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Contribution to the knowledge of the Lepidoptera Tortricidae fauna of Mediterranean ecosystems

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SHORT ABSTRACT AND KEYWORDS

Lepidoptera Tortricidae (Insecta) is the second largest family in Europe. The species of this family are distributed throughout the world except for the most northern territories and the Antarctic. Many entities are important pests of agricultural crops as well as forest and ornamental plants. For their considerable damage and consequent economic impact, they are one of the most studied insects in the world. The research activities of this PhD Thesis aimed to contribute to the knowledge of and to update the Italian and South-European fauna. The *taxa* were caught in different areas of the Mediterranean Basin characterised by many types of vegetation and at altitudes ranging from sea level to 1,900 m, in particular: the Collemeluccio Nature Reserve (Molise region, Central Italy), the Matese Massif (Molise and Campania regions, central-South Italy), the Gargano territory (Puglia region, South Italy), several areas of Calabria (South Italy) and Sicily (South Italy) and different habitats in central-East Greece. During the research, specimens were caught mainly by attraction to light at night-time, mostly with UV-LED light traps, but also by using butterfly nets during the day-time and dusk. To better observe the biology of these insects and their association with the host plant, some specimens were collected from fruits and galls of select forest trees. The ripe and unripe fruits were picked from the ground and directly from the tree; they were stored separately in ventilated plastic containers for future isolation of the adult specimens inside them. To prepare, conserve and identify the specimens, classic methods adopted in the study of Lepidoptera were used. When it was not possible to obtain a certain identification of the samples genetic analysis through DNA barcoding was carried out. In total, 1,539 samples were collected in the field, and 873 specimens that are part of private collections were studied. From the analysis of 2,412 samples, 296 different species were identified. For each study area, a biogeographic analysis was carried out. This work helps to update the distribution of all the species collected. The field survey produced interesting findings. First, several species have been reported in Italy for the first time: *Phtheochroa ochralana* (Chrétien, 1915), *Ancylis minimana* (Caradja, 1916), *Cydia aldocataniae* Trematerra, 2019 and *Cydia magnesiae* Trematerra and Colacci, 2017. *Fulvoclysia forsteri* (Osthelder, 1938) and *Tortricodes selma* Kocak, 1991 have been observed for the first time in Europe. The females of *Thiodia major* (Rebel, 1903) and *Pammene castanicola* Trematerra, 2009 have been described. Finally, the report of *Cochylimorpha scalerciana* Trematerra, 2019 new species for the science. It is also worth mentioning the following findings: 6 new reports for Molise; 59 new species for Calabria and 19 species that have Calabria as a southern limit of their distribution; 26 new *taxa* for Sicily. Final biogeographical considerations related to all the species traced in some areas of the Mediterranean Basin were determined. More than 59% of the species show a wide Palaearctic distribution. Only 15% are tortricids with a European distribution, while a Mediterranean distribution is represented by 6% of the recorded species. We found a total of 10 endemic species. The lists elaborated in this Doctorate Thesis contribute to and update the knowledge of the Lepidoptera Tortricidae fauna in Mediterranean ecosystems.

Keywords: Lepidoptera Tortricidae, Biogeographic analysis, Mediterranean Basin, Fauna.

EXTENDED ABSTRACT

INTRODUCTION

Lepidoptera Tortricidae (Insecta) is the second largest family in Europe. The species of this family are distributed throughout the world except for the most northern territories and the Antarctic. Gilligan *et al*. (2018) reported 11,365 *taxa* of Tortricidae throughout the world, belonging to 1,151 genera. In Italy, Trematerra in 2003 reported 633 tortricids, a number that rises to 670 entities at 2020 (Trematerra, 2020).

Tortricidae are usually small moths, although some exceed 25 mm in wingspan. They can be distinguished from other moths of similar appearance and size by labial palpi directed forward and for the uncoated proboscis of scales. The wings at rest are kept folded to the roof on the abdomen, taking on the appearance of a bell. Many entities are important pests of agricultural crops as well as forest and ornamental plants. Because of the considerable damage and economic inpact they cause, they are among the most studied insects.

This PhD Thesis aimed to characterise the biodiversity of the Tortricidae fauna present in some Mediterranean ecosystems. The Mediterranean is considered one of the richest places in the world in terms of biodiversity. In addition, due to climate change, species have been subjected to modifications of their distribution or have invaded new areas, where they have interacted with native species.

MATERIAL AND METHODS

The *taxa* were caught in different areas of the Mediterranean Basin characterised by many different types of vegetation and at altitudes ranging from sea level to 1,900 m. These areas include the Collemeluccio Nature Reserve (Molise region, Central Italy) (Fig. 1 A), the Matese Massif (the Molise and Campania regions, central-South Italy) (Fig. 1 A), the Gargano territory (Puglia region, South Italy) (Fig. 1 B), several areas of Calabria (South Italy) (Fig. 1 D) and Sicily (South Italy) (Fig. 1 E) and different habitats in central-East Greece (Fig. 1 C).

During the research, specimens were caught mainly by attraction to UV-LED light traps at night-time and by using butterfly nets during the day-time and dusk. Specimens were also studied from private collections of Tortricidae from Calabria and Sicily regions. To better observe the biology of these insects and their association with host plants, some specimens were studied by collecting fruits and galls of some forest trees, in particular *Cupressus sempervirens* L. and *Quercus ilex* L. The ripe and unripe fruits were collected from the ground and directly from the tree. There were stored separately in ventilated plastic containers for future collection of the adult specimens inside them. In all cases, the tortricids (adults) collected were killed with cotton wool balls impregnated with ethyl acetate and kept in containers for transport to the Laboratory of General and applied entomology of the Department of Agriculture, Environmental and Food Sciences (University of Molise, in Campobasso).

To prepare and conserve the specimens, classic methods adopted in the study of Lepidoptera were used. Initially, the samples were placed in humidifiers to soften the muscles, then pinned in the middle of the thorax with an entomological pin and left to dry on entomological setting board with opened wings to observe the wing pattern. The specific determination of the various *taxa* was carried out by observing and comparing

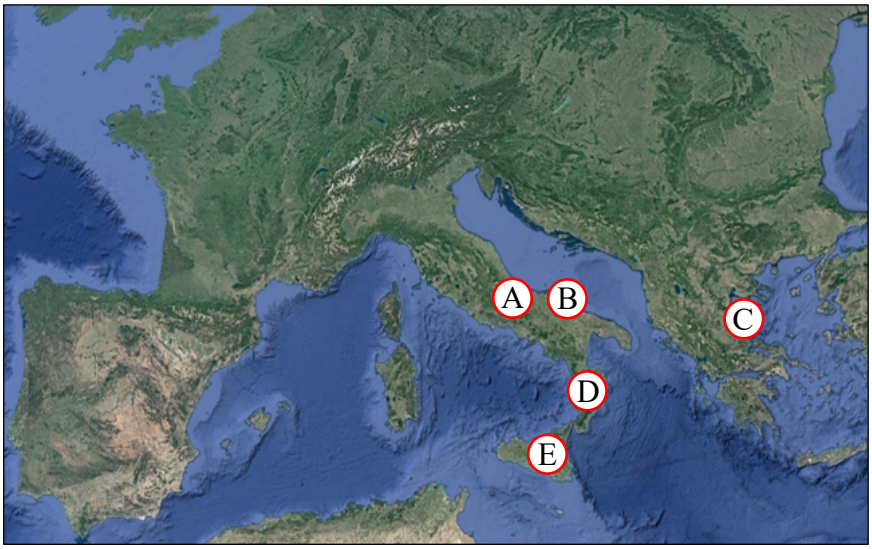


Figure 1 - Investigated areas of the Mediterranean Basin: the Collemeluccio Nature Reserve (Molise region, Central Italy) (A); the Matese Massif (Molise and Campania regions, central-South Italy) (A); the Gargano territory (Puglia region, South Italy) (B); different habitats in central-East Greece (C); several areas of Calabria (South Italy) (D) and Sicily (South Italy) (E).

the wing pattern with specimens deposited in scientific collections and with plates in specialised texts. Given the small size of the specimens and the similarity of the external characters of many species, it was often necessary to study the morphology of the genitalia through the preparation of slides. In cases of uncertain identification, genetic analysis through DNA barcoding, using the database of nucleotide sequences in GenBank, in collaboration with national and international research centres, such as the University of Milano (in Milano) and the Canadian Centre for DNA Barcoding (CCDB) (in Guelph) were made (Hajibabei *et al*., 2006; Ratnasingham and Hebert, 2007). For each investigated area, a biogeographic study on Tortricidae, using chorological analysis, was carried out.

RESULTS AND DISCUSSION

During the three years of the PhD study, 1,539 samples were collected in the field and 873 belonging to private collections were studied, for a total of 2,412 specimens. From the analysis of 2,412 entities, 296 species were identified.

There were 43 species identified at the Collemeluccio Nature Reserve. More than 74% of these species show a wide Palaearctic distribution, with the Asiatic-European and Palaearctic chorotypes being most representative. Fewer species (6.99%) have a European distribution. There are also three new species reported for the first time in Molise region: *Gynnidomorpha luridana* (Greyson, 1870), *Ancylis geminana* (Donovan, [1806]) and *Lathronimpha balearici* Diakonoff, 1972.

There were 37 species collected at the Matese Massif, of which more than 56% show a wide Palaearctic distribution. Only 10% of the collected *taxa* are tortricids with a European distribution. Three species were identified from ripe and unripe acorns of the holm oak (*Quercus ilex*): *Cydia fagiglandana* (Zeller, 1841), *Cydia rymarczki* Varenne and Nel, 2013 and *Cydia aldocataniae* Trematerra, 2019. Only *Blastesthia tessulatana* (Staudinger, 1871) was recorded whole cypress fruit. *C. aldocataniae* has been reported

for the first time in Italy, while *Cochylimorpha straminea* (Haworth, [1811]), *Isotrias huemeri* Trematerra, 1993 and *Pammene aurana* (Fabricius, 1775) are new reports for Molise.

There were 67 species collected at the Gargano territory, of which more than 65% show a wide Palaearctic distribution well represented by the Asiatic-European, Palaearctic and Turano-European chorotypes. Around 12% of the collected *taxa* show a European distribution. *Ancylis minimana* (Caradja, 1916), listed from south-eastern parts of eastern Europe to Ciscaucasia, the Ural Mountains and the Caucasus has been reported for the first time in Italy.

There were 182 species reported in Calabria, of which more than 56% show a wide Palaearctic distribution well represented by the Asiatic-European, Turano-European, Palaearctic and W-Palaearctic chorotypes. More than 13% are tortricids with a European chorotype. There are 2 species with an Appenninic chorotype and 3 species with a S-Appenninic chorotype. *Aleimma loeflingianum* (Linnaeus, 1758); *Acleris abietana* (Hübner, [1819-1822]); *A. sparsana* ([Denis and Schiffermüller], 1775); *A. rhombana* ([Denis and Schiffermüller], 1775); *A. schalleriana* (Linnaeus, 1761); *A. cristana* ([Denis and Schiffermüller], 1775); *A. aspersana* (Hübner, [1814-1817]); *A. hastiana* (Linnaeus, 1758); *A. notana* (Donovan, [1806]); *A. ferrugana* ([Denis and Schiffermüller], 1775); *A. quercinana* (Obraztsov, 1957); *A. literana* (Linnaeus, 1758); *Phtheochroa rugosana* (Hübner, [1796-1799]); *Phalonidia gilvicomana* (Zeller, 1847); *P. manniana* (Fischer von Röslerstamm, 1839); *Agapeta hamana* (Linnaeus, 1758); *Eupoecilia angustana* (Hübner, [1796-1799]); *Aethes cnicana* (Westwood, 1854); *Cochylis salebrana* (Mann, 1862); *C. molliculana* Zeller, 1847; *Eana penziana* (Hübner, [1796-1799]); *Archicnephasia hartigi* Razowski, 1983; *Cnephasia fulturata* Rebel, 1940; *C. hellenica* Obraztsov, 1956; *Batodes angustiorana* (Haworth, [1811]); *Paramesia diffusana* (Kennel, 1899); *Archips crataeganus* (Hübner, [1796-1799]); *Choristoneura diversana* (Hübner, [1814-1817]); *Argyrotaenia ljungiana* (Thunberg, 1797); *Ptycoloma lecheana* (Linnaeus, 1758); *Aphelia ferrugana* (Hübner, 1793); *Isotrias rectifasciana* (Haworth, [1811]); *Bactra lancealana* (Hübner, [1796-1799]); *B. venosana* (Zeller, 1847); *Endothenia nigricostana* (Haworth, [1811]); *E. pullana* (Haworth, [1811]); *Piniphila bifasciana* (Haworth, [1811]); *Syricoris rivulana* (Scopoli, 1763); *Ancylis comptana* (Frölich, 1828); *A. paludana* (Barrett, 1871); *A. badiana* ([Denis and Schiffermüller], 1775); *A. mitterbacheriana* ([Denis and Schiffermüller], 1775); *Rhopobota naevana* (Hübner, [1814-1817]); *Epinotia sordidana* (Hübner, [1823-1824]); *E. solandriana* (Linnaeus, 1758); *E. fraternana* (Haworth, [1811]); *Pelochrista subtiliana* (Jäckh, 1960); *Eucosma hohenwartiana* ([Denis and Schiffermüller], 1775); *E. balatonana* (Osthelder, 1937); *E. albidulana* (Herrich-Schäffer, 1848); *Epiblema graphana* (Treitschke, 1835); *Notocelia aquana* (Hübner, [1796-1799]); *N. rosaecolana* (Doubleday, 1850); *N. trimaculana* (Haworth, [1811]); *Rhyacionia pinivorana* (Liening and Zeller, 1846); *Cydia trogodana* Pröse, 1988; *Grapholita fissana* (Frölich, 1828); *Pammene amygdalana* (Duponchel, 1842); and *Strophedra nitidana* (Fabricius, 1775) have been reported for the first time in Calabria. *Phtheochroa purana* (Guenée, 1846); *Archicnephasia hartigi* Razowski, 1983; *Cnephasia zangheriana* Trematerra, 1991; *Choristoneura murinana* (Hübner, [1796-1799]); *Dichelia histrionana* (Frölich, 1828); *Endothenia lapideana* (Herrich-Schäffer, 1848); *E. pullana* (Haworth, [1811]); *Syricoris lacunana* ([Denis and Schiffermüller], 1775); *Ancylis paludana* (Barrett, 1871); *Spilonota laricana* (Heinemann, 1863); *Epinotia signatana* (Douglas, 1845); *E. nigricana* (Herrich-Schäffer, 1848); *Pelochrista subtiliana* (Jäckh, 1960); *Eucosma balatonana* (Osthelder, 1937); *Gypsonoma sociana* (Haworth, [1811]); *Rhyacionia pinivorana* (Liening and Zeller, 1846); *Cydia coniferana* (Saxesen, 1840); *Pammene albuginana* (Guenée, 1846);

and *P. aurana* (Fabricius, 1775) have Calabria as the southern limit of their distribution. Finally, the report of *Cochylimorpha scalerciana* Trematerra, 2019 new species for the science.

There were 155 species collected in Sicily. More than 60% of the collected *taxa* show a wide Palaearctic distribution while around 11% have a European distribution. Three endemic species were found. *Phtheochroa ochralana* (Chrétien, 1915) and *Cydia magnesiae* Trematerra and Colacci, 2017 are new to the Italian fauna, and *Fulvoclysia forsteri* (Osthelder, 1938) and *Tortricodes selma* Kocak, 1991 have been recorded in Europe for first time. The females of *Thiodia major* (Rebel, 1903) and *Pammene castanicola* Trematerra, 2009 have been described. *Acleris hastiana* (Linnaeus, 1758); *A. notana* (Donovan, [1806]); *Cochylidia rupicola* (Curtis, 1834); *C. moguntiana* (Rössler, 1864); *Cochylis sannitica* Trematerra, 1995; *Eana joannisi* (Schawerda, 1929); *E. italica* (Obraztsov, 1950); *Cnephasia fulturata* Rebel, 1940; *Archips betulanus* (Hübner, [1787]); *A. crataeganus* (Hübner, [1796-1799]); *Pandemis cerasana* (Hübner, 1786); *Olindia schumacherana* (Fabricius, 1787); *Epinotia dalmatana* (Rebel, 1891); *Eucosma obumbratana* (Lienig and Zeller, 1846); *Epiblema cirsianum* (Zeller, 1843); *E. graphanum* (Treitschke, 1835); *Cydia medicaginis* (Kuznetov, 1962); *C. cythisantana* Burmann and Pröse, 1988; *C. ulicetana* (Haworth, [1811]); *C. derrai* Pröse, 1988; *C. leguminana* (Liening and Zeller, 1846); *Lathronimpha balearici* Diakonoff, 1972; *Grapholita pallifrontana* Lienig and Zeller, 1846; *Pammene querceti* Gozmány, 1957; *P. obscurana* (Stephens, 1834); and *Strophedra weirana* (Douglas, 1850) have been reported for the first time in Sicily region.

Finally, 54 species were collected in central-East Greece, of which more than 57% show a wide Palaearctic distribution well represented by the Asiatic-European, Palaearctic, Turano-European and Centralasiatic-European chorotypes. Around 14% of the *taxa* have a European distribution. There are Thessalian and Thessalian-Peloponnesian endemic species. The work started in Greece in 2019 was originally planned to continue in March-June 2020. Because of COVID-19 travel restrictions, this endeavour was postponed to July-October 2021. For this reason, some samples caught during that period are still being identified.

The final biogeographical considerations related to all the species traced in some areas of the Mediterranean Basin were elaborated. More than 59% of the species show a wide Palaearctic distribution. Only 15% are tortricids with a European distribution, while only 6% of the recorded species show a Mediterranean distribution. Of the recorded species, 10 are endemic.

CONCLUSIONS

During the field work, we observed only a few specimens that could be potentially harmful to agricultural and forest plants, especially at the Collemeluccio Nature Reserve and in Greece. This finding suggests that the investigated areas are in good health and maintain a high degree of wilderness preservation. However, it is worth noting the negative role of grazing overload on the biodiversity of this group of Lepidoptera, whose larvae often inhabit grassland and shrubland.

The lists elaborated in this Doctorate Thesis contribute to and update the knowledge of the Lepidoptera Tortricidae fauna in Mediterranean ecosystems.

CHAPTER 1

GENERAL INTRODUCTION AND STATE-OF-THE-ART





1.1 LEPIDOPTERA TORTRICIDAE

1.1.1 General characteristics

Tortricidae is the second largest Lepidoptera family in Europe after Noctuoidea. The species of this family are distributed throughout the world except for the most northern territories and the Antarctic. Razowski (2008) reported that about 9,000 *taxa* had been described, of which 1,700 were in the Palearctic region. Gilligan *et al*. (2018) updated this number to 11,365 *taxa* (belonging to 1,151 genera) described throughout the world. In Italy, Trematerra in 2003 (Trematerra, 2003) reported the presence of 633 tortricids; that number rises to 670 entities considering the data at 2020 (Trematerra, 2020).

Tortricidae are usually small moths with a wingspan of about 20 mm on average, although some exceed 25 mm. They can be distinguished from other moths of similar appearance and size by labial palpi directed forward and for the uncoated proboscis of scales. The wings are relatively wide and have short fringes; at rest they are kept folded to the roof on the abdomen, taking on the appearance of a bell. Some tortricid have sub-rectangular fore wings, with the apical angle close to 90°, while others have a rounded apex. Many species are greyish in colour and cryptic at rest while others have spectacular colours (Trematerra, 2003).

1.1.2 Systematic framework

Genetic analyses have confirmed the monophyletic origin of the Tortricidae family; this origin had been hypothesised based on study of the morphological characters (Regier *et al*., 2012). Tortricidae can be divided into three subfamilies: Tortricinae, Chlidanotinae and Olethreutinae.

Tortricinae, previously considered by Horak and Brown (1991) to be a para- or polyphyletic subfamily, appears to be monophyletic, although no convincing morphological synapomorphies have been found (Regier *et al*., 2012). European species belong to 6 tribes: Tortricini, Cochylini, Cnephasiini, Archipini, Sparganothini and Euliini (Fig. 1.1).

Genetically, Chlidanotinae was found to be a paraphyletic subfamily, in contrast to the common morphology in all the species of the group, whose components present a deep back-longitudinal invagination on the valves of the male genital system (Regier *et al*., 2012). The Polyorthini tribe is the only one to have representatives in the Palearctic fauna (Fig. 1.2).

The genetically confirmed monophyly of the Olethreutinae subfamily is supported by morphological characters, such as the fusion of the *aedeagus* with the *anellus* and the *juxta*, and the presence of an excavation at the base of the valve (Regier *et al*., 2012). European species are divided into 5 tribes: Bactrini, Olethreutini, Enarmoniini, Eucosmini and Grapholitini (Fig. 1.2).

The subfamilies Tortricinae and Olethreutinae are sister groups; Chlidanotinae is the first divergent subfamily (Regier *et al*., 2012).

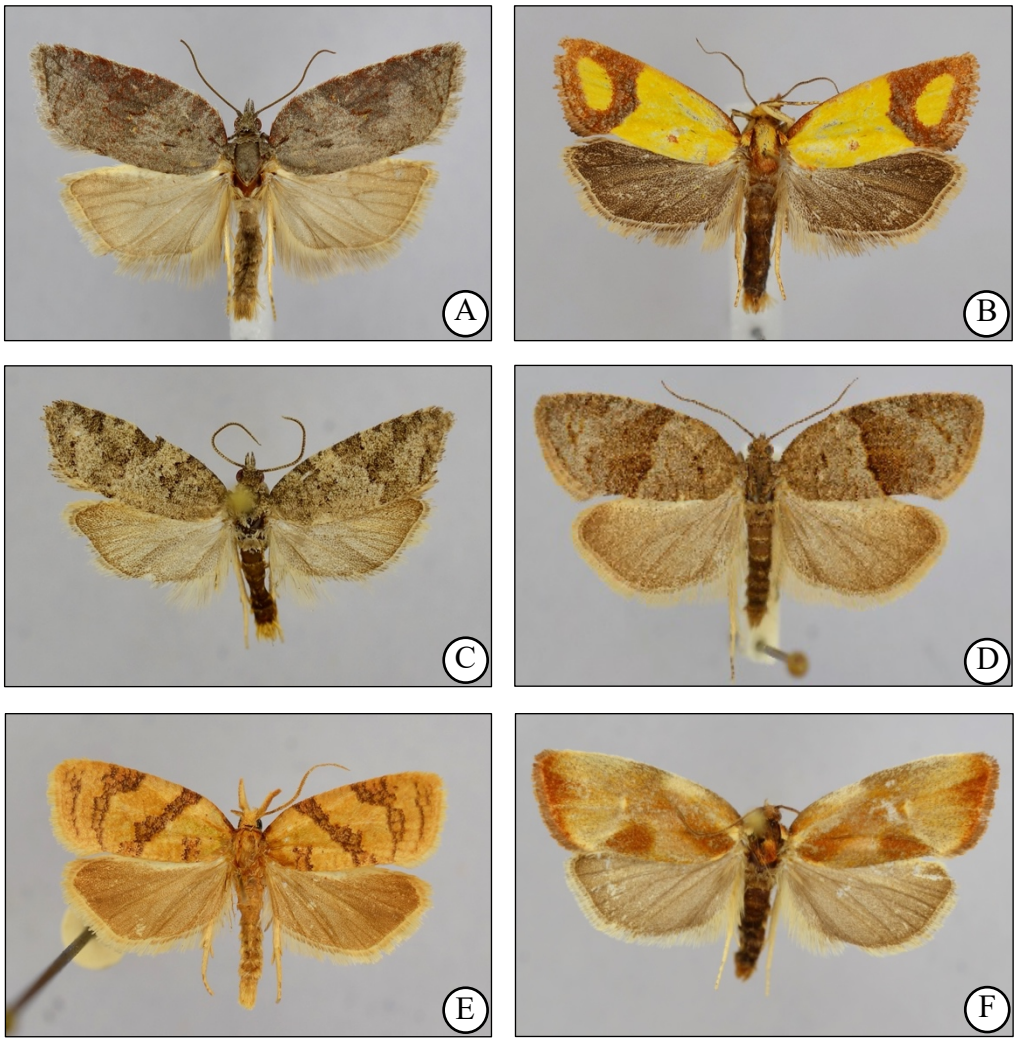


Figure 1.1 – Tortricidae adults: Tortricini, *Acleris sparsana* ([Denis and Schiffermüller]) (wing span: 21 mm) (A); Cochylini, *Agapeta zoegana* (Linnaeus) (wing span: 23 mm) (B); Cnephasiini, *Cnephasia incertana* (Treitschke) (wing span: 14 mm) (C); Archipini, *Syndemis musculana* (Hübner) (wing span: 19 mm) (D); Sparganothini, *Sparganothis pilleriana* ([Denis and Schiffermüller]) (wing span: 18 mm) (E); Euliini, *Eulia ministrana* (Linnaeus) (wing span: 21 mm) (F).

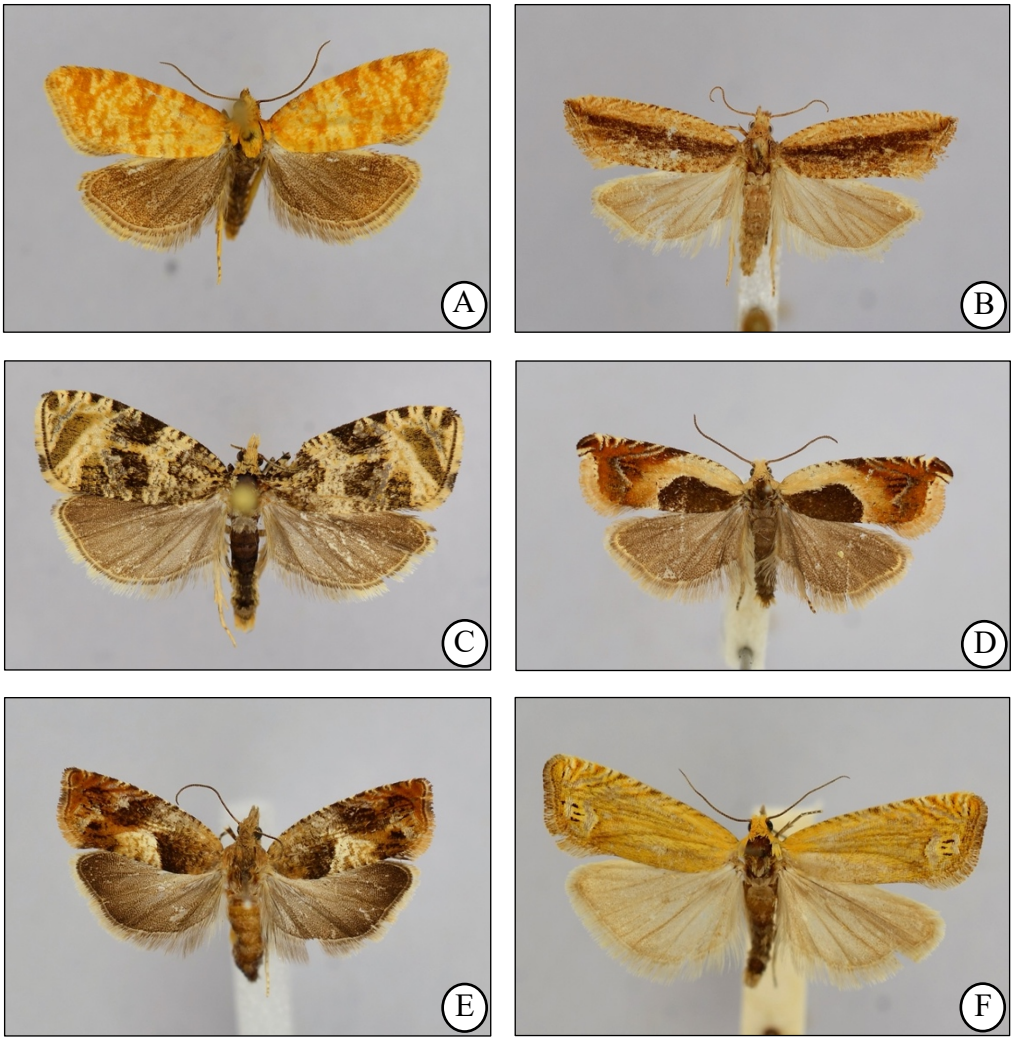


Figure 1.2 – Tortricidae adults: Polyorthini, *Isotrias joannisana* (Turati) (wing span: 16 mm) (A); Bactrini, *Bactra robustana* (Christoph) (wing span: 17 mm) (B); Olethreutini, *Syricoris lacunana* ([Denis and Schiffermüller]) (wing span: 16 mm) (C); Enarmoniini, *Ancylis badiana* ([Denis and Schiffermüller]) (wing span: 13 mm) (D); Eucosmini, *Epinotia tenerana* ([Denis and Schiffermüller]) (wing span: 14 mm) (E); Grapholitini, *Lathronympha strigana* (Fabricius) (wing span: 12 mm) (F).

1.1.3 Morphological characteristics

As mentioned above, in general tortricids can be distinguished according to the shape and maculation of the wings. The colouring of these Lepidoptera usually ranges from whitish to brownish, occasionally to green. The black and white model, typical of some species, is considered a specialised adaptation (Razowski and Becker, 2002).

The wings are usually well developed in the two sexes; only a few species have short-winged females. In general, the hind wings are paler than the front ones and have no drawings (Razowski, 2008). The *frenulum*, simple in males (Fig. 1.3 A), consists of 2-4 bristles in females (Fig. 1.3 B).

The adult has a head covered with scales, generally slightly adherent or raised, often with lateral tufts, smooth or rough, which join above the vertex and protrude between the antennae (Fig. 1.4 A) (Trematerra, 2003). The anterior tibia carries an epiphysis that is located medially; the central one has apical spurs and the posterior one has apical and median spurs.

Many species of tortricid are polymorphic and have distinct genetic forms; the meaning of this phenomenon is still unknown. In some isolated cases they produce exclusive forms. This behaviour suggests the influence of selective mechanisms generally associated with cryptic colouring. On a few occasions, melanic forms have been found. Morphological changes between the two modifications are observed in many bivoltine entities (Trematerra, 2003).

The eggs are lenticular, coated with smooth or finely carved, granulated, reticulated or dimpled *chorion* (Fig. 1.4 B). They are similar in size and shape in the different species of tortricids, generally yellowish or greenish in colour, occasionally reddish (Razowski, 2008). They are usually covered by the secretion of the colleter glands, and they are often also covered by the scales of the female anal tufts or by the wings that remain imprisoned in the mass.

The larva has six ocelli on each side of the head (Fig. 1.4 C). The pseudo-legs have hooks that can be univocal, bi-ordinal or tri-ordinal, arranged in circular or elliptical rows; the hooks of the anal pseudo-legs are organised in a straight continuous line. An anal comb is usually observable, but not in endophagous species.

The pupa is *obtecta* and shows various mobile abdominal segments; in many cases it presents the dorsal spine (Fig. 1.4 D). The *cremaster* can show various states of development (Trematerra, 2003).

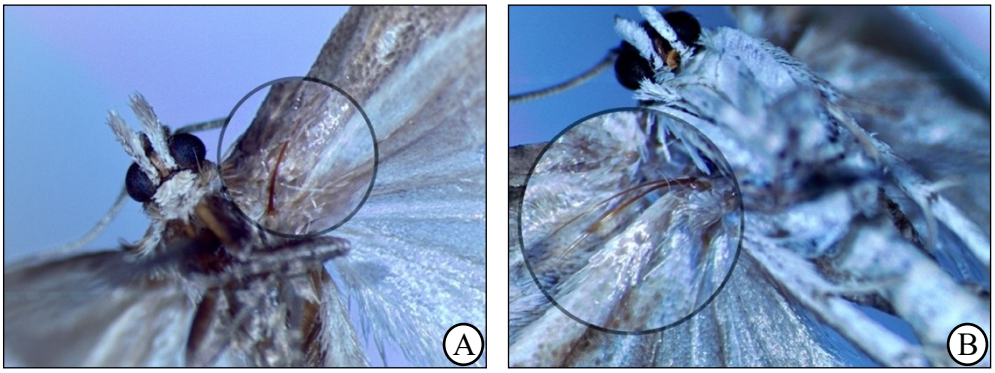


Figure 1.3 – Tortricidae details of *frenulum* in male (A) and female (B).



Figure 1.4 – Stages of Lepidoptera Tortricidae: adult (A), eggs (B), larva (C) and pupa (D).

1.1.4 Biological and ecological notes

Lepidoptera Tortricidae are known mainly in temperate and tropical regions. In our latitudes, these insects have a period of inactivity during which they enter diapause, which allows them to survive in extreme situations. The phenomenon occurs at a fixed point in the life cycle of each species and can be in the egg, larval, pupal or, in some cases, adult stages.

The activity of the adults is crepuscular and they fly mostly at night; however, many species have adapted to a diurnal habit. Most of the species have just a single generation per year (univoltine species), while others have two (bivoltine species) or more generations per year (polyvoltine species). The number of generations depends essentially on the length and temperatures of the warm season. The larvae of most tortricids are oligophagous, although some are monophagous or polyphagous; the feeding modes can be either external or internal, depending on the species. However, the differences in local and regional environmental conditions exert an influence on their life cycle, so much so that a certain variability in the flight period and in the number of annual generations should be expected.

Several *taxa* present occasional individuals who take 2 years to complete their life cycle, remaining in diapause for two successive winters; this phenomenon occurs especially in environments with variable climatic conditions depending on the year, such as in high mountains (Solomon, 1991).

At the larval stage, tortricids develop at the expense of one or more plant species. The larvae of the Cochylini tribe are basically monophagous or oligophagous and almost invariably internal phytophagous. The larvae belonging to the other tribes of the Tortricinae and Chlidanotinae subfamilies are mostly polyphagous and usually live

hidden inside folded or woven leaves and flowers, thus building shelters often characteristic of the species. Among the larvae of the subfamily Olethreutinae, there is a great variety of ways of feeding; some feed on leaves and buds, while others dig in the stems, roots, fruits, seeds and occasionally in the bark or galls. Many are monophagous or oligophagous.

Once development is complete, the Tortricidae larvae usually form a pupa inside silky threads, sometimes in a cocoon (Trematerra, 2003).

Adults have twilight or nocturnal activity; however, in many tribes there are small groups of diurnal habit species, these one is characterized by bright coloring and large ocelli (Razowski, 2008).

1.1.5 Economic importance

Many entities are important pests of agricultural crops as well as forest and ornamental plants (Van Der Geest and Evenhuis, 1991). Because of the considerable damage they can cause and the consequent economic impact, they are some of the most studied insects in the world. The economic importance of these moths arises almost entirely from the activities of the larvae. They have chewing-type mouthparts and are among the world's greatest pests as most of them cause major economic damage in agriculture and horticulture on a wide variety of crops including pome fruits, stone fruits, citrus fruits, grapes, ornamental crops, tea, coffee, cereals and cotton (Ganai and Khan, 2017).

Among the main harmful species in agriculture and forestry, the following are notable: *Tortrix viridana* Linnaeus, 1758, a European oak defoliator (Fig. 1.5 A); *Choristoneura murinana* (Hübner, [1796-1799]) a pest of fir trees; *Eupoecilia ambiguella* (Hübner, [1796-1799]) and *Lobesia botrana* ([Denis and Schiffermüller], 1775), harmful to *Vitis vinifera* (L.) (Fig. 1.5 B); several species of the genus *Archips* (Hübner), which feed on pome fruit; and *Cydia splendana* (Hübner, [1796-1799]), *Pammene fasciana* (Linnaeus, 1761) and *Cydia fagiglandana* (Zeller, 1841), important chestnut pests. Two pests of fruit, *Grapholita funebrana* Treitschke, 1835 of plum and *Cydia pomonella* (Linnaeus, 1758) of apple, are widely distributed throughout the world, they have even been introduced to South America (Razowski, 2008). In particular, *C. pomonella*, commonly called the apple worm, causes considerable damage to the apple tree (Fig. 1.5 C, D) (Brown, 2005).

Globalisation, the international movement of commodities and people among different nations, has dramatically increased the spread of plant and animal species around the world. Among these "introduced" or "exotic" species, insects are the most pervasive, representing 87% of the approximately 2,500 non-native terrestrial invertebrates in Europe (Gilligan *et al*., 2020). For example, *Clepsis peritana* (Clemens, 1860) is a species native to North America that has been reported in Italy and other European countries. It is known as "garden tortrix" or "strawberry garden tortrix" due to its feeding habits: the species is invasive in gardens and strawberry crops (Pinzari *et al*., 2018). Finally, the European grapevine moth, *L. botrana* a native of Europe, has been introduced inadvertently to the wine-growing regions of Argentina, Chile, and California (Gilligan *et al*., 2020).

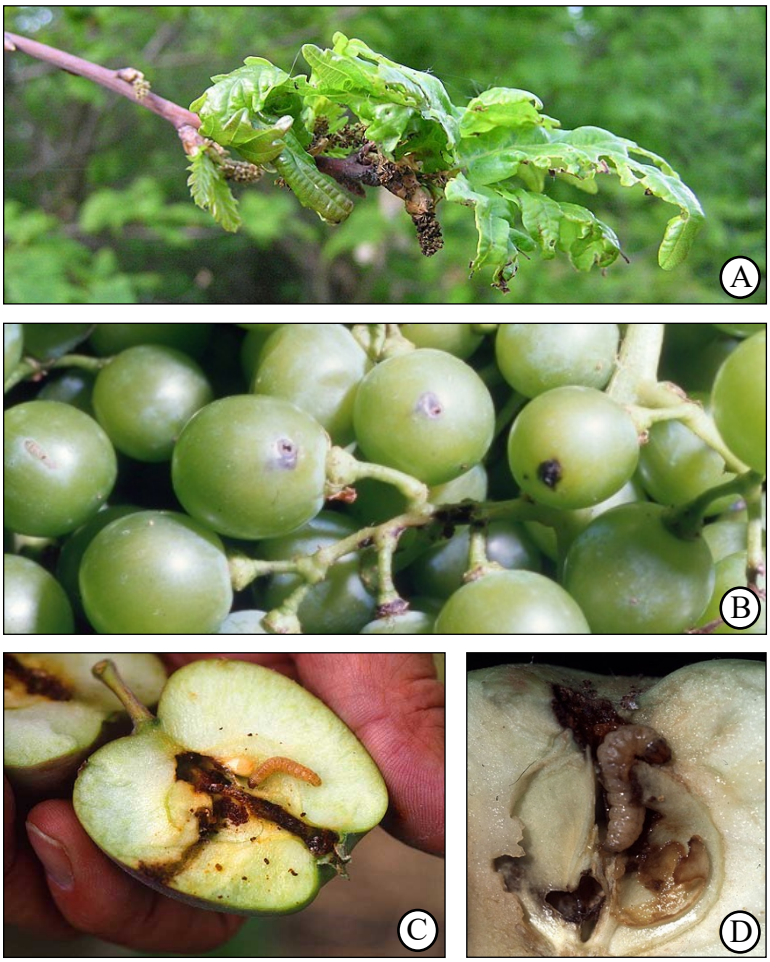


Figure 1.5 – Details of damage caused by Lepidoptera Tortricidae: *Tortrix viridana* Linnaeus (A); *Lobesia botrana* ([Denis and Schiffermüller]) (B); *Cydia pomonella* (Linnaeus) (C, D).

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CHAPTER 2

FAUNISTIC NOTES ON LEPIDOPTERA TORTRICIDAE FROM THE COLLEMELUCCIO NATURE RESERVE (CENTRAL ITALY)





2.1 INTRODUCTION

In this chapter, the results of entomological expeditions at Collemeluccio Nature Reserve are reported. The specimens were collected from late May to September 2019 once a week for a total of 132 samples.

2.2 MATERIALS AND METHODS

2.2.1 Study area

The core of Collemeluccio is part of a unique nature reserve called "Collemeluccio-Montedimezzo", established in 1971, that has been recognised as a UNESCO MAB Biosphere Reserve. The two areas, 20 km away from each other, are in the territory of Alto Molise, a high catchment area of the Trigno River, in an area close to the border with Abruzzo region (Fig. 2.1).

The Collemeluccio Nature Reserve has an extension of 347 ha and is in the countryside of Pescolanciano (Isernia province), at altitudes ranging from 790 to 1,065 metres above sea level (m/a.s.l.). The administrative borders of the Reserve are constituted to the north-east by the Celano-Foggia pathway, to the south-east by the "Vallone Salcitaro", to the south-west by the Trigno River and to the north-west by the "Vallone della Posta" (Abbate and Giovi, 2002).

The substrate consists of micaceous sandstones, silty clays and marble limestones, which give rise to a generally soft morphology, with modest steepness of the slopes, scarce valley incisions and the absence of landslides. On these lithotypes brown acidic, clayey soils develop, with frequent phenomena of hydromorphy (Abbate, 1990). In addition to the waterways reported, in Collemeluccio territory there is a source called "Fonte Cupa". Limited to the spring season, there are pools of water and temporary streams (Abbate and Giovi, 2002). From a climatic point of view, the site is characterised by the absence of summer dryness, sublittoral rainfall and low temperatures despite the modest altitudes (Abbate, 1990). The mean annual temperature is 8.2°C and the annual mean precipitation is 907 mm (1973-1983). January is the coldest month (mean: -2.1°C) and July is the warmest month (mean: 22.4°C), also showing a peak in subaridity (Ravera *et al*., 2010).

The Reserve is characterised by forests associated with *Aquifolio-Fagetum abietetosum albae* Abbate 1990. In this border sector between the central Apennines and the southern Apennines, white fir trees occupy a range between 750 and 1,000 m/a.s.l., showing a good natural renewal, without consistently pushing into the beech woods of the upper band. This also occurs in other Molise stations (Guidi, 1971), which in the recent past constituted an uninterrupted formation with that of Abruzzo (Giacobbe, 1950).

The most widespread plant species in the area is the silver fir (*Abies alba* Mill.) associated with the Turkey oak (*Quercus cerris* L.) (Fig. 2.2).

The dominant tree layer of the Collemeluccio Reserve, 20-25 m high, often has gaps, leaving space for a dominant layer formed by field maple (*Acer campestre* L.), common dogwood (*Cornus sanguinea* L.), hornbeam (*Carpinus betulus* L.) and secondarily hazel (*Corylus avellana* L.), beech (*Fagus sylvatica* L.) and downy oak (*Quercus pubescens* Willd.). The undergrowth is rich in thermophilic elements; among the most common woods there are the wild service tree (*Sorbus torminalis* L.), the wild European pear (*Pyrus pyraster* Burgsd.), the hawthorn (*Crataegus monogyna* Jacq., *C. oxyacantha* L.), the blackthorn (*Prunus spinosa* L.), the common privet (*Ligustrum vulgare* L.) and the European spindletree (*Evonymus europaeus* L.).



Figure 2.1 – The Collemeluccio Nature Reserve territory (Molise region, Central Italy) and trapping sites (white circles).



Figure 2.2 – The vegetation of the Collemeluccio Nature Reserve (Molise region, Central Italy).

The most frequent species of herbaceous vegetation are the slender false brome (*Brachypodium sylvaticum* Huds.), the common primrose (*Primula vulgaris* Huds.) and the early dog-violet (*Viola reichenbachiana* Boreau) (Abbate, 1990). Inside the Reserve there is a large glade occupied by bushes consisting mainly of dog rose (*Rosa canina* L.), blackthorn (*P. spinosa*) and wild European pear (*P. pyraster*) (Abbate and Giovi, 2002).

2.2.2 Methods of collection

Our tortricid specimens were caught mainly by attraction to light at night-time, mostly by using UV-LED light traps, but also by using entomological nets during the day-time (Trematerra *et al*., 2018). In general, light trapping is the most widely used tool for investigating communities of nocturnal Lepidoptera and is used often in studies on the effects of environmental changes on biodiversity around the world and in many types of habitats. These traps have also been used for studying changes in moth communities because of climate warming in different places throughout the world (Infusino *et al*., 2017). The different techniques used to collect samples are listed below.

Entomological net. Specimens were collected with a net by shaking the vegetation and capturing the specimens in flight and then introducing them into specific bottles (Fig. 2.3 A). The net used consists of a handle about 1 m long and a circular support in steel with a diameter of 35 cm on which a very light tulle bag is installed, so as not to ruin the wings of the intercepted adult insects. This method was used during the day-time.

UV-LED light traps. The LED traps consist of an ultraviolet 2.5 m long strip, with a total of 150 LEDs (12 volt and ~15 W), positioned on a cylindrical support of PVC and four transparent plexiglass plates in a radial pattern arranged around it (Fig. 2.3 B). The structure was mounted above a closed container on which a large funnel with a lower hole of about 5 cm in diameter was positioned. The traps were positioned at ground level and were powered by a portable lead battery (Infusino *et al*., 2017). The adult moths, attracted by the light, approached the emission source and collided with the transparent plates, falling through the funnel into the container below. The container contained egg cartons arranged to offer shelter to the caught specimens to avoid excessive deterioration of their wings. The corner of the container contained a bottle equipped with a wick containing tetrachloroethane to narcotise the insects.

Catching with a white sheet. Similarly to the UV-LED light traps, this technique was used during the night-time. This method employed a white cotton cloth (to increase the reflective surface) of about 4 m^2, hung vertically from a rope and in contact with the ground, illuminated by a 160 W mixed light lamp (HVL). The power supply was a Yamato GT095-2T generator, with a power of 650 W. The UV lights were connected to a 12 V lead battery (Fig. 2.3 C). This last equipment results more comfortable and less bulky than the first one, but the light it emits a less bright. The insects were attracted by the light and settled on the white sheet; then, they were collected in a modified plastic bottle. When the bottle contained 10-15 moths, they were narcotised with cotton wool impregnated with ethyl acetate and placed in containers for transport.

All collected samples were studied at the Laboratory of General and applied entomology of the Department of Agriculture, Environmental and Food Sciences (University of Molise, in Campobasso).

2.2.3 Preparation and conservation of the samples

The collected specimens were brought to the laboratory. They were kept for about 15-18 hours in humidifiers containing plastic containers with sterile sand soaked in water on the bottom to soften the muscle for the subsequent stages of preparation (Fig. 2.4 A). The specimens were then fixed by placing an entomological pin of a diameter proportional to the size of the insect at the centre of the thorax. The size of the pins used to prepare tortricid was generally 00, 0 or 1; a micro pin was sometimes needed for very small species.

Each sample was placed on a spread board made up of two small wooden slats mounted in parallel to have a longitudinal slot in the middle, 3 mm thick, and inclined to form an angle a bit less than 180°. Each individual was prepared orthogonally with respect

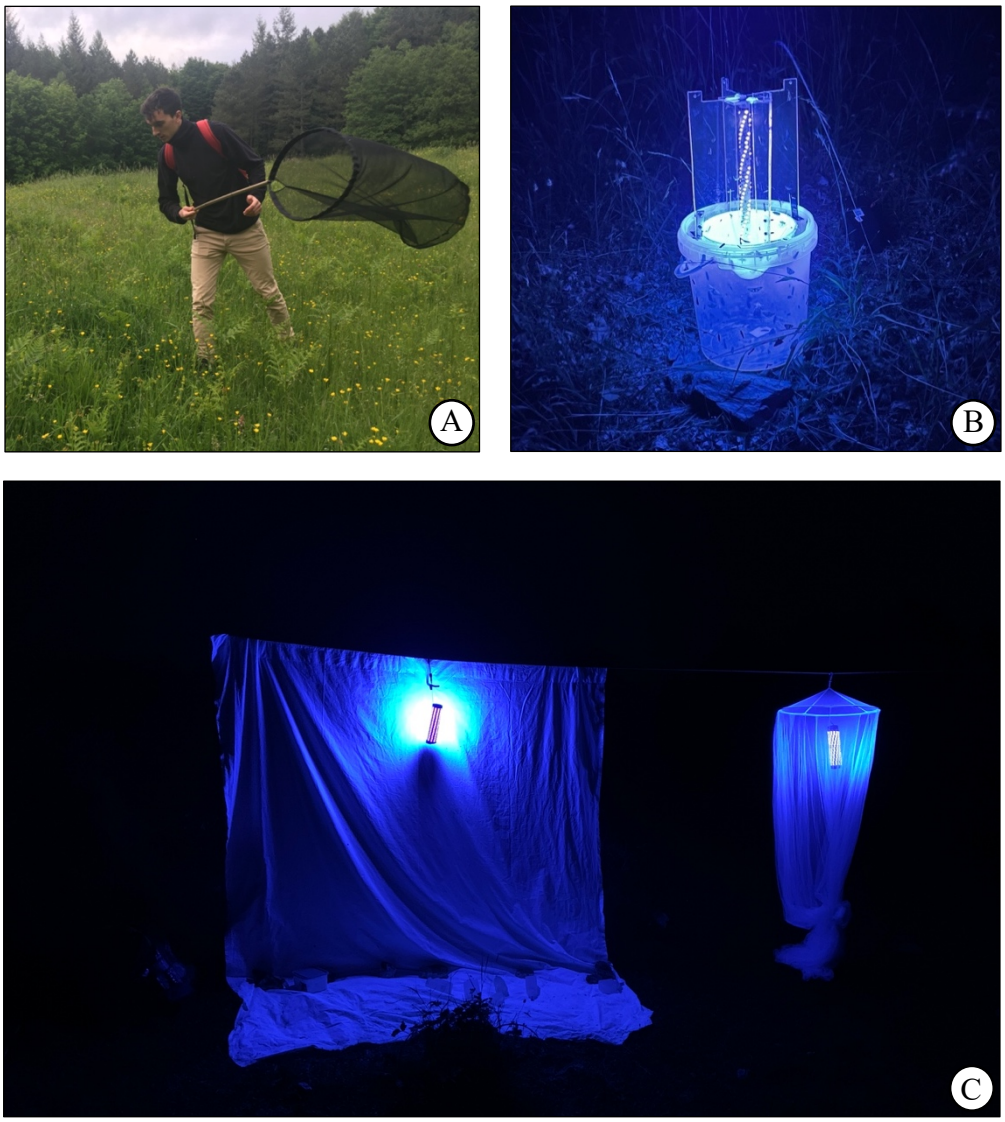


Figure 2.3 – Collection of tortricid adult specimens with the use of entomological net (A), UV-LED light traps (B) and a white sheet with UV-LED (C).

to the spread board and its body was inserted in the groove. Then, with the help of entomological pins, the wings were arranged to form a right angle between the rear edge of the front wing and the body of the moth. The wings, correctly positioned, were immobilised with parchment paper fixed to the wood with other pins. The insects were kept in this position for about 30 days, until they had dried completely (Fig. 2.4 B). Each specimen was assigned an identification label with the following information: nation, region, city, province, location, altitude, date of collection and author of the capture (Fig. 2.4 C). After preparation, all the specimens were placed inside an entomological box to store and to protect them from mould, mushrooms and other insects like those of the family Dermestidae (Fig. 2.4 D).



