erebidae, Arctiinae, Arctiini, Ctenuchina)

J. Grados, J. J. Ramírez, J. Farfán & J. Cerdeña

Abstract

The genus *Corematura* Butler, 1876 currently comprises two species: *Corematura chrysogastra* (Perty, 1833) and *Corematura postflava* (Guérin-Menéville, 1844), historically confused in one taxon. Descriptions of the adults of both species and their geographic distributions in Peru are given: *C. chrysogastra* occurring in the northern Amazon and *C. postflava* in the southern Amazon. The characters that can differentiate them are mentioned, mainly in the male genitalia. A new combination and synonym are included.
KEY WORDS: Lepidoptera, Erebidae, Arctiinae, Arctiini, Ctenuchina, Amazon, new combination, new synonym, Peru.

Contribución al conocimiento del género *Corematura* Butler, 1876 en Perú, con la relación de una nueva sinonimia (Lepidoptera: Erebidae, Arctiinae, Arctiini, Ctenuchina)

Resumen

El género *Corematura* Butler, 1876 consta en la actualidad de dos especies, *C. chrysogastra* (Petry, 1833) y *C. postflava* Guérin-Menéville, 1844), históricamente confundidas en un solo taxón. Se proporcionan las descripciones de los adultos de ambas especies y sus distribuciones geográficas en Perú: *C. chrysogastra* se encuentra en el norte de la Amazonía y *C. postflava* en el sur de la Amazonía. Se mencionan los caracteres diagnósticos que pueden diferenciarlos, fundamentalmente en la genitalia del macho. Se incluye una nueva combinación y nueva sinonimia.
PALABRAS CLAVE: Lepidoptera, Erebidae, Arctiinae, Arctiini, Ctenuchina, Amazonia, nueva combinación, nueva sinonimia, Perú.

Introduction

The genus *Corematura* Butler, 1876 currently consists of two species: *Corematura chrysogastra* (Perty, 1833) and *Corematura postflava* (Guérin-Menéville, 1844). Both of diurnal habits. However, historically it has taken some difficulties to differentiate them, mainly due to lack of material from different places and the study of the type material. The history of the nominal taxa of the genus has curiosities: they were considered as a single species (HAMPSON, 1898; TRAVASSOS, 1952) for more than 50 years and, described twice by the same author, with material from different places, in two different genera (WALKER, 1856, 1864). Both species can be easily confused. In some cases, it is necessary to dissect the genitalia in order to make a correct identification.

The objective of this work is to provide the differences among the morphological characters of the adults, the male genitalia and the patterns of geographical distribution in Peru for the two species of *Corematura*. Redescription of males of both species is provided. For now, it has not been possible to register females for any of the two species. A new synonym and new combination are reported.

Materials and methods

The specimens for the present study have been collected as part of our studies in Systematics and Biogeography of the Neotropical Arctiinae (JG), through some trips to the Amazon region. The specimens have been collected with insect nets. A good number of specimens were collected during the day, with *Heliotropium sp*. bait.

The information symbology of the types is the following: ascending bar (/) was used to separate information from different labels and, semicolon (;) to separate information from the lines within the same label.

The acronyms used follow HEPPNER & LAMAS (1982). The collections consulted were the following: Deutsches Entomologisches Institut, Müncheberg, Deutschland (DEIM); Museum of Comparative Zoology, Harvard University, Cambridge, United States (MCZ); Muséum National d'Histoire Naturelle, Paris, France (MHNP); Natural History Museum, London, United Kingdom (NHMUK); University Museum, Oxford University, Oxford, United Kingdom (UMO); Zoologisches Museum, Humboldt Universität, Berlin, Deutschland; (ZSBS) Zoologisches Sammlungen des Bayerischen Staates, Munich, Deutschland (ZMHB). The specimens have been deposited in the MUSM, except those indicated in the respective text. The terminology used for venation follows COMSTOCK & NEEDMAN (1898, 1899), MILLER (1970), WOOTTON (1979) and COMMON (1990); genitalia follows SIBATANI *et al.* (1954), KUZNETSOV (1967) and KLOTS (1970). Genitalia of specimens was dissected and prepared using a KOH solution (10%) in a water bath. Photographs of the adults were taken with a Nikon D80 camera and those of the genitalia with a Canon EOS Rebel T6 camera and a Canon MP-E 65 mm macro.

Results

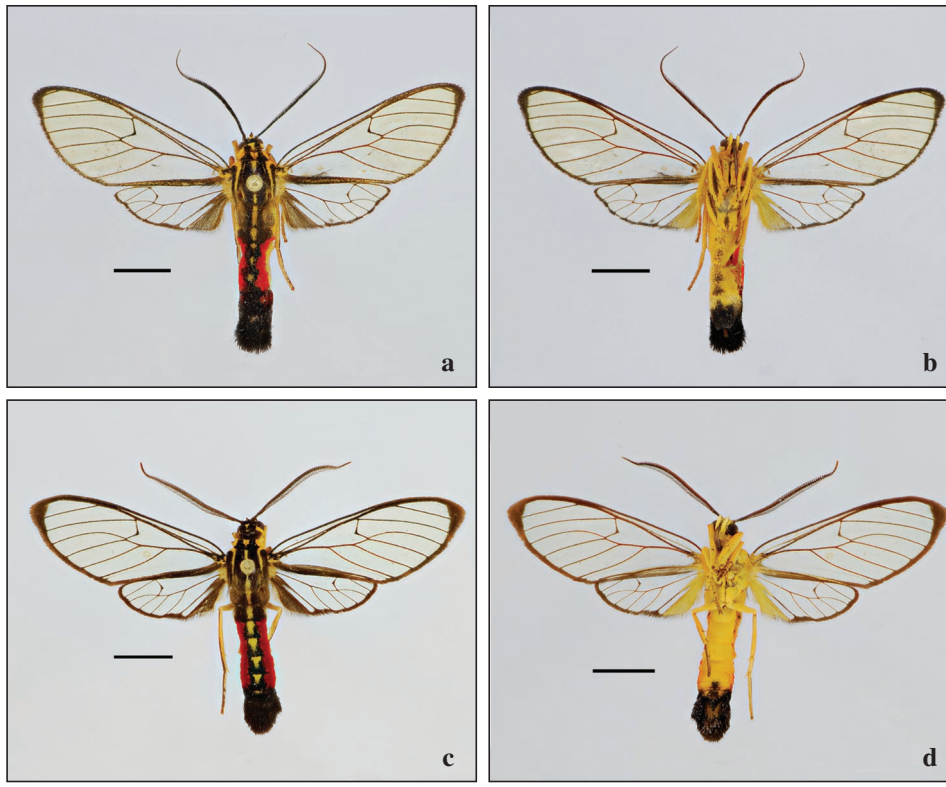
Corematura Butler, 1876

Corematura Butler, 1876. *Journ. Linn. Soc. Lond*., **12**: 403

The genus *Corematura* was proposed by BUTLER (1876), with *Glaucopis chrysogastra* (Perty, 1833) as type species. PERTY (1833) described the species with specimens from "Brasilia aequatorialis" [Brazil], collected during the scientific expedition carried out by Johan Baptist Von Spix (1781-1826) and Friedrich Philipp Von Martius (1794-1868). He had been hired by Maximilian Joseph I, King of Bavaria to install the Academy's Zoology Cabinet. Both arrived to Brazil in 1817 with Archduchess Maria Leopoldina of Austria. The scientists stayed in São Paulo, Minas Gerais, Bahia, Pernambuco, Maranhão and Pará (MOREIRA, 1994; FITTKAU, 2001; BASTOS & ROMERO, 2011; HEIZER, 2018).

Later HAMPSON (1898), considered two species within the genus: *C. chrysogastra* (Perty, 1833) and *C. aliaria* (Druce, 1890), providing a diagnosis of the genus, based on external morphological characters and venation. On the other hand, he considered *C. postflava* as a synonym of C. *chrysogastra*. The works of ZERNY (1912) and DRAUDT (1915) followed HAMPSON's criteria (1898).

TRAVASSOS (1952) provided a redescription of the genus *Corematura*, with some corrections to an earlier work where he considered *C. aliaria* (Travassos, 1938) and distinguishing between *C. chrysogastra* and *C. postflava*. He provided the differences in the characters of the male genitalia and in their geographical distributions. Years later (TRAVASSOS, 1953) created the new genus *Riccia* for the species *C. aliaria* (Druce), arguing that it had morphological characteristics different from *Corematura*.



Figures 1.– Habitus of *Corematura chrysogastra* (Perty, 1833). Perú, Loreto, 8.8 km SE of Bretaña, (**a**) Dorsal view, (**b**) Ventral view, (**c-d**) Habitus of *Corematura postflava* (Guérin-Menéville, 1844). Perú, Madre de Dios, Tambopata reserve, Explore's Inn Lodge, (**c**) Dorsal view, (**d**) Ventral view. Scale bar = 5 mm.

Corematura chrysogastra (Perty, 1833) (Figs 1a, b)

Glaucopis chrysogastra Perty, 1833. *Delect. Anim. Artic.*: 157, pl. 31, fig. 10
LT: Brasilia aequatorialis
Eunomia abdominalis Walker, 1856. *List Lep. Ins. Br. Mus.,* **7**: 1617-1618
LT: Valley of the Amazon
Lagaria abdominalis Walker, 1864. *List Lep. Ins. Br. Mus*, **31** (Supplement): 89
LT: Archidona
Glaucopis tricolor Packard, 1869. *Rep. Peabody Acad.,* **1**: 62, **new synonym**
LT: Napo and Maranon rivers

Material examined: LORETO: Tres Fronteras, Río Putumayo (00º06'S / 75º14'W), 220 m, 1 ♂, XII-2010, J. J. Ramírez leg.; Picuroyacu (03º39'S / 73º15'W), 110 m, 1 ♂, 07-I-2012, J. J. Ramírez leg.; Peña Negra, Carr. Iquitos-Nauta km. 11 (03º52'S / 73º20'W), 130 m, 1 ♂, 07-XI-2008, J. J. Ramírez leg.; Agua Blanca (03º56'S / 73º28'W), 130 m, 1 ♂, 13-I-2015, J. J. Ramírez leg.; San Regis, Albergue La Posada (04º 30'30''S / 73º54'30''W), 130 m, 1 ♂, 21-IX-2002, J. J. Ramírez leg.; Boca del río Samiria (04º40'S / 74º18'W), 120 m, 1 ♂, 16-VIII-1990, H. Lequerica leg.; 1.83 km ENE de Bretaña, Canal de Puinahua (05º14'46''S / 74º19'39''O), 106 m, 1 ♂, 28-29-IV-2013, P. Sánchez leg.; idem except, 1 ♂, 24-25-X-2012; 8.8km SE de Bretaña, Canal de Puinahua (05º20'10.7''S /

74º16’59.44’’W), 90 m, 1 ♂, 31-VII-01-VIII-2014, C. Espinoza leg.; Victoria, Canal de Puinahua (05º40’S / 74º40’W), ca. 130 m, 1 ♂, 21-XI-1969, P. Hocking leg. San Martín: Puente Aguas Verdes (05º41’S / 77º39’W), 950-1150 m, 1 ♂, 25-XI-2002, I. I. Wynne leg.; Rioja (06º04’S / 77º10’W), 800 m, 1 ♂, II-1939, G. Klug leg. Huánuco: La Roca (09º07’S / 76º01’W), 600 m, 2 ♂♂, 18-XII-1966, P. Hocking leg.; Tingo María (09º18’S / 75º59’W), 670 m, 1 ♂, III-1997, M. Büche leg.; idem except, 2 ♂♂, IV-1997; Estación Biológica Panguana (09º38’36’’S / 74º54’55’’W), 230 m, 1 ♂, 08-IX-2014, J. Monzón leg. (Heliotropium bait, day); idem except, 1 ♂, 11-IX-2014; idem except, 12-IX-2014; idem except, 3 ♂♂, VI-2015, R. Van der Merghel leg. Junín: La Merced (11º03’S / 75º20’W), 800 m, 1 ♂, 04-VI-1970, P. Hocking leg.; Río Perene; 2 ♂♂, 06-VI-1996, P. Hocking leg.; 5 km SE de Satipo (11º17’05’’S / 74º40’53’’W), 620 m, 1 ♂, 24-V-1979, G. Lamas leg.; Chanchamayo, 1 ♂, Tamm leg. (ZMHB); Chanchamayo, 1 ♂, Müller leg. (ZMHB).

Diagnosis: Wings transparent, head and thorax black with yellow spots. Tergum black, with red spots on the medial tergites; sternum yellow to the sixth sternite. Vesica short, with cornutus large and very sclerotized in the dorsal part.

Redescription of male (Figs 1a, b): Forewing span: 19 mm-23 mm (n = 28). Head: Black. Frontoclypeus with a yellow edge at the sides and its upper part. A yellow spot at the center of the vertex. Occiput and postgena yellow. Labial palpi short. First segment with yellow scales somewhat elongated. Second and third segments at the front part yellow. Black at the lateral side of the second segment, narrow at the proximal part, widening towards the distal part so that it comprises all the posterior part of the distal end, with a yellow spot on the inside. Antenna bipectinated, black, with some yellow scales at the scape and pedicel. The flagelomeres reach their greatest length at the end of the first half, diminishing in size towards the distal part. Proboscis dark brown. Thorax: Black with some bluish reflection. Patagia black with a narrow yellow spot towards the mesal margin and a larger one towards the anterior part of the ectal margin. The latter covers almost a third of the area. Tegula black, with a yellow spot at its base and a yellow line almost at the center of its entire length. A yellow line on the mesoscutum and mesoscutellum. Posterior part of the metascutum with black and yellow scales. Pleura yellow. Legs yellow. Prothoracic legs: femur with the internal and ectal side with black scales and at the distal part, a black spot; tibia with a black line at the distal end; tarsus with scattered black scales. Epiphysis light brown. Mesothoracic legs: coxa at the ectal part brown; femur with black spots at the ends; tibia with a black line in the proximal part; tarsus with scattered black scales. Metathoracic legs: coxa at the ectal part brown; femur with black spots at the ends; tibia with black scales at both ends; tarsus with black scales forming a continuous line throughout the length. Forewing (dorsal): Transparent with a certain yellowish hue. Veins covered with black scales. Two small yellow spots on the base of the wing. Posterior margin and termen, black. The black area of the termen becomes wider at the apex. Forewing (ventral): Yellow scales at the base. Retinaculum blackish. Veins covered with black scales. Grayish-white scales up to the middle of the extension of the posterior margin. Hindwing (dorsal): Transparent with veins covered with black scales. Costal margin and termen black. The area between A1 and the posterior margin, covered by black scales. Hindwing (ventral): Transparent with veins covered with black scales. Costal margin black, with a few yellow scales. Termen black, from the apex to the A1. The area between A1 and the posterior margin, covered with yellow scales. Abdomen: First tergite black with a bluish hue, with a thin yellow line at the central part. Yellow scales on the lateral parts of the tympanic hood. Second tergite black with a bluish hue, with a red spot towards the latero-posterior part, which becomes narrower towards the dorsal part. Third, fourth and fifth tergites, red, leaving black areas somewhat triangular at the dorsal part and presenting small yellow spots at the central part of these. Sixth to eighth tergites black, presenting black piliform scales. Black spots on the side of the second to fifth tergite. Second to sixth sternites yellow. Seventh and eighth ones black; the last one presents black piliform scales.

Male genitalia (Figs 3a, b, c) (Genitalia # JGA-470) (Z. R. Allpahuayo-Mishana, Agua Blanca, July 13, 2006. J. J. Ramírez): Tegumen short and wide, with sclerotized extensions at the lateral parts. Uncus wide and divided into two branches. Towards the distal part of each branch, a short subdivision. Valvae wide at the base, narrowing towards the distal part, ending in sharp, sclerotized ends heading

towards the internal part. Aedeagus elongated and somewhat sinusoidal, wider towards the distal part. Vesica short with spicules at the basal part and, large and very sclerotized cornutus at the dorsal part.

Variation: The yellow spots at the tergum can occur at the first two tergites, at all three, and in others, up to the sixth or seventh. The black dots at the lateral part of the abdomen, can be only at the two or three first segments. The red lateral spots of the third to fifth tergites can surround the black spots present, but in some specimens, the red spots do not surround the black dots completely. The sixth tergite may present red scales on the dorsolateral part; in some specimens, the scales form a marked red spot, as in the third, fourth and fifth segments.

Distribution (Fig. 4): In the departments of Loreto, San Martín, Huánuco and Junín.

Remarks: WALKER (1856, 1864) described the same species twice, in different genera: *Eunomia abdominalis* Walker 1856 and *Lagaria abdominalis* Walker 1864. The first was described from an unspecified number of specimens belonging to the W. W. Saunders collection (1809-1879) (NATURE, 1879). Part of the Saunders collection was acquired by Frederick William Hope (1797-1862) and is housed at the Oxford Museum (SMITH, 1986). In it exists a specimen which would be the Holotype, from Amazonas (Type Lep: No 159 / *Eunomia abdominalis* Walker / Hope Dept. Oxford; 619; 384; Amaz).

The genus *Lagaria* Walker, 1854 was created as a subgenus within *Glaucopis*, with *Lagaria erythrarchos* as type species. However, *Lagaria* Walker, 1854 is a junior synonym of *Lagaria* Dallas, 1852, for a group of Hemiptera.

The genus *Corematura* Butler, 1876, taking as type species *G. chrysogastra* Perty, 1833. BUTLER (1876) placed the species *Eunomia abdominalis* as synonymous with *G. chrysogastra*, mentioning also that WALKER (1864) described the same species in his Supplement. He mentions that he revised material collected by H.W. Bates from St. Paulo [São Paulo de Olivença] and of Stevens, this last material from *Archidona* (Ecuador). WALKER (1864) had described the species *Lagaria abdominalis* based on material from *Archidona* (Ecuador). In the NHMUK there is only one copy of *Archidona*, which would be the Holotype (*Lagaria abdominalis*; Type; *Archidona* / III & IV 57./58-12;Kb-Dia-Nr./691/B. Kreusel dok.; BMNH (E 1379031). The species *Lagaria abdominalis* is a junior synonym of *Eunomia abdominalis*, recognized as such by TRAVASSOS (1952).

The species *Eunomia abdominalis* was considered by HAMPSON (1898) as synonymous with *G. chrysogastra*. In regards to *Lagaria*, he refers to *Lagaria erythrarchos*, the type species of the genus, considering it as synonymous with the genus *Cosmosoma* Hübner, [1823]. There is not any mention of the species *Lagaria abdonimalis* Walker, 1864. The later works of ZERNY (1912) and DRAUDT (1915-1917) follow only HAMPSON (1898).

PACKARD (1869) described the species *Glaucopis tricolor* with an unspecified number of specimens that were collected on the route from the Napo River to the Marañón River ([Amazon]). The samples were never revised for the species to be valid. In the Museum of Comparative Zoology, Harvard University, Cambridge, there are two specimens (Syntypes) from the Napo and Marañón, collected by James Orton.

1. (Type, 931 / *Glaucopis*, tricolor Pack.; Napo and Maranon rivers; Orton). Without abdomen (Figs 2a, b)

2. (Type, 2,931 / Napo and Maranon, Orton; W. C. Exp.) (Figs 2c, d).

The specimens used by Packard for his description were collected on the first expedition of James Orton (1830-1877), who made three trips to South America, being his priority the exploration of Peruvian territory (NÚÑEZ, 1989, 2013). The first one was carried out with a team of five people, two of them from Williams College. Their first stop was Paita, then they continued to Guayaquil and Quito, reached the Napo River, navigated it downstream to Pebas, on the Marañón, and then to Pará (ORTON, 1870). When ORTON (1870) mentions the Marañón River, he actually refers to the Amazon River. This implies that the *tricolor* specimens were collected between the place where they embarked on the Napo River and Pebas (Amazon River).

HAMPSON (1898) considered *Glaucopis tricolor* as a species within the genus *Argyroeides* Butler, emphasizing that it was not known to him. ZERNY (1912), was not sure of the exact location of

Figures 2.– Syntipes of *Glaucopis tricolor* in MCZ. Type 931, (**a**) Dorsal view, (**b**)Ventral view. Type 2, (**c**) Dorsal view, (**d**) Ventral view.

the species, mentioning in his work, "huius generis?". Quite the opposite happens with DRAUDT (1915), who makes no mention about it, following HAMPSON (1898). For sure, like HAMPSON (1898), neither Zerny nor Draudt did come to revise specimens of *tricolor*.

According to the original description and to the revision of the *tricolor* syntypes, deposited in the Museum of Comparative Zoology, being the morphological characters unmistakable, we consider *Glaucopis tricolor* Packard, 1869 a junior synonym of *Corematura chrysogastra* (Perty, 1833).

Corematura postflava (Guérin-Menéville, 1844) (Figs 1c, d)

Glaucopis postflava Guérin-Menéville, 1844. *Icon. Règne Animal, Ins.*: 501

LT: Bolivia

Material Examined: CUSCO: Segakiato, Urubamba (11º48'S / 72º52'W), 330 m, 1 ♂, 02.X-1997, J. Grados leg. (Diurnal Collection); idem except, 1 ♂, 05-X-1997; idem except, 1 ♂, 12-X-1997; 2 males, Quebrada Bienvenida (12º54'S/71º25'W), 560 m, J. Grados leg. (Heliotropium bait day); Atalaya, Alto río Madre de Dios (12º54'S / 71º22'W), 505 m, 1 ♂, G. Lamas (Diurnal collection); Valle del Urubamba, 2 ♂♂, IX-X, W. Schnuse leg. (identified as *C. chrysogastra* by E. Strand) (DEIM). MADRE DE DIOS: CICRA, Río Los Amigos (12º33'S / 70º06'W), 280 m, 1 ♂, 05-I-2006, A. Asenjo leg. (Heliotropium bait); idem except, 1 ♂, 28-X-2006; ídem except, 1 ♂, 06-XI-2006 (Heliotropium bait day); CICRA, Río Los Amigos (12º33'S / 70º06'W), 280 m, 4 ♂♂, 23-VIII-15-IX-2008, S. Carbonel leg. (Heliotropium bait day); Infierno, Río Tambopata (12º44'S / 69º14'W), 200 m, 1 ♂, J. Grados leg. (Diurnal collection); Albergue Pantiacolla, Río Alto Madre de Dios (12º47'S / 71º13'W), 450 m, 30-IX-03-X-1998, J. Grados leg. (Heliotropium bait day); 30 Km SW Puerto Maldonado, Reserva de Tambopata (12º50'14''S / 69º17'35''W), 300 m, 1 ♂, 16-22-X-1983, C. V. Covell leg.; Albergue Explorer's Inn, Río Tambopata (12º50'14''S / 69º17'35''W), 250 m, 1 ♂, 11-XI-1997, J. Grados leg. (Heliotropium bait day); idem except, 1 ♂, 15-XI-1997; idem except, 5 ♂♂, 18-XI-1997; idem except,

8 ♂♂, 19-XI-1997; idem except, 1 ♂, 20-XI-1997; Boca Río La Torre, Río Tambopata (12º50'11''S / 69º17'43''W), 300 m, 1 ♂, 16-VII-1980, G. Lamas leg.; idem except, 1 ♂, 27-VII-1980; idem except, 1 ♂, 18-X-1983; idem except, 1 ♂, 29-X-1983; Pampas del Heath (12º52'27''S / 68º52'42''W), 200 m, 1 ♂, 05-18-XII-2011. E. Huamaní leg.; Tambopata Research Center, Río Tambopata (13º08'S / 69º36'W), 300 m, 1 ♂, 06-II-1998, J. Grados leg. (Pyrrolizidina bait day); idem except, 1 ♂, 11-V-2003; idem except, 1 ♂, 14-V-2003.

Diagnosis: Transparent wings, head and thorax black, with yellow spots. Tergum black, with red spots on almost all segments. Sternum yellow up to the seventh segment. Valvae with an evaginated structure in the medial part, directed towards the internal part. Vesica directed towards the dorsal part, with a cornutu sclerotized in the distal part and, cornuti in the dorsal part.

Redescription of male (Figs 1c, d): Forewing span: 19 mm-22 mm (n = 41). Head: Black, with a yellow edge around the frontoclypeus. A yellow spot in the center of the vertex. The occiput yellow. Labial palpi short, the first segment with somewhat elongated scales. The second and third ones yellow at the front, black at the lateral sides of the second segment, narrow at the proximal part, widening towards the distal part, covering the entire distal end, leaving a yellow spot at the inside. Antenna black bipectinated, with some yellow scales at the scape and pedicel. The flagelomeres reach their greatest length towards the end of the first half, decreasing in size towards the distal part. Proboscis dark brown. Thorax: Black with some bluish reflection. Patagia black with a narrow yellow spot at the mesal margin and a larger one towards the ectal margin. The latter covering almost a third of the area. Tegula black, with a yellow spot at its base and a yellow line almost at the middle of its entire length. A yellow line on the mesoscutum and mesoscutellum. Back of the metascutum with black and yellow scales. Pleura yellow. Legs yellow. Prothoracic legs: coxa with its mesal side black; femur with its internal part black and on its ectal side black scales scattered throughout its length; tibia with black scales on its proximal part; distal tarsi with black scales. Epiphysis light brown. Mesothoracic legs: femur with a black spot at the distal end; tibia with a black line at the proximal part; tarsi with black scales, notorious at the distal ones. Metathoracic legs: femur with a small black spot at the distal end and black scales scattered at its ectal side; tibia with black scales scattered at its ectal side; tarsus with black scales forming a continuous line throughout its whole length. Forewing (dorsal): Transparent. Veins covered with black scales. Two yellow spots at the base of the wing. Costal margin and termen black. The black area that rises through the termen slightly wider towards the apex. Forewing (ventral): Yellow scales at the base. Retinaculum blackish. Veins covered by black scales. Posterior margin with grayish-white scales up to the middle of its extension. Hindwing (dorsal): Transparent. Veins covered with black scales. Costal margin and termen black. Area between A1 and the posterior margin, covered by black scales. Hindwing (ventral): Transparent. Veins covered with black scales. Costal margin black, with a few yellow scales. Termen black, from the apex to A1. Area between A1 and the internal margin, covered with yellow scales. Abdomen: First abdominal tergite black with a bluish hue and a thinline of yellow scales in the central part and yellow scales on the lateral part of the tympanic hood. Second tergite black with a bluish hue and a red spot towards the latero-posterior part, which becomes narrow towards the dorsal part. An antero-lateral yellow spot and another small one at the anterior part. Third to the sixth tergites red, leaving black areas at the dorsal part, somewhat wider at the posterior part. Small yellow spots on the front of the black spots, somewhat triangular and wider at the front. Seventh tergite black with a small yellow spot on the antero-dorsal part. Eighth tergite black with black piliform scales. Second to seventh sternite, yellow. Towards the lateral parts of the seventh, the yellow spots become narrower towards the caudal part. Eighth segment black with yellow scales on the anterior margin.

Male genitalia (Figs 3d, e, f) (Genitalia # JGA–467) (Reserva de Tambopata, Explorer's Inn, 18-XI-1997, J. Grados leg): Tegumen, wide and short, with sclerotized extensions at the lateral parts. Uncus wide and divided in two branches towards its distal end. Valvae elongated, with an evaginated structure at the medial part, directed towards the internal part. Distal end of the valvae, sharpened. Aedeagus elongated and sinusoidal. Vesica directed towards the dorsal part, with a sclerotized cornutu at the distal part and cornuti at the dorsal part.

Variation: In some specimens, the postero-lateral red spot of the second segment, can cover almost the entire anterior-posterior segment.

Distribution (Fig. 4): According to Guérin-Menéville's description (1844), the species occurs in Bolivia. In Peru, it occurs in the Amazonian forests of the departments of Cusco and Madre de Dios.

Remarks: HAMPSON (1898) considered *G. postflava* as a synonym of *G. chrysogastra*. The treatment for the species was similar in the works of ZERNY (1912) and DRAUDT (1915). In a work on the genus, TRAVASSOS (1938) considered *G. postflava* also as a synonym of *G. chrysogastra*, based on specimens from "Alto Amazonas, São Paulo de Olivença and Rio Preto". Years later, TRAVASSOS (1952) made a redescription of the genus and was able to distinguish two very similar species, with similar morphological characters and chromatic patterns, but different morphologies in the genitalia and geographical distribution. The second species, *G. postflava*, he related to the description provided by GUÉRIN-MENÉVILLE (1844), with material from Bolivia.

Discussion

The two species of *Corematura* have been frequently confused because they have an external morphology and very similar color pattern. Both species occur in Peru, with diurnal habits and having as characteristic feature that the most important differences are at the level of internal morphology (genitalia of males) and geographical distribution (TRAVASSOS, 1938). According to our results, the species have an allopatric distribution. *C. chrysogastra* occurs in the northern Amazon, while *C. postflava* occurs in the southern Amazon.

However, it is necessary to make more evaluations in the south of the departments of Junín and Ucayali, and north of Cusco, to know if there is a geographical barrier between both species or perhaps there are areas where it is possible to find both species. Only more fieldwork can give us more evidence for this and other species.

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J. G.
Departamento de Entomología
Museo de Historia Natural
Universidad Nacional Mayor de San Marcos
Apartado 14-0434
Lima 14
PERÚ / *PERU*
E-mail: gradosjuan@hotmail.com
https://orcid.org/0000-0002-2277-3616

J. J. R.
Universidad Nacional de la Amazonía Peruana
Calle Sargento Lores, 385
Iquitos
PERÚ / *PERU*
E-mail: macrodontia@hotmail.com
https://orcid.org/0000-0001-5760-5172

*J. F.
Museo de Historia Natural
Universidad Nacional de San Agustín de Arequipa
Avenida Alcides Carrion, s/n
Arequipa
PERÚ / *PERU*
E-mail: jjackie4u@gmail.com
https://orcid.org/0000-0001-5913-0756

J. C.
Programa de Pós-graduação em Biologia Animal
Departamento de Zoologia
Instituto de Biociências
Universidade Federal do Rio Grande do Sul
Avenida Bento Gonçalves, 9500
91501-970 Porto Alegre, RS
BRASIL / *BRAZIL*
E-mail: cerdenajoseal@yahoo.es
https://orcid.org/0000-0003-3930-6480

*Autor para la correspondencia / *Corresponding author*

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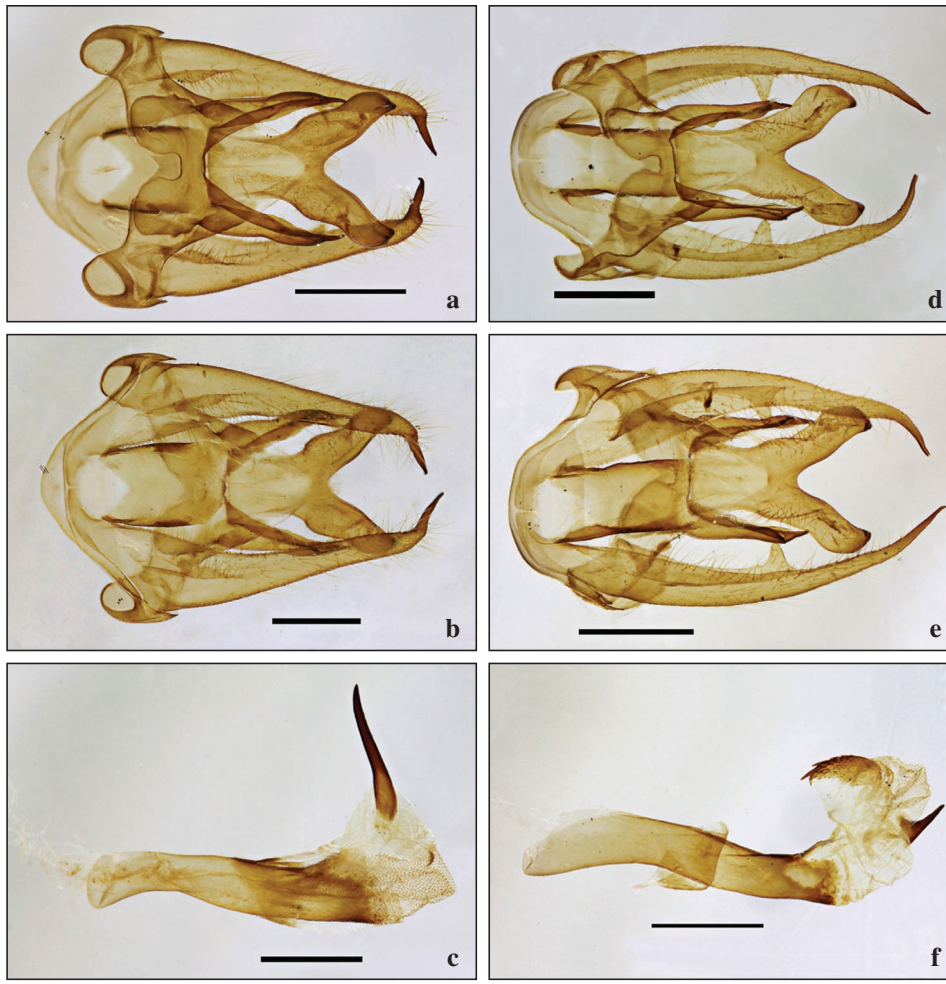

Figures 3.– *Corematura chrysogastra*. Male genitalia (Genitalia JGA # 470, MUSM), (**a**) Dorsal view, (**b**) Ventral view, (**c**) Aedeagus, (**d-f**) *Corematura postflava*. Male genitalia (Genitalia JGA # 467, MUSM), (**d**) Dorsal view, (**e**) Ventral view, (**f**) Aedeagus. Scale bar = 1 mm.

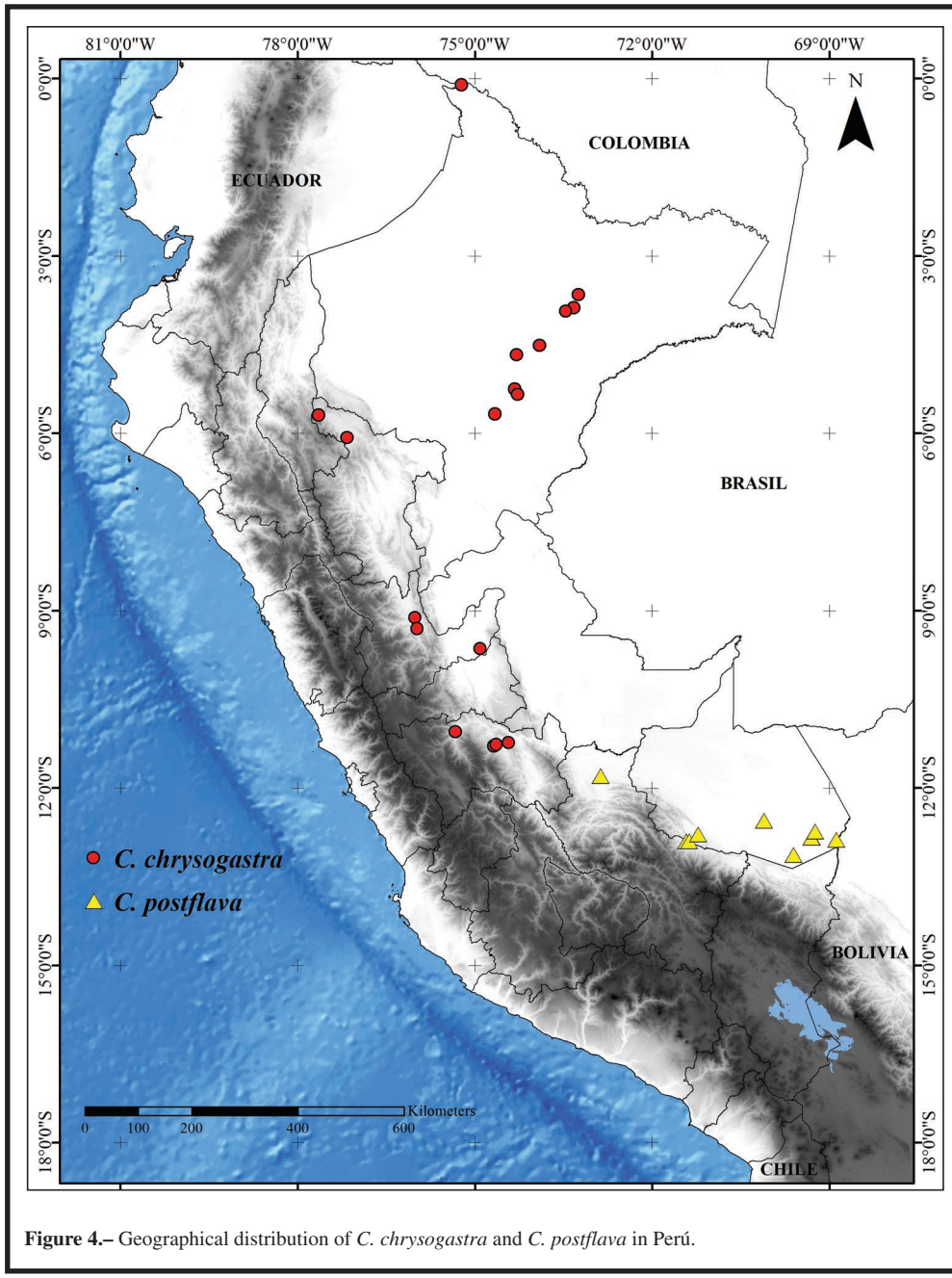

Figure 4.– Geographical distribution of *C. chrysogastra* and *C. postflava* in Perú.

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Primeiro registo de *Thera cupressata* (Geyer, [1831]) para as ilhas dos Açores (Portugal) (Lepidoptera: Geometridae)

V. Vieira

Resumo

A traça-do-cipreste *Thera cupressata* (Geyer, [1831]) é citada pela primeira vez para a ilha de São Miguel, arquipélago dos Açores (Portugal). É uma borboleta originária da Europa. Também, são apresentadas breves notas sobre a distribuição e ecologia desta espécie.
PALAVRAS CHAVE: Lepidoptera, Geometridae, Larentiinae, *Thera cupressata*, ilhas, Açores, Portugal.

First record of *Thera cupressata* (Geyer, [1831]) for the Azores islands (Portugal) (Lepidoptera: Geometridae)

Abstract

The Cypress Carpet *Thera cupressata* (Geyer, [1831]) is recorded for the first time in São Miguel island in the Azores archipelago (Portugal). It is an geometrid moth originated from Europe. Brief notes on worldwide distribution and ecology of this species are included.
KEY WORDS: Lepidoptera, Geometridae, Larentiinae, *Thera cupressata*, islands, Azores, Portugal.

Primer registro de *Thera cupressata* (Geyer, [1831]) para las islas Azores (Portugal) (Lepidoptera: Geometridae)

Resumen

La polilla del ciprés *Thera cupressata* (Geyer, [1831]) se cita por primera vez para la isla de São Miguel, archipiélago de las Azores (Portugal). Es una especie originaria de Europa. Además, se presentan breves notas acerca de la distribución global y ecología de la especie.
PALABRAS CLAVE: Lepidoptera, Geometridae, Larentiinae, *Thera cupressata*, islas, Azores, Portugal.

Introdução

Thera cupressata (Geyer, [1831]) é conhecida vulgarmente por Cypress Carpet (Inglês), Zypressenspanner (Alemão), Corythée du Cyprès (Francês) e Traça-do-cipreste (Português; nome proposto pelo autor). Pertence à família Geometridae Stephens, 1829 e subfamília Larentiinae Duponchel, [1845], seguindo o critério de VIVES MORENO (2014). Atualmente, tem como sinonímia o género *Corythea* Duponchel, [1845] e, ao nível específico, *Geometra cupressata* Geyer, [1831], *Larentia cupressata* (Geyer, [1831]), *Thera cupressaria* Boisduval, 1840 e *Thera grandiscana* Foster & Wohlfahrt, 1981 (VIVES MORENO, 2014; FAUNA EUROPAEA, 2019; LEPIFORUM, 2019).

