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WEEVILS OF FICUZZA NATURE RESERVE (PALERMO PROVINCE,  
SICILY): COMMUNITIES IN OAK FOREST STANDS  
AND THE FIRST CHECKLIST (*Coleoptera Curculionoidea*)

SUMMARY

In spring 2003 weevil beetles (Curculionoidea) were studied in “Riserva Naturale Orientata Bosco di Ficuzza” Nature Reserve, one of the most famous protected areas of Palermo province (Sicily). The study was focused on weevil communities of canopy of oak forest stands (communities in evergreen forest of *Quercus ilex* vs. deciduous forest of *Q. pubescens* s. l.), using beating method; other aim of the research was to provide species inventory (checklist) of this beetle group for the Ficuzza.

Looking at community of the oak forest stands, a total of 28 species of weevils were recorded (417 individuals in 25 samples, *Q. ilex*: 22 species, *Q. pubescens*: 17 species), of which 16 linked to oak trees. The most common species were *Polydrusus siculus*, showing preference for stands dominated by *Quercus pubescens*, followed by *P. elegantulus* and *P. frater*, being more numerous in *Q. ilex* stands. Relative density values of community on both oak species were nearly the same (17 specimens/25 branches), and peaked in the half of May on *Quercus pubescens*, about three weeks later on *Q. ilex*.

The first version of checklist of Curculionoidea for Ficuzza includes following numbers of species: 1 Urodontidae, 2 Anthribidae, 5 Atteblabidae, 1 Brentidae, 32 Apionidae, 2 Nanophidae, 2 Brachyceridae, 1 Erihrinidae, 130 Curculionidae and 1 Rhynchophoridae, altogether 177 taxa, of which 24 endemic to Italy/Sicily. Four species are new for Sicily: *Bagous alismatis* (Marsham, 1802), *Bagous robustus* H. Brisout, 1863, *Sitona limosus* (Rossi, 1792) and *Thamiocolus uniformis* (Gyllenhal, 1837). So far unclear occurrence of *Baris atricolor* (Boheman, 1844) is confirmed in Sicily. Other important records are *Echinodera siciliensis* Stüben, 2003, *E. variegata* (Boheman, 1837) and *Kykliaocalles teter* (Boheman, 1844). Intensive research in future may result in finding more than 100 additional species.

RIASSUNTO

*Comunità di Curculionoidea dei querceti della Riserva Naturale di Ficuzza (Sicilia, provincia di Palermo), con la prima checklist.* Nella primavera 2003 è stata studiata la fauna di Curculionoidea nella “Riserva Naturale Orientata Bosco di Ficuzza”, una delle aree protette più note della provin-

cia di Palermo (Sicilia). Lo studio ha interessato in particolare le comunità di Curculionoidea delle chiome degli alberi di querceti sempreverdi (Leccio *Quercus ilex*) a confronto con quelle di querceti decidui (Roverella *Q. pubescens* s. l.) che sono state ripetutamente campionate con il retino da sfalcio. Scopo del lavoro è stato anche quello di realizzare una checklist delle specie per l'area del bosco di Ficuzza.

In totale sono state rinvenute 28 specie di Curculionoidea (417 individui in 25 campioni, 22 specie su chiome di *Q. ilex*, 17 su chiome di *Q. pubescens*), 16 delle quali sono legate proprio alle querce. Le specie più comuni sono risultate *Polydrusus siculus*, che ha mostrato una preferenza per querceti caratterizzati da *Quercus pubescens*, seguito da *P. elegantulus* e *P. frater*, che invece sono più numerosi in querceti sempreverdi, dominati da *Q. ilex*. Le densità relative delle comunità sono risultate quasi uguali in entrambi i tipi di querceti (17 individui/25 rami), ed hanno raggiunto il picco nella metà di maggio su *Quercus pubescens*, circa tre settimane dopo su *Q. ilex*.

La prima versione della checklist dei Curculionoidea di Ficuzza comprende il seguente numero di specie: 1 Urodontidae, 2 Anthribidae, 5 Attelabidae, 1 Brenthididae, 32 Apionidae, 2 Nanophyidae, 2 Brachyceridae, 1 Erihrinidae, 130 Curculionidae ed 1 Rhynchophoridae, 177 taxa in totale, di cui 24 endemici della Sicilia o Italia. Quattro specie sono risultate nuove per la Sicilia: *Bagous alismatis* (Marshall, 1802), *Bagous robustus* H. Brisout, 1863, *Sitona limosus* (Rossi, 1792) e *Thamnicolus uniformis* (Gyllenhal, 1837). Viene inoltre confermata per la Sicilia la presenza di *Baris atricolor* (Boheman, 1844), in precedenza dubbia. Altri importanti reperti sono stati *Echinodera siciliensis* Stüben, 2003, *E. variegata* (Boheman, 1837) e *Kykliaocalles teter* (Boheman, 1844). Future intensive ricerche potrebbero consentire di trovare almeno altre 100 specie.

## INTRODUCTION

“Riserva Naturale Orientata del Bosco di Ficuzza” Nature Reserve (hereinafter called Ficuzza) is one of the most famous protected areas of Palermo province belonging, with an area of forest more than 4,000 ha, to very important forest complexes of southern Italy. Many naturalists highlighted its importance as a preserve for communities of precious flora and fauna, admiring this reserve for its high biodiversity. While plants and many groups of animals living in this reserve, as birds or mammals, are known rather well (summarised data in RAIMONDO *et. al.*, 2000), there is still lack of specialised researches concerning the insects of Ficuzza.

