



A revision of the genus *Nomisia* in Greece and neighboring regions with the description of two new species

M. CHATZAKI

¹Department of Molecular Biology and Genetics Democritus University of Thrace, Dragana, 68100 Alexandroupolis, Greece.
E-mail address: maria.chatzaki@gmail.com, mchatzak@mbg.duth.gr

Abstract

In this revision ten species of the genus *Nomisia* are diagnosed and taxonomically commented. Of them, five are well established in the previous literature, namely, *N. aussereri* (L. Koch, 1872), *N. exornata* (C. L. Koch, 1839), *N. ripariensis* (O. P.- Cambridge, 1872), *N. orientalis* Dalmas, 1921 and *N. palaestina* (O. P.- Cambridge, 1872). *N. recepta* (Pavesi, 1880) and *N. excerpta* (O. P.- Cambridge, 1872) are critically compared and re-established. *N. excerpta* shows wide intra-specific variation, possibly leading to new species. *N. conigera* (Spassky, 1941) is here synonymized with the recently described *N. anatolica* Seyyar, Ayyildiz & Topçu, 2009. Finally two new species are described, namely, *N. levyi* **n. sp.** and *N. peloponnesiaca* **n. sp.** From the above list, only seven species are recorded in Greece, leaving out *N. orientalis*, *N. recepta* and *N. conigera*.

Key words: ground spiders, Mediterranean, taxonomy, *Nomisia*

Introduction

The genus *Nomisia* is a small genus of the family Gnaphosidae comprising 37 species in total. Their distribution is restricted mainly to temperate and subtropical regions of the Palearctic, with only two species (*N. aussereri* (L. Koch, 1872) and *N. exornata* (C. L. Koch, 1839)) presenting wide distribution over this area (Platnick, 2009). All other species have more local character being recorded only from one or a few countries of the same geographical zone (e.g. Mediterranean). In Greece six species were recorded until now and this is the highest number of *Nomisia* species recorded in a European country. This shows that the origin of the genus may be related to warm places of either Africa or East Mediterranean where the highest diversity is recorded.

In the present study, the genus *Nomisia* is revised in Greece and neighboring regions with the contribution of diagnostic characters and further records, some taxonomic clarifications and the description of two new species. Furthermore *N. anatolica* Seyyar, Ayyildiz & Topçu, 2009 is synonymized to *N. conigera* Spassky, 1941. The final number of species included in this genus and occurring in Greece results in seven.

Material and methods

Material from Aegean islands derives from field expeditions realized by members (including the author) of the Natural History Museum of Crete (NHMC) and is deposited there. Material from Thrace and Samothrace island derives from more recent field work of the author. Material from Peloponnisos derives from the Ph.D thesis of Ioannis Anastasiou and is deposited at the Zoological Museum of the University of Athens (ZMUA). The ZMUA also provided part of the collection of Haralambos Hadjissarantos. Comparative material from Turkey identified as *Nomisia anatolica* Seyyar, Ayyildiz & Topçu, 2009 was kindly loaned by Dr. Seyyar (NUAM). Further comparative material was also examined from the Senckenberg Museum of Natural History (SMF), the Museo Civico di Storia Naturale "Giacomo Doria" (MSNG), the National Museum of Natural

History of Paris (MNHN), the Zoological Museum of the Hebrew University of Jerusalem (ZMHUJ) and the personal collections of Dr. C. Deltsev (ChD) and of Dr. R. Bosmans (RoB).

Identifications took place partly at the Zoological Museum of Berlin during a scientific visit and then at the Democritus University of Thrace. Scale lines of the drawings indicate 0.1 mm. Drawings were prepared by a Leica DM2500 microscope connected to a camera lucida and adjusted with a Leica MZ7.5 stereomicroscope. Drawings of species earlier recorded are taken from Chatzaki *et al.* (2002a).

The following abbreviations are used in the text: ptf: pitfalls, PL: prosoma length, PW: prosoma width, OL: opisthosoma length, Ta: tarsus, Me: metatarsus, Ti: tibia, Pa: patella, Fe: femur, d: dorsal, v: ventral, AME: anterior median eyes, ALE: anterior lateral eyes, PME: posterior median eyes, PLE: posterior lateral eyes. All measurements are given in mm. The min/max measurements are given in somatic characters where more than one specimen was available.

Detailed distributions of species in Greece follow Bosmans & Chatzaki (2005) and most recent literature (e.g. Buchholz 2007). Only relevant primary and secondary citations were considered in the lists of synonymies for each species. For a complete list, compare Platnick (2009).

Results

Nomisia Dalmás, 1921

Yellow to dark brown spiders usually of medium size with few exceptions (e.g. *N. aussereri*, *N. palaestina* which are larger). Carapace with radiating rows of black markings. Black round eyes contoured by blackish circles, except for PME, which are oval and white. Size of eyes almost equal and arranged in two straight lines (posterior row slightly recurved). Opisthosoma dorsally with characteristic blackish bands starting at longitudinal frontline and expanding outwards. Anterior spinnerets well developed, not touching each other. 1st and 4th pairs of legs almost equal in size except for *N. palaestina* and *N. peloponnesiaca* **n. sp.** in which the 4th pair of legs is longer than the 1st. Epigynes usually form a central continuous depression formed by lateral sclerotized margins (e.g. *N. conigera*, *N. excerpta*, *N. exornata*, *N. palaestina*, *N. peloponnesiaca* **n. sp.**, *N. recepta*, *N. ripariensis*, *N. castanea*, *N. negebensis*) and less often also divided by a central septum (e.g. *N. aussereri*). Apart from few exceptions in which spermathecal configuration is more complex (e.g. *N. aussereri* and *N. palaestina*), the vulva is composed by globular or oval spermathecae connected through simple and short introductory ducts. Male palps always bear a distinct and mostly bulging retrolateral tibial apophysis, and a soft ventral tibial apophysis (except for *N. peloponnesiaca* **n. sp.** and *N. ripariensis* in which this apophysis is hardly detected). With the exception of only *N. palaestina* and *N. excerpta*, the embolus is usually connected to a granulated apophysis of various shapes located behind it.

Nomisia aussereri (L. Koch, 1872)

Figs 1–5, 51

Gnaphosa aussereri L. Koch, 1872: p. 298 (♂ ♀ syntypes from Austria, Tirol – not examined)

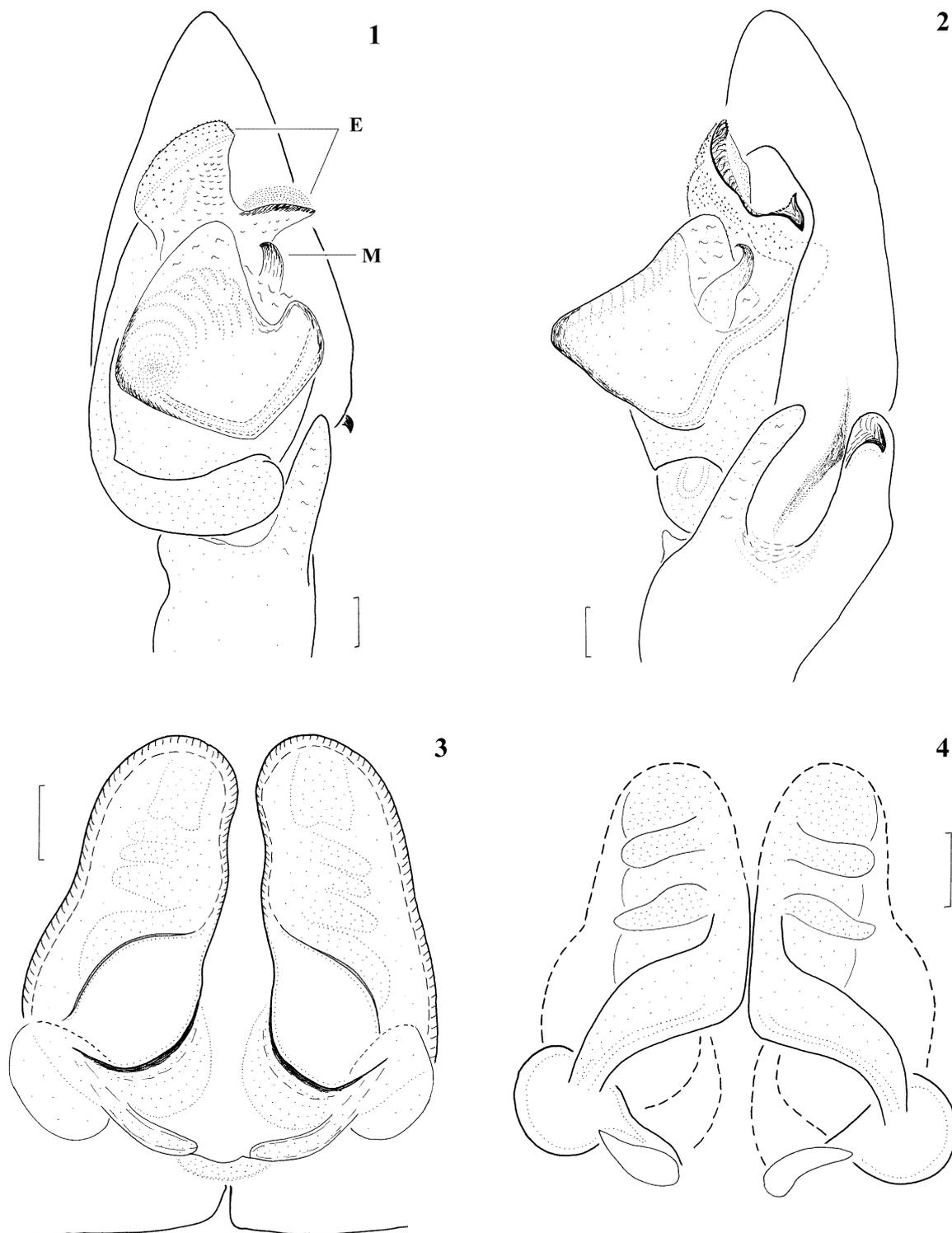
Nomisia aussereri: Dalmás, 1921, p. 297, Figs 81, 99.

Nomisia mauretanicus Dalmás, 1921 (p. 299, Figs 82, 98) from Morocco: syn. by Levy, 1985, p. 929

Gnaphosa marginata O.P. Cambridge, 1874: Dalmás, 1921 (p. 296, Figs 79, 98): syn. by Levy, 1985, p. 929

Diagnosis: *N. aussereri* is easily distinguished from all other *Nomisia* species by the relatively large body size as well as details of their genital organs, such as: broad and densely granulated embolus (E), its corrugations covering the whole apical part of the palp, bulging cone-like prolateral extension of tegulum (Figs 1–2), bifid tibial apophysis with two parts equally sized (Fig. 5), large introductory orifices of epigyne (Fig. 3), leading to coiled spermathecae of distinct shape (Fig. 4).

Citations in Greece: THRACE: Rodopi, Nestos Delta; IPEIROS: Arta; THESSALIA: Magnisia, Volos; STEREA ELLADA: Attiki; AEGEAN ISLANDS: Amorgos; Ikaria; Lipsoi; Rodos; Samos; Tilos.