Encontra-se presente nas regiões do oeste, sul e centro da Europa, desde a Península Ibérica até à costa

oeste da Península Balcânica, incluindo a Grã-Bretanha, Ilhas do Canal Inglesas, França, Alemanha, Suíça, Eslovénia, Croácia, Grécia, Itália, Malta, Sardenha, Sicília, Córsega, Baleares, Espanha continental, Gibraltar, e Portugal continental (LERAUT, 2009; HAUSMANN & VIIDALEPP, 2012; VIVES MORENO, 2014; FAUNA EUROPAEA, 2019). Fora da Europa, está citada para a Tunísia e é considerada duvidosa para o noroeste da Turquia (HAUSMANN & VIIDALEPP, 2012).

Os adultos de *T. cupressata* medem de envergadura entre 22-27 mm (machos) e 28-32 mm (fêmeas), têm uma coloração geral castanho-escura e distinguem-se das outras espécies do género *Thera* por apresentarem nas asas anteriores uma série de faixas escuras, curtas e direcionadas no sentido do ápice das asas, e a fáscia mediana relativamente indistinta. Fotos do adulto e das genitálias masculina e feminina estão disponíveis online (cf. LEWIS, 2019; FARREL, 2019; LEPIFORUM, 2019).

Tem duas gerações por ano (espécie bivoltina), ocorrendo a primeira geração durante os meses de maio-junho e a segunda em agosto-setembro (SKINNER & WILSON, 2009). Também, pode voar ligeiramente mais tarde, durante junho-julho e a segunda geração em outubro-novembro (LEWIS, 2019), prolongando-se até janeiro no sul da Itália (HAUSMANN & VIIDALEPP, 2012). A larva desenvolve-se durante os meses de novembro-maio e em fins de julho-setembro, hibernando nos primeiros estados de desenvolvimento (SKINNER & WILSON, 2009).

A traça-do-cipreste possui hábitos noturnos, sendo atraída pela luz da iluminação pública e pode ser capturada em armadilhas luminosas. Durante o dia tem sido encontrada em repouso nos muros e na folhagem das plantas hospedeiras. As larvas alimentam-se de várias espécies da família Cupressaceae, incluindo o cipreste-da-Califórnia *Cupressus macrocarpa* Hartw., o cipreste-de-Leyland *Cupressus* × *leylandii* A. B. Jacks. & Dallim., o cipreste-mediterrânico *Cupressus sempervirens* L. e o junípero-europeu *Juniperus sabina* L. e suas inúmeras cultivares, arbusto ornamental muito utilizado em jardins e parques (LERAUT, 2009; HAUSMANN & VIIDALEPP, 2012, e literatura citada). Também, terá sido introduzida na Suécia em abetos do género *Abies* Mill., pertencente à família Pinaceae (cf. LOPEZ-VAAMONDE *et al*., 2010).

Resultados e Discussão

Na ilha de São Miguel, arquipélago dos Açores, o autor observou três espécimes da traça-do-cedro *Thera cupressata* (Geyer, [1831]), encontrando-se em repouso junto à luz da iluminação pública de um edifício da Universidade dos Açores, em Ponta Delgada (coordenadas UTM: 37.746721; -25.662041), a saber: o primeiro espécime no dia 07.XII.2017, pelas 13:57 horas, e os outros dois no dia 22-X-2019, pelas 09:00 horas. Os espécimes foram fotografados e deixados em liberdade, à exceção de uma fêmea que foi capturada. Esta media 32,2 mm de envergadura e, na ausência de alimento, morreu no dia 25-X-2019 (fotos da Figs. 1-2).

Figs. 1-2.– Traça-do-cipreste *Thera cupressata* (Geyer, [1831]), Ponta Delgada, ilha de São Miguel, Açores. Adulto capturado em 22-X-2019; **1.** Vista em posição de repouso; **2.** Vista em posição ventral.

Trata-se do primeiro registo de *T. cupressata* para a ilha de São Miguel (Açores), bem como para os restantes arquipélagos da Macaronésia, segundo a literatura consultada (e.g., BÁEZ & MARTÍN, 2004; AGUIAR & KARSHOLT, 2008; LOPEZ-VAAMONDE *et al*., 2010; VIEIRA & KARSHOLT, 2010; HAUSMANN & VIIDALEPP, 2012; VIVES MORENO, 2014; REGO *et al*., 2015; BORGES *et al*., 2018; PÉREZ SANTA-RITA *et al*., 2018; FAUNA EUROPAEA, 2019).

A origem dos três espécimes de *T. cupressata* é desconhecida, assim como se já existe uma população fundadora na ilha de São Miguel (o primeiro adulto fora observado em 2017). Os pioneiros são certamente originários do sul da Europa, onde a espécie se reproduz e demonstra uma boa capacidade de dispersão, podendo a sua propagação ser também potenciada pelo comércio de plantas ornamentais.

A dispersão dos indivíduos pode ser feita voando ativamente, ou sendo transportados passivamente por ventos ou correntes de ar sazonais favoráveis, possivelmente ao lado de outros animais, barcos e/ou aviões. Na literatura existem alguns exemplos de outras espécies de Lepidoptera que certamente alcançaram as ilhas Açorianas por migração, transportadas por correntes de vento favoráveis, nomeadamente, as espécies noturnas *Pseudaletia unipuncta* (Haworth, 1809) (VIEIRA *et al*., 2003), *Ophiusa tirhaca* (Cramer, 1777) (VIEIRA, 2001), *Utetheisa pulchella* (Linnaeus, 1758) (VIEIRA, 2012) e *Cydalima perspectalis* (Walker, 1859) (VIEIRA, 2019) e as espécies diurnas *Danaus plexippus* (Linnaeus, 1758) (NEVES *et al*., 2001), *Hypolimnas misippus* (Linnaeus, 1764) (TENNENT & RUSSEL, 2015) e *Vanessa virginiensis* (Drury, 1773) (VIEIRA, 2017). A libélula migrante *Pantala flavescens* (Fabricius, 1798) (Odonata, Libellulidae) também foi registada pela primeira vez na ilha de São Miguel em 02-XI-2014 (VIEIRA & CORDERO-RIVERA, 2015).

Neste contexto, sob condições de temperatura e ventos favoráveis observados nesta estação do ano (e. g., nos dias 21 e 22, a temperatura média era de 22º C e o vento de nordeste fraco a bonançoso de 05/20 km/h, rodando para sueste e sul), é expectável o aparecimento de adultos errantes de *T. cupressata* nas ilhas açorianas, vindo provavelmente da Europa continental, uma vez que eles possuem uma grande capacidade de dispersão.

Por outro lado, não pode ser excluída a hipótese do transporte passivo em navios de cruzeiro transatlânticos que nesta época do ano fazem escala no porto de Ponta Delgada. De facto, dos 10 navios previstos para o mês de outubro, três atracaram nos dias 17, 21 e 22, sendo oriundos do Mediterrâneo e tendo escalas em portos da Itália (Civitavecchia ou Livorno), Sul de França (Cannes), Espanha (Barcelona, Cádis ou Málaga), Portugal continental (Lisboa) e Açores (Horta, Praia da Vitória e/ou Ponta Delgada).

Finalmente, o estabelecimento de uma população residente nas ilhas açorianas também é provável como consequência da importação acidental de estados do desenvolvimento pré-imaginais (ovo, larva ou pupa) associados às suas plantas hospedeiras das famílias Cupressaceae e Pinaceae, que são objeto de comercialização relativamente frequente entre o continente português e as ilhas.

Nas ilhas dos Açores existem várias plantas que podem ser potenciais hospedeiras de *T. cupressata*, e que compõem a flora dos parques e jardins, arranjos paisagísticos da estrutura rodoviária, plantações florestais e floresta Laurissilva, nomeadamente: família Cupressaceae - cedro-do-mato endémico *Juniperus brevifolia* (Seub.) Antoine, criptoméria *Cryptomeria japonica* (Thunb. Ex L. F.) D. Don, cipreste-do-Arizona *Cupressus arizonica* Greene, cipreste-do-Buçaco *C. lusitanica* Mill., cipreste-da-Califórnia *C. macrocarpa***,** cipreste-mediterrânico *C. sempervirens* L., cedro-do-cheiro *Chamaecyparis lawsoniana* (A. Murray) Parl. e cedro-dourado *Ch. obtusa* (Siebold & Zucc.) Endl.; família Pinaceae - cedro-do-Atlas *Cedrus atlantica* (Endl.) G. Manetii., cedro-do-Himalaia *C. deodara* (Roxb.) G. Don, o pinheiro-bravo *Pinus pinaster* Aiton e o pinheiro-manso *P. pinea* L. (e. g., ALBERGARIA, 2005; SILVA *et al*., 2010).

Dada a importância económica das plantas ornamentais e o valor ecológico e conservacionista dos endemismos presentes nas ilhas dos Açores, conviria fazer uma prospeção local, recorrendo quer à observação direta de ovos, larvas e pupas que possam estar eventualmente associados às plantas hospedeiras, quer à amostragem indireta por via do uso de armadilhas luminosas, a instalar em parques, jardins e zonas ricas em cedro-do-mato na floresta Laurissilva.

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Expresso o meu agradecimento ao Mr. Ole Karsholt (Dinamarca) que confirmou a identificação da espécie, bem como ao Dr. Antonio Vives (Espanha) pela revisão da primeira versão do manuscrito.

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V. V.
cE3c/GBA-Centre for Ecology
Evolution and Environmental Changes
Azorean Biodiversity Group
Universidade dos Açores
Departamento de Biologia/FCT
Rua da Mãe de Deus, 13A
PT-9500-321 Ponta Delgada (Açores)
PORTUGAL / *PORTUGAL*
E-mail: virgilio.ff.vieira@uac.pt
https://orcid.org/0000-0002-3638-1795

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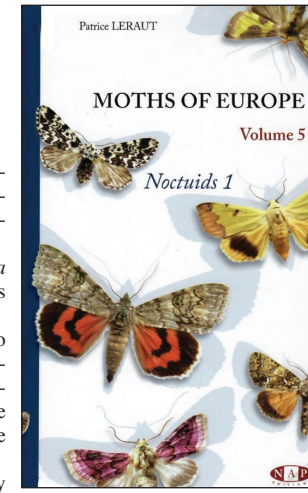

Tenemos en nuestras manos el quinto volumen de la serie Moths of Europe, que trata de la primera parte de los Erebidae, con diez subfamilias y dieciocho tribus, mientras que en los Noctuidae tenemos dieciocho subfamilias y dieciséis tribus.

En este volumen se describe una nueva subespecie *Heliothis veriplaca ifranensis* Leraut, 2019, estableciéndose tres nuevas sinonimias y once nuevas combinaciones.

Después de una introducción y generalidades, se pasa al grueso del trabajo donde se estudian las especies consideradas en el libro. A continuación nos encontramos con una parte muy ilustrativa, donde se indican los lugares más característicos y las especies más singulares que allí se pueden encontrar, como se pueden capturar, procedimientos de colección, preparación e identificación de los especímenes, sobre la nomenclatura y la conservación de los Lepidoptera.

De cada especie considerada, se dan los datos morfológicos del macho y de la hembra, las posibles variaciones, se comentan las especies próximas, la biología, datos de vuelo y unos comentarios adicionales, todo ello acompañado en algunas ocasiones de fotografías de la genitalia del macho y de la hembra, para facilitar su identificación y de un mapa marcando en negro, la zona de distribución. Todos los adultos están fotografiados a lo largo de 120 planchas a todo color, que muestran todas las especies consideradas que se encuentran en Europa y en el norte de África, incluidas las de un elevado número de material tipo y también cuando ha sido necesario, se han ilustrado especies procedentes del Próximo Oriente y de Asia.

También nos encontramos con una Addenda sobre los Erebidae: Arctiinae con algunos ejemplares fotografiados más destacados y acaba la obra con dieciocho planchas a todo color de la genitalia de machos y hembras así como de un índice que abarca los dos volúmenes.

No podemos terminar estas líneas, sin felicitar al autor, nuestro estimado colega Patrice Leraut (conocido por sus aportaciones lepidopterológicas principalmente en el campo de los Pyraloidea) por un trabajo bien ejecutado y fruto del cual, se han clarificado y sacado a la luz muchos problemas sistemáticos y taxonómicos. Igualmente felicitamos a la Editorial, por un trabajo bien realizado y la acertada idea de presentar el libro en dos idiomas en inglés y en francés, lo que sin duda le dará una mayor difusión, por lo que lo recomendamos abiertamente a todos los interesados en el mundo de los Noctuoidea, que no debería de faltar en ninguna biblioteca especializada o general.

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A. Vives Moreno
E-mail: avives1954@outlook.es
https://orcid.org/0000-0003-3772-2747

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Estados inmaturos de Lepidoptera (LVIII). *Morophaga morellus* (Duponchel, 1838) en Huelva, España (Lepidoptera: Tineidae, Scardiinae)

M. Huertas-Dionisio

Resumen

Se describen e ilustran los estados inmaturos de *Morophaga morellus* (Duponchel, 1838), que vuela en Huelva (España), así como una muestra de las alas, su ciclo biológico y la distribución.
PALABRAS CLAVE: Lepidoptera, Tineidae, Scardiinae, *Morophaga morellus,* estados inmaturos, Huelva, España.

Immature stages of Lepidoptera (LVIII). *Morophaga morellus* (Duponchel, 1838) in Huelva, Spain (Lepidoptera: Tineidae, Scardiinae)

Abstract

The Immature stages of *Morophaga morellus* (Duponchel, 1838) from Huelva, (Spain), are described and illustrated, as well as a sample of wing patterns, their biological cycle and distribution.
KEY WORDS: Lepidoptera, Tineidae, Scardiinae, *Morophaga morellus,* immature stages, Huelva, Spain.

Introducción

Morophaga morellus (Duponchel, 1838) fue descubierta en el sur de Francia por M. Barthélemy de orugas encontradas en unos engrosamientos existentes en el tronco de *Morus alba* L., siendo descrita por Duponchel, que le dio el nombre de "morellus" aludiendo al árbol en donde fueron encontradas las orugas. DUMONT (1930), describe los adultos y figura la imagen de las alas anteriores del macho de envergadura de 21-25 mm y la de la hembra de 25-30 mm y la forma *fungicolella* Dumont, 1930. Los imagos de los ejemplares obtenidos en Huelva tienen las alas anteriores de color gris a pardo claro con manchas negras dispersas y de diferentes tamaños, las alas posteriores gris claro, un poco más oscuro en las hembras, aquí mostramos al macho de 21 mm (fig. 1) y a la hembra de 23 mm (fig. 2). La genitalia está representada en PETERSEN (1957) y GAEDIKE (2015).

Material y métodos

El día 14 de enero de 2007 en Fuente La Corcha (Beas-Huelva, UTM 29SPB95), se recoge un gran hongo de soporte (*Pellinus torulosus* Bourd. & Galz.) al pie de un alcornoque (*Quercus suber* L.), encontrando una oruga en la zona deteriorada pegada al tronco, hizo el capullo y salió una hembra el 2 de junio de 2007. El 15 de junio de 2019 en el mismo lugar buscamos este hongo, encontrando uno muy deteriorado con orugas, tuvimos que romperlo para sacar las orugas y los capullos con crisálidas, estos se introdujeron en botes de cristal para observar su evolución y poder dibujarlas. Se pudo obtener un macho el 17 de julio de 2019.

Estados inmaturos

DUMONT (1930), describe de la forma *fungicolella* Dumont, 1930, de Túnez, el huevo, la oruga, la crisálida (figurándola de forma esquemática), su ciclo biológico y alimentación. Aquí describiremos los estados inmaturos de los ejemplares obtenidos en Huelva. El huevo (fig. 22) es elíptico, de 0,90 x 0,25-030 mm, corion liso, blanco translúcido brillante. La oruga, en su último estadio (figs. 3-4), mide de 15 a 16 mm de longitud, de color blanco con tonalidad amarillenta, con setas cortas rubias (fig. 5). Los espiráculos blancos con el peritrema pardo, mayores los del protórax y octavo urito (fig. 13). Patas torácicas pardo de muy claro a translúcido. Patas abdominales del color del cuerpo, las ventrales coronadas (cierran el círculo), con un total de 17 a 23 uñas castañas (fig. 11); las anales con 10 uñas (fig. 12). La cápsula cefálica (figs. 6-7) mide 2 mm de ancha, de amarillo claro a translúcido, con manchas castañas en la zona inferior y laterales de los epicráneos. Mandíbula con 6 puntas o dientes, uno de ellos separado del resto. En las antenas, la antacoria y el artejo basal translúcido, y los artejos medio y terminal castaño. Escudo protorácico (fig. 9) translúcido, la zona posterior pardo muy claro. El escudo anal (en la figura 10, con el 9º urito) es subrectangular, de color blanco a translúcido.

La crisálida macho (figs. 14-16) mide 9,50 mm de longitud y la hembra con los mismos detalles que el macho, de 10 a 11 mm, pardo claro brillante, con doble hilera de dientes castaños en el dorso de los uritos 3 a 7 y sólo una hilera en 8 y 9; el final de las antenas no llega al extremo de las alas, sobrepasando a éstas, las patas metatorácicas. La zona ventral del último urito, tiene dos lóbulos cónicos a cada lado (figs. 17-18), el pequeño muy cerca del mayor y emergiendo de su lateral. Pasa a crisálida en un capullo alargado de 15 a 20 mm de longitud, construido muy cerca de la superficie exterior del hongo (fig. 20), de color pardo claro, es muy resistente, con doble capa de seda y difícil de extraer, en su extremo tiene una tapadera circular (opérculo), con un borde grueso, en uno de sus lados tiene fabricada una bisagra para que se pueda abrir fácilmente por el adulto (fig. 21).

Quetotaxia

La quetotaxia de *Morophaga choragella* ([Denis & Schiffermüller], 1775) así como en la de *Scardia boleti* (Fabricius, 1794) (HINTON (1956), indica que en el protórax sólo están las setas L1 y L2, faltando la L3; en los segmentos A1 a A8, las setas D1 están más separadas que las D2 y la ausencia de la seta L3 en el noveno segmento abdominal. Estas características han sido confirmadas en otros géneros de esta subfamilia (ROBINSON, 1986; ROBINSON & NIELSEN, 1993; GAEDIKE, 2015). En la quetotaxia realizada a *M. morellus* (fig. 13) coinciden los detalles expuestos por HINTON (1956), sobre todo la ausencia de la seta L3 en el protórax.

Ciclo biológico y distribución

Según GAEDIKE (2015), los adultos vuelan de mayo a octubre. De los datos obtenidos en Huelva, se ha comprobado que vuela en junio y julio. Hay una cita de Huelva el 12-X-1958, W. Buddenbrock leg. (PETERSEN, 1960), esta cita podría ser de la Laguna de las Madres (Palos de la Frontera, UTM 29SPB81 y PB91), comentario realizado por D. Pedro Weickert que tuvo contacto con él (HUERTAS-DIONISIO, 2007). DUMONT (1930) señala eclosiones en julio, agosto, septiembre, octubre y noviembre, por lo que se confirma este periodo de vuelo. Por lo lento de su desarrollo, puede que tenga generaciones solapadas dentro de este periodo de tiempo y haga una diapausa a final de año. Los diversos hongos de los que se alimenta están señalados por ROBINSON (1986) y GAEDIKE (2015). Sólo es conocida de los países de Europa en la región mediterránea, también del norte de África, Turquía, región del Caucaso y Afganistán (GAEDIKE, 2015).

Discusión

Aunque está extendida por el Mediterráneo, en la Península Ibérica ha sido citada pocas veces,

una en Huelva y otra en Málaga (PETERSEN, 1960) y señalada de la Península Ibérica por VIVES MORENO (1986 y 2014). Debe estar más extendida, siendo una forma de encontrarla, buscar entre los hongos de soporte y esperar a que salgan los adultos, ya que extraer las orugas y las crisálidas del hongo, suele ser bastante complicado debido a la dureza de este.

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M. H. D.
Apartado de correos, 47
E-21080 Huelva
ESPAÑA / *SPAIN*
E-mail: huertasdionisio@gmail.com
https://orcid.org/0000-0002-6758-1984

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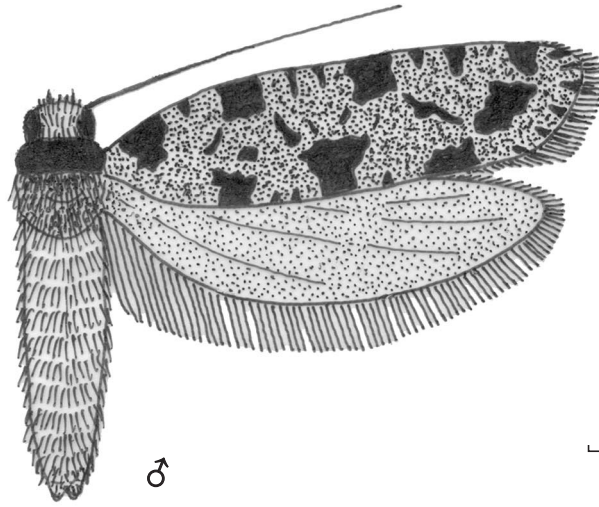
Morophaga morellus (Duponchel, 1838)



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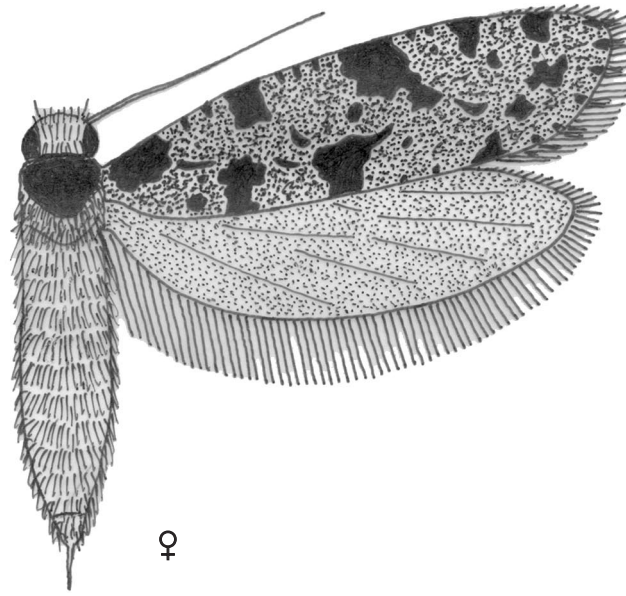

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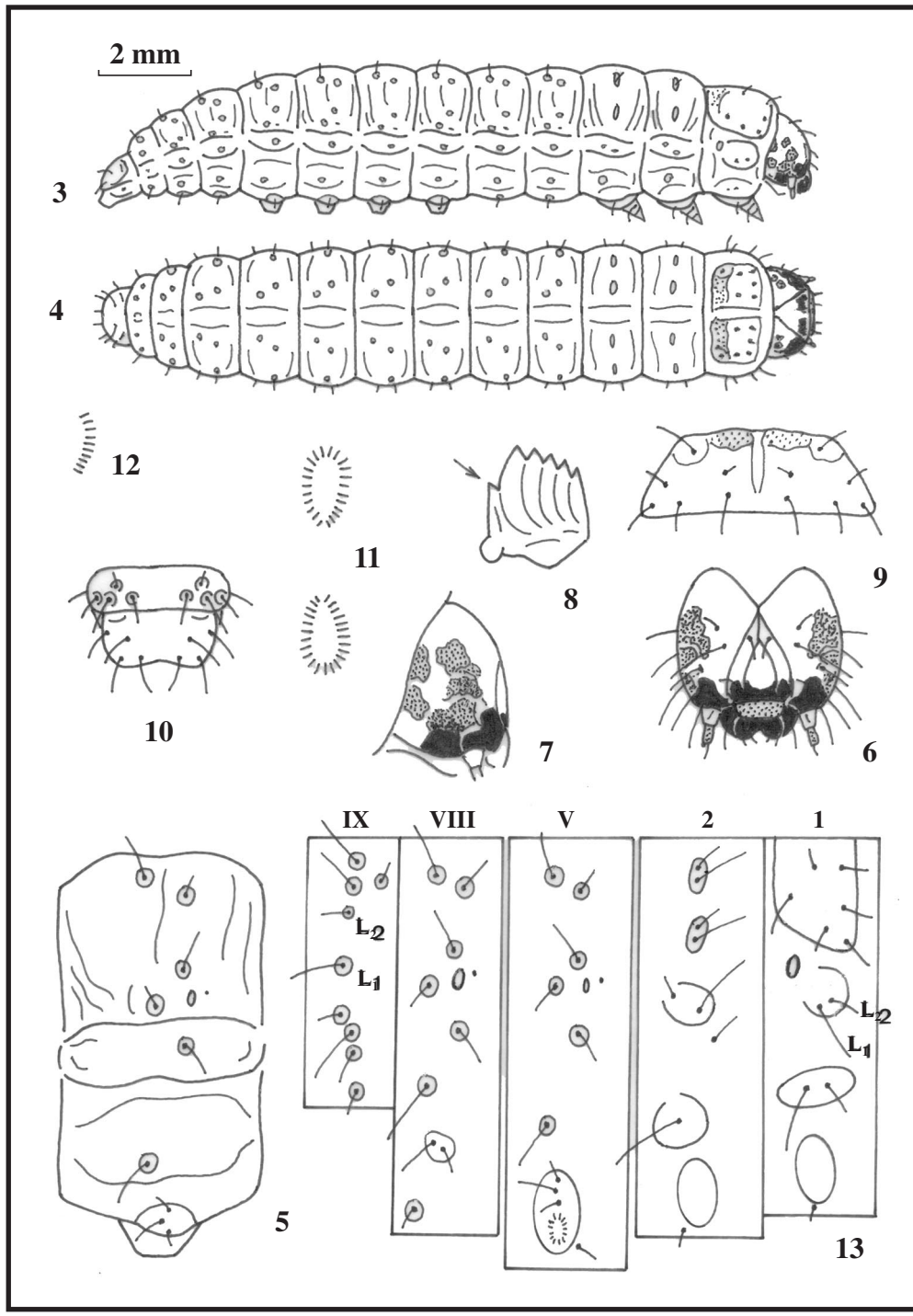
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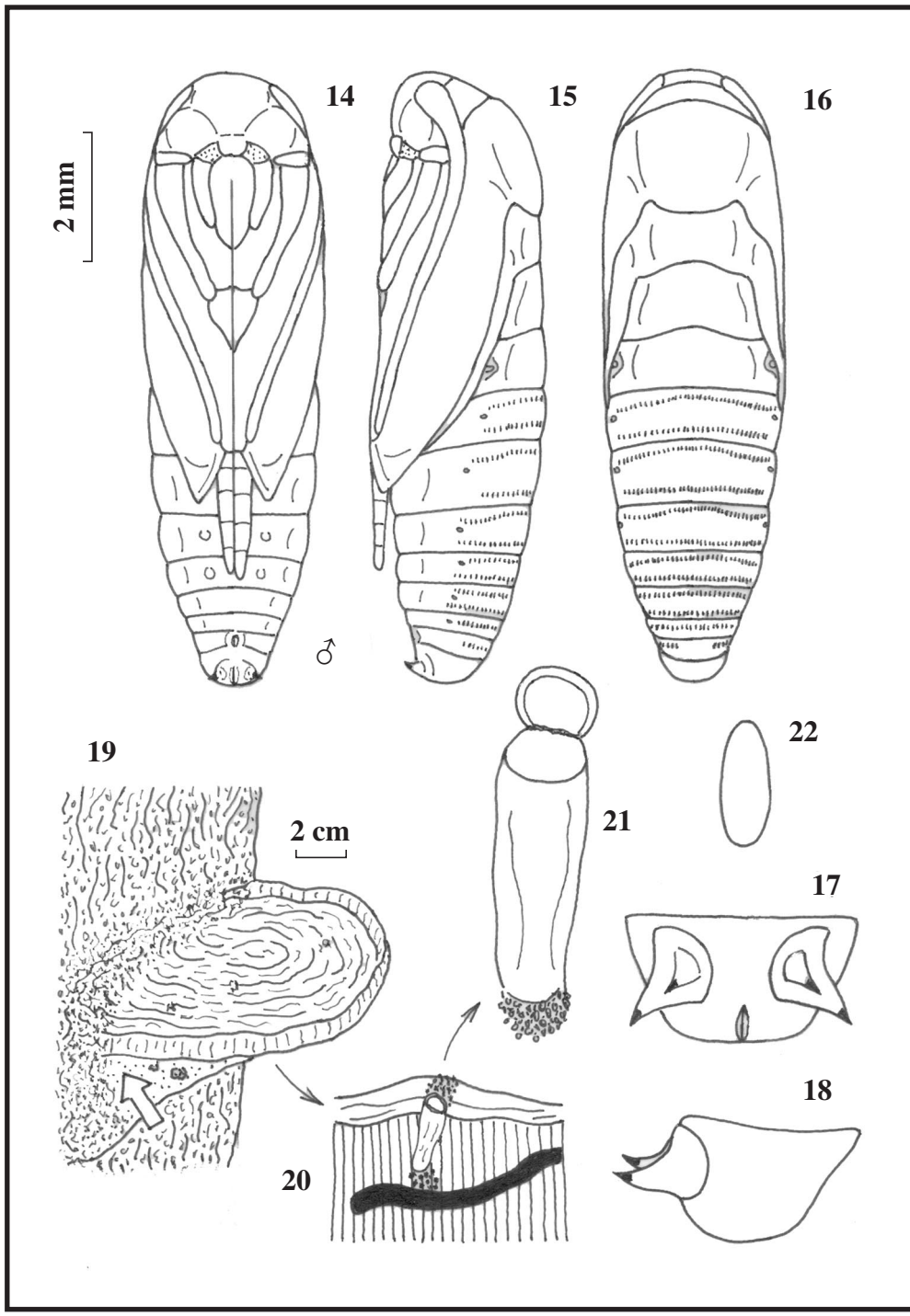
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Records of *Dodia* Dyar, 1901 species in Russian Altai (Lepidoptera: Erebidae, Arctiinae)

J. Šumpich, M. Dvořák, M. Pikner & T. Kadlec

Abstract

Faunistic records of *Dodia* Dyar, 1901 species collected in Altai Mountains (Russia) in 2015-2019 are given. Rare Holarctic species *Dodia albertae* Dyar, 1901 is firstly reported from this territory.
KEY WORDS: Lepidoptera, Erebidae, Arctiinae, faunistic, Altai Republic, Russia.

Registros de las especies de *Dodia* Dyar, 1901 en el Altái ruso (Lepidoptera: Erebidae, Arctiinae)

Resumen

Se dan registros faunísticos de las especies de *Dodia* Dyar, 1901 recogidas en el Macizo de Altai (Rusia) en los años 2015-2019. Para este territorio, se registra por primera vez, la rara especie *Dodia albertae* Dyar, 1901.
PALABRAS CLAVE: Lepidoptera, Erebidae, Arctiinae, faunística, República de Altai, Rusia.

Introduction

Dodia Dyar, 1901 is species-poor genus of erebid moths comprises seven species yet. It is characteristic by external appearance with almost transparent wings with reduced patterns, unique within family Erebidae. Three species have Palearctic distribution: *D. diaphana* (Eversmann, 1848), *D. maja* Rekelj & Česánek, 2009 and *D. sazonovi* Dubatolov, 1990, two are Nearctic distribution *D. tarandus* Schmidt & Macaulay, 2009 and *D. verticalis* Lafontaine & Troubridge, 1999 and two are Holactic distribution *D. albertae* Dyar, 1901 and *D. kononenkoi* Tshistjakov & Lafontaine, 1984. According DUBATULOV (2008), two additional taxa had been originally described as subspecies of *D. kononenkoi* Tshistjakov & Lafontaine, 1984 which were considered as valid species, both with Palearctic distribution (*D. sikhotensis* Tshistjakov, 1988, *D. transbaikalensis* Tshistjakov, 1988). All *Dodia* species occur in boreal and subarctic areas and within Holarctic fauna represent unique cold-adapted group associated with cold mountain habitats, peat bogs or subarctic tundra. This strong specialisation on extreme habitats could be probably the reason why the most of taxa were described only in the last thirty years, and altogether with that only several few faunistic records of these species were published since their descriptions.

The Altai mountain is possible considered to be one of the most attractive mountain range of southern Siberia, frequently visited by lepidopterologists since 19th century. TSHISTJAKOV (1988: 641) published the first records of *Dodia diaphana* from Altai Republic (incorrectly mentioned as Altayski Krai) collected already in 1898. The Arctiinae fauna of southern Siberia was studied in detail by DUBATULOV (1990), and in this work *D. sazonovi* Dubatolov, 1990 was described from high elevation of Altai Mts. Its distribution is known only from the Russian republics of Altai and Tuva so

far, and within genus it has the most restricted distribution area. Despite the intensive work of many lepidopterologists in Altai to date, only these two *Dodia* species were known from here, and additional *Dodia* species - *D. albertae* Dyar, 1901 - was recorded just recently. The main aim of this paper is to present the first records of *D albertae* from Altai Mts. Additionally, based on the taxonomical and faunistic works of TSHISTJAKOV (1988), TSHISTJAKOV & LAFONTAINE (1984), DUBATOLOV (1990), LAFONTAINE & TROUBRIDGE (1999), MURZIN (2003), REKELJ & ČESÁNEK (2009), SCHMIDT & MACAULAY (2009) and WITT & RONKAY (2011), we present the first preliminary world checklist summarizing the current state of knowledge of taxonomy and distribution of all *Dodia* species (Table 1).

Material and methods

Moths were collected by using portable light traps in which the one ultraviolet 8 W / 12 V tube (powered by 7.2 Ah / 12 V lead battery) was used as bait. Some specimens were captured by using net during daytime search. Photographs of voucher specimen were taken with Canon EOS 750 D digital camera, and genitalia with Canon 1100 D mounted in Olympus BX41 microscope.

Abbreviations of museums and private collections in which presented material is deposited:

NMPC	National Museum, Natural History Museum, Prague, Czech Republic
RCMD	Research collection of Marek Dvořák, Smrčná, Czech Republic
RCMP	Research collection of Michal Pikner, Kněžpole, Czech Republic

Dodia albertae Dyar, 1901 (figs 1-3)

Russia, Altai Republic, 6 ♂♂, 18 km SW of ULAGAN, 50º32’32”N; 87º46’44”E, boreal forest, 1700 m a.s.l., 28-VI-2019, gen. prep. Jan Šumpich 19980, M. Dvořák, T. Kadlec, M. Pikner & J. Šumpich leg. (NMPC, RCMD, RCMP).

Bionomy: Adults are usually flying in June and July at boreal peat bogs, but also at rocky scree with *Cedrus* and *Larix*, frequently confined to humid areas with dominance of *Salix* and *Alnus* trees. The Altaic specimens were attracted to light traps during the very cold night (temperature approximately 7-9º C) in boreal forest with dominant *Larix sibirica* Ledeb., and with distinctive growths of *Vaccinium* species and *Ledum palustre* L., in undergrowth (Fig. 3).

Remark: According to DUBATULOV (1990: 148) it is rare species in Russia, nevertheless new records from Altai as well as recently published record from Kazakhstan (WITT & RONKAY, 2011: 291) confirm the large distribution area of this species. New species for Altai Republic (Russia).

Dodia diaphana (Eversmann, 1848)

Russia, Altai Republic, 7 ♂♂, Aktash env., road to 9. station (below Zavod), 50º19’14”N; 87º42’57”E, mountain meadows, 2260 m a.s.l., 22-23-VI-2015, M. Dvořák & J. Šumpich leg. (RCMD, NMPC); 4 ♂♂, Kurai env. (15 km SW), Dzhangyskol lake, 50º10’49”N; 87º44’19”E, coniferous forest, 1830 m a.s.l., 29-30-VI-2019, M. Pikner leg. (RCMP).

Bionomy: Adults occur in June and July in dry habitats, predominantly on rocky scree, but also in humid boreal forests. Moths are active mainly at night.

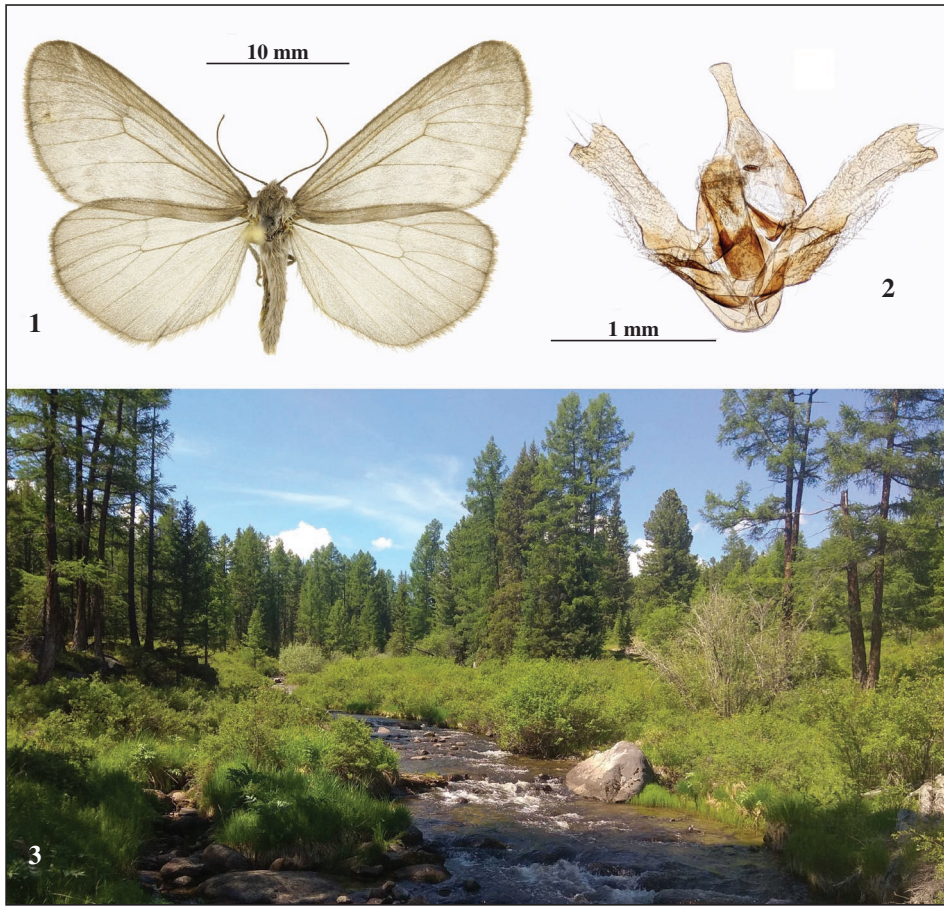
Remarks: In the Altai mountains it is the most distributed *Dodia* species but it is very local and only exceptionally more abundant.

Dodia sazonovi Dubatolov, 1990

Russia, Altai Republic, 5 ♂♂, Aktash env., road to 9. station (Závod), 50º19’34”N; 87º43’54”E, mountain meadows, 2400-2900 m a.s.l., 23-VI-2015, M. Dvořák & J. Šumpich leg. (NMPC, RCMD).

Bionomy: Closely associated to the rocky rubble, caterpillars polyphagous (DUBATOLOV, 1990: 149).

Remarks: Presented specimens were probably collected on the type locality (coordinates were not stated in the original description) during daytime. Until recently, it was considered as endemic for Altai Mts. but IVINSKIS & SALDAITIS (2004: 107) and REKELJ & ČESÁNEK (2009: 275) reported it also from neighbouring Tuva Republic (West Tannu Ola Mts., Tsagan Shibetu Mts.).



Figs 1-3.– *Dodia albertae* Dyar, 1901, Altai mountains. **1.** Adult, males. **2.** Male genitalia. **3.** Boreal forest near Ulagan, habitat of *Dodia albertae* Dyar, 1901 in the Altai mountains.