Figure 2.4 – Details of preparation and conservation of the tortricid adult samples: softening (A), spreading (B), labelling (C) and storage (D).

2.2.4 Preparation of genitalia

The process of "dissection" may be divided into several distinct operations as follows: maceration in potash, washing to remove potash and initial staining, dissecting and cleaning, staining, dehydrating and hardening, clearing and mounting (Fig. 2.5 A). The genitalia were separated with the help of a binocular stereoscope with a maximum magnification of 70x. Staining may occur on several occasions. The complete abdomen was removed from the insect by upward pressure; the metathorax was gently pressed dorsally while the abdomen was removed to prevent severing the metathorax and hindwings. Complete removal of the abdomen is recommended because cutting the abdomen damages it, leaves it incomplete and may also sever the saccus, aedeagus, apodemes or bursa copulatrix. The abdomen was placed in a test tube with about 5 ml of 10% potassium hydroxide (KOH) solution and the test tube was placed in a breaker of boiling water for 2-10 minutes; the exact time depended on the size of the abdomen. The content of the test tube was then poured into a small beaker. The abdomen was removed and placed in distilled water solution in a solid watch glass beneath the microscope. For male genitalia (Fig. 2.5 B), the tip of the abdomen was partly descaled by gentle brushing with the tip of a snipe feather of a fine brush; the genitalia were separated from the abdomen by cutting the attaching membranes. Extraneous debris and deciduous scales on the genitalia were removed by brushing or picking with forceps or needles. Depending on the species, the aedeagus was removed by pulling posteriorly, anteriorly or cutting through the anellus with a needle. Superfluous membranes attached to the vinculum or tegumen were removed.

The abdomen was descaled by transverse brushing while holding the abdomen with forceps. With very small abdomens it was necessary to descale by picking off individual scales with a needle. The inside of the abdomen was cleaned thoroughly with forceps or a needle. During this cleaning process, the genitalia and abdomen were placed in solutions of distilled water and different percentages of alcohol; these solutions were changed frequently. Any further dissection depended upon the species; in general, the chosen method best exposed the taxonomically important characters while minimising damage or distortion.

For dissection of female genitalia (Fig. 2.5 C), preliminary descaling was followed by separation of the genitalia and the abdomen: cutting the abdominal wall anterior to the ostium was sometimes necessary. The genitalia were cleaned, the anal tube was everted and the ovipositor extended; all dirt, debris, fungal hyphae, deciduous scales, receptaculum seminis and remnants of the oviduct were removed. Great care was taken not to damage the apodemes of the eighth and ninth segments. In a distilled water solution, the bursa copulatrix was perforated and the contents flushed out by gentle tapping with a needle. The abdomen was cleaned thoroughly in the same way as described for the male dissection. It is usual to stain genital preparations to improve both visual and photographic resolution of the resultant preparation. We use methylene blue as a dye. Preparations are lightly stained several times during the dissection process to aid recognition of fine membranous structures. It is very easy to overstain a preparation and it is extremely difficult to reduce the degree of colouration: an overstained preparation is difficult to examine and almost impossible to photograph.

All Tortricidae genitalia preparations were mounted on glass microscope slides using Euparal as a mounting medium. The high refractive index of Euparal provides better definition of the chitinous structures than Canada balsam (Robinson, 1976). Dissections were passed through 70% alcohol and thence to absolute alcohol. Before the preparation reached absolute alcohol (which hardens it), the genitalia may be arranged to provide maximum exposure of the relevant features. For example, the genitalia may be placed on a slide, the valves spread and the gnathos pulled ventrally before absolute alcohol is dripped on to the preparation. After absolute alcohol the genital preparation was placed in ventral position and a small drop of Euparal was added on the slide. The coverslip was lowered gently on to the preparation, with care taken not to allow the genitalia to roll, develop bubbles or have the aedeagus float out from under the coverslip. The slide was kept flat and allowed to dry, either on a covered tray at room temperature or in an oven at 45°C for 48 hours (Robinson, 1976).

2.2.5 Identification of *taxa*

The species were determined preliminarily, in collaboration with Professor P. Trematerra and Doctor M. Colacci, by observing and comparing the colours and designs of the wing with specimens deposited in the Trematerra Collection (Campobasso, Italy) and with tables in specialist books (Fig. 2.5 D). Given the small size of the specimens and the similarity of the external characters of many species, it was often necessary to study the morphology of the genitalia through the preparation of slides.

A histological microscope with higher resolution was used to study the details of the anatomical structures. To identify each specimen correctly, the morphology of the genital system was compared both with that of the other slides from material deposited in the Trematerra Collection and with drawings from books and specialist publications.

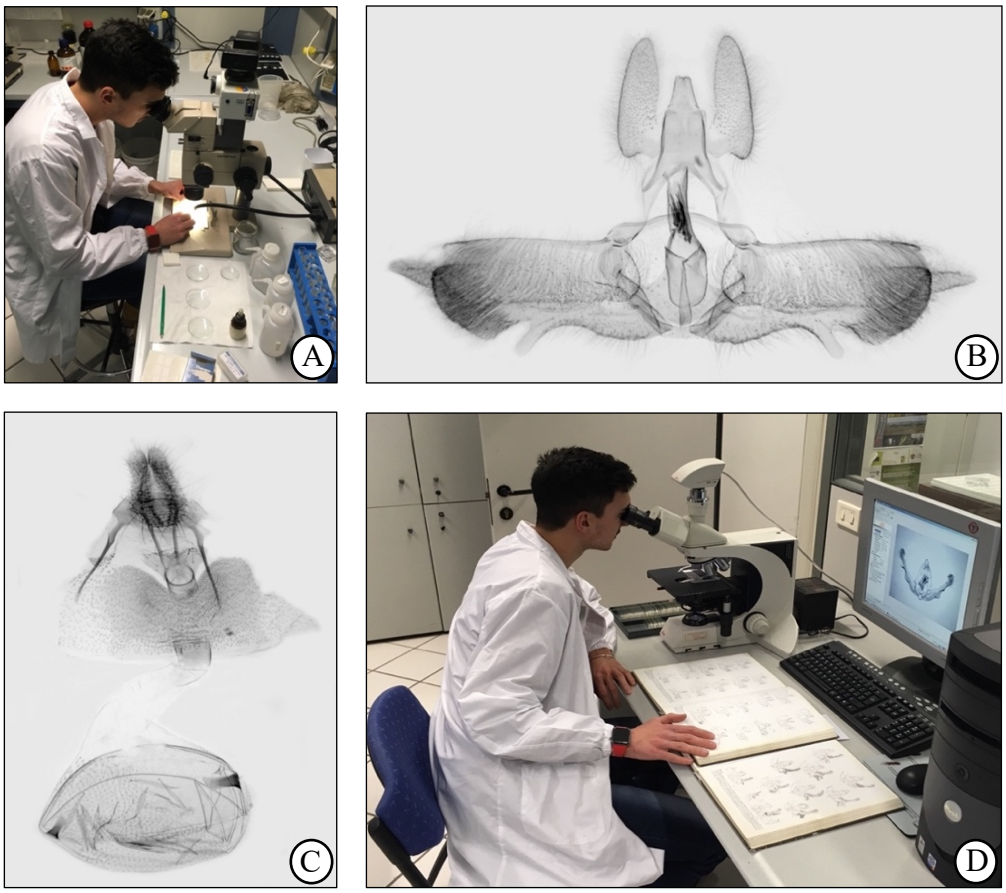


Figure 2.5 – Dissection of the samples (A), male genitalia of *Acleris schalleriana* (L.) (B), female genitalia of *Epinotia tenerana* ([Denis and Schiffermüller]) (C) and identification of the samples (D).

In cases of uncertain identification, comparisons were made with specimens deposited in specialist scientific collections or with genetic analysis through DNA barcoding, using the database of nucleotide sequences in GenBank, in collaboration with national and international research centres, such as the University of Milano (in Milano) and the Canadian Centre for DNA Barcoding (CCDB) (in Guelph) (Hajibabei *et al*., 2006; Ratnasingham and Hebert, 2007).

2.3 RESULTS

To compile the species list, we followed the indications reported by Razowski (2002, 2003, 2009) and Aarvik (2013), with some modifications suggested by Brown (2005) and Gilligan *et al*. (2018) waiting for the recent revision on the tribe Cochylini, proposed at the genetic level by Brown *et al.* 2019, is widely adopted. The distribution of the species was taken mostly from Trematerra (2003), with new data from Trematerra's personal catalogue (unpublished data). For the distribution of species in Italy, we reported N (north), C (centre), S (south), Si (Sicily) and Sa (Sardinia) (Trematerra, 2003). The chorotype of each species was taken from Vigna Taglianti *et al*. (1992, 1999) and Parenzan (1994).

LIST OF TAXA TORTRICIDAE

SUBFAMILY TORTRICINAE

TRIBE COCHYLINI

***Gynnidomorpha luridana* (Greyson, 1870)**
MATERIAL EXAMINED. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Distributed from British Island, Spain to Scandinavia and South Finland, part of East and South Europe; known also from Korea, Russian Far East, Asia Minor, China and Japan. (Italy: C, S).
CHOROTYPE. Asiatic-European.

***Agapeta zoegana* (Linnaeus, 1767)**
MATERIAL EXAMINED. 4 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Palaearctic species known from Europe, northern parts included, to Ural Mts, Asia Minor, Transcaucasia and Kazakhstan. (Italy: N, C, S).
CHOROTYPE. Turano-European.

***Eupoecilia angustana angustana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male and 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Palaearctic subspecies excluded North Africa: Europe, Transcaucasia, Ural Mts, Siberia, China, Russian Far East, Korea and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Aethes williana* (Brahm, 1791)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Palaearctic: North-West Africa and Europe, from Iberian Peninsula to Ural Mts, Transcaucasia, Central Asia, South-West Siberia; Mongolia also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Aethes bilbaensis* (Rössler, 1877)**
MATERIAL EXAMINED. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Palaearctic species; its area extends from North West Africa and Iberian Peninsula to Greece and South Ural Mts, known also from Asia Minor, North Lebanon, Iran, Afghanistan, Pakistan and Turkmenia. Budaskin (1993) found it in Crimea, Caucasus, Transcaucasia and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Aethes cnicana* (Westwood, 1854)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Known from almost entire Europe; also Siberia, Mongolia, China, Russian Far East, Korea and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Aethes rubigana* (Treitschke, 1830)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Palaearctic species whose repartition is not satisfactorily known. In Europe widley distributed west as far as to Caucasus, mentioned also from Transcaucasia, Kazakhstan, Siberia, Mongolia, China and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Diceratura ostrinana* (Guenée, 1845)**
MATERIAL EXAMINED. 8 males and 2 females, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 4 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Palaearctic species known from Algeria and Iberian Peninsula to Hungary and Albania, Greece and Crimea. Other records are from Lebanon, Asia Minor, Transcaucasia, and Siberia. (Italy: N, C, S, Sa).
CHOROTYPE. Centralasiatic-European.

***Cochylis hybridella* (Hübner, [1810-1813])**
MATERIAL EXAMINED. 6 males and 2 females, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie. 4 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Ural Mts, Kazakhstan, West South Siberia, China, Russian Far East, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Cochylis posterana* Zeller, 1847**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 948 m, 19.V.2019, leg. Colacci and Goglia.
DISTRIBUTION. West Palaearctic species occurring east far as Transkaspia, Central Asia and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

TRIBE CNEPHASIINI

***Cnephasia asseclana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe, Canary Is and New Foundland, Morocco, Caucasus, Transcaucasia, Wesrt South Siberia, and Japan. Introduced to North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

TRIBE ARCHIPINI

***Pseudoargyrotoza conwagana* (Fabricius, 1775)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Widley distributed in Europe and whole Palaearctic: from Europe to Ural Mts, Caucasus, Transcaucasia, Asia Minor, Transbaikalia, Far East (South Primorsk, China, Korea, Sakhalin, Japan); known also from Nepal. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Epagoge grotiana* (Fabricius, 1781)**
MATERIAL EXAMINED. 2 males and 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Distributed in West Palaearctic from North West Europe to Ukraine and South Ural Mts, Trans-Ural, Caucasus, and Asia Minor. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Archips xylosteanus* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Palaearctic Region from West Europe to Asia Minor, Caucasus, Iran, Central Asia, China, Russian Far East, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Syndemis musculana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 948 m, 19.V.2019, leg. Colacci and Goglia.
DISTRIBUTION. Known from whole Europe to Ural Mts and Caucasus, Transcaucasia, Kazakhstan, Siberia, Transbaikalia, China, Mongolia, Russian Far East (incl. Kamchatka and Kuril Is) and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Clepsis consimilana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 5 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie. 2 males and 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Europe to East European Russia; West Africa to Lebanon, Asia Minor, Nearctics and Ethiopian region (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

SUBFAMILY OLETHREUTINAE

TRIBE OLETHREUTINI

***Endothenia marginana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, North-West Africa, Transcaucasia; Asia: from Ural Mts to Mongolia, China and Russian Far East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Hedya nubiferana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. West Europe to Ural Mts, Caucasus, Asia Minor, Iraq, Turkmenistan, Iran, Kazakhstan, West Siberia. North America (Canada). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Hedya pruniana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 2 females, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. From West Europe to Ural Mts, Asia Minor, Caucasus, Kazakhstan, North Iran, and Russian Far East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Orthotaenia undulana* ([Denis and Schifferüller], 1775)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe; Caucasus: Armenia and Georgia; Kazakhstan; Siberia (east of Tuva and Transbaikalia, Anadyr) to Far East and Japan. Also North Africa, Asia Minor and North America. (Italy: N, C, S, Sa).
CHOROTYPE. Holarctic.

***Olethreutes arcuellus* (Clerck, 1759)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. From Europe to Caucasus; Asia Minor, Iran, Kazakhstan, West Siberia, and North-West China. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Syricoris lacunana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 3 males and 3 females, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.

DISTRIBUTION. West Europe to Ural Mts and Caucasus, Transcaucasia; Asia Minor, Mongolia, West-South Siberia, China, and Japan. (Italy: N, C, S, Sa).
CHOROTYPE. Asiatic-European.

***Syricoris aurofasciana* (Haworth, [1811])**
MATERIAL EXAMINED. 2 males and 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe, Transcaucasia, Asia Minor; Siberia, Mongolia, Russian Far East, Korea and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

TRIBE ENARMONIINI

***Ancylis geminana* (Donovan, [1806])**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe from Iberian Peninsula and British Is and from Scandinavia to Mediterraneum and Balkan Peninsula; Asia Minor, Transcaucasia, Kazakhstan, Siberia, Mongolia, China, Russian Far East, Japan and Nearctic Region. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Ancylis badiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. From West Europe to Asia Minor, Caucasus, Transcaucasia, Ural Mts, Mongolia and Russian Far East, China, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Ancylis achatana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. From West Europe to Asia Minor, Caucasus, Transcaucasia, Ural Mts, Mongolia and Russian Far East, China, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

TRIBE EUCOSMINI

***Crocidosema plebejana* Zeller, 1847**
MATERIAL EXAMINED. 1 male and 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Entire Europe, North Africa, Asia Minor, Arabia, Iran, Transcaucasia, Turkmenia, India, Taiwan, Australia, North America, and South America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Eucosma cana* (Haworth, [1811])**
MATERIAL EXAMINED. 3 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, Kazakhstan, Central Asia, South Siberia, Russian Far East, China, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Eucosma hohenwartiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 6 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. North Africa, Europe from British Is to Scandinavia to Mediterraneum, East Europe, Transcaucasia, Asia Minor, West and South Siberia to Altaj, Central Asia, West China and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Eucosma scutana* (Constant, 1893)**
MATERIAL EXAMINED. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Europe from France to former USSR countries, from Great Britain to Romania. (Italy: N, C, S, Si).
CHOROTYPE. European.

***Gypsonoma sociana* (Haworth, [1811])**
MATERIAL EXAMINED. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe from France and British Is to Ural Mts and Caucasus, Transcaucasia (Azerbaijan), Siberia, Russian Far East (Priamure, South Primorsk, South Kuril Is) and Japan. (Italy: N, C, S, Sa).
CHOROTYPE. Asiatic-European.

***Epiblema foenellum* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Known from Palaearctic and Oriental Regions. Europe from Spain and British Is to Greece, from Scandinavia to Ural and Caucasus, South-West Siberia, Kazakhstan, Central Asia, Mongolia, Russian Far East: West Tuva, Amur-Zeya area, Priamure, South Primorsk, South Sakhalin, South Kuril Is, Khabarovsk Krai; China: Manchuria, Kuanhsien, Zhejiang; Korea; Japan: Hokkaido, Honshu. Oriental region: India, China, Taiwan and Vietnam. (Italy: N, C, S).
CHOROTYPE. Subcosmopolitan.

***Notocelia uddmanniana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 3 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe, North Africa, Asia Minor, Near East, Caucasus, Transcaucasia, Transural, Iran, Kazakhstan, Tadzhikistan, and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Notocelia aquana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Europe, Morocco, Ural Mts, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, West Siberia, and China. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Notocelia trimaculana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. North Africa (Morocco), Europe from Spain, British Is and Scandinavia to Balkan Peninsula and Asia Minor, East Europe, Caucasus, Transcaucasia, Near East, Iran and Kazakhstan. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

TRIBE GRAPHOLITINI

***Cydia pomonella* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie. 2 males, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 945 m, 12.IX.2019, leg. Fekensa and Goglia.
DISTRIBUTION. Covers the area of distribution of wild apple-tree, Europe, Asia, North-South America, Australia, and New Zealand. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Cydia pyrivora* (Danilevsky, 1947)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Known from Europe, excluded northern parts, as far as Transcaucasia, Asia Minor, North Syria, Siberia, Uzbekistan and Thian Shan in Asia; also Algeria. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cydia triangulella* (Goeze, 1783)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 945 m, 12.IX.2019, leg. Fekensa and Goglia.
DISTRIBUTION. Paleartcic region till Japan, its area covers that of oaks. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Lathronympha balearici* Diakonoff, 1972**
MATERIAL EXAMINED. 1 male and 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe (Estonia, Spain, Italy and Greece). (Italy: C, S, Si).
CHOROTYPE. European.

***Grapholita funebrana* Treitschke, 1835**
MATERIAL EXAMINED. 1 female, Italia, Molise, Pescolanciano (IS), Collemeluccio, 944 m, 25.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Two forms known. The western form occurs in Europe (except for Shetland Is and North Scandinavia), North Africa, Asia Minor, Central Asia and South Kazakhstan. The eastern form is recorded from Transbaikal to China and Japan (Honsyu, Hokkaido). Artificially introduced to many territories. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Pammene querceti* Gozmány, 1957**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 942 m, 27.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Known from Europe (Czech Republic, Slovakia, France, Austria, Italy, Hungary and former Yugoslavia). (Italy: C, S, Si).
CHOROTYPE. S-European.

***Pammene fasciana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 945 m, 12.IX.2019, leg. Fekensa and Goglia.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Dichrorampha simpliciana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Pescolanciano (IS), Collemeluccio, 934 m, 1.VIII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Known from Europe, Asia Minor, Transcaucasia, Iran, South-West Siberia, China, southern part of Russian Far East and Kamchatka. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

During the entomological expeditions at the Collemeluccio Nature Reserve, 43 species belonging to Lepidoptera Tortricidae were collected. The two most abundant tortricid subfamilies recorded are Olethreutinae and Tortricinae, with 27 and 16 species, respectively; the subfamily Chlidanotinae is not represented. Species belonging to the most tribes cited in the Italian fauna (Trematerra, 2003) have been found at the Collemeluccio Nature Reserve (Cochylini with 10, Cnephasiini with 1, Archipini with 5, Olethreutini with 7, Enarmoniini with 3, Eucosmini with 9 and Grapholitini with 8), except for the tribes Tortricini, Sparganothini, Polyorthini, Euliini, and Bactrini.

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CHAPTER 3

FAUNISTIC NOTES ON LEPIDOPTERA TORTRICIDAE FROM THE MATESE MASSIF (CENTRAL-SOUTH ITALY)



3.1 INTRODUCTION

General information on Lepidoptera Tortricidae is reported in Chapter 1. This chapter contains the results of the entomological expeditions at the Matese Massif.

The Matese Massif is one of the most important mountain groups of the southern Apennine; it is located between two regions of Italy, namely Campania and Molise. The entomological analysis was carried out in this area at different altitudinal zone. Giacomini and Fenaroli (1958) divided the Massif into two belts: the first one, from 800-1,000 m/a.s.l. up to 1,800-1,900 m/a.s.l., is called the mountain vegetation belt; the second one, above 1,800-1,900 m/a.s.l., is called the cacuminal vegetation belt.

Trematerra and Gentile (1999) reported 69 species from 1997 to 1999 in the mountain vegetation belt and the cacuminal vegetation belt of the Massif. While completing his bachelor's degree in 2012, Doctor Marco Colacci investigated the foothill belt of the east side of the Massif with the collection of 91 species (Colacci, 2014). For this reason, from June to October 2019 and then in June 2020, we chose to investigate habitats different from those that had been explored previously. With the aim to update and complete as much as possible the work started by other entomologists, we investigated the north-west side of the Massif in the cities of Sant'Agapito and Monteroduni (Isernia province), characterised by the formation of holm oak (*Quercus ilex* L.) at an altitude of 600 m/a.s.l., and the south-west side of the Massif in the city of Fontegreca (Caserta province) at altitude between 400 and 500 m/a.s.l., characterised by a sub-spontaneous formation of *Cupressus sempervirens* var. *horizontalis* (Miller) Aiton. Moreover, some specimens were obtained from acorns of holm oak (*Q. ilex*) of Sant'Agapito and Monteroduni and the fruits of cypress trees (*C. sempervirens* var. *horizontalis*) in Fontegreca. In this case, the ripe and unripe fruits were collected from the ground and directly from the trees. They were placed separately in ventilated plastic containers waiting for the flicker of the adult specimens. With this samples collection, we have obtained a tortricid list as updated and complete as possible for the Matese Massif.

3.2 MATERIALS AND METHODS

3.2.1 Study area

The Matese Massif (Fig. 3.1) is included in the central-South Apennine (in the Molise and Campania regions) and its main peak is Mount Miletto (2,050 m/a.s.l.). Oriented in the north-west–south-east direction, it is delimited to the north by the Bojano plain, to the west by the Volturno valley, to the south by the Calore valley and to the east by the valley of the Tammaro torrent (Santangelo *et al*., 2010).

The Massif is made up of Meso-Cenozoic soils (Giancola and Stanisci, 2006) and is derived from the deformation of the carbonate platform formed by sedimentation in shallow sea environments from the Triassic to the lower Miocene and subsequently emerged during the tectonic events of the Mio-Pliocene. The stratigraphic succession is characterised by dolomites and limestones on which marl and terrigenous deposits rest. During the Middle Cretaceous period, an interruption of sedimentation was evidenced by a stratigraphic gap, highlighted by the presence of bauxite deposits. The Massif is also characterised by extensive karst phenomena, which have given rise to numerous underground caves and epigean forms; of particular interest is the polje on which the Matese Lake sits. Karst also significantly affects the underground water circulation, making the Matese Massif one of the most important aquifers in southern Italy (Santangelo *et al.*, 2010).

From a climatic point of view, given the orientation of its main mountain peaks, the Massif represents a real barrier for the masses of humid air that come from the Tyrrhenian Sea and, after being cooled, lead to abundant rainfall. In accordance with the phytoclimatic framework proposed by Blasi *et al*. (1988) for the Campania region, the study area falls largely in what is called the mountain and high mountain sector (Santangelo *et al*., 2010).

The Massif shows five distinct altitudinal zone that starting from the Bojano plain (about 500 m/a.s.l.) and reach Mount Miletto.

In the basal belt (Fig. 3.2 A), it is possible to observe mixed oak woods with *Quercus cerris* L. and *Quercus frainetto* Ten., which are currently widespread in a very discontinuous way. Along the watercourses bourders it's possible to find some species of *Salix* L. and *Populus* L. The shrub layer is somewhat developed and rich in species depending on the degree of anthropic exploitation; however, it is always dominated by *Carpinus orientalis* Mill., *Rosa canina* L., *Pyrus pyraster* Burgsd., *Sorbus torminalis* L., *Sorbus domestica* L. and *Ligustrum vulgare* L. This belt also contains the Fontegreca cypress woods, which will be discussed later (Fig. 3.2 B).

From the basal belt up to 700 m/a.s.l. (Fig. 3.2 C) there are oak woods mixed with Turkey oak (*Q. cerris*) and downy oak (*Quercus pubescens* Willd.), with plants 12-18 m high, below which is an intricate development of undergrowth consisting of rosaceous plants such as *Rubus ulmifolius* Schott, *Rosa canina* L., *R. arvensis* Huds., *R. agrestis* Savi, *Prunus spinosa* L., *Crataegus monogyna* Jacq., *C. oxyacantha* L. and heliophilous species such as *Asparagus acutifolius* L. The *Q. cerris* and the *Q. pubescens* are associated with *Acer campestre* L., *A. obtusatum* W. and K., *Fraxinus ornus* L., *Sorbus domestica* and *S. torminalis* L.

From 700 to 900 m/a.s.l., in contact with the beech forest, there are woods of black hornbeam (*Ostrya carpinifolia* Scop.) associated with other trees such as *Castanea sativa* Mill., *Acer lobelii* Ten., *F. ornus*, *Q. cerris*, *Fagus sylvatica* L. and, in some cases, *Abies alba* L. The shrub layer is represented by *Laburnum anagyroides* Medik., *Sorbus aria* L. and *Cytisus sessilifolius* L. (Fig. 3.2 D).

The mountainous belt (Fig. 3.2 E), from 900 to 1,600 m/a.s.l., is occupied by deciduous, sciaphilous forests: the beech forests. The arboreal belt almost exclusively contains beech and rarely silver fir. In the shrubby belt there are *Rubus hirtus* W. and K., *Ilex aquifolium* L., *Taxus baccata* L. and *Rosa pendulina* L.

The areas above 1,600 m/a.s.l. (Fig. 3.2 F) can potentially originate beech woods, however, the secular practice of pastoralism has transformed a large part of these surfaces that have developed stable meadow cenoses. The dominant species are *Festuca dimorpha* Guss. and *Bromus erectus* Hudson (AA. VV., 2001).

In the south-west side of the Matese Massif near the city of Fontegreca (Caserta province) there is an area characterised by a sub-spontaneous formation of *C. sempervirens* var. *horizontalis*, of unknown origin and of undefined structure (Fiorucci, 2018). Fontegreca cypress woods is included in the Matese Regional Park; it has a surface of about 40 ha and is crossed by the Sava River, an affluent of the Volturno River that, after an underground route of over 2 km, reappears in Vallone San Pietro in a gorge carved between large limestone cliffs and with very steep slopes. The Sava River divides the cypress woods into two parts. The right cliff is called "Monte dei Cipressi" and it is covered by mixed forest. Up to 400 m/a.s.l., the cypress is more frequent and gradually comes to form a forest, made up of plants of different ages due to annual natural renewal. For many decades, the left bank on the western side has contained a constant diffusion of cypresses, which had been completely absent in earlier years. For this reason, on the left side the population of cypresses is less dense than the right one. A transitional area of 75

ha must be added to the core of the cypress woods. In the last 50 years, the cypress has spread down the "Valle delle Conche", which is on the western side of "Monte dei Cipressi", because of the favourable soil and microclimatic conditions (Raddi *et al*., 2014).

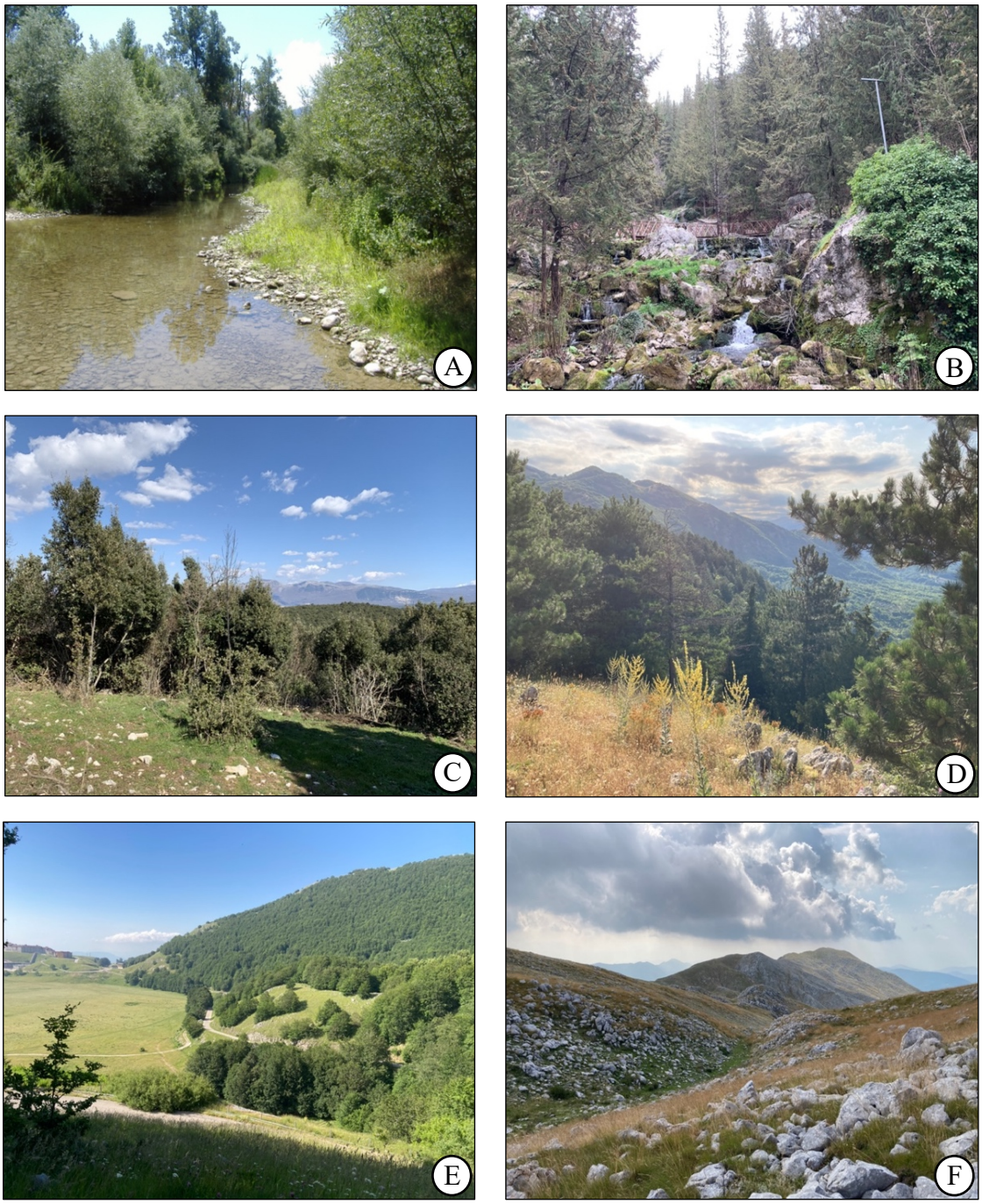
From a geological point of view, it should be remembered that the Fontegreca-Capriati belt is made up of dolomites (limestone consisting of carbonates of calcium and magnesium), whitish crystalline, dolomitic limestones and dolomites containing fossils. These rocks are attributed to the Triassic era. Conglomerate rocks of the Upper Cretaceous rest on this complex. The profile ends with Miocene soils. In conclusion, the territory of the cypress grove, deeper and more developed where the density of the cypresses is greater, has a limestone matrix and can be ascribed to the "red soil" type (Raddi *et al*., 2014).

From a climatic point of view, the cypress woods are characterised by mild winters and hot summers, with abundant summer rain (150 mm). The maximum monthly rainfall is recorded in the period of November-December. In the summer, rainfall decreases significantly, but this rain is sufficient to guarantee a good summer growth of the cypress (Raddi *et al*., 2014).

Analysis of climatic data indicates that the cypress woods environment is a transition between the Mediterranean area of evergreen sclerophylls and deciduous broadleaf trees (Raddi *et al*., 2014). The Fontegreca cypress woods, partly pure and partly mixed with other species, is made up of plants of different age, which indicates a good annual renewal. The pure one is characterised by a very high density of cypresses trees (up to 4,000 per ha) and this limit, together the tendentially superficial soil, the development of other species while the mixed one, in addition to cypresses trees, is characterised by the presence of other arboreal and shrubby species. This last species is frequent along the course of the Sava River. An examination of the floristic composition associated with the cypress woods reveals an abundant presence of species of eastern origin, broad-leaved trees of southern European origin and Mediterranean sclerophylls (Raddi *et al*., 2014).



Figure 3.1 – The Matese Massif territory (Molise and Campania regions, central-South Italy) and trapping localities (white circles).



Figures 3.2 – Details of some of the vegetational landscapes of the Matese Massif (Molise and Campania regions, central-South Italy): Ponte del Comune, San Polo Matese (460 m/a.s.l.) (A); Fontegreca cypress woods, Fontegreca (490 m/a.s.l.) (B); Sant'Agapito (609 m/a.s.l.) (C); Mount Crocella, Bojano (862 m/a.s.l.) (D); Campitello Matese, San Massimo (1,480 m/a.s.l.) (E); Mount Miletto, San Massimo (1,800 m/a.s.l.) (F).

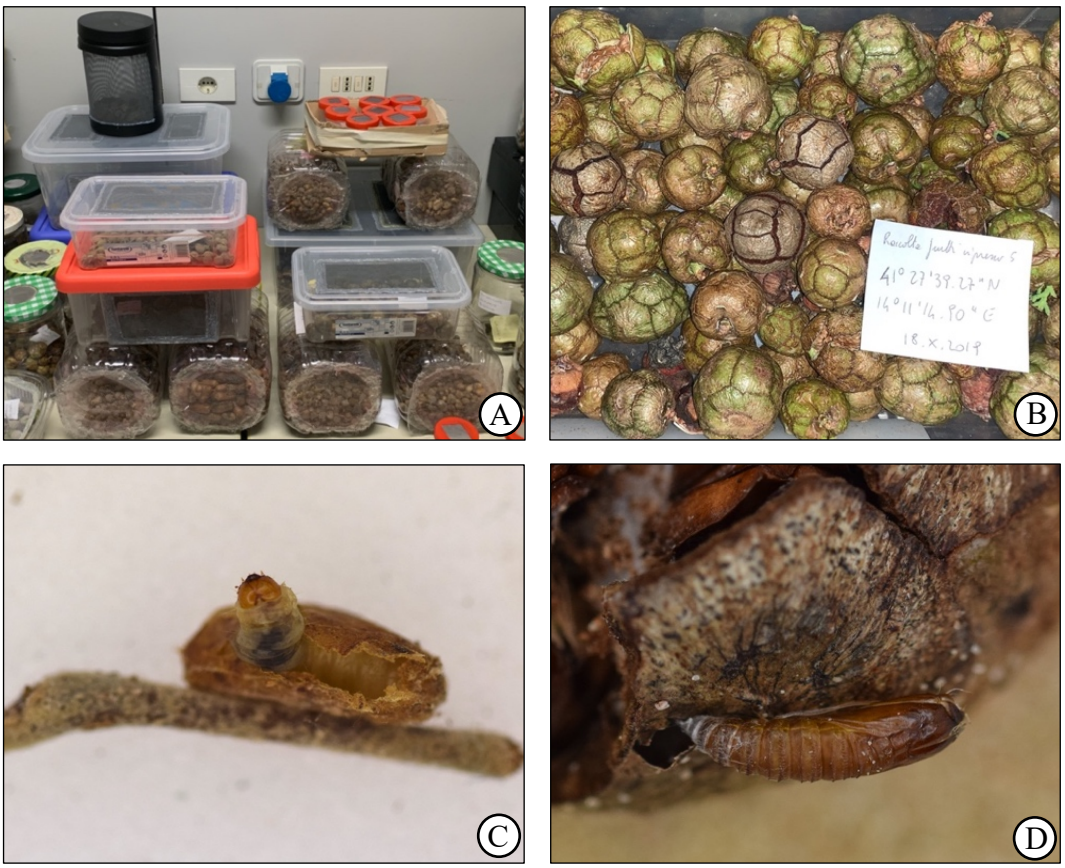


Figure 3.3 – Storage of ripe and unripe fruits of some forestal trees in ventilated boxes (A), labelled with relevant information (B). Details of Tortricidae larvae from holm oak acorn (C) and pupa from cypress fruit (D).

3.2.2 Collection of samples from ripe and unripe fruits of some forestal trees

In addition to the collection methods described in Chapter 2, some specimens have been studied by collecting the fruits of some forest plants, especially *C. sempervirens* and *Q. ilex*. The ripe and unripe fruits were collected from the ground and directly from the trees. They were placed in separate ventilated plastic containers for future examination of the specimens inside them (Fig. 3.3 A). Each container was labelled with the region, city, date and coordinates (Fig. 3.3 B). These containers were placed in our laboratory at room temperature (an average of 20°C during the cold season and 25-26°C during the warm season); this storage might have accelerated the development of the insects. The different stages of insects (larva, pupae and adult) were visible when dissecting the fruit (Fig. 3.3 C, D). Moreover, the damage caused by the insects was observed to describe and study the biology of some species. These detection methods have been useful to update in some cases the association between insects and host plants. Furthermore, this endeavour has provided information about pests that attack holm oak acorns and cypress fruits and have allowed the possibility to study the biology and update the list of moths that carry out their biological cycle on those plants.

3.2.3 Preparation, conservation and identification of the *taxa*

For collection, preparation, conservation and identification of the *taxa*, see Chapter 2.

3.3 RESULTS

As reported in Chapter 2, to compile the species list, we followed the indications reported by Razowski (2002, 2003, 2008, 2009) and Aarvik (2013), with some modifications suggested by Brown (2005) and by Gilligan *et al*. (2018) waiting for the recent revision on the tribe Cochylini, proposed at the genetic level by Brown *et al*. 2019, is widely adopted. Distribution of the species was largely taken from Trematerra (2003), with new data from Trematerra's personal catalogue (unpublished data). For distribution of species in Italy, we reported N (north), C (centre), S (south), Si (Sicily) and Sa (Sardinia) (Trematerra, 2003). The chorotype of each species was taken from Vigna Taglianti *et al*. (1992, 1999) and Parenzan (1994).

LIST OF TAXA TORTRICIDAE

SUBFAMILY TORTRICINAE

TRIBE TORTRICINI

***Aleimma loeflingianum* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male and 6 females, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Europe, Ural Mts, Caucasus, Syria, and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Acleris schalleriana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie. 6 males, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Holarctic species known from Europe to Japan and North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Acleris variegana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. From West Europe and North West Africa to Iran, Turkmenia, Afghanistan, South-West Siberia, China, and Japan; also North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

TRIBE COCHYLINI

***Cochylimorpha straminea* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Known from Europe, Canary Is, North-West Africa, Asia Minor, Egypt, Iran, Transcaucasia, Ural Mts and part of Central Asia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Phalonidia contractana* (Zeller, 1874)**
MATERIAL EXAMINED. 1 male and 1 female, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Widely distributed from Iberian Peninsula to Ural Mts; found also in North Africa, Asia Minor, Israel, Transcaucasia, Iran, Afghanistan, Kashmir, and Central Asia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Aethes tesserana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie. 2 males and 1 female, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Iran, and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Aethes flagellana* (Duponchel, 1836)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Western Palaearctic: Europe from Spain to Crete and South Ural Mts, Kazakhstan and Turkmenia also Morocco, Asia Minor, Transcaucasia, Near East and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Cochylis posterana* Zeller, 1847**
MATERIAL EXAMINED. 2 males, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. West Palaearctic species occurring east far as Transkaspia, Central Asia and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Falseuncaria ruficiliana* (Haworth, [1811])**
MATERIAL EXAMINED. 3 males, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. West Palaearctic: Europe to Ural Mts, in Asia east as far as to Central Asia: Dshungarian, Ala-Tau and West Tuva; also South-West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

TRIBE CNEPHASINI

***Eana argentana* (Clerck, 1759)**
MATERIAL EXAMINED. 6 males, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Holarctic species distributed from Iberian Peninsula to Far East, more south occurring in the mountains. In Kashmir collected up to 3,700 m/a.s.l. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Cnephasia stephensiana* (Doubleday, 1850)**
MATERIAL EXAMINED. 3 males, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie.
DISTRIBUTION. Western part of our region from Iberian Peninsula to Kazakhstan, Near East, Transcaucasia, Central Asia and Asia Minor; also in South-West Siberia, Russian Far East, China, Korea and Japan. Introduced to Canada. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

TRIBE ARCHIPINI

***Pseudoargyrotoza conwagana* (Fabricius, 1775)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie. 1 female, Italia, Campania, Fontegreca (CE), 383 m, 25.VI.2019, leg. Goglia and Marquerie. 1 female, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Bojano (CB), 920 m, Loc. Monte Crocella, 8.VIII.2020, leg. Colacci.
DISTRIBUTION. Widley distributed in Europe and whole Palaearctic: from Europe to Ural Mts, Caucasus, Transcaucasia, Asia Minor, Transbaikalia, Far East (S Primorsk, China, Korea, Sakhalin, Japan); known also from Nepal. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Epagoge grotiana* (Fabricius, 1781)**
MATERIAL EXAMINED. 4 females, Italia, Campania, Fontegreca (CE), 383 m, 25.VI.2019, leg. Goglia and Marquerie. 1 male, Italia, Campania, Fontegreca (CE), 383 m, 18.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Distributed in West Palaearctic from West-North Europe to Ukraine and South Ural Mts, Trans-Ural, Caucasus, and Asia Minor. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Archips podanus* (Scopoli, 1763)**
MATERIAL EXAMINED. 3 males, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie. 1 male, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Known from Europe; Asia Minor, Caucasus, Transcaucasia, Ural Mts, Siberia also Japan. Introduced in North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Archips rosanus* (Linnaeus, 1758)**
MATERIAL EXAMINED. 3 males, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie.
DISTRIBUTION. Palaearctic species; in Sweden up to 66°. By the end of XIX century introduced to North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Syndemis musculana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Known from whole Europe to Ural Mts and Caucasus, Transcaucasia, Kazakhstan, Siberia, Transbaikalia, China, Mongolia, Russian Far East (incl. Kamchatka and Kuril Is) and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Clepsis consimilana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 9 males, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie. 50 males and 5 females, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie. 15 males and 2 females, Italia, Campania, Fontegreca (CE), 383 m, 25.VI.2019, leg. Goglia and Marquerie. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie. 3 males, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia. 1 male, Italia, Molise, Sant'Agapito (IS), 679 m, 10.X.2019, leg. Colacci and Goglia.
DISTRIBUTION. West Europe to East European Russia; West Africa to Lebanon, Asia Minor, Nearctics and Ethiopian region (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

SUBFAMILY CHLIDANOTINAE

TRIBE POLYORTHINI

***Isotrias huemeri* Trematerra, 1993**
MATERIAL EXAMINED. 3 males, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Italy only: Pollino Mts. and Matese Massif (Italy: S).
CHOROTYPE. S-Appeninic endemic.

SUBFAMILY OLETHREUTINAE

TRIBE OLETHREUTINI

***Endothenia gentianaeana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Europe to Ural Mts, Asia Minor, Arabian Peninsula, Transcaucasia, Central Asia, Mongolia, South Siberia, China, Korea, and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Celypha cespitana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 14 males and 1 female, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. West Europe to Ural Mts, Transcaucasia, Asia Minor, Near East; Iran; Russia: South-West Siberia, Central Asia, Cisbaikal, Tuva and Far East (Primorsk); North-East China (Manchuria); Mongolia; Korea; Japan (Hokkaido and Honshu). Also North America. (Italy: N, C, S, Si, Sa).

CHOROTYPE. Holarctic.

TRIBE EUCOSMINI

***Thiodia citrana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. North Africa: Lebanon; Europe from Spain to Karelia and Caucasus; Transcaucasia, Asia Minor, Iran, Kazakhstan, Turkmenia, Central Asia, South-West Siberia, Russian Far East (South Primorsk); China and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Spilonota ocellana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie. 1 male, Italia, Campania, Fontegreca (CE), 383 m, 25.VI.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, North Africa, Caucasus, Asia Minor, Transcaucasia, Iran, Kazakhstan, Turkmenia, Uzbekistan, Tadzhikistan, Russian Far East, Siberia, China, Korea, and Japan. Also Nearctic Region. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Epinotia festivana* (Hübner, 1799)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie. 1 male, Italia, Campania, Fontegreca (CE), 383 m, 18.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe: from Iberian Peninsula to south and east part of the region (excluded northern territories) also Crimea, Caucasus, Ciscaucasia, Transcaucasia, Asia Minor, Dagestan, Iran and North Africa. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Crocidosema plebejana* Zeller, 1847**
MATERIAL EXAMINED. 3 females, Italia, Campania, Fontegreca (CE), 383 m, 25.VI.2019, leg. Goglia and Marquerie. 1 female, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Entire Europe, North Africa, Asia Minor, Arabia, Iran, Transcaucasia, Turkmenia, India, Taiwan, Australia, North America, and South America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Eucosma cana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 31.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, Kazakhstan, Central Asia, South Siberia, Russian Far East, China, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Epiblema cirsianum* (Zeller, 1843)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Known from Spain to Ural Mts, then Siberia and from Kazakhstan to Russian Far East. (Italy: S, Si).
CHOROTYPE. Sibero-European.

***Notocelia uddmanniana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 4 males, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 31.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, North Africa, Asia Minor, Near East, Caucasus, Transcaucasia, Transural, Iran, Kazakhstan, Tadzhikistan, and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

TRIBE GRAPHOLITINI

***Cydia pomonella* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Monteroduni (IS), 598 m, 13.VI.2019, leg. Fekensa, Goglia and Marquerie. 1 male and 1 female, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie. 1 female, Italia, Molise, Sant'Agapito (IS), 675 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Covers the area of distribution of wild apple-tree, Europe, Asia, North-South America, Australia, and New Zealand. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Cydia triangulella* (Goeze, 1783)**
MATERIAL EXAMINED. 1 female, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie. 2 males, Italia, Molise, Sant'Agapito (IS), 679 m, 10.X.2019, leg. Colacci and Goglia. 1 female, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Paleartcic region till Japan, its area covers that of oaks. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Cydia fagiglandana* (Zeller, 1841)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 31.VII.2019, leg. Goglia and Marquerie. 7 males and 2 females, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Europe, Madeira, North-West Africa, Asia Minor, Syria, Iran, and Caucasus. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cydia aldocataniae* Trematerra, 2019**
MATERIAL EXAMINED. 2 males and 3 females, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie. 4 females, Italia, Molise, Sant'Agapito (IS), 675 m, 31.VII.2019, leg. Goglia and Marquerie. 14 females, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Known from Malta, Italy and Greece. (Italy: S).
CHOROTYPE. S-European.

***Cydia rymarckzyki* Varenne and Nel, 2013**
MATERIAL EXAMINED. 28 males and 1 female, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. Europe: France (coastal plain of Alpes-Maritimes), Malta (Buskett) and Greece (Crete). (Italy: N, S).
CHOROTYPE. S-European.

***Pammene querceti* Gozmány, 1957**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 24.VII.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Known from Europe (Czech Republic, Slovakia, France, Austria, Italy, Hungary and former Yugoslavia). (Italy: C, S, Si).
CHOROTYPE. S-European.

***Pammene fasciana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 1 female, Italia, Campania, Fontegreca (CE), 383 m, 25.VI.2019, leg. Goglia and Marquerie.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Pammene gallicolana* (Lienig and Zeller, 1846)**
MATERIAL EXAMINED. 1 male, Italia, Molise, Sant'Agapito (IS), 675 m, 20.VI.2019, leg. Colacci, Goglia and Marquerie. 1 male, Italia, Molise, Sant'Agapito (IS), 679 m, 27.VIII.2019, leg. Colacci and Goglia.
DISTRIBUTION. European species whose repartition area is included in that of *Quercus robur* L.: Eastwards it reaches Ukraine and Moldavia. (Italy: N, C, S).
CHOROTYPE. European.

***Pammene aurana* (Fabricius, 1775)**
MATERIAL EXAMINED. 6 males and 1 female, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. Known from West and Central Palaearctic: from Europe (Spain) to South Siberia and Kazakhstan (Kuznetsk Ala Tau), then Russian Far East and Japan. (Italy: N, S).
CHOROTYPE. Asiatic-European.

***Dichrorampha eximia* (Danilevsky, 1948)**
MATERIAL EXAMINED. 17 males, Italia, Molise, Campitello Matese (CB), 1440 m, 29.VI.2020, leg. Colacci, Goglia and Trematerra.
DISTRIBUTION. A West Palaearctic species known from West Europe (Spain, South France, Italy) and East Europe (former USSR countries, Slovakia, Albania and Crimea). Recorded also from Daghestan, Armenia, Kazakhstan (Zalilijskiy and Dshungarian Ala Tau) and Iraq. (Italy: C, S).
CHOROTYPE. Turano-European.

During the entomological expeditions at the Matese Massif, 37 species belonging to Lepidoptera Tortricidae were collected. The two most abundant tortricid subfamilies recorded are the Olethreutinae and Tortricinae, with 19 and 17 species, respectively; the subfamily Chlidanotinae is represented by only one *taxa*. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found at the Matese Massif (Tortricini with 3 species, Cochylini with 6, Cnephasiini with 2, Archipini with 6, Polyorthini with 1, Olethreutini with 2, Eucosmini with 7 and Grapholitini with 10), except for the tribes Sparganothini, Euliini, Bactrini and Enarmoniini.

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CHAPTER 4

FAUNISTIC NOTES ON LEPIDOPTERA TORTRICIDAE FROM THE GARGANO TERRITORY (SOUTH ITALY)

Data were taken in part from the following publication:

Trematerra P, **Goglia L**, Colacci M (2021) Faunistic notes on Lepidoptera Torticidae of Gargano territory with recording of *Ancylis minimana* (Caradja, 1916) new to Italy. *Redia* **104**: 45-53.

4.1 INTRODUCTION

Gargano territory is a mountainous promontory jutting into the Adriatic Sea from the east coast of Italy, in Puglia (Apulia) region. Called the “spur” of the Italian “boot” (peninsula). From 1991 most of the territory is national park (118,144 ha) (Fig. 4.1). The peninsula is composed entirely of limestone, surrounded by terraces of various geologic periods, and rises to 1,065 m at Mount Calvo. The Gargano preserves an extraordinary concentration of different habitats: rocky coasts, the big and hot southern valleys rich in rare flower and wildlife species, the central beech woodlands situated at low altitudes (300 m/a.s.l.) and rich in centuries-old specimens, Mediterranean pine forests with Aleppo pines (*Pinus halepensis* Mill.), with specimens more than 500 years old. Among the most important endemic species there are *Cytisus decumbens* (Durande) Spach, *Satureja fruticosa italica* Fiori, *Campanula garganica* Ten., and *Cistus clusii* Dunal (Biondi *et al*., 2010). The Umbra Forest (mainly beech, *Fagus sylvatica* L.) is the most famous of the few surviving forest preserves (Fig. 4.2). Updates on plant species of Gargano are recorded in Habitats Directive 92/43/EEC (European Commission, 1992). Later an inventory of new and rare *taxa* of Gargano is presented and discussed by Perrino and Wagensommer (2012).