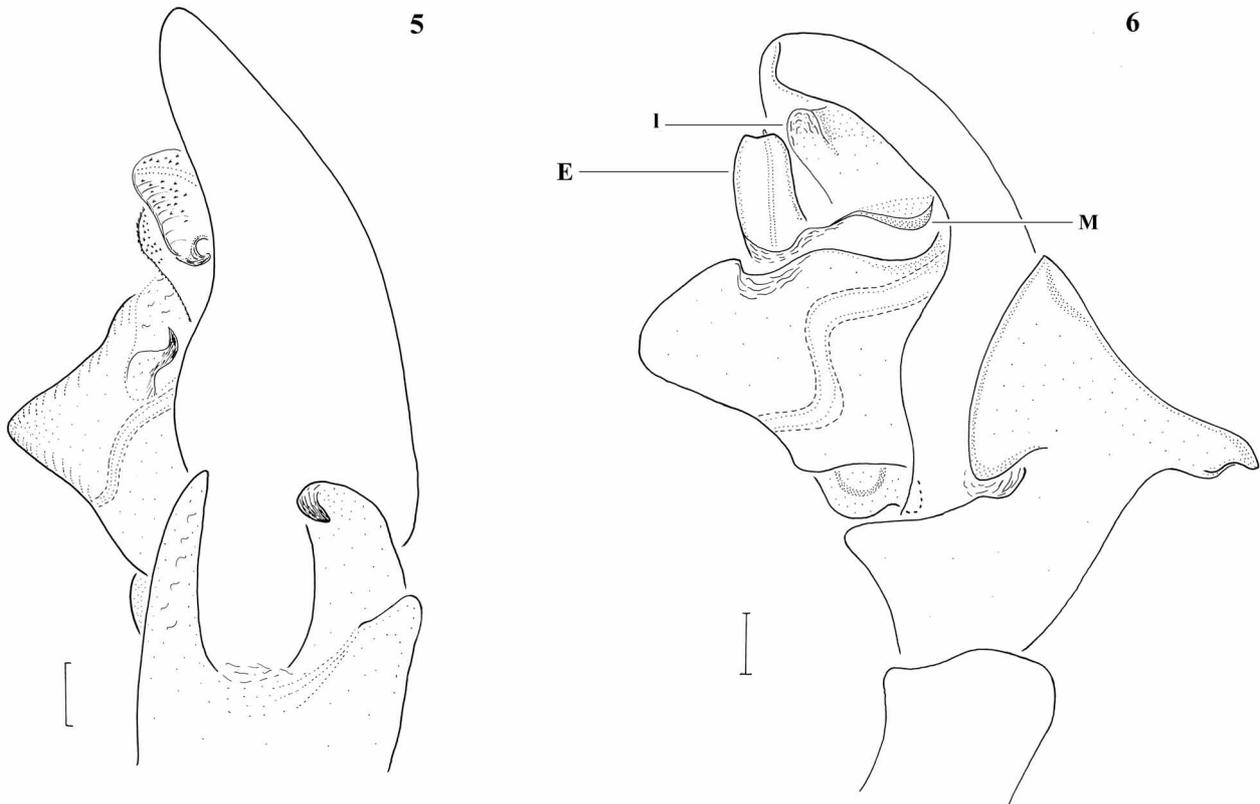


FIGURES 1–4. *N. aussereri* from Peloponnisos, Taygetos Mt. – ZMUA G565.7(1). Male palp, ventral view (1), ventral to retrolateral view (2), epigyne (3), vulva (4). E: embolus. M: median apophysis.

New records: GREECE: Aegean Islands: Nisyros, Yali islet: 1 ♀ (ptf, 30.IV.05 to 05.VI.05, leg. M. Chatzaki, NHMC); Peloponnisos: Taygetos Mt, phrygana, 600 m alt: 1 ♂ (ptf, 21.IX.97 to 29.XI.97, leg. I. Anastasiou, ZMUAG565.7(1); Thrace: Rodopi, Maroneia, phrygano near the village (succession after fire in maqui): 1 ♀ (ptf, 22.V.09 to 24.X.09, leg. M. Chatzaki, NHMC); BULGARIA: South Pirin Mt, Kalimantsi village: 1 ♂ 1 ♀ (11.IX.03, leg. S. Lazarov, ChD); FRANCE: South East part (no further details): 5 ♀♀ (AR3150, MNHN).

Comments: Levy (1985) in his redescription of the species commented upon a possible intraspecific variation concerning the continuity of the median septum of the epigyne. In all specimens examined here the septum clearly separates the epigyne in two parts, continuing laterally to form the introductory orifices at each side. Possibly some specimens examined by Levy were covered by a copulatory plug which hindered the details of the epiginal plate.

Distribution: Morocco, Algeria, Austria, France, Bulgaria, Egypt, Greece, Crimea, Russian plain (steppe zone), Caucasus, Turkey to the steppe zone of Mongolia, Lebanon, Israel.



FIGURES 5–6. *N. aussereri* from Yali islet, Nisyros island complex – NHMC8401. Male palp, retrolateral view (5). *N. conigera* from Turkey. Male palp, ventral to retrolateral view (6). E: embolus, M: median apophysis, I: sclerotized membrane.

Nomisia conigera (Spassky, 1941)

Figs 6–8

Pterotricha conigera Spassky, 1941, p. 22, Fig. 12 (Dm) (holotype from Tadzhikistan - not examined).

Nomisia conigera Ovtsharenko & Fet, 1980, p. 446.

N. anatolica Seyyar, Ayyildiz & Topçu, 2009 (p.63, figs 3–12) (holotype from Turkey, Kayseri Province - not examined).

Nov. Syn.

Diagnosis: *N. conigera* is distinguished from all other congeners by the large triangular tibial apophysis of the palp and the large prolateral extension of the tegulum, as well as the laterally elongated margins of the epigyne, largely disconnected from the central cavity.

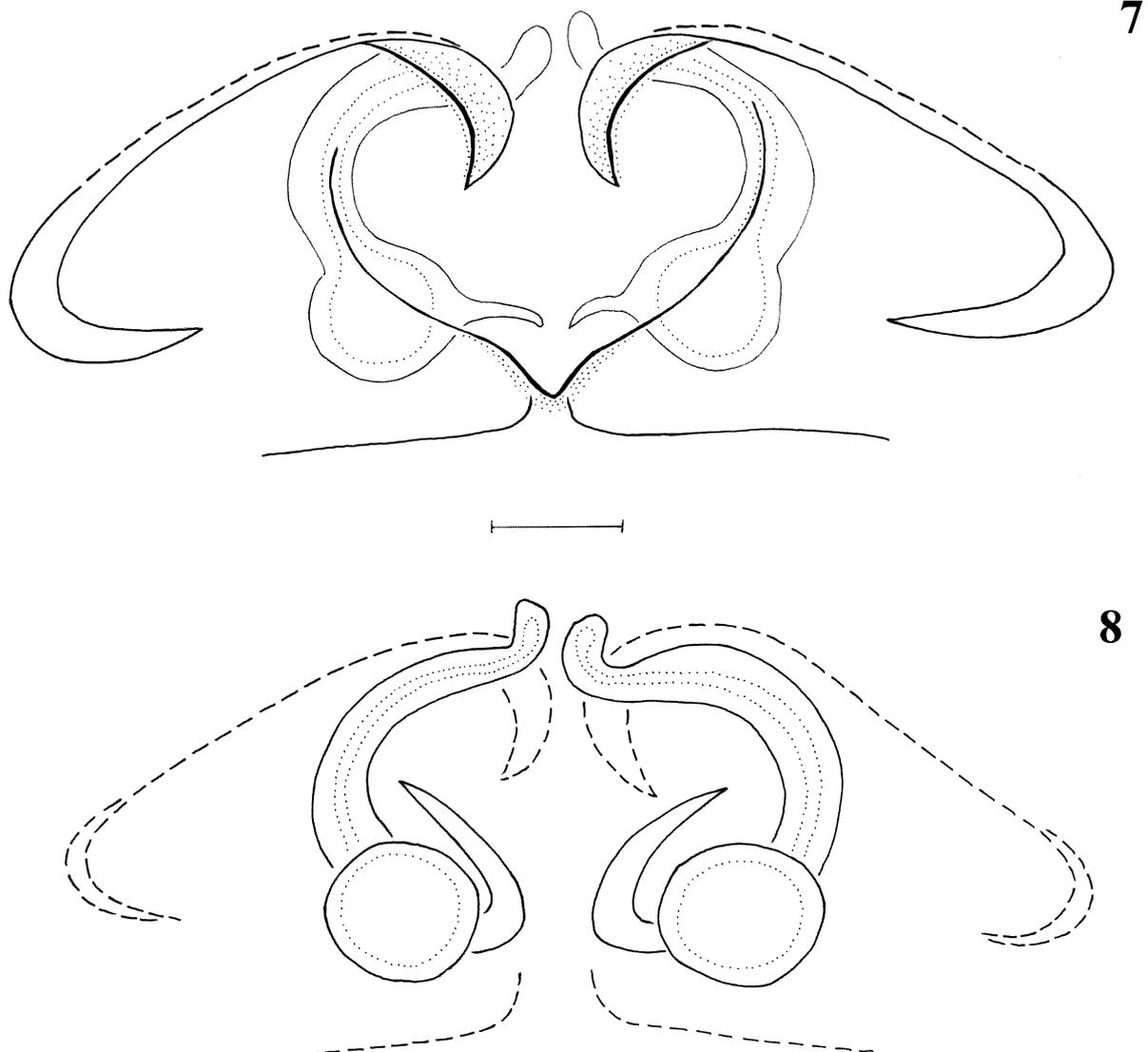
Material examined: TURKEY: Kilis province, Musabeyli district, Karbeyaz village (36°50.372' N, 036°58.021'E), 500 m alt: 1 ♂ 1 ♀ (03.V.2008, leg. O. Seyyar, NUAM).

Comments. *N. conigera* is a relatively poorly recorded species. It was only known by the description of the male from Gissar Valley, Tadzhikistan (Spassky 1941; Spassky & Luppova, 1945 - redescrbed) and other areas of Central Asia republics and Azerbaijan (Mikhailov 1997). Ovtsharenko & Fet (1980) and Chatzaki *et*

al. 2002 had already noted the resemblance of this species to *N. ripariensis* (O. P.-Cambridge, 1872). In absence of comparative material at the time and because the characters seen in the drawing of Spassky (1941, Fig. 12) did not fully conform those of *N. ripariensis*, Chatzaki *et al.* 2002 postponed a possible synonymization.

A newly described species from south central Turkey, *N. anatolica* Seyyar, Ayyildiz & Topçu, 2009 (p. 63, Figs 3–12) gave the solution to this conflict, as it resembles *N. ripariensis* but it still has some clear differences, as commented by the authors in detail. The two species were also compared by the author and were found different in details of the embolic part of the palp, the relative size of the tibial apophysis and in the shape of epigynal margins and spermathecae. However the special features of the male genital organ of *N. anatolica* strongly coincide with the palp of *N. conigera*, as illustrated by Spassky (1941, Fig. 12). The similarity of the two nominal species –*N. conigera* and *N. anatolica*– mostly lies in the peculiar and very characteristic triangular tibial apophysis of the palpal organ, the frontally bulging tegulum, and the wide and strong embolus (E) of equal size at all its length. Hence here the synonymization of *N. anatolica* to *N. conigera* is proposed. Further characters distinct of this species are: in males, reduced median apophysis (M), partly transparent apophysis situated behind embolus with sclerotized lamella (l), slightly protruding in front (Fig. 6) and in females, largely separated lateral margins of the epigyne, not converging posteriorly (Fig. 7).

Distribution: Turkey (for detailed records see Seyyar *et al.* 2009); Azerbaijan, Central Asian republics.



FIGURES 7–8. *N. conigera* from Turkey. Epigyne (7), vulva (8).

Nomisia excerpta (O. P.- Cambridge, 1872)

Figs 9–23, 51

Gnaphosa excerpta O. P.-Cambridge, 1872: p. 266, pl. 15, Fig. 4 (holotype from Israel - not examined).*Nomisia excerpta*: Levy, 1995: p. 933, Figs 31–35; Chatzaki, Thaler & Mylonas, 2002a: p. 583, Figs 49–50, 53–54.

Diagnosis: Notwithstanding the intraspecific variation of the species, *N. excerpta* can still be distinguished by the upright cylindrical embolus and the shape of the tibial apophysis, and the more or less heart-shaped epigynal margins closing at posterior end in combination to the globular spermathecae.

Citations in Greece: CRETE and satellite islands (for detailed records see Chatzaki *et al.* 2002).

New records: GREECE: Ipeiros: Preveza: 1 ♀ (15.VI.38, leg. H. Hadjissarantos, ZMUA6614.22); Stereia Ellada: Aitolokarnania, Amfilochia: 1 ♂ 12 ♀♀ (04.VI.38, leg. H. Hadjissarantos, ZMUA6614.23); Peloponnisos: Taygetos Mt, *Abies* wood, 1600 m alt: 1 ♂ (ptf, 15.III.97 to 06.VII.97, leg. I. Anastasiou, ZMUAG580.2(1)); 1 ♀ (ptf, 15.III.97 to 06.VII.97, leg. I. Anastasiou, ZMUAG580.15(1)); 2 ♀♀ (ptf, 09.V.97 to 05.VII.97, leg. I. Anastasiou, ZMUAG584.5(1)); CYPRUS (no further details): 1 ♂ (SMF38619, sub *N. recepta*, det. Grimm).

