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An annotated Checklist of the fauna of Maraone islet (Aegadian Archipelago, North-Western Sicily)

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ABSTRACT

Maraone islet is located 6,700 m from the north-western coast of Sicily (Italy) and 5,000 m from the island of Levanzo and has a surface area of 31,000 m² and a maximum height of 5 m above sea level. In recent years, we have conducted naturalistic research on this islet and in the following paper we provide an initial checklist of the fauna that we have recorded there. The largest group of animal species was Insecta (49.6%), representing almost half of the total number of animal species present on Maraone islet. No previous faunistic research has been conducted on Maraone islet and almost all of the species recorded are new to the island. Among the most interesting findings was the discovery, for example, of the *Hemidactylus turcicus* (Linnaeus, 1758) (Reptilia Gekkonidae) for the first time on the islet and the description of *Alphasida (Glabrasida) grossa livrerii* n. ssp. (Coleoptera Tenebrionidae). Several taxa are still the subject of more in-depth studies, as most of the sampling was extremely conservative in respect of the small size of the island, the small fauna populations living there, and the delicate ecological balance present. Finally, some ecological observations are provided on the fauna surveyed, their trophic niches and the ecological role of *Malva arborea*, the most common plant on Maraone islet and of vital importance to most species in this faunal community.

KEY WORDS Maraone islet; naturalistic research; Sicily; check-list; biodiversity.

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INTRODUCTION

The Egadi Archipelago, located off the coast of Trapani in western Sicily (Italy) comprises the main islands of Favignana, Levanzo and Marettimo, as well as numerous other small islands that are generally little known from a naturalistic point of view.

As part of research aimed at improving our knowledge of the natural history of the archipelago, excursions were organised to the islet of Maraone (2021-2023). From a bibliographical point of view, there is little information on the fauna and flora of this islet. Gussone (1827–1834, 1842–1845) recorded some plants from this island, but did not distinguish between the specimens collected at Maraone and those collected on the neighbouring island of "Formica". Both islets were generically referred to as "Le Formiche" (Minà Palumbo, 1851; Sparacio, 2022).

Further reports on the flora of Maraone are provided by Pasta & Lo Cascio (2017), with particular reference to the populations of *Calendula maritima*

Guss. These authors also summarise some faunal data relating to the island, particularly the presence of local populations of *Podarcis siculus* (Rafinesque-Schmaltz, 1810) and the Yellow-legged Gull (*Larus michahellis* Naumann, 1840), which nests there (Maggio et al., 2015; Massa et al., 2015).

Following an agreement between the SAAF Department and the Riserva delle Isole Egadi Marine Protected Area, excursions to the islet of Maraone were organised to study the fauna of this small island and improve current knowledge. Our first contribution to the discovery of the breeding of the Little Egret (*Egretta garzetta* Linnaeus, 1766) on the islet of Maraone has already been published (Surdo et al., 2021), while the preliminary work on the island's fauna is presented below, continuing the research and study activity.

MATERIAL AND METHODS

Study area

Maraone islet (Fig. 1) is narrow and long in shape, with the major axis oriented in the NNO-SSE direction. It has a surface area of 31,000 m² and a maximum height of 5 m above sea level. It is located 6,700 m from the western coast of Sicily and 5,000 m from the island of Levanzo. The name may derive from the Sicilian dialect term "maraùni", which refers to the cormorant, *Phalacrocorax carbo* (Linnaeus, 1758) (Pasta & Lo Cascio, 2017).

Maraone is included in the SIC ITA010024 "Fondali dell'Arcipelago delle Isole Egadi" and falls within the Special Protection Area (SPA) ITA010027 "Arcipelago delle Egadi – area marina e terrestre", as defined by the EU Directive 79/409 "Birds". The sea surrounding the Maraone islet falls within zone A (integrated protection) of the Isole Egadi Marine Protected Area. The islet of Maraone is completely uninhabited and the only human presence is represented, towards the centre of the island, by the ruins of a small house built with blocks of calcarenite.

From a geological point of view, the island of Maraone, which rises from the sea surface by only 5 metres, represents the peak of a larger submerged territory. It is formed from Mesozoic-Tertiary carbonate deposits ranging in age from the Upper Triassic to the Eocene. These form the Favignana Unit of the "Facies di M. Acci" and belong to the Pre-Panormidi complex of units (Giunta & Liguori, 1972; Catalano & D'Argento, 1982).

The most significant events to have occurred in this territory, which includes the coastline between Trapani and Marsala and the islands of Favignana and Levanzo, are the eustatic regressions and transgressions that occurred in the Upper Pleistocene and Holocene, which modified the morphogenesis of these coastlines (Agnesi et al., 1993). During the Riss-Wurmian interglacial period, the maximum rise in sea level originated terraces of 8-10 m in Levanzo and Favignana, and submerged the Isola Lunga and the plain of Torre del Bosco-Birgi Novo-Trapani. At the maximum Wurmian regression (18,000 years ago), with the sea level 120 m below the current level, this area became a single landmass (excluding Marettimo), experiencing a period of maximum continentality. The definitive isolation of the Maraone island occurred around 8,000 years ago.

Based on the thermo-pluviometric data from the nearest station (Trapani), it experiences annual rainfall of around 480 mm and average annual temperatures of around 18 °C, resulting in a bioclimate with a lower thermomediterranean termotype and a superior dry ombrotope.

Pasta & Lo Cascio (2017) reported 25 plant taxa on Maraone islet, most of which are (hyper)nitrophilous and tolerant of drought and saline soils. They cite, in particular: *Hyosciamus albus* L., *Malva arborea* (Mill.) Webb & Berthel, *Malva multiflora* (Cav.) Soldano, Banfi & Galasso, *Crithmum maritimum* L., *Lotus cytisoides* L., *Frankenia hirsuta* L., *Spergularia salina* J. Presl et C. Presl., *Arthrocaulon meridionale* Es. Ramírez, Rufo, Sánchez Mata, V. Fuente, *Galium verrucosum* Huds. subsp. *halophilum* (Ponzo) Lambinon. In addition, *Calendula maritima* Guss. and *Limonium ponzoi* (Fiori & Bég.) Brullo, endemic species of the nearby Trapani coast and other surrounding islands, are present on the island; these species are of particular ecological interest. *Anthemis secundiramea* Biv. and *Hornungia revelieri* (Jord.) Soldano, F. Conti, Banfi & Galasso, which were reported in Maraone islet in the past, require further confirmation. During our research, we also found young caper plants (*Capparis spinosa* L.).

Methods

Some excursions to the islet of Maraone have been carried out starting from 1.VI.2021 and sub-

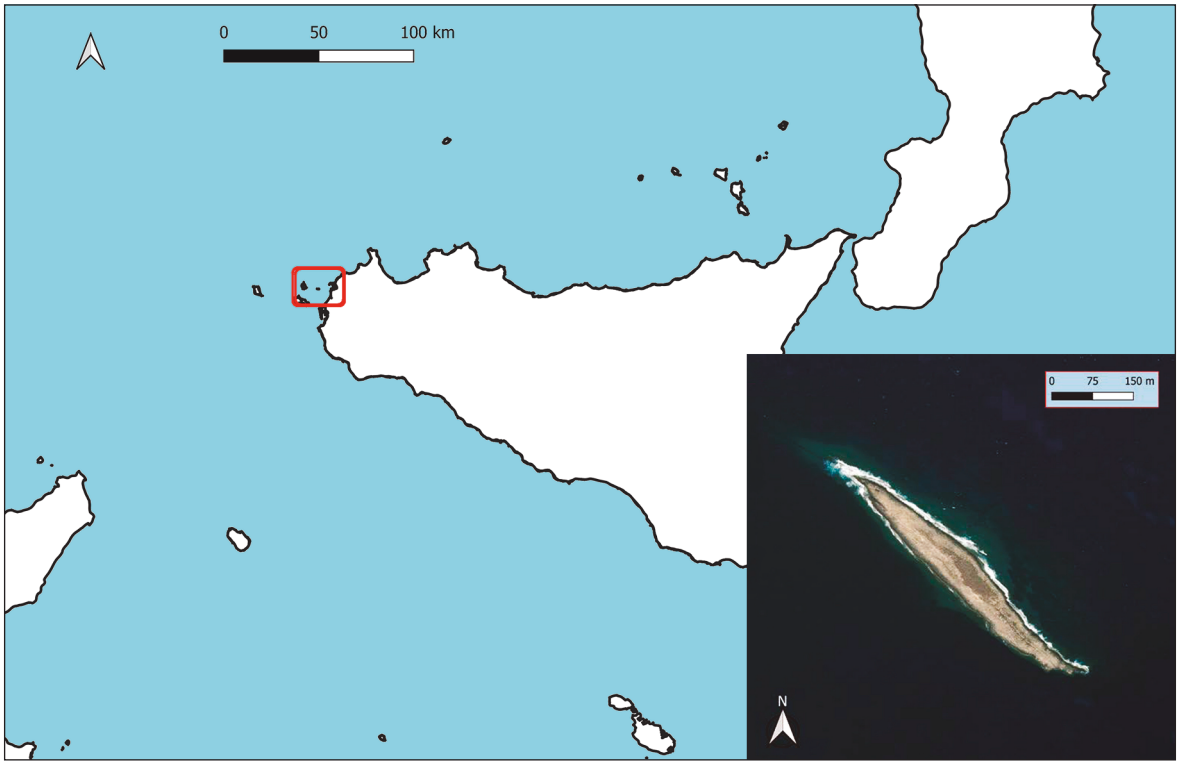


Figure 1. The study area: Maraone islet (Aegadian Archipelago, North-Western Sicily).

sequently on 11.03.2022; 31.05.2022, 3.08.2023, and 1.02.2024.

The specimens were observed in the field on sight on the soil, on the vegetation, under rocks and debris taking care not to alter the environment and sampling only the few specimens necessary for the morphological and taxonomic identification.

Field visits to the study area covered the island's main habitats: the mallow scrub, the coastal strip, and the rocky cliffs with halophilous formations. Various sampling methods were used: 1) visual collection under boulders, among shrubs, on plants and in the soil, in leaf litter, and under rocks; 2) with an entomological aspirator; 3) examination of plant debris and soil in situ or in the laboratory; 4) meadow nets.

Morphological studies were conducted using an Optika stereomicroscope and a Canon EOS 100D and a Nikon D3100 camera. Some morphological structures were studied using a Vevor XSP-36TV optical microscope. The analyzed parts were first extracted from the insect body (already in alcohol or dry), then treated with 10% potassium hydroxide (KOH) for 3–24 hours, subsequently rinsed in distilled water in glass Petri dishes, then immersed in 70% and 85% alcohol for 20 minutes, then placed in a 1.5 ml test tube with xylene to dehydrate the tissues and, finally, placed under a slide with Canada balsam. The samples were stored dry or in 80% alcohol in the collections of the respective authors.

The consulted bibliography and the determinations carried out by other colleagues are cited in the text. Species sequence and nomenclature of birds: Baccetti et al., 2021. The systematic list of arthropods has been organised according to the Giribert & Edgecombe (2019) model; the systematic order of Hexapoda has been set according to the recent model of Du et al. (2024). The systematic list follows that adopted by Stoch (2003). The bibliography is cited in the text.

ABBREVIATIONS AND ACRONYMS. A. Dentici collection, Palermo, Italy (CD); Museum of Zoology "Pietro Doderlein" University of Palermo, Italy (MZDP); I. Sparacio collection, Palermo, Italy (CS), R. Viviano collection, Palermo, Italy (CV). Rl = length of basal part of ovipositor/length of apical part. Ro = length of the body/length of ovipositor; Rp = length of the body/length of aedeagus.



Figure 2. Maraone islet (Aegadian Archipelago, North-Western Sicily).



Figure 3. Central area of the Maraone islet (Aegadian Archipelago, North-Western Sicily).



Figure 4. The south-eastern tip of the Maraone islet with the Formica island and the Sicilian coast (Monte San Giuliano).



Figure 5. South-eastern area of the islet of Maraone with the island of Levanzo in the background.



Figure 6. Maraone islet with the island of Levanzo in the background and, behind, the island of Favignana.



Figure 7. North-western area of the Maraone islet.



Figures 8–13. Some plants from the islet of Maraone (Aegadian Archipelago, North-Western Sicily). Fig. 8: *Hyoscyamus albus*. Fig. 9: *Lotus cytisoides*. Fig. 10: *Matthiola tricuspidata*. Fig. 11: *Mesembryanthemum crystallinum*. Figs. 12, 13: *Calendula maritima*.



Figures 14, 15. Central area of the islet of Maraone covered by dense tree *Malva arborea* vegetation (above) and detail of the flowers (below); this population of tree mallow, which covers a relatively large area, plays an important ecological role for the fauna that lives on this islet.

RESULTS

Systematics

Phylum ARTHROPODA Gravenhorst, 1843
Subphylum CHELICERATA Heymons, 1901
Classis ARACHNIDA Cuvier, 1812
Ordo ORIBATIDA Dugès, 1833
Familia LIACARIDAE Sellnick, 1928
Genus *Liacarus* Michael,1898

Liacarus sp.

Distribution and biology. The oribatid mite family Liacaridae comprises nine genera and 125 species with a cosmopolitan distribution. The cosmopolitan genus *Liacarus* includes over 111 highly diverse species (Subías, 2004, online version 2018; Ermilov et al., 2011). The genera *Liacarus* and *Xenillus* are difficult to deal with taxonomically because they are not clearly defined and include many morphologically diverse species, which are also highly variable intraspecifically (Grobler et al., 2003).

Remarks. In Maraone islet, *Liacarus* sp. lives in leaf litter of *Malva arborea*.

Familia XENILLIDAE Woolley et Higgins, 1966
Genus *Xenillus* Robineau-Desvoidy, 1839

Xenillus sp.

Distribution and biology. The genus *Xenillus* includes approximately 80 species (Balogh & Balogh, 1992; Subías, 2004 online version 2018) widespread throughout the Holarctic and Neotropical regions.

Remarks. In Maraone islet, *Xenillus* sp. lives in leaf litter of *Malva arborea*.

Ordo ARANEAE Clerck, 1757
Superfamilia ERESOIDEA C.L. Koch, 1851
Familia OECOBIIDAE Blackwall, 1862
Genus *Oecobius* Lucas, 1846

Oecobius navus Blackwall, 1859

Distribution and biology. Europe, northern Africa, Turkey, Caucasus, Jordan, Israel, Iran. Introduced to South Africa, China, Korea, Japan, New Zealand, Canada, USA, South America (WSC, 2024).

It builds flat webs with side openings under rocks or in crevices of rock faces or large boulders, on ceilings and along wall corners with protruding signal wires.

Remarks. They are quite common in Maraone islet, some specimens were sampled under the rocks. New record for Trapani province.

Superfamilia GNAPHOSOIDEA Simon, 1893
Familia PRODIDOMIDAE Simon, 1884
Genus *Prodidomus* Hentz, 1847

Prodidomus amaranthinus (Lucas, 1846)

Distribution and biology. Mediterranean (WSC, 2024).

A wine-red species what lives under rocks (Dentici & Amata, 2021).

Remarks. One adult female and two juveniles of this species were sampled under the same rock. New record for Trapani province.

Superfamilia DYSDEROIDEA C.L. Koch, 1837
Familia DYSDERIDAE C.L. Koch, 1837
Subfamilia DYSDERINAE C. L. Koch, 1837
Genus *Dysdera* Latreille, 1804

Dysdera crocata C.L. Koch, 1838

Distribution and biology. *Dysdera crocata* is widespread in Azores, Europe, Turkey, Caucasus, Iraq, Central Asia; introduced to North America, Chile, Brazil, South Africa, Australia, New Zealand, Hawaii (WSC, 2024).

Terrestrial species, it lives usually under rocks or sediment. *Dysdera crocata* has long fangs and a keeled prosoma that allow it to prey on arthropods even with robust carapaces.

Remarks. Two females and one male were sampled on the Maraone islet, but many others, including juveniles, were observed. The large presence of this species can be explained by the abundance of isopods.

Familia SEGESTRIIDAE Simon, 1893
Genus *Ariadna* Audouin, 1826

Ariadna brignolii Wunderlich, 2011

DISTRIBUTION AND BIOLOGY. Italy.

This species, as well as the others belonging to the Segestriidae familia, build tubular webs, inside ravines in the rock or between the barks of trees, at the entrance of which there are silk threads, arranged in a radial pattern, which, when touched, warn the spider on the presence of potential prey.

REMARKS. Four juveniles and two adults (one male and one female) of *Ariadna brignolii* were sampled. All the specimens observed in Maraone islet had built their webs inside dry *Lavatera* sp. stems. This species is a new record for Trapani province.

Superfamilia ARANEOIDEA Latreille, 1806
Familia THERIDIIDAE Sundevall, 1833
Genus *Enoplognatha* Pavesi, 1880

Enoplognatha mandibularis (Lucas, 1846)

DISTRIBUTION AND BIOLOGY. Europe, North Africa, Turkey, Israel, Russia (Europe) to Central Asia, China.

Biology not well known, because often confused with similar species (Nentwig et al., 2024).

REMARKS. Two female specimens were found between some blocks of tuff. New record for Trapani province.

Familia LINYPHIIDAE Blackwall, 1859
Subfamilia ERIGONINAE Emerton, 1882
Genus *Araeoncus* Simon, 1884

Araeoncus humilis (Blackwall, 1841)

DISTRIBUTION AND BIOLOGY. Europe, North Africa, Russia (Europe to South Siberia), Iran, Japan. Introduced to New Zealand.

Small sized species, observable in different habitats.

REMARKS. Only one female specimen was sampled and observed on the Maraone islet. This presence requires further confirmation. New record for Trapani province.

Genus *Diplocephalus* Bertkau, 1883

Diplocephalus graecus (O. P-Cambridge, 1872)

DISTRIBUTION AND BIOLOGY. Madeira, Europe, North Africa, Turkey, Israel.

Since a few decades, this species shows some spreading tendencies within Europe. Nevertheless, it shall not be listed as alien or invasive because it is native for Europe (Nentwing et al., 2024).

REMARKS. *Diplocephalus graecus* has recently been observed in Sicily (Dentici et al., 2022); two male specimens of this species were sampled on the Maraone islet.

Superfamilia FILISTATOIDEA Ausserer, 1867
Familia FILISTATIDAE Ausserer, 1867
Genus *Filistata* Latreille, 1810

Filistata insidiatrix (Forsskål, 1775)

DISTRIBUTION AND BIOLOGY. Mediterranean to Turkmenistan. Introduced to Azores, Cape Verde, Angola, Yemen (Socotra), Venezuela.

These spiders are irregular web builders with a central tubular part, built inside ravines, cracks in rock faces. Often they are found in the spaces between piles of stones and are also common in country houses.

REMARKS. Many specimens were found on the islet, in which the cobwebs were built between the spaces of some piles of rocks and, in one case, among the accumulated dry *Malva arborea* shrubs.

Superfamilia GNAPHOSOIDEA Pocock, 1898
Familia GNAPHOSIDAE Pocock, 1898
Subfamilia GNAPHOSINAE Pocock, 1898
Genus *Nomisia* Dalmas, 1821

Nomisia exornata (C.L. Koch, 1839

DISTRIBUTION AND BIOLOGY. Europe, North Africa, Turkey, Caucasus, Kazakhstan, Central Asia.

Ground spiders with uniform light brown shades, specialized in preying on ants.

REMARKS. Two females of this species were sampled on Maraone islet wandering among the plant debris.

Subfamilia ZELOTINAE Platnick, 1990

Genus *Zelotes* Gistel, 1848

Zelotes callidus (Simon, 1878)

Distribution and biology. Spain, France, Italy, Malta, Morocco.

Wandering ground spiders.

Remarks. Only one male specimen of *Zelotes callidus* was sampled in this islet and two juveniles are temporarily associated with this species. New record for Trapani province.

Familia THOMISIIDAE Sundevall, 1833
Subfamilia THOMISINAE Sundevall, 1833
Genus *Ozyptila* Simon, 1864

Ozyptila confluens (C.L. Koch, 1845)

Distribution and biology. Southern Europe, Syria.

Ground spiders with cryptic coloration that hunt by ambush.

Remarks. Two females of this species were sampled in Maraone islet. New record for Trapani province.

