

An annotated checklist of the Pyralidae of the region of Murcia (Spain) with new records, distribution and biological data (Lepidoptera, Pyraloidea, Pyralidae)

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Abstract

Background

The Murcia Region (south-eastern Iberian Peninsula) has a great diversity of Lepidopteran fauna, as a zoogeographical crossroads and biodiversity hotspot with more than 850 butterflies and moth species recorded.

New information

In the present paper, based on an examination of museum specimens, published records and new samples, a comprehensive and critical species list of Pyralidae moths (Lepidoptera, Pyraloidea) is synthesised. In total, three subfamilies, 67 genera and 142 species have been recorded and these are listed, along with their collection, literature references and biological data, including chorotype, voltinism and the flight period in the study area. The subfamilies are Galleriinae, Phycitinae and Pyralinae. Seventy-three species are newly recorded, sixty-two species are confirmed from literature and only seven species have not been observed for the Murcia Region.

Keywords

Lepidoptera, Pyralidae, checklist, chorology, distribution, new records, phenology, Iberian Peninsula

Introduction

The Pyralidae, belonging to the superfamily Pyraloidea, are mainly nocturnal micromoths (Microlepidoptera) with an estimated 6,000 named species worldwide, of which the European fauna is represented by ca. 470 species (Leraut 2014). In the Iberian Peninsula, 262 species have been recorded (Vives-Moreno 2014). The two main evolutionary lineages within Pyraloidea, Pyralidae and Crambidae, are monophyletically distinguished by the morphology of tympanal organs (Minet 1982, Minet 1983, Slamka 2006). Pyralidae are characterised by the forewing venation with R5 stalked or fused with R3+4 and without oval sclerotisation costad on the base of vein A; presence of paired tympanal organs situated ventrally in the second abdominal segment with tympanum and conjunctivum in the same plane; tympanal chamber cephalad closed and accessory tympana absent in metathorax; lobulus and praecinctorium are absent; male genitalia with uncus arms; and segment A8 of larvae almost always with sclerotised ring around base of seta SD1 (Goater et al. 2005, Slamka 2006).

The Pyralidae of Europe have been relatively well studied, although there is a need for further investigation on habitus and distribution. The Southern European and, especially, Iberian species are poorly recorded and more precise data are necessary for the production of distribution maps. Historically, the first pyralid moth recorded and described from the Murcia Region was *Hypotia miegi* (Ragonot 1895) and, later on, *Hypotia leucographalis* (Hampson 1900) was also described. Caradja (1910) recorded *Acrobasis centunculella* (Mann), *Acrobasis obliqua* (Zeller), *Amphithrix sublineatella* (Staudinger), *Epischnia illotella* Zeller, *Homoeosoma nebulella* (Denis & Schiffermüller), *Homoeosoma sinuella* (Fabricius) and *Pterothrixidia rufella* (Duponchel) and Zerny (1914) described *Aphomia murciella* from Sierra Espuña and recorded *Alophia combustella* (Herrich-Schäffer), *Asalebria florella* (Mann), *Assara conicolella* (Constant), *Dioryctria sylvestrella* (Ratzeburg), *Ephestia welseriella* (Zeller), *Euzophora lunulella* (O. Costa), *Psorosa mediterranea* Amsel, *Aglossa brabanti* Ragonot, *Loryma egregialis* (Herrich-Schäffer) and *Stemmatophora vulpecalis* Ragonot. Subsequently, Caradja (1916) confirmed *Aphomia murciella* Zerny and recorded *Eurhodope cruentella* (Duponchel), *Stemmatophora gadesialis* Ragonot and *Synaphe diffidalis* (Guenée). Schmidt (1934) described *Asalebria pseudoflorella* from Sierra Espuña, considered as a subspecies of *A. ferruginella* (Zerny) at the present time.

Later, Agenjo (1948) described, also from Sierra Espuña, *Epischnia peroni*, currently synonymised with *Epischnia asteris* (Staudinger) and *E. prodromella* (Hübner) and *E. illotella* (Zeller) were recorded for the first time, while Agenjo (1952) recorded *Cryptoblabes gnidiella* (Millière) and *Pempelia palumbella* (Denis & Schiffermüller) amongst others, although *Coenochroa ablutella* (Zeller) and *Homoeosoma nimbella* (Duponchel) (cited as *Homoeosoma subalbatella* Mann) have not been collected during the present study. Subsequently, Amsel (1955) described, also from Sierra Espuña, *Archiephestia murciella* considered as a synonym with *Archiephestia adpiscinella* (Chrétien) and Agenjo (1962) recorded *Ancylosis uncinatella* (Ragonot) and *Hypotia miegi* (Ragonot).

Subsequent contributions are those of Roesler (1973), Derra and Hacker (1982), De Prins (1985), Vives-Moreno (1992), Asselbergs (1993), who recorded *Merulempista turturella* (Zeller) (cited as *M. numidella* (Ragonot)), Slamka (2006), Knölke (2007), Pérez de-Gregorio and Requena (2008a), Pérez de-Gregorio and Requena (2008b), Pérez de-Gregorio and Requena (2008c), Slamka (2010), Pérez de-Gregorio and Requena (2010), Palacios and Abad (2010), Palm (2012), Leraut (2014), Pérez de-Gregorio and Requena (2014), Vives-Moreno (2014), Slamka et al. (2018), Slamka (2019) and Bidzilya et al. (2020).

Recently, *Pseudoinsalebria iberica* Slamka et al. 2018 and *Gymnancylla hillneriella* Gastón and Vives 2018 have been described from Murcia and *Ceutolopha isidis* (Zeller) has been recorded by Girdley et al. 2018, *Gymnancylla hornigii* (Lederer) by Girdley et al. 2019 and *Psorosa ferrugatella* (Turati) and *Epischmia ampliata* (Heinemann) by Girdley et al. 2020.

The Region of Murcia has a great diversity of Lepidopteran fauna, as a zoogeographical crossroads and biodiversity hotspot, with more than 850 butterfly and moth species (Ortiz et al. 2016, unpublished data). The summary ecophysiological characterisation of the study area can be consulted in Garre et al. (2021).

