

Longhorn beetles of the Ficuzza woods (W Sicily, Italy) and their relationship with plant diversity (Coleoptera, Cerambycidae)

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ABSTRACT

The woods in Sicily are the result of centuries of anthropogenic activities that have reduced the surface of wood and changed the original composition even with the introduction of alien species to native flora. The value in terms of biodiversity of these forests remains, however, high for they are the last refuge areas for many animals and plant species. This study was conducted within the Ficuzza woods (West Sicily), extended about 5,000 hectares on the slopes of limestone-dolomite rock of Busambra (1615 m asl), within which lies the largest remaining forest area in western Sicily. It is an area with a wide diversity of vegetation, represented mainly by native forests (holm oak, cork oak, deciduous oaks), groups of riparian vegetation, shrubs, bushes, grasslands, and of non-native forest formations (*Pinus* and *Eucalyptus* woods). The study on Cerambycidae in this area is fragmented and does not specify a relation the species with the surrounding vegetation. This study was performed by choosing among various groups of insects, xylophagous Coleoptera Cerambycidae; existing literature data and extensive collected field data were reviewed. The analysis was also performed by the collection of dead wood in order to distinguish the relationship between the plant species and coleoptera. The results summarize and supplement the data registered so far, shedding further light on the ecological role of this group of insects that are also valid biomarkers of the integrity and complexity of the forest.

KEY WORDS saproxylic beetles; red list; conservation status; Mediterranean vegetation.

Received 05.11.2010; accepted 10.12.2010; printed 30.12.2010

INTRODUCTION

Longhorn beetles (Coleoptera Cerambycidae) are considered an excellent indicator of woodland biodiversity and, particularly, of the wood decomposer community (Holland, 2007). Several scientific studies are demonstrating on a forest ecosystem the importance of silvicultural management intensity, stand structures and, particularly, dead wood to maintain the equilibrium a forest ecosystem (Müller et al., 2008). In Italy, much research is mainly conducted on the Saproxylic beetle taking into consideration mainly systematic aspects. The aim of this study was to contribute to the knowledge of the biodiversity of the largest forest area in Sicily and to show a relation of the forest vegetation with the species richness of Cerambycidae as was performed in

other areas (Lassau et al., 2005; Komonen, 2007; Sirami et al., 2008; Buse et al., 2010). This type of information can be useful for planning large-scale conservation of biodiversity (Holland, 2010).

MATERIALS AND METHODS

Study site

The study area is located in one of the most important forested areas of western Sicily (about 5,000 Ha) (Fig. 1). The territory is dominated by Rocca Busambra, a carbonatic outcrop 15 km long. Woods and Rocca Busambra are included in the natural reserves "Bosco della Ficuzza, Rocca Busambra, Bosco del Cappelliere and Gorgo del Drago" (Figs. 2-13). The protected area, extended about 7,400 ha, is one of the lar-

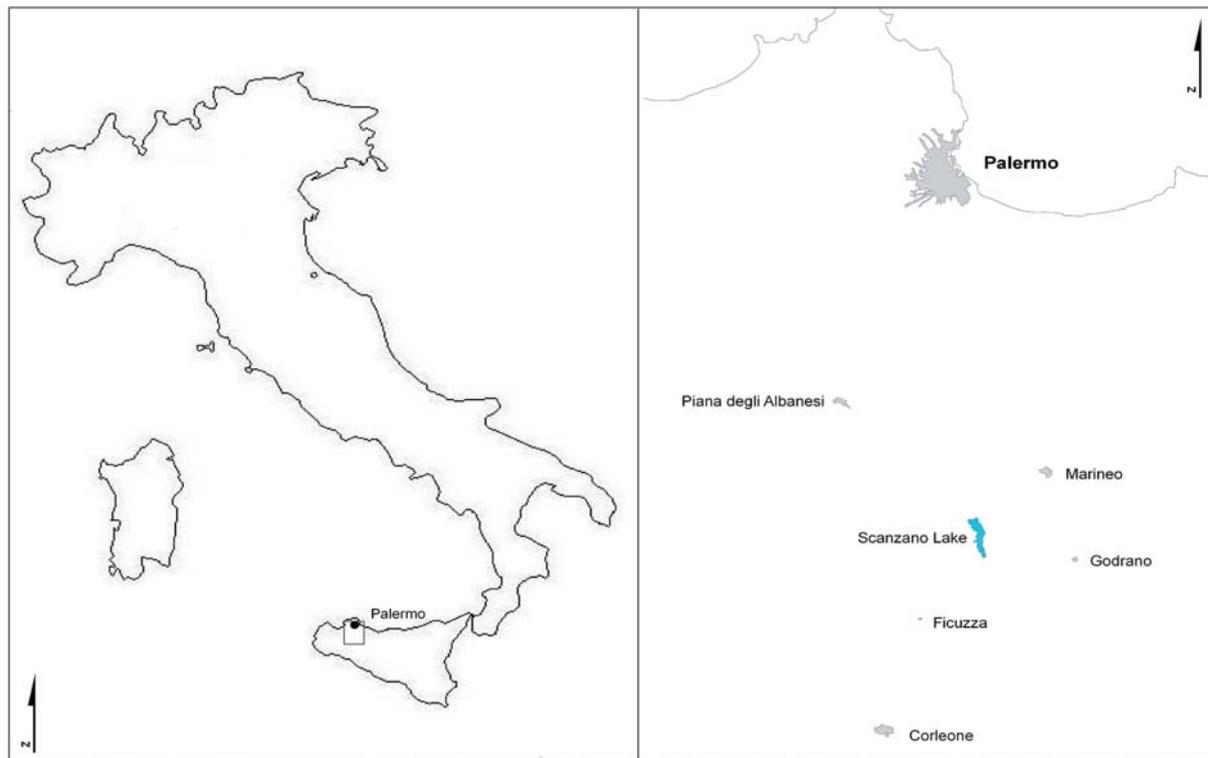


Figure 1. The study area (W Sicily, Italy).

gest natural reserves of Sicily. The bioclimate of the area has been referred to as thermomediterranean lower subhumid, mesomediterranean (from lower to upper subhumid ombrotype) and supra-mediterranean (subhumid and humid ombrotype) thermotypes (Rivas-Martínez, 2008). The vegetation of this area is represented by some cenosis recently studied by Gianguzzi & La Mantia (2004). With reference to the forestry species, the Ficuzza woods are characterised mainly by thermophilous evergreen oaks, *Quercus ilex* L. and *Q. suber* L. and deciduous oaks, downy oak or pubescent oak (*Quercus pubescens* s.l.) (in the Ficuzza woods area there are many species of deciduous oaks: *Q. amplifolia* Guss., *Quercus congesta* C. Presl, *Q. dalechampi* Ten., *Q. leptobalanos* Guss., *Q. virgiliana* (Ten.) Ten. and *Q. gussonei* (Borzì) Brullo). *Quercus gussonei* is an endemic species and thermophilous form of *Quercus cerris* L. that is found in Sicily and is exclusive to the Nebrodi chain and Ficuzza Reserve. The evergreen oak forests are formed mainly by the Holm oak (*Quercus ilex*) grown mainly on calcareous soils of the northern slope of Rocca Busambra. Holm oak is associated with different

species of maple (*Acer campestre* L., *A. pseudo-planatus* L.) wild apple (*Malus sylvestris* Miller), *Pirus amygdaliformis* Vill., manna ash or south european flowering ash (*Fraxinus ornus* L.), common whitebeam (*Sorbus aria*), mahaleb cherry (*Prunus mahaleb*) and deciduous oaks (*Quercus pubescens* s.l.). Other evergreen oaks are cork oak (*Quercus suber*) grown on acid soils in addition with tree heath (*Erica arborea* L.), *Cytisus villosus* Pourret and some species *Cistus*, soft-hairy rockrose (*Cistus creticus* L.), and sage-leaved cistus (*C. salvifolius* L.). The forests of deciduous oaks are formed mainly by *Quercus pubescens* s.l. and *Quercus gussonei* respectively on calcareous and acid soils.

Today *Quercus gussonei* forest stands are showing clear signs of decay (Sala et al., in press).

The vegetation of the streams' water is formed by poplar (*Populus nigra* L., *P. alba* L.), grey elm (*Ulmus canescens* Melville) and various willow species *Salix pedicellata* Desf, *S. alba* L.), mixed, usually in dense, compact clusters. The shrub layer consists mainly of common fig (*Ficus carica* L.), common ivy (*Hedera helix* L.), common bramble (*Rubus*

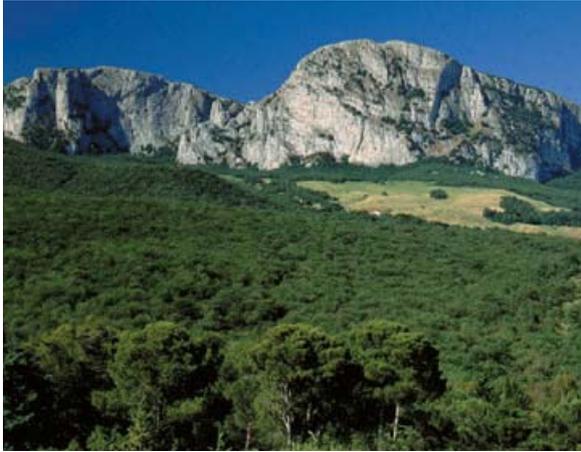


Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7

Figure 2. View of "Rocca Ramosa" with pasture and oak woods dominated by *Quercus pubescens* s.l.

Figure 3. Abandoned mountain pastures of "Valle Maria" place with species of mantle vegetation; in the background the Rocca Busambra.

Figure 4. Mantle vegetation with Rosaceae at the base of Rocca Busambra.

Figure 5. The north side of the Rocca Busambra with oak woods at prevalence of holm oak.

Figure 6. Pastures of the "Piraino" plan on top of the "Valle Cerasa"; in the background "Portella del vento".

Figure 7. Woods dominated by *Quercus pubescens* s.l. in late winter with blooming *Pyrus pyraeaster*; in the background Rocca Ramosa.

ulmifolius Schott s.l.) and herbaceous species such as horsetail (*Equisetum* sp.), *Menta longifolia* L. and *M. aquatica* L. or groupings of *Arundo donax* L., *A. pliniana* Turra and common reed (*Phragmites australis australis* (Cav.) Trin. ex Steud.). The most common shrubs are *Prunus*, *Pyrus*, *Cistus*, *Calicotome*. Vegetation of grasslands is formed by several herbaceous species of Gramineae, Leguminosae, Umbelliferae (such as giant fennel *Ferula communis* L. and wild carrot *Daucus carota* L.), composite (*Cynara cardunculus* L., *Onopordon illyricum* L., *Carduus* spp. and *Cirsium* spp.).

The plantations well integrated with the surrounding landscape are represented by chestnut (*Castanea sativa* Mill.) and narrow-leafed ash (*Fraxinus angustifolia* vahl subsp. *angustifolia* (= *F. oxycarpa* Bieb.). In some cases, several species of pine, cedar and cypress, particularly *Pinus pinea* L. or the *Eucalyptus camaldulensis* Dehnh are planted to form important woods. The effects of afforestation or reforestation on biodiversity is controverse (see La Mantia, 2009; Massa & La Mantia, 2007).

Sampling methods

Cerambycidae were collected during the last ten years. During the years 2007-2010, research was intensified through the breeding of larvae, traps and direct search. The characters of localities are reported in Table 1.

REARING OF LARVAE: branches, portions of stumps and logs with signs of presence of larvae were collected. In the laboratory, samples were placed in special labelled boxes with all the data on plant species, location and date of collection. The samples were monitored regularly, for a period depending on the phenology of the flicker adults species. This method clearly puts in light the binding of species of insects with the forest species.