In the past, the promontory played an important role in the connection with the Balkan flora and fauna, as it is demonstrated by the presence of the so-called "trans-Adriatic" species (Zangheri, 1956; Fenaroli, 1966).

Over time, the Lepidoptera Tortricidae from the Gargano territory has received sporadic attention by both local and foreign entomologists. The only specific works refer to some catches taken from 1953 to 1955 by Zangheri (1956). From 1991 to 1997 Trematerra, Sciarretta and Parenzan carried out field studies on Southern Italy and cited also some data related to Gargano promontory (Trematerra *et al*., 1997).

In the present chapter, we reported a tortricid list as updated and complete as possible for Gargano. For this purpose, in addition to our specimens collected during 2019-2020, we included in this list both the species found in the course of previous entomological researches in that territory and the species cited in literature.



Figure 4.1 – The Gargano territory (Puglia region, South Italy) and trapping localities (white circles).

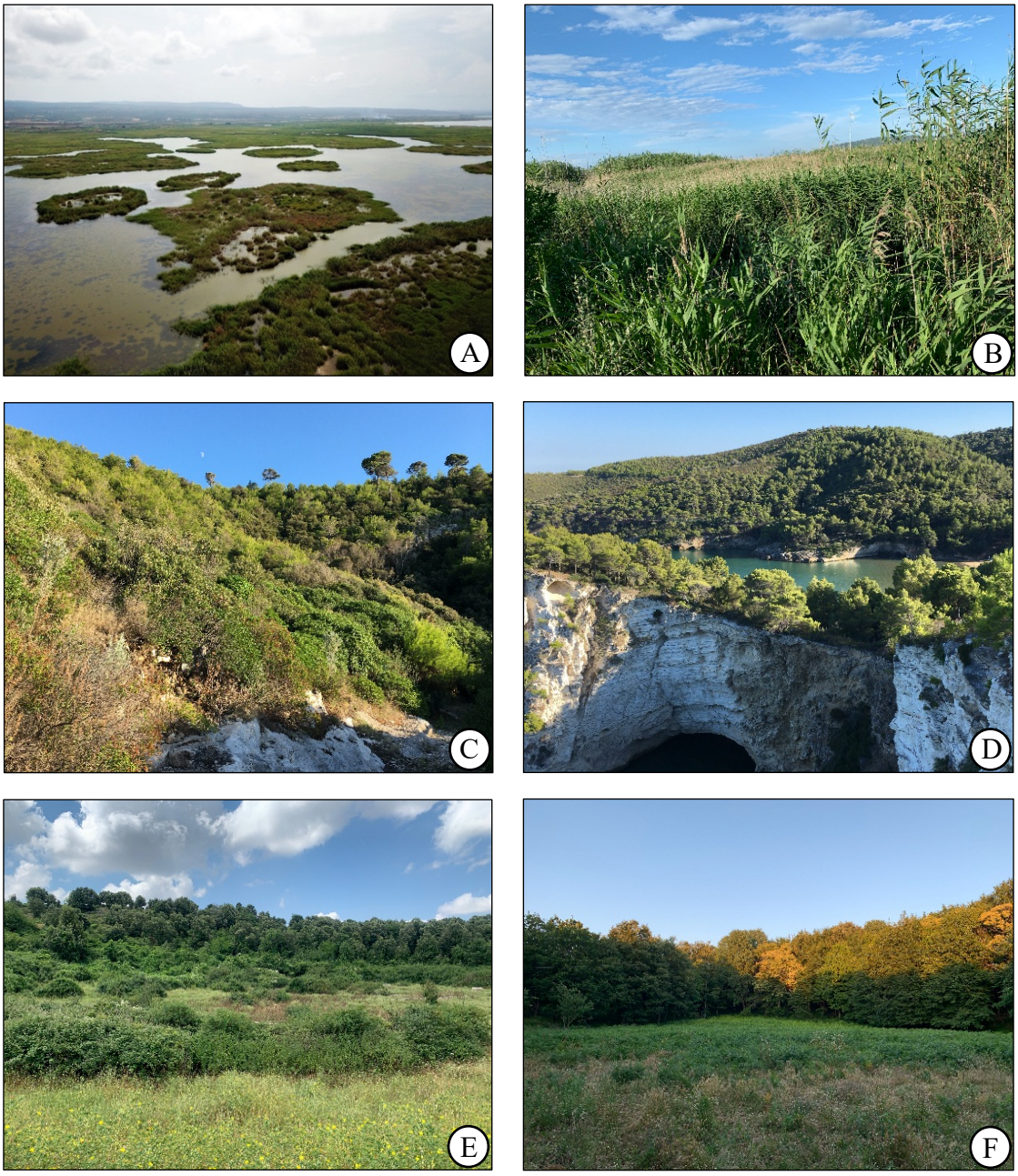


Figure 4.2 – Details of some of the vegetational landscapes of the Gargano Territory (Puglia region, South Italy): State Reserve Lake of Lesina, Lesina (1 m/a.s.l.) (A); Bosco Isola, Marina di Lesina (8 m/a.s.l.) (B); Mount Pucci, Peschici (24 m/a.s.l.) (C); Arco di San Felice, Vieste (30 m/a.s.l.) (D); Doline Cento Pozzi, Rignano Garganico (629 m/a.s.l.) (E); Bosco Spinapulci, San Nicandro Garganico (650 m/a.s.l.) (F).

4.2 MATERIALS AND METHODS

Our specimens were caught both to light at night-time, mostly using UV-LED light traps and also by butterfly net during day-time. The material was identified morphologically; genitalia were prepared using standard methods. All specimens and slides were deposited in the Trematerra Collection (at the University of Molise, Campobasso, Italy).

4.3 RESULTS

As reported in Chapter 2, in the compilation of this inventory, we followed the systematic arrangement adopted by Razowski (2002 and 2003) with some modifications suggested by Brown (2005) and by Gilligan *et al*. (2018) waiting for the recent revision on the tribe Cochylini, proposed at the genetic level by Brown *et al*. 2019, is widely adopted. Distribution of the species was largely taken from Razowski (2002 and 2003), Trematerra (2003) and Aarvik (2013), with new data from Trematerra's personal catalogue (unpubl. data). Chorotype of the species was taken from Vigna Taglianti *et al*. (1992) and Parenzan (1994).

LIST OF TAXA TORTRICIDAE

SUBFAMILY TORTRICINAE

TRIBE TORTRICINI

***Aleimma loeflingianum* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Gargano, San Nicandro Garganico (Foggia), 300 m, 8.VI.1991, leg. P. Trematerra. 1 female, Foresta Umbra, 800 m, 6.VIII.1977, Ist. Ent. Bari; 2 females, *idem*, 12.VI.1982.
DISTRIBUTION. Europe, Ural Mts, Caucasus, Syria, and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Acleris forsskaleana* (Linnaeus, 1758)**
COMMENTS. Reported by Zangheri (1956): Bosco Sfilzi, 30.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, Caucasus, Transcaucasia, Turkmenia, and Iran. Introduced in North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Acleris variegana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Peschici, 29.VI.1980, leg. Baldizzone. 1 female, Vico del Gargano (Foggia), 579 m, 16.VI.2020, leg. Goglia and Palmieri; 1 female, *idem*, 651 m, 18.VI.2020; 1 female, *idem*, 579 m, 30.VI.2020.
DISTRIBUTION. From West Europe and North-West Africa to Iran, Turkmenia, Afghanistan, South-West Siberia, China, and Japan; also North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Acleris hastiana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Lesina (Foggia), 2 m, 18.VI.2020, leg. Goglia and Palmieri.
DISTRIBUTION. A Holarctic species known from West Europe to Japan, Morocco, Siberia, and North America, south as far California. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

TRIBE COCHYLINI

***Hysterophora maculosana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male and 1 female, San Giovanni Rotondo (Foggia), 600 m, 16.IV.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. Europe, Israel, Asia Minor, and Transcaucasia. (Italy: N, C, S, Si, Sa).

CHOROTYPE. Turano-European.

***Phalonidia contractana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 female, Lesina (Foggia), 2 m, 2.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Widely distributed from Iberian Peninsula to Ural Mts; found also in North Africa, Asia Minor, Israel, Transcaucasia, Iran, Afghanistan, Kashmir, and Central Asia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Gynnidomorpha rubricana* (Peyerimhoff, 1877)**
MATERIAL EXAMINED. 1 female, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Known from South East Europe, China, Russian Far East, Korea, and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Aethes tesserana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Foresta Umbra (Foggia), 700 m, 16.IV.1997, leg. Mancini, Trematerra, Sciarretta.
COMMENTS. Reported by Zangheri (1956), Foresta Umbra, 14.VII.1954.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Iran, and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Aethes francillana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 female, Rignano Garganico (Foggia), 629 m, 16.VII.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956), Foresta Umbra, 14-28.VII.1954.
DISTRIBUTION. Europe, Canary Islands and North-West Africa to Transcaucasia, Iran, Afghanistan, Kazakhstan, Tadzhikistan, and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Diceratura roseofasciana* (Mann, 1855)**
MATERIAL EXAMINED. 19 males and 2 females, Lesina (Foggia), 5 m, 15.VII.2020, leg. Goglia and Palmieri. 1 male, Vico del Gargano (Foggia), 558 m, 29.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Europe, Asia Minor, Near East, Iran, Transcaucasia, and Kazakhstan. (Italy: C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Diceratura ostrinana* (Guenée, 1845)**
MATERIAL EXAMINED. 1 male, Gargano, Carpino (Foggia), 300-500 m, 16.IV.1997, leg. Mancini, Sciarretta, Trematerra.
COMMENTS. Listed by Zangheri (1956), 14-15.VII.1954.
DISTRIBUTION. West Palaearctic species known from Algeria and Iberian Peninsula to Hungary and Albania, Greece and Crimea. Other records are from Lebanon, Asia Minor, Transcaucasia, and Siberia. (Italy: N, C, S, Sa).
CHOROTYPE. Centralasiatic-European.

***Cochylis hybridella* (Hübner, [1810-1813])**
MATERIAL EXAMINED. 3 males, Foresta Umbra, 800 m, 6.VIII.1977, Ist. Ent. Bari.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 16.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Ural Mts, Kazakhstan, South-West Siberia, China, Russian Far East, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Cochylis molliculana* Zeller, 1847**
MATERIAL EXAMINED. 1 male, Capoiale (Foggia), 2 m, 16.VI.2020, leg. Goglia and Palmieri. 1 male, Lesina (Foggia), 2 m, 18.VI.2020, leg. Goglia and Palmieri; 1 male, *idem*, 2 m, 1.VII.2020; 1 male, *idem*, 2.VII.2020. 1 male, San Nicandro Garganico (Foggia), 649 m, 30.VI.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Great Britain and from Spain to Greece. (Italy: N, C, S, Si).
CHOROTYPE. Europeo-Mediterranean.

***Cochylis posterana* Zeller, 1847**
MATERIAL EXAMINED. 2 females, Foresta Umbra, 800 m, 6.VIII.1977, Ist. Ent. Bari. 3 males, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri; 4 males, *idem*, 538 m, 28.VII.2020; 1 male, *idem*, 558 m, 29.VII.2020.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 20-28.VII.1954, leg. Zangheri.
DISTRIBUTION. West Palaearctic species occurring east far as Transcaspia, Central Asia and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

TRIBE CNEPHASIINI

***Propiromorpha rhodophana* (Herrich-Schäffer, 1849)**
MATERIAL EXAMINED. 1 male, Lesina (Foggia), 4 m, 17.VI.2020, leg. Goglia and Palmieri. 1 male, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri. 5 males, Vieste (Foggia), 29 m, 3.IX.2021, leg. Colacci and Trematerra.
DISTRIBUTION. South Europe, North-West Africa, Asia Minor, Mongolia, China, Amur Territory, and Primorsk. (Italy: N, C, S)
CHOROTYPE. Palaearctic.

***Cnephasia incertana* (Treitschke, 1835)**
MATERIAL EXAMINED. 1 male, San Nicandro Garganico (Foggia), 300 m, 8.VI.1991, leg. P. Trematerra. 1 male, Torre Mileto (Foggia), 30 m, 9.IV.1992, leg. P. Trematerra. 3 males, Monte Sant'Angelo (Foggia), 500 m, 16.IV.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. Western Palaearctic from Iberian Peninsula to Transcaucasia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cnephasia asseclana* ([Denis and Schiffermüller], 1775)**
COMMENTS. Reported by Zangheri (1956): Monte S. Angelo, 20.V.1954, leg. Zangheri; Foresta Umbra, 14.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, Canary Islands and New Foundland, Morocco, Caucasus, Transcaucasia, West-South Siberia, and Japan. Introduced to North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Cnephasia pasiuana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Gargano, Monte Delio (Foggia), 50 m, 8.VI.1991, leg. P. Trematerra.
DISTRIBUTION. Europe, Morocco, Libya, Egypt, Asia Minor, Syria, and Transcaucasia. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Cnephasia abrasana* (Duponchel, 1843)**
MATERIAL EXAMINED. 1 male and 1 female, Torre Mileto (Foggia), 30 m, 9.VI.1992, leg. P. Trematerra. 2 males and 1 female, Monte Sant'Angelo (Foggia), 500 m, 16.VI.1997, leg. Mancini, Sciarretta, Trematerra. 1 male, Gargano (Foggia), 300-500 m, 16.VI.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. Europe and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European.

***Cnephasia ecullyana* Réal, 1951**
MATERIAL EXAMINED. 2 males, San Nicandro Garganico (Foggia), 300 m, 8.VI.1991, leg. Trematerra. 1 male, Torre Mileto (Foggia), 30 m, 9.V.1992, leg. Trematerra. 1 male, Vico del Gargano (Foggia), 579 m, 16.VI.2020, leg. Goglia and Palmieri; 2 females, *idem*, 559 m, 1.VII.2020.
DISTRIBUTION. Known from Central Southern Europe. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European.

TRIBE ARCHIPINI

***Batodes angustiorana* (Haworth, [1811])**
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 28.VII.1954.
DISTRIBUTION. Europe, North-West Africa, and Asia Minor. Introduced to North America. (Italy: N, C, S, Sa).
CHOROTYPE. Holarctic.

***Epagoge grotiana* (Fabricius, 1781)**
MATERIAL EXAMINED. 1 female, San Nicandro Garganico (Foggia), 649 m, 30.VI.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 14.VIII.1954, leg. Zangheri.
DISTRIBUTION. Distributed in West Palaearctic from West-North Europe to Ukraine and South Ural Mts, Trans-Ural, Caucasus, and Asia Minor. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Archips crataeganus* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, San Nicandro Garganico (Foggia), 649 m, 30.VI.2020, leg. Goglia and Palmieri.
DISTRIBUTION. West Palaearctic, Kazakhstan, Siberia, China, Korea, and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Archips xylosteanus* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Monte Delio (Foggia), 50 m, 8.VI.1991, leg. P. Trematerra.
COMMENTS. Reported by Zangheri (1956): Bosco Ginestra, IX.1954, leg. Zangheri.
DISTRIBUTION. Palaearctic Region from West Europe to Asia Minor, Caucasus, Iran, Central Asia, China, Russian Far East, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Argyrotoenia ljungiana* (Thunberg, 1797)**
MATERIAL EXAMINED. 1 male, Vico del Gargano (Foggia), 579 m, 16.VI.2020, leg. Goglia and Palmieri; 3 females, *idem*, 559 m, 1.VII.2020.
DISTRIBUTION. Palaearctic species distributed from Iberian Peninsula and North-West Africa as far as China, Russian Far East, and North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Cacoecimorpha pronubana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Western Palaearctic from Europe, Morocco, Algeria and Tunisia to Lebanon, Asia Minor, Near East, Crimea, and Japan. Introduced to South Africa and North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Aphelia ferrugana* (Hübner, 1793)**
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 21.V.1954, leg. Zangheri.
DISTRIBUTION. Europe, Caucasus, Asia Minor, Syria, Iraq, and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Clepsis unicolorana* (Duponchel, 1835)**
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 23.V.1954, leg. Zangheri.
DISTRIBUTION. Known from Europe (Portugal, Spain, France, Belgium, Italy, Switzerland, Malta), to Morocco and Mongolia. (Italy: N, C, S).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Clepsis dumicolana* (Zeller, 1847)**
COMMENTS. Reported by Trematerra *et al*. (1997): Foresta Umbra, 800 m, 6.VIII.1977.
DISTRIBUTION. South Europe, Asia Minor, Syria, and Lebanon. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European with Anatolian extension.

***Clepsis consimilana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 7 males and 1 female, Vico del Gargano (Foggia), 579 m, 16.VI.2020, leg. Goglia and Palmieri; 1 male, *idem*, 693 m, 14.VII.2020; 1 male, *idem*, 579 m, 19.VIII.2020, leg. Palmieri. 2 males and 4 females, Lesina (Foggia), 4 m, 17.VI.2020, leg. Goglia and Palmieri; 1 male, *idem*, 2 m, 18.VI.2020. 1 male, San Nicandro Garganico (Foggia), 651 m, 18.VI.2020, leg. Goglia and Palmieri. 3 males and 5 females, Vieste (Foggia), 33 m, 15.VII.2020, leg. Goglia and Palmieri. 1 male, Rignano Garganico (Foggia), 629 m, 16.VII.2020, leg. Goglia and Palmieri. 1 female, San Giovanni Rotondo (Foggia), 595 m, 25.VIII.2020, leg. Goglia and Palmieri. 17 males and 3 females, Peschici (Foggia), 20 m, 26.VIII.2020, leg. Goglia and Palmieri. 5 males and 2 females, Vieste (Foggia), 28 m, 25.IX.2021, leg. Colacci.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 14-15.VII.1954, leg. Zangheri.

DISTRIBUTION. West Europe to East European Russia; West Africa to Lebanon, Asia Minor, Nearctics and Ethiopian region (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

SUBFAMILY OLETHREUTINAE

TRIBE OLETHREUTINI

***Endothenia gentianaeana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Vico del Gargano (Foggia), 536 m, 28.VII.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 15.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe to Ural Mts, Asia Minor, Arabian Peninsula, Transcaucasia, Central Asia, Mongolia, South Siberia, China, Korea, and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Endothenia marginana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 female, Foresta Umbra, 800 m, 6.VIII.1977, Ist. Ent. Bari. 1 male, Lesina (Foggia), 4 m, 17.VI.2020, leg. Goglia and Palmieri; 1 male, *idem*, 2 m, 2.VII.2020. 2 males, San Nicandro Garganico (Foggia), 649 m, 30.VI.2020, leg. Goglia and Palmieri. 3 males and 1 female, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri; 1 male, *idem*, 536 m, 6.VII.2020; 2 males, *idem*, 28.VII.2020.
DISTRIBUTION. Europe, North West Africa, Transcaucasia, Asia: from Ural Mts to Mongolia, China and Russian Far East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Lobesia botrana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 5 males and 1 female, Lesina (Foggia), 4 m, 17.VI.2020, leg. Goglia and Palmieri; 2 males and 3 females, *idem*, 2 m, 18.VI.2020; 9 males, *idem*, 2 m, 2.VII.2020. 1 male, San Nicandro Garganico (Foggia), 649 m, 30.VI.2020, leg. Goglia and Palmieri. 2 males, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri; 4 males, *idem*, 538 m, 28.VII.2020; 16 males and 1 female, *idem*, 558 m, 29.VII.2020; 3 males, *idem*, 536 m, 6.VIII.2020. 2 females, Vieste (Foggia), 28 m, 25.IX.2021, leg. Colacci.
DISTRIBUTION. From West Europe to Ural Mts, North Africa, Asia Minor, Near East, Iraq, Iran, Transcaucasia, Turkmenistan, Kazakhstan, and Japan. North-South America (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Hedya nubiferana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, San Nicandro Garganico (Foggia), 649 m, 30.VI.2020, leg. Goglia and Palmieri.
DISTRIBUTION. West Europe to Ural Mts, Caucasus, Asia Minor, Iraq, Turkmenistan, Iran, Kazakhstan, West Siberia. North America (Canada). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Hedya pruniana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 2 males and 1 female, Monte Sant'Angelo, Vallone Pulsano (Foggia), 400 m, 16.IV.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. From West Europe to Ural Mts, Asia Minor, Caucasus, Kazakhstan, North Iran, and Russian Far East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Olethreutes arcuellus* (Clerck, 1759)**
MATERIAL EXAMINED. 1 female, Bosco Quarto (Foggia), 600 m, 16.IV.1997, leg. Mancini, Sciarretta, Trematerra. 1 female, Foresta Umbra (Foggia), 700 m, 16.IV.1997, leg. Mancini, Sciarretta, Trematerra.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 21-23.V.1954, leg. Zangheri.
DISTRIBUTION. From Europe to Caucasus; Asia Minor, Iran, Kazakhstan, West Siberia, and North-West China. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Syricoris lacunana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males, Vico del Gargano (Foggia), 693 m, 14.VII.2020, leg. Goglia and Palmieri.

DISTRIBUTION. West Europe to Ural Mts and Caucasus, Transcaucasia; Asia Minor, Mongolia, West South Siberia, China, and Japan. (Italy: N, C, S, Sa).
CHOROTYPE. Asiatic-European.

TRIBE ENARMONIINI

***Ancylis comptana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 female, Peschici, 29.VI.1980, leg. Baldizzone.
DISTRIBUTION. From Europe to Ural Mts, Asia Minor, Caucasus, Kazakhstan, Uzbekistan, Siberia Far East, China, Mongolia, Korea, and Japan. Also North America. (Italy: N, C, S, Sa).
CHOROTYPE. Holarctic.

***Ancylis minimana* (Caradja, 1916)**
MATERIAL EXAMINED. 1 female, Vico del Gargano (Foggia), 579 m, 16.VI.2020, leg. Goglia and Palmieri; 1 female, *idem*, 559 m, 1.VII.2020.
DESCRIPTION. Adult wing span 10-12 mm (Fig. 4.3 A). Ground colour of forewing whitish grey distinctly suffused grey-brown especially in terminal part of wing; costal strigulae whitish, dividings brown; postbasal inter fascia and area of speculum slightly paler than markings. Markings brown or greyish brown. Distal edge of dorso-basal blotch weakly convex; median fascia slender in costal half. Cilia with short scales white and long scales greyish brown. Hindwing grey with brownish admixture; cilia with short scales off-white and long scales pale greyish brown.
In male genitalia uncus rudimentary in form of terminal lobe of tegumen; socius broad, rounded; sacculus with sharp ventro-posterior prominence; neck of valva slender, rather short; cucullus ovate, with atrophying ventral lobe; aedeagus slender.
In female genitalia the postostial part of the sterigma is rather large; cingulum median; the signa pair are large and rather equal (Fig. 4.3 B).
DISTRIBUTION. From Eastern and South-East parts of East Europe to Ciscaucasia and Ural Mts, Caucasus. (Italy: Puglia).
CHOROTYPE. Turano-European.
BIOLOGY. Moth collected in June-July. Larva found on buckthorn *Hippophae* spp.
REMARKS. New to the Italian fauna. *Ancylis minimana* is reported by Razowski (2003) among *Ancylis myrtillana* (Treitschke, 1830) and *Ancylis apicella* ([Denis and Schiffermüller], 1775).

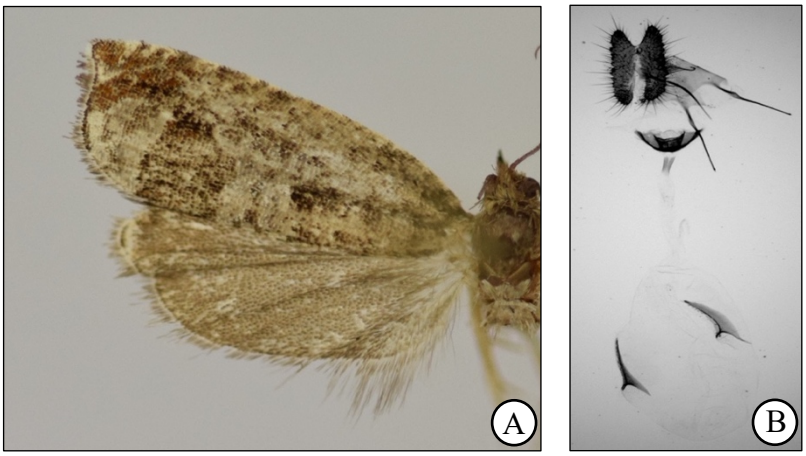


Figure 4.3 – *Ancylis minimana* (Caradja,1916): adult (A); female genitalia (B).

***Ancylis badiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Foresta Umbra, 800 m 6.VIII.1977, Ist. Ent. Bari.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 21.V.1954, leg. Zangheri.
DISTRIBUTION. From West Europe to Asia Minor, Caucasus, Transcaucasia, Ural Mts, Mongolia and Russian Far East, China, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Enarmonia formosana* (Scopoli, 1763)**
COMMENTS. Reported by Zangheri (1956): Bosco Sfilzi, 18.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, North Africa, Ural Mts, Asia Minor, Transural, Caucasus, Kazakhstan, Russian Far East, Japan. Canada (introduced?). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

TRIBE EUCOSMINI

***Thiodia trochilana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male and 1 female, Lesina (Foggia), Bosco Isola, 3.VII.1980, leg. Baldizzone. 1 male, Gargano, Torre Mileto (Foggia), 30 m, 9.IV.1992, leg. P. Trematerra.
DISTRIBUTION. Central-South Europe, East Balticum, southern part of East Europe, North Africa, Asia Minor, Transcaucasia, Turkmenia, and Iran. (Italy: N, C, S, Si).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Rhopobota naevana* (Hübner, [1814-1817])**
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 20-31.VII.1954, leg. Zangheri.
DISTRIBUTION. From Europe to Ural Mts, Caucasus, Transcaucasia, India, Sri-Lanka, Siberia, Far East, Mongolia, China, Korea, and Japan. In the Nearctic Region occurs ssp. *illicifoliana* Kearfott, 1907. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

***Spilonota ocellana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males, Vico del Gargano (Foggia), 536 m, 28.VII.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 20.VII.1954, leg. Zangheri; Bosco Sfilzi, 18.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, North Africa, Caucasus, Asia Minor, Transcaucasia, Iran, Kazakhstan, Turkmenia, Uzbekistan, Tadzhikistan, Russian Far East, Siberia, China, Korea, and Japan. Also Nearctic Region. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Crocidosema plebejana* Zeller, 1847**
MATERIAL EXAMINED. 1 female, Lesina (Foggia), 2 m, 2.VII.2020, leg. Goglia and Palmieri. 1 female, Vico del Gargano (Foggia), 558 m, 29.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Entire Europe, North Africa, Asia Minor, Arabia, Iran, Transcaucasia, Turkmenia, India, Taiwan, Australia, North America, and South America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Pelochrista fusculana* (Zeller, 1847)**
MATERIAL EXAMINED. 4 males and 2 females, Torre Mileto (Foggia), 30 m, 9.IV.1992, leg. P. Trematerra.
DISTRIBUTION. South Europe from Spain to former Yugoslavia, Bulgaria and Romania. North West Africa. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European.

***Pelochrista agrestana* (Treitschke, 1830)**
MATERIAL EXAMINED. 1 male, Foresta Umbra, 600 m, 4.VII.1980, leg. Baldizzone. 1 male, Vico del Gargano (Foggia), 536 m, 28.VII.2020, leg. Goglia and Palmieri; 1 male and 1 female, *idem*, 6.VIII.2020.
DISTRIBUTION. Known chiefly from Lithuania, South West Europe (France, Italy, Austria and former Yugoslavia), and Asia Minor. (Italy: C, S, Si).
CHOROTYPE. S-European.

***Eucosma lugubrana* (Treitschke, 1830)**
COMMENTS. Reported by Zangheri (1956) as present in Gargano promontory.
DISTRIBUTION. Europe, Kazakhstan, Kyrgyzstan, Russian (West Tuva). (Italy: N, S, Si).
CHOROTYPE. Centralasiatic-European.

***Eucosma cana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Vico del Gargano (Foggia), 693 m, 14.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, Kazakhstan, C-Asia, S-Siberia, Russian Far East, China, and Japan. (Italy: N, C, S, Si, Sa).

CHOROTYPE. Asiatic-European.

***Eucosma lacteana* (Treitschke, 1835)**
MATERIAL EXAMINED. S. Nicola, Varano, 23.V.1992, leg. G.R. Langohr.
DISTRIBUTION. From Europe to Russian Far East, South-West Siberia, and Mongolia. (Italy: N, C, S).
CHOROTYPE. Sibero-European.

***Notocelia cynosbatella* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Carpino (Foggia), 300-500 m, 16.V.1997, leg. Mancini, Sciarretta, Trematerra. 1 female, Monte Sant'Angelo (Foggia), Vallone Pulsano, 400 m, 16.V.1997, leg. Mancini, Sciarretta, Trematerra. 1 female, Rignano Garganico (Foggia), 629 m, 16.VII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Europe, Ural Mts, Near East, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, Mongolia, Siberia, and Russian Far East. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Notocelia uddmanniana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 2 males, San Nicandro Garganico (Foggia), 651 m, 18.VI.2020, leg. Goglia and Palmieri; 2 males and 1 female, *idem*, 649 m, 30.VI.2020. 2 males, Vico del Gargano (Foggia), 538 m, 8.VII.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 14-29.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, North Africa, Asia Minor, Near East, Caucasus, Transcaucasia, Transural, Iran, Kazakhstan, Tadzhikistan, and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Notocelia aquana* (Hübner, [1796-1799])**
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 14-21.VII.1954, leg. Zangheri.
DISTRIBUTION. West Europe, Morocco, Ural Mts, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, West Siberia, and China. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

TRIBE GRAPHOLITINI

***Cydia semicinctana* (Kennel, 1901)**
MATERIAL EXAMINED. 2 males, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri; 1 male, *idem*, 536 m, 28.VII.2020.
DISTRIBUTION. Locally in Europe, Asia Minor; North Iran, Uzbekistan, and Turkmenia. (Italy: N, C, S).
CHOROTYPE. Turano-European.

***Cydia pomonella* (Linnaeus, 1758)**
MATERIAL EXAMINED. 2 males, Vico del Gargano (Foggia), 559 m, 1.VII.2020, leg. Goglia and Palmieri; 3 males, *idem*, 558 m, 29.VII.2020. 1 male, Lesina (Foggia), 2 m, 2.VII.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 28.VII.1954, leg. Zangheri.
DISTRIBUTION. Covers the area of distribution of wild apple-tree, Europe, Asia, North-South America, Australia, and New Zealand. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Cydia triangulella* (Goeze, 1783)**
MATERIAL EXAMINED. 1 female, Rignano Garganico (Foggia), Dolina Cento Pozzi, 635 m, 20.VI.2020, from *Quercus ilex* acorns coll. 31.XII.2019, leg. Palmieri.
DISTRIBUTION. Paleartcic region till Japan, its area covers that of oaks. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Cydia fagiglandana* (Zeller, 1841)**
MATERIAL EXAMINED. 1 female, Foresta Umbra, 800 m, 5.VIII.1977, leg. Baldizzone. 1 male, Italia, Puglia, San Nicandro Garganico (Foggia), 540 m, 12.III.2020, from *Quercus ilex* acorns coll. 24.XII.2019, leg. Palmieri; 1 male, *idem*, 31.III.2020; 1 male, *idem*, 27.IV.2020, coll. 3.XI.2019; 1 male, *idem*, 7.V.2020, coll. 3.XI.2019; 1 female, *idem*, 9.V.2020, coll. 3.XI.2019. 1 female, Italia, Puglia, Lesina (Foggia), 3 m, 14.III.2020, from *Quercus ilex* acorns, coll. 1.I.2020, leg. Palmieri. 1 female, Italia, Puglia, San Giovanni Rotondo (Foggia), Pantano di Sant'Egidio, 768 m, 31.V.2020, from *Quercus ilex* acorns coll. 16.XII.2019,

leg. Goglia and Palmieri. 1 male, Lesina (Foggia), 4 m, 17.VI.2020, leg. Goglia and Palmieri; 2 males, *idem*, 5 m, 15.VII.2020. 1 male and 1 female, Italia, Puglia, Vico del Gargano (Foggia), 693 m, 14.VII.2020, leg. Goglia and Palmieri.
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 19-21.VII.1954, leg. Zangheri; Bosco Sfilzi, 18.VII.1954, leg. Zangheri.
DISTRIBUTION. Europe, Madeira, North-West Africa, Asia Minor, Syria, Iran, and Caucasus. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cydia inquinatana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, Foresta Umbra, 600 m, 4.VII.1980, leg. Baldizzone.
DISTRIBUTION. Known from Sweden, Finland, Norway, Russia (St Petersburg), Central and Southern Europe, as far as to lower Volga River territory, Crimea and Caucasus. (Italy: N, C, S, Si).
CHOROTYPE. European with Anatolian extension.

***Lathronympha strigana* (Fabricius, 1775)**
COMMENTS. Reported by Zangheri (1956): Foresta Umbra, 14-15.VII.1956, leg. Zangheri.
DISTRIBUTION. Europe, Caucasus, Asia Minor and Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Sibero-European.

***Grapholita fissana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male, Foresta Umbra, 700 m, 16.V.1999, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. Known from Europe except for British islands and North Scandinavia, east to Ural Mts, Ciscaucasia and Transcaucasia; also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian extension.

***Grapholita orobana* Treitschke, 1830**
MATERIAL EXAMINED. 1 male, Carpino (Foggia), 300-500 m, 16.V.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. Europe (excluded Portugal and Ireland), Asia Minor, Transcaucasus, North Iran, Kazakhstan, Russian Far East, and Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Sibero-European.

***Grapholita funebrana* Treitschke, 1835**
MATERIAL EXAMINED. 1 male, Monte Sant'Angelo (Foggia), Vallone Pulsano, 400 m, 16.V.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. Two forms known. The western form occurs in Europe (except for Shetland islands and North Scandinavia), North Africa, Asia Minor, Central Asia and South Kazakhstan. The eastern form is recorded from Transbaikalia to China and Japan (Honsyu, Hokkaido). Artificially introduced to many territories. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Grapholita janthinana* (Duponchel, 1835)**
MATERIAL EXAMINED. 5 males and 1 female, Vico del Gargano (Foggia), 558 m, 29.VII.2020, leg. Goglia and Palmieri. 1 male and 1 female, San Giovanni Rotondo (Foggia), 595 m, 25.VIII.2020, leg. Goglia and Palmieri.
DISTRIBUTION. Europe, Asia Minor, Crimea, Transcaucasia, and Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Pammene fasciana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 1 male, Vico del Gargano (Foggia), 536 m, 28.VII.2020, leg. Goglia and Palmieri; 2 females, *idem*, 558 m, 29.VII.2020.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Pammene giganteana* (Peyerimhoff, 1863)**
MATERIAL EXAMINED. 3 males, Dune di Lesina (Foggia), 5 m, 28.III.1997, leg. Sciarretta.
DISTRIBUTION. Distributed in Europe from British islands, South Scandinavia and Italy to East Europe. (Italy: N, C, S, Si).
CHOROTYPE. European.

***Pammene rhediella* (Clerck, 1759)**
MATERIAL EXAMINED. 1 male, Monte Sant'Angelo (Foggia), 500 m, 16.V.1997, leg. Mancini, Sciarretta, Trematerra.
DISTRIBUTION. West Palaearctic: Europe north to Scotland, South Scandinavia and Karelia; Asia Minor, Transcaucasia, mountains of Turkmenia, and Central Asia. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Dichrorampha flavidorsana* Knaggs, 1867**
MATERIAL EXAMINED. 1 male, Foresta Umbra, 600 m, 2.VII.1980, leg. Baldizzone.
DISTRIBUTION. Europe, from Spain to Russia, West and South Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Sibero-European.

During our entomological expeditions carried out during 2019-2020 in Gargano territory, we caught 33 species of Lepidoptera Tortricidae, to which we added 34 species collected in the previous years by the senior author or by other entomologists, up to a total of 67 *taxa* of the family. The two most numerous tortricids subfamilies recorded are the Olethreutinae and Tortricinae, which has 37 species and 30 species, respectively; the subfamily Chlidanotinae is not represented. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found in Gargano territory (Tortricini with 4 species, Cochylini 10, Cnephasiini 6, Archipini 10, Olethreutini 7, Enarmoniini 4, Eucosmini 12, and Grapholitini 14), with the exception of the members of the tribes Sparganothini, Euliini, Polyorthini, and Bactrini.

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CHAPTER 5

FAUNISTIC NOTES ON LEPIDOPTERA TORTRICIDAE FROM CALABRIA (SOUTH ITALY)

Data were taken in part from the following publication:

Trematerra P, **Goglia L**, Scalercio S, Colacci M (2018) Lepidoptera Tortricidae from Calabria (southern Italy). *Redia* **101**: 167-181.

5.1 INTRODUCTION

Over time, the Lepidoptera Tortricidae from the Calabria territory (South Italy) have received sporadic attention by both local and foreign entomologists. The only specific works refer to some catches taken on the southern slope of the Pollino Massif by Trematerra (1990 and 1991a) and in a chestnut area of the Sila Mountains by Trematerra *et al*. (1994).

In the present chapter, we reported a tortricid list as updated and complete as possible for Calabria. For this purpose, in addition to our specimens collected from 2013 to 2018, we included in this list both the species found by P. Trematerra in the course of previous entomological researches in that region and the species reported in literature; these last species were collected in an unreported number of samples by light and pheromone traps (Trematerra, 1991a, b and 2003; Trematerra *et al*., 1994 and 1997).

5.2 MATERIALS AND METHODS

Our specimens were caught mainly by attraction to light at night-time, mostly using UV-LED light traps (Infusino *et al*., 2017), but also by butterfly net during day-time. The material was identified morphologically; genitalia were prepared using standard methods, the abdomen was macerated in 10% KOH and dissected under a stereoscopic microscope, the genitalia were separated and mounted in euparal on a glass slide. All specimens and slides were deposited in the Trematerra Collection (at the University of Molise, Campobasso, Italy). From 2013 to 2018 the localities visited were especially in the northern and central part of the Calabrian territory, as Pollino Massif, Sila Mountains and the bordering areas from sea level up to 1,500 m of altitude (Figs. 5.1 and 5.2).

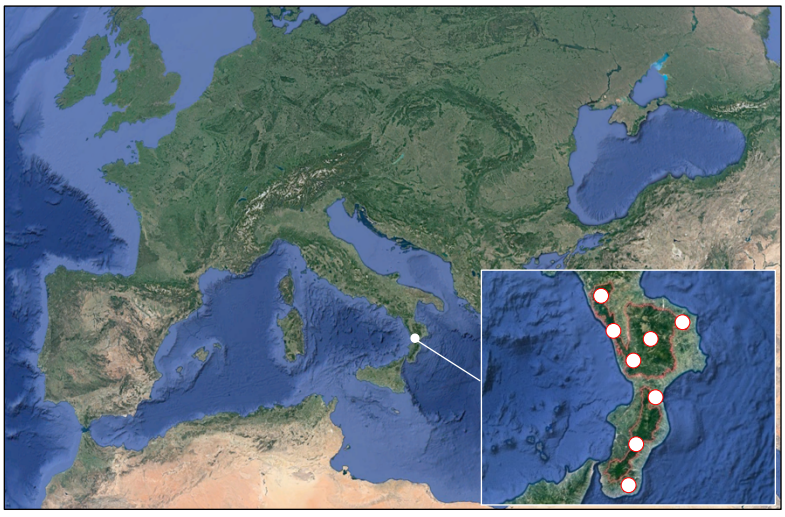


Figure 5.1 – The Calabria region (South Italy) and trapping localities (white circles).

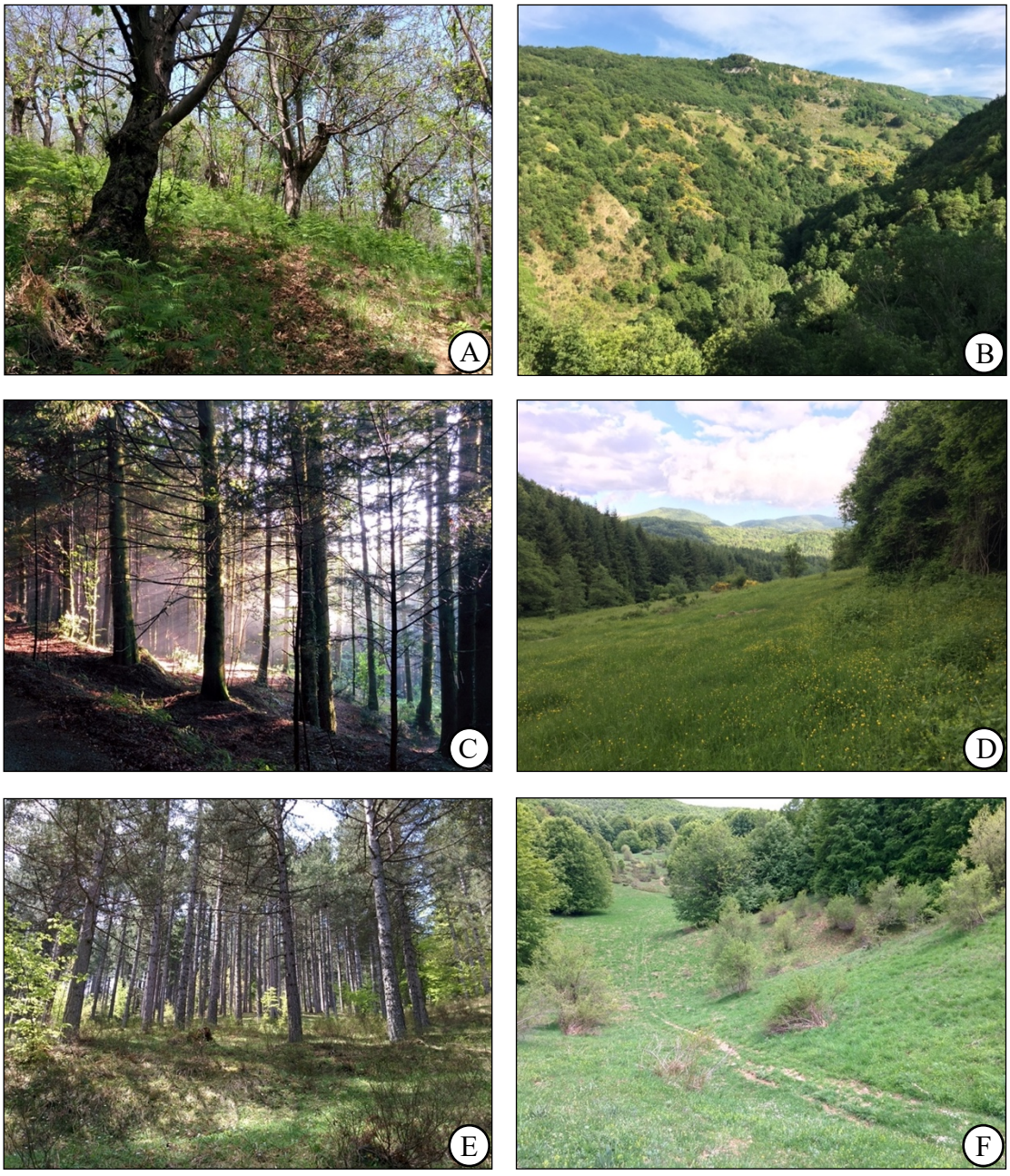


Figure 5.2 – Some habitats visited during entomological expeditions in Calabria region (South Italy): Coastal chain of Paola 541 m/a.s.l. (A); Carolei (Coastal chain) 558 m/a.s.l. (B); Abetina of Serra San Bruno 917 m/a.s.l. (C); Falconara Albanese (Coastal chain) 998 m/a.s.l. (D); Sila National Park 1,300 m/a.s.l. (E); Orsomarso mountains, Pollino National Park 1,470 m/a.s.l. (F).

5.3 RESULTS

As reported in Chapter 2, in the compilation of this inventory we followed the systematic arrangement adopted by Razowski (2002 and 2003) with some modifications suggested by Brown (2005) and by Gilligan *et al*. (2014) waiting for the recent revision on the tribe Cochylini, proposed at the genetic level by Brown *et al*. 2019, is widely adopted. Distribution of the species was largely taken from Razowski (1970), Trematerra (2003) and Aarvik (2013) with new data from Trematerra's personal catalogue (unpubl. data). For distribution of species in Italy we reported N (north); C (centre); S (south); Si (Sicily) and Sa (Sardinia) (Trematerra, 2003). Chorotype of the species was taken from Vigna Taglianti *et al*. (1992, 1999) and Parenzan (1994).

LIST OF TAXA TORTRICIDAE

SUBFAMILY TORTRICINAE

TRIBE TORTRICINI

***Tortrix viridana* Linnaeus, 1758**
MATERIAL EXAMINED. 2 males, Rende (Cosenza), 205 m, 14.V.2014, leg. Scalercio.
DISTRIBUTION. A West Palaearctic species: North-West Africa, Europe from Iberian Peninsula to Ural Mts, Georgia, Azerbaijan, Asia Minor, Iran and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W- Palaearctic.

***Aleimma loeflingianum* (Linnaeus, 1758)**
MATERIAL EXAMINED. 2 males, Montalto Uffugo (Cosenza), 230 m, 24.V.2014, leg. Scalercio. 1 male, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Europe, Ural Mts, Caucasus, Syria and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Acleris abietana* (Hübner, [1819-1822])**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 11.V.2014, leg. Scalercio and Infusino. 1 female, S.S. Bruno (Vibo Valentia), 917 m, 6.IV.2016, leg. Scalercio and Infusino.
DISTRIBUTION. European species, excluded the southern regions (Iberian Peninsula and Greece); also Siberia and Russian Far East. (Italy: N, S).
CHOROTYPE. Sibero-European.

***Acleris sparsana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 27.X.2014, leg. Scalercio. 1 female, Lungro (Cosenza), 1270 m, 26.X.2016, leg. Scalercio and Infusino.
DISTRIBUTION. European species: from Spain to Caucasus, northern part included; also Faeroe Islands, Asia Minor and Transcaucasia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian-Caucasian extension.

***Acleris rhombana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 13.X.2014, leg. Scalercio. 1 male, Rende (Cosenza), 205 m, 4.XI.2014, leg. Scalercio. 1 male, Saracena (Cosenza), 1010 m, 14.X.2015, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1285 m, 18.IX.2017, leg. Scalercio and Infusino.
DISTRIBUTION. West Palaearctic: Europe to Caucasus, Armenia and Turkmenia; also Asia Minor and North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Acleris schalleriana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 1 female, Saracena (Cosenza), 1010 m, 19.VI.2015, leg. Scalercio.
DISTRIBUTION. Holarctic species known from Europe to Japan and North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Acleris cristana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Aprigliano (Cosenza), 1310 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1465 m, 28.VII.2015, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1345 m, 17.VIII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Transpalaearctic species widely distributed from Europe to Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Acleris variegana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Lago Cecita (Cosenza), 1170 m, 15.XI.2013, leg. Scalercio. 1 male, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso. 1 female, Fiego di San Fili (Cosenza), 740 m, 28.V.2015, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1010 m, 19.VI.2015, leg. Scalercio and Infusino. 1 female, S.S. Bruno (Vibo Valentia), 1120 m, 22.VI.2015, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1035 m, 23.IX.2015, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1325 m, 4.XI.2015, leg. Scalercio and Infusino. 1 female, S.B. Ullano (Cosenza), 810 m, 1.VI.2016, leg. Scalercio and Infusino. 1 female, Lungro (Cosenza), 1270 m, 6.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. A Palaearctic species, occurring in Iceland, West Europe to Kazakhstan and South-Central Siberia; also North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Acleris aspersana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 1 male, Righio (Cosenza), 1330 m, 24.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. A Palaearctic species, occurring in Iceland, West Europe to Kazakhstan and South-Central Siberia; also North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Acleris hastiana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 female, S.S. Bruno (Vibo Valentia), 860 m, 7.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. A Holarctic species known from West Europe to Japan, Morocco, Siberia and North America, south as far California. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Acleris notana* (Donovan, [1806])**
MATERIAL EXAMINED. 1 female, M.te Pettinascura (Cosenza), 1300 m, 11.VI.1991, leg. Trematerra.
DISTRIBUTION. Palaearctic species distributed from Iberian Peninsula (British Is and Scandinavia included) to Japan. Introduced to North America. (Italy: N, S, Si, Sa).
CHOROTYPE. Holarctic.

***Acleris ferrugana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, S.S. Bruno (Vibo Valentia), 830 m, 6.IV.2016, leg. Scalercio and Infusino.
DISTRIBUTION. European species also present in Morocco, Caucasus, Ural, West Kazakhstan, Siberia, Transbaikalia, Far East Russian and North America (introduced). (Italy: N, C, S, Sa).
CHOROTYPE. Holarctic.
REMARKS. Collected on early April, previously reported in Trematerra (2003) from June to November.

***Acleris quercinana* (Obraztsov, 1857)**
MATERIAL EXAMINED. 1 female, Montalto Uffugo (Cosenza), 545 m, 1.IV.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe excluded the northern territories except Sweden, Asia Minor, Transcaucasia, Iraq, Iran and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Acleris boscanoides* Razowski, 1959**
RECORDS. Strongoli (Crotone), 14.VI.1985 (in Trematerra, 2003; Pettersson, pers. comm.).
DISTRIBUTION. East Europe (included Italy, Greece and European Turkey), Asia Minor, Iran and Crimea. (Italy: N, S).
CHOROTYPE. Turano-European.

***Acleris literana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 2 females, Alessandria del Carretto (Cosenza), 1345 m, 17.VIII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Known from entire Europe. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European.

TRIBE COCHYLINI

***Phtheochroa purana* (Guenée, 1846)**
MATERIAL EXAMINED. 1 male, Vallone Colloreto (Cosenza), 800 m, 6.VI.1981, leg. Scalercio.
DISTRIBUTION. Europe: former USSR countries, France, Italy, Hungary, former Yugoslavia and Romania. (Italy: N, C, S).
CHOROTYPE. S-European.

***Phtheochroa duponchelana* (Duponchel, 1843)**
MATERIAL EXAMINED. 2 males, Copanello (Catanzaro), 70 m, 9.V.1996, leg. Scalercio. 1 male, Copanello (Catanzaro), 80 m, 24.V.1996, leg. Gatti.
DISTRIBUTION. South-West Europe from France to Greece, Asia Minor, North-West Africa (Morocco and Algeria), Asia Minor, Syria and Lebanon. (Italy: C, S, Si).
CHOROTYPE. Mediterranean.