Considering various bioclimatic approaches relative to temperature (thermotypes) and rainfall (ombrotypes), four different bioclimatic areas can be recognised according to Alcaraz et al. (2008): thermo-, meso-, supra- and oromediterranean (Fig. 1). Climatic and geological interactions differentiate a great variety of habitats as thermoxerophylic on the sunny slopes of the mountains and, on the other hand, as mesophylic in depressions or very dark exposures, in riparian zones amongst halophytic vegetation and on sandbanks and dunes from the inland to the coastal areas along with agricultural crops and anthropophilic areas. Altogether, they make up ten habitats and 47 special terrestrial conservation areas of community importance (Alcaraz et al. 2008).

This present checklist is intended to update the recorded species and to facilitate access to the most recent data on the Pyralidae family from the Murcia Region (south-eastern Iberian Peninsula) for taxonomists providing data about distribution, chorology, phenology and voltinism.

Materials and methods

Adult specimens were examined externally and the genitalia structures were dissected using standard procedures (Leraut 2014) with minor modifications with the use of DMHF (2,5-Dimethyl-4-hydroxy-3(2H)-furanone). Roesler (1973), Slamka (2006), Leraut (2014) and Slamka (2019) were consulted mainly for identifications. Alpha diversity Simpson (Simpson 1949) and Chao1 (Chao 1984) indices, applied to abundance data on 136 species collected, were calculated in PAST software v. 4.0.9 (Hammer et al. 2001).

The list contains all species of Pyralidae collected by the authors until the end of 2021, along with the material deposited in the private collections of J.A. de la Calle, F. Lencina, F.

Albert and F. Arcas. It also includes all of those records previously referenced in the bibliography.

Black and actinic (6 and 15 W) Heath traps, 125 W Robinson traps, 125 W mercury vapour traps and 4 W LED light traps were used for nocturnal sampling. Catches taken during daytime and in the urban environment (street lighting) are also included. All these sampling points are located within the study area and, especially, in the natural protected areas like the mountainous Parks of Sierra Espuña, Sierra de la Pila, El Valle and Carrascoy etc. and the coastal Parks of Calblanque, Monte de las Cenizas and Peña del Águila, Salinas and Arenales de San Pedro del Pinatar, etc.

Notes on the checklist

The subfamilies are systematically ordered and identified, based on the most recent classification of Pyralidae by Nuss et al. (2021), Vives-Moreno (2014) and Slamka (2019) with minor modifications. The genera and species are listed under their subfamilies and are also ordered systematically, together with collection data (sampling localities, altitude, decimal coordinates, date and number of specimens). In addition, for each species, related references and biological data are provided, including general chorotypes and Iberian endemism, voltinism based on literature and the flight period in the study area or nearby areas indicated by months in Roman numerals. All studied specimens are deposited in the entomological collection in the Zoology Department of Murcia University (Spain) and in the collections of Francisco Lencina, Fernando Albert and Francisco Arcas. The occurrence data can be accessed at DOI:<https://doi.org/10.15470/a6fcav>

Roesler (1973), Slamka (2006), Leraut (2014) and Slamka (2019) were consulted to obtain the information on biology, voltinism and geographical distribution of the species, while Calle (1982) and Varga (2010) were consulted for biogeographic criteria. The voltinism of some species is unknown and data in text have been made, based on our observations in the study area.

Annotated checklist of Pyralidae recorded in the Murcia Region

Family Pyralidae

Subfamily Galleriinae

Achroia grisella (Fabricius, 1794)

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: VI, X. First record in Murcia Region.

***Galleria mellonella* (Linnaeus, 1758)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: VII-X. First record in Murcia Region.

***Cathayia insularum* (Speidel & Schmitz, 1991)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Polyvoltine. Flight period: I, VII-IX. First record in Murcia Region.

***Aphomia sociella* (Linnaeus, 1758)**

Distribution: Holarctic

Notes: References: Pérez de-Gregorio and Requena (2010). Biological data: Univoltine. Flight period: V-VII.

***Aphomia murciella* Zerny, 1914**

Distribution: Endemic

Notes: References: Zerny (1914), Caradja (1916), Slamka (2006). Biological data: Univoltine. Flight period: VII-VIII.

***Aphomia sabella* (Hampson, 1901)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Polyvoltine. Flight period: VII-VIII. First record in Murcia Region.

***Aphomia zelleri* (Joannis, 1932)**

Distribution: Eurasiatic

Notes: References: Palacios and Abad (2010). Biological data: Univoltine. Flight period: IX-X.

***Lamoria anella* (Denis & Schiffermüller, 1775)**

Distribution: Cosmopolitan

Notes: Biological data: Bivoltine. Flight period: IV-XI. First record in Murcia Region.

Subfamily Phycitinae

***Coenochroa ablutella* (Zeller, 1839)**

Distribution: Tropical

Notes: References: Agenjo (1952). Biological data: Bivoltine. Flight period: IV-X.

***Peoria cremoricosta* (Ragonot, 1895)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IX. First record in Murcia Region.

***Peoria translucidella* (Chrétien, 1911)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: IX-X. First record in Murcia Region.

***Ematheudes punctellus* (Treitschke, 1833)**

Distribution: Mediterranean-Asiatic

Notes: References: Derra and Hacker (1982). Biological data: Bivoltine. Flight period: V-X.

***Polyochodes stipella* Chrétien, 1911**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: VI. First record in Murcia Region.

***Cryptoblabes gnidiella* (Millière, 1867)**

Distribution: Mediterranean-Asiatic

Notes: References: Agenjo (1952). Biological data: Polyvoltine. Flight period: VII-VIII.

***Pempeliella ardosiella* (Ragonot, 1887)**

Distribution: Atlanto-Mediterranean

Notes: References: Slamka (2019). Biological data: Polyvoltine. Flight period: V-VII.

***Huertasiella italogallicella* (Millière, 1883)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: IX. First record in Murcia Region.

***Uncinus hispanella* (Staudinger, 1859)**

Distribution: Mediterranean-Asiatic

Notes: References: Slamka (2019). Biological data: Bivoltine. Flight period: V-VI.

***Pseudosyria malacella* (Staudinger, 1870)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: II-VIII. First record in Murcia Region.

***Pseudoinsalebria iberica* Slamka, Ylla & Macià, 2018**

Distribution: Endemic

Notes: References: Slamka et al. (2018), Slamka (2019). Biological data: Univoltine. Flight period: IV-V.