TRAPS: air traps in which red wine was added as a lure (Allemand & Aberlenc, 1991). This system is based on the principle that Cerambycidae adults are looking for plant extracts and sugar as a food source which is normally found in the nectar of various spring-summer flowers. Traps consisted of PVC bottles filled with 0.5 liters of red wine suspended to tree branches at

a height of 2 meters. This method was utilized from May to July. This method allowed to capture species that could not be obtained by alternative methods.

DIRECT SEARCH: most of the Coleoptera Cerambycidae have daytime activities. They are commonly found in the spring and summer on flowers, buds and several mature fruits (Lepturini and Clytini in particular) usually in full sun. Others remain on the trunks and large branches of trees (*Cerambyx*, *Aromia*, *Phoracantha*) or remain hidden among the leaves. Many species may wind up on woodpiles, or fences and poles made of dead trees (*Morimus*). Almost all Agapanthini are attached directly on the stem of herbaceous plants on which they develop in the larval stage. The *Dorcadion*, habits radicivore, wander on the ground as well, *Herophila tristis* and *Morimus asper*. Many other Cerambycidae are crepuscular and have nocturnal habits, come out of the galleries and remain on the larval host plant in search of the female to mate before and after oviposition. They can move quickly on branches or fly from plant to plant. As a result of this diverse biological activity, the discovery and collection of adults is directly exposed by the inspection of flowers, shrubs and various plants frequented by these species. Nets were used to gather the Cerambycidae associated with herbaceous plants and an entomological umbrella was used to beat the bushes and trees. Crepuscular and nocturnal species were found using special torches at dusk or by using light traps that attract the Cerambycidae during night flights.

Other data

The data collected in the field were integrated with those obtained from literature and from public and private collections. The data of the Natural History Collections can provide information in analyzing the population trends of Cerambycidae (Jeppsson et al., 2010). Some preliminary results were published in Bellavista et al. (2008) and Bellavista (2010).

Data Sheets

For the general systematic application we followed the one proposed by Bense (1995) and Sama (2002, 2005), recently by Rapuzzi & Sama (2006, 2010) and other specified in the following

Name of localities	Characters of vegetation
Gorgoletti	<i>Quercus gussonei</i> woods. Mainly <i>Q. gussonei</i> woods but also ash. Located north-east in the town of Ficuzza.
Scanzano lake (included Diga Scanzano: Scanzano dike)	Artificial lake adjacent to Ficuzza woods whose banks have been reforested with <i>Eucalyptus camaldulensis</i> ; there are pastures, and along the Eleuterio river there is a dense riparian vegetation dominated with various species of <i>Salix</i> and <i>Ulmus canescens</i> .
Girati	Ash wood between the town of Ficuzza and Rocca Busambra. The woods is a result of reforestation activities started beginning of the 1940s.
Vanchi di Cardone	<i>Eucalyptus</i> woods, adjacent to the road to Godrano town.
Gorgo del Drago	<i>Pinus pinea</i> woods. Woods mainly with <i>P. pinea</i> but also <i>Populus nigra</i> and ash; between the towns of Ficuzza and Godrano.
Piano Rinelli	Cork oak woods to the north north-east of Ficuzza town.
Castagnera	Chestnut woods to the east north-east of Ficuzza town.
Acqua troia	Holm and pubescent oak woods. Woods located at the foot of Rocca Busambra, south of Ficuzza town.
Fanuso woods	Pubescent oak woods in the south south-east of Ficuzza town.
Ficuzza surroundings (near town)	This area includes agricultural land; abandoned or cultivated, woody plants present are common fig (<i>Ficus carica</i>) and walnut (<i>Juglans regia</i> L, eg.).
Contrada (district) Giardinello and Pizzo di Casa	Open area with pasture and shrubs. To the south of Ficuzza town, near the town of Mezzojuso.
Val dei Conti and Bosco del Cappelliere	Mixed woods of <i>Quercus pubescens</i> , <i>Q. suber</i> , <i>Fraxinus</i> sp., <i>Pinus pinea</i> , and <i>Castanea sativa</i> . The woods begin near Scanzano lake, west north-west of Ficuzza town.
Valle Maria and Valle Agnese	Mixed woods of <i>Fraxinus</i> , <i>Castanea sativa</i> and <i>Quercus</i> , grassland, shrubbery of <i>Crataegus</i> sp., <i>Rosa canina</i> L., <i>Prunus</i> sp.. Around a small artificial lake, there is riparian vegetation with <i>Salix</i> and <i>Populus</i> ; east of Ficuzza town, east.
Alpe Ramosa (Ramusa)	Prevailing holm oak wood, near Rocca Busambra, south-west of Ficuzza town.
Bifarera	Slopes of Rocca Ramosa, mixed woods of <i>Q. ilex</i> , <i>Q. pubescens</i> s.l., <i>A. campestre</i> .
Portella del Vento and Pizzo di case	Pastures and small groups of <i>Quercus ilex</i> at a watershed between Ficuzza e Prizzi towns.
Portella cerasa	Watershed between the towns of Ficuzza, Mezzojuso and Prizzi.
Alpe Cucco	Holm oak woods at the foot of Rocca Busambra.
Antica ferrovia (former railway)	Mixed woods of <i>Fraxinus ornus</i> and <i>Q. ilex</i> at the entrance of Ficuzza town.
Vecchia strada ferrata (old railroad line)	Mixed woods of <i>Fraxinus ornus</i> and <i>Q. pubescens</i> s.l. along old railroad line which crosses Ficuzza woods.
Piano Tramontana (Slopes of Rocca Busambra)	Holm oak woods on rock, and pastures with Rosaceae.
Scalilli	Lecceta on rock, shrubs, and agricultural areas; locality along the road for Corleone town.
Marraccia	Agricultural areas near the Scalilli locality.
Catagnano	River between Ficuzza and Tagliavia with riparian vegetation.
Rocca Busambra	Limestone-dolomite rock dominating Ficuzza woods.
Road for Corleone	Road along Ficuzza woods that leads to the town of Corleone (18 km).
Bivio (crossroads) Godrano (or Bivio Lupo)	Beginning of the road for Godrano; mixed woods at <i>Fraxinus angustifolia</i> , <i>Quercus</i> sp. and <i>Q. suber</i> .
Road for Godrano (Godrano road)	Road that crosses Ficuzza woods. Trees that border road are <i>Quercus</i> , <i>Fraxinus</i> , and <i>Eucalyptus</i> .
Godrano	Small town adjacent to Ficuzza woods.
Santuario (Sanctuary) of Tagliavia	Located at 5-6 km from Ficuzza with small woods of <i>Fraxinus angustifolia</i> , <i>Acer campestre</i> and <i>Quercus pubescens</i> s.l., <i>Ulmus minor</i> .
Piana degli Albanesi	Small town 21 km from Ficuzza with forest vegetation similar to that of the territory of Ficuzza.
Marineo	Small town 12 km from Ficuzza.

Table 1. List of main localities inside the woods of or near Ficuzza, cited in the text, and where the Cerambycidae was collected.



Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12



Fig. 13

Figure 8. Reforestation with *Fraxinus angustifolia* at "Valle Cerasa"; in the background cork oak woods on arenaceous rock.
 Figure 9. An artificial lake at the "Alpe Cucco" surrounded mantle and riparian vegetation.
 Figure 10. The Ficuzza Valley, with the Scanzano lake in the background.
 Figure 11. The "Portella Castagnera" with a prevalence of cork oak.
 Figure 12. Reforestation with *Pinus pinea* at "Gorgo del Drago".
 Figure 13. Reforestation with *Eucalyptus camaldulensis* at "Vanchi di cardone".

text. Chorologic categories are those proposed by La Greca (1962), revised by Vigna Taglianti et al. (1993, 1999) and Parenzan (1994). Many aspects of biology and distribution in Italy have been taken from Sama (2002). The data on the ecology and phenology of different species are derived from research cited in the text extended by direct observations. The material studied, if not otherwise indicated, was collected by the owner of the collection. Finally, additional remarks were added to emphasize particular biological or taxonomic and geonemic data.

Abbreviation: collection: R. Alliata, Palermo (CRA) and T. De Stefani, Palermo (CDS), at the Museum of Natural History in Terrasini, Palermo; M. Bellavista, Palermo (CB); V. Aliquò, Palermo (CVA); F. Angelini, Francavilla Fontana, Brindisi (CFA); M. Romano, Capaci (CR); I. Sparacio, Palermo (CS); F. Vitale, University of Messina (CV).

Geographical terms: Continental Italy: includes the Alps and Pianura Padana; Northern Italy: includes the regions of Piedmont, Valle d'Aosta, Liguria, Lombardy, Trentino-Alto Adige, Veneto, Emilia-Romagna; Central Italy: includes the regions of Tuscany, Umbria, Marche and Lazio; Peninsular Italy: excludes the mainland and islands; Southern Italy: includes the regions of Abruzzo, Molise, Campania, Puglia, Basilicata and Calabria; Italy Islands: Sicily and Sardinia.

RESULTS

List of species

Family CERAMBYCIDAE

Subfamily Prioninae

Prinobius myardi (Mulsant, 1842)

Chorotype and distribution. Turano-Mediterranean; central southern Italy, Sicily and Sardinia.

Biology and host plants. Polyphagous on broadleaves, in particular, *Quercus*, *Fraxinus* and fruit trees. Adult nocturnal from June to September.

Materials. Bosco del Cappelliere, 20.VI.2009 (CB).

Remarks and other biological aspects. Species widespread in Sicily but rare elsewhere

probably due to its nocturnal activities. Data reported is related to the remains found in an old trunk of *Quercus suber*.

Aegosoma scabricorne (Scopoli, 1763)

Chorotype and distribution. Turano-European; throughout Italy.

Biology and host plants. Polyphagous, larval stage on broadleaves (*Quercus*, *Fagus*, *Juglans*, *Ulmus*, *Hedera*, *Celtis*, *Populus*, *Acer*, *Prunus*, *Alnus*, *Tilia*, *Aesculus*, *Platanus*, *Tilia*). Adult nocturnal, can be found on the same host plants from June to August.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Bosco del Cappelliere, 25.X.1981, in holes on the trunk of *Populus* sp. (CS).

Remarks and other biological aspects. Species quite present in Sicily but is considered uncommon in this area.

Prionus coriarius (Linnaeus, 1758)

Chorotype and distribution. Turano-European-Mediterranean; continental Italy and Sicily.

Biology and host plants. Preimaginal stages, particularly on broadleaves (*Quercus*, *Fagus*, *Ulmus*, *Castanea*, *Carpinus*, *Alnus*, *Salix*, *Betula*), rarely on conifers (*Abies*, *Pinus*). Adult crepuscular and nocturnal were found in old stumps, on ground, in flight, and when lured by lights.

References. Ficuzza (Sama & Schurmann, 1982; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza 6.VII.1988, 25.VII.1982 (CR).

Remarks and other biological aspects. Uncommon in the area, the specimens were collected during nocturnal hours with the aid of artificial lighting.

Subfamily Lepturinae

Dinoptera collaris (Linnaeus, 1758)

Chorotype and distribution. Asian-European; peninsular Italy, Sicily.

Biology and host plants. Larvae subcortical on many broadleaves (*Populus*, *Castanea*, *Quercus*, *Robinia*). Adult on flowers from May to August.

References. Ramusa (Luigioni & Tirelli, 1912); Ficuzza woods (Ragusa, 1924); Ficuzza (Vitale, 1936).

Remarks and other biological aspects. Species not found during research but often referenced in literature for Ficuzza.

Grammoptera ustulata (Schaller, 1783)

Chorotype and distribution. Turano-European; for the most part of peninsular Italy, and Sicily.

Biology and host plants. Larvae on various broadleaves trees, mainly *Quercus* and *Castanea*. Adult on flowers from April to June.

