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THE SCARABAEOIDEA (COLEOPTERA) OF THE NEBRODI MOUNTAINS (NORTH-EASTERN SICILY, ITALY)

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ABSTRACT. This paper provides a faunal inventory of the Coleoptera Scarabaeoidea of the Nebrodi Mountains, based on historical bibliographical data along with new material collected by the authors in the last few decades and the examination of other public and private collections. A total of 117 species are reported, including both the list of 91 species so far recorded (five of which seem worthy of confirmation) and its update with 31 new records for this territory (with the first record of *Anisoplia sabatinellii* Baraud, 1991 from Sicily). For 59 species new distributional data are also given. Some biogeographical and conservationistic considerations on the Scarabaeoidea fauna of the Nebrodi Mountains are finally provided.

1. Introduction

The Nebrodi Mountains are one of the major biodiversity hotspots in Sicily (Pratesi and Tassi 1974). The great extension of the territory, the diversity of environments and the altitudinal extension contribute to the maintenance of rich biocenosis, also including endemic species and/or stenotopes and stenoecies taxa. To protect this environmental and biological heritage, much of the territory of the Nebrodi Mountains is included within the "Parco dei Nebrodi", the largest protected area in Sicily (about 86,000 hectares) (Giarratana 2004). This area also hosts three Oriented Natural Reserves: "Sambughetti-Campanito" in the province of Enna; "Vallone Calagna sopra Tortorici" and "Laghetti di Marinello" in the province of Messina (Dimarca 2004) and several protected areas belonging to the "Natura 2000" network (MASE 2023) (Table 2). With reference only to the orders of Coleoptera and Lepidoptera, it has been estimated that the Nebrodi Park has the highest biodiversity among the four Sicilian regional parks (Sabella and Sparacio 2004). An important role in terms of biological diversity, at all levels, is played by the Superfamily Scarabaeoidea (Coleoptera). Among them, both saproxylic (Audisio *et al.* 2014) and coprophagous species (Numa *et al.* 2020) are also effective ecological indicators, and this represents an extremely useful tool in assessing the environmental dynamics of places subject to protection. At the same time, the knowledge of the location, consistency, and frequency of the populations of this group of insects appears to be of fundamental importance for the planning of adequate actions to

protect biodiversity in the Nebrodi Park. The first data on the Coleoptera Scarabaeoidea of the Nebrodi territory can be dated back to the research of Ragusa (1872, 1883, 1892a,b, 1893b, 1921, 1926), among the first entomologists to explore this area. Further reports come from contributions on the Scarabaeoidea of Sicily (Aliquò 1970; Aliquò, Massa, and Mignani 1973; Aliquò and F. P. Romano 1975; Sabatinelli 1975a; Arnone 1981; Aliquò 1983; Arnone and Sparacio 1990; Arnone and Massa 1993; Agoglitta *et al.* 2006; Lapiana and Sparacio 2006; Colacurcio 2008; Arnone, Lo Cascio, and Grita 2014), of Italy (Luigioni 1929; Mariani 1971; Carpaneto 1975; Sabatinelli 1975b, 1976; Pierotti 1980; Pittino 1980; Franciscolo 1997; Rastelli 2000; Bartolozzi and Maggini 2005; Carpaneto, Piattella, and Valerio 2005; Ballerio *et al.* 2014) or of the Palaearctic (Goidanich 1925; Baraud 1975a,b, 1992, 1993; Brustel 2004; Bartolozzi, Norbiato, and Cianferoni 2016). Other data were recorded in studies on the Coleoptera of Sicily (Sparacio 1995; Baviera and Sparacio 2002; Contarini 2007; Baviera 2011), or on beetles of particular conservation interest (Sabella and Sparacio 2004; Audisio *et al.* 2007, 2009; Muscarella *et al.* 2013), or in taxonomic contributions (Mariani 1958; Pierotti 1959; Pittino 1978; Pittino and Mariani 1986; Carisio *et al.* 2004; Patacchiola, Fabbriciani, and Boschin 2023) or other (Pratesi and Tassi 1974). Despite this great number of reports, currently there is no synthetic research about the Scarab beetles of the Nebrodi Mountains. This paper, along with the study of the specimens collected by the authors through field research (partly conducted as part of a research project of the University of Messina on the coleopterofauna of the protected areas of north-eastern Sicily), aims to summarize the knowledge available on this group of Coleoptera in the Nebrodi district. This paper should therefore be only a preliminary contribution to the knowledge of Scarab beetles of this territory, subject to updates and future integrations.

2. Study area

2.1. ***Delimitation of boundaries*****.** Located in north-eastern Sicily, the Nebrodi mountain chain (also known as "Caronie" mountains) is part of the "Appennino Siculo" (Sicilian Apennines); it is bordered to the North by the Tyrrhenian Sea, to the East by the Peloritani Mountains, to the South-East by the Etna volcano, to the South by the extreme northern offshoots of the Erei Mountains, to the West by the Madonie massif. In this context, the exact border between Nebrodi and Peloritani Mountains is not entirely clear. Some authors include among the research stations of the Nebrodi district also the Malabotta Woods, which on the contrary is considered by other authors (e.g. Baviera, 2008, 2011 and Contarini, 2007) as the extreme western offshoot of the Peloritani Mountains. On the other hand, Pratesi and Tassi (1974) identified the entire area between Portella Mandrazzi and Portella Favoscuro as a transitional zone between Peloritani sensu stricto and Nebrodi proper. From the above, it is clear the absence of a convention on the interpretation of the boundaries of the Nebrodi district. To give coherence to this research, it therefore seems to be appropriate to establish the perimeter of the study area; according to (however arbitrary, like any other) boundaries thus specified (see Fig. 1): Northern border: Tyrrhenian Sea; Eastern border: municipal territories of Oliveri, Patti, Librizzi, San Piero Patti, Santa Domenica Vittoria (included); South-East border: Mount Etna and Alcantara River; Southern border: ideal line Nicosia – Troina – Bronte, roughly corresponding to the watershed line Troina River-Salso Cimarosa

FIGURE 1. Location and boundaries of the study area (image source: openstreetmap.org; modified)

River; Western border: political border between Palermo and Messina provinces, partly coinciding with the watershed line Tusa River-Pollina River. According to this perimeter (which delimits an area of about 200,000 hectares), the municipalities belonging to the Nebrodi district are 47, 24 of which included in the Nebrodi Park: most in the province of Messina (Acquedolci, Alcara Li Fusi, Capizzi, Caronia, Cesarò, Floresta, Galati Mamertino, Longi, Militello Rosmarino, Mistretta, Raccuja, Sant'Agata di Militello, San Fratello, San Marco d'Alunzio, San Teodoro, Santa Domenica Vittoria, Santo Stefano di Camastra, Tortorici, Ucria), but also in the provinces of Catania (Bronte, Maniace, Randazzo) and Enna (Cerami, Troina).

2.2. ***Altitudinal development, geological features, phytoclimatic characteristics.*** The Nebrodi massif is the third mountain group of Sicily for elevation, after the Etna volcano and the Madonie massif. Nebrodi higher mounts form the so-called "Nebrodi Ridge", which extends almost longitudinally for about 70 km. From a geological point of view, the territory is extremely composite. In the eastern area in contact with the Peloritani Mountains (see above) it is possible to distinguish various geological successions: those of the lower Miocene-middle Pleistocene (such as the Calcarenites of Floresta), of the upper Oligocene-lower Miocene (such as the Flysh of Capo d'Orlando) and of the Cretaceous (Scaly Clays of the Peloritani Mountains) alternate the tectonic Units of the Kabilo-Calabride Chain (Aspromonte, Mandanici, Fondachelli, Longi-Taormina; aged between the Paleozoic and the Oligocene) (ISPRA 2009). The central-western sector appears more uniform, dominated by the tectonic Units of the Apennines-Maghrebid Chain: Panormids (Numid Flysh of the tectonic Unit of Monte Maragone) and Sicilids (Units of Poggio Pracino, Monte Soro, Monte Salici, Troina and Nicosia), aged between the lower Cretaceous and the lower Miocene (ISPRA 2012, 2013). The clayey-calcareous and quarzarenitic-clayey lithofacies of the Flysh of Monte Soro, the Flysh of Reitano and the Flysh Numidico give the morphology of the western sector of the Nebrodi the characteristic landscape with imposing and asymmetrical slopes (Vezzani *et al.* 1972; ISPRA 2013). The climate, and along with it the vegetation, varies greatly according to the elevation and exposure of the slopes. Due to the altitudinal extension, there are two different bioclimates and various thermotypes

and ombrotypes: from the coast up to about 1300 m a.s.l. the Mediterranean bioclimate is imposed, while at higher altitudes the temperate sub-Mediterranean bioclimate is affirmed (see Schicchi (2004) and references therein). Following the bioclimatic successions, three distinct vegetation bands can be found: from the coast and up to about 800 m a.s.l. the thermo-Mediterranean belt stands, with the presence of evergreen oak forests (mainly cork oaks, *Quercus suber*) and Mediterranean scrub; higher up and up to about 1200 m a.s.l. extensive deciduous oak woods (*Quercus* sp. pl.) appear; while at higher altitudes and up to the peaks stand extensive oak and beech forests (*Quercus cerris, Fagus sylvatica*). The highest altitudes of the Nebrodi territory are affected, in winter and often until the beginning of spring, by abundant snow cover, which lasts, under normal conditions, even for five to six months. This creates climatic conditions favorable to the establishment of the beech (*Fagus sylvatica*), which covers on the Nebrodi Mountains as much as 80% of the total area covered in Sicily (Schicchi 2004). Characteristic of the Nebrodi Mountains are the numerous wetlands located at high altitudes: Urio Quattrocchi in the Municipality of Mistretta, Urio Zilìo in the Municipality of Caronia, Maulazzo Lake in the Municipality of Alcara Li Fusi, Biviere di Cesarò and seasonal lakes of Monte Soro in the Municipality of Cesarò, Pisciotto and Cartolari Lakes in the Municipality of Tortorici, Trearie Lake straddling the provinces of Messina with Municipality of Tortorici and Catania with Municipality of Randazzo, biotopes almost unique in Sicily, refuge of rare and/or stenotopes and stenoecies species.

3. Materials and methods

For this research, the specimens collected during field research carried out by the authors in the last three decades, along with the study of some public and private collections and of the bibliographic reports available, have been used. Even the citations relating to taxa of conservation interest included in the "Standard Forms" of the sites of the "Natura 2000" network included in the study area have been consulted (for an overview see Table 4). Field surveys have been performed in all months of the year and in all the most representative environments of the Nebrodi territory, from the coastline to the mountain peaks; especially within the Nebrodi Park, but also in territories and municipalities not included in the perimeter of the protected area: this was done to obtain, for each taxon, a list that includes as many localities as possible. Each collection station is listed with its respective toponym obtained from the IGM maps of scale 1:25,000. The samplings have been carried out with the following methods: visual direct searching (under stones, on vegetation, in dung), using entomological nets, screening of plant debris, pitfall traps at ground level and wine-traps on trees, as well as "windows traps" and light traps. Along data from literature and from examined material in various collections, data from web sources has also been taken into account, namely only those containing new faunistic records and with photos allowing a safe identification, as well as precise collecting data, published in the following websites: *Forum Entomologi Italiani* (2024), referred to as FEI in the text; *iNaturalist* (2024), referred to as NAT in the text. The systematic framework and nomenclature follow Bouchard *et al.* (2011), Ballerio *et al.* (2014), and I. Löbl and D. Löbl (2016), except for some updates (Vondráček *et al.* 2018; Leo, Garagnani, and Sabatinelli 2021) and different taxonomic choices (e.g., Ziani 2002; Ziani and Gudenzi 2013; Nikolajev 2016) which are, however, indicated in the text. For each taxon the following data are given: name, chorotype (according to Lapiana

and Sparacio (2006) and Ballerio *et al.* (2014)), chorological categories (which follow Vigna-Taglianti *et al.* (1993, 1999) and, for the Italian endemic distribution types, Biondi, Urbani, and D'Alessandro (2013)); main larval trophic category (modified by Ballerio *et al.* (2014)); ecological category (according to Carpaneto (1975) and Carpaneto and Piattella (1986)), and examined specimens (grouped by provinces). Data on the ecology of listed taxa are taken from Carpaneto (1975), Carpaneto and Piattella (1986, 1988), Carpaneto, Piattella, and Sabatinelli (1994), Lapiana and Sparacio (2006), Arnone (2010), and personal observations by the authors. The collection data of the examined material are transcribed as they are written on labels pinned under the specimens and standardized as follows: municipality, locality, date, method of collection and/or habitat, the collection in which they are deposited (the collector and the owner of the collection being the same, unless otherwise specified). For each species, the known bibliographic reports for the Nebrodi area (when available) along with brief faunistic, ecological or taxonomic notes are also provided. For taxa of conservation interest, the risk categories according to the lists of Numa *et al.* (2020) for the Mediterranean basin dung beetles and of Audisio *et al.* (2014) for the Italian saproxylic beetles are also added.

Collection abbreviations:

CA: Giovanni Altadonna, private collection, Messina (Italy);
CB: Cosimo Baviera, private collection, Messina (Italy);
CC: Loris Colacurcio, private collection, Zola Pedrosa (Bologna province, Italy);
CD: Marco Dellacasa, private collection, Genova (Italy);
CF: Fabrizio Fabbriciani, private collection, Pistoia (Italy);
CM: Calogero Muscarella, private collection, Palermo (Italy);
CZ: Stefano Ziani, private collection, Meldola (Forlì-Cesena province, Italy);
MSNP: Museo di Storia Naturale, Università di Pisa, Calci (Pisa province, Italy);
MSNR: Claudio Priolo, Museo civico di Scienze Naturali "Angelo Priolo" di Randazzo (Catania province, Italy).

Chorotype codes:

AIM = Afrotropical-Indian-Mediterranean
ASE = Asiatic-European
CAE = Centroasiatic-European
CAM = Centroasiatic-Mediterranean
CEM = Centroasiatic-European-Mediterranean
EME = East-Mediterranean
EUM = European-Mediterranean
EUR = European
MED = Mediterranean
NAF = North-African
OLA = Holarctic
PAL = Palaearctic

SEU = South-European
SIE = Sibiric-European
TEM = Turanic-European-Mediterranean
TUE = Turanic-European
TUM = Turanic-Mediterranean
WME = West-Mediterranean
WEU = West-European

Abbreviations of endemic distribution type

APSI = Apennine-Sicilian
APPE = Apennine
APSD = Apennine-Dinaric
SICI = Sicilian
SISA = Sicilian-Southern-Apennine

Abbreviations of the main larval trophic categories

COP = Coprophagous
FSA = Fito-saprophagous
NEC = Necrophagous
RHI = Rhizophagous
SAP = Saproxylic

Abbreviations of the ecological categories:

Eurytopic
E (sa-me) = Subalpine-Mediterranean

Oligotopic
O (m-sd) = Mountain-Sub-Mediterranean
O (sm-me) = Sub-Mountain-Mediterranean
O (m-me) = Mountain-Mediterranean

Stenotopic
S (m) = Mountain
S (m-sm) = Mountain-Sub-Mountain
S (sd-me) = Sub-Mediterranean-Mediterranean
S (me) = Mediterranean

4. Results

FAUNISTIC LIST

SUPERFAMILIA SCARABAEOIDEA Latreille, 1802

Familia LUCANIDAE Latreille, 1804
Subfamilia SYNDESINAE MacLeay, 1819

Sinodendron cylindricum (Linnaeus, 1758)
Chorotype – SIE
Trophic category – SAP
Ecological category - S (m-sm)
Examined specimens - **Messina** Capizzi, Sorgente Manca Batia (1198 m), ex *Fagus sylvatica*, 6/I-22/II/2014, 2 exx (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, in beech trunk, 4 exx (CM); ibidem, 2/VII/2022, 6 exx (CM); Caronia, Portella dell'Obolo (1500 m), 4/III/2017, 1 ex in beech trunk (CA); Caronia, Portella Pomiere (1460 m), ex pupa in *Fagus sylvatica*, 10-14/VIII/2016, 1 ex, G. Altadonna and S. Capici leg. (CA)

Notes. A saproxylophagous species that develops on various broad-leaved trees; in Sicily it is a relic element, confined to the humid woods of high mountains. In particular, on the Nebrodi Mountains it seems to be a typical component of the *Fagetum* horizon (Contarini 2007). Ragusa (1883, 1892a) wrote: "È comunissima dentro i tronchi degli alberi morti, sulle Madonie e Caronie in giugno e luglio [It is very common inside the trunks of dead trees, on the Madonie and Caronie in June and July]"; while today it appears in constant rarefaction (Lapiana and Sparacio 2006; Arnone 2010). Already reported from the Nebrodi Park (Sparacio 1995; Sabella and Sparacio 2004) and Portella Femmina Morta (Bartolozzi and Maggini 2005). Included in the Red List of Italian saproxylic beetles as Least Concern (LC) (Audisio *et al.* 2014).

Subfamilia LUCANINAE Latreille, 1804

Dorcus parallelipipedus (Linnaeus, 1758)
Chorotype – TEM
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens – **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 1/VII/2022, 1 ex (CM); Alcara Li Fusi, Passo Taverna, Torrente Cuderì (1333 m), 26/VII/2018, 1 ex in beech stump (CA); Capizzi, Sorgente Manca Badia (1188 m), 4/III/2017, 2 exx in beech stump (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 5 exx (CM); Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM); Caronia, Portella Calcari dint. (870 m), 7/VII/2014, 1 ex (CM); Caronia, Portella dell'Obolo (1503 m), 27/V/2012, 1 ex (CM); ibidem, 22/VI/2015, 2 exx (CM); Cesarò, 27/V/1973, C. Priolo leg., 1 ex (MSNR); Cesarò, Contrada Sollazzo Verde (1390 m),

23/VIII/2013, 1 ex (CM); ibidem, 1/VII/2022, 2 exx (CM)

Notes. A saproxylophagous, very polyphagous species, common and widespread in Italy, also in urban parks (Ballerio *et al.* 2014). In Sicily it is a forest, sciophilous species (Contarini 2007), located in various wooded areas of the Sicilian Apennines and Etna (Bartolozzi and Maggini 2005; Lapiana and Sparacio 2006), as well as in some urban parks of Palermo (Bartolozzi and Maggini 2005) and Viviano, *in litteris*. Already recorded from the Nebrodi Mountains by Ragusa (1883, 1892a), Sabella and Sparacio (2004), and Arnone (2010); particularly, from Portella Femmina Morta, San Fratello, Bosco di Pietra Cagliata [probably lapsus for "Pietratagliata" in Municipality of Caronia, authors' note], Portella Maulazzo, Cesarò (Bartolozzi and Maggini 2005; Contarini 2007). It is found in deciduous forests; the adults appear in summer, and they are found in the same trunks or stumps in which the larvae develop, sometimes wintering; sometimes, even in pitfall traps. Included in the Red List of Italian saproxylic beetles as Least Concern (LC) (Audisio *et al.* 2014).

Lucanus tetraodon sicilianus Planet, 1899
Chorotype – SICI
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens – **Messina**: Caronia, Monte Trefinaidi (950-1000 m), 20/VII/2013, remains of several specimens in stumps and trunks of Quercus cerris, G. Altadonna & C. Muscarella leg. (CA); Caronia, Portella Calcari (870 m), 7/VII/2014, 2 exx at dusk (CM); Caronia, Portella Pomo (823 m), 5/VIII/2012, remains of 1♂ preyed in fox dung (CA); Ficarra: Monte Santa Rosalia (820 m), 12/VII/2015, remains of 3 specimens preyed in fox dung (CA); Floresta, dint. (1100 m), 13/VIII/2002 1 ex (CB); Galati Mamertino, Gole del Catafurco (963 m), 12/VIII/2010, 1 ex (CM); Longi, Contrada Pado (970 m), 6/VIII/2022, remains of several specimens (CM); ibidem, 24/VIII/2022, 1 ex, F. & F.P. Faraone leg. (CM); Longi, Bosco di Mangalaviti (1400 m), 29/VII/2015, 1 ♂ wandering on the ground in the early afternoon (CA); San Fratello, Casello Cicalda (970 m), 9/III/2017, 3 larvae under trunk of *Quercus ilex,* not sampled (CA); Ucria (800 m), 7/VIII/2016, 1 ♀ observed in hazel grove (P. Lo Cascio & F. Grita, in litteris) Data from web sources - **Enna**: Troina, 1/VII/2012, 1 ♂, photo by C. Amata (FEI); **Messina**: Gioiosa Marea: Case Pileci (450 m), 2/IX/2011, 1 ♀, photo by M. Bassini (NAT); ibidem, 5/VIII/2021, 1 ♂ at light, photo by M. Bassini (NAT).

Notes. *Lucanus tetraodon* has a central Mediterranean chorotype. *L. t. sicilianus* is a Sicilian endemic subspecies, which is considered to be not valid by some authors (Baraud 1993; Franciscolo 1997; Lapiana and Sparacio 2006; Arnone 2010; Arnone and M. Romano 2020). It differs from the nominotypical subspecies by the greater curvature of the mandibles of the males and by the posterior margin of the pronotum more strongly sinuate in females (Ballerio *et al.* 2014). The observation of these characters in the Sicilian specimens of *Lucanus tetraodon* examined by us, also in a comparative way with specimens of *Lucanus tetraodon* of the Italian peninsula (Calabria, Abruzzo, Lazio, Marche), induces us to accept the validity of this subspecies (following Bartolozzi, Sprecher-Uebersaxe, and Bezděk (2016)), pending further examinations (G. Altadonna, pers. obs.). This beetle occurs in mature deciduous or coniferous forests (see e.g. Aliquò and Mignani (1970)), developing in old trunks on the ground and rotting stumps. In Sicily it is widespread, but localized, in the

main mountainous areas of the island (Sparacio 1995; Bartolozzi and Maggini 2005); there are no certain data from the Erei Mountains and recent reports from Agrigento province are missing. In Sicily it reaches high altitudes compared to other areas of its range (Franciscolo (1997): 178 indicated as the maximum altitude of the species 1300 m a.s.l.; largely surpassed in Sicily: see Baviera and Sparacio (2002)). The adults have summer phenology, they come into activity in the early afternoon but fly mainly at dusk, and they are attracted by artificial lights (especially males), sometimes by pitfall traps (see Lapiana and Sparacio (2006)). For the Nebrodi Mountains it is reported by Ragusa (1883, 1892a), Luigioni (1929), Sparacio (1995), Sabella and Sparacio (2004), Arnone (2010), and Muscarella *et al.* (2013), from Portella Femmina Morta (Franciscolo 1997; Bartolozzi and Maggini 2005; Bartolozzi, Norbiato, and Cianferoni 2016); Monte Soro (Baviera and Sparacio 2002), San Fratello (Bartolozzi and Maggini 2005), Biviere di Cesarò (Baviera 2011). This species appears to be relatively widespread in the forest environments of the Nebrodi Park: this is attested, as well as by the specimens examined and by the bibliographic reports, also by numerous remains observed in the following locations: Bosco di Mangalaviti, surroundings of Longi, Portella Maulazzo, surroundings of Mistretta, surroundings of San Fratello, Monte Pagano (Caronia), Portella dell'Obolo (C. Muscarella, pers. obs.). Moreover, in the Nebrodi district, the adults of this species are regularly preyed upon by *Vulpes vulpes*, as can be seen from the numerous remains found on several occasions in the dung of this Canidae (see above the specimens examined; G. Altadonna, pers. obs.). Cases of fox predation on adults of *Lucanus* sp. pl. are already known in literature (Franciscolo 1997): it is to be evaluated whether an increase in the populations of this Canidae can have negative effects on those of this Lucanidae. Like other saproxylic beetles, *Lucanus tetraodon sicilianus* is in rarefaction due to silvocultural practices that involve the cutting and removal of old trunks and perishable trees; for this reason, it is included in the Red List of Italian saproxylic beetles as Near Threatened (NT) (Audisio *et al.* 2014).

Familia TROGIDAE MacLeay, 1819

Trox (Granulitrox) fabricii Reiche, 1853
Chorotype – WME (South)
Trophic category – NEC (Keratinophagous)
Ecological category - O (m-me)
Examined specimens – **Messina**: Caronia, Pizzo Luminaria (1186 m), 22/VI/2015, 3 exx on dung of Vulpes vulpes (CM); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 2 exx, F.P. Faraone leg. (CM); Mistretta, C.da Magazzinazzo (780 m), 7/III/2023, 2 exx (CA)

Notes. A keratinophagous, not flying species, it is found on corpses of mammals and birds, on dung of wild animals, on the wads of raptors, mainly from autumn to spring (Sparacio 1995). It occurs in North Africa, Iberian Peninsula and Sicily (Ballerio *et al.* 2014), including the circumsicilian islands of Ustica (Riggio 1888), Marettimo (Aliquò and F. P. Romano 1975), Lampedusa, Pantelleria (Gridelli 1960; Ratti 1987; Arnone, Carpaneto, and Piattella 1995), and Favignana (Muscarella 2022). Not previously reported from the

Nebrodi district.