***Asalebria florella* (Mann, 1862)**

Distribution: Eurasiatic

Notes: References: Zerny (1914). Biological data: Bivoltine. Flight period: V-VIII.

***Asalebria ferruginella* (Zerny, 1914)**

Distribution: Mediterranean-Asiatic

Notes: References: Schmidt (1934), Slamka (2019). Biological data: Univoltine. Flight period: V.

***Psorosa dahliella* (Zerny, 1914)**

Distribution: Mediterranean-Asiatic

Notes: References: Slamka (2010). Biological data: Bivoltine. Flight period: V.

***Psorosa ferrugatella* Turati, 1924**

Distribution: Mediterranean-Asiatic

Notes: References: Girdley et al. (2020). Biological data: Polyvoltine. Flight period: IV-VI.

***Psorosa mediterranea* Amsel, 1953**

Distribution: Mediterranean-Asiatic

Notes: References: Zerny (1914), Slamka (2019). Biological data: Polyvoltine. Flight period: V-VIII, X.

***Alophia combustella* (Herrich-Schäffer, 1855)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: III-X. First record in Murcia Region.

***Rhodophaea formosa* (Haworth, 1811)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: V. First record in Murcia Region.

***Sciota elegiella* (Zerny, 1929)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Polyvoltine. Flight period: V-IX. First record in Murcia Region.

***Faveria dionysia* (Zeller, 1846)**

Distribution: Tropical

Notes: References: Slamka (2019). Biological data: Polyvoltine. Flight period: VIII, X.

***Melathrix coenulentella* (Zeller, 1846)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: II, VI, IX-X. First record in Murcia Region.

***Amphithrix sublineatella* (Staudinger, 1859)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1910), Agenjo (1952). Biological data: Bivoltine. Flight period: IV-X.

***Oxybia transversella* (Duponchel, 1836)**

Distribution: Mediterranean-Asiatic

Notes: References: Derra and Hacker (1982), De Prins (1985). Biological data: Polyvoltine. Flight period: II-III, V-X.

***Denticera divisella* (Duponchel, 1843)**

Distribution: Tropical

Notes: References: De Prins (1985). Biological data: Bivoltine. Flight period: II, VIII-XI.

***Oncocera semirubella* (Scopoli, 1763)**

Distribution: Palaearctic

Notes: Biological data: Polyvoltine. Flight period: V, VIII-IX. First record in Murcia Region.

***Etiella zinckenella* (Treitschke, 1832)**

Distribution: Cosmopolitan

Notes: References: Agenjo (1948), Derra and Hacker (1982). Biological data: Polyvoltine. Flight period: V-IX.

***Pima boisduvaliella* (Guenée, 1845)**

Distribution: Holarctic

Notes: Biological data: Bivoltine. Flight period: II-V. First record in Murcia Region.

***Merulempista turturella* (Zeller, 1848)**

Distribution: Mediterranean-Asiatic

Notes: References: Asselbergs (1993). Biological data: Bivoltine. Flight period: IV-V, VII-IX.

***Merulempista azrouella* (D. Lucas, 1933)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II-IV, VII. First record in Murcia Region.

***Tephros ochreella* Ragonot, 1893**

Distribution: Mediterranean-Asiatic

Notes: References: Vives-Moreno (1992), Vives-Moreno (2014), Slamka (2019).
Biological data: Univoltine. Flight period: V.

***Pempelia palumbella* (Denis & Schiffermüller, 1775)**

Distribution: Eurasiatic

Notes: References: Slamka (2019). Biological data: Bivoltine. Flight period: I-XII.

***Pempelia albariella* Zeller, 1839**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: V-VII. First record in Murcia Region.

***Pempelia genistella* (Duponchel, 1836)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: VIII. First record in Murcia Region.

***Pempelia brephiella* (Staudinger, 1879)**

Distribution: Mediterranean-Asiatic

Notes: References: Pérez de-Gregorio and Requena (2014), Slamka (2019). Biological data: Bivoltine. Flight period: II-VI, IX-XII.

***Pempelia compositella* (Treitschke, 1835)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: III-VIII. First record in Murcia Region.

***Phycita roborella* (Denis & Schiffermüller, 1775)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: IX. First record in Murcia Region.

***Phycita diaphana* (Staudinger, 1870)**

Distribution: Tropical

Notes: Biological data: Polyvoltine. Flight period: IV, IX-X. First record in Murcia Region.

***Ceutholopha isidis* (Zeller, 1867)**

Distribution: Tropical

Notes: References: Girdley et al. (2018). Biological data: Polyvoltine. Flight period: V, VIII.

***Dioryctria abietella* (Denis & Schiffermüller, 1775)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: V, IX. First record in Murcia Region.

***Dioryctria sylvestrella* (Ratzeburg, 1840)**

Distribution: Eurasiatic

Notes: References: Zerny (1914). Biological data: Univoltine. Flight period: IX-X.

***Dioryctria mendacella* (Staudinger, 1859)**

Distribution: Mediterranean-Asiatic

Notes: References: Knölke (2007). Biological data: Bivoltine. Flight period: II-X.

***Dioryctria pineae* (Staudinger, 1859)**

Distribution: Mediterranean-Asiatic

Notes: References: Pérez de-Gregorio and Requena (2014). Biological data: Univoltine. Flight period: IX-X.

***Epischnia prodromella* (Hübner, 1799)**

Distribution: Mediterranean-Asiatic

Notes: References: Agenjo (1948). Biological data: Bivoltine. Flight period: IV-VII, IX, XII.

***Epischnia illotella* Zeller, 1839**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1910), Agenjo (1948), Agenjo (1952), Pérez de-Gregorio and Requena (2014). Biological data: Bivoltine. Flight period: II-XI.

***Epischnia asteris* Staudinger, 1871**

Distribution: Atlanto-Mediterranean

Notes: References: Agenjo (1948), Pérez de-Gregorio and Requena (2014). Biological data: Bivoltine. Flight period: IV-VII, X.

***Epischnia ampliata* (Heinemann, 1864)**

Distribution: Eurasiatic

Notes: References: Girdley et al. (2020). Biological data: Univoltine. Flight period: II.

***Nephterix angustella* (Hübner, 1796)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: VIII. First record in Murcia Region.

***Acrobasis legatea* (Haworth, 1811)**

Distribution: Mediterranean-Asiatic

Notes: References: Derra and Hacker (1982). Biological data: Univoltine. Flight period: V-VIII.

