ON SOME SPIDERS (ARACHNIDA, ARANEAE) FROM THE SURROUNDINGS OF CASTELLABATE, ITALY

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ABSTRACT

During the spring of 2011, spiders of 159 species were collected in the surroundings of Castellabate, Salerno, Italy. A list of collected species is given. *Metopobactrus verticalis* (Simon, 1881) and *Euryopis sexalbomaculata* (Lucas, 1846) are reported for the first time for Italy. Some species are new records for southern Italy: *Dysdera granulata* Kulczynski, 1897, *Erigone autumnalis* Emerton, 1882, *Trichoncus ambrosii* Wunderlich 2011, *Leptorchestes peresi* (Simon, 1868), *Salticus unciger* (Simon, 1868), *Sitticus inexpectus* Logunov & Kronestedt, 1997, *Enoplognatha testacea* Simon, 1884, *Neottiura herbigrada* (Simon, 1873), and *Tmarus stellio* Simon, 1875. Three species could not be identied as yet: *Theridion* spec., *Pseudeuophrys* spec., and *Spermophorides* spec. The latter two probably are new species and still have to be described. Illustrations are provided for *Zelotes paroculus*, *Metopobactrus verticalis*, *Trichoncus sordidus*, *Enoplognatha testacea*, and *Euryopis sexalbomaculata*.

Key words: Araneae, Castellabate, Italy, southern Italy

INTRODUCTION

In the springtime of 2011, the two authors made a trip to Gargano in Italy in order to study the spider fauna of southern Italy. In 2013 we continued our research in the surroundings of Castellabate, province Salerno in the region Campania. Fieldwork was carried out by both during the period 5-11 May 2013 and continued by PJvH until 17 May 2013.

The region is best characterized as agricultural landscape with some forested areas. Most of the collection areas are located in one of the biggest national parks of Italy, the "Parco Nazionale del Cilento, Vallo di Diano e Alburni". The localities where we collected are listed below and shown on a map (fig. 1). Coordinates are given as WGS84.

The Fauna Europaea database (Van Helsdingen 2014) is used as source of information on species distributions in Europe.



Fig. 1. Map showing collection localities.

Nieuwsbrief SPINED 34

THE SPIDER FAUNA OF ITALY

The spider fauna of southern Italy is relatively poorly known if compared with the northern half of the country. The alpine region has been studied intensively from West to East over the last decades and the Appenines formed the research area of Di Caporiacco. The southern half of the country has been studied less thoroughly than the northern parts. Of course Paolo Brignoli carried out research there, but his interest soon shifted to other countries such as Greece and Turkey as well as many other regions from South America to Nepal and the Philippine Islands and even Melanesia. A broad world-wide interest with the disadvantage of having less time available for his home country.

Island faunas often are investigated with some preference, probably because of the clear boundaries of an area delimited by sea. Sardinia has received more general faunistic attention through Trotta (2011) and Pantini et al. (2013), while others revised material from this island for revisions of some taxa. Sicily was equally studied by the university of Catania and other arachnologists as well.

Our general observation is that the Iberian peninsula, southern Italy, and the Balkan show clear differences in their faunas, although this may be biased by insufficient taxonomic knowledge of many taxa. In many families we all know notoriously difficult genera or species-groups with problematic species recognition and chaotic nomenclature as a consequence. We were confronted with several of such enigmatic species. We have treated them accordingly and in many cases could only allot them to a genus or a species-group and refrained from giving them a species name so as not to burden the literature with doubtful or wrong data. We decided to publish the results we now have and subsequently – in a next publication - supply descriptions of new species. We also hope to collect more material on a forthcoming trip to southern Italy.

LOCALITIES

Locality 1

Monte Licosa, S. of San Marco, Province Salerno, 05-05-2013 - 40°14'39.86"N 14°57'23.56"E [SIJ, PJvH] *Pistacia terabinthus*, white *Cistus* spec., higher grasses; hand collecting, beating, sweeping.



Fig. 2. Locality 1, Monte Licosa.

Locality 2

Monte Licosa, S. of San Marco, Province Salerno, 05-05-2013 - 40°14'58.09"N 14°56'13.56"E [SIJ, PJvH] Sandy trails, *Arbutus unedo, Erica arborea, Pistacia terabinthus, Cistus* spec.; hand collecting, beating, sweeping.

Locality 3

Selva Monte di Perdifumo W of Perdifumo, Province Salerno, 06-05-2013 - 40°15'41.57"N 15°03'01.04"E [SIJ, PJvH]

Roadside; Castanea plantation, Spartium junceum, Genista spec., Thymus spec., Rubus spec., Allium neapolitanum, Serapias spec.; hand collecting, beating, sweeping.

Locality 4

Monte Tresino, SW of Agropoli, Province Salerno, 07-05-2013 - 40°19'02.66"N 14°56'30.98"E [SIJ, PJvH] Along road with *Pinus* spec., *Pistacia terabinthus*, *Spartium junceum*, *Cistus*, tall grasses; hand collecting, beating, sweeping.

Locality 5

N. of estuary of Sele River between Eboli and Capaccio, Province Salerno, 08-05-2013 - 40°29'02.15"N 14°56'32.33"E [SIJ, PJvH]

Neglected beach area with rubbish washed ashore and dune vegetation; sweeping and hand collecting.

Locality 6

Capaccio Vecchio, Province Salerno, 08-05-2013 - 40°26'48.58"N 15°03'25.07"E [SIJ, PJvH]. Along road from church (Sta Madonna del Granato) eastwards; road verges; vegetation with *Ceratonia siliqua*, *Pistacia terabinthus, Cercis siliquastrum, Myrtus communis, Allium neapolitanum, Ophrys* spec., *Serapias* spec.; hand collecting, beating, sweeping.



Fig. 3. Locality 5, Foce del Sele. Fig. 4. Locality 6, Capacio Vecchio.

Locality 7

Capaccio Vecchio, Province Salerno, footpath towards ruin 09-05-2013 - 40°26'32.38"N 15°03'30.81"E [SIJ, PJvH]

Juniperus spec., Cercis siliquastrum, Ceratonia siliqua, Myrtus communis, Quercus spec., Allium neapolitanum; hand collecting, beating, sweeping.

Locality 8

Doto River, S. of village of Doto, Province Salerno, 10-05-2013 - 40°27'46.79"N 15°12'22.93"E [SIJ, PJvH] River bed with boulders and pebbles; poplars and herbal vegetation on river bank, hand collecting and sweeping.