Discussion

According to MURZIN (2003: 32) and WITT & RONKAY (2011: 143) the new Altaic specimens of *D. albertae* could belong to subspecies of *D. atra atra* which was originally described from Sajan mountains in southern Siberia, Russia. However, this taxon was already synonymized by TSHISTJAKOV & LAFONTAINE (1984: 1553) with nominal subspecies described from Canada. In contrast to that, one of these authors later described new subspecies *D. atra eudiopta* from central Siberia, namely from the area between Alakit and Verhnaya Tomba rivers, imprecisely presented as the

lower reaches of the Lena river (TSHISTJAKOV, 1988: 638). This description is based on the smaller wingspan, lighter pattern on the forewings and shorter protrusion in ventral part of the apex of valvae. However, the shape of valva of this taxon, published by TSHISTJAKOV (1988: 637), corresponds with our Altaic specimens (Fig. 2). Moreover, SCHMIDT & MACAULAY (2009: 82) showed the high variability of this character, where the shape of valvae of sample from Muskox Lake in Canada represented in Figure 4c also fully fits with our Altaic specimen. Similarly, the specimen collected also in the Yukon Territory in Canada and published by REKELJ & ČESÁNEK (2009: 278) has identical genitalia with our Altaic specimen, too. Therefore, taxonomic position of particular taxa of *D. albertae* require future study, and presented ordering to subspecies *atra* is necessary to consider as provisional. Similarly, also taxonomic position of further *Dodia* taxa, primarily *sikhotensis* and *transbaikalensis* should be revised due their unclear status (cf. MURZIN, 2003: 33; DUBATULOV, 2008: 297).

Checklist of *Dodia* Dyar, 1901

(Legend: HO - Holarctic distribution, PA - Palearctic distribution, NE - Nearctic distribution

Note: * Affiliation of North American populations to concrete subspecies is unclear so far, holotypus originates from Magadan Region in Russia (TSHISTJAKOV & LAFONTAINE, 1984: 1554).

Taxon	**Distribution**
Dodia albertae Dyar, 1901	HO
D. albertae albertae Dyar, 1901 (subspecies)	NE (USA: Alaska, Canada)
D. albertae atra A. Bang-Haas, 1912 (subspecies)	PA (Russia: mountains in Siberia, Kazakhstan, N Mongolia)
D. albertae eudiopta Tshistjakov, 1988 (subspecies)	PA (Russia: subarctic tundra)
(= *D. kozhantshikovi* Sheljuzhko, 1918)	PA (Russia: Dzhugdzhur Mountains)
Dodia diaphana (Eversmann, 1848)	PA
D. diaphana diaphana (Eversmann, 1848)	PA (Russia: Siberia, Far East, Mongolia)
D. diaphana arctica Tshistjakov, 1988 (subspecies)	PA (Russia: subarctic area)
Dodia kononenkoi Tshistjakov & Lafontaine, 1984	HO*
D. kononenkoi kononenkoi Tshistjakov & Lafontaine, 1984 (subspecies)	PA (Russia: Siberia)
D. kononenkoi sikhotensis Tshistjakov, 1988 (?subspecies)	PA (Russia: Far East)
D. kononenkoi transbaikalensis Tshistjakov, 1988 (?subspecies)	PA (Russia: southern Siberia)
Dodia maja Rekelj & Česánek, 2009	PA (Russia: Magadan)
Dodia sazonovi Dubatolov, 1990	PA (Russia: Altai, Tuva)
Dodia tarandus Schmidt & Macaulay, 2009	NE (Canada)
Dodia verticalis Lafontaine & Troubridge, 1999	NE (Canada)

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*J. Š.
National Museum
Natural History Museum
Department of Entomology
Cirkusová, 1470
CZ-193 00 Praha 9 - Horní Počernice
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: jansumpich@seznam.cz
https://orcid.org/0000-0002-0262-2941

M. D.
Smrčná, 144
CZ-588 01 Smrčná
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: dvorak.mark@seznam.cz
https://orcid.org/0000-0001-7315-9563

M. P.
Kněžpole, 17
CZ-68712 Bílovice
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: michalpikner@seznam.cz
https://orcid.org/0000-0002-4223-7167

T. K.
Faculty of Environmental Sciences
Czech University of Life Sciences Prague
Kamýcká, 129
CZ-Praha-Suchdol 165 00
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: lepidopter@seznam.cz
https://orcid.org/0000-0002-6371-2617

* Autor para la correspondencia / *Corresponding author*

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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.

7.– Se recuerda a todos los socios de la obligación de estar autorizados para recoger Lepidoptera, con fines científicos, en España y que está prohibida todo tipo de actividad comercial, con el material capturado.

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.

Application for permits to collect Lepidoptera in Spain for scientific purposes

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.

6.– It's obligatory to publish in *SHILAP Revista de lepidopterología*, the new species or subspecies that are discovered and to remit to SHILAP **a part of the TYPE material**, for later incorporation into the Lepidoptera Collection of the National Museum Natural Sciences, Madrid, Spain.

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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The first information about Geometridae of Katun Nature Reserve, Central Altai, Russia (Lepidoptera: Geometridae)

A. E. Naydenov & R. V. Yakovlev

Abstract

Thirty seven Geometridae species were reported for the territory of the Katun Nature Reserve.
KEY WORDS: Lepidoptera, Geometridae, Altai, protected areas, fauna, entomology, Russia.

La primera información acerca de los Geometridae de la Reserva Natural de Katún, Altái Central, Rusia (Lepidoptera: Geometridae)

Resumen

Treinta y siete especies de Geometridae fueron citadas para el territorio de la Reserva Natural de Katún.
PALABRAS CLAVE: Lepidoptera, Geometridae, Altái, áreas protegidas, fauna, entomología, Rusia.

Introduction

Katun Nature Reserve is a specially protected natural territory, located in the Katunskii Mt. Ridge (or the "Katunskie Belki" Mt. Ridge) in the Central Altai (Fig. 1), forming part of the "Golden Mountains of Altai" UNESCO World Heritage Site. The ridge is characterized by a complete succession of altitudinal vegetation belts of the Altai-Sayan Mountain System, ranging from desertified steppes to the nival zone (KUMINOVA, 1960; SEDELNIKOV, 1988; KOSTERIN, 1994).

Most well was researched butterflies fauna (Lepidoptera, Rhopalocera) of Katunskii Mt. Ridge (KOSTERIN, 1994, 2007). Partly information about geometer moths has in the publication (VASILENKO, 2007), but collecting localities are not located on the official territory of Katun Nature Reserve.

Materials and methods

The article is based on the materials collected by the author in territory of Katun Nature Reserve and adjoining areas in the period 15-VII-07-VII-2018. The Geometridae fauna was examined in seven localities of this territory (Fig. 2):

1. Russia, Altai Republic, Katunskie Belki Mts., Sredneye Mul'tinskoye lake, 49º 58'N; 85º 50'E, H - 1740-1800 m., 16-22-VII-2018.
2. Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018.

3. Russia, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018.
4. Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018.
5. Russia, Altai Republic, Katunskie Belki Mts, mouth of Northern Ioldo river, 49º 49'N; 86º 09'E, H - 1791 m., 29-VII-2018.
6. Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E – 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018.
7. Russia, Altai Republic, Katunskie Belki Mts, mouth of Kyrgyz river, 49º 57'N; 86º 06'E, H - 1200 m., 04-05-VIII-2018.

The Geometridae were collected by the following methods: 1. Mowing with a butterfly net; 2. Night catching on light.

Results

Species list of geometer moths with collecting localities:

ENNOMINAE

Lomaspilis marginata (Linnaeus, 1758)

Material: 1♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Cabera exanthemata (Scopoli, 1763)

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Apeira syringaria (Linnaeus, 1758)

Material: 3 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Hylaea fasciaria (Linnaeus, 1758)

Material: 2 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Macaria loricaria (Eversmann, 1837)

Material: 3 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Macaria wauaria (Linnaeus, 1758)

Material: 8 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Chiasmia clathrata (Linnaeus, 1758)

Material: 2 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 4952'N; 8606'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Gnophopsodos sabine Erlacher & Erlacher, 2016

Material: 8 ♂♂, 5 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Alcis deversata (Staudinger, 1892)

Material: 3 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E – 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

GEOMETRINAE

Geometra papilionaria Linnaeus, 1758

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. Katun Nature Reserve, Ust-Koksa).

STERRHINAE

Idaea serpentata (Hufnagel, 1767)

Material: 2 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Scopula dignata (Guenée, [1858])

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E – 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Scopula frigidaria (Möschler, 1860)

Material: 1 ♂, 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, 2 ♀♀, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Scopula immorata (Linnaeus, 1758)

Material: 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Scopula ternata Schrank, 1802

Material: 4 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E.

Naydenov, Novoaltaysk); 2 ♂♂, 1 ♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Scopula virgulata ([Denis & Schiffermüller], 1775)

Material: 1 ♂, 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

LARENTIINAE

Scotopteryx chenopodiata (Linnaeus, 1758)

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts., Sredneye Mul'tinskoye lake, 49º 58'N; 85º 50'E, H - 1740-1800 m., 16-22-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 11 ♂♂, 4 ♀♀, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 3 ♂♂, 1 ♀, Altai Republic, Katunskie Belki Mts, mouth of Northern Ioldo river, 49º 49'N; 86º 09'E, H - 1791 m., 29-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Xanthorhoe designata (Hufnagel, 1767)

Material: 3 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Xanthorhoe fluctuata (Linnaeus, 1758)

Material: 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 4949'N; 8611'E - 8613'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Xanthorhoe montanata ([Denis & Schiffermüller], 1775)

Material: 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, 1 ♀, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♀, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 4 ♂♂, 3 ♀♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Pseudentephria lamata (Staudinger, 1897)

Material: 2 ♂♂, 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Entephria caesiata ([Denis & Schiffermüller], 1775)

Material: 6 ♂♂, 5 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 3 ♂♂, 3 ♀♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Entephria tzygankovi Wehrli, 1929

Material: 2 ♂♂, 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Spargania luctuata ([Denis & Schiffermüller], 1775)

Material: 5 ♂♂, 2 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Hydriomena furcata (Thunberg, 1784)

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 9 ♂♂, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Stamnodes pauperaria (Eversmann, 1848)

Material: 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Colostygia aptata (Hübner, [1813])

Material: 13 ♂♂, 3 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 6 ♂♂, 1 ♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º11'E – 86º13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Dysstroma truncata (Hufnagel, 1767)

Material: 4 ♂♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 1 ♂, 3 ♀♀, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Eulithis mellinata (Fabricius, 1787)

Material: 1 ♂, 2 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Eulithis populata (Linnaeus, 1758)

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E – 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Eulithis prunata (Linnaeus, 1758)

Material: 7 ♂♂, 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Asthena amurensis (Staudinger, 1897)

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Coenocalpe lapidata (Hübner, [1809])

Material: 1 ♂, Russia, Altai Republic, Katunskie Belki Mts, mouth of Kyrgyz river, 49º 57'N; 86º 06'E, H - 1200 m., 04-05-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Horisme scotosiata (Guenée, 1858)

Material: 10 ♂♂, 6 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, confluence of Ioldo and Kazinikha rivers, cordon «Kazinikha» 49º 52'N; 86º 06'E, H - 1487-1700 m., 24-VII-04-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Eupithecia pimpinellata (Hübner, [1813])

Material: 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Northern Ioldo river valley, 49º 49'N; 86º 11'E - 86º 13'E, H - 2030-2300 m., 30-VII-02-VIII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Eupithecia satyrata (Hübner, [1813])

Material: 1 ♀, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk); 2 ♀♀, Altai Republic, Katunskie Belki Mts, Poperechnoye lake, 49º 55'N; 85º 53'E, H - 1885-2000 m., 21-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Eupithecia veratraria Herrich-Schäffer, 1848

Material: 2 ♀♀, Russia, Altai Republic, Katunskie Belki Mts, Verkhneye Mul'tinskoye lake, 49º 55'N; 85º 50'E, H - 1795-1900 m., 20-VII-2018, leg. A. E. Naydenov & K. E. Akulova (coll. A. E. Naydenov, Novoaltaysk).

Discussion

The fauna of geometer moths of the Katun Nature Reserve is currently represented by 37 species of 25 genera. This list of Geometridae can't be considered final, as this group of moths requires a long period of research on the different areas on territory of the reserve.

Acknowledgements

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A. E. N.
Altai State University
pr. Lenina, 61
RUS-656049 Barnaul
RUSIA / *RUSSIA*
E-mail: colias24@mail.ru
https://orcid.org/0000-0001-3578-9367-3578

*R. V. Y.
Altai State University
pr. Lenina, 61
RUS-656049 Barnaul
RUSIA / *RUSSIA*
E-mail: yakovlev_asu@mail.ru
https://orcid.org/0000-0001-9512-8709

y / *and*

Tomsk State University
Laboratory of Biodiversity and Ecology
Lenin pr. 36
RUS-634050 Tomsk
RUSIA / *RUSSIA*

*Autor para la correspondencia / *Corresponding author*

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Figures 1-2.– 1. Location of Katun Nature Reserve. **2.** Map of Katun Nature Reserve with collecting localities.

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First description of the male genitalia of *Psorosa lacteomarginata* (A. Costa, 1888) (Lepidoptera: Pyralidae, Phycitinae)

M. Pinzari

Abstract

The genitalia of *Psorosa lacteomarginata* (A. Costa, 1888) endemic to Sardinia (Italy) are illustrated and described for the first time.
KEY WORDS: Lepidoptera, Pyralidae, Phycitinae, male genitalia, Italy.

Primera descripción de la genitalia del macho de *Psorosa lacteomarginata* (A. Costa, 1888) (Lepidoptera: Pyralidae, Phycitinae)

Resumen

Se describe e ilustra, por primera vez, la genitalia del macho de de *Psorosa lacteomarginata* (A. Costa, 1888) endémico de Cerdeña (Italia).
PALABRAS CLAVE: Lepidoptera, Pyralidae, Phycitinae, genitalia macho, Italia.

Introduction

In the context of an ongoing study on Lepidoptera fauna in Italy, the results of which were partly cited in PINZARI *et al*. (2019) and concerning the history and distribution of *Pempeliella* (PINZARI & PINZARI, 2019a) and *Delplanqueia* (PINZARI & PINZARI, 2019b) group in Italy, we found a specimen of *Psorosa lacteomarginata* (A. Costa, 1888) of Hartig's collection that is preserved at "Museo di Zoologia dell'Università la Sapienza di Roma"(MZUR).

Genitalia of *Psorosa lacteomarginata* have never been described in the literature, perhaps because it is an endemic species of Sardinia (Italy) with a relatively well characterized habitus. Available information on this topic is sparse and limited to the description by A. COSTA (1888). Recently, LERAUT (2014) said simply in his book on pyralids of Europe he does not know the species.

At present, only the original citation by A. Costa in 1888 is known and the author referred that he did not dissect the genitalia to preserve the specimen (a male). An image of this individual (only moth) is shown in Lepiforum (2019).

Here, we provided for the first time the description of the male genitalia of *Psorosa lacteomarginata*.

Materials and methods

Distribution of *Psorosa lacteomarginata*: It is endemic of Sardinia (Italy); It was described by

A. COSTA (1888) on the basis of a single individual collected on the banks of the river Coghinas in the S. Rocco district (Sassari) in northern Sardinia. In Europe and in Italy there are also three species belonging to the genus *Psorosa: P. dahliella* (Treitschke, 1832), *P. mediterranella* Amsel, 1954 and *P. nucleolella* (Moschler, 1866). According to BASSI *et al*. (1995) the Italian specimens of *P. nucleolella* are perhaps to be attributed to *mediterranella.* Male genitalia were illustrated by LERAUT (2014).

A specimen of *P. lacteomarginata* in Prose's collection (ZSM) was photographed by Michel Kettner and shown at www.lepiforum.de in "Bestimmung von Schmetterlingen (Lepidoptera) und ihren Präimaginalstadien" (2019). It is a male collected on 7-VII-1972 at Musei (Southern Sardinia) (120 m) by Hartig.

Material examined: We studied a male of *P. lacteomarginata* from the South of Sardinia and collected on 9-VIII-1936 at "Stagno di Cagliari" by Hartig (fig.1). The specimen was identified by Zerny as *Psorosa predotai* Rbl. and is located in Hartig's collection at Museo di Zoologia dell'Università di Roma "La Sapienza" (MZUR).

Species identification: The moth species was identified by external habitus using the taxonomic characters reported by A. COSTA (1888): *"Il di sopra del corpo ha color di vinaccia. ….Le ali hanno il margine costale o esterno di un bianco latteo e la frangia del margine estremo cenerino-argentina".* "The upper surface of the body is cinnabar red coloured.... The costal or external margin of wings is milky white and the fringe of the extreme margin is cenerine argentine". The complete original description of *Psorosa lacteomarginata* is reported in Appendix 1. For the species determination we took into account the label of species identification by Zerny (fig. 1 F) as *P. predotai* Rebel, 1936 (= *Pempelia lacteomarginata* A. Costa, 1888) (BASSI *et al.*, 1995) and we also considered the photographs published on the website Lepiforum (Lepiforum, 2019).

Genitalia dissection and preservation: The male genitalia were not in good condition; they were boiled in 10% potassium hydroxide solution for few minutes and mounted on a slide to make a photograph. Successively, the slide was dismantled to preserve the genitalia. Genital parts were glycerol-preserved into microtubes. These were closed with vinyl glue that is easily soluble in water and put under the specimen itself. The specimen is again deposited in Hartig's collection at MZUR.

Results

Original description of *Pempelia lacteomarginata* A. Costa, 1888: *"Avendone un individuo solo in perfetto stato di conservazione, rimasto con le ali adattate al corpo come nel riposo, non abbiam voluto sconciarlo col distenderne le ali; con che si sarebbe perduto l'abito naturale della specie. Per la qual cosa delle ali inferiori, che rimangono del tutto nascoste, nulla diremo. D'altronde il loro colorito varia di poco nelle specie tutte del medesimo gruppo. Descriveremo quindi l' insetto nella forma sotto cui si ritrova. Capo: fronte molto convessa, sporgente, con squame allungale dirette in avanti formando un bel ciuffo avanzato al di là della faccia: questa verticale, piana, quasi rettangolare, rivestita di squame minutissime non elevate. Palpi foltamente squamosi: inferiormente con una cresta compressa a margine seghettato costituita da squame più grandi; l'ultimo articolo molto ottuso all'estremità. Antenne robuste: il primo articolo ingrossato, cilindraceo. Ali superiori anguste, fortemente accartucciate, sicché nello stato di riposo l'insetto si presenta di forma cilindracea. Il di sopra del corpo ha color di vinaccia. Nel capo vi ha una striscia da cadaun lato contigua al rispettivo occhio e la faccia per intero, argentine. Le ali hanno il margine costale o esterno di un bianco latteo e la frangia del margine estremo cenerino-argentina. Il petto ed i piedi sono piombini con scarse squame argentine. L'addome è rivestito di squame argentine. Osservazione. La fattezza del capo di questa specie è alquanto diversa da quelle di molte altre Pempelia da noi osservate. Non ci saremmo pertanto azzardati a dar come nuova la*

specie, se non fossimo stati in ciò confortati dall'autorevole parere del chiaro Lepidotterologo Staudinger, cui l'abbiamo comunicata."

In figure 1 we showed the studied specimen of *Psorosa lacteomarginata* (A. Costa, 1888) displaying the upper and lower surface of adult (fig. 1 A and B), its genitalia and two historical labels (fig. 1 F). Terms used by ROESLER (1986) were adopted for the following description of the male genitalia of *Psorosa lacteomarginata.*

Male genitalia: Uncus normal, rounded; gnathos triangular hook; processus vinculi well developed; valva slender and longer than vinculum; spatula-shaped; narrower in the basal area after *sacculus*, then it widens up to fl, then begins to squeeze towards the upper edge until it reaches the costa which is straight and free of processes, rounded tip; unfortunately, in fig. 1 C the detachment of the valvae from the costae does not allow the shrinkage to be appreciated well; verrucose basal process that is present in other species of *Psorosa* genus (LERAUT, 2014) is absent; finally, two coremata are present at VIII abdominal segment (fig. 1 D). Aedeagus (fig. 1 E): relatively short with semilateral ductus ejaculatorius; slender to caecum penis; at vesica, almost throughout its circumference, a denticulate plate surrounds two cornuti: one of these is large, corrugated, along two thirds of the aedeagus; the other cornutus is long half of the first.

Remarks and conclusions

Currently the male of *Psorosa lacteomarginata* in Europe is unmistakable in appearance especially if the specimens are in good condition.

The female is not known to us, nor is biology known. The original description in the case of sloppy specimens probably does not allow easy identification of the species which in the male is however easily distinguishable from the other *Psorosa* and from *Deplanqueia* species (PINZARI & PINZARI, 2019b) with the examination of the genitalia.

Male genitalia differ from the other European *Psorosa* species in particular for cornuti contained in the vesica of aedeagus.

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M. P.
Dipartimento di Biologia
Università di Roma Tor Vergata
Via della Ricerca Scientifica, 1
I- 00133 Roma
ITALIA / *ITALY*
E-mail: manuela.pinzari@uniroma2.it
https://orcid.org/0000-0003-0829-3453

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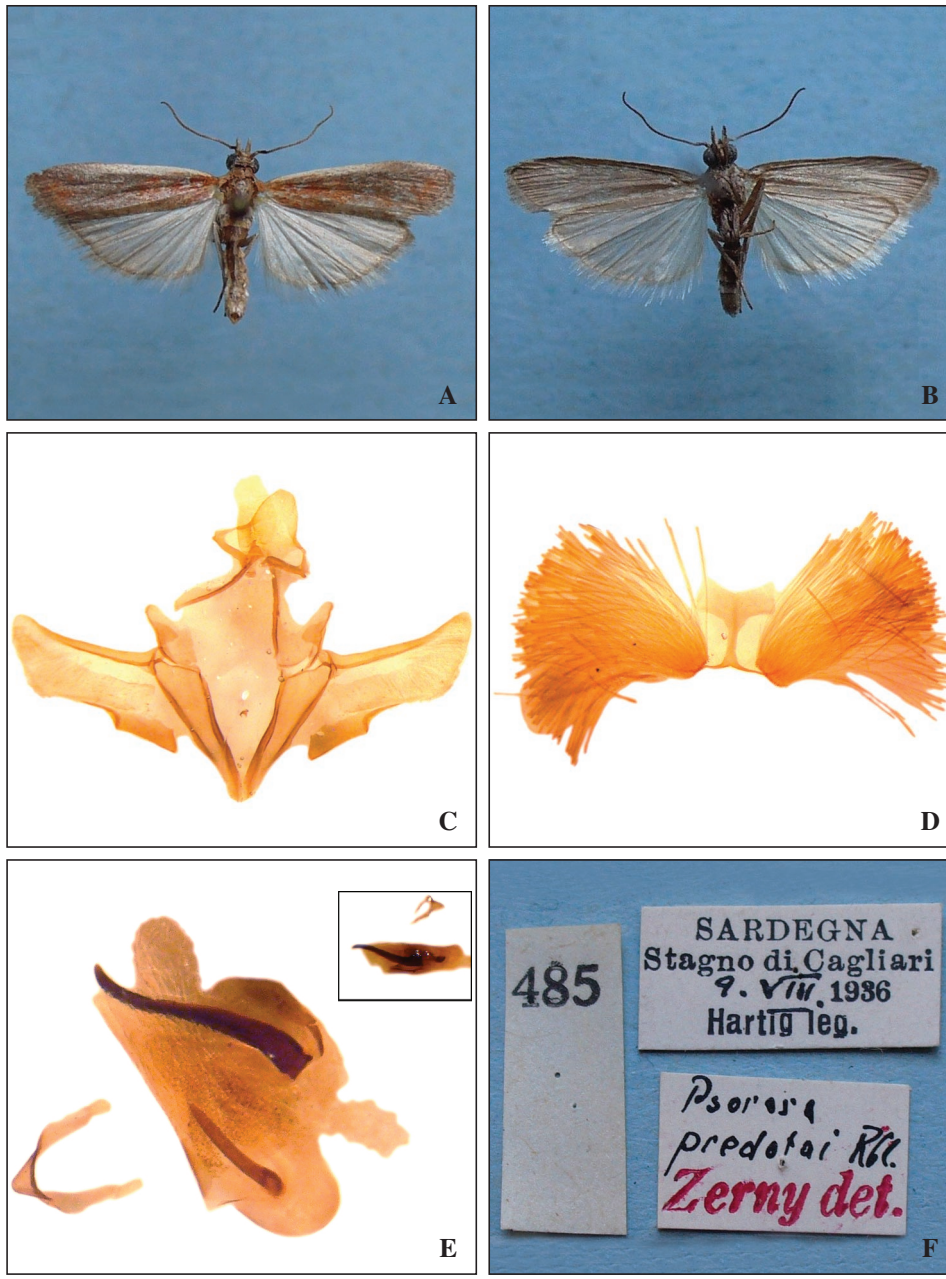

Fig. 1.– *Psorosa lacteomarginata* (A. Costa, 1888) adult (wingspan 15 mm): **A**, upperside; **B**, underside; genitalia (PIRA 556, M. Pinzari), **C**, gnathos-valvae complex; **D**, coremata at VIII abdominal segment; **E**, aedeagus and anellus (at top right aedeagus before compression by slide); **F**, historical labels.

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Scythris camelella Walshingham, 1907 recorded in Spain as new species for Europe (Lepidoptera: Scythrididae)

I. Richter & J. Šumpich

Abstract

The first record of *Scythris camelella* Walshingham, 1907 in Spain and Europe is presented. One male was recorded on the sand habitats near Santa Pola (Alicante) in Spain.
KEY WORDS: Lepidoptera, Scythrididae, *Scythris camelella,* faunistics, new record, Spain.

Scythris camelella **Walshingham, 1907 registrado en España como una nueva especie para Europa (Lepidoptera: Scythrididae)**

Resumen

Se presenta el primer registro de *Scythris camelella* Walshingham, 1907 en España y Europa. Un ejemplar macho fue colectado en hábitat arenosos cerca de Santa Pola (Alicante), España.
PALABRAS CLAVES: Lepidoptera, Scythrididae, *Scythris camelella*, faunística, nuevo registro, España.

Introduction

Scythridid fauna of Spain is very well known. The last checklist of Scythrididae of Spanish mainland was made by VIVES MORENO (2014), and it comprises 91 species in total. After this publication, *Scythris spiniferella* Nupponen & Savenkov, 2019 and *Enolmis delnoydella* Groenen & Schreurs, 2016 were described on the basis of Spanish material (GROENEN & SCHREURS, 2016; NUPPONEN & SAVENKOV, 2019).

Scythris camelella Walshingham, 1907 was recorded on the wet habitats nothern of Santa Pola (Spain) during the joint trip of the second author and Marek Dvořák - collector of the present record. Only one male was atracted to ultraviolet light which was installed in the salt marshe with sparce vegetation, but with reeds in the close surroundings (Fig. 3). This locality is a part of great territory where wetlands and salt marshes belong to the common habitats. The well-preserved habitats south of Santa Pola are protected, e.g. El Parque Natural de las Lagunas de La Mata and Torrevieja, but the locality on which *S. camelella* was recorded has been always without territorial protection. This is why this locality practically does not exist in the present due the quick development in this densely populated area.

Material examined

Scythris camelella Walshingham, 1907 (Figs 1-2): Spain, Alicante, Santa Pola, 1 km south of Balsares, 50 m a.s.l., 1 ♂, 12-VI-2007 (gen. prep. 29390 Ig. Richter), M. Dvořák leg. (coll. Ig. Richter).

Discussion

Scythris camelella was described on the basis of five males collected in Biskra in Algeria (WALSINGHAM, 1907). It is widely distributed in the Palaearctic and Afrotropical regions, namely it was recorded in Egypt, Iran, Sudan, Tunisia (BENGTSSON, 1997), Jordan (NUPPONEN, 2005), Afghanistan, Jordan, Pakistan, Syria, South Africa, Namibia, Kenya and Yemen (NUPPONEN, 2018). The present record is the first one for Spain and for whole Europe.

The biology was not hitherto described despite one specimen from the type series was bred from a cocoon (WALSINGHAM, 1907). The type specimens were collected in April (WALSINGHAM, 1907), but the moths are active also in late autumn (BENGTSSON, 1997). With regard to the date of the present record (June), it probably occurrs in more broods from April to October. According to BENGTSSON (1997) *S. camelella* belongs to *camelella* species-group.

Acknowledgements

We are indebted to Mr. Marek Dvořák (Czech Republic) for giving us the opportunity to study the Spanish material collected by him, and Bengt Å. Bengtsson (Sweden) is thanked for the confirmation of the species identification. We are grateful to Emmanuel Arriaga-Varela (México) for the translation of abstract into Spanish and the improvement of English. The work of Jan Šumpich was financially supported by the Ministry of Culture of the Czech Republic (DKRVO 2019-2023/5.I.b, National Museum, 00023272).

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I. R.
Malá Čausa, 289
SK-97101 Malá Čausa
ESLOVAQUIA / *SLOVAKIA*
E-mail: ignac.richter@gmail.com
https://orcid.org/0000-0001-8122-8709

*J. Š.
National Museum
Department of Entomology
Cirkusová, 1740
CZ-193 00 Praha 9 - Horní Počernice
REPÚBLICA CHECA / *CZECH REPUBLIC*
E-mail: jansumpich@seznam.cz
https://orcid.org/0000-0002-0262-2941

*Autor para correspondencia / *Corrresponding author*

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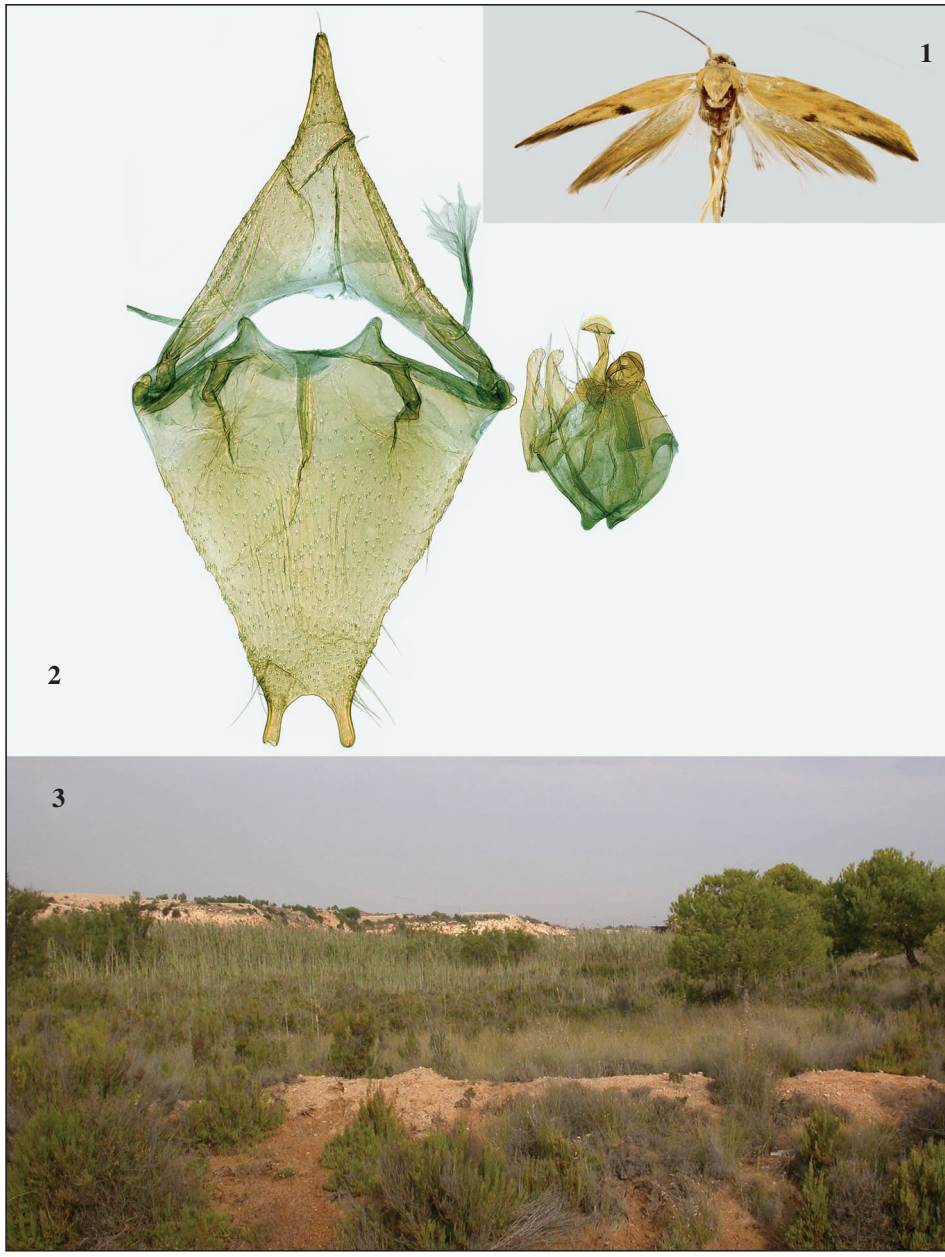

Figs 1-3.– *Scythris camelella* Walshingham, 1907, Spain. **1.** Adult, males. **2.** Male genitalia. **3.** Habitat of *S. camelella* near Santa Pola (Alicante) in Spain.

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Notes on Afrotropical Crambinae. A new species of *Sebrus* Błeszyński, 1970 from Malawi (Lepidoptera: Pyraloidea)

G. Bassi

Abstract

Sebrus kovtunovichi Bassi, sp. n., the sixth known species of the Afrotropical genus *Sebrus* Błeszyński, 1970 is described and illustrated. The characteristics of the genus and distribution of its species are briefly discussed.
KEY WORDS: Lepidoptera, Pyraloidea, Crambidae, Crambinae, distribution, new species, Malawi.

Notas sobre los Crambinae afrotropicales. Una nueva especie de *Sebrus* Błeszyński, 1970 de Malaui (Lepidoptera: Pyraloidea)

Resumen

Se describe e ilustra *Sebrus kovtunovichi* Bassi, sp. n., la sexta especie conocida del género afrotropical del género *Sebrus* Błeszyński, 1970. Se discuten brevemente las características del género y distribución de las especies.
PALABRAS CLAVE: Lepidoptera, Pyraloidea, Crambidae, Crambinae, distribución, nueva especie, Malaui.

Introduction

The genus *Sebrus* was erected by BŁESZYŃSKI (1970: 12) for the single Madagascan species *Sebrus amandus* Bassi, 1995 described two additional species and moved two more species from *Crambus* Fabricius, 1798.

Among the very valuable material collected by Russian colleagues V. Kovtunovich and P. Ustjuzhanin in several research expeditions throughout Southern Africa, a pair of small specimens captured by the first in Malawi have proven to be a new species of this genus, and it is described below.

Material and methods

Genitalia preparations were made following ROBINSON (1976). The terminology of the genitalia follows KLOTS (1970) and KRISTENSEN (2003). Genitalia photographs were taken with a Canon S120 digital camera. The habitus photos were made with a Nikon D300 digital camera. The images were enhanced with Adobe Photoshop Elements. The length of the labial palpus is compared to the maximum diameter of the compound eye in side view. The material is in the research collection of Graziano Bassi (CGB).

Taxonomy

Sebrus Błeszyński, 1970: 12
Type species: *Sebrus amandus* Błeszyński, 1970, by original designation.

Diagnosis: *Sebrus* belongs to tribe Crambini Latreille, 1810 and is close to *Culladia* Moore, 1886 and *Pediasia* Hübner, [1825] in features of male and female genitalia. Male genitalia are characteristic in having double costal processes and in the phallus bearing an external subapical process. The female genitalia of the three genera have the same proximal ductus seminalis origin from the ductus bursae (Fig. 4), but *Sebrus* lacks the typical subostial sac of *Culladia*, have the sterigma adorned with sclerotized processes as opposed to the membranous ostial area present in *Pediasia*, and have apophyses anteriores strongly reduced while they are normally developed in *Culladia* and *Pediasia*.

List of the species of *Sebrus* Błeszyński, 1970

Sebrus absconditus Bassi, 1995: 619
Type locality: Republic of South Africa
Distribution: Republic of South Africa, Zimbabwe.

Sebrus amandus Błeszyński, 1970: 12
Type locality: Madagascar
Distribution: Madagascar.

Sebrus argus Bassi, 1995: 619, 621
Type locality: Democratic Republic of the Congo
Distribution: Democratic Republic of the Congo, Zambia.

Sebrus perdentellus (Hampson, 1919: 287) (*Crambus*)
Type locality: Malawi
Distribution: Malawi.

Sebrus pseudosparsellus (Błeszyński, 1961: 188, 190) (*Crambus*)
Type locality: Zimbabwe
Distribution: Democratic Republic of the Congo, Zimbabwe.

***Sebrus kovtunovichi* Bassi, sp. n.**

Holotype ♂: Malawi, Rumphi District, Nyika N. P., 10º43'40S, 33º39'11E, 1923 m, 30-31-XII-2011, V. Kovtunovich leg., genitalia slide 6280, Collezione G. Bassi 54001.

Paratype ♀: Malawi, Rumphi District, Nyika N. P., 10º43'40S, 33º39'11E, 1923 m, 30-31-XII-2011, V. Kovtunovich legit, genitalia slide 6276, Collezione G. Bassi 53030.

Etymology: The species is dedicated to Dr Vasiliy Nikolaevich Kovtunovich, well-known Russian specialist of Pterophoridae, who collected the type series.

Diagnosis: *Sebrus kovtunuvichi* is similar to its congeners in habitus, but *S. absconditus*, *S. amandus* and *S. perdentellus* are larger and darker, *S. pseudosparsellus* has a well-defined post medial fascia on the forewing and *S. argus* has brown maculations on the forewing. The male genitalia of the new species cannot be confused with those of any congener in possessing two long and pointed subapical teeth on the phallus and two slender cornuti in the vesica. In female genitalia, the produced sterigma and the shape of the ductus bursae are diagnostic.

Description (Figs 1-2): Wingspan of both specimens 15 mm. Labial palpi 4 X longer than

widest diameter of eye, white with double brown grey band on outer side. Maxillary palpi white with brown grey at base. Antennae weakly serrate in male, thickened in female, brown with silvery white costa. Frons rounded, slightly produced, white. Ocelli well developed. Chaetosemata minute. Head, patagia and tegulae white. Thorax white suffused with yellow. Forewing ground colour white sprinkled with brown, especially on dorsum; costa grey, streaked with brown; antemedial fascia ill-defined, narrow, brown, bowed in medially; postmedial fascia brown, deeply serrated; terminal line dark brown; outer margin with three small dots in medial sector; fringes silvery white, with both short and long scales bordered brown; female more deeply suffused with brown than male; underside bright bronze brown, terminal line dark brown and fringes white with both short and long scales tipped dark brown. Hindwing ivory yellow suffused with brown near apex; fringes with short scales ivory yellow and long scales white; underside in male white with costa suffused with bronze brown, terminal line brown and fringes white; in female underside darker than in male, fringes white with short scales tipped brown. Legs dorsally white with tarsi annulated with brown and ventrally bronze brown. Abdomen yellow suffused with white in male, orange yellow in female.

Male genitalia (Fig. 3): Uncus narrow, apically slightly down curved and pointed; gnathos slightly longer than uncus, with rounded apex; tegumen slender, subrectangular; juxta U-shaped, lightly sclerotized; vinculum triangular, with long dorsal projection; pseudosaccus subconical, well developed; valva triangular, narrowing distally and strongly upcurved toward rounded cucullus; costa separated from valva by a sclerotized bridge and ending with two pointed and strongly upcurved spurs, the distal about twice as long as the proximal; phallus longer than valva, with two pointed subapical teeth of different lengths; vesica with two slender cornuti, the basal twice as long as the distal, and several scobinations.

