

ON SOME SPIDERS FROM GARGANO, APULIA, ITALY**Steven IJland**

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ABSTRACT

In the springtime of 2011, 507 adult spiders (plus 7 identifiable subadults) representing a total of 135 species were collected in Gargano, Apulia, Italy. A list of collected spiders is given. *Zelotes rinske* spec. nov. is described after a single female. *Dictyna innocens* O. P.-Cambridge, 1872, *Leptodrassus femineus* (Simon, 1873), *Nomisia recepta* (Pavesi, 1880), *Zelotes criniger* Denis, 1937, *Pellenes brevis* (Simon, 1868), and *Salticus propinquus* Lucas, 1846 are reported for the first time from mainland Italy. Illustrations are provided of the problematic species *Dictyna innocens* O. P.-Cambridge, 1872. The poorly-known female of *Araeoncus altissimus* Simon, 1884 is described and depicted. 141 specimens representing 105 species were DNA barcoded.

Key words: Araneae, barcoding, *Zelotes rinske*

INTRODUCTION

In the springtime of 2011, two of the authors (PJvH and SIJ) made a trip to Gargano in Italy in order to study spiders. Gargano is a peninsula situated in the province of Apulia (Puglia) and is known as the “spur” of the Italian “boot” (fig. 1). The Gargano promontory is rich in karst structures like caves and dolines. It has a very rich flora and fauna, and is known as one of the richest locations for orchids in Europe with some 56 species, some of which are endemic. In the past the promontory was entirely covered with forests, of which now only 15% remains (<http://www.orchideedelgargano.it/1/4>)

In 1991 the Gargano National park was founded. It covers about 121,118 hectares with a variety of habitats. In the heart of Gargano, the Foresta Umbra can be found, a dense and old forest. Other habitats in the park include maquis, meadows extensively grazed by cattle and very rich in orchids, steep cliffs overhanging the sea, salt lakes, and marshes to the south. Though the marshes are not on the promontory, they are part of the Gargano National Park.

Because of the variety of habitats and the interesting geology, we decided to investigate the spider fauna of Gargano. The localities where we collected are listed below. Coordinates are given as WGS84. The Fauna Europaea database (Van Helsdingen 2012) was used as source of information on distribution.

LOCALITIES**Locality 1**

Extensively grazed meadows on Monte Sacro (41°757'N 16°028'E / 41.758°N 16.033°E), sweeping and hand collecting. With 872m Monte Sacro is the third highest point of Gargano. We collected in extensively grazed meadows, with hedges and some trees. Many *Orchis* species and other orchids, *Asphodeline lutea*, *Asphodelus*, *Smiranium perfoliatum*. Collecting dates: 12.iv.2011, 20.iv.2011, 24.iv.2011, 29.iv.2011.

Locality 2

Foresta Umbra, an old mixed Oak and Beech forest (41.793°N 15.991°E / 41.859°N 16.033°E / 41.83833°N 16.04083°E). Hand collecting and beating from shrubs. Collecting dates: 14.iv.2011, 4.v.2011, 8.v.2011.

Locality 3

In and around the house we stayed on Monte Sacro (41.753°N 16.028°E). Collecting date: 26.iv.2011.

Locality 4

Shrubs, rocky, extensively grazed, with Juniper trees (*Juniperus oxycedrus* and *J. phoenicea*), between Mattinata and Monte Sacro (41.737°N 16.039°E), sweeping and hand collecting. Collecting date: 24.iv.2011.



Fig. 1. Map showing collection localities.

Locality 5

Holm oak *Quercus ilex* forest on slope of Monte Sacro (41.759°N 16.039°E). Beating, sweeping, hand collecting. Collecting dates: 14.iv.2011, 27.iv.2011.

Locality 6

Wetland area “Palude de Frattarolo”, a marshy area situated south of Manfredonia (41.567°N 15.873°E). Hand collecting and sweeping on the verges of a path with a rich vegetation of mainly Milk thistle *Silibum marianum*, Thistles *Cirsium* spec., Teasel *Dipsacus* spec., and striking plants such as Honeywort *Cerinthe major* and Tamarisk *Tamarix africana*, and a belt of Common reed *Phragmites* along a canal and ditch on the marshy side. Collecting dates: 25.iv.2011, 7.v.2011.

Locality 7

Torre del Segnale, Baia del Zagare. A walk down from the Strada provinciale 53 at an elevation of 149 metre down to sea level along a footpath following the steep coast (41.752°N 16.153°E). At the first part rocks with sparse vegetation (Rosemary *Rosmarinus officinalis*, Turpentine tree *Pistacia terebinthus*), at the second part an olive grove, and deciduous forest the last part of the track. Hand collecting, sweeping. Collecting dates: 19.iv.2011, 28.iv.2011.

Locality 8

Pèchici, 3 km south of village, along path through olive orchard with shrubs and weeds along fence, and around house (41.918°N 16.023°E). Sweeping and hand-collecting. Collecting dates: 2.v.2011, 3-7.v.2011

Locality 9

6 km South of Vico del Gargano, along path in agricultural area (41.885°N 15.985°E), hand-collecting. Collecting date: 4.v.2011.

Locality 10

Lago di Varano, border of saltwater lake on north side (41.903°N 15.803°E). Sweeping in low vegetation. Collecting date: 3.v.2011.

Locality 11

In coastal area north of west end of Lago di Lesina, a salt water lagoon, (41.909°N 15.267°E). Sweeping and hand-collecting Collecting date: 6.v.2011.

Locality 12

Coastal dunes near Marina de Lesina (41.917°N 15.309°E), beaten from *Juniperus*. Collecting date: 6.v.2011.

Locality 13

East of Pèchici, near Torre di Sfinale at coast (41.936°N 16.088°E), under stones on sandy soil. Collecting date: 5.v.2011.

Locality 14

East of Pèchici, at coast, Palude de Sfinale near Torre di Sfinale, marshy area (but dry at time of visit and obviously used for dumping trash, heavily polluted at places), low vegetation such as rushes and reeds and shrubs (*Myrica gale*) (41.935°N 16.086°E). Sweeping and hand-collecting. Collecting date: 5.v.2011.

BARCODING

Tissues from 1-4 legs were sent to the NCB Naturalis DNA barcoding facility. All DNA voucher specimens were photographed. Extractions were performed using the Macherey-Nagel NucleoMag Tissue kit (<http://www.mn-net.com/>) on the Thermo Labsystems KingFisher extraction robot. PCR was performed using the primers LCO1490 (5'-GGTCAACAAATCATCATAAAGATATTGG-3') (Folmer et al., 1994) and Chelicerate Reverse 2 (5'-GGATGGCCAAAAAATCAAATAAATG-3') (Barrett and Hebert, 2005). PCR reactions contained 18.75µl mQ, 2.5µl 10x PCR buffer CL, 1.0µl 25mM of each primer, 0.5µl 2.5mM dNTPs and 0.25µl 5U Qiagen Taq. PCR was performed using initial denaturation of 180s at 94°C, followed by 40 cycles of 15s at 94°C, 30s at 50°C and 40s at 72°C, finished with a final extension of 300s at 72°C and pause at 12°C. Sequencing was performed by BaseClear (<http://www.baseclear.com/>). For all barcoded specimens, sequences, images, and collection data were uploaded to the Barcode of Life Database (BOLD; <http://www.boldsystems.org/>).

In all 507 adult spiders (plus 7 identifiable subadults) representing a total of 135 species were collected for this study. DNA barcoding was attempted for 132 of these species. 1-3 specimens of each species were attempted including both sexes when available. 141 of the 190 specimens attempted yielded a successful DNA barcode sequence (74% success rate). 105 species yielded at least one DNA barcode sequence (80% success rate). The pattern of successes and failures in barcoding attempts suggests that biases may be at play. Linyphiids (32 specimens attempted) and salticids (29 specimens attempted) comprised the two largest specimen pools attempted by family, and both had relatively high failure rates (47% and 62%, respectively). The next 8 families ranked by specimens attempted all had above average success rates (>75%) for pools of attempted specimens ranging from 22 to 6. When looking just at species for which more than one specimen was attempted, we noticed a tendency for all specimens to either succeed or fail. So in the families with the highest failure rates, linyphiids and salticids, there were 10 and 9 species respectively with more than one specimen attempted. For linyphiids, all specimens were successful for 4 species and all failed for 5 species, only one species had mixed success. Salticids showed a similar pattern with 5 species successful for all specimens, 3 species failing for all specimens, and one species with mixed success. All of this seems to suggest that taxonomic factors at multiple levels may be driving DNA barcoding success.

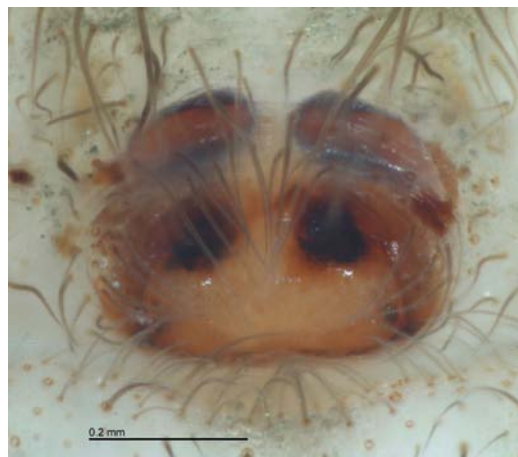


Fig. 2. *Malthonica dalmatica*. Epigyne, ventral view. Photograph Jeremy Miller.