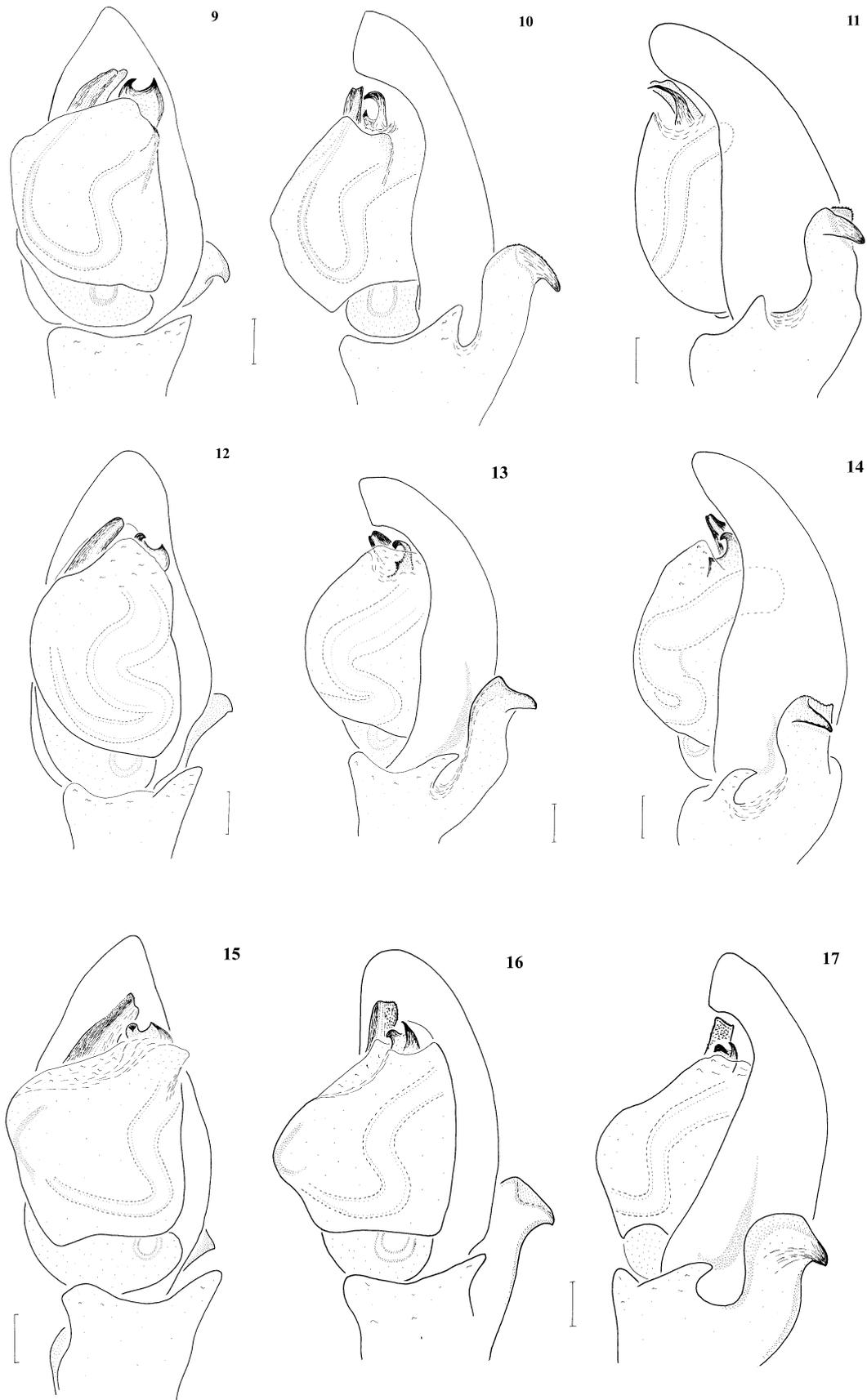
Comparative material examined: ISRAEL: Mt Meron: 1 ♀ (29.IV.75, leg. M. Warburg, ZMHUJ); Poriyya, east slope: 1 ♂ (01.IV.68, leg. Amitai, MNHUI-14881).

Comments. *N. excerpta* and *N. recepta* (Pavesi, 1880) have been the subject of taxonomic puzzle several times (Levy 1995, p. 933, Figs 31–35; Chatzaki *et al.* 2002, p. 583, Figs 49–50, 53–54). Levy (1995) and Chatzaki *et al.* (2002) reported on the resemblance of the two species, which, according to the former is superficial among males and not existent among females. The close examination of the type of *N. recepta* and a couple of topotypic specimens of *N. excerpta* (the type of *N. excerpta* was unavailable to the author and is probably lost) leaves no doubt about the clear separation of the two species, mainly based on the shape of the embolus and tibial apophysis of the male pedipalp, and the shape of both the lateral margins of the epigyne and the spermathecae (see also detailed comments in *N. recepta* section). However, the examination of specimens from several localities from Greece (Peloponnisos, Ipeiros, Sterea Ellada and Crete) and Cyprus leads to a clear intraspecific variation. Differences among the four morphogroups may be observed on the following elements:

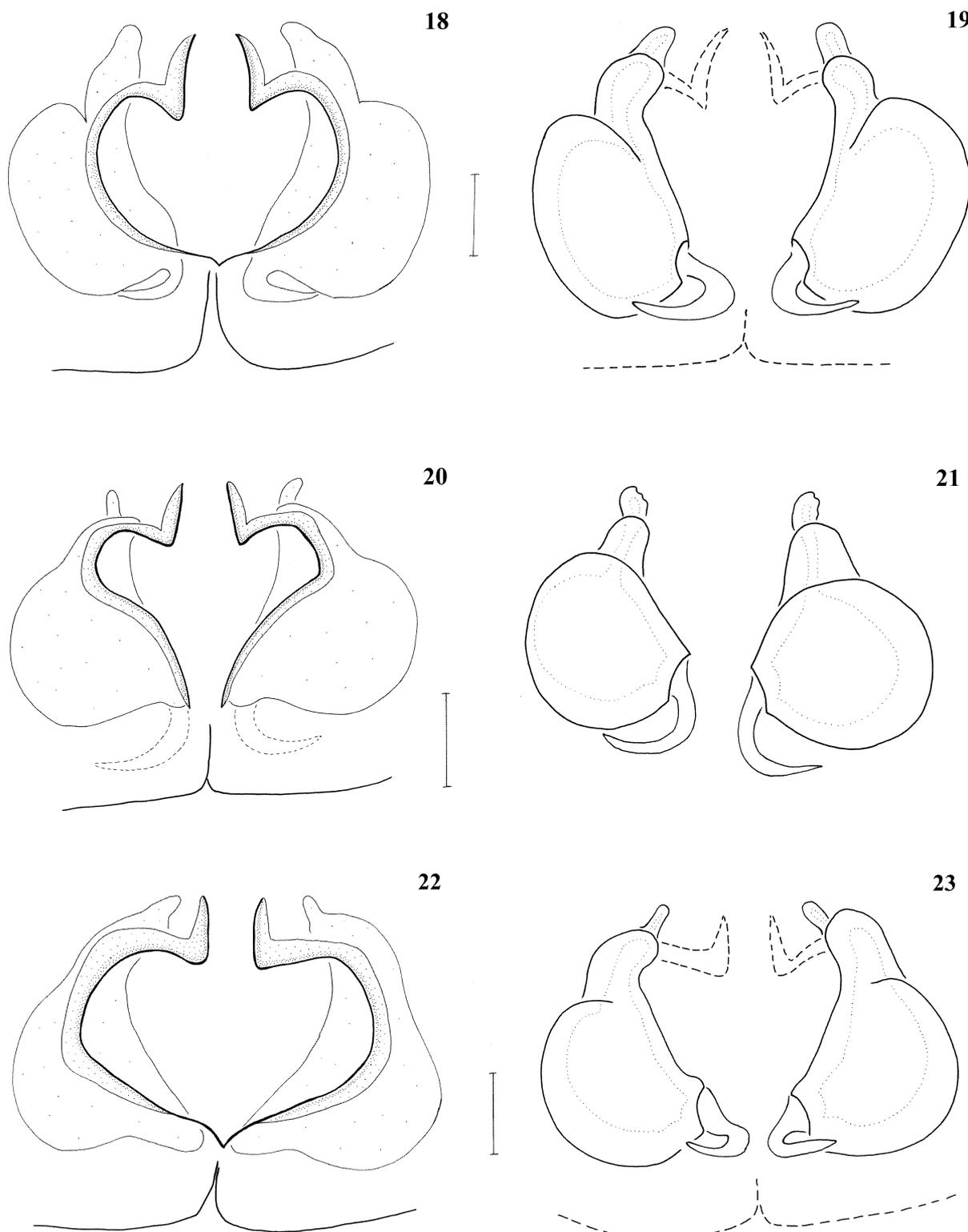
♂: the embolus of specimens from Peloponnisos (Fig. 12), Sterea Ellada and Cyprus (Fig. 9) are smoother at the surface and more slender compared to that from Crete (Fig. 15); the spermophore of specimens from Peloponnisos (Figs 13–14) is wider and the tegulum more slender (Fig. 12) compared with the other two, which are more similar in the general shape of the tegulum, creating angles at prolateral sides (Figs 9 and 15); membranous endings at the apical part of tegulum form different shapes at all three specimens; the tibial apophysis of the specimens from both Peloponnisos and Crete are more bulging when viewed retrolaterally and dorsally than that from Cyprus, notwithstanding their similarity in shape; finally the whole bulb of the specimen from Cyprus is smaller compared to the specimens from Peloponnisos and Crete, and is more similar to that of the male from Sterea Ellada.

♀: the shape of the lateral margins of the epigyne is clearly different in all three morphogroups (Figs 18, 20, 22), although the interior genital organs (spermathecae, introductory ducts) seem almost inseparable (Figs 19, 21, 23). The specimen from Ipeiros was identical to that found from Sterea Ellada. In the female specimen from Israel the lateral margins are fully heart-shaped giving an intermediate impression of the specimen from Peloponnisos (Fig. 18) and from Sterea Ellada (20). The introductory ducts are longer and the spermathecae more globular than all Greek specimens.

The afore-mentioned differences among Greek populations could also be considered as sufficient for species separation. In this case, only the specimen from Cyprus would correspond to the “true” *N. excerpta*, as it is the only one which is identical to the topotypic specimens examined. The specimens from Crete, Peloponnisos and mainland Greece would correspond to three new species respectively. However, until more material is collected throughout the country and the range of the species is fully understood (as well as the degree of morphological distinction among geographical units), the author remains reluctant to the creation of new species.



FIGURES 9–17. *N. excerpta* from Cyprus - SMF38619 (9–11), from Peloponnisos, Taygetos Mt. – ZMUA G580.2(1) (12–14) and from Gavdopoula islet (Crete) –NHMC554 (15–17). Male palp, ventral view (9, 12, 15), ventral to retrolateral view (10, 13, 16), retrolateral view (11, 14, 17).



FIGURES 18–23. *N. excerpta* from Peloponnisos, Taygetos Mt. – ZMUA G584.5 (18–19), from mainland Greece, Amfilochia – ZMUA6614.23 (20–21) and from Gavdopoula islet (Crete) – NHMC554. Epigyne (18, 20, 22), vulva (19, 21, 23).

It is noteworthy that the only recording of *N. excerpta* by Levy (1995) from Tunisia is here considered as a misidentification, thus returning the species to its original identification, i.e. *N. recepta*. This is based on the direct comparison of the voucher that Levy examined (1 ♂ from Tunisia det. as *N. recepta* by Dalmas, MNHN

Ar. 3183) and the type of *N. recepta*. Taking into consideration the difficulty in separating the two species, and the distribution range of *N. recepta* at the central part of the Mediterranean (Algeria, Tunisia, Sicily, Malta), it could be argued that the record of the species from the Canary Islands, based on the synonymization of *N. verneau* (Simon, 1889) to *N. excerpta* by Levy (1995) is also doubtful. Although specimens of *N. verneau* were unavailable to the author, Dalmas' illustration (1921, p. 282, Fig. 64) would better match *N. recepta* epigyne than *N. excerpta*. *N. excerpta*'s distribution seems to be more safely restricted to the East Mediterranean area.

Distribution: Canary Islands (?), Greece, Cyprus, Israel, Syria, Lebanon.

Nomisia exornata (C. L. Koch, 1839)

Figs 24–27, 52

Pythonissa exornata C. L. Koch, 1839: p. 63, Figs 476–477 (holotype from Greece, Nafplio – not examined)

Nomisia exornata: Dalmas, 1921, p. 278, Figs 61, 83; Seyyar et al. 2009, p. 64, Fig.1.

Diagnosis: *N. exornata* is distinguished from its male congeners by the large embolus (relative to the rest of tegulum), the characteristic membrane behind it and the remarkably curved and pointed tip (like a claw) of the tibial apophysis which is turned downwards. Females are similar to *N. excerpta*, *N. recepta*, *N. peloponnesiaca* n. sp. and *N. ripariensis* but are distinguished from them by the longer and more coiled introductory ducts of spermathecae as well as the lateral margins of the epigyne not reaching one another and leaving the lobes of the spermathecae outside their frame.