Superfamilia SCYTODOIDEA Blackwall, 1864
Familia SICARIIDAE Keyserling, 1880
Subfamilia LOXOSCELINAE Simon, 1893
Genus *Loxosceles* Heineken et Lowe, 1832

Loxosceles rufescens Dufour, 1820

Distribution and biology. Southern Europe, northern Africa to Iran, Afghanistan. Introduced to USA, Mexico, Peru, Macaronesia, South Africa, India, China, Japan, Korea, Laos, Thailand, Philippines, Australia, Hawaii.

In dry habitats, under stones, rock crevices. Often in and around houses and buildings.

This species can bite humans, as also all other *Loxosceles* species in the world. In contrast to all other spider bites, this bite does not cause pain but could cause necrotic lesions. Most bites cause moderate local itchiness and redness, self-healing without complications within short time. More severe cases are rare and may include necrotic injuries, sometimes healing only after months. However, such cases are rare for this European species.

Since a few decades, this species shows some spreading tendencies within Europe. Nevertheless, it shall not be listed as alien or invasive because it is native for Europe (Nentwig et al., 2024).

Remarks. Two juvenile specimens of this species were sampled in Maraone islet under the same stone.

Superfamilia SALTICOIDEA Blackwall, 1865
Familia SALTICIDAE Blackwall, 1865
Subfamilia SALTICINAE Blackwall, 1841Genus *Pseudeuophrys* Dahl, 1912

Pseudeuophrys lanigera (Simon, 1871)

Distribution and biology. Europe, Turkey, Caucasus, Iran? Introduced to USA. Since a few decades, this species shows some spreading tendencies within Europe. Nevertheless, it shall not be listed as alien or invasive because it is native for Europe (Nentwig et al., 2024).

Pseudeuophrys lanigera lives in buildings and at walls.

Remarks. Only one female specimen was collected on the islet, wandering on the *Malva arborea* plants. New record for Trapani province.

Ordo PSEUDOSCORPIONIDA Haeckel, 1866
Familia CHELIFERIDAE Risso, 1827
Subfailia CHELIFERINAE Risso 1827
Genus *Dactylochelifer* Beier, 1932

Dactylochelifer latreillii latreillii (Leach, 1817)

Distribution and biology. Mainland Italy, Sardegna, Sicilia (Pantini & Isaia, 2024).

There is no detailed data on the biology of this species.

Remarks. In Maraone islet, this species lives in leaf litter of *Malva arborea*.

Genus *Hysterochelifer* Chamberlin, 1832

Hysterochelifer tuberculatus tuberculatus (Lucas, 1849)

Distribution and biology. Mainland Italy, Sardegna, Sicilia (Pantini & Isaia, 2024).

There is no certain data on the biology of this species.

REMARKS. Six specimens of *H. tuberculatus tuberculatus* were collected on the ground under plant debris.

Subphylum MYRIAPODA Latreille, 1802
Classis CHILOPODA Latreille, 1817
Ordo GEOPHILOMORPHA Pocock, 1895
Familia HIMANTARIIDAE Bollman 1893
Genus *Himantarium* Koch, 1847

Himantarium mediterraneum Meinert, 1870 (Figs. 16–18)

DISTRIBUTION AND BIOLOGY. Species reported in Sardinia, Sicily, Pelagie Islands (Lampedusa and Linosa), Tunisia (Silvestri, 1897; Manfredi, 1960; Matic & Darabantu, 1968; Zapparoli in Massa, 1995; Bonato & Minelli, 2021) and Spanish provinces of Ceuta and Melilla (north-west of Africa) (Cabanillas et al., 2023); nevertheless, the species is not mentioned for Sicily in ChiloBase (Bonato et al., 2016) or for Europe in ChiloKey (Bonato et al., 2014).

This species is associated with thermophilic vegetation formations: garrigue, pastures, scrubland, cultivated land and degraded environments (Zapparoli in Massa, 1995). Matic & Darabantu (1968) report it for the Ippari Valley (Vittoria, RG), Etna (Bosco Nicolosi), Pedara (Etna) and Erice (Trapani). In Sicily, it has also been observed in Favignana (TP) in Cala Rossa and Monte Catalfano (Bagheria, Palermo) on a south-facing slope with Poaceae formations and sparse Mediterranean scrub, in grassland areas with sparse *Pinus* reforestation (Monte Pecoraro, Cinisi) and in sunny rocky meadows under boulders near urban landfills (Bellolampo, Palermo) (Viviano pers. data).

REMARKS. Bonato & Minelli (2014), based on the morphological characteristics of the last pair of legs and the pattern of the dorsal sclerite in the last segment, previously highlighted by various authors (Attems 1929; Brolemann 1930; Demange 1949), distinguish the North African populations of *H. mediterraneum* from the European populations attributed to *H. europaeum* Chalande et Ribaut, 1909. Matic (1967) and Foddai et al. (1995) do not report this species for the Egadi Islands, therefore this data is new for these islands. Recently, Iorio (2021) confirms this species in European territory only for Sicily.

It is the most common geophilomorph on the island. Numerous specimens were found under rocks among *Malva arborea* plants; occasionally they find refuge inside empty shells of *Eobania vermiculata* (O.F. Müller, 1774). The specimens examined were compared with Brolemann (1930, fig. 34), where in the last pair of legs, in both males and females, the segments are swollen rather than slender as in *H. europaeum* (Brolemann, 1930, figs. 35-36).

Familia GEOPHILIDAE Leach, 1815
Genus *Henia* Koch, 1847

Henia pulchella (Meinert, 1870) (Figs. 19–21)

DISTRIBUTION AND BIOLOGY. Mediterranean. Europe: Greece, Italy (including Sicily); North Africa: Algeria (ChiloBase 2.0: Bonato et al., 2016).

New species for the Egadi Islands.

REMARKS. *Henia pulchella* was found only in the *Malva* maquis litter and in the first layer of moist soil rich in organic substance, even under small boulders. The specimens examined have 51-55 pairs of legs (males) and 56 pairs of legs (females) and measure an average of 20 mm in length.

Genus *Pachymerium* Koch, 1847

Pachymerium ferrugineum (Koch, 1835)

DISTRIBUTION AND BIOLOGY. W-Palearctic, distribution including all Italy, Sicily, Sardinia and smaller islands. Species already known for the Egadi Islands (Zapparoli, 1995).

It is a euriecia species, with high adaptation to numerous environments: supralittoral area, Mediterranean scrub, peri-lake, degraded open spaces, derived pastures, etc.

REMARKS. On Maraone islet, *Pachymerium ferrugineum* is present in *Malva* maquis**,** under stones and in leaf litter.

Ordo SCOLOPENDROMORPHA Pocock, 1895
Familia CRYPTOPIDAE Kohlrausch, 1881
Genus *Cryptops* Leach, 1814

Cryptops trisulcatus Brölemann, 1902 (Figs. 22–24)

DISTRIBUTION AND BIOLOGY. Western Mediter-



Figures 16–21. Chilopoda (Geophilomorpha) from Maraone islet. Figs. 16-18: *Himantarium mediterraneum* with habitus (Fig. 16), female (Fig. 17) and male (Fig. 18). Figs. 19-21: *Henia pulchella* with body (Fig. 19), ventral side of head (Fig. 20) and ultimate legs of male (Fig. 21).

ranean (Algeria, Iberian Peninsula, southern France, Corsica, Italy) (Zapparoli, 1995), also reported in Romania (Matic, 1966 a), Bulgaria (Bachvarova, 2011) and Greece (Zapparoli, 1994).

In Italy, it is distributed in Sardinia and Sicily, Liguria and central-southern regions, small Italian and Sicilian islands (including Favignana and Marettimo), in thermophilic, open and forests environments (Zapparoli, 1995).

REMARKS. Only four specimens in the *Malva* maquis in February, under stones.

Classe DIPLOPODA Blainville in Gervais, 1844
Ordo POLYXENIDA Lucas, 1840
Familia POLYXENIDAE Lucas, 1840
Genus *Polyxenus* Latzel, 1884

Polyxenus lagurus (Linnaeus, 1758)

DISTRIBUTION AND BIOLOGY. Very widespread species in the Western Paleartic (Recuero & Rodrìguez-Flores, 2023), Europe, North America and Australia (Enghoff, 1976; Condè, 1996; Short & Vahtera, 2017). In Italy and Sicily (not reported only in Sardinia), it is the only species currently known (Foddai et al., 1995).

REMARKS. *Polyxenus lagurus* is found in leaf litter, under the bark of dead trees, stones and debris. Recent molecular studies seem to suggest the presence of new species in the Italian territory (Short et al., 2020). *Polyxenus lagurus* belongs to a group of diplopods that has not been studied extensively in Sicily, where only the aforementioned species is reported (Foddai et al., 1995; Stoch, 2003; Minelli, 2021).

In Italy, this genus is represented by four species: *P. lagurus*, the most common, *P. macedonicus* (Verhoeff, 1952) originally described for the island of Ischia, *P. lapidicola* Silvestri, 1903 known exclusively from the beach of Portici, *P. albus* Pocock, 1894 found for the first time in Liguria in Genoa, and finally *Polyxenus* sp. for Tuscany based on genetic data (Short et al., 2020). However, in Minelli (2021) only *P. lagurus*, *P. lapidicola* and *P. albus* are mentioned.

Familia LOPHOPROCTIDAE Silvestri, 1897
Genus *Lophoproctus* Pocock, 1895

Lophoproctus cf. ***lucidus*** (Chalande, 1888)

DISTRIBUTION AND BIOLOGY. Short (2015) mentions the genus *Lophoproctus* for Sicily, but indicating it as «*lucidus/coecus*?», two species well distributed in the Mediterranean area. *Lophoproctus lucidus* is distributed in North Africa and France, while *L. coecus* is well distributed in Italy, South-East France, Russia, Georgia, Iran and Kyrgyzstan (Short, 2015). Silvestri & Verhoeff considered these species as synonymous (Short, 2015).

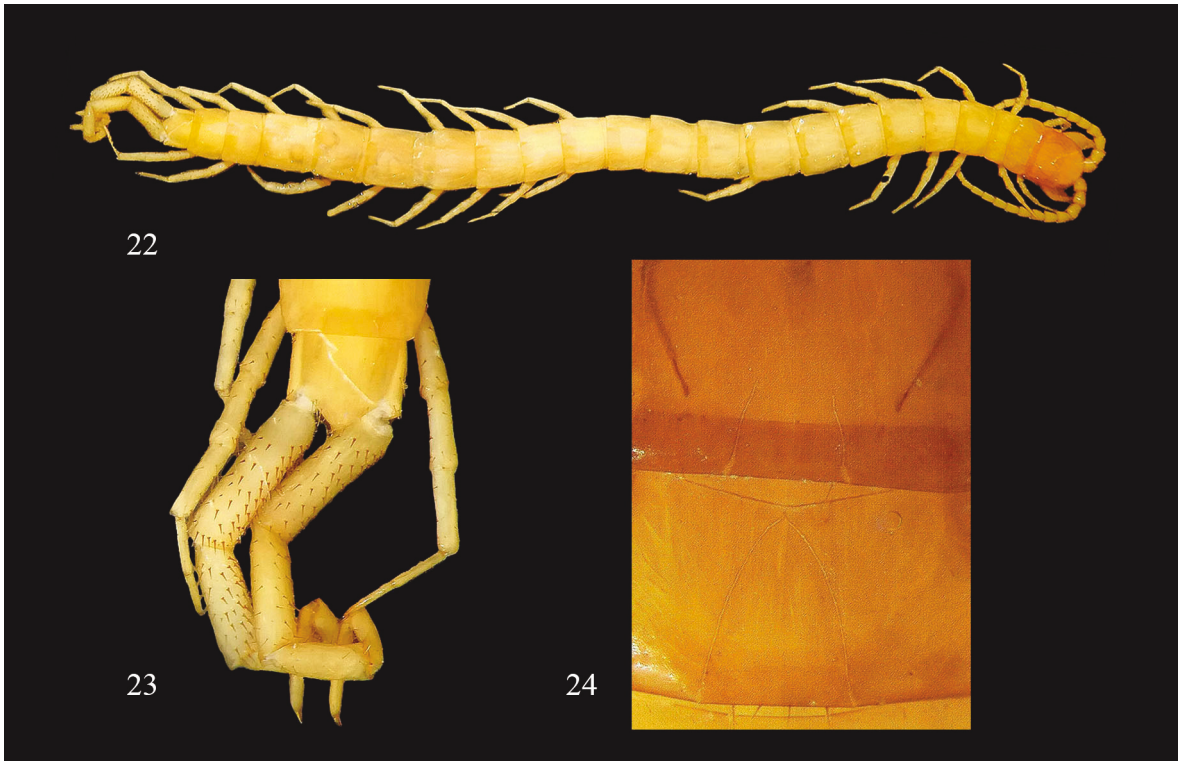
REMARKS. The only specimen found in the organic debris was a juvenile who failed to grow up. *Lophoproctus lucidus* was found in Trapani province from Bosco Angimbè (Calatafimi-Segesta). It is characterized by 4 basiconic sensilla in the 6th antennomere, 3 of which are horizontally aligned and the fourth arranged posteriorly (Short, 2015, fig. 2).

Subphylum CRUSTACEA Brünnich, 1772
Classis MALACOSTRACA (Latreille, 1802)
Ordo AMPHIPODA Latreille, 1816
Familia TALITRIDAE Rafinesque, 1815
Genus *Talitrus* Latreille et Bosc, 1802

Talitrus saltator (Montagu, 1808)

DISTRIBUTION AND BIOLOGY. *Talitrus saltator* is widely distributed along the Mediterranean and European sandy coasts (Marques et al., 2003).

In Sicily, its bioaccumulation of heavy metals on the eastern coasts has been studied (Conti et al., 2016). It is a species typical of sandy shores, feeding on organic debris washed up on beaches and performing characteristic jumps, hence its common name “sea fleas” (Lapiana & Sparacio, 2009). It develops without a larval stage, and the young are released from the female’s proletarian sac in an autonomous stage similar to that of adults (Scapini et al., 1996). They are crepuscular and nocturnal animals, while during the day they live on damp sand in temporary shelters. The solar orientation of *T. saltator* is well known: it uses the solar compass (sea-land axis) to find the area of the beach where it lives during the day and relies on a chronometric mechanism that compensates for the apparent motion of the sun, which functions independently of the lunar orientation at night (see Ugolini et al., 2007 and cited authors).



Figures 22–24. Chilopoda (Scolopendromorpha) from Maraone islet: *Cryptops trisulcatus*. Fig. 22: body. Fig. 23: ultimate pair of legs. Fig. 24: posterior margin of head and T1.

Remarks. Numerous specimens were found in *Salicornietum* and in *Malva arborea* maquis from February to May, when the substrate is damp.

Ordo ISOPODA Latreille, 1817
Familia SPELAEONISCIDAE Vandel, 1948
Genus *Hybleoniscus* Caruso, Pezzino, Messina et Lombardo, 2017

Hybleoniscus petraliai (Caruso & Lombardo, 1977) (Figs. 25–27)

Distribution and biology. Endemic species of Sicily, endogeous, linked to humid environments from the plains to the hills (Pezzino, 2014; Caruso et al., 2017).

Remarks. Few specimens of this species were found in the malvetum, under large buried boulders and in the soil under layers of litter mixed with stones. Both sexes are characterised by their small size (1.6–1.7 mm male and 2.2–2.5 mm female). The study of the endopodite of the first pair of pleopods (Figs. 26, 27) of two male specimens is comparable to the descriptions and images in Caruso et al. (2017). This is a new report for the province of Trapani. The nearest location is Monte Pellegrino near Palermo (Pezzino, 2014; Caruso et al., 2017).

Familia PHILOSCIIDAE Kinahan, 1857
Genus *Ctenoscia* Verhoeff, 1928

Ctenoscia minima (Dollfus, 1892) = *C. dorsalis* (Verhoeff, 1928)

Distribution and biology. Widespread species in the western Mediterranean, from Italy to Spain, including major islands such as the Balearics, the Canaries, Corsica, Malta, Sardinia and Sicily, as well as Morocco and North Africa; recently reported in Britain (Hughes, 2024).

Remarks. Already known in the Egadi Islands under the name *C. dorsalis* (Caruso, 1973; Pezzino, 2014), it is considered by Caruso (1973) to be a relict species of the Egadi Islands. It was identified by studying the distal part of the endopodite of the first pair of pleopods of a single male, which is

straight in shape. Recently, *C. dorsalis* has been considered a junior synonym of *C. minima* by Taiti & Rossano (2015) on the basis of the endopodite and the apex of the pleopod being straight rather than curved outwards. Hughes (2024) also confirms this variability within a single population.

On the Maraone islet, this species lives in the *Malva arborea* maquis, under boulders and mixed debris, together with other isopods.

Familia PORCELLIONIDAE Brandt, 1831
Genus *Acaeroplastes* Verhoeff, 1918

Acaeroplastes melanurus (Budde-Lund, 1885)

DISTRIBUTION AND BIOLOGY. This species is distributed in Italy, Sicily and the islands surrounding Sicily, Spain, the Azores, France, Croatia and the coast of Algeria; its range is northern Mediterranean-Atlantic (Caruso, 1973; Pezzino, 2014).

It lives near the sea, in plains and hilly areas, even above 1000 m altitude (Pezzino, 2014).

REMARKS. *Acaeroplastes melanurus* was found among *Malva arborea* plants, under boulders and small stones.

Genus *Leptotrichus* Budde-Lund, 1879

Leptotrichus panzerii (Audouin, 1826)

DISTRIBUTION AND BIOLOGY. Mediterranean-Macaronesian, common species in Sicily and the adjacent smaller islands.

Leptotrichus panzerii is a species moderately xerophilous, sublapidicolous and terricolous; it sinks into the loose soil very quickly (Pezzino, 2014).

REMARKS. Very common in areas of the Maraone islet covered with vegetation, under stones, in plant debris and buried in the sand.

Genus *Porcellio* Latreille, 1804

Porcellio lamellatus Budde-Lund, 1885

DISTRIBUTION AND BIOLOGY. It is present along



Figures 25–27. Isopoda (Spelaeoniscidae) from Maraone islet: *Hybleoniscus petraliai*.
Fig. 25: body. Fig. 26: endopodite. Fig. 27: endopodite apex.

all the coasts of the Mediterranean basin, along the northern coasts of the Black Sea, and on the European Atlantic coasts. The species is also known from the Hawaiian Islands, where it was probably introduced by man (Taiti & Ferrara, 1991; Taiti & Howarth, 1996; Taiti, 1999).

Porcellio lamellatus is a typical coastal species that lives under rocks near the sea or any other salty water environment (Montesanto et al., 2007).

Remarks. Only two specimens of this species were collected in the debris. The specimens have a cephalon with two very pronounced lateral lobes and a quadrangular central lobe extending forward and bent upwards.

Familia ARMADILLIDIDAE Brandt, 1833
Genus *Armadillidium* Brandt, 1833

Armadillidium granulatum Brandt, 1833

Distribution and biology. Atlantic-Mediterranean species widespread along the Atlantic coasts of France and Portugal, on the coasts of the Mediterranean Sea and the Black Sea; common in Sicily and the surrounding islands (Pezzino, 2014).

Remarks. *Armadillidium granulatum* lives in the soil, under rocks; it is a common species in *Crithmum maritimum* formations (Pezzino, 2014). Specimens of Maraone have been observed in salt marshes and mallow scrub, where they form numerous clusters.

Subphylum HEXAPODA Latreille, 1825
Superclassis HOLOMERENTOMA Prell, 1912
Classis ENTOGNATHA Stummer-Traunfels, 1891
Ordo COLLEMBOLA Lubbock, 1870
Subordo SYMPHYPLEONA (Börner, 1901)

Familia SMINTHURIDAE (Lubbock, 1862) (Fig.)

Distribution and biology. Is the largest and one of the most widely distributed families of Symphypleona (https://www.collembola.org/). Representatives of the Symphypleona order live mainly above the litter layer (Fiordigigli, 2009).

Remarks. The species of this Familia are morphologically characterised by a rounded body with indistinguishable abdominal segmentation; they live on the surface and do not usually have any particular morphological adaptations for endogeic life (Latella, 2015).