***Phtheochroa rugosana* (Hübner, [1769-1799])**
MATERIAL EXAMINED. 1 female, S.B. Ullano (Cosenza), 893 m, 28.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from Europe; Canary Islands, North-West Africa, Asia Minor and Transcaucasia. (Italy: N, S).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Cochylimorpha sparsana* (Staudinger, 1880)**
MATERIAL EXAMINED. 2 males, Vivaio Sbanditi (Cosenza), 1351 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, Pedace (Cosenza), 1450 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 25.V.2015, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1355 m, 18.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from Europe (former USSR countries, Spain and Italy) and Asia Minor. (Italy: N, S).
CHOROTYPE. European with Anatolian extension.

***Cochylimorpha scalerciana* Trematerra, 2019**
MATERIAL EXAMINED. 2 males, Calabria, Sila, Vivaio Sbanditi (Cosenza), 1351 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, Calabria, Sila, Montagna Grande (Cosenza), 1355 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, Calabria, Colle Macchie, Pedace (Cosenza), 1450 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, Calabria, Sila, Vivaio Sbanditi (Cosenza), 1351 m, 25.V.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Europe (Italy). Trematerra (2019) report it for various locations of the Sila Mountains, Cosenza (Calabria). (Italy: S).
CHOROTYPE. S-Appenninic.

***Phalonidia gilvicomana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 male, S.S. Bruno (Vibo Valentia), 830 m, 30.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe from Spain and British Is to Scandinavia and Finland, former USSR countries, Bulgaria and Greece. (Italy: N, S).
CHOROTYPE. European.

***Phalonidia manniana* (Fischer von Röslerstamm, 1839)**
MATERIAL EXAMINED. 2 males, Orsomarso (Cosenza), 160 m, 27.VIII.2014, leg. Scalercio.
DISTRIBUTION. A widely distributed Palaearctic species; distributed from Europe to South Ural; in Asia from Transcaucasia, Kazakhstan, Siberia, Russian Far East, Mongolia and China. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Agapeta hamana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 2 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, Falconara Albanese (Cosenza), 921 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. West Palaearctic excluded the southern territories, north to 66° (Europe, Transcaucasia, Central Asia, West and South Siberia, Asia Minor, Iran, Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, West China and North India). (Italy: N, C, S).
CHOROTYPE. Centralasiatic-European.

***Agapeta zoegana* (Linnaeus, 1767)**
MATERIAL EXAMINED. 1 male, Pianette di Dipignano (Cosenza), 765 m, 29.VII.2013, leg. Scalercio. 1 male, La Fossiata (Cosenza), 1300 m, 13.VIII.2013, leg. Scalercio. 1 female, Spezzano della Sila (Cosenza), 1350 m, 8.VII.2014, leg. Scalercio. 2 males, Mangiatoie (Cosenza), 1275 m, 25.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. West Palaearctic species known from Europe, northern parts included, to Ural Mts, Asia Minor, Transcaucasia and Kazakhstan. (Italy: N, C, S).
CHOROTYPE. Turano-European.

***Eupoecilia angustana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, Alessandria del Carretto (Cosenza), 1337 m, 19.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic subspecies excluded North Africa: Europe, Transcaucasia, Ural Mts, Siberia, China, Russian Far East, Korea and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Aethes piercei* (Obraztsov, 1952)**
MATERIAL EXAMINED. 1 male, Cozzi dell'Anticristo (Cosenza), 1300 m, 28.V.1989, leg. Trematerra. 1 female, M.te Crasta (Cosenza), 1200 m, 28.V.1989, leg. Trematerra. 2 females, S. Coppola di Paola (Cosenza), 1400 m, 13.VI.1991, leg. Trematerra.
DISTRIBUTION. European species (from France and British Is to former Yugoslavia, Spain and Italy). (Italy: N, C, S).
CHOROTYPE. European.

***Aethes williana* (Brahm, 1791)**
MATERIAL EXAMINED. 1 male, San Ferdinando (Reggio Calabria), 5 m, 15.VII.2017, leg. Bonelli.
DISTRIBUTION. West Palaearctic: North-West Africa and Europe, from Iberian Peninsula to Ural Mts, Transcaucasia, Central Asia, South-West Siberia; Mongolia also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Aethes moribundana* (Staudinger, 1859)**
MATERIAL EXAMINED. 5 males, Saracena (Cosenza), 990 m, 20.V.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic species distributed from Iberian Peninsula to Mongolia, exl. northern territories e.g. British Is and Scandinavia. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Aethes tesserana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Pedace (Cosenza), 1440 m, 15.VI.2015, leg. Scalercio and Infusino. 2 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Iran and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Aethes kasyi* Razowski, 1962**
RECORDS. Cozzi dell'Anticristo (Cosenza), 30.VII.1990, leg. Trematerra (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from South-East Europe included Spain, then Transcaucasia, Crimea, Iran, Tajikistan and Afghanistan. (Italy: N, S, Si).
CHOROTYPE. Turano-European.

***Aethes francillana* (Haworth, [1811])**
RECORDS. 1 male, Castrovillari (Cosenza), 350 m, 10.VI.1978 (in Trematerra, 2003; Parenzan, pers. comm.).

DISTRIBUTION. Europe, Canary Is and North-West Africa to Transcaucasia, Iran, Afghanistan, Kazakhstan, Tadzhikistan and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Aethes bilbaensis* (Rössler, 1877)**
MATERIAL EXAMINED. 1 male, Donnici (Cosenza), 550 m, 23.VII.2013, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1355 m, 5.VII.2016, leg. Scalercio and Infusino. 1 male, Montalto Uffugo (Cosenza), 550 m, 27.VII.2016, leg. Scalercio and Infusino. 1 male, San Ferdinando (Reggio Calabria), 5 m, 11.VII.2017, leg. Bonelli.
DISTRIBUTION. West Palaearctic species; its area extends from North-West Africa and Iberian Peninsula to Greece and South Ural Mts, known also from Asia Minor, North Lebanon, Iran, Afghanistan, Pakistan and Turkmenia. Budaskin (1993) found it in Crimea, Caucasus, Transcaucasia and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Aethes rubiginana* (Walsingham, 1903)**
MATERIAL EXAMINED. 2 males, Copanello (Catanzaro), 70 m, 10.V.1996, leg. Scalercio. 1 female, Copanello (Catanzaro), 70 m, 10.V.1996, leg. Gatti. 1 female, Copanello (Catanzaro), 70 m, 25.VI.1996, leg. Gatti.
DISTRIBUTION. Known from NW Africa: Morocco and Algeria; Europe: Denmark, Corsica and Italy. (Italy: S, Si, Sa).
CHOROTYPE. Europeo-Mediterranean.

***Aethes mauritanica* (Walsingham, 1898)**
MATERIAL EXAMINED. 1 female, Rossano lido (Cosenza), 8.V.1981, leg. Scalercio.
DISTRIBUTION. Known from North-West Africa: Morocco and Libya; Europe (Spain, Italy, former Yugoslavia, Bulgaria, Greece and European Turkey); also Asia Minor. (Italy: N, S, Sa).
CHOROTYPE. Mediterranean.

***Aethes cnicana* (Westwood, 1854)**
MATERIAL EXAMINED. 2 males, S.S. Bruno (Vibo Valentia), 925 m, 7.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from almost entire Europe; also Siberia, Mongolia, China, Russian Far East, Korea and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Cochylis hybridella* (Hübner, [1810-1813])**
RECORDS. 3 males, Camigliatello (Cosenza), 3.VIII.1921 (in Trematerra, 1991b).
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Ural Mts, Kazakhstan, West-South Siberia, China, Russian Far East, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Cochylis salebrana* (Mann, 1862)**
MATERIAL EXAMINED. 1 male, Pianette di Dipignano (Cosenza), 765 m, 5.VIII.2013, leg. Scalercio. 1 male, Montalto Uffugo (Cosenza), 550 m, 25.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Known from former USSR countries, France, Spain, Italy, Hungary, former Yugoslavia, Romania and Bulgaria; recorded also from Asia Minor, Caucasus and Transcaucasia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European.

***Cochylis molliculana* Zeller, 1847**
MATERIAL EXAMINED. 1 male, Rende (Cosenza), 204 m, 24.V.2017, leg. Colacci and Goglia.
DISTRIBUTION. Great Britain and from Spain to Greece. (Italy: N, C, S, Si).
CHOROTYPE. Europeo-Mediterranean.

***Cochylis posterana* Zeller, 1847**
MATERIAL EXAMINED. 1 male, Lago Cecita (Cosenza), 1176 m, 2.IX.2013, leg. Scalercio. 2 males, San Fili (Cosenza), 630 m, 25.VI.2015, leg. Scalercio and Infusino. 1 male, Fiego di San Fili (Cosenza), 720 m, 25.VI.2015, leg. Scalercio and Infusino. 1 male, Fiego di San Fili (Cosenza), 740 m, 25.VI.2015, leg. Scalercio and Infusino. 1 female, San Bernardo (Cosenza), 1380 m, 11.V.2016, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1420 m, 6.VI.2016, leg. Scalercio and Infusino. 1 female, San Bernardo

(Cosenza), 1380 m, 25.VII.2016, leg. Scalercio and Infusino. 1 female, Saracena (Cosenza), 1475 m, 1.VIII.2016, leg. Scalercio and Infusino. 1 female, Montalto Uffugo (Cosenza), 545 m, 29.VIII.2016, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1291 m, 21.VI.2017, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1291 m, 19.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. West Palaearctic species occurring east far as Transcaspia, Central Asia and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

TRIBE CNEPHASIINI

***Propiromorpha rhodophana* (Herrich-Schäffer, 1849)**
RECORDS. Rossano Lido (Cosenza), 5 m, 20.VII.1981, leg. Parenzan (in Trematerra *et al*., 1997).
DISTRIBUTION. South Europe, North-West Africa, Asia Minor, Mongolia, China, Amur Territory and Primorsk. (Italy: N, C, S)
CHOROTYPE. Palaearctic.

***Eana penziana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Saracena (Cosenza), 1035 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 860 m, 22.VI.2015, leg. Scalercio and Infusino. 2 males, San Bernardo (Cosenza), 1383 m, 7.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Widely distributed in West Palaearctic: Europe to British Islands and Scandinavia, south to Mediterraneum, east to Causasus, Ural Mts and South-West Siberia; also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Eana italica* (Obraztsov, 1950)**
MATERIAL EXAMINED. 1 female, Saracena (Cosenza), 1475 m, 1.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from South-East Europe: Italy, former Yugoslavia, Albania and Greece. (Italy: C, S, Si).
CHOROTYPE. Appennino-Dinaric.

***Archicnephasia hartigi* Razowski, 1983**
MATERIAL EXAMINED. 1 male, Alessandria del Carretto (Cosenza), 1345 m, 12.XI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Known from Italy. (Italy: C, S).
CHOROTYPE. S-Appenninic.

***Cnephasia incertana* (Treitschke, 1835)**
MATERIAL EXAMINED. 5 males, Falconara Albanese (Cosenza), 921 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 5 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Western Palaearctic from Iberian Peninsula to Transcaucasia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cnephasia stephensiana* (Doubleday, 1850)**
MATERIAL EXAMINED. 1 female, Spezzano della Sila (Cosenza), 1299 m, 24.VII.2017, leg. Scalercio and Infusino. 1 female, Fallistro (Cosenza), 1376 m, 24.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Western part of our region from Iberian Peninsula to Kazakhstan, Near East, Transcaucasia, Central Asia and Asia Minor; also in South-West Siberia, Russian Far East, China, Korea and Japan. Introduced to Canada. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Cnephasia asseclana* ([Denis and Schiffermüller], 1775)**
RECORDS. Sersale (Catanzaro), 6-20.VII.1986 (in Trematerra *et al*., 1994).
DISTRIBUTION. Europe, Canary Is and New Foundland, Morocco, Caucasus, Transcaucasia, West-South Siberia, and Japan. Introduced to North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Cnephasia zangheriana* Trematerra, 1991**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Saracena (Cosenza), 1370 m, 20.V.2015, leg. Scalercio and Infusino. 2 males, Saracena (Cosenza), 1431

m, 6.VI.2016, leg. Scalercio and Infusino. 3 males, San Nicola Silano (Cosenza), 1435 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. Endemic in Italy (Pollino Mts). (Italy: C, S).
CHOROTYPE. Appenninic.

***Cnephasia pasiuana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso.
DISTRIBUTION. Europe, Morocco, Libya, Egypt, Asia Minor, Syria, and Transcaucasia. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Cnephasia communana* (Herrich-Schäffer, 1847)**
MATERIAL EXAMINED. 1 female, Pedace (Cosenza), 1450 m, 15.VII.2015, leg. Scalercio and Infusino. 1 male, Acquaformosa (Cosenza), 1357 m, 15.IV.2016, leg. Scalercio and Infusino. 1 male, Montalto Uffugo (Cosenza), 565 m, 1.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Western Palaearctic from Iberian Peninsula to Scandinavia (British Is included) and Caucasus; Transcaucasia, Morocco, Asia Minor, Central Asia, South-West Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cnephasia cupressivorana* (Staudinger, 1871)**
MATERIAL EXAMINED. 1 male, Alessandria del Carretto (Cosenza), 1253 m, 18.IV.2017, leg. Scalercio and Infusino.
DISTRIBUTION. South-West Europe from Iberian Peninsula to Balkan Peninsula up to Greece, north to Romania, Mediterranean Isles, Asia Minor and Kyrgyzstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Cnephasia abrasana* (Duponchel, 1843)**
MATERIAL EXAMINED. 1 male, Righio (Cosenza), 1341 m, 24.V.2017, leg. Scalercio and Infusino. 1 male, Fallistro (Cosenza), 1376 m, 31.V.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Europe and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European.

***Cnephasia chrysantheana* (Duponchel, 1842)**
RECORDS. Sersale (Catanzaro), 15.VI-20.VII.1985; Sersale (Catanzaro), 15.VI-20.VII.1986 (in Trematerra *et al*.,1994).
DISTRIBUTION. West Palaearctic species occurring from Iberian Peninsula to Ukraine; also Morocco, Algeria, Transcaucasia, Asia Minor and Near East. (Italy: N, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cnephasia fulturata* Rebel, 1940**
MATERIAL EXAMINED. 1 male, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso.
DISTRIBUTION. Known in Europe only from Iberian Peninsula, France and Italy, also recorded from North Africa (Algeria) and Asia Minor. (Italy: C, S, Si).
CHOROTYPE. European-N-African.

***Cnephasia hellenica* Obraztsov, 1956**
MATERIAL EXAMINED. 1 male, Fiego di San Fili (Cosenza), 740 m, 25.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. South-East Europe: from Iberian Peninsula to Greece, north to Romania and former USSR countries. Known also from Daghestan, Transcaucasia, Turkmenia and Asia Minor. (Italy: C, S).
CHOROTYPE. Turano-European.

***Cnephasia ecullyana* Réal, 1951**
MATERIAL EXAMINED. 1 female, Rende (Cosenza), 205 m, 14.V.2014, leg. Scalercio.
DISTRIBUTION. Known from Central Southern Europe. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European.

TRIBE ARCHIPINI

***Batodes angustiorana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Montalto Uffugo (Cosenza), 565 m, 1.VI.2016, leg. Scalercio and Infusino.

DISTRIBUTION. Europe, North-West Africa and Asia Minor. Introduced to North America. (Italy: N, C, S, Sa).
CHOROTYPE. Holarctic.

***Epagoge grotiana* (Fabricius, 1781)**
MATERIAL EXAMINED. 1 female, S.B. Ullano (Cosenza), 880 m, 28.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Distributed in West Palaearctic from North-West Europe to Ukraine and South Ural Mts, Trans-Ural, Caucasus and Asia Minor. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Paramesia gnomana* (Clerck, 1759)**
MATERIAL EXAMINED. 1 male, Cozzi dell'Anticristo (Cosenza), 1300 m, 30.VII.1990, leg. Trematerra.
DISTRIBUTION. Known from Iberian Peninsula (included British Is and Scandinavia) to Balkan Peninsula and Ural Mts, then Caucasus, Transcaucasia, West Kazakhstan and West Siberia; also Asia Minor and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Paramesia diffusana* (Kennel, 1899)**
MATERIAL EXAMINED. 2 males, Lago Cecita (Cosenza), 1163 m, 13.VIII.2013, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 5.VIII.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 13.VIII.2014, leg. Scalercio. 1 female, S.S. Bruno (Vibo Valentia), 924 m, 6.IV.2016, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1460 m, 1.VIII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. South-East Europe (Spain, Corsica, Italy, Greece and Estonia). (Italy: S, Si).
CHOROTYPE. SE-European.

***Archips podanus* (Scopoli, 1763)**
MATERIAL EXAMINED. 2 males, Orsomarso (Cosenza), 160 m, 27.VIII.2014, leg. Scalercio. 1 male, S.S. Bruno (Vibo Valentia), 840 m, 22.VI.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 830 m, 30.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from Europe; Asia Minor, Caucasus, Transcaucasia, Ural Mts, Siberia also Japan. Introduced in North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Archips crataeganus* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Montalto Uffugo (Cosenza), 230 m, 24.V.2014, leg. Scalercio.
DISTRIBUTION. West Palaearctic, Kazakhstan, Siberia, China, Korea, Japan. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Archips rosanus* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Fiego di San Fili (Cosenza), 720 m, 25.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic species; in Sweden up to 66°. By the end of XIX century introduced to North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Choristoneura diversana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 1 male, S.S. Bruno (Vibo Valentia), 840 m, 22.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic species: from Europe to Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Choristoneura murinana* (Hübner, [1796-1799])**
RECORDS. Pollino, 10.VII.1989, leg. Trematerra (in Trematerra *et al*., 1994).
DISTRIBUTION. Palaearctic region. (Italy: N, S).
CHOROTYPE. Asiatic-European.

***Argyrotaenia ljungiana* (Thunberg, 1797)**
MATERIAL EXAMINED. 1 male, Montalto Uffugo (Cosenza), 545 m, 25.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic species distributed from Iberian Peninsula and North-West Africa as far as China, Russian Far East and North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Ptycoloma lecheana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Alessandria del Carretto (Cosenza), 1285 m, 21.VI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic species widley distributed in Europe: from its western parts to Ural Mts, in Kazakhstan, Azerbaijan, South-West Siberia, Transbaikalia, Primorsk, China, Korea and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Pandemis cerasana* (Hübner, 1786)**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 29.VII.2014, leg. Scalercio.
DISTRIBUTION. Transpalaearctic species widely distributed in Europe, from Iberian Peninsula as far as to Ural Mts and Caucasus, then South Siberia, Kazakhstan, Mongolia, China and Far East; also Asia Minor and Iran. Introduced to North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Pandemis heparana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Lago Cecita (Cosenza), 1163 m, 30.VII.2013, leg. Scalercio. 2 males, La Fossiata (Cosenza), 1300 m, 13.VIII.2013, leg. Scalercio. 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 29.VII.2014, leg. Scalercio. 2 males, Lago Cecita (Cosenza), 1163 m, 13.VIII.2014, leg. Scalercio. 2 males, Orsomarso (Cosenza), 160 m, 27.VIII.2014, leg. Scalercio.
DISTRIBUTION. Transpalaearctic species: widley distributed in Europe; also know from Asia Minor, Transcaucasia, Ural Mts, North Kazakhstan, Siberia, Lake Baikal, Himalaya, Mongolia, China, Russian Far East, Korea and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Syndemis musculana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 20.X.2014, leg. Scalercio. 1 female, S.S. Bruno (Vibo Valentia), 830 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 835 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 883 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 917 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 924 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, S.B. Ullano (Cosenza), 810 m, 1.VI.2016, leg. Scalercio and Infusino. 1 female, S.B. Ullano (Cosenza), 880 m, 1.VI.2016, leg. Scalercio and Infusino. 1 female, Saracena (Cosenza), 1431 m, 6.VI.2016, leg. Scalercio and Infusino. 1 male, San Giovanni in Fiore (Cosenza), 1250 m, 24.V.2017, leg. Scalercio and Infusino. 2 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, Rovale (Cosenza), 1440 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. Known from whole Europe to Ural Mts and Caucasus, Transcaucasia, Kazakhstan, Siberia, Transbaikalia, China, Mongolia, Russian Far East (incl. Kamchatka and Kuril Is) and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Cacoecimorpha pronubana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Montalto Uffugo (Cosenza), 550 m, 27.VII.2016, leg. Scalercio and Infusino. 1 female, San Ferdinando (Reggio Calabria), 5 m, 15.VII.2017, leg. Bonelli.
DISTRIBUTION. Western Palaearctic from Europe, Morocco, Algeria and Tunisia to Lebanon, Asia Minor, Near East, Crimea and Japan. Introduced to South Africa and North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Aphelia ochreana* (Hübner, [1797-1799])**
RECORDS. Cozzo San Lorenzo (Cosenza), 29.V.1990 (in Trematerra *et al*., 1994).
DISTRIBUTION. Europe, Caucasus, Asia Minor, Syria, Iraq and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Dichelia histrionana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1355 m, 18.VI.2014, leg. Scalercio. 2 males, Vivaio Sbanditi (Cosenza), 1350 m, 20.VII.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 27.VII.2015, leg. Scalercio and Infusino.

DISTRIBUTION. Known from West Europe (France) to Scandinavia, also from South-East Europe and Caucasus. (Italy: N, S).
CHOROTYPE. European.

***Clepsis spectrana* (Treitschke, 1830)**
RECORDS. Rossano (Cosenza), 2 m, 8.V.1981, leg. Parenzan (in Trematerra *et al*., 1997).
DISTRIBUTION. Known from Europe, Caucasus, Transcaucasia, West Kazakistan and West Siberia. (Italy: N, C, S, Si).
CHOROTYPE. European.

***Clepsis pallidana* (Fabricius, 1776)**
RECORDS. Rossano (Cosenza), 2 m, 8.V.1981, leg. Parenzan (in Trematerra *et al*., 1997).
DISTRIBUTION. Palaearctic species known from Europe (Spain) to Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Clepsis consimilana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 1 female, Donnici (Cosenza), 550 m, 23.VII.2013, leg. Scalercio. 1 male, Pianette di Dipignano (Cosenza), 765 m, 5.VIII.2013, leg. Scalercio. 1 male, Rende (Cosenza), 205 m, 14.V.2014, leg. Scalercio. 1 male, Sangineto (Cosenza), 50 m, 10.VIII.2014, leg. Scalercio. 1 male, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso. 1 male, Montalto Uffugo (Cosenza), 565 m, 28.V.2015, leg. Scalercio and Infusino. 1 male, Rende (Cosenza), 204 m, 24.V.2017, leg. Colacci and Goglia. 4 males, Carolei (Cosenza), 558 m, 24.V.2017, leg. Colacci, Goglia and Scalercio. 1 male and 1 female, Paola (Cosenza), 2 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 3 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. West Europe to East European Russia; West Africa to Lebanon, Asia Minor, Nearctic and Ethiopian region (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

TRIBE EULIINI

***Eulia ministrana* (Linnaeus, 1758)**
RECORDS. Sersale (Catanzaro), 29.VI-3.VIII.1985; Sersale (Catanzaro), 29.VI-3.VIII.1986 (in Trematerra *et al*., 1994).
DISTRIBUTION. Transpalaearctic species distributed (except for most southern parts) in Europe from Iberian Peninsula and British Islands to Ural Mts, then from Kazakhstan and West Siberia to North China, Korea and Japan; also North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

SUBFAMILY CHLIDANOTINAE

TRIBE POLYORTHINI

***Olindia schumacherana* (Fabricius, 1787)**
MATERIAL EXAMINED. 1 female, S.S. Bruno (Vibo Valentia), 860 m, 22.VI.2015, leg. Scalercio and Infusino. 2 males, S.S. Bruno (Vibo Valentia), 924 m, 30.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe from Spain, British Is and Scandinavia to Italy and Corsica; also East Europe. (Italy: N, C, S, Sa, Si).
CHOROTYPE. European.

***Isotrias rectifasciana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 female, Lago Cecita (Cosenza), 1163 m, 30.VII.2013, leg. Scalercio.
DISTRIBUTION. A European species distributed from Spain, British Islands and France as far as to Denmark and Greece, East Europe and Asia Minor. (Italy: N, C, S).
CHOROTYPE. European.

***Isotrias joannisana* (Turati, 1921)**
RECORDS. Cozzi dell'Anticristo (Cosenza), 28.V.1989; Cozzi dell'Anticristo (Cosenza), 28.V.1990 (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from Central and South Italy only. (Italy: C, S).
CHOROTYPE. Appenninic.

***Isotrias martelliana* Trematerra, 1990**
MATERIAL EXAMINED. 1 male and 1 female, Cozzi dell'Anticristo (Cosenza), 1300 m, 28.V.1989, leg. Trematerra.
DISTRIBUTION. Known only from Italy. (Italy: S).
CHOROTYPE. S-Appenninic.

SUBFAMILY OLETHREUTINAE

TRIBE BACTRINI

***Bactra bactrana* (Kennel, 1901)**
MATERIAL EXAMINED. 1 male, Righio (Cosenza), 1355 m, 23.V.2014, leg. Scalercio. 1 male, S.S. Bruno (Vibo Valentia), 830 m, 10.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. From Europe: Iberian Peninsula, France, Corsica, Italy, Malta, Greece, former Yugoslavia and former USSR countries. In addition Canary Is, Morocco, Algeria, Egypt, Asia Minor, Arabia, Mesopotamia, Iraq, Iran, Caucasus, Transcaucasia, Afghanistan, Caspian area, Tadzhikistan, Uzbekistan. Including Oriental (Pakistan, India) and Ethiopian regions (Madagascar). (Italy: N, C, S, Si).
CHOROTYPE. Subcosmopolitan.

***Bactra lancealana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, Orsomarso (Cosenza), 160 m, 27.VIII.2014, leg. Scalercio.
DISTRIBUTION. Palaearctic region, probably excluded Japan; known from North Africa, Europe from Iberian Peninsula to Ural Mts, Kazakhstan, then Siberia to Mongolia, China and Russian Far East; known also from Transcaucasia, Asia Minor, Central Asia, Iran, Afghanistan and Kamchatka. In Oriental region noticed in Sri Lanka and in Nearctic region (USA and Canada). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

***Bactra venosana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 male, Paola (Cosenza), 20 m, 9.VI.2017, leg. Scalercio.
DISTRIBUTION. Known from South-West Europe; from Madeira and Canary Is: Gran Canaria; N Africa: Morocco and Algeria; Arabian Peninsula; Japan; Afrotropical region: Sudan; Oriental region: India, Sri Lanka, Thailand, Philippines, Indonesia, North and South Vietnam, South China, Taiwan; Australian region: Marianas Is, Caroline Is, Fiji, Australia; noticed also in Hawaii. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

TRIBE OLETHREUTINI

***Endothenia gentianaeana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male and 1 female, Orsomarso (Cosenza), 160 m, 27.VIII.2014, leg. Scalercio.
DISTRIBUTION. Europe to Ural Mts, Asia Minor, Arabian Peninsula, Transcaucasia, Central Asia, Mongolia, South Siberia, China, Korea and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Endothenia marginana* (Haworth, [1811])**
RECORDS. 1 male, Aieta (Cosenza), 500 m, 12.VII.1989, leg. Hausmann (in Trematerra, 2003; unpubl. data).
DISTRIBUTION. Europe, North-West Africa, Transcaucasia, Asia: from Ural Mts to Mongolia, China and Russian Far East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Endothenia lapideana* (Herrich-Schäffer, 1848)**
MATERIAL EXAMINED. 1 male, Aieta (Cosenza), 500 m, 12.VII.1989, leg. Hausmann.
DISTRIBUTION. Known from Europe excluded northern territories. (Italy: N, C, S).
CHOROTYPE. European.

***Endothenia nigricostana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 13.VIII.2014, leg. Scalercio.
DISTRIBUTION. Holarctic region: Europe, South Siberia, Far East (Primorsk), Korea and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Endothenia pullana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 female, Lago Cecita (Cosenza), 1163 m, 13.VIII.2014, leg. Scalercio.
DISTRIBUTION. A European species widley distributed throughout the continent: West Europe and British Is to Balticum, Ukraine and Russia. (Italy: N, C, S).
CHOROTYPE. European.

***Lobesia botrana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Calopezzati (Cosenza), 10 m, 25.IV.2015, leg. Scalercio.
DISTRIBUTION. From West Europe to Ural Mts, North Africa, Asia Minor, Near East, Iraq, Iran, Transcaucasia, Turkmenistan, Kazakhstan, and Japan. North-South America (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Lobesia bicinctana* (Duponchel, 1844)**
RECORDS. 1 male, Aieta (Cosenza), 300 m, 11.VII.1989, leg. Hausmann (in Trematerra, 2003; unpubl. data).
DISTRIBUTION. Europe; Asia Minor; Transcaucasia; Russia: South Siberia, Transbaikalia, Russian Far East (Primorsk); Mongolia; China: Manchuria; Korea; Japan: Hokkaido, Honshu; also from Canada. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Eudemis profundana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Donnici (Cosenza), 550 m, 23.VII.2013, leg. Scalercio.
DISTRIBUTION. This species occurs in West Palaearctic as it was recorded in Europe from Spain to West Ukraine and Ural Mts, except for the northern belt; also Asia Minor and Arzebaijan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian extension.

***Hedya salicella* (Linnaeus, 1758)**
RECORDS. 1 female, Lao river (Cosenza), 50 m, 8.VI.1990, leg. Hausmann (in Trematerra, 2003; unpubl. data).
DISTRIBUTION. Palaearctic subregion from Europe (Spain) to China and South Primorsk, except for North Africa, Asia Minor and Japan. Introduced to North America. (Italy: N, S, Sa).
CHOROTYPE. Holarctic.

***Hedya nubiferana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Alessandria del Carretto (Cosenza), 1285 m, 21.VI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. West Europe to Ural Mts, Caucasus, Asia Minor, Iraq, Turkmenistan, Iran, Kazakhstan, West Siberia. North America (Canada). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Hedya ochroleucana* (Frölich, 1828)**
RECORDS. Sersale (Catanzaro), 15.VI-10.VIII.1985 (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from Iberian Peninsula to Ural Mts, Asia Minor, Iran, Caucasus and Transcaucasia, Kazakhstan and from Siberia to Transbaikal and Cisbaikal, Mongolia, China, Korea and Russian Far East (Amur Territory to Sakhalin). Known also from North America. (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Metendothenia atropunctana* (Zetterstedt, 1839)**
MATERIAL EXAMINED. 1 male, Saracena (Cosenza), 1340 m, 20.V.2015, leg. Scalercio and Infusino. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 25.V.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 970 m, 26.V.2015, leg. Scalercio and Infusino. 1 male, Vivaio Sbanditi (Cosenza), 1352 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Acquaformosa (Cosenza), 1357 m, 6.VI.2016, leg. Scalercio and Infusino. 1 female, Saracena (Cosenza), 1431 m, 6.VI.2016, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1010 m, leg. Scalercio and Infusino. 1 male, San Nicola Silano (Cosenza), 1435 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. Europe, from Iberian Peninsula included British Is and Scandinavia to Kola Pns., and Ural Mts; Caucasus, Armenia, Kazakhstan, Russia (Altaj, Siberia and Transbaikalia) and Far East: Primorsk, Kamchatka, Kuril Is (Kunashir); Mongolia; North-West China; Korea; Japan. North America: USA (Alaska) and North-West Canada. (Italy: N, C, S, Si).

CHOROTYPE. Holarctic.

***Piniphila bifasciana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 female, Lago Cecita (Cosenza), 1163 m, 30.VII.2013, leg. Scalercio. 1 male, La Fossiata (Cosenza), 1300 m, 13.VIII.2013, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 5.VIII.2014, leg. Scalercio. 3 males, Montagna Grande (Cosenza), 1325 m, 25.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe, Siberia, Russian Far East (Primorsk); Korea; Japan: Hokkaido. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Olethreutes arcuellus* (Clerck, 1759)**
MATERIAL EXAMINED. 2 males, Vivaio Sbanditi (Cosenza), 1350 m, 18.VI.2014, leg. Scalercio. 4 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 4 males, Falconara Albanese (Cosenza), 921 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, San Nicola Silano (Cosenza), 1435 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. From Europe to Caucasus; Asia Minor, Iran, Kazakhstan, West Siberia, and North-West China. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Celypha cespitana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 1 male, San Bernardo (Cosenza), 1380 m, 25.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. West Europe to Ural Mts, Transcaucasia, Asia Minor, Near East; Iran; Russia: South-West Siberia, Central Asia, Cisbaikal, Tuva and Far East (Primorsk); North-East China (Manchuria); Mongolia; Korea; Japan (Hokkaido and Honshu). Also North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Syricoris lacunana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Donnici (Cosenza), 550 m, 7.VIII.2013, leg. Scalercio. 2 males, Sila (Cosenza), 1300 m, 18.VI.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 2 males, Vivaio Sbanditi (Cosenza), 1350 m, 17.VII.2014, leg. Scalercio. 2 males, Montalto Uffugo (Cosenza), 540 m, 28.V.2015, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1370 m, 15.VI.2015, leg. Scalercio and Infusino. 2 males, Saracena (Cosenza), 1475 m, 19.VI.2015, leg. Scalercio and Infusino. 2 males, S.S. Bruno (Vibo Valentia), 840 m, 22.VI.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 830 m, 30.V.2016, leg. Scalercio and Infusino. 2 males, S.S. Bruno (Vibo Valentia), 924 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, Lungro (Cosenza), 1270 m, 6.VI.2016, leg. Scalercio and Infusino. 1 male, Acquaformosa (Cosenza), 1366 m, 6.VI.2016, leg. Scalercio and Infusino. 2 males and 1 female, Carolei (Cosenza), 558 m, 24.V.2017, leg. Colacci, Goglia and Scalercio. 9 males and 3 females, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 12 males, Falconara Albanese (Cosenza), 921 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, Alessandria del Carretto (Cosenza), 1285 m, 21.VI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. West Europe to Ural Mts and Caucasus, Transcaucasia; Asia Minor, Mongolia, West-South Siberia, China and Japan. (Italy: N, C, S, Sa).
CHOROTYPE. Asiatic-European.

***Syricoris rivulana* (Scopoli, 1763)**
MATERIAL EXAMINED. 1 male, S.S. Bruno (Vibo Valentia), 835 m, 30.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Palaearctic region, Europe: from Iberian Peninsula to Scandinavia; in East Europe to Ural Mts, Transcaucasia, Siberia, Kazakhstan, Amur area, Russian Far East (Primorsk); also Mongolia, China and Korea. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

TRIBE ENARMONIINI

***Ancylis laetana* (Fabricius, 1775)**
MATERIAL EXAMINED. 1 male, Soveria Mannelli (Catanzaro), 12.VI.1991, leg. Trematerra.
DISTRIBUTION. Europe from Spain included British Is and Scandinavia to Mediterraneum and Ural Mts; Kazakhstan, from Siberia to Far East: Priamure, South Primorsk; North-East China. (Italy: N, C, S).
CHOROTYPE. Sibero-European.

***Ancylis comptana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male, Saracena (Cosenza), 1315 m, 14.V.2015, leg. Scalercio and Infusino.
DISTRIBUTION. From Europe to Ural Mts, Asia Minor, Caucasus, Kazakhstan, Uzbekistan, Siberia Far East, China, Mongolia, Korea and Japan. Also North America. (Italy: N, C, S, Sa).
CHOROTYPE. Holarctic.

***Ancylis paludana* (Barrett, 1871)**
MATERIAL EXAMINED. 3 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. West Europe from France included British Is and Scandinavia to East Europe; also Siberia, Yakutia, Far East (Priamure to Kamchatka); Mongolia, China and North America. (Italy: N, S).
CHOROTYPE. Holarctic.

***Ancylis badiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Montagna Grande (Cosenza), 1370 m, 15.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. From West Europe to Asia Minor, Caucasus, Transcaucasia, Ural Mts, Mongolia and Russian Far East, China, Korea and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Ancylis mitterbacheriana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, S.B. Ullano (Cosenza), 893 m, 1.VI.2016, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1431 m, 6.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe from Spain, British Is and Scandinavia to Mediterraneum and Balkan Peninsula, east to Ural Mts and Transcaucasia; also Asia Minor and China (Shandong). (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

TRIBE EUCOSMINI

***Thiodia major* (Rebel, 1903)**
RECORDS. Mendicino (Cosenza), 15.VI-6.VII.1989 (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from South Europe, from South France and Italy to Balkan peninsula. (Italy: C, S, Si, Sa).
CHOROTYPE. S-European.

***Thiodia trochilana* (Frölich, 1828)**
MATERIAL EXAMINED. 2 males, Saracena (Cosenza), 1035 m, 15.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Central-South Europe, East Balticum, southern part of East Europe, North Africa, Asia Minor, Transcaucasia, Turkmenia and Iran. (Italy: N, C, S, Si).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Rhopobota stagnana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males, Cozzi dell'Anticristo (Cosenza), 1300 m, 28.V.1989, leg. Trematerra.
DISTRIBUTION. West Palaearctic species known from Europe and Asia Minor as far as to Caucasus, Transcaucasia and Transural. (Italy: N, C, S, Si).
CHOROTYPE. European with Anatolian-Caucasian extension.

***Rhopobota naevana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 1 female, S.S. Bruno (Vibo Valentia), 886 m, 30.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. From Europe to Ural Mts, Caucasus, Transcaucasia, India, Sri-Lanka, Siberia, Far East, Mongolia, China, Korea and Japan. In the Nearctic Region occurs ssp. *illicifoliana* Kearfott, 1907. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

***Spilonota ocellana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Lago Cecita (Cosenza), 1163 m, 30.VII.2013, leg. Scalercio. 1 male and 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 29.VII.2014, leg. Scalercio. 1 male, Mormanno (Cosenza), 970 m, 1.VIII.2016, leg. Scalercio and Infusino. 1 female, Acquaformosa (Cosenza), 1357 m, 1.VIII.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 883 m, 3.VIII.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 925 m, 3.VIII.2016, leg. Scalercio and Infusino. 1 male,

Alessandria del Carretto (Cosenza), 1253 m, 13.VII.2017, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1345 m, 19.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Europe, North Africa, Caucasus, Asia Minor, Transcaucasia, Iran, Kazakhstan, Turkmenia, Uzbekistan, Tadzhikistan, Russian Far East, Siberia, China, Korea and Japan. Also Nearctic Region. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Spilonota laricana* (Heinemann, 1863)**
RECORDS. Sersale (Catanzaro), 20.VII.1985 (in Trematerra *et al*., 1994).
DISTRIBUTION. Europe from France to Romania and Scandinavia (Included British Is), in its eastern part from Karelia to Caucasus; also Siberia, Russian Far East (Priamure and South Primorsk), China, Japan and Neartic Region (North America). (Italy: N, C, S).
CHOROTYPE. Holarctic.

***Epinotia festivana* (Hübner, 1799)**
MATERIAL EXAMINED. 1 female, Donnici (Cosenza), 550 m, 23.VII.2013, leg. Scalercio. 1 male, Montalto Uffugo (Cosenza), 550 m, 25.VI.2015, leg. Scalercio and Infusino. 1 male, Montalto Uffugo (Cosenza), 545 m, 1.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe: from Iberian Peninsula to south and east part of the region (excluded northern territories) also Crimea, Caucasus, Ciscaucasia, Transcaucasia, Asia Minor, Dagestan, Iran and North Africa. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Epinotia thapsiana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 female, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso.
DISTRIBUTION. Canary Is, southern and median belts of Europe to East European Russia, Transcaucasia, Asia Minor, Iran, South-West Siberia, Kazakhstan, Tadzhikistan, Turkmenia and Korea. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Epinotia sordidana* (Hübner, [1823-1824])**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 13.X.2014, leg. Scalercio. 1 male, Alessandria del Carretto (Cosenza), 1285 m, 18.IX.2017, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1345 m, 18.IX.2017, leg. Scalercio and Infusino. 1 female, Alessandria del Carretto (Cosenza), 1305 m, 12.XI.2017, leg. Scalercio and Infusino. 1 female, Alessandria del Carretto (Cosenza), 1345 m, 12.XI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Known from whole Europe. (Italy: N, S, Si).
CHOROTYPE. European.

***Epinotia solandriana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 13.X.2014, leg. Scalercio.
DISTRIBUTION. West Europe to Ural Mts, Transcaucasia; also Asia Minor, Iran, Kazakhstan, Russia: Siberia to Far East (Amur-Zeya Territory, Priamure, South Primorsk, South Sakhalin, South Kuril Is, Kamchatka); also North-East China, Korea, Japan (Hokkaido and Honshu) and Neartic region (North America). (Italy: N, S).
CHOROTYPE. Holarctic.
REMARKS. Collected in middle October, previously reported in Trematerra (2003) from June to August.

***Epinotia signatana* (Douglas, 1845)**
MATERIAL EXAMINED. 2 females, Cozzi dell'Anticristo (Cosenza), 1000 m, 13.VI.1991, leg. Trematerra.
DISTRIBUTION. Palaearctic species known in Europe from British Is and Scandinavia to Mediterranean Sea, also East Europe, Asian Russia (Siberia; Far East: Priamure, South Primorsk); China; Korea; Japan: Hokkaido, Honshu. (Italy: S).
CHOROTYPE. Asiatic-European.

***Epinotia immundana* (Ficher von Röslerstamm, 1839)**
MATERIAL EXAMINED. 1 male, Donnici (Cosenza), 550 m, 23.VII.2013, leg. Scalercio.
DISTRIBUTION. West Europe from Iberian Peninsula to British Is, Scandinavia and Balkan Peninsula; East Europe to Ural Mts, Transcaucasia, Asia Minor, Kazakhstan and West Siberia. (Italy: N, C, S).
CHOROTYPE. Turano-European.

***Epinotia subocellana* (Donovan, [1806])**
MATERIAL EXAMINED. 1 male, Rovale (Cosenza), 1440 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. Palaearctic region except for southern belt, from Spain and British Is to Ural Mts, South-West Siberia; Far East: South Sakhalin, Kuril Is (Kunashir I.). (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Epinotia nigricana* (Herrich-Schäffer, 1847)**
RECORDS. Sila varie località (Cosenza), 13.VI.1991 (in Trematerra *et al*., 1994).
DISTRIBUTION. Europe from France to East Europe, and from Scandinavia to Italy, former Yugoslavia, Romania and Greece; also Turkey (Bolu). (Italy: N, C, S).
CHOROTYPE. European with Anatolian extension.

***Epinotia tenerana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males, Vivaio Sbanditi (Cosenza), 1350 m, 17.VII.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 29.VII.2014, leg. Scalercio. 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 13.VIII.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 6.VII.2015, leg. Scalercio and Infusino. 1 female, Vivaio Sbanditi (Cosenza), 1351 m, 27.VII.2015, leg. Scalercio and Infusino. 1 female, S.S. Bruno (Vibo Valentia), 917 m, 3.VIII.2016, leg. Scalercio and Infusino. 3 females, Lungro (Cosenza), 1270 m, 31.VIII.2016, leg. Scalercio and Infusino. 1 male, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, Spezzano della Sila (Cosenza), 1324 m, 24.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. West Europe from Iberian Peninsula to former Yugoslavia and from British Is to Scandinavia, East Europe to Ural Mts, Transcaucasia, Asia Minor, Russian Far East: South Primorsk; China, Korea and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Epinotia fraternana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 female, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Europe from Spain and Great Britain to Scandinavia and Greece, Mts of South-East Europe. Also from Turkey. (Italy: N, C, S).
CHOROTYPE. European with Anatolian extension.

***Crocidosema plebejana* Zeller, 1847**
MATERIAL EXAMINED. 1 male and 1 female, Montescuro (Cosenza), 1610 m, 6.III.2016, leg. Scalercio. 1 male, Montalto Uffugo (Cosenza), 550 m, 1.VI.2016, leg. Scalercio and Infusino. 1 male, S.B. Ullano (Cosenza), 825 m, 1.VI.2016, leg. Scalercio and Infusino. 1 male, S.B. Ullano (Cosenza), 845 m, 1.VI.2016, leg. Scalercio and Infusino. 1 female, Paola (Cosenza), 20 m, 9.VI.2017, leg. Scalercio. 1 male, Alessandria del Carretto (Cosenza), 1314 m, 21.VI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Entire Europe, North Africa, Asia Minor, Arabia, Iran, Transcaucasia, Turkmenia, India, Taiwan, Australia, North America and South America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.
REMARKS. Collected also on early March, previously reported in Trematerra (2003) from April to November and in Trematerra and Colacci (2016) from May to November.

***Pelochrista mollitana* (Zeller, 1847)**
MATERIAL EXAMINED. 2 males, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso; 1 male, S.S. Bruno (Vibo Valentia), 883 m, 3.VIII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. West Europe from France to South Scandinavia; Mediterraneum from Iberian Peninsula to Greece, and Bulgaria; North Africa; East Europe from East Balticum to Crimea, Caucasus; also Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Pelochrista agrestana* (Treitschke, 1830)**
MATERIAL EXAMINED. 1 male, Savelli (Crotone), 1000 m, 12.VIII.1998, leg. Sciarretta.
DISTRIBUTION. Known chiefly from Lithuania, South-West Europe (France, Italy, Austria and former Yugoslavia) and Asia Minor. (Italy: C, S, Si).
CHOROTYPE. S-European.

***Pelochrista bleuseana* (Oberthür, 1888)**
RECORDS. Sersale (Catanzaro), 6.VII.1985; Sersale (Catanzaro), 22.IX.1985; Perticaro (Catanzaro), 6.VII.1988; Mendicino (Cosenza), 4-18.VII.1988; Perticaro (Catanzaro) 18.VIII.1988; Mendicino (Cosenza), 19.VI.1989; Mendicino (Cosenza), 3.X.1989 (in Trematerra *et al*., 1994).
DISTRIBUTION. Spain and Italy. Described from North-West Africa (Morocco and Algeria). (Italy: S).
CHOROTYPE. W-Mediterranean.

***Pelochrista subtiliana* (Jäckh, 1960)**
MATERIAL EXAMINED. 1 male, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, Falconara Albanese (Cosenza), 921 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. European species known to date from Italy, Austria, Slovakia, Czech Republic, Germany and Hungary. Also from Russia (Khabarovsk Krai). (Italy: N, S).
CHOROTYPE. Asiatic-European.

***Eucosma cana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Fossiata (Cosenza), 1300 m, 13.VIII.2013, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 29.VII.2014, leg. Scalercio. 1 male, S.S. Bruno (Vibo Valentia), 940 m, 19.VII.2015, leg. Scalercio and Infusino. 1 male, Spezzano della Sila, 1299 m, 24.VII.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, Kazakhstan, Central Asia, South Siberia, Russian Far East, China and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Eucosma hohenwartiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males, Pianette di Dipignano (Cosenza), 765 m, 5.VIII.2013, leg. Scalercio.
DISTRIBUTION. North Africa, Europe from British Is to Scandinavia to Mediterraneum, East Europe, Transcaucasia, Asia Minor, West and South Siberia to Altaj, Central Asia, West China and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Eucosma balatonana* (Osthelder, 1937)**
MATERIAL EXAMINED. 1 male, Montagna Grande (Cosenza), 1370 m, 15.VI.2015, leg. Scalercio and Infusino. 1 female, Montalto Uffugo (Cosenza), 545 m, 25.VI.2015, leg. Scalercio and Infusino. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 6.VII.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Europe: Spain, France, Germany, Switzerland, Austria, Italy, Hungary, Denmark, Sweden, East Europe; South-West Siberia; Kazakhstan. (Italy: N, C, S).
CHOROTYPE. Centralasiatic-European.

***Eucosma conterminana* (Guenée, 1845)**
MATERIAL EXAMINED. 1 male, Cozzi dell'Anticristo (Cosenza), 1000 m, 13.VI.1992, leg. Trematerra.
DISTRIBUTION. Europe from Portugal (British Is and Scandinavia included) to Caucasus, Ural Mts, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, Souh-West Siberia, Mongolia, Far East (Priamure and South Primosk) and China. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Eucosma albidulana* (Herrich-Schäffer, 1848)**
MATERIAL EXAMINED. 1 male, Pianette di Dipignano (Cosenza), 765 m, 5.VIII.2013, leg. Scalercio. 1 male, Aprigliano (Cosenza), 1310 m, 15.VI.2015, leg. Scalercio and Infusino.
DISTRIBUTION. West and Central Palaearctic: North Africa, West Europe from France to Poland, South Europe, Balkan Peninsula, East Europe, Asia Minor, Iran, Transcaucasia, Kazakhstan and Central Asia. (Italy: N, C, S).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Gypsonoma minutana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Europe from Iberian Peninsula and Great Britain to Scandinavia and Greece, East Europe to Ural; also Israel, Iran, Afghanistan, Central Asia, Siberia, Mongolia, Russian Far East (Priamure and South Primorsk); North-West China, Korea, Japan (Hokkaido and Honshu); North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Gypsonoma sociana* (Haworth, 1811)**
MATERIAL EXAMINED. 1 male, Cozzi dell'Anticristo, 1300 m, 28.V.1990, leg. Trematerra.
DISTRIBUTION. Europe from France and British Is to Ural Mts and Caucasus, Transcaucasia (Azerbaijan), Siberia, Russian Far East (Priamure, South Primorsk, South Kuril Is) and Japan. (Italy: N, C, S, Sa).
CHOROTYPE. Asiatic-European.

***Epiblema sticticanum* (Fabricius, 1794)**
MATERIAL EXAMINED. 1 male, San Lucido (Cosenza), 950 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Palaearctic species known in Europe from Spain to Ural Mts and Caucasus, north to British Is, Scandinavia and Karelia, Transcaucasia, Asia Minor, Iran, Siberia, Kazakhstan, Russian Far East (Amur Territory, South Primorsk), China and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Epiblema scutulanum* ([Denis and Schiffermüller], 1775)**
RECORDS. Sersale (Catanzaro), 3-17.VIII.1985; Sersale (Catanzaro), 3-17.VIII.1986; Soveria Mannelli (Catanzaro), 4.VI-27.VII.1987; Cozzi dell'Anticristo (Cosenza), 28.V.1989; Monte Gariglione (Catanzaro), 12.VI.1991 (in Trematerra *et al*., 1994).
DISTRIBUTION. Palaearctic species widely distributed in Europe from Iberian Peninsula to Ural Mts, known also from Siberia, Kazakhstan and Russian Far East (South Primorsk, Amur, Khabarovsk Krai); also Morocco. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Epiblema foenellum* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Fiego di San Fili (Cosenza), 720 m, 22.VII.2015, leg. Scalercio and Infusino. 2 males, Montalto Uffugo (Cosenza), 545 m, 28.VI.2016, leg. Scalercio and Infusino. 2 females, Montalto Uffugo (Cosenza), 545 m, 29.VIII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from Palaearctic and Oriental Regions. Europe from Spain and British Is to Greece, from Scandinavia to Urals and Caucasus, South-West Siberia, Kazakhstan, Central Asia, Mongolia, Russian Far East: West Tuva, Amur-Zeya area, Priamure, South Primorsk, South Sakhalin, South Kuril Is, Khabarovsk Krai; China: Manchuria, Kuanhsien, Zhejiang; Korea; Japan: Hokkaido, Honshu. Oriental region: India, China, Taiwan and Vietnam. (Italy: N, C, S).
CHOROTYPE. Subcosmopolitan.