Trox (Granulitrox) niger Rossi, 1792
Chorotype – TUE
Trophic category – NEC (Keratinophagous)
Ecological category - O (m-me)
Examined specimens – **Messina**: Caronia, Monte Pagano (400 m), 12/II/2017, F.P. Faraone leg., 1 ex (CM); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, F.P. Faraone leg., 3 exx (CM); Longi, Bosco di Mangalaviti (1308 m), 30/VIII/2014, 1 ex at light (CM)

Notes. A keratinophagous flying species, living from the basal plane up to 1500 m above sea level on corpses of mammals and birds, on excrements of wild animals, on the wads of raptors; it is active almost all year round (Sparacio 1995; Ballerio *et al.* 2014). Not previously reported from the Nebrodi district.

Trox (Niditrox) scaber (Linnaeus, 1767)
Chorotype – PAL
Trophic category – NEC (Keratinophagous)
Ecological category - O (m-me)
Examined specimens – **Messina**: Longi, Stretta di Longi (240 m), 27/VI/2013, 1 ex on spider net (CM)

Notes. A necro-saprophagous species, very localized in Sicily, previously known only from Piazza Armerina (Enna province), Ficuzza (Palermo province), Grotta di Santa Ninfa (Trapani province) (Ragusa 1883; Zunino and Varrica 2001; Arnone 2010). The above cited specimen is therefore the first report for the Nebrodi district and for eastern Sicily.

Familia GEOTRUPIDAE Latreille, 1802

Typhaeus typhoeus (Linnaeus, 1758)
Chorotype – EUR
Trophic category – COP
Ecological category - O (sm-me)
Examined specimens – **Messina**: Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F. P. Faraone leg., 3 exx (CM); Longi, Bosco di Mangalaviti (1308 m), 6/I/2010, 2 exx (CM); San Salvatore di Fitalia, Serro delle Ciappe, 25/V/2008, 1 ex (CM); Tusa, C.da Acquatico (750 m), 29/XII/2022, 1 ex under pig dung (CA); Tusa, C.da Scalagatti (790 m), 26/XII/2022, 2 exx under bovine dung (CA); ibidem (650 m), 8/I/2023, 1 ex, remains (CA); Tusa, Il Calvario (561 m), 31/XII/2022, 1 ex in sheep pasture (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 1 ex in bovine dung (CA)

Notes. A species localized in Sicily, *Typhaeus typhoeus* appears in late autumn and is normally encountered throughout the winter, sometimes until the beginning of spring. On the Nebrodi Mountains, where it is already reported (Sparacio 1995; Sabella and Sparacio 2004), it seems to be rarer than on the neighbouring mountain ranges (Madonie, Peloritani).

Although it is thought to be linked mostly to the rabbit and sheep dung (Ballerio *et al.* 2014), during the present research this species has been found on various types of dung (mostly bovine dung).

Stereopyge douei (Gory, 1841)
Chorotype – NAF (extended to Sicily)
Trophic category – COP (horse and bovine dung)
Ecological category - O (m-me)
Examined specimens – **Messina**: Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 34 exx (CZ); Cesarò, Contrada Buffali (1250 m), 2/X/1976, Pierotti leg., 1 ex (CD); Cesarò, Monte Soro, 13/VI/1995, R. Lisa leg., 2 exx (CC); Cesarò, Portella Femmina Morta, 26/VI/1991, Sclano leg., 2 exx (CC)

Notes. Species, in Sicily, widespread but very localized, with spring and autumn phenology; it occurs in various environments covering a wide altitudinal spectrum, from the coasts to the mountain horizon, living on bovine and horse dung (Aliquò, Massa, and Mignani 1973; Sparacio 1995; Lapiana and Sparacio 2006). For Nebrodi district is so far reported (sub *Geotrupes douei*) by Sabella and Sparacio (2004) from the Nebrodi Park area and by Agoglitta *et al.* (2006) from Troina. Under a nomenclatorial point of view, Ziani (2005) explained that, even if Costa (1847) described the genus as *Streopuge*, the valid name to use is *Stereopyge*, an incorrect subsequent spelling but in prevailing usage. Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Geotrupes (Geotrupes) spiniger (Marsham, 1802)
Chorotype – TUE (introduced in Australia)
Trophic category – COP
Ecological category - E (sa-me)
Examined specimens – **Catania**: Randazzo, C.da Torazza (680 m), 1/X/2017, 1 ex under bovine dung (CA); Randazzo, Fiume Alcantara (680 m), 27/XII/2014, 1 ex under bovine dung (CA); **Enna**: Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 3 exx under bovine dung (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 11/VIII/1998, 1 ex (CB); ibidem, 14/V/2004, 2 exx (CB); Capizzi, C.da Nefare (957 m), 6/I/2014, 11 exx under bovine dung (CA); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, remains of some specimens preyed in fox dung (CA); ibidem, 5/VIII/2012, 2 exx in horse and bovine dung (CA); Capizzi, Via San Miceli (905 m), 6/I/2014, 1 ex under bovine dung (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 2 exx (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 1 ex (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 2 exx (CM); Caronia, Portella dell'Obolo (1503 m), 20/VIII/2011, 8 exx in bovine dung (CA); ibidem, 3/VIII/2018, 1 ex under bovine dung (CA); Caronia, Portella Pomiere (1450 m), 10/VIII/2016, 1 ex under bovine dung (CA); Caronia, Portella Pomo (823 m), 20/VIII/2011, 2 exx in bovine dung (CA); Castel di Lucio, loc. Maloseno, 17/XII/2015, 1 ex, S. Altadonna leg. (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 2 exx, F.P. & F. Faraone leg. (CM); Cesarò, C.da Ciappa de Tusa (1050 m ca), 23/IX/2012, 1 ex in bovine dung (CA); Cesarò, Biviere di Cesarò (1283 m), 11/X/2001-11/IV/2002, in pitfall trap, 1 ex (CB); Cesarò, C.da Buffali (1250 m), 9/III/2017, 1 ex under bovine dung (CA); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 2 exx (CZ); Cesarò, Colle Finocchio (1100 m), 16/II/2015, 1 ex under bovine dung (CA); Cesarò, contrada Ruggirà - Comunelli, 1/XI/2011, 4 exx in bovine dung (CA); Cesarò, Monte Soro (1500 m ca), IX/2003-26/IV/2004, pitfall trap, 1 ex (CB);

ibidem (1847 m), 11/VIII/1998, 1 ex (CB); pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 6 exx (CD); Cesarò, Torrente Torti (1380 m), 7/XII/2013, 1 ex wandering on the ground (CA); Ficarra, Monte Santa Rosalia (820 m), 12/VII/2015, remains of 2 exx (CA); Floresta, 14/V/1998, 2 exx (CB); Floresta, dint. (1300 m ca), 27/VII/2012, 1 ex in bovine dung (CA); Floresta, Piano di Musarra (1200 m), 25/IV/2015, 2 exx under bovine dung (CA); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 1 ex (MSNP); Galati Mamertino: Gole del Catafurco (963 m), 7/I/2010, 1 ex (CM); ibidem, 6/I/2020, 2 exx (CM); Longi, Bosco di Mangalaviti (1308 m), 6/I/2010, 1 ex (CM); Longi, Portella Gazzana (979 m), 22/VI/2012, 1 ex (CM); Longi, Rocche del Crasto (1205 m), 30/IX/2006, 2 exx (CM); ibidem, 27/VI/2013, 1 ex (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 4 exx (CM); ibidem, 30/IX/2013, 1 ex (CM); Mistretta, dint., 18/XI/2017, 1 ex, S. Altadonna leg. (CA); Pettineo, Piano d'Olmo (617 m), 8/XI/2014, 1 ex, S. Altadonna leg. (CA); ibidem, 28/XII/2022, 1 ex flying at dusk, G. Altadonna leg. (CB); Pettineo, Vallone Loreto (700 m), 14/X/2015, 1 ex, S. Altadonna leg. (CA); San Fratello, lecceta, c.da Gianfi (900 m), 9/III/2017, 1 ex under bovine dung (CA); Tortorici, Monte Pojummoru (1400 m), 14/VIII/1998, 1 ex (CB); Tusa (750 m ca), 31/XII/2012, 1 ex in bovine dung (CA); Tusa, Bosco Tardara, 31/I/2018, 3 exx wandering on the ground, S. Altadonna leg. (CA, CB, CZ); Tusa, C.da Scalagatti (750 m), 15/XI/2014, 4 exx, G. Altadonna leg. (CA, CB), Tusa, Piano Vagna (460 m), 5/IX/2017, 1 ex under bovine dung (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 1 ex under bovine dung (CA); Ucria, dint. (1000 m), 25-28/VII/2002, 1 ex (CB); Ucria, Piano di Musagra (1278 m), 25/XII/2016, 1 ex wandering on the ground (CA); Data from web sources - **Enna**: Troina, 22/XII/2016, photo by C. Amata (FEI)

Notes. It is one of the most common species of Geotrupidae in Sicily, second only to *Jekelius intermedius* (Arnone 2010). On the Nebrodi Mountains it is a very common and widespread species, found all year round, in open pastures as in wooded areas, from hilly altitudes to the high mountains, in bovine and equine dung. It was possible to observe this species (sometimes with *Bubas bison*; see below) flying at morning and especially at dusk in search of bovine dung (G. Altadonna, pers. obs.), as already been reported by Sparacio (1995). So far recorded from the Nebrodi Mountains by Ballerio *et al.* (2014) and by Agoglitta *et al.* (2006) from Portella Femmina Morta (unpublished data of Massa, 1969-70), Mistretta and Troina.

Jekelius (Jekelius) intermedius (O. G. Costa, 1839)
Chorotype – WME
Trophic category – COP
Ecological category - O (m-me)
Examined specimens – **Catania**: Randazzo, C.da Rovetello (910 m), 15/X/2016, 2 exx (CA); Randazzo, Fiume Alcantara (680 m), 1/IX/2016, 1 ex, G. Altadonna leg. (CB); **Enna**: Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 3 exx under bovine dung (CA); ibidem, Laghetti Campanito (1200 m), 16/VIII/2022, 1 ex, S. Altadonna leg. (CA); ibidem, Casa Argenteria (1170 m), 16/VIII/2022, 1 ex, remains (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 1 ex (CM); Alcara Li Fusi, Rocche del Crasto (420 m), 26/IX/2002, F. Strumia leg., 4 exx (MSNP); Capizzi, Casale Dugo (1370 m), 5/VIII/2012, 1 ex in bovine dung (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 1 ex (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 1 ex (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 1 ex (CM); Caronia, Portella dell'Obolo (1503 m), 22/VI/2015, 1 ex (CM); Castel di Lucio, Pizzo Croce, 1/XI/2017, 3 exx, S. Altadonna leg. (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 2 exx, F.P. & F. Faraone leg. (CM); Cesarò, 23/VIII/2013, 1 ex (CM); Cesarò, Contrada Sollazzo Verde (1390

m), 23/VIII/2013, 1 ex (CM); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 1 ex (CM); Cesarò, Biviere di Cesarò (1278 m), 11/VIII/2010, 6 exx (CM); ibidem, 23/VIII/2013, 1 ex (CM); ibidem, 20/VIII/2022, 1 ex (CA); ibidem (1283 m), 11/IV-19/VI/2002, pitfall trap, 1 ex (CB); ibidem, 14/V/2004-15/V/2005, pitfall trap, 1 ex (CB); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 6 exx (CZ); Cesarò, contrada Ruggirà - Comunelli, 1/XI/2011, 12 exx on dung of cow, horse, dog and wandering on the ground (CA); ibidem, 25/III/2012, 1 ex on dog dung (CA); Ficarra: Monte Santa Rosalia (820 m), 12/VII/2015, 1 ex, remains (CA); Galati Mamertino, San Basilio, loc. Molisa (798 m), 7/I/2010, 1 ex (CM); ibidem, 12/VIII/2010, 1 ex (CM); Longi, Bosco di Mangalaviti (1308 m), 30/VIII/2014, 1 ex (CM); Longi, Portella Gazzana (979 m), 22/VI/2012, 1 ex (CM); Longi, Rocche del Crasto (1206 m), 1/IV/2007, 1 ex (CM); ibidem, 1/X/2006, 1 ex (CM); ibidem, 27/VI/2013, 1 ex (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 1 ex (CM); Longi, Rocche del Crasto, Bosco Soprano (1080 m), 8/VIII/2020, 2 exx (CA); Mistretta, dint., 18/XI/2017, 1 ex, S. Altadonna leg. (CA); Pettineo, C.da Contrasto, Abbeveratoio (742 m), 2/V/2015, 1 ex (CA); Pettineo, Piano d'Olmo (617 m), 15/XI/2014, 3 exx (CA), ibidem, 4/XII/2015, 1 ex, S. Altadonna leg. (CZ); ibidem, I/2018, S. Altadonna leg., 1 ex (CZ), ibidem (700 m), 9/X/2022, 5 exx in bovine dung, G. Altadonna leg. (CB); San Fratello, 13/VI/1989, Lisa leg., 5 exx (CZ); ibidem, 14/VI/1989, R. Lisa leg., 1 ex (CC); San Fratello, Portella Femmina Morta, 13/VI/1989, R. Lisa leg., 1 ex (CC); San Fratello, Monte Fossa del Lupo (1200 m), 16/II/2015, remains of around 20 exx in bottle of beer abandoned by unkowns (CA); San Fratello, Muto (1300 m), 20/V/1968, M. Arnone leg., 1 ex (CD); San Teodoro, Contrada Giannino (950 m), 29/IX/2013, 1 ex (CA); Tusa, C.da Acquatico (600 m), I/2022, 1 ex, S. Altadonna leg. (CA); Tusa, C.da Follia (760 m), 9/X/2022, 3 exx (CA); Tusa, C.da Scalagatti (670 m), 9/I/2023, 1 ex, remains, not sampled (CA); Tusa, Cozzo Lassanó (786 m), 9/X/2022, 1 ex (CA); Tusa, Piano Catarrà (830 m), 28/XII/2022, 1 ex, remains (CA) Data from web sources - **Messina**: Alcara Li Fusi, Poggio Pracino (1300 m), 17/IV/2017, photo by R. Catania (NAT); Gioiosa Marea, Gioiosa Guardia (800 m), 23/XI/2014, photo by M. Bassini (NAT)

Notes. *Jekelius intermedius* is the most widespread Geotrupidae species in Sicily, occurring in almost throughout the main island, as well as in many circumsicilian islands (Agoglitta *et al.* 2006). Mainly coprophagous species, but very adaptable (sometimes also necrophagous), on the Nebrodi Mountains is a thermophilic species, preferring in general the most exposed slopes as already been observed by Arnone (2010). Collected year-round, but it is most common from autumn to spring. Already recorded from Mistretta, Monte Sambughetti and Nicosia (Agoglitta *et al.* 2006). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Sericotrupes niger (Marsham, 1802)
Chorotype – WEU
Trophic category – COP
Ecological category - O (m-me)
Examined specimens – **Catania**: Bronte, Castello Nelson (700 m), 28/XII/2013, 1 ex wandering on the ground (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 18/VII/2015, 2 exx (CA); Capizzi, C.da Nefare (957 m), 6/I/2014, 6 exx under bovine dung (CA); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, remains of some specimens preyed in fox dung (CA); Capizzi, Caserma Mafauda (1369 m), 10/VIII/2016, 1 ex, remains (CA); Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 5 exx (CM); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Portella Pomiere (1450 m), 10/VIII/2016, 1 ex under bovine dung (CA); Caronia, Portella Pomo (823 m), 20/VIII/2011, 1 ex in bovine dung (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022,

1 ex, F.P. & F. Faraone leg. (CM); Cesarò, Biviere di Cesarò (1278 m), 22/VI/2013, 5 exx in horse dung (CA); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 4 exx (CZ); Galati Mamertino, San Basilio, Gole del Catafurco (963 m), 6/I/2020, 1 ex (CM); Longi, Bosco di Mangalaviti (1308 m), 6/I/2010, 5 exx (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 1 ex (CM); ibidem, 30/IX/2013, 2 exx (CM); Pettineo, Piano d'Olmo (617 m), 15/XI/2014, 1 ex (CA); Santo Stefano di Camastra, Santuario Letto Santo (870 m), 30/XII/2022, 1 ex in bovine dung (CA); Tusa (750 m ca), 15/VIII/2011, 1 ex in bovine dung (CA); Tusa, C.da Scalagatti (650 m), 15/XI/2014, 1 ex (CA); Tusa, foce torrente Tusa, 27/XII/2022, 1 ex under human dung (CA); ibidem, 30/XII/2022, 4 exx under human dung, G. Altadonna leg. (CA, CB)

Notes. Thermophilic species, which is widely diffused and common in Sicily, from the coastline to medium altitudes (Sparacio 1995). On the Nebrodi Mountains it is usually found in open pastures and in wooded clearings, in bovine and equine dung, up to about 1400 m above sea level. So far reported by Agoglitta *et al.* (2006) from Portella Femmina Morta (unpublished data of Massa, 1969-70), Caronia (Moglia), Mistretta, Santa Domenica Vittoria.

Trypocopris (Trypocopris) pyrenaeus cyanicolor (Capra, 1930)
Chorotype – APSI
Trophic category – COP
Ecological category - O (m-me)
Examined specimens – **Messina**: Alcara Li Fusi, Bosco di Scavioli (1400 m), 29/VII/2015, 6 exx (CA); ibidem (1200 m), 20/VIII/2022, 1 ex in bovine dung (CA); idem, 2 exx, G. Altadonna leg. (CZ); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, 1 ex, remains (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 1 ex (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 1 ex (CM); ibidem (1050 m), 20/VII/2013, 1 ex, remains (CA); Caronia, C.da Volpara (1420 m), 1/V/2014, 1 ex (CA); Caronia, Portella dell'Obolo (1503 m), 1/V/2014, 1 ex on pig dung (CA); Caronia, Portella Pomiere (1450 m), 10/VIII/2016, 1 ex (CA); Caronia, Portella Pomo dint. (900 m), 1/V/2014, 2 exx (CA); idem, 2 exx, G. Altadonna leg. (CF); Caronia, Timpone Mirio (1485 m), 10/VIII/2016, 1 ex (CA); Cesarò, Biviere di Cesarò, dint. (1350 m), 28/VII/2015, 2 exx (CA); Biviere di Cesarò (1274 m); 11/IV/2002, 1 ex (CB); Monte Soro, 22/V/1979, I. Sparacio leg., 3 exx (CZ); pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 2 exx (MSNP); idem, A. Rey leg., 18 exx (CD); ibidem (1500 m), 27/VII/1989, Sclano leg., 2 exx (CF); Portella Femmina Morta (1400 m), 18/V/1971, V. Aliquò leg., 6 exx (CD); ibidem, 1/V/1982, Magrini leg., 2 exx (CZ); ibidem, 15/VIII/1984, PAD. MAL. leg., 2 exx (CC); ibidem, 6/X/1990, V. Aliquò leg., 6 exx (CC); ibidem (1524 m), 26/VII/2018, 1 ex in bovine dung (CA); Cesarò, Portella Calacudera (1560 m), 18/V/2019, 2 exx, G. Altadonna & C. Falcone leg. (CA); idem, 4 exx, G. Altadonna leg. (CF); Cesarò, sentiero Portella Femmina Morta-Portella Calacudera (1520 m), 26/VII/2018, 3 exx (CA); Longi, Bosco di Mangalaviti (1308 m), 27/VI/2013, 4 exx (CM); Longi, Contrada Pado (970 m), 23/VIII/2022, F. & F.P. Faraone leg., 1 ex (CM); Mistretta, Contrada Medda (1110 m), 22/VII/2018, 1 ex, remains (CA); San Fratello, 18/VI/1971, V. Aliquò leg., 3 exx (CD); ibidem, 14/VI/1989, Lisa leg., 3 exx (CZ); ibidem, 30/VI/1989, Lisa leg., 6 exx (CZ); ibidem, 12/VI/1999, 4 exx (CZ); ibidem (1300 m), 17/V/2002, 2 exx (CB); ibidem, 17/X/2002, C. Baviera leg., 1 ex (CC); San Fratello, Muto (1300 m), 20/V/1968, M. Arnone leg., 3 exx (CD); San Fratello, Portella Calacudera (1560 m), 28/VII/2015, 2 exx (CA); San Fratello, strada San Fratello-Portella Femmina Morta (900-1100 m), 11/VI/1991, F. Angelini leg., 1 ex (MSNR)

Notes. *Trypocopris pyrenaeus* is a polytypic species with chorotype WEU. This subspecies in Sicily occurs only on Madonie and Nebrodi Mountains, although the latter host the most abundant populations of the island (Sparacio 1995; Lapiana and Sparacio 2006). *Trypocopris pyrenaeus cyanicolor* is one of the most characteristic faunal elements of the deciduous forests of the Nebrodi Mountains, where it appears, especially in the spring season, along the paths and in the undergrowth, in search of dung (mostly bovine and pigs). Already recorded from the Nebrodi Park (Sabella and Sparacio 2004), Caronia, Pizzo Battaglia, Pizzo Lippo [sic; the correct toponym is "Pizzo Lipo", above San Fratello, authors' note], Pizzo San Michele, Passo dei Tre, San Fratello (Mariani 1958; Carisio *et al.* 2004; Agoglitta *et al.* 2006), included unpublished data of Massa, 1969-70, Portella Femmina Morta, Monte Soro, Mistretta (Aliquò, Massa, and Mignani 1973; Rastelli 2000; Agoglitta *et al.* 2006; Ballerio *et al.* 2014).

Familia GLAPHYRIDAE MacLeay, 1819
Subfamilia AMPHICOMINAE Blanchard, 1845

Amphicoma carcelii (Laporte de Castelnau, 1832)
Chorotype – APSI
Trophic category – RHI
Ecological category - O (m-me)

Notes. Species only recently reported from Sicily by three specimens collected at Scala di Patti, near Tindari (Colacurcio 2008).

Familia SCARABAEIDAE Latreille, 1802
Subfamilia APHODIINAE Leach, 1815

Acanthobodilus immundus (Creutzer, 1799)
Chorotype – ASE
Trophic category – COP
Ecological category - O (sm-me)
Examined specimens – **Messina**: Alcara Li Fusi (400 m), 26/VI/2007, at light, 1 ex (CB); Cesarò, 12/VI/1999, 1 ex (CZ); Portella Femmina Morta (1400 m), 28/V/1977, A. Casale leg., 3 exx (CD)

Notes. A xerothermophilic species, with a phenology spanning from early spring to autumn; it occurs in various environments covering a wide altitudinal spectrum, from the coasts to the mountain horizon (in Sicily up to 1600 m a.s.l.) (Arnone and Massa 1993; Ballerio *et al.* 2014). So far reported from Portella Femmina Morta (Arnone and Massa 1993).

Acrossus siculus siculus (Harold, 1862)
Chorotype – SICI

Trophic category – COP
Ecological category - S (m)
Examined specimens – **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 18/VII/2015, 14 exx in bovine dung (CA); ibidem, 28/VII/2015, 1 ex (CA); Capizzi, 3/VII/1992, 1 ex (CB); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, 1 ex under stone in spider net (CA); Caronia, Bosco della Tassita (1380 m), 3/VIII/2013, C. Baviera & G. Altadonna leg., 1 ex (CA); Caronia, Portella Obolo (1400/1500 m), 16/VI/2006, G. Sama leg., 22 exx (CZ); ibidem, 16-29/VI/2012, D. Baratelli leg., 1 ex (CF); Caronia, Timpone Mirio (1485 m), 3/VIII/2013, 1 ex (CA); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 3 exx (CM); ibidem (1400 m), 1/V/1972, S. Battoni leg., 1 ex (CD); ibidem, 8/VII/1973, B. Massa leg., 1 ex (CD); ibidem (1500 m), 13/VII/1975, Betti leg., 2 exx (CC); ibidem, 20/VII/1976, B. Calì leg., 3 exx (CD); ibidem, 21/VII/1978, Vicari leg., 1 ex (CZ); ibidem, 24/VII/1980, M. Arnone leg., 2 exx (CC); idem, M. Arnone leg., 49 exx (CD); ibidem, 4/VII/1985, Castelli leg., 2 exx (CC); ibidem, 6/VII/1985, V. Aliquò leg., 11 exx (CZ); ibidem, 18/VII/1985, M. Arnone leg., 2 exx (MSNP); ibidem, 12/VII/1986, V. Aliquò leg., 5 exx (CZ); idem, V. Aliquò leg., 17 exx (CD); ibidem, 13/VII/1987, V. Aliquò leg., 11 exx (CZ); ibidem, 21/VII/2007, M. Arnone leg., 1 ex (CF); ibidem (1524 m), 26/VII/2018, 1 ex in bovine dung (CA); ibidem; 12/VI/1999, 9 exx (CZ); ibidem (1600 m), 4/VII/1985, 2 exx (CZ); Cesarò, Monte Soro, 10/VII/1983, V. Aliquò leg., 4 exx (CZ); idem, V. Aliquò leg., 4 exx (CC); ibidem (1847 m), 15/VII/2013, M. Arnone leg., 66 exx (CD); ibidem (1847 m), 23/IV/2017, 4 exx under stones (CA); ibidem (1600 m), 22/VII/1989, I. Sparacio leg., 1 ex (CC); ibidem (1700 m), 20/V/2000, 1 ex (CB); ibidem (1700 m), 6/I/2010, sifting, 1 ex (CB); ibidem (1847 m), 3/VII/1999, sifting sub *Acer pseudoplatanus*, 8 exx (CB); ibidem (1750 m), ai bordi del laghetto, 15/VII/2013, M. Arnone leg., 1 ex (CF); Monte Soro: Miraglia, 10/VII/1986, P. Rapuzzi leg., 2 exx (CC); idem, P. Rapuzzi leg., 1 ex (CZ); San Fratello, 10/VII/1983, V. Aliquò leg., 2 exx (CC); ibidem, 10/VII/1988, V. Aliquò leg., 2 exx (CZ).

