

Revision of the genus *Zodarion* Walckenaer, 1833, part II. Western and Central Europe, including Italy (Araneae: Zodariidae)

R. Bosmans

Laboratorium voor Ecologie, Zoögeografie en Natuurbehoud, Ledeganckstraat 35, B-9000 Gent, Belgium

Summary

In this paper 26 *Zodarion* species occurring in Western and Central Europe are described or figured. *Z. couseransense* and *Z. sardum* are new species. The following new synonyms are established: *Z. ionicum* Brignoli, 1984 = *Z. frenatum* Simon, 1884, n. syn.; *Z. mahnerti* Brignoli, 1984 = *Z. emarginatum* (Simon, 1873), n. syn.; *Z. neapolitanum* Denis, 1935 = *Z. remotum* Denis, 1935, n. syn.; *Z. sabbadinii* Pesarini, 1993 = *Z. simoni* Denis, 1935 = *Z. ludibundum* Simon, 1914, n. syn.; *Z. elegans maculisternum* Caporiacco, 1950 = *Z. elegans simplicior* Simon, 1914 = *Z. elegans elegans* (Simon, 1873), n. syn. A new definition of the species groups, an identification key and distribution maps are also given.

Introduction

In the first part of a revision of the European representatives of the genus *Zodarion*, the species occurring in the Iberian Peninsula were revised (Bosmans, 1994). The peninsula appeared to be very rich in species, as the presence of no less than 27 species was confirmed.

As a second part of this revision, I present here the species from Western and Central Europe. All species observed hitherto in France, Belgium, Great Britain, Italy, Switzerland, Germany, Austria, Czech Republic, Slovakia and Poland are included. A third and last contribution will deal with the species from the rest of Europe.

History

The early history of the genus *Zodarion* in Western and Central Europe starts with the description of *Lucia germanica* by C. L. Koch in 1837 and of *Enyo italica* by Canestrini in 1868. Names derived from countries were very popular at that time, as illustrated later by names such as *Z. graecum* and *Z. gallicum*. Any specimen collected in Greece was always named *Z. graecum*, but it appears now that many of these old citations are incorrect. Type material of the first two described species, *Z. germanicum* and *Z. italicum*, is still available, so there is no doubt about their identity.

In several papers and especially in volumes I and VI of *Les Arachnides de France*, Simon described quite accurately several new species, first in the genus *Enyo*, and later in the genus *Zodarion* itself: *E. fusca* and *E. maculata* in 1870, *E. elegans*, *E. emarginata*, *E. gallica*, *E. nigriceps* and *E. soror* in 1873, *E. fulvonigra* and *E. timida* in 1874 in the first volume of *Les Arachnides de France*, *Z. frenatum* in 1884 and finally *Z. ludibundum*, *Z. marginiceps*, *Z. pusio* and *Z. rubidum* in 1914 in the sixth volume of *Les Arachnides de France*. An excellent key for all these species was provided and was

accompanied by figures. Although one has to take pains and struggle with the French, and although some figures are sketchy, it is quite possible to identify specimens. Type material of all these species is present in the Muséum national d'Histoire naturelle, Paris. It is often composed of a large type series, because Simon used to place all his material from France in the same vial, labelling it "Gallia" or even "Europe". These vials appear to contain many specimens which have been incorrectly identified, perhaps not only by Simon, but also by researchers using his collection later. It is evident that in most of these cases, a lectotype and paralectotypes have to be selected.

In several papers, Denis (1934a, 1935a,b) and Caporiacco (1940, 1951) described the species *Z. confusum*, *Z. gracilitibiale*, *Z. neapolitanum*, *Z. obscurum*, *Z. remotum*, *Z. vicinum*, *Z. denisi* and *Z. ruffoi*. Unfortunately these later workers did not have the same taxonomic insight as Simon. Most of their descriptions are based on a single specimen, sexes have often been incorrectly matched, and their figures are mere sketches. Since the papers of Denis and Caporiacco, identifying *Zodarion* species of the *italicum* group has become impossible. Denis (1937a) revised the genus *Zodarion*, but he had no clear picture of the species belonging to this group. Using his revision, it is not possible to identify correctly *Z. gallicum* or *Z. ludibundum*; it was, however, possible with Simon's key of 1914.

The fact that none of these species has been recorded or cited subsequently, clearly illustrates this. Only *Z. hamatum*, another species of the *italicum* group described later by Wiehle (1964), has been repeatedly cited (Wunderlich, 1980b; Noflatscher, 1988, 1990, 1991; Thaler & Noflatscher, 1990).