The only specimen collected, together with the detrital material of mallow, is a partially damaged juvenile belonging to this Familia.

Ordo PODUROMORPHA Börner, 1913
Familia HYPOGASTRURIDAE Börner, 1906

Distribution and biology. Members of this Familia are common and widespread with a cosmopolitan distribution of about 660 species in about 40 genera (Park & Park, 2006).

Remarks. On the islet of Maraone, several specimens attributable to this Familia were collected in the upper layers of soil and under stones with accumulations of organic debris.

Familia ONYCHIURIDAE Lubbock, 1867

Distribution and biology. A cosmopolitan Familia, also present in the Arctic, which lives in various epigeal and hypogeal environments. Many species in this Familia are slender in appearance, light-coloured or white. Most onychurids are eyeless. They do not have a furcula, although some species have vestigial traces of one.

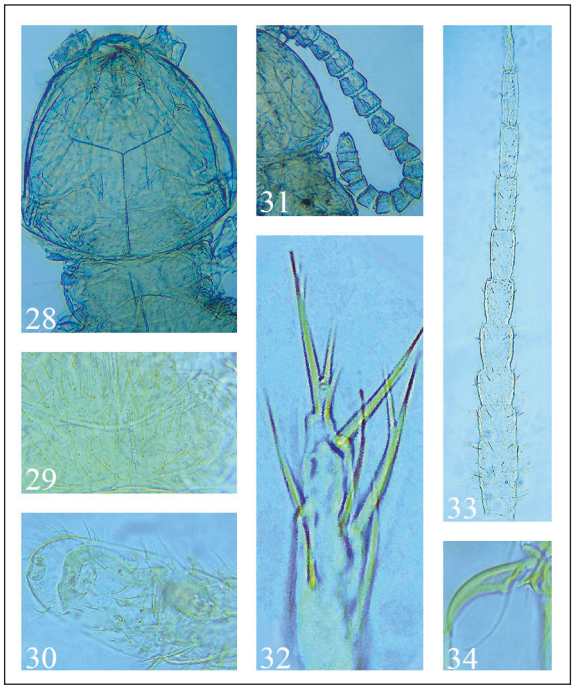
Remarks. A few specimens of this familia have been collected in the soil of the islet of Maraone.

Ordo DIPLURA Börner,1904
Familia CAMPODEIDAE Lubbock, 1873
Genus *Campodea* Westwood, 1842

Campodea cf. ***fragilis*** Meinert, 1865 (Figs. 28–34)

Distribution and Biology. The Campodeidae Familia in Sicily is represented by two genera and five species: *Campodea grassii* Silvestri, 1912, *C. majorica sicula* Condé, 1957, *C. malpighii* Silvestri, 1912, *Plusiocampa suspiciosa* Condé et Mathieu, 1958 and *P. tinoamorei* Sendra et Nicolosi, 2019.

Remarks. On the islet of Maraone, this species lives in the soil, both in the *Malva arborea* scrub (where it takes refuge under stones, in organic debris and in the top few centimetres of soil) and at the edges of the scrub itself under stones that are moderately buried. The specimens examined al-



Figures 28–34. Diplura from Maraone islet: *Campodea* cf. *fragilis*. Fig. 28: head. Fig. 29: pronotum. Fig. 30: apex antennae. Fig. 31: antennae. Fig. 32: stylus 7° urotergite Fig. 33: cercus. Fig. 34: claw.

lowed for determination at the genus level (3+3 macrosetae on the pronotum, hooked nail shape with protruding basal inner margin and setiform lateral process). The attribution to *C. fragilis* is based on the shape of the urosternal styles and the apically curved setiform process that reaches the tip of the claw, bifid and trifid setae in the first antennomeres, and antennae with 15–20 segments (from Sendra & Moreno, 2004). However, the pronotum shape, the arrangement of the macrosetae and the shape of the terminal cerci are not attributable with certainty to this species but may also refer to juvenile specimens.

Familia JAPYGIDAE Lubbock, 1873
Genus *Monojapyx* Paclt, 1957

Monojapyx simplex (Verhoeff, 1923) (Figs. 35-37)

DISTRIBUTION AND BIOLOGY. Western Mediterranean. Originally described for Sicily (Verhoeff, 1923), this species was subsequently reported in other areas of south-western Europe, such as Malta, Spain and the Balearic Islands (Silvestri, 1948a; Pagés, 1978; Ginés, 1982; Sendra & Zaragoza, 1982; Doblas Miranda, 2007). Maraone is the second micro-island environment in the Mediterranean area, having recently been reported on Isola delle Femmine, not far from Palermo (Viviano et al., 2024).

REMARKS. *Monojapyx simplex* from Maraone islet has a body length of 6.5-7.6 mm, antennae with 28 segments, a trapezoidal head, narrower at the front, seventh urotergite with straight rear margin angles, without angular processes, asymmetrical cerci. On this small island, it is the most abundant diplurans, commonly found in *Malvetum*, in the top layers of soil under litter and among stones.

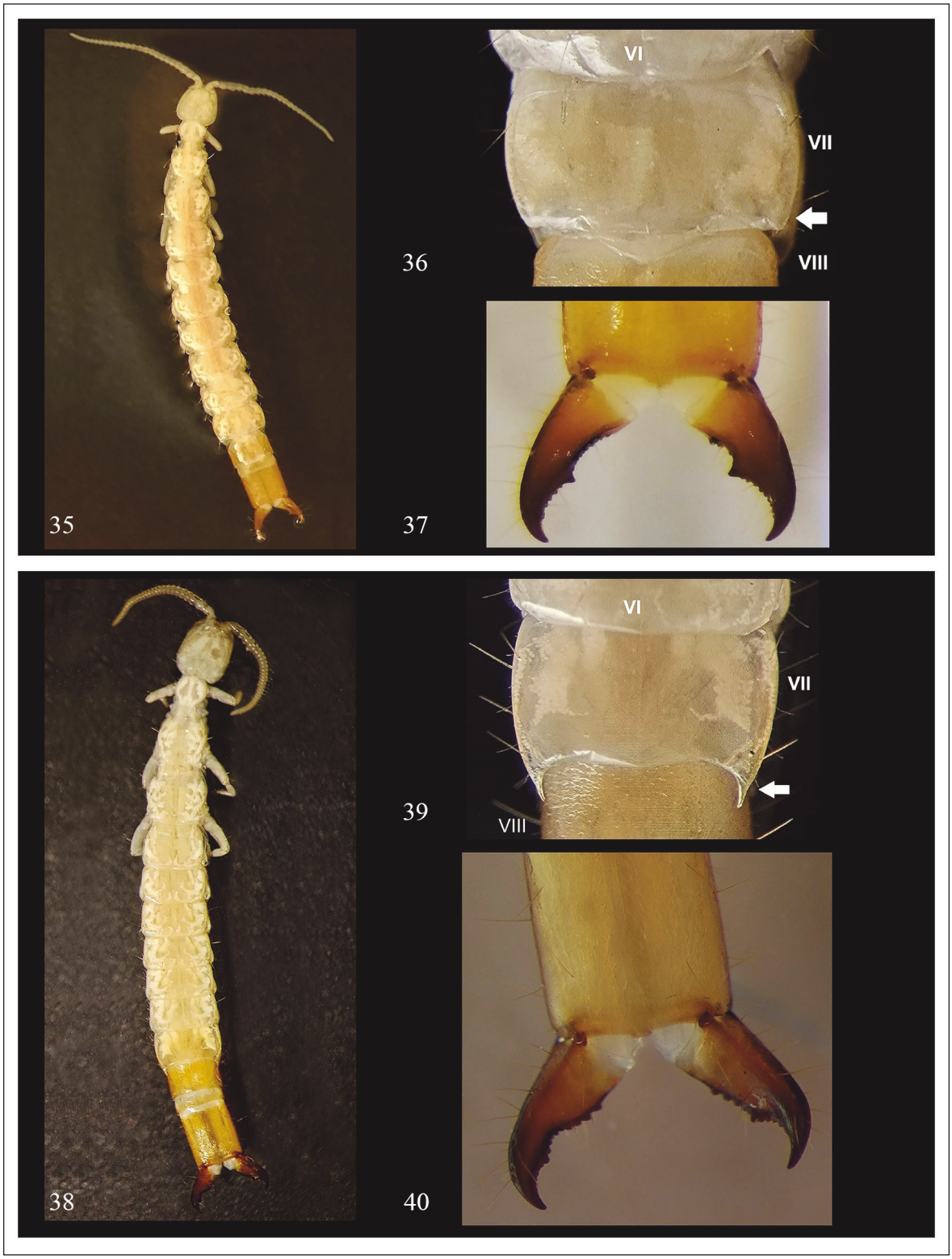
Genus *Megajapyx* Verhoeff, 1904

Megajapyx (Homojapyx) major trinachrius (Silvestri, 1948) (Figs. 38–40)

DISTRIBUTION AND BIOLOGY. *Megajapyx (H.) major* has three subspecies in Italy: *M. (H.) major major* Grassi, 1886 for mainland Italy and the peninsula; *M. (H.) major sardous* Silvestri, 1948 endemic to Sardinia; *M. (H.) major trinachrius* endemic to Sicily (Ramellini, 1995), which is new to the Egadi Islands and new to a micro-island context.

The biology of *M. (H.) major trinachrius* has been accurately described by Silvestri (1948b): females lay 20 to 36 eggs in spring, from April to June, grouped together and adhering to each other to form a sort of cluster, attached to a stalk which in turn is attached to the surface of a stone. The eggs are protected by the mother. The hatchlings emerge from the eggs after 15 days and remain attached to the egg stalk until the third moult and until the yolk is completely digested. The first and second moults are characterised by undeveloped cerci, i.e. rudiments without teeth on the inner margins, which appear from the third moult onwards.

REMARKS. Grassi (1886) describes *M. (H.) major major* for the first time for Lombardy (Italy): "*antenne di circa 36 articoli… angoli posteriori della settima lamina dorsale addominale, che prolungansi in una lunga punta triangolare… lunghezza minima di nove mm: lunghezza massima dodici mm*… [antennae of about 36 segments... posterior angles of the seventh dorsal abdominal plate,



Figures 35–40. Diplura (Japygidae) from Maraone islet. Figs. 35-37: *Monojapyx simplex*, body (Fig. 35), 7° urotergite (Fig. 36) and cercus (Fig. 37). Figs. 38-40: *Megajapyx major trinachrius* body (Fig. 38), 7° urotergite (Fig. 39) and cercus (Fig. 40).

which extend into a long triangular tip... minimum length of nine millimetres: maximum length twelve millimetres]" which he primarily calls "*forma grande* [large form]"; in the same work, he also reports this species for "*Catania… ho trovato esemplari che avevano tutti i caratteri della mia forma grande* [Catania... I found specimens that had all the characteristics of my large form]", which is the ssp. *trinachrius* described 62 years later by Silvestri (1948b). Verhoeff (1923) cited 'J. major *Grassi, Silv. ... auf Sizilien bei Bagheria*', referring to this species. Finally, Silvestri (1948b) differentiates this species into three subspecies exclusively by the number of antennae segments (36 ssp. *major*, 33 ssp. *sardous*, 34 ssp. *trinachrius*), as well as by geographical distribution. *Megajapyx (H.) major trinachrius* is reported for "*Boccadifalco (Palermo); Melitello di Catania. Adrano (Catania); Ucria (Messina)*".

The specimen from the Maraone islet has a body length of 9.8 mm, antennae composed of 34 segments, a quadrangular head, seventh urotergite with well-pronounced angular processes and a sharp apex, asymmetrical cerci.

On the Maraone islet, *M. (H.) major trinachrius* is rare, living in the *Malva arborea* scrub, under boulders and in rubble, together with the more common *Monojapyx simplex*.

OTHER MATERIAL EXAMINED. ITALY • 1 ex; Palermo, Monte Pellegrino, Pizzo Volo d'Aquila; 350–380 m; 38°09'28"N 13°21'53"E; 31 Mar. 2019; RVC-En-0156. • 3 exx; Palermo, Orto Botanico; 06 Ott. 2023; RVC-En-0337; • 1 ex; Carini (PA), Villagrazia di Carini, C.da Margi; 6 m; 38°10'02.01"N 13°11'50.50"E; 30 Nov. 2024; RVC-En-0369. • 3xx; Isola delle Femmine (PA), Isola; 20 m; 38°12'38"N 13°14'05"E; 12 Giu. 2025; RVC-En-0496. • 3 exx; Carini (PA), Monte Pecoraro, Vallone Garamello, on *Ceratonia siliqua* litter; 310–370 m; 38°08'55"N 13°08'44.4"E; 11 Ott. 2025; RVC.

Classis INSECTA Linnaeus, 1758
Ordo ZYGENTOMA Börner,1904
Familia LEPISMATIDAE Latreille, 1802
Genus *Ctenolepisma* Escherich, 1905

Ctenolepisma ciliatum (Dufour, 1831)

DISTRIBUTION AND BIOLOGY. South Palaeartic. It is one of the most widespread species of Lepismatidae (Molero-Baltanas et al., 2010).

Common in Sicily and Sardinia, it is a thermophilic species (Molero-Baltanas et al., 2000).

REMARKS. A very common species in the *Malva arborea* scrub, where it is found in large numbers. Generally a sublapidicolous species, it also takes refuge in the litter, where it finds its main source of food.

Ordo ODONATA Fabricius, 1793
Familia LIBELLULIDAE Rambur, 1842
Genus *Sympetrum* Newman, 1833

Sympetrum fonscolombii (Sélys-Longchamps, 1776)

DISTRIBUTION AND BIOLOGY. Asian-African distribution with a range extended to southern Europe including throughout Italy.

It is a pioneer, migratory species, whose larvae develop in stagnant fresh and brackish waters. For western Sicily probably is the most abundant species in certain periods of the year (autumn) and present in every type of wetlands; also migrating individuals can be observed faraway from breeding sites, such as urban areas, islands,and open sea (Surdo, 2025).

REMARKS. This species was observed and identified in flight on the Maraone islet.

Ordo ORTHOPTERA Latreille, 1793
Familia ACRIDIIDAE MacLeay, 1821
Genus *Anacridium* Uvarov, 1923

Anacridium aegyptium (Linnaeus, 1758)

DISTRIBUTION AND BIOLOGY. European-Asian species, very common in the Mediterranean area, widespread in Sicily and nearby islands.

It has summer-autumn phenology and overwinters as an adult (Massa, 2011).

REMARKS. *Anacridium aegyptium* was observed and identified on the Maraone islet while resting on *Malva arborea* plants.

Ordo EMBIOPTERA Lameere, 1900
Familia EMBIIDAE Burmeister, 1839
Genus *Embia* Latreille, 1829

Embia sp.

Distribution and Biology. The genus *Embia* in Italy is represented by ten species (Cianferoni & Ceccolini, 2024), four of which are recorded in Sicily: *E. ramburi* Rimsky-Korsakow, 1905, from the island of Lampedusa only (Fontana et al., 2021), *E. tyrrhenica* Stefani, 1953, *E. minapalumboi* Fontana, 2024, endemic to the Madonie, and *Embia* sp. (Fontana, 2024). This latter species, not yet described and collected in Carlentini (Syracuse) by Fontana (2002), is characterized by its apterous adults and very dark, almost black, bodies, similar to *E. tyrrhenica* in the shape of the terminalia rather than to *E. ramburi* (Ross personal communication in Fontana, 2002 and Fontana et al., 2021). A morphological, genetic, and distribution study is underway in Sicily (Fontana personal communication).

The *Embia* population living on Maraone islet (see also Ross, 1966 and Klass & Ulbricht, 2009) appears similar to *Embia* sp. (sensu Fontana, 2002).

Remarks. It is very common on Maraone islet, living in the mallow scrub in numerous colonies among the leaves deposited on the ground and at the interface between rocks and soil layers; it feeds on decaying leaves. It also lives in the adjacent Arthrocnemum formation: under stones, organic debris, and within bone fragments.

Familia OLIGOTOMIDAE Enderlein, 1909
Genus *Haploembia* Verhoeff, 1904

Haploembia solieri Rambur, 1842

Distribution and Biology. Widely distributed in the Mediterranean area and introduced in USA and Japan (Ross, 1966; Fontana, 2002; Nozaki et al., 2018), recently discovered in Georgia (South Caucasus) (Seropian et al., 2023). It is present throughout Italy including the major islands (Stoch, 2003).

Biology similar to that of the previous species with which it lives together in many localities.

Remarks. On the islet of Maraone, *Haploembia solieri* was found in greater numbers in the litter of *Malva arborea*, but also in the halophilic zone of *Arthrocnemum*, where it creates shelters under stones and in plant debris. It differs from the previous species in the shape of its terminalia and the presence of two callosities on the basitarse and one on the first tarsomere.

Ordo BLATTODEA Latreille, 1810
Familia BLATTELLIDAE Karny, 1908
Genus *Loboptera* Brunner von Wattenwyl, 1865

Loboptera decipiens (Germar, 1817)

Distribution and Biology. *Loboptera decipiens* is widespread throughout the Mediterranean area (including Sicily, Sardinia, Lampedusa, Linosa and Pantelleria, continental Italy, Malta), southern Europe (Romania, Bulgaria, Crimea), Madeira Island, Southwestern Asia, Kazakhstan, from sea level up to high altitudes averages (Failla & Messina, 1983; Baccetti et al., 1995; Hristov & Chobanov, 2016; Bohn & Sciberras, 2021).

Remarks. *Loboptera decipiens* is uncommon on the islet of Maraone, where it is found in the *Malva arborea* scrub, among the leaf litter. Some oothecae of this species have also been found in the debris.

Ordo PSOCOPTERA Shipley, 1904
Familia TROGIIDAE Roesler, 1944
Genus *Cerobasis* Kolbe, 1882

Cerobasis guestfalica (Kolbe, 1880) (Figs. 41, 42)

Distribution and Biology. A cosmopolitan species (Lienhard & Mifsud, 2015), known in Italy since 1900 (Ribaga, 1900), where it is distributed in almost all continental regions, Sardinia and Sicily (Schneider & Dessart, 1983; Schneider & Lienhard in Minelli, 1995). In Sicily, it was first reported in Lentini (Palazzelli, Syracuse) on *Citrus deliciosa* trees by Baz (1993) but was not subsequently reported in the Checklist of Italian Fauna (1995, 2003, 2021). With the new data relating to the islet of Maraone, the presence of this species in Sicily is confirmed, and for the first time, in a micro-island context.

This species is associated with the bark of certain trees and shrubs and is also found in litter, occasionally synanthropic. *Cerobasis guestfalica* is a species that generally reproduces parthenogenetically, while males are extremely rare and known only in Great Britain and Poland (Lien-

hard, 1998). Morphologically, it is easily distinguished from other Psocoptera species by the characteristic anchor-shaped pattern on its forehead (New, 1974).

REMARKS. On the islet of Maraone, a total of eight specimens were found between 2021 and 2024, both in the *Malva arborea* scrub and in the Arthrocnemum formation. These are only female specimens found among the litter and under small to medium-sized boulders, partly covered by plant debris or in the plant debris accumulated under the underside of the stones.

OTHER EXAMINED MATERIAL. ITALY • 6 exx; Carini (Palermo), Villagrazia di Carini, C.da Margi; 6 m asl; 38°10'02.01"N 13°11'50.50"E; 25 Mar. 2024; under bark of *Citrus* sp.; legit. R.Viviano (RVC) • 3 exx; Palermo, Monte Pellegrino, Piano della Grotta; 400 m asl; 38°10'30"N 13°20'59"E; 15 Set. 2024; under bark of *Eucalyptus*; legit. R. Viviano (RVC); • 10 exx; Mazara del Vallo (Trapani); 25 Feb.- 04 Mar. 2025; in urbe into private garden, under stones; legit: A. Ditta (RVC).

Genus *Lepinotus* Heyden, 1850
Lepinotus reticulatus Enderlein, 1905 (Figs. 43, 44)

DISTRIBUTION AND BIOLOGY. It is a cosmopolitan species, reported for numerous European and world countries (http://Psocodea.SpeciesFile.org). It lives in different environmental contexts such as in litter and soil, in bird nests and mammal bedding, occasionally in bird plumage and granaries (Mockford, 1993). For Sicily it is reported by Baz (1993: Monti Madonie, Rifugio Marini) but not by Schneider & Lienhard (1995), Stoch (2003) and in the new checklist of the Italian fauna (Bologna et al., 2021). Recently reported for Isola delle Femmine Nature Reserve near Palermo (Viviano et al., 2024).