Female genitalia (Fig. 4): Papillae anales subtriangular, with sclerotized section narrowing dorsally. Apophyses posteriores subtriangular, rather short. Apophyses anteriores strongly reduced. Abdominal segment VIII a moderately sclerotized, narrow ring. Ostium bursae slightly produced and bent outwards. Sterigma forming a sclerotized hood on ostium bursae, and with a spiny, shield like lamella postvaginalis. Ductus bursae more than twice as long as corpus bursae, sinuous, narrowing medially, strongly sclerotized in basal half, then membranous. Ductus seminalis branching off close to ostium bursae. Corpus bursae suboval.

Biology: Unknown. The adults were attracted to an artificial light in a mixed vegetation habitat of grasses, shrubs, *Protea* sp., *Brachystegia* sp. and *Acacia* sp. trees in the undulated Nyika Plateau (Fig. 5).

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G. B.
Via Sant'Agostino, 51
I-10051 Avigliana (Torino)
ITALIA / *ITALY*
E-mail*:* alphacrambus@gmail.com
https://orcid.org/0000-0002-6028-0740

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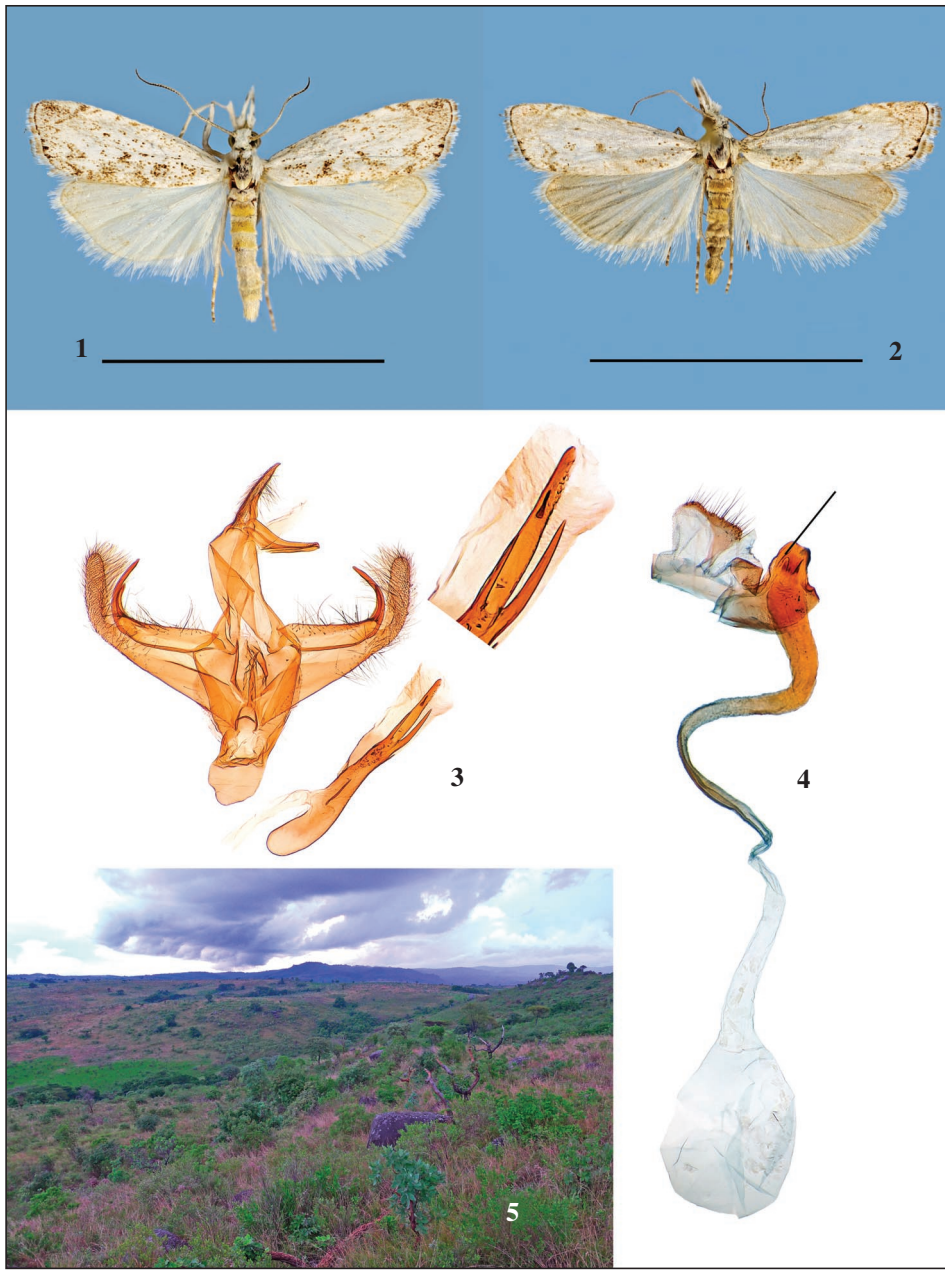

Figs 1-5.– *Sebrus kovtunivichi* Bassi, sp. n. Scale bars of adults = 10 mm. **1.** Male holotype. **2.** Female paratype. **3.** Male genitalia with apex of phallus enlarged. **4.** Female genitalia with evidence of origin of the ductus seminalis. **5.** Habitat (photo V. Kovtunovich).

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Mesophleps ochracella (Turati, 1926) new to Italy (Lepidoptera: Gelechiidae)

M. Pinzari & M. Pinzari

Abstract

Mesophleps ochracella (Turati, 1926), an interesting species, was found for the first time in Basilicata, Italy.
KEY WORDS: Lepidoptera, Gelechiidae, *Mesophleps ochracella*, Italy.

Mesophleps ochracella **(Turati, 1926), nueva para Italia (Lepidoptera: Gelechiidae)**

Resumen

Mesophleps ochracella (Turati, 1926), una interesante especie, fue encontrada por primera vez en Basilicata, Italia.
PALABRAS CLAVE: Lepidoptera, Gelechiidae, *Mesophleps ochracella*, Italia.

Introduction

In the context of an ongoing study on the biology of butterfly endangered species (PINZARI, 2016a, 2019a; PINZARI *et al*., 2017, 2019) and Lepidoptera fauna in Italy (PINZARI, 2016b, 2019b, 2020; PINZARI *et al*., 2018; PINZARI & PINZARI, 2019a, 2019b, 2019c) we focused our attention on little-known species in central Italy.

In recent times, our research has also been extended to the South of Italy and to the Islands with encouraging results (PINZARI, 2019b; PINZARI & PINZARI, 2019c) which showed how much the fauna and biology of Lepidoptera in southern Italy are still scarcely known and lead to a further attention.

This paper illustrates a new result of the survey campaign carried out in Basilicata in July 2019: the finding of *Mesophleps ochracella* (Turati, 1926).

Materials and methods

The genus *Mesophleps* Hübner, [1825] includes five species in Europe (LI & SATTLER, 2012): *M. silacella* (Hübner, 1796), *M. corsicella* (Herrich-Schaffer, 1856), *M. oxycedrella* (Millière, 1871), *M. trinotella* Herrich-Schaffer, 1856, and *M. ochracella* (Turati, 1926). In Italy are present four species: *M. silacella* and *M. corsicella* everywhere; *M. oxycedrella* in Sicily and Sardinia (BALDIZZONE *et al.,* 1995; LI & SATTLER, 2012); specimens of *M. trinotella* that were collected in Liguria, Sardinia and Sicily have been examined and determined by LI & SATTLER (2012).

M. ochracella is present in Europe, Spain (including Balearic Islands), France (Alpes-Maritimes), Malta, Greece (Lakonia, Crete), in north African countries as Morocco, Algeria, Libya, and probably in Turkmenistan (TURATI, 1926; NEL & NEL, 2003; VARENNE & NEL, 2011; LI & SATTLER, 2012; VAN NIEUKERKEN & KARSHOLT, 2019).

Collecting site: The survey on Lepidoptera fauna in South of Italy was carried out on 8-14 July 2019 at Marina di Pisticci (MT) both on the coastal dune and in the cultivated areas in the surrounding of Masseria Macchia Relais San Pio & Marina. Moths were light-trapped by Mixed Light 160 W lamp mounted in fixed sites with electricity available.

Species identification: The moth species was identified by external habitus (figs 1 A-B) using the taxonomic characters reported by LI & SATTLER (2012). The species determination is based on the broadly triangular ventral tuft of the labial palpus segment 2 (fig. 1 D). This characteristic is sufficient to distinguish the studied species from the other European species. Female genitalia is very similar to *trinotella*, but the basally broader ductus seminalis allows to tell apart the female of *ochracella* from *trinotella*. The other parts of genitalia are fully identical to those of other congeneric species; they are shown in fig. 2 C.

Results

Mesophleps ochracella (Turati, 1926)

Record: ITALY, Basilicata, Marina di Pisticci (MT), at sea level, 1 ♀, 6-VII-2019, M. Pinzari and M. Pinzari leg.

Notes: The specimen was attracted by lux at 10 p.m. within an area mainly cultivated with citrus groves some kilometres away from the coastal dune.

Biology: Host-plants are unknown, but on account of the close relationship to *M. trinotella* some species of Cruciferae are likely (LI & SATTLER, 2012).

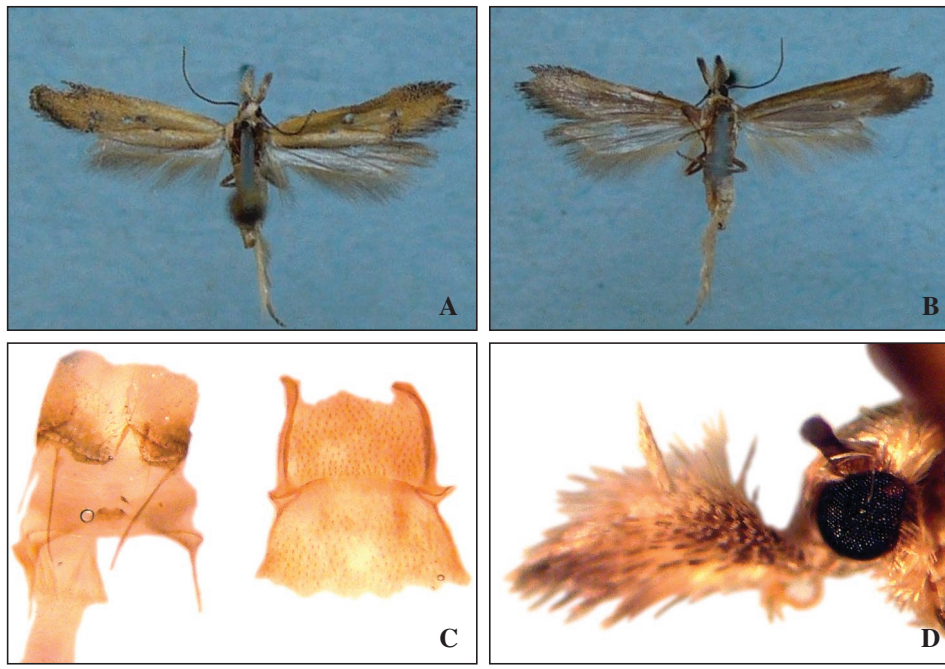

Fig. 1.– *Mesophleps ochracella* (Turati, 1926) ♀ wingspan 12 mm: **A**) front; **B**) back; **C**) genitalia and abdominal sternal support system (gen. praep. GELE 938 M. Pinzari); **D**) labial palpus.

Remarks and conclusion

The microlepidoptera fauna of the South of Italy and especially Basilicata are still relatively scarcely known as also shown by the recent discovery of *Epicallima icterinella* (Mann, 1867) (PINZARI, 2019b). Therefore, the collecting of *Mesophleps ochracella* (Turati, 1926) for the first time in Italy is not a great surprise. It is in fact a circummediterranean species that is known of Spain, France, Greece, Crete and North Africa, and was essentially lacking only in Italy.

From the coastal areas, we expect new surprises: dedicated investigations would be needed, But surprises for the Italian Lepidoptera fauna, we expected from the revision of old published data on records of which the specimens are preserved in museum and private collections. In fact, in view of the revision of *Mesophleps* by LI & SATTLER (2012), the finding of *M. ochracella* shows the need for review of the data recorded on other congeneric species in Italy.

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*M. P.
Dipartimento di Biologia
Università di Roma Tor Vergata
Via della Ricerca Scientifica, 1
I-00133 Roma
ITALIA / *ITALY*
E-mail: manuela.pinzari@uniroma2.it
https://orcid.org/0000-0003-0829-3453

M. P.
Piazza Francesco Morosini, 12
I-00136 Roma
ITALIA / *ITALY*
E-mail: mario.pinzari@uniroma3.it
https://orcid.org/0000-0002-5279-2092

*Autor para la correspondencia / *Corresponding author*

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New taxa of Tortricidae moths from West Kazakhstan (Lepidoptera: Tortricidae)

E. V. Tsvetkov

Abstract

Three new species and one new subspecies of Tortricidae are described from West Kazakhstan (Atyrau and Mangistau Provinces). They are *Phtheochroa suleimana* Tsvetkov, sp. n., *Phtheochroa accurata* Tsvetkov, sp. n., *Eucosma fulvana suncretana* Tsvetkov, ssp. n. and *Eucosma paulorosea* Tsvetkov, sp. n. The adult of male, female and the genitalia of all described taxa are illustrated.
KEY WORDS: Lepidoptera, Tortricidae, new species, Kazakhstan.

Nuevas taxas de Tortricidae del oeste de Kazajstán (Lepidoptera: Tortricidae)

Resumen

Se describen tres nuevas especies y una subespecie de Tortricidae del oeste de Kazajstán (Provincias de Atyrau y Mangystau). Son: *Phtheochroa suleimana* Tsvetkov, sp. n., *Phtheochroa accurata* Tsvetkov, sp. n., *Eucosma fulvana suncretana* Tsvetkov, ssp. n. y *Eucosma paulorosea* Tsvetkov, sp. n. Se ilustran el macho, la hembra y la genitalia de todas las especies descritas.
PALABRAS CLAVA: Lepidoptera, Tortricidae, nuevas especies, Kazajstán.

Introduction

Descriptions in the present paper are based on material collected by the author in West Kazakhstan. Our first expedition to this area was undertaken in May 2016 and the visited localities were along the route Atyrau-Kulsary-Beineu-Shetpe. The habitats in the area are semidesert or steppe saline lands, sandy semideserts, chalk steppes, rocky canyons and rocky mountain places at low altitude (up to 450 m). Formally the territory belongs to Atyrau and Mangistau Provinces of Kazakhstan.

Fluorescent lamp (85 W, 6400 K) was used for attracting to light, some material on the family Tortricidae was collected by net during the evening time.

As a result, two undescribed species, *Phtheochroa* sp. and *Eucosma* sp., were distinguished. Unfortunately, the series consisted of rather worn specimens. Another *Phtheochroa* sp. much resembled *P. sodaliana* (Haworth, 1811) externally but didn't belong to the latter species. Judging by females its status was not certainly clear, but males were missing in the series. Also, a large species of *Eucosma* sp. with light unusual coloration was noticeable among the collected samples. Its population inhabits plateau Akkergeshen and the moth seemed to relate to chalk soil. After more detailed studying it became clear that this population can be referred to a new subspecies of *Eucosma fulvana* (Stephens, 1834).

The second author's expedition to West Kazakhstan was in late April and in the beginning of

May 2019. More fresh specimens of the same leaf-roller moths were collected and males of *Phtheochroa* sp. It came over that this species is undescribed, it is related to *P. sodaliana* and *Phtheochroa reisseri* (Razowski, 1970) and well differs from them by male genitalia. So, three new species and one new subspecies of leaf-roller moths are described below.

***Phtheochroa accurata* Tsvetkov, sp. n.** (figs 1, 2, 7, 9)

Type material: Holotype ♂, KAZAKHSTAN, Mangistau Province, 11 km E of vill. Sarga, 3-V-2016, leg. E. Tsvetkov. Paratypes (4 ♂♂, 3 ♀♀): KAZAKHSTAN, Mangistau Province, 11 km E of vill. Sarga, 3 ♂♂, 3-V-2016, leg. E. Tsvetkov; the same locality, 1 ♂, 2 ♀♀, 5-V-2019, leg. E. Tsvetkov; Atyrau Province, Akkergeshen Plateau, 47º19'14" N, 54º24'14" E, 1 ♀,1-V-2016, leg. E. Tsvetkov. Type material is deposited in the collection of Zoological Institute, St. Petersburg.

Imago (figs 1, 2): Head and body covered by whitish, creamy and olive scales. Legs brown, each segment with white ring distally. Labial palps pointed ahead, nearly 1.7 diameters of eye. Maxillary palps short and stout, club like. Proboscis strongly reduced, very short. Antennae ciliate in both sexes, male cilia slightly longer (1.5 of segment width) than female cilia (nearly a segment width). Female antennae shorter (2/5 of the forewing) than male antennae (1/2). Forewing 5-5.5 mm elongate with costa parallel to inner margin, termen almost straight, apex pointed. Rather variable forewing pattern formed by composition of olive spots (sometimes creamy or brownish). The spots are divided by streaky white lines. Basal area olive with traces of white strigulae. Five spots located along costa in terminal 1/2 of the wing, subterminally located spot (second from the apex) is the largest. Costal strigulae indistinct. Medial fascia dark olive brown varies in shape. It is contrasted by white background on the sides. Subterminal fascia not reaching inner margin, shorter, as an oblong spot which is almost merged with neighboring spots. Dark brown terminal line rangy, often interrupted, formed by merging spots. Fringe white and partly olive brown with variable pattern. Underside of the forewing dark brown with whitish costal area. Several brown spots located in this area in terminal 1/2 of the wing. Hindwing underside and upper side grey, in some cases with lighter whitish basal part. Fringe whitish with contrast grey basal band occupying from 1/3 to 1/4 of fringe width.

Male genitalia (fig. 7): Uncus reverse T-shaped with free stick like distal part which is slightly curved. Socii as very small thin angulate plates. Anal tube short, cup shaped. Tegumen elongate, heavily sclerified along the anterior edge. Cucullus of valvae weakly sclerified with almost parallel edges, widely rounded at apex, densely covered with bristles in ventrocaudal 1/2. Costa relatively wide, heavily sclerified. Dorsal edge of valva with strongly sclerified basal bidentate prominence adjacent to transtilla. Sacculus straight and well sclerified. Its distal part forms convexity of ventrocaudal edge of valva. Transtilla very short (on fig. 7 it is shown separated from valvae), medial part trapezoidal with small central hollow and tiny spines on the edge. Juxta relatively large, nearly semicircular. Vinculum well sclerified, more stout on the sides. Aedeagus pointed distally, not thick with thinner distal half which is evenly curved down. Dorsal side of aedeagus with excavation at distal end occupying 1/3 of the length. Dentate plate is present distally on the left side. Ductus ejaculatorius arises from nearly a middle of aedeagus. One rather thin nail like cornutus in vesica (nearly 2/3 of aedeagus).

Female genitalia (fig. 9): Papillae analis elongate, densely covered by small bristles. Posterior apophyses nearly twice longer than papillae analis and almost equal to anterior apophyses. Posterior apophyses bear large triangular broadenings in their anterior half. Eighth tergum broad, angulate on sides. Anterior edge of the tergum with central hollow. Lateral convex sclerites form distal part of sterigma. Proximal part of sterigma - a plate covering antrum. Posterior edge of this plate with V-shaped hollow. Antrum trapezoidal and well sclerified, flat. Ductus bursae short and wide, slightly tapering. Its sclerotization week and usually heavier on the right side. Corpus bursae small membranous. It's elongated with large bulb located dorsally at ductus base. The bulb is rather variable in shape, it can be conical, spherical or digitate (as on fig. 9) and it bears the base of seminal duct. Posterior part of corpus bursae week easily damaged during dissection.

Diagnosis: *P. accurata* is close to *Phtheochroa amasiana* (Ragonot, 1894) and *Phtheochroa gracillimana* (Rebel, 1910) in genitalia and resembles the last species externally. Exact separation is possible by genitalia structure. Males of both *P. amasiana* and *P. gracillimana* are distinguished from males of the described species by presence of free pointed termination of sacculus and much longer uncus. Also, the edge of medial part of transtilla is convex without hollow. In *P. accurata* it is concave with small hollow dividing two small vanes. Aedeagus much shorter in *P. gracillimana*. In females of *P. amasiana* sterigma lacks V-shaped hollow, large triangular broadenings of posterior apophyses are absent, bursa copulatrix without a bulb on dorsal side. *Phtheochroa cymatodana* (Rebel, 1927) is another species close to *P. accurata* in genitalia. But in this species forewing ground color white and forewing pattern quite different. In male genitalia very short free termination of sacculus present, cornutus less than half of aedeagus in length, uncus narrowing from base to apex, socii larger.

Etymology: The name emphasizes a fine forewing pattern with many small elements.

Biology: The series of *P. accurata* were taken in saline land at the foot of rocky slope. This place represents a terrace at the edge of plateau Ustyurt. Semidesert vegetation such as *Salsola arbusculiformis* Drobow, *Convolvulus fruticosus* Pall., *Athraphaxis spinosa* L., *Caragana grandiflora* M. Bieb., *Artemisia* sp. can be mentioned for the habitat. One male of the described species comes from Akkergeshen plateau, from a habitat with various calcifilic semidesert and steppe vegetation.

***Phtheochroa suleimana* Tsvetkov, sp. n**. (figs 3, 8, 10)

Type material: Holotype ♂, KAZAKHSTAN, Mangistau Province, 10 km NE of vill. Taushchik, 2-V-2019, leg. E. Tsvetkov. Paratypes (1 ♂, 4 ♀♀): KAZAKHSTAN, Mangistau Province, 10 km NE of vill. Taushchik, 1 ♂, 3 ♀♀, 2-V-2019, leg. E. Tsvetkov; Mangistau Province, S env. of spring Akmysh, 1 ♀, 9-V-2016, leg. E. Tsvetkov. Type material is deposited in the collection of Zoological Institute, St. Petersburg.

Imago (fig. 3): Head and thorax in white or light creamy scales. Abdomen and labial palpi covered by whitish and brown scales. Forelegs and midlegs brown: femur in white and brown scales, tibia dark brown with medial and distal white rings, each tarsomere dark brown also with white ring distally. Femur of hindlegs covered by whitish and brown scales, tibia white like most part of tarsus, tarsomeres checkered only dorsally (brown and whitish areas on each segment). Labial palps nearly 1.6-1.7 diameters of eye, pointed ahead, third segment slightly drooping. Maxillary palps extremely small. Proboscis very short. Antennae white from dorsal side, nearly 2/5 of the forewing. Cilia of female antennae shorter (0.5 of flagellomere width) than cilia in males which is nearly equal to flagellomere width. Forewing 5-5.5 mm, triangular, apex rounded, termen straight. Costa insignificantly convex, inner margin convex in basal 1/2. Ground color of the forewing white, black medial and subterminal fasciae very contrast. Basal area white with delicate dark costal streaks forming a variable pattern and two small black spots. A spot at the inner angle and one spot adjacent to costa. The latter spot usually continued with fine black line directed at right angle to inner margin. Sometimes only a part of this line present as a black streak in the center of basal area (as on fig. 3). Medial fascia consists of two black contrast spots and brownish grey framing. Subterminal fascia can be partly dark ash grey, party brownish grey. It is crossed by light line. Area between fasciae ash grey. Also, ash grey angulate spots and fine streaks present adjacent to costa in medial and subterminal parts. Rusty or brown spot near apex. A series of black dots (4-7) along inner margin in medial part. Fringe consists of brown and dark grey scales. Underside of the forewing dark brown and partly black. White areas copying white pattern of the upperside. Hindwing grey densely covered with white rounded spots except for the apical part of the wing. Underside with the same pattern. Two dark grey and two whitish stripes on the fringe.

Male genitalia (fig. 8): Uncus broad and heavy, distal half abruptly curved down almost at right angle. Apical part resembles a duck beak. Large concavity at junction of tegumen and uncus present (seen in lateral view). Socii large, nearly triangular. Inner surface of socii bristly. Tegumen large, elongate. Its posterior margin angulate. Anterior margin with deep V-shaped hollow. Sacculus of valva

well sclerified, almost straight, sharply angled terminally. Cucullus oblong, apex widely rounded. Costa well sclerified. Dorsal edge of valva with strongly sclerified basal bidentate prominence adjacent to transtilla. Transtilla large and heavily sclerified, medial part trapezoidal with tiny central hollow, massive convexities present on sides. Juxta as a heavily sclerified slightly curved plate. Its edge adjacent to vinculum widely rounded, opposite side with shallow hollow and rounded angles on sides. Aedeagus short and thick, spine like sharp distal projection on ventral side. Dorsal side of aedeagus almost entirely membranous, only very short middle part sclerified. Proximal part at nearly 1/5 also membranous. Curved distal sclerified plate present as a protrusion on the right side. Two long nail like cornuti in vesica (nearly 3/4 and 1/2 of aedeagus). The shorter cornutus very thin with small base. The longer cornutus very slightly curved, its base rounded.

Female genitalia (fig. 10): Papillae analis elongate, densely covered by small bristles. Apophyses relatively short, fine without broadenings. Anterior apophyses very short, about 0.18-0.2 mm. Posterior apophyses nearly twice longer and not very much longer than papillae analis. Eighth tergum very short and broad, side protrusions narrow. Anterior edge of the tergum with shallow hollow. Proximal and distal parts of sterigma very broad and short. Heavily sclerified proximal part forming ostium is fused with weakly sclerified anteostial plate which is widely rounded on sides. Bursa copulatrix elongate membranous, fused with very short and rather wide membranous antrum. Right side of bursa bears a bulb posteriorly. Seminal duct arises from ventral side of bursa. Sclerite structure in bursa slightly varies.

Diagnosis: The species is related to *Phtheochroa sodaliana* (Haworth, 1811), *Phtheochroa reisseri* (Razowski, 1970) and *Phtheochroa dodrantaria* (Razowski, 1970), separation from the first two species by external appearance is hardly possible. But differences in genitalia between *P. suleimana* and all compared species are very clear. In male genitalia of *P. suleimana* shape of uncus is characteristic. It is large, heavily sclerified and very broad with abruptly curved down distal part which can't be unbent. Transtilla bears large side convexities, tegumen angulate on sides (in ventral view). Quite different shape of uncus in *P. sodaliana* (slightly bent in proximal 1/2 and much narrower) and in *P. reisseri* (narrower with two short terminal processes). In males of the compared species side convexities of transtilla are absent or insignificant, tegumen not angulate in ventral view. Females differ by sclerite structure in bursa copulatrix. Some similarity *P. suleimana* with *Phtheochroa dodrantaria* should be mentioned. The latter species with lighter subterminal area of the forewing lacking dark spots present in *P. suleimana*. In male genitalia aedeagus of *P. dodrantaria* with one cornutus in vesica (two cornuti in *P. suleimana*), shape of uncus and transtilla quite different.

Etymology: The name comes from Arabic name Suleiman.

Biology: *P. suleimana* is found in two very different habitats: rocky valley of a stream in the Mangistau mountain range and southern calcic slope with saline and calcifilic vegetation (near vill. Taushchik).

Eucosma paulorosea **Tsvetkov, sp. n.** (figs. 4, 11, 12)

Type material: Holotype ♀, KAZAKHSTAN, Mangistau Province, S env. of spring Akmysh, 44º13'13" N, 51º58'51" E, 3-V-2019, leg. E. Tsvetkov. Paratypes (3 ♂♂, 2 ♀♀): KAZAKHSTAN, Mangistau Province, S env. of spring Akmysh, 44º13'02" N, 51º58'26" E, 1 ♂, 9-V-2016, leg. E. Tsvetkov; the same locality, 1 ♀, 10-V-2016, leg. E. Tsvetkov; Mangistau Province, 11 km E of vill. Sarga, terrace of Ustyurt plateau, 2 ♂♂, 3-V-2016, leg. E. Tsvetkov; Mangistau Province, 9 km SW of vill Sai Otes, canyon, 1 ♀, 7-V-2016, leg. E. Tsvetkov. Type material is deposited in the collection of Zoological Institute, St. Petersburg.

Imago (fig. 4): Head and legs grey, thorax covered with mixture of grey and pink scales, abdomen brownish grey. Labial palps nearly 1.6-1.7 diameters of eye, pointed ahead, third segment drooping. Maxillary palps very small, proboscis developed. Antennae relatively short (about 1/3 of the forewing or some longer), cilia very short. Antennae covered with whitish grey scales from dorsal side. Forewing 7-8.5 mm, elongate triangular with rounded tornus. Costa almost straight or very

slightly convex. Costal fold present in males (nearly 1/3 of the forewing). Forewing ground color yellowish ochreous. Fresh specimens of such coloration can be observed in the beginning of flight period. However, imagines quickly lose this coloration and become worn with greyish forewing. Elements of forewing pattern are speculum and costal strigulae. Speculum yellow with remnants of white metallic lines and two black dots very close to termen. Costal strigulae as whitish metallic lines in subapical area. The lines usually interrupted and sometimes unclear. Fringe pink (pink and grey scales). In worn specimens pink scales of the fringe partly lost as a rule. Underside of the forewing dark brown, subapical area whitish with fine dark brown strigulation. Hindwing brown, basal and medial area usually lighter. Fringe light brown. Underside of the hindwing whitish.

Male genitalia (fig. 11): Uncus very small. Socii well sclerified, short digital with narrowing apical part, widely spaced. Gnathos elongate and narrow, as a small rectangular plate with stout membranous termination. Lobes of gnathos well sclerified and narrow. Transtilla membranous. Cucullus of valva short with wide bristly area along ventrocaudal edge. Ventral prominence of cucullus hardly protruding. Neck of valva very broad and rather short, almost free of bristles. Basal part of valva some smaller than cucullus, covered with bristles. Aedeagus small, tapering with thick base and fine distal part. Dorsal side of aedeagus membranous at apex. Vesica with long tubular plate (cornuti not found).

Female genitalia (fig. 12): Papillae analis elongate, covered by small bristles. Posterior apophyses about 1.3-1.4 of papillae analis and some longer than anterior apophyses. Posterior apophyses robust, anterior apophyses gradually narrowing to their ends. Eighth tergum trapezoidal, broadest posteriorly. Postostial plate very short and small. Its margins bear tiny projections: two symmetrically located projections of anterior margin, and three projections of posterior margin. Anteostial plate relatively large, tapering distally with massive proximal part. Anterior margin widely rounded; two vane-like protrusions of posterior margin are enfolding ostium. Ductus bursae membranous. Cingulum nearly cylindrical, irregularly curved, covered by anteostial plate (in ventral view). Bursa copulatrix ovate membranous with two equal signa in posterior part.

Diagnosis: *E. paulorosea* is related to *Eucosma sublucidana* (Kennel, 1901), a species endemic to Spain. Type material of *E. sublucidana* was examined by RAZOWSKI (1971) who described the male. Judging by illustration of male genitalia the new species is close to *E. sublucidana* in shape of valva. In *E. paulorosea* uncus very small, socii widely spaced. While uncus of *E. sublucidana* is much larger, socii closely spaced. *E. paulorosea* can be easily separated from all *Eucosma* species by its peculiar coloration: forewing fringe of *E. paulorosea* is pink (bright pink and grey scales), inner angle of the forewing is decorated with pink scales.

Etymology: “Paulo rosea” means “a little pink” in Latin. The name is associated with pink elements in the forewing pattern.

Biology: *E. paulorosea* inhabits rocky slopes, canyons, stony semidesert places. The species seems to be widely distributed in West Kazakhstan; however, it occurs rather rarely in the habitat. Flight period in late April and early May.

Eucosma fulvana suncretana **Tsvetkov, ssp. n.** (figs. 5, 6, 13, 14)

Type material: Holotype ♂, KAZAKHSTAN, Atyrau Province, Akkergeshen plateau, 47º19’14” N, 54º24’14” E, 22-V-2016, leg. E. Tsvetkov. Paratypes (11 ♂♂, 1 ♀): the same locality, 8 ♂♂, 1 ♀, 22-V-2016, leg. E. Tsvetkov; the same locality, 3 ♂♂, 8-V-2019, leg. E. Tsvetkov. Type material is deposited in the collection of Zoological Institute, St. Petersburg (Russia).

Imago (figs 5, 6): Head, thorax, legs and abdomen white. Labial palps nearly 1.4-1.5 diameters of eye, pointed ahead. Maxillary palps very small, proboscis short. Antennae shortly ciliate, covered by white scales from dorsal side. Forewing 9-11 mm, elongate triangular with rounded apex and tornus. Costa slightly convex or sometimes almost straight, inner margin convex in basal 1/2. Costal fold present in males (nearly 0.4 of the forewing). Forewing ground color whitish grey. Basal area grey or brownish grey except for whitish stripe along costa. This grey area is contrasted from outer

side by whitish medial area, but only in hind 1/2 of the wing where oblique border between areas clearly defined. Subterminal area whitish grey, sometimes with brownish tinge. Two parallel white metallic lines and black dots and streaks form speculum. The inner black pattern of speculum much varies. In some cases, black dots also present in medial area near speculum. Costal strigulae indistinct, pale ochreous, occupy subapical part. Fringe brown from apex to nearly M_2 vein and white in the hind 1/2 of the forewing. Forewing underside dark brown. White costal streak widening from 1/2 of costa to apex, short brown costal strigulations present on the streak. Hindwing light brown, underside whitish with slight brownish tinge and darker subcostal area. Fringe white.

Genitalia (figs 13, 14): No significant differences from the genitalia of nominative subspecies were found.

Diagnosis: The described subspecies is well distinguished from the nominative subspecies by its whitish coloration. In *E. fulvana suncretana* thorax clearly white and lacks reddish or brownish tinge unlike the thorax in *E. fulvana fulvana.* Ground color of the forewing in subspecies *suncretana* contrastingly different, it is whitish grey and not fulvous, reddish or brown like in *E. f. fulvana.* Externally *E. f. suncretana* resembles *Eucosma caliacrana* (Caradja, 1931) which has whitish forewing with pale brown strigulation. But in *E. caliacrana* such strigulation occupies also basal area. Basal area in the forewing of *E. caliacrana* not darker than medial and subterminal areas. In the described subspecies pale ochreous strigulation is mostly in subapical area, basal area much darker than medial and subterminal areas. Male and female genitalia is well distinguished from those of *E. caliacrana*. In males of *E. caliacrana* cucullus of valva shorter and smaller, its ventral prominence hardly defined. In females of *E. caliacrana* posterior edge of anteostial part of sterigma bears two pointed projections on sides, but in *suncretana* anteostial part of sterigma bears widely rounded projections. Light colored species *Eucosma getonia* Razowski, 1972, described from Mongolia, can be mixed with *suncretana*. Easy separation of males is possible as males of *E. getonia* lack costal fold on the forewing. Neck of valva longer in males of *E. getonia*, postostial part of sterigma quite different in females of *E. getonia* and *E. fulvana subcretana. Eucosma halophilana* Budashkin, 2009 and *Eucosma lacteana* (Treitschke, 1835) can be separated by light colored basal area of the forewing. In male genitalia of these species ventral prominence of cucullus much wider, neck of valva longer. In female genitalia anteostial part of sterigma longer and narrower. Light colored *Eucosma metzneriana* (Treitschke, 1830) can be mixed with *suncretana*, especially if the specimens of *E. metzneriana* are worn and dorsal streak on the forewing is undistinguishable. *Eucosma albicosta* Falkovitsh, 1964 from Kazakhstan is characterized by different male and female genitalia structure.

Etymology: *Suncretana* is a fictional two-part word related to the moth habitat. “Sun” - the Sun, “creta” - chalk in Latin.

Biology: *E. fulvana suncretana* inhabits chalk steppe and semidesert areas of plateau Akkergeshen and highly possible also plateau Aktolagai in West Kazakhstan where the vegetation is similar. The hostplant of *E. fulvana suncretana* is probably *Centaurea kazakorum* Iljin as imagines were observed only in places where this plant grows. The butterflies were active in the evening hours, series were attracted to light in the nighttime. Flight period in May.

Systematic remarks: According to AGASSIZ & LANGMAID (2004) *Eucosma hohenwartiana* group of species includes *Eucosma hohenwartiana* ([Denis & Schiffermüller], 1775), *Eucosma fulvana* (Stephens, 1834) and *Eucosma parvulana* (Wilkinson, 1859). The group was revised basing on the differences in ovipositor of females. However, several authors are skeptical of these conclusions as the differences between species were not demonstrated sufficiently. SINEV (2008) treated *E. fulvana* as a synonym of *E. hohenwartiana*. In contrary to this opinion both *E. hohenwartiana* and *E. fulvana* are listed in Nordic-Baltic Checklist of Lepidoptera (AARVIK *et al.*, 2017). So, the status of the discussed taxa is disputable. Having studied female ovipositor in *E. fulvana suncretana* I found short posterior apophyses nearly equal to papillae analis. This corresponds to *E. fulvana* sensu Agassiz & Langmaid, 2004. So, *E. suncretana* is described here as a subspecies of *E. fulvana*.