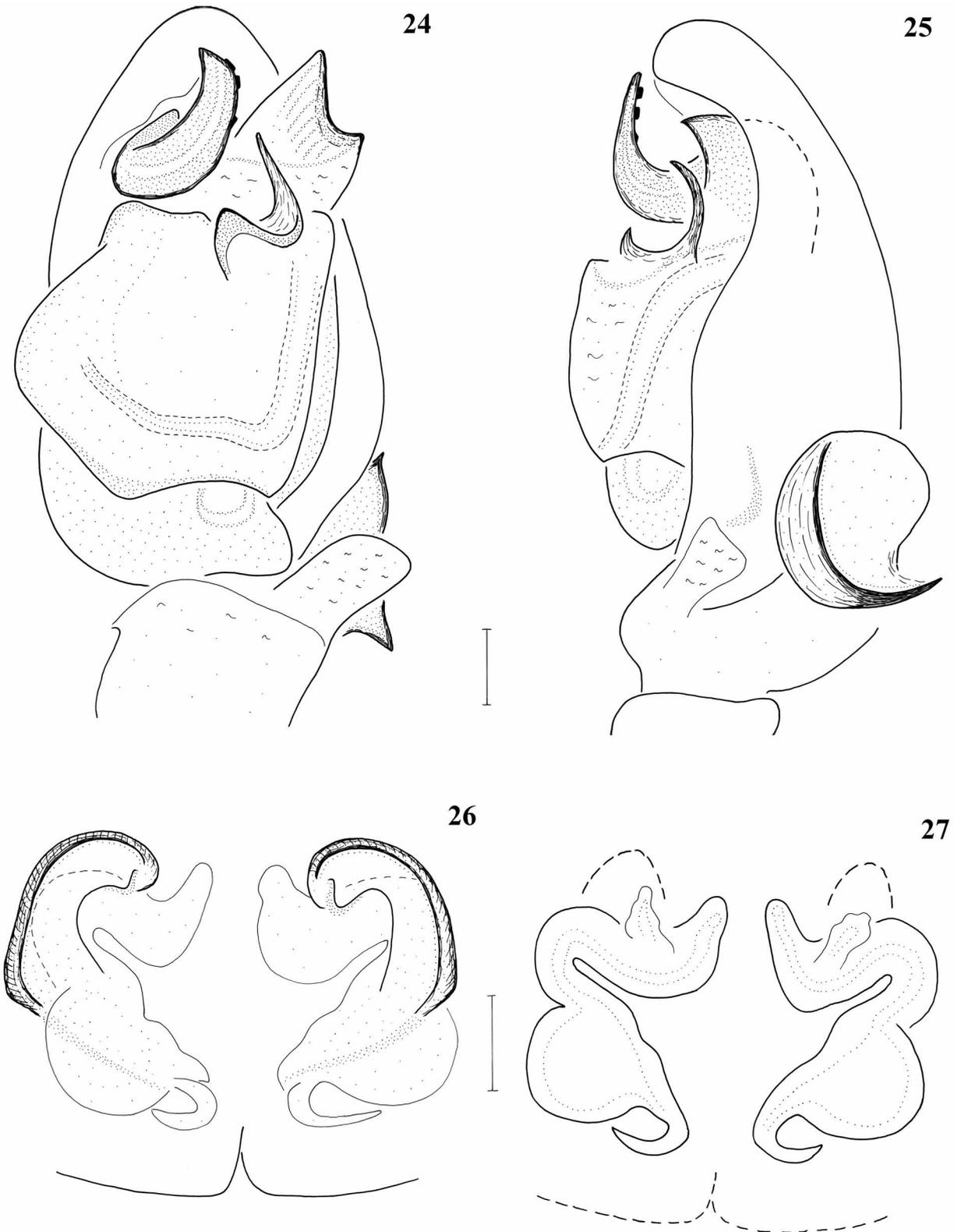
Citations in Greece: IPEIROS: Arta; IONIAN ISLANDS: Kefallonia; Kerkyra; THESSALIA: Magnisia; STEREA ELLADA: Attiki; Salamina; PELOPONNISOS: Argolida, Nafplio; AEGEAN ISLANDS: Evvoia, Dystos; Naxos; Syros; Santorini; Palia Kammeni; Rodos; Symi; CRETE (?).

New records: GREECE: Thrace: Dadia: 2 ♂♂ 1 ♀ (ptf, 04.VI.07, leg. S. Buchholz); Nestos Delta: 2 ♂♂ (ptf, 27.V.07, leg. S. Buchholz); Aegean Islands (all deposited at NHMC): Samothece: Feggari Mt, 300 m alt: 1 ♀ (14.III.09 to 18.VII.09, leg. M. Chatzaki); Thassos: 2 ♂♂ (ptf, 29.V.07, leg. S. Buchholz); Astypalaia: Chora to Maltezana, shortly after the narrowest part of the island: 5 ♂♂ 9 ♀♀ (ptf, 24.IV.05 to 13.VI.05); E part of the island, Maltezana to Vathy, *Juniperus* sp.: 1 ♂ 2 ♀♀ (ptf, 24.IV.05 to 13.VI.05); W part of the island, Kastro district, Agios Ioannis church: 2 ♂♂ (ptf, 24.IV.05 to 13.VI.05); Stream after Agios Ioannis church: 4 ♂♂ 15 ♀♀ (ptf, 27.IV.05 to 13.VI.05); Pontikousa islet: 6 ♂♂ 17 ♀♀ (ptf, 26.IV.05 to 12.VI.05); Ofidousa islet: 17 ♂♂ 17 ♀♀ (ptf, 24.IV.05 to 12.VI.05); Kounoupoi islet: 21 ♂♂ 22 ♀♀ (ptf, 24.IV.05 to 11.VI.05); Koutsomytis islet: 10 ♂♂ 9 ♀♀ (ptf, 24.IV.05 to 11.VI.05); Agia Kyriaki islet: 2 ♂♂ 16 ♀♀ (ptf, 25.IV.05 to 11.VI.05); Kalymnos: Stimenia, at the end of the road, close to the church of Ag. Nikolaos: 3 ♂♂ 2 ♀♀ (ptf, 06.IV.05 to 09.VI.05); Kalavros islet: 41 ♂♂ 4 ♀♀ (ptf, 04.IV.05 to 10.VI.05); Plati islet: *Juniperus oxycedrus* 2 ♂♂ (ptf, 31.III.05 to 08.VI.05); Lakkos - *Juniperus macrocarpa*: 4 ♂♂ 1 ♀ (ptf, 03.IV.05 to 08.VI.05); Pserimos islet, SE part - abandoned cultivations near the beach, phrygana: 11 ♂♂ 1 ♀ (ptf, 02.IV.05 to 07.VI.05); NW part, natural phrygana: 1 ♀ (ptf, 01.IV.05 to 07.VI.05); Nisyros: Nikia to Avlaki - phrygana: 1 ♀ (ptf, 01.V.05 to 05.VI.05); Nikia to Avlaki, phrygana - maquis: 45 ♂♂ 27 ♀♀ (ptf, 01.V.05 to 05.VI.05); Kaldera: 10 ♂♂ 8 ♀♀ (ptf, 01.V.05 to 05.VI.05); Moni Evangelistrias, road of Palaiokastro: 10 ♂♂ 8 ♀♀ (ptf, 01.V.05 to 01.VI.05); Pergousa islet: 1 ♀ (ptf, 05.V.05 to 06.VI.05) [all leg. M. Chatzaki]; Samos: Psili Ammos: 2 ♂♂ 2 ♀♀ (ptf, 02.V.2006 to 06.VII.2006); 1 ♀ (ptf, 05.V.07 to 01.VII.07); 3 ♂♂ (04.III.08 to 09.V.08) [all leg. D. Kaltsas]; Santorini: Pori-Fira: 2 ♂♂ 22 ♀♀ (ptf, 14.IV.06 to 14.07.06); Akrotiri-Kabia beach: 3 ♂♂ 6 ♀♀ (ptf, 23.IV.06 to 14.07.06); Vlichada: 8 ♂♂ 9 ♀♀ (ptf, 23.IV.06 to 14.07.06); Prof. Hlias: 1 ♀ (ptf, 17.V.03 to 24.VIII.03); Oia: 1 ♂ 6 ♀♀ (17.V.03 to 24.VIII.03); Thirasia: 4 ♂♂ 10 ♀♀ (ptf, 20.IV.06 to 04.08.06) [all leg. M. Chatzaki]; Rodos: Attaviros, 1000 m alt: 2 ♂♂ 3 ♀♀ (ptf, 12.V.06 to 08.VII.06) (leg. M. Chatzaki & D. Kaltsas).

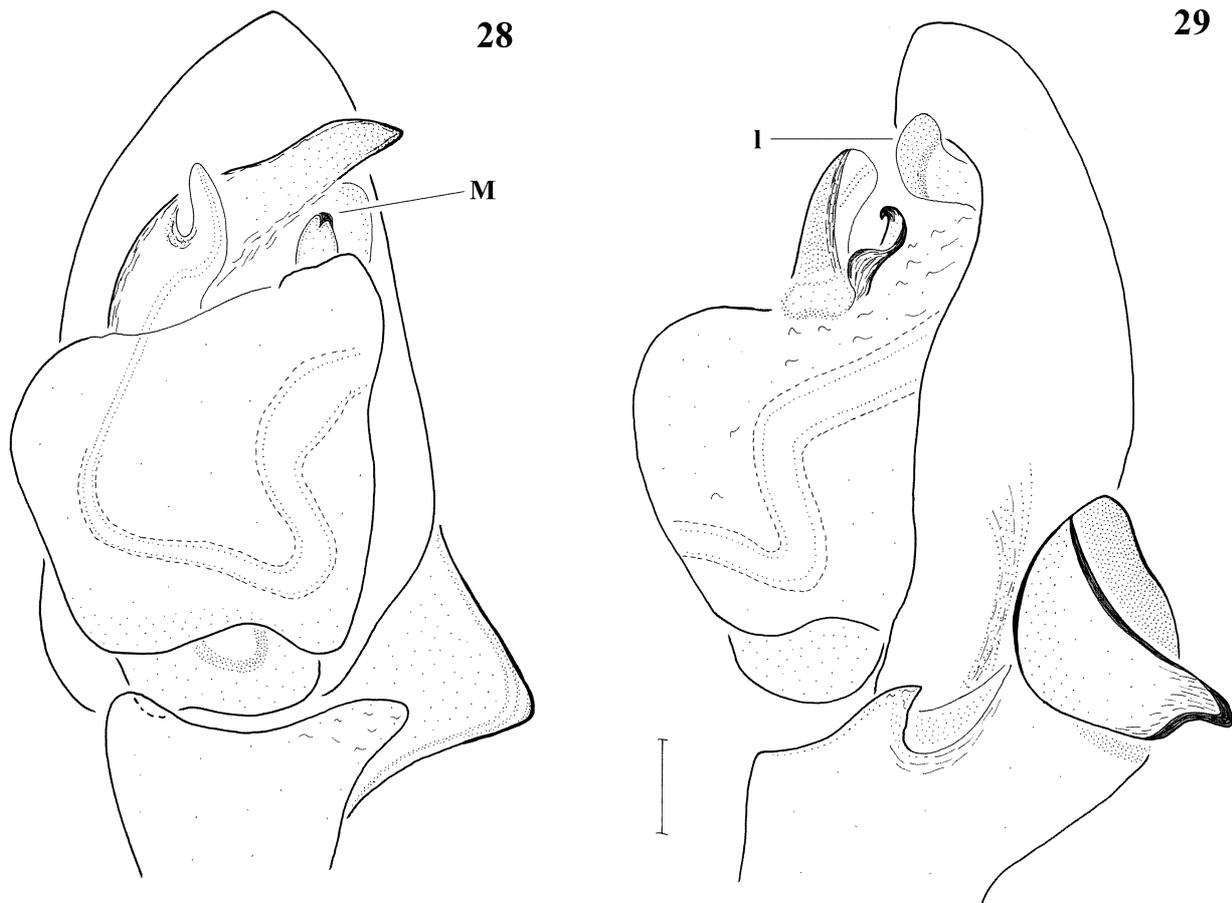
Comments. The presence of *N. exornata* on Crete is doubted. The record is by Roewer (1959). However the author has made extensive samplings all over the island of Crete and never found any. Because of the general similarity of this species to *N. excerpta* which is widely distributed on the island of Crete and also

because there are already two species of *Nomisia* documented on the same island, it may be assumed that Roewer's identification was wrong.

Distribution: Europe to Central Asia.



FIGURES 24–27. *N. exornata* from Astypalaia island – NHMC8433. Male palp, ventral view (24), retrolateral view (25), epigyne (26), vulva (27).



FIGURES 28–29. *N. levyi* n. sp. from Attiki – SMF2425. Male palp, ventral view (28), ventral to retrolateral view (29). M: median apophysis. I: sclerotized membrane.