***Acrobasis bithynella* Zeller, 1848**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VII-X. First record in Murcia Region.

***Acrobasis obliqua* (Zeller, 1847)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1910). Biological data: Univoltine. Flight period: II-V.

***Acrobasis romanella* (Millière, 1869)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: VIII-X. First record in Murcia Region.

***Acrobasis sodalella* Zeller, 1848**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VIII. First record in Murcia Region.

***Acrobasis fallouella* (Ragonot, 1871)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VI-VIII. First record in Murcia Region.

***Acrobasis centunculella* (Mann, 1859)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1910). Biological data: Univoltine. Flight period: II-X.

***Acrobasis obtusella* (Hübner, 1796)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. First record in Murcia Region.

***Apomyelois bistratella* (Hulst, 1887)**

Distribution: Holarctic

Notes: Biological data: Univoltine. Flight period: VIII. First record in Murcia Region.

***Apomyelois ceratoniae* (Zeller, 1839)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: IV-V, VII-X. First record in Murcia Region.

***Eurhodope rosella* (Scopoli, 1763)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI-VII. First record in Murcia Region.

***Eurhodope cruentella* (Duponchel, 1843)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1916), Pérez de-Gregorio and Requena (2008c).
Biological data: Univoltine. Flight period: IV-VI.

***Myelois circumvoluta* (Geoffroy in Fourcroy, 1785)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: IV. First record in Murcia Region.

***Myelois fuscicostella* Mann, 1861**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: III-V. First record in Murcia Region.

***Valdovecaria hispanicella* (Herrich-Schäffer, 1855)**

Distribution: Atlanto-Mediterranean

Notes: References: Pérez de-Gregorio and Requena (2010). Biological data: Univoltine. Flight period: IV-IX.

***Pterothrixidia rufella* (Duponchel, 1836)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1910). Biological data: Univoltine. Flight period: VI-VIII.

***Seeboldia korgosella* Ragonot, 1887**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: IV, VIII. First record in Murcia Region.

***Epischidia fulvostrigella* (Eversmann, 1844)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VIII-IX. First record in Murcia Region.

***Gymnancya ruscionella* (Ragonot, 1888)**

Distribution: Atlanto-Mediterranean

Notes: References: Gastón and Vives (2018). Biological data: Bivoltine. Flight period: III-VI, VIII-IX.

***Gymnancyla hillneriella* Gastón & Vives, 2018**

Distribution: Endemic

Notes: References: Gastón and Vives (2018). Biological data: Bivoltine. Flight period: II-IX.

***Gymnancyla canella* (Denis & Schiffermüller, 1775)**

Distribution: Mediterranean-Asiatic

Notes: References: Gastón and Vives (2018). Biological data: Univoltine. Flight period: VIII.

***Metallostichodes nygrocianella* (Constant, 1865)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IX. First record in Murcia Region.

***Assara conicolella* (Constant, 1884)**

Distribution: Mediterranean-Asiatic

Notes: References: Zerny (1914). Biological data: Univoltine. Flight period: VIII.

***Euzophera pinguis* (Haworth, 1811)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: V, VII-X. First record in Murcia Region.

***Euzophera lunulella* (O. Costa, 1836)**

Distribution: Mediterranean-Asiatic

Notes: References: Zerny (1914), Derra and Hacker (1982), Pérez de-Gregorio and Requena (2008b), Palacios and Abad (2010). Biological data: Univoltine. Flight period: VI-IX.

***Euzophera osseatella* (Treitschke, 1832)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Polyvoltine. Flight period: V, X. First record in Murcia Region.

***Euzopherodes vapidella* (Mann, 1857)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Polyvoltine. Flight period: II-V, X-XI. First record in Murcia Region.

***Nyctegretis ruminella* (La Harpe, 1860)**

Distribution: Mediterranean-Asiatic

Notes: References: Pérez de-Gregorio and Requena (2014). Biological data: Bivoltine. Flight period: V-VI, VIII.

***Ancylosis cinnamomella* (Duponchel, 1836)**

Distribution: Eurasiatic

Notes: References: De Prins (1985). Biological data: Bivoltine. Flight period: I-X.

***Ancylosis uncinatella* (Ragonot, 1890)**

Distribution: Atlanto-Mediterranean

Notes: References: Agenjo (1962), Derra and Hacker (1982). Biological data: Bivoltine. Flight period: III, V, VII.

***Ancylosis maculifera* Staudinger, 1870**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: V. First record in Murcia Region.

***Ancylosis samaritanella* (Zeller, 1867)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: VII. First record in Murcia Region.

***Ancylosis roscidella* (Eversmann, 1844)**

Distribution: Eurasiatic

Notes: References: Roesler (1973). Biological data: Bivoltine.

***Ancylosis gracilella* (Ragonot, 1887)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Polyvoltine. Flight period: IV-V, IX. First record in Murcia Region.

***Ancylosis harmoniella* (Ragonot, 1887)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IV-V, X. First record in Murcia Region.

***Ancylosis rhodochrella* (Herrich-Schäffer, 1852)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: V, VIII. First record in Murcia Region.

***Ancylosis oblitella* (Zeller, 1848)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: IV, VII-XI. First record in Murcia Region.

***Ancylosis calcariella* Ragonot, 1901**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: IV-V, VII-X. First record in Murcia Region.

***Ancylosis yerburii* (Butler, 1884)**

Distribution: Mediterranean-Asiatic

Notes: References: Bidzilya et al. (2020). Biological data: Bivoltine. Flight period: III-VII, IX.

***Homoeosoma sinuella* (Fabricius, 1794)**

Distribution: Eurasiatic

Notes: References: Caradja (1910), Derra and Hacker (1982). Biological data: Bivoltine. Flight period: V-VIII.

***Homoeosoma nebulella* (Denis & Schiffermüller, 1775)**

Distribution: Eurasiatic

Notes: References: Caradja (1910). Biological data: Polyvoltine. Flight period: VIII.

***Homoeosoma nimbella* (Duponchel, 1837)**

Distribution: Eurasiatic

Notes: References: Agenjo (1952). Biological data: Bivoltine. Flight period: V.

***Phycitodes arenicola* (Chrétien, 1911)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: V. First record in Murcia Region.