Fig. 5. Locality 8, Doto river. Fig. 6. Locality 10, San Biase.

Locality 9

Controne, Province Salerno on SW slope, 10-05-2013 - 40°30'54.45"N 15°13'08.62"E [SIJ, PJvH] Road N of Controne and W of main road (488); olive plantation and margin of forest; *Hedera helix* on stone walls; hand collecting, beating, sweeping

Locality 10

San Biase, Province Salerno, 11-05-2013 - 40°12'06.69"N 15°17'46.04"E [SIJ, PJvH] Dirt road and footpath (517) through mixed forest with *Castanea sativa*, *Pteridium aquilinum* and open grassy patches; hand collecting, beating, sweeping.

Locality 11 WWF Reserva Oase di Persano along the river Sele, Province Salerno, 12-05-2013 - 40°35'21.34"N 15° 5'52.18" E [PJvH] Hand collecting in river bed with boulders and pebbles; sweeping in grasslands.

Locality 12

Rosaine, SE of Case del Conté, Province Salerno, 13-05-2013, 40°13'34.70"N 14°58'34.83" E [PJvH] Neglected olive plantation on steep S-slope with *Pistacia terabinthus* and pine trees; hand collecting, beating, sifting of litter.

Locality 13

Along road to Punta Licosa, Province Salerno; 15-05-2013, between 40°14'34.91"N 14°54'49.96"E and 40°14'23.75"N 14°54'52.91"E [PJvH]

Along road through estate, olive plantations bordered by *Pinus* stands mixed with *Eycalyptus* spec., *Ceratonia* siliqua and *Pistacia terabinthus*.

Locality 14

Giungarro, Province Salerno, 16-05-2013 - 40°24'37.73"N 15°03'46.28"E [PJvH] Along dirt road and footpath with shrubs and small trees (*Quercus* spec., *Pistacea* spec., *Rubus* spec.).

Locality 15

Rosaine, SE of Case del Conté, Province Salerno, 17-05-2013, 40°13'34.70"N 14°58'34.83"E [PJvH]

Locality 16

Holiday apartment near Castellabate 4-5-2013 till 11-5-2013 - 40°17'34.12"N 14°58'05.18"E [SIJ, PJvH] Terraced garden with various ornamental trees; hand collecting.



Fig. 7. Locality 16, Garden Agriturismo Castellabate.

REMARKS ON SOME SPECIES

In the next section all collected species are listed, including the localities (numbered as given above), sex, and geographic information. Geographic information is given as North, South, Sardinia and Sicily. North includes the regions Friuli Venezia Giulia, Veneto, Trentino-Alto Adige, Lombardia, Val d'Aosta, Piemonte, Liguria, Emilia-Romagna and South includes the regions Toscana, Marche, Umbria, Lazio, Abruzzi, Molise, Campania, Puglia, Basilicata, Calabria. If no specific reference is given, the source of geographic information is the Checklist of the Italian Fauna on-line 2.0 (Pesarini 2003). Just before finalizing this paper, a new checklist of the Italian spiders was published (Pantini & Isaia, 2014). Unfortunately this list does no longer differentiate between North and South Italy.

We were not able to identify all specimens to the species. Many genera have their problematic speciesgroups where available identification tools (such as the internet facility of Nentwig et al.) show shortcomings, usually because available descriptions do not offer sufficient characters for the species of such species-groups while revisions with good overviews and illustrations of the species are not yet published. Examples of such difficult taxa are *Trichoncus*, the *melanurum*-group of *Theridion* and *Euryopis*. We hope to collect more material in the future. Some – probably new - species will be described in the near future in a separate paper.

ANYPHAENIDAE

Anyphaena accentuata (Walckenaer, 1802) Localities 3, 10; f; North, South, Sardinia Anyphaena sabina L. Koch, 1866 Localities 1, 7; m; North, South, Sardinia

ARANEIDAE

Araniella cucurbitina (Clerck, 1757)

Localities 7, 8, 9, 14; m/f; North, South, Sardinia, Sicily Araniella opisthographa (Kulczynski, 1905) Localities 7, 8; m/f; North, South (Blanke 1982) Blanke reports A. opisthographa from the south of Italy (Blanke 1982). Interestingly, he mentions in his paper that of the twin species A. cucurbitina and A. opisthographa the former is more common in the South of Europe, while the latter is more common in the North, but that in South Italy however A. opisthographa is the more common species. Cyclosa conica (Pallas, 1772) Localities 3, 10; m/f; North, South, Sardinia, Sicily Cyclosa insulana (Costa, 1834) Localities 1, 11, 14; m/f; North, South, Sardinia, Sicily Cyclosa sierrae Simon, 1870 Localities 2, 4, 6, 7, 13; m/f; North, South, Sardinia C. sierrae was the more common species of the genus Cvrtarachne ixoides (Simom, 1870) Locality 14; j; South, Sardinia (Pantini et al. 2013) Only a single subadult female was collected by beating shrubs along a footpath Cyrtophora citricola (Forskal,, 1775) Locality 1; j; South, Sardinia, Sicily Gibbaranea bituberculata (Walckenaer, 1802) Localities 3, 6, 8, 10, 14; m/f; North, South, Sardinia, Sicily Glyptogona sextuberculata (Keyserling, 1863) Localities 5, 12; f; North, South Only two juvenile specimens were collected, both in decaying vegetation and in detritus. Hypsosinga albovittata (Westring, 1951) Localities 3, 5; f; North, South, Sardinia, Sicily Hypsosinga sanguinea (C.L.Koch, 1844) Locality 1; f; North, South, Sardinia (Pantini et al. 2013) Larinioides suspicax (O. P.-Cambridge, 1876) Locality 11; f; South, Sardinia (Pantini et al. 2013), Sicily Mangora acalypha (Walckenaer, 1802) Localities 1, 2, 3, 4, 5, 8, 10, 11, 13, 14; m/f; North, South, Sardinia, Sicily Extremely common on all sites visited. Neoscona adianta (Walckenaer, 1802) Localities 1, 2, 4, 8, 11, 13, 14; m; North, South, Sardinia, Sicily Common everywhere, mostly in subadult stage when we arrived and becoming adult during the last week. Singa nitidula C.L. Koch, 1844 Localities 8, 11; m/f; North, South Zilla diodia (Walckenaer, 1802) Localities 3, 4, 6, 7, 9, 10, 13; m/f; North, South, Sardinia, Sicily **CLUBIONIDAE** Clubiona leucaspis Simon, 1932 Localities 1, 6, 7, 13; m/f; North, South, Sardinia (Pantini et al. 2013) DICTYNIDAE Dictyna arundinacea (Linnaeus, 1758 Localities 8, 11; m/f; North, South, Sardinia (Pantini et al. 2013), Sicily Dictyna latens (Fabricius, 1775) Locality 12; m/f; Sardinia (Pantini et al. 2013) Dictyna uncinata Thorell, 1856 Localities 8, 9; m/f; North, South (IJland et al. 2012) Marilynia bicolor (Simon, 1870) Localities 5, 1; m; North, South, Sardinia (Pantini et al. 2013) *Nigma puella* (Simon, 1870) Localities 4, 6, 7, 9, 10; m/f; North, South, Sardinia (Pantini et al. 2013)