REMARKS. Only a few specimens of *L. reticulatus* were collected in the detritus of *Malva arborea*. This species was identified by comparison with specimens from Isola delle Femmine (Palermo, Sicily) and by the presence of a vestigial wing with a micro-reticulated base (Fig. 37). Lienhard (1995) attributes great importance to this morphological characteristic, which he includes in the dichotomous keys for the recognition of this group of species.

Familia LIPOSCELIDAE
Genus *Liposcelis* Motschulsky, 1852

Liposcelis cf. ***bostrychophila*** Badonnel, 1931

DISTRIBUTION AND BIOLOGY. A cosmopolitan species, with parthenogenetic development, thermophilic and also synanthropic; this species can also live under tree bark and in litter; it is also found in the nests of birds, mammals and hymenoptera (Lienhard, 1998 and cited works).

REMARKS. Few specimens can be attributed to this species due to the poor preservation of the few specimens sampled, which nevertheless show the cuticular sculpture of the vertex and abdominal tergites as reported by Lienhard (1998, Pl. 4, figs. a, b, g).

Liposcelis cf. ***rugosa*** Badonnel, 1945 (Figs. 45, 46)

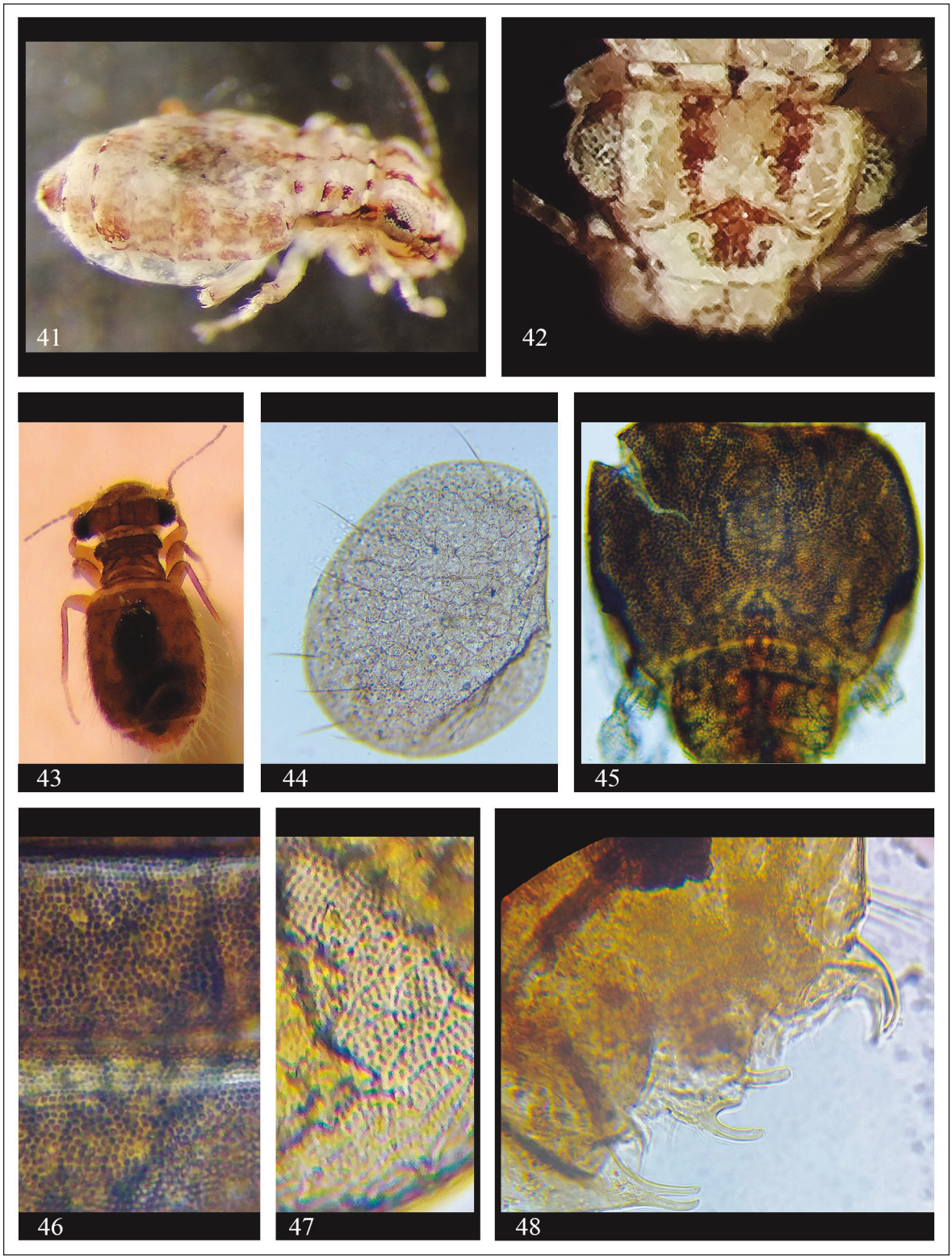
DISTRIBUTION AND BIOLOGY. Mediterranean species, living in the soil and litter, of which the male is unknown (Lienhard, 1998).

Originally described for Morocco, *Liposcelis rugosa* was subsequently found in the Canary Islands (Tenerife) (Lienhard, 1990), Greece (Badonnel, 1973; Lienhard, 1990) and Cyprus (loc. Limassol) from a museum specimen collected by Hauser (Lienhard, 1998) and Portugal (cited in Yoshizawa & Lienhard, 2010). Also found in the United States as pests of stored products (Throne et al., 2006).

REMARKS. *Liposcelis rugosa* is morphologically characterised by very large tubercles on the vertex and tergites, an intersegmental membrane consisting only of a hyaline line on the tergites with a sclerotised posterior transverse band similar to the anterior band.

The only specimen sampled has a strongly granulated head and tergites with granulations as reported by Lienhard (1998, Pl. 5, fig. b). Considering the similarity with *L. tricolor* (Badonnel, 1973), we have attributed the only specimen examined to *L. rugosa* for comparison purposes only. However, both species would be new species for the Italian fauna.

Familia LACHESILLIDAE
Genus *Lachesilla* Westwood, 1840



Figures 41–48. Psocoptera from Maraone islet. Figs. 41, 42: *Cerobasis guestfalica* (Trogiidae) body (Fig. 41) and head (Fig. 42). Figs. 43, 44: *Lepinotus reticulatus* body (Fig. 43) and wing (Fig. 44). Figs. 45, 46: *Liposcelis* cf. *rugosa* head (Fig. 45) and tergites (Fig. 46). Fig. 47: *L.* cf. *bostrychophila*, vertex. Fig. 48: *Lachesilla dimorpha*, terminalia male.

Lachesilla dimorpha Lienhard, 1981 (Fig. 48)

DISTRIBUTION AND BIOLOGY. A species distributed throughout the Mediterranean, originally described for Greece and subsequently reported for Tunisia (Lienhard, 1987) and Spain (Baz, 1989; 1999). Recently, *L. dimorpha* has also been reported for southern Italy (Schneider & Lienhard, 1995; Sabia, 1996; Stoch, 2003), Cyprus, Turkey (Lienhard, 1998) and Malta (Lienhard & Mifsud, 2015). In Sicily, this genus is known for the species *L. pedicularia* (Linnaeus, 1758), which was reported by Baz (1993) from Mount Etna (CT), while *L. dimorpha* is a new species for the Sicilian fauna.

REMARKS. A single male specimen was found in the litter of *Malva arborea*. The terminalia (Fig. 39) was compared, both ventrally and laterally, with the drawings provided by Lienhard (1981, figs. 34, 35).

Ordo COLEOPTERA Linnaeus, 1758
Subordo POLYPHAGA Emery, 1886
Superfamilia HYDROPHILOIDEA Latreille, 1802
Familia STAPHYLINIDAE Latreille, 1802
Subfamilia ALEOCHARINAE Fleming, 1821
Genus *Atheta* Thomson, 1858

Atheta sp.

DISTRIBUTION AND BIOLOGY. The rove beetle genus *Atheta* includes 1900 described species in the world fauna (Orlov, 2019) of which the majority, about 1500 species, are known from the Palaearctic Region (Schülke & Smetana, 2015). Almost all of these species are poorly known from a taxonomic and systematic point of view.

They are usually predators in soil and leaf litter, in ant and termite nests, in the mushrooms, in the dung and in almost all terrestrial habitats.

REMARKS. Only one specimen attributable to this genus has been found on the islet of Maraone in the *Malva arborea* maquis, in the leaf litter.

Superfamilia HISTEROIDEA Gyllenhal, 1808
Familia HISTERIDAE Gyllenhal, 1808
Subfamilia HISTERINAE Gyllenhal, 1808
Genus *Pactolinus* Motschulsky, 1860

Pactolinus major (Linnaeus, 1767)

DISTRIBUTION AND BIOLOGY. A species recorded throughout the Mediterranean area, also reported in the Canary Islands and various regions of Africa. In Italy, it is more common in peninsular and insular regions, especially along the coast, but also in various northern regions (Vienna, 1980; Penati & Vienna, 2021).

It is found in animal dung and decomposing carcasses.

REMARKS. Common species on the islet of Maraone in open areas, wandering on the ground, under stones or on the carcasses of dead birds, particularly Yellow-legged Gulls. This species was observed preying on a living *Parmena pubescens* (Figs. 62, 63).

Superfamilia BOSTRICHOIDEA Latreille, 1802
Familia DERMESTIDAE Latreille, 1804
Subfamilia DERMESTINAE Latreille, 1804
Genus *Dermestes* Linnaeus, 1758
Subgenus *Dermestinus* Zhantiev, 1967

Dermestes (Dermestinus) frischii Kugelann, 1792

DISTRIBUTION AND BIOLOGY. Cosmopolitan species (Háva, 2015, 2022); it is distributed throughout Italy (Nardi, 2021).

REMARKS. Some specimens of this species have been found on carcasses of Yellow-legged Gulls.

Superfamilia CLEROIDEA Latreille, 1802
Familia RHADALIDAE LeConte, 1861
Subfamilia APLOCNEMINAE Mulsant et Rey, 1868
Genus *Aplocnemus* Stephens, 1830

Aplocnemus pectinatus Küster, 1849

DISTRIBUTION AND BIOLOGY. The distribution of this species is Central Mediterranean present in the Balearic Islands, Corsica, Sardinia, Sicily, Malta, Southern Italy, Tunisia, Algeria. Already reported for Favignana, Levanzo and Marettimo (Liberti 1995; Baviera & Liberti, 2010).

REMARKS. Two specimens of this species were collected on *Malva arborea* flowers in Maraone during the spring months.

Superfamilia CUCUJOIDEA Latreille, 1802
Familia CORYLOPHIDAE LeConte, 1852

Subfamilia CORYLOPHINAE LeConte, 1852
Genus *Arthrolips* Wollaston, 1854

Arthrolips picea (Comolli, 1837)

Distribution and biology. Central Asia-European-Mediterranean extended to the Macaronesian region. It is recorded for several Italian regions, including Sicily (Bowestead, 1999).

It is frequently found in mouldy straw in barns and in bales of both straw and hay, also in leaf litter and other vegetable debris (Bowestead, 1999).

Remarks. *Arthrolips picea* was found in Maraone islet on the *Malva arborea* leaf litter as well as in Isola delle Femmine, small island near Palermo (Sparacio et al., 2024). The spermatheca of the specimen collected in Maraone islet corresponds to that illustrated by Bowestead (1999) for this species.

Familia LATRIDIIDAE Erichson, 1842
Subfamilia CORTICARIINAE Curtis, 1829
Genus *Melanophthalma* Motschulsky, 1866
Subgenus *Melanophthalma* Motschulsky, 1866

Melanophthalma (Melanophthalma) distinguenda (Comolli, 1837)

Distribution and biology. Xerothermic and cosmopolitan species, distributed throughout most of the Palearctic region and reported throughout Italy, Sicily and Sardinia (Angelini & Rücker, 1999; Johnson, 2007; Rücker, 2020).

Remarks. Only one specimen attributable to this species was collected on the islet of Maraone in the debris collected at the base of *Malva arborea* plants.

Superfamilia TENEBRIONOIDEA Latreille, 1802
Familia MORDELLIDAE Latreille, 1802
Subfamilia MORDELLINAE Latreille, 1802
Genus *Mordellistena* Costa, 1854

Mordellistena sp.

Distribution and biology. This genus is widespread all over the world, and with around twenty species are also found in Italy (Ruzzier, 2021).

Remarks. Only two specimens attributable to this genus has been found on the Maraone islet on the *Malva arborea* flowers.

Familia TENEBRIONIDAE Latreille, 1802
Subfamilia PIMELIINAE Latreille, 1802
Genus *Alphasida* Escalera, 1905
Subgenus *Glabrasida* Escalera, 1910
Species *grossa* Solier, 1836

Alphasida (Glabrasida) grossa livrerii n. ssp.
https://zoobank.org/A2ED6788-B433-456A-8313-F04498DA4495

Type material. Holotype. ITALY • 1 spm male (Figs. 49, 52, 53); Maraone islet (Aegadian Archipelago, Sicily); 1 Jun. 2021; I. Sparacio legit (MZDP). Paratypes. ITALY • 1 spm male and 3 spm females; same data as the holotype; CS. 5 spm males; 1 Jun. 2021; R. Viviano legit; CV. 1 spm female; 1 Jun. 2021; R. Viviano legit; MZDP. 2 spm males; 10 Mar. 2022; I. Sparacio legit; CS. 2 spm females; 10 Mar. 2022; R. Viviano legit; CV. 5 spm females; 31 May 2022; I. Sparacio legit; CS. 4 spm males and 5 spm females; 1 Feb. 2024; R. Viviano legit; CV.

Description of the holotype. Male. Length 12.5 mm; entirely black, rather shiny, red-brownish along the edges of the scutellum and the elytral suture; with a thin and yellowish pilosity very short on the pronotum and elytra, slightly longer on the head, antennae and legs.

Head with coarse and little close punctation with a transversal depression between the clypeus and the top; clypeogenal suture, clypeus indented; antennae short and slender, 3rd antennomere elongated and longer than the 4th (almost double), 5th-8th short and not dilated at the apex, 9th as long as wide not dilated at the apex.

Pronotum transverse, about 2 times broader than long, with maximal width in the basal third of the lateral margins; lateral margins elevated and enlarged, sub-rectilinear up to about a third of the pronotum then curved and narrowed forward; base of the pronotum wider than the anterior margin (about double); disc of the pronotum little convex, with medium size and not close punctation; anterior margin deeply indented with slightly protruding; the posterior margin is slightly sinuous and protrudes slightly backwards towards the center, with posterior angles protruding slightly backwards. Propleura with little and spaced out punctuation.

Elytra subparallel to the lateral margins and rounded at the apex, slightly elongated, with the disc and and perisutural area flattened, rounded humeri,

costae thin and minute, small and irregular spaced punctuation; epipleura enough broad, little shiny, with very little and widely spaced punctuaction.

Legs black, slim, shiny, with fine golden yellow pilosity. Protibia with two short apical spines, robust and equal in length.

Aedeagus (length 3.8–4.15 mm) with parameres shorter than phallobase (Ph/Pa = 1.03–1.05) and lateral margins slightly wider at the base; endophallus with sub-parallel sides up to about half of the length then gradually narrowing apically.

VARIABILITY. Length: males 11.5–13.2 mm; females 12.1–14.8 mm. Entirely black in colour, rather shiny, often red-brownish along the edges of the scutellum, the elytral suture, pronotum and elytra; costae of the elytra often absent or not very visible. Sexual dimorphism present (Figs. 50, 56, 57): females large and convex on pronotum and elytra, with antennae shorter; elytra shorter, with the costae obsolete and often absent, punctation minute and spaced on rough surface; the protibiae with the very long outer tooth. Ovipositor elongated with length 7 mm (+/- 0.5 mm), Ro = 2 mm (+/- 0.3); Rl = 3.1 mm (+/- 0.2); the apical part is longer and thinner, and the basal part is wider at the base. The paraprocta are widened slightly before the base, then narrowed and oblique at the distal end; the proctiger is finely punctured, the apical part subtroncate; the coxita apicalia are elongated and narrowed at the apex, fossula gonostyloidis with 2–3 apical setae; the sclerites vulvaris laterales are narrow and elongated.

DISTRIBUTION AND BIOLOGY. *Alphasida (Glabrasida) grossa* belongs to the group II of *Alphasida* (*Glabrasida*) Escalera, 1910. The taxa of this group are distributed in the Mediterranean area, from the south of the Iberian Peninsula to Syria, the Middle East, northern Africa, southern mainland Italy and the island regions of Sicily, Pantelleria and Malta (Perez-Vera & Ávila, 2017).

It is widespread in Sicily, especially on the southern half of the island and in the northwest; Southern mainland Italy (Puglie e Calabria). In Sicily, *A. (G.) grossa* is present in many circum-Sicilian islands such as Favignana, Levanzo, Marettimo, Ustica, Isola delle Femmine (Aliquò & Soldati, 2010). Related taxa are *A. (G.) cossyrensis* Reitter, 1917 from the island of Pantelleria, *A. (G.) sicula sicula* (Solier, 1836) from north-eastern Sicily and *A. (G.) sicula melitana* Reitter, 1894 from Malta (Aliquò & Soldati, 2010; Perez-Vera & Ávila, 2017; Leo & Ruzzier, 2021). *Alphasida (Glabrasida) grossa livrerii* n. ssp. is only known from the type locality: islet of Maraone, Aegadian Archipelago (Trapani, Western Sicily, Italy).

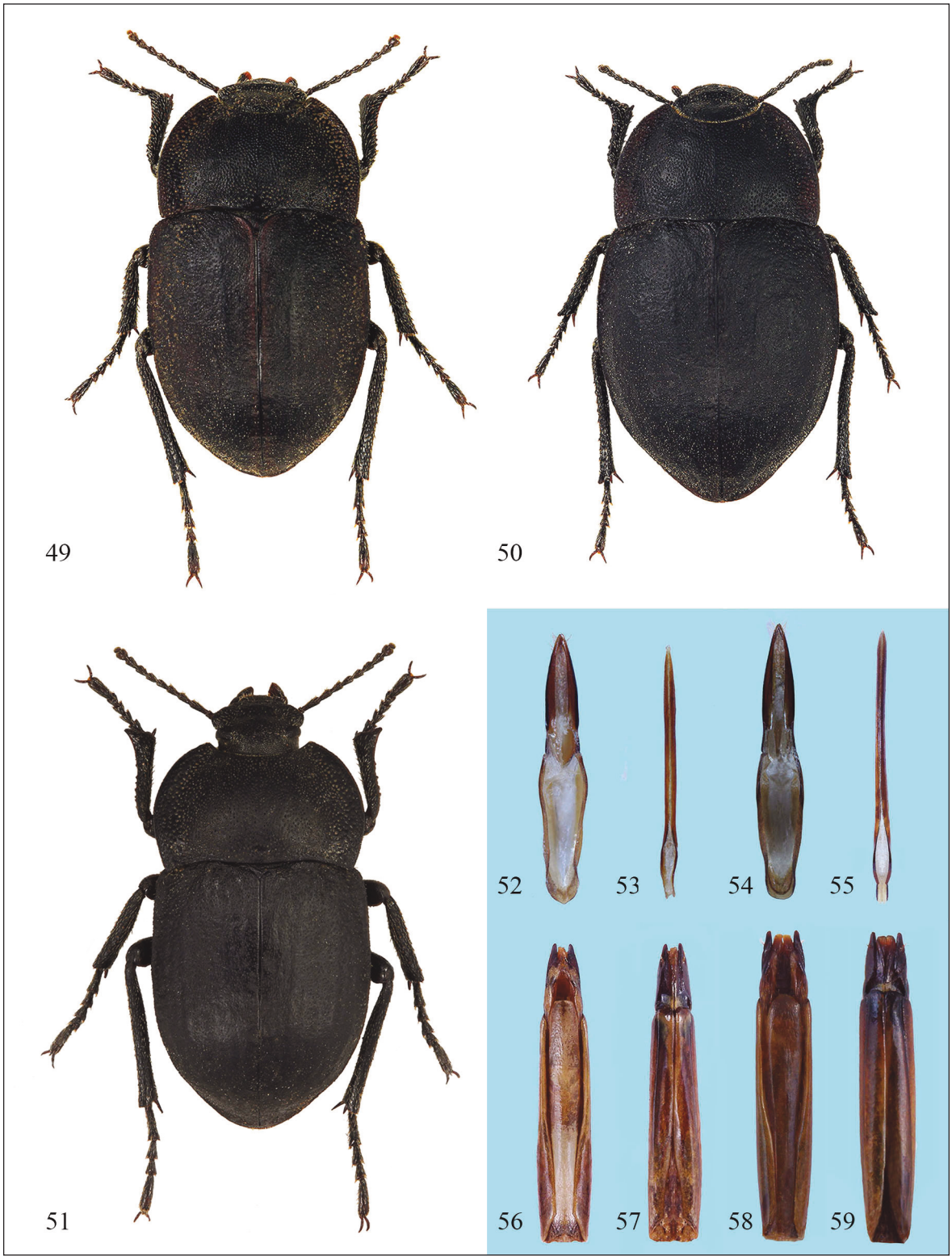
ETYMOLOGY. This new taxon is dedicated to Salvatore Console Livreri previous director of the Marine Protected Area (MPA) of the Aegadian Archipelago.