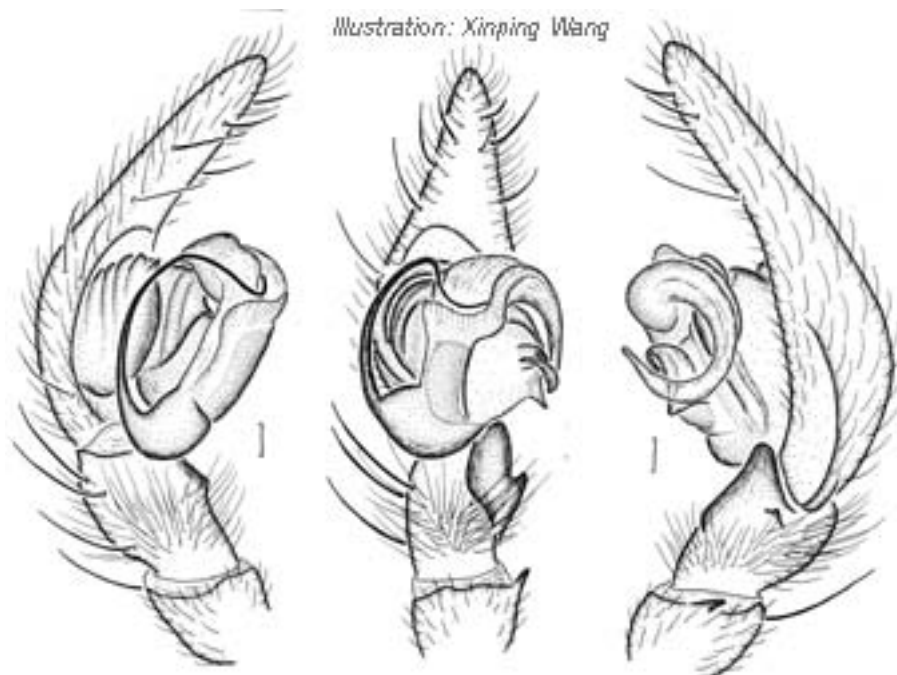


Fig. 3. *Pireneitega garibaldii*, male palp. Courtesy Xinping Wang.

REMARKS ON SOME SPECIES

In table 1 all collected species are listed, including the localities. Voucher numbers are given if the specimen is barcoded, as reference number of the collection in Naturalis. Some information on interesting species is given below.

GNAPHOSIDAE

Malthonica dalmatica (Kulczynski, 1906) (fig. 2)

This species has a wide distribution, from France to the Ukraine along the Mediterranean countries, but does not seem to be common anywhere. The picture of the epigyne provided here may help future recognition.

Pireneitega garibaldii (Kritscher, 1969) (fig. 3)

This species is known from the Italian mainland and Sicily only. One male was collected in the Foresta Umbra, and was identified with help of the website <http://www.amaurobiidae.com> (Wang, 2012). The figure of the male palp is also from this website, courtesy of Xinping Wang.

DICTYNIDAE

Dictyna innocens O. P.-Cambridge, 1872 (figs. 4-5)

Three males and two females of a *Dictyna* species were collected in Palude di Frattarolo (locality 6), 6 km south of Manfredonia, mainly from branches of *Tamarix africana*. The species clearly belongs to the *Dictyna latens* group (*Brigittea* sensu Lehtinen, 1967) on account of the divided cribellum and the rugose apex of the conductor. From this group, *D. latens*, *D. civica*, *D. kosiorowiczi* and *D. vicina* are reported from Italy. The former two are well-known species and do not match our collected specimens, the latter two however are rather poorly described. *D. vicina* can be ruled out based on the shape of the palpal patellar apophysis (Simon, 1914, fig. 110). The available descriptions of *D. kosiorowiczi* are not sufficiently detailed for reliable identification (Simon, 1914; Barrientos & Ferrández, 1982), but could match our collected specimens. A better candidate however is *Dictyna innocens*. The female of this species was described by O. P.-Cambridge from the plains of the Jordan, Palestine (O. P.-Cambridge, 1872), and a male from Egypt (O. P.-Cambridge, 1876). Strand concluded it was impossible to recognize *D. innocens* from the original description by O.P.-Cambridge, and described a new species under the name *D. aharonii* from a single female only that according to him is closely related to *D. innocens* (Strand, 1914). Lehtinen synonymized *D. aharonii* with *D. innocens*, but concluded that O. P.-Cambridge's female and male were not conspecific, leading him to



Fig. 4. *Dictyna innocens*. Male habitus, chelicerae, and epigyne. Photographs Steven IJland.

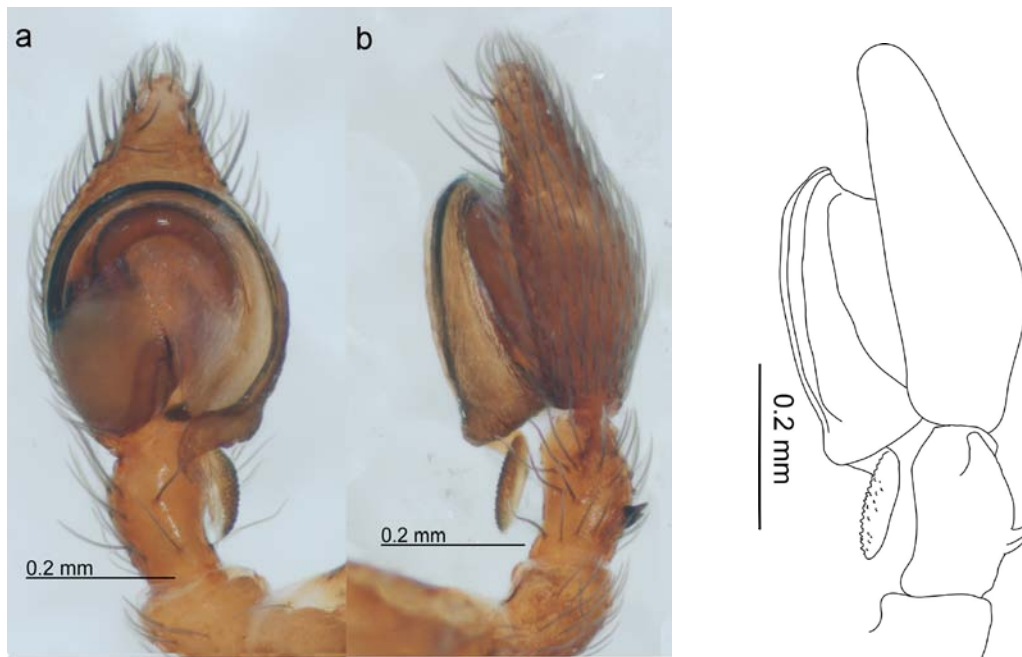


Fig. 5. *Dictyna innocens*. Left male palp ventral (a), left male palp retrolateral (b and drawing).

synonymise the male of *D. innocens* sensu O.P.-Cambridge with *D. vicina* (Lehtinen, 1967). Bristowe described *Dictyna jacksoni* from females only from Greece, and specifically mentions the divided cribellum (Bristowe, 1935). The male is described by Hadjissarantos from Greece (Hadjissarantos, 1940). Although the drawings of the male palp are rather poor, the double toothed apophysis on the palpal tibia is clearly depicted, which is not the case in the drawings of *D. kosiorowiczi*. The drawings do match our male specimens, and so does the description of Bristowe's female. Lehtinen synonymized *D. jacksoni* with *D. innocens* (under his new genus *Brigittea*), stated the type preservation of Bristowe's females is unknown, and does not refer to Hadjissarantos' male types. No further justification is given for the synonymization.

This species group is in need of revision, and the species we found cannot be determined with certainty from the available literature. More DNA barcoding data of this genus might help elucidate the relationship of the known species and their distribution. For the moment, we assign the collected species to *D. innocens*, which is a first record for Italy.

DYSDERIDAE

Dysdera spec.

One male of *Dysdera bottazziae* Caporiacco, 1951 was collected, and three females that could not be assigned to species level. The identification of female *Dysdera* specimens, especially without accompanying males is very difficult, even by experts (Christa Deeleman-Reinhold, personal communication). Undoubtedly many undescribed *Dysdera* are still to be discovered in the Mediterranean region. Barcoding might help elucidate the complex relationships, however, we achieved to barcode only one of the four specimens we tried, an undetermined female.

GNAPHOSIDAE

***Leptodrassus femineus* (Simon, 1873)**

One male of *Leptodrassus femineus* was collected at Torre del Segnale, locality 7. This species is known from Portugal to Israel, including Sicily. This is the first record for mainland Italy.

***Nomisia exornata* (C.L. Koch, 1839)** (fig. 6)

This species has a southern- and central-European distribution and reaches further east into Central-Asia. Since there are few illustrations available the picture of the epigyne provided here may help future recognition.

***Nomisia recepta* (Pavesi, 1880)** (fig. 7)

This is the first time *Nomisia recepta* is reported from mainland Italy. The species is known from Sicily. Chatzaki points out that *N. recepta* and *N. excerpta* have been the subject of taxonomic puzzle several times (Chatzaki, 2010). Although Chatzaki leaves open the possibility that *N. excerpta* might consist of several different species, she also states there is no doubt that *N. recepta* and *N. excerpta* are clear separated species. Our specimen has been DNA barcoded, which might help elucidating the taxonomic puzzle.