References. Ramusa (Luigioni & Tirelli, 1912); Ficuzza (Ragusa, 1924; Sama, 1988, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Scanzano lake, ex *Quercus*, 22.III.1981/8-9.IV.1981 (CS); Ficuzza: Bivio Lupo, ex *Quercus*, 6.III.1983/11.IV.1983 (CS); Ficuzza woods, ex *Quercus*, 24.III.1984/19-20.IV.1984 (CS); Alpe Cucco, 20.VI.2009 (CB/CS).

Remarks and other biological aspects. Common, breeds on dead wood of *Quercus pubescens* s.l. found in the adult stage on flowers; also attracted by sugary substances.

Grammoptera viridipennis (Pic, 1893)

Chorotype and distribution. Endemic; Sicily.

Biology and host plants. Larvae on dead branches of broadleaves: *Quercus*, *Castanea sativa*, *Acer*, *Pyrus piraster* (Sama & Schurmann, 1982); *Prunus* (Sama, 1988). Adult on flowers and trees.

References. Ficuzza woods (Rapuzzi & Sama, 2006; Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 15.IV.1981 (CB).

Remarks and other biological aspects. Species living in the woods of Northern Sicily (Baviera & Sparacio, 2002; Rapuzzi & Sama, 2006), uncommon in the Ficuzza woods.

Grammoptera ruficornis flavipes (Pic, 1892)

Chorotype and distribution. *G. ruficornis ruficornis* (Fabricius, 1781) Turano-European (throughout Italy, excluding Sardinia); ssp. *obscuricornis* Kraatz, 1886 only Azerbaijan; ssp. *flavipes* endemic of Sicily.

Biology and host plants. Larvae polyphagous on broadleaves trees and shrubs. Adult on flowers.

References. Ficuzza (Ragusa, 1924; Vitale, 1936 sub *G. ruficornis flavipes*); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 14.VI.2009 (CB).

Remarks and other biological aspects. Uncommon in the Ficuzza woods; adult collected on flowers.

Neopicella sicula (Ganglbauer, 1885)

Chorotype and distribution. Endemic; Sicily.

Biology and host plants. Larvae lives on dead parts of plants living as *Fagus sylvatica* and *Quercus* (Sama & Schurmann, 1982) *Acer campestre*, *A. pseudoplanatus* (Sama, 1988).

References. Ficuzza (Ragusa, 1924; Sama, 2005; Rapuzzi & Sama, 2006); Ficuzza woods (Sparacio, 1999; Bellavista et al., 2008; Bellavista, 2010).

Reperti: Alpe Cucco, 2.VI.2009-20.VI.2009 (CS); Alpe Cucco, 20.VII.2009 (CB); Bivio Lupo, 20.VII.2009 (CS); Bosco Fanuso, 25.VI.2010 (CB).

Remarks and other biological aspects. Found on trees but rarely on flowers; also attracted by sweet foods, often in the territory of Ficuzza woods.

Stictoleptura cordigera cordigera (Fuesslins, 1775)

Chorotype and distribution. Turano-European; throughout Italy.

Biology and host plants. Larvae develops on a variety of broadleaves trees (*Quercus*, *Pistacia*, *Castanea*), also reported on *Pinus* in Israele (Bytinski-Salz, 1956). Adult on flowers from May to August.

References. Ficuzza (Ragusa, 1924 sub ab. *immaculata*; Sama & Schurmann, 1982; Sama, 1988, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza 12.VI.1928 (CRA); Ficuzza woods, 7.VII.1959, 1.VII.1960, 21.VI.1962, 21.VI.1964, 19.VII.1964, 18.VI.1978 (CVA); Ficuzza, 20.VII.1958 (CVA); Ficuzza, 27.VII.1972, 6.VI.1975, 13.VII.1988 (CR); Scanzano lake, 8.VII.2008 (CS); Valle Agnese, 20.VI.2010.

Remarks and other biological aspects. Common throughout Sicily; found in the adult stage, during the spring and summer, on flowers of Umbelliferae, Composite and wild artichokes (Fig. 14).

Pachytodes erraticus (Dalman, 1817)

Chorotype and distribution. Turano-European; throughout Italy, excluding Sardinia.

Biology and host plants. Biology pre-imaginal little known; larvae in soil. The adult is often related to the forests of *Castanea sativa* (Sama, 1988; 2002). Adult on flowers from May to July.

References. Ficuzza (Ragusa, 1924; Vitale, 1936; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza VII.1929 (CRA); Fanuso, 20.VI.1981, 14.VI.1981 (CR); Val dei Conti, 19.VI.1981 (CS); Valle Maria, 1.VII.1992 (CS); Scanzano lake, 16.VIII.2009 (CB); Alpe Cucco, 16.VIII.2009 (CB).

Remarks and other biological aspects. Common in Ficuzza, the adult stage from June to July on a variety of blooms, in particular, Umbelliferae and *Rubus* (Fig. 15).

Alosterna tabacicolor tabacicolor (DeGeer, 1775)

Chorotype and distribution. Siberian-European; nearly all of mainland Italy, but less frequent in the southern regions and Sicily.

Biology and host plants. Larvae on various broadleaves trees (*Quercus*, *Corylus*, *Acer*, *Betula*, *Carpinus*) and conifers (*Picea*). Found in the adult stage on flowers from May-June; also attracted by sugary substances.

References. Ficuzza (Ragusa, 1924).

Materials. Ficuzza, 12.VI.1928 (CRA).

Remarks and other biological aspects. Reported in Sicily from Ragusa (1924), excluded by Sama & Schurmann (1982) and Sama (1988, 1994, 2005), not reported by Biscaccianti (2002a), confirmed by Rapuzzi & Sama (2006). Species constantly present in Sicily as demonstrated by the findings on the *Alliata* collection.

Pseudovadonia livida (Fabricius, 1776)

Chorotype and distribution. Siberian-European; throughout Italy, excluding Sardinia.

Biology and host plants. Larvae in the soil, symbiotic with saprophytic fungi of the genus *Marasmius* which eats hyphae and mycelia (Burakowski, 1979); also reported on *Salix alba* (Kovacs & Hegyessy, 1995). Adult on flowers from May to June.

References. Ficuzza (Ragusa, 1924; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza 12.VI.1928 (CRA); Valle Maria, 29.V.1981 (CS).

Remarks and other biological aspects. Adult is common in the Ficuzza woods, appears from May to June and is found mainly on flowers of *Achillea*.

Rutpela maculata nigricornis (Rapuzzi & Sama, 2006)

Chorotype and distribution. *Rutpela maculata* (Poda, 1761) s.l. Turano-European and throughout Italy; ssp. *nigricornis* Sicily and Calabria (Aspromonte).

Biology and host plants. Larvae polyphagous on broadleaves trees (*Salix*, *Quercus*, *Alnus*, *Populus*, *Crataegus*, *Corylus*, *Betula*, *Enonymus*, *Sarothamnus*), rarely on conifers (*Pinus*, *Picea* and *Abies alba*). Adult on flowers from May to August.

References. Ficuzza (Ragusa, 1924; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Rapuzzi & Sama, 2010).

Materials. Ficuzza woods, VII.2009 (CB).

Remarks and other biological aspects. Ragusa (1924) claims as “very common” on the Ficuzza woods, nowadays, it appears less frequently; adult is found in the summer months on the flowers of Umbelliferae and *Rubus*.

Stenurella bifasciata bifasciata (Müller, 1776)

Chorotype and distribution. Siberian-European; ssp. *limbiventris* (Reitter, 1898) North-Eastern Turkey, ssp. *nigrosuturalis* (Reitter, 1895) southeastern Turkey; throughout Italy.

Biology and host plants. Larvae reported on *Pinus* (Müller, 1949-1953), *Spartium junceum* and *Ficus carica* (Sama, 1988), *Ulmus* (Švácha & Danilevsky, 1989), *Quercus robur* (Kovacs & Hegyessy, 1995), *Rosa canina* (Sama, 2002). Adult on flowers from May to August.

References. Ficuzza (Ragusa, 1924); Ficuzza woods (Sama, 2005; Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 7.VII.1959, 29.VI.1960, 2.VII.1960 19.VII.1964 (CVA); Alpe Cucco 24.VIII.1969 (CR); Godrano road, 23.VII.1972 (CR); Scanzano lake, VII.2009 (CB);

Remarks and other biological aspects. Very common in Sicily and in Ficuzza; adult active in the spring and summer; found on flowers, in particular, bramble (Fig. 16).

Subfamily Aseminae

Arhopalus rusticus (Linnaeus, 1758)

Chorotype and distribution. Oloartic; continental Italy and Sicily.

Biology and host plants. Larvae and adult on conifers *Larix*, *Abies*, and particularly, *Pinus*. Adult nocturnal from June to September; attracted also by artificial lights.

References. Bellavista et al., 2008; Bellavista, 2010.

Materials. Ficuzza surroundings attracted by light, 15.VIII.1982 (CR).

Remarks and other biological aspects. In Sicily, larvae and adult are found mainly on *Pinus*.

Arhopalus ferus (Mulsant, 1839)

Chorotype and distribution. Palearctic; throughout Italy.

Biology and host plants. Larvae and adult on conifers, especially *Pinus* and *Picea*. Adult nocturnal from June to September, also attracted by lights.

References. Ficuzza (Bivio Godrano) (Sama, 1988 sub *tristis*; Sama, 2005).

Materials. Ficuzza, 3.VII.1983 (CS).

Remarks and other biological aspects. Species common in Sicily which grows mainly on various species of *Pinus* used for reforestation.

Subfamily Cerambycinae

Phoracantha semipunctata (Fabricius, 1775)

Chorotype and distribution. Species native to Australia, now cosmopolite (where *Eucalyptus* is planted).

Biology and host plants. Larvae and adult on many species of *Eucalyptus*.

References. Ficuzza woods (Sparacio, 1992; Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 25.VII.1982 (CR); Ficuzza woods, 7.VII.1988 (CVA); Bivio Lupo, VII.2008 (CB).

Remarks and other biological aspects. First reported in Sardinia, Italy (Tassi, 1969) and Sicily (Romano & Carapezza, 1975). Common in *Eucalyptus* plantations in Sicily and in Ficuzza around 1980-1990, in recent years, gradually decreased due to the presence of *P. recurva*.

Phoracantha recurva (Newman, 1840)

Chorotype and distribution. Species native to Australia, cosmopolite (where *Eucalyptus* is planted).

Biology and host plants. Larvae and adult on many species of *Eucalyptus*.

References. Ficuzza woods (Romano, 2007; Bellavista et al., 2008; Bellavista, 2010).

Findings: Godrano road, 22.XII.2006 (CR); Bivio Lupo, 16.VI.2008 (CS) and 3.VIII.2009 (CB).

Remarks and other biological aspects. First reported in Sardinia, Italy (Cillo et al., 2006) and Sicily (Mazzeo & Siscaro, 2007). *P. recurva* is fast wide-spreading in *Eucalyptus* plantations in Sicily (Romano, 2007) which tends to substitute *P. semipunctata*. Very common during the summers of 2008 and 2009 in the host plant (*E. camaldulensis*) of the Ficuzza woods (Fig. 17).

Hesperophanes sericeus (Fabricius, 1787)

Chorotype and distribution. Mediterranean; Liguria, Veneto, Emilia Romagna, F. Venezia Giulia, central and southern regions, Sicily and Sardinia (Sama, 1988).

Biology and host plants. Larvae polyphagous, in dead wood of broadleaves: *Ficus*, *Pistacia*, *Vitis*, *Quercus*, *Platanus*, *Ceratonia*, *Paliurus*, *Prunus*; in Egypt on the *Halocnenum strobilaceum* (Andres, 1910; Alfieri, 1976).

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 1.VII.1992, in a woodshed (CS).

Remarks and other biological aspects. It is almost always found in the twilight hours and at night, strayed on fields, on host plants or attracted by artificial lights. Scarcely found in Ficuzza.

Trichoferus holosericeus (Rossi, 1790)

Chorotype and distribution. Turano-European-Mediterranean; throughout Italy.