Notes. *Acrossus siculus* is a species with chorotype APSI, the nominotypical subspecies is a Sicilian endemic taxon, linked to the mountain forests of the Madonie and Nebrodi massifs of the *Fagetum* horizon, where it is found in summer, in the shady undergrowth, mainly on rather fresh horse dung (Arnone and Massa 1993; Sparacio 1995; Arnone 2010), but also on bovine dung and, during spring, under stones (G. Altadonna, pers. obs.). On the Nebrodi Mountains it is localized, but sometimes locally abundant. Already recorded from the Nebrodi Park (Sabella and Sparacio 2004) sub *Aphodius siculus siculus*, from Portella Femmina Morta (Pratesi and Tassi 1974) sub "afodio carpetano, differenziato in una razza propria della Sicilia [*Aphodius carpetanus*, differentiated in a variety occurring in Sicily]"; (Aliquò and F. P. Romano 1975; Arnone and Massa 1993; Ballerio *et al.* 2014), Monte Soro (Arnone and Massa 1993; Baviera 2011; Ballerio *et al.* 2014) and Caronia (Arnone and Massa 1993). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Anomius castaneus (Illiger, 1803)
Chorotype – WME
Trophic category – COP
Ecological category - S (sd-me)
Examined specimens – **Catania**: Randazzo, Fiume Alcantara (680 m), 9/IX/2017, 1 ex under bovine dung (CA).

Notes. Late summer-autumn species, linked to the pastures of the basal plane (Ballerio *et al.* 2014). In Sicily it is found on sheep and bovine dung, both along the coasts and at hilly altitudes (Arnone and Massa 1993). Not previously reported from the Nebrodi district. Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Aphodius fimetarius (Linnaeus, 1758)
Chorotype – PAL
Trophic category – COP
Ecological category - E (sa-me)
Examined specimens – **Catania**: Randazzo, Bosco del Flascio (970 m), 6/VII/2014, under bovine dung, 7 exx (CA); Randazzo; C.da Torazza (680 m), 1/X/2017, 2 exx under bovine dung (CA); **Enna**: Nicosia: C.da Campanito (1120 m), 26/VII/2015, 7 exx under bovine dung (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1444 m), 23/VI/2013, under bovine dung, 1 ex (CA); ibidem (1400 m), 18/VII/2015, under bovine dung, 1 ex (CA); ibidem (1440 m), 29/VII/2023, 1 ex in bovine dung (CA); Capizzi, C.da Nefare (957 m), 6/I/2014, 1 ex (CA); Capizzi, Via S. Miceli (905 m), 6/I/2014, 2 exx (CA); Caronia, foce torrente Caronia, 4/III/2017, 1 ex under bovine dung (CA); Caronia, Portella dell'Obolo (1500 m), 4/III/2017, 1 ex under bovine dung (CA); Cesarò, 12/VI/1999, 1 ex (CZ); Cesarò, C.da Solecchiate (1022 m), 19/X/2016, 5 exx under bovine dung (CA); idem, 7 exx, G. Altadonna leg. (CZ); Cesarò, Monte Soro (1847 m), 3/VII/1999, 1 ex (CB); ibidem, 21/VII/1978, M. Arnone leg., 4 exx (CD); ibidem, 24/VI/1984, M. Romano leg., 1 ex (CD); Cesarò, C.da Buffali (1250 m), 9/III/2017, 2 exx under bovine dung (CA); Cesarò, Portella Femmina Morta (1500 m), 3/VI/1985, A. Rey leg., 1 ex (CD); Cesarò, Vallone Farina (1100 m), 7/XII/2013, under bovine dung, 2 exx (CA); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 1 ex (MSNP); Pettineo, Piano d'Olmo (700 m), 9/X/2022, 2 exx under bovine dung (CA); San Fratello, 4/VII/1975, Betti leg., 2 exx (CC); San Fratello (675 m), 31/III/1984, M. Arnone leg., 1 ex (CD); San Teodoro, C.da Sciammo (1000 m), 5/I/2015, 4 exx under bovine dung (CA).

Notes. One of the most common and widespread Aphodiinae in Sicily, occurring all year round from the coasts to the mountain pastures (Sparacio 1995; Ballerio *et al.* 2014). Not previously reported from the Nebrodi district. The recent taxonomic and nomenclatorial history of this taxon and the close relative *Aphodius pedellus* (DeGeer,1774) [see below] is rather tempestuous. After a chromosome analysis, Wilson (2001) stated that material regarded as *Aphodius fimetarius* comprised two species, *A. fimetarius* and *A. pedellus*, which have a very similar external and aedeagical morphology but a different karyotype. Both species have been reported to be widespread in the Palaearctic ecozone. After some systematic and nomenclatorial troubles (Angus, Wilson, and Krell 2012; VV.AA. 2012; Fery and Rössner 2015) and the opinion of the ICZN (2014), now most of the authors seem to follow the interpretation given in this paper.

Aphodius foetidus (Herbst, 1783)
Chorotype – EUM (with extension to Anatolia)
Trophic category – COP
Ecological category - O (sm-e)
Examined specimens – **Messina**: Cesarò, 12/VI/1999, 3 exx (CZ); Cesarò, C.da Solecchiate (1022 m), 19/X/2016, under bovine dung, 2 exx (CA); Portella Femmina Morta (1524 m), 13/VII/1975, Betti leg., 1 ex (CC); ibidem (1500 m), 3/VI/1985, A. Rey leg., 5 exx (CD); ibidem (1400 m),

22/V/1977, A. Casale leg., 1 ex (CD); Cesarò, Vallone Farina (1100 m), 7/XII/2013, under bovine dung, 1 ex (CA); Floresta, 12/VI/1995, Lisa leg., 5 exx (CZ); San Fratello (675 m), 18/V/1984, M. Arnone leg., 25 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 6 exx (CD); San Fratello, strada San Fratello-Portella Femmina Morta (900-1100 m), 11/VI/1991, F. Angelini leg., 11 exx (CD); Santo Stefano di Camastra: Santuario Letto Santo (870 m), 30/XII/2022, 2 exx in bovine dung (CA); Tortorici, Casa Batessa (1296 m), 29/VI/2014, 1 ex under bovine dung (CA).

Notes. A common species, with a phenology spanning from spring to summer (Ballerio *et al.* 2014), on the Nebrodi Mountains it is found mostly under bovine dung in hilly and mountain pastures. Not previously reported from the Nebrodi district.

Aphodius pedellus (De Geer, 1774)
Chorotype – OLA
Trophic category – COP
Ecological category - E (sa-me)
Examined specimens – **Messina**: Santo Stefano di Camastra: Santuario Letto Santo (870 m), 30/XII/2022, 2 exx in bovine dung (CA); Tusa, C.da Scalagatti (790 m), 26/XII/2022, 4 exx in bovine dung (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 3 exx in bovine dung (CA).

Notes. Biology similar to that of *A. fimetarius*. Not previously reported from the Nebrodi district. See under *A. fimetarius* for nomenclatorial and systematic problems connected to this taxon.

Biralus mahunkaorum Ádám, 1983
Chorotype – WME
Trophic category – COP
Ecological category - O (sm-me)
Examined specimens – **Messina**: San Fratello (675 m), 31/III/1984, M. Arnone leg., 5 exx (CD).

Notes. A spring species, occurring from the coast up to 1500 m a.s.l. (Ballerio *et al.* 2014). On the Madonie Mountains this species, uncommon in Sicily, was found on sheep and bovine dung up to 1600 m a.s.l. (Lapiana and Sparacio (2006), sub *Biralus satellitius* (Herbst, 1789)). Not previously reported from the Nebrodi district.

Bodiloides ictericus ghardimaouensis (Balthasar, 1929)
Chorotype – TUM
Trophic category – COP
Ecological category - O (m-me)
Examined specimens – **Catania**: Randazzo, C.da Torazza (680 m), 1/X/2017, 1 ex under bovine dung (CA); Randazzo, Fiume Alcantara (680 m), 1/IX/2016, 3 exx under bovine dung (CA); ibidem, 9/IX/2017, 4 exx under bovine dung (CA); **Enna**: Cerami (970 m), 24/VI/1988, 2 exx (CZ); **Messina**: Cesarò, 12/VI/1999, 3 exx (CZ); Biviere di Cesarò (1270 m), 11/VIII/1998, 2 exx (CB); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 10 exx (CZ); Monte Soro (1847 m), 24/VI/1984, M. Romano leg., 2 exx (CD); Portella Femmina Morta (1500 m), 11/IX/1988, M. Arnone leg., 2 exx

(CC); ibidem (1400 m), 28/V/1987, A. Casale leg., 3 exx (CD); ibidem, 14/VIII/1982, V. Aliquò leg., 17 exx (CD); San Fratello, strada San Fratello-Portella Femmina Morta (900-1100 m), 11/VI/1991, F. Angelini leg., 1 ex (CD); Tusa, Castel di Tusa (6 m), 18/X/1976, G. Parodi leg., 5 exx (CD).

Notes. In Sicily this species, whose phenology spans from April to October, occurs in open pastures, from the coasts to the mountains, mostly on sheep dung (Arnone and Massa 1993). So far reported from Biviere di Cesarò, Vallone San Fratello, Portella Femmina Morta, Castel di Tusa, Nicosia (Arnone and Massa 1993). Among the 14 specimens preserved in Ragusa collection, one bears the label "Mistretta leg. De Marchi" (Arnone 2010). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Bodilopsis rufa (Moll, 1782)
Chorotype – ASE
Trophic category – COP
Ecological category - S (m-sm)
Examined specimens – **Messina**: Cesarò, Monte Soro (1847 m), 24/VI/1984, M. Romano leg., 3 exx (CD); Cesarò, Portella Femmina Morta (1500 m), 14/VIII/1982, V. Aliquò leg., 32 exx (CD); Cesarò, sentiero Portella Femmina Morta-Portella Calacudera (1520 m), 26/VII/2018, 4 exx under bovine dung (CA); idem, 1 ex, G. Altadonna leg. (CZ); Tortorici, Monte Pojummoru (1400 m), 14/VIII/1998, 1 ex (CB).

Notes. A stenotopic species, in Sicily it occurs from summer to autumn, in woods clearings and mountain pastures, at high altitudes (Arnone and Massa 1993). So far recorded from Caronia, Mistretta (Ragusa 1883, 1892b, sub *Bodilus rufus*), Portella Femmina Morta, Portella Maulazzo (Arnone and Massa 1993), sub *Aphodius (Agrilinus) scybalarius* (Fabricius, 1781).

Bodilus beduinus (Reitter, 1892)
Chorotype – WME
Trophic category – COP
Ecological category - S (me)

Notes. A stenotopic species, with a phenology spanning from summer to autumn; it lives in open pastures on ovine and bovine dung (Arnone and Massa 1993). From the Nebrodi district it was reported from Nicosia (Arnone and Massa 1993). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Bodilus lugens (Creutzer, 1799)
Chorotype – CAE (with extension to the Maghreb)
Trophic category – COP
Ecological category - O (m-me)
Examined specimens - **Enna**: Cerami (970 m), 24/VI/1988, 12 exx (CZ); **Messina**: Cesarò, 12/VI/1999, 1 ex (CZ); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 12 exx (CZ); idem, S. Ziani leg., 5 exx (CD); Cesarò, Contrada Ruggirà (1000 m), 8/VIII/2013, 2 exx under bovine dung, G. Altadonna leg.

(CA, CB); Cesarò, Portella Femmina Morta (1500 m), 24/VII/1980, M. Arnone leg., 5 exx (CD).

Notes. This species was reported as quite common in Sicily (Ragusa 1883, 1892b); today, however, it appears infrequent. It is found under bovine dung during summer. Already reported from the Nebrodi Mountains (Ballerio *et al.* 2014).

Calamosternus algiricus (Mariani & Pittino, 1983)
Chorotype – WME
Trophic category – COP
Ecological category - O (m-me)

Notes. In Sicily this species is found during autumn and winter and seems to be linked to the sheep dung (Arnone and Massa 1993). Reported from Monte Soro, Vallone San Fratello, Monte Trefinaidi (Arnone and Massa 1993), sub *Aphodius (Calamosternus) hyxos algiricus*. Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Calamosternus granarius (Linnaeus, 1767)
Chorotype – PAL
Trophic category – COP
Ecological category - E (sa-me)
Examined specimens - **Enna**: Cerami (970 m), 24/VI/1988, 1 ex (CZ); **Messina**: Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 4 exx (CM); Caronia, foce torrente Caronia, 4/III/2017, 9 exx under bovine dung (CA); Cesarò, Biviere di Cesarò (1283 m), 3/VII/1999, 2 exx (CB); Cesarò, Monte Soro, strada per Biviere di Cesarò (1450 m), 20/V/1978, M. Arnone leg., 1 ex (CD); Cesarò, Portella Femmina Morta (1400 m), 28/V/1977, A. Casale leg., 1 ex (CD); Floresta: Piano di Musarra (1200 m), 25/IV/2015, in bovine dung, 1 ex (CA); Mistretta, Urio Quattrocchi (1000 m), 30/IV/2003, 1 ex (CB); Oliveri, Monte della Volpe (480 m), 7/IV/2022, 1 ex in bovine dung (CA); Pettineo, Piano d'Olmo (630 m), 2/V/2015, in bovine dung, 1 ex (CA); ibidem (617 m), 26/XII/2019, 1 ex (CA); San Fratello (675 m), 18/V/1984, M. Arnone leg., 5 exx (CD); San Fratello, dint. (1300 m), 17/V/1992, 1 ex (CB); San Fratello, Vallone San Fratello (710 m), 16/IV/1984, M. Arnone leg., 1 ex (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 4 exx (CD); Tortorici, Lago Pisciotto (1200 m), 15/IV/2005, 1 ex (CB).

Notes. Species common throughout Sicily, as already noted by Ragusa (1883, 1892b), who first reported it from the Nebrodi Mountains. He described an aberration characterized by small size and the apex of the elytra chestnut-colored collected in Caronia (*Aphodius granarius* var. *apicalis* Ragusa, 1892, now deemed as junior synonym of *C. granarius*). However, one of the specimens thus determined in the Ragusa collection (Arnone 2010) belongs to *Calamosternus mayeri*.

Calamosternus mayeri (Pilleri, 1953)
Chorotype – WME
Trophic category – COP
Ecological category - O (m-me)

Examined specimens - **Messina**: Caronia, foce torrente Caronia, 4/III/2017, 5 exx under bovine dung (CA); idem, 1 ex, G. Altadonna leg. (CZ); San Fratello, Vallone San Fratello (710 m), 16/IV/1984, M. Arnone leg., 3 exx (CD).

Notes. Early spring species, linked to the pastures of the basal plane (Ballerio *et al.* 2014). Not previously reported from the Nebrodi Mountains, although already collected at Caronia by Ragusa (see above). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Chilothorax lineolatus (Illiger, 1803)
Chorotype – TUM
Trophic category – COP
Ecological category - O (m-me)
Examined specimens - **Messina**: Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM); San Fratello (675 m), 31/III/1984, M. Arnone leg., 438 exx (CD); ibidem, 18/V/1984, M. Arnone leg., 106 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 2 exx (CD); Tusa, Vallone Capodici (800 m), 28/XII/2022, 1 ex in bovine dung, G. Altadonna leg. (CZ)

Notes. A spring species, linked to pastures from the coasts to medium altitudes, especially on sheep dung (Sparacio 1995; Ballerio *et al.* 2014). Not previously reported from the Nebrodi district.

Chilothorax paykulli (Bedel, 1907)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m-me)
Examined specimens - **Messina**: Santo Stefano di Camastra, Santuario Letto Santo (870 m), 30/XII/2022, 2 exx in bovine dung (CA); Tusa, C.da Scalagatti (790 m), 26/XII/2022, 5 exx in bovine dung (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 4 exx in bovine dung (CA); idem, 17 exx, G. Altadonna leg. (CZ); idem, 2 exx, G. Altadonna leg. (CM)

Notes. Species in rarefaction in Sicily (Arnone 2010), whose phenology spans from autumn to early spring; in Sicily it occurs mainly in wooded pastures from 800 up to 1100 m a.s.l. (Arnone and Massa 1993). So far recorded, in the Nebrodi district, only from Portella Femmina Morta (Aliquò 1970), sub *Aphodius (Volinus) tessulatus*.

Colobopterus erraticus (Linnaeus, 1758)
Chorotype – ASE (introduced in North America)
Trophic category – COP
Ecological category - E (sa-me)
Examined specimens - **Enna**: Cerami (970 m), 24/VI/1988, 2 exx (CZ); **Messina**: Alcara Li Fusi, Lago Maulazzo (1440 m), 29/VII/2023, 1 ex in bovine dung (CA); Capizzi, Casale Dugo (1342 m), 28/VII/2023, 2 exx in bovine dung (CA); Caronia, foce torrente Caronia, 4/III/2017, 1 ex under bovine dung (CA); Cesarò, 12/VI/1999, 3 exx (CZ); Biviere di Cesarò (1274 m), 11/IV/2002, 1 ex

(CB); Portella Femmina Morta (1520 m), 31/V/2014, 2 exx in bovine dung (CA); ibidem (1400 m), 22/V/1977, A. Casale leg., 1 ex (CD); ibidem, 29/V/1977, A. Casale leg., 4 exx (CD); Pettineo, Piano d'Olmo (630 m), 2/V/2015, 7 exx in bovine dung, G. Altadonna leg. (CA, CB); San Fratello (675 m), 31/III/1984, M. Arnone leg., 38 exx (CD); ibidem, 18/V/1984, M. Arnone leg., 2 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 1 ex (CD)

Notes. A common species, it lives in exposed pastures, from sea level to mountain altitudes, during spring and summer, on fresh bovine dung (Sparacio 1995). Not previously reported from the Nebrodi district.

Erytus cognatus (Fairmaire, 1860)
Chorotype – MED
Trophic category – COP
Ecological category - O (sm-me)

Notes. Ragusa (1883, 1892b), recording the species from Sicily (sub *Aphodius (Eurytus) brunneus* Klug, 1845), wrote that he possessed, among others, a specimen of the Caronie mountains. In the Ragusa collection, indeed, is preserved a specimen bearing the label "Mistretta [leg.] De Marchi". In Italy it is known only of Sicily, exclusively by the Ragusa's and Failla Tedaldi's collection specimens. There is a lack of recently collected Sicilian specimens (Arnone 2010). It must be said that the subgeneric name "*Eurytus*" used by Ragusa (1883, 1892b), clearly a misspelling for *Erytus* Mulsant and Rey (1870), is an incorrect subsequent spelling, therefore not available (ICZN 1999, Article 33.3). Nevertheless, that name was used by some subsequent authors, such as Thery (1925) and Gridelli (1930).

Esymus merdarius (Fabricius, 1775)
Chorotype – CAE (with extension to the Maghreb)
Trophic category – COP
Ecological category - O (m-me)
Examined specimens - **Messina**: Caronia, foce torrente Caronia, 4/III/2017, 1 ex under bovine dung (CA); San Fratello, Vallone San Fratello (600 m), 31/IV/1984, M. Arnone leg., 7 exx (CC)

Notes. A species with a spring phenology, occurring in various environments, from the coasts up to 1500 m a.s.l. (Arnone and Massa 1993). Today this species appears to be in rarefaction in Sicily (Arnone 2010). So far reported from Mistretta (Ragusa 1883, 1892b), sub *Esymus merdarius*), Vallone San Fratello, Muto (San Fratello), Monte Trefinaidi (Arnone and Massa 1993). Despite that the original spelling of the name is "*Esymus*" (Mulsant and Rey 1870), some earlier authors, including Ragusa (1883, 1892b), have used the spelling "*Esimus*". This name, not being an emendation or a mandatory change, and not being in prevailing usage, is to be considered an incorrect subsequent spelling (ICZN 1999, Article 33.3).

Esymus pusillus pusillus (Herbst, 1789)
Chorotype – SIE

Trophic category – COP
Ecological category - O (m-me)

Notes. This species is little known from Sicily (Arnone and Massa 1993). It was reported for the first time from Sicily by Ragusa (1926), sub *Aphodius (Orodalus) pusillus*, basing on three specimens collected by him under stones in Mistretta in June. Studying Ragusa collection, Arnone (2010) observed that, among the four specimens currently preserved in the Ragusa collection with the label *"Aphodius pusillus"*, three of them (without a label with the collection data) were found to belong to the species *Liothorax niger* (Illiger, 1798) and the fourth (also without data) is a *Phalacronothus biguttatus* (Germar, 1824).

Euorodalus paracoenosus (Balthasar & Hrubant, 1960)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m-me)
Examined specimens - **Messina**: Caronia, Monte Trefinaidi (1000 m), 4/V/1978, M. Arnone leg., 1 ex (CD); Pettineo, Piano d'Olmo (630 m), 2/V/2015, 2 exx in bovine dung, G. Altadonna leg. (CA, CZ)

Notes. This species was already reported from the Nebrodi Park (Sabella and Sparacio 2004), sub *Aphodius paracoenosus*. It was first reported from Sicily (Mistretta) by Ragusa (1883, 1892b), sub *Aphodius tristis* Panzer, 1800 [= *A. coenosus* Panzer, 1798, subsequently splitted in two species, *E. coenosus* with a northern distribution, and *E. paracoenosus*, with a southern distribution]. Its presence in the island was then confirmed by Arnone (1981), sub *Aphodius paracoenosus*, on specimens collected at Monte Trefinaidi on sheep dung, record also mentioned in Arnone and Massa (1993). The examined specimens from Pettineo provide therefore the third known locality from Sicily, of a species hitherto reported, for the island, only from the Nebrodi Mountains.

Labarrus lividus (Olivier, 1789)
Chorotype – MED
Trophic category – COP
Ecological category - O (sm-me)
Examined specimens - **Catania**: Randazzo, Fiume Alcantara (680 m), 1/IX/2016, 1 ex under bovine dung (CA)

Notes. A late summer species, xerothermophilous, in pastures of the basal plane (Ballerio *et al.* 2014); not previously reported from the Nebrodi district.

Limarus zenkeri (Germar, 1813)
Chorotype – EUR
Trophic category – COP
Ecological category - S (m)
Examined specimens - **Messina**: Cesarò, Monte Soro (1847 m), 24/VI/1984, M. Romano leg., 14 exx (CD); Portella Femmina Morta (1500 m), 15/VII/1978, M. Arnone leg., 4 exx (CD); ibidem,

24/VII/1980, M. Arnone leg., 20 exx (CD); ibidem, 12/VI/1999, 26 exx (CZ); San Fratello, strada San Fratello-Portella Femmina Morta (900-1100 m), 11/VI/1991, F. Angelini leg., 1 ex (CD); Tortorici, Monte Pojummoru (1400 m), 14/VIII/1998, 1 ex (CB).

Notes. A stenotopic species linked to the mountain horizon, uncommon in Sicily (Mariani 1971; Lapiana and Sparacio 2006). It lives both on sheep and bovine dung, adults appearing from May to October (Arnone and Massa 1993). Already known from the Nebrodi Park (Sabella and Sparacio 2004), sub *Aphodius zenkeri*, the first record from Sicily was the reported from Monte Soro (Mariani 1971), Portella Femmina Morta (Pratesi and Tassi 1974), sub "afodio dello Zenker" (Aliquò and F. P. Romano 1975; Arnone and Massa 1993), Biviere di Cesarò, Portella Maulazzo (Arnone and Massa 1993).

Liothorax niger (Illiger, 1798)
Chorotype – CAE
Trophic category – FSA
Ecological category - O (m - me)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo, dint. (1300 m); 21/V/2011, 3 exx (CB); Portella Maulazzo (1450 m), 20/V/1978, M. Arnone leg., 4 exx (CD); Cesarò, Biviere di Cesarò (1283 m), 26/V/2004, 1 ex (CB); ibidem, 27/V/2006, 2 exx (CB); Monte Soro (1600 m), 2/V/1987, V. Aliquò leg., 5 exx (CC); ibidem (1750 m), 21/V/1978, M. Arnone leg., 4 exx (CD); ibidem (1800 m), laghetto, 3/VI/2000, M. Arnone leg., 2 exx (CF); Monte Soro, strada per Biviere di Cesarò (1450 m), 20/V/1978, M. Arnone leg., 2 exx (CD); Portella Femmina Morta, 10/V/1986, D. Castelli leg., 4 exx (CC); ibidem (1400 m), 1/VI/1969, I. Bucciarelli leg., 14 exx (CD); Mistretta (900 m), VI/1899, Fiori leg. (CD); Mistretta, Bosco Medda (1000 m), 26/V/1974, B. Massa leg., 12 exx (CD); Mistretta, lago Quattrocchi, 26/V/1974, V. Aliquò leg., 3 exx (CC); ibidem (1000 m), 30/IV/2003, 1 ex (CB); ibidem (1030 m), 7/V/2007, F. Angelini leg., 3 exx (CD); San Fratello, dint. (1300 m), 17/V/2001, 2 exx (CB); ibidem, 17/V/2002, 1 ex (CB); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 3 exx (CD); Tortorici, Casa Batessa (1296 m), 25/IV/2015, 2 exx (CA); Lago Trearie (1435 m), 2/VII/2005, 2 exx (CB); ibidem, 4/VI/2009, 4 exx (CB)

Notes. A detritivorous species, linked to wooded environments, margins of pools or in any case very humid areas (Aliquò and F. P. Romano 1975; Arnone and Massa 1993; Lapiana and Sparacio 2006), so far recorded from the Nebrodi Park (Sabella and Sparacio 2004), sub *Aphodius niger*. It was reported for the first time from Sicily by Aliquò and F. P. Romano (1975), who recorded it from the Madonie massif, the Lake Quattrocchi and Mount Soro; localities later confirmed by Arnone and Massa (1993) which also reported this species from Biviere di Cesarò, Portella Femmina Morta, Portella Maulazzo, Mistretta, Mistretta, Bosco Medda. In Ragusa collection there are three specimens labeled "Mistretta V.1920 [leg.] F. Muzzi" and one specimen labeled "San Fratello V.1920 [leg.] F. Muzzi" (Arnone 2010).