As for the weevil beetles (Coleoptera Curculionoidea), already in older works (e.g., LUIGIONI, 1929, LUIGIONI & TIRELLI, 1929, PORTA, 1932) „Bosco della Ficuzza” used to be mentioned many times. It is also known as *locus typicus* of some species, and even recently, there are being described new species of weevils from this territory. Except for single records, appearing from time to time in literature, however, there is no paper concerning with weevil fauna of this Reserve in more comprehensive way.

The author of this paper, dealing with weevils of oak forest stands of Central Europe (specifically in the Czech Republic) during his doctoral study, choose this Reserve for a short-term research done during his stay at

University of Palermo in spring 2003. There were two aims during the research, namely to obtain basic information about weevil communities associated with oak stands of Ficuzza that could be, at least partially, used for a later comparison with those living in Central Europe, and to focus on studying the superfamily Curculionoidea in Ficuzza in general point of view, collecting these beetles all over the Reserve within a range of habitats, in attempt to provide the first inventory (checklist) of weevils for the Ficuzza Nature Reserve.

#### MATERIAL AND METHODS

Research was carried out from February to June 2003. There were established 6 study plots (P1...P6) next to Ficuzza village, in the forest complex under massif of Rocca Busambra Mt. The plots, shortly described below, were established as transects of length of 50 m, lying along level line (altitude, slope orientation, slope, woody plants - w, herbs - h, stand height - sh, and collecting method - CM are given; degree in coverage in % is given only for dominant tree species. I thank Ing. R. Repka (Brno) for identification of herbs):

**P1 – A mature stand of Holm oak:** 1030 m a. s. l.; NNE; 5 °; w: *Quercus ilex* 60%, *Q. pubescens* 40%, *Acer campestre*, *Crataegus* sp., *Ruscus aculeatus* (latter two create compact shrub layer); sh: about 12 m; h: dominate *Euphorbia ceratocarpa?*, *Festuca rubra*, *Thalictrum calabricum*; CM: beating from *Q. ilex* and *Crataegus* sp.

**P2 – A middle-aged stand of Holm oak with high stand density:** 980 m; N; 20 °; w: *Q. ilex* 90%, *Q. pubescens* 10%, *Crataegus* sp., *Rosa* sp., *Fraxinus angustifolia* (in undergrowth); sh: about 8 m; h: very low density, dominate *Melica arrecta?*; *Brachypodium sylvaticum*, CM: beating from *Q. ilex*.

**P3 – A mature stand of Holm oak with dense shrub layer:** 930 m; NE; 10 °; w: *Q. ilex* 60%, *Q. pubescens* 30%, *Crataegus* sp., *Fraxinus angustifolia*, *Lonicera etrusca*, very dense shrub layer with *Ruscus aculeatus*, *Rosa* sp., *Prunus* sp.; sh: about 12 m; h: dominate *Festuca* sp., *Brachypodium* sp., *Melica uniflora*; CM: beating from *Q. ilex*.

**P4 – A mature stand of Downy oak:** 920 m; N; 5 °; w: *Q. pubescens* 70%, *Acer campestre* 10%, *Q. ilex*, *Ruscus aculeatus*, *Rosa* sp., *Lonicera etrusca*, *Crataegus* sp.; sh: 10 m; h: dominate *Brachypodium sylvaticum*, *Dactylis hispanica*, *Poa trivialis*; CM: beating from *Q. pubescens* and *Acer campestre*.

**P5 – A young oak stand with rich herb layer:** 730 m; NNE; 5 °; w: *Q. pubescens* 70%, *Q. ilex*, *Pyrus amygdaliformis*, *Calicotome* sp., *Thesium* sp., *Cistus* sp., sh: 4-5 m; h: dominate *Inula oculus-christi*, *Cynosurus echinatus*, *Briza maxima*; CM: beating from *Q. pubescens*, sweeping in herb layer.

**P6 – A middle-aged stand of narrow-leaved ash:** 800 m; N; 5 °; w: *Fraxinus angustifolia* 50%, *Q. pubescens*, *Crataegus* sp., sh: 6 m; h: dominate *Dactylis hispanica*, *Secale strictum*, *Briza maxima*; *Cynosurus cristatus*, CM: beating from *Fraxinus angustifolia* and sweeping in herb layer.

Beetles were collected at two-week intervals (from end of April till end of June every plot was visited five times). Canopy weevils were sampled by beating (one sample = beating from 25 branches) into a beating tray of dimensions of 1 x 1 m from dominant tree species (Holm oak *Quercus ilex*, Downy oak *Q. pubescens* s. l.) and additionally from other woody species (*Crataegus* sp., *Acer campestre*, *Fraxinus angustifolia*). On plots P5 and P6, also weevils living in herb layer were sampled by sweeping (one sample = 100 sweeps of width of 2 m with sweep net of diameter of 40 cm). *Quercus pubescens* s. l. includes, in this paper, following taxa: *Q. virgiliana*, *Q. congesta*, *Q. dalechampii*, *Q. amplifolia* and *Q. leptobalanos* (see BRULLO *et al.*, 1998).

Species are classified according to topic relations of adults: a - arboricolous, living permanently on woody plants; h - herbicolous, living continuously in the herb layer (or on low shrubs); and t - terricolous species, living in soil or in leaf litter).

For a quantitative comparison of weevil communities on the individual woody species, the relative density (RD) value was used (see e.g. HOLECOVA, 1991).  $RD = \frac{\sum n}{\sum s}$ , where  $\sum n$  = total number of individuals obtained from a certain woody species and  $\sum s$  = total number of samples taken from a given woody species. So, in the case of beating, the relative density value means average number of specimens beaten from 25 branches of a certain woody species, and in the case of sweeping this means average number of specimens obtained by 100 sweeps at a certain study plot.