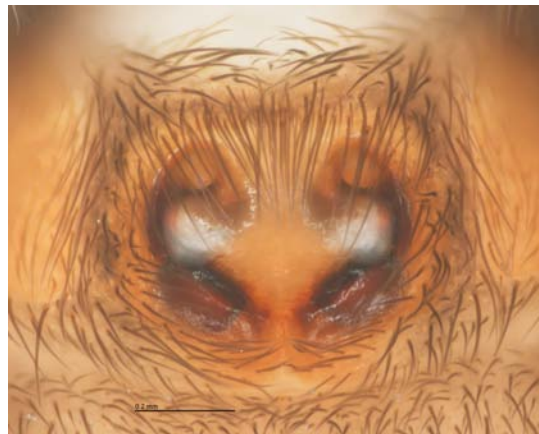


Fig. 6. *Nomisia exornata*, epigyne. Photograph Jeremy Miller.

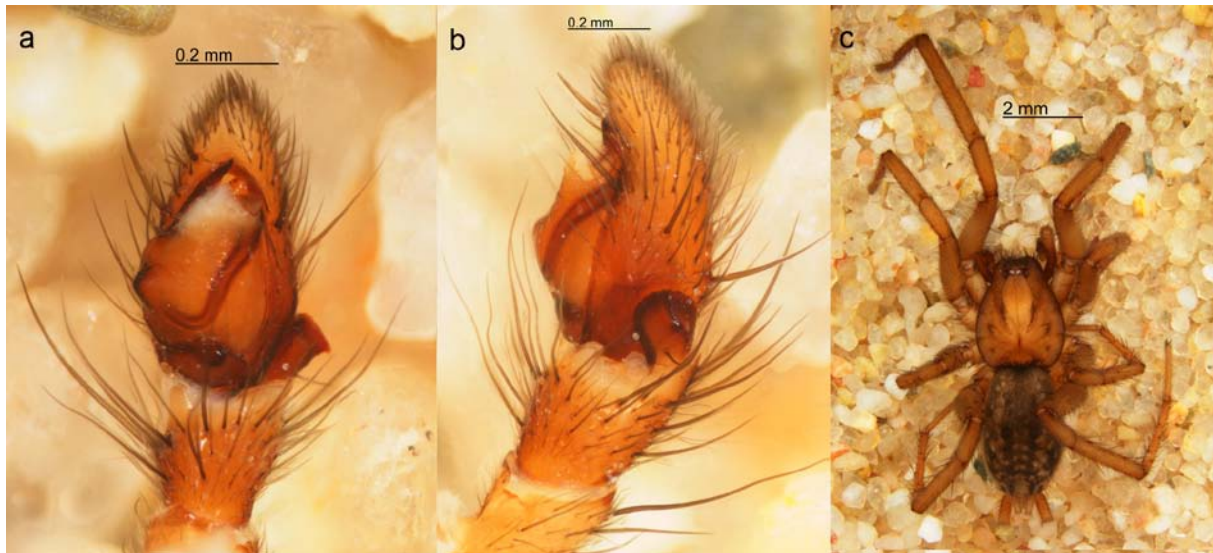


Fig 7. *Nomisia recepta*, male. Left palp ventral (a), left palp retrolateral (b), habitus (c). Photographs Steven IJland.

***Trachyzelotes huberti* Platnick & Murphy, 1984** (fig. 8)

Four males of a *Trachyzelotes* species were collected at Pèchici, 3 km south of the village, locality 8. In their description of *T. huberti*, Platnick and Murphy (Platnick & Murphy, 1984) specify that the retrolateral loop of the embolar base occupies less than half of the bulb length (fig. 8b). They state that *T. huberti* can be distinguished from the similar species *T. costatus* (= *T. bardiae*) by the smaller retrolateral loop of the embolar base, *T. costatus* having the retrolateral loop of the embolar base occupying about half of bulb length. Levy

(1998) synonymized *T. bardiae* with *T. costatus*. Since we did not collect any females we cannot use the morphology of the epigyne for support. Since *T. huberti* is already known from Italy (and Algeria) we provisionally identify our specimens with this species. *T. bardiae* has a more general Mediterranean distribution from Portugal through Sicily (but not the Italian mainland) to Israel. One of our specimens was sent in for DNA barcoding and the result might show the way to the true identity of our specimens. Again, the genus *Trachyzelotes*, too, is in need of revision.

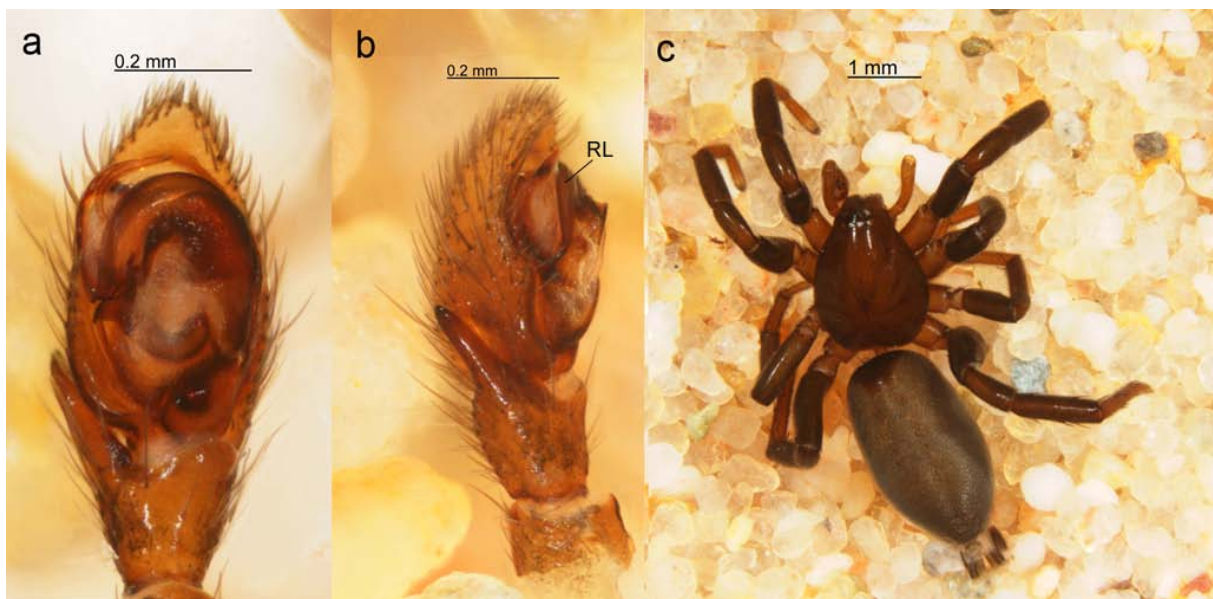


Fig 8. *Trachyzelotes huberti*, male. Right palp, ventral view (a) and retrolateral view (b); habitus (c). Photographs Steven IJland. RL: retrolateral loop of the embolar base.

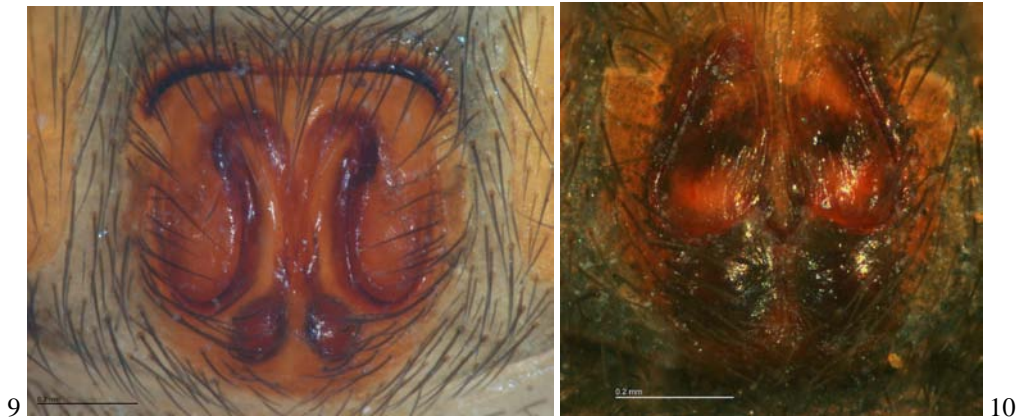


Fig. 9. *Zelotes denapes*, epigyne. Fig. 10. *Zelotes rinske* spec. nov., epigyne. Photographs Jeremy Miller.

***Zelotes criniger* Denis, 1937**

Two males of *Zelotes criniger* were collected at Torre del Segnale, locality 7. The species is known from Portugal, Spain and Sicily. This is the first report for mainland Italy. For a long time *Z. criniger* was known from males only, but recently Senglet (Senglet, 2011) synonymized *Z. denisi* Marinaro, 1967 with *Z. criniger*. *Z. denisi* Marinaro, 1967 was known from females only.

***Zelotes denapes* Platnick, 1993** (fig. 9)

This species has not been illustrated other than the illustrations of *Zelotes caporiaccoi* Denis, 1953 (Caporiacco & Denis, 1953: 59, figs. 1-4), for which a replacement name was provided by Platnick (Platnick, 1993) because of primary homonymy (*Zelotes caporiaccoi* Roewer, 1951). The picture of the epigyne provided here may help future recognition.

***Zelotes rinske* Van Helsdingen spec. nov.** (figs. 10-11)

Holotype: ♀, Italy, Puglia, Gargano, Terra del Segnale, Baia del Zagare, between start of footpath from Strada provinciale 53 (149 m) down to sea level, 28.iv.2011, 41.75219°N 16.15297°E, P.J. van Helsdingen leg., deposited in the collection of the Naturalis Biodiversity Center, Leiden.

Etymology. The species is named after Rinske Boersma, spouse of the first author, who supported us during the collecting trip to Gargano.

Diagnosis.

The species is characterized by the following combination of characters. Epigyne longer than wide. In the ventral view of the epigyne there are, in the area between the two lateral pouches (term used by Senglet, 2004, fig. 1c) distinct dark, oblique, pigmented bands at either side in a striated area. Receptacula large. The two rod-like offshoots (OG, fig. 11), which stand perpendicularly to the two parallel mesal ducts. No similar combination of characters could be found in the available literature.