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E. V. T.
Mechnikova, 3-1-30
195271, St. Petersburg
RUSIA / *RUSSIA*
E-mail: tsvcountcal@rambler.ru
https://orcid.org/0000-0003-0614-9810

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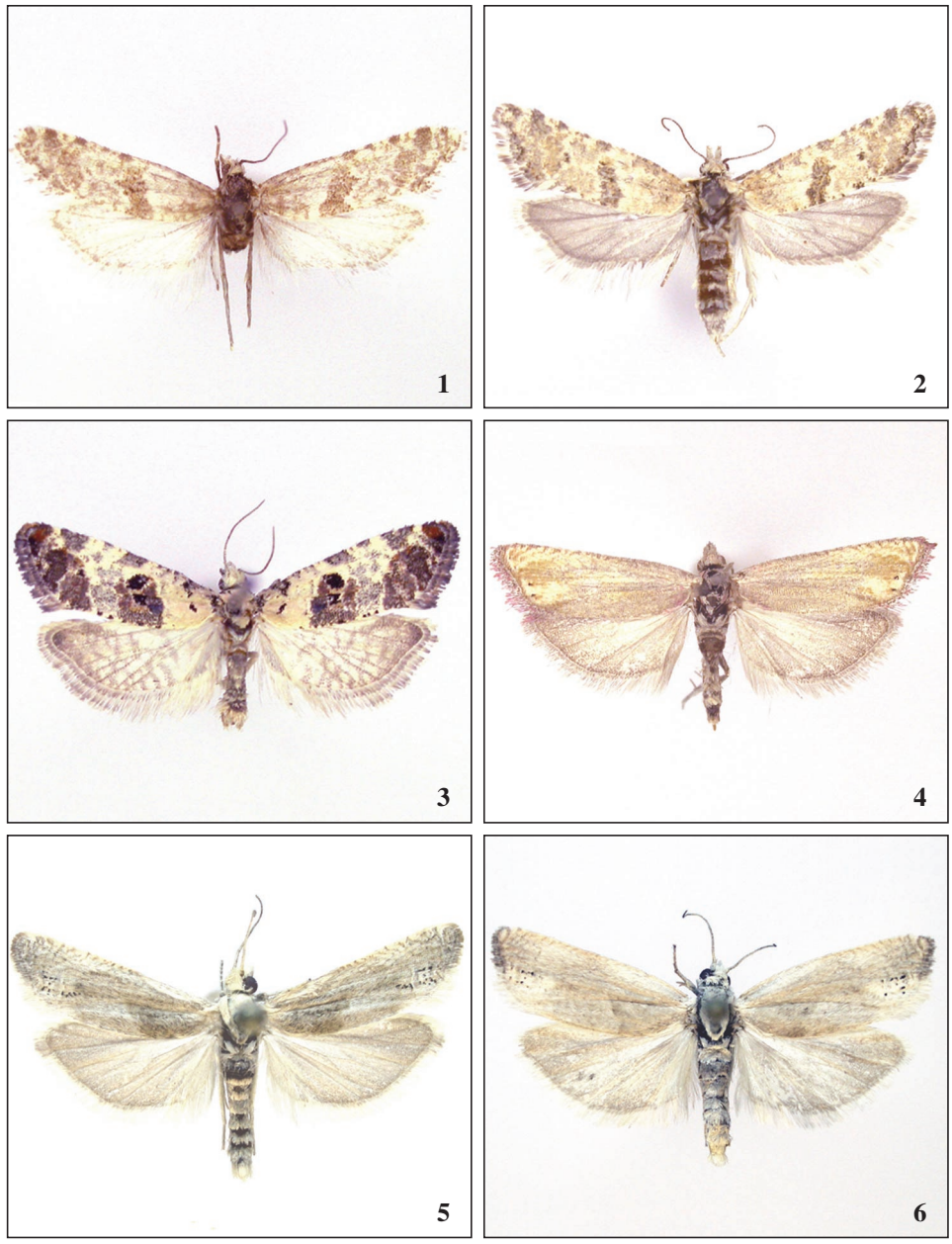
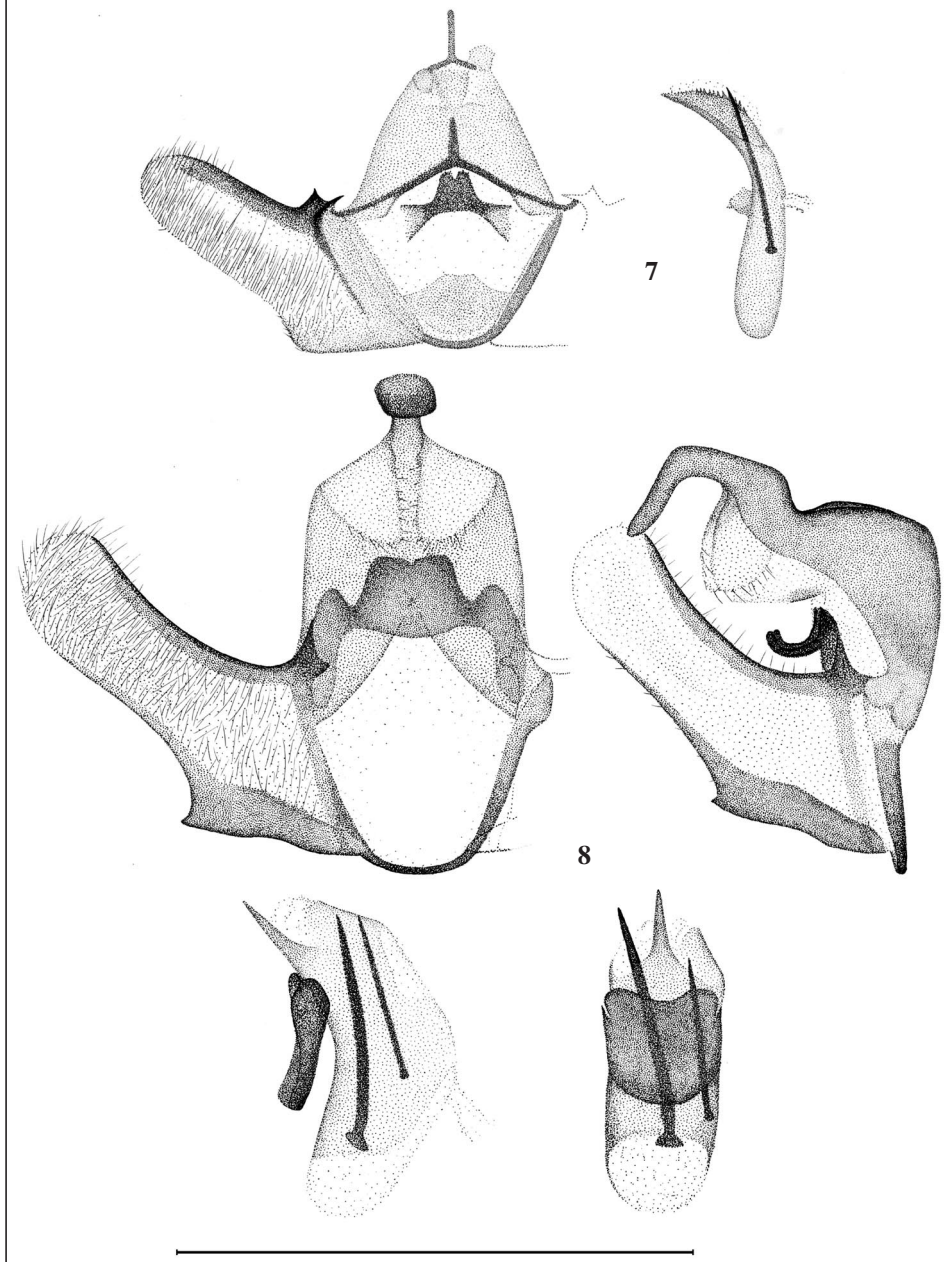
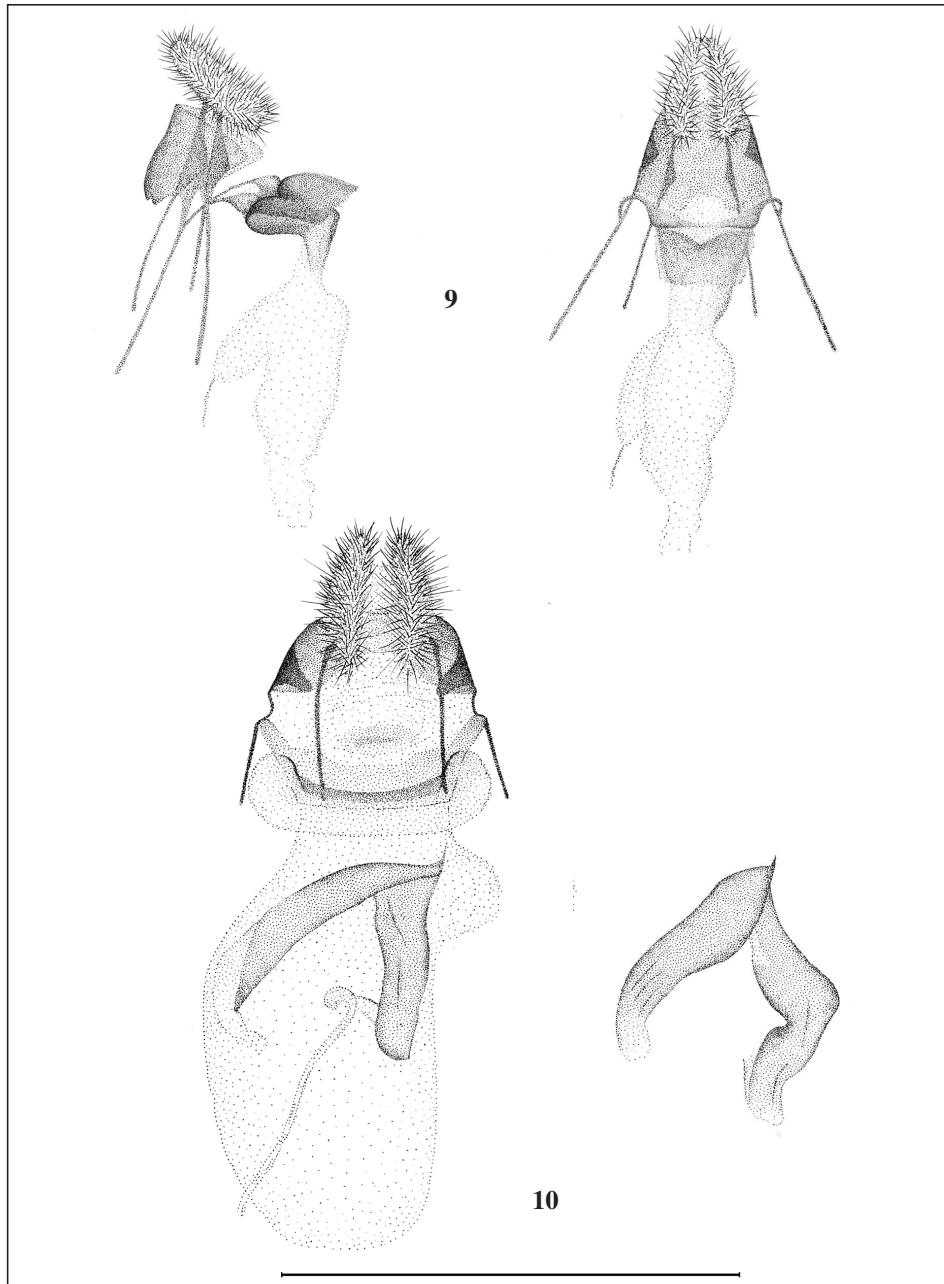


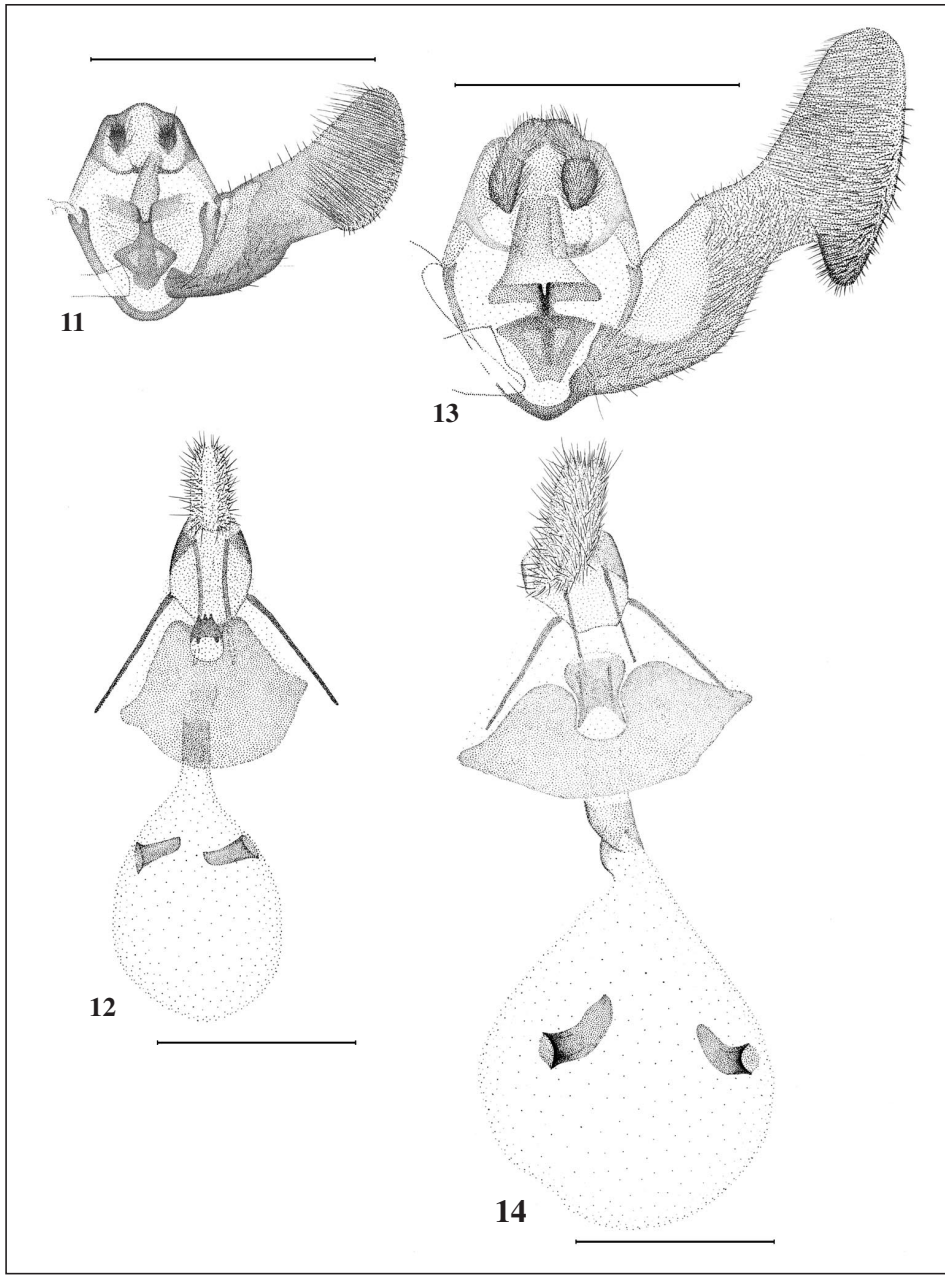
Figs. 1-6.– Type specimens of the described leaf-roller moths. **1.** *Phtheochroa accurata* Tsvetkov, sp. n., holotype; **2.** *Phtheochroa accurata* Tsvetkov, sp. n., paratype, ♀; **3.** *Phtheochroa suleimana* Tsvetkov, sp. n., holotype; **4.** *Eucosma paulorosea* Tsvetkov, sp. n., holotype; **5.** *Eucosma fulvana suncretana* Tsvetkov, ssp. n. (holotype); **6.** *Eucosma fulvana suncretana* Tsvetkov, ssp. n.. paratype, ♀.



Figs. 7-8.– Male genitalia of *Phtheochroa* sp. (scale 1 mm). **7.** *Phtheochroa accurata* Tsvetkov, sp. n., transtilla is shown separated from valvae; **8.** *Phtheochroa suleimana* Tsvetkov, sp. n.



Figs. 9-10.– Female genitalia of *Phtheochroa* sp. (scale 1 mm). **9.** *Phtheochroa accurata* Tsvetkov, sp. n.; **10.** *Phtheochroa suleimana* Tsvetkov, sp. n., variation of sclerite on the right image.



Figs. 11-14.– Genitalia of *Eucosma* sp. (scale 1 mm). **11.** *Eucosma paulorosea* Tsvetkov, sp. n., male genitalia; **12.** *Eucosma paulorosea* Tsvetkov, sp. n., female genitalia; **13.** *Eucosma fulvana suncretana* Tsvetkov, ssp. n., male genitalia; **14.** *Eucosma fulvana suncretana* Tsvetkov, ssp. n., female genitalia.

REVISION DE PUBLICACIONES
BOOK REVIEWS

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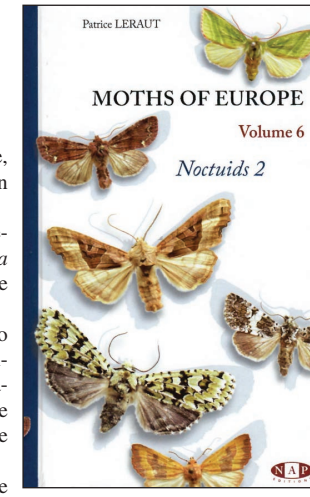

Tenemos en nuestras manos el sexto volumen de la serie Moths of Europe, que trata de la segunda parte de los Noctuidae, con diez tribus, mientras que en los Nolidae tenemos dos subfamilias.

En este volumen se describe una especie nueva *Mniotype adjaciensis* Leraut, 2019 y cuatro nuevas subespecies *Dasypolia templi rougeoti*, *Hadena compta cyrnea*, *H. compta atlasica* y *H. caesia luqueti*, estableciéndose siete nuevas sinonimias

Después de una introducción y generalidades, se pasa al grueso del trabajo donde se estudian las especies consideradas en el libro. A continuación nos encontramos con una parte muy ilustrativa, donde se indican los lugares más característicos y las especies más singulares que allí se pueden encontrar, como se pueden capturar, procedimientos de colección, preparación e identificación de los especímenes, sobre la nomenclatura y la conservación de los Lepidoptera.

De cada especie considerada, se dan los datos morfológicos del macho y de la hembra, las posibles variaciones, se comentan las especies próximas, la biología, datos de vuelo y unos comentarios adicionales, todo ello acompañado en algunas ocasiones de fotografías de la genitalia del macho y de la hembra, para facilitar su identificación y de un mapa marcando en negro, la zona de distribución. Todos los adultos están fotografiados a lo largo de 127 planchas a todo color, que muestran todas las especies consideradas que se encuentran en Europa y en el norte de África, incluidas las de un elevado número de material tipo y también cuando ha sido necesario, se han ilustrado especies procedentes del Próximo Oriente y de Asia.

Acaba la obra con once planchas a todo color de la genitalia de machos y hembras de algunas de las especies consideradas, así como de un índice que abarca los dos volúmenes.

No podemos terminar estas líneas, sin felicitar al autor, nuestro estimado colega Patrice Leraut por un trabajo bien ejecutado, si bien lamentamos, tanto en este volumen como en el anterior, que no se pusieran fotografías la genitalia de casi todas las especies. Igualmente felicitamos a la Editorial, por un trabajo bien realizado y la acertada idea de presentar el libro en dos idiomas en inglés y en francés, lo que sin duda le dará una mayor difusión, por lo que lo recomendamos abiertamente a todos los interesados en el mundo de los Noctuoidea, que no debería de faltar en ninguna biblioteca especializada o general.

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A. Vives Moreno
E-mail: avives1954@outlook.es
https://orcid.org/0000-0003-3772-2747

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Primeira citação de *Cydalima perspectalis* (Walker, 1859) para a ilha de São Miguel, Açores (Portugal) (Lepidoptera: Crambidae)

V. Vieira

Resumo

A traça-do-buxo *Cydalima perspectalis* (Walker, 1859) é citada pela primeira vez para a ilha de São Miguel, arquipélago dos Açores. É uma espécie originária da Ásia Oriental, invasora, que causa danos graves em diferentes plantas ornamentais do género *Buxus* L. na Europa. Também, são apresentadas algumas notas sobre a distribuição e ecologia desta espécie.
PALAVRAS CHAVE: Lepidoptera, Crambidae, Spilomelinae, *Cydalima perspectalis*, ilhas, Açores, Portugal.

First record of *Cydalima perspectalis* (Walker, 1859) from São Miguel island, Azores (Portugal) (Lepidoptera: Crambidae)

Abstract

The box tree moth *Cydalima perspectalis* (Walker, 1859) is recorded for the first time in São Miguel island in the Azores archipelago. It is an invasive species from Eastern Asia that causes severe damages to different species of ornamental plants of the genus *Buxus* L. in Europe. Notes on worldwide distribution and ecology of this species are provided.
KEYWORDS: Lepidoptera, Crambidae, Spilomelinae, *Cydalima perspectalis*, islands, Azores, Portugal.

Primera cita de *Cydalima perspectalis* (Walker, 1859) para la isla de São Miguel, Açores (Portugal) (Lepidoptera: Crambidae)

Resumen

La polilla del boj *Cydalima perspectalis* (Walker, 1859) se cita por primera vez para la isla de São Miguel, archipiélago de las Azores. Es una especie invasora en el este de Asia que está causando graves daños en distintas plantas ornamentales del género *Buxus* L. en Europa. Además, se presentan algunas notas acerca de la distribución global y ecología de la especie.
PALABRAS CLAVE: Lepidoptera, Crambidae, Spilomelinae, *Cydalima perspectalis*, islas, Azores, Portugal.

Introduction

A traça-do-buxo *Cydalima perspectalis* (Walker, 1859) pertence à família Crambidae e subfamília Spilomelinae. Originalmente descrita por WALKER (1859) como *Phakellura perspectalis*, foi incluída por vários autores em diversos géneros, nomeadamente *Phakellura* Guilding, 1830, *Palpita* Hubner, [1808], *Diaphania* Hubner, [1818], *Glyphodes* Guenee, 1854 e *Neoglyphodes* Streltzov, 2008; os trabalhos de filogenia e nomenclatura de MALLY & NUSS (2010) permitiram validá-la como pertencendo ao género *Cydalima* Lederer, 1863 (MALLY & NUSS, 2010; VIVES MORENO, 2014; PLANT *et al*., 2019).

A traça-do-buxo é uma espécie invasora, originária da Ásia Oriental (nativa da China e Coreia), que foi introduzida na Alemanha em 2007 (KRÜGER, 2008), provavelmente por via da introdução de plantas de buxo infestadas com larvas, encontrando-se desde então em expansão na Europa (PLANT *et al*., 2019). Atualmente, está registada para 40 países (EPPO, 2019), desde o Oriente à Europa Ocidental, passando por países da Europa de Leste e da Europa Central. É considerada como residente no Reino Unido (Inglaterra, Escócia, Irlanda do Norte) e na Península Ibérica, incluindo Espanha e Portugal. O primeiro registo na ilha mediterrânica de Malta remonta a 2018 (AGIUS, 2018). No continente Americano está circunscrita ao Canadá (GÓMEZ-UNDIANO *et al*., 2018; YUKICH, 2018; EPPO, 2019).

Em Portugal, segundo o Serviço Nacional Avisos Agrícolas da Estação de Avisos de Entre Douro e Minho (circular nº 11, de 5/7/2017), *C. perspectalis* foi detetada pela primeira vez em 2016 no Norte, nomeadamente, em Caminha, Vila Nova de Cerveira, Ponte de Lima, Santo Tirso, estando a expandir-se para outras regiões (SNAA, 2017). Em 8-XI-2018, já era referida como «nova praga ameaça sebes de buxo na região de Sintra», sendo então objeto de uma sessão de esclarecimento, promovida pela PARQUES DE SINTRA (2018).

Os adultos de *C. perspectalis* têm uma envergadura de 36-44 mm e, segundo MALLY & NUSS (2010), apresentam três hábitos distintos: o fenótipo mais comum tem as asas brancas hialinas com as extremidades das asas e do corpo ornadas com uma franja castanha e uma característica mancha branca em forma de lúnula na célula discoidal das asas anteriores; uma variante tem também uma faixa castanha na borda inferior das asas anteriores, a qual é branca na forma típica; uma forma melânica completamente castanha, conservando visível a mancha branca nas asas anteriores, sendo o fenótipo mais raro na natureza. Os dois sexos são semelhantes, distinguindo-se os machos pela extremidade do abdómen castanho, que é mais distendido e possui a genitália externa coberta de um tufo suplementar de pelos.

Os ovos são redondos, achatados, translúcidos e de cor amarelada, sobrepostos na face inferior da folha como escamas de peixe (BRUA, 2013). Cada postura pode ter entre 5-20 ovos (LEUTHARDT & BAUR, 2013).

As larvas do último estado larvar são grandes, atingindo 35-40 mm de comprimento, têm coloração geral verde-clara, corpo estriado longitudinalmente de verde escuro, linhas negras com pontos esbranquiçados, sedas no corpo, três pares de patas torácicas amarelas e cinco pares abdominais e cabeça de cor preta brilhante (BRUA, 2013).

As pupas medem até 21 mm de comprimento, são de cor verde-claro e amarelo-claro, apresentando quatro linhas castanho-escuras, separadas por linhas claras; a linha dorsal é de cor castanha-alaranjada (BRUA, 2013).

A traça-do-buxo tem hábitos noturnos, sendo atraída pela luz (e.g. iluminação pública). Durante o dia, encontra-se inativa e escondida, mas podendo ser observada em repouso nos muros e sobre a planta hospedeira. A larva também tem atividade noturna, pelo que é mais difícil de observar durante o dia. A larva passa por seis a sete mudas e entra em diapausa obrigatória entre 5-6 semanas (NACAMBO *et al.*, 2013). A pupação ocorre nas folhas da planta hospedeira.

A traça-do-buxo origina várias gerações por ano. Na Inglaterra, os adultos voam entre abril e novembro, ocorrendo uma sobreposição de várias gerações (PLANT *et al*., 2019). Na Ásia, pode ter três ou quatro gerações anuais, originando pelo menos duas gerações nas regiões climaticamente favoráveis ao seu desenvolvimento (NACAMBO *et al.*, 2013; STRACHINIS *et al*., 2015). Em França, ocorrem duas a três gerações por ano (BRUA, 2013).

A traça-do-buxo é uma praga invasora que tem causado danos graves em diversas plantas do género *Buxus* L. nas florestas naturais de buxo e nas estruturas de buxo de notáveis jardins dos países do Leste e do Centro da Europa (GÓMEZ-UNDIANO *et al*., 2018; EPPO, 2019; PLANT *et al*., 2019). Segundo a literatura consultada, várias espécies de plantas podem fazer parte da alimentação da traça-do-buxo, a saber: *Buxus sempervirens* L., *B. microphylla* Sieb. & Zucc., *B. sinica* Rehhder & E. H., *B. balearica* Lam., *Euonymus alatus* (Thunb.) Siebold. (BRUA, 2013), *Euonymus japonicus* Thunb., *Ilex purpurea* Hassk. (MARUYAMA, 1993) e *Murraya paniculata* (L.) Jack (WANG, 2008). Também, não se exclui a

possibilidade dela se adaptar às plantas europeias, tais como *Ilex aquifolium* L. e *Euonymus europaeus* L. (LEPIFORUM, 2019).

Resultados e discussão

Na ilha de São Miguel, arquipélago dos Açores, o autor capturou uma fêmea adulta da traça-do-buxo *Cydalima perspectalis* (Walker, 1859), da forma branca comum, no dia 23-IX-2019, pelas 10:00 horas (fotos da Figs. 1-2), encontrando-se em repouso no teto branco de um edifício da Universidade dos Açores, em Ponta Delgada (coordenadas UTM: 37.746721; -25.662041). Um segundo adulto totalmente castanho, da forma melânica (foto da Figs. 1-3), foi observado no dia 25-IX-2019, pelas 14:30 horas, no jardim da mesma Universidade (coordenadas UTM: 37.745517; -25.663386), pousado sobre o buxo *Buxus sempervirens* L. (Buxaceae) (foto da Figs. 1-4).

Figs. 1-4.– Traça-do-buxo *Cydalima perspectalis* (Walker, 1859), Ponta Delgada, São Miguel, Açores. Adulto normal capturado em 24-IX-2019: **1.** Vista em posição de repouso; **2.** Vista em posição ventral. **3.** Forma melânica observada em 25-IX-2019, em posição de repouso. 4. Buxo *Buxus sempervirens* L. (Buxaceae).

A fêmea capturada pelo autor media 40 mm de envergadura e, na ausência de alimento, morreu ao fim de três dias. No entanto, é desconhecido se a fêmea fez qualquer postura na natureza antes da sua captura, e se haverá lugar a uma população fundadora na ilha de São Miguel. O espécime melânico foi fotografado pelo autor e ficou em liberdade.

Trata-se do primeiro registo de *C. perspectalis* para a ilha de São Miguel (Açores), bem como para os restantes arquipélagos da Macaronésia, segundo a literatura consultada (e.g., BÁEZ & MARTÍN, 2004; AGUIAR & KARSHOLT, 2008; MALLY & NUSS, 2010; VIEIRA & KARSHOLT, 2010; VIVES MORENO, 2014; REGO *et al*., 2015; GARCÍA-BARROS *et al*., 2015; GÓMEZ-UNDIANO *et al*., 2018; BORGES *et al*., 2018; PÉREZ SANTA-RITA *et al*., 2018; EPPO, 2019; PLANT *et al*., 2019).

A origem destes dois espécimes de *C. perspectalis* é desconhecida. Provavelmente, é originária da Europa Ocidental, onde já se encontra presente durante todo o ano (GARCÍA-BARROS *et al*., 2015; GÓMEZ-UNDIANO *et al*., 2018; AGIUS, 2018; EPPO, 2019; PLANT *et al*., 2019), tal como previa o modelo climático elaborado por NACAMBO *et al*. (2013) em que a traça-do-buxo tem capacidade para se dispersar e estabelecer com sucesso na maior parte da Europa (especialmente no Sul), exceto na maioria dos países da Fenoscândia e a Escócia. Além disso, a sua propagação na Europa é vista principalmente como o resultado do comércio de plantas ornamentais do género *Buxus* (LEUTHARDT & BAUR, 2013; PLANT *et al*., 2019).

A dispersão dos indivíduos pode ser feita voando ativamente, ou sendo transportados passivamente por ventos ou correntes de ar sazonais favoráveis, possivelmente ao lado de outros animais, barcos e/ou aviões. Na literatura, existem alguns exemplos de outras espécies de Lepidoptera que certamente alcançaram as ilhas Açorianas por migração, transportadas por correntes de vento favoráveis, nomeadamente, as espécies noturnas *Pseudaletia unipuncta* (Haworth, 1809) (VIEIRA *et al*., 2003), *Ophiusa tirhaca* (Cramer, 1977) (VIEIRA, 2001) e *Utetheisa pulchella* (Linnaeus, 1758) (VIEIRA, 2012) e as espécies diurnas *Danaus plexippus* (Linnaeus, 1758) (NEVES *et al*., 2001), *Hypolimnas misippus* (Linnaeus, 1764) (TENNENT & RUSSEL, 2015) e *Vanessa virginiensis* (Drury, 1773) (VIEIRA, 2017). A libélula migrante *Pantala flavescens* (Fabricius, 1798) (Odonata: Libellulidae) também foi registada pela primeira vez na ilha de São Miguel em 02-XI-2014 (VIEIRA & CORDERO-RIVERA, 2015).

Neste contexto, sob condições de temperatura e ventos favoráveis (e.g., no dia 23, a temperatura média era de 22º C e o vento sudoeste moderado de 20/40 km/h, com rajadas até 50 km/h, rodando para noroeste e tornando-se fraco a bonançoso - 05/20 km/h), é expectável o aparecimento de adultos errantes de *C. perspectalis* nas ilhas açorianas, vindo provavelmente da Europa continental, uma vez que eles possuem uma grande capacidade de dispersão (e. g., NACAMBO *et al*., 2013; PLANT *et al*., 2019).

Porém, o estabelecimento de uma população residente é mais provável como sendo a consequência da importação acidental de estados do desenvolvimento pré-imaginais (ovo, larva e pupa) associados à sua planta hospedeira preferencial, *Buxus sempervirens*. Este arbusto, originário da região Mediterrânica, é considerado nativo e raro no Norte de Portugal continental e plantado como arbusto de sebe em todo o país; o plantio é comercializado nos Açores aonde se encontra em vários jardins históricos e sebes, estando naturalmente distribuído pelas ilhas das Flores, Faial, São Jorge, Terceira, São Miguel e Santa Maria (ELIAS & SILVA, 2019).

Segundo o SNAA (2017), em Portugal ainda não estão homologados produtos para o controlo da traça-do-buxo, mas têm-se revelado eficazes os bioinsecticidas à base de *Bacillus thuringiensis* Berliner, 1915, nemátodes entomopatogénicos e piretroides naturais extraídos de *Crysanthemun* sp., bem como os inseticidas à base de Cypermetrina, Deltametrina, entre outros.

Finalmente, visando a despistagem de uma eventual população pioneira de *C. perspectalis* nas ilhas dos Açores, num primeiro momento, recomenda-se a observação direta de ovos, larvas e pupas que poderão estar associados às plantas hospedeiras, bem como a amostragem indireta por via do uso de armadilhas luminosas e de feromona, a instalar em parques, jardins e sebes, preferencialmente junto do buxo.

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V. V.
cE3c/GBA-Centre for Ecology
Evolution and Environmental Changes
Azorean Biodiversity Group
Universidade dos Açores
Departamento de Biologia/FCT
Rua da Mãe de Deus, 13A
PT-9500-321 Ponta Delgada (Açores)
PORTUGAL / *PORTUGAL*
E-mail: virgilio.ff.vieira@uac.pt
https://orcid.org/0000-0002-3638-1795

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Taxonomic notes on Portuguese Microlepidoptera II. *Cochylimorpha punctiferana* (Ragonot, 1881) stat. rev., a neglected Portuguese species (Lepidoptera: Tortricidae)

M. F. V. Corley & S. Ferreira

Abstract

The endemic Portuguese *Cochylimorpha punctiferana* (Ragonot, 1881) is resurrected from synonymy with *C. discopunctana* (Eversmann, 1844) based on clear differences in female genitalia and DNA barcode. A neotype is designated.
KEY WORDS: Lepidoptera, Tortricidae, synonymy reversed, *Cochylimorpha*, DNA barcoding, Portugal.

Notas taxonómicas sobre Microlepidoptera de Portugal II. ***Cochylimorpha punctiferana*** **(Ragonot, 1881) stat. rev., uma espécie negligenciada (Lepidoptera: Tortricidae)**

Resumo

O endemismo português *Cochylimorpha punctiferana* (Ragonot, 1881) é removido da sinonímia com *C. discopunctana* (Eversmann, 1844) com base em marcadas diferenças tanto na genitália feminina, como no DNA barcode. Um neotipo é designado.
PALAVRAS CHAVE: Lepidoptera, Tortricidae, reversão de sinonímia, *Cochylimorpha*, DNA barcoding, Portugal.

Notas taxonómicas sobre Microlepidoptera de Portugal II. ***Cochylimorpha punctiferana*** **(Ragonot, 1881) stat. rev., una especie descuidada (Lepidoptera: Tortricidae)**

Resumen

El endemismo portugués *Cochylimorpha punctiferana* (Ragonot, 1881) es sacado de la sinonímia con *C. discopunctana* (Eversmann, 1844) con base a las diferencias tanto en la genitalia femenina, como en el código de barras ADN. Se designa un neotipo.
PALABRAS CLAVE: Lepidoptera, Tortricidae, sinonimia removida, *Cochylimorpha*, código de barras ADN, Portugal.

Introduction

This is the second in a series of papers on Portuguese Microlepidoptera covering various taxonomic topics. In this paper *Cochylimorpha punctiferana* (Ragonot, 1881) is reinstated as a good species. *Cochylis punctiferana* Ragonot, 1881 was described from a single specimen from Bragança in

north-east Portugal collected by Manuel d'Oliveira (RAGONOT, 1881). It has since been placed under a succession of generic names: *Euxanthis* Hübner, [1825], *Stenodes* Guenée 1845 and is currently in *Cochylimorpha* Razowski, 1959. The species was illustrated in colour by KENNEL (1913) next to a figure of *Euxanthis discopunctana* (Eversmann, 1844) from Russia.

The two moths appear similar but not quite identical. In the text, Kennel places *punctiferana* in synonymy with *discopunctana*. RAZOWSKI (1970) followed Kennel in placing *punctiferana* as a synonym of *discopunctana*, adding that he suspected the type was lost. In 2000 Martin Corley looked for the type specimen among Ragonot's types in MNHN, but was unable to find it. Kennel's treatment of *punctiferana* has been followed in all relevant works. Only CORLEY (2015a) questioned it on the grounds that it was based on external appearance only, without examination of genitalia. Martin Corley's copy of KENNEL (1908-1921) has a pencilled note by T. Bainbrigge-Fletcher, a previous owner of the copy, that "punctiferana seems distinct species!". CORLEY (2015b) included it as a valid species in the Portuguese list with the intention of raising awareness of the taxon, but without providing positive evidence that it was a good species. In 2016 a male specimen was collected and in 2017, three females were collected in eastern Portugal and DNA barcodes were obtained from the male and one female. Recently a DNA barcode of *C. discopunctana* (from Russia, BOLD code: LEALT864-16) has become available and shows above 8.5% divergence from the Portuguese specimens. Together with differences in the female genitalia this is convincing evidence that *C. punctiferana* is a valid species clearly different from *C. discopunctana*. It is redescribed below. Since the original specimen described by Ragonot is apparently lost, a neotype is designated in order to stabilise the nomenclature in the future.

Abbreviations

INV	Reference number for invertebrate sample in InBIO Barcoding Initiative, Portugal
MNHN	Muséum National d'Histoire Naturelle, Paris, France
NHMUK	The Natural History Museum, London, United Kingdom

Methods

Genitalia were dissected using standard techniques (ROBINSON, 1976).

DNA barcodes were obtained following the protocol described in CORLEY *et al*. (2019).

Cochylimorpha punctiferana (Ragonot, 1881), **bona sp**.

Material examined: 1 ♂, PORTUGAL, Trás-os-Montes, Macedo de Cavaleiros, Vale da Porca, 24-IV-2016, J. Nunes, C. Silva and E. Jesus, INV00582: BOLD code: IBILP 1562-19. Neotype female, PORTUGAL, Beira Baixa, Idanha-a-Nova, Segura, 30-III-2017, Corley, Ferreira and Mata, gen. prep. B. Goodey 5185, INV04209: BOLD code: IBILP 1563-19, to be placed in NHMUK; 2 ♀♀ with same data as neotype, one with gen. prep. 5186, in coll. M. Corley.

Description (taken, with minor modifications, from RAGONOT, 1881): (Fig. 1). Wingspan 12.5-13.5 mm. Forewings much suffused with brownish-grey, leaving but little of the whitish ground colour. The base, a rather broad fascia, which begins on the costa nearly in the middle, going straight down to the median vein, then slanting towards the base and ending straight on the inner margin from the dorsal vein, and a large triangular spot on the dorsal margin before the anal angle, are all dark greyish brown. Between the fascia and the spot on the dorsal margin is a narrow white space. At the end of the median vein there is a very distinct round blackish dot surrounded with whitish; above on the costa is a small brown spot, beyond which there are two others forming an arc, below which there is a pale brownish cloud parallel with the terminal margin. Before the apex is another small brown spot, and the fringes, which are white, are distinctly chequered above and beneath with large brownish spots at the base and extremity. The underside is blackish brown, spotted with dark brown on the whitish costa.

The hindwings are dark brownish grey above and lighter below, the fringes white.

In the Segura specimens the brown coloration mentioned by Ragonot is distinctly tinged olive. Ragonot gives the wingspan as 7 mm, clearly an error.

Male. The only known male is apparently lost. In the photo (fig. 2) it has the chequered fringes rather less distinct than in the females. Male genitalia are not available for study.

Female genitalia (Figs 3, 4). Tergite VIII and sterigma heavily sclerotised; colliculum with narrow lateral sclerites; ductus bursae, short, as wide as long, lightly sclerotised but without internal sclerite; corpus bursae shortly ellipsoid, spiculate in anterior three-quarters, without sclerite.

Diagnosis: *C. punctiferana* is characterised by the blackish dot in the midline of forewing at two-thirds and the roughly triangular spot on the dorsal margin near the tornus, together with the chequered fringe. Similar species are *C. discopunctana*, *C. discolorana* (Kennel, 1899), *C. fuscimacula* (Falkovitsh, 1963) and *C. obliquana* (Eversmann, 1844) which all have the dot at two-thirds variously developed, but none shows the combination of the large triangular spot near tornus and chequered fringes. RAGONOT (1881) mentions *Aethes languidana* (Mann, 1855) (as *reversana* Staudinger, 1859) as similar, but this lacks the blackish dot. In the female genitalia none of these species has the short wide ductus bursae of *punctiferana* and all have a sclerite of greater or lesser size in ductus bursae or corpus bursae or both. These species are all figured by RAZOWSKI (2002, 2009).

Biology: The Segura specimens were collected in fresh condition on 31 March; the male from Macedo de Cavaleiros was collected on 24 April. The date of collection of the original specimen from Bragança was not given. The Segura locality is at the foot of a steep slope with abundant and varied wildflowers, close to a river. Where known, *Cochylimorpha* larvae are internal feeders in flower- and seed-heads, stems or roots of Asteraceae or rarely Dipsacaceae, so it is probable that this is also the case with *punctiferana*.

Distribution: Endemic to Portugal, being known from just three localities in the east of the country, although the precise location of the original specimen is not known, since Bragança is a large district. The site could possibly have been at some distance from the city.

Remarks

The male genitalia of *C. punctiferana* remain unknown, as the specimen from Macedo de Cavaleiros has been lost. At Segura the site is on the west bank of the Ribeiro de Santa Marina, a few hundred metres from its confluence with the Rio Erges, which forms the border between Portugal and Spain, so *C. punctiferana* is likely to be present in the latter country.