Dominance (D) of the species was evaluated according to TISCHLER (1949): E = eudominant (> 10%); D = dominant (5-10%); SD = subdominant (2-5%); R = recedent (1-2%); SR = subrecedent species (< 1%).

Other ecological indices were not used (e.g. similarity, diversity) due to relatively short time for studying weevils in study area when the size of the catch obtained did not allow any in-depth statistical analysis of the data. Nevertheless, I suppose, the results summarised in tables and figures in the following pages will be sufficient to give an idea about basic characteristics of weevil communities associated with oak stands of Ficuzza.

The checklist of weevils presented in this paper is based on material collected by me during the research in Ficuzza, on material housed in private collection of a colleague of mine (I. Sparacio coll., Palermo), and on some

records published in the most recent scientific papers on weevils that I have had at my disposal. Historical records (for example, many weevil species of Ficuzza mentioned LUIGIONI & TIRELLI, 1929) were not accepted due to not always reliable identification and especially taxonomic problems. Species names and classification of Curculionoidea (families Urodontidae, Anthribidae, Nemonychidae, Attelabidae, Brentidae, Apionidae, Nanophyidae, Brachyceridae, Curculionidae and Rhynchophoridae) are given according to ALONSO-ZARAZAGA & LYAL (1999) and ABBAZZI *et al.* (1994). Identified specimens are deposited in the author's collection (R. Stejskal coll., Brno) except for a few specimens (G. Osella coll., L'Aquila).

## RESULTS AND DISCUSSION

### *Weevil communities in oak forest stands*

Attention has been paid, in particular, at differences in weevil communities between two tree species, Holm oak (*Quercus ilex*) and Downy oak (*Q. pubescens* s. l.), prevailing in forest stands of Ficuzza.

A total of 28 species (417 individuals in 25 samples) of weevils were recorded from the 6 plots, of which 16 species linked to oak. The contribution from the canopies of Holm oak was 22 species, and that from the canopies of Downy oak was 17 species. A total of 11 species were shared by both Holm oak and Downy oak. The highest plot total was 15 species from the study plot P3, a mature stand of Holm oak with dense shrub layer.

Values of the mean relative density of community on both oak species were nearly the same, 16.9 and 16.4 specimens/25 branches for Holm oak and Downy oak, respectively. On single plots the values of relative density varied from 12.2 (Downy oak on P4) to 21.8 specimens/25 branches (Holm oak on P3).

The most common species were *Polydrusus siculus*, *P. elegantulus* and *P. frater*, whose changes in relative density during vernal months are shown in Fig. 2, followed by *Curculio glandium* and *Phyllobius longipilis*. *P. siculus* showed a preference for Downy oak, while *P. elegantulus* and *P. frater* were more numerous on Holm oak. The relative density of the latter three weevil species mentioned above, as well as the total relative density of whole community, peaked in (half of) May on Downy oak, and about three weeks later (at the beginning of June) on Holm oak (see Figs. 1 and 2). This is possibly related to different altitude (and thus different climatic conditions) of the two forest formations in Ficuzza, where deciduous forests with prevalence of Downy oak are situated in lower altitudes, and above them evergreen forests with prevalence of Holm oak follow.

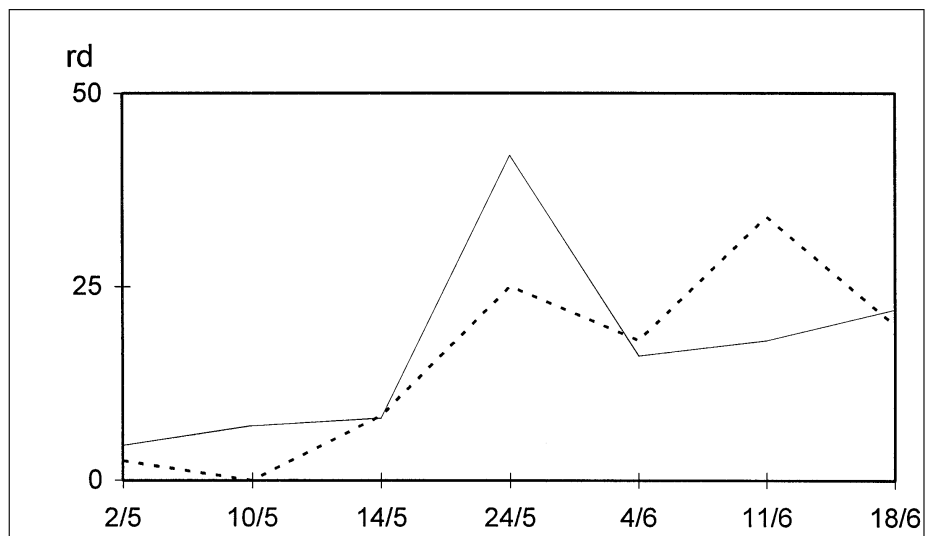


Fig. 1 — Changes in relative density (number of specimens obtained from 25 branches) of weevils in canopy of Downy oak (normal line) and Holm oak (dashed line) in Ficuzza Nature Reserve during spring 2003.