DYSDERIDAE

Dysdera granulata Kulczynski, 1897 Locality 1; m; North, **new for South** Harpactea gridellii (Caporiacco, 1951) Localities 4, 15; m; South, Sicily **EUTICHURIDAE** Cheiracanthium mildei Koch, 1864 Localities 6, 7; m/f; North, South, Sardinia (Pantini et al. 2013), Sicily Cheiracanthium pennyi O.P.-Cambridge, 1873 Locality 16; m; South, Sardinia (Pantini et al. 2013) **GNAPHOSIDAE** Aphantaulax cincta (Koch, 1866) Localities 6, 7; m; South, Sardinia Drassodes lapidosus (Walckenaer, 1802) Locality 10; m/f; North, South, Sardinia, Sicily Haplodrassus signifer (C.L.Koch, 1839) Locality 3; f; North, South, Sardinia, Sicily Heser nilicola (O.P.-Cambridge, 1874) Locality 5; m; North (Pantini et al. 2008), South, Sardinia (Pantini et al. 2013), Sicily (Di Franco 2001) Nomisia exornata (C.L.Koch, 1839) Localities 3, 4, 7, 13, 16; m; North, South, Sardinia, Sicily Scotophaeus scutulatus (Koch, 1866) Locality 2; f; North, South, Sardinia (Pantini et al. 2013) Setaphis carmeli (O.P.-Cambridge, 1872) Locality 16; m; North, South, Sardinia Trachyzelotes huberti Platnick & Murphy, 1984 Locality 4; m; South (Di Franco 1996, IJland et al. 2012) Trachyzelotes pedestris (C.L.Koch, 1837) Locality 3; f; North, South, Sardinia (Pantini et al. 2013) Zelotes denapes Platnick, 1993 Locality 5; f; South Zelotes paroculus Simon, 1914 Localities 3, 7; m; North (Pantini et al. 2008), South (Di Franco 1995) Wunderlich (2011) considers Zelotes paroculus to belong to the genus Drassyllus, because of the

Wunderlich (2011) considers *Zelotes paroculus* to belong to the genus *Drassyllus*, because of the absence of an intercalary sclerite and the existence of ventral bristles on the male opisthosoma. Although these observations are correct, *Z. paroculus* does not match the diagnosis for the genus *Drassyllus* as given by Platnick, as the palp is missing a a bifid, medially situated terminal apophysis (Platnick and Shadab, 1982). *Z. paroculus* is however indeed not correctly placed in *Zelotes*, as are many other species currently in this genus. Future revisions of *Zelotes* will undoubtedly result in a transfer. Figures 8 and 9 show the ventral and retrolateral view of the male palp.



Fig. 8-9. Zelotes paroculus. 8, ventral and 9, retrolateral view of the male palp.

LINYPHIIDAE Cresmatoneta mutinensis (Canestrini, 1868) Locality 6; f; North, South, Sardinia (Pantini et al. 2013) Diplocephalus graecus (O. P.-Cambridge, 1872) Localities 10, 11; f; North, South, Sardinia (Pantini et al. 2013) Erigone autumnalis Emerton, 1882 Locality 4; m; North (Pantini & Isaia 2008), new for South Erigone autumnalis is a species common to North America. In Europe it is most likely introduced, and has been reported from Switzerland (Hänggi 1990) and the North of Italy (Pesarini 1996). It has also been found in the United Arab Emirates (Tanasevitch 2010). Introductions in other countries seem very likely. Erigone dentipalpis (Wider, 1834) Locality 8; f; North, South, Sardinia (Pantini et al. 2013) Frontinellina frutetorum (C.L. Koch, 1834) Localities 1, 2, 3, 4, 6, 7, 10, 14; m/f; North, South, Sardinia (Pantini et al. 2013), Sicily Common on most sites. Gonatium biimpressum Simon, 1884 Locality 12; m; South, Sardinia Hypomma cornutum (Blackwall, 1833) Locality 11; f; North, South Linyphia mimonti Simon, 1884 Localities 6.7; f; South Beaten from trees. Maso gallicus Simon, 1894 Localities 2, 16; m/f; North, South (IJland et al. 2012), Sardinia (Pantini et al. 2013) Maso sundevalli (Westring, 1851) Locality 3; f; South Neriene furtiva (O. P.-Cambridge, 1871) Localities 4, 9, 10; m; North, South, Sardinia (Pantini et al. 2013) Metopobactrus verticalis (Simon, 1881) Locality 8; m; new for Italy Material: A single male from Doto, 10.v.2013, in vegetation. Metopobactrus Simon, 1884 is represented with nine species in Europe, one of which is Holarctic (Metopobactrus prominulus) which is fairly common. The distributions of the other European species are poorly known, there are relatively few records, and some species seem to have low densities or escape collecting efforts. One species occurs in North America, although the correct placement of the latter is doubted (see the World Spider Catalog under Metopobactrus pacificus and Micrargus aleuticus). When using the available sources of characters of the different species a one-hundred percent convincing identification still remains difficult. For the present specimen there are two candidates, Metopobactrus nadigi and M. verticalis. For reasons outlined below we selected M. verticalis as the most likely. According to Pesarini (2003) there were four Metopobactrus species present in Italy (nadigi, prominulus,

According to Pesarini (2003) there were four *Metopobactrus* species present in Italy (*naaigi*, *prominulus* rayi, and *schenkeli*), but in the meantime rayi has been separated as *Sauron rayi* while *M. schenkeli* subsequently disappeared again into synonymy with *Metopobactrus prominulus* (O. Pickard-Cambridge, 1872) (Muff et al. 2007).