Description of female holotype.

Measurements (in mm). Total length 5.5. Carapace length 2.5, width 2.0. Abdomen length 3.3, width 2.0. Height of clypeus 0.1. Chelicerae length 0.75, width 0.50.

General habitus of a *Zelotes*. Carapace dull black, abdomen black, branchial opercula brown. Sternum shiny brownish-black. Legs black with femora I with light-brown retro-lateral streak over its whole length, metatarsi brownish-black, tarsi light-brown; coxae black with brown bases. All segments of palp brown. Chelicerae black with a striking light yellow-brown area at the tip, from base of fang to mesal corner; some long black setae on the frontal surface.

Measurements of leg-segments.

	I	II	III	IV
Fe	1.80	1.60	1.40	2.05
Pa	1.25	1.00	0.75	1.20
Ti	1.35	1.25	1.05	1.65
Mt	1.15	1.10	1.10	2.00
Ta	1.05	1.05	0.90	1.05

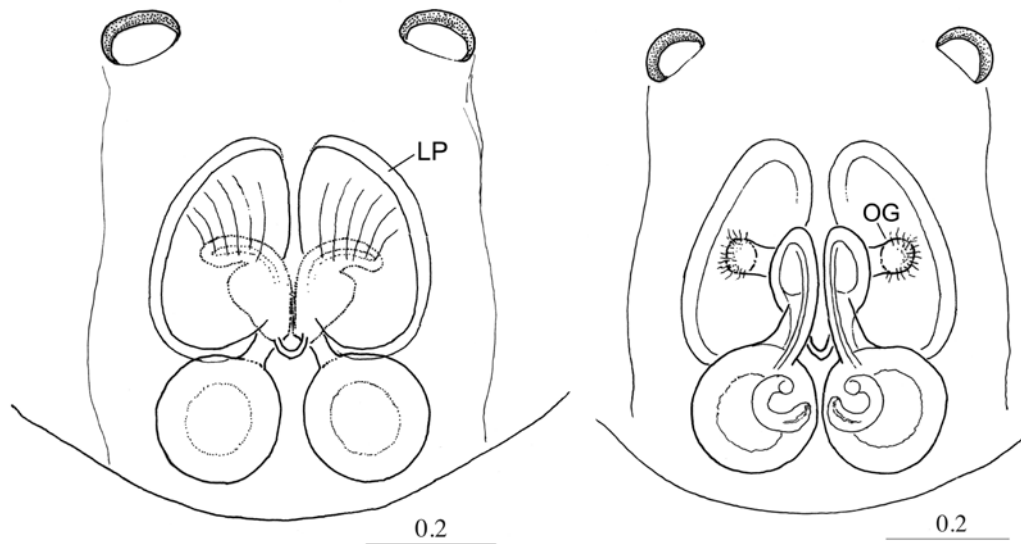


Fig. 11. *Zelotes rinske* spec. nov., epigyne, ventral view. LP: lateral pouch; OG, Ouverture dans l'atrium genital.

Epigyne and vulva (figs. 10-11). Epigyneal area longer than wide, the two antero-lateral sockets included. Very dark in ventral view with lateral oval “frames” faintly visible, separated by a narrow median groove with a socket or pit at its posterior tip. A shadowy, lightly pigmented, transverse band crosses the frames consisting of pigmented parallel bars in the integuments. Receptacula faintly visible through the heavily pigmented epigyneal area. Vulva: receptacula seminis very large. On the dorsal side of the receptacula a small sausage-shaped appendage is visible, function unknown. In the dorsal aspect two heavily sclerotized, parallel and mesally situated ducts run from the receptacula in anterior direction. A short rod-like off-shoot sticks out laterally at either side of the duct and is the “ouverture dans l’atrium genital” (OG) as described by Jézéquel (Jézéquel, 1961: 520). The sperm ducts are formed by the lateral bows (grooves) on the ventral surface. The drawings are useful as fingerprints more than as constructional drawing since I do not understand the real functioning of the organ.

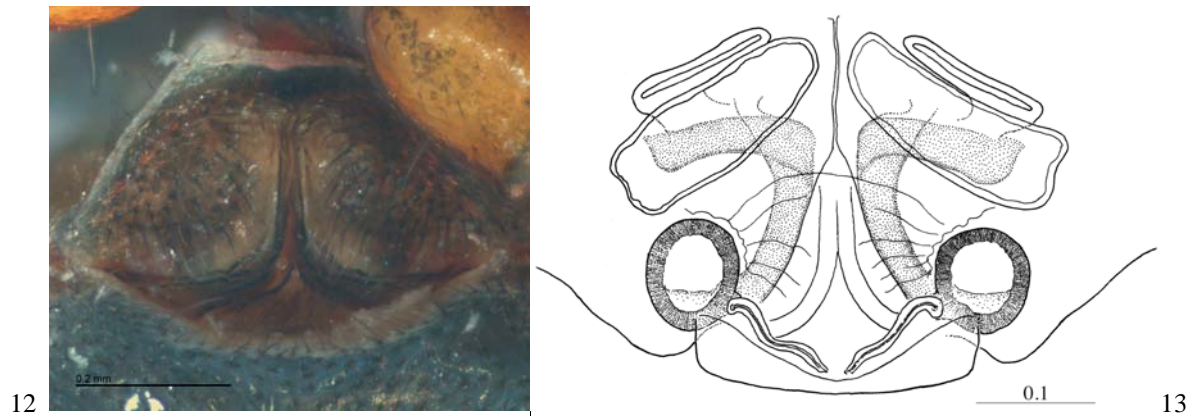
LINYPHIIDAE

Araeoncus altissimus Simon, 1884 (figs. 12-13)

Three males and one female of this species were collected at Mt Sacro near Mattinata on 12.iv.2011, locality 1. A single female from Foresta Umbra, 17.iv.2011, is thought to belong also to this species. This latter specimen was used for dissection and illustration of the epigyne.

Males of *Diplocephalus* and *Araeoncus* can usually be distinguished relatively easily by the shape of the cephalothorax and the species-specific modification of the tibial apophysis of the palp. Females lack such somal characters and are much less easily characterized at the generic level. Most epigynes in these two genera characteristically have two lateral plates at either side of a longitudinal fissure. The shape of the lateral plates and the length-width ratio are helpful in a way, and vulval structures give additional support when available from earlier, published research. In the present case it was assumed that the three males and single female from the same locality belonged to one species. The second female specimen from Foresta Umbra looks identical in all aspects.

The male palp of *Araeoncus altissimus* Simon, 1884 has been depicted (e.g. Bosmans 1996, figs. 74-78). The epigyne has been illustrated by Simon (Simon, 1926, fig. 649), Denis (Denis, 1948, figs 30-31; same figures again in 1968, fig. 26-31), Pesarini (Pesarini, 1996, fig. 8), and Bosmans (Bosmans, 1996, figs. 79-80). Bosmans also included a figure of the vulval structure (fig. 81), the only one published so far. But in our opinion, this is an error and the male and female drawings depict different species. We suggest the female is a *Dicymbium* species and not an *Araeoncus* because of the mesally prolonged lateral plates directly next to the median fissure and the internal structure with the anteriorly situated receptacula and the spectacle-shaped loops, also visible in the ventral view of the epigyne (Bosman’s fig. 80). A photographic picture of the epigyne and a rather schematic drawing of the vulva are provided here.



Figs. 12-13. *Araeoncus altissimus*, epigyne and vulva. Photograph Jeremy Miller.

Description

Material: 1 ♀, Italy, Puglia, Gargano, Foresta Umbra, 17.iv.2011, 41.79333°N 15.99111°E, S. IJland leg.

Measurements

Measurements (in mm). Total length 2.9. Carapace length 1.25, width 0.95. Abdomen length 2.0, width 1.15. Height of clypeus 0.29. Chelicerae length 0.55, width 0.28.

The specimen is dark-brown with dark-grey abdomen. All parts shiny. Chelicerae with four well-developed teeth on the frontal margin and a small one near the fang, ventral margin with four small teeth near base of fang opposite the small dorsal tooth. Tibiae I and II with two dorsal spines, III and IV with one. TmI 0.52, TmIV absent. AME smaller than other eyes and closer to each other than to ALE. Distance between PME larger than between PME and PLE.

Measurements of leg-segments.

	I	II	III	IV
Fe	1.10	1.00	0.90	1.15
Pa	0.35	0.32	0.29	0.31
Ti	1.00	0.92	0.70	1.10
Mt	0.87	0.85	0.75	1.00
Ta	0.55	0.55	0.45	0.55

Epigyne and vulva (figs. 12-13). – Epigyne consisting of two lateral plates separated by a fissure. A broad, more or less T-shaped median posterior plate protrudes from the fissure. The lateral plates bear setae on the ventral surface but leave a gutter-like rim free, this gutter bordered mesally and posteriorly by a raised ridge (not present in *Diplocephalus*). The vulva shows the receptacula situated posteriorly. The internal structures of the vulva are very difficult to unravel because they partly consist of membranous ducts from the entrance of the copulatory duct onwards. The later parts, from the turning point towards the receptaculum, are sclerotized and well-discernible. The position of the receptacula near the posterior margin of the epigyne and the mesal position of the distal part of the ducts might be diagnostic. The whole conformation of the vulva is clearly distinct from *Diplocephalus*.

The drawings are useful as fingerprints more than as constructional drawing since we do not understand the real structure of the organ.