Biology and host plants. Larvae polyphagous on broadleaves, and even on dead cut wood: *Quer-*



Fig. 14



Fig. 15



Fig. 16



Fig. 17

Figure 14. *Stictoleptura cordigera cordigera*, Valle Agnese, 20.VI.2010.

Figure 15. *Pachytodes erraticus*, Vallone Rocca d'Elice (beginnings at Alpe Cucco), 18.VI.2010 (photo C. Muscarella).

Figure 16. *Stenurella bifasciata bifasciata*, Gorgo del Drago, 18.VI.2010 (photo C. Muscarella).

Figure 17. *Phoracantha recurva*, Bivio Lupo, 3.VIII.2009.

cus, *Pistacia*, *Ficus carica*, *Populus*, *Prunus*, *Juglans*, *Ostrya carpinifolia*, *Ulmus*, *Robinia pseudoacacia*. It is one of the most important Cerambycidae exploiters of broadleaves woods in the Mediterranean area (Crivellaro, 2005). Adult found during twilight and night hours, on same host plants; attracted by artificial lights.

References. Ficuzza (Ragusa, 1924 *sub cinctus*); Ficuzza (Bivio Godrano) (Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza surroundings, 20.VI.2009 (CB/CS).

Remarks and other biological aspects. Many specimens found in holm oaks woods, attracted by sweet substances.

Trichoferus griseus (Fabricius, 1792)

Chorotype and distribution. Mediterranean, extending to Macaronesia; throughout Italy.

Biology and host plants. Linked to *Ficus carica*.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza town, attracted by light, 2.VII.2008 (CS).

Remarks and other biological aspects. Usually on host plant, *Ficus carica*, widespread in Sicily, scarcely in the Ficuzza woods.

Trichoferus fasciculatus (Faldermann, 1837)

Chorotype and distribution. Turano-Mediterranean, extending to Macaronesia; practically all

of Italy, particularly in central and southern regions, Sicily and Sardinia.

Biology and host plants. Larvae polyphagous on broadleaves, but also reported on *Pinus*, *Taxus baccata*, *Cupressus* and *Cedrus*.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, ex *Ulmus*, 24.III.1984/18.VII.1984 (CS); Scanzano lake, 27.VIII.2009 (CB); Valle Maria, ex *Ficus carica*, 8.III.2009/4.VII.2009 (CS).

Remarks and other biological aspects. Common in Sicily and Ficuzza.

Stromatium unicolor (Olivier, 1795)

Chorotype and distribution. Mediterranean, subcosmopolitan with imported timber; practically all of Italy.

Biology and host plants. Larvae in numerous broadleaves; also attacks cut and timber wood. Adult found during twilight and night hours, living on host plants from June to August; attracted by artificial lights.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 1.VII.1992, in a woodshed (CS).

Remarks and other biological aspects. Species widespread in Sicily but scarce. Reported only one finding in the Ficuzza woods.

Cerambyx cerdo (Linnaeus, 1758)

Chorotype and distribution. Turano-European-Mediterranean; throughout Italy.

Biology and host plants. Larvae on *Quercus* but also reported on other broadleaves *Fraxinus*, *Castanea*, *Ulmus*. Adult in summer months on host plants, attracted by sugary substances.

References. Santuario di Tagliavia (Pincitore Marott, 1873 sub *Hammoticherus heros*); Ficuzza (Baviera & Sparacio, 2004); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 15-16.V.(1)911, L.T., 1 ex. v. *pfisteri* Stierl. (CV); Valle Agnese, 4.VII.2010 (CB).

Remarks and other biological aspects. Species uncommon in Ficuzza. Adult appears in summer, daytime and twilight activities on oaks.

Cerambyx miles (Bonelli, 1823)

Chorotype and distribution. South European; almost all of mainland Italy and Sicily.

Biology and host plants. Larvae preferably on *Quercus*, but also on *Prunus*, *Crataegus*, *Carpinus*, *Vitis vinifera*.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods (Bivio Lupo) 26.IV.1966 (CR).

Remarks and other biological aspects. Biology similar to previous species, but less frequent in Sicily and Ficuzza.

Cerambyx welensii (Küster, 1846)

Chorotype and distribution. Turanic-South European; throughout Italy except Sardinia.

Biology and host plants. Larvae usually found on *Quercus ilex*. Adult found during twilight and night hours from May to August.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 1.VII.1992 (CS).

Remarks and other biological aspects. Crepuscular and nocturnal, uncommon in the Ficuzza woods. In Spain, *C. welensii* is strictly linked to *Q. suber* (López-Pantoja et al., 2008).

Cerambyx scopolii scopolii (Fuesslins, 1775)

Chorotype and distribution. *C. scopolii scopolii* Turano-European, throughout Italy; ssp. *siculus* (Rapuzzi & Sama, 2010) recently described in Sicily (Nebrodi and Madonie mountains).

Biology and host plants. Larval development on broadleaves as *Quercus*, *Castanea*, *Pirus*, *Prunus*, *Carpinus*, *Ostrya*, *Juglans*, *Fagus*. Adult on trees and flowers from May to August.

References. Santuario di Tagliavia (Pincitore Marott, 1873 sub *Hammoticherus cerdo*); Ficuzza (Sama & Schurmann, 1982; Sama, 1988); Ficuzza woods (Bellavista et al., 2008, Bellavista, 2010).

Materials. Ficuzza, 25.V.1928 (CRA); Alpe Cucco, 20.V.2010 (CB); Valle Agnese, 20.VI.2010, 4.VII.2010, 13.VII.2010 (CB).

Remarks and other biological aspects. Specimens collected in the Ficuzza woods and the specimens observed in the surroundings of Palermo (Monreale, Valle del Fiume Oreto) are attributable to the nominal subspecies (Fig. 18). They do not exhibit the distinctive characters of ssp. *siculus* recently described (Rapuzzi & Sama, 2010) such as the major dorsal pubescence, shorter antennae, and shorter and swollen 3rd

and 4th antennal that we ourselves had observed in exemplary specimens from the Madonie mountains (Piano Battaglia).

We had collected *C. scopolii scopolii* in the Ficuzza woods territory during the daytime from May to July, on plants and flowers, attracted by sugary substances.

Purpuricenus kaehleri (Linnaeus, 1758)

Chorotype and distribution. Turano-European; throughout Italy, Sardinia (?).

Biology and host plants. Larval development on broadleaves, in particular, *Quercus*, *Prunus*, *Castanea*, *Juglans*, *Crataegus*, *Robinia*. Adult on trees and flowers.

References. Piana degli Albanesi, (Sama & Schurmann, 1982; Sama, 1988); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Piana degli Albanesi: 26.VI.1970, 28.VI.1971 (CVA); 14.VI.1981 (CS); Ficuzza, 20.VI.2010 (CB).

Remarks and other biological aspects. Common in the forests of Nebrodi and Madonie, uncommon in Ficuzza but exceptional findings in the nearby territory of Piana degli Albanesi was reported. Adult is found during the summer months mostly on flowering thistles and wild artichokes or chestnut inflorescences.

Penichroa fasciata (Stephens, 1831)

Chorotype and distribution. Turano-Mediterranean; introduced in North America. Central and Southern Italy, Sicily, Sardinia, sporadic in Northern Italy.

Biology and host plants. Larval development in dead wood and various broadleaves, particularly *Ceratonia* and *Pistacia* in southern and insular Italy (Sama, 1988); reported on *Pinus halepensis* (Peyerimhoff, 1919; Sama, 1988) and *Thuja* (Sama, 2002). Adult found at night on host plants from May to July or attracted by artificial lights.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Godrano road, 20.VI.2010 (CS).

Remarks and other biological aspects. Common in Sicily, at low and medium altitudes, adult found in summer twilight and night.

Gracilia minuta (Fabricius, 1781)

Chorotype and distribution. W-Mediterranean; sub-cosmopolitan due to the passive importing

through timber; throughout Italy, sporadic in the Northern regions.

Biology and host plants. Larvae polyphagous on broadleaves, including shrubs. In Italy, it seems to prefer *Castanea*, *Salix*, *Quercus* (Sama, 1988); also reported on conifers as *Cedrus* and *Pinus*. Adult found during twilight and night hours, usually stationary on the same plants.

References. Ficuzza (Ragusa, 1924); Ficuzza woods (Sama, 2005; Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, ex *Rubus* sp., 7.IV/8.V.1984 (CS), ex *Rosa canina*, 6.III/15.VI.1985 (CS); Valle Agnese, ex *Castanea sativa*, 7.III.2010/5-6.VI.2010 (CB/CS).

Remarks and other biological aspects. In Ficuzza woods, larvae are common in the dead wood of *Rubus* and *Rosa canina* from which was reared in many specimens.

Nathrius brevipennis (Mulsant, 1839)

Chorotype and distribution. West-Mediterranean; sub-cosmopolitan, to passive introduction: Central Europe, China, North and South America (see Sama, 1988, 2002); throughout Italy.

Biology and host plants. Larvae polyphagous on broadleaves, in particular, *Salix*, *Castanea*, *Quercus ilex*, *Pistacia*, *Ceratonia*; occasionally on conifers: *Cupressus* (Picard, 1929), *Pinus halepensis* (Peyerimhoff, 1919), *Picea excelsa* (Brasavola de Massa, 1935; Sturani, 1981); *Cedrus* (Sama, 2002). Adult found at night hours, on the same host plants from June to August.

References. Ficuzza (De Stefani Perez & Riggio, 1882; Ragusa, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Godrano, attracted by light, VII.2008 (CB).

Remarks and other biological aspects. Common in Sicily at low and medium altitudes, it mainly spreads on holm oak (*Quercus ilex*) and carob (*Ceratonia siliqua*).

Brachyteroma ottomanum Heyden, 1863

Chorotype and distribution. Eastern Mediterranean; nearly all of Continental Italy, Sicily.

Biology and host plants. Reared larvae in Greece from *Hedera helix* (Sama, 1988).

References. Ramusa (Luigioni & Tirelli, 1912); Ficuzza, Ragusa (1924), quoted: "On May 15, 1871, many specimens were taken";

Ficuzza (Sama & Schurmann, 1982; Sama, 1988); Rocca Busambra (Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 6.VI.1991 (CFA).

Remarks and other biological aspects. Common in Sicily but localized; present in the adult stage in the spring season on flowers of *Crataegus*, often in several concentrations.

Stenopterus rufus rufus (Linnaeus, 1767)

Chorotype and distribution. Turano-European; throughout Italy.

Biology and host plants. Larvae in dead wood of various broadleaves: *Quercus*, *Castanea*, *Robinia*, *Juglans*, *Prunus*, *Salix*. Adult found on flowers from May to July.

References. Ficuzza (Sama & Schurmann, 1982; Sama, 1988); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 24.V.1981 (CS); Ficuzza, 29.V.1981 (CB); Valle Maria ex *Rosa canina*, 8.III/17.V.2009; Valle Agnese, 20.VI.2010 (CS).

Remarks and other biological aspects. Common in Sicily in the summer months on various flowers, especially composite and Umbelliferae (Fig. 19).

Stenopterus ater (Linnaeus, 1767)

Chorotype and distribution. West-Mediterranean; throughout Italy.

Biology and host plants. Larvae in dead wood of many species of broadleaves as *Pistacia*, *Ceratonia*, *Ficus carica*, *Ulmus*, *Genista*; in North Africa on *Acacia tortilis* (Sama, 1988). Adult found on flowers from May to July.

References. Ficuzza (Ragusa, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, ex *Ficus carica*, 22.III.1981-31.V.1981 (CB); Diga Scanzano, 4.VI.1991 (CS); Valle Agnese, 20.VI.2010 (CB, CS).

Remarks and other biological aspects. Biology similar to *Stenopterus rufus rufus* which is often found in the same locations.

Callimus angulatus angulatus (Schrank, 1789)

Chorotype and distribution. Turano-European-Mediterranean; throughout Italy except Sardinia.