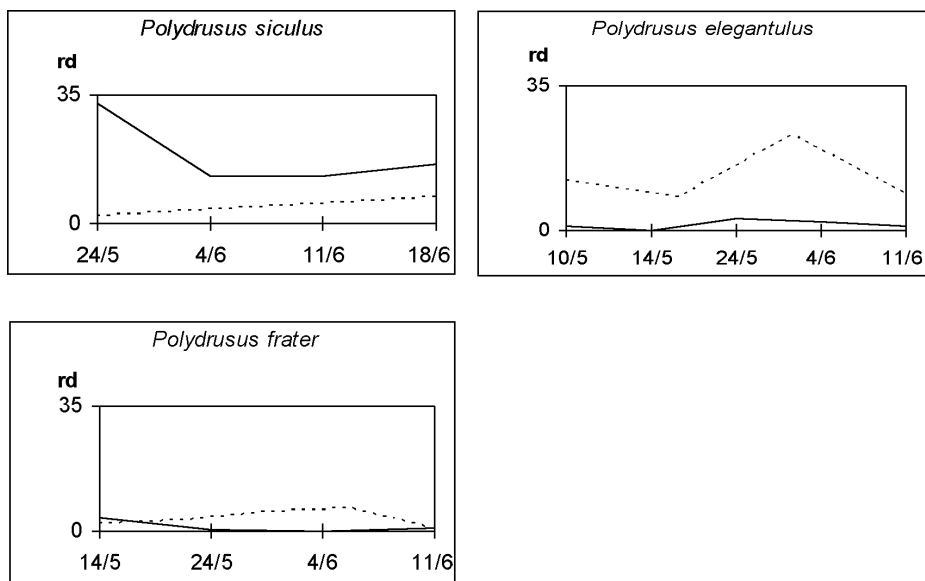


Fig. 2 — Changes in relative density (number of specimens obtained from 25 branches) of three most numerous weevil species in canopy of Downy oak (normal line) and Holm oak (dashed line) in Ficuzza Nature Reserve during spring 2003.

There was a difference in occurrence of herbicolous species in oak canopies that is worth mentioning. While in canopy of Downy oak only 3 herbicolous species with very low values of dominance and relative density were recorded, in canopy of Holm oak there were collected 11 herbicoles, some of those were in total dominant or even eudominant. The reason of such a migration of species normally living in the herb layer is unclear. They may find, in tree crowns, a better microclimate for surviving the unfavourable conditions (drought), as mentioned, for example, by HOLECOVA (1991, 1992) referring to WAGNER (1941), who first pointed out this phenomenon. HOLECOVA (1992) gives that, in Slovakia, this phenomenon is conspicuous mainly in oak-hornbeam stands, where in September the herbicolous species represent qualitatively and quantitatively more than half of the coenosis; on the contrary, in closed beech forests the herbicoles are less numerous, representing only 10% of all found species. In general, more herbicolous species are found on woody species in deforested areas as compared with trees in closed forest complexes (HOLECOVA 1991). Among herbicoles only members of family Apionidae were recorded on oaks in Ficuzza, of those the most numerous were *Pseudoprotapion astragali*, *Kalcapion semivittatum* and *Eutrichapion vorax*.

Catch obtained additionally from other woody species (*Crataegus* sp., *Acer campestre*, *Fraxinus angustifolia*) and from herb layer is not commented here because of insufficient size of samples (data on this catch are shown in Table 1). Maybe one fact worth mentioning is the low species richness on narrow-leaved ash, where only 3 species (only 4 individuals!) were beaten from this tree species, during 5 visits of study plot P6, of which none linked to ash. In general, ash is not very popular with weevils in Ficuzza, compared with other woody species; out of study plots the only species observed here and there numerously in ash canopies was *Otiorhynchus aurifer*.

#### *Checklist of weevils of Ficuzza*

The first version of checklist of Curculionoidea for Ficuzza includes following numbers of species: 1 Urodontidae, 2 Anthribidae, 5 Attelabidae, 1 Brentidae, 32 Apionidae, 2 Nanophyidae, 2 Brachyceridae, 1 Eirrhinidae, 130 Curculionidae and 1 Rhynchophoridae, altogether 177 taxa, of which 24 endemic to Italy/Sicily (marked with an \* in the list).

Collecting method and habitat preference are given for every species collected by myself (see below abbreviations), in other cases names of person who collected and identified the species, or literature resource of the record are given.

Table 1  
*Weevil species in two main forest types of Ficuzza Nature Reserve (evergreen vs. deciduous forest). Species are ranked according to topic relations of adults (symbols a, b, t), each of them being characterised by its relative density (rd) and dominance (D) at single study plots (for explanations see Materials and Methods). When multiplying the relative density five times, one obtains the real number of individuals collected.*

Topic relation	Forest formation											
	Evergreen forest					Deciduous forest						
	P1		P2		P3	P4		P5		P6		
	1030 m		980 m		930 m	920 m		730 m		800 m		
	Crataegus		Quercus ilex							Fraxinus	herb layer	
	rd	D	rd	D	rd	D	rd	D	rd	D	rd	D
a	0.2	SD					0.2	R				
a							0.2	SD				
a	2.4	E	1.0	D	3.0	E	1.0	E	0.2	R	0.4	-
a					0.2	SR						
a							0.4	SD				
a	0.6	D			0.2	SR			0.6	SD		
a												
a					0.2	R			0.2	R		
a												
a												
a	1.0	D			1.6	D	0.3	SD	0.2	R	1.4	D
a	1.4	D										
a	1.4	D			4.4	E			0.6	SD	0.8	SD
a	0.2	SD			1.6	D			1.0	D	0.2	R
a					1.4	D			1.2	D	1.2	D
a												
a	0.6	D			4.8	E	0.3	SD	5.8	E	15.6	E
a					0.6	SD					1.4	E
a									0.2	R	0.4	R
a	0.2	R			0.2	SR					0.4	R
a											0.2	R
h	0.6	D			0.2	SR			0.3	SD		
h												
h					0.2	R			0.3	SD		
h												0.2