REMARKS. Following Perez-Vera & Ávila (2017), *A. (G.) grossa* is a variable species in terms of the presence and height of the elitral ribs and the punctuation of the pronotum and elytra, with fairly consistent dimensions ranging from 12.5 to 14.7 mm for males (average = 13.6 mm) and from 13.5 to 15.5 mm for females (average = 14.5 mm). Solier (1836) reports larger body measurements (16–17 mm) (Fig. 51). The parameres of the aedeagus are more restricted at the base, measuring 4.0–4.25 mm in length, with a parameres/phallobase (Ph/Pa) ratio of 1.33 (Figs. 54, 55). The ovipositor (Pérez-Vera, 2014) has a shorter and more robust apical part (in particular the coxita apicalia), and a non-dilated basal part (Ro = 1.94; Rl = 2.81) (Figs. 58, 59).

The new subspecies is characterised morphologically by its smaller body size, slightly elongated elytra, lateral margins of the pronotum narrowed anteriorly with less prominent anterior and posterior angles,with less prominent anterior and posterior angles, the shape of aedeagus and, in particular, that of the ovipositor which has a narrower apical part and a wider basal part.

These differences are evident compared to the neighbouring populations of *A. (G.) grossa* from western Sicily, including Favignana, Levanzo and Marettimo, which we examined for comparison. The morphological characteristics attributed to *A. (G.) grossa grossa* by Perez-Vera & Ávila (2017) are confirmed, with body sizes in the specimens examined by us being larger than those reported, especially in females.

The biometric analysis performed on these populations (Scopello, Custonaci, Erice, Marsala, Cave di Cusa) and on those in Maraone, based on five main measurements (TL: total length, TW: total width, EL: elytra length, PW: pronotum width, PL: pronotum length; M: males, F: females) is shown below (Tables 1–4, Fig. 61).



Figures 49, 50, 52, 53, 56, 57. *Alphasida (Glabrasida) grossa livrerii* n. ssp. Fig. 49: holotype male. Fig. 50: paratype female (length = 13.2 mm). Figs. 52, 53: aedeagus (Fig. 52) and penis (Fig. 53). Figs. 56, 57: ovodepositor female dorsal (Fig. 56) and ventral view (Fig. 57). Figures 51, 54, 55, 58, 59. *A. (G.) grossa grossa* from Erice (Trapani, Sicily, Italy): male dorsal view, length = 14.2 mm (Fig. 51), aedeagus (Fig. 54), penis (Fig. 55), ovodepositor in dorsal (Fig. 58) and ventral view (Fig. 59).

A. g. grossa F - n. 13	Mean ± S.E. (Min-Max)	*A. g. livrerii* F - n. 12	Mean ± S.E. (Min-Max)
TL	15.87 (14.3-18.2)	TL	13.69±0.20 (12.1-14.8)
TW	9.146 (8.1-10.5)	TW	8.2±0.11 (7.2-8.7)
EL	11.1 (9.3-12.2)	EL	10.01±0.14 (8.8-10.6)
PW	7.430 (6.8-8.9)	PW	6.78±0.11 (5.8-7.4)
PL	4.392 (4-5.3)	PL	3.68±0.06 (3.3-4)

A. g. grossa M - n. 15	Mean ± S.E. (Min-Max)	*A. g. livrerii* M - n. 10	Mean ± S.E. (Min-Max)
TL	13.84±0.20 (13.00-16.00)	TL	12.42±0.15 (11.50-13.20)
TW	7.7±0.12 (7.00-8.40)	TW	7.33±0.13 (6.50-7.80)
EL	9.44±0.11 (8.80-10.30)	EL	8.83±0.13 (8.30-9.50)
PW	6.9±0.10 (6.30-7.80)	PW	6.18±0.10 (5.60-6.50)
PL	4.22±0.07 (3.80-4.80)	PL	3.2±0.08 (2.80-3.50)

Table 1. Descriptive statistics for the five morphometric variables (TL, TW, EL, PW, PL) in the four analysed groups of *Alphasida grossa*: females and males of *A. grossa. grossa* (N-W Sicily) and females and males of *A. grossa livrerii* n. ssp. (Maraone islet). For each variable, mean, standard error (S.E.), and range (Min–Max) are reported. The data highlight biometric differences between the two subspecies and between sexes within populations.

	A. grossa grossa M	*A. grossa livrerii* M	*A. grossa grossa* F	*A. grossa livrerii* F	**Total**
A. grossa grossa M	15	0	0	0	15
A. grossa livrerii M	1	9	0	0	10
A. grossa grossa F	1	0	12	0	13
A. grossa livrerii F	0	1	0	11	12
Total	17	10	12	11	50

Table 2. Confusion matrix from discriminant analysis. The overall correct classification rate is 94%, with only 3 out of 50 individuals misclassified. Classification was most accurate for *A. grossa grossa* males (100%).

	Axis 1	Axis 2
TL	0.70118	0.074273
TW	0.3619	0.18665
EL	0.4473	0.20056
PW	0.24652	-0.016248
PL	0.23747	-0.13329

Table 3. Loadings of TL, TW, EL, PW and PL on the first two axes of the linear discriminant analysis. Axis 1 is dominated by TL, with additional contributions from TW and EL, while Axis 2 shows weaker positive loadings for TW and EL and minor negative loadings for PW and PL.

	A. g. grossa M	*A. g. livrerii* M	*A. g. grossa* F	*A. g. livrerii* F
A. g. grossa M		3.55E-05	2.31E-06	2.38E-05
A. g. livrerii M	3.55E-05		3.67E-06	0.051457
A. g. grossa F	2.31E-06	3.67E-06		0.00032985
A. g. livrerii F	2.38E-05	0.051457	0.00032985	
MANOVA Pairwise				

Wilks' lambda:	0.06191
df1:	15
df2:	116.3
F:	13.49
p (same):	4.56E-19
MANOVA Summary	

Table 4. MANOVA global and pairwise results. The low Wilks' lambda and highly significant p-value indicate strong multivariate separation among groups. All pairwise differences are significant, except between sexes of *A. grossa livrerii*.

The MANOVA revealed highly significant morphometric differences among sex-subspecies groups of *A. (G.) grossa*. The Wilks' lambda = 0.0619 indicates strong multivariate separation. The overall test yielded F = 13.49 with df1 = 15 and df2 = 116.3, and was highly significant ($p = 4.555 \times 10^{-19}$), confirming that the biometric variables (TL, TW, EL, PW, PL) effectively discriminate among the four sex-subspecies combinations.

Pairwise comparisons showed significant differences between all group pairs, with extremely low p-values (e.g., *A. grossa grossa* M vs *A. grossa livrerii* M: $p = 2.31 \times 10^{-6}$) except for *A. (G.) grossa livrerii* n. ssp. M vs *A. (G.) grossa livrerii* n.

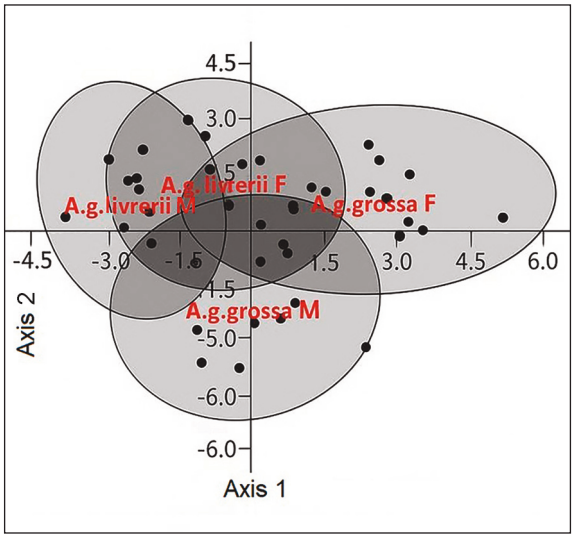


Figure 60. Scatter plot with confidence ellipses. Morphometric group distribution in the discriminant plane (Axis 1 vs Axis 2). Ellipses represent 95% confidence intervals for each group (*A. grossa grossa* M/F, *A. grossa livrerii* M/F). Centroid separation highlights clear differentiation between subspecies and sexes.



Figure 61. *Alphasida (G.) grossa livrerii* n. ssp. from Maraone islet.

ssp. F, which was marginally significant (p = 0.0515), suggesting weaker sexual dimorphism in the insular population.

The results demonstrate clear morphometric differentiation between *A. (G.) grossa grossa* (W-Sicily) and *A. (G.) grossa livrerii* n. ssp. (Maraone islet) with distinct and consistent biometric patterns, not attributable solely to sexual dimorphism.

Sexual dimorphism is pronounced in *A. (G.) grossa grossa* but weaker in *A. (G.) grossa livrerii* n. ssp., likely reflecting selective pressures typical of small islands (reduced competition, limited resources, environmental stability). The distinct separation of group centroids in the discriminant space suggests that geographic isolation has promoted morphometric divergence consistent with insular micro-differentiation.

Overall, the findings support the hypothesis that *A. (G.) grossa livrerii* n. ssp. represents a morphometrically distinct insular population, with biometric traits differing from both the nominal subspecies and between sexes.

Genus *Stenosis* Herbst, 1799
Subgenus *Stenosis* Herbst, 1799

Stenosis (Stenosis) sardoa sardoa (Küster, 1848)

Distribution and biology. *Stenosis (S.) sardoa sardoa* (locus typicus: Sardegna) is widespread in the western Mediterranean and, in Italy, in the Tyrrhenian regions, Sardinia and Sicily; the subspecies *ardoini* Canzoneri, 1970 (locus typicus: Rome, Italy) is endemic to some peninsular regions and Sicily; the subspecies *laeviventris* Desbrochers des Loges, 1881 has been recorded in Ukraine and Turkey (Löbl & Smetana, 2008). In Sicily, *S. (S.) sardoa sardoa* seems to be prevalent in the Egadi Islands, Ustica and Pantelleria (Aliquò & Soldati, 2010).

Remarks. This species was found in Maraone islet in small populations under stones and various debris.

Subfamilia TENEBRIONINAE Latreille, 1802
Genus *Blaps* Fabricius, 1775
Subenus *Blaps* Fabricius, 1775

Blaps (Blaps) gigas (Linnaeus, 1767) (Fig. 64)

Distribution and biology. Turanic-Mediterranean chorotype, present throughout the Mediterranean basin, the Canary Islands, the Azores, and, further west, in Turkey, Kazakhstan and Iraq; introduced into Central Europe and also reported in Iceland (Löbl & Smetana, 2008; Leo & Ruzzier, 2021).

Remarks. This species is common in Sicily, es-

pecially in coastal areas and islands around Sicily, in stables, cellars, caves, ruderal and anthropised environments (Aliquò & Soldati, 2010) and also in the Egadi Islands, especially in Favignana. It is one of the most frequent beetles in Maraone islet, where it is found in small colonies under large stones.

Genus *Catomus* Allard, 1876
Subgenus *Catomus* Allard, 1876

Catomus (Catomus) consentaneus (Küster, 1851).

DISTRIBUTION AND BIOLOGY. Mediterranean. In Italy, it is mainly reported in the peninsular regions, Sicily and Sardinia (Leo & Ruzzier, 2021).

REMARKS. Not previously reported for the Egadi Islands (Aliquò & Soldati, 2010) but *C. (C.) consentaneus* is sometimes confused with *C. (C.) rotundicollis* (Guérin-Méneville, 1825), a species much more widespread in Sicily.

Superfamilia CHRYSOMELOIDEA Latreille, 1802
Familia CERAMBYCIDAE Latreille, 1802
Subfamilia LAMINAE Latreille, 1825
Genus *Parmena* Dejean, 1821
Subgenus *Parmena* Dejean, 1821

Parmena (Parmena) pubescens pubescens Dalman, 1817 (Fig. 65)

DISTRIBUTION AND BIOLOGY. Mediterranean chorotype. The nominal subspecies is widespread in the south-eastern Mediterranean and, in Italy, mainly along the coasts of the peninsular regions and Sicily.

Larval development in the stems of various herbaceous plants and shrubs: *Crithmum*, *Ferula*, *Foeniculum*, *Thapsia*, *Chrysanthemum*, *Euphorbia*, *Papaver*, *Ficus*, *Nerium*. The adult is found in the larval galleries of host plants or under bark, rarely under stones or other debris.

REMARKS. The most common and widespread species of *Parmena* in Sicily, also present in all the Egadi and the Aeolian Islands (Cecchi & Lo Cascio, 2000; Sama, 2005; Lo Cascio et al., 2006). According to Danilevsky (2012) this taxon should be accepted as *Parmena pilosa* Brullé, 1832 with *P. pilosa inclusa* Mulsant, 1863 in Sicily (Danilevsky 2016a, b).

This species on the Maraone islet develops in its larval stage in the stems of the *Malva arborea*, where it is also found in its adult stage.

Superfamilia CURCULIONOIDEA Latreille, 1802
Familia BRACHYCERIDAE Billberg, 1820
Subfamilia BRACHYCERINAE Billberg, 1820
Genus *Brachycerus* A.G. Olivier, 1789

Brachycerus albidentatus Gyllenhal, 1840

DISTRIBUTION AND BIOLOGY. Croatia, Corsica, central and southern Italy, Malta, and Tunisia (Osella & Riti, 1995; Colonnelli, 2011).

It lives on Liliaceae, sometimes damaging garlic (Servadei, 1953; Espinosa et al., 1991).

REMARKS. *Brachycerus albidentatus* was found in Maraone islet wandering on the ground.

Brachycerus undatus (Fabricius, 1798)

DISTRIBUTION AND BIOLOGY. Mediterranean species, reported throughout Italy (except for the northernmost areas), Sicily and Sardinia (Colonnelli, 2011).

REMARKS. The larval stage takes place in the bulbs of various wild and cultivated Amaryllidaceae and Araceae; the adult feeds on the leaves of the same plants (Hoffmann, 1950). On the islet of Maraone, it has been found wandering on the ground or under stones.

Familia CURCULIONIDAE Latreille, 1802
Genus *Otiorhynchus* Germar, 1822
Subgenus *Arammichbus* Gozis, 1882

Otiorhynchus (Arammichbus) aegatensis Magnano, 1992

DISTRIBUTION AND BIOLOGY. Magnano (1992) describes *O. (A.) aegatensis* as an endemic species of the Egadi Islands: Marettimo, from which the holotype comes, Favignana and Levanzo (Di Marco et al., 2002; Baviera & Magnano, 2010).

REMARKS. Morphologically, *O. (A.) aegatensis* is characterized by a regularly rounded pronotum, more distant areoles, and the shape of the spiculum gastrale and spermatheca. The specimens collected at Maraone islet correspond to these morphological



Figures 62–65. Coleoptera from Maraone islet. Figs. 62, 63: *Pactolinus major* (Hysteridae) preying on a living *Parmena pubescens* (Cerambycidae). Fig. 64: *Blaps gigas* (Tenebrionidae) under stones. Fig. 65. *Parmena pubescens* in the stems of the *Malva arborea* where the larva develops.

characteristics, despite the interspecific diversity evident in comparisons with other populations of the Aegadian Islands. On Maraone islet, *O. (A.) aegatensis* was found in the leaf litter of the *Malva arborea* scrub and at its edges under stones.

Also noteworthy is the presence of several beetle remains, almost always medium or large in size, derived from the ingestion or excrement of birds that preyed on these species in neighboring areas. Among the identified beetles we highlight: *Pentodon bidens punctatus* (Villers, 1789) (Scarabaeidae Dynastinae) and *Sepidium siculum* Solier, 1843 (Tenebrionidae).

Ordo THYSANOPTERA Haliday, 1836
Familia THRIPIDAE Stevens, 1829
Genus *Thrips* Linnaeus, 1758

Thrips fuscipennis Haliday, 1836

DISTRIBUTION AND BIOLOGY. Palearctic, excluding Northern Africa, introduced into North America; polyphagous, on many different plants, including woody plants, especially Rosaceae (Strassen, 2003).

REMARKS. Few specimens in *Malva arborea* maquis. Remains of another specimen belonging to this family were found on the islet of Maraone.

Ordo HEMIPTERA Linnaeus, 1758
Subordo HETEROPTERA Latreille, 1810
Familia ANTHOCORIDAE Fieber, 1837
Genus *Orius* Wolff, 1811

Orius laevigatus (Wolff, 1811)

DISTRIBUTION AND BIOLOGY. Species widely distributed in the western Palearctic, common on many Mediterranean islands (Carapezza, 1995). Biology similar to the previous species. It is found on numerous plants (Tommasini, 2004).

Species of the genus *Orius* are generalist predators of small arthropods in a wide range of natural and agricultural habitats (Vacante et al., 1997), including Thripidae (Mouratidis et al., 2022).

REMARKS. This species has been found on *Malva arborea* plants, both on the leaves and in the leaf litter.

Familia MIRIDAE Hahn, 1831
Genus *Dicyphus* Fieber, 1858

Dicyphus (Brachyceroea) albonasutus Wagner, 1951

DISTRIBUTION AND BIOLOGY. It was first reported in Sicily by Tamanini (1981) and subsequently in the Palermo province on Fabaceae (Sanchez & Cassis, 2018). Tamanini (1981) also reported it in Calabria on *Linaria* (= *Kickxia*) *spuria* (L.) Dumort (Plantaginaceae) and on *Ononis spinosa* Linnaus., 1753 (Fabaceae).

REMARKS. Two specimens of this species were found on the islet of Maraone in the *Malva arborea* scrub. The identification is confirmed by the extraction of the male genitalia and comparison of the characteristic scutellar, pronotal and cephalic patterns.

Familia PYRRHOCORIDAE Fieber, 1860
Genus *Pyrrhocoris* Fallén, 1814

Pyrrhocoris apterus Linnaeus, 1758

DISTRIBUTION AND BIOLOGY. Central Asian-European-Mediterranean; including all of Italy (Carapezza, 1995).

Pyrrhocoris apterus is a gregarious and polyphagous species and has been observed feeding on seeds and other parts of many plant species (Asparagaceae, Asteraceae, Fabaceae, Malvaceae, etc.) (Kristenová et al., 2011 and cited works).

REMARKS. It is the most common heteropteran on the Maraone islet, with the largest population concentrated in the *Malva arborea* scrub. It is often observed even in the most exposed areas, with numerous specimens concentrated on the regurgitations of Yellow-legged Gull (Figs. 66, 67).

Genus *Scantius* Stål, 1866

Scantius aegyptius italicus (Rossi, 1790)

DISTRIBUTION AND BIOLOGY. *Scantius aegyptius aegyptius* (Linnaeus, 1758) is present in North Africa, the Canary Islands, Israel, Iraq and in the islands of the Sicilian Channel Lampedusa, Linosa and Pantelleria while *S. aegyptius italicus* is wide-



Figures 66, 67. Hemiptera from Maraone islet (above and below: *Pyrrhocoris apterus* (Pyrrhocoridae). Numerous specimens of this species concentrated on the regurgitations of Yellow-legged Gull in exposed areas and bettwen rocks of the islet. These photos refer to two different groups.

spread in southern Europe including Sicily (Carapezza, 1995).