***Epiblema costipunctana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, S. Coppola di Paola (Cosenza), 1300 m, 28.V.1990, leg. Trematerra.
DISTRIBUTION. Europe from Spain and British Is to Italy and Greece, South Scandinavia, southern and east belt of Europe. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European.

***Epiblema graphana* (Treitschke, 1835)**
MATERIAL EXAMINED. 2 males and 1 female, M.te Gariglione (Catanzaro), 1600 m, 12.VI.1991, leg. Trematerra.
DISTRIBUTION. West Europe from Spain to South Scandinavia, south to Balkan Peninsula, Asia Minor, Caucasus, Iran, Transcaucasia, Afghanistan, Kazakhstan, South-West Siberia, Transbaikal and China. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Notocelia cynosbatella* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 29.VII.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1353 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1370 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Mangiatoie (Cosenza), 1270 m, 11.V.2016, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1433 m, 6.VI.2016, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1431 m, 6.VI.2016, leg. Scalercio and Infusino. 3 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 1 male, Alessandria del Carretto (Cosenza), 1285 m, 21.VI.2017, leg. Scalercio and Infusino. 1 male, San Nicola Silano (Cosenza), 1435 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. Europe, Ural Mts, Near East, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, Mongolia, Siberia and Russian Far East. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Notocelia uddmanniana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 24.VII.2014, leg. Scalercio. 1 male, San Fili (Cosenza), 630 m, 28.V.2015, leg. Scalercio and Infusino. 1 male, Fiego di San Fili (Cosenza), 720 m, 28.V.2015, leg. Scalercio and Infusino. 1 male, Aprigliano (Cosenza), 1310 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 1080 m, 22.VI.2015, leg. Scalercio and Infusino. 1 male, Fiego di San Fili (Cosenza), 720 m, 25.VI.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 879 m, 10.V.2016, leg. Scalercio and Infusino. 1 male, S.B. Ullano (Cosenza), 825 m, 27.VII.2016, leg. Scalercio and Infusino. 1 female, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Europe, North Africa, Asia Minor, Near East, Caucasus, Transcaucasia, Transural, Iran, Kazakhstan, Tadzhikistan and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Notocelia aquana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Montagna Grande (Cosenza), 1235 m, 25.VII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. West Europe, Morocco, Ural Mts, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, West Siberia and China. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Notocelia rosaecolana* (Doubleday, 1850)**
MATERIAL EXAMINED. 1 male, Saracena (Cosenza), 1010 m, 20.V.2015, leg. Scalercio and Infusino. 1 male, Aprigliano (Cosenza), 1310 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1010 m, 19.VI.2015, leg. Scalercio and Infusino. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 6.VII.2015, leg. Scalercio and Infusino.
DISTRIBUTION. Europe from Spain, British Is and Scandinavia to Ural Mts, Caucasus, Asia Minor, Iran, Central Asia, Mongolia, Russian Far East: Amur-Zeya area, South Primorsk, South Sakhalin, South Kuril Is (Kunashir I.); North-East China, Korea, Japan (Hokkaido, Honshu, Shikoku, Kyushu), Nearctic Region: Canada and U.S.A. (Italy: N, S).
CHOROTYPE. Holarctic.

***Notocelia trimaculana* (Haworth, [1811])**
MATERIAL EXAMINED. 2 males, Alessandria del Carretto (Cosenza), 1337 m, 21.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. North Africa (Morocco), Europe from Spain, British Is and Scandinavia to Balkan Peninsula and Asia Minor, East Europe, Caucasus, Transcaucasia, Near East, Iran and Kazakhstan. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Blastesthia tessulatana* (Staudinger, 1871)**
MATERIAL EXAMINED. 3 males, Rende (Cosenza), 205 m, 14.V.2014, leg. Scalercio.
DISTRIBUTION. North Africa, South-West Europe: Iberian Peninsula, France, Malta, Italy, Switzerland, Greece, Crete, Balkan Peninsula and part of East Europe; also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-Europeo-Mediterranean.

***Rhyacionia buoliana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Aieta (Cosenza), 500 m, 12.VII.1989, leg. Hausmann.
DISTRIBUTION. Madeira, North Africa, Europe: from Iberian Peninsula, British Is and Scandinavia to Greece, Ural Mts and Caucasus; also Transcaucasia, Asia Minor, Near East (Israel), Korea, China and Japan. Introduced to Nearctic region (North America) and Neotropical region (Argentina and Uruguay). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

***Rhyacionia pinicolana* (Doubleday, 1849)**
MATERIAL EXAMINED. 1 male, Lago Cecita (Cosenza), 1163 m, 30.VII.2013, leg. Scalercio. 2 females, Fossiata (Cosenza), 1300 m, 13.VIII.2013, leg. Scalercio. 1 female, Lago Cecita (Cosenza), 1163 m, 13.VIII.2014, leg. Scalercio. 1 male, Montagna Grande (Cosenza), 1235 m, 25.VII.2016, leg. Scalercio and Infusino.

DISTRIBUTION. Europe from Iberian Peninsula, British Is and Scandinavia to Romania, Cisural, Caucasus, Transcaucasia, Siberia, Russian Far East (Amur-Zeya area, South Primorsk, South Kuril Is), China, Korea and Japan (Hokkaido). (Italy: N, S, Si).
CHOROTYPE. Asiatic-European.

***Rhyacionia pinivorana* (Lienig and Zeller, 1846)**
MATERIAL EXAMINED. 1 male, Vivaio Sbanditi (Cosenza), 1354 m, 5.VI.2015, leg. Scalercio and Infusino. 1 male, Aprigliano (Cosenza), 1310 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Mangiatoie (Cosenza), 1275 m, 11.V.2016, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1370 m, 11.V.2016, leg. Scalercio and Infusino. 1 male, Mangiatoie (Cosenza), 1275 m, 7.VI.2016, leg. Scalercio and Infusino. 1 male, San Bernardo (Cosenza), 1383 m, 7.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe from Spain, British Is and Scandinavia to former Yugoslavia and Balkan Peninsula, East Europe to Caucasus, Kazakhstan, Russia (Siberia), Far East (Amur-Zeya area, Priamure), China, Korea and Japan (Honshu). (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Clavigesta sylvestrana* (Curtis, 1850)**
MATERIAL EXAMINED. 2 males, Lago Cecita (Cosenza), 1163 m, 13.VIII.2013, leg. Scalercio. 1 male, Fossiata (Cosenza), 1300 m, 13.VIII.2013, leg. Scalercio. 8 males, Lago Cecita (Cosenza), 1176 m, 2.IX.2013, leg. Scalercio. 5 males and 2 females, Lago Cecita (Cosenza), 1163 m, 13.VIII.2014, leg. Scalercio. 1 male, Diga del Menta (Reggio Calabria), 1380 m, 26.VIII.2016, leg. Scalercio.
DISTRIBUTION. West Europe: from Spain and British Is to Italy, the Netherlands and Germany; East Europe and Greece. (Italy: N, C, S, Si).
CHOROTYPE. European.

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***Cydia semicinctana* (Kennel, 1901)**
RECORDS. Sersale (Catanzaro), 1.VI.1985; Sersale (Catanzaro), 31.VIII.1985; Sersale (Catanzaro), 10.V.1986; Sersale (Catanzaro), 16.VIII.1986; Perticaro (Catanzaro), 6.VII-3.VIII.1988; Mendicino (Cosenza), 1-15.VIII.1988 (in Trematerra *et al*., 1994).
DISTRIBUTION. Locally in Europe, Asia Minor; North Iran, Uzbekistan and Turkmenia. (Italy: N, C, S).
CHOROTYPE. Turano-European.

***Cydia succedana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Righio (Cosenza), 1355 m, 23.V.2014, leg. Scalercio. 1 male, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Montagna Grande (Cosenza), 1355 m, 11.V.2015, leg. Scalercio and Infusino. 1 male, Montagna Grande (Cosenza), 1355 m, 18.V.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 940 m, 26.V.2015, leg. Scalercio and Infusino. 2 males, S.S. Bruno (Vibo Valentia), 1040 m, 26.V.2015, leg. Scalercio and Infusino. 1 male, Fiego di San Fili (Cosenza), 740 m, 28.V.2015, leg. Scalercio and Infusino. 1 male, Vivaio Sbanditi (Cosenza), 1351 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Pedace (Cosenza), 1440 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 830 m, 10.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 840 m, 10.V.2016, leg. Scalercio and Infusino. 1 male, Mangiatoie (Cosenza), 1270 m, 11.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 840 m, 30.V.2016, leg. Scalercio and Infusino. 1 male, S.S. Bruno (Vibo Valentia), 925 m, 30.V.2016, leg. Scalercio and Infusino. 4 males, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio. 6 males and 1 female, San Nicola Silano (Cosenza), 1435 m, 17.V.2018, leg. Colacci and Goglia. 1 female, Rovale (Cosenza), 1440 m, 17.V.2018, leg. Colacci and Goglia.
DISTRIBUTION. Known from West and Central Palaearctic: Europe from Iberian Peninsula (included British Is and Scandinavia) to Morocco, Asia Minor, Transcaucasia, Iran, Afghanistan, Kazakhstan, Central Asia, South Siberia and Mongolia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cydia ulicetana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, San Fili (Cosenza), 831 m, 25.V.2017, leg. Colacci, Goglia and Scalercio.
DISTRIBUTION. Known from British Is, Germany, France and former USSR countries, in southern Europe recorded from Iberian Peninsula, Italy and Malta. Also Turkey and North Africa. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian-Maghreb extension.

***Cydia trogodana* Pröse, 1988**
MATERIAL EXAMINED. 1 male, Palizzi Marina (Reggio Calabria), 3 m, 15.V.2015, leg. Urso.
DISTRIBUTION. Europe (Spain, Italy, Greece and Crete) and Cyprus. (Italy: S, Si).
CHOROTYPE. Mediterranean.

***Cydia coniferana* (Saxesen, 1840)**
RECORDS. Sersale (Catanzaro), 15.VI-31.VIII.1985; Sersale (Catanzaro), 15.VI-31.VIII.1986 (in Trematerra *et al*., 1994).
DISTRIBUTION. Transpalaearctic species spread from Iberian Peninsula, British Is and Scandinavia to Russian Far East; Siberia and Mongolia. (Italy: N, C, S).
CHOROTYPE. Sibero-European.

***Cydia pomonella* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 male, Pianette di Dipignano (Cosenza), 765 m, 29.VII.2013, leg. Scalercio. 2 males and 1 female, Pianette di Dipignano (Cosenza), 765 m, 5.VIII.2013, leg. Scalercio. 1 male, Montalto Uffugo (Cosenza), 230 m, 24.V.2014, leg. Scalercio.
DISTRIBUTION. Covers the area of distribution of wild apple-tree, Europe, Asia, North-South America, Australia and New Zealand. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Cydia triangulella* (Goeze, 1783)**
MATERIAL EXAMINED. 1 female, S.B. Ullano (Cosenza), 893 m, 29.VIII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Paleartcic region till Japan, its area covers that of oaks. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Cydia fagiglandana* (Zeller, 1841)**
MATERIAL EXAMINED. 1 male, Pianette di Dipignano (Cosenza), 765 m, 5.VIII.2013, leg. Scalercio. 1 male, Donnici (Cosenza), 550 m, 7.VIII.2013, leg. Scalercio. 1 female, Lago Cecita (Cosenza), 1163 m, 13.VIII.2013, leg. Scalercio. 1 female, Vivaio Sbanditi (Cosenza), 1350 m, 26.VI.2014, leg. Scalercio. 1 male, Lago Cecita (Cosenza), 1163 m, 13.VIII.2014, leg. Scalercio. 1 female, Saracena (Cosenza), 1010 m, 20.V.2015, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1010 m, 19.VI.2015, leg. Scalercio and Infusino. 1 male, Saracena (Cosenza), 1460 m, 20.VII.2015, leg. Scalercio and Infusino. 2 females, Montagna Grande (Cosenza), 1355 m, 25.VII.2016, leg. Scalercio and Infusino. 1 female, Lungro (Cosenza), 1270 m, 1.VIII.2016, leg. Scalercio and Infusino. 1 female, Acquaformosa (Cosenza), 1357 m, 1.VIII.2016, leg. Scalercio and Infusino. 1 female, Montalto Uffugo (Cosenza), 545 m, 29.VIII.2016, leg. Scalercio and Infusino. 1 female, S.B. Ullano (Cosenza), 731 m, 29.VIII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe, Madeira, North-West Africa, Asia Minor, Syria, Iran, and Caucasus. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cydia amplana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, f. Argentino (Cosenza), 250 m, 4.IX.1991, leg. Hausmann.
DISTRIBUTION. W Palaearctic species known from whole Europe, included British Islands and Sweden; Transcaucasia; Asia Minor and Syria. Bound rather with southern territories. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Lathronympha strigana* (Fabricius, 1775)**
MATERIAL EXAMINED. 1 male, Aprigliano (Cosenza), 1310 m, 15.VI.2015, leg. Scalercio and Infusino. 1 male, Alessandria del Carretto (Cosenza), 1291 m, 21.VI.2017, leg. Scalercio and Infusino.
DISTRIBUTION. Europe, Caucasus, Asia Minor and Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Sibero-European.

***Selania leplastriana* (Curtis, 1831)**
MATERIAL EXAMINED. 1 female, Sangineto (Cosenza), 50 m, 10.VIII.2014, leg. Scalercio.
DISTRIBUTION. A West Palaearctic species known from Madeira, North Africa, Europe included Great Britain and Sweden, also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Selania capparidana* (Zeller, 1847)**
MATERIAL EXAMINED. 4 males and 4 females, Copanello (Catanzaro), 70 m, 25.VII.1996, leg. ?. 4 males and 4 females, Copanello (Catanzaro), 70 m, 10.VIII.1996, leg. Trematerra.
DISTRIBUTION. North Africa and South-West Europe (Spain to Greece). (Italy: N, S, Si, Sa).
CHOROTYPE. Mediterranean.

***Grapholita fissana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male, S.B. Ullano (Cosenza), 893 m, 1.VI.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Known from Europe except for British Is and North Scandinavia, east to Ural Mts, Ciscaucasia and Transcaucasia; also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian extension.

***Grapholita difficilana* (Walsingam, 1900)**
MATERIAL EXAMINED. 1 male, Cozzi dell'Anticristo (Cosenza), 1300 m, 28.V.1990, leg. Trematerra. 1 female, lago Ampollino (Cosenza), 1300 m, 11.VI.1991, leg. Trematerra. 5 females, Cozzi dell'Anticristo (Cosenza), 1300 m, 13.VI.1991, leg. Trematerra.
DISTRIBUTION. Known from Europe (former USSR countries, Slovakia, Germany, Belgium, France, Italy and Hungary), Asia Minor and Syria. (Italy: C, S, Sa).
CHOROTYPE. Europeo-Mediterranean.

***Grapholita lunulana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Donnici (Cosenza), 550 m, 18.V.2014, leg. Scalercio.
DISTRIBUTION. West and Central parts of Palaearctic region: Entire Europe as far as Karelia and Ural Mts. Also Central-North Africa, Asia Minor, Caucasus, mountains of Central Asia as far as Altaj. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Grapholita orobana* Treitschke, 1830**
RECORDS. Sersale (Catanzaro), 15.VI-6.VII.1985; Sersale (Catanzaro), 15.VI-6.VII.1986; Soveria Mannelli (Catanzaro), 4.VI-23.VII.1987; Soveria Mannelli (Catanzaro), 4.VI-23.VII.1988; Mendicino (Cosenza), 6-20.VII.1987; Mendicino (Cosenza), 27.VI-4.VII.1988; Monte Cerviero (Cosenza), 28.V.1989 (in Trematerra *et al*., 1994).
DISTRIBUTION. Europe (excluded Portugal and Ireland), Asia Minor, Transcaucasus, North Iran, Kazakhstan, Russian Far East and Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Sibero-European.

***Grapholita gemmiferana* Treitschke, 1835**
RECORDS. Sersale (Catanzaro), 28.V-22.VI.1985; Sersale (Catanzaro), 10.V.1986; Sersale (Catanzaro), 6.VII.1986; Soveria Mannelli (Catanzaro), 4-25.VI.1987 (in Trematerra *et al*., 1994).
DISTRIBUTION. Palaearctic region: Europe from Iberian Peninsula, Great Britain and Sweden to East Europe and Greece; also Asia Minor, northern part of Russia, Transcaucasia, Kazakhstan and South-West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Sibero-European.

***Grapholita lathyrana* (Hübner, [1811-1813])**
MATERIAL EXAMINED. 1 male, Gariglione (Catanzaro), 1600 m, 12.VI.1991, leg. Trematerra.
DISTRIBUTION. European species distributed from Biritsh Is, France, Italy and Greece to East Europe (Moscow). (Italy: N, C, S, Si).
CHOROTYPE. European.

***Grapholita funebrana* Treitschke, 1835**
RECORDS. Sersale (Catanzaro), 22.VI-14.IX.1985; Sersale (Catanzaro), 17.V-16.VIII.1986; Soveria Mannelli (Catanzaro), 4.VI-10.IX.1987; Mendicino (Cosenza), 22.VI-21.IX.1987; Soveria Mannelli (Catanzaro), 4.VI-10.IX.1988; Mendicino (Cosenza), 22.VI-21.IX.1988; Perticaro (Catanzaro), 24.VI-20.VIII.1988; Mendicino (Cosenza), 22.VI-21.IX.1989 (in Trematerra *et al*., 1994).
DISTRIBUTION. Two forms known. The western form occurs in Europe (except for Shetland Is and North Scandinavia), North Africa, Asia Minor, Central Asia and South Kazakhstan. The eastern form is recorded from Transbaikalia to China and Japan (Honsyu, Hokkaido). Artificially introduced to many territories. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Grapholita janthinana* (Duponchel, 1835)**
RECORDS. Sersale (Catanzaro), 12.VII-2.VIII.1986; Mendicino (Cosenza), 20.VII.1987 (in Trematerra *et al*.,1994).
DISTRIBUTION. Europe, Asia Minor, Crimea, Transcaucasia and Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Grapholita tenebrosana* Duponchel, 1843**
RECORDS. Sersale (Catanzaro), 15.VI-27.VII.1985; Sersale (Catanzaro), 15.VI-27.VII.1986; Soveria Mannelli (Catanzaro), 4.VI-2.VII.1987; Soveria Mannelli (Catanzaro), 4.VI-2.VII.1988; Mendicino (Cosenza), 29.VI.1989 (in Trematerra *et al*., 1994).
DISTRIBUTION. Palaearctic species known from Europe, Asia Minor then from Siberia, Transcaucasia, Kazakhstan, Russian far East (Kuril Is) and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Pammene amygdalana* (Duponchel, 1842)**
MATERIAL EXAMINED. 1 male, Pianette di Dipignano (Cosenza), 765 m, 29.VII.2013, leg. Scalercio.
DISTRIBUTION. Known from western part of Palaearctic from North Africa, Europe excluded northern parts, Asia Minor and Syria. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Europeo-Mediterranean.

***Pammene querceti* Gozmány, 1957**
RECORDS. Sersale (Catanzaro), 25.V.1985; Sersale (Catanzaro), 10.VIII.1985; Sersale (Catanzaro), 10.V-7.VI.1986 (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from Europe (Czech Republic, Slovakia, France, Austria, Italy, Hungary and former Yugoslavia). (Italy: C, S, Si).
CHOROTYPE. S-European.

***Pammene fasciana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 1 male, Fiego di San Fili (Cosenza), 740 m, 25.VI.2015, leg. Scalercio and Infusino. 2 females, S.B. Ullano (Cosenza), 825 m, 27.VII.2016, leg. Scalercio and Infusino. 2 males, Montalto Uffugo (Cosenza), 550 m, 29.VIII.2016, leg. Scalercio and Infusino.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Pammene argyrana* (Hübner, 1799)**
RECORDS. Sersale (Catanzaro) 13.VII-17.VIII.1985 (in Trematerra *et al*., 1994).
DISTRIBUTION. European species whose area of repartition extends east as far as to Caucasus. In North Europe recorded from British Is and Scandinavia. (Italy: N, C, S).
CHOROTYPE. European.
REMARKS. Collected in July-August, previously reported in Trematerra (2003) from April to June.

***Pammene albuginana* (Guenée, 1845)**
RECORDS. Sersale (Catanzaro), 14.IX.1985; Sersale (Catanzaro), 7.V.1986; Soveria Mannelli (Catanzaro), 4.VI.1987; Mendicino (Cosenza), 28.IX-19.X.1987; Soveria Mannelli (Catanzaro), 1.X.1987 (in Trematerra *et al*., 1994).
DISTRIBUTION. European species distributed from Iberian Peninsula, British Is and Scandinavia to South-East European part of Russia. (Italy: N, C, S).
CHOROTYPE. European.

***Pammene gallicolana* (Lienig and Zeller, 1846)**
RECORDS. Sersale (Catanzaro), 29.VI-5.X.1985; Sersale (Catanzaro), 10.V-2.VIII.1986; Mendicino (Cosenza), 1.VI-12.X.1987; Soveria Mannelli (Catanzaro), 4.VI-8.X.1987; Mendicino (Cosenza), 1.VI-12.X.1988; Perticaro (Catanzaro), 20.VII.1988; Mendicino (Cosenza), 1.VI-12.X.1989 (in Trematerra *et al*., 1994).
DISTRIBUTION. European species whose repartition area is included in that of *Quercus robur* L.: Eastwards it reaches Ukraine and Moldavia. (Italy: N, C, S).
CHOROTYPE. European.

***Pammene spiniana* (Duponchel, 1843)**
RECORDS. Soveria Mannelli (Catanzaro), 20.VIII-8.X.1987; Mendicino (Cosenza), 21.IX-19.X.1987 (in Trematerra *et al*., 1994).
DISTRIBUTION. West Palaearctic species known from Europe (north to British Is and Sweden, south to Mediterranean Sea, east in southern part of European Russia) and North Africa. (Italy: N, C, S).
CHOROTYPE. European with Maghreb extension.

***Pammene blockiana* (Herrich-Schäffer, 1851)**
RECORDS. Sersale (Catanzaro), 19.VII-2.VIII.1986 (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from Europe (former USSR countries, Germany, France, Italy and former Yugoslavia) and Black Sea coast. (Italy: N, C, S).
CHOROTYPE. S-European.

***Pammene aurana* (Fabricius, 1775)**
RECORDS. Sersale (Catanzaro), 20.VII.1985; Soveria Mannelli (Catanzaro), 17.IX.1987 (in Trematerra *et al*., 1994).
DISTRIBUTION. Known from West and Central Palaearctic: from Europe (Spain) to South Siberia and Kazakhstan (Kuznetsk Ala Tau), then Russian Far East and Japan. (Italy: N, S).
CHOROTYPE. Asiatic-European.

***Strophedra nitidana* (Fabricius, 1794)**
MATERIAL EXAMINED. 1 male, S.S. Bruno (Vibo Valentia), 830 m, 30.V.2016, leg. Scalercio and Infusino.
DISTRIBUTION. European-Manchurian species known from Portugal to Caucasus then from China, Amur Territory, Korea and Japan. (Italy: N, C, S).
CHOROTYPE. Asiatic-European.

***Dichrorampha acuminatana* (Lienig and Zeller, 1846)**
RECORDS. Sersale (Catanzaro), 29.VI.1985; Copanello (Catanzaro), 24.IV.1992, leg. Trematerra (in Trematerra *et al*., 1994).
DISTRIBUTION. West Palaearctic species known from Spain (British Is and Scandinavia included) to Karelia and Crimea; also Morocco and Asia Minor. Reported from North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Dichrorampha letarfensis* Gibeaux, 1983**
MATERIAL EXAMINED. 4 males and 5 females, Copanello (Catanzaro), 20 m, 24.IV.1992, leg. Trematerra.
DISTRIBUTION. Known from Western Mediterraneum: North-West Africa: Morocco, Algeria, and Tunisia; Europe: Portugal and Italy. (Italy: N, C, S, Si).
CHOROTYPE. W-Mediterranean.

***Dichrorampha gemellana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 male, Lago Cecita (Cosenza), 1176 m, 2.IX.2013, leg. Scalercio.
DISTRIBUTION. Known from Europe (France, Corsica and Italy). (Italy: N, S, Si, Sa).
CHOROTYPE. Tirrenic.

During our entomological expeditions realized from 2013 to 2018 in Calabria region, 123 species of Lepidoptera Tortricidae were caught, to which we added 23 species deposited in the Trematerra Collection and other 36 species reported by Trematerra in the course of entomological researches carried out in the past in the Calabrian territory, up to a total of 182 *taxa* of the family. Species belonging to all the tribes cited in the Italian fauna (Trematerra, 2003) have been found in Calabria, with the exception of the members of the Sparganothini tribe (subfamily Tortricinae), the two most numerous tortricids subfamilies recorded are the Tortricinae and the Olethreutinae, which has 76 species and 102 species, respectively; the subfamily Chlidanotinae is represented by 4 *taxa*.

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CHAPTER 6

FAUNISTIC NOTES ON LEPIDOPTERA TORTRICIDAE FROM SICILY (SOUTH ITALY)

Data were taken in part from the following publication:

Trematerra P, Colacci M, **Goglia L**, Bella S (2021) Lepidoptera Tortricidae from Sicily with new *taxa* for Italian and European fauna and description of *Thiodia major* (Rebel) and *Pammene castanicola* Trematerra females. *Journal of Entomological and Acarological Research,* doi: 10.4081/jear.2021.10144 (in press).

6.1 INTRODUCTION

Over time, the Lepidoptera fauna of Sicily has received the attention of Italian and foreign entomologists, especially for the zoogeographic interest of the Island, for the richness of biotopes and for tourism interest.

The main contributions referring to the Tortricidae family can be found in the work of Minà-Palumbo and Failla-Tebaldi (1889) in which the Authors listed 113 tortricids living on the Island. After the catalog of Enrico Ragusa (1905) dedicated to the moths of Sicily, in 1938 Mariani published a new catalog, which groups 15 years of research carried out on the Island, 184 species were assigned to the tortricids to which with delay, in a note appeared in 1948, due to "the serious events that have engulfed our country", the same Author adds *Tortrix amplana* (Hübner) and *Phalonidia atricapitana* (Stephens). 61 years after the publication of Curò's catalog of Lepidoptera d'Italia (1880), Mariani (1940-41) prints his *Fauna Lepidopterorum Italiae*, where Sicily is among the best known areas of Italy.

During the spring of 1954 Mariani and Klimesch decided to collaborate to draw up an *addenda* to the Catalog of the Lepidoptera of Sicily. However, they were able to carry out their work only in 1957, after the completion of the studies of some groups by foreign specialist entomologists and once the description of the new species found was ready. Thus, 10 Tortricidae were added to the first *addenda* (Mariani and Klimesch, 1957).

In 1999, the annotated list of Lepidoptera Tortricidae collected in Sicily by Salvatore Bella and Paolo Russo near the interesting wetland of Pantano Longarini (Syracuse-Ragusa provinces) was reported by Trematerra *et al*. (1999), where 15 species of Tortricidae were listed, some of which of particular interest as *Cochylis salebrana* (Mann, 1862) and *Bactra furfurana* (Haworth, [1811]) found for the first time on the Island, and *Cydia multistriana* (Chrétien, 1915) new to Europe, previously known only for Tunisia and Morocco. Romano and Romano (1995), after a field trip carried out on the islands of Lampedusa, Linosa and Pantelleria cited three common species of tortricids, while Trematerra (1999) reports *Aethes rubiginana* (Walsingham, 1903) collected in Taormina and Lipari as new for Italy. In the same year, studying the material collected by Friedrich von Hartig in different locations in Sicily, especially from Etna Mount, it was possible to describe *Cnephasia etnana* Razowski and Trematerra 1999 (Razowski and Trematerra, 1999), and from the Pantani di Vendicari (Syracuse province) was described the new species *Pelochrista cannatana* Trematerra, 2000 (Trematerra, 2000).

In the Catalog of "Lepidoptera Tortricidae della fauna italiana" realized by Trematerra (2003) 246 species are listed for Sicily. A few years later, among the chestnut groves of Milo, on the slopes of Etna, specimens of *Pammene* Hübner were found and described as *castanicola* Trematerra, 2009 (Trematerra and Clausi, 2009).

By checking Fauna Europaea (Aarvik, 2013) and from a further survey of the international papers, other species collected in Sicily can be traced (Trematerra unpublished data), some of which are endemic, so much so as to bring the fauna of the Tortricidae to 250 entities, one of the richest region in Italy.

Following the study results of the material collected and preserved by dr Salvatore Bella in his collection and surveys on the territory carried out over time by the other co-authors of the paper. The majority of the species studied were collected mainly in the Etna Natural Park, Iblei Mountains, Nebrodi Natural Park, and Peloritani Mountains.

6.2 MATERIALS AND METHODS

Sicily is widely recognized as one of the main biodiversity hot-spots in the Mediterranean Basin. Our entomological expeditions visited the following eleven 'macro areas' of Sicily: Lipari Island, Vulcano Island, Peloritani Mounts, Madonie Mounts, Nebrodi Mounts, Etna Mount, Erei Mounts, Piana di Catania, Agrigento area, Iblei Mounts, and Pantelleria Island (Fig. 6.1, Table 6.1).

Lipari Island and Vulcano Island, they are typically Mediterranean, quite rich and well diversified flora, with a predominance of thermophytic and xerophytic species. *Pinus radiata* D. Don, *P. pinaster* Aiton and *P. halepensis* Mill., *Vitis* L., *Capparis spinosa* L., *Opuntia ficus-indica* (L.) Mill., *Prunus spinosa* L., *Mesembryanthemum* L., *Genista ephedroides* DC., *Nerium oleander* L., and *Casuarina* spp. L. are the most common plants.

Peloritani Mounts (Fig. 6.2 A), together with the Aspromonte, Serre and Sila Massif (Calabria region), they represent a patch of the Alpine orogeny located in the central part of the Mediterranean Basin: the so-called Calabrian-Peloritani Arc. The physiognomic diversity determines a remarkable variety of habitat, with an extraordinary richness in flora and vegetation. The rich flora of this territory includes rare and highly localized palaeo-endemites, such as *Colymbada tauromentana* (Guss.) Holub., *Brassica raimondoi* Sciandr. and *Limonium sibthorpianum* (Guss.) Kuntze.

Madonie Mounts, one of the park's most notable natural features is the extensive forest of beech trees (*Fagus* L.) found only at 1,500 meters and above. These are the most southerly beech forests in Europe. Lower down, below 1,600 meters, there are large forests of *Quercus ilex* L., *Q. pubescens* Willd. and *Q. suber* L., and the rare manna ash (*Fraxinus ornus* L.) is still farmed. Also *Abies nebrodensis* (Lojac.) Mattei is present. The mountains contain some 1,500 species and sub-species of plants, around 60% of all those found in Sicily.

Nebrodi Mounts (Fig. 6.2 B), are a mountain range that runs along the north east of Sicily. Together with the Madonie and the Peloritani they form the Sicilian Apennines. Much of the mountains are covered by thick forests of cork trees (*Quercus suber* L.) on the lowest slopes giving way to oak (*Quercus* spp. L.) and then beech (*Fagus* spp. L.) at the higher elevations. Yew trees (*Taxus baccata* L.) occur in the beech forests. In many areas the upland forest has been cleared to make mountain pastures.

Etna Mount (Fig. 6.2 C), in the basement the landscape is dominated by citrus groves, vineyards, olive groves, almond groves, pistachio groves and fruit trees. In the altitudinal range between 1,000 and 1,500 meters, the vegetation is characterized by pine forests with *Pinus nigra laricio* (Poir.) Maire, *Betula aetnensis* Raf., *Fagus sylvatica* L. and *Populus tremula* L. Chestnut groves are widespread in the same climatic zone as the oaks. In the plain between 1,500 and 2,400 meters the *Astragalus* spp. L. is in association with *Berberis aetnensis* C. Presl, *Juniperus hemisfaerica* J. and C. Presl, *Genista aetnensis* (Biv.) DC., *Viola aetnensis* (Ging. and DC.) Strobl, *Cerastium minus* Schur. *Saponaria sicula* Raf. and *Rumex aetnensis* C. Presl live among the sands and lapilli. Above 2,400 meters, only sparse populations of *Rumex* spp. L. and *Senecio* spp. L. survive.

Erei Mounts, are characterized by *Eucalyptus* forests (*Eucalyptus camaldulensis* Dehnh., *E. globulus* Labill., *E. botrioydes* Sm., *E. gomphocephala* DC., *E. trabutii* M. Vilm., and *E. maidenii* F. Muell.), poplar grove, pine forest of *Pinus pinea* L., and pastures.



Figure 6.1 – Sicily region (South Italy) and trapping localities visited. Lipari Island (1); Vulcano Island (2); Peloritani Mounts (3); Madonie Mounts (4); Nebrodi Mounts (5); Etna Mount (6); Erei Mounts (7); Piana di Catania (8); Agrigento area (9); Iblei Mounts (10); Pantelleria Island (11).

Piana di Catania (Fig. 6.2 D), the prevalent agriculture in the Catania plain is citrus with an almost absolute prevalence of orange, but there are also olive groves, cereal and legume cultivation.

Agrigento area (Fig. 6.2 E), the area comprises three different habitats: a natural wooded area, dominated by *Quercus pubescens* Willd. and by *Q. ilex* L., a reforested evergreen pine area comprising *Pinus halepensis* Mill. and *Cupressus sempervirens* L., and a section of the reforested pine area that was transformed by sylvicultural management to include *Quercus* L., *Fraxinus* L., *Acer* L. and *Ulmus* L.

Iblei Mounts (Fig. 6.2 F), environment characterized by scattered crops and carob trees (*Ceratonia siliqua* L.). In Longarini and Pantano Cuba there are *Salicornia* spp. L., *Salsola* spp. L., *Arthrocnemum* spp. Moq., *Limonium* spp. Mill., *Juncus* spp. L. and in the less salty areas *Carex* spp. L. and *Phragmites* spp. Adans.

Pantelleria Island, territory characterized by the presence of a natural wood of *Pinus pinaster* var. *cossyra* Aiton, woods of *P. halepensis* Mill., mediterranean bush, vineyards, cultivation of figs and capers. *Quercus ilex* L., *Erica multiflora* L. and *E. arborea* L., *Arbustus unedo* L., *Cistus* L. are also present.





Figure 6.2 - Details of some investigated environmentals in Sicily region (South Italy): Peloritani Mounts, Riserva Naturale Orientata Fiumedinisi e Monte Scuderi, Fiumedinisi (Messina), 302 m/a.s.l. (A); Nebrodi Mounts, Riserva Orientata Naturale Bosco di Malabotta, Montalbano Elicona (Messina), 1,224 m/a.s.l. (B); Etna Mounts, Monte Pomiciaro, Zafferana Etnea (Catania), 1,432 m/a.s.l. (C); Piana di Catania, Oasi del Simeto (Catania), 1 m/a.s.l. (D); Agrigento area, Riserva Naturale Orientata Monte Cammarata, Santo Stefano Quisquina (Agrigento), 968 m/a.s.l. (E); Iblei Mounts, Sortino (Syracuse), 368 m/a.s.l. (F).

Table 6.1 – List of Sicilian localities and sites visited.

1 – LIPARI ISLAND
Lipari - Isole Eolie (Messina)

2 – VULCANO ISLAND
Vulcano - Isole Eolie (Messina)

3 – PELORITANI MOUNTS
Peloritani1 - Alì Superiore (Messina), Contrada Ferrera (Monte Scuderi), 550 m
Peloritani2 - Fiumedinisi (Messina), 301 m
Peloritani3 - Fiumedinisi (Messina), 550 m
Peloritani4 - Taormina (Messina), 100 m

4 – MADONIE MOUNTS
Madonie1 - Cefalù (Palermo), Mazzaforno, 30 m
Madonie2 - Collesano (Palermo), Contrada Volpignano, 900 m
Madonie3 - Isnello (Palermo), Piano Zucchi, 1000 m
Madonie4 - Petralia Sottana (Palermo), Portella Arena, Piano Battaglia, 1520 m
Madonie5 - Petralia Sottana (Palermo), Piano Battaglia, 1850 m

5 – NEBRODI MOUNTS
Nebrodi1 - Caronia (Messina), Fiumara Caronia, 50 m
Nebrodi2 - Cesarò (Messina), Contrada Radica, 1300 m
Nebrodi3 - Cesarò (Messina), Biviere di Cesarò, 1300 m
Nebrodi4 - Cesarò (Messina), Portella Calacudera, 1300 m
Nebrodi5 - Cesarò (Messina), Monte Soro, 1572 m
Nebrodi6 - Montalbano Elicona (Messina), Bosco di Malabotta, 1204 m
Nebrodi7 - Torrenova (Messina)

6 – ETNA MOUNT
Etna1 - Aci Catena (Catania), Contrada Tor di Casalotto, 225 m
Etna2 - Aci Sant'Antonio (Catania), Santa Maria la Stella, località Boschetto, 366 m
Etna3 - Acireale (Catania), Pennisi, località Sciare Torrisi, 460 m
Etna4 - Belpasso (Catania), Milia, Monte San Leo, 1040 m
Etna5 - Biancavilla (Catania), Milia, Rugoso Grosso, 1500 m
Etna6 - Bronte (Catania), Ponte di Serravalle, 563 m
Etna7 - Castiglione di Sicilia (Catania), Bosco Ragabo, Caserma Pitarrone, 1480 m
Etna8 - Castiglione di Sicilia (Catania), Vallone Medda, 530 m
Etna9 - Catania, Cibali, 86 m
Etna10 - Catania, Monte Po, 100 m
Etna11 - Catania, Cittadella Universitaria, 150 m
Etna12 - Catania, Orto Botanico
Etna13 - Catania, San Giovanni Galermo, 296 m
Etna14 - Catania, Sant'Agata li Battiati, 300 m
Etna15 - Trecastagni (Catania), Cozzarelle, 791 m
Etna16 - Pedara (Catania), 600 m
Etna17 - Nicolosi (Catania), località Ragala, 950 m
Etna18 - Etna Nord (Catania), Bosco di betulle, Rifugio Citelli, 1600-1700 m
Etna19 - Etna Sud (Catania), Starda Nicolosi, Rifugio Sapienza, 1000-1600 m
Etna20 - Fiumefreddo di Sicilia (Catania), 5 m
Etna21 - Giarre (Catania), Cava Grande, 327 m
Etna22 - Linguaglossa (Catania), Contrada Salici, 570 m
Etna23 - Linguaglossa (Catania), 966 m
Etna24 - Linguaglossa (Catania), Bosco Ragabo, Rifugio Brunek, 1400 m
Etna25 - Linguaglossa (Catania), Monte Baracca, 1723 m
Etna26 - Monte Etna, versante orientale (Catania), Rifugio Citelli, 1700 m
Etna27 - Maletto (Catania), Fontana Murata, 1000 m
Etna28 - Mascalucia (Catania), Bosco di Massa Annunziata, 550 m
Etna29 - Mascalucia (Catania), Massa Annunziata, 550 m
Etna30 - Milo (Catania), Bosco Nicolosi, 750 m
Etna31 - Milo (Catania), 800-1000 m
Etna32 - Milo (Catania), Fornazzo, 824 m
Etna33 - Milo (Catania), Località Casa Pietra Cannone, 1150 m
Etna34 - Monte Etna Sud (Catania), 1900 m
Etna35 - Monte Etna (Catania), Nicolosi, località Ragala, 950 m
Etna36 - Monte Etna (Catania), Belpasso, 1100 m
Etna37 - Monte Etna (Catania), Nicolosi, contrada Camercia, 1100 m
Etna38 - Monte Etna (Catania), Zafferana, contrada Cerrita, 1350 m
Etna39 - Monte Etna (Catania), Zafferana, Piano delle Donne, 1500 m
Etna40 - Monte Etna (Catania), Zafferana, Rifugio Citelli, 1746 m
Etna41 - Monte Etna, versante Sud (Catania), Sciarre di Mascalucia (Pedara), 500 m
Etna42 - Monte Etna, versante Sud (Catania), Ragala, 800 m
Etna43 - Monte Etna, versante Sud (Catania), Castagneti di Pedara, 900-1000 m
Etna44 - Monte Etna, versante Sud (Catania), Monte Faggi, 1650 m
Etna45 - Monte Etna, versante Sud (Catania), Piano del Vescovo, 1700 m
Etna46 - Monte Etna, versante Sud (Catania), dintorni Grand Hotel, 1900 m
Etna47 - Monte Etna, versante occidentale (Catania), Frutt. Intralco, 1380 m

Etna48 - Monte Etna, versante occidentale (Catania), Piano Falanea, 1500 m
Etna49 - Monte Etna, versante occidentale (Catania), Pineta, 1600-1800 m
Etna50 - Monte Etna, versante occidentale (Catania), Albergo Serra la Neve, 1650 m
Etna51 - Monte Etna, versante occidentale (Catania), Citelli, 1700 m
Etna52 - Monte Etna versante occidentale (Catania), Pineta, 1700 m
Etna53 - Nicolosi (Catania), Monti Rossi, 750 m
Etna54 - Piedimonte Etneo (Catania), Presa, 606 m
Etna55 - Piedimonte Etneo (Catania), Vena, 771 m
Etna56 - Ragalna (Catania), Milia, 1250 m
Etna57 - Ragalna (Catania), Milia, 1260 m
Etna58 - Ragalna (Catania), Milia, 1326 m
Etna59 - Ragalna (Catania), Piano Vetore, 1700 m
Etna60 - Randazzo (Catania), Monte Santa Maria, 1400 m
Etna61 - Randazzo (Catania), Lago Trearie, 1420 m
Etna62 - San Gregorio di Catania (Catania), Contrada Cerza, 120 m
Etna63 - San Gregorio di Catania (Catania), Complesso Immacolatelle e Micio Conti, 200 m
Etna64 - San Gregorio di Catania (Catania), Complesso Immacolatelle, 294 m
Etna65 - Sant'Agata li Battiati (Catania), 325 m
Etna66 - Sant'Alfio (Catania), Magazzeni, 1020 m
Etna67 - Sant'Alfio (Catania), Magazzeni, località Pietrafucile, 1100 m
Etna68 - Sant'Alfio (Catania), Contrada Cerrita, 1358 m
Etna69 - Sant'Alfio (Catania), Monti Sartorius, 1700 m
Etna70 - Sant'Alfio (Catania), Rifugio Citelli, 1746 m
Etna71 - Santa Venerina (Catania), Monachella, 300 m
Etna72 - Trecastagni (Catania), Monte Cicirello, 965 m
Etna73 - Tremestieri Etneo (Catania), 450 m
Etna74 - Viagrande (Catania), Monte Serra, 504 m
Etna75 - Zafferana (Catania), Valle San Giacomo, 700 m
Etna76 - Zafferana (Catania), 1500 m
Etna77 - Zafferana Etnea (Catania), Valle San Giacomo, 600 m
Etna78 - Zafferana Etnea (Catania), Valle San Giacomo, 740 m
Etna79 - Zafferana Etnea (Catania), Piano Dell'Acqua, 742 m
Etna80 - Zafferana Etnea (Catania), Monte Zoccolaro, 1000 m
Etna81 - Zafferana Etnea (Catania), Case del Vescovo, 1374 m
Etna82 - Zafferana Etnea (Catania), Valle del Tripodo, 1460 m

7 – EREI MOUNTS
Erei - Nicosia (Enna), 688 m

8 – PIANA DI CATANIA
Piana di Catania1 - Catania, Contrada Primosole, 0-5 m
Piana di Catania2 - Catania, Contrada Spina Santa, 0-5 m
Piana di Catania3 - Catania, Contrada Spina Santa, 18 m
Piana di Catania4 - Catania, Contrada Torre Allegra, 0-5 m
Piana di Catania5 - Catania, Foce fiume Simeto, 0-5 m
Piana di Catania6 - Catania, Oasi del fiume Simeto, Contrada Primosole, 0-5 m
Piana di Catania7 - Catania, Foce del fiume Simeto, 3 m
Piana di Catania8 - Catania, Foce fiume San Leonardo, 0-5 m
Piana di Catania9 - Catania, Plaia Pineta

9 – AGRIGENTO AREA
Agrigento1 - Santo Stefano Quisquina (Agrigento), 940 m
Agrigento2 - Siculiana (Agrigento), Torre Salsa, Valle Pantano, 50 m

10 – IBLEI MOUNTS
Iblei1 - Vizzini (Catania), Fiume Vizzini, 320 m
Iblei2 - Vizzini (Catania), Fiume Vizzini, Contrada Rubalà, 320 m
Iblei3 - Vizzini (Catania), Contrada Paradiso, 510 m
Iblei4 - Vizzini (Catania), Fiume Vizzini, Contrada Poggio Lago, 580 m
Iblei5 - Monterosso Almo (Ragusa), Monte Lauro, 750 m
Iblei6 - Ragusa, 400 m
Iblei7 - Santa Croce Camerina (Ragusa)
Iblei8 - Vittoria (Ragusa), Pineta d'Aleppo, 91 m
Iblei9 - Augusta (Siracusa), Castelluccio, 15 m
Iblei10 - Avola (Siracusa), Fiume Cassibile, 39 m
Iblei11 - Noto (Siracusa), Cava Carosello, 322 m
Iblei12 - Noto (Siracusa), Fiume Manghisi, Ponte SS 287, 396 m
Iblei13 - Noto (Siracusa), Testa dell'Acqua, 590 m
Iblei14 - Pachino (Siracusa), Marzamemi, 0-5 m
Iblei15 - Pachino (Siracusa), Pantano Longarini, 0-5 m
Iblei16 - Portopalo di Capo Passero (Siracusa), Capo Isola delle Correnti, 0-5 m
Iblei17 - Sortino (Siracusa), Valle Fiume Anapo, Contrada Fusco, 200 m
Iblei18 - Sortino (Siracusa), 368 m

11 – PANTELLERIA ISLAND
Pantelleria - Isola di Pantelleria (Trapani), Sateria, 10 m

6.3 RESULTS

As reported in Chapter 2, in the present chapter, in compiling the different lists, the indications reported by Razowski (2002, 2003, 2009) and Aarvik (2013), were followed, with some modifications suggested by Brown (2005) and by Gilligan *et al*. (2018) waiting for the recent revision on the tribe Cochylini, proposed at the genetic level by Brown *et al*. 2019, is widely adopted. Distribution of the species was largely taken from Trematerra (2003) with new data from Trematerra's personal catalogue (unpubl. data). For distribution of species in Italy we reported N (north); C (centre); S (south); Si (Sicily); Sa (Sardinia) (Trematerra, 2003). Chorotype of the species was taken from Vigna Taglianti *et al*. (1992, 1999) and Parenzan (1994).

LIST OF TAXA TORTRICIDAE

SUBFAMILY TORTRICINAE

TRIBE TORTRICINI

***Tortrix viridana* Linnaeus, 1758**
MATERIAL EXAMINED. Madonie1: 3 females, 10.VI.1993. Etna5: 1 male, 28.VI.1995; 5 males, 25.VI.1996; 1 male, 16.VII.1996. Etna6: 1 female, 31.V.2000.
DISTRIBUTION. A West Palaearctic species: North-West Africa, Europe from Iberian Peninsula to Ural Mts, Georgia, Azerbaijan, Asia Minor, Iran and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W- Palaearctic.

***Aleimma loeflingiana* (Linnaeus, 1758)**
MATERIAL EXAMINED. Etna5: 1 male, 28.VI.1995; 1 male and 6 females, 16.VII.1996. Etna6: 1 male, 31.V.2000. Etna63: 1 female, 8.XI.1991.
DISTRIBUTION. Europe, Ural Mts, Caucasus, Syria and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Acleris forsskaleana* (Linnaeus, 1758)**
MATERIAL EXAMINED. Nebrodi5: 1 male, 3.VIII.1992.
DISTRIBUTION. Europe, Caucasus, Transcaucasia, Turkmenia and Iran. Introduced in North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Acleris sparsana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna15: 1 male, 5.IX.2020.
DISTRIBUTION. European species: from Spain to Caucasus, northern part included; also Faeroe Islands, Asia Minor and Transcaucasia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian-Caucasian extension.

***Acleris rhombana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Peloritani1: 1 male, 4.X.1995. Nebrodi5: 1 male, 3.VIII.1992. Etna5: 1 male and 1 female, 20.X.1993; 2 males, 8.IX.1994; 1 female, 19.IX.1995; 1 male and 3 females, 15.X.1996; 1 female, 20.VIII.1999. Etna15: 1 male, 5.IX.2020. Etna30: 1 male, 24.X.1994. Etna47: 1 male, 30.X.1949. Etna48: 1 male, 30.X.1949. Etna56: 1 female, 5.IX.1995. Etna58: 1 female, 29.VIII.1991; 1 male, 8.IX.1995. Etna77: 2 males and 2 females, 3.VII.1995. Etna78: 1 female, 3.VII.1995. Etna82: 5 males and 2 females, 3.X.1994. Erei: 1 male, II.2000.
DISTRIBUTION. West Palaearctic: Europe to Caucasus, Armenia and Turkmenia; also Asia Minor and North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Acleris variegana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna2: 1 female, 21.VI.1996. Etna21: 1 male, 6.X.1991. Etna22: 1 female, 8.X.1996. Etna70: 2 females, 17.VI.1997. Etna77: 1 female, 3.II.1995; 1 male and 1 female, 3.VII.1995. Etna78: 1 female, 17.XI.1996. Iblei5: 2 males, 5.VI.2001. Iblei10: 1 male, 5.VI.1992. Iblei17: 3 males, 10.XI.1996; 2 males and 2 females, 8.XII.1996; 1 male, 24.V.1998; 1 male, 20.XI.1998.

DISTRIBUTION. A Palaearctic species, occurring in Iceland, West Europe to Kazakhstan and South-Central Siberia; also North America. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Acleris hastiana* (Linnaeus, 1758)**
MATERIAL EXAMINED. Iblei17: 1 female, 20.VII.1996; 1 male, 1.V.1999.
DISTRIBUTION. A Holarctic species known from West Europe to Japan, Morocco, Siberia and North America, south as far California. (Italy: N, C, S, Sa; new to the Sicilian fauna).
CHOROTYPE. Holarctic.

***Acleris notana* (Donovan, [1806])**
MATERIAL EXAMINED. Nebrodi5: 1 female, 11.VII.1993.
DISTRIBUTION. Palaearctic species distributed from Iberian Peninsula (British Is and Scandinavia included) to Japan. Introduced to North America. (Italy: N, S, Sa; new to the Sicilian fauna).
CHOROTYPE. Holarctic.