***Nomisia levyi* n. sp.**

Figs 28–29, 52

Etymology. The species name is dedicated to the late arachnologist G. Levy from Israel.

Type: GREECE: Attiki, Pentelikon: 1 ♂ holotype, (SMF 2425, sub. *N. recepta*, det. Roewer, 1931)

Diagnosis: *N. levyi* n. sp. is easily distinguished by the characteristic configuration of the bulging bifid embolus.

Description. Measurements ♂ n = 1: PL: 1.9, PW: 1.5, OL: 2.

♂♀: The single specimen available to the author was too fragile for detailed examination of somatic parts, measurements and leg spination examination (the specimen was deprived of any spines). It is a spider of average size and pale yellow coloration. The absence of the characteristic black dorsal markings on the abdomen, present at all members of the genus, is possibly due to its preservation in alcohol for a very long time.

♂ Pedipalp (Figs 28–29): tegulum robust, reduced at apical posterior side, uncovering a bulging embolus. Embolus bifid with one lower upright part where the spermophore ends and another, longer, almost vertically directed to the former, reaching out of the upper part of the cymbium. The same structure looks like a separate apophysis (I) in tetrolateral view (Fig. 29). A small part of the median apophysis (M) is visible when viewed from ventral side, as most of it is covered by the upper surface of the tegulum. Tibial apophyses with a small, membranous, pointed ventral extension and a dorsally directed pointed lobe on its main part.

Distribution. GREECE, Attiki.

***Nomisia orientalis* Dalmas, 1921**

N. orientalis Dalmas, 1921: p. 289, Figs 72, 91 (Dmf) (holotype from Asia Minor – not examined); Seyyar *et al.* 2009: p. 65, Figs 13–20 (mf).

Comments. *N. orientalis* was described by Dalmas (1921, p. 289, figs 72, 91) from Turkey (Asia Minor). Its presence was confirmed by Seyyar *et al.* (2009) who provided further illustrations of the genital organs of both sexes (p. 65, Figs 13–20) and further records from south – central Turkey. Material under this species name was found in the collection of H. Hadjissarantos at ZMUA although no record of it was ever published. All material identified as *N. orientalis* was examined by the author and was found identical to *N. palaestina* (see records in the relevant species). Therefore no records are valid for *N. orientalis* in the Greek territory, at least until new data confirm its presence.

Distribution: Turkey (not Greece).

***Nomisia palaestina* (O. P.- Cambridge, 1872)**

Figs 30–33, 53

Gnaphosa palaestina O. P.- Cambridge, 1872: p. 231, pl. 15, Fig. 8, (holotype from Israel- not examined).

Diagnosis: *N. palaestina* is easily identified by the S-shaped embolus of the male pedipalp reaching almost the end of the cymbium, the slender median apophysis and the distinct shape of both the epigyne and the spermathecae (oval with long cylindrical tubes forming extra pouches interiorly).

Citations in Greece: PELOPONNISOS: Argolida, Mt. Mainalo; AEGEAN ISLANDS: Kos.

New records: GREECE: Attiki: Parnis-Mola: 2 ♀♀ (16.VII.36, leg. H. Hadjissarantos, ZMUA6614.19); Parnis-Mola: 1 ♀ (08.VI.36, leg. H. Hadjissarantos, ZMUA6614.21); Tatoi: 2 ♀♀ (04.VI.39, leg. H. Hadjissarantos, ZMUA6614.18); Peloponnisos: Tegea: 1 ♂, 3 imm. (01.V.37, leg. H. Hadjissarantos, ZMUA6614.16); Taygetos Mt, 1800 m alt: 1 ♂ (ptf, 13.IV.97 to 06.VII.97, leg. I. Anastasiou, ZMUA G584.3(1)); Mainalo Mt, 1700 m alt: 1 ♂ 4 ♀♀ (ptf, 15.IV.97 to 10.VII.97, leg. I. Anastasiou, ZMUA); Crete: Kapsaliana: 1 ♀ (05.V.36, leg. H. Hadjissarantos, ZMUA6614.17); Samos: Koumaradaios: 1 ♀ (01.VIII.37, leg. H. Hadjissarantos, ZMUA6614.20); TURKEY: Osmaniye province, Çardak village (37°04.987'N, 036°16.148'E), 126 m alt: 1 ♀ (01.V.2007, leg. Seyyar, NUAM).

Distribution: Greece, Turkey, Israel, Syria, Palestine.

***Nomisia peloponnesiaca* n. sp.**

Figs 34–39, 53

Etymology. The species name derives from the district where it was found for the first time, Peloponnisos.

Type: GREECE: Peloponnisos, Taygetos Mt, phrygana, 600 m alt: 1 ♂ holotype, 1 ♀ paratype (ptf, 15.III.97 to 06.VII.97, leg. I. Anastasiou, ZMUA G588.3(1)).

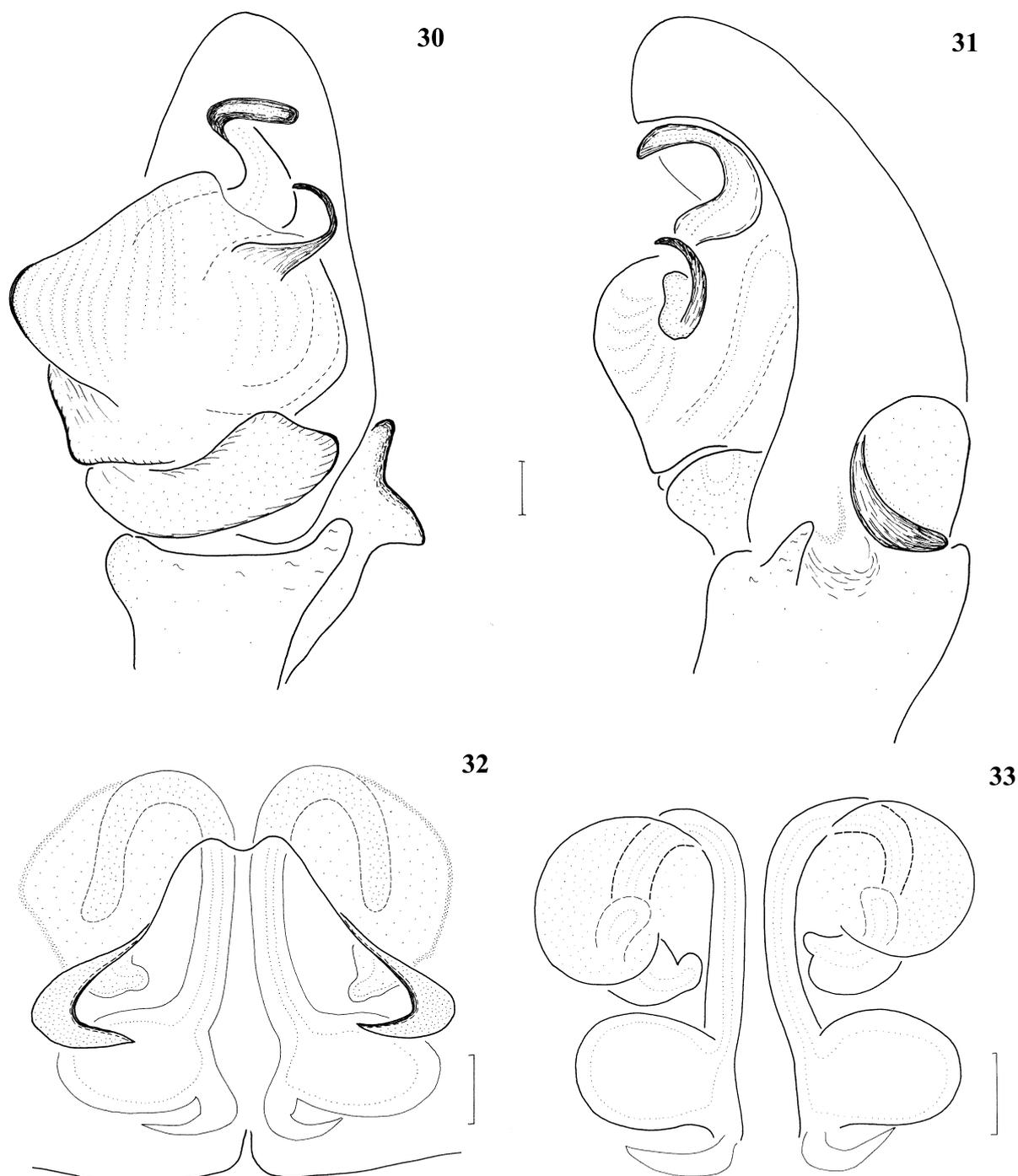
Other material: GREECE: Peloponnisos: Taygetos Mt, phrygana, 600 m alt: 1 ♀ (ptf, 15.III.97 to 06.VII.97, leg. I. Anastasiou, ZMUA G588.1(1)); 1 ♀ (ptf, 09.V.97 to 05.VII.97, leg. I. Anastasiou, ZMUA G584.3(1)); Mainalo Mt, conifer wood, 1400 m alt: 1 ♂ (ptf, 09.V.97 to 05.VII.97, leg. I. Anastasiou, ZMUA).

Diagnosis: *N. peloponnesiaca* n. sp. is distinguished from its congeners by the bulging tegulum, the distinct horizontal embolus and shape and size of the tibial apophysis of the male pedipalp. It is also distinguished by the shape of the two-chambered spermathecae and the distinct central pouches that they form.

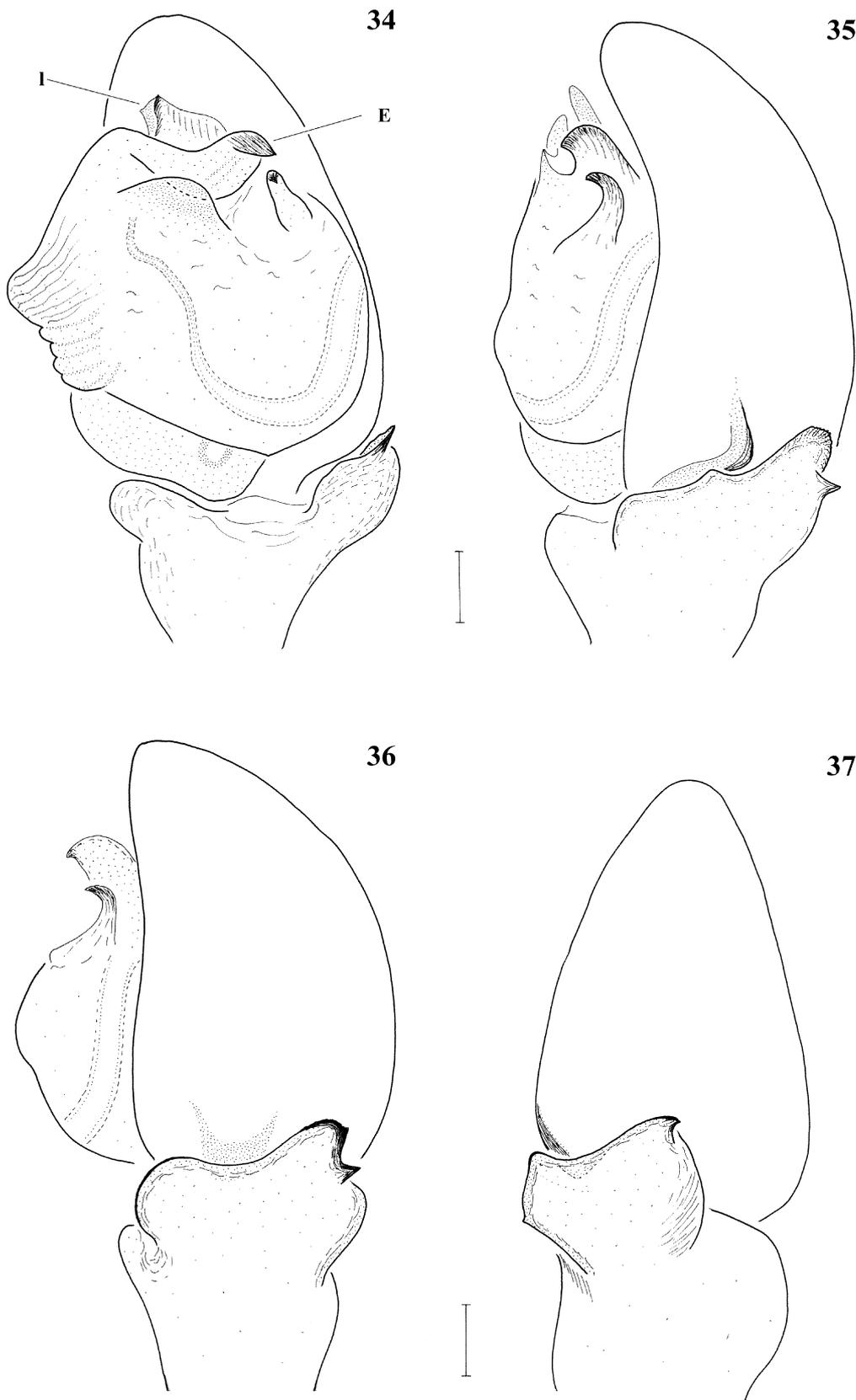
Description. Measurements ♂ (♀) n = 2 (3): PL: 2.3 (2–2.3), PW: 1.7–2 (1.3–1.5), OL: 2.5–2.9 (2.2–3.2).