segue table 1



continua table 1

Topic relation	Evergreen forest						Deciduous forest						
	P1		P2		P3		P4		P5		P6		
	1030 m		980 m		930 m		920 m		730 m		800 m		
Crataegus		Quercus ilex				Acer		Quercus pubescens		Fraxinus		herb layer	
rd	D	rd	D	rd	D	rd	D	rd	D	rd	D	rd	D
<i>Centorhynchus pallipes</i>													
<i>Dichromacalles dromedarius</i>													
<i>Donus cyrtus</i>													
<i>Eurichapton punctigerum</i>	0.4	D	0.2	R	0.4	SD							
<i>Eurichapton viciae</i>	0.2	SD	0.2	R	1.4	E	1.6	D					
<i>Eurichapton vorax</i>							0.2	SR					
<i>Holotrichapton aethiops?</i>							0.2	SR					
<i>Holotrichapton ononis</i>	0.4	D	0.2	R									
<i>Hypera meles</i>													
<i>Kalcipion semivittatum</i>	1.0	SD	1.6	D	0.6	SD	1.2	D					
<i>Oryxolaemus scabiosus</i>			0.4	SD			0.2	SR					
<i>Oxystoma pomonae</i>							0.3	SD					
<i>Perapion violaceum</i>													
<i>Protapion assimile</i>													
<i>Protapion interjectum</i>							0.3	SD					
<i>Protapion laevicolle</i>													
<i>Protapion nigrifarse</i>	0.2	0.6					0.5	D	0.6	SD			
<i>Pseudoprotapion astragali</i>			0.2	R	0.4	SD	2.2	D					
<i>Sciaphilomorphus aurosus</i>							0.5	D					
<i>Sitona lineatus</i>													
<i>Smicronyx cyaneus</i>													
<i>Smicronyx reitchi?</i>													
<i>Tychius amplicollis</i>													
<i>Tychius cuprifer</i>													
<i>Tychius quinquepunctatus</i>													
<i>Brachycerus muricatus</i>													
<i>Choerocephalus</i> sp.													
<i>Kyklioaalles teter</i>							0.2	R					
Total relative density	6.8	15.8	13.0	14	21.8	12.2	6.5	7.4	20.6	0.8	3.8		
Number of species	11	14	14	14	15	12	14	17	10	3	10		

Collecting method: s - sweeping, hp - checking host plants (hand-collecting, or using a net for beating from single plants), si - sifting, b - beating, st - hand-collecting under stones, su - hand-collecting on soil surface, on roads etc.

Habitat preference (i.e. habitat where the species was found): f - forests, p - intensive pastures (grazing land often with a part of ruderal and other degraded habitats), m - meadows (extensive pastures), r - road margins, l - littoral habitats and swamps. There are possible combinations of symbols, for instance, f+p means that species was found both in forest and intensive pastures.

- URODONTIDAE 1  
*Bruchela flavescens*: s+hp, r  
 ANTHRIBIDAE 2  
*Brachytarsus areolatus* Boheman, 1845: hp, p  
*B. fasciatus* (Forster, 1771): b, f  
 ATTELABIDAE 5  
*Attelabus nitens* (Scopoli, 1763): b, f  
*Neocoenorrhinus aequatus* (Linnaeus, 1767): b, f+p  
*N. interpunctatus* (Stephens, 1831): b, f  
*Rhynchites auratus* (Scopoli, 1763): b, f+p  
*R. giganteus* Krynicki, 1832: b, f+p  
 BRENTHIDAE 1  
*Amorphocephala coronata* (Germar, 1817): leg. Romano, det. Stejskal  
 APIONIDAE 34  
*Aspidapion radiolus* (Marsham, 1802): s, r  
*Catapion corsicum* (Desbrochers, 1888): leg. Sparacio, det. Giusto  
*C. seniculus* (Kirby, 1808) complex: s, m  
*Ceratapion damryi* (Desbrochers, 1894): b, f  
*C. gibbirostre* (Gyllenhal, 1813): s+b, f+p+r  
*C. onopordi* (Kirby, 1808): s, p+r  
*Eutrichapion facetum* (Gyllenhal, 1839): s, m  
*E. punctigerum* (Paykull, 1792): s, p+m  
*E. viciae* (Paykull, 1800): s+b, m+f  
*E. vorax* (Herbst, 1797): s+b, f  
*Exapion subparallelum* (Desbrochers, 1888): s, f+p  
*Hemitrichapion* sp.: s, m  
*H. aethiops?* (Herbst, 1797): s, f  
*H. ononis* (Kirby, 1808): s+b, f  
*H. pisi* (Fabricius, 1801): s, p+m  
*Ischnopterapion virens* (Herbst, 1797): s, p+f  
*Kalcapion semivittatum* (Gyllenhal, 1833): hp+b, r+f  
*Malvapion malvae* (Fabricius, 1775): hp, r  
*Melanapion minimum* (Herbst, 1797): b, l  
*Omphalapion hookeri* (Kirby, 1808): hp, r  
*Oryxolaemus scabiosus* (Weise, 1889): b, f+p  
*Oxystoma pomonae* (Fabricius, 1798): s+b, f+p  
*Perapion violaceum* (Kirby, 1808): hp, p+r, det. Schön