REMARKS. Together with *Pyrrhocoris apterus*, this species is quite common in *Malva arborea* scrub, in foliage and on the ground under stones.

Familia RHOPALIDAE Amyot et Serville, 1843
Genus *Liorhyssus* Stål, 1870

Liorhyssus hyalinus (Fabricius, 1794)

DISTRIBUTION AND BIOLOGY. Cosmopolitan (Carapezza, 1995).

Liorhyssus hyalinus is polyphagous, having been recorded from 22 species in nine families as true host that support nymphal; hosts are best represented in the Asteraceae and Malvaceae, followed by the Euphorbiaceae, Geraniaceae, and Solanaceae (Hradil et al., 2007).

REMARKS. Few specimen of this species observed in *Malva arborea* maquis, on leaves and stem.

Familia OXYCARENIDAE Stål, 1862
Genus *Oxycarenus* Fieber, 1837

Oxycarenus lavaterae (Fabricius, 1787)

DISTRIBUTION AND BIOLOGY. *Oxycarenus lavaterae* has a Western Mediterranean distribution, present throughout Italy and the Mediterranean Islands (Carapezza, 1995).

Oligophagous species lives on plants belonging to the Malvaceae (https://bladmineerders. nl/).

REMARKS. *Oxycarenus lavaterae* is commonly found in *Malva arborea* maquis, both on plants and in leaf litter.

Familia CYDNIDAE Billberg, 1820
Genus *Macroscytus* Fieber, 1860

Macroscytus brunneus (Fabricius, 1803)

DISTRIBUTION AND BIOLOGY. Palearctic and Afrotropical regions (Lis, 2000). In Italy, *M. brunneus*, is particularly common in the peninsular and insular regions including Sicily and many of the small islets surrounding it, namely Lampedusa, Linosa, Pantelleria, Marettimo, Favignana, Ustica, Filicudi, Salina, Lipari, Vulcano and Stromboli (Servadei, 1967; Tamanini, 1981; Carapezza, 1977; 1981; 1995; Lo Verde & Carapezza, 2018).

They feed mainly on roots or as seed-feeders on host plants belonging to several families (Grazia et al. 2015).

REMARKS. A single specimen of *Macroscytus brunneus* was found on the Maraone islet at the edge of the *Malva arborea* scrub, under a rock, and observed attempting to escape by burrowing into the sandy soil.

Subordo AUCHENORRHYNCHA Dumeril, 1806
Familia ISSIDAE Spinola, 1839
Genus *Clybeccus* Gnezdilov, 2003

Clybeccus declivum (Dlabola, 1986)

DISTRIBUTION AND BIOLOGY. Species reported for Greece, Italy, Spain, Tunisia and Malta (Gnezdilov, 2003; 2010; 2011; Gnezdilov et al., 2004; D'Urso & Mifsud, 2012; D'Urso et al., 2019; Thanou et al., 2024) and for the circum-Sicilian Islands of Lampedusa, Pantelleria, and Favignana (Gnezdilov, 2003; Gnezdilov et al., 2014).

Species linked to dry biotopes, on plants such as *Periploca angustifolia* Labill. and *Avena sterilis* L. (D'Urso & Mifsud, 2012; Thanou et al., 2024).

REMARKS. Several specimens of this species were found on the islet of Maraone among the leaves of *Malva arborea*. The specimens were compared for their main morphological characteristics with the plates of Gnezdilov et al. (2014, plate 14: d, e, f) and the drawings of the genitals by Dlabola (1986, figs. 113-120).

Familia CICADELLIDAE Latreille, 1802
Genus *Eupteryx* Curtis, 1831

Eupteryx melissae Curtis, 1837

DISTRIBUTION AND BIOLOGY. A Turanic-Euromediterranean-Ethiopian species recorded also in the Nearctic Region and associated with Lamiaceae (Biedermann & Niedringhaus, 2004).

REMARKS. This species has been identified by its cephalic pattern characterised by five dots (ten dots in the related *E. decemnotata* Rey, 1891) and the shape of its genitals (Christian, 1956, figs. 7 a, b,

c). On the islet of Maraone, *E. melissae* has been found on the leaves of *Malva arborea*.

Subordo STERNORRHYNCHA Amyot et Audinet-Serville, 1843
Familia APHIDIDAE Latreille, 1802
Genus *Aphis* Linnaeus, 1758

Aphis umbrella (Börner, 1950)

Distribution and biology. *Aphis umbrella* is found in Europe, the Middle East and Central Asia (Mifsud et al., 2011). Its primary host is *Malva* spp. and some other Malvaceae; in Italy, secondary hosts are *Althea* spp., *Lavatera cretica* L. [=*Malva multiflora* (Cav.) Soldano, Banfi & Galasso] and *Malope malacoides* L. (Roberti, 1993). It has a monoecious holocycle with alate males in North Europe, although it is probably anholocyclic in warmer regions (Blackman & Eastop, 2006).

Remarks. A dozen specimens of this species were found on mallow leaves in May; there were also two specimens parasitised by small Aphidiinae wasps, not yet fully formed.

Ordo HYMENOPTERA Linnaeus, 1758
Familia ICHNEUMONIDAE Latreille, 1802
Subfamilia CAMPOPLEGINAE Förster, 1869
Genus *Hyposoter* Förster, 1869

Hyposoter didymator (Thunberg, 1822)

Distribution and biology. This species has been recorded widely in the literature across Eurasia from Ireland to Russia and Tajikistan. It was introduced to Australia and New Zealand (Galsworthy et al., 2023).

Rearing records are very numerous from a wide variety of lepidopteran hosts, including Geometridae, Lasiocampidae, Noctuidae, Notodontidae, Papilionidae and Pieridae. Recently reported for the first time in south-eastern Sicily, such as antagonist of the host Noctuidae *Spodoptera littoralis* (Boisduval, 1833) (Tropea Garzia & Siscaro, 2002).

Remarks. Only one female *Hyposoter didymator* was found on the islet of Maraone, morphologically characterised by: posterior tibia with proximal dorsal white spot, dark subproximal ring and thicker dark apical ring, mediodorsally white; seventh tergite not incised dorsally; finely granulated speculum (Galsworthy et al., 2023).

Familia ENCYRTIDAE Walker, 1837

Distribution and biology. Encyrtidae is one of the largest families of Chalcidoidea. It consists of two subfamilies and includes more than 460 genera with 3800 described species (Noyes, 2019).

Almost all extant Tetracneminae and many Encyrtinae species are parasitoids of Pseudococcidae (Coccoidea), but among Encyrtinae, some are parasitoids of other groups of insects, spiders, and mites (Simutnik & Trjapitzin 2008), and members of more than 20 genera are egg parasitoids (Heraty et al., 2013). In Sicily 31 species of this family are reported (Stoch, 2003).

Remarks. Only one damaged specimen attributable to this family.

Familia BRACONIDAE Nees, 1812
Genus *Diaeretiella* Starý, 1960

Diaeretiella rapae (M'Intosh, 1855)

Distribution and biology. *Diaeretiella rapae* is a highly polyphagous parasitic wasp that exclusively parasitizes approximately 98 species of aphids infesting more than 180 plant species belonging to 43 plant families distributed in 87 countries worldwide (Singh & Singh, 2015).

Remarks. Only one specimen attributable to this species has been found on the islet of Maraone.

Familia BETHYLIDAE Förster, 1856
Subfamilia EPYRINAE Kieffer, 1914
Genus *Epyris* Westwood, 1832

Epyris cf. ***sublevis*** Kieffer, 1904

Distribution and biology. The Bethylidae are primitive, relatively small (usually 1-10 mm long) wasps that primarily parasitize lepidopterous or coleopterous larvae (Krombein, 1996). The same biology is known for the subfamilia Epyrinae (Santos & González, 2004).

The genus *Epyris* has 272 valid species worldwide, only two of which are recorded in Sicily: *E.*

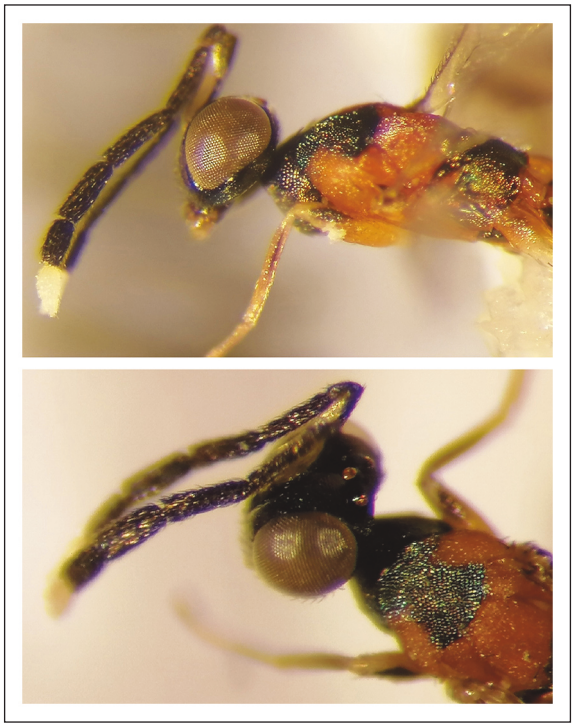


Figure 68. *Hemiptarsenus dropion* from Maraone islet: head, antenna and thorax.

gaullei Kieffer, 1906, known in the Trapani-Erice area, and *E. niger* Westwood, 1832 (Azevedo et al., 2010).

REMARKS. The only specimen sampled on the islet of Maraone is attributed to this species based on comparison with the description provided by Kieffer (1904) and the dichotomous keys of Nagy (1970). In particular, the specimen in question has a finely punctured head and thorax, while *E. gaullei* is distinguished not only by a series of morphological characteristics but also by its coarsely punctured head and thorax.

Familia EULOPHIDAE
Genus *Hemiptarsenus* Westwood, 1833

Hemiptarsenus dropion (Walker, 1839) (Fig. 68)
= *Hemiptarsenus ornatus* (Nees, 1834)

DISTRIBUTION AND BIOLOGY. Palaearctic region (Zhu et al., 2000).

The genus *Hemiptarsenus* includes numerous species which are potentially important for biological control of leaf miners belonging to Diptera, Lepidoptera, Coleoptera and Hymenoptera (Gibson 1997; Burgio et al., 2007; Yang et al., 2015). *Hemiptarsenus ornatus* parasitises Lepidoptera such as *Stigmella nanivora* [= *Stigmella betulicola* (Stainton, 1856)], *Stigmella dryadella* (Hofmann, 1868), *Phyllonorycter medicaginella* (Gerasimov, 1930), *Lithocolletis helianthemella* [= *Triberta helianthemella* (Herrich-Schäeffer, 1860)] and the diptera *Liriomyza trifolii* (Burgess, 1880) and *Phytomyza ranunculi* (Schrank, 1803) (Bouček, 1959; Bachmaier, 1965; Askew & Shaw, 1974; Minkenberg & Lenteren, 1985; Mishchenko & Yefremova, 2012). *Hemiptarsenus ornatus* is considered synonymous with *H. dropion* (Zhu et al., 2000; Tao et al., 2021). Stoch (2003) mentions *H. dropion* only for southern Italy, therefore it would be a new species for the Sicilian fauna.

REMARKS. A single female specimen of this species emerged from a larva found in the debris of the *Malva arborea* scrub two months after it was discovered (from February to April).

Familia FORMICIDAE Latreille, 1809
Genus *Tetramorium* Mayr, 1855

Tetramorium semilaeve Andrè, 1833

DISTRIBUTION AND BIOLOGY. A West Mediterranean species belonging to a group in need of taxonomic revision. The East Mediterranean records have been considered dubious (Borowiec et al., 2015).

It is a thermophilic species mostly inhabiting areas with sparse vegetation (Borowiec et al., 2015).

REMARKS. Common species on the islet of Maraone, under stones and in the debris of the *Malva arborea* scrub.

Genus *Plagiolepis* Mayr, 1861

Plagiolepis pygmaea (Latreille, 1798)

DISTRIBUTION AND BIOLOGY. A widespread South European species, thermophilous and preferring areas with sparse vegetation (Seifert 2018). Two closely related but social parasite species may be found as “inquilines” in the nests of *P. pygmaea* in Sicily: the very rare *P. grassei*



Figures 69–77 Diptera from Maraone islet. Figs. 69, 70: *Tethina* cf. *longirostris* head (Fig. 69) and terminalia male (Fig. 70). Figs. 71, 72: *Aphanotrigonum* cf. *femorellum* female, lateral (Fig. 71) and ventral view (Fig. 72). Figs. 73–75. *Trixoscelis pedestris* femor and tibia (Fig. 73), head (Fig. 74), and genitalia (Fig. 75). Figs. 76, 77: *Gymnochiromyia mihalyii* body (Fig. 76), thorax and head (Fig. 77).

Le Masne, 1956 and the exclusively workerless *P. xene* Stärcke, 1936 (Schifani 2017; Degueldre et al. 2021).

REMARKS. Some specimens of this species were found in the debris of the *Malva arborea* scrub on the islet of Maraone in spring.

Familia APIDAE Latreille, 1802
Genus *Bombus* Latreille, 1802

Bombus (Bombus) terrestris (Linnaeus, 1758)

DISTRIBUTION AND BIOLOGY. It is widespread in Europe, northern Africa (Morocco, Algeria, Tunisia, and Libya), and western Asia; recently recorded for Egadi's Archipelago and only for Marettimo Island (Catania et al., 2022).

Bombus (B.) terrestris is an efficient pollinator of a wide variety of native plants and of crops (Velthuis & Cobb, 1991; Velthuis & van Doorn, 2006). Since *B. (B.) terrestris* was artificially bred for pollination services in greenhouses and subsequently introduced for commercial reasons globally, this species has been recognized as invasive, disturbing local ecosystems (Dafni et al., 2010).

REMARKS. Only one dead specimen on the edge of the *Malva arborea* scrub in May.

Ordo DIPTERA Linnaeus, 1758
Familia CANACIDAE Jones, 1906
Subfamilia TETHININAE Hendel, 1916
Genus *Tethina* Haliday, 1838

Tethina cf. ***longirostris*** (Loew, 1865) (Figs. 69, 70)

DISTRIBUTION AND BIOLOGY. Palaearctic: Algeria, Cyprus, Egypt, France, Germany, Greece (Crete), Israel, Italy (Sicily), Malta, Spain (including Balearic Islands), Tunisia (Munari & Mathis, 2010; Munari, 2011).

This species is often observed on flowers; it has also been observed on rocky coasts far from sandy beaches (Munari & Ebejer, 2001). It is a variable species in size and terminal morphology (Munari & Merz, 2003).

REMARKS. Only five specimens (3 females and 2 males) were found in *Malva arborea* scrub.

Familia CHLOROPIDAE Rondani, 1856
Subfamilia OSCINELLINAE Becker, 1910
Genus *Aphanotrigonum* Duda, 1932

Aphanotrigonum cf. ***femorellum*** (Collin, 1946) (Figs. 71, 72)

DISTRIBUTION AND BIOLOGY. Species with European-Mediterranean distribution, extending to East Asia (Nartshuk, 2004; 2016). In the Mediterranean area, it has been reported for the Balearic Islands, Maltese Islands and Sardinia (Nartshuk, 2013) and in Tunisia (Nartshuk, 2004). The subfamily Oscinellinae, to which *Aphanotrigonum* belongs, includes saprophagous and phytosaprophagous species (Nartshuk, 2013).

REMARKS. A single female specimen attributable to this species by comparison was collected in the *Malva arborea* scrub. If this presence is confirmed, *Aphanotrigonum femorellum* would be a new species for Sicily.

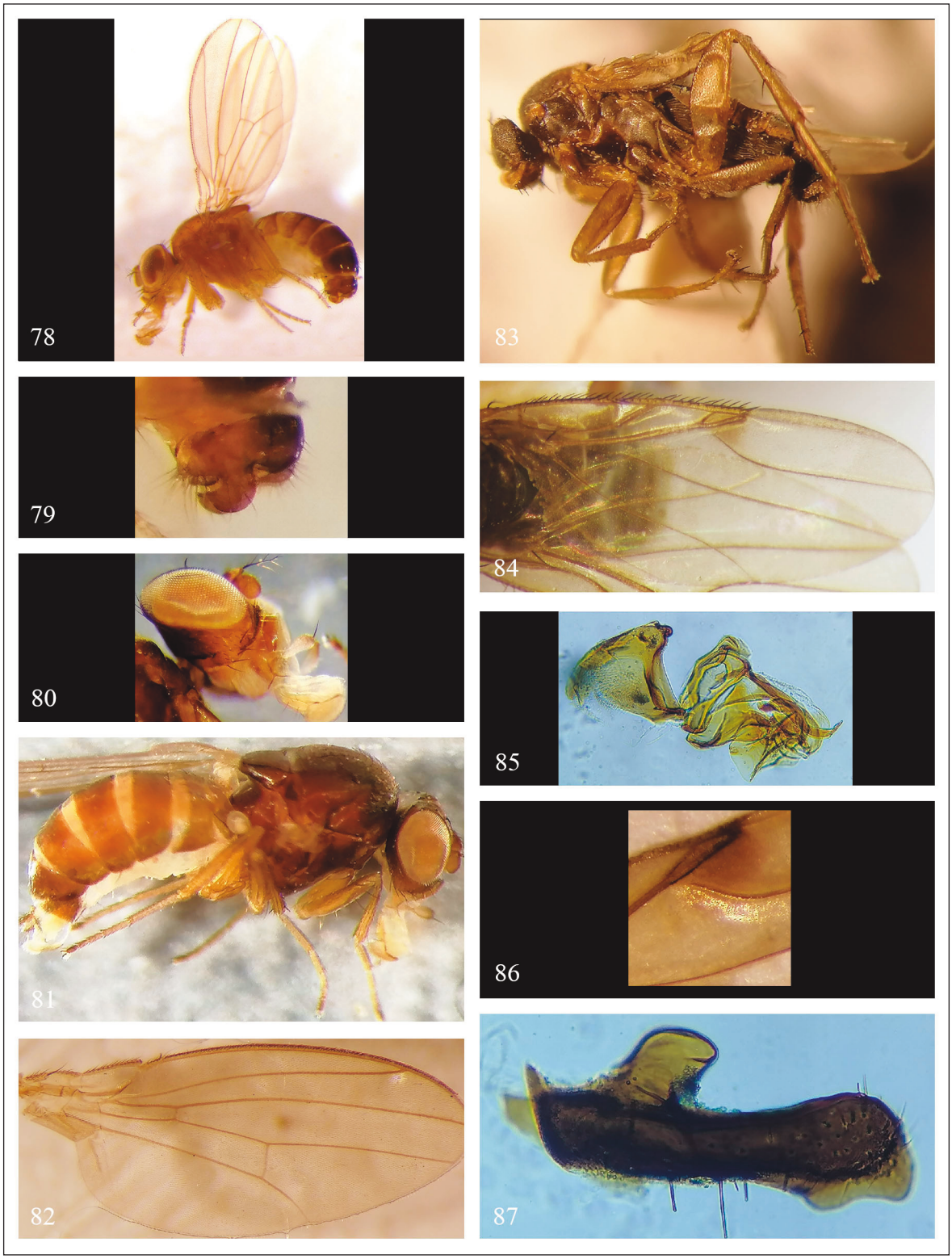
Familia HELEOMYZIDAE Westwood, 1840
Subfamilia TRIXOSCELIDINAE Hendel, 1916
Genus *Trixoscelis* Rondani, 1856

Trixoscelis pedestris (Loew, 1865) (Figs. 73–75)

DISTRIBUTION AND BIOLOGY. Southern Europe, Asia, Minor, Canary Islands and North Africa (Hackman, 1970), asiatic parts of Turkey (Soós, 1984; Woznica, 2007), and Balearic Islands (Ebejer, 2003; Carles-Tolrá & Ventura, 2008). The unknown larvae of the genus *Trixoscelis* are probably saprophagous and the adults are thermophilous can be swept from vegetation in warm, sandy, steppe and forest steppe habitats (Roháček, 2006).