Biology and host plants. Larval development in dead wood of *Quercus*, *Ostrya*, *Fagus*, *Crataegus*, *Castanea*, *Fraxinus*. Adult found on flower from May to June.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Rocca Busambra, 2.VI.2009 (CS).

Remarks and other biological aspects. Biology similar to previous species which often coexists.

Callimus abdominalis (Olivier, 1795)

Chorotype and distribution. South-European; Central and Southern Italy, Sicily, Sardinia.

Biology and host plants. Larvae development in the dead wood of various broadleaves as *Quercus ilex*, *Acer*, *Rosa*, *Ostrya*, *Pistacia*, *Tilia*, *Cercis*, *Prunus*. Adult is found on different host plants or inflorescence from May to July.

References. Ficuzza, Ragusa (1924) quoted: "taken by me by beating hawthorns and Umbelliferae"; Vitale (1936); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 13.IV.1987, on *Rosa canina* (CS); Bosco Fanuso, on *Rosa canina*, 25.VI.2010 (CB).

Remarks and other biological aspects. Discovered on the Madonie mountains in Sicily (Sama & Schurmann, 1982; Sama, 1988, Sama, 2005). Relatively common on the flowers of *Rosa canina* in the Ficuzza woods (Fig. 20).

Certallum ebulinum (Linnaeus, 1781)

Chorotype and distribution. Turano-Mediterranean; Central and Southern Italy, Sicily.

Biology and host plants. Larval development in the stem of the Lamiaceae and Cruciferae (*Sisymbrium*, *Erysinum*, *Psychine*, *Raphanus*). Adult lives on the same host plants from March to May.

References. Ficuzza woods and Bifarera (Pincitore Marott, 1873); Ficuzza (Ragusa, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Portella del Vento, 10.VI.1981 (CR); Contrada Giardinello, 8.V.1986, Alpe Cucco, 27.V.1995 and Portella Cerasa, 10.V.1997 (CS).

Remarks and other biological aspects. Common in Sicily, at low and medium altitudes; adult in spring season lives in meadows where there are host plants on which it develops at the larval stage.

Deilus fugax (Olivier, 1790)

Chorotype and distribution. Turano-Mediterranean; throughout Italy.

Biology and host plants. Larvae on various species of Fabaceae (Papilionaceae): *Calycotome*, *Spartium junceum*, *Cytisus*, *Sarothamnus*, *Genista*. Adult lives on the same plants or flowers from April to June.

References. Ficuzza (Ragusa, 1924; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza 12.VI.1928 (CRA); Val dei Conti, 15.VI.1974 (CR); Ficuzza woods, 18.IV.1984, ex *Spartium junceum* (CS).

Remarks and other biological aspects. Reared on dead wood of *Spartium junceum* or collected at the adult stage on the same plant or in flowers of Umbelliferae in spring season.

Aromia moschata ambrosiaca (Stevens, 1809)

Chorotype and distribution. Central Asian-Mediterranean; reported in the southern regions of Italy and Sicily.

Biology and host plants. Pre-imaginal stages on various species of *Salix*. Adult on flowers and trees; attracted by sugary substances.

References. Catagnano (Pincitore Marott, 1873 sub *A. rosarum*).

Remarks and other biological aspects. *A. moschata ambrosiaca*, "very common on willows on the entire Island (Sicily)" quoted by Ragusa (1924), but today in strong rarefaction. We are informed of some captures of *A. moschata ambrosiaca* near Ficuzza.

Hylotrupes bajulus (Linnaeus, 1758)

Chorotype and distribution. Palearctic; cosmopolitan due to passive importing; throughout Italy.

Biology and host plants. Larvae and adults on dead wood of conifers (*Pinus*, *Abies*, *Picea*...), also on cut and timber wood.

References. Ficuzza (Sama & Schurmann, 1982; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Val dei Conti 3.VII.1983 (CS); Ficuzza, along "Vecchia strada ferrata" (old railroad line), 23.VI.1996 (CR).

Remarks and other biological aspects. Species related to the conifers, also present in urban environments in cut and timber wood.

Phymatodes testaceus (Linnaeus, 1758)

Chorotype and distribution. Palearctic; throughout Italy.

Biology and host plants. Larvae and adults on various broadleaves, in particular, *Quercus*.

References. Ficuzza (Vitale, 1936); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Fanuso, 27.V.1973; Ficuzza woods, 26.VI.1982 (CR); Bivio Lupo, 16.VI.2008 (CS); Scanzano lake, 8.VII.2008 (CB, CS); Ficuzza, Antica ferrovia (former railway), 20.VII.2009 (CS); Bosco Fanuso, 25.VI.2010 (CB); Alpe Cucco, 27.VI.2010 (CB).

Remarks and other biological aspects. Frequent throughout the researched area but a difficult find due to it being an arboreal species. Commonly found in sugar-baited traps.

Poecilium lividum (Rossi, 1794)

Chorotype and distribution. Mediterranean; throughout Italy.

Biology and host plants. Larvae in dead wood of various broadleaves, in particular, *Quercus ilex* and *Castanea sativa*. Adult on host plants grown from April to June.

References. Bifarera (Pincitore Marott, 1873 sub *Callidium melancholicum*).

Remarks and other biological aspects. Species founded in Ficuzza woods (Pincitore Marott, 1873) taken from Bellavista et al (2008). In Sicily, *P. lividum* discovered in Castelbuono (Ragusa, 1924), Messina (Vitale, 1936) and in some locations on the Madonie and Nebrodi mountains (Sama & Schurmann, 1982; Sama, 1988).

Poecilium alni (Linnaeus, 1767)

Chorotype and distribution. Turano-European; throughout Italy but seemingly not present in Sardinia.

Biology and host plants. Larvae attacks the weakened or recently cut small branches of broadleaves, in particular, *Quercus* but also *Castanea*, *Alnus*, *Acer*, *Ulmus*, *Corylus*. Adult found on host plants from April to June.

References. Ficuzza (Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Valle Agnese, 7.III.2010/8.VI.2010, ex *Castanea sativa* (CS).

Remarks and other biological aspects. In Sicily grows mainly on *Quercus* and *Castanea sativa*.

Xylotrechus antilope (Schönherr, 1817)

Chorotype and distribution. Turano-European; in Italy, species is discontinuous; indicated in particular in the central and northern regions.

Biology and host plants. Larvae on broadleaves, *Castanea sativa* and, in particular, *Quercus*. Adult found on host plants, rarely on flowers, from June to July.

Materials. Alpe Cucco, 20.VI.2009 (CB, CS).

Remarks and other biological aspects. Recently documented on the Nebrodi and Madonie mountains in Sicily (Sama, 1999; Rapuzzi & Sama, 2006).

Xylotrechus arvicola (Olivier, 1795)

Chorotype and distribution. Turano-European-Mediterranean; throughout Italy.

Biology and host plants. Larvae growth on dead wood of many broadleaves as *Acer*, *Carpinus*, *Corylus*, *Ulmus*, *Quercus*, *Ostrya*, *Fagus*, *Prunus*, *Sorbus*, *Crataegus*. Adult is stationary on the same plant, often on flowers, from May to August.

References. Ficuzza (Ragusa, 1924; Vitale, 1936); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 6.VIII.1958 (CVA); Bivio Lupo, ex *Quercus* sp., 25.II/28.V.1992 (CS); Scanzano lake, 8.VII.2008 (CS); Ficuzza, ex *Fraxinus angustifolia*, 14.VI.2009 (CB); Alpe Cucco, 20.VI.2009 (CB, CS); Ficuzza surroundings, VII.2009 (CB);

Remarks and other biological aspects. Common in Ficuzza, where it bred on dead wood of *Quercus* and *Fraxinus angustifolia*.

Clytus clavicornis (Reiche, 1860)

Chorotype and distribution. Endemic of Sicily.

Biology and host plants. Larvae on *Castanea sativa* and *Acer*. Adult on trees, rarely on flowers, from May to July.

References. Ficuzza (Tassi, 1966; Sama & Schurmann, 1982; Sama, 2005); Ficuzza woods (Sparacio, 1999; Bellavista et al., 2008; Bellavista, 2010).

Materials. Scanzano dike, 4.VI.1991 (CS); Alpe Cucco, 20.VI.2010 (CB, CS); Bosco Fanuso, 20.VI.2010 (CB).

Remarks and other biological aspects. Uncommon in Ficuzza, but common in the rest of Sicily and at low altitudes. Adult was collected on flowers of Umbelliferae or attracted by sweet foods.

Clytus rhamni rhamni (Germar, 1817)

Chorotype and distribution. *Clytus rhamni* s.l. has chorotypes Turano-European; widely distributed in Europe, Asia minor, Middle East; throughout Italy.

Biology and host plants. Larvae on various deciduous trees and shrubs: *Prunus*, *Robinia*, *Castanea sativa*, *Quercus*, *Paliurus*, *Ulmus*, *Styrax officinalis*, *Cistus*, *Coronilla emerus*, *Pistacia lentiscus*. Adult on flower.

References. Ficuzza (Ragusa, 1874; 1924; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 6.VI.1975 (CR); Ficuzza woods, 29.V.1981, 20.VI.2010 (CS); Ficuzza woods, 29.V.1981 (CB);

Remarks and other biological aspects. Common everywhere, in meadows, glades of woods, along paths, in spring and summer, on flowers, in particular, Umbelliferae.

Plagionotus arcuatus (Linnaeus, 1758)

Chorotype and distribution. Turano-European; throughout Italy.

Biology and host plants. Larvae polyphagous on broadleaves as *Castanea*, *Carpinus*, *Fagus*, *Salix*, *Prunus*, *Robinia* and, in particular, *Quercus*. Adult usually stationary on host plants, often on various flowers from May to July.

Materials. Ficuzza woods, 11.VI.1983 (CR); Alpe Cucco, 20.VI.2010 (CB); Valle Agnese, 4.VII.2010 (CB).

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Remarks and other biological aspects. Species widespread in Sicily, in particular, although uncommon; collected several times in Ficuzza woods and of which were unknown.

Plagionotus siculus (Castelnau & Gory, 1835) = *scalaris* Brullé, 1832

Chorotype and distribution. Western (Central)-Mediterranean; reported in the central and southern regions of Italy, and Sicily.

Biology and host plants. Larvae on root of Malvacee as the *Lavatera stenopetala* e *Malva sylvestris*. Adult usually found on the flowers of same species.

References. Ramusa (Pincitore Marott, 1873 sub *Clytus floralis*); Ficuzza (Ragusa, 1874, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Scanzano lake, 29.V.1981 (CS).

Remarks and other biological aspects. Species common in Sicily where it is found in open fields and clearings of forests; nearly always on the flowers of *Malva*.

Chlorophorus varius (Müller, 1766)

Chorotype and distribution. Siberian–European; throughout Italy.

Biology and host plants. Larvae on deciduous plants: *Quercus*, *Pistacia*, *Castanea sativa*, *Vitis*, *Robinia*, *Spartium*, *Crataegus*, *Salicornia*, *Paliurus*, *Juglans*. Adult on flowers.

References. Ramusa (Pincitore Marott, 1873 sub *Clytus ornatus*); Ficuzza (Ragusa, 1924); Ficuzza and Piana degli Albanesi (Sama & Schurmann, 1982); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 21.VI.1962 (CVA); Alpe Cucco, 24.VIII.1969 (CR); Ficuzza woods, 27.VII.1972 (CR); Alpe Cucco, 13.VII.2010 (CB).

Remarks and other biological aspects. Common in Sicily, found in the adult stage during summer months on the flowers of Umbelliferae, in fallow fields, edges of woods, or in open and arid environments with low vegetation cover (Fig. 21).

Chlorophorus glabromaculatus (Goeze, 1777)

Chorotype and distribution. European; throughout Italy.