***Phycitodes binaevella* (Hübner, 1813)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: III-V. First record in Murcia Region.

***Phycitodes saxicola* (Vaughan, 1870)**

Distribution: Eurasiatic

Notes: References: Roesler (1973). Biological data: Bivoltine. Flight period: II-VI, VIII-XI.

***Phycitodes lacteella* (Rothschild, 1915)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: II, VI, IX-X. First record in Murcia Region.

***Phycitodes bentinckella* (Pierce, 1937)**

Distribution: Atlanto-Mediterranean

Notes: References: Roesler (1973). Biological data: Univoltine.

***Phycitodes albatella* (Ragonot, 1887)**

Distribution: Holarctic

Notes: References: Roesler (1973). Biological data: Polyvoltine. Flight period: VI.

***Phycitodes inquinatella* (Ragonot, 1887)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: V, VII-VIII. First record in Murcia Region.

***Archiephestia adpiscinella* (Chrétien, 1911)**

Distribution: Mediterranean-Asiatic

Notes: References: Leraut (2014). Biological data: Univoltine. Flight period: V-X.

***Plodia interpunctella* (Hübner, 1813)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: V-IX. First record in Murcia Region.

***Ephestia disparella* Ragonot, 1901**

Distribution: Mediterranean-Asiatic

Notes: References: Roesler (1973). Biological data: Univoltine. Flight period: VI.

***Ephestia parasitella* Staudinger, 1859**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Polyvoltine. Flight period: V-VI, IX. First record in Murcia Region.

***Ephestia woodiella* Richards & Thomson, 1832**

Distribution: Eurasiatic

Notes: Biological data: Polyvoltine. Flight period: IX. First record in Murcia Region.

***Ephestia kuehniella* (Zeller, 1879)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: VI, XII. First record in Murcia Region.

***Ephestia welseriella* (Zeller, 1848)**

Distribution: Mediterranean-Asiatic

Notes: References: Zerny (1914), Derra and Hacker (1982). Biological data: Bivoltine. Flight period: V-VIII.

***Cadra furcatella* (Herrich-Schäffer, 1851)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: VI. First record in Murcia Region.

***Cadra figulilella* (Gregson, 1871)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: V-X. First record in Murcia Region.

***Cadra cautella* (Walker, 1863)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: VIII. First record in Murcia Region.

***Cadra calidella* (Guenée, 1845)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Polyvoltine. Flight period: IX. First record in Murcia Region.

Subfamily Pyralinae

***Endotricha flammealis* (Denis & Schiffermüller, 1775)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: VI-IX. First record in Murcia Region.

***Hypotia corticalis* (Denis & Schiffermüller, 1775)**

Distribution: Mediterranean-Asiatic

Notes: References: Agenjo (1952). Biological data: Bivoltine. Flight period: V-VIII.

***Hypotia infulalis* Lederer, 1858**

Distribution: Mediterranean-Asiatic

Notes: References: Vives-Moreno (1992). Biological data: Bivoltine. Flight period: II-X.

***Hypotia pectinalis* (Herrich-Schäffer, 1838)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IV-V, VII-VIII. First record in Murcia Region.

***Hypotia miegi* (Ragonot, 1895)**

Distribution: Endemic

Notes: References: Ragonot (1895), Agenjo (1962), Slamka (2006). Biological data: Bivoltine. Flight period: II-III, V-IX.

***Hypotia leucographalis* (Hampson, 1900)**

Distribution: Endemic

Notes: References: Hampson (1900), Agenjo (1952), Slamka (2006). Biological data: Bivoltine. Flight period: IV-V, VII-X.

***Synaphe moldavica* (Esper, 1794)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: V-VI. First record in Murcia Region.

***Synaphe diffidalis* (Guenée, 1854)**

Distribution: Atlanto-Mediterranean

Notes: References: Caradja (1916). Biological data: Univoltine. Flight period: II-V.

***Synaphe predotalis* (Zerny, 1927)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: VI-VIII. First record in Murcia Region.

***Synaphe punctalis* (Fabricius, 1775)**

Distribution: Eurasiatic

Notes: References: Slamka (2006). Biological data: Univoltine. Flight period: VII-VIII.

***Pyralis farinalis* (Linnaeus, 1758)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: III-IV, VI-XI. First record in Murcia Region.

***Aglossa pingualis* (Linnaeus, 1758)**

Distribution: Cosmopolitan

Notes: Biological data: Univoltine. Flight period: IV, IX-X. First record in Murcia Region.

***Aglossa caprealis* (Hübner, 1809)**

Distribution: Cosmopolitan

Notes: Biological data: Univoltine. Flight period: VI. First record in Murcia Region.

***Aglossa brabanti* Ragonot, 1884**

Distribution: Atlanto-Mediterranean

Notes: References: Zerny (1914), Slamka (2006), Pérez de-Gregorio and Requena (2008a). Biological data: Univoltine. Flight period: V-VIII.

***Aglossa mayrae* Ylla, Šumpich, Gastón, Huertas & Macià, 2017**

Distribution: Endemic

Notes: Biological data: Bivoltine. Flight period: IV-V. First record in Murcia Region.

***Stemmatophora combustalis* (Fisher von Röslerstamm, 1842)**

Distribution: Mediterranean-Asiatic

Notes: References: Derra and Hacker (1982). Biological data: Univoltine. Flight period: V-VIII.

***Stemmatophora gadesalis* Ragonot, 1882**

Distribution: Atlanto-Mediterranean

Notes: References: Caradja (1916). Biological data: Univoltine.

***Stemmatophora vulpecalis* Ragonot, 1891**

Distribution: Atlanto-Mediterranean

Notes: References: Zerny (1914), Slamka (2006). Biological data: Univoltine. Flight period: VI-VIII.

***Stemmatophora syriacalis* (Ragonot, 1895)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VI-VIII. First record in Murcia Region.

***Stemmatophora rungsi* (Leraut, 2000)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: IX. First record in Murcia Region.

***Stemmatophora brunnealis* (Treitschke, 1829)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VIII-X. First record in Murcia Region.

***Stemmatophora borgialis* (Duponchel, 1833)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: VII-X. First record in Murcia Region.

***Maradana fuscolimbalis* (Ragonot, 1887)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Polyvoltine. Flight period: IV-XI. First record in Murcia Region.