- Protapion assimile* (Kirby, 1797): s, f  
*P. interjectum* (Desbrochers, 1895): b, f  
*P. laevicolle* (Kirby, 1811): b, f  
*P. nigritarse* (Kirby, 1808): s+b, f+p  
*P. trifolii* (Linnaeus, 1768): leg. Sparacio, det. Giusto  
*Pseudoprotapion astragali* (Paykull, 1800): s+b, f  
*Squamapion leucophaetum* (Wencker, 1864): s, m  
*Stenopteration tenue* (Kirby, 1808): s, m+p  
*Taeniapion rufescens* (Gyllenhal, 1833): s, f+p+r  
 NANOPHYIDAE 2  
*Corimalia tamarisci* (Gyllenhal, 1838): b, l  
*Hypophyes pallidulus* (Gravenhorst, 1807): b, l  
 BRACHYCERIDAE 2  
*Brachycerus muricatus* (Fabricius, 1792): s+su, f+p  
*B. undatus undatus* (Fabricius, 1798): su, r+p  
 ERIRHINIDAE 1  
*Notaris scirpi* (Fabricius, 1792): s, l  
 CURCULIONIDAE 130  
*Acallocrates minutesquamosus* (Reiche, 1869): st, f, det. Stüben  
 \**Acallorneuma doderoi* A. & F. Solari, 1908: OSELLA & ZUPPA (2002)  
*Alophus nictitans singularis* Jacquelin du Val, 1854: st, p  
*Anisorrhynchus barbarus sturmi* Boheman, 1842: su, p+r  
*A. monachus* (Germar, 1817): su, p+r  
*Anthonomus pedicularius* (Linnaeus, 1758): b, f+p  
*A. rubi* (Herbst, 1795): s, f+p  
*A. spilotus?* Redtenbacher, 1849: b, p  
*Aulacobaris coeruleascens* (Scopoli, 1763): s, p  
*A. spoliata* (Boheman, 1836): s, l  
*Bagous alismatis* (Marsham, 1802): hp, l  
*B. robustus* H. Brisout, 1863: hp, l  
*Bangasternus provincialis* (Fairmaire, 1863): hp, r  
*Baris atricolor* (Boheman, 1844): hp, m  
*Bradybatus tomentosus* Desbrochers, 1892: b, f  
*Brachyderes pubescens* Boheman, 1833: leg. Sparacio, det. Stejskal  
*Calosirus terminatus* (Herbst, 1795): s, f  
*Ceutorhynchus assimilis* (Paykull, 1792): s, r  
*C. pallipes* (Crotch, 1866): s, r  
*C. chalybaeus* Germar, 1825: sj, f  
*C. pallidactylus* (Marsham, 1802): s, r  
*C. picitarsis* Gyllenhal, 1837: sj, f  
*C. sulcicollis* (Paykull, 1800): s, r  
*Cleonis pigra* (Scopoli, 1763): hp, m  
*Coeliodes erythroleucos* (Gmelin, 1790): b, f  
*C. ruber* (Marsham, 1802): b, f, Fremuth revid.  
*Coniatus tamarisci* (Fabricius, 1787): b, l  
*Coryssomerus capucinus* (Beck, 1817): s, p  
*Curculio glandium* Marsham, 1802: b, f  
*C. pellitus* (Boheman, 1843): b, f  
*C. pyrrhoceras* Marsham, 1802: b, f  
*C. venosus* (Gravenhorst, 1807): b, f

- Dichromacalles diocletianus* (Germar, 1817): st, p  
*D. dromedarius* Germar, 1844: s, f  
*Donus crinitus* (Boheman, 1834): s, p  
*D. cyrtus* Germar, 1821: s, f  
*Dorytomus dejeani* Faust, 1882: b, l  
*D. taeniatus* (Fabricius, 1781): b, l  
*\*Echinodera siciliensis* Stüben, 2003: si, f, det. Stüben  
*E. variegata* (Boheman, 1837): si, f  
*Gymnetron bipustulatum* (Rossi, 1794): s, f  
*G. tetrum* (Fabricius, 1792): s, f  
*G. variabile* Rosenhauer, 1856: s, f  
*G. vestitum* (Germar, 1821): s, f  
*Hadroplontus trimaculatus* (Fabricius, 1775): s, p  
*\*Heteromeira neapolitana?* (Faust, 1890): si, f, det. Osella  
*\*Heteromeira* sp.: si, f  
*Hypera meles* (Fabricius, 1792): s, p  
*H. nigrirostris* (Fabricius, 1792): s, p  
*H. scolymi* (Capiomont, 1868): s, p, det. Skuhrovec  
*H. cumana?* (Petri, 1901): s, p, det. Skuhrovec  
*H. postica?* (Gyllenhal, 1813): s, p, det. Skuhrovec  
*H. zoilus* (Scopoli, 1763): s, p  
*\*Choerocephalus* sp.: st+s, f+p  
*Kykliaocalles teter* (Boheman, 1844): si+b, f  
*Larinus buccinator* (Olivier, 1807): hp, p  
*L. curtus* Hochhut, 1851: hp, p  
*L. cynarae* (Fabricius, 1787): hp, p+r  
*L. flavescens* Germar, 1824: hp, p+r  
*L. jaceae* (Fabricius, 1775): hp, p  
*L. rusticanus* Gyllenhal, 1836: hp, p+r  
*\*Leiosoma s. scrobiferum* Rottenberg, 1871: si, f  
*Limobius borealis* (Paykull, 1792): s, m  
*Lixomorphus algirus* (Linnaeus, 1758): leg. Reina, det. Stejskal  
*Lixus angustatus* (Fabricius, 1775): s+b, f+p  
*L. ascanii* (Linnaeus, 1767): leg. Sparacio, det. Magnano  
*L. bidens* Capiomont, 1873: hp, m  
*L. cardui* (Olivier, 1808): hp, p+r  
*L. filiformis* (Fabricius, 1781): hp, p+r  
*Magdalis armigera* (Fourcroy, 1785): b, f  
*M. barbicornis* (Latreille, 1804): b, f  
*M. cerasi* (Linnaeus, 1785): b, f  
*M. exarata* H. Brisout, 1862: b, f  
*Mecaspis striatellus* (Fabricius, 1792): leg. Sparacio, det. Stejskal  
*Miarus plantarum* (Germar, 1824): s, p  
*Microplontus rugulosus* (Herbst, 1795): s, r  
*Minyops carinatus* (Linnaeus, 1767): su, f  
*Mogulones asperifoliarum* (Gyllenhal, 1813): s, f  
*M. geographicus* (Goeze, 1777): s, p  
*Mogulones* sp.: s, r  
*Nedyus quadrimaculatus* (Linnaeus, 1758): s, f+p  
*Orthochaetes insignis* Aubé, 1863: OSELLA & ZUPPA (1994)