The now collected specimen resembles *Metopobactrus nadigi* (Thaler, 1976) in the shape of the tibial apophysis of the male palp and the shape of the prosoma, but differs in some other aspects. It is slightly larger and the TmI is higher (0.75 against 0.6 in *nadigi*), a differential character according to Thaler (1976). All other species do not show the combination of characters found in the specimen dealt with here, with the exception of *Metopobactrus verticalis* Simon, 1881. This species was not included in the short overview presented by Thaler (1976), probably because Thaler focused on alpine spiders, while *M. verticalis* was described from Corsica. Simon described the species after a single male specimen (Simon 1881) and was subsequently repeated by Simon himself in his different books on the spider fauna of France. So far it has remained an endemic species for Corsica. This is now challenged by our tentative identification of a specimen from the Campania region in southern Italy.

It should be noted here that there were no illustrations with the original description (Simon 1881: 248) and that the illustrations offered by Simon in 1884 (Simon 1884: 722, figs. 593-595) show a curious and non-fitting lateral view of the prosoma together with figures of the dorsal and retrolateral aspect of the male palpal tibia. The figure of the prosoma is repeated in his "Histoire naturelle des Araignées" (Simon 1894: 614, fig. 659 (=c)), while the last time he referred to this species, in the posthumous second volume of his last treatise on the spiders of France (Simon 1926), a different figure is presented of the prosoma. Apparently



Fig. 10-12. *Metopobactrus verticalis*. 10, frontal aspect of male; 11, palpal tibia, dorsal aspect; 12, retrolateral aspect of the male palp.

Simon corrected the figure or repaired an earlier mistake. A figure of the female genital organ is presented there for the first time, but no characters of the female are given. Therefore, there is a double mystery as to the composition of the original sample of *"Erigone" verticalis* Simon, 1881 from Corsica. A unique male specimen, or more specimens among which one or more females? No clarifying information has been presented ever.

These 1926 illustrations are included in the identification tool "Spiders of Europe" (Nentwig et al. 2014) and were used by us for the purpose of identification. The identification tool contains also a Navikey key for the Linyphiidae which has made use of many more characters and measurements than ever supplied by Simon himself. It is unclear who assembled these measurements and descriptive information which is not available in any of the cited articles.

Measurements (all in mm) of the Italian specimen.

Total L 1.75; prosoma L 0.87, W 0.67; opisthosoma L 0.97, W 0,70.

Legs: all tibiae with one dorsal spine, position of d-spine on tibia I 0.31; L spine 1.0 diameter (= 0.087 mm) of leg segment. TmI 0.79, TmIV 0.75. No other leg-spines present, apart from the standard dorsal spine on the patella. Tarsal claws without denticles.

	Ι	II	III	IV
Fe	0.61	0.59	0.50	0.66
Pa	0.19	0.19	0.19	0.19
Ti	0.60	0.55	0.44	0.62
Mt	0.46	0.49	0.42	0.56
Та	0.29	0.30	0.25	0.29

The specimen is dark with lighter legs. Prosoma with raised cephalic region (fig. 10), PME on either side of the turret, blackish-brown, becoming gradually light-brown towards posterior margin. Sternum blackish. Chelicerae brown suffused with black. Opisthosoma black on all sides. Legs yellow-brown.

Male palp (figs 11-12). Outline of tibial apophysis as depicted, dorsal branch slender and with terminal hook and minor denticles on ventral side. Bulbus characterized by the typically bent embolus. Size of the specimen and the position of TmI are in agreement with the data presented for *Metopobactrus verticalis* in "Spiders of Europe" (Nentwig et al. 2014) which probably are based on the original Simon material. *M. nadigi* is smaller and the TmI is lower. The shape of the palpal tibia in lateral view of our specimen more or less agrees with that presented by Thaler for *M. nadigi* (Thaler 1976, fig. 29), but there are minor differences in the shape, while in the dorsal aspect the dorsal tibial apophysis is more pointed in our specimen than in *nadigi* (compare Thaler's fig. 35 with our fig. 11). The shape of the terminal section of the embolus resembles that of *nadigi* but is not known for *verticalis*. Obviously the original material should be examined to confirm our present tentative identification and redelimit the two species.

Distribution.

Reported from Corsica and now from southern Italy. We here assume that *Metopobactrus verticalis* is a Mediterranean species, while *M. nadigi* is restricted to the Alps. We consider this an attractive zoogeographical support for our tentative identification. *M. nadigi* is known from Austria, Switzerland, Liechtenstein, and northern Italy (Van Helsdingen 2014). All records come from alpine regions and mostly from localities well above sea level but elevations are not always mentioned (Thaler 1976, Switzerland,

Graubunden, 1300m; Hanggi, 1989, Switzerland, Ticiono, Salorino; Noflatscher 1990, Italy, Sudtirol, Guntschna near Bozen, 450m; Pesarini 1996, Bosco di Cansiglio in Alpi Venete; Zingerle 1997, Italy, Sudtirol, Dolomites, 1590 and 2000-2080m; Thaler 1999, Austria, Ötztaler Alpen, Obergurgl, 2070m; Arnold 2001, Liechtenstein, above Balzers (elevation over 472m)).

Styloctetor romanus (O. P.-Cambridge, 1872)

Locality 13; f; North, South

Tenuiphantes herbicola (Simon, 1884)

Localities 4, 5, 6, 9, 10; m/f; South, Sardinia (Pantini et al. 2013)

Tenuiphantes tenuis (Blackwall, 1852)

Localities 3, 7, 8, 10, 11; m/f; North, South, Sardinia (Pantini et al. 2013)

Trichoncus ambrosii Wunderlich 2011

Locality 3; f; North (Wunderlich 2011), new for South

This species was described in 2011 by Wunderlich from Switzerland and the North of Italy. Our finding extends the range to the South of Italy.