Biology and host plants. Larvae in dead wood of various deciduous plants: *Quercus*, *Populus*, *Prunus*, *Castanea sativa*, *Vitis*, *Robinia*, *Acer*, *Ulmus*, *Salix*; reported on *Zelkova crenata*, a plant of exotic origin, and on conifers (*Juniperus communis*). Adult on host plants from June to August.

References. Ficuzza (Ragusa, 1874 sub *Clytus 4 punctatus*); Ficuzza (Sama, 1988; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, ex *Castanea sativa*, VI.1981 (CR); Falde Rocca Busambra, Piano Tramontana, 3.VIII.1986 (CR); Scanzano lake, 8.VII.2008 (CS) and 27.VIII.2009 (CB); Alpe Cucco, 16.VIII.2009 (CB).

Remarks and other biological aspects. Species emerges in summer; widespread throughout Sicily.

Chlorophorus trifasciatus (Fabricius, 1781)

Chorotype and distribution. Mediterranean; reported in some areas of Central Europe (Hungary and Ticino); throughout Italy, excluding Sardinia.

Biology and host plants. Larvae in the roots of herbaceous plants as *Onosis natrix* and *Dorycnium hirsutum* (Sama, 1988). Adult on host plants or in flowers from May to June.

References. Ficuzza (Ragusa, 1874; 1924; Sama, 2005); Godrano (Sama, 1988); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Road for Godrano, 23.VII.1972 (CR); Ficuzza, 27.VII.1972 (CR); Ficuzza, 20.VII.2009 (CS).

Remarks and other biological aspects. Species widespread in Sicily, however always collections in few specimens (Sparacio, 1992); usually in grass or on the edges of vegetated areas, mainly on flowers. Also uncommon in Ficuzza woods.

Chlorophorus sartor (Müller, 1766)

Chorotype and distribution. Turano–European; throughout Italy.

Biology and host plants. Larvae polyphagous on many deciduous trees and shrubs. Adult on flower from May to July.

References. Ficuzza (Sama, 1988; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Val dei Conti, 15.VI.1974 (CR); Ficuzza, 29.V.1981 (CB); Valle Agnese, ex *Castanea sativa*, 7.III.2010/8.VI.2010 (CS).

Remarks and other biological aspects. Species common throughout Sicily. At the adult stage it is found in the meadows and the forest edges; in spring and summer months on flowers and many plant species (Fig. 22).

Subfamily Lamiinae

Pedestredorcadion etruscum (Rossi, 1790)

Chorotype and distribution. Apennine; Continental Italy; Sicily.

Biology and host plants. Larvae in the roots of Gramineae and other herbaceous plants.

References. Ficuzza woods (Luigioni & Tirelli, 1912); Ficuzza (Ragusa, 1924; Vitale, 1936); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Valle Maria, 29.IV.2000 (CS).

Remarks and other biological aspects. Sporadic in Ficuzza woods, can be found at the adult stage, usually nomadic in open ground, on trails, or in the glades of woods.

Morinus asper asper (Sulzer, 1776)

Chorotype and distribution. South-European; throughout Italy.

Biology and host plants. Larvae polyphagous in dead wood of broadleaves, such as *Fagus*, *Populus*, *Juglans*, *Tilia*, *Acer*, *Hedera helix*, *Salix* and conifers (*Abies*, *Pinus*, *Cedrus*). Adult is stationary on host plants, or can be found on wood piles; nomadic in open ground from April to July.

References. Ficuzza (Ragusa, 1924 sub *M. funereus*); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza 12.VI.1928; VI.1929 (CRA); 7.V.1973 (CR); Bivio Lupo, 16.VI.2008 (CS).

Remarks and other biological aspects. Common species in Sicily. Adult male is very characteristic for its long antennae, usually found in spring and summer months in open ground, on wood piles and roads through woods (Figg. 23-24).

Herophila tristis tristis (Linnaeus, 1787)

Chorotype and distribution. South European; throughout Italy.

Biology and host plants. Larva in dead wood of deciduous trees (*Ficus carica*, *Morus*, *Salix*, *Tamarix*, *Populus*) or in roots of herbaceous plants: *Dianthus* (Müller, 1949-1953), *Astragalus* (Demelt, 1963), *Melilotus* (Sturani, 1981), *Onopordon* and *Artemisia* (Sama, 2002). Adult near the same host plants from April to July.

References. Ficuzza (Ragusa, 1924; Sama & Schurmann, 1982, Sama, 1988); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, Scalilli, 20.VI.1969 (CR); Scanzano dike, 25.II.1992 (CS).

Remarks and other biological aspects. The adult of this species is commonly found in spring and summer months, nomadic on open ground, and along roads or forest trails; sometimes, in the winter months under stones or plant debris.

Mesosa nebulosa (Fabricius, 1781)

Chorotype and distribution. European, extended to the Maghreb; throughout Italy.

Biology and host plants. Larvae in dead and even rotting wood of various deciduous trees including *Quercus*, *Castanea sativa*, *Carpinus*, *Ostrya*, *Fagus*, *Tilia*, *Corylus*, *Aesculus hippocastanum*; rarely on conifer (*Picea excelsa*). Adult in the winter months in pupal cells, can be found on the host plant from April to August.

References. Ficuzza (Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, inside branches of *Quercus* sp., 20.VI.1969 (CR); Ficuzza woods, 600 m, 26.X.1980, inside branches of *Quercus pubescens* (CR).

Remarks and other biological aspects. Species uncommon in Sicily; specimens collected in the Ficuzza woods were all found in pupal cells inside oak tree branches.

Agapanthia cardui (Linnaeus, 1767)

Chorotype and distribution. Turano-Mediterranean, extended to Macaronesia; throughout Italy.

Biology and host plants. Larvae polyphagous on herbaceous species: *Urtica*, *Cirsium*, *Scolymus*, *Carduus*, *Melilotus*, *Heracleum*, *Senecio*, *Eupatorium*, *Chrysanthemum*, *Dipsacus*, *Valeriana*, *Salvia* and *Pyrethrum*. Adult is found on the same plants.

References. Ficuzza woods (Pincitore Marott, 1873); Ficuzza (Ragusa, 1924; Sama & Schurmann, 1982; Sama, 1988); Ficuzza woods (Rapuzzi & Sama, 2006; Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 23.V.1940, 31.V.1941 (CDS); Ficuzza woods, 19.VII.1964 (CVA); Ficuzza, 25.V.1965 (CR); Scanzano lake, 8.VII.2008, 2.VI.2009 (CS).

Remarks and other biological aspects. Common throughout Sicily and the Ficuzza woods. Adult is found from March to June on plant stems, in particular Carduaceae, or using the net in pastures.

Agapanthia suturalis (Fabricius, 1767)

Chorotype and distribution. Mediterranean; in Italy, reported in Calabria and Sicily (Rapuzzi & Sama, 2006).

Biology and host plants. Apparently similar to *A. cardui*.

References. Ficuzza woods (Pincitore Marott, 1873; Bellavista et al., 2008; Bellavista, 2010).



Fig. 18



Fig. 19



Fig. 20



Fig. 21



Fig. 22



Fig. 23

Figure 18. *Cerambyx scopolii scopolii*, Palermo, Fondo Micciulla, 10.VI.2009.

Figure 19. *Stenopterus rufus rufus*, Valle Agnese, 20.VI.2010.

Figure 20. *Callimus abdominalis*, Bosco Fanuso, 25.VI.2010.

Figure 21. *Chlorophorus varius*, Alpe Cucco, 13.VII.2010.

Figure 22. *Chlorophorus sartor*, Ficuzza woods, 20.VI.2010.

Figure 23. Particular of *Morinus asper asper* mandibles, Alpe Cucco, 27.V.2010 (photo C. Muscarella).

Materials. Ficuzza, 12.VI.2008 (CS).

Remarks and other biological aspects. Species recently separated from *A. cardui* (Rapuzzi & Sama, 2006). The species differs in that it has an extended form, elytra covered with yellowish pubescence and significantly weakened in the back, antennae sometimes reddish in color with the bottom of the scape covered with dense bristles. The ventral surface of the body has a dense and lying pubescence, a lobe of median edeago with an angular protuberance that is absent in *A. cardui*. Based on these characteristics, we attribute the specimens indicated to this territory along with *A. cardui* and *A. suturalis* just as Pincitore Marott (1873) had indicated for Ficuzza woods.

Agapanthia violacea (Fabricius, 1775)

Chorotype and distribution. Siberian-European; throughout Italy. Sardinia (?).

Biology and host plants. Larvae on various herbaceous plants: *Centranthus ruber*, *Psoralea bituminosa*, *Carduus collinus*, *Knautia arvensis*, *Onobrychis viciifolia*, *Medicago*, *Scabiosa*. The adult is found on the same plant.

References. Ficuzza (Sama & Schurmann, 1982; Sama, 1988; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 29.V.1975 (CVA); Ficuzza woods, 29.V.1981 - 28.V.1983 (CS); Ficuzza, 22.V.1983 (CR); Portella del Vento, 11.VI.1983 (CR); contrada Giardinello, 8.V.1986 (CS).

Remarks and other biological aspects. Adult is found in Ficuzza woods on stems of *Centranthus ruber* from April to June.

Agapanthia maculicornis davidi (Slama, 1986)

Chorotype and distribution. Subspecies endemic to Central and Southern Italy and Sicily; *A. maculicornis maculicornis* is widespread in central and south-eastern Europe and western Siberia.

Biology and host plants. Larval growth on *Campanula conglomerata*, *Dianthus superbus*, *Helianthemum* (see Sama, 2002); reared in Sicily from the dead stems of thistles (Sama & Schurmann, 1982; Sama, 1988). Adult on host plants from May to June.

References. Ficuzza (Ragusa, 1924; Vitale, 1936; Sama, 1988; Sama, 2005).

Remarks and other biological aspects. Species widespread in Sicily but uncommon elsewhere.

Agapanthia asphodeli (Latreille, 1804)

Chorotype and distribution. Mediterranean; throughout Italy, periodically in the Northern regions.

Biology and host plants. Larvae on *Asphodelus*; also reported on *Carduus* spp., *Thapsia* spp. and *Ferula* spp. (Sama & Schurmann, 1982; Sama, 1988, 2002; Pesarini & Sabbadini, 1994; Sparacio, 1999; Rastelli et al., 2001). Adult found on the same plants from March to May.

References. Ficuzza (Ragusa, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Slopes of Rocca Busambra, 28.V.2008 (CB).

Remarks and other biological aspects. Adult can be found on the stems of host plants in early spring. Species reported in Sicily as well as the island of Lampedusa (Pisciotta et al., 2008).

Agapanthia sicula sicula (Ganglbauer, 1884)

Chorotype and distribution. Endemic of Sicily; la ssp. *malmerendii* (Sama, 1981) in Central and Southern Italy and Sardinia.

Biology and host plants. Larvae on Carduaceae and *Chrysanthemum coronarium* (Sturani, 1981). Adult is found on the same plant from April to June.

References. Ficuzza (Ragusa, 1924); Rocca Busambra (Sturani, 1981: ex *Onopordon* sp., *Carduus* and *Chrysanthemum coronarium*); Ficuzza, Bivio Godrano (Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 19.V.1961; 16.V.1990 (CVA); Pizzo di Case, 17.V.1981, on *Onopordon* sp. (CS); Bivio Lupo, 29.V.1981 (CS); Ficuzza, 18.VI.1982 (CFA); Alpe Ramosa, 4.VI.1991, on *Onopordon* sp. (CS); Valle Maria, 1.VII.1992; Alpe Cucco, 27.V.1995, 22.V.1999 (CS); Scanzano lake, 8.VII.2008 and 2.VI.2009 (CS); Ficuzza woods, 14.VI.2009 (CB).

Remarks and other biological aspects. Common in Sicily and in Ficuzza on the edges of the woods and along the trails in meadows and open areas in general. Adult is commonly found from April to June on the stems of various thistles (Figg. 25-26).