- Otiorynchus affaber* Boheman, 1843: leg. Sparacio, det. Magnano  
*O. aurifer* Boheman, 1843: st+b, f+p+r  
*O. crivicollis* Gyllenhal, 1834: leg. Sparacio, det. Magnano  
*O. meridionalis* Gyllenhal, 1834: BAVIERA & SPARACIO (2002)  
 \**O. striatosetosus* Boheman, 1843: MAGNANO (1999)  
 \**O. umbilicatoides* Reitter, 1912: MAGNANO (1993)  
*Pachytychius hordei squamosus* (Gyllenhal, 1836): s, p  
*P. sparsutus* (Olivier, 1807): leg. Sparacio, det. Stejskal  
 \**Phyllobius longipilis* Boheman, 1843: b, f  
 \**Ph. pyri reicheldius* Desbrochers, 1873: b, f  
 \**Polydrusus armipes faillae* Desbrochers, 1859: b, f  
*P. elegantulus* (Boheman, 1840): b, f  
 \**P. frater* Rottenberg, 1871: b, f  
 \**P. pilosus italicus* Schilsky, 1910: b, f  
 \**P. sicanus* Chevrolat, 1860: b, f, p  
 \**P. siculus* Desbrochers, 1879: b, f  
 \**Pseudomylocerus neapolitanus* (Pic, 1901): s, r  
 \**Pseudomeira solarii* (Péricart, 1963): PIEROTTI & BELLÒ (1994)  
 \**P. pfisteri* (Stierlin, 1864): PIEROTTI & BELLÒ (1994)  
*Rhambphus oxyacanthae* (Marsham, 1802): b, p  
*Rhinocyllus conicus* (Frölich, 1792): s, p  
*Rhynchaenus pilosus* (Fabricius, 1781): b, f  
*R. signifer* (Creutzer, 1799): b, f  
 \**Rutera bellieri* (Reiche, 1860): si, f, det. Stüben  
 \**Sciaphilomorphus aurosus* (Boheman, 1845): s, p  
*Sibinia attalica* Gyllenhal, 1836: s, p  
*S. pellucens* (Scopoli, 1772): s, p  
*S. variata* Gyllenhal, 1836: s, p  
 \**Simo grandis* (Desbrochers, 1888): s, f  
*Sitona discoideus* (Gyllenhal, 1834): leg. Sparacio, det. Magnano  
*S. limosus* (Rossi, 1792): s, r  
*S. lineatus* (Linnaeus, 1758): s, p+m+f  
*S. puncticollis* Stephens, 1831: s, p  
 \**Solariola ruffoi* Osella & Di Marco, 1996: OSELLA & DI MARCO (1993-96)  
*Smicronyx cyaneus* (Gyllenhal, 1836): hp+s, f  
*S. jungermanniae* (Reich, 1797): s, p  
*S. rugicollis?* Rey, 1895: s, p  
*S. reichi?* (Gyllenhal, 1836): s, p  
*Stenocarus ruficornis* (Stephens, 1831): si, p  
 \**Styphlus vidanoi* Osella & Zuppa (1994): OSELLA & ZUPPA (1994)  
*Thamiocolus uniformis* (Gyllenhal, 1837): hp, m  
 \**Torneuma* sp.: leg. Sparacio  
*Tychius amplicollis* Aubé, 1850: s, p  
*T. argentatus* Chevrolat, 1859: s, p  
*T. cuprifer* (Panzer, 1799): s, p  
*T. quinquepunctatus* (Linnaeus, 1758): s, p+m  
*T. tibialis* Boheman, 1843: s, p  
*Zacladus exiguus* (Olivier, 1807): s, m

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*Sphenophorus parumpunctatus* (Gyllenhal, 1837): leg. Sparacio, det. Stejskal

*Comments on remarkable records*

New species for Sicily and species whose possible occurrence in Sicily is here confirmed are written in bold. Number following after data of collecting means number of specimens collected. When there is no specification in the text, it means R. Stejskal leg., det. and coll., G. Osella revid.

***Baris atricolor* (Boheman, 1844)**: Ficuzza – Rocca Busambra, 21.VI.2003, more specimens, on *Phlomis* sp. Adults were found sitting on top part of host plant (on flowers). In Italy, the species lives on *Phlomis herbaventi* and especially on *Stachys germanica*, it is known from the Balkans, Caucasus, Southern Russia, Asia Minor and in Italy from Abruzzo, Lazio, Puglia and Basilicata (TALAMELLI, 1997). Occurrence in Sicily, possible according to ABBAZZI *et al.* (1994), is here confirmed.