Loraphodius suarius (Faldermann, 1835)
Chorotype – TUM
Trophic category – FSA
Ecological category - O (sm - me)

Examined specimens - **Messina**: Biviere di Cesarò (1200 m), 5/VIII-9/IX/2005, pitfall trap in *Quercus cerris*, 1 ex (CB); Cesarò, C.da Ciappa de' Tusa (1050 m ca), 23/IX/2012, 2 exx in bovine dung (CA); idem, 1 ex, G. Altadonna leg. (CZ)

Notes. A localized species in Sicily, with an autumnal phenology, it lives in open pastures on sheep and bovine dung (Arnone and Massa 1993; Lapiana and Sparacio 2006). Already reported from Mistretta, Urio Quattrocchi (Arnone and Massa 1993).

Melinopterus consputus (Creutzer, 1799)
Chorotype – TUE (with extension to the Maghreb)
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Caronia, Portella Pomo (823 m), 1/V/2014, under bovine dung, 1 ex (CA); Cesarò, Biviere di Cesarò (1283 m), 11/IV/2002, 1 ex (CB); Cesarò, C.da Ruggirà (1000 m), 25/III/2012, 4 exx in sheep dung, G. Altadonna leg. (CA); idem, 1 ex, G. Altadonna leg. (CZ); Cesarò, Monte Soro (1500 m ca), 11/X/2001-11/IV/2002, in pitfall trap, 2 exx (CB); Cesarò, Monte Soro (1847 m), 27/X/1973, M. Arnone leg., 1 ex (CD); Cesarò, torrente Torti (1300 m), 3/XI/2010, 1 ex (CB); Cesarò, Vallone Farina (1100 m), 7/XII/2013, 2 exx under bovine dung (CA); idem, 1 ex, G. Altadonna leg. (CZ); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 6 exx (MSNP); Mistretta (900 m), 4/XI/1969, V. Aliquò leg., 8 exx (CD); ibidem, 4/XI/1973, 9 exx (CD); Mistretta, Urio Quattrocchi (1000 m), 30/IV/2003, 2 exx (CB); San Fratello, Vallone San Fratello (710 m), 31/III/1984, M. Arnone leg., 2 exx (CD); Santo Stefano di Camastra, Santuario Letto Santo (870 m), 30/XII/2022, 7 exx in bovine dung, G. Altadonna leg. (CA), idem, 2 exx, G. Altadonna leg. (CM); Tortorici, Lago Pisciotto (1200 m), 15/IV/2005, 4 exx (CB); Tortorici, Lago Pisciotto (1240 m), 25/IV/2015, under bovine dung, 1 ex (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 2 exx in bovine dung (CA); idem, 10 exx, G. Altadonna leg. (CZ)

Notes. The most frequent species of the genus *Melinopterus* in Sicily; it lives in all types of dung with preference to bovine dung, in exposed hill and low mountain pastures (Arnone 2010). Not previously reported from the Nebrodi Mountains.

Melinopterus prodromus (Brahm, 1790)
Chorotype – CAE (with extension to the Maghreb)
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Cesarò, C.da Ruggirà (1000 m), 25/III/2012, 2 exx in sheep dung, G. Altadonna leg. (CA, CZ); Tortorici, Lago Pisciotto (1200 m), 15/IV/2005, 2 exx (CB)

Notes. A species living in hilly pastures, with a phenology spanning from autumn to spring (Ballerio *et al.* 2014). Already reported from the Nebrodi Mountains, on specimens preserved in the Ragusa collection ("Mistretta leg. De Marchi") (Arnone 2010).

Melinopterus sphacelatus (Panzer, 1798)
Chorotype – TUE (with extension to the Maghreb)

Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Tortorici, Lago Pisciotto (1200 m), 15/IV/2005, 2 exx (CB); ibidem (1240 m), 25/IV/2015, 5 exx under bovine dung (CA); idem, 2 exx, G. Altadonna leg. (CZ)

Notes. A species living in hilly pastures, with a spring phenology (Lapiana and Sparacio 2006). Not previously reported from the Nebrodi district.

Melinopterus tingens (Reitter, 1892)
Chorotype – WME
Trophic category – COP
Ecological category - O (m - me)

Notes. An infrequent species, in Italy known only from Sicily and Sardinia. So far reported from the Nebrodi Mountains (Mistretta) by Ragusa (1883, 1892b), sub *Aphodius punctatosulcatus* Sturm, 1805 (see also Arnone 2010); record then cited by Luigioni (1929). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Nimbus contaminatus (Herbst, 1783)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m - sd)
Examined specimens - **Messina**: Biviere di Cesarò (1278 m), 11/X/2001, 3 exx (CB); ibidem, 11/IV/2002, 1 ex (CB); Portella Femmina Morta (1400 m), 1/XI/1981, M. Arnone leg., 22 exx (CD); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 5 exx (MSNP)

Notes. A species so far reported from the Nebrodi Mountains (Mistretta) by Ragusa (1883, 1892b), sub *Aphodius (Nimbius) contaminatus*, which also explained the discriminating characters between this and the following species. Also in this case, "*Nimbius*" is an incorrect subsequent spelling, unavailable name according to ICZN (1999, Article 33.3). Biology similar to that of *N. obliteratus*.

Nimbus obliteratus (Panzer, 1823)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Caronia, Bosco della Tassita (1380 m), 29/IV/2015, windows trap, 1 ex, C. Baviera leg. (CA); Caronia, Contrada Moglia (1467 m), 30/IX/2018, 5 exx in bovine dung (CA); idem, 4 exx, G. Altadonna leg. (CZ); idem, 2 exx, G. Altadonna leg. (CB); Cesarò, Torrente Torti (1300 m), 3/XI/2010, 1 ex (CB); Santo Stefano di Camastra, Santuario Letto Santo (870 m), 30/XII/2022, 2 exx in bovine dung (CA); idem, 2 exx, G. Altadonna leg. (CM); Tusa, Vallone Capodici (800 m), 28/XII/2022, 18 exx in bovine dung (CA); idem, 4 exx, G. Altadonna leg. (CM); idem, 9 exx, G. Altadonna leg. (CZ)

Notes. A species whose phenology spans from autumn to winter, it lives mainly on bovine dung in shady and wooded pastures, sometimes locally abundant (Lapiana and Sparacio 2006). Not previously reported from the Nebrodi district.

Otophorus haemorrhoidalis (Linnaeus, 1758)
Chorotype – PAL
Trophic category – COP
Ecological category - E (sa - me)
Examined specimens - **Catania**: Randazzo, Fiume Alcantara (680 m), 1/IX/2016, 3 exx under bovine dung (CA); ibidem, 9/IX/2017, 1 ex under bovine dung (CA); ibidem, 18/IX/2022, 1 ex under bovine dung (CA); **Enna**: Cerami (970 m), 24/VI/1988, 4 exx (CZ); Cerami, C.da Gugliatore (970 m), 3/VIII/2018, 1 ex in bovine dung (CA); Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 1 ex in bovine dung (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1440 m), 29/VII/2023, 16 exx in bovine dung (CA); Capizzi, Casale Dugo (1342 m), 28/VII/2023, 4 exx in bovine dung (CA); Caronia, Portella Pomo (823 m), 3/VIII/2012, 1 ex in bovine dung (CA); Castel di Lucio (600 m), 4/VIII/2012, 6 exx in bovine dung (CA); Cesarò, 12/VI/1999, 1 ex (CZ); Biviere di Cesarò (1283 m), 11/VIII/1998, 1 ex (CB); Biviere di Cesarò, Sorgente Acquafridda (1256 m), 18/VII/2015, 1 ex (CA); Cesarò, C.da Ruggirà (1000 m), 8/VIII/2013, 1 ex in bovine dung (CA); Cesarò, Monte Soro (1847 m), 24/VI/1984, M. Romano leg., 6 exx (CD); Cesarò, Portella Femmina Morta (1400 m), 29/V/1977, A. Casale leg., 2 exx (CD); Cesarò, sentiero Portella Femmina Morta-Portella Calacudera (1520 m), 26/VII/2018, 3 exx in bovine dung (CA); Floresta, dint. (1300 m), 27/VII/2012, 1 ex in bovine dung (CA); Pettineo, Piano d'Olmo (630 m), 2/V/2015, in bovine dung, 4 exx (CA); ibidem (700 m), 9/X/2022, 2 exx under bovine dung (CA); San Fratello (375 m), 26/VII/1981, V. Aliquò leg., 6 exx (CD); San Fratello (675 m), 28/VII/1978, B. Massa leg., 11 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 2 exx (CD); San Fratello, strada San Fratello-Portella Femmina Morta (900-1100 m), 11/VI/1991, F. Angelini leg., 1 ex (CD); Tortorici, Casa Batessa (1296 m), 29/VI/2014, 1 ex under bovine dung (CA); Tortorici, Monte Pojummoru (1400 m), 14/VIII/1998, 1 ex (CB)

Notes. Along with *Aphodius fimetarius*, this is one of the most common Aphodiinae in Sicily, occurring all year round, mostly on bovine dung, from basal plain up to high altitudes. It was reported as new from Sicily by Ragusa (1883, 1892b) based on three specimens collected in July, in the woods of Caronia, see also (Arnone 2010).

Phalacronothus biguttatus (Germar, 1824)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m - me)

Notes. An infrequent species in Sicily, with a spring and (perhaps) autumnal phenology, living in exposed pastures on sheep dung (Arnone and Massa 1993). So far reported from Monte Trefinaidi by Arnone and Massa (1993).

Phalacronothus quadrimaculatus (Linnaeus, 1760)
Chorotype – SIE (with extension to the Maghreb)

Trophic category – COP
Ecological category - O (m - me)

Notes. An infrequent species in Sicily, with a spring phenology, living on sheep dung (Arnone and Massa 1993). Ragusa (1883, 1892b), sub *Aphodius (Orodalus) quadrimaculatus*, recorded for the first time this taxon from Sicily on a specimen collected on the Caronie Mountains (Arnone 2010); although the species had already been recorded from the island by de Bertolini (1872). Also reported from Monte Trefinaidi by Arnone and Massa (1993).

Planolinoides borealis (Gyllenhal, 1827)
Chorotype – SIE
Trophic category – COP
Ecological category - S (m - sm)
Examined specimens - **Messina**: Caronia, Monte Trefinaidi (1000 m), 23/V/1985, M. Arnone leg., 1 ex (CD); Cesarò, 12/VI/1999, 2 exx (CZ); Biviere di Cesarò (1400 m), 6/VI/1981, M. Arnone leg., 1 ex (CD); pendici NW Monte Soro (1400 m), 2/VI/1985, A. Rey leg., 1 ex (CD); Monte Soro (1847 m), 24/VI/1984, M. Romano leg., 126 exx (CD); Portella Femmina Morta, 12/VI/1999, 16 exx (CZ); ibidem (1500 m), 3/VI/1985, A. Rey leg., 24 exx (CD); ibidem (1400 m), 1/VI/1969, I. Bucciarelli leg., 1 ex (CD); Portella Maulazzo (1400 m), 17/V/2001, 1 ex (CB); Cesarò, sentiero Portella Femmina Morta-Portella Calacudera (1520 m), 26/VII/2018, 4 exx under bovine dung (CA); San Fratello dint. (1100 m), 13/X/2005, sifting sub *Quercus ilex*, 2 exx (CB); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 6 exx (CD)

Notes. A stenotopic species, whose phenology spans from spring to late summer. It lives in shady, wooded pastures at mountain altitudes on bovine, sheep and pig dung; in Sicily it is localized but sometimes locally abundant (Arnone and Massa 1993). Already recorded from the Nebrodi Park (Sabella and Sparacio 2004), sub *Aphodius borealis*; particularly from Portella Femmina Morta (Carpaneto 1975), Mistretta (Pittino 1980), Biviere di Cesarò, Portella Femmina Morta, Portella Maulazzo, Monte Soro, Monte Trefinaidi (Arnone and Massa 1993), sub *Aphodius (Planolinus) borealis*.

Pseudacrossus suffertus (A. Schmidt, 1916)
Chorotype – EME
Trophic category – FSA
Ecological category - O (m - me)

Notes. A rare species, it is found in isolated specimens from the coast up to 1500 m a.s.l., during summer and autumn (Ballerio *et al.* 2014; Arnone and M. Romano 2020). Reported from the Nebrodi Park (Sabella and Sparacio 2004), (sub *Aphodius suffertus ampliatus* Reitter, 1892, now deemed as junior synonym of *P. suffertus*), Mistretta (Dellacasa 1983) and Cesarò (C.da Buffali: Ballerio *et al.* (2014). Among the 11 specimens preserved in Ragusa collection, one bears the label: "Mistretta leg. De Marchi" (Arnone 2010). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Sigorus porcus (Fabricius, 1792)
Chorotype – TUE
Trophic category – COP (kleptoparasite of *Geotrupes* sp.)
Ecological category - O (sm - me)

Notes. This rare species, which has an autumnal phenology, is a kleptoparasite of dung deposits of *Geotrupes* sp. (Ballerio *et al.* 2014). It was recorded so far, in the Nebrodi area, only from Mistretta (Ragusa 1883, 1892b).

Subrinus sturmi (Harold, 1870)
Chorotype – CEM
Trophic category – COP (kleptoparasite of *Geotrupes* sp.)
Ecological category - O (sm - me)
Examined specimens - **Catania**: Randazzo, Fiume Alcantara (680 m), 1/IX/2016, 3 exx under bovine dung (CA); **Enna**: Cerami: C.da Gugliatore (970 m), 3/VIII/2018, 1 ex in bovine dung (CA); **Messina**: Cesarò, 12/VI/1999, 1 ex (CZ); Cesarò, Monte Soro (1847 m), 24/VI/1984, M. Romano leg., 1 ex (CD)

Notes. A species with a phenology spanning from summer to autumn, living on sheep and bovine dung in open pastures of hilly and mountain altitudes (Lapiana and Sparacio 2006). Not previously reported from the Nebrodi district.

Trichonotulus scrofa (Fabricius, 1787)
Chorotype – CAE (with extension to the Maghreb; introduced in North America)
Trophic category – COP
Ecological category - O (m - me)

Notes. A species in probably rarefaction in Sicily (Arnone 2010), it lives in open pastures on sheep and bovine dung (Lapiana and Sparacio 2006). Recorded by Ragusa (1883, 1892b) from Mistretta.

Volinus sticticus (Panzer, 1798)
Chorotype – CAE
Trophic category – COP
Ecological category - O (m - sd)
Examined specimens - **Messina**: Caronia, Bosco della Tassita (1380 m), 29/IV/2015, windows trap, 5 exx, C. Baviera leg. (CB, CA); Cesarò, torrente Torti (1300 m), 3/XI/2010, 2 exx (CB); Cesarò, pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 23 exx (CD); Portella Femmina Morta, 12/VI/1999, 6 exx (CZ); San Fratello, dint. (1100 m), 13/X/2005, sifting sub *Q. ilex*, 1 ex (CB); ibidem, 27/XI/2005, sifting sub *Q. ilex* et *Q. pubescens* s.l., 1 ex (CB); Tortorici, Lago Pisciotto (1240 m), 25/IV/2015, under bovine dung, 1 ex (CA)

Notes. A moderately orophilous species in Italy (Mariani 1971), as well as in Sicily, where it lives on bovine, sheep, horse and pig dung, showing a spring and autumnal phenology

(Arnone and Massa 1993). Already reported from several localities of the Nebrodi Mountains: Portella Femmina Morta, San Fratello, San Fratello, Muto, Monte Trefinaidi, Urio Quattrocchi (Arnone and Massa 1993), sub *Aphodius (Chilothorax) sticticus*.

Psammodius laevipennis A. Costa, 1844
Chorotype – TEM
Trophic category – FSA
Ecological category - S (me)

Notes. A species related to sandy, coastal or inland substrates (Lapiana and Sparacio 2006; Arnone 2010). In the Nebrodi district was reported from Acquedolci: Foce del Furiano (Pittino 1978).

Platytomus tibialis (Fabricius, 1798)
Chorotype – TUM (with extension to the Macaronesia)
Trophic category – FSA
Ecological category - S (me)
Examined specimens - **Messina**: Cesarò, Biviere di Cesarò (1400 m), 23/VI/1986, M. Arnone leg., 3 exx (CD)

Notes. The report of *Diastictus vulneratus* (Sturm, 1805) from Mistretta by Ragusa (1883, 1892b), then cited also by Carpaneto, Piattella, and Valerio (2005), should probably refer to this species, to which belong all the specimens determined as "*Diastictus vulneratus* Sturm" and as "*Psammobius vulneratus* Sturm" preserved in Ragusa collection (Arnone 2010).

Pleurophorus caesus (Panzer, 1796)
Chorotype – PAL
Trophic category – FSA
Ecological category - O (m - me)
Examined specimens - **Messina**: Cesarò, Biviere di Cesarò, dint., Sorgente Acquafridda (1250 m), 15/IV-14/V/2005, sifting sub *Acer*, 1 ex (CB); Monte Soro (1700 m), 23/X/2010, 1 ex (CB); Mistretta, Urio Quattrocchi (1000 m), 30/IV/2003, 1 ex (CB); Oliveri, Monte della Volpe (450 m), 9/IV/2022, 1 ex (CA)

Notes. A saprophagous, psammophilous species (Ballerio *et al.* 2014); it feeds on plant debris and decaying organic substances (Sparacio 1995). So far recorded, from the Nebrodi Mountains, only from Mistretta (Pittino and Mariani 1986).

Rhyssemus parallelus Reitter, 1892
Chorotype – WME
Trophic category – FSA
Ecological category - S (me)

Notes. A saprophagous, psammophilous species, living along the coasts, streams, and rivers, where it is found between the roots of herbaceous plants and plant debris (Ballerio *et al.* 2014). So far recorded from Nebrodi Mountains, only from Bronte: Fiume Simeto (Pierotti 1980).

Rhyssemus plicatus (Germar, 1817)
Chorotype – WME
Trophic category – FSA
Ecological category - S (me)
Examined specimens - **Messina**: Ficarra, 20/IV/2010, sifting sub *Quercus suber*, 1 ex (CB); Reitano (100 m), 8/III/2009, sifting sub *Olea*, 2 exx (CB)

Notes. Biology like that of the previous species. Not previously reported from the Nebrodi district.

Subfamilia SCARABAEINAE Latreille, 1802

Ateuchetus variolosus (Fabricius, 1787)
Chorotype – MED
Trophic category – COP
Ecological category - O (m-me)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 6/VII/2014, 1 ex (CM); Alcara Li Fusi, Rocche del Crasto (420 m), 26/IX/2002, F. Strumia leg., 1 ex (MSNP); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 4 exx (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 1 ex (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 1 ex (CM); Caronia, Torrente Caronia, 26/VI/2016, 1 ex (CM); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, 2 exx (CM); Galati Mamertino, San Basilio, loc. Molisa (798 m), 7/I/2010, 1 ex under stone (CM); ibidem, 12/VIII/2010, 5 exx (CM); Pettineo, Piano d'Olmo, 8/XI/2014, 1 ex, S. Altadonna leg. (CA); ibidem (617 m), 15/XI/2014, 2 exx (CA); ibidem (700 m), 2/V/2015, 2 exx, G. Altadonna leg. (CA, CB); Pettineo, Vallone Loreto (700 m), 14/X/2015, 1 ex, S. Altadonna leg. (CA); Pettineo, Vallone San Giovanni (420 m), 2/XI/2015, 1 ex, S. Altadonna leg. (CA); Tusa, C.da Difesa (695 m), 29/VII/2021, 1 ex (CM); Tusa, C.da Follia (760 m), 9/X/2022, remains, not collected (CA) Data from web sources - **Messina**: Gioiosa Marea: Gioiosa Guardia (800 m), 23/XI/2014, photo by M. Bassini (NAT); ibidem, 26/IV/2021, photo by M. Bassini (NAT); Patti, Sorrentini (500 m), 4/XI/2020, photo by M. Bassini (NAT).

Notes. Following Ziani (2002) and Ziani and Gudenzi (2013), we consider the taxon *Ateuchetus*, usually reported as a subgenus of *Scarabaeus* (see, e.g., Ballerio *et al.* (2014)), as a valid genus. *Ateuchetus variolosus* is by far the most common "rolling" beetle in Nebrodi Mountains as well as in whole Sicily (Arnone 2010). Thermophilic species, in the study area it shows a marked preference for hilly altitudes and low mountains. It is possible to observe it from May to November, more numerous in autumn, wandering on the ground or while shaping and carrying the dung ball. Under stones during winter (see also Sparacio (1995) and Lapiana and Sparacio (2006)). So far recorded (sub *Scarabaeus variolosus*)

from the Nebrodi Park (Sabella and Sparacio 2004), Caronia, Santo Stefano di Camastra, Nicosia (Agoglitta *et al.* 2006) and Mistretta (Agoglitta *et al.* 2006; Ballerio *et al.* 2014). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Ateuchetus semipunctatus (Fabricius, 1792)
Chorotype – WME
Trophic category – COP
Ecological category - S (me)

Notes. A species closely related to sandy coasts, today in Sicily it is almost totally extinct, due to the disappearance of coastal sandy pastures (Lapiana and Sparacio 2006, 2008; Arnone 2010). So far reported from Capo d'Orlando and Zappulla (Agoglitta *et al.* 2006), there is a lack of recent finds in the coasts of the Nebrodi district, where it has probably disappeared. Recorded as Vulnerable (VU) in the Red List of Numa *et al.* (2020).

Scarabaeus sacer Linnaeus, 1758
Chorotype – TUM
Trophic category – COP
Ecological category - S (sd - me)

Notes. In Sicily this species, as well as in other Italian regions, has suffered a significant decrease of its populations due to the alteration of the retrodunal environments to which it is related (Sparacio 1995; Lapiana and Sparacio 2006, 2008). From the Nebrodi discrict it is known only from a historical specimen from Zappulla (Agoglitta *et al.* 2006). Today, its presence along the coasts of the study area seems possible, but unlikely.

Scarabaeus typhon (Fischer von Waldheim, 1823)
Chorotype – CAE
Trophic category – COP
Ecological category - S (m - me)
Examined specimens - **Messina**: Castell'Umberto, Monte Rotondo (1000 m), 18/X/2013, F.P. Faraone (pers. obs.)

Notes. An oligotopic species with an ample phenology, which in Sicily spreads from late spring to late autumn (Agoglitta *et al.* 2006). Despite being reported of several Sicilian localities (Agoglitta *et al.* 2006) it seems to be rare and in strong rarefaction as well as other Sicilian coprophagous beetles. Not previously reported from the Nebrodi district.

Gymnopleurus (Gymnopleurus) sturmii (Macleay, 1821)
Chorotype – MED
Trophic category – COP
Ecological category - O (sm - me)

Notes. It was considered as a common species in Sicily, in the plains and hilly pastures, with a phenology spanning from spring to summer (Sparacio 1995). However, today it seems to be a localized and uncommon species in Sicily. In the Nebrodi district it is very sporadic, reported only from Troina (Agoglitta *et al.* 2006). Recorded as Near Threatened (NT) in the Red List of Numa *et al.* (2020).

Sisyphus schaefferi schaefferi (Linnaeus, 1758)
Chorotype – EUR
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo, 6/VII/2014, 2 exx (CM); Capizzi, 6/VII/1992, 2 exx (CB); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, remains of 1 specimen preyed in fox dung (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 1 ex (CM); ibidem, 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 1 ex (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 1 ex (CM); Caronia, Portella Pomo (823 m), 5/VIII/2012, 1 ex in bovine dung (CA); Cesarò, Biviere di Cesarò (1283 m), 11/IV-19/VI/2002, pitfall trap, 1 ex (CB); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 1 ex (CZ); Cesarò, Portella Femmina Morta, 23/VI/1971, V. Aliquò leg., 1 ex (CD); Galati Mamertino, San Basilio, loc. Molisa (798 m), 12/VIII/2010, 1 ex (CM); Longi, Bosco di Mangalaviti (1308 m), 27/VI/2013, 3 exx (CM); San Fratello, 12/VI/1999, 15 exx (CZ); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 4 exx (CD)

Notes. A localized species in Sicily, but sometimes locally abundant. On the Nebrodi Mountains, as well as in the rest of Sicily, it is found in spring and summer, mainly in wooded environments of medium and high altitudes (Sparacio 1995). Already reported from Caronia (Sparacio 1995), Pizzo Battaglia (Caronia), Mistretta, Monte Soro, Portella di Femmina Morta, Pizzo San Michele, San Fratello (Agoglitta *et al.* 2006).