♂♀: Red brown spiders of medium size. Abdomen light grey with characteristic lines along it. Males with

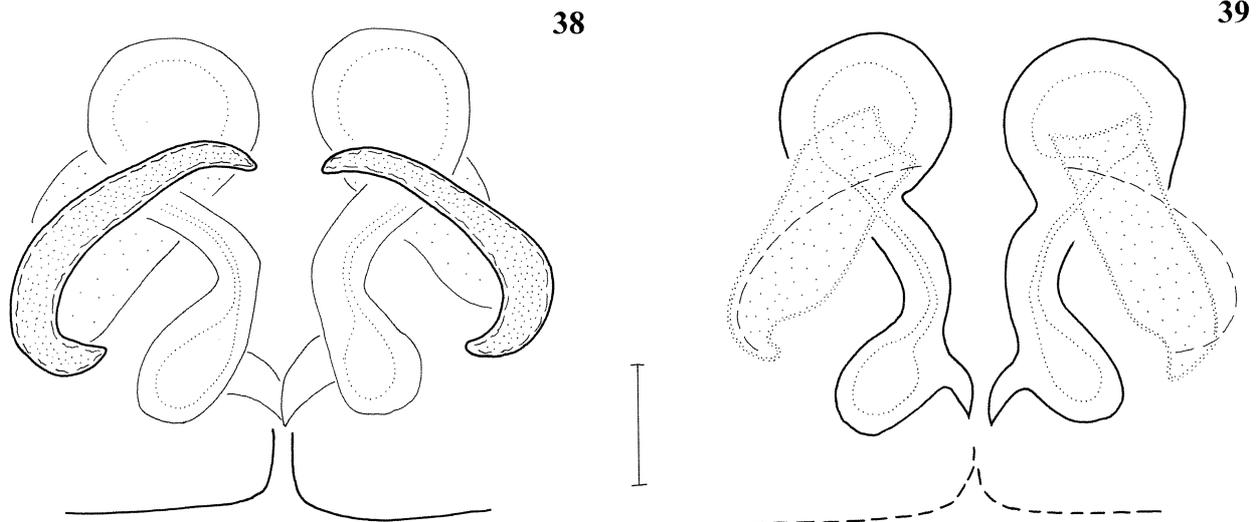
large scutum. Eyes round except for slightly oblique PME. AME black, all other white with black surrounding. Anterior and posterior row of eyes straight or slightly procurved. Distance between AME closer than distance between AME and ALE. Posterior eyes equidistantly positioned. Chelicerae with dentated keel at its entire surface.



FIGURES 30–33. *N. palaestina* from Peloponnisos, Taygetos Mt. – ZMUA G585.12(1) (♂), and Mainalo Mt (♀). Male palp, ventral view (30), retrolateral view (31), epigyne (32), vulva (33).



FIGURES 34–37. *N. peloponnesiaca* n. sp. from Peloponnisos, Mainalo Mt. Male palp, ventral view (34), ventral to retrolateral view (35), retrolateral view (36), dorsal view (37).



FIGURES 38–39. *N. peloponnesiaca* n. sp. from Peloponnisos, Taygetos Mt. – ZMUA G584.3(1). Epigyne (38), vulva (39).

In both sexes the fourth pair of legs is longer than the first, a character that is shared with *N. palaestina* but not with all its congeners.

Leg spination: Fe: I d 3 ; II d 3 ; III d 5–6; IV d 5–6. Pa: I–II - ; III–IV p 1 r 1. Ti: ♂ I v 2; ♀ I v 1–2; ♂ II v 2; ♀ II v 2 p 1; III–IV spinose. Me: ♂ I v 4–5; ♀ I v 4; II v 4; III–IV spinose. Ta: all with dense hair.

♂ Pedipalp (Figs 34–37): Tegulum robust with prolateral extension of membranous corrugated surface. Embolus large, directed horizontally and with an extra fold at its end. A sclerotized apophysis (I) is situated behind embolus. Tibial apophysis expanding from retrolateral edge of cymbium to more than half its width (Figs 35–37). Round and short frontal part, continuing to a groove, adjusted to a lateral furrow of the cymbium (Fig. 35) and leading to a bifid end with an upper round lobe and a lower small and pointed tip (Figs 36–37).

Epigyne (Fig. 38): Lateral margins oblique, narrow at apical part and widening at basal part. Compared with its congeners with similar shape of epigyne (i.e. *N. excerpta*, *N. exornata*, *N. recepta*, and *N. ripariensis*) *N. peloponnesiaca* n. sp. is different by the general shape of these margins, limiting the central depression to about 2/3 of the total length of spermathecae. Therefore the latter are partly positioned above the frame that these margins form.

Vulva (Fig. 39): Spermathecae long with two chambers: one large, round-shaped at anterior part, connected with an extra lateral pouch and one smaller at posterior part, oval-shaped. The two are connected by a cylindrical tube.

Distribution: GREECE, Peloponnisos.

Nomisia recepta (Pavesi, 1880)

Figs 40–46

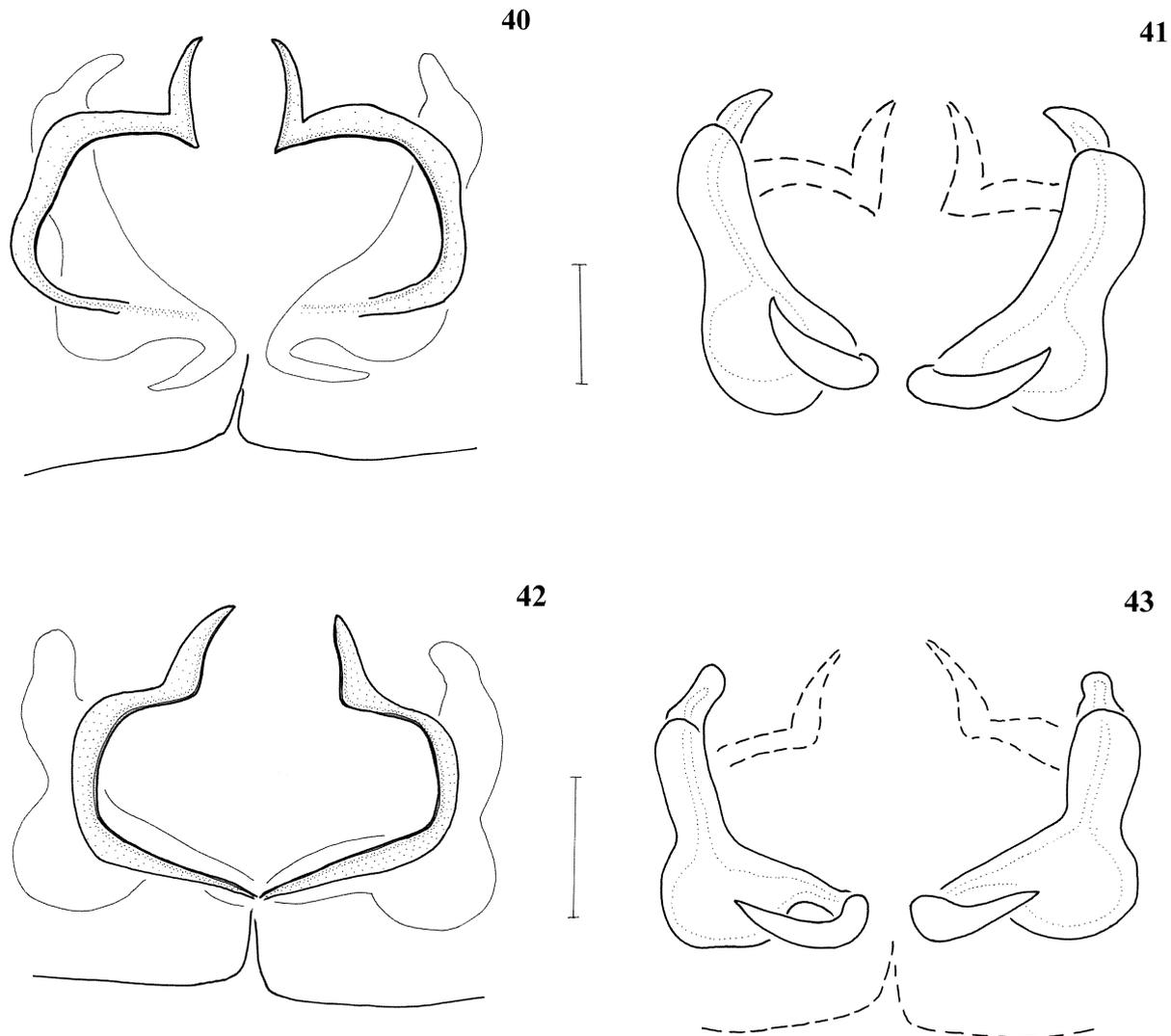
Gnaphosa recepta Pavesi, 1880: p. 355 (holotype from Tunisia, Tozer, leg. A. Kerim, MSNG - examined).

Nomisia excerpta: Levy, 1995, p. 933, Figs 36–40 ♂ from Tunisia (Kebilli, leg. Letourneux, MNHN, Ar. 3183 - examined). Misidentification.

N. recepta: Dalmas, 1921, p. 283, Figs 66, 86–87; Di Franco, 1986: p. 140, Figs 2–5.

Diagnosis: *N. recepta* is separated from its congeners by the less pronounced size of its embolus, its bifid crested end and the globular shape of the tibial apophysis (especially when viewed from ventral to retrolateral side). Females can be distinguished by the less closed epigynal margins at posterior end compared to *N.*

excerpta and the spermathecae having almost the same size (width) as the introductory ducts. In comparison to *N. ripariensis*' females, *N. recepta* differs in the relative position of the introductory ducts, being wide apart instead of approaching at the anterior part.



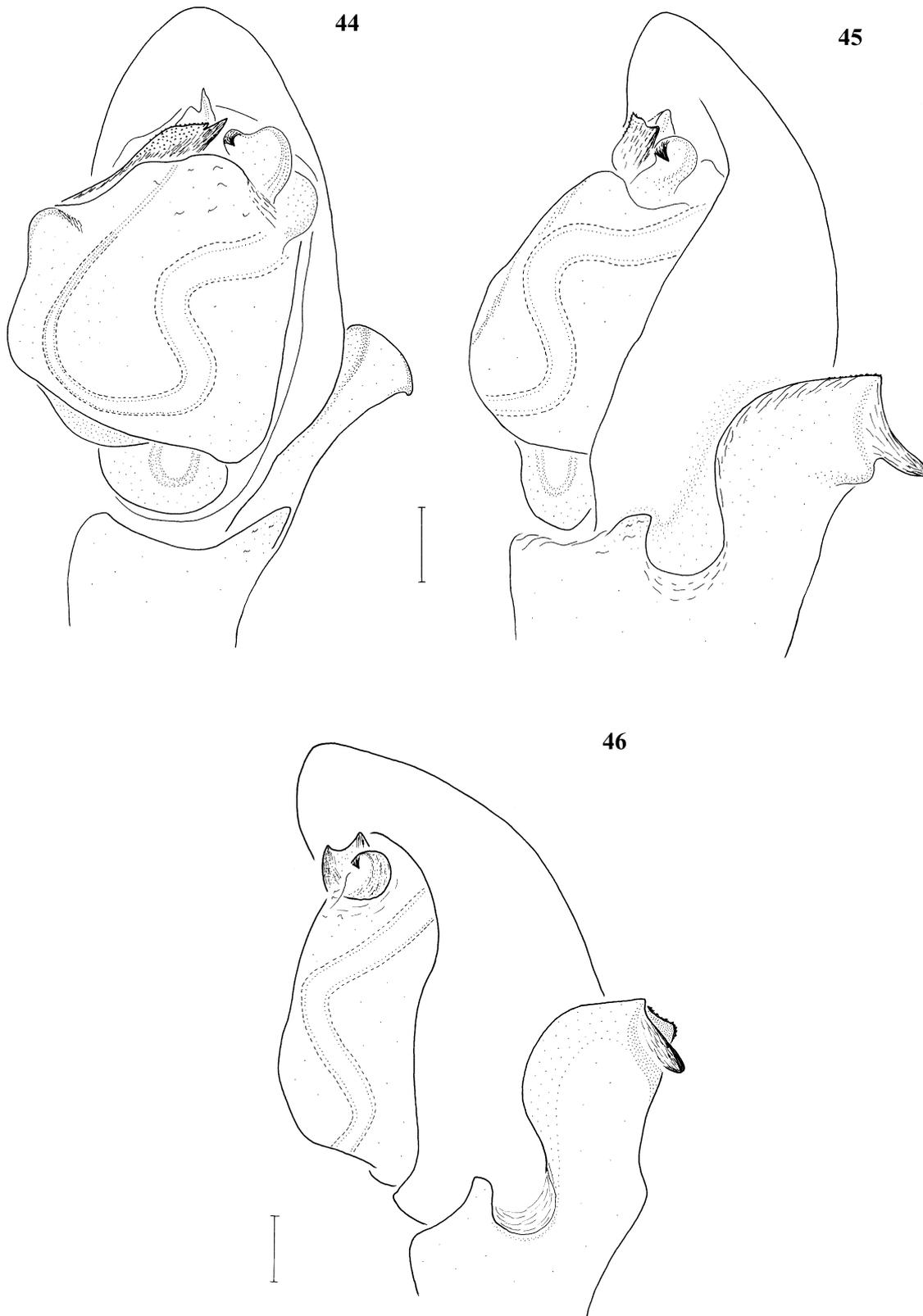
FIGURES 40–43. *N. recepta* from Corsica – MNHN AR3182 (40–41). *N. recepta* from Cyprus, Kourio - NHMC (42–43). Epigyne (40,42), vulva (41, 43).