Currently, the only species of this genus reported in Sicily is *T. approximata* (Loew, 1865) (Loew, 1865; Lo Giudice & Woźnica, 2021). *Trixoscelis pedestris* is not included in the latest Italian checklist (Bologna et al., 2021), therefore it is a new species for the Italian fauna.

REMARKS. Among the dipterans collected at Maraone, *T. pedestris* is the most common species. The male genitalia and the front and rear legs correspond to Hackman's illustrations (1970, figs. 22, 27, 32); the identification was further confirmed by Paul Beuk and Martin Ebejer (personal communication).



Figures 78–87. Diptera from Maraone islet. Figs. 78, 79: *Drosophila simulans* (Drosophilidae) body (Fig. 78) and terminalia (Fig. 79). Figs. 80–82. *D. subobscura* head (Fig. 80), body (Fig. 81) and wing (Fig. 82). Figs. 83–87: *Spiniphora maculata* (Phoridae) body, wing, genitalia, macula of the wing and lobe of hypopygium.

Familia CHYROMYIDAE Schiner, 1863
Genus *Gymnochiromyia* Hendel, 1933

Gymnochiromyia mihalyii Soós, 1979 (Figs. 76, 77)

DISTRIBUTION AND BIOLOGY. Europeo-Mediterranean, recently reported from Sicily and Sardinia (Ebejer, 2005). To prefer open countryside including dunes and cultivated fields, from the seashore up to an altitude of 1000 m in *Castanea* Mill. e *Corylus* L. woods (Ebejer, 2005).

REMARKS. Species found within the *Malva arborea* scrub. Identification confirmed by Martin Ebejer (pers. comm.).

Familia DROSOPHILIDAE Rondani, 1856
Subfamilia DROSOPHILINAE Rondani, 1856
Genus *Drosophila* Fallen, 1823

Drosophila simulans Sturtevant, 1919 (Figs. 78, 79)

DISTRIBUTION AND BIOLOGY. Cosmopolitan species, already reported for Sicily (Stoch, 2003; Bächli, 2021).

Biology similar to that of other *Drosophila* species, feeding mainly or exclusively on fruit.

REMARKS. Morphologically very similar to *D. melanogaster* Meigen, 1830, from which it differs mainly in the shape of the male terminalia (Sturtevant, 1919). A single male specimen was found on the islet of Maraone, which were identified by Paul Beuk.

Drosophila subobscura Collin in Gordon, 1936 (Figs. 80–82)

DISTRIBUTION AND BIOLOGY. Subcosmopolitan. It is a species of Palaearctic origin, ranging from Scandinavia to North Africa, extending to the Middle East in Iran (Bächli, 1979), and subsequently introduced to Canada, the USA and Chile (Ayala et al., 1989). Present throughout Italy, including Sardinia and Sicily (Stoch, 2003; Bächli, 2021).

Biology similar to that of other *Drosophila*.

REMARKS. Only four specimens of this species have been found on the islet of Maraone, which were identified by Paul Beuk.

Familia CECIDOMYIIDAE Newman, 1834

DISTRIBUTION AND BIOLOGY. Altogether 5700 species of this family are known to occur in the world (Gagné, 2004), of which about 3200 occur in the Palaearctic Region and 1700 in Europe (Skuhravá, 2005).

The larvae are phytophagous, mycophagous, saprophagous, or zoophagous. Many phytophagous larvae are gall-forming, inducing galls on various plants, while some live freely in the flower heads or stems of plants without forming galls. Zoophagous larvae are predators of other gall-forming midges, aphids, mites, coccidians, or other small arthropods. Mycophagous and saprophagous larvae are associated with fungi. The lifespan of an adult is very short, only a few hours or five days at most (Skuhravá, 2006).

REMARKS. This species is associated with *Malva arborea* scrub. A few adults emerged inside the bag containing the plant debris. Subsequently, the specimens were found to be damaged and unidentifiable because they were missing diagnostic parts (G. Cerasa pers. comm.).

Familia PHORIDAE Latreille, 1796
Subfamilia PHORINAE Curtis, 1833
Genus *Spiniphora* Malloch, 1909

Spiniphora maculata (Meigen, 1830) (Figs. 83–87)

DISTRIBUTION AND BIOLOGY. European species also reported in North Africa (Barker, 2004). In Italy, it is known only in northern locations (Gorizia) from Schmitz (1928) under the name *Paraspiniphora helicivora* (Dufour, 1841), a name synonymised by Disney (1979) with *S. maculata* (see also Stoch, 2003).

Spiniphora maculata is a species whose larval development is linked to both dead (Dufour, 1841; Lundbeck, 1922; Disney, 1972) and living gastropods (Keilin, 1911; Coupland, 1994).

REMARKS. Only two specimens (1 female and 1 male) were found on the islet of Maraone in the soil sample collected in the *Malva arborea* scrub. In agreement with Barker (2004), who mentions Helicidae (*Eobania*, *Cornu*, *Theba*) and Geomitridae (*Cernuella*) molluscs as the main hosts of this species, it is likely that this species is linked to Helicidae *E. vermiculata*, a relatively common species within the surveyed area.

Familia SPHAEROCERIDAE Macquart, 1835
Subfamilia LIMOSININAE Frey, 1921
Genus *Pullimosina* Rohacek, 1983

Pullimosina heteroneura (Haliday, 1836)

DISTRIBUTION AND BIOLOGY. It is a common and cosmopolitan species, known from Europe, Africa, Australia, New Zealand, Hawaii, Afghanistan, Formosa, and the Azores (Roháček, 1983), present throughout Italy, including the major islands (Stoch, 2003).

Pullimosina heteroneura lives in organic environments, including decomposing matter, mushroom beds, mammal nests, carcasses, manure, caves and dairy factories (Marshall, 1986 and cited authors).

REMARKS. Only one female specimen of *P. heteroneura* was recorded on the islet of Maraone in May.

Familia CALLIPHORIDAE Brauer et Bergenstamm, 1889
Subfamilia CALLIPHORINAE Brauer et Bergenstamm, 1889
Genus *Lucilia* Robineau-Desvoidy, 1830

Lucilia cf. ***sericata*** (Meigen, 1826)

DISTRIBUTION AND BIOLOGY. Sub-cosmopolitan species (Nandi, 2002).

Adults are oviparous, typically a domestic species. They can be collected from decaying matters, carrion, excrements and fruits (Pont, 1980).

REMARKS. *Lucilia sericata* was found on the islands of Maraone on the carcasses of Yellow-legged Gull; it was only spotted in flight, which is why this identification is to be confirmed.

Familia SARCOPHAGIDAE Macquart, 1834
Subfamilia PARAMACRONYCHIINAE Brauer et Bergenstamm, 1889
Genus *Sarcophila* Rondani, 1856

Sarcophila latifrons (Fallén, 1817)

DISTRIBUTION AND BIOLOGY. Species with Palaearctic distribution, although occasionally also found in the eastern region (Pape, 1996), and already known in Sicily (Pape et al., 1995).

Sarcophila latifrons is a necrophagous species (Pape, 1987; Martinez-Sanchez et al., 2000). Adults fly on flowers, faeces, carrion and organic matter, also found on snails together with other species of Sarcophagidae (Richet & Whitmore, 2004). In Europe, Richet (1990) believes it may be a suspected parasitoid on *Cepaea nemoralis* (Linnaeus, 1758).

REMARKS. A single male specimen was found on the islet of Maraone, identified by studying its genitals (Lehrer, 2003), inside an envelope together with Helicidae shells (*Theba pisana* and *Eobania vermiculata*) collected in the halophilous scrub of *Arthrocaulon meridionale* in June.

Genus *Sarcophaga* Meigen, 1826
Subgenus *Liosarcophaga* Enderlein, 1928

Sarcophaga (Liosarcophaga) tibialis Macquart, 1851

DISTRIBUTION AND BIOLOGY. *Sarcophaga (L.) tibialis* is widespread throughout the Afrotropical Region, Madagascar and parts of Europe (Zumpt, 1965, 1972; Dear 1980; Pape, 1996); it is present throughout Italy, including Sicily and Sardinia (Pape et al., 1995).

It has been reported to breed in carrion and animal excrement (Aspoas 1991).

REMARKS. A single male of this species, identified by D. Whitmore, was collected, like the previous species, in an envelope together with Helicidae shells (*Theba pisana* and *Eobania vermiculata*) collected in the halophilous scrub of *Arthrocaulon meridionale* in March.

Ordo LEPIDOPTERA Linnaeus, 1758
Familia NOCTUIDAE Latreiller, 1809
Subfamilia NOCTUINAE Latreille, 1809
Genus *Noctua* Linnaeus, 1758

Noctua pronuba (Linnaeus, 1758)

DISTRIBUTION AND BIOLOGY. A species with a Palearctic distribution covering the whole of Italy (Robineau, 2012). Mifsud (1977) mentions it as a pest of lettuce, potato and tomato crops in Malta. Adults are observed in spring and autumn (Infusino et al., 2012; Cernigliaro et al., 2012). In Sicily, the caterpillars are found on plants of the

genera *Primula*, *Rumex*, *Polygonum*, *Atriplex*, *Myosotis*, *Viola*, *Taraxacum* (Cernigliaro et al., 2012).

REMARKS. In Maraone islet, a single chrysalis was found under rocks and foliage in March in the *Malva arborea* scrub. The adult emerged after about a week in the laboratory.

Familia NYMPHALIDAE Rafinesque, 1815
Subfamilia NYMPHALINAE Rafinesque, 1815
Genus *Vanessa* Fabricius, 1807

Vanessa cardui (Linnaeus, 1758)

DISTRIBUTION AND BIOLOGY. A species with Holarctic distribution, it is found throughout Italy from the coast up to 2,500 m asl (Leraut, 2016).

The caterpillars develop on *Carduus* and *Cirsium* (Liardo & Zafarana, 2003).

REMARKS. Observed in flight on the islet of Maraone.

Familia PIERIDAE Duponchel, 1832
Subfamilia COLIADINAE Swainson, 1827
Genus *Colias* Fabricius, 1807

Colias crocea **(**Geoffroy, 1785)

DISTRIBUTION AND BIOLOGY. Species distributed across Europe, the Mediterranean and Asia Minor; in Italy, it is found from the plains up to 2,400 m asl (Leraut, 2016).

The caterpillars live on legumes (Tshikolovets, 2011; Liardo & Zafarana, 2003).

REMARKS. Observed in flight on the islet of Maraone.

Subfamilia PIERINAE Duponchel, 1832
Genus *Pieris* Schrank, 1801

Pieris rapae (Linnaeus, 1758)

DISTRIBUTION AND BIOLOGY. Cosmopolitan distribution throughout Italy (Leraut, 2016).

The caterpillar develops on Brassicaceae plants (Tshikolovets, 2011; Liardo & Zafarana, 2003).

REMARKS. Observed in flight on the islet of Maraone.

Familia TINEIDAE Latreille, 1810
Subfamilia TINEINAE Latreille, 1810
Genus *Trichophaga* Ragonot, 1894

Trichophaga tapetzella (Hübner, 1805)

DISTRIBUTION AND BIOLOGY. Cosmopolitan species with preimaginal stages on skin, hair and foodstuffs (Tremblay, 1996). Sciarretta et al. (2006) report it as subtroglossene for Molise, feeding on substances and debris of animal origin.

REMARKS. Some specimens emerged in the laboratory in May from *Malva arborea* leaf debris mixed with dry stem fragments.

Familia ERIOCOTTIDAE Spuler, 1898
Subfamilia ERIOCOTTINAE Spuler, 1898
Genus *Eriocottis* Zeller, 1847

Eriocottis fuscanella Zeller, 1847

DISTRIBUTION AND BIOLOGY. This species is present in central-southern Italy, Sardinia, Sicily (Gaedike et al., 1995; Stoch, 2003), Turkey (Iren & Ahned, 1973), Malta (Sammut, 1984) and has recently been reported in southern France (Sterk et al., 2024).

Eriocottis fuscanella was described for Sicily, in the provinces of Messina and Syracuse, on *Arbutus unedo* L. and *Erica arborea* L. (Zeller, 1847).

REMARKS. This species was also sampled on specimens fluttered in the laboratory in May from leaf litter of *Malva arborea* mixed with dry stem fragments.

Familia GEOMETRIDAE Leach, 1815
Subfamilia LARENTIINAE Duponchel, 1845
Genus *Larentia* Treitschke, 1825

Larentia malvata (Rambur, 1833)

DISTRIBUTION AND BIOLOGY. W-Mediterranean transadriatic. In Italy, it has been reported in Sicily and Sardinia (Mariani, 1941), Lazio (Prola & Racheli, 1979) and Marche (Spada, 1892–1893).

The larva lives on *Lavatera arborea* L., *L. olbia* L., *L. punctata* All. e *Malva* sp. (Lhomme, 1923–35).

REMARKS. Only unhatched chrysalises were found in the litter of *Malva arborea* in Maraone.

The tip of the chrysalis has a bifid point point (Leraut, 2009; www.leps.it).

Phylum MOLLUSCA Cuvier, 1797
Classis GASTROPODA Cuvier, 1791
Ordo LITTORINIMORPHA Pchelintsev, 1963
Familia POMATIIDAE Newton, 1891
Genus *Tudorella* P. Fischer, 1885

Tudorella multisulcata (Potiez et Michaud, 1838)

Distribution and biology. *Tudorella multisulcata* is widespread in the mountains of Trapani and southern Sicily while *T. panormitana* (Sacchi, 1954) is an endemic species of the Palermo Mountains, widespread from Trabia in the west to Monte Palmeto in the east (Pfenninger et al., 2010).

Tudorella multisulcata is a xeroresistent species typical of calcareous and rocky soil but it lives also under stones in clayey or sandy soils.

Remarks. Species already reported for the Aegadian Archipelago (Fiorentino et al., 2004). Only a few shells of this species have been collected on the islet of Maraone.

Ordo AMPHIPULMONATA Schrödl, 2014
Familia ELLOBIIDAE L. Pfeiffer, 1854
Subfamilia PYTHIINAE Odhner, 1925 (1880)
Genus *Myosotella* Monterosato, 1906

Myosotella myositis (Draparnaud, 1801)

Distribution and biology. *Myosotella myosotis* is native to Europe (Mediterranean Sea coasts, West European coasts, Baltic Sea and Black Sea) but introduced into several locations including North America, Gulf of Mexico, South Africa, Australia, and New Zealand (Giusti et al., 1995).

This species lives at sea level, at the highest high-tide level, in semi-terrestrial environment, usually under stones, sea algae and *Posidonia* accumulations and driftwood in areas with brackish water as in the salt pans (Welter-Schultes, 2012).

Remarks. Species already reported for the Egadi Islands (Fiorentino et al., 2004). Only a few shells of this species have been collected on the islet of Maraone.

Infraclassis PULMONATA Cuvier in Blanville, 1824
Ordo STYLOMMATOPHORA A. Schmidt, 1855
Familia ENIDAE B.B. Woodward, 1903
Subfamilia ENINAE B.B. Woodward, 1903 (1880)
Genus *Mastus* H. Beck, 1837

Mastus pupa (Linnaeus, 1758)

Distribution and biology. Mediterranean, including peninsular Italy, Sardinia and Sicily (Alzona, 1971; Bodon et al., 2021).

It is a thermophilic species, present in a wide variety of habitats.

Remarks. This species lives on Maraone islet under stones or debris.

Familia FERUSSACIIDAE Bourguignat, 1883
Genus *Ferussacia* Risso, 1826

Ferussacia folliculum (Schröter, 1784)

Distribution and biology. Mediterranean. In Italy, it is reported from Liguria, Emilia Romagna, peninsular regions, Sicily and Sardinia (Bodon et al., 2021).

Thermophilic species, inhabiting arid environments with little vegetation cover.

Remarks. A single shell of this species were found on Maraone islet under stones or debris.

Familia CLAUSILIIDAE J.E. Gray, 1855
Subfamilia ALOPIINAE A. J. Wagner, 1913
Genus *Papillifera* Hartmann, 1842
Species *papillaris* (O.F. Müller, 1774)

Papillifera papillaris cf. ***affinis*** (Philippi, 1836)

Distribution and biology. According to Nordsieck (2022), the genus *Papillifera* includes two species, *P. papillaris* and *P. solida* (Draparnaud, 1805), both originate from Italy. *Papillifera papillaris* is widely distributed in the Mediterranean area, *P. solida* has been found beyond Italy only in southern France (Provence). Both species differ mainly by the dark subsutural band of the shell, which is present in *P. papillaris* and in general absent in *P. solida* (Nordsieck 2011, 2013).

The following subspecies, almost all of which live in Sicily, are ascribed to *P. papillaris papillaris*

from mainland Italy south to northern Calabria; *P. papillaris transitans* (Paulucci, 1878) from southern Calabria (higher parts of Monte Consolino und Monte Stella); *P. papillaris affinis* from Sicily, southern Calabria, Malta, and Tunisia; *P. papillaris brevissima* (L. Pfeiffer, 1859) from southern eastern Sicily; *P. papillaris tinei* (Westerlund, 1878) from southern Sicily near the coast; *P. papillaris rudicosta* (O. Böttger, 1878) from southern eastern Sicily (Muglia). In particular, *P. papillaris affinis* has been reported from the Egadi islands of Favignana, Levanzo, and Marettimo Nordsieck (2022).

REMARKS. Living specimens and empty shells of this species were found on Maraone islet under stones or debris in the *Malva arborea* maquis.

Familia MILACIDAE Ellis, 1926
Genus *Milax* J.E. Gray, 1855

Milax sp.

DISTRIBUTION AND BIOLOGY. The genus *Milax* has a Euro-Mediterranean-Caucasian distribution (Wiktor, 1987).

REMARKS. Only a few limacella attributable to the *Milax* genus were found. This finding requires further confirmation.

Familia TRISSEXODONTIDAE H. Nordsieck, 1987
Subfamilia TRISSEXODONTINAE H. Nordsieck, 1987
Genus *Caracollina* H. Beck, 1837

Caracollina lenticula (Michaud, 1831) (Fig. 88)

DISTRIBUTION AND BIOLOGY. Mediterranean distribution, including peninsular Italy, Sicily and Sardinia (Bodon et al., 2021).

A thermophilic and thalassophilic species, is very common in Sicily from a few meters above sea level up to medium altitudes, usually under stones.

REMARKS. Living specimens and empty shells of *C. lenticula* were found on Maraone islet in the *Malva arborea* litter and under stones with *Eobania vermiculata* and *Xerotricha apicina*.

Familia GEOMITRIDAE C.R. Boettger, 1909
Subfamilia HELICELLINAE Ihering, 1909
Genus *Xerotricha* Monterosato, 1892

Xerotricha apicina (Lamarck, 1822)

DISTRIBUTION AND BIOLOGY. Mediterranean distribution, reported in Italy from Veneto, Liguria, peninsular regions, Sicily and Sardinia (Alzona, 1971; Cossignani & Cossignani, 1995, 2020; Bodon et al., 2021).

This species is very common in Sicily under stones and debris from coastal areas to medium altitudes, in natural or anthropized environments.

REMARKS. *Xerotricha apicina* is the most common species in the tree mallow litter, as evidenced by the live specimens found and the hundreds of shells lying on the ground.

Genus *Cernuella* Schlüter, 1838

Cernuella cf. ***cisalpina*** (Rossmässler, 1837)

DISTRIBUTION AND BIOLOGY. European-Mediterranean distribution, almost all of continental and peninsular Italy, Sicily and Sardinia (Manganelli & Giusti, 1987; Giusti et al., 1995; Bodon et al., 2021).

In Sicily, this species is common at low and medium altitudes, in natural and anthropized environments.

REMARKS. A few specimens living on plants and under stones in the open areas of the islet of Maraone.

Cernuella cf. ***virgata*** (Da Costa, 1778) (Fig. 89)

DISTRIBUTION AND BIOLOGY. European-Mediterranean distribution, almost all of continental and peninsular Italy, Sicily and Sardinia (Manganelli & Giusti, 1987; Giusti et al., 1995; Bodon et al., 2021).

Thermophilic and xeroresistant species, it is widespread in Sicily, at low and medium altitudes, in different natural environments, even degraded and anthropized, often in in numerous colonies on grasses and shrubs, often in association with *Eobania vermiculata* and, above all, *Theba pisana*.