Copris (Copris) lunaris (Linnaeus, 1758)
Chorotype – TUE (extended to China)
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Enna**: Nicosia: C.da Campanito (1120 m), 16/VIII/2022, 1 ex, remains under bovine dung (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1444 m), 22/VI/2013, 1 ex in horse dung (CA); ibidem (1400 m), 31/V/2014, 1 ex (CA); Capizzi, 10/VII/1992, 1 ex (CB); Capizzi, Casale Dugo (1370 m), 5/VIII/2012, 2 exx in horse and bovine dung (CA); ibidem, 3/VIII/2018, remains of 1 specimen preyed in fox dung (CA); Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM); Caronia, Monte Trefinaidi, Portella Calcari dint. (830 m ca), 20/VII/2013, 1 ex in bovine dung, G. Altadonna & C. Muscarella leg. (CA); Caronia, Portella Pomo (823 m), 20/VIII/2011, 2 exx in bovine dung (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 1 ex, F.P. & F. Faraone leg. (CM); Cesarò, C.da Ciappa de Tusa (1050 m ca), 3/VIII/2012, 1 ex in bovine dung (CA); Cesarò, Biviere di Cesarò (1283 m), 3/VII/1999, 2 exx (CB); ibidem, 14/V/2004, 1 ex (CB); ibidem, 14/V/2005, 3 exx (CB); ibidem (1278 m), 22/VI/2013, 1 ex in horse dung (CA); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 10 exx (CZ); ibidem (1350 m), 16/IV/2005, 2 exx (CB); Cesarò, Contrada Sollazzo Verde (1390 m), 11/VIII/2010, 3 exx (CM); pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 19 exx (CD); Cesarò, sentiero Portella Femmina Morta-Portella

Calacudera (1520 m), 26/VII/2018, 2 exx under bovine dung (CA); Floresta, Portella dello Zoppo (1264 m), 14/IX/2016, 1 ex wandering on the ground (CA); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 4 exx (MSNP); Pettineo, Piano d'Olmo (700 m), 9/X/2022, 1 ex under bovine dung (CA); San Fratello, Portella Femmina Morta (1500 m), 23/IV/2017, 2 exx under stones (CA); Tortorici, Lago Pisciotto (1240 m), 25/IV/2015, 1 ex under stone (CA)

Notes. This species generally prefers high altitudes and shady pastures in Sicily (Sparacio 1995). On the Nebrodi Mountains *Copris lunaris* is common, in late spring and summer, in forest environments on bovine and equine dung. So far recorded from the Nebrodi Park (Sabella and Sparacio 2004), Pizzo Battaglia, Mistretta, Pizzo San Michele, San Fratello and Troina (Agoglitta *et al.* 2006).

Copris (Copris) hispanus cavolinii (Petagna, 1792)
Chorotype – EME (extending to Pakistan and India)
Trophic category – COP
Ecological category - O (sm - me)
Examined specimens - **Messina**: Longi, Bosco di Mangalaviti (1308 m), 30/VIII/2014, 1 ex (CM); Longi, Rocche del Crasto (1206 m), 31/VIII/2014, 1 ex (CM); Pettineo, Piano d'Olmo (617 m), 8/XI/2014, 1 ex, S. Altadonna leg. (CA); ibidem, 15/XI/2014, 1 ex (CA); ibidem (630 m), 2/V/2015, 1 ex (CA); ibidem (730 m), 15/XII/2022, 1 ex, remains (CA); ibidem (550 m), 7/I/2023, 1 ex under stone (CA); Santo Stefano di Camastra: Santuario Letto Santo (874 m), 22/VII/2018, 1 ex, remains (CA).

Notes. According to recent chromosomal studies, this taxon, usually considered as subspecies of *Copris hispanus* (Linnaeus, 1764) (see, e.g., Ballerio *et al.* (2014)), should have specific validity (Falahee and Angus 2010). This subspecies has a spring and autumn phenology and it prefers open pastures, of low and medium hills (Sparacio 1995; Ballerio *et al.* 2014); (C. Muscarella, pers. obs.). So far recorded from Mistretta, Monte Soro, Portella di Femmina Morta, Pizzo San Michele, San Fratello (Agoglitta *et al.* 2006).

Bubas bison (Linnaeus, 1767)
Chorotype – WME
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Catania**: Maniace: Bosco di Petrosino (990 m), 28/XII/2013, 4 exx under bovine dung (CA); Randazzo, Fiume Alcantara (680 m), 27/XII/2014, 3 exx under bovine dung (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 1 ex (CM); Alcara Li Fusi, Torrente Rosmarino (250 m), 20/VIII/2022, 1 ex, remains (CA); Capizzi, C.da Nefare (957 m), 6/I/2014, 2 exx under bovine dung (CA); Capizzi, Caserma Mafauda (1369 m), 10/VIII/2016, 1 ex, remains (CA); Capizzi, Via San Miceli (905 m), 6/I/2014, 1 ex under bovine dung (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 3 exx (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 2 exx (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 1 ex (CM); Caronia, Portella dell'Obolo (1503 m), 22/VI/2015, 3 exx (CM); Caronia, foce torrente Caronia, 4/III/2017, 2 exx under bovine dung (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 1 ex, F.P. & F. Faraone leg. (CM); Cesarò, C.da Ciappa de' Tusa (1050 m

ca), 23/IX/2012, 1 ex in bovine dung (CA); Cesarò, contrada Ruggirà (1100 m), 1/XI/2011, 3 exx under bovine dung (CA); Cesarò, pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 3 exx (CD); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 1 ex (CM); Cesarò, C.da Sant'Elia (1100 m), 16/II/2015, 2 exx under horse dung (CA); Cesarò, C.da Solecchiate (1022 m), 19/X/2016, 3 exx under bovine dung (CA); idem, 3 exx, G. Altadonna leg. (CB); idem, 5 exx, G. Altadonna leg. (CZ); Cesarò, Vallone Farina (1100 m), 7/XII/2013, 1 ex in bovine dung (CA); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 5 exx (MSNP); Longi, Portella Gazzana (979 m), 22/VI/2012, 5 exx (CM); Longi, Rocche del Crasto (1206 m), 27/VI/2013, 1 ex (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 2 exx (CM); Oliveri, 4/III/2017, 1 ex (CA); Patti, Laghetti Marinello, 2/II/2002, 2 exx (CB); Pettineo, Piano d'Olmo (617 m), 8/XI/2014, 1 ex, S. Altadonna leg. (CA); ibidem (630 m), 2/V/2015, 1 ex under bovine dung (CA); ibidem (730 m), 15/XII/2022, 1 ex under bovine dung, G. Altadonna leg. (CZ); San Teodoro, C.da Giannino (1033 m), 5/I/2015, 2 exx under bovine dung (CA); San Teodoro, C.da Sciammo (1000 m), 5/I/2015, 4 exx under bovine dung (CA); Tusa, C.da Scalagatti (750 m), 15/XI/2014, 2 exx under bovine dung (CA); ibidem (790 m), 26/XII/2022, 4 exx under bovine dung (CA); ibidem (670 m), 9/I/2023, 1 ex in bovine dung, G. Altadonna leg. (CB); Tusa, Castel di Tusa, 18/XII/2021, 1 ex (CA); Tusa, Piano Catarrà (830 m), 28/XII/2022, 1 ex flying on bovine dung (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 5 exx under bovine dung, G. Altadonna leg. (CA, CB) Data from web sources - **Enna**: Troina, 13/XII/2016, photo by C. Amata (FEI).

Notes. This is one of the most common Scarabaeinae in Sicily, as well as on the Nebrodi Mountains, where it is found, mainly in the winter season, under the bovine dung, in open pastures, from the coast to the mountain plain, but above all at hill and low mountain altitudes (Sparacio 1995). It was possible to observe this species flying at morning and especially at dusk in search of bovine dung (G. Altadonna, pers. obs.). So far reported from Monte San Fratello and Mistretta (Agoglitta *et al.* 2006). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Cheironitis furcifer (Rossi, 1792)
Chorotype – MED
Trophic category – COP
Ecological category - O (sm - me)
Examined specimens - **Messina**: Caronia, dint. (40 m), 25/VI/2016, 4 exx in bovine dung (CM); Caronia, Torrente Caronia, 26/VI/2016, 4 exx (CM); Caronia, Portella Pomo (823 m), 20/VIII/2011, 1 ex in bovine dung (CA); Pettineo, C.da Contrasto, Abbeveratoio (742 m), 4/VII/2015, 1 ex in bovine dung (CA).

Notes. A coprophagous species with summer phenology; it lives in exposed pastures in plains and hills (Sparacio 1995). In Sicily it has been very sensitive to environmental changes of anthropic origin, so much so that today it is almost completely extinct on the island (Lapiana and Sparacio 2008). So far reported from the Nebrodi Park (Sabella and Sparacio 2004), sub *Chironitis furcifer*, Nicosia and Mistretta (Agoglitta *et al.* 2006) (with unpublished data of Massa, 1969-70). Branco and Ziani (2005) have shown that the correct spelling of the name is "*Cheironitis*". Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Cheironitis irroratus (Rossi, 1790)
Chorotype – WME
Trophic category – COP
Ecological category - S (sm - me)
Examined specimens - **Catania**: Randazzo, Fiume Alcantara (680 m), 1/IX/2016, under bovine dung, 3 exx (CA); **Messina**: Caronia, dint. (40 m), 25/VI/2016, 4 exx in bovine dung (CM); Tusa (750 m ca), 15/VIII/2011, 1 ex in bovine dung (CA); Tusa, Piano Vagna (460 m), 5/IX/2017, under bovine dung, 1 ex (CA) Data from web sources - **Messina**: Rocche del Crasto, 17/VIII/1996, 1 ex on sheep dung, M. Plumari leg. (FEI)

Notes. A xerothermophilic species with late-summer phenology, in Sicily until October (Sparacio 1995). Like the previous one, it is found in lowland and hill cattle pastures, but it is more common and widespread in Sicily than *C. furcifer*. Not previously reported from the Nebrodi district.

Onitis ion (Olivier, 1789)
Chorotype – WME
Trophic category – COP
Ecological category - O (sm - me)
Examined specimens - **Messina**: Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM); Caronia, Monte Trefinaidi, c.da Crocitti (850 m ca), 20/VII/2013, 1 ex, remains (CA); Pettineo, Piano d'Olmo (630 m), 2/V/2015, 1 ex (CA).

Notes. A coprophagous, thermophilic species, closely linked to the dung of large herbivores, in Sicily it has suffered a lot from environmental changes and today it is in strong rarefaction (Lapiana and Sparacio 2008). So far recorded from the Nebrodi Park (Sabella and Sparacio 2004) and Mistretta (Agoglitta *et al.* 2006). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Euoniticellus fulvus (Goeze, 1777)
Chorotype – CEM
Trophic category – COP
Ecological category - E (sa - me)
Examined specimens - **Catania**: Randazzo, C.da Torazza (680 m), 1/X/2017, 3 exx under bovine dung (CA); **Enna**: Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 5 exx under bovine dung (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 2 exx (CM); ibidem (1400 m), 18/VII/2015, 2 exx in bovine dung (CA); ibidem (1440 m), 29/VII/2023, 1 ex in bovine dung (CA); Capizzi, Casale Dugo (1342 m), 28/VII/2023, 2 exx in bovine dung (CA); Caronia, Portella Pomo (823 m), 5/VIII/2012, 3 exx in bovine dung (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 1 ex, F.P. & F. Faraone leg. (CM); Cesarò, 12/VI/1999, 2 exx (CZ); Cesarò, C.da Ruggirà (1000 m), 8/VIII/2013, 3 exx in bovine dung (CA); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, 1 ex on bovine dung (CM); Biviere di Cesarò (1283 m), 3/VII/1999, 2 exx (CB); ibidem (1278 m), 22/VI/2013, 1 ex in horse dung (CA); Monte Soro, 24/VI/1984, M. Romano leg., 1 ex (CD); ibidem (1800 m), 21/X/2006, sifting, 1 ex (CB); Monte Soro, Portella Maulazzo dint. (1500 m), 22/VI/2013, 1 ex in horse dung (CA); Portella Femmina Morta (1524 m), 13/VII/1975, Betti leg.,

2 exx (CC); ibidem, 23/VIII/1969, V. Aliquò leg., 6 exx (CD); ibidem (1520 m), 31/V/2014, 2 exx in bovine dung (CA); Floresta, dint. (1300 m ca), 27/VII/2012, 6 exx in bovine dung (CA); San Fratello (675 m), 31/III/1984, M. Arnone leg., 2 exx (CD); ibidem, 18/V/1984, M. Arnone leg., 29 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 3 exx (CD); Sant'Agata Militello: C.da Santa Quaranta (642 m), 31/VII/2016, 1 ex in bovine dung (CA); Tortorici, Casa Batessa (1296 m), 29/VI/2014, 1 ex in bovine dung (CA); Tortorici, Monte Pojummoru (1400 m), 14/VIII/1998, 2 exx (CB).

Notes. A quite common species in Sicily, in bovine and equine dung, during spring and summer (Sparacio 1995). So far reported from Portella Femmina Morta, Nicosia (unpublished data of Massa 1969-70) and Biviere di Cesarò (Agoglitta *et al.* 2006).

Euoniticellus pallipes (Fabricius, 1798)
Chorotype – CEM
Trophic category – COP
Ecological category - O (sm - me)
Examined specimens - **Messina**: Caronia, torrente Caronia (40 m), 25/VI/2016, 2 exx in bovine dung (CM, CF).

Notes. A spring-summer species, coprophagous, xerothermophilous, linked to the pastures of the basal plane (Ballerio *et al.* 2014). Not previously reported from the Nebrodi district.

Caccobius (Caccobius) schreberi (Linnaeus, 1767)
Chorotype – CEM
Trophic category – COP
Ecological category - E (sa - me)
Examined specimens - **Enna**: Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 1 ex in bovine dung (CA); **Messina**: San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 1 ex (CD).

Notes. A coprophagous species, whose phenology spans from March to October (Sparacio 1995). This species was recorded as very common by Ragusa (1883, 1892b); today, in contrast, it appears to be rare in Sicily. So far recorded from Monte Soro (Agoglitta *et al.* 2006).

Euonthophagus amyntas amyntas (Olivier, 1789)
Chorotype – TUE
Trophic category – COP
Ecological category - O (sm - me)

Notes. A species reported as common in Sicily by Ragusa (1883); instead, today it seems to be in reduction (Arnone 2010). So far reported, from Nebrodi Mountains, only from Mistretta (Agoglitta *et al.* 2006).

Onthophagus (Furconthophagus) furcatus (Fabricius, 1781)
Chorotype – TEM
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM).

Notes. A species known, from Sicily, by very few specimens. So far known, from the Nebrodi district, only from Zappulla (Arnone 2010).

Onthophagus (Onthophagus) taurus (Schreber, 1759)
Chorotype – TEM
Trophic category – COP
Ecological category - E (sa - me)
Examined specimens - **Catania**: Randazzo, Fiume Alcantara (680 m), 1/IX/2016, 3 exx under bovine dung (CA); ibidem, 9/IX/2017, 1 ex under bovine dung (CA); Randazzo, Poggio Rotondo (1000 m), 3/VIII/2015, 2 exx in bovine dung (CA); **Enna**: Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 1 ex in bovine dung, G. Altadonna leg. (CZ); **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 4 exx (CM); ibidem (1400 m), 3/VII/1999, 1 ex (CB); Capizzi, Casale Dugo (1342 m), 28/VII/2023, 3 exx in bovine dung (CA); Caronia, foce torrente Caronia, 4/III/2017, 1 ex in bovine dung (CA); Caronia, Monte Pagano (400 m), 26/VI/2015, 1 ex (CM); Castel di Lucio (600 m ca), 4/VIII/2012, 2 exx in bovine dung (CA); Cesarò, 12/VI/1999, 1 ex (CZ); Cesarò, C.da Ciappa de Tusa (1050 m ca), 3/VIII/2012, 2 exx in bovine dung (CA); ibidem, 23/IX/2012, 1 ex in bovine dung (CA), ibidem, 13/VII/2013, 1 ex in bovine dung (CA); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 2 exx (CM); Cesarò, Biviere di Cesarò (1270 m), 1/VIII/1998, 2 exx (CB); ibidem, 14/V/2004, 1 ex (CB); Pettineo, Piano d'Olmo (617 m), 28/VI-3/VIII/2016, 1 ex in pitfall trap (CA); San Fratello, 14/VI/1989, R. Lisa leg., 2 exx (CC); San Fratello (675 m), 18/V/1984, M. Arnone leg., 3 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 1 ex (CD); Sant'Agata Militello, C.da Santa Quaranta (642 m), 31/VII/2016, 3 exx in bovine dung (CA); Tusa, C.da Murro (300 m), 24/VII/2014, 3 exx under bovine dung (CA).

Notes. A common species in Sicily, from early spring to autumn, from the coasts to the mountain beech forests. From Nebrodi Mountains, only recorded, so far, from Mistretta and Monte Soro (Agoglitta *et al.* 2006).

Onthophagus (Palaeonthophagus) andalusicus andalusicus Watl, 1835
Chorotype – WME
Trophic category – COP
Ecological category - O (m - me)

Notes. An uncommon species; recorded from Nebrodi Mountains, only from Monte Sambughetti and Mistretta (Goidanich 1925; Agoglitta *et al.* 2006). Recorded as Least Concern (LC) in the Red List of Numa *et al.* (2020).

Onthophagus (Palaeonthophagus) grossepunctatus Reitter, 1905
Chorotype – SEU
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Enna**: Nicosia, C.da Campanito (1120 m), 16/VIII/2022, 1 ex in bovine dung (CA); **Messina**: Cesarò, 12/VI/1999, 2 exx (CZ); Biviere di Cesarò (1278 m), 11/IV-19/VI/2002, pitfall trap, 2 exx (CB); ibidem (1283 m), 14/V/2004-15/V/2005, pitfall trap, 2 exx (CB); ibidem, 24/VI/2006, 1 ex (CB); Monte Soro, 24/VI/1984, M. Romano leg., S. Ziani det., 1 ex (CD); pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., S. Ziani det., 1 ex (CD); Portella Femmina Morta, 12/VI/1999, 6 exx (CZ); ibidem (1500 m), 4/VI/1985, A. Rey leg., S. Ziani det., 2 exx (CD); Pettineo, Piano d'Olmo (630 m), 2/V/2015, under bovine dung, 1 ex (CA); San Fratello (675 m), 31/III/1984, M. Arnone leg., 2 exx (CD); ibidem, 18/V/1984, M. Arnone leg., 8 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 9 exx (CD).

Notes. This species was recorded for the first time from Sicily by Ragusa (1926) and yet known from Nebrodi Mountains, as it had already been reported from Biviere di Cesarò (Agoglitta *et al.* 2006).

Onthophagus (Palaeonthophagus) massai Baraud, 1975
Chorotype – SICI
Trophic category – COP
Ecological category - O (m - sd)
Examined specimens - **Enna**: Nicosia: C.da Campanito (1120 m), 16/VIII/2022, 22 exx under bovine dung, G. Altadonna leg. (CZ); ibidem, 9 exx, G. Altadonna leg. (CF); **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 18/VII/2015, in bovine dung, 1 ex (CA); Capizzi, C.da Nefare (957 m), 6/I/2014, under bovine dung, 1 ex (CA); Capizzi, Casale Dugo (1370 m), 5/VIII/2012, 1 ex in bovine dung (CA); ibidem, 1/V/2014, under bovine dung, 5 exx (CA); Caronia, Bosco della Tassita (1380 m), 29/IV/2015, windows trap, 14 exx, C. Baviera leg. (CB, CA); Caronia, C.da Moglia (1467 m), 30/IX/2018, 3 exx under bovine dung (CA); Caronia, foce torrente Caronia, 4/III/2017, 2 exx in bovine dung (CA); Caronia, Portella dell'Obolo (1503 m), 1/V/2014, 1 ex on pigs dung (CA); Caronia, Portella Pomo (823 m), 5/VIII/2012, 1 ex in bovine dung (CA); Cesarò, 12/VI/1999, 2 exx (CZ); ibidem, VII/1983, Pierotti leg., 1 ex (CD); Cesarò, C.da Ciappa de Tusa (1050 m ca), 3/VIII/2012, 5 exx under bovine dung (CA); idem, 1 ex, G. Altadonna leg. (CZ); Cesarò, Biviere di Cesarò (1274 m), 11/VIII/1998, 1 ex (CB); ibidem, 11/X/2001-11/IV/2002, pitfall trap, 2 exx (CB); ibidem, 11/IV/2002, 1 ex (CB); ibidem, 3/V/2005, 1 ex (CB); ibidem (1283 m), 14/V/2004-14/V/2005, pitfall trap, 1 ex (CB); ibidem (1278 m), 22/VI/2013, under horse dung, 3 exx (CA); Cesarò, C.da Solecchiate (1022 m), 19/X/2016, 1 ex under bovine dung (CA); Cesarò, Cantoniera Cicogna (1323 m), 24/VI/1988, 4 exx (CZ); Cesarò, Monte Soro, 13/VI/1995, Lisa leg., 5 exx (CZ); Monte Soro (1500 m ca), 11/X/2001-11/IV/2002, pitfall trap, 2 exx (CB); Monte Soro: Portella Maulazzo dint. (1500 m), 22/VI/2013, 1 ex in horse dung (CA); Cesarò, Portella Femmina Morta (1500 m), 13/VII/1975, Betti leg., 2 exx (CC); ibidem, 6/X/1990, V. Aliquò leg., 3 exx (CZ); ibidem, 12/VI/1999, 11 exx (CZ); Floresta: Piano di Musarra (1200 m), 25/IV/2015, in bovine dung, 1 ex (CA); Galati Mamertino (850 m), 26/IX/2002, M. Zuffi leg., 26 exx (MSNP); Mistretta, Monte Castelli, 25/IV/1992, collector not indicated, 1 ex (CC); Pettineo, C.da Contrasto, Abbeveratorio (742 m), 26/VI/2016, 1 ex (CA); Pettineo, Piano d'Olmo (630 m), 2/V/2015, in bovine dung, 1 ex (CA); ibidem (617 m), 26/XII/2019, 1 ex (CA); San Fratello dint. (800 m), 18/III/1973, Bonometto leg., 6 exx (CZ); San Fratello, 12/VI/1999, 1 ex (CZ); San Fratello (675 m), 31/III/1984, M. Arnone leg., 3 exx (CD); ibidem, 18/V/1984, M. Arnone leg., 5

exx (CD); San Fratello, dint. (1300 m), 17/V/2001, 2 exx (CB); San Fratello, lecceta, c.da Gianfi (900 m), 9/III/2017, 3 exx under bovine dung (CA); Sant'Agata Militello: C.da Santa Quaranta (642 m), 31/VII/2016, 1 ex in bovine dung (CA); Santo Stefano di Camastra: Santuario Letto Santo (870 m), 30/XII/2022, 3 exx in bovine dung (CA); idem, 2 exx, G. Altadonna leg. (CM); Tortorici, Lago Pisciotto (1200 m), 15/IV/2005, 2 exx (CB); Tortorici, Lago Pisciotto (1240 m), 25/IV/2015, in bovine dung, 3 exx (CA); Tusa, C.da Murro (300 m), 24/VII/2014, under bovine dung, 1 ex (CA); Tusa, Vallone Capodici (800 m), 28/XII/2022, 2 exx in bovine dung (CA) Data from web sources - **Enna**: Troina, 27/XII/2016, photo by C. Amata (FEI).

Notes. This species, whose phenology spans from spring to autumn, lives in mountain pastures (Sparacio 1995), on bovine, horse and pig dung (G. Altadonna, pers. obs.). Not all authors (e.g., Palestrini (1981) and Agoglitta *et al.* (2006)) agree on the validity of this taxon, endemic to Sicily, which according to Baraud (1975b) is vicariant of the related *O. fracticornis* (Preyssler, 1790) on the island. However, recent chromosomal studies (Falahee and Angus 2010; Pizzo *et al.* 2011) justify the subdivision of the two taxa at a specific level, confirming Baraud's diagnosis. So far recorded from Cesarò (Pierotti 1959), sub *O. fracticornis*, Portella Femmina Morta (unpublished data by Massa, 1969-70), Mistretta, Monte Soro (Agoglitta *et al.* 2006), sub *O. fracticornis*, Biviere di Cesarò (Baviera 2011), sub *Aplidia massai*, due to *lapsus calami*. The record of *Onthophagus (Palaeonthophagus) coenobita* (Herbst, 1783) from Mistretta by Ragusa (1883, 1892b) is instead to be referred to *O. massai*, to which belong all the specimens identified as "*Onthophagus coenobita* (Herbst)" in Ragusa collection (Arnone 2010). This species was recorded as "Data Deficient" (DD) in the Red List of Numa *et al.* (2020).

Onthophagus (Palaeonthophagus) medius (Kugelann, 1792)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Portella Femmina Morta, 12/VI/1999, 1 ex (CZ); ibidem (1520 m), 31/V/2014, 1 ex under bovine dung (CA).