***Acleris quercinana* (Obraztsov, 1957)**
MATERIAL EXAMINED. Peloritani4: 1 female, 8.VI.1950. Etna16: 1 male, 24.XI.1948.
DISTRIBUTION. Europe excluded the northern territories except Sweden, Asia Minor, Transcaucasia, Iraq, Iran and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Acleris literana* (Linnaeus, 1758)**
MATERIAL EXAMINED. Etna24: 1 male, 3.VI.1997.
DISTRIBUTION. Known from entire Europe. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European.

TRIBE COCHYLINI

***Phtheochroa ochralana* (Chrétien, 1915)**
MATERIAL EXAMINED. Etna22: 1 male, 15.XI.1997. Iblei17: 1 male, 28.XI.1997.
DISTRIBUTION. Known from Tunisia, Algeria, Libya, Malta, Greece, Saudi Arabia and Central Arabia. New to the Italian fauna.
CHOROTYPE. Mediterraneo-Sindian.
DESCRIPTION. Wing spam 15-16 mm. Ground colour of forewing whitish or cream often with yellow admixture; costal dots yellowish. Markings pale brownish yellow (often weak) with much darker dots consisting of median fascia and two broad fasciae in distal third of wing. Cilia cream. Hindwing cream, tinged brownish on periphery; cilia white (Fig. 6.3 A). It is similar to *P. fulvicinctana* (Constant), closely allied to *P. krulikovskiji* (Obraztsov) distinct in having larva slender, much smaller cornuti, broader aedeagus and median part of transtilla (Figs 6.3 B).
BIOLOGY. Adults collected in September to November. Larvae recorded on *Haloxylon articulatum* (Razowski, 2009).

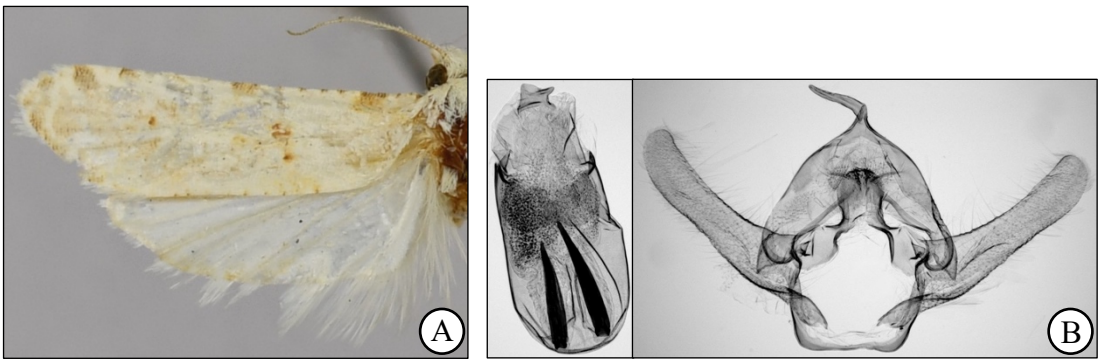


Figure 6.3 - *Phtheochroa ochralana* (Chrétien, 1915): adult (wing) (A); aedeagus and male genitalia (B).

***Phtheochroa duponchelana* (Duponchel, 1843)**
MATERIAL EXAMINED. Peloritani4: 1 male, 16.IV.1950; 1 male, 21.V.1950. Etna11: 1 male, 22.IV.1996. Iblei2: 1 male, 16.V.1999. Iblei10: 2 males, 25.IV.1992.
DISTRIBUTION. South-West Europe from France to Greece, Asia Minor, North-West Africa (Morocco and Algeria), Asia Minor, Syria and Lebanon. (Italy: C, S, Si).
CHOROTYPE. Mediterranean.

***Cochylimorpha decolorella* (Zeller, 1839)**
MATERIAL EXAMINED. Vulcano: 2 males, V.1972.
DISTRIBUTION. Known from Canary Is to Iberian Peninsula, Corsica, Malta, Morocco, Egypt and Turkey. Also Asia Minor and Bulgaria. (Italy: C, Si, Sa).
CHOROTYPE. Mediterranean.

***Cochylimorpha straminea* (Haworth, [1811])**
MATERIAL EXAMINED. Piana di Catania5: 1 male, 28.I.1996; 1 female, 27.IV.1997. Piana di Catania8: 1 male, 12.III.2000. Iblei1: 1 male, 1.V.1991. Iblei2: 3 males, 23.IV.1993. Iblei10: 1 male and 1 female, 20.IX.1992. Iblei13: 1 male, 17.XI.1994.
DISTRIBUTION. Known from Europe, Canary I., North-West Africa, Asia Minor, Egypt, Iran, Transcaucasia, Ural Mts and part of Central Asia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Phalonidia albipalpana* (Zeller, 1847)**
MATERIAL EXAMINED. Piana di Catania6: 2 males, 4.IX.2020. Iblei15: 1 male, 20.VII.1996.
DISTRIBUTION. Europe excluded northern parts from Corsica to Ural Mts, then Caucasus, Asia Minor and Central Asia. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

***Phalonidia contractana* (Zeller, 1847)**
MATERIAL EXAMINED. Piana di Catania5: 1 male, 22.V.1991. Piana di Catania6: 1 male, 4.IX.2020. Iblei3: 2 males, 24.VIII.1995. Iblei10: 1 female, 20.IX.1992.
DISTRIBUTION. Widely distributed from Iberian Peninsula to Ural Mts; found also in North Africa, Asia Minor, Israel, Transcaucasia, Iran, Afghanistan, Kashmir and Central Asia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

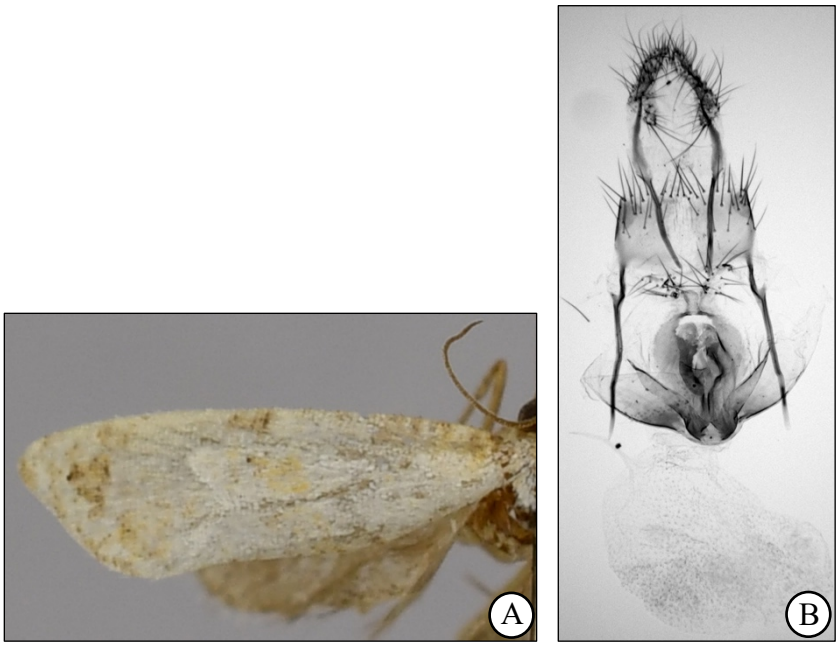


Figure 6.4 - *Fulvoclysia forsteri* (Osthelder, 1938): adult (wing) (A); female genitalia (B).

***Fulvoclysia forsteri* (Osthelder, 1938)**
MATERIAL EXAMINED. Piana di Catania 3: 1 male, 26.IV.1994.

DISTRIBUTION. Known from Azerbaijan and Iran. New to the European fauna.
CHOROTYPE. Turano-Mediterranean.
DESCRIPTION. Wing spam 27-28 mm. Ground colour of forewing cream with slight yellowish hue; cilia paler. Hindwing brownish, rather dark; cilia cream (Fig. 6.4 A). Comparable with *F. rjabovi* V.I. Kuznetzov but *F. forsteri* with broad socius, more curved sacculus terminating in broad thorn and longer aedeagus. Female genitalia, surroundings of ostium bursae rather weakly sclerotized, elongate; corpus bursae with sparse spinulation (Fig. 6.4 B)
BIOLOGY. Moths collected in July, food plant and habitat not known (Razowski, 2009). Our specimen was collected on late April.

***Eupoecilia angustana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Nebrodi5: 1 male, 11.VII.1993.
DISTRIBUTION. Palaearctic subspecies excluded North Africa: Europe, Transcaucasia, Ural Mts, Siberia, China, Russian Far East, Korea and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Aethes margarotana* (Duponchel, 1836)**
MATERIAL EXAMINED. Etna22: 1 female, 9.V.1995. Etna27: 1 female, 9.VII.1995. Etna72: 1 female, 22.VI.1993. Etna77: 1 female, 3.X.1996.
DISTRIBUTION. West Palaearctic species occurring from Iberian Peninsula (British Is included) to Armenia. Known also from Siberia, China, Russian Far East and North-West Africa. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Aethes williana* (Brahm, 1791)**
MATERIAL EXAMINED. Madonie 3: 1 female, 14.V.2000. Etna4: 1 male, 28.IV.1994. Piana di Catania8: 1 female, 5.IX.1994. Iblei2: 2 males, 26.IV.1997.
DISTRIBUTION. West Palaearctic: North-West Africa and Europe, from Iberian Peninsula to Ural Mts, Transcaucasia, Central Asia, South-West Siberia; Mongolia also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Aethes tesserana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna6: 1 male, V.1999. Etna27: 2 males, 9.VII.1995; 1 female, 7.VI.1998. Etna64: 1 male, 3.V.1997.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Iran and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Aethes beatricella* (Walsingham, 1898)**
MATERIAL EXAMINED. Etna27: 1 female, 7.VI.1998. Etna63: 1 female, 23.IV.1994.
DISTRIBUTION. West Palaearctic species known from North-West Africa and Iberian Peninsula to British Is, Sweden, Italy and Balkan Peninsula. Budashkin (1993) recorded it from Crimea, Voronezh Distr. in Russia and Daghestan. (Italy: N, C, S, Si).
CHOROTYPE. European with Maghreb extension.

***Aethes francillana* (Haworth, [1811])**
MATERIAL EXAMINED. Etna2: 1 male, 21.V.1993. Etna6: 1 female, 31.V.2000. Etna22: 1 female, 18.V.1994; 1 male, 9.V.1995. Etna35: 1 female, 17.VI.2008. Etna54: 1 male, 17.VI.1993. Iblei7: 1 female, 6.VI.2001.
DISTRIBUTION. Europe, Canary Is and North-West Africa to Transcaucasia, Iran, Afghanistan, Kazakhstan, Tadzhikistan and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Aethes bilbaensis* (Rössler, 1877)**
MATERIAL EXAMINED. Peloritani4: 1 male, 17.V.1950. Nebrodi6: 1 male, 10.IX.2020. Etna35: 2 males, 12.VI.2008; 2 males, 14.VI.2008. Etna41: 1 male, 20.VI.1949. Etna77: 1 male and 1 female, 3.VII.1995. Iblei11: 3 males, 7.IX.2020.
DISTRIBUTION. West Palaearctic species; its area extends from North-West Africa and Iberian Peninsula to Greece and South-Ural Mts, known also from Asia Minor, North Lebanon, Iran, Afghanistan, Pakistan and Turkmenia. Budaskin (1993) found it in Crimea, Caucasus, Transcaucasia and West Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Aethes tornella* (Walsingham, 1898)**
MATERIAL EXAMINED. Iblei10: 1 male, 5.VI.1992.
DISTRIBUTION. Europe excluded northern parts from Iberian Peninsula to Bulgaria; also Asia Minor, Transcaucasia and Central Asia. (Italy: N, C, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Aethes rubiginana* (Walsingham, 1903)**
MATERIAL EXAMINED. Iblei15: 1 male, 23.VI.1996.
DISTRIBUTION. Known from North-West Africa: Morocco and Algeria; Europe: Denmark, Corsica and Italy. (Italy: S, Si, Sa).
CHOROTYPE. Europeo-Mediterranean.

***Cochylidia rupicola* (Curtis, 1834)**
MATERIAL EXAMINED. Peloritani1: 3 males, 29.VI.1995. Peloritani2: 1 male, 9.IX.2020.
DISTRIBUTION. West Palaearctic species recorded from Europe, Asia Minor, Lebanon, Transcaucasia, Turkmenistan and Iran. (Italy: N, C, S, Sa; new to the Sicilian fauna).
CHOROTYPE. Turano-European.

***Cochylidia moguntiana* (Rössler, 1864)**
MATERIAL EXAMINED. Peloritani3: 1 female, 9.IX.2020.
DISTRIBUTION. Transpalaearctic species widely distributed in Europe (from Iberian Peninsula to Ural Mts). Also East Afghanistan, North-East Pakistan, China and Korea. (Italy: N, C, S; new to the Sicilian fauna).
CHOROTYPE. Asiatic-European.

***Cochylidia implicitana* (Wocke, 1856)**
MATERIAL EXAMINED. Etna82: 1 male, 23.V.1994.
DISTRIBUTION. Europe from Iberian Peninsula and North-West Africa to Ural Mts, West Siberia, Kazakhstan, Kyrgyzstan and South-West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Cochylis nana* (Haworth, [1811])**
MATERIAL EXAMINED. Etna18: 5 males and 4 females, 13.VI.2002. Etna39: 1 female, 18.VI.2008.
DISTRIBUTION. Holarctic species known from entire Europe, Asia Minor, Siberia and Russian Far East. Also North America. (Italy: N, Si).
CHOROTYPE. Holarctic.

***Cochylis epilinana* (Duponchel, 1842)**
MATERIAL EXAMINED. Iblei2: 1 male, 9.V.1994.
DISTRIBUTION. West Palaearctic, except for British Is. From Canary Is, North-West Africa and Iberian Peninsula to Ural Mts, Transcaucasia, Asia Minor, Near East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cochylis hybridella* (Hübner, [1810-1813])**
MATERIAL EXAMINED. Etna15: 5 males, 5.IX.2020. Etna30: 1 female, 5.IX.2001. Etna32: 1 male and 1 female, 4.VIII.1998. Etna54: 1 female, 17.VI.1993. Etna77: 1 female, 3.VII.1995.
DISTRIBUTION. Europe, Asia Minor, Transcaucasia, Ural Mts, Kazakhstan, South-West Siberia, China, Russian Far East, Korea, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Cochylis sannitica* Trematerra, 1995**
MATERIAL EXAMINED. Iblei2: 1 male, 17.VI.1991; 1 male, 6.VIII.1991.
DISTRIBUTION. Known in Europe from former Yugoslavia and Italy. (Italy: C, S; new to the Sicilian fauna).
CHOROTYPE. E-Mediterranean.

***Cochylis molliculana* Zeller, 1847**
MATERIAL EXAMINED. Piana di Catania3: 1 female, 26.IV.1994. Agrigento2: 2 males, 5.VII.1996.
DISTRIBUTION. Great Britain and from Spain to Greece. (Italy: N, C, S, Si).
CHOROTYPE. Europeo-Mediterranean.

***Cochylis pallidana* Zeller, 1847**
MATERIAL EXAMINED. Nebrodi6: 1 female, 10.IX.2020.
DISTRIBUTION. West Palaearctic species: Europe from Iberian Peninsula to Scandinavia and Greece, East Europe and North Africa. Also recorded from Asia Minor, Middle East, Turkmenistan, Russia (Altaj) and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Cochylis posterana* Zeller, 1847**
MATERIAL EXAMINED. Peloritani1: 1 male, 21.VII.1996. Etna2: 1 female, 21.VII.1993. Etna8: 1 male, 4.V.1993. Etna78: 1 male, 31.V.1995; 1 male, 3.VII.1995. Iblei1: 1 male, 6.VIII.1991. Iblei2: 1 male, 26.IV.1997. Iblei10: 1 male, 25.IV.1992. Iblei13: 3 males, 20.VIII.1995.
DISTRIBUTION. West Palaearctic species occurring east far as Transcaspia, Central Asia and West Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

TRIBE CNEPHASIINI

***Tortricodes selma* Kocak, 1991**
MATERIAL EXAMINED. Etna2: 1 male, 19.III.1994. Etna22: 2 females, 13.III.1994. Etna74: 3 males, 2.III.1994. Etna78: 2 males, 4.II.1998.
DISTRIBUTION. Described from Turkey by Kocak in 1991. New to the European fauna.
CHOROTYPE. Mediterranean.
DESCRIPTION. Wing spam 17.5-21 mm. Fore wing narrow, shiny brownish gray, stretched almost straight in males, evenly curved in females; outer edge sloping; apex pointed. Hindwings are light brown-gray (Fig. 6.5 A). *T. selma* is closed to *T. alternella* (Den. and Shiff.), differs from the latter in the shape of the valve and the aedeagus in males (Fig. 6.5 B), in the shape of the signum and bursa in females.
BIOLOGY. Adults described from Kuzca Pinari 1,300 m (Turkey) in March in a side with *Quecus pubescens* Willd. mixed to *Populus tremula* L. Food plant unknown (Kocak, 1991).

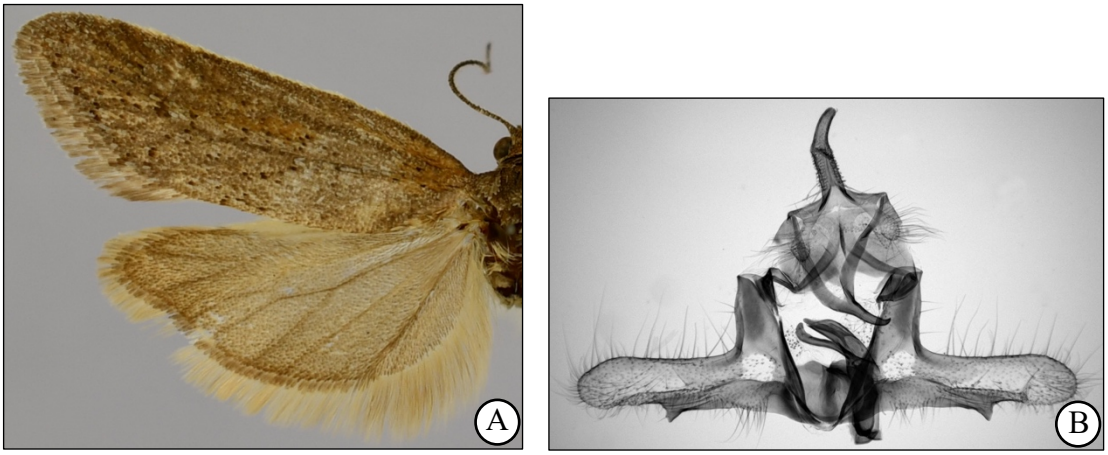


Figure 6.5 - *Tortricodes selma* Kocak, 1991: adult (wing) (A); male genitalia (B).

***Eana incanana* (Stephens, 1852)**
MATERIAL EXAMINED. Nebrodi5: 1 female, 21.VI.1992; 2 males and 1 female, 11.VII.1993; 2 males, 23.VII.1993.
DISTRIBUTION. Palaearctic species occurring from Spain to Transural, Transcaucasia, Siberia, also Far East (Amur Territory, Primorsk). (Italy: N, C, S, Si).
CHOROTYPE. Sibero-European.

***Eana joannisi* (Schawerda, 1929)**
MATERIAL EXAMINED. Nebrodi5: 1 female, 3.VIII.1992. Iblei10: 1 male and 1 female, 5.VI.1992.
DISTRIBUTION. Known only for Europe in France, Corsica and Italy. (Italy: Sa; new to the Sicilian fauna).
CHOROTYPE. Tirrenic.

***Eana italica* (Obraztsov, 1950)**
MATERIAL EXAMINED. Madonie3: 1 male, 12.VII.1994.
DISTRIBUTION. Known from South-East Europe: Italy, former Yugoslavia, Albania and Greece. (Italy: C, S; new to the Sicilian fauna).
CHOROTYPE. S-European.

***Cnephasia incertana* (Treitschke, 1835)**
MATERIAL EXAMINED. Etna22: 2 males, 18.V.1994.
DISTRIBUTION. Western Palaearctic from Iberian Peninsula to Transcaucasia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cnephasia stephensiana* (Doubleday, 1850)**
MATERIAL EXAMINED. Nebrodi2: 1 female, 4.V.1997. Etna22: 1 female, 9.V.1995. Etna70: 1 female, V.1997.
DISTRIBUTION. Western part of our region from Iberian Peninsula to Kazakhstan, Near East, Transcaucasia, Central Asia and Asia Minor; also in South-West Siberia, Russian Far East, China, Korea and Japan. Introduced to Canada. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Cnephasia pasiuana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Iblei5: 1 male and 1 female, 5.VI.2001.
DISTRIBUTION. Europe, Morocco, Libya, Egypt, Asia Minor, Syria and Transcaucasia. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Cnephasia communana* (Herrich-Schäffer, 1847)**
MATERIAL EXAMINED. Madonie2: 1 female, 16.V.1993. Nebrodi5: 1 female, 3.VIII.1992. Etna5: 1 female, 14.V.1994; 4 males, 23.V.1996. Etna22: 1 female, 9.V.1995. Iblei12: 1 female, 5.IV.1995. Iblei17: 1 female, 25.III.1996.
DISTRIBUTION. Western Palaearctic from Iberian Peninsula to Scandinavia (British Is included) and Caucasus; Transcaucasia, Morocco, Asia Minor, Central Asia, South-West Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cnephasia cupressivorana* (Staudinger, 1871)**
MATERIAL EXAMINED. Madonie2: 3 males and 1 female, 16.V.1993. Nebrodi5: 3 males and 1 female, 2.VI.2000. Etna4: 1 male, 24.IV.1993. Etna5: 1 female, 23.V.1996. Etna57: 1 male, 24.III.2000; 1 male and 1 female, 17.IV.2000. Etna61: 1 male, 1.V.1998. Etna66: 1 male, 21.IV.1993. Iblei12: 1 male, 17.XI.1994. Iblei17: 1 male, 18.II.2001.
DISTRIBUTION. South-West Europe from Iberian Peninsula to Balkan Peninsula up to Greece, north to Romania, Mediterranean Is, Asia Minor and Kyrgyzstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-European.

***Cnephasia etnana* Razowski and Trematerra, 1999**
MATERIAL EXAMINED. Etna4: 1 male, 28.IV.1994. Etna43: 1 male, 5.V.1949; 2 males and 1 female, 26.V.1949. Iblei4: 1 female, 2.V.1994.
DISTRIBUTION. Endemic in Sicily. (Italy: Si).
CHOROTYPE. Sicilian endemic.

***Cnephasia chrysantheana* (Duponchel, 1842)**
MATERIAL EXAMINED. Etna22: 1 male, 18.V.1995; 1 female, 20.V.1995. Etna57: 1 female, 15.V.2000. Iblei1: 1 female, 23.V.1992.
DISTRIBUTION. West Palaearctic species occurring from Iberian Peninsula to Ukraine; also Morocco, Algeria, Transcaucasia, Asia Minor and Near East. (Italy: N, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cnephasia longana* (Haworth, [1811])**
MATERIAL EXAMINED. Lipari: 1 male, 20-27.V.1972. Etna63: 1 male, 27.V.1991. Piana di Catania9: 1 female, 18.V.1949.
DISTRIBUTION. Known from Europe: from Iberian Peninsula to British Is and Scandinavia up to Mediterraneum (Greece and Crete) and east to western European Russia; also Canary Islands, North-West Africa, Asia Minor, Central Asia and North America (Introduced). (Italy: N, C, S, Si, Sa).

CHOROTYPE. Holarctic.

***Cnephasia bizensis* Réal, 1953**
MATERIAL EXAMINED. Pantelleria: 2 males and 1 female, 24.IV.2003.
DISTRIBUTION. Known only from France, Italy and former Yugoslavia. (Italy: Si).
CHOROTYPE. S-European.

***Cnephasia fulturata* Rebel, 1940**
MATERIAL EXAMINED. Iblei1: 1 male, 23.V.1992. Iblei17: 1 male, 24.V.1999.
DISTRIBUTION. Known in Europe only from Iberian Peninsula, France and Italy, also recorded from North Africa (Algeria) and Asia Minor. (Italy: C, S; new to the Sicilian fauna).
CHOROTYPE. European-N-African.

***Cnephasia gueneana* (Duponchel, 1836)**
MATERIAL EXAMINED. Piana di Catania6: 1 male, 12.V.1996.
DISTRIBUTION. Known from Great Britain and South Europe; also Canaries Is, North-West Africa, Cyprus and Crete. (Italy: N, Si, Sa).
CHOROTYPE. European with Maghreb-Macaronesia extension.

***Cnephasia amseli* (Lucas, 1942)**
MATERIAL EXAMINED. Pantelleria: 8 males and 2 females, 24.IV.2003.
DISTRIBUTION. Known from Italy, Malta and Tunisia. (Italy: Si).
CHOROTYPE. N-African.

***Cnephasia ecullyana* Réal, 1951**
MATERIAL EXAMINED. Etna2: 1 female, 21.VI.1996. Etna35: 1 female, 12.VI.2008.
DISTRIBUTION. Known from Central Southern Europe. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European.

***Cnephasia fragosana* (Zeller, 1847)**
MATERIAL EXAMINED. Etna42: 1 male, 23.V.1949.
DISTRIBUTION. In Europe spread from France, Italy and Greece; also from North-West Africa (Morocco, Mauritania and Algeria) and Asia Minor. (Italy: Si, Sa).
CHOROTYPE. Mediterranean.

TRIBE ARCHIPINI

***Paramesia gnomana* (Clerck, 1759)**
MATERIAL EXAMINED. Nebrodi5: 3 males and 5 females, 3.VIII.1992; 1 male, 11.VIII.1991; 1 male, 18.VIII.1991; 1 male, 11.VII.1993; 1 male, 23.VII.1993. Etna5: 1 male, 20.VIII.1999. Etna14: 1 female, 5.IX.2020. Etna24: 1 male and 1 female, 12.VII.1998. Etna68: 1 male, VII.1997; 1 male, 19.VIII.1999. Etna70: 1 male, 17.VI.1997; 2 males, 2.VII.1997; 1 male, 13.X.1997. Etna82: 2 males and 1 female, 16.VIII.1993; 2 males, 26.VII.1994.
DISTRIBUTION. Known from Iberian Peninsula (included British Is and Scandinavia) to Balkan Peninsula and Ural Mts, then Caucasus, Transcaucasia, West Kazakhstan and West Siberia; also Asia Minor and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Paramesia diffusana* (Kennel, 1899)**
MATERIAL EXAMINED. Etna30: 1 female, 30.VII.1994. Etna60: 1 male, 26.VIII.1996. Etna65: 1 female, 7.V.1993.
DISTRIBUTION. South-East Europe (Spain, Corsica, Italy, Greece and Estonia). (Italy: S, Si).
CHOROTYPE. SE-European.

***Avaria hyerana* (Millière, 1858)**
MATERIAL EXAMINED. Nebrodi5: 1 male, 14.X.1993. Etna2: 1 female, 17.X.1996.
DISTRIBUTION. Known from Western part of our region, excl. the northern areas. Europe (France, Spain, Portugal, Malta, Italy, former Yugoslavia, Greece and Crete), Canary Isles and North-West Africa. (Italy: N, Si, Sa).
CHOROTYPE. Mediterranean.

***Archips betulanus* (Hübner, [1787])**
MATERIAL EXAMINED. Peloritani3: 1 female, 9.IX.2020.
DISTRIBUTION. Known from Europe to Japan. (Italy: N, C; new to the Sicilian fauna).
CHOROTYPE. Palaearctic.

***Archips podanus* (Scopoli, 1763)**
MATERIAL EXAMINED. Peloritani1: 1 female, 21.VII.1996. Etna20: 1 male, 29.XI.1995.
DISTRIBUTION. Known from Europe; Asia Minor, Caucasus, Transcaucasia, Ural Mts, Siberia also Japan. Introduced in North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Archips crataeganus* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Etna78: 1 male, 3.VII.1995.
DISTRIBUTION. West Palaearctic, Kazakhstan, Siberia, China, Korea, Japan. (Italy: N, C, S; new to the Sicilian fauna).
CHOROTYPE. Palaearctic.

***Archips xylosteanus* (Linnaeus, 1758)**
MATERIAL EXAMINED. Peloritani1: 1 male, 21.VIII.1996. Nebrodi2: 2 males, 4.VIII.1997. Etna59: 2 females, 5.IX.1995. Etna77: 3 males, 3.VII.1995. Iblei17: 1 male, 18.V.1996; 1 male, 15.VI.1996.
DISTRIBUTION. Palaearctic Region from West Europe to Asia Minor, Caucasus, Iran, Central Asia, China, Russian Far East, and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Archips rosanus* (Linnaeus, 1758)**
MATERIAL EXAMINED. Etna22: 1 female, 7.IX.1996.
DISTRIBUTION. Palaearctic species; in Sweden up to 66°. By the end of XIX century introduced to North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Choristoneura hebenstreitella* (Müller, 1764)**
MATERIAL EXAMINED. Etna71: 1 male, 12.VI.1997.
DISTRIBUTION. Known from Europe, Asia Minor, Caucasus, Transcaucasia, Ural Mts, West Kazakhstan and Iran. (Italy: N, C, S, Si).
CHOROTYPE. Turano-European.

***Pandemis cerasana* (Hübner, 1786)**
MATERIAL EXAMINED. Nebrodi5: 2 males, 3.VIII.1992; 4 males, 11.VII.1993.
DISTRIBUTION. Transpalaearctic species widely distributed in Europe, from Iberian Peninsula as far as to Ural Mts and Caucasus, then South Siberia, Kazakhstan, Mongolia, China and Far East; also Asia Minor and Iran. Introduced to North America. (Italy: N, C, S; new to the Sicilian fauna).
CHOROTYPE. Holarctic.

***Cacoecimorpha pronubana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Etna4: 1 female, 4.V.1993. Etna11: 1 male, 1994. Etna22: 1 female, 11.X.1993; 1 male, 20.V.1995; 1 female, 8.X.1996; 1 female, 23.X.1996. Etna28: 1 female, 22.III.1997. Etna29: 1 male, 8.V.1993. Etna63: 1 male, 23.IV.1994. Etna62: 1 female, 15.VI.1993; 1 female, 8.X.1995; 1 male, VI.1998. Etna80: 1 male, 29.IX.1991. Agrigento2: 2 females, 5.VII.1996. Iblei6: 1 female, 16.VI.1999. Iblei10: 2 females, 26.VI.1992. Iblei16: 1 male, VIII.1992.
DISTRIBUTION. Western Palaearctic from Europe, Morocco, Algeria and Tunisia to Lebanon, Asia Minor, Near East, Crimea and Japan. Introduced to South Africa and North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Aphelia (Zelotherses) ferrugana* (Hübner, 1793)**
MATERIAL EXAMINED. Nebrodi3: 1 male, 4.VI.1999; 1 male, 4.VI.2000. Etna5: 1 male, 9.VI.1996.
DISTRIBUTION. Europe, Caucasus, Asia Minor, Syria, Iraq and Iran. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Clepsis dumicolana* (Zeller, 1847)**
MATERIAL EXAMINED. Etna12: 1 female, 12.V.1949. Etna14: 1 male, 7.V.1993. Etna22: 2 males, 23.V.1990; 2 males, 15.V.1998.
DISTRIBUTION. South Europe, Asia Minor, Syria and Lebanon. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European with Anatolian extension.

***Clepsis consimilana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. Peloritani1: 1 female, 21.VII.1996; 1 male, 26.VII.1996. Peloritani2: 5 males and 1 female, 9.IX.2020. Peloritani4: 1 male, 9.VI.1950; 2 males, 16.X.1994. Nebrodi2: 2 males, 4.VIII.1997. Nebrodi5: 1 male, 11.VII.1993. Nebrodi6: 1 male, 10.IX.2020. Etna2: 3 males, 23.VI.1991; 2 males, 9.X.1992; 3 females, 21.V.1993; 1 male, 22.V.1994; 2 males and 3 females, 26.V.1994; 2 males and 2 females, 21.VI.1996; 1 male and 1 female, 17.VII.1996. Etna6: 1 male, V.1999. Etna8: 1 male, 14.V.1993. Etna9: 1 female, 19.IV.2001. Etna17: 1 male and 1 female, 23.VI.2008. Etna22: 1 male, 9.V.1995; 1 female, 27.IX.1996; 1 female, 16.X.1996; 1 male, 15.V.1998. Etna28: 1 male, 18.IX.1998. Etna30: 2 females, 15.IX.1994. Etna55: 1 male, 20.V.1993. Etna62: 1 male, 20.IX.1995; 1 male and 1 female, 8.X.1995; 1 male, XI.1996; 1 female, 17.IX.1997; 1 male, 22.IX.1997; 1 female, 1998; 1 male, 15.V.1999; 1 male, 15.IX.1999. Etna63: 1 male, 27.V.1991; 1 male, 18.IV.1994; 1 male, 25.X.1995. Etna70: 1 male, 3.VI.1997. Etna73: 1 female, 3.X.1993; 1 male, 26.IX.1995. Etna74: 2 males, 12.V.1994; 1 male, 7.VII.1994. Etna77: 4 males, 3.VII.1995; 1 female, 17.XI.1996. Etna79: 1 female, 8.X.1993. Piana di Catania4: 1 male, 26.IV.1994. Agrigento1: 1 male, 11.IX.2020. Iblei3: 1 male, 24.VIII.1995. Iblei10: 1 male, 25.IV.1992; 4 males, 26.VI.1992; 1 male, 20.IX.1992. Iblei11: 3 males, 7.IX.2020. Iblei15: 1 female, 10.XI.1996. Iblei17: 1 female, 9.X.1996; 1 female, 29.IV.1998; 1 male, 15.V.1999; 1 male and 1 female, 24.VIII.1999. Iblei18: 6 males and 3 females, 6.IX.2020.
DISTRIBUTION. West Europe to East European Russia; West Africa to Lebanon, Asia Minor, Nearctic and Ethiopian region (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Clepsis siciliana* (Ragonot, 1894)**
MATERIAL EXAMINED. Madonie5: 1 male and 1 female, 14.VII.1993.
DISTRIBUTION. Known from Iberian Peninsula, South France, Italy, Algeria and Crete. (Italy: Si).
CHOROTYPE. Mediterranean.

***Lozotaeniodes formosanus* (Frölich, 1830)**
MATERIAL EXAMINED. Etna24: 1 female, VII.1997.
DISTRIBUTION. Chiefly southern Europe, from Iberian Peninsula to Italy and Corsica; also Great Britain, France, Germany, Switzerland and Belgium; in North Europe from Denmark; also southern part of Ukraine and Russia. (Italy: N, S, Si).
CHOROTYPE. European.

SUBFAMILY CHLIDANOTINAE

TRIBE POLYORTHINI

***Olindia schumacherana* (Fabricius, 1787)**
MATERIAL EXAMINED. Peloritani1: 3 males, 4.X.1995.
DISTRIBUTION. Europe from Spain, British Is and Scandinavia to Italy and Corsica; also East Europe. (Italy: N, C, S, Sa; new to the Sicilian fauna).
CHOROTYPE. European.

SUBFAMILY OLETHREUTINAE

TRIBE BACTRINI

***Bactra furfurana* (Haworth, [1811])**
MATERIAL EXAMINED. Iblei15: 1 male, 18.V.1996.
DISTRIBUTION. Known from whole Europe to Japan; also Nearctic Region (North America). (Italy: N, C, Si).
CHOROTYPE. Holarctic.

***Bactra bactrana* (Kennel, 1901)**
MATERIAL EXAMINED. Nebrodi5: 1 male, 21.VI.1992. Etna11: 1 male, 5.IV.1991. Etna22: 1 female, 18.X.1996. Etna62: 2 males, 10.X.1997. Etna74: 1 female, 7.VII.1994; 6 males and 1 female, 28.IX.1994. Nebrodi3: 2 males, 4.VI.1999. Piana di Catania4: 1 male, 23.XI.1998.
DISTRIBUTION. From Europe: Iberian Peninsula, France, Corsica, Italy, Malta, Greece, former Yugoslavia and former USSR countries. In addition Canary Is, Morocco, Algeria, Egypt, Asia Minor, Arabia, Mesopotamia, Iraq, Iran, Caucasus, Transcaucasia, Afghanistan, Caspian area, Tadzhikistan, Uzbekistan. Including Oriental (Pakistan, India) and Ethiopian regions (Madagascar). (Italy: N, C, S, Si).
CHOROTYPE. Subcosmopolitan.

***Bactra lancealana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Nebrodi3: 1 female, 4.VI.2000. Iblei15: 1 male, 7.V.1995.
DISTRIBUTION. Palaearctic region, probably excluded Japan; known from North Africa, Europe from Iberian Peninsula to Ural Mts, Kazakhstan, then Siberia to Mongolia, China and Russian Far East; known also from Transcaucasia, Asia Minor, Central Asia, Iran, Afghanistan and Kamchatka. In Oriental region noticed in Sri Lanka and in Nearctic region (USA and Canada). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

***Bactra robustana* (Christoph, 1872)**
MATERIAL EXAMINED. Nebrodi3: 1 male, 4.VI.2000; 1 male, 14.VII.2001. Nebrodi5: 3 males, 11.VII.1993.
DISTRIBUTION. Europe; North Africa: Morocco; Asia Minor, Caucasus, Transcaucasia, Iran, Ural Mts, Afghanistan, Kazakhstan, Kyrgyzstan, South Siberia, Mongolia, Russian Far East and Japan (Honshu). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Bactra venosana* (Zeller, 1847)**
MATERIAL EXAMINED. Peloritani3: 5 males, 9.IX.2020. Etna2: 1 male, 23.V.1991; 1 female, 9.X.1992. Etna22: 1 male, 18.X.1996. Etna74: 1 male, 7.VII.1994.
DISTRIBUTION. Known from South-West Europe; from Madeira and Canary Is: Gran Canaria; North Africa: Morocco and Algeria; Arabian Peninsula; Japan; Afrotropical region: Sudan; Oriental region: India, Sri Lanka, Thailand, Philippines, Indonesia, North and South Vietnam, South China, Taiwan; Australian region: Marianas Is, Caroline Is, Fiji, Australia; noticed also in Hawaii. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

TRIBE OLETHREUTINI

***Endothenia marginana* (Haworth, [1811])**
MATERIAL EXAMINED. Etna2: 5 males, 21.VI.1996. Etna5: 1 male, 25.VI.1996. Etna54: 1 female, 17.VI.1993. Etna63: 1 male, 8.IV.1996; 1 male, 28.IV.1996. Agrigento2: 1 male, 5.VII.1996. Iblei1: 1 male, 17.VI.1991.
DISTRIBUTION. Europe, North-West Africa, Transcaucasia, Asia: from Ural Mts to Mongolia, China and Russian Far East. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Lobesia (Lobesia) botrana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna2: 1 male, 13.VIII.1993. Etna13: 1 male and 1 female, 27.IV.2000. Etna22: 1 male, 22.IV.1993. Etna28: 1 male, 29.IX.1999. Etna62: 1 male, 8.V.1997. Piana di Catania6: 2 males, 12.V.1996. Iblei14: 2 males, 6.VIII.1993. Pantelleria: 2 males, 20.VII.2021.
DISTRIBUTION. From West Europe to Ural Mts, North Africa, Asia Minor, Near East, Iraq, Iran, Transcaucasia, Turkmenistan, Kazakhstan, and Japan. North-South America (introduced). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Lobesia (Lobesia) reliquana* (Hübner, [1825] 1816)**
MATERIAL EXAMINED. Iblei13: 1 male, 20.VIII.1995.
DISTRIBUTION. Palaearctic species known from Europe; Caucasus; Transcaucasia; Iran; Siberia; Russian Far East: Primorsk; China; Korea and Japan: Hokkaido, Honshu, Shikoku. (Italy: N, C, Si, Sa).
CHOROTYPE. Asiatic-European.

***Lobesia (Lobesia) bicinctana* (Duponchel, 1844)**
MATERIAL EXAMINED. Agrigento2: 1 female, 5.VII.1996. Iblei17: 1 male, 24.VI.1998.
DISTRIBUTION. Europe; Asia Minor; Transcaucasia; Russia: South Siberia, Transbaikalia, Russian Far East (Primorsk); Mongolia; China: Manchuria; Korea; Japan: Hokkaido, Honshu; also from Canada. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Lobesia (Lobesia) quaggana* (Mann, 1855)**
MATERIAL EXAMINED. Iblei17: 1 female, 15.V.1999.
DISTRIBUTION. Spread in South-West Europe from Portugal to Dalmatia also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-European with Anatolian extension.

***Lobesia (Lobesia) porrectana* (Zeller, 1847)**
MATERIAL EXAMINED. Etna8: 1 male, 14.V.1993.
DISTRIBUTION. Europe (France, Iberian Peninsula, Corsica, Malta and Italy); also Asia Minor. (Italy: S, Si, Sa).
CHOROTYPE. S-European with Anatolian extension.

***Lobesia (Lobesia) indusiana* (Zeller, 1847)**
MATERIAL EXAMINED. Iblei9: 2 males, 5.X.2002. Iblei15: 1 male, 10.XI.1996.
DISTRIBUTION. Known from South-East Europe; also Caucasus and Daghestan. (Italy: N, C, Si, Sa).
CHOROTYPE. Turano-European.

***Lobesia (Lobesia) littoralis* (Humphreys and Westwood, 1845)**
MATERIAL EXAMINED. Iblei15: 1 female, 15.VI.1996.
DISTRIBUTION. Known in Europe excluded eastern parts; also North Africa and Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Eudemis profundana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Nebrodi2: 1 male, 4.VIII.1997; 1 female, 4.VIII.2000. Etna5: 2 males, 16.VII.1996; 3 males, 12.IX.1996; 1 female, 20.VIII.1999. Etna24: 1 male, 17.VIII.1999; 1 female, 9.VII.2000. Etna30: 1 male, 22.VIII.1998. Etna57: 1 male, 18.VI.1997.
DISTRIBUTION. This species occurs in West Palaearctic as it was recorded in Europe from Spain to West Ukraine and Ural Mts, except for the northern belt; also Asia Minor and Arzebaijan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. European with Anatolian extension.

***Hedya nubiferana* (Haworth, [1811])**
MATERIAL EXAMINED. Etna2: 1 male, 26.V.1994. Iblei3: 1 female, 31.V.1992.
DISTRIBUTION. West Europe to Ural Mts, Caucasus, Asia Minor, Iraq, Turkmenistan, Iran, Kazakhstan, West Siberia. North America (Canada). (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Metendothenia atropunctana* (Zetterstedt, 1839)**
MATERIAL EXAMINED. Madonie4: 1 male, 20.VII.1992. Nebrodi5: 2 females, 21.VI.1992; 1 male, 3.VIII.1992; 1 male, 11.VIII.1993.
DISTRIBUTION. Europe, from Iberian Peninsula included British Is and Scandinavia to Kola Pns., and Ural Mts; Caucasus, Armenia, Kazakhstan, Russia (Altaj, Siberia and Transbaikalia) and Far East: Primorsk, Kamchatka, Kuril Is (Kunashir); Mongolia; North-West China; Korea; Japan. North America: USA (Alaska) and North-West Canada. (Italy: N, C, S, Si).
CHOROTYPE. Holarctic.

***Olethreutes arcuellus* (Clerck, 1759)**
MATERIAL EXAMINED. Etna5: 2 males, 9.VI.1996. Etna57: 1 male, 29.V.1997. Etna24: 1 male, 31.V.1998. Etna67: 1 male, 9.V.1999.
DISTRIBUTION. From Europe to Caucasus; Asia Minor, Iran, Kazakhstan, West Siberia, and North-West China. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

TRIBE ENARMONIINI

***Ancylis mitterbacheriana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna43: 1 male, 26.V.1949. Etna78: 1 female, 3.VII.1995.
DISTRIBUTION. Europe from Spain, British Is and Scandinavia to Mediterraneum and Balkan Peninsula, east to Ural Mts and Transcaucasia; also Asia Minor and China (Shandong). (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

TRIBE EUCOSMINI

***Thiodia major* (Rebel, 1903)**
MATERIAL EXAMINED. Etna5: 2 males, 25.VI.1996. Etna68: 1 male, 12.VI.1997; 2 males, VII.1997; 2 males, 12.VII.1997. Etna70: 2 males, 2.VII.1997. Etna75: 1 male, 12.VI.2002. Etna76: 1 male and 1 female, 17.VI.1999.
DISTRIBUTION. Known from South Europe, from South France and Italy to Balkan peninsula. (Italy: C, S, Si, Sa).
CHOROTYPE. S-European.
DESCRIPTION. Adult (Fig. 6.6 A) – Wingspan 16-21 mm. Ground colour of forewing light ivory yellow; strigulation weak brownish; costal strigulae cream, dividings brownish sprinkled of blackish scales; speculum slightly paler than wing with some blackish inner spots in form of longitudinal strigulae on a median suffusion. Markings umber light brown, scales black sprinkles, with pale walnut hues. Cilia light ivory. Hindwing brownish; cilia concolour, with light ivory basal strip.
Male genitalia (Fig. 6.6 B). Uncus very short; socius short, haired; tegument simple, cup shaped; ventral edge of sacculus curved; angle of sacculus rather distinct; neck of valva broad; ventral incision of sacculus deep; row of hairs extending from angle of cucullus; two large processes at base of caudal edge of cucullus; aedeagus simple, large and developed, terminal part of aedeagus spatuliform, without subterminal thorns; numerous long cornuti.
Female genitalia (Fig. 6.6 C). Ovipositor slightly elongated; papillae anales very small, slender; apophyses posteriors long; sterigma fused with sclerite of colliculum slightly expanding distally, very short beyond ostium bursae; membranous broadening between this last and cingulum; cingulum a slender tubular asymmetrical sclerite in post median part of ductus bursae; ductus bursae elongate; two signa differing in size, one in the shape of a very developed spine.
According to Razowski (2003) *T. major* is closed to *T. citrana* (Hübner) and confused with *T. citrana* var. *sardiniana* Schawerda.
BIOLOGY. Species of the genus *Thiodia* have one generation a year; larvae in spun leaves, flowers and twigs.

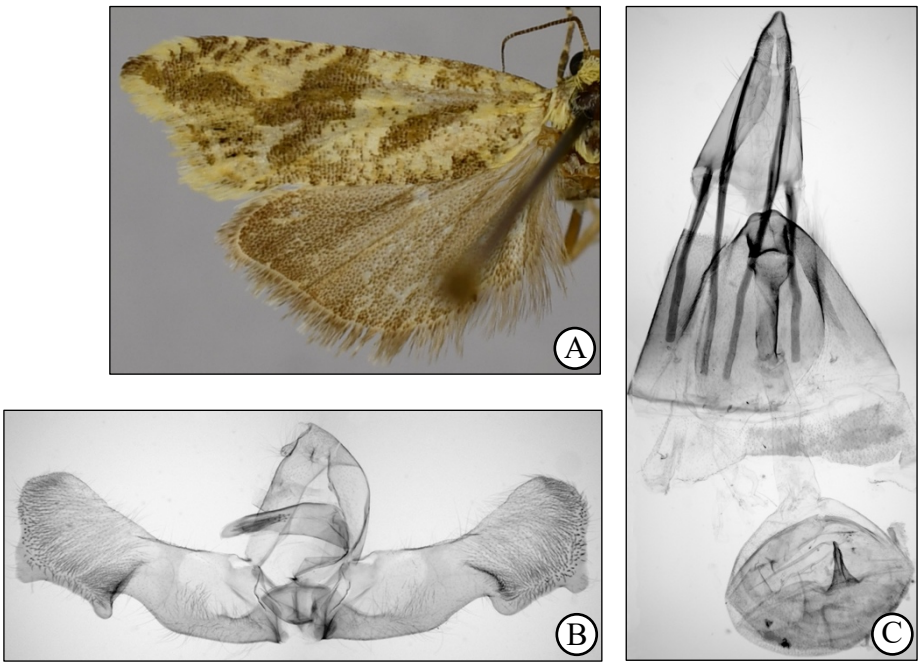


Figure 6.6 - *Thiodia major* (Rebel, 1903): adult (wing) (A); male genitalia (B); female genitalia (C).

***Rhopobota naevana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. Nebrodi5: 1 male, 27.VIII.1995. Nebrodi5: 1 male, 11.VII.1993.
DISTRIBUTION. From Europe to Ural Mts, Caucasus, Transcaucasia, India, Sri-Lanka, Siberia, Far East, Mongolia, China, Korea and Japan. In the Nearctic Region occurs ssp. *illicifoliana* Kearfott, 1907. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Subcosmopolitan.

***Spilonota ocellana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Nebrodi2: 1 male, 4.VIII.1997. Nebrodi5: 1 male and 1 female, 3.VIII.1992; 3 males and 1 female, 11.VII.1993. Etna1: 1 male, 3.IV.1991. Iblei10: 1 female, 5.VI.1992.
DISTRIBUTION. Europe, North Africa, Caucasus, Asia Minor, Transcaucasia, Iran, Kazakhstan, Turkmenia, Uzbekistan, Tadzhikistan, Russian Far East, Siberia, China, Korea and Japan. Also Nearctic Region. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Acroclita subsequana* (Herrich-Schäffer, 1851)**
MATERIAL EXAMINED. Peloritani4: 1 male, 2.XII.1949. Etna63: 1 male, 25.X.1995.
DISTRIBUTION. Recorded from Europe (Great Britain, France, Iberian Peninsula, Malta and Italy); also Canary Is and Morocco. (Italy: Si, Sa).
CHOROTYPE. SW-European.

***Epinotia festivana* (Hübner, 1799)**
MATERIAL EXAMINED. Etna2: 2 males, 21.VI.1996; 1 male and 1 female, 17.VII.1996. Etna32: 1 male, 4.VIII.1998. Etna77: 2 males, 3.VII.1995.
DISTRIBUTION. Europe: from Iberian Peninsula to south and east part of the region (excluded northern territories) also Crimea, Caucasus, Ciscaucasia, Transcaucasia, Asia Minor, Dagestan, Iran and North Africa. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Epinotia thapsiana* (Zeller, 1847)**
MATERIAL EXAMINED. Peloritani1: 1 male, 21.VII.1996; 1 male, 26.VII.1996. Etna22: 2 males, 20.IV.1994. Etna36: 1 female, 16.VI.2008. Piana di Catania7: 1 male, 4.IX.2020.
DISTRIBUTION. Canary Is, southern and median belts of Europe to East European Russia, Transcaucasia, Asia Minor, Iran, South-West Siberia, Kazakhstan, Tadzhikistan, Turkmenia and Korea. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Epinotia dalmatana* (Rebel, 1891)**
MATERIAL EXAMINED. Peloritani1: 2 males, 26.VII.1996. Iblei10: 1 male, 26.VI.1992. Iblei12: 1 male, 20.VII.1995.
DISTRIBUTION. South Europe from Iberian Peninsula and France to Dalmatia, part of East Europe; also Asia Minor, Iran, Iraq, Syria and Transcaucasia. (Italy: N, S; new to the Sicilian fauna).
CHOROTYPE. Turano-European.