“*Ceratinella apollonii* Di Caporiacco, 1938” (figs. 14-16)

Material: Italy, Puglia, Gargano, between Mattinata and Monte Sacro (41.73737°N 16.03880°E), 24.iv.2011, shrubs, rocky, extensively grazed, with Juniper trees (*Juniperus oxycedrus* and *J. phoenicea*), sweeping and hand collecting, P.J. van Helsdingen leg.

The collecting methods used at this site were beating of branches and turning stones. This specimen probably was found under a stone. The most striking character of the specimen is the skin of the abdomen which is completely covered on all sides by small warts each with a seta on top. In the literature we found only one species which seems to have this character, *Ceratinella apollonii* Di Caporiacco, 1938, described after a single male specimen from Carnia in Italy. We have not checked the holotype, which might be preserved in Florence,



Figs. 14-15. “*Ceratinella apollonii*”, habitus and epigyne. Photographs Jeremy Miller.

and the placement of our female specimen with this species is therefore not more than a suggestion. We describe the species and depict it so as to facilitate recognition in the future.

Description

Measurements

Measurements (in mm). Total length 1.45. Carapace length 0.62, width 0.50. Abdomen length 1.01, width 0.69. Height of clypeus 0.12. Chelicerae length 0.23, width 0.11.

Cephalothorax, chelicerae and sternum blackish-brown, shiny, sternum with setae. Abdomen completely covered on all sides by small warts each with a seta on top. Legs rather stout; ratio length/diameter 6.6. All tibiae with a single d-spine, on tibia I at 0.24 of length of tibia, length of spine on Ti I 1.45 times diameter. TmI 0.35, TmIV absent. Median eyes small, AME separated by half a diameter, PME by one-and a-half diameter.

Measurements of leg-segments.

	I	II	III	IV
Fe	0.53	0.50	0.42	0.62
Pa	0.19	0.16	0.16	0.20
Ti	0.46	0.41	0.34	0.51
Mt	0.40	0.37	0.35	0.44
Ta	0.31	0.29	0.26	0.31

Epigyne and vulva (figs. 15- 16). – Epigyne with two chitinized arches at either side of a small, black mesal protrusion. Receptacula seminis laterally and close to the posterior margin. In front of the vulva lies a balloon-

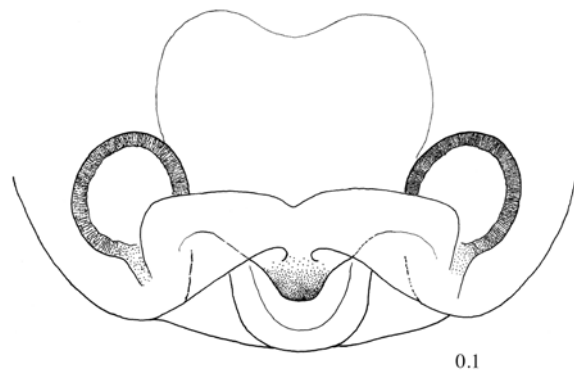


Fig. 16. “*Ceratinella apollonii*”, vulva.

like structure which may have no direct functional relation to the vulva. We are aware of the long embolus in the drawing made by Di Caporiacco (1938, fig. 1) for which we cannot discern a corresponding duct in the vulva.

To our regret we have to report that the epigyne was lost during handling, so what remains are the specimen, the pictures and the drawing. Unfortunately also the barcoding for this specimen failed.

The inclusion in *Ceratinella* of the holotype male as well as the present female from Gargano is very unlikely and should be reconsidered after re-examination of the type-specimen.

PISAURIDAE

Pisaura spec.

We collected males and females from an as yet unidentified *Pisaura* species. The species are very similar to *Pisaura mirabilis* (Clerck, 1757), but there are some differences in both pedipalps and epigynes. Also DNA barcode suggests a different species. Four *Pisaura* species are reported from Italy (van Helsdingen, 2012), but based on the available literature we cannot yet assign a name to our species. It has been noticed before that *Pisaura* in the Mediterranean area might be a species complex (Brignoli, 1984). Lack of good illustrations, especially of males, and misidentifications in literature (Brignoli, 1984; Wunderlich 1992) complicate identification. We intend to publish in another paper on this matter.

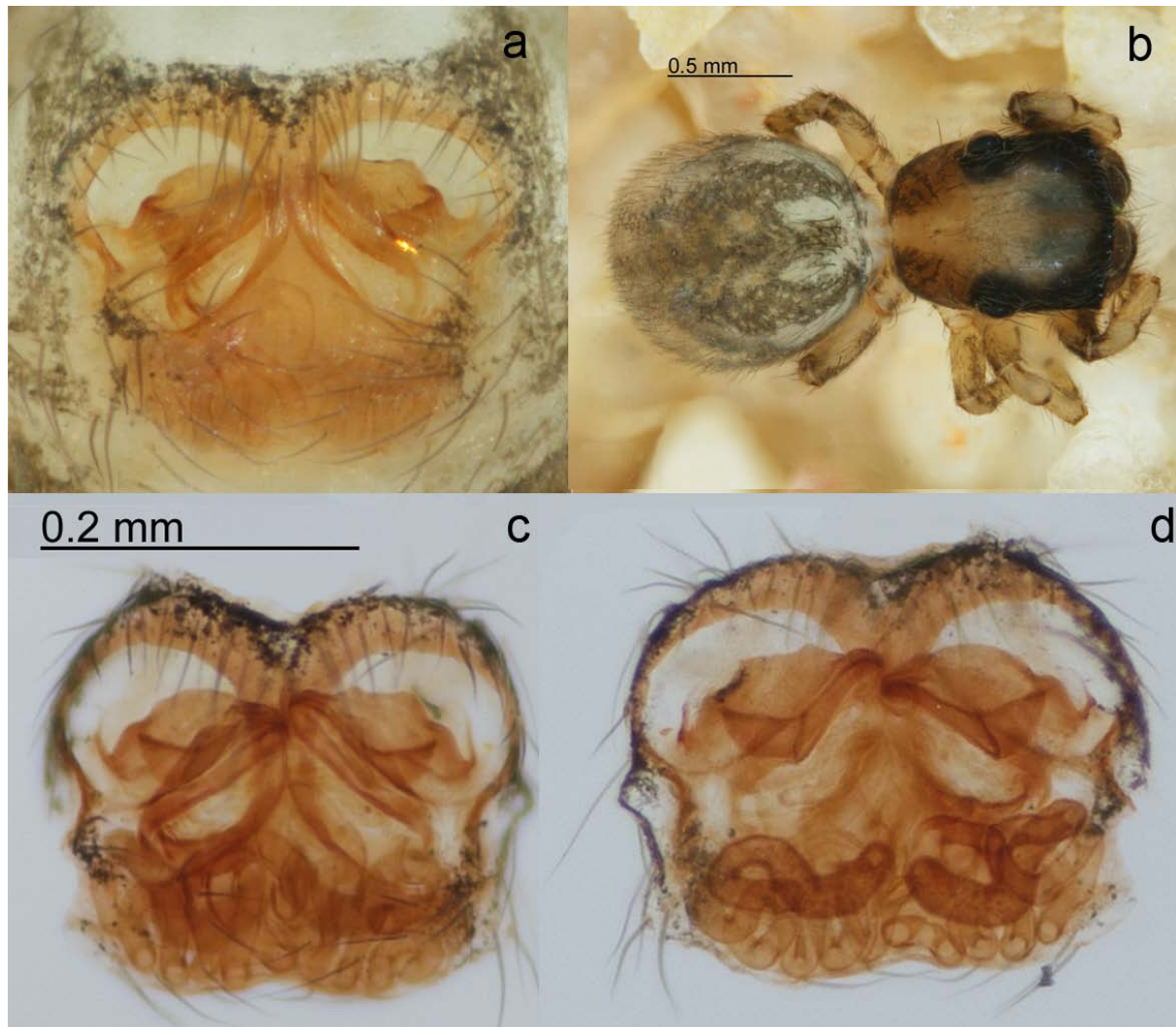


Fig 17. *Neon spec.*, female, epigyne (a), habitus (b), vulva ventral (c) and vulva dorsal view (d). Photographs Steven IJland.

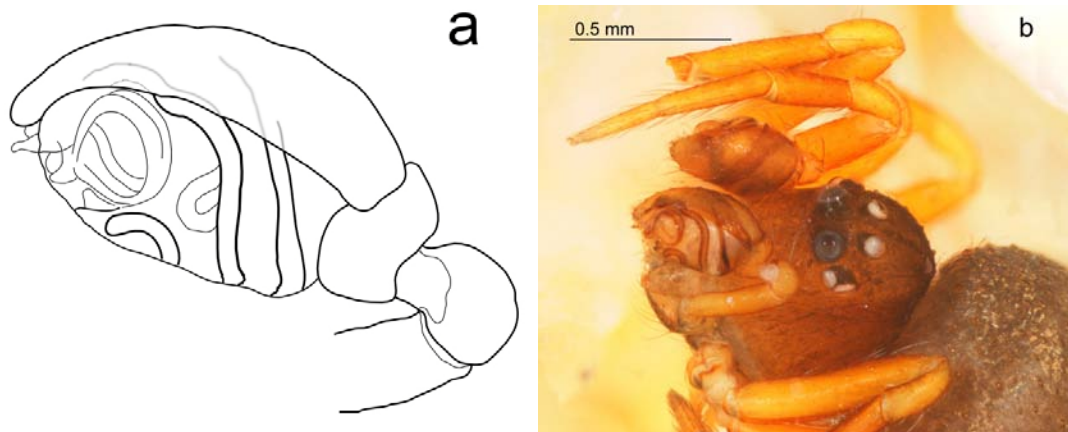


Fig. 18. *Lasaeola convexa*, male, left male palps (a), detail (b). Photograph Steven IJland.