Trichoncus sordidus Simon, 1884

Localities 4, 7, 12; m/f; North, South

We note that the opisthosoma of our specimens is grey and not black as indicated by Nentwig et al. (2014). For the sake of future users the vulva is depicted (fig. 13-16) in order to support the following description of the organ. In Trichoncus the male palp has a thread-like embolus and the vulva correspondingly shows coiled sperm ducts. The entrance of the ducts is situated in the median-posterior section of the epigyne, which is not a simple plate but a more massive, 3-dimensional element. The median fissure on the ventral side is closed off on the posterior side by a triangular lip. The median fissure thus is inverted Y-shaped (fig. 13-14). Between lip and margins of the fissure there are entrances on either side towards a tunnel-like duct through the median-posterior section, the ducts running anteriorly and slightly converging, then turning outwards and under (= dorsally of) the more heavily sclerotized fusion of the sperm duct with the receptaculum. The sperm duct next makes a double curve before turning back to the receptaculum. Characteristic for T. sordidus are the parallel tracks of the sperm ducts as seen in the ventral aspect – the postero-lateral one being the section which runs outwards from the entrance in the median-posterior section while the antero-mesal parallel one runs in the opposite direction from the apical turning point towards the receptaculum seminis. In the figure of the vulva as seen from the ventral side (fig. 14) this is indicated by little arrows. This type of construction with a slit-like entrance and ducts running through a median-posterior section might be a generic character in Trichoncus. It is not shown in the available illustrations such as Wunderlich's monographic chapter on Trichoncus (Wunderlich 2011: 281-293 and illustrations on p. 302-310) or Nentwig et al. (2014) where the vulva is clearly depicted for the purpose of recognition of the species (fingerprint method).



Figs. 13-16. Trichoncus sordidus. 13-14, ventral aspects, 15-16, dorsal aspects of vulva.

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LIOCRANDAE
Mesiotelus tenuissimus (Koch, 1866)
   Locality 16; f; South, Sardinia, Sicily
LYCOSIDAE
Alopecosa albofasciata (Brullé, 1832)
   Localities 3, 4, 6, 7, 9, 16; m/f; North, South, Sardinia, Sicily
Arctosa cinerea (Fabricius, 1777)
   Locality 8; f; North, South, Sardinia, Sicily
Arctosa lacustris (Simon, 1876)
   Locality 8; m; North, South, Sardinia, Sicily
Aulonia albimana (Walckenaer, 1805)
   Localities 3, 10; f; North, South, Sardinia (Pantini et al. 2013)
Pardosa cf alacris (C.L. Koch, 1833)
   Locality 3; f; Italy (Trotta 2005), North (Paschetta et al. 2012)
   The Pardosa lugubris-group consists of 6 species, of which females are not clearly identifiable by
   morphological characters. Therefore females preferably have to be identified via males caught in the same
   place (Nentwig et al. 2014). As no males where collected along with the females, we here tentatively assign
   the species to P. alacris, because if it keys out when following the key for Pardosa of the Spiders of Europe
   website (Nentwig et al. 2014).
Pardosa hortensis Thorell, 1872
   Localities 3, 10; m/f; North, South, Sardinia (Pantini et al. 2013)
Pardosa saltans Töpfer-Hofmann, 2000
   Locality 10; m; Italy (Topfer-Hofmann et al. 2000; Trotta 2005); South (IJland et al. 2012)
Pardosa wagleri (Hahn, 1822)
   Locality 8; m/f; North, South
Piratula latitans (Blackwall, 1841)
   Localities 8, 11; m/f; North, South, Sardinia (Pantini et al. 2013)
Trabea paradoxa Simon, 1876
   Localities 12, 15; m/f; South
   Specimens were collected from needle litter around conifer trees on a steep slope.
Trochosa hispanica Simon, 1870
   Localities 10, 16; f; North, South, Sardinia
MIMETIDAE
Ero aphana (Walckenaer, 1802)
   Locality 5; m; North, South, Sardinia (Pantini et al. 2013)
Mimetus laevigatus (Keyserling, 1863)
   Locality 7; m/f; North, South, Sicily
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MITURGIDAE

Zora spinimana (Sundevall, 1833) Locality 10; m; North, South

OECOBIIDAE

Oecobius maculatus Simon, 1870 Localities 1, 16; m; North, South (IJland et al. 2012), Sardinia (Wunderlich 1995), Sicily (Wunderlich 1995)

OXYOPIDAE

Oxyopes heterophthalmus (Latreille, 1804) Locality 8; m; North, South, Sardinia, Sicily

PHILODROMIDAE

Philodromus buxi Simon, 1884
Locality 11; m; North, South, Sardinia (Pantini et al. 2013)
Philodromus dispar Walckenaer, 1826
Localities 3, 9, 10; m/f; North, South, Sardinia (Pantini et al. 2013)
Philodromus longipalpis Simon, 1870
Locality 7; m; South (Muster et al. 2004)
Philodromus rufus Walckenaers, 1826

Locality 7; f; North, South, Sardinia (Pantini et al. 2013)

Pulchellodromus bistigma (Simon, 1870)

Localities 1, 9; m/f; North (Muster et al. 2007), South (Muster et al. 2007), Sardinia (Muster et al. 2007) *Pulchellodromus pulchellus* (Lucas, 1846)

Localities 1, 7; m/f; South, Sardinia, Sicily

Tibellus macellus Simon, 1875

Localities 1, 11; m/f; North, South

PHOLCIDAE

Holocnemus pluchei (Scopoli, 1763)

Locality 1; f; North, South, Sardinia, Sicily

Spermophorides aff. huberti (Senglet, 1973).

Locality 6; m/f

Spermophorides is a genus known from southwestern Europe, some mediterranean islands and the Canary Islands, where it has radiated extensively: 23 of the 33 known species are described from this archipelago. Also one species is described from Tanzania, and an uncertain species from the Seychelles (Huber, 2007). Most of the Mediterranean species have been described by Senglet in the genus *Spermophora*, in 1973 (Senglet, 1973). Wunderlich described the many species from the Canary Islands in 1987 under *Spermophora*, but later erected a new genus *Spermophorides* for these species-group and described some additional species (Wunderlich 1992). Senglet suggests that *Spermophorides* are difficult to capture because of the small size, cryptic colouration and the ability to disappear from view through immobility, which would explain a certain underreporting (Senglet 1973).

We collected four females and one male of a *Spermophorides* species from crevices and under overhanging rocks along a road side. The species is very close to *S. huberti*, but there are differences in the male palp, especially in the procursus, and in the epigyne in the shape and place of the pockets on the posterior epigynal plate (Senglet's "alvéoles d'ancrage"). Our specimens likely belong to a new species, which will be described in another paper.

PHRUROLITHIDAE

Phrurolithus minimus C.L.Koch, 1839
Localities 1, 3, 10; m/f; North, South
Phrurolithus nigrinus (Simon, 1878)
Localities 4, 16; m; Italy (Trotta 2005), South (IJland et al. 2012)

PISAURIDAE

Pisaura mirabilis (Clerck, 1757)

Localities 6, 8, 10, 13, 14; m/f; North, South, Sardinia

Pisaura novicia (L. Koch, 1878)

Locality 16; m; North (Brignoli 1984), South (Brignoli 1984), Sardinia (Brignoli 1984)

One male of Pisaura novicia has been collected.

