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## New reports and remarks on *Gnaphosidae* (Arachnida, Araneae) of Sicily

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### RIASSUNTO

Nel presente lavoro viene fornito un primo elenco degli *Gnaphosidae* (Arachnida, Araneae) finora rinvenuti in Sicilia, tra le specie trovate 7 sono risultate nuove per l' isola e *Zelotes labilis* Simon per l'Italia. In base ai tipi di distribuzione delle specie recensite è stato possibile formulare alcune ipotesi sull'origine della fauna siciliana di *Gnaphosidae*.

Parole chiave: Araneae, *Gnaphosidae*, Fauna di Sicilia.

### SUMMARY

The Author reports a list of *Gnaphosidae* (Arachnida, Aranea) living in Sicily. 7 species are new for the Island and *Zelotes labilis* Simon for Italy. Brief notes on the models of the distribution of the species recorded and hypotheses on the origin of Sicilian *Gnaphosidae* fauna are given.

Key words: Araneae, *Gnaphosidae*, Sicilian fauna.

Presently, Sicilian *Gnaphosidae* are not very well known as, they have been only sporadically studied by Arachnologists; specimens of this family have occasionally been collected in different parts of the island and only few species have been reported from Sicily (SIMON, 1878, 1914; CANESTRINI & PAVESI, 1870; DE DALMAS, 1921; CAPORIACCO, 1949; BRIGNOLI & MURPHY, pers. com.). Only recently some Authors, among which mostly GRIMM, PLATNICK and DI FRANCO have reported further species. Considering the importance of *Gnaphosidae* in bio-

geographical studies (see PLATNICK, 1976) and the particular origin and position of Sicily, in the middle of the Mediterranean Sea, since 1982 researches were started to find out which species occur in this area and in which environments. As Sicily is a large island with a great variety of environments, different both in geomorphological and in vegetational aspects, considering that a large part of it is intensively cultivated and many areas are strongly degraded, actually some important districts have already been carefully investigated while, others are presently subject to intensive studies. Up to now, the largest number of data about Sicilian Gnaphosids have been recorded in the N-E part where, in some localities, specimens have been periodically collected with pitfall traps and by direct inspection. *Gnaphosidae* of Nebrodi Mounts have been studied particularly well, as the most important woody environments (beech, turkey oak, turkey and cork oak and cork forests) and some typical grasslands of this area have been intensively investigated (DI FRANCO, 1989). Specimens belonging to *Nomisia exornata* (C.L. Koch), *Gnaphosa lonai* Caporiacco, *Gnaphosa lucifuga* (Walckenaer), *Gnaphosa tigrina* Simon, *Drassodes persimilis* Denis, *Echemus angustifrons* (Westring), *Haplodrassus dalmatensis* (L. Koch), *Zelotes apricorum* (L. Koch), *Zelotes atroceruleus* (Simon), *Zelotes calactinus* Di Franco, *Zelotes femellus* (L. Koch), *Zelotes labilis* Simon, *Zelotes petrensis* (C.L. Koch), *Drassyllus praeficus* (L. Koch), *Trachyzelotes barbatus* (L. Koch) were collected by direct inspection on Madonie Mounts (Palermo). Typical of Madonie is the enigmatic species *G. lonai*, so similar to *G. lucifuga* to be considered by many Authors the very same species. On Madonie I have also found *Z. labilis* for the first time in Italy. Gnaphosids of Etna Mount are unfortunately not very well known as, until now, not many specimens have been collected there. The species already identified are: *Gnaphosa montana* (L. Koch), *G. tigrina*, *Nomisia aussereri* (L. Koch), *N. exornata*, *Nomisia recepta* (Pavesi), *Drassodes lapidosus* (Walckenaer), *Haplodrassus severus* (C.L. Koch), *Haplodrassus signifer* (C.L. Koch), *Z. apricorum*, *Z. calactinus*, *Zelotes carmeli* (O.P. Cambridge), *Zelotes electus* (C.L. Koch), *Zelotes fuscotestaceus* (Simon), *Z. petrensis*. Periodical researches, with pitfall traps, have recently been carried on, even in the southern part of Sicily: at Cava Grande of Avola, (riparian environment, Iblei Mounts -SR) and at Vendicari (sandy shore area - SR) and a few species seem to be very interesting (in preparation). Furthermore, specimens have occasionally been collected in other districts of Sicily. Gnaphosids of circumsicilian

Islands are also little known, except for Salina (Aeolian Island) (DI FRANCO, 1986). Other Authors in the past have reported *Scotophaeus blackwalli* (Thorell) from Stromboli, Eolian Islands (GRIMM, 1985); *Zelotes civicus* (Simon) from Lampedusa (ROEWER, 1960) and *Trachyzelotes mutabilis* (Simon) in Linosa (Pelagie Islands) and *Trachyzelotes barbatus* (L. Koch) in Favignana (Egadi Islands) (PLATNICK & MURPHY, 1984).