SALTICIDAE

Neon spec. (fig. 17)

A female belonging to *Neon* was collected at Torre del Segnale, locality 7. The epigyne is very similar to the illustration by Roberts of what he tentatively identifies as *N. pusio* (Roberts, 1998). Logunov synonymized *N. pusio* with *N. convolutus*, based on the male type material (Logunov, 2004). He also suggests that *N. convolutus* might be a junior synonym of *N. rayi*, but lacks comparative material to prove or reject this possibility. The epigyne of our specimen does not match the published illustrations of *N. rayi*, so if Logunov is right, our specimen might belong to a yet undescribed species. If not, our specimen might still be *N. convolutus*. As the female of *N. convolutus* has never been formally described, and we did not collect male specimens, we choose not to assign a species name yet. Unfortunately DNA barcoding failed for this specimen, so a barcode sequence will not help to match this female to its male.

Pellenes brevis (Simon, 1868)

One male of *Pellenes brevis* was collected at Mattinata, locality 4. The species is reported from Sicily, this is the first record from mainland Italy. It also occurs in several other European countries (Van Helsdingen, 2012).

Salticus propinquus Lucas, 1846

On the border of Lago di Varano, locality 10, a male of *Salticus propinquus* was collected. The species is reported from several Mediterranean countries, also from Sicily. This is the first report from mainland Italy ((Van Helsdingen, 2012)).

TETRAGNATHIDAE

Tetragnatha reimoseri (Rosca, 1938)

The authors reported on this species in a previous paper (IJland & van Helsdingen, 2011). The species was recorded from Italy for the first time.

THERIDIIDAE

Lasaeola convexa (Blackwall, 1870) (figs. 18)

This species has a wide distribution along the Mediterranean countries. Pictures of the pedipalp are provided here to help future recognition.

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REFERENCES

- Barrett, R.D.H. & P.D.N. Hebert 2005. Identifying spiders through DNA barcodes. – *Canadian Journal of Zoology* 83: 481-491.
- Barrientos, J. A. & M. A. Ferrández 1982. La colección de araneidos del Departamento de Zoología de la Universidad de Salamanca, III: arañas migalomorfas, haploginas, y cribeladas. – *Boletín de la Asociación Española de Entomología* 5: 75-86.
- BOLD: <http://boldsystems.org/>
- Bosmans, R. 1996. The genera *Araeoncus* Simon, *Delorripis* Simon and *Diplocephalus* Bertkau in northern Africa (Araneae: Linyphiidae: Erigoninae). *Studies on North African Linyphiidae VII*. – *Belgian Journal of Zoology* 126: 123-151.
- Brignoli, P. M. 1984. Zur Problematik der mediterranen *Pisaura*-Arten (Arachnida, Araneae, Pisauridae). – *Zoologischer Anzeiger* 213: 33-43.
- Bristowe, W. S. 1935. The spiders of Greece and the adjacent islands. – *Proceedings of the Zoological Society of London* 1934: 733-788.
- Caporiacco, L. di. 1938. Osservazioni ecologiche su *Dicranopalpus gasteinensis* Opilioni calcicolo. – *Redia* 24: 33-56.
- Caporiacco, L. di & J. Denis 1953. Descrizione di tre species di aracnidi dell'isola di Zannone. – *Bollettino di Zoologia* 20: 59-63.
- Chatzaki, M. 2010. A revision of the genus *Nomisia* in Greece and neighboring regions with the description of two new species. – *Zootaxa* 2501: 1-22.
- Denis, J. 1948. Notes sur les érigonides. VII. Remarques sur le genre *Araeoncus* Simon et quelques genres voisins. – *Bulletin de la Société entomologique de France* 53: 19-32.
- Denis, J. 1968. Notes d'aranéologie marocaine. X. Les érigonides du Maroc. – *Bulletin de la Société des Sciences naturelles et physiques du Maroc* 47: 137-164.
- Folmer, O., M. Black, W. Hoeh, R. Lutz & R. Vrijenhoek 1994. DNA primers for the amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. – *Molecular Marine Biology and Biotechnology* 3: 294-299.
- Hadjissarantos, H. 1940. Les araignées de l'Attique. – Athens
- Helsdingen, P.J. van 2012. Araneae. Fauna Europaea Database, Version 2012.2. – www.european-arachnology.org.
- IJland, S. & P.J. van Helsdingen 2011. *Tetragnatha reimoseri* (Rosca, 1938) recorded from Italy for the first time (Araneae, Tetragnathidae). – *Nieuwsbrief SPINED* 30: 22-24.
- Jézéquel, J.F. 1961. Contribution à l'étude des *Zelotes* femelles (Araneida, Labidognatha, Drassodidae >>Gnaphosidae<<) de la faune française. – *Verhandlungen der deutschen Zoologische Gesellschaft in Saarbrücken (Zoologischer Anzeiger)* 25 (Supplement): 519-532.
- Lehtinen, P. T. 1967. Classification of the cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha. – *Annales zoologici Fennici* 4: 199-468.
- Levy, G. 1998. The ground-spider genera *Setaphis*, *Trachyzelotes*, *Zelotes*, and *Drassyllus* (Araneae: Gnaphosidae) in Israel. – *Israel Journal of Zoology* 44: 93-158.
- Logunov, D. V. 2004. Notes on new and poorly known Palearctic species of the genera *Neon*, *Sitticus* and *Synageles* (Araneae: Salticidae). – *Bulletin of the British Arachnological Society* 13: 33-40.
- Le Peru, B. 2011. The spiders of Europe, a synthesis of data: Volume 1 Atypidae to Theridiidae. – *Mémoires de la Société linneenne de Lyon* 2: 1-522.
- Pesarini, C. 1996. Note su alcuni Erigonidae italiani, con descrizione di una nuova specie (Araneae). – *Atti delle Società italiana de Scienze naturali e del Museo civico di Storia naturale di Milano* 135(2):413-429.
- Platnick, N. I. 1993. *Advances in spider taxonomy 1988-1991, with synonymies and transfers 1940-1980*. – New York, 846 pp.
- Platnick, N. I. & J. A. Murphy 1984. A revision of the spider genera *Trachyzelotes* and *Urozelotes* (Araneae, Gnaphosidae). – *American Museum Novitates* 2792: 1-30.
- Roberts, M. J. 1998. *Spinnengids*. – Tirion, Baarn, Netherlands, 397 pp.
- Senglet, A. 2004. Copulatory mechanisms in *Zelotes*, *Drassyllus* and *Trachyzelotes* (Araneae, Gnaphosidae), with additional faunistic and taxonomic data on species from Southwest Europe. – *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 77: 87-119.
- Senglet, A. 2011. New species in the *Zelotes tenuis*-group and new or little known species in other *Zelotes* groups (Gnaphosidae, Araneae). – *Revue suisse de Zoologie* 118: 513-559.
- Simon, E. 1880. Description de trois espèces nouvelles d'araignées d'Égypte. – *Buletin de la Société d'entomologie de France* (5) 10: xcvi-xcix.
- Simon, E. 1881. Les arachnides de France 5: 1-180. – Paris.
- Simon, E. 1914. Les arachnides de France. Synopsis générale et catalogue des espèces françaises de l'ordre des Araneae 6(1): 1-308. – Paris.
- Simon, E. 1926. Les arachnides de France 2(6): 309-532. – Paris.
- Strand, E. 1914. Zweite mitteilung über Spinnen aus Palästina, gesammelt von Herrn Dr J. Aharoni. – *Archiv für Naturgeschichte* 80(A3): 173-186.
- Wang, X. P. 2012. Online Coelotinae, version 2.0. – <http://www.amaurobiidae.com>
- Wunderlich, J. 1992. Die Spinnen-Fauna der Makaronesischen Inseln: Taxonomie, Ökologie, Biogeographie und Evolution. – *Beiträge zur Araneologie* 1: 1-619.

Table 1: List of all species collected, and their localities. An explanation on localities can be found in the text. The voucher number refers to specimens that have been barcoded, followed in parentheses by the sex (m=male, f=female, j=juvenile/subadult) and site number of the barcoded specimens. Failed attempts to obtain DNA barcode sequences (followed by the sex or sexes of the specimens attempted) are noted, as are those species for which DNA barcode sequencing was not attempted.