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* M. F. V. C.
Pucketty Farm Cottage
Faringdon
GB-Oxfordshire SN7 8JP
GRAN BRETAÑA / *GREAT BRITAIN*
E-mail: martin.corley@btinternet.com
https://orcid.org/0000-0003-4240-8007

y / *and*

CIBIO / InBIO
Centro de Investigação em Biodiversidade e Recursos Genéticos
Universidade do Porto
Campus Agrário de Vairão
P-4485-661 Vairão
PORTUGAL / *PORTUGAL*

S. F.
CIBIO / InBIO
Centro de Investigação em Biodiversidade e Recursos Genéticos
Universidade do Porto
Campus Agrário de Vairão
P-4485-661 Vairão
PORTUGAL / *PORTUGAL*
E-mail: hiporame@gmail.com
https://orcid.org/0000-0002-6884-3966

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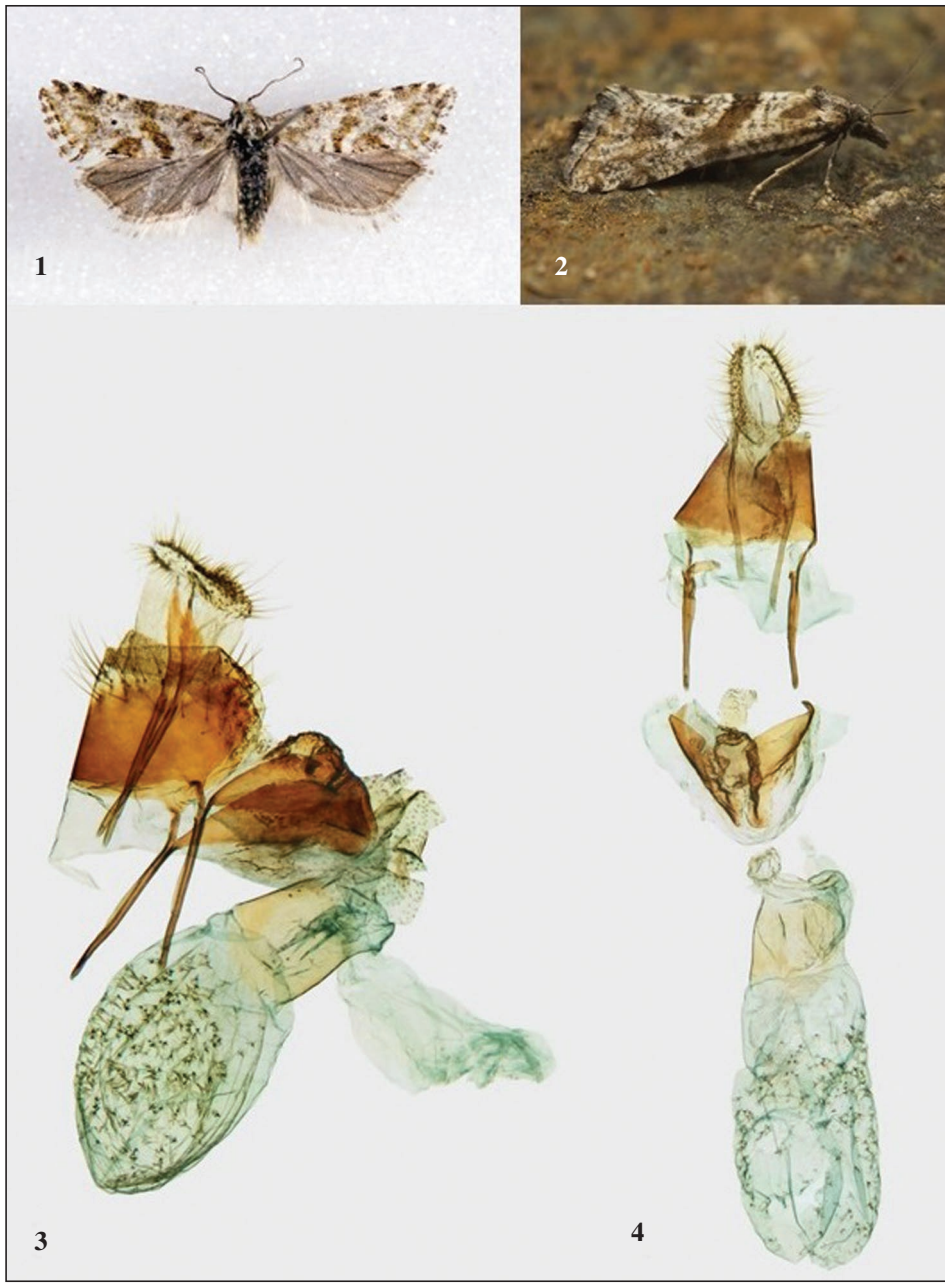

Figs. 1-4.– 1. *Cochylimorpha punctiferana* (Rag.), neotype female, Segura, 31-III-2017. **2.** *Cochylimorpha punctiferana* (Rag.), male, Macedo de Cavaleiros, 24-IV-2016 (J. Nunes). **3.** Female genitalia, lateral view, Segura (gen. prep. 5185). **4.** Female genitalia, ventral view, Segura (gen. prep. 5186).

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Contribución al conocimiento de los Lepidoptera de la cuenca de río Frío, Santander, Colombia (Lepidoptera: Papilionoidea)

A. Villalobos-Moreno & J. A. Salazar

Resumen

Se realizaron capturas de Lepidoptera (Papilionoidea) dentro del proyecto de Caracterización de la Entomofauna Silvestre de la cuenca de río Frío, ubicada en el nororiente de los Andes colombianos en el departamento de Santander. Se analizaron los datos de colecta de seis localidades dentro de la cuenca de río Frío, cinco sitios formaban parte del proyecto de Caracterización y uno más, un trabajo de grado realizado en el Jardín Botánico Eloy Valenzuela. Se colectaron 660 ejemplares pertenecientes a 164 especies de las familias Hesperiidae, Papilionidae, Pieridae, Lycaenidae, Riodinidae y Nymphalidae. La familia Nymphalidae fue la mayor abundancia (489) y riqueza de especies (99). La Finca La Esperanza fue el sitio con mayor abundancia (231) y mayor riqueza de especies (75). El análisis de la calidad del inventario indicó una riqueza potencial de 259,10 especies, una pendiente de la curva de 0,48, una proporción de especies observadas del 62,91% y un esfuerzo de muestreo del 99,91%. La comparación de los inventarios entre sitios de muestreo permitió observar cierta similitud entre La Mariana, La Judía y El Diviso, posiblemente por la cercanía altitudinal y geográfica. Mientras que La Nevera presentó la mayor diferencia con todos los sitios de muestreo, lo cual se puede explicar por la influencia de las zonas de páramo.
PALABRAS CLAVE: Lepidoptera, Papilionoidea, abundancia y riqueza, análisis de similitud, Colombia.

Contribution to the knowledge of Lepidoptera of Frio river basin, Santander, Colombia (Lepidoptera: Papilionoidea)

Abstract

We made captures of the Lepidoptera (Papilionoidea) in the project of Characterization of Wild Entomofauna of Frio river basin. We analysed the collection data of six localities in Frio river basin, five places were part of the project of Characterization, and one more, a degree work in the Eloy Valenzuela Botanical Garden. We collected 660 individuals belonging to 164 specie of the families Hesperiidae, Papilionidae, Pieridae, Lycaenidae, Riodinidae and Nymphalidae. The family Nymphalidae was higher abundance (489) and richness of specie (99). La Esperanza was the locality with higher abundance (231) and richness of specie (75). The analysis of inventory quality indicated a potential richness of 259.10 specie, a curve slope of 0.48, a proportion of observed specie of 62.91% and a sampling effort of 99.91%. The comparison of inventories of each locality allowed observing a certain similarity between La Mariana, La Judia and El Diviso, possibly by the altitudinal and geographical proximity. While, La Nevera presented the higher differences with all the others sampling places, which can be explained by the influence of the moorland zones.
KEY WORDS: Lepidoptera, Papilionoidea, abundance and richness, analysis of similarity, Colombia.

Introducción

Colombia es un país verdaderamente privilegiado en biodiversidad, gracias a la posición geográfi-

ca, diversidad de ecosistemas y gran complejidad vegetal. Estas condiciones hacen que ocupe los primeros lugares en varios grupos, como el tercer lugar en diversidad de Lepidoptera diurnas con más de 3.780 especies, las cuales se distribuyen entre las familias Hesperiidae, Papilionidae, Pieridae, Nymphalidae, Libytheidae, Riodinidae y Lycaenidae (ANDRADE-C., 1990; HUERTAS & ARIAS, 2007; LAMAS, 2004; VÉLEZ & SALAZAR, 1991). En el departamento de Santander se ha realizado un buen número de capturas de Lepidoptera, especialmente en proyectos de caracterización de flora y fauna, salidas de campo, prácticas docentes y trabajos de grado, lo cual ha contribuido al fortalecimiento de las colecciones entomológicas en el departamento de Santander, y adicionalmente, suministran abundantes datos sobre la fauna local (VILLALOBOS-MORENO *et al.*, 2012). No obstante, todavía quedan zonas del nororiente colombiano que han sido poco estudiadas o incluso, que aún no han sido exploradas, de tal manera que el nororiente de los Andes es un territorio que tiene mucho por decir en términos biológicos y medioambientales (PARDO-LOCARNO & VILLALOBOS-MORENO, 2016; VILLALOBOS-MORENO *et al.*, 2013; VILLALOBOS-MORENO *et al.*, 2017).

Existe una evidente preferencia para estudiar los Lepidoptera, la cual se basa en su gran atractivo por abundancia, facilidad de encuentro, endemismos, belleza, sensibilidad ecológica, fácil manejo en campo, diversidad, estabilidad espaciotemporal y por ser un grupo taxonómicamente bien conocido (ANDRADE *et al.*, 2013; BROWN, 1991; KREMEN, 1992, 1994; LLORENTE & MARTÍNEZ, 1998; OSPINA-LÓPEZ *et al.*, 2015). Los Lepidoptera diurnas son valiosos bioindicadores de la calidad de los ecosistemas por ser sensibles a los cambios de temperatura, humedad, radiación solar y disturbios de sus hábitats, convirtiéndose en una importante herramienta para la evaluación del grado de conservación o alteración del medio natural (BROWN, 1997; EHRLICH, 1984; KREMEN *et al.*, 1993, 1994). De este modo, la degradación de áreas silvestres contribuye con la extinción de muchas especies de Lepidoptera, lo que es particularmente crítico en la zona Andina debido a la ampliación de la frontera agrícola y urbana (MASO & PIOJAN, 1997; PALACIOS & CONSTANTINO, 2006). Adicionalmente, los Lepidoptera diurnos cumplen funciones muy importantes en los ecosistemas, como ser polinizadores, servir de alimento para otros animales y ayudar a la renovación vegetal, debido a que sus orugas se alimentan de plantas nutricias que generalmente muy específicas y en muchos casos, la supervivencia de una especie de Lepidoptera está relacionada con la existencia de una especie de planta; interacciones que son el resultado de procesos coevolutivos y que son factores responsables de megadiversidad en bosques tropicales (PALACIOS & CONSTANTINO, 2006).

En la presente investigación, se estudió la estructura y composición de la comunidad de Lepidoptera diurna en un rango altitudinal comprendido entre los 1.000 y 2.611 msnm dentro de la cuenca del río Frío en los Andes nororientales de Colombia y se aportaron datos sobre la composición, abundancia y distribución, información básica para servirá para realizar trabajos de profundización en el tema y será un importante insumo para establecer posibles programas de conservación en la zona de estudio.

Materiales y métodos

Área de estudio

La cuenca de río Frío forma parte de las cuencas que conforman la cuenca de río de Oro, que se ubica en la cuenca superior del río Lebrija en el departamento de Santander. La cuenca de río Frío se encuentra localizada al sur y suroriente de la ciudad de Bucaramanga, capital del departamento de Santander, ubicada al nororiente de los Andes colombianos (Figura 1). La zona presenta un área total de 11.820 hectáreas y se calcula que el río tiene algo más de 30 km de longitud, está delimitada entre las coordenadas 7º03’29,78 N – 73º09’01,68 O y 7º08’09,25 N – 73º00’50,01 O, y presenta un gradiente altitudinal que van desde los 700 y 2.850 msnm (GÓMEZ & LÓPEZ, 2005; INGEOMINAS, 2007). Se resalta que desde el punto conocido como Finca La Esperanza hasta la desembocadura, la cuenca se encuentra altamente intervenida por urbanizaciones, vías, zonas recreativas y deportivas, entre otras, motivo por el cual, el sitio de muestreo más bajo de la cuenca, corresponde al Jardín Botánico Eloy Valenzuela, ubicado dentro del casco urbano del municipio de Floridablanca. Los afluentes principales del

río Frío son las quebradas Providencia, Dos Aguas, Suratoque, Zapamanga, Aguablanca, Judía Chiquita, Judía Grande, La Carbona y La Estancia. A la altura de 1.050 msnm en el sitio conocido como La Esperanza, el Acueducto Metropolitano de Bucaramanga-AMB tiene una bocatoma en donde aprovecha las aguas de río Frío para abastecer gran parte de la población de Floridablanca (INGEOMINAS, 2007). En términos generales, los sitios de estudio corresponden a bosques secundarios en buen estado de conservación (ACDI-CDMB, 1985a y 1985b; ROA & GUERRERO, 2003), incluso el Cerro La Judía presenta un bosque primario donde se ha registrado importantes elementos de flora y fauna, motivo por el cual, se elevó al nivel de Parque Natural Regional (SUÁREZ, 2012). Sin embargo, el Jardín Botánico Eloy Valenzuela, que se ubica en el casco urbano del municipio de Floridablanca, se considera un lugar altamente intervenido.

Fase de campo

Se realizaron colectas de Lepidoptera diurnas en el marco del Proyecto de Caracterización de Flora y Fauna Silvestre del área de jurisdicción de la CDMB, y en un trabajo de grado en el Jardín Botánico Eloy Valenzuela, de tal forma que se tienen un total de seis localidades entre los 1.000 y los 2.611 msnm. En cada sitio de muestreo se realizaron colectas de individuos en recorridos libres al azar de longitud no definida, desde las 9 am a las 5 pm, durante 5 ó 6 días, haciendo capturas con red entomológica de 45 cm de diámetro y mango de madera; para el trabajo de grado, las capturas se realizaron durante 14 días. Los ejemplares colectados se sacrificaron y guardaron en sobres de papel milano para ser llevados al laboratorio de la CDMB y ser montados siguiendo normas internacionales (TRIPLEHORN & JOHNSON, 2004). La determinación taxonómica se realizó siguiendo las claves e ilustraciones de D'ABRERA (1984, 1987) LE CROM *et al.* (2002, 2004), NEILD (1996, 2008) y SALAZAR (2007), así como por comparación en la Colección Entomológica del Instituto de Ciencias Naturales de la Universidad Nacional de Colombia. Se utilizó la organización sistemática propuesta por LAMAS (2004). Todos los muestreos se realizaron en el interior bosques secundarios bien conservados, orillas de camino y bordes de quebradas.

Calidad del inventario

Se realizó un análisis de esfuerzo de muestreo para examinar el grado de conocimiento alcanzado acerca del inventario de especies y predecir la riqueza potencial de la zona de estudio. Se consideró cada unidad de esfuerzo de muestreo (UEM) como el sumatorio de los datos procedentes de los diferentes días de trabajo reportados para la cuenca de río Frío y una trabajo de grado de Biología, por lo tanto, al tratarse de un estudio amplio, se tuvieron en cuenta 82 UEM. Mediante el programa EstimateS (COLWELL, 2000), se aleatorizó la entrada de datos (1.000 iteraciones) para evitar sesgos en el cálculo de la riqueza observada. Para predecir la riqueza potencial, se utilizó el estadístico no paramétrico Chao1 (basado en abundancias), por tratarse de un estimador robusto de la riqueza mínima que suele ofrecer mejores resultados que otros estimadores (GOTELLI & COLWELL, 2001; WALTHER & MOORE, 2005). Con el programa CurveExpert (HYAMS, 2009), se ajustaron las estimaciones a una curva asintótica Clench, para poder realizar el cálculo de diferentes parámetros de la curva (JIMÉNEZ-VALVERDE & HORTAL, 2003).

Comparación entre sitios de muestreo

Con el propósito de establecer posibles diferencias entre los sitios de muestreo de la presente investigación dentro de la cuenca de río Frío, se comparó el inventario de taxones reportados para cada uno de los sitios de muestreo. Utilizando el programa PAST 3 (HAMMER *et al.*, 2001) se calcularon los índices de Jaccard entre inventarios, y se construyó el respectivo fenograma, mediante una estrategia de "Single linkage", estimándose así, la similitud entre los diferentes sitios de estudios (LUDWIG & REYNOLDS, 1988; MAGURRAN, 1988).

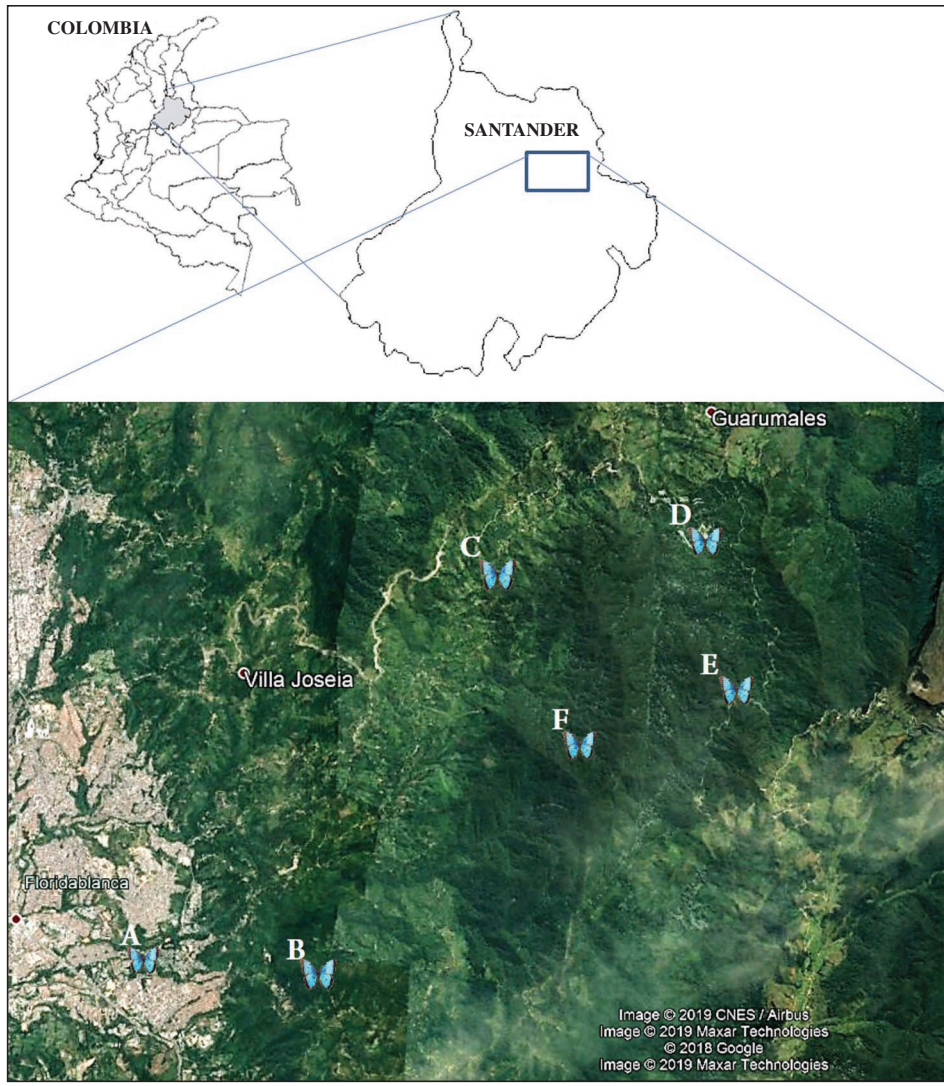
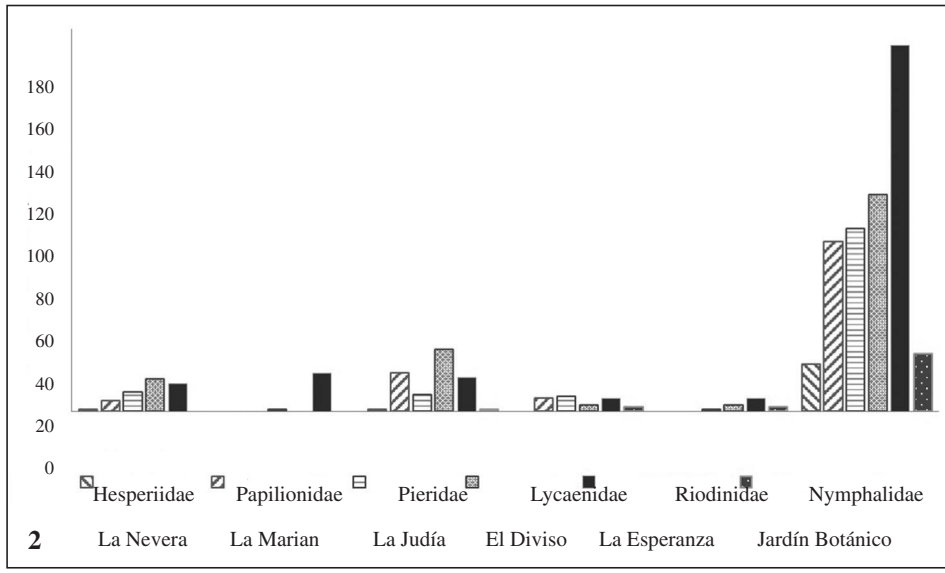


Figura 1.– Ubicación de los sitios de muestreo dentro de la cuenca de río Frío. **A:** Jardín Botánico Eloy Valenzuela; **B:** Finca Experimental La Esperanza; **C:** Finca Experimental El Diviso; **D:** Finca La Mariana; **E:** La Nevera; **F:** Cerro La Judía. (Adaptado de Google Earth Pro).

Resultados y discusión

Se colectaron 660 ejemplares pertenecientes a 162 especies, agrupados en las familias Hesperiidae, Papilionidae, Pieridae, Lycaenidae, Riodinidae y Nymphalidae (Anexo 1). Siendo la familia Nymphalidae la mejor representada en todos los sitios de muestreo y la de mayor abundancia y riqueza de especies, con 489 ejemplares y 100 especies (Figuras 2 y 3). En el mismo orden de ideas, La Finca

La Esperanza fue el sitio con mayor abundancia con 231 individuos colectados y con la mayor riqueza de especies (75) (Figura 4). Ninguna especie fue registrada en todos los sitios de muestreo, sin embrago, *Chlosyne lacinia* y *Hermeutychia hermes* fueron reportadas en cinco localidades y *Leptophobia aripa*, *Pedaliodes phrasis*, *Steremnia selva* y *Vetius coryna* se colectaron en cuatro localidades.



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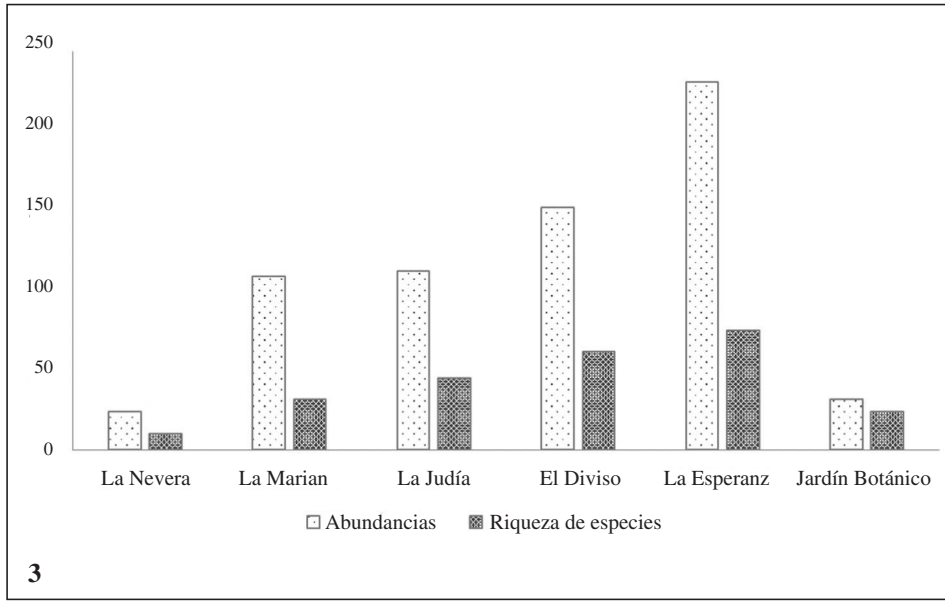

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Figuras 2-3.– 2. Abundancias de las familias de Lepidoptera en los diferentes sitios de muestreo. **3.** Abundancias y riquezas de especies en cada uno de los sitios de muestreo.

En el Anexo 1 se presenta la sinopsis de especies de la zona de estudio, clasificadas en especies abundantes: más de diez registros, especies comunes: entre seis y diez registros, especies escasas: entre dos y cinco registros y especies raras: un solo registro (FAGUA, 1996; HENAO, 2006; HENAO & STILES, 2018). Se apreció que 6,75% de las especies fueron abundantes, 17,18% comunes, 41,72% escasas y 34,36% raras. Las especies con mayores abundancias en los muestreos de la cuenca de río Frío fueron *Heliconius cydno* (27), *Oleria makrena* (26), *Pedaliodes phrasis* (25), *Chlosyne lacinia* (21), *Adelpha alala* (15), *Hypanartia lethe* (15) y *Mechanitis menapis* (15). Por el contrario, 56 especies estuvieron representadas por un solo ejemplar y considerada en la categoría de raras, dentro de las cuales se encuentran algunas especies que en términos generales son poco comunes y/o difíciles de capturar como *Archaeoprepona chromus*, *Caria domitianus*, *Catonephele chromis*, *Catonephele numilia*, *Patia orise*, *Neographium dioxippus*, *Heraclides androgeus*, *Junea dorinda*, *Narope cyllaborus*, *Oenomaus ortygnus*, *Rhetus arcius* y *Telemiades antiope*.

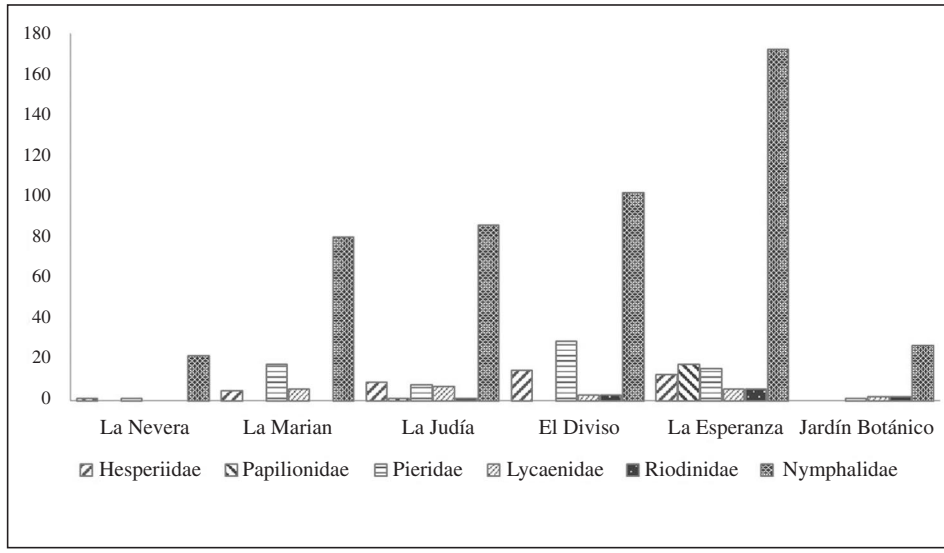

Figura 4.– Abundancias por familia en cada uno de los sitios de muestreo.

Calidad del inventario

La riqueza potencial estimada según el ajuste a la curva Clench alcanzó un total de 259,10 especies (asíntota de la función; ver figura 5). A pesar de que la pendiente de la curva es aún alta (0,48), la proporción de especies observadas fue del 62,91%, que corresponde a un esfuerzo de muestreo estimado del 99,91%. Con estos valores calculados, se podría considerar que el muestreo es relativamente apropiado, pero que evidentemente existen un número de especies por reportarse en la cuenca de río Frío. El análisis de la calidad del inventario en cada uno de los sitios de muestreo, sustenta la afirmación anterior sobre la necesidad de mayores colectas para establecer una sinopsis de especies para la zona que representen la riqueza real de la cuenca de río Frío. Si bien algunos porcentajes de especies observadas superan el 60%, La Nevera (61,65), La Mariana (69,22) y El Diviso (61,41), otros valores son extremadamente bajos, como en el caso del trabajo de grado realizado en el Jardín Botánico Eloy Valenzuela en el cual se calculó que se observaron solamente el 17,74% de las especies del lugar. En la tabla I se resumen los principales resultados del análisis de la calidad del inventario en cada uno de los sitios de muestreo.

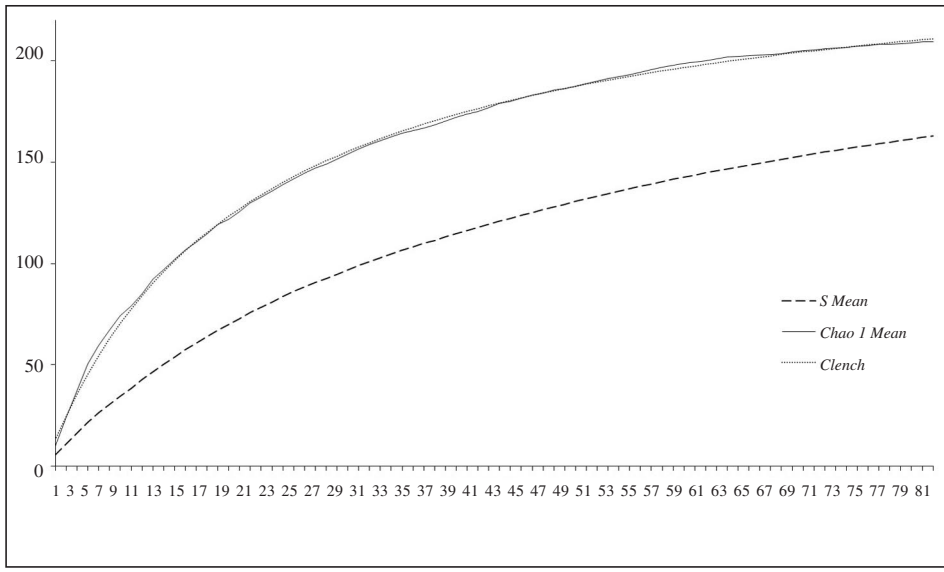

Figura 5–. Análisis de la calidad del inventario. S Mean: curva de riqueza observada aleatorizada; Chao 1 Mean: curva de riqueza potencial obtenida mediante el estimador no paramétrico Chao1; Clench: curva ajustada a la asíntota Clench [y = (13,86 • x) / (1 + 0,05 • x)]; Error estándar: 1,5562; Coeficiente de correlación: 0,9995.

Tabla I.– Resumen de los análisis de la calidad del inventario para cada sitio de muestreo.

SITIOS	Riqueza Observada	Riqueza Potencial	% Especies Observadas	Esfuerzo Muestreo	Coeficiente Correlación
La Nevera	10	16,22	61,65	97,19	0,9875
La Mariana	32	47,68	69,22	99,54	0,9627
La Judía	45	86,85	51,81	86,12	0,9823
El Diviso	62	100,96	61,41	99,78	0,9758
La Esperanza	75	134,7	54,94	99,33	0,9988
Jardín Botánico	24	135,28	17,74	99.09	0,973

COMPARACIÓN ENTRE LOS SITIOS DE MUESTREO

La comparación de los inventarios de taxones de los sitios de muestreo en la zona de estudio permitió observar cierta relación entre La Mariana, La Judía y El Diviso, posiblemente por la similitud altitudinal y su cercanía geográfica (Figura 6). La Nevera presentó la mayor diferencia con todos los sitios de muestreo, lo cual se puede explicar por la influencia de las zonas de páramo, pocos metros más arriba en el gradiente. Adicionalmente, los sitios de muestreo más abajo en el gradiente, La Esperanza y Jardín Botánico, también presentaron una notable diferencia con los otros sitios de muestreo.

Conclusiones

Se colectaron 660 ejemplares pertenecientes a 162 especies, agrupados en las familias Hesperiidae, Papilionidae, Pieridae, Lycaenidae, Riodinidae y Nymphalidae, siendo esta última, la mejor re-

presentada en todos los sitios de muestreo y la de mayor abundancia y riqueza de especies, con 489 ejemplares y 100 especies; la finca La Esperanza fue el sitio con mayor abundancia (231) y con la mayor riqueza de especies (75).

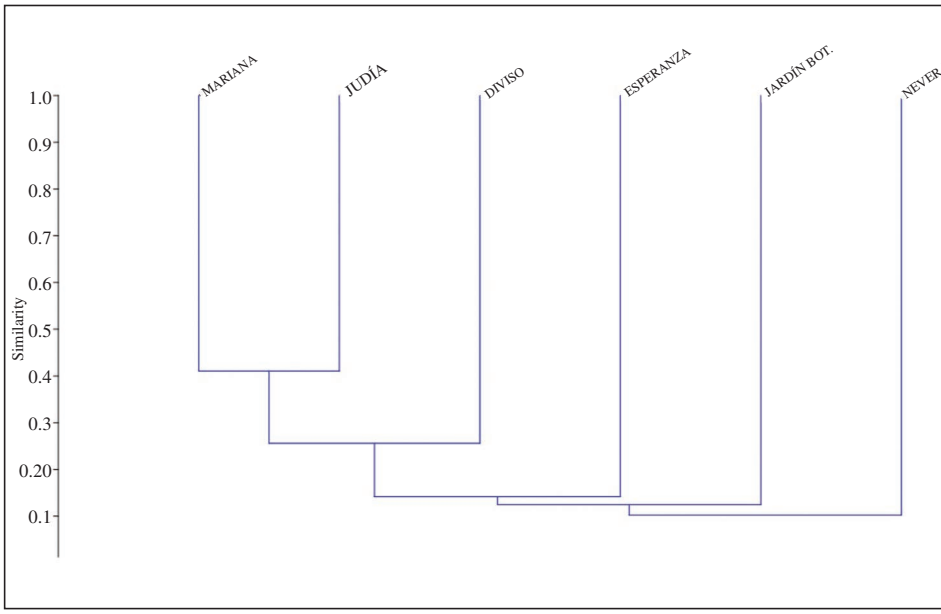

Figura 6.– Análisis de Similaridad entre los sitios de muestreo en la cuenca de río Frío, Santander, Colombia. Coeficiente de correlación: 0,9282.

Si bien las colectas no se realizaron en un proyecto específico de lepidopterología, sino en colectas generales de flora y fauna silvestre de la zona de estudio, el presente documento hace un importante aporte al conocimiento de los Lepidoptera del nororiente colombiano, siendo evidente en el análisis de la calidad del inventario que aún falta un cierto número de especie por ser reportadas, esto permite proponer posibles nuevos muestreos para las localidades estudiadas y otras que se puedan definir. Los datos suministrados en la presente investigación, con respecto a la estructura y composición de la comunidad de Lepidoptera diurnas en el rango altitudinal comprendido entre los 1.000 y 2.611 msnm dentro de la cuenca del río Frío en los Andes nororientales de Colombia, son importantes como punto de partida para realizar trabajos de profundización en el tema y como insumo para establecer posibles programas de conservación en la zona de estudio.

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*A. V. M.
Grupo de Investigaciones Entomológicas y Ambientales-GENA
Calle 91 No. 22-104 Apto 403
Bucaramanga
COLOMBIA / *COLOMBIA*
E-mail: alfvillalmo@gmail.com
E-mail: avillalobosmo@unal.edu.co
https://orcid.org/0000-0003-1713-7823

J. A. S. E.
MVZ
Centro de Museos
Museo de Historia Natural
Universidad de Caldas
Calle 65 No. 26 - 10
Manizales - Caldas
COLOMBIA / *COLOMBIA*
E-mail: julianmantis@gmail.com
https://orcid.org/0000-0003-2268-7803

*Autor para la correspondencia / *Corresponding author*

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Anexo 1.– Listado de especies y categorías de Lepidoptera colectadas en la cuenca de río Frío, Santander, Colombia. N: Abundancia total, CT: Categoría. A: Abundante, C: Común, E: Escasa, R: Rara.