Agapanthia irrorata (Fabricius, 1787)

Chorotype and distribution. West Mediterranean; Southern Italy, Sicily and Sardinia.

Biology and host plants. Larvae on *Thapsia*, *Onopordon*, *Ferula*, *Salvia*, *Daucus*, *Phoeniculum* and *Chrysanthemum*. Adult is found on the same plant from April to June.

References. Marraccia (Pincitore Marott, 1873); Ficuzza (Ragusa, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Piano di Tramontana, 28.VI.1982 (CR); Portella del Vento, 11.VI.1983 (CR); Ficuzza woods, 5.VII.1987 (CVA); Alpe Cucco, 27.V.1995 – 21/22.V.1999 (CS).

Remarks and other biological aspects. Common species in Sicily. The adult is found from May-June mainly on the slopes of Rocca Busambra in Ficuzza woods, on the stems of carduacee (*Onopordon*) and *Ferula communis*.

Calamobius filum (Rossi, 1790)

Chorotype and distribution. Mediterranean; throughout Italy.

Biology and host plants. Larvae on wild and cultivated Gramineae. Adult is found on the same plants.

References. Ramusa (Luigioni & Tirelli, 1912); Ficuzza (Ragusa, 1924); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza 15.V.1927, 12.VI.1928 (CRA); Ficuzza woods, 15.V.1961; 16.V.1990 (CVA); Ficuzza, 23.V.1940 (CDS); Ficuzza woods, 29.V.1981 (CS); Ficuzza, 12.VI.1983 (CS).

Remarks and other biological aspects. Common throughout Sicily, including Ficuzza woods and neighbouring areas. Adult can be found in the spring on the stems of Gramineae.

Niphona picticornis (Mulsant, 1839)

Chorotype and distribution. Mediterranean; throughout continental Italy, Sicily and Sardinia; sporadic in the North.

Biology and host plants. Larvae polyphagous on deciduous trees, in particular, *Ficus carica*, *Spartium junceum*, *Pistacia*, *Robinia*, *Castanea sativa*, *Quercus*, *Calycotome* and *Euphorbia dendroides*; reported on conifers (*Pinus*) (Sturani, 1981). Adult hibernates in pupal cells on host plants; from May to August, attracted by artificial light.

References. Ficuzza (Ragusa, 1924); Ficuzza: Bivio Godrano (Sama, 1988; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza IX.1935 (CRA); Ficuzza, 5.III.1992/4.VI.1992, ex *Ulmus* (CS) (Fig. 27).

Remarks and other biological aspects. Very common in Sicily; adult is commonly found in the summer months, attracted by artificial lights.

Parmena subpubescens (Hellrigl, 1971)

Chorotype and distribution. Tyrrhenian; Southern Italy, Sicily, Sardinia (see Biscaccianti, 2002b, 2003).

Biology and host plants. Larvae and adult on *Ficus carica* and *Nerium oleander*.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, along road for Corleone, ex *Ficus carica*, 6.III.1983/9.VI.1983 (CS).

Remarks and other biological aspects. Species reported on the island of Marettimo (Hellrigl, 1971), really more widespread in Sicily and elsewhere in the Tyrrhenian (Biscaccianti, 2002b, 2003).

Parmena pubescens (Dalman, 1817)

Chorotype and distribution. Mediterranean; South-European subspecies (limited to the Italian peninsula, Sicily and Malta).

Biology and host plants. Larvae has been reported on *Ferula*, *Foeniculum*, *Euphorbia*, *Lavatera*, *Carduaceae*, *Ficus carica* in Sicily (Sama & Schurmann, 1982).

References. Ficuzza (Ragusa, 1924; Vitale, 1936; Sama & Schurmann, 1982; Sama, 1988, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza woods, 16.I.1974, 11.XI.1990 (CVA); road for Godrano, 24.XI.1974 (CR); Ficuzza, 9.I.1982 (CR); Valle Maria, 9.I.1982 (CR); Ficuzza woods, 23.XII.1978, 29.V.1981, 24.III.1984 (CS); Ficuzza, 6.III.1983/ 25.VI.1983, ex *Euphorbia* sp. (CS); Scanzano dyke, 5.III.1992 (CS); Godrano, Gorgo del Drago, 14.III.2004 (CS); Ficuzza woods, 30.III.2009 (CB); Valle Agnese, 29.IV.2010 (CS).

Remarks and other biological aspects. Common in Ficuzza. Found in the adult stage in winter months, under stones or barks of trees, particularly *Eucalyptus* and oaks, and even in small colonies (Fig. 28).

Deroplia troberti troberti (Mulsant, 1843)

Chorotype and distribution. West-Mediterranean; Italian continental, sporadic in Northern Italy, Sicily and Sardinia.

Biology and host plants. Larvae on *Quercus*, *Pistacia lentiscus*, *Laurus*, *Nerium oleander* and *Juglans regia*. Adult on the same plants from March to May.

References. Ficuzza (Ragusa, 1924).

Remarks and other biological aspects. Species no longer found in Ficuzza.

Pogonocherus hispidus (Linnaeus, 1758)

Chorotype and distribution. Turano-European-Mediterranean; throughout Italy. Sardinia (?).

Biology and host plants. Larvae on deciduous broadleaves trees and shrubs: *Ficus carica*, *Hedera*, *Rhamnus frangula*, *Alnus*, *Morus*, *Sambucus*, *Sorbus*, *Populus*, *Cornus*, *Fraxinus*, *Tilia*, *Corylus*, *Quercus* and various *Rosaceae*. Adult on the same host plants from August to September.

References. Ficuzza (Ragusa, 1924; Baviera & Sparacio, 2004); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. 1 ex Ficuzza 11.VI.(19)09 (CV); Ficuzza, VII.2009 (CB).

Remarks and other biological aspects. Larvae found on the *Ficus carica* in Sicily (Sama & Schurmann, 1982). Species uncommon in nature in the adult stage.

Leiopus nebulosus (Linnaeus, 1758)

Chorotype and distribution. European; throughout Italy. Sardinia (?).

Biology and host plants. Larvae polyphagous on deciduous trees, including shrubs, but rarely on conifers: *Picea* and *Abies alba* (cfr. Sama & Schurmann, 1982). Adult on the same host plants from May to July.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 1.VII.1992, in a woodshed (CS).

Remarks and other biological aspects. Species uncommon in Sicily (Rapuzzi e Sama, 2006). Remains were found in an old woodshed in Ficuzza woods.

Aegomorphus clavipes (Schrank, 1781)

Chorotype and distribution. Siberian-European-Mediterranean; throughout Italy.

Biology and host plants. Larvae polyphagous on deciduous trees, in particular, *Betula*, *Populus*, *Prunus avium* and *Juglans*; also: *Castanea*, *Quercus*, *Corylus*, *Tilia*, *Fagus*, *Morus*, *Nerium oleander* and more. Adult on the same host plants from May to July.

References. Ficuzza: Bivio Godrano (Sama & Schurmann, 1982; Sama, 2005); Godrano (Sama, 1988); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Valle Maria, on *Fraxinus angustifolia*, 29.V.1981 (CS); Bosco del Cappelliere on *Populus* sp., 1.VII.1992 (CS).

Remarks and other biological aspects. Specimens found were collected from the stumps of *Fraxinus* and *Populus* during daylight hours. Flicker holes and remains of adults in the galleries were present.

Opsilia coeruleascens (Scopoli, 1763)

Chorotype and distribution. Asian-European; throughout Italy.

Biology and host plants. Larvae on Borraginaceae (*Echium*, *Cerithe*, *Cynoglossum*, *Anchusa*, *Symphitum*, *Lithospermum*, *Lycopsis*); also *Inula conyza* (Kovacs & Hegyessy, 1995), and other herbaceous plants (Sama, 2002). Adult on host plants from April to June.

References. Ficuzza (Ragusa, 1924; Sama, 1988, 2005); Ficuzza (Sturani, 1981: ex *Echium* sp.); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Portella del Vento, 6.VI.1975, 17.VI.1984 (CR); Ficuzza, 6.VI.1975, (CVA); Ficuzza, 25.V.1981 (CS); Alpe Cucco, 22.V.1999 (CS).

Remarks and other biological aspects. Common in meadows and open areas in throughout Sicily. In Ficuzza the adult is found exclusively on host plants, usually *Echium* sp.

Phytoecia rufipes (Olivier, 1795)

Chorotype and distribution. Western Mediterranean; Central and Southern Italy and Sicily.

Biology and host plants. Larval development in Sicily on *Foeniculum vulgare* (Sama & Schurmann, 1982) but also on *Ferula galbanifera* (Müller, 1949-53). Adult on host plants from May to June.

References. Ficuzza (Ragusa, 1924; Sama, 2005).



Fig. 24



Fig. 25



Fig. 26



Fig. 27



Fig. 28



Fig. 29

Figure 24. *Morinus asper asper* male, Bivio Lupo, 16.VI.2008.

Figure 25. *Agapanthia sicula sicula*, Ficuzza woods, 14.VI.2009.

Figure 26. *Agapanthia sicula sicula* flying, Ficuzza, 14.V.2009 (photo C. Muscarella).

Figure 27. *Niphona picticornis*, Ficuzza, 4.VI.1992.

Figure 28. *Parmena pubescens*, Bivio Lupo, 13.XI.2010 (photo C. Muscarella).

Figure 29. *Phytoecia virgula*, Vallone Rocca d'Elice (beginnings at Alpe Cucco), 18.VI.2010 (photo C. Muscarella).

Materials. Ficuzza VI.1938 (CRA); Portella del Vento, 11.VI.1983, 17.VI.1984, 21.V.1989 (CR); Ficuzza, along “Vecchia strada ferrata” (old railroad line) 23.VI.1996 (CR).

Remarks and other biological aspects. Common in Sicily and Ficuzza woods on meadows where host plants srow.

Phytoecia nigricornis (Fabricius, 1781)

Chorotype and distribution. Siberian-European; throughout Italy except Sardinia.

Biology and host plants. Larvae mainly on *Tanacetum vulgare* but also *Artemisia*, *Solidago*, *Galatella*, *Achillea* and *Chrysanthemum*.

References. Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, along “Vecchia strada ferrata” (old railroad line), 23.VI.1996 (CR)

Remarks and other biological aspects. Species uncommon in Sicily and in Ficuzza.

Phytoecia caerulea (Scopoli, 1772)

Chorotype and distribution. Turano-European; Central and Southern Italy and Sicily.

Biology and host plants. Larvae on Brassicaceae, genus *Sinapis*, *Sisymbrium*, *Rapistrum* and others; also reported on *Linum* (Kovacs & Hegyessy, 1995). Adult on host plants from March to May.

References. Ficuzza (Ragusa, 1924; Sama, 2005); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Contrada Giardinello, 6.V.1984 (CS); Portella Cerasa, 10.V.1997 (CS).

Remarks and other biological aspects. Common in Sicily and Ficuzza woods on meadows with Cruciferae during the spring season months.

Phytoecia virgula (Charpentier, 1825)

Chorotype and distribution. Turano-European; throughout Italy except Sardinia.

Biology and host plants. Larvae on *Carduaceae*, *Artemisia*, *Daucus*, *Chrysanthemum*, and *Hieracium*. Adult on host plants from April to June.

References. Ficuzza (Ragusa, 1924; Vitale, 1936); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Road for Godrano, 26.V.1973, 1.V.1977 (CR); Contrada Giardinello, 8.V.1986 (CS).

Remarks and other biological aspects. The reported findings were discovered with the use of net litters on meadow (Fig. 29).

Oberea oculata (Linnaeus, 1758)

Chorotype and distribution. Siberian-European; throughout Italy.

Biology and host plants. Larvae and adult on *Salix*.

References. Marineo (Sama & Schurmann, 1982).

Remarks and other biological aspects. We are signalling this species for the area studied based on the findings of Sama & Schurmann (1980) on a neighbouring territory.