	Locality		1		2		3		4		5		6		7		8		9		10		11		12		13		14		total		Voucher number (sex, site)			
	Sex		m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f				
AGELENIDAE																																				
<i>Malthonica dalmatica</i> (Kulczynski, 1906)																																				
																		1														1	RMNH.ARA.16217 (f, 8)			
<i>Pireneitega garibaldii</i> (Kritscher, 1969)																																				
					1																												1	RMNH.ARA.16059 (m, 2)		
<i>Tegenaria fuesslini</i> Pavesi, 1873																																				
																	1																1	Failed (m)		
AMAUROBIIDAE																																				
<i>Amaurobius erberi</i> (Keyserling, 1863)																																				
			1	3							2	1																				3	4	RMNH.ARA.16029 (m, 5) RMNH.ARA.16030 (f,5)		
ANYPHAENIDAE																																				
<i>Anyphaena sabina</i> Koch, 1866																																				
										1	1																					1	1	RMNH.ARA.16079 (f, 5) RMNH.ARA.16211 (m, 5)		
ARANEIDAE																																				
<i>Agalenatea redii</i> (Scopoli, 1763)																																				
							2											3															5	RMNH.ARA.16093 (f, 4)		
<i>Araniella inconspicua</i> (Simon, 1874)																																				
							2																										2	RMNH.ARA.16062 (f, 4)		
<i>Cyclosa conica</i> (Pallas, 1772)																																				
											3																						3	RMNH.ARA.16198 (f, 5)		
<i>Cyclosa sierrae</i> Simon, 1870																																				
			1													3	4	2															6	4	RMNH.ARA.16019 (m, 7) RMNH.ARA.16176 (f, 7)	
<i>Cyrtophora citricola</i> (Forsskål, 1775)																																				
																		3j															3j	RMNH.ARA.16250 (j, 8)		
<i>Gibbaranea bituberculata</i> (Walckenaer, 1802)																																				
							2		1	3								2															1	9	RMNH.ARA.16238 (f, 8) RMNH.ARA.16236 (f, 5) RMNH.ARA.16239 (m, 5)	
<i>Hypsosinga heri</i> (Hahn, 1831)																																				
											2	9																					2	9	RMNH.ARA.16095 (f, 6) RMNH.ARA.16216 (m, 6)	
<i>Hypsosinga pygmaea</i> (Sundevall, 1832)																																				
											1	1										1											2	1	RMNH.ARA.16167 (f, 6) RMNH.ARA.16220 (m, 6)	
<i>Larinioides cornutus</i> (Clerck, 1757)																																				
											1	4										2	2							1		1	4	7	RMNH.ARA.16174 (f, 11) RMNH.ARA.16177 (m, 6)	
<i>Mangora acalypha</i> (Walckenaer, 1802)																																				
			1														2	1	2	2	1													7	9	RMNH.ARA.16185 (f, 14) Failed (m)
<i>Zilla diodia</i> (Walckenaer, 1802)																																				
																	1		5															6	RMNH.ARA.16109 (f, 7)	
<i>Zygiella x-notata</i> (Clerck, 1757)																																				
								2																										2	RMNH.ARA.16084 (f, 3)	
CORINNIDAE																																				
<i>Liophrurillus flavitarsis</i> (Simon, 1846)																																				
																																		1	RMNH.ARA.16222 (m, 10)	
<i>Phrurolithus minimus</i> C.L.Koch, 1839																																				
											4	4																						4	4	RMNH.ARA.16072 (m, 6) Failed (f)
<i>Phrurolithus nigrinus</i> (Simon, 1878)																																				
			2	1																														2	1	Failed (f, m)
CLUBIONIDAE																																				
<i>Clubiona comta</i> C.L.Koch, 1839																																				
											1																							1	RMNH.ARA.16088 (f, 5)	

	Locality		1		2		3		4		5		6		7		8		9		10		11		12		13		14		total		Voucher number (sex, site)
	Sex	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f		
<i>Clubiona leucaspis</i> Simon, 1932					1	1	1																							1	2	RMNH.ARA.16190 (m, 4) RMNH.ARA.16237 (f, 4)	
<i>Clubiona phragmitis</i> C.L. Koch, 1843												1																		1		RMNH.ARA.16188 (f, 6)	
DICTYNIDAE																																	
<i>Argenna patula</i> (Simon, 1874)											1																			1		RMNH.ARA.16205 (m, 6)	
<i>Dictyna arundinacea</i> (Linnaeus, 1758)					2																									2		Not attempted	
<i>Dictyna innocens</i> O. P.-Cambridge, 1872											3	2																		3	2	RMNH.ARA.16057 (f, 6) RMNH.ARA.16058 (m, 6)	
<i>Dictyna pusilla</i> Thorell, 1856											8																			8		RMNH.ARA.16241 (m, 6)	
<i>Dictyna uncinata</i> Thorell, 1856		1																												1		RMNH.ARA.16054 (m, 1)	
<i>Nigma puella</i> (Simon, 1870)																1						2	1							2	2	RMNH.ARA.16161 (f, 11) RMNH.ARA.16204 (m, 11)	
DYSDERIDAE																																	
<i>Dysdera bottazziae</i> Caporiacco, 1951		1																												1		Failed (m)	
<i>Dysdera</i> spec. 1			1																											1		Failed (f)	
<i>Dysdera</i> spec. 2			1																											1		RMNH.ARA.16240 (f, 1)	
<i>Dysdera</i> spec. 3													1																	1		Failed (f)	
GNAPHOSIDAE																																	
<i>Drassodes lapidosus</i> (Walckenaer, 1802)															2															2		RMNH.ARA.16207 (m, 7)	
<i>Drassodes lutescens</i> (C.L.Koch, 1839)							1																							1		RMNH.ARA.16080 (f, 4)	
<i>Drassyllus pusillus</i> (C.L. Koch, 1833)			1																											1		RMNH.ARA.16178 (f, 1)	
<i>Drassyllus villicus</i> (Thorell, 1875)		1																												1		Failed (m)	
<i>Haplodrassus dalmatensis</i> (L. Koch, 1866)																									1					1		RMNH.ARA.16223 (m, 13)	
<i>Haplodrassus signifer</i> (C.L.Koch, 1839)		1	1																											1	1	RMNH.ARA.16031 (f, 1) RMNH.ARA.16032 (m, 1)	
<i>Leptodrassus femineus</i> (Simon, 1873)													1																	1		RMNH.ARA.16020 (m, 7)	
<i>Micaria albovittata</i> (Lucas, 1846)		1																												1		RMNH.ARA.16227 (m, 1)	
<i>Micaria pulicaria</i> (Sundevall, 1831)											2	2																		2	2	RMNH.ARA.16096 (f, 6) RMNH.ARA.16097 (m, 6)	
<i>Nomisia exornata</i> (C.L. Koch, 1839)			1																												1		RMNH.ARA.16245 (f, 1)
<i>Nomisia recepta</i> (Pavesi, 1880)															6															6		RMNH.ARA.16242 (m, 6)	
<i>Scotophaeus scutulatus</i> (L. Koch, 1866)					1																	1								2		RMNH.ARA.16226 (f, 3)	
<i>Setaphis carmeli</i> (O. P.-Cambridge, 1872)																1														1		RMNH.ARA.16170 (m, 8)	
<i>Trachyzelotes barbatus</i> (L. Koch, 1866)																1														1		RMNH.ARA.16246 (m, 8)	
<i>Trachyzelotes huberti</i> Platnick & Murphy, 1984																4														4		RMNH.ARA.16244 (m, 8)	
<i>Trachyzelotes pedestris</i> (C.L.Koch, 1837)		1																												1		RMNH.ARA.16074 (m, 1)	
<i>Zelotes criniger</i> Denis, 1937													2																	2		Failed (m)	
<i>Zelotes denapes</i> Platnick, 1993			3												1		2													6		Failed (f)	
<i>Zelotes oblongus</i> (C.L.Koch, 1833)								1																						1		RMNH.ARA.16075 (f, 5)	
<i>Zelotes rinske</i> spec. nov.															1															1		RMNH.ARA.16184 (f, 7)	
LIOCRANIDAE																																	
<i>Agroeca cuprea</i> Menge, 1873												1																		1		Failed (f)	
LINYPHIIDAE																																	

Locality	1		2		3		4		5		6		7		8		9		10		11		12		13		14		total		Voucher number (sex, site)
	Sex	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f		
<i>Acartauchenius scurrilis</i> (O.P.-Cambridge, 1872)		1																										1		Failed (m)	
<i>Araeoncus altissimus</i> Simon, 1884		3	1		1																							3	2	Failed (f, f, m)	
cf. " <i>Ceratinella apollonii</i> "								1																					1	Failed (f)	
<i>Diplocephalus graecus</i> (O.P.-Cambridge, 1872)			2																										3	Failed (f)	
<i>Entelecara acuminata</i> (Wider, 1834)																												1	5	Failed (f, m)	
<i>Entelecara aestiva</i> Simon, 1918																												2		Failed (f)	
<i>Frontinellina frutetorum</i> (C.L.Koch, 1834)		2	1						3	2	1				1	1	1	5										8	9	RMNH.ARA.16041 (m, 1) RMNH.ARA.16042 (f, 1)	
<i>Gnathonarium dentatum</i> (Wider, 1834)																		3	8									3	8	Failed (f, m)	
<i>Linyphia hortensis</i> Sundevall, 1830																												2		RMNH.ARA.16082 (f, 2)	
<i>Linyphia mimonti</i> Simon, 1884			2					1	1																			1	3	RMNH.ARA.16017 (f, 1) RMNH.ARA.16175 (m, 4)	
<i>Maso gallicus</i> Simon, 1894																												1	1	Failed (f, m)	
<i>Meioneta fuscipalpa</i> (C.L.Koch, 1836)		1	1																									1	1	RMNH.ARA.16038 (m, 1) RMNH.ARA.16055 (f, 1)	
<i>Meioneta rurestris</i> (C.L. Koch, 1836)		1																										1		RMNH.ARA.16196 (m, 1)	
<i>Microlinyphia impigra</i> (O.P.-Cambridge, 1871)																		4											4	RMNH.ARA.16073 (f, 4)	
<i>Nematogmus sanguinolentus</i> (Walckenaer, 1842)		1																										1		Failed (m, 1)	
<i>Neriere peltata</i> (Wider, 1834)					2	2																						2	2	Failed (f, m)	
<i>Sintula retroversus</i> (O.P.-Cambridge, 1875)			1																										1	RMNH.ARA.16053 (f, 1)	
<i>Tenuiphantes herbicola</i> (Simon, 1884)			3							1	4																	1	8	RMNH.ARA.16033 (m, 5) Failed (f)	
<i>Tenuiphantes tenuis</i> (Blackwall, 1852)			1																									2	3	RMNH.ARA.16213 (m, 2) RMNH.ARA.16214 (f, 6)	
LYCOSIDAE																															
<i>Alopecosa accentuata</i> (Latreille, 1817)			1																										1		RMNH.ARA.16089 (f, 1)
<i>Alopecosa albofasciata</i> (Brulle, 1832)		3	1																										3	1	RMNH.ARA.16206 (f, 1) RMNH.ARA.16090 (m, 1)
<i>Pardosa hortensis</i> (Thorell, 1872)		1	10																										8		RMNH.ARA.16091 (f, 1) RMNH.ARA.16101 (f, 1) RMNH.ARA.16102 (m, 1)
<i>Pardosa prativaga</i> (Koch, 1870)																		1	2										1	2	RMNH.ARA.16107 (m,6)
<i>Pardosa proxima</i> (C.L.Koch, 1847)		1	6																									2	11	Not attempted	
<i>Pardosa saltans</i> Töpfer-Hofmann, 2000					2	4																						2	4	RMNH.ARA.16193 (f, 2) RMNH.ARA.16234 (m, 2)	
<i>Trochosa ruricola</i> (De Geer, 1778)																												2		RMNH.ARA.16248 (m, 6)	
MITURGIDAE																															
<i>Cheiracanthium mildei</i> Koch, 1864						2																							3		RMNH.ARA.16085 (m, 3)
<i>Cheiracanthium pelasgicum</i> (C.L.Koch, 1837)			1																										1		RMNH.ARA.16100 (f, 1)
OECOBIIDAE																															
<i>Oecobius maculatus</i> Simon, 1870																													1		Failed (f)
<i>Uroctea durandi</i> (Latreille, 1809)																															RMNH.ARA.16274 (j, 3)
PHILODROMIDAE																															
<i>Philodromus aureolus</i> (Clerck, 1757)																												2	2	RMNH.ARA.16192 (m, 13)	