Familia	Subfamilia	Especie	N	CT
Hesperiidae	Eudaminae	*Astraptes talus* (Cramer, 1777)	3	E
		Telemiades antiope (Plötz, 1882)	1	R
		Urbanus dorantes (Stoll, 1790)	3	E
		Urbanus teleus (Hübner, 1821)	5	E
	Pyrginae	*Achlyodes busirus heros* Ehrmann, 1909	1	R
		Achlyodes pallida (R. Felder, 1869)	5	E
		Carrhenes meridensis Godman & Salvin, 1895	1	R
		Celaenorrhinus shema (Hewitson, 1877)	1	R
		Celaenorrhinus songoensis Draudt, 1922	1	R
		Heliopetes laviana (Hewitson, 1868)	1	R
		Pyrgus oileus (Linnaeus, 1767)	3	E
		Pyrrhopyge aziza Hewitson, 1866	1	R
		Sostrata grippa Evans, 1953	2	E
	Hesperiinae	*Orthos orthos* (Godman, 1900)	2	E
		Poanes azin (Godman, 1900)	2	E
		Vettius coryna (Hewitson, 1866)	9	C
		Vettius fuldai (E. Bell, 1930)	2	E
Papilionidae	Papilioninae	*Neographium dioxippus* (Hewitson, 1856)	1	R
		Heraclides anchisiades (Esper, 1788)	12	A
		Heraclides androgeus (Cramer, 1775)	1	R
		Heraclides paeon (Boisduval, 1836)	1	R
		Heraclides thoas nealces Rothschild & Jordan, 1906	3	E
		Parides erithalion (Boisduval, 1836)	1	R
Pieridae	Dismorphiinae	*Dismorphia medora* (E. Doubleday, 1844)	8	C
		Enantia melite (Linnaeus, 1763)	3	E
		Lieinix nemesis (Latreille, [1813])	4	E
		Patia orise (Boisduval, 1836)	1	R
		Pseudopieris nehemia (Boisduval, 1836)	1	R
	Coliadinae	*Colias dimera* E. Doubleday, 1847	7	C
		Eurema albula (Cramer, 1775)	3	E
		Eurema salome (C. Felder & R. Felder, 1861)	1	R
		Eurema xanthochlora (Kollar, 1850)	1	R
		Nathalis plauta E. Doubleday, 1847	1	R
		Phoebis argante (Fabricius, 1775)	4	E
	Pierinae	*Hesperocharis marchalii* (Guérin-Méneville, 1844)	3	E
		Catasticta colla (E. Doubleday, 1847)	7	C
		Catasticta manco (E. Doubleday, 1848)	1	R
		Catasticta sisamus (Fabricius, 1793)	2	C
		Leodonta tellane (Hewitson, 1860)	1	R
		Leodonta zenobia (C. Felder & R. Felder, 1865)	3	E
		Leptophobia aripa (Boisduval, 1836)	10	C
		Leptophobia caesia (Lucas, 1852)	3	E
		Leptophobia eleone (E. Doubleday, 1847)	6	C
		Leptophobia eleusis (Lucas, 1852)	1	R
		Leptophobia tovaria (C. Felder & R. Felder, 1861)	2	E
Lycaenidae	Teclinae	*Apuecla* sp.	6	C
		Arawacus leucogyna (C. Felder & R. Felder, 1865)	2	E
		Calycopis sp.	1	R
		Lathecla mimula (Draudt, 1920)	3	E
		Oenomaus ortygnus (Cramer, 1779)	1	R
		Panthiades bathildis (C. Felder & R. Felder, 1865)	2	E

		Timaeta balzabamba (Goodson, 1945)	5	E
	Polyommatinae	*Hemiargus hanno* (Stoll, 1790)	3	E
		Leptotes cassius (Cramer, 1775)	1	R
Riodinidae	Riodininae	*Caria domitianus* (Fabricius, 1793)	1	R
		Emesis brimo Godman & Salvin, 1889	1	R
		Hyphilaria parthenis (Westwood, 1851)	1	R
		Hyphilaria thasus (Stoll, 1780)	2	E
		Leucochimona lepida (Godman & Salvin, 1885)	3	E
		Mesosemia mevania Hewitson, [1857]	2	E
		Rhetus arcius (Linnaeus, 1763)	1	R
		Thisbe lycorias (Hewitson, [1853])	1	R
Nymphalidae	Danainae	*Ceratinia neso* (Hübner, [1806])	10	C
		Greta andromica (Hewitson, [1855])	2	E
		Greta dercetis (E. Doubleday, 1847)	1	R
		Greta libethris (C. Felder & R. Felder, 1865)	3	E
		Hyalyris sp.	7	C
		Ithomia drymo Hübner, 1816	2	E
		Mechanitis menapis Hewitson, [1856]	15	A
		Oleria makrena (Hewitson, 1854)	26	A
		Pteronymia latila (Hewitson, [1855])	1	R
		Pteronymia laura (Staudinger, 1885)	2	E
		Sais rosalia (Cramer, 1779)	2	E
		Thyridia psidii aedesia Doubleday, 1847	1	R
	Heliconiinae	*Abananote hylonome* (E. Doubleday, 1844)	9	C
		Actinote latior Jordan, 1913	6	C
		Actinote anteas (Doubleday, [1821])	3	E
		Altinote dicaeus (Latreille, [1817])	2	E
		Altinote neleus (Latreille, [1813])	2	E
		Altinote stratonice (Latreille, [1813])	6	C
		Dione juno (Cramer, 1779)	4	E
		Eueides aliphera (Godart, 1819)	2	E
		Heliconius charitonia (Linnaeus, 1767)	1	R
		Heliconius clysonimus Latreille, [1817]	7	C
		Heliconius cydno (E. Doubleday, 1847)	27	A
		Heliconius doris obscurus Weymer, 1891	1	R
		Heliconius eleuchia (Hewitson, [1854])	2	E
		Heliconius erato (Linnaeus, 1758)	1	R
		Heliconius hecale (Fabricius, 1776)	1	R
		Heliconius melpomene (Linnaeus, 1758)	5	E
		Philaetria dido (Linnaeus, 1763)	2	E
	Limenitidinae	*Adelpha alala completa* Fruhstorfer, 1907	15	A
		Adelpha iphicleola (H. Bates, 1864)	1	R
		Adelpha justina (C. Felder & R. Felder, 1861)	2	E
		Adelpha lycorias lara (Hewitson, 1850)	1	R
		Adelpha salmoneus (Butler, 1866)	3	E
	Apaturinae	*Doxocopa pavon* (Latreille, [1809])	5	E
	Biblidinae	*Callicore eunomia* (Hewitson, 1853)	1	R
		Callicore pitheas (Latreille, [1813])	4	E
		Catonephele chromis E. Doubleday, [1848]	1	R
		Catonephele numilia (Cramer, 1775)	1	R
		Diaethria clymena dodone (Guenée, 1872)	9	C
		Diaethria euclides (Latreille, [1809])	1	R
		Dynamine athemon (Linnaeus, 1758)	1	R
		Epiphile epimenes kalbreyeri Fassl, 1912	1	R
		Epiphile iblis C. Felder & R. Felder, 1861	1	R

		Hamadryas feronia (Linnaeus, 1758)	1	R
		Nica flavilla (Godart, [1824])	2	E
		Perisama humboldtii (Guérin-Méneville, [1844])	1	R
	Cyrestinae	*Marpesia chiron* (Fabricius, 1775)	1	R
		Marpesia corinna (Latreille, [1813])	5	E
		Marpesia zerynthia Hübner, [1823]	5	E
	Nymphalinae	*Anartia amathea* (Linnaeus, 1758)	4	E
		Anartia jatrophae (Linnaeus, 1763)	1	R
		Chlosyne lacinia (Geyer, 1837)	21	A
		Colobura dirce (Linnaeus, 1758)	3	E
		Eresia polina Hewitson, 1852	2	E
		Gnathotriche exclamationis (Kollar, 1850)	1	R
		Historis odius (Fabricius, 1775)	4	E
		Hypanartia kefersteini (E. Doubleday, [1847])	2	E
		Hypanartia lethe (Fabricius, 1793)	15	A
		Janatella leucodesma (C. Felder & R. Felder, 1861)	1	R
		Junonia evarete (Cramer, 1779)	1	R
		Siproeta epaphus (Latreille, [1813])	1	R
		Siproeta stelenes (Linnaeus, 1758)	3	E
		Tegosa anieta (Hewitson, 1864)	7	C
		Vanessa braziliensis (Moore, 1883)	2	E
		Vanessa virginiensis (Drury, 1773)	3	E
	Charaxinae	*Archaeoprepona chromus* (Guérin-Méneville, 1844)	1	R
		Archaeoprepona demophon (Linnaeus, 1758)	2	E
		Consul fabius (Cramer, 1776)	3	E
		Consul panariste (Hewitson, 1856)	8	C
	Satyrinae	*Caligo eurilochus* (Cramer, 1775)	3	E
		Caligo oileus C. Felder & R. Felder, 1861	5	E
		Cissia terrestris (A. Butler, 1867)	11	A
		Corades chelonis Hewitson, 1863	2	E
		Corades enyo Hewitson, [1849]	10	C
		Corderopedaliodes corderoi (Dognin, 1893)	12	A
		Eretris porphyria perija Adams & Bernard, 1979	7	C
		Eryphanis automedon (Cramer, 1775)	2	E
		Euptychoides laccine (Felder & Felder, 1867)	4	E
		Euptychoides saturnus (Butler, 1867)	2	E
		Forsterinaria inornata (C. Felder & R. Felder, 1867)	4	E
		Hermeuptychia hermes (Fabricius, 1775)	12	A
		Junea dorinda (C. Felder & R. Felder, 1862)	1	R
		Lasiophila zapatoza sombra Thieme, 1907	7	C
		Lymanopoda albocincta Hewitson, 1861	9	C
		Lymanopoda obsoleta (Westwood, 1851)	5	E
		Morpho helenor peleides Kollar, 1850	7	C
		Morpho sulkowskyi Kollar, 1850	3	E
		Mygona irmina (E. Doubleday, [1849])	9	C
		Narope cyllabarus Westwood, 1851	1	R
		Opsiphanes cassina C. Felder & R. Felder, 1862	2	E
		Oressinoma typhla E. Doubleday, [1849]	9	C
		Pareuptychia ocirrhoe (Fabricius, 1776)	8	C
		Pedaliodes phaea (Hewitson, 1862)	7	C
		Pedaliodes phrasis Grose-Smith, 1900	25	A
		Pedaliodes plotina (Hewitson, 1862)	10	C
		Pedaliodes polla Thieme, 1905	2	E
		Pronophila thelebe E. Doubleday, [1849]	2	E
		Steremnia selva Adams, 1986	7	C
		Taygetis sp.	1	R

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Two new species of the tribe Rhodometrini Agenjo, 1951 from Sichuan, China (Lepidoptera: Geometridae)

L. Cui, D. Y. Xue & N. Jiang

Abstract

Two new species of the tribe Rhodometrini Agenjo, 1951 are described from Sichuan of China: *Rhodometra rosea* Cui, Xue & Jiang, sp. n. and *Casilda hemirosea* Cui, Xue & Jiang, sp. n. Diagnoses of the new species are provided; illustrations of external features and genitalia of the new species are also presented.
KEY WORDS: Lepidoptera, Geometridae, *Casilda*, *Rhodometra*, diagnosis, morphology, taxonomy, China.

Dos nuevas especies de la tribu Rhodometrini Agenjo, 1951 de Sichuan, China (Lepidoptera: Geometridae)

Resumen

Se describen dos nuevas especies de la tribu Rhodometrini Agenjo, 1951 de Sichuan, China: *Rhodometra rosea* Cui, Xue & Jiang, sp. n. y *Casilda hemirosea* Cui, Xue & Jiang, sp. n. Se proporciona la diagnosis de las nuevas especies; también se presentan ilustraciones de los caracteres externos y de la genitalia de las nuevas especies.
PALABRAS CLAVE: Lepidoptera, Geometridae, *Casilda*, *Rhodometra*, diagnosis, morfología, taxonomía, China.

Introduction

The tribe Rhodometrini Agenjo, 1951 belongs to the subfamily Sterrhinae Meyrick, 1892 (HAUSMANN, 2004). The species of the tribe are mainly distributed in the tropical African area (HAUSMANN, 2004; PARSONS *et al.*, 1999). The forewing colour of the adult is usually pale yellowish and with a rosy postmedial line (HOLLOWAY, 1997; SIHVONEN & KAILA, 2004). Although, the $Sc+R_1$ of the hindwing is anastomosing with the discal cell at least to the middle which prefers to place Rhodometrini in the Larentiinae Duponchel, [1845], but considering the characters of the genitalia, it belongs to the Sterrhinae (PROUT, 1930-1938).

The genus *Rhodometra* was established by MEYRICK (1892), and the type species *Phalaena sacraria* Linnaeus, 1767 was subsequently designed by LHOMME (1930). It is composed of eleven species distributed all over the world: the type species is almost cosmopolitan, eight species are distributed in the Afrotropical region, and two in the western Neotropical region (PARSONS *et al.*, 1999; HAUSMANN, 2004). At present, only one species, *Rh. sacraria*, has been recorded from China (ZHU & XUE, 1992).

The genus *Casilda* Agenjo, 1952 was established based on the type species *Sterrha consecraria* Staudinger, 1871. It is a small genus composed of four species found throughout the world; the species are known to be distributed in the western Palaearctic and the eastern Afrotropical regions (PROUT,

1912-1916, 1934-1939; AGENJO, 1952; SUTTON, 1963; RAINERI, 1992; VIIDALEPP, 1996; PARSONS *et al.*, 1999; HAUSMANN, 2004). At present, only one species, *C. antophilaria* (Hübner, [1813]) has been recorded from China.

As a result of study of material obtained from recent expeditions and re-examination of collection materials from China, we have discovered several new species of Sterrhinae (CUI *et al*., 2018a, 2018b, 2019a, 2019b, 2019c; XUE *et al*., 2018). The purpose of this paper is to describe two new species of the tribe Rhodometrini from China: *Rhodometra rosea* Cui, Xue & Jiang, sp. n. and *Casilda hemirosea* Cui, Xue & Jiang, sp. n., and provide diagnostic characters of the new taxa.

Materials and methods

Specimens used in this study are deposited in the following collections: Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing, China, and Zoologisches Forschungsmuseum Alexander Koenig (ZFMK), Bonn, Germany. Terminology for wing venation follows the Comstock-Needham System (COMSTOCK, 1918) as adopted for Geometridae by SCOBLE (1992) and HAUSMANN (2001); that for genitalia follows PIERCE (1914), KLOTS (1970), and NICHOLS (1989). Photographs of moths were taken with a digital camera. Composite images were generated using Auto-Montage software version 5.03.0061 (Synoptics Ltd). The plates were compiled using Adobe Photoshop software 7.0. Ink (Adobe Systems Software Ireland Ltd).

Taxonomy

Rhodometra rosea Cui, Xue & Jiang, sp. n. (Figs 1, 4-5, 10)

Material examined: Holotype ♂, CHINA: Sichuan (IZCAS): Batang, Xiaqiong, Bashen Wenquan shanzhuang, 2662 m, 28-29-VII-2014, coll. Pan Xiaodan. Paratypes: Sichuan (IZCAS): 1 ♂, Dukou, Pingdi, 20-VI-1981, coll. Zhang Baolin; 2 ♀♀, Dukou, 1900 m, 22-VIII-1980, 10-VI-1981, coll. Zhang Baolin; 1 ♀, Yanyuan, Jinhe, 1250 m, 2-VII-1984, coll. Liu Dajun; 1 ♀, Huili, Yimen, 31-VII-1974; Sichuan (ZFMK): 1 ♀, Batang (Tibet), Im Tal des Yangtze, 2800 m; 26-IX-1936, coll. H. Höne.

Description adult (Fig. 1): Antennae yellowish white or yellowish brown dorsally, blackish grey at apex; bipectinate in male, pectination long, filiform at apical one-fifth; filiform in female, ventral side covered with short cilia. Frons yellow, strongly protruding. Labial palpus yellow, extending beyond frons, the terminal segment short and thick. Vertex yellow. Patagia, tegulae and dorsal side of thorax yellow. Hind tibia in male and female with two pairs of spurs. Forewing length: male 18–20 mm; female 18 mm. Forewing pointed at apex, outer margin smooth; hindwing with apex rounded. Forewing yellow; hindwing yellowish white. Forewing with costa rosy at basal one-third; discal spot absent; postmedial line rosy, arising from apex, straight, inclined inwards to middle part of inner margin; fringes pale yellow. Hindwing without transverse line. Underside paler; postmedial line of forewing distinct, yellowish brown, deeper on veins. Venation. Forewing with one areole; R_1–R_4 stalked, R_1–R_4 and R_5 connate; hindwing with Sc+R_1 fused ca. one-half length of discal cell; Rs and M_1 shortly stalked, veins M_3 and CuA_1 separated.

Male genitalia (Figs 4-5): Uncus thin and digitiform. Socii process-like, small and thick. Gnathos absent. Valva columniform, short, flat with short setae at apex. Saccus rounded and broad. Aedeagus straight with a small spur at subapical part; vesica with a small cornutus.

Female genitalia (Fig. 10): Apophyses anteriores ca. one-half of apophyses posteriors in length. Surrounding of ostium sclerotised. Sterigma rounded and raised at middle of posterior part. Ductus bursae membranous, slightly sclerotised near ostium, shorter than corpus bursae. Corpus bursae long; signum with one vertical bar, slightly sclerotised surrounded, nearly oval-like.

Diagnosis: *Rh. rosea* is very similar to *Rh. sacraria* (Linnaeus, 1767) (Figs 2, 6-7, 11); however, the discal spot of the forewing is absolutely absent in *Rh. rosea*, while in *Rh. sacraria*, it is present or traceable. In the genitalia, the uncus of the male genitalia is narrower with rounded apex in *Rh. rosea*,

while it is broader with acute apex in *Rh. sacraria*; the terminal margin of the sterigma of the female genitalia is rounded in *Rh. rosea*, while it is produced in *Rh. sacraria*; the ductus bursae has irregularly shaped sclerite near the ostium in *Rh. sacraria*, while *Rh. rosea* does not have this character.

Distribution: China (Sichuan).

Etymology: The species is named on the basis of the Latin *roseus*, which refers to the reddish colour of the postmedial line on the forewing.

***Casilda hemirosea* Cui, Xue & Jiang, sp. n.** (Figs 3, 8-9)

Material examined: Holotype ♂, China: Sichuan (IZCAS): Batang, Xiaqiong, Bashen wenquan shanzhuang, 2662 m, 28-29-VII-2014; coll. Pan Xiaodan. Paratypes: Sichuan (IZCAS): 1 ♂, Batang, 2000 m; 13-VIII-1982, coll. Wang Shuyong. Sichuan (ZFMK): 1 ♂, Batang (Tibet), Untere Urwaldzone, 3800 m, 3-X-1936, coll. H. Höne.

Description: Adult (Fig. 3). Male antennae white ventrally at basal part and gradually deep grey towards apex; strongly bipectinate to four-fifths. Frons yellow diffused with reddish scales, strongly protruded. Labial palpi yellowish brown, not extending beyond frons, third segment thick. Vertex yellowish with reddish scales. Patagia yellow. Tegulae yellowish with reddish scales. Hind tibia with two pairs of spurs in male. Forewing length: male 16 mm. Forewing with acute apex; outer margin almost straight. Hindwing with rounded outer margin. Forewing yellow; hindwing paler than forewing. Forewing with costa reddish at basal half; discal spot absent; postmedial line reddish, raising from sub-apex, straight, inclined inwards to apical one-third of inner margin; fringes pale yellow. Hindwing without transverse line. Underside with grey scales between basal part and postmedial line on forewing. Venation. Forewing with one areole; R_1-R_4 stalked, R_1-R_4 and R_5 connate; hindwing with Sc+R_1 fused ca. one-half length of discal cell; Rs and M_1 shortly stalked, veins M_3 and CuA_1 separated.

Male genitalia (Figs 8-9): Uncus digitiform and acute at apex. Socii short and stout with a small protrusion basally inside. Valva narrow and long; costal margin concave and forming a triangular process at sub-apex; ventral margin densely covered with strong bristles with a very small strongly sclerotised process at middle. Vinculum with a pair of triangular sclerites; Juxta small and strongly sclerotised. Aedeagus with an acute spur vertically at apex; cornutus a stout spur.

Female genitalia: Unknown.

Diagnosis: The species is different from other congeners by the combination of the following characters: the reddish line on the costa of the forewing is ca. one-half length of the costa; the postmedial line of the forewing is extending from the sub-apex to terminal one-third of the inner margin. In the male genitalia, the costal margin of the valva is curved and forms a triangular process subapically; the middle part of the ventral margin of the valva has a very small strongly sclerotised process.

Distribution: China (Sichuan).

Etymology: The species is named based on the Latin *hemi-* and *roseus*, which refers to the pale reddish colour on the basal half of the costa of the forewing.

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D. Y. X., *N. J.
Key Laboratory of Zoological Systematics and Evolution
Institute of Zoology Chinese Academy of Sciences
Beijing 100101
CHINA / *CHINA*
E-mail: xuedy@ioz.ac.cn
https://orcid.org/0000-0002-5603-4459
* E-mail: jiangn@ioz.ac.cn
https://orcid.org/0000-0003-4211-1385

L. C.
Key Laboratory of Zoological Systematics and Evolution
Institute of Zoology Chinese Academy of Sciences
Beijing 100101
CHINA / *CHINA*
E-mail: cuile@ioz.ac.cn
https://orcid.org/0000-0003-0552-3647

y / *and*

University of Chinese Academy of Sciences
Beijing 100049
CHINA / *CHINA*

*Autor para la correspondencia / *Corresponding author*

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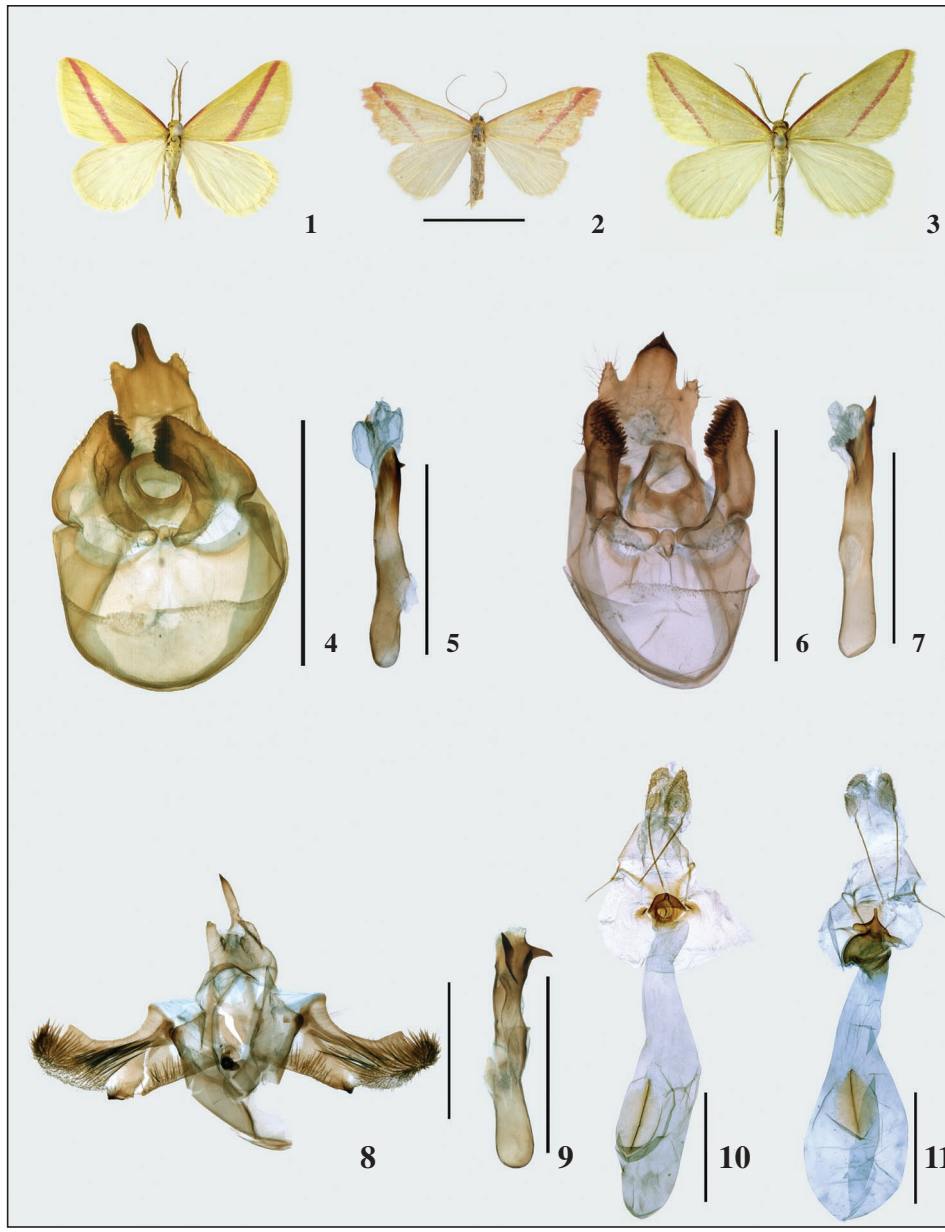

Figures 1-11.– Adults. **1.** *Rhodometra rosea* Cui, Xue & Jiang, sp. n., holotype; **2.** *Rh. sacraria* (Linnaeus, 1767); **3.** *Casilda hemirosea* Cui, Xue & Jiang, sp. n., holotype (Scale bars = 1 cm). **4-9.** Male genitalia. **4-5.** *Rh. rosea* Cui, Xue & Jiang, sp. n., paratype; **6-7.** *Rh. sacraria* (Linnaeus, 1767); **8-9.** *C. hemirosea* Cui, Xue & Jiang, sp. n., paratype. **10-11.** Female genitalia. **10.** *Rh. rosea* Cui, Xue & Jiang, sp. n., paratype; **11.** *Rh. sacraria* (Scale bars = 1 mm).

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Descriptions of two new species in the genus *Pseudococcyx* Swatchek, 1958 from Spain and Turkey (Lepidoptera: Tortricidae, Eucosmini)

K. Larsen

Abstract

Two new species in the genus *Pseudococcyx* Swatchek, 1958 are described. *Pseudococcyx friedmariana* Larsen, sp. n. and *Pseudococcyx oskariana* Larsen, sp. n. from respectively Spain and Turkey. The two new species are regarded as sister species with western and eastern distribution in the Mediterranean area. The species are easy to recognize both externally and in the genitalia. A tentative systematic position is proposed. Photos of adults and genitalia are provided.
KEY WORDS: Lepidoptera, Tortricidae, Eucosmini, *Pseudococcyx friedmariana*, *Pseudococcyx oskariana*, Spain, Turkey.

Descripción de dos nuevas especies en el género *Pseudococcyx* Swatchek, 1958 de España y Turquía (Lepidoptera: Tortricidae, Eucosmini)

Resumen

Se describen dos nuevas especies en el género *Pseudococcyx* Swatchek, 1958. *Pseudococcyx friedmariana* Larsen, sp. n. y *Pseudococcyx oskariana* Larsen, sp. n. respectivamente de España y Turquía. Las dos nuevas especies son observadas como especies hermanas, con la distribución occidental y oriental en el área Mediterránea. Ambas especies son fácilmente reconocibles externamente y en la genitalia. Se propone una tentativa sobre la posición sistemática. Se proporcionan fotos de los adultos y genitalia.
PALABRAS CLAVE: Lepidoptera, Tortricidae, Eucosmini, *Pseudococcyx friedmariana*, *Pseudococcyx oskariana*, España, Turquía.

Introduction

The author has received pictures of imago and male genitalia of a Tortricidae species for determination. Undetermined material from Spain and Turkey in the collection of the author was respectively examined. The result is discovery of a new species for science from Turkey and another new species for science from Spain in the genus *Pseudococcyx* Swatchek, 1958. As the total number of species in the genus *Pseudococcyx* now is raised from four to six, the systematic positions of the new species in the genus are discussed. Proposal of systematic position on basis of external characters combined with the structure of male and female genitalia is given. The material is partly too old for DNA examination.

Material and methods

The specimens were collected in a light trap with eight watt super actinic tube and with mercury vapur bulbs. Collecting methods for older specimens is not known.

The genitalia slides were made according to standard procedures and mounted in euparal. Photos of genitalia were taken by a Toup Tek camera mounted on a Toup Tek binocular microscope. Photographs of specimens were taken with a Canon EOS50D camera and a 100 mm Canon macro lens.

In total eight specimens are examined. The type material is deposit in Zoological Museum of Copenhagen, the research collection of Knud Larsen, and the research collection of Friedmar Graf.

The nomenclature for adults and genitalia follow HORAK (1991, 2006) and RAZOWSKI (2003).

Abbreviations

FG - research collection of Friedmar Graf, Bautzen, Germany
gen. prep. - genital preparation
KL - research collection of Knud Larsen, Dyssegaard, Denmark
ZMUC - Zoological Museum, Natural History Museum of Denmark, Copenhagen, Denmark.

Results

Pseudococcyx Swatchek, 1958 is a genus with until now only four known species. The distributional pattern is mainly European. The genus belong to a group of Eucosmini genera, where most of the species are connected with Pinaceae and Cupressaceae as food plants. In Europe the highest diversity of these species are in Central and South Europe, Turkey and the Mediterranean Islands. (KARSHOLT & RAZOWSKI, 1996; LARSEN, 2010; VIVES MORENO, 2014).

The biology of the two new species are not known, but the known collecting sites are primary Pinaceae Forest.

***Pseudococcyx friedmariana* Larsen, sp. n.** (Figs 1-2)

Material examined: Holotype ♂, SPAIN, Teruel, Umgebung Albarracín, 12-14-VI-1963, Buddenbrock leg., gen. prep. 3511 ♂ KL. Paratype ♂, SPAIN, Jaén, Wald bei Hornos, 38º12'25"N 02º41'20"W, 989 m, 20-VI-2019, F. Graf leg., gen. prep. ♂ Glycerin in vial (FG).

Description. Male (Figs 1-2): Wingspan 15-18 mm. Frons with grey scales tip light yellow forming a yellowish patch on top. Vertex grey. Labial pals short, terminal segment very short, grey. Antenna more than half the length of the forewing, grey, weekly whitish ringed. Thorax and tegulae grey. Abdomen dark grey. Legs grey, whitish ringed.

Forewing elongate with round apex. Termen round. Ground colour dark grey with light grey drawings forming a submedian interfascia and a week speculum. Subbasal fascia outward angled. Cilia grey with black basal line. Hindwing dark grey. Cilia lighter grey with a black basal line. Underside of wings grey.

Male genitalia (Fig. 5): Tegumen large, elongate, uncus flat rounded, socii very long, curved, irregularly edged and hairy, gnathos triangular, phallus simple with deciduous small cornuti, valve elongate, ventral incision curved sharply towards cucullus, cucullus hairy with hooked formed spines at dorsal edge, sacculus flat elongate, angled, small horn close to pronounced basal cavity, ending at costa with a small irregular edged area.

Female not known.

Biology: Not known except the collecting date and the localities. The "Wald bei Hornos" is a *Pinus* forest about 1.000 m above sea level. The precise position of the second locality is not known, but the surroundings of Albarracín is low mountainous up to 1.500 m. above sea level.

Etymology: The species name *friedmariana* refers to the collector who turned my attention to *Pseudococcyx* species.

Diagnoses: *P. friedmariana* is not resembling any other *Pseudococcyx* species. The dark and light

grey drawings and the grey frons is characteristic. The flat uncus, the elongate valve and the irregular basal cavity separate the species from all other *Pseudococcyx species.*

***Pseudococcyx oskariana* Larsen, sp. n.** (Figs 3-4)

Material examined: Holotype ♂, TURKEY, Konya, Beysehir 21-22-VI-1974, 1.300 m. Groß leg., gen. prep. 3512 ♂ KL. Paratypes five females, TURKEY, Ankara, Beynam Ornam, bei Karaali, four specimens, 19-20-VI-1979, 1.400 m, Groß leg., gen. prep. 3518 ♀ KL.; Yozgat, Yozgat Milliparki, one specimen, 9-VII-2000, 1.500 m, K. Larsen leg., gen. prep. 3513 ♀ KL.

Description male (Fig. 3): Wingspan 16 mm. Frons and vertex ochreous. Labial palps short, grey, opposite side whitish, terminal segment very short, whitish. Antenna more than half the length of the forewing, grey. Thorax and tegulae dark grey.

Forewing elongate with slightly round apex. Ground colour dark grey, drawings lighter grey rather inconspicuous. Median fascia angled one third from costa. Basal fascia dark, angled. Costal strigula lighter grey at outer half, specula week with a dark dividing line. Cilia light grey with dark basal line and with partly darker tipped scales. Hindwing dark grey . Two patches of blackish scales expanding along veins from base of wing. Cilia as in forewing. Underside of forewing dark grey, lighter towards apex and with whitish costal strigula at outer third. Underside of hindwing dark grey.

Female (Fig. 4): Wingspan 16-19 mm. Colour and drawings as in male, but more well defined. Abdomen rather long with long visible papillae anales.

Male genitalia (Fig. 6): Tegumen large, elongate, uncus pointed, socii very long, straight, gnathos triangular, phallus short, valve elongate, ventral incision smoothly curved, cucullus long, hairy with hooked formed spines at dorsal edge, sacculus flat elongate, small horn close to pronounced basal cavity, ending at costa with circular area.

Female genitalia (Figs 7, 7a): sterigma round, elongate, weak posterior, ductus bursa long, incision at ostium, widening towards ductus seminalis, a few minor spines before ductus seminalis, signum medium sized, funnel shaped, apophyses long, thin.

Biology: Not known except the collecting dates and the three known localities, which all are primary *Pinus* forest 1.300 to 1.500 m above sea level.

Etymology: The species name *oskariana* refers to my grandson, who is engaged in activities with moth.

Diagnoses: *P. oskariana* is characterized by the ochreous frons and vertex and the pronounced median fascia. In the male genitalia by the shape of uncus, socii, cucullus, ventral incision and basal cavity and in the female genitalia by the rounded sterigma and the lack of cingulum in the long ductus bursa.

Discussion

The two new species in the genus *Pseudococcyx* are obviously very closely related. Male genitalia of *P. friedmariana* and *P. oskariana* have the exact same structure, but they are at the same time very easy to recognize both in the imagines and in the genitalia. Externally the ochreous frons and vertex in *P. oskariana* separates the species easily.

The female of *P. friedmariana* is not known.

Tentative systematic position of the two new species.

On basis of the male genitalia *P. friedmariana* and *P. oskariana* could be sister species with west respectively east Mediterranean distribution, as is seen in many other genera and also in the closely related *Pinus* feeding genera (LARSEN, 2010). The male genitalia are in structure very close to *P. posticana* (Zetterstedt, 1839) especially *P. friedmariana*.

On basis of the female genitalia *P. oskariana* have affinities to other species in the genus in the single funnel shaped signum and in the shape of sterigma. All species in the genus have a large cingulum, but in *P. oskariana* this is substituted by a few small spines close to ductus seminalis.

The conclusion is that the two new species represent early representatives with respectively west and east distribution pattern in the Mediterranean area.

The closest relation seems to be to the more widespread species *P. posticana* (Zetterstedt, 1839).

Proposed systematic position:

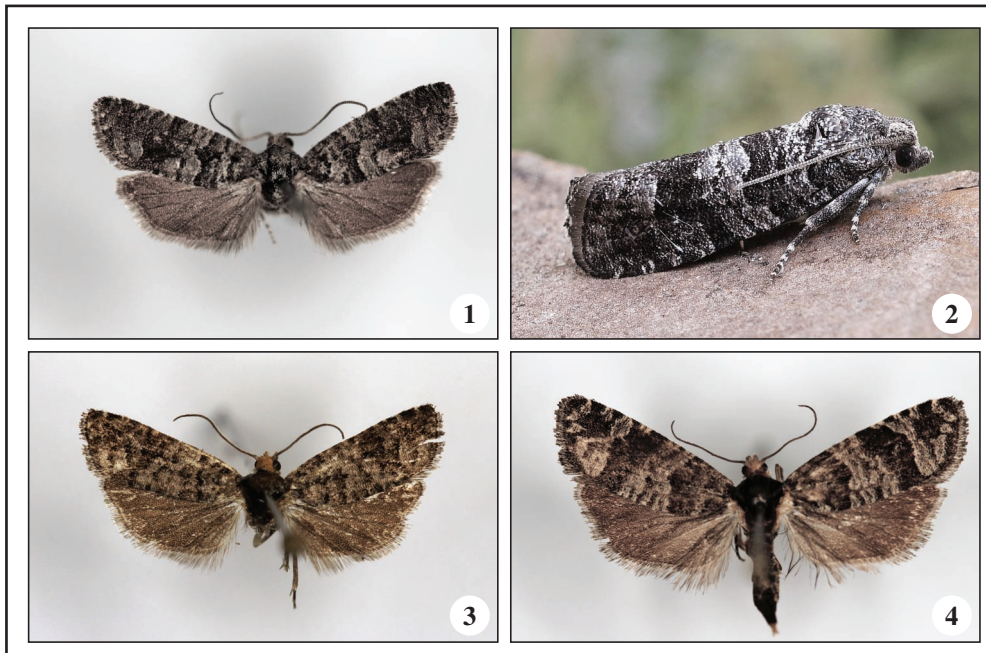
Pseudococcyx Swatschek, 1958

P. oskariana Larsen, sp. n.
P. friedmariana Larsen, sp. n.
P. posticana (Zetterstedt, 1839)
P. turionella (Linnaeus, 1758)
P. mughiana (Zeller, 1868)
P. tessulatana (Staudinger, 1871)

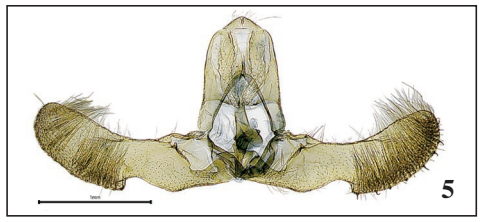
Full synonymy of genus and species can be seen in AARVIK *et al*. (2017) and GILLEGAN *et al*. (2014).

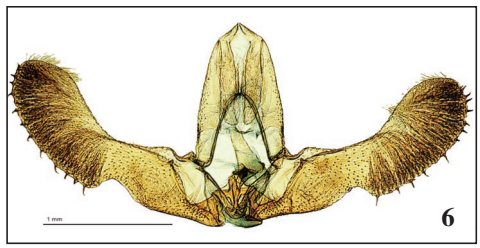
Acknowledgements

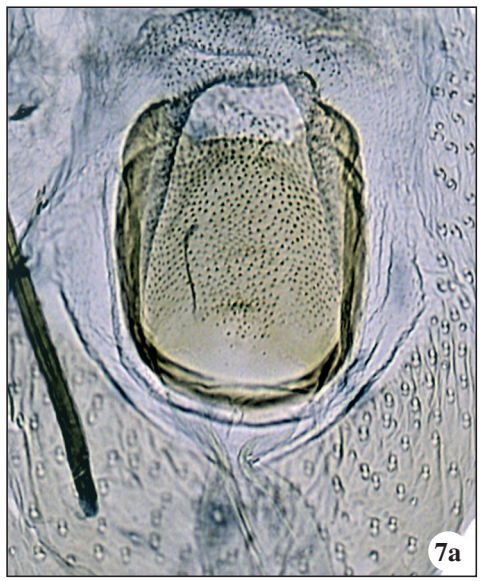
A special thank is given to Mr. Friedmar Graf who kindly sent me photos of imago and genitalia of a Spanish specimen for determination. The author is likewise grateful to Dr. Antonio Vives, Spain for translating the abstract into Spanish, editing the article and to the referee for linguistic advice.



Figures 1-4.– 1. *Pseudococcyx friedmariana* Larsen, sp. n. Holotype ♂. 15 mm. Spain, Albarracín. **2.** *P. friedmariana* Larsen, sp. n. Paratype ♂. 18 mm. Resting position. Spain, Hornos. **3.** *Pseudococcyx oskariana* Larsen, sp. n. Holotype ♂. 16 mm. Turkey, Beysehir. **4.** *P. oskariana* Larsen, sp. n. Paratype ♀. 19 mm. Turkey, Karaali.







Figures 5-7.– 5. *P. friedmariana* Larsen, sp. n. Holotype ♂. Gen. prep. 3511 ♂. KL. **6.** *P. oskariana* Larsen, sp. n. Holotype ♂. Gen. prep. 3512 ♂. KL. **7.** *P. oskariana* Larsen, sp. n. Paratype ♀. Gen. prep. 3518 ♀. KL. **7a.** *P. oskariana* Larsen, sp. n. Paratype ♀. Gen. prep. 3513 ♀. Sterigma. KL. Turkey, Yozgat.

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K. L.
Røntoftevej, 33
DK-2870 Dyssegaard
DINAMARCA / *DENNMARK*
E-mail: knud.torts@gmail.com
https://orcid.org/0000-0001-5556-3503

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The Tineoidea of Morocco (Lepidoptera: Meessiidae, Tineidae)

R. Gaedike

Abstract

As a result of the study of Tineoidea collected in Morocco, it was possible to establish the occurrence of 72 species (9 Meessiidae and 63 Tineidae). One species is described as new: *Anomalotinea tabelli* Gaedike, sp. n..
KEY WORDS: Lepidoptera, Tineoidea, Meessiidae, Tineidae, new species, Morocco.

Los Tineoidea de Marruecos
(Lepidoptera: Meessiidae, Tineidae)

Resumen

Como resultado del estudio de Tineoidea colectados en Marruecos, fue possible establecer la presencia de 72 especies (9 Meessiidae y 63 Tineidae). Se describe una especie como nueva *Anomalotinea tabelli* Gaedike, sp. n.
PALABRAS CLAVE: Lepidoptera, Tineoidea, Meessiidare, Tineidae, nueva especie, Marruecos.

Introduction

The kindness of Lauri Kaila, Finnish Museum of Natural History, Helsinki, enabled me to study interesting material from Morocco, collected during recent years. The study prompted me to collate the records of the Tineoidea hitherto found in Morocco. The examined material, sent for determination to my predecessor G. Petersen and me in the past, is deposited in numerous collections (see abbreviations). The names of localities are written as they are on the labels.

Abbreviations

AZD	Aqua-Zoo, Düsseldorf, Germany
coll. Baldizzone	Giorgio Baldizzone, Asti, Italy
coll. Bettag	Erich Bettag, Dudenhofen, Germany
coll. de Prins	Willy de Prins, Brussels, Belgium
coll. Werno	Andreas Werno, Neunkirchen, Germany
FMNH	Finnish Museum of Natural History, Helsinki, Finland
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MNVD	Museum für Naturkunde und Vorgeschichte, Dessau, Germany
NMW	Naturhistorisches Museum, Vienna, Austria
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
SMNK	Staatliches Museum für Naturkunde, Karlsruhe, Germany
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany

ZMHB	Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung, Berlin, Germany
ZMUC	Zoological Museum, Copenhagen, Denmark
ZSM	Zoologische Staatssammlung, Munich, Germany

MEESSIIDAE

Tenaga nigripunctella (Haworth, 1828)

PETERSEN (1962); - PETERSEN & GAEDIKE (1979).