In 2011, we collected males and females from an as yet unidentified *Pisaura* species in Gargano (IJland et al. 2012). Lack of good illustrations, especially of males, and misidentifications in literature (Brignoli, 1984; Wunderlich 1992) complicated identification. We already concluded the species we collected in Gargano is not *P. novicia* based on the uploaded DNA barcode of our unidentified *Pisaura* species in the Barcode of Life Database (BOLD; http://www.boldsystems.org/). Recently Nadolny et al. redescribed the male of *Pisaura novicia* (Nadolny 2012), so now we can also conclude the same based on morphology.

SALTICIDAE

Aelurillus v-insignitus (Clerck, 1757)	
Locality 10; f; North, South, Sardinia	
Ballus chalybeius (Walckenaer, 1802)	
Localities 3, 13, 15; m/f; North, South, Sardinia, Sicily	
Carrhotus xanthogramma (Latreille, 1819)	
Locality 8; f; North, South, Sardinia (Pantini et al. 2013)	
<i>Cyrba algerina</i> (Lucas, 1846)	
Locality 4; f; North, South, Sardinia, Sicily	
Euophrys herbigrada (Simon, 1871)	
Locality 16, f; North, South, Sardinia (Pantini et al. 2013)	
Evarcha falcata (Clerck, 1757)	
Locality 10; f; North, South, Sardinia, Sicily	

Evarcha jucunda (Lucas, 1846) Localities 4, 6, 7, 9, 12, 13, 14; m/f; North, South, Sardinia, Sicily Heliophanus apiatus Simon, 1868 Localities 5, 6; m/f; South, Sardinia, Sicily Heliophanus cupreus (Walckenaer, 1802) Locality 10; m; North, South, Sardinia, Sicily Heliophanus flavipes (Hahn, 1832) Locality 10; f; North, South, Sardinia, Sicily Heliophanus kochii Simon, 1868 Locality 2; m; North, South, Sardinia Heliophanus melinus Koch, 1867 Locality 6; m; North, South, Sardinia, Sicily Heliophanus tribulosus Simon, 1868 Localities 1, 2, 4, 6, 7, 10, 12, 13, 14; m/f; North, South, Sicily The most common Heliophanus, collected at many localities. Icius hamatus (C.L. Koch, 1846) Localities 8, 11, 16; m/f; North, South, Sardinia, Sicily Icius subinermis Simon, 1937 Locality 8; m; South, Sardinia, Sicily Leptorchestes peresi (Simon, 1868) Localities 4, 7; m/f; North, new for South This species has not been reported for southern Italy yet. L. peresi has been reported from northern Italy, southern France and Greece, so occurrence in southern Italy is not unexpected. Macaroeris nidicolens (Walckenaer, 1802) Localities 7, 13; m/f; North, South, Sardinia Menemerus semilimbatus (Hahn, 1829) Localities 1, 16; m/f; North, South, Sardinia, Sicily Menemerus taeniatus (L. Koch, 1867) Locality 7; m; North, South, Sicily Philaeus chrysops (Poda, 1761) Localities 4, 7; m/f; North, South, Sardinia, Sicily Phintella castriesiana (Grube, 1861) Locality 8; f; North, South, Sicily Phlegra bresnieri (Lucas, 1846) Locality 3; m/f; North, South, Sardinia, Sicily Pseudeuophrys aff. nebrodensis Alicata & Cantarella, 2000 Locality 3; m/f We have collected several male and female specimens of a species which is close to Pseudeuophrys nebrodensis as described by Alicata & Cantarella (2000). That species was described after male and female material from Sicily and subsequently recorded from Sardinia (Pantini et al. 2013). The only available illustrations are those with the first description. The differences observed merit the description of a new species, which will follow subsequently. Salticus scenicus (Clerck, 1757) Localities 8, 12; m/f; North, South, Sardinia, Sicily Salticus unciger (Simon, 1868) Localities 4, 6, 9; m; North, new for South, Sicily Sitticus inexpectus Logunov & Kronestedt, 1997 Locality 7; f; North (Kronestedt 1998), new for South **SCYTODIDAE** Scytodes velutina Heineken & Lowe, 1832 Localities 12, 15; f; South, Sardinia (Pantini et al. 2013), Sicily Specimens were found in needle litter around conifer trees on a steep slope.

SEGESTRIIDAE

Segestria senoculata (Linnaeus, 1758) Locality 4; j; North, South, Sardinia (Pantini et al. 2013)

SPARASSIDAE

Micrommata ligurina (C.L.Koch, 1845)

Localities 8, 16; m; North, South, Sardinia, Sicily *Olios argelasius* (Walckenaer, 1805)
Localities 1, 4, 6, 7; m/f; North, South, Sardinia (Pantini et al. 2013), Sicily
TETRAGNATHIDAE *Metellina merianae* (Scopoli, 1763)
Locality 3; m/f; North, South (Trotta 2007), Sardinia (Pantini et al. 2013), Sicily (Pantini & Isaia, 2014) *Metellina mengei* (Blackwall, 1869)
Localities 3, 9, 10; m/f; North, South (Brignoli 1979; Trotta 2011), Sardinia (Pantini et al. 2013)

Tetragnatha extensa (Linnaeus, 1785)

Locality 11; m; North, South, Sardinia, Sicily

Tetragnatha intermedia Kulczynski, 1891

Localities 1, 3, 5, 13, 15; m/f; South (IJland et al. 2012), Sardinia (Pantini et al. 2013)

Tetragnatha montana Simon, 1874

Localities 8, 11; m/f; North, South, Sardinia (Pantini et al. 2013)

Tetragnatha nitens (Audouin, 1826)

Locality 11; f; North, South, Sardinia, Sardinia (Pantini et al. 2013), Sicily

THERIDIIDAE

Anelosimus vittatus (C.L. Koch, 1830) Localities 2. 4, 6, 7, 8, 10, 11; m/f; North, South, Sardinia (Pantini et al. 2013)
Asagena phalerata (Panzer, 1801) Locality 4; f; North, South, Sardinia (Pantini et al. 2013), Sicily
Crustulina scabripes Simon, 1881 Localities 4, 6, 15; m/f; North, South, Sardinia (Pantini et al. 2013), Sicily
Enoplognatha afrodite Hippa & Oksala, 1983 Localities 6, 7, 9; m/f; North (Pantini et al. 2008), South (IJland et al. 2012), Sardinia (Pantini et al. 2013)
Enoplognatha thoracica (Hahn, 1833) Localities 6, 10; m; North, South, Sardinia (Pantini et al. 2013), Sicily

Enoplognatha testacea Simon, 1884

Locality 15; f; North, new for South, Sardinia (Pantini et al. 2013)

Material: a single female specimen from Rosaine, a warm, south oriented slope consisting of a neglected and degraded terraces with olive plantation and coniferous trees on some higher terraces is identified as *Enoplognatha testacea*.