Locality Sex	1		2		3		4		5		6		7		8		9		10		11		12		13		14		total		Voucher number (sex, site)
	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	
<i>Philodromus bistigma</i> Simon, 1870															1					1									2	RMNH.ARA.16194 (f, 8)	
<i>Thanatus arenarius</i> Koch, 1872							1																					1	RMNH.ARA.16094 (f, 4)		
<i>Tibellus macellus</i> Simon, 1875										1	1								2	3		2						3	6	RMNH.ARA.16159 (f, 10) RMNH.ARA.16164 (m, 10) RMNH.ARA.16233 (f, 11)	
PISAURIDAE																															
<i>Pisaura spec.</i>	2	2													1														3	2	RMNH.ARA.16183 (m, 1) RMNH.ARA.16218 (f, 1)
SALTICIDAE																															
<i>Aelurillus v-insignitus</i> (Clerck, 1757)													1	1														1	1	Failed (f, m)	
<i>Chalcoscirtus infimus</i> (Simon, 1868)													2	5														2	5	Failed (f, m)	
<i>Euophrys herbigrada</i> (Simon, 1871)	1										2																	3		Failed (m)	
<i>Evarcha falcata</i> (Clerck, 1757)			1																									1		Failed (m)	
<i>Evarcha jucunda</i> (Lucas, 1846)	1						1	1				1																3	1	Failed (f, m)	
<i>Heliophanus apiatus</i> Simon, 1868										1																		1		RMNH.ARA.16203 (m, 6)	
<i>Heliophanus cupreus</i> (Walckenaer, 1802)	2	1																										2	1	RMNH.ARA.16043 (f, 1) RMNH.ARA.16044 (m, 1)	
<i>Heliophanus flavipes</i> (Hahn, 1832)	2									1																		3		Failed (m, 1)	
<i>Heliophanus kochii</i> Simon, 1868	1					1																			1			2	1	RMNH.ARA.16066 (m, 1)	
<i>Heliophanus melinus</i> Koch, 1867					1															1								1	1	RMNH.ARA.16181 (m, 4) RMNH.ARA.16182 (f, 10)	
<i>Heliophanus tribulosus</i> Simon, 1868											4	2			2		1					1	1			5	3	12	6	RMNH.ARA.16051 (m, 7) RMNH.ARA.16231 (f, 12)	
<i>Macaroeis nidicolens</i> (Walckenaer, 1802)																							1			1	1	2	1	RMNH.ARA.16201 (f, 14) RMNH.ARA.16230 (m, 14)	
<i>Mendoza canestrinii</i> (Ninni, 1868)												2																2		RMNH.ARA.16105 (f, 6)	
<i>Myrmarachne formicaria</i> (De Geer, 1778)											2	1																2	1	RMNH.ARA.16103 (m, 6) RMNH.ARA.16104 (f, 6)	
<i>Neon spec.</i>														1														1		Failed (f)	
<i>Pellenes brevis</i> (Simon, 1868)					1																							1		Failed (m)	
<i>Pellenes geniculatus</i> (Simon, 1868)													1															1		RMNH.ARA.16050 (f, 7)	
<i>Phlegra bresnieri</i> (Lucas, 1846)					1	1																						1	1	RMNH.ARA.16040 (m, 4) Failed (f)	
<i>Pseudeuophrys erratica</i> (Walckenaer, 1826)	1																											1		RMNH.ARA.16064 (m, 1)	
<i>Salticus propinquus</i> Lucas 1846																				1								1		RMNH.ARA.16163 (m, 10)	
SICARIIDAE																															
<i>Loxosceles rufescens</i> (Dufour, 1820)																										1j			1j		Failed (j, 13)
SPARASSIDAE																															
<i>Micrommata ligurina</i> (C.L.Koch, 1845)	1																												1		RMNH.ARA.16076 (m, 1)
TETRAGNATHIDAE																															
<i>Metellina mengei</i> (Blackwall, 1869)			3																										3		RMNH.ARA.16235 (m, 2)
<i>Tetragnatha extensa</i> (Linnaeus, 1758)																				1									1		RMNH.ARA.16160 (m, 10)

Locality Sex	1		2		3		4		5		6		7		8		9		10		11		12		13		14		total		Voucher number (sex, site)	
	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f		
<i>Tetragnatha intermedia</i> Kulczynski, 1891											1															2	1	2	2	RMNH.ARA.16168 (f, 14) RMNH.ARA.16199 (m, 14)		
<i>Tetragnatha reimoseri</i> (Rosca, 1939)											4	4																	4	4	RMNH.ARA.16077 (m, 6) RMNH.ARA.16212 (f, 6)	
THERIDIIDAE																																
<i>Anelosimus pulchellus</i> (Walckenaer, 1802)																						1					1		3	6	Failed (f, m)	
<i>Argyrodes argyroides</i> (Walckenaer, 1841)																3j														3j	RMNH.ARA.16249 (j, 8)	
<i>Enoplognatha afrodite</i> Hippa & Oksala 1983																1														1	RMNH.ARA.16195 (f, 8)	
<i>Enoplognatha mandibularis</i> (Lucas, 1846)																									1					1	Failed (f)	
<i>Episinus truncatus</i> Latreille, 1809											1																			1	RMNH.ARA.16221 (f, 6)	
<i>Euryopsis episinoides</i> (Walckenaer, 1847)											2							1		1	2					1		5	2	RMNH.ARA.16078 (m, 6) RMNH.ARA.16208 (f, 10)		
<i>Kochiura aulica</i> (C.L. Koch, 1838)											2	2										1							3	2	RMNH.ARA.16200 (f, 6) RMNH.ARA.16219 (m, 6)	
<i>Lasaeola convexa</i> (Blackwall, 1870)								2																					2		RMNH.ARA.16243 (m, 4)	
<i>Paidiscura pallens</i> (Blackwall, 1834)				1																									1		RMNH.ARA.16083 (m, 2)	
<i>Platnickina nigropunctata</i> (Lucas, 1846)																										1				1	RMNH.ARA.16171 (m, 12)	
<i>Rubroridion musivum</i> (Simon, 1873)											1																8	5	8	6	RMNH.ARA.16056 (f, 6) Failed (f)	
<i>Simitidion simile</i> (C.L.Koch, 1836)							5						2		1	2	1								1			1	2	11	4	RMNH.ARA.16169 (m, 8) RMNH.ARA.16179 (f, 8)
<i>Theridion genistae</i> Simon, 1873																												1		1	RMNH.ARA.16158 (m, 14)	
<i>Theridion hemerobium</i> Simon, 1914	1																													1	RMNH.ARA.16229 (m, 1)	
<i>Theridion mystaceum</i> Koch, 1870				1		1	1	1								2										1			4	3	RMNH.ARA.16086 (f, 3) Failed (m)	
THOMISIDAE																																
<i>Synema globosum</i> (Fabricius, 1775)	1										1	2		3	2				1	1	1	1					2	1	9	7	RMNH.ARA.16035 (m, 6) RMNH.ARA.16036 (f, 6)	
<i>Thomisus onustus</i> Walckenaer, 1806																						2								4	RMNH.ARA.16224 (m, 10)	
<i>Xysticus kempeleni</i> Thorell, 1872											2	5																	2	7	RMNH.ARA.16048 (f, 6) RMNH.ARA.16049 (m, 6)	
<i>Xysticus kochi</i> Thorell, 1872				1							1																		1	1	RMNH.ARA.16162 (m, 6)	
ZODARIIDAE																																
<i>Zodarion elegans</i> (Simon, 1873)																6														6	RMNH.ARA.16189 (m, 8)	
<i>Zodarion italicum</i> (Canestrini, 1868)																2														2	RMNH.ARA.16052 (f, 7)	
<i>Zodarion spec.</i>	1																													1	Not attempted	
ZORIDAE																																
<i>Zora manicata</i> Simon, 1878	1	4									1																		1	6	RMNH.ARA.16037 (f, 1)	