***Bagous alismatis* (Marsham, 1802)**: Ficuzza – Laghetto Coda di Riccio, 14.VI.2003, 10; 21.VI.2003, 4, on *Alisma plantago*. Widespread in Europa, Asia Minor and Siberia (CALDARA & O'BRIAN, 1998), known from Italian peninsula and Sardinia (ABBAZZI & OSELLA, 1992; ABBAZZI *et al.*, 1994), newly recorded for Sicily.

***Bagous robustus* H. Brisout, 1863**: Ficuzza – Laghetto Coda di Riccio, 14.VI.2003, 6; 21.VI.2003, 6 specimens, on *Alisma plantago*. Widely distributed in Europe, Anatolia and North Africa (CALDARA & O'BRIAN, 1998). Known only from Italian peninsula and Sardinia (ABBAZZI *et al.*, 1994), newly recorded for Sicily.

*Choerocephalus* sp.: Ficuzza – pasture under Rocca Busambra, 18.III.2003, 1, under a stone; 10.V.2003, 2, sweeping in forest with *Fraxinus angustifolia*, all R. Stejskal lgt., G. Osella det. and coll. Identification of species has not been possible due to present taxonomy of the genus (taxonomic revision is very needful). Most likely the specimens belong to 2 different species (G. Osella, pers. comm.).

*Echinodera* (*Dieckmannia*) *siciliensis* Stüben, 2003: Ficuzza – forest under Rocca Ramusa, 26.III.2003, 5; forest under Rocca Busambra, 2.IV.2003, 2; 11.IV.2003, 3; 24.V.2003, 1; 25.V.2003, 1; 29.V.2003, 6, all R. Stejskal leg., coll., P. E. Stüben det. All specimens collected by sifting. In Sicily, I have known the species also from other localities (Palermo, Oreto - Cozzo Suvarelli, 280 m a. s. l.; Riserva dello Zingaro; Madonie: Mt. Pizzo S. Angelo, 950 m a. s. l.; Piano Zucchi, 1100 m a. s. l. - the latter data, I. Sparacio leg.). I believe that while *E. variegata* is a species more associated with forest habitats, *E. siciliensis* lives both in forest and in deforested areas (often under solitary trees). The species, recently described by STÜBEN (2003), is endemic to Sicily and occurs in many forms very commonly especially in Northern Sicily (P. Stüben, pers. comm.).

*Echinodera* (*Echinodera* s. str.) *variegata* (Boheman, 1837): Ficuzza, 16.III.1997, 1, leg. I. Sparacio, coll. Stejskal; forest under Rocca Ramusa, 6.III.2003, many specimens, under bark of ash and under stones; forest close Godrano, 18.III.2003, 7 (2 specimens, P. E. Stüben coll.), sifting; all R. Stejskal leg., det., coll., P. E. Stüben revid. In Sicily, I have collected this species also in the Madonie Mts., Pizzo S. Angelo (950 m), 2.VI.2003, 3. So far it is known from Sicily (including Pantelleria and Lampedusa: OSELLA & RITI, 1995), Korfu and Greece and may occur in southern Italy (STÜBEN, 1998). Additional records for Sicily.

*Sitona* (*Sitona* s. str.) *limosus* (Rossi, 1792): Ficuzza, 1 km SW of village, 6.V.2003, 1 specimen, on Fabaceae. I have also identified 2 specimens from L. Sfondato (CL), 15-24.I.2001, ground trap, leg. G. Lo Verde. Distribution: Italy, France, Tyrol, Greece, Turkey, Syria, Algeria, Morocco (HOFFMAN, 1950). As very common species known from Italian peninsula (it is probably absent in North of Italy), however not recorded from Sicily by ABBAZZI & OSELLA (1992), neither by ABBAZZI *et al.* (1994). New species for Sicily.

*Thamiocolus uniformis* (Gyllenhal, 1837): Ficuzza – Rocca Busambra, 1200 m, 21.VI.2003, beaten from *Phlomis* sp. Species of southern Europe, where it is distributed from Albania to southern Italy (DIECKMANN, 1973). In Italy it is very rare (G. Osella - pers. comm.); recorded from Puglia, Basilicata, Calabria (ABBAZZI & OSELLA, 1992). New species for Sicily.

## CONCLUSION

In this paper, I tried to present the Ficuzza Nature Reserve, a famous protected area of Palermo province, from an entomological point of view. My research was focused on weevil beetles and their linkage to forest vegetation of the Reserve. There has been found a difference in weevil communities of both types of forest vegetation compared (evergreen forest vs. deciduous forest), especially in qualitative structure of the communities. In spite of the relatively low number of species found in oak canopy (Holm oak 22 species, Downy oak 17 species), the oak stands are to be considered as an important source of insect diversity. We must realise that it is difficult to study this diversity in forest due to structural density and complexity of forest ecosystem where the oak canopy represents just a part of whole ecosystem.

Other aim of the research was to provide the first inventory of weevil beetles for the Ficuzza Nature Reserve. One may ask: *What is the sense of such an inventory? Is it not outdated?* In my opinion, the most important point in

conserving an ecosystem effectively is to know species living in it and their demands. Another point is that investigations repeated after a period of time (for example 50 years) can tell us whether and how the species composition of an ecosystem/country/continent has changed, and can help us explain possible causes of these changes (natural selection, climate change, increasing human impact etc).

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