Notes. Not previously reported from the Nebrodi district. In the past 150 years at least, this taxon was always considered as junior synonym of *O. vacca*, until Rössner, Schönfeld, and Ahrens (2010), based on morphological and molecular evidence, identified *O. medius* as a good western Palaearctic species. Both the taxa occur in Sicily (see also under *O. vacca*).

Onthophagus (Palaeonthophagus) opacicollis Reitter, 1892
Chorotype – MED (introduced in Australia)
Trophic category – COP
Ecological category - O (m - sd)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 31/V/2003, 1 ex (CB); Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 3 exx (CM); Cesarò: Biviere di Cesarò (1278 m), 11/X/2001-11/IV/2002, pitfall trap, 1 ex (CB); ibidem, 31/V/2003, 2 exx (CB); ibidem, 14/V/2004, 1 ex (CB); Cesarò: Portella Femmina Morta, 1/VI/1969, I. Bucciarelli leg., 1 ex (CD); Tortorici, Monte Pojummoru (1400 m), 14/VIII/1998, 1 ex (CB); Tusa, C.da Scalagatti

(790 m), 26/XII/2022, 1 ex in bovine dung (CA).

Notes. This species lives in exposed pastures (Lapiana and Sparacio 2006). Not previously reported from the Nebrodi district.

Onthophagus (Palaeonthophagus) ruficapillus Brullé, 1832
Chorotype – CAE
Trophic category – COP
Ecological category - O (sm - me)

Notes. An uncommon species in Sicily, so far reported from Torrente Cuderì (Agoglitta *et al.* 2006), a locality between Lake Maulazzo and Biviere di Cesarò.

Onthophagus (Palaeonthophagus) semicornis (Panzer, 1798)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Biviere di Cesarò (1283 m), 14/V/2004 -15/V/2005, pitfall trap, 1 ex (CB).

Notes. This species was firstly recorded from Sicily by Ragusa (1893c) on specimens collected in Madonie massif. It is found in exposed pastures; often in burrows of small mammals (Aliquò and F. P. Romano 1975; Ziani 2003; Ballerio *et al.* 2014). Not previously reported from the Nebrodi district.

Onthophagus (Palaeonthophagus) vacca (Linnaeus, 1767)
Chorotype – TEM
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 1 ex (CM); Caronia, foce torrente Caronia, 4/III/2017, 2 exx under bovine dung (CA); Caronia, Monte Pagano (400 m), 26/VI/2015, 5 exx (CM); ibidem, 9/III/2023, C. Muscarella & F.P. Faraone leg., 1 ex (CM); Cesarò: pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 3 exx (CD); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 1 ex (CM); Cesarò: Biviere di Cesarò (1270 m), 31/V/2003, 1 ex (CB); Floresta: Piano di Musarra (1200 m), 25/IV/2025, 1 ex in bovine dung (CA); San Fratello (675 m), 31/III/1984, M. Arnone leg., 2 exx (CD); ibidem, 18/V/1984, M. Arnone leg., 3 exx (CD); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 1 ex (CD); Tortorici, Lago Pisciotto (1240 m), 25/IV/2015, 5 exx in bovine dung (CA).

Notes. This is a common species in Sicily, living on bovine dung from the coasts to the mountain horizon, with a phenology spanning from March to October (Sparacio, 1995). It was recorded so far, from Nebrodi Mountains, only from Monte Soro and Portella Femmina Morta (Agoglitta *et al.* 2006). See also under *O. medius*.

Onthophagus (Palaeonthophagus) verticicornis (Laicharting, 1781)
Chorotype – TUE
Trophic category – COP
Ecological category - O (m - me)
Examined specimens - **Messina**: Caronia, 20 Km S [= Pizzo Luminaria 1178 m, authors' note], 20/IV/2003, Magnani leg., 1 ex (CZ); Caronia, Bosco della Tassita (1380 m), 29/IV/2015, windows trap, C. Baviera leg., 2 exx (CB, CA); Cesarò, 12/VI/1999, 2 exx (CZ); Biviere di Cesarò (1283 m), 14/V/2004, 2 exx (CB); ibidem, 13/V/2005, 1 ex (CB); pendici NW Monte Soro (1400 m), 1/VI/1985, A. Rey leg., 47 exx (CD); Portella Calacudera (1560 m), 18/V/2019, C. Falcone & G. Altadonna leg., 1 ex (CA); Portella Femmina Morta, 12/VI/1999, 4 exx (CZ); ibidem (1500 m), 4/VI/1985, A. Rey leg., 3 exx (CD); San Fratello, 14/VI/1989, Lisa leg., 3 exx (CZ); ibidem (675 m), 18/V/1984, M. Arnone leg., 1 ex (CD); San Fratello, Casello Muto (1300 m), 20/V/2000, 1 ex (CB); San Fratello, Portella Femmina Morta (1500 m), 23/IV/2017, 1 ex under stone (CA); San Fratello (1600 m), 8/VI/2009, A. Simon leg., vache, prairie, 10 exx (CD); Tortorici, Lago Pisciotto (1200 m), 15/IV/2005 2 exx (CB); ibidem (1240 m), 25/IV/2015, 3 exx in bovine dung (CA); Tortorici, Lago Trearie (1400 m), 4/VI/2009, 3 exx (CB).

Notes. This species was recorded so far, from Nebrodi Mountains, from Caronia (Contrada Moglia, Pizzo Battaglia), Mistretta and Monte Soro (Agoglitta *et al.* 2006).

Subfamilia ORPHNINAE Erichson, 1847

Hybalus benoiti Tournier, 1864
Chorotype – SISA
Trophic category – RHI
Ecological category - O (sm - me)
Examined specimens - **Enna**: Nicosia: Monte Sambughetti (1505 m), 3/XI/2010, sifting, C. Baviera et C. Bellò leg., 1 ex (CB).

Notes. This uncommon species is found from autumn to spring, from the coasts to the mountains, localized. Adults are found under the stones and among the roots of grasses, in damp places; while the larvae are rhizophagous (Sparacio 1995; Ballerio *et al.* 2014). So far recorded from the Nebrodi Park by Sabella and Sparacio (2004).

Subfamilia MELOLONTHINAE Leach, 1819

Hymenoplia sicula Blanchard, 1850
Chorotype – APSI
Trophic category – RHI
Ecological category - O (m - me)

Notes. An Italian endemic species, rare and localized, described from Sicily, it has also been collected in Apulia (Baraud 1992) and in Calabria (Ballerio *et al.* 2020). It is found

on grasses, in the clearings of mountain woods, from June to July (Sparacio 1995). So far reported from the Nebrodi Park by Sabella and Sparacio (2004).

Hoplia (Hoplia) paganettii J. Müller, 1907
Chorotype – SISA
Trophic category – RHI
Ecological category - O (sm - me)

Notes. A rare and localized species, apparently linked to riparian environments from the coasts to hill altitudes; currently known from a few localities in Calabria and Sicily. Patacchiola, Fabbriciani, and Boschin (2023), who have redescribed that species recently, considered it vicariant of *Hoplia (Hoplia) minuta* (Panzer, 1789) in Sicily, therefore excluding the occurrence of the latter from the island. In the Nebrodi area so far reported only from Zappulla, on specimens preserved in Raniero Alliata's collection (Patacchiola, Fabbriciani, and Boschin 2023).

Aplidia hirticollis (Burmeister, 1855)
Chorotype – SISA
Trophic category – RHI
Ecological category - O (m - me)
Examined specimens - **Messina**: Alcara Li Fusi, Portella Maulazzo (1470 m), 6/VII/2014, 5 exx (CM); ibidem, 1/VII/2022, 3 exx (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 6 exx (CM); Caronia, Monte Trefinaidi (1050 m ca), 20/VII/2013, 1 ex, remains (CA); Caronia, Portella Calcari (870 m), 7/VII/2014, 2 exx (CM); ibidem, 20/V/2012, 1 ex (CM); Caronia, Portella Pomo (800 m), 10/VIII/2016, 1 ex under stone, remains (CA); Castell'Umberto, 20/VI/2019, 1 ex, F.P. & F. Faraone leg. (CM); ibidem, 26/VI/2022, 1 ex, F.P. & F. Faraone leg. (CM); Castell'Umberto, Monte Rotondo (1000 m), 26/VII/2022, 1 ex, F.P. & F. Faraone leg. (CM); Longi, Bosco di Mangalaviti (1308 m), 2/VII/2022, 1 ex at light (CM); Longi, Contrada Pado (970 m), 6/VIII/2022, 5 exx (CM); ibidem, 24/VIII/2022, F.P. & F. Faraone leg., 1 ex (CM); Ucria, dint. (1000 m), 25-28/VII/2002, 2 exx (CB)
Data from web sources - **Enna**: Troina, 22/V/2016, photo by C. Amata (FEI); **Messina**: Patti: C.da Monte (150 m), 6/VI/2021, photo by S. Segreto (NAT).

Notes. This species is by far the most common of the genus *Aplidia* in Sicily. It occurs in various environments, from the coasts (between late May and early June) to the mountains (until August) (Sparacio 1995). However, its phenology (limited to a few minutes before dusk and a few weeks per year) makes it rather elusive (as well as other Melolonthinae), and therefore it is probably more widespread in the study area than appears by the examined specimens. Not previously reported from the Nebrodi district.

Amphimallon fuscum (Scopoli, 1786)
Chorotype – SEU
Trophic category – RHI
Ecological category - S (m - sm)

Notes. A rare species in Sicily; it flies in the late afternoon and at dusk, in summer, at high altitudes (Lapiana and Sparacio 2006). So far recorded only from the Nebrodi Park (Sabella and Sparacio 2004).

Amphimallon javeti Stierlin, 1864
Chorotype – SISA
Trophic category – RHI
Ecological category - S (m - sm)
Examined specimens - **Messina**: Alcara Li Fusi, 6/V/1973, C. Priolo leg., 1 ex (MSNR); Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 4 exx flying at dusk (CM); ibidem, 1/VII/2022, 3 exx (CM); Castell'Umberto, Monte Rotondo (980 m), 13/VII/2022, 5 exx, F.P. & F. Faraone leg. (CM); Longi, Bosco di Mangalaviti (1308 m), 27/VI/2013, 1 ex under stone (CM); ibidem, 2/VII/2022, 2 exx, at dusk (CM); Longi, Case Magalaviti (1280 m), 21/VI/2021, 2 exx (CM); Tortorici, Lago Trearie (1435 m), 2/VII/2005, 2 exx (CB).

Notes. A species vicariant of *Amphimallon solstitiale* in Sicily, *Amphimallon javeti* has been long considered endemic to the island, until it was found also in Calabria (Ballerio *et al.* 2011). Sporadic and localized, it flies at dusk, in the summer months (Lapiana and Sparacio 2006). Yet recorded from the Nebrodi Park (Sparacio 1995; Sabella and Sparacio 2004), sub *Amphimallon solstitiale javeti*. The only specimen preserved in Ragusa collection bearing a locality label has the following data: "Mistretta, Santa Croce [di S. Stefano] 20.VI.1915" (Arnone 2010). This place actually belongs to the Municipality of Santo Stefano di Camastra and it is also known as "Santuario Letto Santo" [Holy Bed Sanctuary].

Amphimallon pseudomajale Sabatinelli, 1976
Chorotype – SISA
Trophic category – RHI
Ecological category - S (m - sm)

Notes. A rare species, endemic to the mountain ranges of North-Eastern Sicily and Southern Calabria (Ballerio *et al.* 2014). In Sicily it is known mainly from Mount Etna (Sabatinelli 1976; Sparacio 1995). For the Nebrodi district it has been recorded from the "Natura 2000" site "ITA070007 Bosco del Flascio" (MASE 2023).

Firminus ciliatus ciliatus (Reiche, 1862)
Chorotype – SICI
Trophic category – RHI
Ecological category - S (m - sm)
Examined specimens - **Messina**: Alcara Li Fusi (1000 m), 20/III/2017, L. Colacurcio leg., 2 exx (CF); Castell'Umberto, Monte Rotondo (980 m), 20/VI/2022, remains of several specimens under stones, F.P. & F. Faraone leg. (CM); Cesarò: Biviere di Cesarò (1200 m), 18/V/2012, sifting, 3 exx (CB); Monte Soro (1700 m), 20/V/2000, 2 exx (CB); Portella Femmina Morta (1500 m), 23/IV/2017, remains of 3 exx under stones (CA).

Notes. A species with late winter and early spring phenology; it is found under stones, in the clearings of mountain forests; localized, but sometimes locally abundant (Ballerio *et al.* 2014). So far recorded from the Nebrodi Park sub *Rhizotrogus ciliatus ciliatus* (Sabella and Sparacio 2004), Monte Soro (Baviera 2011; Arnone, Lo Cascio, and Grita 2014), Portella Femmina Morta, San Fratello, Muto, Case Batessa, Mistretta (Arnone, Lo Cascio, and Grita 2014).

Rhizotrogus romanoi Sabatinelli, 1975
Chorotype – SICI
Trophic category – RHI
Ecological category - S (m - sm)
Examined specimens - **Messina**: Biviere di Cesarò (1200 m), 26/V/2006, 1 ex (CB).

Notes. A Sicilian endemic species, very rare, occurring only in Madonie and Nebrodi mountain chains, where it flies at dusk from May to July (Sparacio 1995). Portella Femmina Morta is one of the locality of the specimens of the type series, together with Piano Battaglia (Sabatinelli 1975a). Already reported from the Nebrodi Park (Sabella and Sparacio 2004) and Biviere di Cesarò (Baviera 2011).

Rhizotrogus siculus Baraud, 1970
Chorotype – SISA
Trophic category – RHI
Ecological category - S (m-sm)

Notes. A very rare species endemic to Sicily and Calabria; mainly known from the Madonie Mountains and neighbouring mountain localities. It flies at dusk from May to July (Sparacio 1995; Ballerio *et al.* 2014). Reported from the Nebrodi Park (Sabella and Sparacio 2004).

Anoxia (Protanoxia) orientalis (Krynicky, 1832)
Chorotype – EME
Trophic category – RHI
Ecological category - S (me)
Examined specimens - **Messina**: Patti, Laghetti di Marinello, 4/VII/1999, 1 ex at light (CB)

Notes. An uncommon species, mainly linked to the sandy coastal strip and in apparent rarefaction in Sicily due to the degradation of its habitat (Muscarella *et al.* 2022). It is active in June and July, flying at dusk on the highest branches of riparian and coastal vegetation (Sparacio 1995). So far recorded from the Nebrodi Park (Sabella and Sparacio 2004).

Subfamilia RUTELINAE MacLeay, 1819

Anomala ausonia Erichson, 1847
Chorotype – WME
Trophic category – RHI
Ecological category - O (sm-me)
Examined specimens - **Messina**: Caronia, Mulino di Caronia (150 m), 26/VI/2016, 2 exx at light (CM).

Notes. A species mainly linked to the coastal strip, where it is possible to meet it during the twilight flight, in the late spring and summer months (Ballerio *et al.* 2014). Widespread in Sicily particularly along the South coasts (C. Muscarella, pers. obs.). Not previously reported from the Nebrodi district.

Anisoplia (Anisoplia) monticola marginata Kraatz, 1883
Chorotype – SISA
Trophic category – RHI
Ecological category - O (m-sd)
Examined specimens - **Messina**: Caronia, Portella Calcari (870 m), 7/VII/2014, 3 exx on grasses (CM); Floresta, 2/VII/2005, 2 exx (CB).

Notes. This species is found on grasses, in the clearings of mountain woods, from June to July (Sparacio 1995). So far recorded from the Nebrodi Park (Sabella and Sparacio 2004).

Anisoplia (Anisoplia) sabatinellii Baraud, 1991
Chorotype - SISA
Trophic category - RHI
Ecological category - O (m-me)
Examined specimens - **Messina**: Biviere di Cesarò (1283 m), 5/VII/2004, 4 exx (CB); ibidem, 2/VII/2005, 2 exx (CB).

Notes. Italian endemic species, known from southern Italy (Apulia, Calabria) (Ballerio *et al.* 2011). First record from Sicily (see Ballerio *et al.* 2014; Arnone and M. Romano 2020)

Anisoplia (Anisoplia) tempestiva Erichson, 1847
Chorotype – SEU
Trophic category – RHI
Ecological category - O (m-sd)
Examined specimens - **Messina**: Caronia, Portella Calcari (870 m), 7/VII/2014, 6 exx on grasses (CM); idem, 2 exx, C. Muscarella leg. (CF).

Notes. A species so far recorded in the study area, sub *Anisoplia sicula* Reitter, 1889 (presently deemed as junior synonym of *A. tempestiva*), by Ragusa (1883, 1893b) ("la trovai comunissima alle Caronie [I found it very common on the Caronie Mountains]") – in whose

collection there are specimens labeled "Mistretta, C.da Medda" (Arnone 2010) – and from the Nebrodi Park (Sabella and Sparacio 2004). Biology similar to that of the other *Anisoplia* spp.

Subfamilia PACHYPODINAE Erichson, 1840

Pachypus caesus Erichson, 1840
Chorotype – SICI
Trophic category – RHI
Ecological category - S (sd-me)

Notes. Species endemic to Sicily, whose phenology is closely linked to autumn rains (Ragusa 1883, 1893a; Arnone and Sparacio 1990; Sparacio 1995). So far recorded from Torrenova (Aliquò and F. P. Romano 1975; Arnone and Sparacio 1990), Sant'Agata di Militello, San Fratello, Santo Stefano di Camastra (Arnone and Sparacio 1990) and from the Nebrodi Park (Sabella and Sparacio 2004).

Subfamilia DYNASTINAE MacLeay, 1819

Pentodon bidens punctatum (Villers, 1789)
Chorotype – MED
Trophic category – RHI
Ecological category - O (sm-me)
Examined specimens - **Catania**: Randazzo, Fiume Alcantara (680 m), 18/IX/2022, 1 ex, remains (CA); **Messina**: Acquedolci, 28/IV/1973, V. Aliquò leg., 1 ex (CD); Alcara Li Fusi, Lago Maulazzo (1400 m), 3/III/2022, F.P. Faraone leg., 1 ex (CM); Cesarò, Monte Soro (1800 m), 21/X/2006, 1 ex (CB); Floresta, 24/VI/2007, 1 ex (CB); Pettineo, Piano d'Olmo (617 m), 8/XI/2014, 1 ex, S. Altadonna leg. (CA)
Data from web sources - **Messina**: Longi, Contrada Pado (970 m), 14/VI/2016 (NAT)

Notes. A not rare and widely spread species in Sicily; whose phenology spans from March to October (Sparacio 1995). Although it also occurs at mountain altitudes, it is more common at low and medium altitudes (G. Altadonna, pers. obs). Not previously reported from the Nebrodi district.

Phyllognathus excavatus (Förster, 1771)
Chorotype – TUM
Trophic category – RHI
Ecological category - S (sd-me)
Examined specimens - **Messina**: Oliveri, 5/IX/2017, at light, remains of 1 ♀ (CA); ibidem, 15/IX/2017, at light, remains of 1 ♂ and 1 ♀ (CA) Data from web sources - **Messina**: Patti, Marina di Patti,

1/IX/2019 (NAT)

Notes. A species subject to strong population fluctuations over the years; often more common from July to September, especially (but not exclusively) along the coasts. Adults fly at dusk and are attracted by artificial lights, while larvae feed on organic debris and roots (Sparacio 1995). Not previously reported from the Nebrodi district, it is probably more widespread in the study area than it appears from the few specimens collected.

Oryctes nasicornis grypus Illiger, 1803
Chorotype – WME
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Messina**: Alcara Li Fusi, in urbe (400 m), 20/VIII/2022, remains of 1 ex (CA); Caronia, Monte Pagano (400 m), 9/III/2023, C. Muscarella & F.P. Faraone leg., 2 exx (CM); Caronia, Monte Trefinaidi (1152 m), 6/VIII/2006, 1 ex (CM); ibidem, 19/V/2012, 2 exx (CM); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, some larvae the wood mould at the base of a strain of *Acer* sp. (C. Muscarella, pers. obs.); Cesarò, Biviere di Cesarò (1200 m), 9/IX/200, 1 ex (CB); Cesarò, C.da Cosaro (920 m), 31/VII/2016, remains of 1 ♀ (CA); Floresta, Portella Favoscuro (1256 m), 29/VII/2018, remains of 1 ex (CA); Santo Stefano di Camastra, Santuario Letto Santo (874 m), 22/VII/2018, remains of some specimens (CA); Sinagra, in urbe (260 m), 26/VI/2016, 1 ex (CM).
Data from web sources - **Messina**: Capo d'Orlando, 25/VI/2022 (NAT); San Marco d'Alunzio, c.da Genovese (310 m), 20/VI/2021, photo by F. Priola (NAT); Sant'Agata Militello, 19/VI/2022, photo by A. Trusso (NAT).

Notes. A polytypic species, *Oryctes nasicornis* occurs in Sicily with the subspecies *O. n. grypus*, widespread also in North Africa and the Iberian Peninsula (Ballerio *et al.* 2014). Common in wooded and rural environments, the larva feeds on organic debris. Preimaginal development often (though not exclusively) occurs in dead wood in contact with the ground. Adults fly at dusk and are attracted by artificial lights (Sparacio 1995). Already reported from the Nebrodi Park (Sabella and Sparacio 2004) particularly from Portella Femmina Morta (Ballerio *et al.* 2014). Listed as Least Concern in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014).

Subfamilia CETONIINAE Leach, 1815

Valgus hemipterus (Linnaeus, 1758)
Chorotype – SIE
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo (1400 m), 27/V/2006, 1 ex (CB); ibidem (1440 m), 22/VI/2013, 1 ex in the cavity of a *Fagus sylvatica* (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, Monte Trefinaidi (1152 m), 19/V/2012, 1 ex (CM); Cesarò, Portella Femmina Morta (1524 m), 22/VI/2013, 1 ex on Rosa canina (CA); ibidem (1520 m), 31/V/2014, 1 ex on *Asphodelus* sp. (CA); Longi, Portella Gazzana (979 m), 22/VI/2012, 1 ex (CM);

San Fratello, Casello Muto (1300 m), 20/V/2000, 1 ex (CB).

Notes. A common species in spring and summer, in the clearings of mountain woods (Sparacio 1995). Already recorded from the Nebrodi Park (Sabella and Sparacio 2004). Listed as Least Concern (LC) in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014).

Gnorimus decempunctatus Helfer, 1833
Chorotype – SICI)
Trophic category – SAP
Ecological category - S(m-sm)

Notes. A saproxylic species, endemic to Sicily, related to the rotten trunks and rotting cavities of the old *Quercus* and *Fagus* trees; very elusive and rare, although locally abundant (C. Muscarella, pers. obs.). It is considered Endangered (EN) by Audisio *et al.* (2014) in the Red List of Italian saproxylic beetles. Ragusa (1883, 1893b) wrote: "È propria delle Madonie, ma sono sicuro che si deve pure trovare alle Caronie [It is recorded from the Madonie, but I'm sure it must also be found in the Caronie]"; prediction later confirmed by himself (Ragusa 1921). Reported from the Nebrodi Mountains also by Pratesi and Tassi (1974): Portella Femmina Morta, sub "gnorimo dai dieci punti"; Sparacio (1995) and Sabella and Sparacio (2004), sub *Aulerostictus decempunctatus*); Arnone (2010): "Caronia VII. [leg.] E. Ragusa") and Muscarella *et al.* (2013).

Trichius gallicus gallicus Dejean, 1821
Chorotype – EUR
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Messina**: Cesarò, Contrada Sollazzo Verde (1390 m), 7/VII/2014, 1 ex on *Rubus* sp. (CM).

Notes. An uncommon species in Sicily, it is found in the clearings of woods on flowers, from June to August (Sparacio 1995). Already recorded from the Nebrodi Park (Sabella and Sparacio 2004), sub *Trichius rosaceus* Voet, 1766 and from the Nebrodi Mountains (Ballerio *et al.* 2014). Listed as Least Concern (LC) in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014).

Osmoderma cristinae Sparacio, 1994
Chorotype – SICI
Trophic category – SAP
Ecological category - S (m-sm)
Examined specimens - **Messina**: Cesarò, Biviere di Cesarò (1200 m), 5/VIII/2005, 1 ex (CB); ibidem, 5/VIII-9/IX/2005 in *Quercus* sp., 1 ex (CB); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, some larvae in the wood mould at the base of a strain of *Acer* sp. (C. Muscarella, pers. obs.); Longi,

Bosco di Mangalaviti (1308 m), 2/VII/2022, some larvae in a rotten strain of *Quercus* sp. (CM).

Notes. A species endemic to Sicily, saproxylophagous (but also xylophagous: see Lapiana and Sparacio (2006)), related to rotting cavities of centuries-old broadleaves (*Quercus, Acer*), listed as Endangered (EN) by Audisio *et al.* (2014) in the Red List of Italian saproxylic beetles. Described on specimens collected in the Madonie Mountains (Sparacio 1994, 1995), it was found later also in Nebrodi Mountains (Brustel 2004; Baviera 2011; Muscarella *et al.* 2013; Ballerio *et al.* 2014), Peloritani (Baviera 2008, 2011) and Etna (Campo *et al.* 2015). From the study area it was so far recorded from Muto above San Fratello (Brustel 2004) and from Biviere di Cesarò (Baviera 2011).