Material examined: ITALY: Sicily: 1 ♂ (SMF 38620, det. U. Grimm); FRANCE: south part, Corsica: 3 ♀♀ (MNHN, AR3182); TUNISIA: Kebilli: 3 ♂♂ (AR3183, MNHN); ALGERIA: Wil. M' Sila, El Melez (N.E. M' Sila), 800 m alt, along dry river in steppe: 1 ♂ 1 ♀ (ptf, 01.III.88, leg. R. Bosmans); CYPRUS: Kourio: 1 ♀ (01.VIII.07 to 10.XI.07, leg. D. Kaltsas, NHMC).

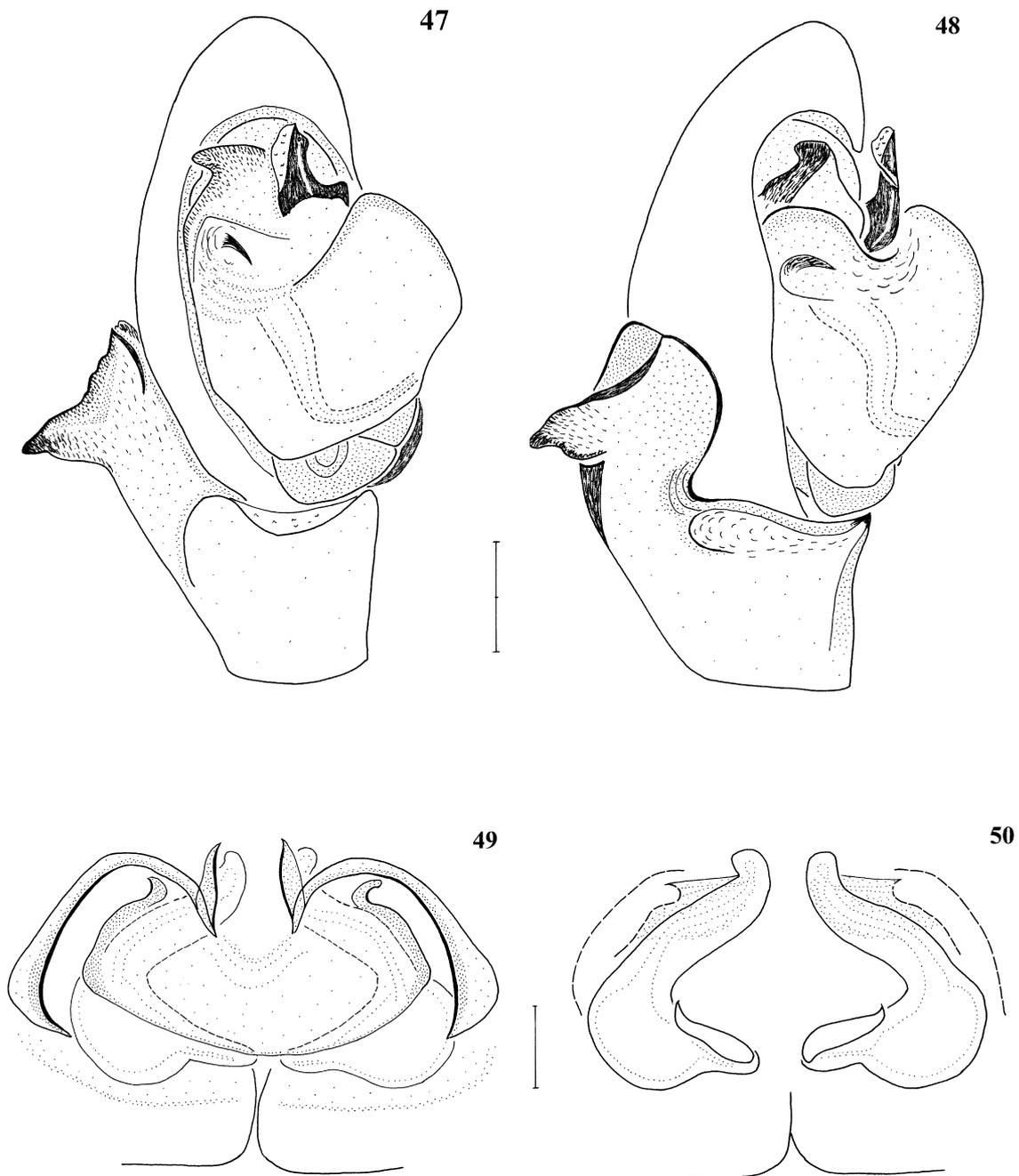
Comments. Although not previously reported in the literature from Greece, one vial in Hadjissarantos's collection was under the name *N. recepta*. Unfortunately the vial included a female from Crete, but without epigyne. Therefore the record could not be confirmed. Furthermore, because of the intensive samplings that the author has realized on the island of Crete without tracing this species, it seems improbable that the identification of Hadjissarantos was correct.

N. recepta is here illustrated and examined in detail in order to untangle the puzzle between this and the very similar species *N. excerpta*, also mixed up in the literature. The male of *N. recepta* was described by Pavesi (1880, p. 355) from Tunisia. Later Dalmás (1921, p. 283, Figs 66, 86–87) described the female and identified two distinct forms among the specimens he recorded, namely one from southern France, which he

described as larger in size, with differences in the spinnerets and with different shape of epigynal margins (...”their epigyne is larger and more straight in front...””) and one from north African countries (i.e. Algeria and Egypt). In males he did not observe any notable differences in the genital organs but noted that specimens



FIGURES 44–46. *N. recepta* from Sicily – SMF38620. Male palp, ventral view (44), ventral to retrolateral view (45), retrolateral view (46).



FIGURES 47–50. *N. ripariensis*. Male palp, ventral view (47), ventral to retrolateral view (48), epigyne (49), vulva (50) (taken from Chatzaki *et al.* 2002).

from Tunisia and Sicily are clearly larger than those found in Algeria. Di Franco (1986: p. 140, Figs 2–5) and Baldacchino *et al.* (1993) recorded the species from Sicily (island of Salina) and Malta respectively and then Levy (1995, p. 933, Figs 36–40) commented on the species, adding the report of a misidentification by Dalmas for a specimen from Tunisia as *N. recepta* instead of *N. excerpta*, which was the correct identification according to him. He based this on the examination of the type of *N. excerpta*, although he had not seen the type of *N. recepta*. Unfortunately the opposite has happened here, as it was impossible to trace the type of *N. excerpta*. However, a close examination of the type of *N. recepta* and the specimen from Tunisia examined by Levy, leaves no doubt that they are identical. The same is true for another male specimen found at the collection of the Senckenberg museum from Sicily.

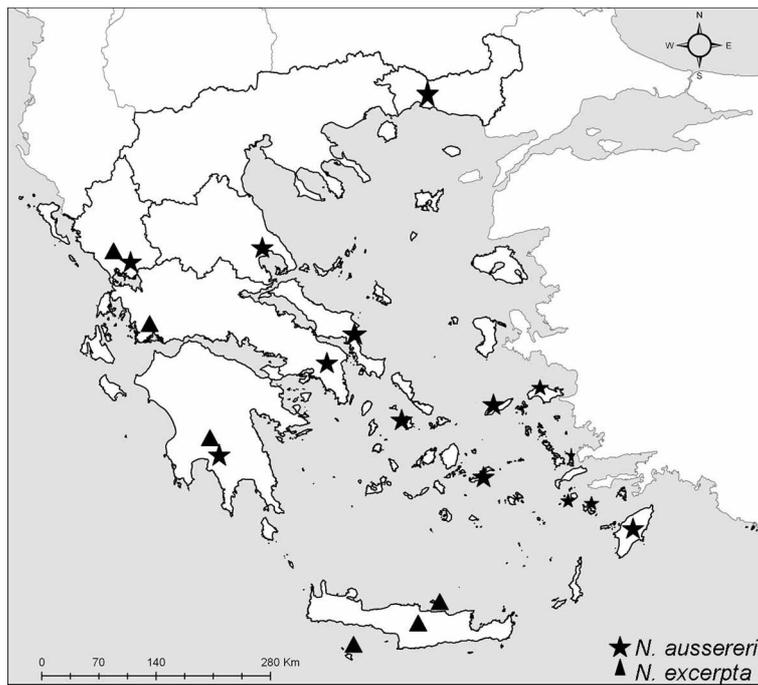


FIGURE 51. Distribution map of *N. aussereri* and *N. excerpta* in Greece.

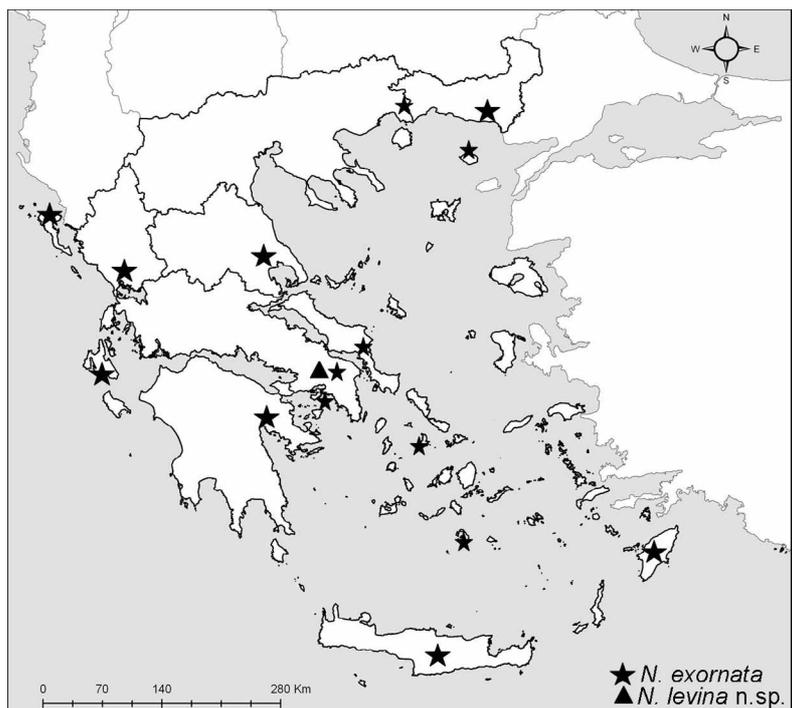


FIGURE 52. Distribution map of *N. exornata* and *N. levyi* n. sp. in Greece.

The drawings provided by Di Franco (1986) and Levy (1995) are identical in the details of both male and female genital organs. In relation to females there are no obvious differences between their drawings (Figs 4–5 and 39–40 respectively) and the ones provided here which illustrate females from Corsica and Cyprus (Figs 40–43). However the details of male genital organs are far less denoted in their drawings (Figs 2–3 and 36–37 respectively) than in Figs 44–46 of the present paper, which might be due to a lack of high magnification microscopic view of the vouchers. If examined at high magnification, males of *N. recepta* are clearly separated from *N. excerpta* (and all its congeners) by the following characters: the embolus is bifid with a

pointed crest at each part and densely granulated (Fig. 44); the median apophysis does not have two pointed edges (like in most cases of *N. excerpta*), probably because the superficial surface of the tegulum covers most of it; the tibial apophysis is more rounded and globular from ventral side making the whole apophysis look larger relative to the size of the bulb (Figs 45–46). Because the type and the vouchers examined by the author all bear the same characters without any apparent variation, it is here concluded that at least for the Central Mediterranean regions (Corsica, Malta, Sicily, Tunisia and Algeria) the presence of *N. recepta* cannot be doubted, contrary to *N. excerpta* which should be excluded from the catalogues of the above areas.