Until now the species of *Gnaphosidae* recorded in Sicily are at least 54 (see later in Species distribution). 7 of them are here reported for the first time from Sicily: *G. montana* (L. Koch), *Aphantaulax cincta* (L. Koch), *A. seminigra* (Simon), *D. persimilis* (Simon), *Zelotes nilicola* (O.P. Cambridge), *Trachyzelotes costatus* (Denis) and *Trachyzelotes lyonneti* (Audouin). A new species of *Synaphosus* has recently been found by PLATNICK (in preparation). Among them, the most interesting are: *D. persimilis* Denis never found out of N. Africa, *Z. calactinus* Di Franco, a new species, endemic of Sicily, and *Drassyllus* cfr. *villicus* (Thorell), whose specimens are morphologically rather different from the continental type so much so that, probably, it is to be considered a new endemic species. Specimens morphologically related to *D. villicus* have not been found in Sicily. Nevertheless, the presence of some species on the Island need to be verified. *D. lutescens*, mentioned only by SIMON (1878) and never found in Sicily again, is so similar to *D. persimilis* that the two species could have been confused. Moreover, I could not observe specimens of *Zelotes siculus* (Simon), which, according to SIMON (1878), is very much alike *Prosthesima vernalis* L. Koch, syn. of *Zelotes pumilus* (C.L. Koch), and other species of the same group. As *Z. siculus* could be confused with other related species it is important to clarify its taxonomic position. The genus *Micaria* has not been taken in consideration as only recently it has definitively been included among *Gnaphosidae* (PLATNICK & SHADAB, 1988).

Although the informations about the distributions of *Gnaphosidae* in the Mediterranean basin are so far rather poor, some hypotheses on the origin of Sicilian *Gnaphosidae* fauna could be put forward on the basis of the data already known. Such hypotheses are exclusively based on the species that have an European or Mediterranean distribution, since species with a wider range (11.1 %) (fig. 1 a) are not significant for this purpose, as their actual distribution could be determined by passiv transport or by a rapid colonization of all the Boreal Continents during the Plio-pleistocene. The Sicilian population is mainly invading, especially

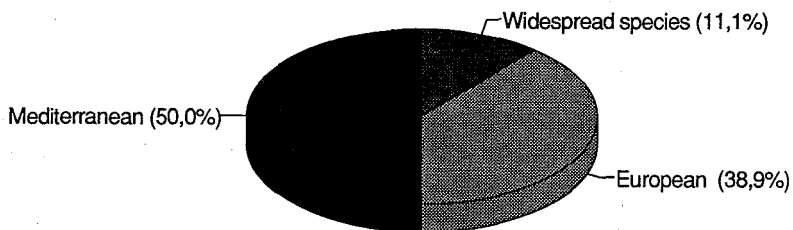
as regards species which have an European gravitation (38.9 %) (Fig. 1 b): infact, probably, they were able to colonize Sicily during the penultimate glaciation of the Pleistocene (Rissian), when Calabria and Sicily were joined and the Apenninic peninsula was already formed. Before that time, during Pliocene, they could not have reached Sicily as S-Italy was an archipelago. Even the species with an euro-maghrebian (14.3 %) and S-euromaghrebian range (14.3 %) could be considered species with an European gravitation; since their presence in N-Africa is restricted to Maghreb where they could have arrived during the salinity crisis of the Messinian when, the Iberian Peninsula and Maghreb were linked. A remarkable part of the Sicilian Gnaphosids population (50 %) (fig. 1 c) shows distribution patterns localized in the Mediterranean region; the differences among these patterns have certainly been produced by various biogeographical causes. The species with holomediterranean (29.63 %) and S-euromediterranean (3.70 %) distributions might be old paleomediterranean elements that extended their range during the interglacials. The species with a N-mediterranean (7.41 %) distribution probably derive from S-european taxa. Remarkable enough is the absence of species with a paleotyrrenic distribution, sensu La Greca (1990), that we usually have in other groups, i.g. *Cybaeodes*. The species with a Siculo-maghrebian range and *Z. siculus* might really have a paleotyrrenic distribution. The origin of the W-mediterranean species, a considerable percentage (22.22 %) is more difficult to explain: they might be paleotyrrenic species, of the middle Miocene, clearly linked to vicariance events, that extended their range in all the W-Mediterranean territories during the salinity crisis of the Messinian. The three neoen-demic species *Gnaphosa lonai*, *Z. calactinus* and *D. cfr. villicus* are so clearly related to European species that they must have arised from European populations, and differentiated in Sicily during the Pleistocene.

Researches on Sicilian *Gnaphosidae* are still in progress as a large part of the Island is still to be investigated.