Aethiessa floralis squamosa (Gory & Percheron, 1833)
Chorotype – SISA
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Catania**: Randazzo, Bosco del Flascio (970 m), 6/VII/2014, 1 ex on *Cynara cardunculus* (CA); Randazzo, Bosco del Flascio, contrada Piano del Lago (1120 m ca), 6/VII/2013, 1 ex on cardoon (CA); Randazzo, Fiume Flascio (950 m), 7/VII/2013, 1 ex on *Cynara cardunculus* (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 1 ex (CM); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, 1 ex, remains (CA); ibidem (1342 m), 28/VII/2023, 3 exx on *Onopordum illyricum*(CA); Capizzi, Sorgente Manca Batia (1188 m), 7/VIII/2019, 1 ex, remains (CA); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 2 exx (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 4 exx on cardoon (CM); ibidem, 19/VI/2022, 8 exx (CM); Caronia, Monte Trefinaidi (1152 m), 6/VIII/2006, 6 exx (CM); ibidem, 19/V/2012, 2 exx (CM); ibidem (1000 m), 20/VII/2013, 7 exx on *Cynara cardunculus*, G. Altadonna & C. Muscarella leg. (CA); idem, 2 exx (CM); Caronia, Pizzo di Luminaria (1186 m), 22/VI/2015, 1 ex (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 2 exx on cardoon (CM); Caronia, Portella dell'Obolo (1503 m), 22/VI/2015, 1 ex (CM); Caronia, Torrente Caronia, 26/VI/2016, 4 exx (CM); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, 1 ex (CM); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 2 exx (CM); ibidem (1500 m), 1/VII/2022, 1 ex (CM); Cesarò, Biviere di Cesarò (1278 m), 11/VIII/2010, 1 ex (CM); Galati Mamertino, San Basilio, loc. Molisa (798 m), 12/VIII/2010, 5 exx (CM); Longi, Portella Gazzana (979 m), 22/VI/2012, 1 ex (CM); Longi, Rocche del Crasto (1206 m), 27/VI/2013, 4 exx (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 6 exx (CM); Pettineo, Piano d'Olmo (620 m), 4/VII/2015, 6 exx on *Cynara cardunculus*, G. Altadonna leg. (CA, CB); ibidem (617 m), 28/VI-3/VIII/2016, 1 ex in pitfall trap (CA); San Fratello, dint., 12/VIII/2010, 5 exx (CM); San Fratello, Vallone San Fratello, 26/VI/1983, M. Arnone leg., 4 exx (CD); Sant'Agata Militello: C.da Santa Quaranta (640 m), 27/VII/2014, 5 exx on *Cynara cardunculus* (CA); Santa Domenica Vittoria, Poggio Rotondo (1200 m), 23/VI/2013, 2 exx on *Cynara cardunculus* (CA); Tusa: C.da Murro (300 m), 24/VII/2014, 2 exx on cardoon (CA).
Data from web sources - **Messina**: Castel di Tusa, 5/VIII/2021, photo by M. Pecoraro (NAT); San Marco d'Alunzio, C.da Ponte (300 m), 10/VII/2022, photo by C. Allegra (NAT).

Notes. The recent taxonomic and nomenclatorial history of this taxon is rather complex. Sparacio (2009) distinguished the Sicilian and Calabrian populations of *Aethiessa floralis* (Fabricius, 1787) as a separate species from those of North Africa, with the name of *Aethiessa squamosa* (Gory & Percheron, 1833). Not all authors agree with this approach:

e.g. Ballerio *et al.* (2014) retained the name *A. floralis* for the Italian *Aethiessa*. Then, Bezděk (2016) and Montreuil *et al.* (2022) considered the taxon "*squamosa*" (Gory & Percheron, 1833) as a subspecies of *A. floralis* (for more details see Montreuil *et al.* (2022), the analysis of which is followed in this paper). Eventually, Tauzin (2023) has recently stated that the taxon *A. floralis squamosa* (Gory & Percheron, 1833) is a synonym of *Aethiessa floralis divergens* Bedel, 1889, whose distribution stretches from Eastern Morocco across Algeria and Tunisia to Sicily and Calabria (Tauzin 2023). In Sicily, as well as on the Nebrodi Mountains, this species is common in summer, on the inflorescences of cardoons and wild artichokes, from June to August (Sparacio 1995). So far reported by Ragusa (1872), sub *Cetonia floralis*, from the woods of Caronia (Piano del Pero). Listed as Near Threated (NT) in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014).

Cetonia aurata sicula Aliquò, 1983
Chorotype – SISA
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Catania**: Randazzo, Bosco del Flascio (970 m), 6/VII/2014, 1 ex on *Cynara cardunculus* (CA); **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 1 ex (CM); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 1 ex (CM); Caronia, C.da Volpara (1407 m), 10/VIII/2016-V/2017, ex larva in a trunk of *Quercus cerris*, 1 ex (CA); Caronia, Monte Pagano (400 m), 26/VI/2015, 1 ex on cardoon (CM); ibidem, 19/VI/2022, 3 exx (CM); Caronia, Monte Trefinaidi (1152 m), 6/VIII/2006, 1 ex (CM); ibidem, 19/V/2012, 2 exx (CM); ibidem (1000 m), 20/VII/2013, 11 exx on *Rubus* sp. and *Cynara cardunculus*, G. Altadonna & C. Muscarella leg. (CA), idem, 1 ex (CM); Caronia, Pizzo di Luminaria (1186 m), 22/VI/2015, 8 exx (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 4 exx on cardoons (CM); Caronia, Portella dell'Obolo (1503 m), 22/VI/2015, 1 ex (CM); Caronia, Torrente Caronia, 26/VI/2016, 6 exx (CM); Cesarò, 27/V/1973, C. Priolo leg., 1 ex (MSNR); Cesarò: Biviere di Cesarò (1278 m), 11/VIII/2010, 6 exx (CM); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, 1 ex (CM); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 1 ex (CM); ibidem (1500 m), 1/VII/2022, 1 ex (CM); ibidem (1524 m), 13/VII/2013, 2 exx on *Rubus* sp. (CA); Galati Mamertino, San Basilio, loc. Molisa (798 m), 12/VIII/2010, 4 exx (CM); Longi, dint. (1300 m), 25/VII/2004, 6 exx (CB); ibidem, 6/VIII/2004, 10 exx (CB); Longi, Portella Gazzana (979 m), 22/VI/2012, 1 ex (CM); Longi, Rocche del Crasto (1206 m), 27/VI/2013, 8 exx (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 3 exx (CM); Pettineo, Piano d'Olmo (620 m), 4/VII/2015, 6 exx on Cynara cardunculus (CA); San Fratello, 6/VII/1981, V. Aliquò leg., 1 ex (Paratypus) (CD); San Fratello, dint., 12/VIII/2010, 3 exx (CM); San Fratello, Vallone San Fratello, 26/VI/1983, M. Arnone leg., 3 exx (CD); San Fratello, Vallone San Fratello (400 m), 4/VII/1982, M. Romano leg., 4 exx (CD).

Notes. A Sicilian endemic subspecies, it is found on the inflorescences of *Rubus* sp., cardoons and wild artichokes, from May to August (Sparacio 1995). Some specimens of the type series come from the Nebrodi Mountains (Portella Femmina Morta, San Fratello, Reitano, Mistretta: Aliquò (1983). Already collected by Ragusa (1872) in the Caronia woods (Piano del Pero) and near Mistretta (Arnone 2010), it was also reported from San Fratello and Monte Trefinaidi (Ballerio *et al.* 2014), as well as from the Nebrodi Park (Sabella and Sparacio 2004). Listed as Near Threatened (NT) in the Red List of Italian

saproxylic beetles (Audisio *et al.* 2014).

Protaetia (Cetonischema) speciosissima (Scopoli, 1786)
Chorotype – EUR
Trophic category – SAP
Ecological category - O (m-me)

Notes. Another showy Cetoniinae collected on cardoons by Ragusa (1872) in the Caronia woods (Piano del Pero, sub *Cetonia speciosissima*). Ragusa (1883, 1893b) later wrote: "Non è rara specialmente sulle Madonie e Caronie [It is not rare especially on the Madonie and Caronie]". It is an uncommon species in Sicily, occurring only in wooded mountain localities (Sparacio 1995); there are no recent records from localities of the Nebrodi area. Elusive, it lives on the crowns of oaks and wild pear trees; occasionally it can be observed on Carduaceae flowers (Lapiana and Sparacio 2006). Listed as Least Concern (LC) by Audisio *et al.* (2014) in the Red List of Italian saproxylic beetles.

Protaetia (Eupotosia) affinis affinis (Andersch, 1797)
Chorotype – EUR
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Messina**: Caronia, Monte Pagano (400 m), 26/VI/2015, 4 exx on cardoons (CM); ibidem, 19/VI/2022, 1 ex (CM); Caronia, Monte Trefinaidi (1000 m ca), 20/VII/2013, 2 exx on *Cynara cardunculus* (CA, CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 1 ex on cardoon (CM).

Notes. An uncommon species in Sicily, it is found in summer, on flowers of cardoons and wild artichokes (Sparacio, 1995), in the clearings of oak woods (G. Altadonna & C. Muscarella, pers. obs.). Already reported from Caronia woods (Piano del Pero) by Ragusa (1872), sub *Cetonia affinis*; see also Arnone (2010), sub *Eupotosia affinis*, and from the Nebrodi Park (Sabella and Sparacio 2004), sub *Eupotosia affinis*. Listed as Least Concern (LC) in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014).

Protaetia (Netocia) squamosa squamosa (Lefebvre, 1827)
Chorotype – SICI
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Messina**: Pettineo, Piano d'Olmo (617 m), 4/VII/2015, 1 ex on *Cynara cardunculus* (CA).

Notes. A polytypic species, endemic to Italy (chorotype APSI), uncommon and localized. The subspecies *Protaetia (Netocia) squamosa crassicollis* (Burmeister, 1842) is widespread in Southern Italy, while the nominotypical subspecies is endemic to Sicily (Sparacio 2009). Larvae of this subspecies were considered saproxylophagous (Ballerio *et al.* 2014), therefore it is listed as Vulnerable (VU) in the Red List of Italian saproxylic beetles by Audisio *et al.*

(2014). The recent morphological description and biological observations of the larva of this subspecies confirm the hypothesis that the larva develops also in the root system of large herbaceous plants (such as Carduaceae, on which flowers the adults are found) (Bellavista and Sparacio 2020). Already sampled on the Nebrodi Mountains by Ragusa (specimens of his collection labeled as follows: "Caronia VII. [1871] [leg.] E. Ragusa": see Arnone (2010), sub *Netocia squamosa squamosa*) and recorded from the Nebrodi Park (Sabella and Sparacio (2004), sub *Netocia squamosa squamosa*).

Protaetia (Potosia) hypocrita (Ragusa, 1905) (= *Protaetia (Potosia) cuprea incerta* (A. Costa, 1852))
Chorotype – SICI
Trophic category – SAP
Ecological category - O (m-me)
Examined specimens - **Messina**: Alcara Li Fusi, Lago Maulazzo (1470 m), 6/VII/2014, 1 ex (CM); Portella Maulazzo (1480 m), ex pupa in a stump of *Pyrus*, 23/VIII/-22/X/2013, 1 ex (CM); Caronia, Bosco della Tassita (1406 m), 27/V/2012, 4 exx (CM); Caronia, Monte Pagano (400 m), 26/VI/2015, 4 exx on cardoons (CM); ibidem, 19/VI/2022, 1 ex (CM); Caronia, Monte Trefinaidi (1152 m), 6/VIII/2006, 1 ex (CM); ibidem, 19/V/2012, 1 ex (CM); Caronia, Pizzo Luminaria (1186 m), 22/VI/2015, 1 ex (CM); Caronia, Portella Calcari (870 m), 7/VII/2014, 1 ex on cardoon (CM); Caronia, Portella dell'Obolo (1503 m), 22/VI/2015, 8 exx (CM); Caronia, Torrente Caronia, 26/VI/2016, 6 exx (CM); Caronia, Monte Trefinaidi (950 m ca), 20/VII/2013, 1 ex in trunk of *Quercus cerris*, G. Altadonna & C. Muscarella leg. (CA); Caronia, Portella Pomo (800 m), 10/VIII/2016, 1 ex in the wood mould at the base of a strain of *Quercus fontanesii* (CA); Castell'Umberto, Monte Rotondo (1000 m), 24/IX/2022, 1 ex, F.P. & F. Faraone leg. (CM); Cesarò, Contrada Sollazzo Verde (1390 m), 23/VIII/2013, 4 exx (CM); Cesarò, Portella Femmina Morta (1541 m), 23/VIII/2013, 1 ex (CM); ibidem (1500 m), 1/VII/2022, 1 ex (CM); Cesarò: Biviere di Cesarò (1278 m), 11/VIII/2010, 1 ex (CM); Galati Mamertino, San Basilio, loc. Molisa (798 m), 12/VIII/2010, 1 ex (CM); Longi, Portella Gazzana (979 m), 22/VI/2012, 1 ex (CM); Longi, Rocche del Crasto (1206 m), 27/VI/2013, 4 exx (CM); Longi, Stretta di Longi (240 m), 27/VI/2013, 1 ex (CM); Pettineo, Piano d'Olmo (620 m), 4/VII/2015, 4 exx on *Cynara cardunculus* and *Rubus* sp. (CA); San Fratello, dint., 12/VIII/2010, 1 ex (CM); Santa Domenica Vittoria, Poggio Rotondo (1200 m), 23/VI/2013, 1 ex on *Cynara cardunculus* (CA); Tusa: Cozzo Lassanò (760 m), 28/VI-3/VIII/2016, 1 ex in wine-trap on *Quercus suber* (CA).

Notes. This species is found on the inflorescences (mainly of cardoons and wild artichokes), from May to August (Sparacio 1995). Following Sparacio (2009) we consider valid the name *Protaetia (Potosia) hypocrita* (Ragusa, 1905), of which Arnone (2010) has designated the lectotype. The specific status of this taxon (usually considered a subspecies of *Protaetia (Potosia) cuprea* (Fabricius, 1775) (see e.g. Ballerio *et al.* (2014)), has been confirmed recently by molecular analysis (Vondráček *et al.* 2018). Already collected on Nebrodi Mountains by Ragusa (specimens labeled as follows: "Caronia VII. [1871] [leg.] E. Ragusa" preserved in his collection: cfr. Arnone (2010), sub *Potosia hypocrita*), it is also reported from San Fratello (Ballerio *et al.* (2014), sub *Protaetia (Potosia) cuprea hypocrita*) and from the Nebrodi Park (Sabella and Sparacio 2004). Listed as Least Concern (LC) in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014).

Tropinota hirta hirta (Poda von Neuhaus, 1761)
Chorotype – EUM
Trophic category – FSA
Ecological category - O (m-me)
Examined specimens - **Catania**: Randazzo, Bosco del Flascio (970 m), 6/VII/2014, 1 ex on *Cynara cardunculus* (CA); **Messina**: Biviere di Cesarò (1278 m), 26/V/2004, 1 ex (CB).

Notes. A common species on flowers, during spring and summer; often along with *Oxythyrea funesta* (Sparacio, 1995). Not previously reported from the Nebrodi district.

Tropinota squallida squallida (Scopoli, 1783)
Chorotype – EUM
Trophic category – FSA
Ecological category - O (m-me)
Examined specimens - **Messina**: Cesarò, C.da Cosaro (920 m), 23/IV/2017, 2 exx on flowers of Asteraceae (CA); Cesarò, Portella Femmina Morta (1524 m), 22/VI/2013, 1 ex on *Rosa canina* (CA); Oliveri, Monte della Volpe (450 m), 8/IV/2022, 5 exx on Asteraceae (CA); Pettineo, Piano d'Olmo (620 m), 4/VII/2015, 1 ex on *Cynara cardunculus* (CA); Santa Domenica Vittoria, C.da Iuncarà (800 m), 23/VI/2013, 1 ex on *Rubus* sp. (CA).
Data from web sources - **Messina**: Gioiosa Marea, C.da Galbato (250 m), 15/IV/2022, photo by C. Glania (NAT).

Notes. A common species in Sicily; appearing in spring at low altitudes and during summer in the mountains (Lapiana and Sparacio 2006). Not previously reported from the Nebrodi district.

Oxythyrea funesta (Poda von Neuhaus, 1761)
Chorotype – CEM
Trophic category – FSA
Ecological category - O (m-me)
Examined specimens - **Catania**: Randazzo, Bosco del Flascio (970 m), 6/VII/2014, 1 ex on *Cynara cardunculus* (CA); Randazzo, Bosco del Flascio, contrada Piano del Lago (1150 m ca), 6/VII/2013, several specimens on Carduaceae, not collected (G. Altadonna, pers. obs.); Randazzo, Fiume Flascio (950 m), 7/VII/2013, 5 exx on *Cynara cardunculus* (CA); **Messina**: Alcara Li Fusi, Contrada Scavioli (1200 m), 26/VII/2018, 1 ex on *Cynara cardunculus* (CA); Alcara Li Fusi, Piano di Stèseni (1000 m), 26/VII/2018, 1 ex on *Cynara cardunculus* (CA); Capizzi, Casale Dugo (1370 m), 3/VIII/2018, 3 exx on cardoons and flowers of *Rubus* (CA); ibidem (1342 m), 28/VII/2023, 1 ex on *Onopordum illyricum* (CA); Caronia, Monte Trefinaidi, 20/VII/2013, 2 exx su on cardoon (CA); Caronia, Portella Pomiere (1450 m), 5/VIII/2012, 1 ex on cardoon (CA); Caronia, Torrente Caronia, 26/VI/2016, 4 exx (CM); Cesarò: c.da Cosaro (920 m), 18/VII/2015, 1 ex on *Daucus carota* (CA); Cesarò: c.da Ruggirà (1050 m), 31/V/2014, 1 ex on cardoon (CA); Cesarò, Colle Finocchio (1143 m), 6/VII/2014, 3 exx on cardoon (CA); Cesarò, Portella Femmina Morta (1500 m), 1/VII/2022, 4 exx (CM); Mistretta: Case Rinandi (600 m), 26/VII/2015, 1 ex on *Daucus carota* (CA); Mistretta, Contrada Burgisato, Vallone Ogliastro (620 m), 22/VII/2018, 1 ex on *Daucus carota* (CA); Pettineo, Piano d'Olmo (630 m), 2/V/2015, 2 exx (CA); ibidem (620 m), 4/VII/2015, 2 exx on *Cynara cardunculus*, G. Altadonna leg. (CA, CB); Sant'Agata Militello: C.da Santa Quaranta (640 m), 27/VII/2014, 2 exx on *Cynara*

cardunculus (CA); Santa Domenica Vittoria (950 m), 16/V/2015, 2 exx on cardoon and *Rosa canina* (CA).
Data from web sources - **Messina**: Patti: C.da Monte (150 m), 6/IV/2021, photo by S. Segreto (NAT); Gioiosa Marea: Case Pileci (450 m), 17/IV/2021, photo by S. Segreto (NAT).

Notes. A very common species in Sicily, from the coasts to the beech woods in the mountains, on flowers. Its phenology spans from early spring to late summer (Sparacio, 1995). Not previously reported from the Nebrodi district.

Doubtful records:

Anoplotrupes stercorosus (Hartmann in Scriba, 1791) (Geotrupidae)

Notes. Species reported by Agoglitta *et al.* (2006) from Portella Femmina Morta; it is not reported from Sicily in the recent Checklist of Arnone and M. Romano (2020). Its occurrence in the Nebrodi area needs confirmation.

Geotrupes (Geotrupes) stercorarius (Linnaeus, 1758) (Geotrupidae)

Notes. Agoglitta *et al.* (2006) recorded this species from Portella di Femmina Morta by a specimen dated VIII.1984 preserved in Barbero collection (Turin). This species is known from Sicily for a few other reports, none of which after 1970. Its current occurence in Sicily, as well in Southern Italy, is rather unlikely and at least to be verified.

Trypocopris (Trypocopris) vernalis apenninicus (Mariani, 1958) (Geotrupidae)

Notes. The only report of this taxon from Sicily (not cited by Arnone and M. Romano (2020)) is based on a specimen, preserved in Valdinazzi collection (Alessandria), which reports the following data: "Portella di Femmina Morta 31.V.[19]71" (Agoglitta *et al.* 2006). However, even the authors of the report doubt the accuracy of the geographical data. Without more data, we consider reasonable to exclude this species from the study area.

Melinopterus reyi (Reitter, 1892) (Scarabaeidae Aphodiinae)

Notes. A species reported from "Portella Mandrazzi (Caronie)" by Arnone and Massa (1993). Portella Mandrazzi is a locality of the western Peloritani Mountains. However, the presence of the species in the study area would not be surprising.

Onthophagus (Palaeonthophagus) nuchicornis (Linnaeus, 1758) (Scarabaeidae Scarabaeinae)

Notes. A species recorded from Cesarò (Agoglitta *et al.* 2006), but not reported from Sicily by Arnone and M. Romano (2020). Its occurrence in the study area seems worthy of confirmation.

5. Conclusions and final remarks

Currently, the presence in Sicily of 199 taxa of Scarabaeoidea is confirmed. Indeed, to the 198 taxa listed by Arnone and M. Romano (2020), the very recent records of *Brindalus rotundipennis* (Reitter, 1892) and *Onthophagus (Furconthophagus) sellatus* Klug, 1845 (Patacchiola and Fabbriciani 2021a,b) must be added. Moreover, the occurrence in the island of *Hoplia (Hoplia) minuta* (Panzer, 1789) must be excluded (Patacchiola, Fabbriciani, and Boschin 2023), while the presence of *Trox (Granulitrox) granulipennis* Fairmaire, 1852 – which, after being reported by Baraud (1977) had been not collected in Sicily in nearly half a century – has been recently confirmed (Fabbriciani and Patacchiola 2021). According to the results of this research, 117 species of Scarabaeoidea are ascertained from the Nebrodi district; this is equivalent to 58.8% of the species known from Sicily. Among the 91 species hitherto reported in the bibliography, 59 are confirmed by the present contribution, five (*Anoplotrupes stercorosus, Geotrupes (Geotrupes) stercorarius, Trypocopris (Trypocopris) vernalis apenninicus, Onthophagus (Palaeonthophagus) nuchicornis, Melinopterus reyi*) appear doubtful or need confirmation (and therefore they are removed from the total); while 31 taxa are reported for the first time from the Nebrodi district; among them, one (*Anisoplia sabatinellii*) is also new from Sicily (see Tab. 1). Before any analysis of this population, a comparison between the taxa of Scarabaeoidea known from the Nebrodi Mountains and those reported from the neighboring Madonie massif (see Table 1) suggests a series of considerations which are therefore summarized below. Currently, 133 taxa of Scarabaeoidea are confirmed from the Madonie massif (Lapiana and Sparacio 2006; Arnone 2010; Arnone and M. Romano 2019, 2020; Patacchiola, Fabbriciani, and Boschin 2023), equivalent to 66.8% of the known species from Sicily; a number 8% greater than that available for the Nebrodi Mountains. To underline the specificity of the faunal communities of the two territories (which are however assimilated by common ecosystems, such as forest and pre-forest environments and high-altitude pastures) it should be noted that some species occur in only one of the two mountain ranges. In particular, the taxa reported from the Nebrodi Mountains but not from the Madonie Mountains (excluding doubtful records) are 12. On the other hand, there are 27 taxa occurring in the Madonie Mountains not so far recorded from the Nebrodi district (see Tab. 1). This outcome deserves some remarks. It is probable, indeed, that the absence in the Nebrodi district of at least some of these taxa is only apparent, to be attributed to a lack of research rather than to a real absence in the study area; and that therefore the discrepancy highlighted will be eroded in future with more targeted researches. This consideration is likely especially in the case of species not necessarily rare, but elusive due to their particular ecology (e.g., *Hybosorus illigeri*) or rare by the phenology restricted to a few weeks a year and limited to the twilight hours. In particular, the surprising lack of finds of *Anoxia matutinalis*, a widespread species in Sicily and Calabria (Leo, Garagnani, and Sabatinelli 2021), is certainly due to lack of research. Targeted research could lead to the discovery of the presence in the study area also of certain psammophilous or coprophagous species, rare and/or localized (*Agrilinus ibericus, Euorodalus tersus, Melinopterus reyi, Euoniticellus pallens*); while certain taxa related to the basal plane and/or very sensitive to environmental changes (*Alocoderus hydrochaeris, Mecynodes striatulus, Gymnopleurus (Gymnopleurus) mopsus mopsus, Anoxia scutellaris sicula*) have probably become extinct even before being discovered. Finally, some species reported from the Madonie massif

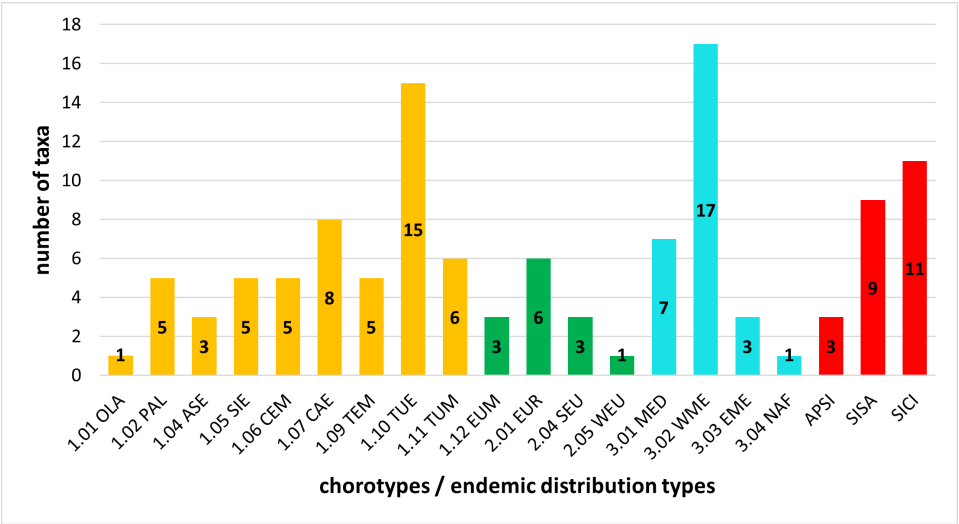

FIGURE 2. Number of taxa of the Scarab beetles from the Nebrodi district divided into the different chorotype or endemic distribution type categories

but not recorded from Nebrodi Mountains (*Agoliinus ragusae, Oxyomus sylvestris, Aplidia transversa transversa, Aplidia villigera, Geotrogus sicelis, Melolontha melolontha*), even if they are not exclusive, in Sicily, of the Madonie district, are typical of this area; irreplaceably characterizing its environments from an ecological and faunal point of view (Lapiana and Sparacio 2006). Considering the above, any biogeographical or ecological analysis of the Scarabaeoidea population of the Nebrodi district must inevitably be considered provisional. Nevertheless, on the basis of the data collected hitherto, it is possible to observe a prevalence of elements with palaearctic broad-distributed chorotypes (56 species, equivalent to 48% of the total), followed by elements with Mediterranean distribution (28 species, corresponding to 24% of the total); while the number of species with chorotypes with European distribution is lower (10, i.e. 8% of the total). Both the absolute number (23) and percentage (20%) of endemisms are high; Sicilian endemisms alone amount to 9% of the total species surveyed in the study area (see Figs. 2, 3).