Distribution: Corsica, Malta, Sicily, Tunisia, Algeria, Egypt (?), Cyprus (not Greece).

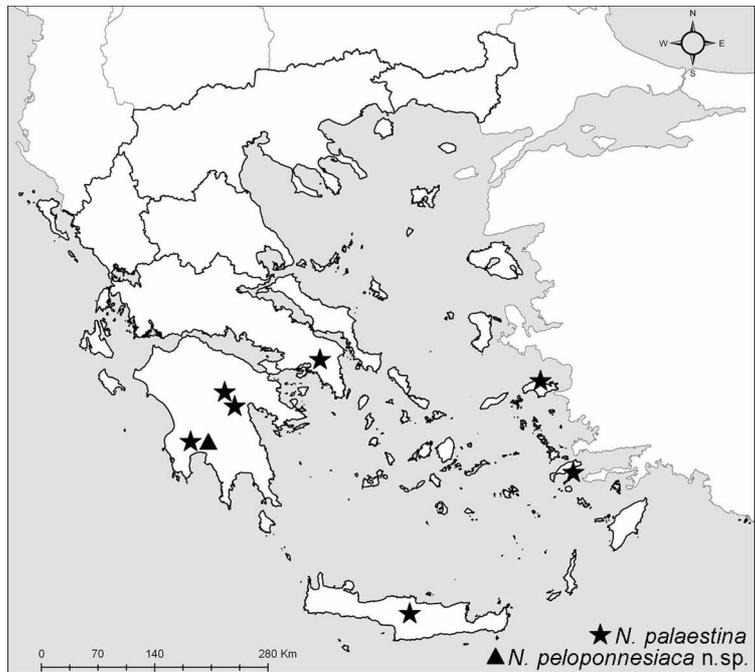


FIGURE 53. Distribution map of *N. palaestina* and *N. peloponnesiaca n. sp.* in Greece.

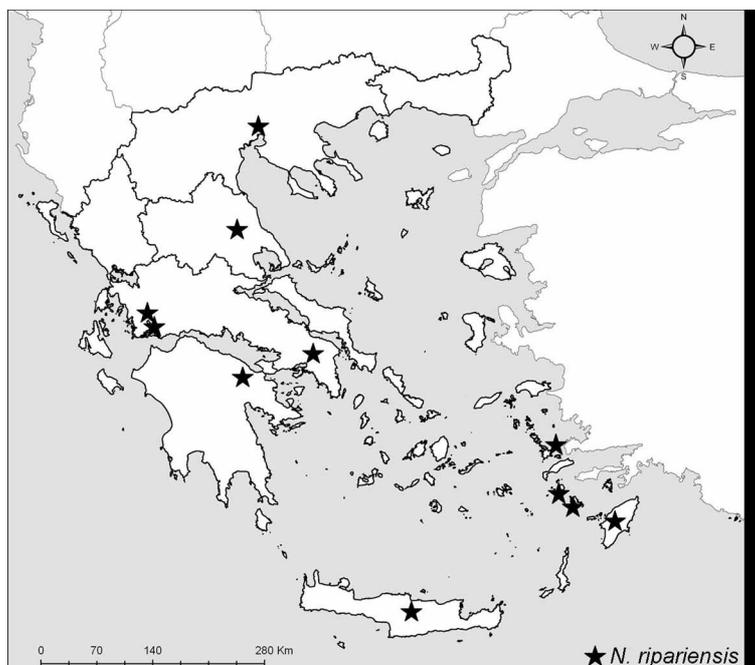


FIGURE 54. Distribution map of *N. ripariensis* in Greece.

***Nomisia ripariensis* (O. P.- Cambridge, 1872)**

Figs 47–50, 54

Pterotricha ripariensis; Simon, 1916: 274; Caporiacco, 1929: 230; Bristowe, 1935: 746; Drensky, 1936: 136.*Nomisia ripariensis*; Roewer, 1928: 114; Werner, 1934: 164; Hadjissarantos, 1940: 75; Caporiacco, 1948: 61; Dunin, 1984: 50; Levy, 1995: 931; Chatzaki & al., 2002a: 585.

Diagnosis: *N. ripariensis* is distinguished by the distinct shape of the tibial apophysis, only similar to *N. conigera* (but see differences in the latter). The epigyne and vulva resemble the general shape of *N. excerpta*, *N. recepta* and *N. peloponnesiaca* **n. sp.** but differ from them in details of the combination of characters: lateral margins of epigyne are open at posterior part (unlike *N. excerpta* and partly *N. recepta*) and with an extra vertical neck at anterior part (unlike *N. peloponnesiaca* **n. sp.**); introductory ducts meet together anteriorly (unlike *N. recepta*) and spermathecae are less globular than in *N. excerpta*.

Citations in Greece: THRACE: Rodopi, Nestos Delta, Aladgagiola (Schroeder & Buchholz in prep., pers. com.); MAKEDONIA: Thessaloniki; THESSALIA: Larisa; STEREA ELLADA: Attiki; Aitolokarnania; Agrinio; Amfilochia; PELOPONNISOS: Korinthia; AEGEAN ISLANDS: Rodos; Symi; CRETE.

New records: GREECE: Pserimos islet, SE part - abandoned cultivations near the beach, phrygana: 3 ♂♂ 2 ♀♀ (ptf, 02.IV.05 to 07.VI.05); cultivations near the only settlement of the islet: 9 ♂♂ 2 ♀♀ (ptf, 02.IV.05 to 07.VI.05); Nisyros: Pergousa islet: 1 ♂ 1 ♀ (ptf, 05.V.05 to 06.VI.05) [all leg. M. Chatzaki].

Comments. *N. ripariensis* is mostly found to sand dunes and coastal areas (Chatzaki et al. 2002; Buchholz 2009) and feeds on ants (Levy 1995).

Distribution: Bulgaria, Greece, Turkey, Israel, Syria, Lebanon, Azerbaijan.

Acknowledgements

This study was partly accomplished thanks to a visit to the Zoological Museum of Berlin, funded by the European Commission's Research Infrastructure Action via the SYNTHESYS Project and to the infrastructure provided by the Natural History Museum of the University of Crete. I am deeply grateful to the curator of the Berlin museum Jason Dunlop and to the curators of several other museums who kindly offered their help for providing me comparative material: Peter Schwendinger (Geneve), Peter Jäger (Frankfurt), Christoph Hörweg (Wien), Christine Rollard (Paris), Maria Tavano (Genova), Tasos Legakis (Athens), Christo Deltshev (Sofia), Ariel Chipman (Jerusalem) and Robert Bosmans (Brussels). I am also grateful to colleagues from the Natural History Museum of Crete who provided infrastructure and material for this study (Manolis Nikolakakis, Dimitris Kaltsas, Eleni Panayiotou) and I. Anastasiou for offering me his arachnological collection for further study. I thank Yuri Marusik for helping in the translation of Russian texts, the editor M. Ramírez and Mykola Kovblyuk and one anonymous reviewer for providing valuable comments to the manuscript.

References

- Baldacchino, A.E., Dandria, D., Lanfranco, E. & Schembri, P.J. (1993) Records of spiders (Arachnida: Araneae) from the Meltese islands (Central Mediterranean). *Central Mediterranean Naturalist (Malta)*, 2, 37–59.
- Bosmans, R. & Chatzaki, M. (2005) A catalogue of the spiders of Greece. A critical review of all spider species cited from Greece with their localities. *Arachnological contributions Nieuwsbrief van de Belgische Arachnologische Vereniging* 20(2), 1–123.
- Bristowe, W.S. (1935) The Spiders of Greece and the adjacent islands. *Proceedings of the Zoological Society of London*, 1934, 733–788.
- Buchholz, S. (2007) A first contribution to the arachnofauna (Arachnida: Araneae) of the Nestos Delta (NE Greece). *Acta zoologica Bulgarica*, 59(3), 241–252.
- Buchholz, S. (2009) Community structure of spiders in coastal habitats of a Mediterranean delta region (Nestos Delta, NE Greece). *Animal Biodiversity and Conservation*, 32.2, 101–115.

- Cambridge, O.-P. (1872) Descriptions of twenty-four new species of *Erigone*. *Proceedings of the zoological Society of London*, 747–769.
- Caporiacco, L. (1929) Aracnidi. In Ricerche faunistiche nelle isole italiane dell'Egeo. *Archivio zoologico italiano*, 13, 221–242.
- Caporiacco, L. (1948) L'arachnofauna di Rodi. *Redia*, 33, 27–75.
- Chatzaki, M., Thaler, K. & Mylonas, M. (2002) Ground spiders (Gnaphosidae; Araneidae) of Kriti (Greece). Taxonomy and distribution. I. *Revue suisse de Zoologie*, 109, 559–601.
- Dalmas, R. de (1921) Monographie des araignées de la section des *Pterotracha*. *Annales de la Société entomologique de France*, 89, 233–328.
- Di Franco, F. (1986) Gnaphosidae (Arachnida, Araneae) dell' isola di Salina (isole Eolie). *Animalia*, 13, 137–157.
- Drensky, P. (1935) Katalog der echten Spinnen (Araneae) der Balkanhalbinsel. *Sbornik na beulgarskata Akademia na naukite (Sofia)*, 32, 1–223.
- Dunin, P.M. (1984) [Fauna and ecology of the spiders of the Apscheron Peninsula, Azerbadjan SSR]. In: *Fauna and Ecology of Arachnids*. Univ. of Perm, pp. 45–60.
- Hadjissarantos, H. (1940) The spiders of Attiki. *Thesis, University of Athens, Athens*, 132 pp. (in Greek).
- Koch, C.L. (1839) *Die Arachniden*. Nürnberg, Funfter Band, pp. 125–158, Sechster Band, pp. 1–156, Siebenter Band, pp. 1–106.
- Koch, L. (1972) Beitrag zur Kenntniss der Arachnidenfauna Tirols. *Zeitschrift des Ferdinandeums für Tirol und Voralberg*, 17, 239–328.
- Levy, G. (1995) Revision of the spider subfamily Gnaphosinae in Israel (Araneae: Gnaphosidae). *Journal of Natural History*, 29, 919–981.
- Mikhailov, K.G. (1997) *Catalogue of the spiders of the territories of the former Soviet Union (Arachnida, Aranei)*. Moscow, Zoological Museum, Moscow State University, 416 pp.
- Ovtsharenko, V.I. & Fet, V. (1980) Fauna and ecology of spiders (Aranei) of Badkhyz (Turkmenian, SSR). *Revue d'Entomologie de l' URSS*, 59, 442–447.
- Pavesi, P. (1880) Aracnidi di Tunisia. *Annali del Museo Civico di Storia naturale di Genova*, 15, 283–388.
- Platnick, N.I. (2009) The World Spider Catalog, Version 10.0: <http://research.amnh.org/entomology/spiders/catalog/GNAPHOSIDAE.html>
- Roewer, C.F. (1959) Die Araneae, Solifuga und Opiliones der Sammlungen des Herrn Dr. K. Lindberg aus Griechenland, Creta, Anatolien, Iran und Indien. *Göteborgs kunglige Vetenskaps-och Vitterhets-Samhälles Handlingar*, 8(4), 1–47.
- Seyyar, O., Ayyildiz, N. & Topu, A. (2009) Description of a new species of the genus *Nomisia* Dalmas, 1921 (Araneae: Gnaphosidae) from Turkey with some faunistical remarks. *Zootaxa*, 2006, 62–68.
- Simon, E. (1916) Liste des arachnides recueillis à Salonique pendant l'occupation française (1916) par le sergent Pierre Denier, membre de la Société. *Annales de la Société entomologique de France*, 85, 273–276.
- Spassky, S. (1941) Araneae palaearticae novae VI. *Folia Zoologica et Hydrobiologica*, 11, 12–27.
- Spassky, S. & Luppova (1945) Spiders of Tadzhikistan. *Revue d' entomologie de l' URSS*, 28, 43–55.
- Werner, F. (1934) Ergebnisse einer zoologischen Studien- und Sammlungsreise nach die Inseln des Ägäischen Meeres. *Sitzungsberichte der kais. Akademie der Wissenschaften (Mathematisch-naturwissenschaftliche Klasse)*. Wien, 143, 159–168.