***Bostra obsoletalis* (Mann, 1884)**

Distribution: Mediterranean-Asiatic

Notes: References: De Prins (1985). Biological data: Bivoltine. Flight period: IV-IX.

***Loryma egregialis* (Herrich-Schäffer, 1838)**

Distribution: Mediterranean-Asiatic

Notes: References: Zerny (1914), Agenjo (1952), Slamka (2006). Biological data: Bivoltine. Flight period: IV-X.

***Hypsopygia costalis* (Fabricius, 1775)**

Distribution: Holarctic

Notes: Biological data: Bivoltine. Flight period: VI-X. First record in Murcia Region.

***Hypsopygia incarnatalis* (Zeller, 1847)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: IX-X. First record in Murcia Region.

Analysis

The list includes 142 species in 67 genera and three subfamilies: Galleriinae (8 species), Phycitinae (107 species) and Pyralinae (27 species). Seventy-three new records (51%) from the Murcia Region are added to its Lepidopteran fauna.

The most species-rich subfamily, Phycitinae, comprises 77.6% of all genera and 75.3% of all species, while Pyralinae comprise 14.9% and 19.1% and Galleriinae with 7.5% and 5.6%, respectively (Table 1).

The European family of Pyralidae consists of 470 species (Leraut 2014), whilst the Iberian Pyralidae fauna comprise 262 extant species (Vives-Moreno 2014). Thus, to date, the number of species known from the Murcia Region accounts for approximately 30% of the European total and 54.1% of the Iberian species.

Alpha diversity indices applied to abundance data (2683 individuals of 136 species collected) showed a low dominance value of 0.96 (all taxa are equally present) and a Chao1 estimate of total species richness amongst 140 species (lower value) to 165.5 species (upper value) which is close to 142 species studied and foresees the addition of new species in the future.

Known Pyralidae diversity in the Murcia Region seem relatively rich when compared to those in other Iberian Regions and with the whole of the Iberian Peninsula, as for instance, similar Iberian Regions extensively surveyed like Catalonia (172 species; Dantart 2020) and Aragon (163 species; Redondo et al. 2017). This may be because intensive surveys have started only recently or because the biodiversity is greater closer to the temperate areas. However, we are sure that an increase in the sampling effort will allow adding new species to the of Pyralidae checklist from the Murcia Region.

The most species-rich Pyralidae genera in the Murcia Region are *Ancylosis* (11 species, 7.7%), *Acrobasis* (8 species, 5.6%), *Phycitoides* and *Stemmatophora* (7 species, 4.9% each, respectively), *Pempelia*, *Ephestia* and *Hypotia* (5 species, 3.5% each, respectively) and *Aphomia*, *Cadra*, *Dioryctria*, *Epischinia*, *Aglossa* and *Synaphe* (4 species, 2.8% each, respectively). The majority of genera (12) are species-poor (2-3 species) or known in the Murcia Region from a single species (42 genera).

Species richness varies substantially amongst the different bioclimatic areas of the Murcia Region (Fig. 1). The Thermomediterranean area has the most diverse Pyralidae fauna with

116 species recorded, followed by the Mesomediterranean area with 73 species, while the Supra- and Oromediterranean areas appear to be less diverse with 39 species (Table 2). In each of these areas, 54 species are unique in the Thermo-, 10 in Meso- and four in Supra- and Oromediterranean areas, while 41 species were recorded in two areas and 26 in the three studied areas. Approximately 47.8% of the species can be considered specialists in a given bioclimatic area, while the other 52.2% can be considered as opportunists of different types of vegetation that characterise each of the bioclimatic areas. The detailed data for the bioclimatic areas of Pyralidae in the Murcia Region are summarised in Table 2.

Chorological analysis for the family Pyralidae in the Region of Murcia showed that the Mediterranean chorotype is the most abundant with 59.2% of the total, which is consistent with the geographical position of the study area. Amongst these, the Asiatic-Mediterranean elements (41.5%) are more frequent than the Atlanto-Mediterranean elements (17.6%). On the other hand, the elements of wide distribution, such as the Eurasiatic, Holarctic and Palaearctic (24.6%), are the most common in the mountainous biotopes of the centre and north of the study area, while the tropical and cosmopolitan species (12.0%) have their origin mainly in Africa. The presence of opportunistic species is due to the agricultural crop fields that dominate part of the Murcian territory. The Iberian endemisms are represented with six species (4.2%).

Regarding the biology of the species, the environmental conditions of the study area, which affect the availability of trophic resources for reproduction, suggest that most of the species are bivoltins (40.8%) and univoltins (38.0%), while the rest are polyvoltins (21.1%). Most of the Phycitinae recorded species feed on plant species belonging to the Asteraceae, Cistaceae, Fabaceae, Pinaceae, Fagaceae, Oleaceae, Chenopodiaceae and Lamiaceae families, amongst others. The most particular cases are those related to the genera *Cadra*, *Ephestia* and *Plodia* which are pests on stored products. Some species, such as *Apomyeolis ceratoniae* (Zeller), *Cryptoblabe gnidiella* (Millière), *Etiella zinckenella* (Treitschke) and *Euzophera pinguis* (Haworth) must be controlled since they are agricultural crop pests. Many of the species of the subfamily Galleriinae live in bee, bumblebee or wasp nests as well as on plant detritus. Others, such as *Aphomia sabella* (Hampson) and *Cathayia insularum* (Speidel & Schmitz), are parasites of palm trees (*Phoenix* spp.). In relation to the subfamily Pyralinae, most of the species feed on plant and animal detritus with *Pyralis farinalis* (Linnaeus) being also a particular pest on cereal flour. Finally, the food source and diet of 27.4% of species are unknown, so it will be necessary to carry out complementary studies for further biological understanding.

Some taxa cited in the references have been removed from the checklist as *Epischnia muscidella* Ragonot, cited in Caradja (1916), because it is distributed in Turkey (Leraut 2014); *Hypotia syrtalis* (Ragonot) also cited in Caradja (1916) was removed in Slamka (2006) and Vives-Moreno (2014); *Psorosa nucleolella* (Möschler) cited in Zerny (1914) from Sierra Espuña mountains was removed according to Slamka (2019); *Tephros cyriella* (Erschoff), cited from Sierra Espuña mountains in Vives-Moreno (1992) and later corrected as *T. ochreella* Ragonot in Vives-Moreno (2014) and Slamka (2019); *Laristania albipunctella* (Chrétien), cited in Palm (2012), Leraut (2014) and Vives-Moreno (2014), has been cited as a new species *Pseudoinsalebria iberica* Slamka, Ylla & Macià (Slamka et al.