Infurcitinea marcunella (Rebel, 1901)

PETERSEN (1962); - PETERSEN & GAEDIKE (1979).

Infurcitinea frustigerella (Walsingham, 1907)

Examined material: Smimou, 1 ♂, 15-III-1974, leg. R. and E. Bender (SMNK); 7 km östlich [East of] Mogador, 1 ♂, 13-14-III-1974, leg. Friedel (SMNK); Moyen Atlas, Prov. Meknès, Ifrane, 2 ♂♂, 28-IV-11-V-1967, leg. De Lajonquière (MNHN); Meknès-Tafilalet, 33º27'20"N, 5º2'18"W, Ifrane, 1920 m, 3 ♂♂, 9-V-2011, leg. J. and A. Kullberg (FMNH); Prov. Ifrane, Michlifen, 2 ♂♂, 9-10-V-2010, leg. J. Kullberg and Z. Kolev (FMNH); Tafrault, 1000 m, 1 ♂, 23-24-III-2005, leg. O. Karsholt (ZMUC).

Infurcitinea italicoides Gaedike, 2009

GAEDIKE (2009): Type localities: Imilil; Anezi; Arbaa Sahel.

Examined material: Ht. Atlas, Toublat-Massiv, Tamatert near Imilil, 2400 m, 31º9'N, 7º53'W, 2 ♂♂, 27-VII-2008, leg. A. Steiner (SMNK); Agadir, 21 km N, 635 m, 2 ♂♂, 22-V-2010, leg. Werno (coll. Werno); Agadir, 20 km N, 8 ♂♂, 25-IV-2014, leg. W. Mey (ZMHB); High Atlas, Ouirgane, 10 km W, 7 ♂♂, 30-V-3-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC); High Atlas, Ljoukak, 18 km SW, 1300-1500 m, 1 ♂, 2-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC); Anti Atlas, Ait Mansour, 1410 m, 1 ♂, 31-V-2010, leg. Werno (coll. Werno).

Infurcitinea atrifasciella (Staudinger, 1871)

PETERSEN & GAEDIKE (1979).

Examined material: Taroudanut, 1 ♂, 21-V-1986, leg. Curletti, (coll. Baldizzone); Tizi n'Test, 1900 m, 1 ♀, 26-V-1985, leg. Sama (coll. Baldizzone); dint. Khenitra, 2 ♀♀, 1-V-1990, leg. Bassi; Olmi & Scaramozzino (coll. Baldizzone); El Ksiba, 32º31'39"N, 06º01'13"W, 2 ♂♂, 1 ♀, 26-V-2005, leg. Werno (coll. Werno); Tahanaoute, 31º15'49"N, 07º52'50"W, 1 ♀, 20-V-2005, leg. Werno (coll. Werno); Oukaimden, 2600 m, 31º12'14"N, 07º51'42"W, 1 ♀, 23-V-2005, leg. Werno (coll. Werno); Oukaimden area, 31º10'N, 07º50'W, 2815 m, 1 ♀, 28-VII-2008, leg. A. Steiner (SMNK); Marrakesch-Tensift-Al-Haouz-Asguine, 1 ♂, 26-V-2010, leg. Werno (coll. Werno); Al Haouz, Ourika, 31º50'N, 7º40'W, 1 ♂, 1 ♀, 14-V-2011, leg. J. and A. Kullberg (FMNH); High Atlas, Ouirgane, 10 km W, 1 ♂, 30-V-3-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC); Prov. Azilal, Ail Bouzid, 14 ♂♂, 2 ♀♀, 30-IV-7-V-2015, leg. J. Kullberg (FMNH).

Infurcitinea maroccana Petersen & Gaedike, 1979

PETERSEN & GAEDIKE (1979): Type location: Oukaim'den.

Infurcitinea incertula (Meyrick, 1928)

MEYRICK (1928): Type locality: Tinmel; - GAEDIKE (2009).

Examined material: Marrakesch-Tensift-Al-Haouz, Tizi-n-Ted, 2045 m, 2 ♂♂, 23-V-2010, leg. Werno (coll. Werno); Agadir, 21 km N, 635 m, 1 ♀, 22-V-2010, leg. Werno (coll. Werno); High Atlas, 12 km SW Ljoukak, 1300 m, 4 ♂♂, 1 ♀, 5-V-2016, leg. Hviid; Larsen and Nilsson (ZMUC); Anti Atlas, Tafraout, 12 km E, 1590 m, 1 ♂, 27-IV-2013, leg. J. Tabell (FMNH).

Infurcitinea parincertula Gaedike, 2019

GAEDIKE (2019a): Type locality: Ouirgane.

Infurcitinea maura Petersen, 1962
PETERSEN (1962): Type locality: Tangier; - GAEDIKE (2009).

TINEIDAE

Hapsifera multiguttella (Ragonot, 1895)
Examined material: Moyen Atlas, Beni Mellal, 1 ♂, VII-1972, leg. Friedel (SMNK); Prov. Tadia-Azilal, 7 km N Beni Mellal, 600 m, 1 ♂, 1 ♀, 27-V-2005, leg. Werno (coll. Werno); Marrakesch-Tensift-Al-Haouz, Tamaloula, 1 ♂, 8-VIII-2013, leg. Werno (coll. Werno); High Atlas, Ouirgane, 925 m, 2 ♂♂, 30-31-V-2015, leg. Hviid, Karsholt and Larsen (ZMUC); High Atlas, 7 km S Ouirgane, 2 ♂♂, 1 ♀, 5-V-2016, leg. Hviid; Larsen and Nilsson (ZMUC); High Atlas, 6 km NW Ouirgane, 1 ♂, 1-2-V-2016, leg. Hviid; Larsen and Nilsson (ZMUC); Prov. Essaouira: Douar Tisgharin, 540 m, 1 ♀, 22-IV-2015, leg. J. Kullberg (FMNH).

Rhodobates algiricella (Rebel, 1901)
PETERSEN & GAEDIKE (1979).

Rhodobates friedeli Petersen, 1987
PETERSEN (1987): Type location: Agadir-Rokein.
Examined material: Agadir O-Sous, 7 ♂♂, leg. Pinker (SMNK).

Morophaga morellus (Duponchel, 1838)
PETERSEN & GAEDIKE (1979).
Examined material: High Atlas, 7 km S Ouirgane, 950 m, 1 ♂, 1-5-V-2016, leg. Hviid; Larsen and Nilsson (ZMUC); Rabat, Forêt de Mamora, 1 ♂, 25-26-IV-1989, leg. Exp. Kopenhagen (ZMUC).

Morophaga choragella ([Denis & Schiffermüller], 1775)
GAEDIKE (2009).

Nemapogon inconditella (Lucas, 1956)
LUCAS (1956): Type location: Ifrane; - PETERSEN & GAEDIKE (1979) (under the name of the synonym *heydeni* Petersen, 1957).

Nemapogon agenjoi Petersen, 1959
GAEDIKE (2015a).
Examined material: High Atlas, Ljoukak, 23 km SW, 1 ♀, 2-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC).

Nemapogon palmella (Chrétien, 1908)
PETERSEN & GAEDIKE (1979).
Examined material: Agadir, 1 ♀, 20-28-IV-2009, leg. W. Mey (ZMHB); High Atlas, 6 km NW of Ouirgane, 31º12'29"N, 8º4'23"W, 1 ♀, 1-2-V-2016, leg. Hviid; Larsen and Nilsson (ZMUC); Demnate, 1070 m, 1 ♂, 22-XI-2014, leg. J. Kullber (ZMUC).

Nemapogon picarella (Clerck, 1759)
GAEDIKE (2009); - GAEDIKE (2015a).

Nemapogon sardicus Gaedike, 1983
GAEDIKE (2009).
Examined material: Anti Atlas, Tizi-Mlil, 1590 m, 1 ♂, 1-VI-2010, leg. Werno (coll. Werno); Marrakesch-Tensift-Al Haouz, Tiz-n-Test, 2045 m, 1 ♀, 29-V-2010, leg. Werno (coll. Werno); Marrakesch-Tensift-Al Haouz-Asguine, 1 ♂, 7-VI-2013, leg. Bläsius (coll. Werno); High Atlas, Oukaim'den, 2600 m, 2 ♂♂, 9-11-VIII-1975, leg. F. Kasy (NMW); High Atlas, Ouirgane, 925 m, 1 ♂, 30-31-V-2015, leg. Hviid; Karsholt and Larsen (ZMUC); High Atlas, 3 km N of Ouirgane, 950 m, 1 ♂, 1 ♀, 1-5-V-2016, leg. Hviid;

Larsen and Nilsson (ZMUC); High Atlas, 14 km E of Asni, 1820 m, 1 ♀, 1-5-V-2016, leg. Hviid; Larsen and Nilsson (ZMUC); Prov. Essaouira: Douar Tisgharin, 540 m, 2 ♀♀, 22-IV-2015, leg. J. Kullberg (FMNH); Prov. Tadla-Azilal, El Kaba, 1 ♂, 28-V-2005, leg. Werno (coll. Werno); Agadir, 3 ♂♂, 18-29-III-1975, leg. K. Mikkola (FMNH).

Nemapogon granella (Linnaeus, 1758)
PETERSEN & GAEDIKE (1979).

Nemapogon variatella (Clemens, 1859)
Examined material: dint. Khenitra, 1 ♂, 1-V-1990, leg. Bassi & Scaramizzino (coll. Baldizzone).

Neurothaumasia ankerella (Mann, 1867)
GAEDIKE (2009).

Neurothaumasia ragusaella (Wocke, 1889)
PETERSEN & GAEDIKE (1979).
Examined material: Anti Atlas, Djebel Siroua, 30 km W Anzal, 1500 m, 1 ♂, 18-VI-2011, leg. R. Bläsius (coll. Werno).

Pachyarthra mediterraneae (Baker, 1894)
LUCAS (1933): Type locality of the synonym *Tineola pallidella*: Ouida; - LUCAS (1950): Type locality of the synonym *Euplocera variegata*: Sehouls; - PETERSEN & GAEDIKE (1979).
Examined material: Ademine, 1 ♀, middle of XI-1974, leg. Pinker (SMNK).

Pachyarthra lividella (Chrétien, 1915)
PETERSEN & GAEDIKE (1979).
Examined material: Agadir-Ademine, 35 ♂♂, 1 ♀, XI-1974, leg. Friedel (SMNK; SDEI); Agadir-Rokein, 3♂♂, 8-XI-1974, leg. Friedel (SMNK); env. of Agadir, 10 ♂♂, XI-1974, leg. Friedel (SMNK); env. of Agadir, 1 ♀, 26-X-2012, leg. Bläsius (coll. Werno); Agadir, O-Sous, 48 ♂♂, 14 ♀♀, leg. Pinker (SMNK; SDEI); Ademine, 1 ♂, middle of XI-1974, leg. Pinker (SMNK); Agadir, Azrarag, 1 ♀, 24-IV-2012, leg. Bläsius (coll. Werno); Marrakesch-Tensift-Al Haouz-Tamaloukt, 700 m, 1 ♂, 1 ♀, 18-IV-2016, 21-VII-2012, leg. Bläsius (ZSM; coll. Werno).

Pachyarthra ochroplicella (Chrétien, 1915)
PETERSEN & GAEDIKE (1979).
Examined material: Agadir and env. of Agadir, 3 ♂♂, 1 ♀, XI-1974, leg. Friedel (SMNK); 20 km N of Agadir, Vallée de Paradis, 1 ♂, 7-VIII-2013, leg. Werno (coll. Werno); High Atlas, env. of Tacheddirt, 2300 m, 22 ♂♂, 8-22-VIII-1975, leg. Groß (AZD; SDEI); High Atlas, Tiz-n-Tichka, 2100 m, 2 ♂♂, 2 ♀♀, 11-VIII-1997, leg. Bettag (coll. Bettag); High Atlas, Tiz-n-Test, 2100 m, 4 ♂♂, 4-X-1996, leg. Lingenhöle (SMNS); Marrakesch-Tensift-Al Haouz and Imi Nifri, 2 ♂♂, 12-VIII-2013, 13-VIII-2013, leg. Werno (coll. Werno); Anti Atlas, Tizi Teratine, 1900 m, 1 ♂, 12-VIII-1975, leg. Groß (AZD).

Myrmecozela diacona Walsingham, 1907
PETERSEN & GAEDIKE (1979).
Examined material: Anti Atlas, Souk-el-Had-d'Afella-Irhir, 1 ♂, 2-IV-1997, leg. Hoppe (ZSM).

Myrmecozela ataxella (Chrétien, 1905)
Examined material: Anti Atlas, 15 km SW Tirhmi, 1 ♂, 31-I-1990, leg. De Freina (ZSM); env. of Tamegroute, Vallée du Dráa, 1 ♂, 12-II-1996, leg. Hoppe (ZSM).

Ateliotum petrinella (Herrich-Schäffer, 1854)
Examined material: High Atlas, Toubkal-Massiv, Oukaimden area, 31º10'N, 7º50'W, 2815 m, 1 ♂, 3-

VIII-2008, leg. A. Steiner (SMNK); High Atlas, 23 km SW Ljoukat, 1 ♂, 2-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC); Maknès-Tafilalet, 32º35'N, 4º33'W, 2170 m, 1 ♂, leg. J. and A. Kullberg (FMNH).

Cephimallota tunesiella (Zagulajev, 1966)

Examined material: Grand Atlas, Ijoukak, 1 ♀, 10-20-IX-1937, leg. Jourdan.

Cephimallota crassiflavella Bruand, 1851

Examined material: Marrakesch-tensift-El Khaouz Asguine, 970 m, 1 ♂, 4-VI-2010, leg. Werno (coll. Werno).

Edosa lardatella (Lederer, 1858)

PETERSEN & GAEDIKE (1979).

Examined material: Val d'Ifrane, 1 ♀, 25-29-X-1974, leg. Friedel (SMNK); Agdz, 1 ♂, 11-IV-1976, leg. Thomas (MNVD); Vallée du Draa, Tagounite, 700 m, 1 ♂, 29-III-1997, leg. Hoppe (ZSM); Souss-Massa-Draa, Anezi, 10 km W, 800 m, 1 ♀, 17-V-2005, leg. M. Meyer (coll. Werno); Prov. Meknès-Tafilalet Azrou, 1600 m, 1 ♂, 28-V-2005, leg. Werno (coll. Werno); Tafilalt, Taznakt, 1000 m, 3 ♂♂, 1 ♀, 8-IV-1980, leg. Thomas (MNVD); Sahara, Zugora, 4 ♂♂, 4-16-IV-1974, leg. Bender (SMNK); High Atlas, Asni, 1150 m, 1 ♂, 7-9-V-1974, leg. Bender (SMNK); Tinerhir, 1350 m, 3 ♂♂, 6-8-V-1973, leg. Bender (SMNK).

Perissomastix biskraella (Rebel, 1901)

PETERSEN & GAEDIKE (1979).

Examined material: High Atlas, Asni, 1150 m, 4 ♂♂, 7-9-V-1974, leg. Bender (SMNK); Ksar-es-Souk, 30 km O of Tinehir, 1 ♂, 14-VIII-1975, leg. Groß (AZD); Westsahara, 2 km S of Faun Agoutir, 2 ♂♂, 1-VI-2000, leg. Hoppe (ZSM).

Crassicornella agenjoi (Petersen, 1957)

PETERSEN (1962); - PETERSEN & GAEDIKE (1979).

Examined material: Houed Korifla, 80 km SE Rabat, 1 ♂, 13-V-1988, leg. Curletti (coll. Baldizzone); Ifrane, 1700 m, 25-VII-1975, 6 ♂♂, leg. Groß (AZD); Tabarka, 1 ♂, 29-VII-3-VIII-1995, leg. Mey (ZMHB); Meknès-tafilalet, Azrou, 1600 m, 2 ♂♂, 28-V-2005, leg. Meyer (coll. Werno); Tangier, 7 ♂♂, VII-VIII-1934, leg. Querci (MNHN).

Crassicornella zernyi (Petersen, 1957)

PETERSEN (1957a): Type locality: Tachdirt; - PETERSEN & GAEDIKE (1979); - GAEDIKE (2009).

Examined material: numerous specimens (over eighty) from entire country.

Crassicornella hirundinea (Meyrick, 1928)

PETERSEN & GAEDIKE (1979).

Examined material: Tizi-n' Test, 1900 m, 3 ♂♂, 25-V-1985, leg. Sama (coll. Baldizzone); Agadir and env. of Agadir, 3 ♂♂, 1 ♀, 16-IV-2012, leg. Müller (ZMHB); 25-IV-2014, leg. Mey (ZMHB); 10-III-2012, leg. Bläsius (coll. Werno); Middle Atlas, Prov. Ifrane, 4 ♂♂, 7-9-V-2010, leg. Kullberg & Kolev (FMNH).

Ceratuncus maroccanella (Amsel, 1951)

AMSEL (1951): Type locality: Goundafa.

Examined material: High Atlas, Oukaimden, 1600 m, 11-18-VI-1933, 1 ♂, leg. Zerny (NMW); High Atlas, Asni, 1200 m, 2 ♂♂, 6-VII-1984, leg. de Prins (coll. de Prins); High Atlas, 10 km NW Ouirgane, 1050 m, 1 ♂, 30-V-3-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC); High Atlas, Ljoukak, 23 km SW, 1 ♂, 2-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC) Marrakesch-Tensift-El Haouz-Asguine, 970 m, 1 ♂, 3-VI-2010, leg. Werno (coll. Werno).

Reisserita karsholti Gaedike, 2009

GAEDIKE (2009): Type locality: Sidi Kaould, 25km S Essaouira.

Examined material: 6 km SE Essaouira, 1 ♂, 26-27-IV-2015, leg. J. Kullberg (FMNH).

Reisserita meyi Gaedike, 2015
GAEDIKE (2015): Type locality: Agadir.

Reisserita cinnamomella Gaedike, 2015
GAEDIKE (2015): Type locality: Midelt.

Reisserita bettagi Gaedike, 2009
GAEDIKE (2009): Type locality: Ifrane.

Reisserita chalcopterella (Zerny, 1935)
ZERNY (1935): Type locality: Tachdirt; - GAEDIKE (2009).
Examined material: High Atlas, Telouet, 2900 m, 1 ♂, 11-VIII-1997, leg. Bettag (coll. Bettag); High Atlas, 9 and 10 km NW Ouirgane, 31º12'50"N, 8º4'24"W, 4 ♂♂, leg. Hviid; Karsholt and Larsen (ZMUC); High Atlas, Prov. Taroudant, Tamaloukt, 700 m, 1 ♂, 10-VI-2013, leg. Bläsius (coll. Werno); Demnale, env. of Tizi-n-Azioun, 1 ♂, 27-VI-2013, leg. Bläsius (coll. Werno).

Reisserita stengeli Gaedike, 2009
GAEDIKE (2009): Type locality: Moyen Atlas, Forêt des Cedres.

Reisserita luteopterella Petersen, 1957
PETERSEN (1957): Type locality: Goundafa; - GAEDIKE (2009).
Examined material: Tinin, 29º43'35"N, 9º16'33"W, 1 ♂, 16-V-2005, leg. Werno (coll. Werno); Marrakesch-Tensift-Al Haouz, Tiz-n-Test, 2645 m, 3 ♂♂, 8-VI-2013, leg. Bläsius; 11-VIII-2013, leg. Werno (coll. Werno).

Reisserita parva Petersen & Gaedike, 1979
PETERSEN & GAEDIKE (1979): Paratype location: Tangier.

Anomalotinea pseudoranella (Petersen & Gaedike, 1979)
PETERSEN & GAEDIKE (1979): Type location: Sangal (under the genus name *Reisserita*).

Anomalotinea paepalella (Walsingham, 1907)
GAEDIKE (2009).

Anomalotinea fulvescentella (Lucas, 1956)
LUCAS (1956): Type locality: Ifrane; - PETERSEN & GAEDIKE (1979): Type locality: Oukaimden and Azrou (of the synonym *maroccana* Petersen & Gaedike, 1979).
Examined material: numerous additional specimens (34 ♂♂) from the type locality Ifrane in coll. SMNK; NMW; AZD; SDEI; ZSM; Marrakesch-Tensift-El Haouz-Asguine, 1 ♂, 4-VI-2010, leg. Werno (coll. Werno); Marrakesch-Tensift-El Haouz-Fadh rat, 2580 m, 2 ♂♂, 2-VII-2013, leg. Bläsius (coll. Werno).

Anomalotinea tisliticola Gaedike & Kullberg, 2015
GAEDIKE & KULLBERG (2015): Type locality: Prov. Er Rachidia, Lake Tislit.

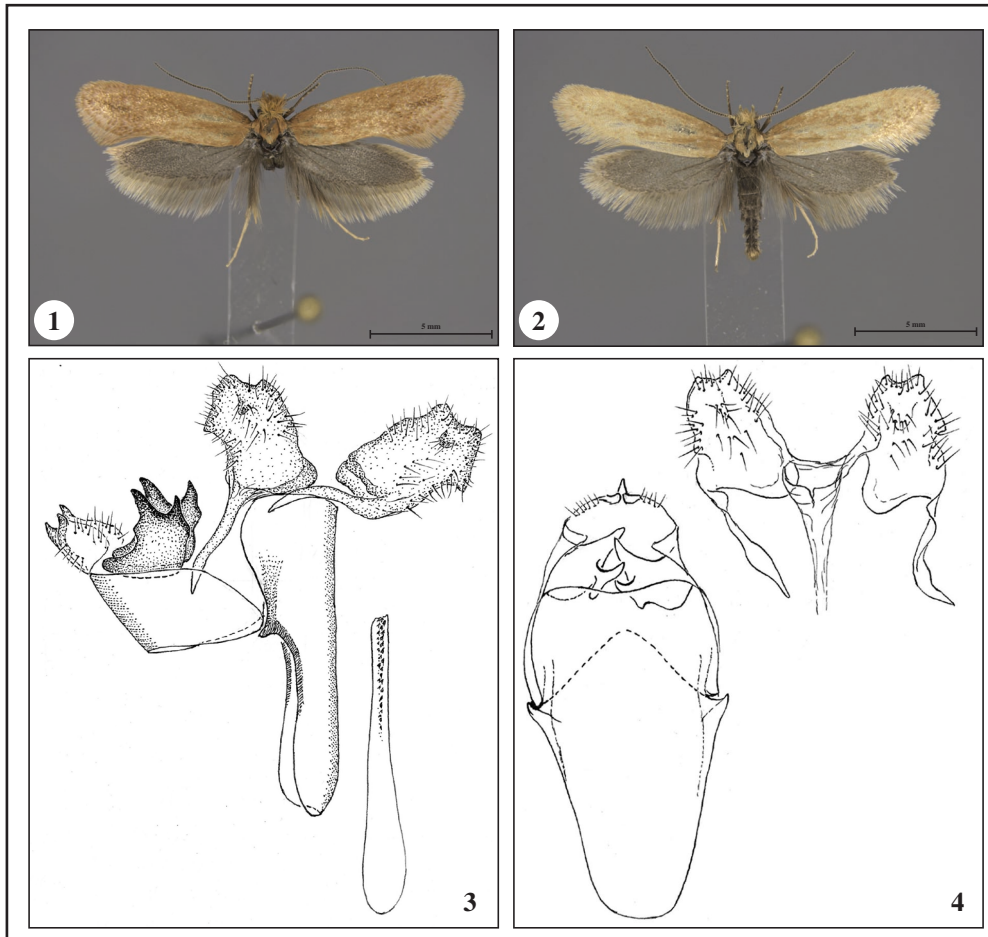
Anomalotinea wernoi Gaedike, 2009
GAEDIKE (2009): Type locality: Tinn.
Examined material: Anti Atlas, Tizi-Mlil, 1590 m, 2 ♂♂, 1-VI-2010, leg. Werno (coll. Werno); Agadir, residence Al Faras, 2 ♂♂, 20-28-IV-2009, leg. Mey (ZMHB).

Anomalotinea derrai Gaedike, 2009
GAEDIKE (2009): Type locality: Mischliften.

Anomalotinea hviidi Gaedike, 2019
GAEDIKE (2019a): Type locality: Ouirgane.

Anomalotinea tabelli Gaedike, sp. n.

Material examined: Holotype ♂: Morocco, El Hajeb Prov., El Hajeb 2,8km WNW, 860 m, N 33.69072 W 5.40304, 15-V-2016, J. Tabell leg.; Gen.präp. [genitalia slide] Gaedike NR. 9716; Holotypus ♂, *Anomalotinea tabelli* sp. n., det. R. Gaedike 2019 (FMNH). Paratypes: 6 ♂♂, with same dates, three of them with slides NR. 9712, 9713, 9717 (FMNH; SDEI); 1 ♂, Morocco, El Hajeb Prov., El Hajeb 3,3 km WNW, 820 m, N 33.68944 W 5.40940, 17-V-2016, J. Tabell leg.; Gen.präp. [genitalia slide] Gaedike NR. 9711 (FMNH).



Figs 1-4.– *Anomalotinea tabelli* Gaedike, sp. n. **1-2.** Paratypes, Morocco, El Hajeb Prov.. **3-4.** Male paratypes, Morocco, El Hajeb Prov.

Description (figs 1-2): Wingspan 15-17mm; head brush dark yellow-brown, area from neck to insertion of antenna somewhat lighter; scape of antenna with same coloration, with pecten, flagellum ringed, nearly 2/4 of the length of forewing; palpus also yellowish-brown, lighter on inside, second segment with numerous long bristle-shaped scales; thorax and tegulae yellow-brown, forewing with same coloration, without any pattern; hindwing grey.

Variation: Some specimens with pale yellow coloration (see fig. 2).

Male genitalia (figs 3-4): Uncus with hook-shaped tip, characteristically for the genus; gnathos arms unusually broad, proximally forked, with two pointed tips; saccus broad, laterally with more strongly sclerotized hook-like edge (connection with tegumen), narrower to rounded tip; valva somewhat longer than gnathos, more or less parallel-sided, ventral edge straight, costal edge at 1/2 and costal and ventral angles proximally each with small blunt process, on inside near proximal edge with small bristled process, somewhat different sized on each valva; transtilla narrow, as long as valva; phallus as long as saccus, with row of minute more strongly sclerotized thorns. Valvae on ventral edge connected with a structure (juxta or anellus?).

Female genitalia: Unknown.

Diagnosis: Superficially not clearly distinguishable from other members of the genus, but the genitalia structure shows some distinct differences. The shape of gnathos arms and valvae, especially the very long transtilla are unique in the genus.

Etymology: Named in honour of the collector, Jukka Tabell.

Trichophaga tapetzella (Linnaeus, 1758)

Examined material: Prov. Al Haouz, Asgaour, 1320 m, 1 ♀, 11-12-V-2015, leg. Kullberg (FMNH).

The following two species were separated only in 2001 (GAEDIKE & KARSHOLT, 2001). This is why all earlier indications in the literature can be accepted only after re- examination.

Trichophaga bipartitella (Ragonot, 1892)

Examined material: Agadir-Ademine, 1 ♀, XI-1974, leg. Friedel (SMNK); 40 km S Larache, 1 ♂, 1 ♀, 23-24-IV-1989, Exp. Mus. Copenhagen (ZMUC); Prov. Merlef, Tizlit, 1 ♂, 1 ♀, 12-IV-2015, leg. Tabell (FMNH); Prov. Setlat, Oulad Abhou, 1 ♂, 10-IV-2015, leg. Tabell (FMNH).

Trichophaga robinsoni Gaedike & Karsholt, 2001

Examined material: Sous, Inezgane, 2 ♂♂, 3 ♀♀, 17-18-III-1974, leg. Bender (SMNK); 37 km SE Bouizkarn, Oasis Tachjicht, 550 m, 2 ♂♂, 3-II-1990, leg. de Freina (SMNK); Agadir, O-Sous, 1 ♂, leg. Pinker (SMNK); 2 km S Foun Agoutir, 65 km E Torfaya, 1 ♂, 1 ♀, 1-VI-2000, leg. Hoppe (ZSM); Anti Atlas, 12 km E Assaka, 1 ♂, 1 ♀, 31-V-2000, leg. Hoppe (ZSM); High Atlas, Taroudant, 1 ♂, 27-V-1995, leg. Macek.

Ceratophaga infuscatella (Joannis, 1897)

PETERSEN & GAEDIKE (1979).

Elatobia fuliginosella (Lienig & Zeller, 1846)

GAEDIKE (2009).

Elatobia maroccana Gaedike, 2019

GAEDIKE (2019a): Type localities: North of Taroudant; Agadir; Idni.

Examined material: Prov. Settat, 2,5 km E Said Machou, 100 m, 1 ♂, 18-V-2016, leg. Tabell (FMNH): **First record beside type series.**

Tineola bisselliella (Hummel, 1823)

Examined material: High Atlas, 23km SW Ljoukak, 1 ♀, 2-VI-2015, leg. Hviid; Karsholt & Larsen (ZMUC).

Tinea murariella Staudinger, 1859

ROBINSON (1979).

Examined material: Agadir, 3 ♂♂, 1 ♀, 18-29-III-1975, leg. Mikkola (FMNH); Essouira, 1 ♂, 28-IV-2009, leg. Mey (ZMHB).

Tinea dubiella Stainton, 1859

ROBINSON (1979); - PETERSEN & GAEDIKE (1979) (under the name of the synonym *turicensis* Müller-Rutz, 1920).

Tinea flavescentella Haworth, 1828

GAEDIKE (2019).

Tinea basifasciella Ragonot, 1895

Examined material: High Atlas, Asni, 1200 m, 1 ♀, 6-VII-1984, leg. de prins (coll. de Prins); High Atlas, Ljoukak, 23 km SW, 1600 m, 1 ♀, 2-VI-2015, leg. Hviid; Karsholt and Larsen (ZMUC); High Atlas, Agadir, vic. Val Paradis, Tifrit, 1 ♂, 24-IV-2016, leg. Bläsius (coll. Werno); Tahanaoute, Tiz-n-Tagatout, 2 ♂♂, 20-V-2005, leg. Werno (coll. Werno); Prov. Meknés-Tafilalet, Azrou, 1 ♀, 30-V-2005, leg. Werno (coll. Werno); Rabat, 1 ♂, 20-IV-1942, leg. Rungs (MNHN).

Niditinea fuscella (Linnaeus, 1758)

PETERSEN & GAEDIKE (1979).

Examined material: Ouezzane, 300 m, 1 ♀, 21-22-IV-1989, Exp. Mus. Copenhagen (ZMUC); Moyen Atlas, Ifrane, 1 ♀, 5-10-VII-1972, leg. Hahn (ZSM).

Proterospastis autochthones (Walsingham, 1907)

GAEDIKE (2019).

Proterospastis orientalis (Petersen, 1959)

GAEDIKE (2019).

Examined material: High Atlas, Ouirgane, 11 km S, 1 ♂, 30-31-V-2015, leg. Hviid; Karsholt and Larsen (ZMUC).

Monopis imella (Hübner, [1813])

Examined material: Rabat, 1 ♀, [without collection dates and collector name]; High Atlas, Asni, 1 ♀, 6-VII-1984, leg. de Prins (coll. de Prins); 40 km S Larache, 1 ♂, 23-24-IV-1989, Exp. Zool. Mus. Copenhagen (ZMUC); Quezzane, 1 ♂, 21-22-IV.1989, Exp. Zool. Mus. Copenhagen (ZMUC); env. of Ifrane, 1600 m, 2 ♂♂, 1 ♀, 11-22-VI-1996, leg. Bettag (coll. Bettag); Marrakesch-Tensift-El Haouz Asguine, 2 ♂♂, 4-VI-2010, leg. Werno (coll. Werno).

Monopis crocicapitella (Clemens, 1859)

TURATI (1919): Type locality of the synonym *cecconii*: Tanger.

Monopis nigricantella (Millière, 1872)

Examined material: Ouezzane, 1 ♂, 21-23-IV-1989, Exp. Zool. Mus. Copenhagen (ZMUC); 40 km S Larache, 1 ♂, 23-24-IV-1989, Exp. Zool. Mus. Copenhagen (ZMUC).

Xerantica tephroclysta Meyrick, 1930

ROBINSON; GAEDIKE; BLÄSIUS & BETTAG (2006), - GAEDIKE (2007).

Examined material: Prov. Ouerzazate, Gorge du Oades, 8 km Nait Bou Allal, N 31,42, W 6,02, 2 specimens, 23-VI-2005, leg. N. Pöll.

Amphixystis maroccana Gaedike, 2009

GAEDIKE (2009): Type locality: Sidi Ifni.

Examined material: 21 km N of Agadir, 1 ♂, 8-VIII-2013, leg. Werno (coll. Werno); 20 km N Agadir, 4 ♂♂, 25-IV-2014, leg. Mey (ZMHB; SDEI).

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R. G.
Florusstraße, 5
D-53225 Bonn
ALEMANIA / *GERMANY*
E-mail: tinagma@msn.com
https://orcid.org/0000-0002-9347-6678

y / *and*

Senckenberg Deutsches Entomologisches Institut
Eberswalder Str. 90
D-15374 Müncheberg
ALEMANIA / *GERMANY*

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GÓMEZ DE AIZPÚRUA, C. & ARROYO VARELA, M., 1994.– Principales Noctuidos actuales de interés agrícola	15 euros	20 euros	25 euros
GÓMEZ DE AIZPÚRUA, C., 1992.– Biología y morfología de las orugas. Lepidoptera, tomo X: Noctuidae	15 euros	20 euros	25 euros
VIVES MORENO, A., 1988.– Catálogo mundial sistemático y de distribución de la familia Coleophoridae Hübner, [1825] (Insecta: Lepidoptera)	10 euros	15 euros	20 euros
VIVES MORENO, A., 2104.– 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)	90 euros	99 euros	110 euros
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NOTICIAS GENERALES / *GENERAL NEWS*

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KENNEL, J. (1908-1921) 1921.– *Die Palearktischen Tortriciden. Eine monographische Darstellung*. 24 planchas a todo color, todas las planchas, no texto, encuadernadas con las tapas originales ..... 100 euros

SEITZ, A., 1914.– *Die Gross Schmetterlinge der Erde. Die palaearktischen Eulen* [Noctuoidea]. Tomo 3, con 75 planchas originales, con 4.338 figuras, todas las planchas, no texto, encuadernadas con las tapas originales ..... 200 euros

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REVISORES 2018-2019 / *REFEREES 2018-2019*.– Los siguientes revisores colaboraron en la evaluación de los manuscritos durante el año 2018-2019. Expresamos nuestros más sinceros agradecimientos a estas personas por el tiempo y energía que dedicaron a sus evaluaciones, de las cuales dependen los estándares de calidad y la puntualidad de la revista SHILAP Revista de lepidopterología (SHILAP Revta. lepid.) / *The following referees collaborated on the evaluation of manuscripts during 2018-2019. We express our sincerest thanks to them for the time and energy devoted to their evaluations, since the standards of quality and timeliness of the journal SHILAP Revista de lepidopterologia (SHILAP Revta. lepid.) depend on them*: Mr. Leif Aarvik (Noruega / *Norway*); Dr. Stanislav Adabjev (Bulgaria / *Bulgaria*); Dr. Judite Alves (Brasil / *Brazil*); Prof. Dr. Vasilii V. Anikin (Rusia / *Russia*); Mr. Jan Asselbergs (Holanda / *Holland*); Dr. Giorgio Baldizzone (Italia / *Italy*); Dr. Francesca Barbero (Italia / *Italy*); Dr. Salvatore Bella (Italia / *Italy*); Dr. Oleksiy Bidzilya (Rusia / *Russia*); Prof. Dr. Jaroslaw Buszko (Polonia / *Poland*); Dr. Selma Caliskan (Turquía / *Turkey*); Dr. Feza Can (Turquía / *Turkey*); Dr. Steve Collins (Reino Unido / *United Kingdom*); Dr. Selami Candan (Turquía / *Turkey*); D. Francisco Javier Conde de Saro (España / *Spain*); Mr. Martin M. F. Corley (Reino Unido / *United Kingdom*); Dr. Eric Drouet (Francia / *France*); Dr. Konstantini A. Efetov (Rusia / *Russia*); Dr. Gustav Elsner (República Checa / *Czech Republic*); Ing. Andrés Expósito Hermosa (España / *Spain*); Dr. Claudio Flamigini (Italia / *Italy*); Dr. Enrique García-Barros Saura (España / *Spain*); D. Javier Gastón Ortiz (España / *Spain*); Dr. Monsoon Jyoti Gogoi (India / *India*); Dr. Oleg G. Gorbunov (Russia / *Russia*); Dr. Elena Guskova (Rusia / *Russia*); Dr. Péter Gyulai (Hungría / *Hungary*); Dr. Peter Huemer (Austria / *Austria*); Dr. Blanca Huertas (Reino Unido / *United Kingdom*); Dr. Lauri Kaila (Finlandia / *Finland*); Prof. Dr. Ahmet Ö. Koçak (Turquía / *Turkey*); Dr. Stanislav K. Korb ((Rusia / *Russia*); Prof. Dr. Gerardo Lamas Muller (Perú / *Peru*); Dr. Zdenk Laštůvka (República Checa / *Czech Republic*); Prof. Dr. Houhun Li (China / *China*); Dr. Alexander Lvovsky (Rusia / *Russia*); Dr. Koen V. M. Maes (Bélgica / *Belgium*); Dr. Alireza Naderi (Irán / *Iran*); Dr. Antonio S. Ortiz (España / *Spain*); Dr. Franz Pühringer (Austria / *Austria*); Prof. Dr. Józef Razowski (Polonia / *Poland*); Dr. Lászlo Ronkay (Hungría / *Hungary*); Dr. Motoki Saito (Japón / *Japan*); Dr. Klaus Sattler (Reino Unido / *United Kingdom*); Dr. Arturo Serrano (Portugal / *Portugal*); Dr. Hikonet Murat Sipahioglu (Turquía / *Turkey*); Dr. Stefano Scalercio (Italia / *Italy*); Mr. František Slamka (Eslovaquia / *Slovakia*); Mr. Jan Šumpich (República Checa / *Czech Republic*); Dr. Alma Solís (EE.UU. / *USA*); Dr. Andrej Sviridov (Rusia / *Russia*); Dr. Gerhard Tarmann

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SHILAP REVISTA DE LEPIDOPTEROLOGÍA, RENUEVA LA EXCELENCIA 2019-2020 / *SHILAP REVISTA DE LEPIDOPTEROLOGIA, RENOVATES THE EXCELLENCE* 2019-2020.– Tenemos el placer de anunciar que nuestra publicación *SHILAP Revista de lepidopterología* ha superado el proceso de evaluación de calidad de las revistas científicas españolas que la Fundación Española para la Ciencia y la Tecnología (FECYT) ha llevado a cabo durante el año 2019. Después de este arduo proceso, la resolución definitiva de la convocatoria establece que *SHILAP Revista de lepidopterología* ha logrado superar los 12 indicadores de calidad y ha obtenido la certificación de FECYT que selecciona y califica nuestra publicación como **EXCELENTE**, junto con otras 127 revistas. / *We have the pleasure of announcing that our publication* SHILAP Revista de lepidopterología *has successfully passed the quality evaluation process of Spanish scientific magazines carried out by the Spanish Foundation for Science and Technology (FECYT) during 2019. After this complicated process, the final finding establishes that* SHILAP Revista de lepidopterología *has passed the 12 indicators of quality and obtained the certificate of FECYT that selects and qualifies our publication as* ***EXCELLENT****, together with 127 other journals*.– **DETALLES / *DETAILS*:** SHILAP, Apartado de correos, 331, E-28010 Madrid, ESPAÑA / *SPAIN* (E-mail: avives1954@outlook.es).

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