REMARKS. Relatively common under stones and on plants in the open areas of the islet of Maraone.

Subfamilia GEOMITRINAE C. R. Boettger, 1909

Genus *Trochoidea* Brown, 1827



Figures 88–92. Mollusca Gastropoda from Maraone islet. Fig. 88: *Caracollina lenticula* under stone. Fig. 89: *Cernuella* cf. *virgata* on *Arthrocaulon meridionale*. Fig. 90: *Cochlicella acuta*. Fig. 91: *Theba pisana* on ruins. Fig. 92: *Eobania vermiculata*.

Trochoidea trochoides (Poiret, 1789)

DISTRIBUTION AND BIOLOGY. *Trochoidea trochoides* is widespread in the Mediterranean area in France, Corsica, Spain, the Balearic Islands, the Dodecanese Islands, Albania, Croatia, Montenegro and almost all regions of Italy, especially the peninsular ones, Sardinia and Sicily (Bodon et al., 2021).

A thermophilic and xero-resistant species, it is found at low and medium altitudes, under rocks or on plants.

REMARKS. Only one shell of this species has been found on the islet of Maraone.

Genus *Cochlicella* A. Férussac, 1821

Cochlicella acuta (O.F. Müller, 1774) (Fig. 90)

DISTRIBUTION AND BIOLOGY. Mediterranean. It is reported for almost all of continental and peninsular Italy, Sicily and Sardinia (Alzona, 1971; Cossignani & Cossignani, 1995, 2020; Bodon et al., 2021).

In Sicily, *C. acuta* is very common from a few meters above sea level up to medium altitudes usually on plants and shrubs.

REMARKS. A few specimens living on plants and under stones in the open areas of the islet of Maraone.

Cochlicella conoidea (Draparnaud, 1801)

DISTRIBUTION AND BIOLOGY. Western Mediterranean. Peninsular Italy, Sicily and Sardinia (Bodon et al., 2021).

A thermophilic, thalassophilic and psammophilic species, in Sicily, it is found on sandy coastlines, behind dunes and at low altitudes, sometimes in large colonies on plants and shrubs.

REMARKS. In the litter between the rocks, only a shell.

Familia HELICIDAE Rafinesque, 1815
Subfamilia MURELLINAE P. Hesse, 1918
Genus *Marmorana* W. Hartmann, 1844

Marmorana muralis (O.F. Müller, 1774)

DISTRIBUTION AND BIOLOGY. The *Marmorana* genus includes several species native to Sicily, with rupicolous and calcium-loving habits. They are fragmented into many populations, sometimes even limited to small areas, based on the morphological variability of their shells.

REMARKS. Only a few empty shells of this species were found in the study area, at the base of the rocks outcropping near the ruins of the abandoned house and in the mallow scrub. Its presence on the island may be linked to human or avian transport.

Subfamilia HELICINAE Rafinesque, 1815
Genus *Theba* Risso, 1826

Theba pisana (O.F. Müller, 1774) (Fig. 91)

DISTRIBUTION AND BIOLOGY. Mediterranean distribution extended to Macaronesia and to the North African and European Atlantic coasts (Gittenberger & Ripken, 1987), passively diffused in other extra-European countries (Giusti et al., 1995). In Italy, it is reported from almost all of continental and peninsular Italy, Sicily and Sardinia (Alzona, 1971; Bodon et al., 2021).

Theba pisana is a thermophilic and photophilic species, typically linked to the dune system but also present in Sicily in more inland localities, at low altitudes, where it is found on various herbs and shrubs, often in large populations.

REMARKS. Living specimens of *T. pisana* have been found on plants in the open areas of the islet of Maraone. Common.

Genus *Cantareus* Risso, 1826

Cantareus apertus (Born, 1778)

DISTRIBUTION AND BIOLOGY. Mediterranean distribution; In Italy, it is reported from Liguria, Veneto, peninsular regions, Sicily and Sardinia (Bodon et al., 2021). The genus *Cantareus* has included only this species for many years. Following Bouaziz-Yahiatene et al. (2019), mainly based on molecular data, *C. subapertus* (Ancey, 1893) and *C. koraegaelius* (Bourguignat in Locard, 1882) from Algeria are also attributed to this genus.

It is thermophilic, common in open, arid, even anthropized and degraded environments, at low and medium altitudes. In Summer it estivates, under the

ground, closing the aperture of the shell with a robust white and convex epiphragm.

Cantareus apertus with *Cornu aspersum* (O. F. Müller, 1774), *Eobania vermiculata* and *Theba pisana* are the best known edible molluscs in the Sicilian tradition (De Stefani, 1923; Pusateri, 2016; Sparacio, 2020).

Remarks. A small living colony of *C. apertus* has been found on Maraone islet in the *Malva arborea* maquis.

Genus *Eobania* P. Hesse, 1913

Eobania vermiculata (O.F. Müller, 1774) (Fig. 92)

Distribution and biology. Mediterranean species is reported for almost all of continental and peninsular Italy, Sicily and Sardinia (Bodon et al., 2021). Widespread by man in many non-Mediterranean countries. *Eobania vermiculata* is present in all the circum-Sicilian islands, including Aegadian Archipelago, with more or less differentiated populations (Benoit, 1857–1862, 1875, 1882; Monterosato, 1892; Alzona, 1971; Fiorentino et al., 2004).

It is thermophilic, common in many types of environments, both natural and anthropized, from a few meters above sea level up to medium altitudes.

Remarks. Living specimens of *E. vermiculata* have been found on Maraone island under rocks at the edge of the *Malva arborea* maquis or under debris in the leaf litter. Common.

Phylum VERTEBRATA Bateson, 1885
Subphylum VERTEBRATA J-B. Lamarck, 1801
Classis REPTILIA Laurenti, 1768
Ordo SQUAMATA Oppel, 1811
Familia GEKKONIDAE Gray, 1825
Subfamilia GEKKONINAE Gray, 1825
Genus *Hemidactylus* Oken, 1817

Hemidactylus turcicus (Linnaeus, 1758) (Fig. 93)

Distribution and biology. *Hemidactylus turcicus* is native to the Mediterranean area reaching the southern and eastern boundaries, respectively, in Somalia and India; it has spread to many parts of the world including East Africa, South and North America, the Caribbean area. This species has been reported on almost all the circum-Sicilian islands, even the smallest ones (Lo Cascio & Sciberras, 2020).

Remarks. Several specimens of this species were observed and photographed during various excursions to the islet of Maraone. *Hemidactylus turcicus* was not yet known to inhabit this small island (Lo Cascio & Sciberras, 2020).

Familia LACERTIDAE Gray, 1825
Sottofamilia LACERTINAE Gray, 1825
Genus *Podarcis* Wagler, 1830

Podarcis siculus (Rafinesque-Schmaltz, 1810) (Fig. 94)

Distribution and biology. The distribution of *P. siculus* is limited to the Italian Peninsula (including the main islands) and the E-Adriatic coast, but the species has been introduced in several localities of S-Europe, N-Africa, Turkey and United States. This species is widespread in almost all the circum-Sicilian islands with some melanic or hyperchromatic populations (Lo Cascio & Sciberras, 2020) that have been referred to distinct subspecies considered as not valid and therefore synonymized (Razzetti et al., 2006). This, however, deserves greater taxonomic attention (Lo Valvo et al., 2004; Faraone, 2011; Senczuk et al., 2019).

Remarks. Several specimens of *Podarcis siculus* were observed and photographed during various excursions to the islet of Maraone. This population tends towards chromatic melanism. Species already reported for Maraone (Lo Cascio & Sciberras, 2020).

Classis AVES
Ordo PELECANIFORMES Sharpe, 1891
Familia ARDEIDAE Leach, 1820
Genus *Egretta* Forster, 1817

Egretta garzetta (Linnaeus, 1766)
Little Egret (Figs. 95, 97)

Distribution and biology. *Egretta garzetta* colonized Sicily in the early 1990s (Brichetti & Fasola, 1986); starting in 2010 it also began to reproduce in the province of Trapani, initially in the



Figures 93–96. Vertebrata from Maraone islet. Fig. 93: *Hemidactylus turcicus* (Reptilia Gekkonidae) under stone and with eggs. Fig. 94: *Podarcis siculus* (Reptilia Lacertidae) at the base of *Malva arborea* plants. Fig. 95: Little Egret (Aves Ardeidae), three chicks in the nest. Fig. 96: Yellow-legged Gull (Aves Laridae) egg.



Figure 97. Little Egret from Maraone islet (Aegadian Archipelago, Western Sicily).

Trapani Salt Pans Nature Reserve on sparsely vegetated islets mainly represented by tree mallow (*Malva arborea*) and subsequently on artefacts such as mills (Surdo, 2016), and subsequently at the Stagnone di Marsala on the island of Schola, using *Opuntia ficus-indica* (L.) Mill. as a nesting site, and on Lunga Island always on artifacts (Rannisi et al., 2024).

Remarks. *Egretta garzetta* is reported as a nesting species on Maraone islet by Surdo et al. (2021) with 29 nests recorded. During the subsequent visit on 31 May 2022, 36 nests were recorded and at least 40 chicks had already left the nest. On 3 August 2023, 37 nests were found with about ten chicks still unable to fly.

Ordo CHARADRIIFORMES Huxley, 1867
Familia LARIDAE Rafinesque, 1815
Subfamilia LARINAE Rafinesque, 1815
Genus *Larus* Linnaeus, 1758

Larus michahellis J.F. Naumann, 1840
Yellow-legged Gull (Fig. 96)

Distribution and biology. In Sicily, a resident, migratory, and very common wintering species (Massa et al., 2021), with a strong increase in numbers.

Remarks. On Maraone islet, there is a breeding colony of *Larus michahellis* with a few dozen pairs. This species has previously been reported on the islets of Maraone, Colombaia, Palumbo, and Asinelli with 150 pairs according to Perco et al. (1986) and at least 300 pairs according to Massa et al. (2015: last survey dated 29 May 2012).

Familia SCOPOLACIDAE Vigors, 1825
Genus *Actitis* Illiger, 1811

Actitis hypoleucos (Linnaeus, 1758)
Common Sandpiper

Distribution and biology. In Sicily, Common Sandpiper is a common migratory and wintering bird, an occasional breeder (Massa et al., 2021), certainly underestimated during wintering due to its solitary behavior, it is well distributed

along the preferably rocky sea coast (Surdo, 2024).

REMARKS. A specimen of *A. hypoleucos* was observed on 11.3.2022 and on 3.8.2023.

Ordo PASSERIFORMES Linnaeus, 1758
Familia STURNIDAE Rafinesque, 1815
Genus *Sturnus* Linnaeus, 1758

Sturnus vulgaris Linnaeus, 1758 - Common Starling

DISTRIBUTION AND BIOLOGY. In Sicily the species is rare as a resident while common as a migrant and winterer (Massa et al., 2021).

REMARKS. A specimen of *S. vulgaris* was observed on Maraone islet on 11.3.2022

Familia MUSCICAPIDAE Vigors, 1825
Genus *Erithacus* Cuvier, 1800

Erithacus rubecula (Linnaeus, 1758)
European Robin

DISTRIBUTION AND BIOLOGY. In Sicily the species is rare as a resident while very common as a migrant and winterer (Massa et al., 2021).

REMARKS. A specimen of *E. rubecula* was observed on Maraone islet on 11.3.2022.

Genus *Saxicola* Bechstein, 1802

Saxicola torquatus (Linnaeus, 1766)
Common Stonechat

DISTRIBUTION AND BIOLOGY. This species inhabits sub-Saharan Africa and adjacent regions. In Sicily, a resident, migratory, and common wintering species (Massa et al., 2021).

REMARKS. A specimen of *S. torquatus* was observed on Maraone islet on 11.3.2022.

DISCUSSION AND CONCLUSIONS

Research conducted on the Maraone islet has allowed us to provide new data to improve our understanding of this small, almost unknown

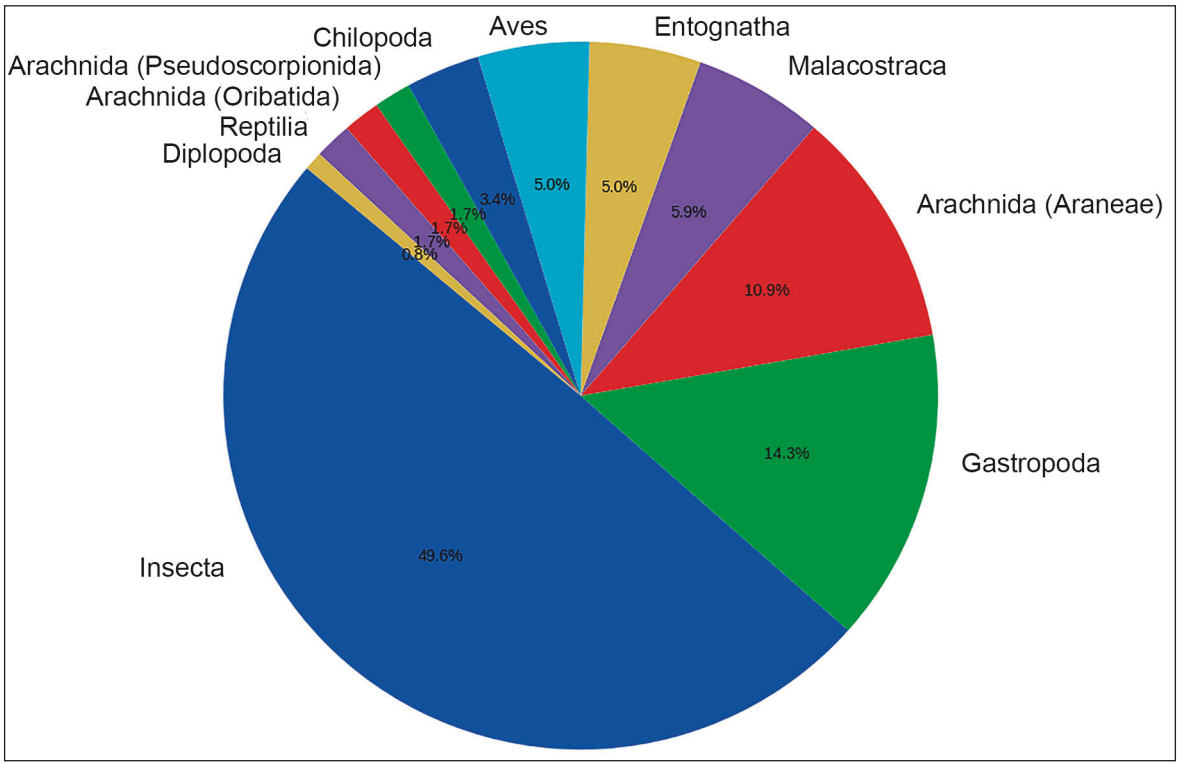


Figure 98. Relative contribution of each taxonomic class to the species assemblage of Maraone Island.

environment, particularly with regard to the fauna that inhabits it. The research is not yet complete and several taxa are the subject of more in-depth taxonomic studies, but the results obtained so far are satisfactory.

The most numerous faunal group is that of Insecta, accounting for around half (49.6%) of the total species inhabiting Maraone Island; followed by Mollusca Gastropoda (14.3%) and Arachnida (10.9%) (Fig. 90). Among the vertebrates, only two reptiles are present (*Hemidactylus turcicus*, new to Maraone, and *Podarcis siculus*), and two birds (*Egretta garzetta* and *Larus michahellis*) nest there. Of particular interest, as previously reported, is the Little Egret colony, which, after five years of observation, appears to be fairly stable.

In addition to the census of fauna on Maraone islet, which provides a better understanding of the animal species that inhabit it, the ecological observations of these populations and the territory in which they live are also of particular interest.

The particular physical characteristics of this small island strongly influence the presence and survival of the fauna that inhabits it.

Its narrow, elongated shape and low coastline allow the sea, when rough, to invade temporarily part of the islet, creating a zone around the entire perimeter of Maraone that is unsuitable for plant and animal life. The surface of Maraone that can support flora and fauna is thus further reduced. The island's almost flat morphology also exposes it to the intense action of winds, rain, excessive solar radiation and salty air. Ultimately, the habitable area is even smaller than the entire surface of the islet, reducing to the small central elevation, which is narrow and elongated, covering an area of approximately 2,400 square metres.

This central area is entirely covered by large *Malva arborea* specimens, whose presence plays a key role in the development and survival of the local fauna.

Malva arborea is an emicryptophyte with an arboreal/arbustive growth habit. It is biennial or perennial and grows to a height of 0.5–2 m (rarely 3 m), with an erect, lignified stem up to 7–8 cm in diameter at the base. The leaves are orbicular, 8–18 cm in diameter, lobed with five or nine lobes with a serrated margin. The flowers have a diameter of 3–4 cm, ranging from dark pink to purple, and grow in fascicled axillary clusters of two to seven. Period of flowering: April–September. The seeds are enclosed in an impermeable outer layer and can remain viable for years, even after prolonged immersion in saltwater. They can be transported from one location to another by floating fruit or through birds. This species is widespread along the western European and Mediterranean coastlines, from the British Isles to Algeria, Libya and Greece, and has been acclimatised in various parts of the world (Domina et al., 2021; Bartolucci et al., 2024; Cambria & Di Gregorio, 2024).

Malva arborea thrives in its natural habitat in the presence of seawater, eliminating salt through its leaves (Okusanya & Fawole, 1985). This gives it a clear competitive advantage over other plants in these environments. However, in some islands where most birds nest on the ground, it is believed that the development of this plant hinders the lives of these populations, for example in Australian islands with crested terns (*Thalasseus bergii* Lichtenstein, 1823) that build their nests outdoors (Veitch & Clout, 2002). In the Scottish islands, the spread of *Malva arborea* also seems to hinder both the growth of native vegetation and the growth of puffin populations (*Fratercula arctica* Linnaeus, 1758) (Van Der Wal et al., 2008). In various islands in New Zealand, *Malva arborea* is considered an invasive species for which specific eradication programmes exist.

In the Mediterranean islands, including the islet of Maraone, *Malva arborea,* however, plays an important role in the development and survival of the local fauna.

By completely covering the limestone substrate on which they grow, *Malva arborea* plants protect the soil and the living beings that inhabit it from excessive salt carried by the wind and waves of the sea. At the same time, fallen leaves and decomposing parts of the stem feed a layer of organic matter that promotes the development of detritivorous and saproxylic invertebrates such as numerous species of Myriapoda, Crustacea and Hexapoda.

This litter, retaining as much moisture as possible, favours the life cycle of various other animal species, such as Mollusca Gasteropoda.

The *Parmena pubescens* (Coleoptera Cerambycidae) develops in the trunk and branches of this plant, where it can be found both as a larva and as an adult. These abandoned larval galleries in the dried stems and branches are used as a refuge by

several other species, such as the Coleoptera Tenebrionidae *Catomus (C.) consentaneus*.

The spider *Ariadna brignolii* is a small species; females (slightly larger than males) can reach 8 mm in body length. This species builds a typical tubular web inside crevices in rock or tree bark, the tip of which is irradiated by a series of silk threads, useful for capturing prey that touches them. All specimens collected were found on the island of Maraone, inside inside the stems of *Malva arborea*, both still standing and fallen to the ground due to breakage.

The leaves and flowers of *Malva arborea* ultimately provide an ideal environment for Coleoptera, Hemiptera, Lepidoptera and various other invertebrates.

Little Egret build their nests on the stems of *Malva arborea* a few centimetres from the ground. Other animal species that we observed on the Maraone islet are confined to the terrain immediately adjacent to the perimeter of the mallow grove, where they can be found walking on the ground or under stones as *Brachycerus undatus*, *Alphasida (G.) grossa livrerii* n. ssp., *Blaps gigas*, *Stenosis (S.) sardoa sardoa*, or in plants, like gastropod molluscs *Cernuella* cf. *virgata* and *Theba pisana.*

Other species that live in the surrounding open spaces include the Yellow-legged Gull, which nests on the ground, and some flying, ubiquitous beetles such as *Pactolinus major*, which is almost always found on the carcasses of dead Yellow-legged Gull.

From the brief summary, it is clear that the community of flora and fauna on the Maraone islet is based on a delicate ecological balance. Further research is needed on these populations to improve our understanding of them and to implement appropriate control and protection programmes.

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