An overview of the genus *Enoplognatha* shows a genus with many closely resembling species, at least in the female sex. The males have additional characters in the modified chelicerae and palpal structures, but single females are more difficult to identify. The basic dorsal abdominal patterns are species-specific but show variation in the intensity of pigmentation. The epigynes have hardly any characteristic and easily measurable elements. Differences in the vulval structures are slight. For that reason we here depict the vulva and present a rather detailed description of the abdominal pattern. Our specimen is of light colouration with a faintly indicated leaf-like dorsal abdominal pattern and has the following characters.

Measurements (in mm): total length 3.2; prosoma length 1.3, width 1.0. Length Fe I 1.25.

Prosoma and legs light-brown, chelicerae slightly darker brown, sternum grey-brown; prosoma with a narrow dark borderline. Legs weakly annulated with broad greyish mid-sections on femora. Basal dorsal spines on tibiae long and slender, about 1.4 times as long as diameter of leg segment. Opisthosoma (figs. 17-18): dorsally with a more or less leaf-like pattern consisting of a dark grey frontal area followed by two pairs of dark grey lateral blotches on either side and ending with a dark grey posterior area with a straight posterior margin, this dark grey pattern enclosing a light grey central area with two pairs of composite white spots and a vague spot more distally; spinnerets surrounded by black; the area between the dorsal ornamentation and the spinnerets – the backside of the opisthosoma - filled in with some narrow greyish transverse bars with white blotches above; ventrally dark grey from epigastric furrow up to spinnerets with lighter lateral areas in the middle which show some white blotches.



Figs. 17-19. Enoplognatha testacea. 17, dorsal aspect, 18, caudal aspect of opisthosoma; 19, dorsal view of vulva.

Vulva as depicted (fig. 19) with simple, non-coiled sperm ducts which have the entrances close together and enter the receptacula after a short curve towards their posterior tips; receptacula large, globular and nearly touching mesally.

This is the first record from the south of Italy.

Episinus maculipes Cavanna, 1867

Localities 7, 10, 13; m/f; North, South, Sardinia (Pantini et al. 2013)

Episinus truncatus Latreille, 1809

Localities 1, 6, 16; m/f; North, South, Sardinia

Euryopis episinoides (Walckenaer, 1847)

Locality 4; m; North, South, Sardinia

Euryopis sexalbomaculata (Lucas, 1846)

Locality 12; f; new for Italy

So far not recorded from the Italian mainland. A single female specimen.

The identification is confirmed by some experts. None of the descriptions and illustrations seem to cover our specimen, but the species is said to be variable as to its abdominal colour pattern (Le Peru 2011: 396). The collected specimen has eight silvery-white dorsal spots (fig. 20) which is in contradiction with the specific name. The pair of posterior spots above the spinnerets are well-separated. This strongly deviates from available illustrations such as presented by Levy (Levy 1998: 146, fig. 277) which shows much less contrast in black and white and the shape of the spots. Ventrally one pair of white spots in front of spinnerets (fig. 21). The epigyne is very characteristic in our specimen (fig. 22) and much different from Levy's drawing (Levy 1998, fig. 282). Our specimen is more, but not completely, in agreement with the figure presented by Kovblyuk et al. (Kovblyuk et al. 2008, fig. 55). It deviates in the shape of the anterior depressed area, which is more curved in Kovblyuk's illustration in comparison to our specimen.

It looks as if within the genus *Euryopis* as presently delimited there are (at least) two different types of species. There are species with a dorsal abdominal pattern existing of well-defined, clear silvery white spots on a dark opisthosoma and a pair of such spots on the ventral side resulting in a strong contrasting pattern. There are other species where such spots are much less sharply defined, have irregular margins and are not silvery white but are part of a more intricate pattern with black areas on a yelllow or brown background, resulting in a less contrasting pattern.



Fig. 20-22. Euryopis sexalbomaculata. 20, dorsal aspect; 21, ventral aspect; 22, epigyne, ventral aspect.

Epigynes likely show different constructions. All species have a central opening to the spermducts, according to the available illustrations usually situated in a darkly pigmented medial area. Some illustrations give the impression of a straight anterior border which might serve as a foothold for male palpal elements, but other species seem to lack this. We checked the only indigenous species of this genus in the Netherlands, *Euryopis flavomaculata* (C.L. Koch, 1836), on this feature and could not find a trace of such a structure. There is a group of species – among which the specimen dealt with here – in which the anterior margin of the epigyne shows a more intricate form, a socket-like depression, presumably linked to a special function to support the male palp during copulation. Species clearly showing this model are *E. laeta* (Westring, 1861), *E. margaritata* (L. Koch, 1867), *E. orsovensis* Kulczynski, 1894, *E. quinqueguttata* Thorell, 1875, *E. sexalbomaculata* (Lucas, 1846) and possibly *E. clarus* Ponomarev, 2005. We should add here that many illustrations are difficult to interpret as to this construction feature.

The two sections noticed in the abdominal patterns and in the shape of the epigyne do not lead to the same group of species. However, we have the feeling that the genus *Euryopis* is not a clearly defined taxonomic entity. The single character which delimits the genus is the shape of the cheliceral claw, which is relatively slender. The genus needs revision.