Tetrops praeusta (Linnaeus, 1758)

Chorotype and distribution. Siberian-European-Mediterranean; throughout Italy (Sama, 1994; 2002).

Biology and host plants. Larvae and adult on many broadleaves: *Quercus*, *Populus*, *Salix*, *Acer*, *Rhamnus*, *Ulmus*, *Tilia*, *Crataegus*, and *Amygdalus*.

References. Ficuzza (Ragusa, 1924; Vitale, 1936); Ficuzza woods (Bellavista et al., 2008; Bellavista, 2010).

Materials. Ficuzza, 6.VI.1991 (CFA).

Remarks and other biological aspects. Reported as a common species in Ficuzza by Ragusa (1924).

Tetrops starkii (Chevrolat, 1859)

Chorotype and distribution. European; extended to the Caucasus Region. Reported in some Northern regions of Italy and Basilicata (Sama, 1994; 2002).

Biology and host plants. Larvae and adult on *Fraxinus*.

References. Ficuzza woods, Alpe Cucco (Bellavista et al., 2009; Bellavista, 2010).

Materials. Ficuzza woods, Alpe Cucco, ex *Fraxinus angustifolia*, 9.I.2009/13 14.IV.2009 (CS).

Remarks and other biological aspects. Species discovered recently for the first time in Sicily (Bellavista et al., 2009).

Chorotypes	Number of species	Percentage (%)
CHOROTYPES AT WIDE DISTRIBUTION		
Sub-cosmopolitan or cosmopolitan chorotype	5	6,2
Olartic	1	1,3
Palaearctic	2	2,5
Asiatic-European	2	2,5
Central Asian-Mediterranean	1	1,3
Siberian-European- Mediterranean	2	2,5
Siberian-European	7	8,7
Turano-Mediterranean	5	6,2
Turano-European	15	18,7
Turano-European-Mediterranean	6	7,5
EUROPEAN CHOROTYPES		
European	4	5,0
South-European	5	6,2
MEDITERRANEAN CHOROTYPES		
Mediterranean	9	11,3
Eastern-Mediterranean	1	1,3
West-Mediterranean	5	6,2
ENDEMIC CHOROTYPES		
Tyrrhenian	1	1,3
Apennine	3	3,8
Sicilian	6	7,5
Total	80	100,0

Table 2. Chorotypes of Cerambycidae living in Ficuzza.

DISCUSSION AND CONCLUSION

Research in the Ficuzza woods was conducted over the last year and intensified from 2007 to 2010, integrating field data with informations derived from the study of public and private collections; 80 species of Coleoptera Cerambycidae were identified. Of these, 17 are new to the Ficuzza woods, 11 of which were reported in Bellavista et al. (2008) and Bellavista (2010) and one species, *Tetrops starkii*, is new for Sicily (Bellavista et al., 2009). Regarding the chorotypes (Table 2), the prevailing widespread species were 46 (57.5% of total) of which 15 are Turan-European (18.7% of total), followed by the Mediterranean species (15 species, 18.7% of total). Ten species (12.5%) are endemic or have a very restricted area of distribution. Six of them (7.5%) are endemic only to Sicily. In the case of the subspecies, the chorotypes, is referred to the distribution of a subspecies itself.

The entire population of Cerambycidae of the Ficuzza woods represented 63.78% of all the species reported in Sicily, estimated at 127 species.

Italy is the European country with the highest number of saproxylic beetles (255 species), followed by France, Slovakia, Spain and Austria (Nieto & Alexander, 2010). The high number of species living in Ficuzza is probably the result of the strong heterogeneity of the forest vegetation. The narrow altitudinal range accounts for the lack of communities linked to the low-altitude coastline, and the communities of mountain forests. Few species are related to the pine woods despite the presence of large areas planted with *Pinus pinea*. This confirms that pine is allochthonous.

The rearing of larvae confirms the relationship between certain species of trees or shrubs and several species of Cerambycidae (Table 3).

The results from traps, direct searching, and rearing of larvae allowed to formulate this list in order of importance for Cerambycidae diversity: mixed *Fraxinus* and *Quercus* woods, grassland and shrubs > riparian vegetation > holm oak and pubescent oak woods > ash woods > abandoned agricultural land or cultivated with common fig, walnut ... > pubescent oak wood > Cork oak woods > *Quercus gussonei* woods > *Chestnut*

Host Plants	Cerambycidae
<i>Fraxinus angustifolia</i>	<i>Xylotrechus arvicola</i> , <i>Aegomorphus clavipes</i> , <i>Tetrops starki</i>
<i>Quercus pubescens</i> s.l.	<i>Grammoptera ustulata</i> , <i>Xylotrechus arvicola</i> , <i>Mesosa nebulosa</i>
<i>Quercus suber</i>	<i>Cerambyx welensii</i>
<i>Ulmus minor</i>	<i>Leptidea brevipennis</i>
<i>Ulmus</i> sp.	<i>Trichoferus fasciculatus</i> , <i>Niphona picticornis</i>
<i>Castanea sativa</i>	<i>Poecilium alni</i> , <i>Chlorophorus glabromaculatus</i> , <i>Chlorophorus sartor</i> , <i>Phymatodes testaceus</i> , <i>Gracilia minuta</i>
<i>Ficus carica</i>	<i>Trichoferus fasciculatus</i> , <i>Parmena subpubescens</i>
<i>Populus nigra</i>	<i>Aegomorphus clavipes</i> , <i>Aegosoma scrabicorne</i>
<i>Pinus pinea</i>	<i>Arhopalus ferus</i>
<i>Eucalyptus camaldulensis</i>	<i>Phoracantha semipunctata</i> , <i>Phoracantha recurva</i>
<i>Spartium junceum</i>	<i>Deilus fugax</i>
<i>Euphorbia</i> sp.	<i>Parmena pubescens</i>
<i>Rubus</i> sp.	<i>Gracilia minuta</i>
<i>Onopordon</i> sp.	<i>Agapanthia sicula</i>
<i>Carduus</i>	<i>Agapanthia sicula</i>
<i>Chrysanthemum coronarium</i>	<i>Agapanthia sicula</i>
<i>Echium</i> sp.	<i>Opsilia coeruleascens</i>
<i>Rosa canina</i>	<i>Gracilia minuta</i> , <i>Stenopterus rufus</i>
<i>Centranthus ruber</i>	<i>Agapanthia violacea</i>

Table 3. Cerambycidae of the Ficuzza woods to be related to the host plant (larva breeding, discovery of adults, or the remains of adults in pupal cells ...).

wood> *Eucalyptus* wood> *Pinus pinea* wood> holm oak dominated wood.

The differences are closely related to vegetation and do not depend on dead wood because in Ficuzza woods it is very present in different types of vegetation. Some studies in various parts of the world suggest, in fact, that about 20% of the insect fauna living in the forests is associated with old trees and dead wood Grove (2002) found that “Volume of coarse woody debris proved the strongest positive correlate of species richness, while the basal area of larger-diameter trees proved a more robust indicator of abundance, incidence and assemblage composition, and was also correlated with species richness”.

For this reason, dead wood is one of the indicators chosen to assess the state of forests and the sustainability of their management (MCPFE, 2003; EEA, 2007) and was included among the parameters to be collected in the recent national forest inventory in Italy (Pignatti et al., 2009). Throughout Europe, saproxylic insects have been identified as a highly threatened group (Davies et al., 2008).

Many authors consider this a consequence of an intensive forestry which has modified the biotic and abiotic processes occurring within

forest and woodland ecosystems (Davies et al., 2008); the removal and reduction in quality of dead and decaying wood is considered one of the principal reasons for the decline in the saproxylic invertebrate fauna (Davies et al., 2008).

Another important aspect regarding the population of Cerambycidae of Ficuzza, is the rarity of some Longhorn beetles species living in the Ficuzza woods, in fact, 35 (44%) of all Cerambycidae of Ficuzza woods, 28% of Cerambycidae of Sicily, are included in the Cerambycidae red list (Table 4).

Everything has implications for management; Davies et al. (2002), identify some best practices to conserve the saproxylic diversity: i) “Promoting the value of veteran trees and old-growth wooded habitats”; ii) “Encouraging microhabitat heterogeneity”. Also, the study of the ecology of xylophagous beetles can provide important information for forest history and for the adoption of more accurate measures of forest management (Vodka et al., 2009). So far the majority of the studies have been conducted in forest environments in Fennoscandia.” (Davies et al., 2002), it is therefore necessary to implement research in Mediterranean forests.

Species	IUCN Red List Category (Europe)	IUCN Red List Criteria (Europe)	IUCN Red List Category (EU 27)	IUCN Red List Criteria (EU 27)	Endemic to Europe?	Endemic to EU 27?
<i>Aromia moschata</i>	LC	LC				
<i>Brachyteroma ottomanum</i>	LC		LC		YES	
<i>Callimus abdominalis</i>	LC		LC		YES	
<i>Callimus angulatus</i>	LC		LC			
<i>Cerambyx cerdo</i>	NT		NT			
<i>Cerambyx miles</i>	NT		NT			
<i>Cerambyx scopoli</i>	LC		LC			
<i>Cerambyx welensii</i>	NT		NT			
<i>Chlorophorus glabromaculatus</i>	LC		LC		YES	
<i>Chlorophorus sartor</i>	LC		LC			
<i>Chlorophorus varius</i>	LC		LC			
<i>Clytus clavicornis</i>	VU	B1ab(iii)+2a b(iii)*	VU	B1ab(iii)+2ab (iii)*	Yes	Yes
<i>Clytus rhamni</i>	LC		LC			
<i>Deilus fugax</i>	LC		LC			
<i>Gracilia minuta</i>	LC		LC			
<i>Hesperophanes sericeus</i>	LC		LC			
<i>Hylotrupes bajulus</i>	LC		LC			
<i>Nathrius brevipennis</i>	DD		DD			
<i>Penichroa fasciata</i>	LC		LC			
<i>Phymatodes testaceus</i>	LC		LC			
<i>Plagionotus arcuatus</i>	LC		LC			
<i>Plagionotus detritus</i>	LC		LC			
<i>Poecilium alni</i>	LC		LC			
<i>Poecilium lividum</i>	DD		NT			
<i>Prinobius myardi</i>	LC		LC			
<i>Prionus coriarius</i>	LC		LC			
<i>Purpuricenus kaehleri</i>	LC		LC			
<i>Stenopterus ater</i>	LC		LC			
<i>Stenopterus atricornis</i>	VU	B2ab(iii)*	VU	B2ab(iii)*		
<i>Stromatium unicolor</i>	LC		LC			
<i>Trichoferus fasciculatus</i>	LC		LC			
<i>Trichoferus griseus</i>	LC		LC			
<i>Trichoferus holosericeus</i>	LC		LC			
<i>Xylotrechus antilope</i>	LC		LC			
<i>Xylotrechus arvicola</i>	LC		LC			

Table 4. Status of Sicily Cerambicydae (from Nieto & Alexander, 2010)

LC: Least Concern; NT: Near Threatened; VU: Vulnerable; *: Under Section V (the criteria for Critically Endangered, Endangered and Vulnerable) there is a hierarchical alphanumeric numbering system of criteria and subcriteria (see IUCN, 2001).

ACKNOWLEDGEMENTS

This study was carried out with funds from the University of Palermo, (FRS, 2006 - ex quota 60%). Project: “The dynamics of biodiversity in forest and pre-forest ecosystems in Sicily” (responsible T. La Mantia). The study would not possible without the active cooperation of the “Dipartimento Regionale Azienda Foreste

Demaniali” (DRAFD) who authorized the researches in the Reserve.

In particular, we thank F. De Luca already Head of the Provincial office of DRAFD and the managers, G. Landini and F. Castiglia, the technical agent, G. Landini, and the forest workers. We are also grateful to S. Ciccarello for collaborating to the English translation, C. Muscarella for some photos and C. Di Leo for drawing the figure 1.

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