2018). Finally, *Gymnancylla hornigii* (Lederer) was cited in Girdley et al. (2019), but misidentified with *Epischidia fulvostrigella* (Eversmann) according to morphological and barcode data (unpublished data).

Discussion

Prior to our investigation, the number of known Pyralidae moth species in the Murcia Region was 69. Our study increases this number to a total of 142, based on an examination of museum specimens, published records and sampled individuals, accounting for 54.1% of all of the Iberian species known. This study presents an updated checklist of current Pyralidae moth species with their distribution and biological information for the Murcia Region in the south-eastern Iberian Peninsula.

This study serves as both a guide for collection in the poorly sampled south-western European continent and a comprehensive reference list with the Pyralidae taxa and localities where conservation is an important priority for policy-makers, conservation planners and for the management of insect diversity in Spain.

We encourage lepidopterists holding additional data on systematically collected pyralids to produce an updated dataset. Additionally, new intensive surveys in adjacent regions are being conducted and unknown specimens are continuously identified to species level.

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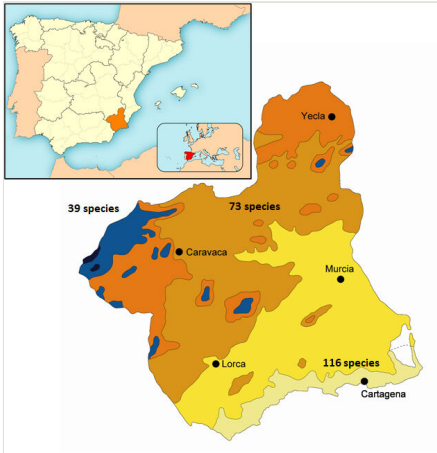


Figure 1.

Map of the known species diversity in the bioclimatic areas in the Murcia Region. Black and blue: Oro- and Supramediterranean; orange and light brown: Cold and mild Mesomediterranean; Yellow and light green: Upper and lower Thermomediterranean.

Table 1.

Numbers and percentages of known genera and species recorded for each subfamily in Murcia Region.

Subfamilies	Genus richness	% Genus	Species richness	% Species
Galleriinae	5	7.5	8	5.6
Phycitinae	52	77.6	107	75.3
Pyralinae	10	14.9	27	19.1
Total	67	100	142	100

Table 2.

List of unique species in each bioclimatic area or in more than one bioclimatic area.

Oro- and Supramediterranean	<i>Acrobasis obtusella</i> (Hübner, 1796)
	<i>Phycita roborella</i> ([Denis & Schiffermüller], 1775)
	<i>Eurhodope rosella</i> (Scopoli, 1763)
	<i>Cadra furcatella</i> (Herrich-Schäffer, 1851)
Mesomediterranean	<i>Huertasiella italogallicella</i> (Millière, 1883)
	<i>Rhodophaea formosa</i> (Haworth, 1811)
	<i>Pempelia albariella</i> Zeller, 1839
	<i>Pempelia genistella</i> (Duponchel, 1836)
	<i>Seeboldia korgosella</i> Ragonot, 1887
	<i>Ancylosis rhodochrella</i> (Herrich-Schäffer, 1852)
	<i>Homoeosoma nebulella</i> ([Denis & Schiffermüller], 1775)
	<i>Phycitodes arenicola</i> (Chrétien, 1911)
	<i>Synaphe punctalis</i> (Fabricius, 1775)
	<i>Stemmatophora rungsi</i> (Leraut, 2000)
Thermomediterranean	<i>Achroia grisella</i> (Fabricius, 1794)
	<i>Aphomia murciella</i> Zerny, 1914
	<i>Aphomia sabella</i> (Hampson, 1901)
	<i>Lamoria zelleri</i> (Joannis, 1932)
	<i>Peoria cremoricosta</i> (Ragonot, 1895)
	<i>Peoria translucidella</i> (Chrétien, 1911)
	<i>Polyochodes stipella</i> Chrétien, 1911
	<i>Cryptoblabes gnidiella</i> (Millière, 1867)
	<i>Pseudosyria malacella</i> (Staudinger, 1870)
	<i>Psorosa ferrugatella</i> Turati, 1924
	<i>Sciota elegiella</i> (Zerny, [1929])
	<i>Faveria dionysia</i> (Zeller, 1846)
	<i>Melathrix coenulentella</i> (Zeller, 1846)

	<i>Denticera divisella</i> (Duponchel, [1843])
	<i>Merulempista turturella</i> (Zeller, 1848)
	<i>Merulempista azrouella</i> (D. Lucas, 1933)
	<i>Tephris ochreella</i> Ragonot, 1893
	<i>Phycita diaphana</i> (Staudinger, 1870)
	<i>Ceutholopha isidis</i> (Zeller, 1867)
	<i>Epischnia ampliata</i> (Heinemann, 1864)
	<i>Nephoterix angustella</i> (Hübner, 1796)
	<i>Acrobasis sodalella</i> Zeller, 1848
	<i>Apomyeloides bistriatella</i> (Hulst, 1887)
	<i>Myeloides circumvoluta</i> (Geoffroy in Fourcroy, 1785)
	<i>Epischidia fulvostrigella</i> (Eversmann, 1844)
	<i>Gymnancyla hillneriella</i> Gastón & Vives, 2018
	<i>Gymnancyla canella</i> ([Denis & Schiffermüller], 1775)
	<i>Metallostichodes nygrociarella</i> (Constant, 1865)
	<i>Assara conicolella</i> (Constant, 1884)
	<i>Euzophera osseatella</i> (Treitschke, 1832)
	<i>Euzopherodes vapidella</i> (Mann, 1857)
	<i>Nyctegretis ruminella</i> (La Harpe, 1860)
	<i>Ancylosis uncinatella</i> (Ragonot, 1890)
	<i>Ancylosis maculifera</i> Staudinger, 1870
	<i>Ancylosis samaritanella</i> (Zeller, 1867)
	<i>Ancylosis calcariella</i> Ragonot, 1901
	<i>Ancylosis yerburii</i> (Butler, 1884)
	<i>Phycitodes binaevella</i> (Hübner, [1813])
	<i>Phycitodes lacteella</i> (Rothschild, 1915)
	<i>Phycitodes inquinatella</i> (Ragonot, 1887)
	<i>Plodia interpunctella</i> (Hübner, [1813])
	<i>Ephestia disparella</i> Ragonot, 1901
	<i>Ephestia woodiella</i> Richards & Thomson, 1832
	<i>Ephestia kuehniella</i> (Zeller, 1879)