***Epinotia demarniana* (Fischer von Röslerstamm, 1840)**
MATERIAL EXAMINED. Etna25: 1 male, 29.VII.1998. Etna69: 1 female, 9.VIII.1996.
DISTRIBUTION. North and Central belts of Europe; also Ural Mts, South-West Siberia, Russian Far East, China and Japan. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Epinotia ramella* (Linnaeus, 1758)**
MATERIAL EXAMINED. Etna40: 1 female, 2.VII.1997; 4 males and 1 female, 28.VIII.1997. Etna57: 1 male, VII.1997. Etna68: 1 male, 12.VI.1997. Etna69: 1 male, 9.VIII.1996.
DISTRIBUTION. Europe from Iberian Peninsula and British Is to Scandinavia and Balkan Peninsula, East Europe, Kazakhstan, Russian Far East (Priamure, South Primorsk, South Sakhalin), China, Korea and Japan. (Italy: N, Si).
CHOROTYPE. Asiatic-European.

***Epinotia bilunana* (Haworth, [1811])**
MATERIAL EXAMINED. Etna18: 1 male and 2 females, 13.VI.2002. Etna70: 1 female, 2.VII.1997.

DISTRIBUTION. Europe from Iberian Peninsula, British Is and Scandinavia to Balkan Peninsula, East Europe, Kazakhstan, Siberia and Russian Far East. (Italy: N, Si).
CHOROTYPE. Sibero-European.

***Zeiraphera rufimitrana* (Herrich-Schäffer, 1847)**
MATERIAL EXAMINED. Etna24: 1 male, 9.VII.2000.
DISTRIBUTION. Europe from Spain and Great Britain to Scandinavia, in the south from Italy to Balkan Peninsula and Greece, East Europe, Siberia, Russian Far East (Siberia, Priamure, South Primosk, South Sakhalin, South Kuril Is), Mongolia, China, Korea and Japan. (Italy: N, Si).
CHOROTYPE. Asiatic-European.

***Zeiraphera isertana* (Fabricius, 1794)**
MATERIAL EXAMINED. Madonie2: 2 males and 2 females, 14.VII.1993. Etna5: 1 male, 16.VII.1996.
DISTRIBUTION. Europe from Iberian Peninsula to Albania and from British Is to Scandinavia, East Europe to Priurale, excluding northern and South-East parts; also Transcaucasia (Armenia). (Italy: N, C, S, Si, Sa).
CHOROTYPE. European.

***Crocidosema plebejana* Zeller, 1847**
MATERIAL EXAMINED. Peloritani1: 1 female, 26.VII.1996. Peloritani4: 1 female, 16.X.1994. Etna2: 1 male, 28.IV.1994; 1 male, 1.V.1994; 1 female, 21.V.1996. Etna9: 2 males, 21.III.2001; 1 male, 18.IV.2001. Etna10: 1 male, 31.V.1994. Etna25: 1 male and 1 female, 29.VII.1998. Etna28: 1 male, VII.1998. Etna30: 1 male: Milo, 18.VII.1996. Etna37: 1 female, 20.VI.2008. Etna62: 1 female, 21.VI.1997; 1 male, 15.XI.1997; 1 female, VI.1998; 1 female, 15.V.1999. Piana di Catania6: 1 male, 12.V.1996. Iblei10: 1 female, 5.VI.1992. Iblei16: 1 male, VIII.1992.
DISTRIBUTION. Entire Europe, North Africa, Asia Minor, Arabia, Iran, Transcaucasia, Turkmenia, India, Taiwan, Australia, North America and South America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Pelochrista mollitana* (Zeller, 1847)**
MATERIAL EXAMINED. Nebrodi1: 1 male, 17.V.1995. Iblei10: 1 male, 5.VI.1992.
DISTRIBUTION. West Europe from France to South Scandinavia; Mediterraneum from Iberian Peninsula to Greece, and Bulgaria; North Africa; East Europe from East Balticum to Crimea, Caucasus; also Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Pelochrista agrestana* (Treitschke, 1830)**
MATERIAL EXAMINED. Nebrodi2: 1 male, 4.VIII.1997. Etna2: 7 males, 21.VI.1996; 3 males, 17.VII.1996. Etna28: 1 male, 6.VII.2000. Etna32: 1 male, 4.VIII.1998. Etna58: 2 males, 1.IX.1991. Etna74: 3 males, 7.VII.1994. Etna77: 1 male, 17.VIII.1991; 5 males, 3.VII.1995. Etna78: 1 male, 31.V.1995. Piana di Catania5: 2 males and 1 female, 27.IV.1997. Agrigento2: 1 male, 5.VII.1996. Iblei2: 2 males, 17.VI.1991; 3 males, 11.IX.1991. Iblei3: 2 males, 24.VIII.1995. Iblei10: 1 male, 26.VI.1992; 2 males, 20.IX.1992. Iblei17: 1 male: 14.VIII.1996.
DISTRIBUTION. Known chiefly from Lithuania, South-West Europe (France, Italy, Austria and former Yugoslavia) and Asia Minor. (Italy: C, S, Si).
CHOROTYPE. S-European.

***Pelochrista cannatana* Trematerra, 2000**
MATERIAL EXAMINED. Iblei15: 1 male and 1 female, 4.VI.1995.
DISTRIBUTION. Known only from Sicily. (Italy: Si).
CHOROTYPE. Sicilian endemic.

***Eucosma cana* (Haworth, [1811])**
MATERIAL EXAMINED. Nebrodi2: 3 males and 1 female, 4.VIII.1997. Nebrodi5: 1 male, 21.VI.1992; 3 males, 3.VIII.1992; 4 males, 11.VII.1993. Etna2: 1 female, 9.X.1992; 1 male, 21.V.1996. Etna8: 2 males, 14.V.1993. Etna22: 1 male, 18.V.1994. Etna62: 1 male, 15.V.1991. Etna64: 1 female, 3.V.1997. Etna74: 1 male, 12.V.1994.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, Kazakhstan, Central Asia, South Siberia, Russian Far East, China and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Eucosma hohenwartiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna22: 2 females, 18.V.1994; 1 female, 9.V.1995.
DISTRIBUTION. North Africa, Europe from British Is to Scandinavia to Mediterraneum, East Europe, Transcaucasia, Asia Minor, West and South Siberia to Altaj, Central Asia, West China and Japan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Asiatic-European.

***Eucosma obumbratana* (Lienig and Zeller, 1846)**
MATERIAL EXAMINED. Nebrodi5: 1 male, 3.VIII.1992.
DISTRIBUTION. West Europe from Shetland Is and North Scandinavia to Mediterraneum, East Europe from Onega Lake to North Caucasus, Transcaucasia, Middle East, Siberia, Kazakhstan, Russian Far East (Priamure, South Primorsk) and North-East China. (Italy: N, C; new to the Sicilian fauna).
CHOROTYPE. Sibero-European.

***Gypsonoma imparana* (Muller-Rutz, 1914)**
MATERIAL EXAMINED. Peloritani3: 1 male, 9.IX.2020.
DISTRIBUTION. Europe: France, Italy, Switzerland, Germany and Austria. Also from Russia: Khabarovsk Krai. (Italy: N, Si).
CHOROTYPE. Asiatic-European.

***Epiblema scutulanum* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Nebrodi3: 1 female, 14.VII.2001.
DISTRIBUTION. Palaearctic species widely distributed in Europe from Iberian Peninsula to Ural Mts, known also from Siberia, Kazakhstan and Russian Far East (South Primorsk, Amur, Khabarovsk Krai); also Morocco. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Epiblema cirsianum* (Zeller, 1843)**
MATERIAL EXAMINED. Iblei2: 1 male, 2.V.1999. Iblei8: 1 male, 15.VII.2001.
DISTRIBUTION. Known from Spain to Ural Mts, then Siberia and from Kazakhstan to Russian Far East. (Italy: S; new to the Sicilian fauna).
CHOROTYPE. Sibero-European.

***Epiblema graphanum* (Treitschke, 1835)**
MATERIAL EXAMINED. Etna68: 1 male, 12.VI.1997.
DISTRIBUTION. West Europe from Spain to South Scandinavia, south to Balkan Peninsula, Asia Minor, Caucasus, Iran, Transcaucasia, Afghanistan, Kazakhstan, South-West Siberia, Transbaikal and China. (Italy: N, C, S; new to the Sicilian fauna).
CHOROTYPE. Centralasiatic-European.

***Epiblema chretieni* Obraztsov, 1952**
MATERIAL EXAMINED. Etna68: 1 male, 12.VI.1997.
DISTRIBUTION. Europe: France, Italy, Switzerland, Hungary and Albania. (Italy: N, Si).
CHOROTYPE. S-European.

***Notocelia cynosbatella* (Linnaeus, 1758)**
MATERIAL EXAMINED. Madonie2: 1 male, 16.V.1993. Nebrodi3: 1 female, 4.VI.2000.
DISTRIBUTION. Europe, Ural Mts, Near East, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, Mongolia, Siberia and Russian Far East. (Italy: N, C, S, Si).
CHOROTYPE. Asiatic-European.

***Notocelia uddmanniana* (Linnaeus, 1758)**
MATERIAL EXAMINED. Nebrodi5: 1 male, 11.VII.1993. Nebrodi6: 1 male, 10.IX.2020. Etna70: 1 male, 2.VII.1997. Etna77: 4 males, 3.VII.1995.
DISTRIBUTION. Europe, North Africa, Asia Minor, Near East, Caucasus, Transcaucasia, Transural, Iran, Kazakhstan, Tadzhikistan and South Siberia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Notocelia aquana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Nebrodi5: 4 males, 11.VII.1993.

DISTRIBUTION. West Europe, Morocco, Ural Mts, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, Central Asia, West Siberia and China. (Italy: N, C, S, Si).
CHOROTYPE. Palaearctic.

***Notocelia incarnatana* (Hübner, 1800)**
MATERIAL EXAMINED. Nebrodi6: 2 females, 10.IX.2020. Etna5: 1 male, 8.IX.1994; 1 male and 1 female, 25.VI.1996; 1 male, 12.IX.1996; 1 male, 20.VIII.1999. Etna53: 1 female, 20.IX.1995. Etna62: 1 male, 19.VI.1994. Etna68: 1 female, 20.VIII.1996. Etna71: 1 male, 11.V.1992. Iblei10: 2 males, 20.IX.1992.
DISTRIBUTION. Europe from Iberian Peninsula, British Is and Scandinavia to northen parts of European Russia, south to Asia Minor, Caucasus, Transcaucasia, Siberia, Kazakhstan, Turkmenia, Pribaikalie, Mongolia, Russian Far East (West Tuva, Amur, Priamure, South Primorsk, Khabarovsk Krai), North China and Morocco. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Notocelia trimaculana* (Haworth, [1811])**
MATERIAL EXAMINED. Nebrodi5: 2 males, 3.VIII.1992.
DISTRIBUTION. North Africa (Morocco), Europe from Spain, British Is and Scandinavia to Balkan Peninsula and Asia Minor, East Europe, Caucasus, Transcaucasia, Near East, Iran and Kazakhstan. (Italy: N, C, S, Si).
CHOROTYPE. W-Palaearctic.

***Blasthesthia tessulatana* (Staudinger, 1871)**
MATERIAL EXAMINED. Etna8: 1 male, 14.V.1993.
DISTRIBUTION. North Africa, South-West Europe: Iberian Peninsula, France, Malta, Italy, Switzerland, Greece, Crete, Balkan Peninsula and part of East Europe; also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. S-Europeo-Mediterranean.

***Rhyacionia pinicolana* (Doubleday, 1849)**
MATERIAL EXAMINED. Etna7: 1 female, 20.VIII.1991. Etna49: 1 male, 1.VIII.1948. Etna59: 1 male and 1 female, 5.IX.1995. Etna73: 1 male, 28.VIII.1997; 1 male, 13.X.1997.
DISTRIBUTION. Europe from Iberian Peninsula, British Is and Scandinavia to Romania, Cisural, Caucasus, Transcaucasia, Siberia, Russian Far East (Amur-Zeya area, South Primorsk, South Kuril Is), China, Korea and Japan (Hokkaido). (Italy: N, S, Si).
CHOROTYPE. Asiatic-European.

***Rhyacionia hafneri* (Rebel, 1937)**
MATERIAL EXAMINED. Etna68: 1 male, 12.VI.1997.
DISTRIBUTION. Known from Europe: Slovenia, Czech Republic, Hungary, former Yugoslavia, Bulgaria, Italy and Greece. (Italy: N, Si).
CHOROTYPE. E-European.

***Clavigesta sylvestrana* (Curtis, 1850)**
MATERIAL EXAMINED. Etna81: 1 female, 28.VIII.2000.
DISTRIBUTION. West Europe: from Spain and British Is to Italy, the Netherlands and Germany; East Europe and Greece. (Italy: N, C, S, Si).
CHOROTYPE. European.

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***Cydia plumbiferana* (Staudinger, 1871)**
MATERIAL EXAMINED. Etna24: 1 female, 31.V.1998.
DISTRIBUTION. Known from Europe (France, Italy, Greece and Crete) and Lebanon. (Italy: N, C, Si).
CHOROTYPE. Mediterranean.

***Cydia medicaginis* (Kuznetzov, 1962)**
MATERIAL EXAMINED. Agrigento2: 1 female, 5.VII.1996.
DISTRIBUTION. distributed from West Europe to Transcaucasia, known also from Kazakhstan, South Siberia and West Tuva. (Italy: N; new to the Sicilian fauna).
CHOROTYPE. Centralasiatic-European.

***Cydia succedana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna19: 1 male, 13.VI.2002.
DISTRIBUTION. Known from West and Central Palaearctic: Europe from Iberian Peninsula (included British Is and Scandinavia) to Morocco, Asia Minor, Transcaucasia, Iran, Afghanistan, Kazakhstan, Central Asia, South Siberia and Mongolia. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cydia cythisantana* Burmann and Pröse, 1988**
MATERIAL EXAMINED. Etna70: 1 male, 2.VII.1997.
DISTRIBUTION. Known only from Italy and Switzerland. (Italy: N; new to the Sicilian fauna).
CHOROTYPE. S-European.

***Cydia ulicetana* (Haworth, [1811])**
MATERIAL EXAMINED. Nebrodi2: 1 male, 2.VI.2000. Piana di Catania1: 1 male, 26.IV.1998. Piana di Catania3: 1 male, 2.III.1999; 1 male, 26.III.1999. Iblei2: 4 males, 26.IV.1997; 1 male, 2.V.1999.
DISTRIBUTION. Known from British Is, Germany, France and former USSR countries, in southern Europe recorded from Iberian Peninsula, Italy and Malta. Also Turkey and North Africa. (Italy: N, C, S, Sa; new to the Sicilian fauna).
CHOROTYPE. European with Anatolian-Maghreb extension.

***Cydia derrai* Pröse, 1988**
MATERIAL EXAMINED. Etna30: 1 female, 5.IX.2001. Piana di Catania5: 1 female, no data.
DISTRIBUTION. Known only from Corsica and Italy. (Italy: C, Sa; new to the Sicilian fauna).
CHOROTYPE. Tirrenic.

***Cydia trogodana* Pröse, 1988**
MATERIAL EXAMINED. Lipari: 1 female, 20-27.V.1972. Etna2: 1 female, 17.VII.1991; 1 male, 21.V.1996; 1 male, 21.VI.1996. Etna5: 1 female, 12.IX.1996. Etna19: 10 males and 5 females, 13.VI.2002. Etna24: 1 male, 19.VIII.2001. Etna32: 2 females, 4.VIII.1998. Etna34: 1 male and 1 female, 4.VII.1994. Etna35: 1 female, 12.VI.2008; 1 male, 14.VI.2008. Etna40: 1 male, 15.VI.2008. Etna42: 1 female, 23.V.1949. Etna46: 1 male, 17.VI.2008. Etna50: 1 female, 15.VIII.1949. Etna51: 1 male, 4.VII.1948. Etna52: 1 male, 29.VIII.1949. Etna53: 1 female, 18.VI.1996. Etna68: 1 male, 19.VII.1999. Etna70: 1 female, 3.VIII.1994. Etna75: 1 female, 12.VI.2002. Etna82: 1 male, 16.VIII.1993; 3 males, 26.VII.1994. Iblei17: 1 male, 29.IV.1998.
DISTRIBUTION. Europe (Spain, Italy, Greece and Crete) and Cyprus. (Italy: S, Si).
CHOROTYPE. Mediterranean.

***Cydia conicolana* (Heylaerts, 1874)**
MATERIAL EXAMINED. Etna68: 1 female, 12.VI.1997.
DISTRIBUTION. Known from Western part of the region, from Spain and British Is to Greece, Asia Minor and Caucasus. (Italy: C, Si).
CHOROTYPE. European with Anatolian-Caucasian extension.

***Cydia pomonella* (Linnaeus, 1758)**
MATERIAL EXAMINED. Peloritani1: 1 female, 21.VII.1996; 1 male, 26.VII.1996; 1 female, 21.VIII.1996. Nebrodi4: 2 females, 27.VIII.1995. Etna32: 1 male, 4.VIII.1998. Etna78: 1 male, 3.VII.1995. Piana di Catania6: 1 male, 12.V.1996. Agrigento2: 1 female, 5.VII.1996. Iblei12: 1 male, 26.VI.1992; 2 males, 20.VII.1995. Iblei17: 1 female, 15.V.1999. Iblei18: 1 male, 6.IX.2020.
DISTRIBUTION. Covers the area of distribution of wild apple-tree, Europe, Asia, North-South America, Australia and New Zealand. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Cosmopolitan.

***Cydia pyrivora* (Danilevsky, 1947)**
MATERIAL EXAMINED. Nebrodi5: 1 female, 11.VIII.1993. Etna62: 1 female, 14.V.2001.
DISTRIBUTION. Known from Europe, excluded northern parts, as far as Transcaucasia, Asia Minor, North Syria, Siberia, Uzbekistan and Thian Shan in Asia; also Algeria. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cydia leguminana* (Lienig and Zeller, 1846)**
MATERIAL EXAMINED. Nebrodi2: 1 male, 2.VI.2000.

DISTRIBUTION. Palaearctic region: North Africa, Europe, Asia Minor, Kazakhstan, South Siberia, North-West China, Korea and Russian Far East (Kamchatka). (Italy: N; new to the Sicilian fauna).
CHOROTYPE. Palaearctic.

***Cydia triangulella* (Goeze, 1783)**
MATERIAL EXAMINED. Peloritani2: 1 male, 9.IX.2020. Nebrodi2: 1 female, 4.VIII.1997. Nebrodi4: 1 male and 1 female, 27.VIII.1999. Nebrodi6: 6 males and 1 female, 10.IX.2020. Etna2: 1 female, 28.IX.1992; 1 male, 9.X.1992. Etna5: 1 male, 19.IX.1995; 1 female, 12.IX.1996; 1 male, 20.VIII.1999. Etna15: 4 males and 3 females, 5.IX.2020. Etna22: 1 male, 11.III.1994; 1 male and 1 female, 17.IX.1994. Etna23: 7 males and 1 female, 8.IX.2020. Etna30: 4 males and 6 females, 15.IX.1994; 1 female, 3.VIII.1999. Etna33: 1 female, 31.VII.1996. Etna62: 1 female, 18.I.1995; 1 female, 8.VIII.1997. Etna68: 2 males and 1 female, 19.VIII.1999. Etna70: 1 female, 17.VI.1997; 1 male and 1 female, 2.VII.1997. Etna73: 1 male, 3.X.1994. Etna78: 1 male, 9.VI.1991; 1 female, 21.VIII.1992. Etna82: 1 male and 1 female, 16.VIII.1993; 1 male, 3.X.1995. Iblei18: 1 male, 6.IX.2020.
DISTRIBUTION. Paleartcic region till Japan, its area covers that of oaks. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Palaearctic.

***Cydia fagiglandana* (Zeller, 1841)**
MATERIAL EXAMINED. Peloritani1: 1 male, 21.VIII.1996. Nebrodi4: 1 male, 27.VIII.1995. Nebrodi5: 4 males, 3.VIII.1992; 1 male and 1 female, 11.VII.1993; 1 male, 23.VII.1993. Etna2: 1 male, 21.VII.1993. Etna3: 1 male, 15.VIII.1991. Etna5: 1 male, 20.VIII.1999. Etna22: 1 male, 28.VII.1992; 2 males, 18.VIII.1995. Etna23: 4 males and 1 female, 8.IX.2020. Etna30: 1 male and 1 female, 15.IX.1994; 1 female, 4.X.1994. Etna64: 1 male, 6.VII.1997. Etna70: 1 male, 2.VII.1997. Etna78: 1 male, 21.VIII.1992; 1 female, 28.VII.2000. Agrigento1: 6 males and 1 female, 11.IX.2020. Iblei3: 1 female, 24.VIII.1995. Iblei13: 1 male, 20.VIII.1995. Iblei18: 15 males and 2 females, 6.IX.2020.
DISTRIBUTION. Europe, Madeira, North-West Africa, Asia Minor, Syria, Iran, and Caucasus. (Italy: N, C, S, Si, Sa).
CHOROTYPE. W-Palaearctic.

***Cydia magnesiae* Trematerra and Colacci, 2017**
MATERIAL EXAMINED. Agrigento1: 2 males, 11.IX.2020. Iblei18: 1 male, 6.IX.2020.
DISTRIBUTION. Europe: Greece. New to the Italian fauna.
CHOROTYPE. Mediterranean.
DESCRIPTION. Externally *Cydia magnesiae* looks like *Grapholita funebrana* (Treitschke) (Fig. 6.7 A), but in the genitalia it is similar to *Cydia fagiglandana* (Zeller). From the latter species it differs by the conformation of valvae, the caudal angle of the sacculus, by cucullus and by aedeagus having basal part enlarged (Fig. 6.7 B). The female genitalia differ by the post-ostial part of the sterigma, the cingulum being elongated, the presence of a weak sclerite at base of ductus seminalis, and by the absence of a diverticulum (Trematerra and Colacci, 2017).
BIOLOGY. Moths collected in June and September. Larval foodplant unknown (Trematerra and Colacci, 2017).

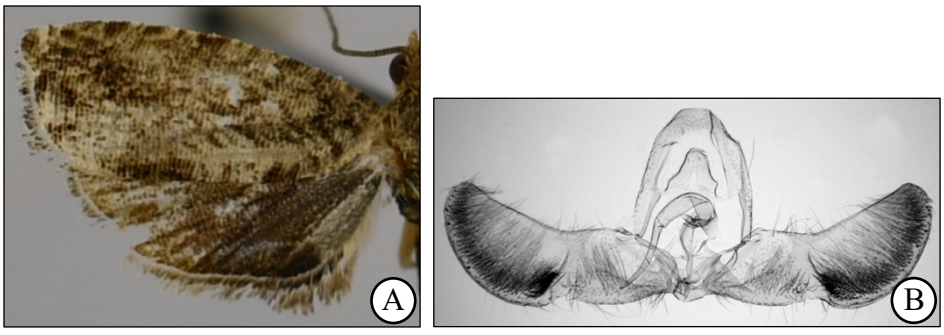


Figure 6.7 - *Cydia magnesiae* Trematerra and Colacci, 2017: adult (wing) (A); male genitalia (B).

***Cydia amplana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Peloritani1: 1 male, 21.VIII.1996. Etna23: 4 males and 5 females, 8.IX.2020. Etna30: 3 males and 3 females, 15.IX.1994. Etna32: 1 male, 13.IX.1991. Etna74: 1 male, 28.IX.1995.

DISTRIBUTION. West Palaearctic species known from whole Europe, included British Islands and Sweden; Transcaucasia; Asia Minor and Syria. Bound rather with southern territories. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Cydia inquinatana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. Nebrodi5: 1 male, 21.VI.1992; 1 male, 11.VII.1993.
DISTRIBUTION. Known from Sweden, Finland, Norway, Russia (St Petersburg), Central and Southern Europe, as far as to lower Volga River territory, Crimea and Caucasus. (Italy: N, C, S, Si).
CHOROTYPE. European with Anatolian extension.

***Lathronimpha balearici* Diakonoff, 1972**
MATERIAL EXAMINED. Peloritani1: 1 male, 26.VII.1996. Etna70: 1 male, 17.VI.1997. Iblei13: 2 males, 23.XI.1994.
DISTRIBUTION. Europe (Estonia, Spain, Italy and Greece). (Italy: C, S; new to the Sicilian fauna).
CHOROTYPE. European.

***Selania leplastriana* (Curtis, 1831)**
MATERIAL EXAMINED. Etna2: 1 female, 6.IX.1997. Etna63: 1 female, 21.IV.1996. Iblei16: 1 male, VIII.1992.
DISTRIBUTION. A West Palaearctic species known from Madeira, North Africa, Europe included Great Britain and Sweden, also Asia Minor. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-Europeo-Mediterranean.

***Selania capparidana* (Zeller, 1847)**
MATERIAL EXAMINED. Pantelleria: 1 male, 20.IV.2019; 2 females, 20.VII.2021.
DISTRIBUTION. North Africa and South-West Europe (Spain to Greece). (Italy: N, S, Si, Sa).
CHOROTYPE. Mediterranean.

***Grapholita pallifrontana* Lienig and Zeller, 1846**
MATERIAL EXAMINED. Piana di Catania2: 1 male, 22.VI.1999. Piana di Catania3: 1 male, 22.VI.1999. Piana di Catania8: 1 male, 12.III.2000.
DISTRIBUTION. A Palaearctic species distributed from West Europe included British Is and South Scandinavia through Siberia to Far East (S Primorsk); also Asia Minor, Caucasus, Transbaikal and Japan. (Italy: N, C, S; new to the Sicilian fauna).
CHOROTYPE. Asiatic-European.

***Grapholita lunulana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. Etna22: 1 female, 27.IV.1998. Etna67: 2 males, 9.V.1995.
DISTRIBUTION. West and Central parts of Palaearctic region: Entire Europe as far as Karelia and Ural Mts. Also Central-North Africa, Asia Minor, Caucasus, mountains of Central Asia as far as Altaj. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Grapholita orobana* Treitschke, 1830**
MATERIAL EXAMINED. Etna43: 1 female, 5.V.1949. Etna61: 1 male, 1.V.1998.
DISTRIBUTION. Europe (excluded Portugal and Ireland), Asia Minor, Transcaucasus, North Iran, Kazakhstan, Russian Far East and Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Sibero-European.

***Grapholita janthinana* (Duponchel, 1835)**
MATERIAL EXAMINED. Iblei6: 4 females, 16.VI.1999.
DISTRIBUTION. Europe, Asia Minor, Crimea, Transcaucasia and Kazakhstan. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Turano-European.

***Pammene querceti* Gozmány, 1957**
MATERIAL EXAMINED. Iblei18: 2 males, 6.IX.2020.
DISTRIBUTION. Known from Europe (Czech Republic, Slovakia, France, Austria, Italy, Hungary and former Yugoslavia). (Italy: C, S; new to the Sicilian fauna).
CHOROTYPE. S-European.

***Pammene giganteana* (Peyerimhoff, 1863)**
MATERIAL EXAMINED. Nebrodi7: 1 male, 3.IV.1997.
DISTRIBUTION. Distributed in Europe from British islands, South Scandinavia and Italy to East Europe. (Italy: N, C, S, Si).
CHOROTYPE. European.

***Pammene obscurana* (Stephens, 1834)**
MATERIAL EXAMINED. Etna28: 1 female, 18.IV.1999.
DISTRIBUTION. Palaearctic region: Europe, Siberia, Kazakhstan, Mongolia, Amur Region in the Russian Far East and Japan. (Italy: N, S; new to the Sicilian fauna).
CHOROTYPE. Asiatic-European.

***Pammene rhediella* (Clerck, 1759)**
MATERIAL EXAMINED. Nebrodi3: 1 female, 4.VI.1999.
DISTRIBUTION. West Palaearctic: Europe north to Scotland, South Scandinavia and Karelia; Asia Minor, Transcaucasia, mountains of Turkmenia, and Central Asia. (Italy: N, C, S, Si).
CHOROTYPE. Centralasiatic-European.

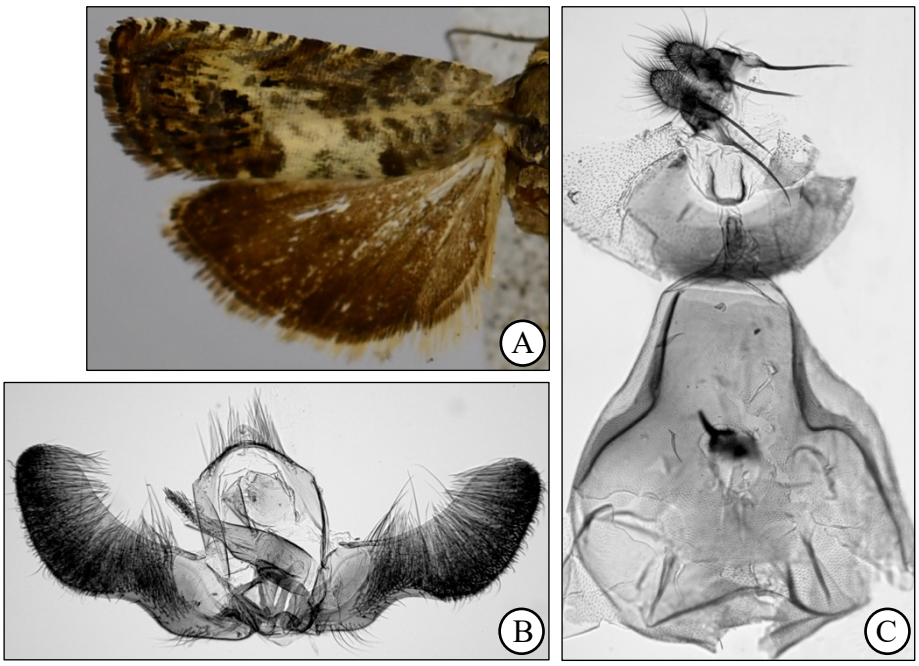


Figure 6.8 – *Pammene castanicola* Trematerra, 2009: adult (wing) (A); male genitalia (B); female genitalia (C).

***Pammene castanicola* Trematerra, 2009**
MATERIAL EXAMINED. Nebrodi4: 1 male, 4.VIII.1997. Nebrodi5: 1 male and 1 female, 3.VIII.1992. Etna31: 3 males, 26.IV.2007.
DISTRIBUTION. Known only for Sicily. (Italy: Si).
CHOROTYPE. Sicilian endemic.
DESCRIPTION. Adult - Wing span 14-18 mm (Fig. 6.8 A). Ground color of forewing white forming a large dorsal patch extending almost to subapical area where tinged creamy; costal strigulae grey divided with brown-grey; speculum cream ochreous with black inner spots and silvery lines. Remaining area of wing suffused and strigulated grey or brownish grey, paler to dorsal patch than beyond it where grey-brown with some black spots. Terminal part of wing with brownish-black or ochreous soffusions. Cilia brownish grey. Hindwing brownish paler in basal area or brown. Cilia whitish, brownish at apex.
In male genitalia it is similar to *P. fasciana* L., the differences are small (Trematerra and Clausi, 2009) (Fig. 6.8 B).
Female genitalia. Postostial plate of sterigma concave with lateral edges limited by ribs; anteostial part slender; median portion cup-shaped fused with colliculum; this last often with dorsal V-shaped sclerite and median sclerite; ductus bursae very short; cingulum usually extending in middle distally; ductus seminalis

broad basally originating at base of ductus bursae; signa well developed. Seventh sternite more or less elongate postero-lateral corners limited from concavities by well sclerotized ribs (Fig. 6.8 C).
BIOLOGY: Larva found in October-April in fruits of *Castanea sativa* Mill. Pupa in March-May. Adults in flight from April till August.

***Strophedra weirana* (Douglas, 1850)**
MATERIAL EXAMINED. Nebrodi5: 1 male, 3.VIII.1992.
DISTRIBUTION. A West Palaearctic specie known from Europe, Caucasus and Asia Minor. (Italy: N, C, S; new to the Sicilian fauna).
CHOROTYPE. European with Anatolian-Caucasian extension.

***Dichrorampha acuminatana* (Lienig and Zeller, 1846)**
MATERIAL EXAMINED. Etna5: 5 males, 19.IX.1995. Etna59: 1 male and 1 female, 5.IX.1995. Etna60: 1 male and 1 female, 8.IX.1995.
DISTRIBUTION. West Palaearctic species known from Spain (British Is and Scandinavia included) to Karelia and Crimea; also Morocco and Asia Minor. Reported from North America. (Italy: N, C, S, Si, Sa).
CHOROTYPE. Holarctic.

***Dichrorampha gemellana* (Zeller, 1847)**
MATERIAL EXAMINED. Peloritani1: 1 male, 21.VIII.1996. Etna22: 1 female, 2.X.1993; 1 male, 5.X.1994. Etna23: 1 male, 8.IX.2020. Etna24: 1 male and 1 female, 27.VIII.1996; 1 male, 30.VIII.1996. Etna30: 1 male, 4.X.1994. Etna34: 7 males and 7 females, 4.VII.1994. Etna44: 1 male, 17.VIII.1948. Etna52: 2 males and 1 female, 29.VII.1949. Etna63: 1 male, 13.IV.1994. Etna74: 1 female, 28.IX.1994.
DISTRIBUTION. Known from Europe (France, Corsica and Italy). (Italy: N, S, Si, Sa).
CHOROTYPE. Tirrenic.

***Dichrorampha flavidorsana* Knaggs, 1867**
MATERIAL EXAMINED. Etna80: 1 female, 18.VIII.2000. Etna82: 1 male, 16.VIII.1993.
DISTRIBUTION. Europe, from Spain to Russia, West and South Siberia. (Italy: N, C, S, Si).
CHOROTYPE. Sibero-European.

***Dichrorampha klimeschiana* Toll, 1955**
MATERIAL EXAMINED. Etna19: 6 males and 6 females, 13.VI.2002. Etna26: 1 male, 4.VII.1948. Etna34: 2 males, 4.VII.1994. Etna38: 1 male, 18.VI.2008. Etna45: 1 male, 19.VI.2008.
DISTRIBUTION. In Europe known from Italy and former USSR countries; also Kazakhstan, South Siberia and Russian Far East. (Italy: N, S, Si).
CHOROTYPE. Sibero-European.

A list of 155 species of Lepidoptera Tortricidae collected in Sicily is reported. The two most numerous tortricids subfamilies recorded are the Olethreutinae and Tortricinae, which has 84 species and 70 species, respectively; the subfamily Chlidanotinae is represented by 1 species. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found (Tortricini with 10 species, Cochylini 26, Cnephasiini 18, Archipini 16, Polyorthini 1, Bactrini 5, Olethreutini 12, Enarmoniini 1, Eucosmini 33, and Grapholitini 33), with the exception of the members of the tribes Sparganothini and Euliini.

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CHAPTER 7

FAUNISTIC NOTES ON LEPIDOPTERA TORTRICIDAE FROM CENTRAL-EAST GREECE



7.1 INTRODUCTION

General information on Lepidoptera Tortricidae is reported in Chapter 1. In this chapter, the results of entomological expedition in central-East Greece are reported.

In terms of biodiversity, Greece is one of the richest European and Mediterranean countries, with many endemic species of plants and animals and important habitats. This is due to its geographic position, its climatic and topographic characteristics and its diverse terrain. Another important parameter is the fact that in general the traditional farming activities cause limited disturbance. More specifically, the total number of species in Greece is estimated to be approximately 50,000, and most are insects (Demertzis *et al*., 2018).

During the last decade, the Tortricidae from Greece have received only sporadic attention by foreign lepidopterists, with publications referring to one or a few entities (*e.g.* Aarvik and Karsholt, 1993; Trematerra and Karsholt, 1996; Trematerra and Aarvik, 1998; Gozmany, 2012; Bassi, 2014). Moreover, summary works that consider the Hellenic fauna are lacking (Gozmany, 2012).

Considering the above information, we selected the Greek peninsula to investigate the Lepidoptera Tortricidae fauna. This choice was made to continue the research that had been started in the same area by Trematerra and Colacci (2016, 2017). Those authors obtained important data about this family of moths and discovered 3 new species. For this purpose, an entomological expedition was organised in 2019, deepening the investigations in the same sites studied previously and exploring new areas. Heterogeneous habitats were investigated at altitudes between sea level and 1,527 m/a.s.l. Other data were obtained from 1 July to 3 October 2021, with the collection of more than 400 samples of the family Tortricidae in different environments.

7.2 MATERIALS AND METHODS

7.2.1 Study area

We recorded species especially from the Thessaly region (Fig. 7.1). It is situated centrally in the Greek mainland and is bordered by Macedonia to the north, Epirus to the west, Sterea Ellas to the south and the Aegean Sea to the east. Thessaly has also retained its position and borders the new administrative division of Greece. The region is divided into five units and covers an area of 14,037 km^2. Karditsa as well as large parts of the Larissa and Trikala units are primarily agricultural areas. The Northern Sporades consists of 24 small islands, only four of which are permanently inhabited. Magnesia and parts of the Trikala and Larissa units are mountainous, including parts of the highest mountain massif in Greece: Mount Olympus (2,917 m/a.s.l.), Mount Pindus (2,637 m/a.s.l.), Mount Ossa (1,978 m/a.s.l.) and the Pelion Mountains (1,624 m/a.s.l.) (Borowiec *et al*., 2018). Our collection sites were situated mostly in the mountainous areas of Pelion, but we also collected some samples from agricultural areas, lowland pastures and forests. The most investigated areas were: the Peneo River (0-237 m/a.s.l.) (Fig. 7.2 A), the area near Lake Panagiotiko (240 m/a.s.l.) (Fig. 7.2 B), Mount Ossa (878- 1,520 m/a.s.l.) (Fig. 7.2 C), the Pelion Mountains (750-1,527 m/a.s.l.) (Fig. 7.2 D, E) and Mount Olympus (325-1,500 m/a.s.l.) (Fig. 7.2 F).

The Pelion Mountains are in Magnesia and are situated between the Aegean Sea to the north-east and the Pegasitic Gulf to the south-west. It is bordered on the west by the Plain of Thessaly while Mount Ossa rises to the north. The island of Skiathos lies to the east (Brussell, 2004). The highest peak is Pourianos Stavros (altitude 1,624 m/a.s.l.).

Depending on the area, the Pelion Mountains have either a moist climate with long, hot summers and mild winters, very moist through the entire season, or a mild Mediterranean climate with hot and dry summers and a mild winter. Heat waves and intense cold periods are rare (Trematerra and Colacci, 2017).

From a geologic point of view, on the Pelion peninsula, the so-called "Flysch of Plesidi", was sampled. This siliciclastic sequence of Maastrichtian age is composed of sandy-pelitic beds, contains red conglomerates and overlies the Cenomanian limestones. The conglomerates contain limestone pebbles and rarely sandstone elements (Faupl *et al*., 1999).

Pelion's diverse ecosystem is made up of coastal, plain and mountain zones. This area consists of thick vegetation of deciduous forests and developed maquis shrubs. It has 3 vegetation zones with 14 ecotypes, supporting rich species communities. The typical Mediterranean shrubland (*Quercetalia ilicis*) covers the low altitudes and includes most of the self-sown aromatic and pharmaceutical *taxa*, such as *Salvia fruticosa* Mill., *Thymus* spp. L., *Sideritis* spp. L., etc. The para-Mediterranean broad-leaved deciduous trees zone (*Quercetalia pubescentis*) covers the middle altitude of the area and includes oak (*Quercus frainetto* Ten.) and chestnut forests (*Castanea sativa* Mill.). The beech forest zone (*Fagetalia*) covers the areas above the para-Mediterranean zone up to the tree-limit zone. The central part of the Pelion Mountains is covered by a thick beech-tree forest (*F. sylvatica* L.) with an excellent structure and maintenance state; this is the dominant vegetation of the higher zones. There are also aspen tree formations (*Populus tremula* L.) and goat willow trees (*Salix caprea* L.). Cultivated species consist mainly of fruit trees (apple, apricot, cherry, kiwi, lemon, orange, pear, almond and walnut) as well as live trees and vineyards.

7.2.2 Collection, preparation, conservation and identification of the *taxa*

For collection, preparation, conservation and identification of the *taxa*, see Chapter 2.

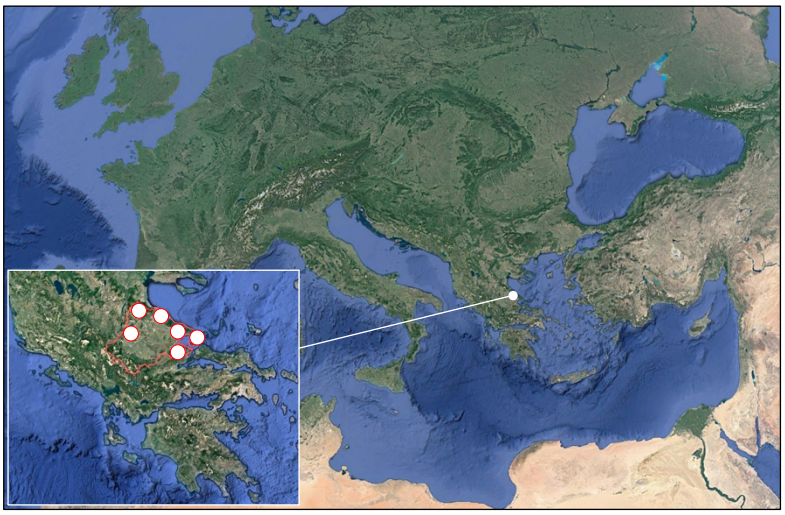


Figure 7.1 – Europe and part of Greece, with the catching localities marked with white circles in the inset.

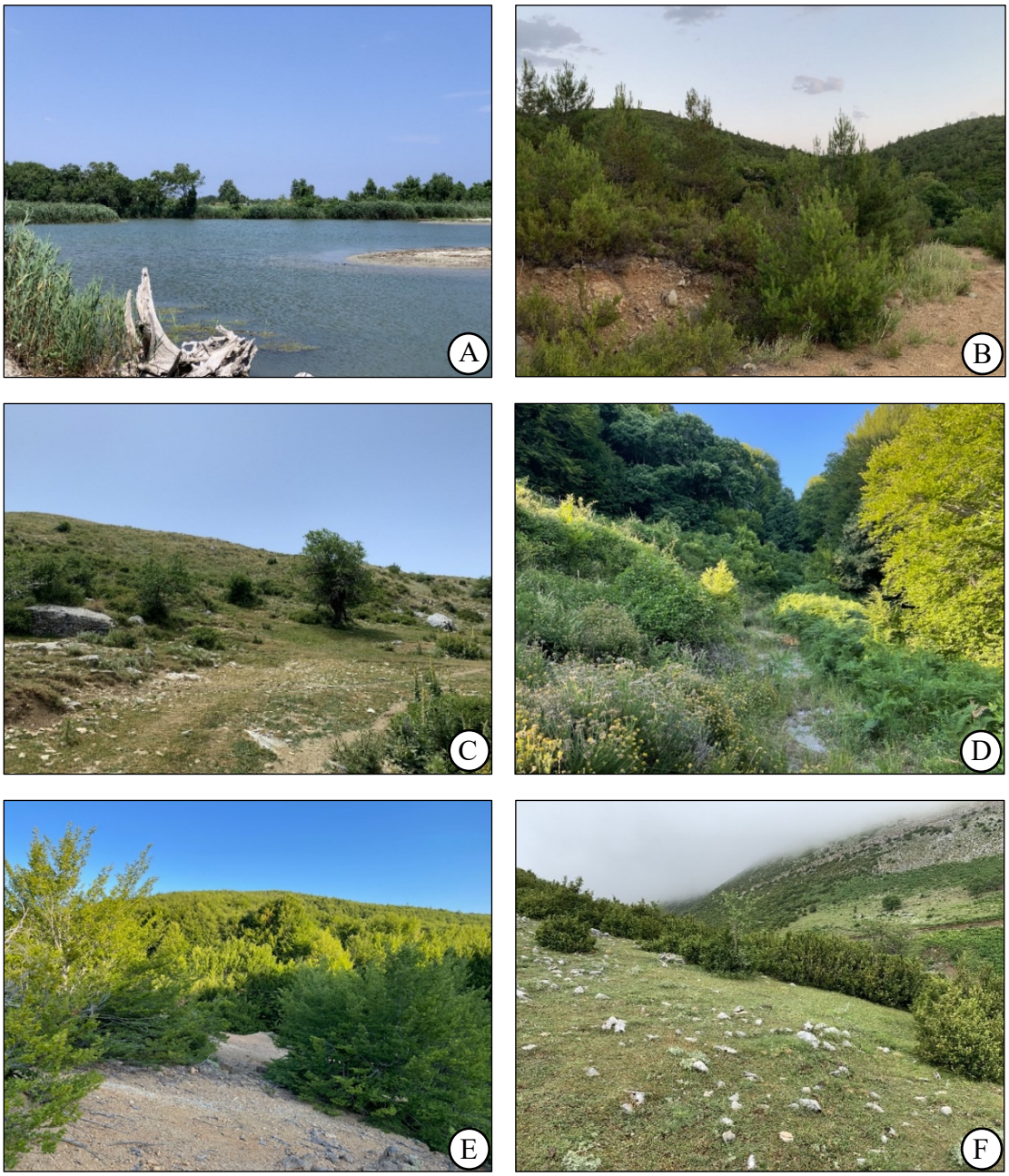


Figure 7.2 – Details of some investigated environments in central-East Greece: the Peneo River, Alexandrini (10 m/a.s.l.) (A); Lake Panagiotiko, Afetes (170 m/a.s.l.) (B); Mount Ossa, Spilia (850 m/a.s.l.) (C); Pelion Mountains, Chania (1,169 m/a.s.l.) (D); Pelion Mountains, Makrinitsa (1,383 m/a.s.l.) (E); Mount Olympus, Kalivia (1,500 m/a.s.l.) (F).

7.3 RESULTS

As reported in Chapter 2, to compile the species list, we followed the indications reported by Razowski (2002, 2003, 2008, 2009) and Aarvik (2013), with some modifications suggested by Brown (2005) and by Gilligan *et al*. (2018) waiting for the recent revision on the tribe Cochylini, proposed at the genetic level by Brown *et al*. 2019, is widely adopted. The distribution of the species was largely taken from Trematerra (2003), with new data from Trematerra's personal catalogue (unpublished data). The chorotype of species was taken from Vigna Taglianti *et al*. (1992, 1999) and Parenzan (1994).

LIST OF TAXA TORTRICIDAE

SUBFAMILY TORTRICINAE

TRIBE TORTRICINI

***Acleris forsskaleana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Larissa, Mt Ossa, Spilia, 850 m, 10.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe, Caucasus, Transcaucasia, Turkmenia, and Iran. Introduced in North America.
CHOROTYPE. Turano-European.

TRIBE COCHYLINI

***Cochylimorpha meridiana* (Staudinger, 1859)**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Mt Pelion, Drakia, 800 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. In Europe known from Iberian Peninsula, France and Switzerland, then from former Yugoslavia to Greece, Bulgaria, Romania and South-East Russia. Recorded from Caucasus to China; also Middle East and Central Asia.
CHOROTYPE. Centralasiatic-European.

***Phalonidia gilvicomana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1300 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe from Spain and British Is to Scandinavia and Finland, former USSR countries, Bulgaria and Greece.
CHOROTYPE. European.

***Phalonidia affinitana* (Douglas, 1846)**
MATERIAL EXAMINED. 3 males, Greece, Thessaly, Kouloura, 1 m, 12.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Known from Europe to Ural Mts, Transcaucasia and Caucasus.
CHOROTYPE. European.

***Ceratoxanthis giansalottii* Bassi, 2014**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 4.VII.2019, Colacci and Goglia legit. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1156 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit.
DISTRIBUTION. Europe (Greece).
CHOROTYPE. Thessalian-Peloponnesian endemic.

***Diceratura rhodograpta* Djakonov, 1929**
MATERIAL EXAMINED. 1 female, Greece, Larissa, Mt Ossa, Spilia, 850 m, 10.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. In Europe known from former USSR countries, France, Italy, former Yugoslavia, Greece and Ukraine (Crimea); also Transcaucasia, Asia Minor and North Syria.
CHOROTYPE. Mediterranean.

***Cochylis molliculana* Zeller, 1847**
MATERIAL EXAMINED. 10 males, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Great Britain and from Spain to Greece.
CHOROTYPE. Europeo-Mediterranean.

***Cochylis posterana* Zeller, 1847**
MATERIAL EXAMINED. 1 male, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Larissa, Mt Ossa, Spilia, 850 m, 10.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. West Palaearctic species occurring east far as Transkaspia, Central Asia and West Siberia.
CHOROTYPE. Palaearctic.

TRIBE CNEPHASIINI

***Oxypteron impar* Staudinger, 1871**
MATERIAL EXAMINED. 1 female, Greece, Larissa, Mt Ossa, Spilia, 850 m, 10.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. South-East Europe, North Caucasus, Transcaucasia, Kazakhstan and Central Asia (mainly after Kuznetov op. cit.).
CHOROTYPE. Centralasiatic-European.

***Eana incanana* (Stephens, 1852)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 4.VII.2019, Colacci and Goglia legit. 3 males and 7 females, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 5 males and 9 females, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Palaearctic species occurring from Spain to Transural, Transcaucasia, Siberia, also Far East (Amur Territory, Primorsk).
CHOROTYPE. Sibero-European.

***Eana italica* (Obraztsov, 1950)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1300 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Known from South-East Europe: Italy, former Yugoslavia, Albania and Greece.
CHOROTYPE. Appennino-Dinaric.

TRIBE ARCHIPINI

***Epagoge grotiana* (Fabricius, 1781)**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 4.VII.2019, Colacci and Goglia legit. 1 male and 3 females, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1520 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit. 2 males and 22 females, Greece, Magnesia, Mt Pelion, Chania, 1355 m, 9.VII.2021, Giuffrida and Goglia legit. 3 females, Greece, Magnesia, Mt Pelion, Chania, 1168 m, 17.VII.2021, Goglia and Karasmanoglou legit.
DISTRIBUTION. Distributed in West Palaearctic from Nnorth-West Europe to Ukraine and South Ural Mts, Trans-Ural, Caucasus, and Asia Minor.
CHOROTYPE. W-Palaearctic.

***Paramesia gnomana* (Clerck, 1759)**
MATERIAL EXAMINED. 3 males and 7 females, Greece, Magnesia, Mt Pelion, Chania, 1355 m, 9.VII.2021, Giuffrida and Goglia legit. 3 males, Greece, Magnesia, Mt Pelion, Chania, 1168 m, 17.VII.2021, Goglia and Karasmanoglou legit. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1156 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit. 2 females, Greece, Magnesia, Mt Pelion, Chania, 1158 m, 31.VII.2021, Goglia legit.
DISTRIBUTION. Known from Iberian Peninsula (included British Is and Scandinavia) to Balkan Peninsula and Ural Mts, then Caucasus, Transcaucasia, West Kazakhstan and West Siberia; also Asia Minor and Iran.