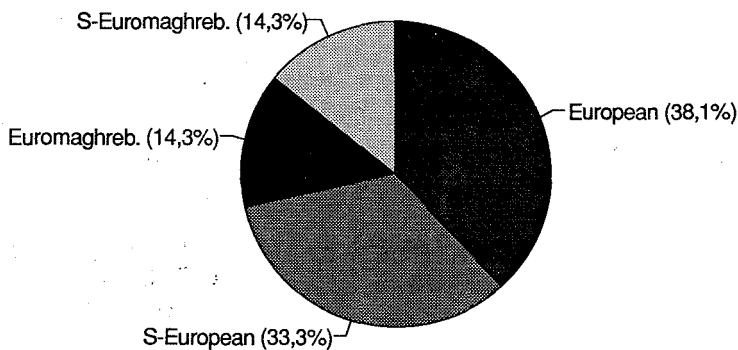
### *Species distribution*

**Widespreaad species:** *Urozelotes rusticus* (L. Koch, 1872), *Callilepis nocturna* (Linneus, 1758), *Haplodrassus signifer* (C.L. Koch, 1839), *Drassodes lapidosus* (Walckenaer, 1802), *Drassodes pubescens* (Thorell, 1866), *Haplodrassus dalmatensis* (L. Koch, 1866).

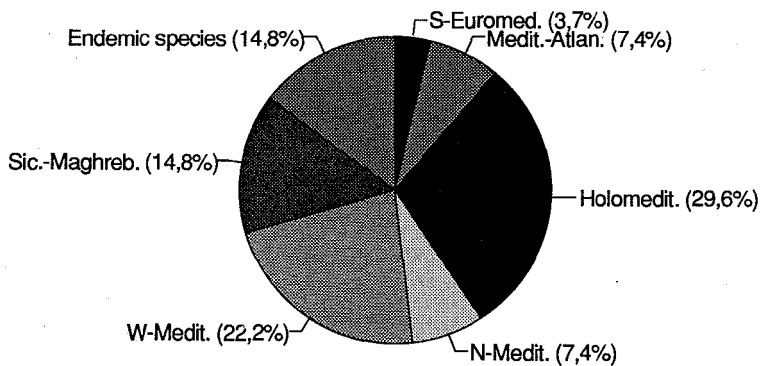
Figs. 1 a-c. Percentage of species distribution: (a) Widespread, European and Mediterranean species. (b) species with a prevailing european distribution. (c) species with a prevailing mediterranean distribution.



**A**



**B**



**C**

*Species with a prevailing european distribution*

**European:** *Gnaphosa lucifuga* (Walckenaer, 1802), *Gnaphosa montana* (L. Koch, 1866), *Echemus angustifrons* (Westring, 1862), *Drassyllus praeficus* (L. Koch, 1866), *Zelotes electus* (C.L. Koch, 1839), *Zelotes atroceruleus* (Simon, 1878), *Zelotes petrensis* (C.L. Koch, 1839), *Trachyzelotes pedestris* (C.L. Koch, 1839).

**S - european:** *Gnaphosa alacris* Simon, 1878, *Aphantaulax seminigra* Simon, 1878, *Leptodrassus femineus* (Simon, 1873), *Poecilochroa variana* (C.L. Koch, 1839), *Synaphosus* n. sp., *Zelotes civicus* (Simon, 1878), *Zelotes femellus* (L. Koch, 1866).

**Euromaghrebian:** *Phaeoedus braccatus* (L. Koch, 1866), *Scotophaeus blackwalli* (Thorell, 1871), *Scotophaeus validus* (Lucas, 1846).

**S - euromaghrebian:** *Haplodrassus severus* (C.L. Koch, 1839), *Zelotes apricorum* (L. Koch, 1876), *Zelotes tenuis* (L. Koch, 1866).

*Species with a prevailing mediterranean distribution*

**Holomediterranean:** *Gnaphosa tigrina* Simon, 1878, *Drassodes lutescens* (C.L. Koch, 1839), *Zelotes carmeli* (O.P. Cambridge, 1872), *Zelotes nilicola* (O.P. Cambridge, 1874), *Trachyzelotes barbatus* (L. Koch, 1866), *Trachyzelotes fuscipes* (L. Koch, 1866), *Trachyzelotes lyonneti* (Audouin, 1827), *Trachyzelotes mutabilis* (Simon, 1878).

**S - euromediterranean:** *Aphantaulax cincta* (L. Koch, 1866).

**Mediterranean - atlantic:** *Nomisia aussereri* (L. Koch, 1876), *Nomisia exornata* (C.L. Koch, 1839).

**N - mediterranean:** *Haplodrassus invalidus* (O.P. Cambridge, 1872), *Zelotes callidus* (Simon, 1878).

**W - mediterranean:** *Nomisia recepta* (Pavesi, 1880), *Poecilochroa albomaculata* (Lucas, 1866), *Zelotes fuscorufus*, (Simon, 1878), *Zelo-*

*tes fuscotestaceus* (Simon, 1878), *Zelotes labilis* Simon, 1914, *Trachyzelotes costatus* (Denis, 1952).

**Siculo-maghrebian:** *Drassodes persimilis* Denis, 1937, *Zelotes criniger* Denis, 1937, *Zelotes denisi* Marinaro, 1967, *Zelotes pluridentatus* Marinaro, 1967.

**Endemic species:** *Gnaphosa lonai* Caporiacco, 1949, *Zelotes calactinus* Di Franco, 1988, *Zelotes siculus* (Simon, 1878), *Drassyllus* cfr. *villicus* (Thorell, 1875).

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