	<i>Cadra cautella</i> (Walker, 1863)
	<i>Cadra calidella</i> (Guenée, 1845)
	<i>Hypotia infulalis</i> Lederer, 1858
	<i>Hypotia pectinalis</i> (Herrich-Schäffer, 1838)
	<i>Hypotia leucographalis</i> (Hampson, 1900)
	<i>Pyralis farinalis</i> (Linnaeus, 1758)
	<i>Aglossa pinguinalis</i> (Linnaeus, 1758)
	<i>Aglossa caprealis</i> (Hübner, [1809])
	<i>Hypsopygia costalis</i> (Fabricius, 1775)
	<i>Hypsopygia incarnatalis</i> (Zeller, 1847)
Oro-, Supra- and Mesomediterranean	<i>Aphomia sociella</i> (Linnaeus, 1758)
	<i>Uncinus hispanella</i> (Staudinger, 1859)
	<i>Acrobasis romanella</i> (Millière, 1869)
	<i>Pterothrixidia rufella</i> (Duponchel, 1836)
	<i>Synaphe moldavica</i> (Esper, 1794)
Meso- and Thermomediterranean	<i>Cathayia insularum</i> (Speidel & Schmitz, 1991)
	<i>Pseudoin-salebria iberica</i> Slamka, Ylla & Macià, 2018
	<i>Psorosa mediterranea</i> Amsel, 1953
	<i>Oncocera semirubella</i> (Scopoli, 1763)
	<i>Pima boisduvaliella</i> (Guenée, 1845)
	<i>Pempelia brephiella</i> (Staudinger, 1879)
	<i>Dioryctria sylvestrella</i> (Ratzeburg, 1840)
	<i>Dioryctria pineae</i> (Staudinger, 1859)
	<i>Apomyelois ceratoniae</i> (Zeller, 1839)
	<i>Eurhodope cruentella</i> (Duponchel, [1843])
	<i>Myelois fuscicostella</i> Mann, 1861
	<i>Valdovecaria hispanicella</i> (Herrich-Schäffer, 1855)
	<i>Gymnancyla ruscionella</i> (Ragonot, 1888)
	<i>Euzophera pinguis</i> (Haworth, 1811)

	<i>Ancylosis gracilella</i> (Ragonot, 1887)
	<i>Ancylosis harmoniella</i> (Ragonot, 1887)
	<i>Ancylosis oblitella</i> (Zeller, 1848)
	<i>Phycitodes saxicola</i> (Vaughan, 1870)
	<i>Archiephestia adpiscinella</i> (Chrétien, 1911)
	<i>Ephestia parasitella</i> Staudinger, 1859
	<i>Ephestia welseriella</i> (Zeller, 1848)
	<i>Cadra figulilella</i> (Gregson, 1871)
	<i>Hypotia corticalis</i> ([Denis & Schiffermüller], 1775)
	<i>Hypotia miegi</i> (Ragonot, 1895)
	<i>Synaphe diffidalis</i> (Guenée, 1854)
	<i>Synaphe predotalis</i> (Zerny, 1927)
	<i>Aglossa brabanti</i> Ragonot, 1884
	<i>Aglosa mayrae</i> Ylla, Šumpich, Gastón, Huertas & Macià, 2017
	<i>Stemmatophora syriacalis</i> (Ragonot, 1895)
	<i>Stemmatophora borgialis</i> (Duponchel, [1833])
	<i>Maradana fuscolimbalis</i> (Ragonot, 1887)
	<i>Loryma egregialis</i> (Herrich-Schäffer, 1838)
Oro- and Supra- and Thermomediterranean	<i>Alophia combustella</i> (Herrich-Schäffer, 1855)
	<i>Dioryctria abietella</i> ([Denis & Schiffermüller], 1775)
	<i>Acrobasis legatea</i> (Haworth, 1811)
	<i>Phycitodes albatella</i> (Ragonot, 1887)
All areas	<i>Galleria mellonella</i> (Linnaeus, 1758)
	<i>Lamoria anella</i> ([Denis & Schiffermüller], 1775)
	<i>Ematheudes punctellus</i> (Treitschke, 1833)
	<i>Pempeliella ardosiella</i> (Ragonot, 1887)
	<i>Asalebria florella</i> (Mann, 1862)
	<i>Amphithrix sublineatella</i> (Staudinger, 1859)
	<i>Oxybia transversella</i> (Duponchel, 1836)

	<i>Etiella zinckenella</i> (Treitschke, 1832)
	<i>Pempelia palumbella</i> ([Denis & Schiffermüller], 1775)
	<i>Pempelia compositella</i> (Treitschke, 1835)
	<i>Dioryctria mendacella</i> (Staudinger, 1859)
	<i>Epischnia prodromella</i> (Hübner, [1799])
	<i>Epischnia illotella</i> Zeller, 1839
	<i>Epischnia asteris</i> Staudinger, 1871
	<i>Acrobasis bithynella</i> Zeller, 1848
	<i>Acrobasis obliqua</i> (Zeller, 1847)
	<i>Acrobasis fallouella</i> (Ragonot, 1871)
	<i>Acrobasis centunculella</i> (Mann, 1859)
	<i>Euzophera lunulella</i> (O. Costa, [1836])
	<i>Ancylosis cinnamomella</i> (Duponchel, 1836)
	<i>Homoeosoma sinuella</i> (Fabricius, 1794)
	<i>Endotricha flammealis</i> ([Denis & Schiffermüller], 1775)
	<i>Stemmatophora combustalis</i> (Fisher von Röslerstamm, [1842])
	<i>Stemmatophora vulpecalis</i> Ragonot, 1891
	<i>Stemmatophora brunnealis</i> (Treitschke, 1829)
	<i>Bostra obsoletalis</i> (Mann, 1884)