CHOROTYPE. Turano-European.

***Avaria hyerana* (Millière, 1858)**
MATERIAL EXAMINED. 4 males, Greece, Thessaly, Spilia, 878 m, 17.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Known from Western part of our region, excl. the northern areas. Europe (France, Spain, Portugal, Malta, Italy, former Yugoslavia, Greece and Crete), Canary Isles and North-West Africa.
CHOROTYPE. Mediterranean.

***Archips podanus* (Scopoli, 1763)**
MATERIAL EXAMINED. 1 male, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Known from Europe; Asia Minor, Caucasus, Transcaucasia, Ural Mts, Siberia also Japan. Introduced in North America.
CHOROTYPE. Holarctic.

***Choristoneura lafauryana* Kennel, 1910**
MATERIAL EXAMINED. 2 males and 1 female, Greece, Thessaly, Kouloura, 2 m, 12.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Known from South and Central Europe to Transcaucasia, Asia Minor, South Siberia, Russian Far East, Korea, China and Japan.
CHOROTYPE: Asiatic-European.

***Clepsis burgasiensis* (Rebel, 1916)**
MATERIAL EXAMINED. 2 males, Greece, Thessaly, Spilia, 878 m, 17.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Known only from Bulgaria, Macedonia and Greece.
CHOROTYPE: S-European.

***Clepsis consimilana* (Hübner, [1814-1817])**
MATERIAL EXAMINED. 2 females, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Portaria, 1000 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Magnesia, Afetes, 170 m, 8.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Afetes, 192 m, 18.VII.2021, Goglia and Karasmanoglou legit. 2 males, Greece, Thessaly, Dion, 325 m, 15.IX.2021, Bella, Catania and Goglia legit. 1 female, Greece, Magnesia, Portaria, 748 m, 18.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. West Europe to East European Russia; West Africa to Lebanon, Asia Minor, Nearctics and Ethiopian region (introduced).
CHOROTYPE. Cosmopolitan.

SUBFAMILY OLETHREUTINAE

TRIBE OLETHREUTINI

***Endothenia oblongana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Pineos river, Kalabaka, 231 m, 1.VIII.2021, Goglia legit.
DISTRIBUTION. Known from whole Europe.
CHOROTYPE. European.

***Endothenia marginana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Greece, Thessaly, Kouloura, 2 m, 12.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Europe, North-West Africa, Transcaucasia, Asia: from Ural Mts to Mongolia, China and Russian Far East.
CHOROTYPE. Palaearctic.

***Endothenia lapideana* (Herrich-Schäffer, 1848)**
MATERIAL EXAMINED. 1 female, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.

DISTRIBUTION. Known from Europe excluded northern territories.
CHOROTYPE. European.

***Endothenia nigricostana* (Haworth, [1811])**
MATERIAL EXAMINED. 1 male, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Holarctic region: Europe, South Siberia, Far East (Primorsk), Korea and Japan.
CHOROTYPE. Asiatic-European.

***Lobesia botrana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Afetes, 170 m, 8.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. From West Europe to Ural Mts, North Africa, Asia Minor, Near East, Iraq, Iran, Transcaucasia, Turkmenistan, Kazakhstan, and Japan. North-South America (introduced).
CHOROTYPE. Cosmopolitan.

***Lobesia artemisiana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 female, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe excluded British Is and Scandinavia; widely spread in South-East Europe. Also Transcaucasia; Asia Minor; Iraq; Iran.
CHOROTYPE. Turano-European.

***Pristerognatha fuligana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Greece, Thessaly, Spilia, 878 m, 17.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Known from Europe excluded its southern part; Kazakhstan, Siberia, Russian Far East, Japan (Hokkaido and Honshu).
CHOROTYPE. Asiatic-European.

***Olethreutes arcuellus* (Clerck, 1759)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 4.VII.2019, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. From Europe to Caucasus; Asia Minor, Iran, Kazakhstan, West Siberia, and North-West China.
CHOROTYPE. Centralasiatic-European.

***Syricoris lacunana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 4.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1520 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. West Europe to Ural Mts and Caucasus, Transcaucasia; Asia Minor, Mongolia, South-West Siberia, China, and Japan.
CHOROTYPE. Asiatic-European.

TRIBE ENARMONIINI

***Ancylis comptana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male, Greece, Larissa, Mt Olympus, Kalivia, 1500 m, 11.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. From Europe to Ural Mts, Asia Minor, Caucasus, Kazakhstan, Uzbekistan, Siberia Far East, China, Mongolia, Korea, and Japan. Also North America.
CHOROTYPE. Holarctic.

***Ancylis badiana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 male, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.

DISTRIBUTION. From West Europe to Asia Minor, Caucasus, Transcaucasia, Ural Mts, Mongolia and Russian Far East, China, Korea, and Japan.
CHOROTYPE. Asiatic-European.

***Ancylis achatana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Greece, Larissa, Mt Olympus, Kalivia, 1100 m, 11.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. From West Europe to Asia Minor, Caucasus, Transcaucasia, Ural Mts, Mongolia and Russian Far East, China, Korea, and Japan.
CHOROTYPE. Asiatic-European.

TRIBE EUCOSMINI

***Thiodia trochilana* (Frölich, 1828)**
MATERIAL EXAMINED. 1 male, Greece, Larissa, Mt Ossa, Spilia, 850 m, 10.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Central-South Europe, East Balticum, southern part of East Europe, North Africa, Asia Minor, Transcaucasia, Turkmenia and Iran.
CHOROTYPE. Turano-Europeo-Mediterranean.

***Spilonota ocellana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1520 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male and 1 female, Greece, Magnesia, Mt Pelion, Chania, 1300 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1156 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit.
DISTRIBUTION. Europe, North Africa, Caucasus, Asia Minor, Transcaucasia, Iran, Kazakhstan, Turkmenia, Uzbekistan, Tadzhikistan, Russian Far East, Siberia, China, Korea, and Japan. Also Nearctic Region.
CHOROTYPE. Holarctic.

***Gibberifera simplana* (Fischer von Röslerstamm, 1836)**
MATERIAL EXAMINED. 2 females, Greece, Magnesia, Peneo river, Kalabaka, 231 m, 1.VIII.2021, Goglia legit.
DISTRIBUTION. Europe from France and British Is to Italy, Romania and Scandinavia, East Europe excluded northern territories; North China, Korea, Russian Far East: Amur-Zeya area; Japan: Honshu.
CHOROTYPE. Asiatic-European.

***Epinotia thapsiana* (Zeller, 1847)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Canary Is, southern and median belts of Europe to East European Russia, Transcaucasia, Asia Minor, Iran, South-West Siberia, Kazakhstan, Tadzhikistan, Turkmenia and Korea.
CHOROTYPE. Asiatic-European.

***Crocidosema plebejana* Zeller, 1847**
MATERIAL EXAMINED. 2 females, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Volos, 6 m, 25.VII.2021, Goglia legit.
DISTRIBUTION. Entire Europe, North Africa, Asia Minor, Arabia, Iran, Transcaucasia, Turkmenia, India, Taiwan, Australia, North America, and South America.
CHOROTYPE. Cosmopolitan.

***Pelochrista agrestana* (Treitschke, 1830)**
MATERIAL EXAMINED. 2 males, Greece, Magnesia, Mt Pelion, Chania, 907 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit.
DISTRIBUTION. Known chiefly from Lithuania, South-West Europe (France, Italy, Austria and former Yugoslavia), and Asia Minor.

CHOROTYPE. S-European.

***Gypsonoma imparana* (Muller-Rutz, 1914)**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Volos, 6 m, 11.VII.2021, Goglia legit.
DISTRIBUTION. Europe: France, Italy, Switzerland, Germany and Austria. Also from Russia: Khabarovsk Krai.
CHOROTYPE. Asiatic-European.

***Gypsonoma nitidulana* (Lienig and Zeller, 1846)**
MATERIAL EXAMINED. 1 male and 1 female, Greece, Larissa, Alexandrini, Peneo river, 10 m, 9.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe from British Is and Scandinavia as far as Ural Mts, Siberia, Asia Minor, Mongolia, Russia (Altaj), Russian Far East: Priamure, South Primorsk, South Kuril Is (Shikotan I).
CHOROTYPE. Asiatic-European.

***Notocelia uddmanniana* (Linnaeus, 1758)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe, North Africa, Asia Minor, Near East, Caucasus, Transcaucasia, Transural, Iran, Kazakhstan, Tadzhikistan, and S-Siberia.
CHOROTYPE. Palaearctic.

***Notocelia aquana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1168 m, 17.VII.2021, Goglia and Karasmanoglou legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1156 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit. 1 female, Greece, Magnesia, Portaria, 748 m, 18.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. West Europe, Morocco, Ural Mts, Caucasus, Transcaucasia, Asia Minor, Iran, Kazakhstan, C-Asia, W-Siberia, and China.
CHOROTYPE. Palaearctic.

***Notocelia incarnatana* (Hübner, 1800)**
MATERIAL EXAMINED. 1 male and 2 females, Greece, Magnesia, Trikeri, 33 m, 13.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Europe from Iberian Peninsula, British Is and Scandinavia to northern parts of European Russia, south to Asia Minor, Caucasus, Transcaucasia, Siberia, Kazakhstan, Turkmenia, Pribaikalie, Mongolia, Russian Far East (West Tuva, Amur, Priamure, South Primorsk, Khabarovsk Krai), North China and Morocco.
CHOROTYPE. Palaearctic.

***Blastesthia tessulatana* (Staudinger, 1871)**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Volos, Nea Ionia, 57 m, 11.VIII.2021, Goglia legit.
DISTRIBUTION. North Africa, South-West Europe: Iberian Peninsula, France, Malta, Italy, Switzerland, Greece, Crete, Balkan Peninsula and part of East Europe; also Asia Minor.
CHOROTYPE. S-Europeo-Mediterranean.

***Rhyacionia buoliana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males and 7 females, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Madeira, North Africa, Europe: from Iberian Peninsula, British Is and Scandinavia to Greece, Ural Mts and Caucasus; also Transcaucasia, Asia Minor, Near East (Israel), Korea, China and Japan. Introduced to Nearctic region (North America) and Neotropical region (Argentina and Uruguay).
CHOROTYPE. Subcosmopolitan.

TRIBE GRAPHOLITINI

***Cydia succedana* ([Denis and Schiffermüller], 1775)**
MATERIAL EXAMINED. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 4.VII.2019, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male and 1 female, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 6.VII.2019, Bella,

Catania, Colacci and Goglia legit. 2 males and 1 female, Greece, Magnesia, Mt Pelion, Chania, 1300 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Known from West and Central Palaearctic: Europe from Iberian Peninsula (included British Is and Scandinavia) to Morocco, Asia Minor, Transcaucasia, Iran, Afghanistan, Kazakhstan, Central Asia, South Siberia and Mongolia.
CHOROTYPE. Centralasiatic-Europeo-Mediterranean.

***Cydia trogodana* Pröse, 1988**
MATERIAL EXAMINED. 1 male and 4 females, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1350 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe (Spain, Italy, Greece and Crete) and Cyprus.
CHOROTYPE. Mediterranean.

***Cydia triangulella* (Goeze, 1783)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Chania, 57 m, 11.IX.2021, Bella, Catania and Goglia legit. 1 female, Greece, Magnesia, Chania, 1157 m, 11.IX.2021, Bella, Catania and Goglia legit. 2 females, Greece, Lamia, Anavra, 947 m, 14.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Paleartcic region till Japan, its area covers that of oaks.
CHOROTYPE. Palaearctic.

***Cydia fagiglandana* (Zeller, 1841)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 4 males and 1 female, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Portaria, 1000 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Chania, 1300 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Larissa, Mt Ossa, Spilia, 850 m, 10.VII.2019, Bella, Catania, Colacci and Goglia legit. 8 males, Greece, Magnesia, Mt Pelion, Portaria, 858 m, 29.VII.2021, Goglia legit. 1 male and 2 females, Greece, Magnesia, Mt Pelion, Portaria, 907 m, 29.VII.2021, Fotiou, Goglia and Karasmanoglou legit. 6 males and 2 females, Greece, Magnesia, Trikeri, 33 m, 13.IX.2021, Bella, Catania and Goglia legit. 13 males and 1 female, Greece, Magnesia, Trikeri, 148 m, 13.IX.2021, Bella, Catania and Goglia legit. 1 male, Greece, Lamia, Anavra, 803 m, 14.IX.2021, Bella, Catania and Goglia legit. 1 male, Greece, Lamia, Anavra, 947 m, 14.IX.2021, Bella, Catania and Goglia legit. 2 males and 1 female, Greece, Thessaly, Dion, 204 m, 15.IX.2021, Bella, Catania and Goglia legit. 1 female, Greece, Thessaly, Spilia, 849 m, 17.IX.2021, Bella, Catania and Goglia legit. 3 males and 1 female, Greece, Magnesia, Portaria, 748 m, 18.IX.2021, Bella, Catania and Goglia legit. 5 males and 1 female, Greece, Magnesia, Portaria, 851 m, 18.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Europe, Madeira, North-West Africa, Asia Minor, Syria, Iran, and Caucasus.
CHOROTYPE. W-Palaearctic.

***Cydia aldocataniae* Trematerra, 2019**
MATERIAL EXAMINED. 1 male and 2 females, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 2 males and 1 female, Greece, Magnesia, Afetes, 170 m, 8.VII.2019, Bella, Catania, Colacci and Goglia legit. 1 male, Greece, Magnesia, Mt Pelion, Portaria, 907 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit. 1 male, Greece, Magnesia, Trikeri, 33 m, 13.IX.2021, Bella, Catania and Goglia legit. 3 males, Greece, Magnesia, Trikeri, 148 m, 13.IX.2021, Bella, Catania and Goglia legit. 1 male, Greece, Lamia, Anavra, 803 m, 14.IX.2021, Bella, Catania and Goglia legit. 3 males, Greece, Thessaly, Dion, 204 m, 15.IX.2021, Bella, Catania and Goglia. 1 male, Greece, Thessaly, Spilia, 849 m, 17.IX.2021, Bella, Catania and Goglia legit. 1 male, Greece, Magnesia, Portaria, 851 m, 18.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Known from Malta, Italy and Greece. (Italy: S).
CHOROTYPE. S-European.

***Cydia magnesiae* Trematerra and Colacci, 2017**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Mt Pelion, Portaria, 858 m, 29.VII.2021, Goglia legit. 2 males, Greece, Magnesia, Mt Pelion, Portaria, 907 m, 29.VII.2021, Fotiou, Goglia and Karasmanoglou legit. 2 males, Greece, Magnesia, Trikeri, 33 m, 13.IX.2021, Bella, Catania and Goglia legit. 10 males and 1 female, Greece, Magnesia, Trikeri, 148 m, 13.IX.2021, Bella, Catania and Goglia legit. 3 males and 1 female, Greece, Lamia, Anavra, 947 m, 14.IX.2021, Bella, Catania and Goglia legit. 2 females, Greece, Thessaly, Spilia, 849 m, 17.IX.2021, Bella, Catania and Goglia legit. 1 male, Greece, Magnesia, Portaria,

748 m, 18.IX.2021, Bella, Catania and Goglia legit. 1 male, Greece, Magnesia, Portaria, 851 m, 18.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. Europe: Greece and Italy.
CHOROTYPE. Mediterranean.

***Cydia amplana* (Hübner, [1796-1799])**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Trikeri, 33 m, 13.IX.2021, Bella, Catania and Goglia legit. 8 males and 2 females, Greece, Magnesia, Trikeri, 148 m, 13.IX.2021, Bella, Catania and Goglia legit. 2 males and 1 female, Greece, Thessaly, Dion, 204 m, 15.IX.2021, Bella, Catania and Goglia legit. 1 male and 1 female, Greece, Magnesia, Portaria, 851 m, 18.IX.2021, Bella, Catania and Goglia legit.
DISTRIBUTION. West Palaearctic species known from whole Europe, included British Islands and Sweden; Transcaucasia; Asia Minor and Syria. Bound rather with southern territories.
CHOROTYPE. Turano-European.

***Cydia pelionae* Trematerra and Colacci, 2016**
MATERIAL EXAMINED. 1 male, Greece, Magnesia, Mt Pelion, Portaria, 1000 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe (Greece).
CHOROTYPE. Thessalian endemic.

***Lathronympha balearici* Diakonoff, 1972**
MATERIAL EXAMINED. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1520 m, 6.VII.2019, Bella, Catania, Colacci and Goglia legit.
DISTRIBUTION. Europe (Estonia, Spain, Italy and Greece).
CHOROTYPE. European.

***Grapholita molesta* (Busck, 1916)**
MATERIAL EXAMINED. 1 female, Greece, Magnesia, Lechonia, 5 m, 20.IX.2021, *Ficus carica*, ex fructu 17.IX.2021, leg. Rodovitis.
DISTRIBUTION. A Palaearctic species distributed in North-West Africa (Morocco), Europe from Spain and British Is to Balkan Peninsula, Ukraine, also Caucasus, Transcaucasia; in Asia in North-East, Central and South China, Taiwan, Korean and Japan. Introduced to North and South America, Australia and New Zeland.
CHOROTYPE. Subcosmopolitan.

***Pammene fasciana* (Linnaeus, 1761)**
MATERIAL EXAMINED. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1150 m, 5.VII.2019, Bella, Catania, Colacci and Goglia legit. 4 males, Greece, Magnesia, Mt Pelion, Portaria, 750 m, 7.VII.2019, Bella, Catania, Colacci and Goglia legit. 2 males, Greece, Magnesia, Mt Pelion, Chania, 1355 m, 9.VII.2021, Giuffrida and Goglia legit. 1 female, Greece, Magnesia, Mt Pelion, Chania, 1168 m, 17.VII.2021, Goglia and Karasmanoglou legit. 5 males, Greece, Magnesia, Mt Pelion, Chania, 1156 m, 28.VII.2021, Fotiou, Goglia and Karasmanoglou legit.
DISTRIBUTION. Europe, Asia Minor, Caucasus, Transcaucasia, and Iran.
CHOROTYPE. Turano-European.

Preliminarly, during the entomological expeditions conducted in Greece in 2019 and 2021, 54 species of Lepidoptera Tortricidae were collected. The two most abundant tortricid subfamilies recorded are Olethreutinae and Tortricinae, with 36 and 18 species, respectively. The Chlidanotinae subfamily is not represented. In particular were found the following species for each tribes: Tortricini with 1 species, Cochylini with 7, Cnephasiini with 3, Archipini with 7, Olethreutini with 9, Enarmoniini with 3, Eucosmini with 13 and Grapholitini with 11; species belonging to the tribes Sparganothini, Euliini, Polyorthini and Bactrini are not retrieved.

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CHAPTER 8

CONCLUSIONS
AND
FUTURE PERSPECTIVES





8.1 CONCLUSIONS

8.1.1 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND AT THE COLLEMELUCCIO NATURE RESERVE (CENTRAL ITALY)

During the entomological expeditions at the Collemeluccio Nature Reserve, 43 species belonging to Lepidoptera Tortricidae were collected. The two most abundant tortricid subfamilies recorded are Olethreutinae and Tortricinae, with 27 and 16 species, respectively; the subfamily Chlidanotinae is not represented. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found at the Collemeluccio Nature Reserve (Cochylini with 10, Cnephasiini with 1, Archipini with 5, Olethreutini with 7, Enarmoniini with 3, Eucosmini with 9 and Grapholitini with 8), except for the tribes Tortricini, Sparganothini, Polyorthini, Euliini, and Bactrini.

Table 8.1 shows the biogeographic study of the Tortricidae found at the Collemeluccio Nature Reserve, using chorological analysis. The Cosmopolitan (6.98%) and Holarctic (9.30%) species are well represented while there are few Subcosmopolitan (2.33%) *taxa*.

Table 8.1 – Chorological categories with the number and percentage of species collected at the Collemeluccio Nature Reserve (Central Italy).

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan distibution	**4**	**9.31**
Cosmopolitan	3	6.98
Subcosmopolitan	1	2.33
Holartic distribution	**4**	**9.30**
Holarctic	4	9.30
Wide Palaearctc distribution	**32**	**74.40**
Palaearctic	7	16.27
W-Palaearctic	2	4.65
Asiatic-European	17	39.53
Centralasiatic-Europeo-Mediterranean	2	4.65
Centralasiatic-European	2	4.65
Turano-European	2	4.65
European distribution	**3**	**6.99**
European	2	4.66
S-European	1	2.33

More than 74% of the species show a wide Palaearctic distribution in this grouping. The most represented species have the Asiatic-European (39.53%) and Palaearctic (16.27%) chorotypes. The W-Palaearctic, Centralasiatic-Europeo-Mediterranean, Centralasiatic-European and Turano-European chorotypes each have

around 4.65%. Around 6% of the collected *taxa* are tortricids with a European distribution; the elements belonging to this distribution are European (4.66%) and S-European (2.33%) chorotypes.

There are also three new reports for Molise: *Gynnidomorpha luridana* (Greyson, 1870), *Ancylis geminana* (Donovan, [1806]) and *Lathronimpha balearici* Diakonoff, 1972.

8.1.2 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND AT THE MATESE MASSIF (CENTRAL-SOUTH ITALY)

During the entomological expeditions at the Matese Massif, 37 species belonging to Lepidoptera Tortricidae were collected. The two most abundant tortricid subfamilies recorded are the Olethreutinae and Tortricinae, with 19 and 17 species, respectively; the subfamily Chlidanotinae is represented by only one *taxa*. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found at the Matese Massif (Tortricini with 3 species, Cochylini with 6, Cnephasiini with 2, Archipini with 6, Polyorthini with 1, Olethreutini with 2, Eucosmini with 7 and Grapholitini with 10), except for the tribes Sparganothini, Euliini, Bactrini and Enarmoniini.

Table 8.2 shows the biogeographic study on the Tortricidae found at the Matese Massif, using chorological analysis. Cosmopolitan (8.11%) and Holarctic (21.60%) species are well represented.

Table 8.2 – Chorological categories with the number and percentage of species collected at the Matese Massif (central-South Italy).

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan dstribution	**3**	**8.11**
Cosmopolitan	3	8.11
Holarctic distribution	**8**	**21.60**
Holarctic	8	21.60
Wide Palaearctic distribution	**21**	**56.78**
Palaearctic	3	8.11
W-Palaearcitc	3	8.11
Asiatic-European	6	16.22
Sibero-European	1	2.70
Centralasiatic-Europeo-Mediterranean	2	5.41
Centralasiatic-European	2	5.41
Turano-Europeo-Mediterranean	2	5.41
Turano-European	2	5.41
European distribution	**4**	**10.81**
European	1	2.70
S-European	3	8.11
Endemic Italian species	**1**	**2.70**
S-Appenninic	1	2.70

More than 56% of the species show a wide Palaearctic distribution in this grouping; the Asiatic-European (16.22%), Palaearctic (8.11%) and W-Palaearctic (8.11%) chorotypes are most abundant. Fewer are Centralasiatic-Europeo-Mediterranean (5.41%), Centralasiatic-European (5.41%), Turano-Europeo-Mediterranean (5.41%), Turano-Europeo (5.41%) and Sibero-European (2.70%). Around 10% of the collected *taxa* are tortricids with a European distribution; the elements belonging to this distribution show S-European (8.11%) and European (2.70%) chorotypes. Finally, there is one species with the S-Apenninic chorotype.

We collected three species from the ripe and unripe acorns of holm oak *Quercus ilex* L.: *Cydia fagiglandana* (Zeller, 1841); *Cydia rymarczki* Varenne and Nel, 2013 previously reported only in Veneto; and *Cydia aldocataniae* Trematerra, 2019, described for the first time by Trematerra (2019a) for Malta and reported for the first time in Italy. We only found *Blastesthia tessulatana* (Staudinger, 1871) in the fruit from cypress *Cupressus sempervirens* var. *horizontalis* (Miller) Aiton. Of particular interest is the finding of one Apennine endemism: *Isotrias huemeri* Trematerra, 1993. In addition to the first report of *C. aldocataniae* for Italy, there are also three new reports for Molise: *Cochylimorpha straminea* (Haworth, [1811]), *Isotrias huemeri* Trematerra 1993, and *Pammene aurana* (Fabricius, 1794).

8.1.3 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND AT THE GARGANO TERRITORY (SOUTH ITALY)

During our entomological expeditions carried out during 2019-2020 in Gargano territory, we caught 33 species of Lepidoptera Tortricidae, to which we added 34 species collected in the previous years by the senior author or by other entomologists, up to a total of 67 *taxa* of the family. The two most numerous tortricids subfamilies recorded are the Olethreutinae and Tortricinae, which has 37 species and 30 species, respectively; the subfamily Chlidanotinae is not represented. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found in Gargano territory (Tortricini with 4 species, Cochylini 10, Cnephasiini 6, Archipini 10, Olethreutini 7, Enarmoniini 4, Eucosmini 12, and Grapholitini 14), with the exception of the members of the tribes Sparganothini, Euliini, Polyorthini, and Bactrini.

Ancylis minimana (Caradja, 1916) (Olethreutinae, Enarmoniini), listed from south-eastern parts of eastern Europe to Ciscaucasia, Ural Mts, and Caucasus, is reported for the first time in Italy.

From a biogeographic point of view, it can be noted that in Gargano territory there are few Cosmopolitan species (7.46%), European (2.99%), and Holarctic (13.43%). More than 70% of the species show a wide Palaearctic distribution. In this grouping, the species with the chorotypes Asiatic-European (13.43%), Palaearctic (11.95%) and Turano-European (11.95%) are well represented. Fewer are the W-Palaearctic (8.95%), Centralasiatic-European (7.46%), Sibero-European (5.97%), Centralasiatic-Europeo-Mediterranean (2.99%), European with Anatolian extension (2.99%), Turano-Europeo-Mediterranean (1.49%), Europeo-Mediterranean (1.49%) and S-European with Anatolian extension (1.49%). Around 7% of the collected *taxa* are tortricids with European distribution; the elements belonging to this chorotype show S-European (4.47%) and European (2.99%) (Table 8.3).

Overall, we observed that a limited number of specimens belonging to entities potentially harmful to agricultural and forest plants was recorded, especially in the central part of the territory (in Gargano territory) this suggests that this area is in good health and maintains a high degree of naturalness. However, it is worth noting the negative role of grazing overload on the biodiversity of this group of Lepidoptera, whose larvae often inhabit the land with grass- and shrubland.

Table 8.3 – Chorological categories with the number and percentage of species collected at the Gargano Territory (South Italy).

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan distribution	**6**	**8.95**
Cosmopolitan	5	7.46
Subcosmopolitan	1	1.49
Holarctic distribution	**9**	**13.43**
Holarctic	9	13.43
Wide Palaearctic distribution	**47**	**70.16**
Palaearctic	8	11.95
W-Palaearctic	6	8.95
Asiatic-European	9	13.43
Sibero-European	4	5.97
Centralasiatic-Europeo-Mediterranean	2	2.99
Centralasiatic-European	5	7.46
Turano-Europeo-Mediterranean	1	1.49
Turano-European	8	11.95
Europeo-Mediterranean	1	1.49
European (extension Anatolian)	2	2.99
S-European (extension Anatolian)	1	1.49
European distribution	**5**	**7.46**
European	2	2.99
S-European	3	4.47

8.1.4 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND IN CALABRIA (SOUTH ITALY)

During our entomological expeditions realized from 2013 to 2018 in Calabria region, 123 species of Lepidoptera Tortricidae were caught, to which we added 23 species deposited in the Trematerra Collection and other 36 species reported by Trematerra in the course of entomological researches carried out in the past in the Calabrian territory, up to a total of 182 *taxa* of the family.

Species belonging to all the tribes cited in the Italian fauna (Trematerra, 2003) have been found in Calabria, with the exception of the members of the Sparganothini tribe (subfamily Tortricinae), the two most numerous tortricids subfamilies recorded are the Tortricinae and the Olethreutinae, which has 76 species and 102 species, respectively; the subfamily Chlidanotinae is represented by 4 *taxa*.

Table 8.4 shows the biogeographic study of the Tortricidae found in Calabria, using chorological analysis. There are few Cosmopolitan (2.76%) and Subcosmopolitan (3.31%) species while Holarctic species (16.09%) are well represented. More than 56% of the species show a wide Palaearctic distribution. In this grouping, the species with the Asiatic-European (18.28%), Turano-European (6.63%), Palaearctic (5.52%) and W-Palaearctic (4.97%) chorotypes are well represented. The Centralasiatic-Europeo-Mediterranean (2.76%), Turano-Europeo-Mediterranean (2.76%), European with Anatolian extension (2.76%) and Europeo-Mediterranean (2.21%) chorotypes are less represented. A few of the other chorotypes have percentages from 0.55% to 1.10%. More than 13% of the collected *taxa* are tortricids with a European distribution; the elements

belonging to this chorotype are European (9.39%), S-European (3.87%) and SE-European (0.55%). Only 4.96% of the *taxa* show the Mediterranean distribution, including the Mediterranean (2.21%); W-Mediterranean (1.10%); and S-European-Mediterranean, Tirrenic, Apenninic-Dinaric elements (each with 0.55%). Finally, there are two species with the Apenninic chorotype and three species with the S-Apenninic chorotype.

The fauna of Lepidoptera Tortricidae in the Calabrian study areas is dominated by forest elements, on the contrary, only few are agrarian elements. Many species are related to arboreal and uncultivated plants; the latter have been expanding on lands due to the abandonment of the fields and the continuous deforestation. The increase in plant cover favors the increase of lepidopteran populations (of all families) with mesophilic or nemoral behaviour.

Unlike what has occurred for other Italian regions, the tortricids present in the southern areas of the country have received little or sporadic attention from Italian and foreign entomologists. Overall information on this matter can be found in the Checklist of the Italian fauna (Trematerra, 1995) and in the "Catalogue of Lepidoptera Tortricidae of the Italian fauna" (Trematerra, 2003).

In the present report, 59 of the whole species (over 30% of the total) were found for the first time in the Calabria: *Aleimma loeflingianum* (Linnaeus, 1758); *Acleris abietana* (Hübner, [1819-1822]); *A. sparsana* ([Denis and Schiffermüller], 1775); *A. rhombana* ([Denis and Schiffermüller], 1775); *A. schalleriana* (Linnaeus, 1761); *A. cristana* ([Denis and Schiffermüller], 1775); *A. aspersana* (Hübner, [1814-1817]); *A. hastiana* (Linnaeus, 1758); *A. notana* (Donovan, [1806]); *A. ferrugana* ([Denis and Schiffermüller], 1775); *A. quercinana* (Obraztsov, 1957); *A. literana* (Linnaeus, 1758); *Phtheochroa rugosana* (Hübner, [1796-1799]); *Phalonidia gilvicomana* (Zeller, 1847); *P. manniana* (Fischer von Röslerstamm, 1839); *Agapeta hamana* (Linnaeus, 1758); *Eupoecilia angustana* (Hübner, [1796-1799]); *Aethes cnicana* (Westwood, 1854); *Cochylis salebrana* (Mann, 1862); *C. molliculana* Zeller, 1847; *Eana penziana* (Hübner, [1796-1799]); *Archicnephasia hartigi* Razowski, 1983; *Cnephasia fulturata* Rebel, 1940; *C. hellenica* Obraztsov, 1956; *Batodes angustiorana* (Haworth, [1811]); *Paramesia diffusana* (Kennel, 1899); *Archips crataeganus* (Hübner, [1796-1799]); *Choristoneura diversana* (Hübner, [1814-1817]); *Argyrotaenia ljungiana* (Thunberg, 1797); *Ptycoloma lecheana* (Linnaeus, 1758); *Aphelia ferrugana* (Hübner, 1793); *Isotrias rectifasciana* (Haworth, [1811]); *Bactra lancealana* (Hübner, [1796-1799]); *B. venosana* (Zeller, 1847); *Endothenia nigricostana* (Haworth, [1811]); *E. pullana* (Haworth, [1811]); *Piniphila bifasciana* (Haworth, [1811]); *Syricoris rivulana* (Scopoli, 1763); *Ancylis comptana* (Frölich, 1828); *A. paludana* (Barrett, 1871); *A. badiana* ([Denis and Schiffermüller], 1775); *A. mitterbacheriana* ([Denis and Schiffermüller], 1775); *Rhopobota naevana* (Hübner, [1814-1817]); *Epinotia sordidana* (Hübner, [1823-1824]); *E. solandriana* (Linnaeus, 1758); *E. fraternana* (Haworth, [1811]); *Pelochrista subtiliana* (Jäckh, 1960); *Eucosma hohenwartiana* ([Denis and Schiffermüller], 1775); *E. balatonana* (Osthelder, 1937); *E. albidulana* (Herrich-Schäffer, 1848); *Epiblema graphana* (Treitschke, 1835); *Notocelia aquana* (Hübner, [1796-1799]); *N. rosaecolana* (Doubleday, 1850); *N. trimaculana* (Haworth, [1811]); *Rhyacionia pinivorana* (Liening and Zeller, 1846); *Cydia trogodana* Pröse, 1988; *Grapholita fissana* (Frölich, 1828); *Pammene amygdalana* (Duponchel, 1842); and *Strophedra nitidana* (Fabricius, 1775).

Our findings furthermore revealed 19 species that have as a southern limit of their distribution area the Calabrian territory: *Phtheochroa purana* (Guenée. 1846); *Archicnephasia hartigi* Razowski, 1983; *Cnephasia zangheriana* Trematerra, 1991; *Choristoneura murinana* (Hübner, [1796-1799]); *Dichelia histrionana* (Frölich, 1828); *Endothenia lapideana* (Herrich-Schäffer, 1848); *E. pullana* (Haworth, [1811]); *Syricoris*

Table 8.4 – Chorological categories with the number and percentage of species collected in Calabria (South Italy).

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan distribution	**11**	**6.07**
Cosmopolitan	5	2.76
Subcosmopolitann	6	3.31
Holarctic distribution	**29**	**16.09**
Holarctic	29	16.09
Wide Palaearctic distribution	**103**	**56.37**
Palaearctic	10	5.52
W-Palaearctic	9	4.97
Asiatic-European	34	18.28
Sibero-European	6	3.31
Centraliasiatic-Europeo-Mediterranean	5	2.76
Centralasiatic-European	8	4.42
Turano-Europeo-Mediterranean	5	2.76
Turano-European	12	6.63
Europeo-N-African	1	0.55
Europeo-Mediterranean	4	2.21
European (extension Anatolian)	5	2.76
European (extension Maghrebian)	1	0.55
European (extension Anatolian-Maghrebian)	1	0.55
European (extension Anatolian-Caucasian)	2	1.10
European distribution	**25**	**13.81**
European	17	9.39
S-European	7	3.87
SE-European	1	0.55
Mediterranean distribution	**9**	**4.96**
Mediterranean	4	2.21
S-Europeo-Mediterranean	1	0.55
W-Mediterranean	2	1.10
Tirrenic	1	0.55
Appennino-Dinaric	1	0.55
Endemic Italian species	**5**	**2.70**
Appenninic	2	1.10
S-Appenninic	3	1.60

lacunana ([Denis and Schiffermüller], 1775); *Ancylis paludana* (Barrett, 1871); *Spilonota laricana* (Heinemann, 1863); *Epinotia signatana* (Douglas, 1845); *E. nigricana* (Herrich-Schäffer, 1848); *Pelochrista subtiliana* (Jäckh, 1960); *Eucosma balatonana* (Osthelder, 1937); *Gypsonoma sociana* (Haworth, [1811]); *Rhyacionia pinivorana* (Liening and Zeller, 1846); *Cydia coniferana* (Saxesen, 1840); *Pammene albuginana* (Guenée, 1846); and *P. aurana* (Fabricius, 1775)

The finding of the two Apennine endemisms, *Cnephasia zangheriana* Trematerra, 1991 and *Isotrias joannisana* (Turati, 1921), and two S-Apennines species, *Isotrias martelliana* Trematerra, 1990 and *Archicnephasia hartigi* Razowski, 1983, is of particular interest. Finally, the report of *Cochylimorpha scalerciana* Trematerra, 2019 new species for the science (Trematerra, 2019b).

Overall it is possible to observe that a limited number of specimens belonging to entities potentially harmful to agricultural and forest plants was recorded in Calabria, especially in the northern and central part of the territory, this suggests that these areas may in good health and maintains a high degree of naturalness. However, the absence of tortricid pests could be also due to the particular natural habitats visited during the entomological expeditions.

8.1.5 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND IN SICILY (SOUTH ITALY)

A list of 155 species of Lepidoptera Tortricidae collected in Sicily is reported. The two most numerous tortricids subfamilies recorded are the Olethreutinae and Tortricinae, which has 84 species and 70 species, respectively; the subfamily Chlidanotinae is represented by 1 species. Species belonging to almost all the tribes cited in the Italian fauna (Trematerra, 2003) have been found (Tortricini with 10 species, Cochylini 26, Cnephasiini 18, Archipini 16, Polyorthini 1, Bactrini 5, Olethreutini 12, Enarmoniini 1, Eucosmini 33, and Grapholitini 33), with the exception of the members of the tribes Sparganothini and Euliini.

Referring to the individual localities, in Lipari Island were collected 2 species, in Vulcano Island 1, on Erei Mounts 1, on Etna Mount 93, on Iblei Mounts 50, on Madonie Mounts 9, on Nebrodi Mounts 46, on Peloritani Mounts 23, in Piana di Catania 20, Agrigento area 10, and in Pantelleria Island 4.

Phtheochroa ochralana (Chrétien, 1915) and *Cydia magnesiae* Trematerra and Colacci, 2017 are new to Italian fauna; *Fulvoclysia forsteri* (Osthelder, 1938) and *Tortricodes selma* Kocak, 1991 are recorded for first time in Europe. The females of *Thiodia major* (Rebel, 1903) and *Pammene castanicola* Trematerra, 2009 are described. The following species are cited for first time in Sicily: *Acleris hastiana* (Linnaeus, 1758); *A. notana* (Donovan, [1806]); *Cochylidia rupicola* (Curtis, 1834); *C. moguntiana* (Rössler, 1864); *Cochylis sannitica* Trematerra, 1995; *Eana joannisi* (Schawerda, 1929); *E. italica* (Obraztsov, 1950); *Cnephasia fulturata* Rebel, 1940; *Archips betulanus*(Hübner, [1787]); *A. crataeganus* (Hübner, [1796-1799]); *Pandemis cerasana* (Hübner, 1786); *Olindia schumacherana* (Fabricius, 1787); *Epinotia dalmatana* (Rebel, 1891); *Eucosma obumbratana* (Lienig and Zeller, 1846); *Epiblema cirsianum* (Zeller, 1843); *E. graphanum* (Treitschke, 1835); *Cydia medicaginis* (Kuznetov, 1962); *C. cythisantana* Burmann and Pröse, 1988; *C. ulicetana* (Haworth, [1811]); *C. derrai* Pröse, 1988; *C. leguminana* (Liening and Zeller, 1846); *Lathronimpha balearici* Diakonoff, 1972; *Grapholita pallifrontana* Lienig and Zeller, 1846; *Pammene querceti* Gozmány, 1957; *P. obscurana* (Stephens, 1834); and *Strophedra weirana* (Douglas, 1850) (Kocak,

Table 8.5 – Chorological categories with the number and percentages of species collected in Sicily (South Italy).

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan distribution	**9**	**5.79**
Cosmopolitan	5	3.21
Subcosmopolitann	4	2.58
Holarctic distribution	**16**	**10.32**
Holarctic	16	10.32
Wide Palaearctic distribution	**93**	**60.00**
Palaearctic	15	9.68
W-Palaearctic	10	6.45
Asiatic-European	17	10.92
Sibero-European	7	4.52
Centraliasiatic-Europeo-Mediterranean	7	4.52
Centralasiatic-European	8	5.16
Turano-Europeo-Mediterranean	3	1.94
Turano-European	10	6.45
Turano-Mediterranean	1	0.65
Europeo-N-African	1	0.65
Europeo-Mediterranean	2	1.29
Mediterraneo-Sindian	1	0.65
European (extension Anatolian)	2	1.29
S-European (extension Anatolian)	3	1.94
European (extension Maghrebian)	1	0.65
European (extension Anatolian-Maghrebian)	1	0.65
European (extension Anatolian-Caucasian)	3	1.94
European (extension Maghrebian-Macronesia)	1	0.65
European distribution	**18**	**11.61**
European	7	4.52
S-European	8	5.14
E-European	1	0.65
SE-European	1	0.65
SW-European	1	0.65
Mediterranean distribution	**16**	**10.34**
Mediterranean	10	6.45
S-Europeo-Mediterranean	1	0.65
E-Mediterranean	1	0.65
Tirrenic	3	1.94
N-African	1	0.65
Endemic Italian species	**3**	**1.94**
Sicilian	3	1.94

1991; Trematerra, 2003; Razowski, 2009; Aarvik, 2013; Trematerra and Clausi, 2009; Trematerra and Colacci, 2017).

A biogeographic study on the Tortricidae found in Sicily and here reported (Table 8.5), using chorological analysis, was carried out. Sixty percent of the species show a wide Palaearctic distribution; in this grouping, the species with the chorotypes Asiatic-European (10.92%), Palaearctic (9.68%), W-Palaearctic and Turano-European (6.45%), Centralasiatic-European (5.16%), Sibero-European and Centraliasiatic-Europeo-Mediterranean (4.52%) are well represented. A few of the other chorotypes have percentages from 1.94% to 0.65%. About of 11% of the collected *taxa* are tortricids with European distribution; the elements belonging to this chorotype show mostly S-European (5.14%) and European (4.52%) distribution.

The Mediterranean *taxa* are shown by 10.34% of the recorded species including Mediterranean (6.45%) and Tirrenic (1.94%). Holarctic and Cosmopolitan and Subcosmopolitan distributions are represented by 10.32% and 5.79% respectively. Furthermore, three species are Endemic Italian species.

Below are the data referring to the localities with the greatest number of species:

Peloritani Mounts. More than 52% of the species show a wide Palaearctic distribution (52.17%), the *taxa* with the chorotypes Turano-European (17.39%), Palaearctic (13.04%) and Asiatic-European (13.04%) are well represented in this grouping. In the chorological category of Cosmopolitan and Subcosmopolitan distribution (with 17.39%), cosmopolitan species are 13.04%. Of the species with European distribution (13.04%) more than 8% are European and 4.35% are SW-European. With Mediterranean distribution (8.70%) are included Mediterranean and Tirrenic species with 4.35% each. Species with Holarctic distribution are 8.70%.

Nebrodi Mounts. In this locality wide part of species show a Palaearctic distribution 65.22%, with Palaearctic 17.39% and Asiatic-European 10.87%; the other *taxa* have Cosmopolitan and Subcosmopolitan distribution 10.87% in which Subcosmopolitan are 6.52%, Holarctic distribution 13.04%, Mediterranean and European distributions 4.35%, each.

Etna Mount. More than 55% have wide Palaearctic distribution, with Asiatic-European 11.83% and Palaearctic 9.68%. European distribution (13.98%), with European (5.38%) and S-European (5.38%). Holarctic distribution (10.75%). Mediterranean distribution (9.68%), of which Mediterranean 6.45%. Cosmopolitan and Subcosmopolitan distribution (7.53%). Two are Endemic Italian species.

Piana di Catania. About 57% of listed *taxa* have wide Palaearctic distribution, with Asiatic-European (10.53%) and Centralasiatic-Europeo-Mediterranean 10.53%. The other species are of Cosmopolitan and Subcosmopolitan distribution (26.32%). Holarctic distribution (5.26%). S-European distribution and Tirrenic distribution each have 5.26%.

Iblei Mounts. Species collected in this locality have wide Palaearctic distribution (58.00%), with W-Palaearctic (12.00%) and Palaearctic (8.00%). Cosmopolitan distribution (10.00%). Holarctic distribution (12.00%). Mediterranean distribution (8.00%), and S-European distribution (4.00%). Two are Endemic Italian species.

8.1.6 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND IN CENTRAL-EAST GREECE

During the entomological expeditions conducted in Greece in 2019 and 2021, 54 species of Lepidoptera Tortricidae were collected. The two most abundant tortricid subfamilies recorded are Olethreutinae and Tortricinae, with 36 and 18 species, respectively. The Chlidanotinae subfamily is not represented. In particular were found the following species for each tribes: Tortricini with 1 species,

Cochylini with 7, Cnephasiini with 3, Archipini with 7, Olethreutini with 9, Enarmoniini with 3, Eucosmini with 13 and Grapholitini with 11; species belonging to the tribes Sparganothini, Euliini, Polyorthini and Bactrini are not retrieved.

Table 8.6 – Chorological categories with the number and percentage of species collected in central-East Greece.

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan distribution	**5**	**9.26**
Cosmopolitan	3	5.56
Subcosmopolitan	2	3.70
Holarctic distribution	**3**	**5.56**
Holarctic	3	5.56
Wide Palaearctic distribution	**31**	**57.40**
Palaearctic	6	11.11
W-Palaearctic	2	3.70
Asiatic-European	10	18.52
Sibero-European	1	1.85
Centralasiatic-Europeo-Mediterranean	1	1.85
Centralasiatic-European	3	5.56
Turano-Europeo-Mediterranean	1	1.85
Turano-European	5	9.26
Europeo-Mediteranean	1	1.85
S-Europeo-Mediterranean	1	1.85
European distribution	**8**	**14.82**
European	5	9.26
S-European	3	5.56
Mediteranean distribution	**5**	**9.26**
Mediterranean	4	7.41
Appennino-Dinaric	1	1.85
Endemic Greek species	**2**	**3.70**
Thessalian endemic	1	1.85
Thessalian-Peloponnesian endemic	1	1.85

Table 8.6 shows the biogeographic study of the Tortricidae found in central-East Greece using chorological analysis. There are few Cosmopolitan (5.56%), Subcosmopolitan (3.70%) and Holartic (5.56%) species.

More than 57% of the species show a wide Palaearctic distribution. In this grouping, the species with the Asiatic-European (18.52%), Palaearctic (11.11%), Turano-European (9.26%) and Centralasiatic-European (5.56%) chorotypes are well represented. Fewer species have a W-Palaearctic (3.70%) chorotype; all the other chorotypes contain 1.85% of the species. More than 14% of the collected *taxa* are tortricids with a European distribution; the elements belonging to this chorotype are European (9.26%) and S-

European (5.56%). Only 9.26% of the recorded species show a Mediterranean distribution, including Mediterranean (7.41%) and Appennino-Dinaric (1.85%) elements. Finally, two species have the Thessalian and Thessalian-Peloponnesian chorotype.

The work started in Greece in 2019 was originally planned to continue in March-June 2020. Because of COVID-19 travel restrictions, this endeavour was postponed to July-October 2021. For this reason, some samples caught during that period are still being identified.

8.2 FUTURE PERSPECTIVES

8.2.1 BIOGEOGRAPHICAL CONSIDERATIONS RELATED TO TORTRICIDAE SPECIES FOUND IN THE MEDITERRANEAN ECOSYSTEMS

From the material collected in the field and studied from private collections, in some areas of the Mediterranean Basin, we traced 296 species of Lepidoptera Tortricidae. The two most abundant tortricid subfamilies are Olethreutinae and Tortricinae, with 166 and 125 species, respectively. The Chlidanotinae subfamily is represented by 5 *taxa*. In particular were found the following species for each tribes: Tortricini with 16 species, Cochylini with 51, Cnephasiini with 27, Archipini with 30, Eulini with 1, Polyorthini with 5, Bactrini with 5, Olethreutini with 28, Enarmoniini with 9, Eucosmini with 65 and Grapholitini with 59; species belonging to the tribe Sparganothini are not retrieved.

Table 8.7 present the data of the biogeographic study, using chorological analysis. There are few Cosmopolitan (1.69%), Subcosmopolitan (2.36%) and Holartic (11.80%) species. More than 60% of the species show a wide Palaearctic distribution. In this grouping, the species with the Asiatic-European (19.25%), Turano-European (7.43%), Palaearctic (5.74%) and Centralasiatic-European (5.74%) chorotypes are well represented. The other chorotypes have percentages from 0.34% to 4.73%. More than 14% of the collected *taxa* are tortricids with a European distribution; the elements belonging to this chorotype show European (8.11%) and S-European (5.07%); all the other chorotypes have percentages of 0.34%. Only 6.42% of the recorded species have a Mediterranean distribution, including Mediterranean (4.05%) and Tirrenic (1.01%) elements. There are very few species with the W-Mediterranean (0.68%), E-Mediterranean (0.34%) and N-African (0.34%) chorotypes. Finally, we have found 10 endemic species with Appenninic (0.68%), S-Appenninic (1.01%), Sicilian (1.01%), Thessalian (0.34%) and Thessalian-Peloponnesian (0.34%) chorotypes.

The lists elaborated in this Doctorate Thesis contribute to and update the knowledge of the Lepidoptera Tortricidae fauna in Mediterranean ecosystems.

Table 8.7 – Chorological categories with the number and percentage of the species collected in Mediterranean Basin.

CHOROTYPE	N. OF SPECIES	%
Cosmopolitan and Subcosmopolitan distribution	**12**	**4.05**
Cosmopolitan	5	1.69
Subcosmopolitan	7	2.36
Holarctic distribution	**35**	**11.80**
Holarctic	35	11.80
Wide Palaearctic distribution	**178**	**60.15**
Palaearctic	17	5.74
W-Palaearctic	10	3.38
Asiatic-European	57	19.25
Sibero-European	14	4.73
Centralasiatic-Europeo-Mediterranean	9	3.04
Centralasiatic-European	17	5.74
Turano-Europeo-Mediterranean	6	2.03
Turano-European	22	7.43
Turano-Mediterranean	1	0.34
European-N-African	1	0.34
Europeo-Mediterranean	4	1.35
S-Europeo-Mediterranean	2	0.68
Mediterranean-Sindian	1	0.34
European (extension Anatolian-Caucasian)	4	1.35
European (extension Anatolian-Maghreb)	1	0.34
European (extension Maghreb-Macaronesia)	1	0.34
European (extension Anatolian)	6	2.03
S-European (extension Anatolian)	3	1.02
European (extension Maghreb)	2	0.68
European distribution	**42**	**14.20**
European	24	8.11
S-European	15	5.07
SW-European	1	0.34
SE-European	1	0.34
E-European	1	0.34
Mediterranean distribution	**19**	**6.42**
Mediterranean	12	4.05
W-Mediterranean	2	0.68
E-Mediterranean	1	0.34
Tirrenic	3	1.01
N-African	1	0.34
Endemic Italian species	**8**	**2.70**
Appenninic	2	0.68
S-Appenninic	3	1.01
Sicilian endemic	3	1.01
Endemic Greek species	**2**	**0.68**
Thessalian endemic	1	0.34
Thessalian-Peloponnesian endemic	1	0.34

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Scientific Articles

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