Kochiura aulica (C.L.Koch, 1838) Localities 1, 2, 4, 5, 6, 7, 8, 13; m/f; North, South, Sardinia, Sicily Neottiura herbigrada (Simon, 1873) Localities 6, 9, 14, 15; m/f; North, new for South, Sardinia (Pantini et al. 2013) Phycosoma inornatum (O.P.-Cambridge, 1861) Localities 6, 7, 16; f; North, South Platnickina tincta (Walckenaer, 1802) Locality 11; m; North, South, Sardinia (Pantini et al. 2013), Sicily Robertus lividus (Blackwall, 1836) Locality 9; f; North, South Ruborridion musivum (Simon, 1873) Localities 4, 5; m/f; North, South (IJland et al. 2012), Sardinia (Pantini et al. 2013) A Mediterranean species with a range from Portugal, Spain, Balearic Islands, France and Corsica, Italy (Gargano), and Croatia, but not further eastward. Simitidion simile (C.L. Koch, 1836) Localities 4, 6, 7, 10, 13, 14; m/f; North, South, Sardinia (Pantini et al. 2013), Sicily Steatoda albomaculata (De Geer, 1778) Locality 5; f; North, South, Sardinia Steatoda paykulliana (Walckenaer, 1805) Locality 10; f; North, South, Sardinia, Sicily Theridion spec. (melanurum-group) Localities 6, 7, 9, and 14; m/f. Theridion still is a large genus, even though many species have been transferred to other genera over the years. Identification sometimes proves to be difficult. We collected specimens of two Theridion species which were identifiable (Theridion varians Hahn, 1833, 11m and 5f from three localities, and Theridion pinastri L. Koch, 1872, a single female from a single locality). The other specimens we collected (2m 4f, from four localities) proved to be difficult. All belong to the *melanurum*-group, a complex taxon the species of which can only be distinguished through very painstaking comparison of details in the genitalia. Available descriptions show quite an amount of variation in the characters used by the authors. Illustrations consist of drawings made by the persons who studied some species of the group or described new species and stress the differences they thought to be important and helpful for the users. In the male the focus lies on the distal elements of the palp, especially the tegular apophysis and conductor (Agnarsson et al. 2007), while in the female the shape and size of the epigyneal pit and the length of the copulatory ducts and their complexity of structure and coils are used for discrimination. But these characters are not always fully supplied by all authors, making an overview of the species of this species-group hardly possible. Therefore we will seek a solution in the future through the study of further material and in the present paper place them as *Theridion* spec. (melanurum-group). Theridion pinastri L. Koch, 1872 Locality 14; f; North, South, Sardinia (Pantini et al. 2013) Theridion varians Hahn, 1833

Localities 7, 13, 15; m/f; North, South, Sardinia

THOMISIDAE

Heriaeus oblongus Simon, 1918

Locality 10; f; North, South Monaeses paradoxus (Lucas, 1846) Localities 1, 4, 13; m/f; South, Sardinia (Pantini et al. 2013) Runcinia grammica (C.L.Koch, 1837) Locality 5; f; North, South, Sardinia, Sicily Synema globosum (Fabricius, 1775) Localities 1, 2, 4, 5, 6, 7, 8, 12, 13; m/f; North, South, Sardinia, Sicily Thomisus onustus Walckenear, 1805 Localities 5, 10; m/f; North, South, Sardinia, Sicily Tmarus piger (Walckenaer, 1802) Locality 10; m/f; North, South Tmarus stellio Simon, 1875 Locality 7; m; North, new for South A Mediterranean species, but no records from Greece. Xysticus acerbus Thorell, 1872 Locality 6; f; North, South, Sardinia (Pantini et al. 2013) Xysticus cor Canestrini, 1873 Locality 4; f; North, South, Sardinia Xysticus kochi Thorell, 1872 Localities 7, 8; m; North, South, Sardinia Xysticus lanio C.L. Koch, 1824 Localities 3, 10; m; North, South, Sardinia

ULOBORIDAE

Uloborus plumipes Lucas, 1846
Localities 9, 12, 13, 14; m/f; South, Sardinia (Pantini et al. 2013), Sicily natural population restricted to the South, in greenhouses etc more to the North Uloborus walckenaerius Latreille, 1806
Localities 1, 8, 10, 11, 14, 16; m/f; North, South, Sardinia (Pantini et al. 2013)

ZODARIIDAE

Zodarion confusum Denis, 1935 Locality 3; f; North, South (Bosmans 1997)
Zodarion italicum (Canestrini, 1868) Locality 10; f; North, South, Sardinia (Pantini et al. 2013)

DISCUSSION

A number of species found during our 2013 inventory trip can be classified as common for the region because they were collected at many of the sites visited: *Mangora acalypha* (Walckenaer), *Frontinellina frutetorum* (C.L. Koch), *Heliophanus tribulosus* Simon, *Kochiura aulica* (C.L.Koch), and *Synema globosum* (Fabricius). These species were also found in Gargano during our inventory in 2011 (IJland et al. 2012). They can be considered to belong to the general spider fauna of southern Italy. Otherwise, but not surprisingly, the list of species encountered show obvious differences. During the inventory trip in Gargano, we collected 135 species, of which 58 were also collected during the current inventory with 159 species collected..

The clear difference in the composition of the spider fauna of the two areas can be partly atributed to the differences in habitat. In Gargano we could visit two wetland areas and could examine the typical spider fauna of this type of habitat. In the Campania region we did not visit any sites of this type. Closest to it were the riverine habitats along the Doto River (locality 8) and the River Sele near but just outside the WWF Reserva Oase di Persano (locality 11). Both are fast floating rivers with pebble beaches and pebble-covered stretches in the winter-bed with stray isolated shrubs (*Salix* pec.) and bordered by higher trees on the river banks. No stagnant water and no vegetation of reeds and herbs which offer the structures for spiders to build their webs, find prey or hide. These pebble-covered sites offer a good habitat for Lycosidae and Salticidae, but we have not seen any *Pirata* species or *Clubiona* species characteristic for wetland habitats.

As usual there were also single specimens of rare species or more common species with low densities or more cryptic species easily overlooked in daytime. Some species were found to be characteristic for certain microhabitats. *Trabea paradoxa* Simon and *Scytodes velutina* Heineken & Lowe for example were sifted from litter under pinetrees

Even when taking the differences in habitat into account, less than 50% overlap in collected species is an indication of the species richness of this area. On both inventory trips species new for science were collected, making the south of Italy an interesting area for further research.

ACKNOWLEDGEMENTS

We want to thank Robert Bosmans (Belgium), Holger Frick (Vaduz, Liechtenstein), Bernhard Huber (Bonn, Germany), Mykola Kovblyuk (Simferopol, Ukrain), Barbara Thaler-Knoflach (Innsbruck, Austria), Herman Vanuytven (Belgium) and Johan Van Keer (Deurne, Belgium) for their support through help, advices and suggestions for the identification of problematic species.

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