From an ecological point of view (see Fig. 4), the Scarabaeoidea of the Nebrodi district are largely oligotopic species (83, i.e. 71% of the total), occurring in different altitudinal zones, as expected 57 are the taxa Mountain-Mediterranean (O m-me), largely the first category observed, followed by the stenotopic ones (25, i.e. 21% of the total), which live in a few nearby vegetational areas (11 of this taxa being Mountain-Sub-Mountain) and the euritopic ones (9, i.e. 8% of the total), present in all vegetational areas. Regarding the trophic categories (see Fig. 5), most of taxa (71, equal to 61% of the entire population) show a larval diet predominantly coprophagus, while only 3 taxa are necrophagous. The rhizophagous and saproxylic taxa with 19 and 14 are instead 16% and 12% of the total. Finally, the fito-saprophagous taxa are 10 (8% of the total). These proportions do not

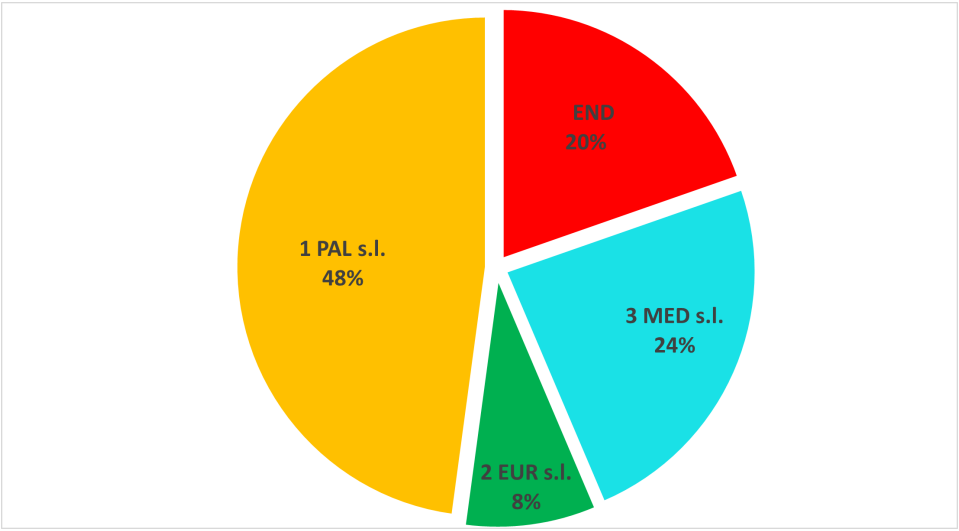

FIGURE 3. Percentages of taxa of the Scarab beetles from the Nebrodi district for chorotype class

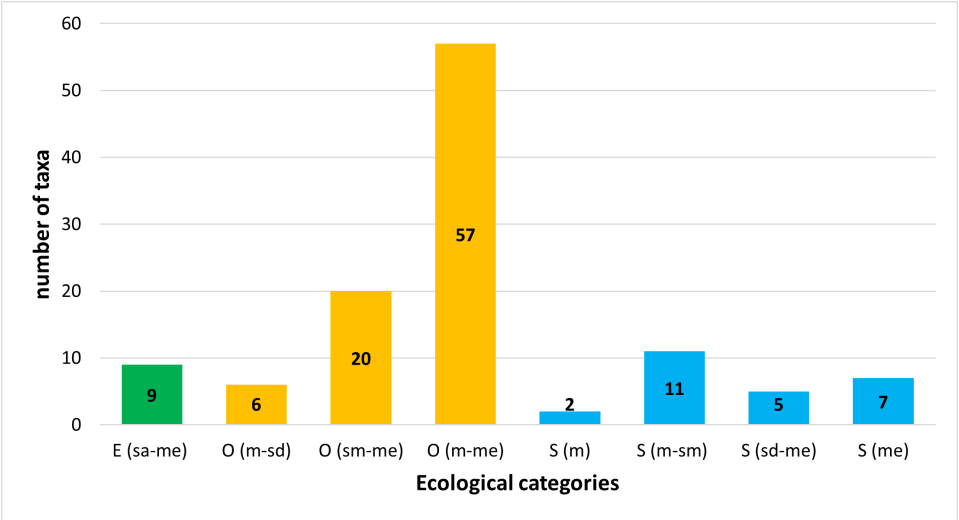

FIGURE 4. Number of taxa of the Scarab beetles from the Nebrodi district divided into the different ecological categories. E = Eurytopic, O = Oligotopic, S = Stenotopic

differ significantly, as was to be expected, from those recorded for the Scarab beetles of the Madonie massif (see Lapiana and Sparacio 2006).

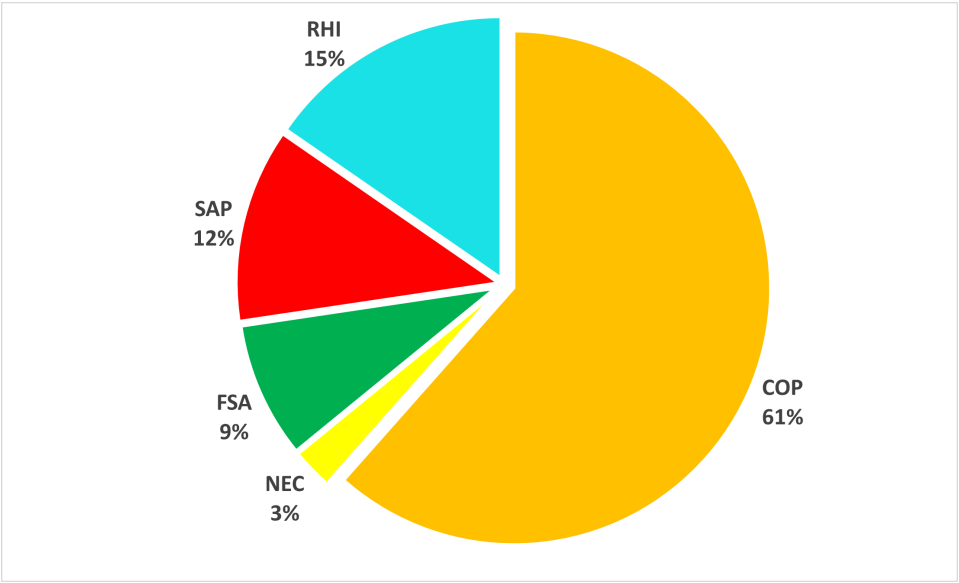

FIGURE 5. Percentages of taxa of the Scarab beetles from the Nebrodi district for main larval trophic category

The data collected so far on the Scarabaeoidea fauna of the Nebrodi Mountains, although partial and liable to future updates, confirm the importance of this territory to the conservation of the biodiversity in Sicily. The study area hosts important Scarab beetles' communities, including rare and/or stenotopic taxa, mostly in the pastures and the wooded areas, environments that characterize the landscape of the Nebrodi Mountains. The ecological importance of mountain wooded pastures is underlined by the occurrence of some species of coprophagous beetles of high biogeographical interest only in this environment: *Trypocopris (Trypocopris) pyraeneus cyanicolor, Acrossus siculus siculus, Limarus zenkeri*, *Planolinoides borealis, Pseudacrossus suffertus*. These species (along with others) have often been collected on dung of animals reared in a semi-wild state and typical of the Nebrodi territory, such as the Nebrodi Goat, the "Sanfratellano" Horse and the "Nero dei Nebrodi" Pig, whose breeding is still the main source of income for the local inhabitants. Nevertheless, the sustainability of livestock activity, even more so within a protected area, must consider certain parameters, within wooded areas (Vaneria 2004). Equally crucial are the xeric pastures of plains and hills, which host species in decline (*Erytus cognatus, Esymus merdarius, Cheironitis furcifer, Euoniticellus pallipes, Onitis ion, Gymnopleurus (Gymnopleurus) sturmii*) whose presence on the Nebrodi Mountains therefore assumes a particular importance not only by an ecological point of view, but also at the conservation level (Lapiana and Sparacio 2008; Numa *et al.* 2020). Finally, for some large "rolling" beetles linked to sandy coasts and so far reported from the study area, namely *Ateuchetus semipunctatus* and *Scarabaeus sacer*, there are no known collected specimens after, respectively, the Thirties and the Fifties of the Twentieth century (Agoglitta *et al.* 2006). The

deciduous forests of the Nebrodi Mountains, in addition to constituing in themselves an element of remarkable botanical value (Schicchi, 2004), have got a key ecological role, as they host different saproxylophagous beetles that are included in the Habitat Directive (Trizzino *et al.* 2013), e.g., among the Scarabaeoidea, *Osmoderma cristinae* (Muscarella *et al.* 2013); as well as at least 70 species of the 436 included in the "European Red List of Saproxylic Beetles" (Sabella and Sparacio 2004; Nieto and Alexander 2010; Muscarella *et al.* 2013), i.e., more than 16% of the saproxylophagous beetles considered threatened or endangered in Europe. In reference only to the saproxylic Scarabaeoidea, the Nebrodi Mountains host the 17.6% of the taxa considered to be threatened or endangered in Italy (Audisio *et al.* 2014), namely: *Osmoderma cristinae, Gnorimus decempunctatus* (both Endangered), *Protaetia (Netocia) squamosa* (Vulnerable). Moreover, one of the rarest Italian Scarabeoidea, the Sicilian endemic Lucanidae, *Aesalus scarabeoides siculus* Baviera, 2008 evaluated as CR (Critical Risk) in the Red List of Italian saproxylic beetles (Audisio *et al.* 2014) living in oaks with decaying fungi, is known only from Malabotta Wood (Baviera 2008), on the border between Peloritani and Nebrodi Mounts and is very probably present also in Nebrodi Mounts. Despite the existence of specific European and Italian laws concerning the protection of the saproxylic fauna and guidelines for the management of the "dead wood", in the Nebrodi Park (as well as in other protected areas of Sicily) is still widespread the custom of remove the dead stumps (or even the death parts of live trees). These practices, often unauthorized, entail an enormous loss in biodiversity as they have a negative impact not only on the populations of saproxylic fauna (Scarabaeoidea comprised), but also on the entire food chain in forest ecosystems (Muscarella *et al.* 2013, and references therein). Finally, another problem, only apparently marginal, concerns the malpractice consisting in the abandonment of bottles of alcohol (especially beer) in the undergrowth by people, as repeatedly encountered by one of us (G. Altadonna) in different localities of the Nebrodi Park (Portella dell'Obolo, Caserma Mafauda, Lecceta di San Fratello, etc.). This custom creates involuntary pitfall traps, especially if the bottles are still partly filled with liquid, with potentially disastrous effects for the insect fauna of the soil (Geotrupidae, Carabidae, Tenebrionidae and so on), as already highlighted by Lapiana and Sparacio (2008). Therefore, the protection of the Scarabaeoidea communities of the Nebrodi Mountains cannot be separated from the understanding of the problems of management of the complex ecosystems of this district; in order to carry out actions that fully protect biocenosis and microhabitats with the single endangered species (Gobbi 2004; Ballerio 2021).

TABLE 1. The recorded species of Coleoptera Scarabaeoidea from Nebrodi and Madonie Mountains. Legend: ○ = bibliographic record only; ● = record confirmed by the present study; + = new record.

TAXA	CHOROTYPES	NEBRODI MTS	MADONIE MTS
LUCANIDAE			
Sinodendron cylindricum (Linnaeus 1758)	SIE	●	○
Dorcus parallelipipedus (Linnaeus 1758)	TEM	●	○
Lucanus tetraodon sicilianus Planet, 1899	SICI	●	○
TROGIDAE			
Trox (Granulitrox) fabricii Reiche, 1853	WME	+	○
Trox (Granulitrox) litoralis Pittino, 1991	MED		○
Trox (Granulitrox) niger Rossi, 1792	TUE	+	○
Trox (Niditrox) scaber (Linnaeus, 1767)	PAL	+	
GEOTRUPIDAE			
Typhaeus typhoeus (Linnaeus, 1758)	EUR	●	○
Stereopyge douei (Gory, 1841)	NAF	●	○
Geotrupes (Geotrupes) spiniger (Marsham, 1802)	TUE	●	○
Jekelius (Jekelius) intermedius (O. G. Costa, 1839)	WME	●	○
Sericotrupes niger (Marsham, 1802)	WEU	●	○
Trypocopris (Trypocopris) pyrenaeus cyanicolor (Capra, 1930)	APSI	●	○
HYBOSORIDAE			
Hybosorus illigeri Reiche, 1853	AIM		○
GLAPHYRIDAE			
Amphicoma carcelii (Laporte de Castelnau, 1832)	APSI	○	
SCARABAEIDAE APHODIINAE			
Acanthobodilus immundus (Creutzer, 1799)	ASE	●	○
Acrossus luridus (Fabricius, 1775)	ASE		○
Acrossus siculus siculus (Harold, 1862)	SICI	●	○
Agoliinus ragusae (Reitter, 1892)	SISA		○
Agrilinus constans (Duftschmidt, 1805)	CAE		○
Agrilinus convexus (Erichson, 1848)	ASE		○
Agrilinus ibericus (Harold, 1874)	MED		○
Alocoderus hydrochaeris (Fabricius, 1798)	TEM		○
Anomius castaneus (Illiger, 1803)	WME	+	○
Aphodius fimetarius (Linnaeus, 1758)	PAL	+	○
Aphodius foetidus (Herbst, 1783)	EUM	+	○
Aphodius pedellus (De Geer, 1774)	OLA	+	○
Biralus mahunkaorum Ádám, 1983	WME	+	○
Bodiloides ictericus ghardimaouensis (Balthasar, 1929)	TUM	●	○
Bodilopsis rufa (Moll, 1782)	ASE	●	○

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Table 1 – *Continued from previous page*

TAXA	CHOROTYPES	NEBRODI MTS	MADONIE MTS
Bodilus beduinus (Reitter, 1892)	WME	○	○
Bodilus lugens (Creutzer, 1799)	CAE	●	○
Calamosternus algiricus (Mariani & Pittino, 1983)	WME	○	○
Calamosternus granarius (Linnaeus, 1767)	PAL	●	○
Calamosternus mayeri (Pilleri, 1953)	WME	+	○
Chilothorax lineolatus (Illiger, 1803)	TUM	+	○
Chilothorax paykulli (Bedel, 1907)	TUE	●	○
Colobopterus erraticus (Linnaeus, 1758)	ASE	+	○
Erytus cognatus (Fairmaire, 1860)	MED	○	○
Esymus merdarius (Fabricius, 1775)	CAE	●	
Esymus pusillus pusillus (Herbst, 1789)	SIE	○	○
Eudolus quadriguttatus (Herbst, 1783)	CEM		○
Euheptaulacus carinatus esuriens G. Dellacasa, 1983	SICI		○
Euorodalus paracoenosus (Balthasar & Hrubant, 1960)	TUE	●	
Euorodalus tersus (Erichson, 1848)	WME		○
Labarrus lividus (Olivier, 1789)	MED	+	○
Limarus zenkeri (Germar, 1813)	EUR	●	○
Liothorax niger (Illiger, 1798)	CAE	●	○
Loraphodius suarius (Faldermann, 1835)	TUM	●	○
Mecynodes striatulus (Waltl, 1835)	MED		○
Melinopterus consputus (Creutzer, 1799)	TUE	+	○
Melinopterus prodromus (Brahm, 1790)	CAE	●	○
Melinopterus reyi (Reitter, 1892)	SEU		○
Melinopterus sphacelatus (Panzer, 1798)	TUE	+	○
Melinopterus tingens (Reitter, 1892)	WME		○
Nimbus contaminatus (Herbst, 1783)	TUE	●	○
Nimbus obliteratus (Panzer, 1823)	TUE	+	○
Otophorus haemorrhoidalis (Linnaeus, 1758)	PAL	●	○
Oxyomus sylvestris (Scopoli, 1763)	CAE		○
Phalacronothus biguttatus (Germar, 1824)	TUE	○	○
Phalacronothus quadrimaculatus (Linnaeus, 1760)	SIE	○	
Planolinoides borealis (Gyllenhal, 1827)	SIE	●	○
Pseudacrossus suffertus (A. Schmidt, 1916)	EME	○	○
Sigorus porcus (Fabricius, 1792)	TUE	○	○
Subrinus sturmi (Harold, 1870)	CEM	+	○
Trichonotulus scrofa (Fabricius, 1787)	CAE	○	○
Volinus sticticus (Panzer, 1798)	CAE	●	○
Brindalus porcicollis (Illiger, 1803)	MED		○

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Table 1 – *Continued from previous page*

TAXA	CHOROTYPES	NEBRODI MTS	MADONIE MTS
Platytomus tibialis (Fabricius, 1798)	TUM	●	○
Psammodius laevipennis A. Costa, 1844	TEM	○	○
Pleurophorus caesus (Panzer, 1796)	PAL	●	○
Pleurophorus mediterranicus Pittino & Mariani, 1986	WME		○
Rhyssemus parallelus Reitter, 1892	WME	○	○
Rhyssemus plicatus (Germar, 1817)	WME	+	○
Rhyssemus sulcatus (Olivier, 1789)	WME		○
SCARABAEIDAE SCARABAEINAE			
Ateuchetus variolosus (Fabricius, 1787)	MED	●	○
Ateuchetus semipunctatus (Fabricius, 1792)	WME	○	○
Scarabaeus sacer Linnaeus, 1758	TUM	○	○
Scarabaeus typhon (Fischer von Waldheim, 1823)	CAE	+	○
Gymnopleurus (Gymnopleurus) mopsus mopsus(Pallas, 1781)	CAE		○
Gymnopleurus (Gymnopleurus) sturmii (Macleay, 1821)	MED	○	○
Sisyphus schaefferi schaefferi (Linnaeus, 1758)	EUR	●	○
Copris (Copris) lunaris (Linnaeus, 1758)	TUE	●	○
Copris (Copris) hispanus cavolinii Petagna, 1792	EME	●	○
Bubas bison (Linnaeus, 1767)	WME	●	○
Cheironitis furcifer (Rossi, 1792)	MED	●	○
Cheironitis irroratus (Rossi, 1790)	WME	+	○
Onitis ion (Olivier, 1789)	WME	●	○
Euoniticellus fulvus (Goeze, 1777)	CEM	●	○
Euoniticellus pallens (Olivier, 1789)	CAM		○
Euoniticellus pallipes (Fabricius, 1798)	CEM	+	○
Caccobius (Caccobius) schreberi (Linnaeus, 1767)	CEM	●	○
Euonthophagus amyntas amyntas (Olivier, 1789)	TUE	○	○
Onthophagus (Furconthophagus) furcatus (Fabricius, 1781)	TEM	●	
Onthophagus (Onthophagus) taurus (Schreber, 1759)	TEM	●	○
Onthophagus (Palaeonthophagus) andalusicus andalusicus Watl, 1835	WME	○	○
Onthophagus (Palaeonthophagus) grossepunctatus Reitter, 1905	SEU	●	○
Onthophagus (Palaeonthophagus) massai Baraud, 1975	SICI	●	○

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Table 1 – *Continued from previous page*

TAXA	CHOROTYPES	NEBRODI MTS	MADONIE MTS
Onthophagus (Palaeonthophagus) medius (Kugelann, 1792)	TUE	+	
Onthophagus (Palaeonthophagus) opacicollis Reitter, 1892	MED	+	○
Onthophagus (Palaeonthophagus) ruficapillus Brullé, 1832	CAE	○	○
Onthophagus (Palaeonthophagus) semicornis (Panzer, 1798)	TUE	+	○
Onthophagus (Palaeonthophagus) vacca (Linnaeus, 1767)	TEM	●	○
Onthophagus (Palaeonthophagus) verticicornis (Laicharting, 1781)	TUE	●	○
SCARABAEIDAE ORPHNINAE			
Hybalus benoiti Tournier, 1864	SISA	●	○
Hybalus bigibber Reitter, 1892	SICI		○
SCARABAEIDAE MELOLONTHINAE			
Hymenoplia sicula Blanchard, 1850	APSI	○	○
Hoplia (Hoplia) paganettii J. Müller, 1907	SISA	○	○
Amphimallon fuscum (Scopoli, 1786)	SEU	○	○
Amphimallon javeti Stierlin, 1864	SISA	●	○
Amphimallon pseudomajale Sabatinelli, 1976	SISA	○	
Aplidia hirticollis (Burmeister, 1855)	SISA	+	○
Aplidia transversa transversa (Fabricius, 1801)	EUR		○
Aplidia villigera (Burmeister, 1855)	SICI		○
Firminus ciliatus ciliatus (Reiche, 1862)	SICI	●	○
Geotrogus sicelis Blanchard, 1850	SICI		○
Rhizotrogus romanoi Sabatinelli, 1975	SICI	●	○
Rhizotrogus siculus Baraud, 1970	SISA	○	○
Anoxia (Anoxia) scutellaris sicula Motschulsky, 1860	SICI		○
Anoxia (Mesanoxia) matutinalis matutinalis Laporte de Castelnau, 1832	APSD		○
Anoxia (Protanoxia) orientalis (Krynicky, 1832)	EME	●	○
Melolontha melolontha (Linnaeus, 1758)	EUR		○
SCARABAEIDAE RUTELINAE			
Anomala ausonia Erichson, 1847	WME	+	○
Anisoplia (Anisoplia) monticola marginata Kraatz, 1883	SISA	●	○
Anisoplia (Anisoplia) sabatinellii Baraud, 1991	SISA	+	

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Table 1 – *Continued from previous page*

TAXA	CHOROTYPES	NEBRODI MTS	MADONIE MTS
Anisoplia (Anisoplia) tempestiva Erichson, 1847	SEU	●	○
SCARABAEIDAE PACHYPODINAE			
Pachypus caesus Erichson, 1840	SICI	○	○
SCARABAEIDAE DYNASTINAE			
Pentodon bidens punctatum (Villers, 1789)	MED	+	○
Phyllognathus excavatus (Förster, 1771)	TUM	+	○
Oryctes nasicornis grypus Illiger, 1803	WME	●	○
SCARABAEIDAE CETONIINAE			
Valgus hemipterus (Linnaeus, 1758)	SIE	●	○
Gnorimus decempunctatus Helfer, 1833	SICI	○	○
Trichius gallicus gallicus Dejean, 1821	EUR	●	○
Osmoderma cristinae Sparacio, 1994	SICI	●	○
Aethiessa floralis squamosa (Gory & Percheron, 1833)	SISA	●	○
Cetonia aurata sicula Aliquò, 1983	SICI	●	○
Protaetia (Cetonischema) speciosissima (Scopoli, 1786)	EUR	○	○
Protaetia (Eupotosia) affinis affinis (Andersch, 1797)	EUR	●	○
Protaetia (Netocia) morio morio (Fabricius, 1781)	WME		○
Protaetia (Netocia) squamosa squamosa (Lefebvre, 1827)	SICI	●	○
Protaetia (Potosia) hypocrita (Ragusa, 1905)	SICI	●	○
Protaetia (Potosia) opaca (Fabricius, 1787)	WME		○
Tropinota hirta hirta (Poda von Neuhaus, 1761)	EUM	+	
Tropinota squallida squallida (Scopoli, 1783)	EUM	+	○
Oxythyrea funesta (Poda von Neuhaus, 1761)	CEM	+	○
Total *taxa*	**147**	117	133
	Total *taxa*	**Nebrodi Mts**	**Madonie Mts**

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