A redescription of these insufficiently known or doubtful species is essential, and in order to do so, type specimens had to be investigated, but here another problem arises. Denis had the unfortunate habit of not putting labels with new names in the tubes of the new species he described. For his revision of the genus (1937a), he studied the collections of the most important European museums. He described new species, indicating in which museum the types were deposited, as should be done, but he never added labels with the new names. Hence, a request to these museums to examine these types always produced a negative response; according to the curators, they were not present. Fortunately, I asked to examine all the *Zodarion* specimens present in the museums, and I was thereby able to trace the types of *Z. confusum* (NMW, sub *Z. italicum*), *Z. remotum* (BMNH, sub *Z. italicum*) and *Z. neapolitanum* (MNHN, sub *Z. gallicum*).

According to Denis (1935b) the types of *Z. obscurum* and *Z. vicinum* are in the MCSNG, but they are not available at the moment. At least we know that they will not be labelled as such, but will still carry the older labels of Dalmas (1922), who cited them first from Isola Giglio as *Z. italicum*.

Examining Caporiacco's types is equally difficult, as many of the Italian museums do not reply to requests for

material. I was able to examine the holotype of *Z. ruffoi*, but failed to examine the type material of *Z. denisi*.

All these difficulties explain why this revision of the genus *Zodarion* has been very time consuming. But thanks to abundant material from Italy, sent to me by various colleagues, I assume that I have correctly recognised all the species so far described. If ever the types of *Z. denisi*, *Z. obscurum* and *Z. vicinum* become available, conclusions different from mine could emerge. For the sake of stability, let us hope this will not be the case.

Material and methods

For a clear diagnosis of the genus *Zodarion*, I refer to the revision by Jocqué (1991) of the genera of the family Zodariidae.

I have tried to examine as many specimens as possible. Much of the material was collected by myself, and many colleagues loaned their material for study. As misidentifications occur regularly, I tried to verify all previously cited material. This was often impossible, and some records thus remain doubtful. In the following text, an unverified record is simply followed by the name of the author (white circles on the maps), whereas a verified record is followed also by the name of the institute or private collection where it is deposited (black circles on the maps). In the case of *Z. italicum*, for instance, the locality "Lozère: Florac (CJD, MNHNP; Denis, 1939a)" represents a verified record, whereas the locality "Hautes Alpes: Briançon (Simon, 1914; Denis, 1937a)" represents an unverified one. All distribution records from outside the study area are also included.

Left male palps are drawn in retrolateral and ventral view. Diagnostic characters are the shape of the tibia and its apophyses, the embolus and the retinaculum. As the retinaculum is attached by a membrane to the rest of the bulbus, its position is variable. The drawings always show the retinaculum in its resting position. Males collected in pitfall traps often have expanded palps, and in these specimens the retinaculum occupies a totally different position.

The external epigynes and cleared epigynes (vulvae) in clove oil are illustrated in ventral view. All measurements are in mm.

Abbreviations: Institutions: AMNH=American Museum of Natural History, New York; BMNH=Natural History Museum, London; IRSNB=Institut royal des Sciences naturelles de Belgique, Bruxelles; IZPAN=Instytut Zoologiczny, Polska Akademia Nauk, Warsaw; MCSNG=Museo Civico di Storia naturale, Genova; MCSNVn=Museo Civico di Storia naturale, Venezia; MCSNVr=Museo Civico di Storia naturale, Verona; MCZ=Museum of Comparative Zoology, Cambridge, Mass.; MHNG=Muséum d'Histoire naturelle, Genève; MNHNP=Muséum national d'Histoire naturelle, Paris; MRAC=Musée royal de l'Afrique Centrale, Tervuren; MSNM=Museo di Storia naturale, Milano; MZSF=Museo zoologico della "Specola", Firenze; NMB=Naturhistorisches Museum, Basel; NMW=Naturhistorisches Museum, Wien; SMF=Natur-Museum und Forschungsinstitut

Senckenberg, Frankfurt am Main; ZHHM=Zoological department of the Hungarian Natural History Museum, Budapest; ZMB=Zoologisches Museum, Berlin; ZMH=Zoologisches Museum, Hamburg.

Private collections: CAN=collection Aart Noordam; CCD=collection Christa Deeleman; CEB=collection Elisabeth Bauchhens; CFG=collection Fulvio Gasparo; CJD=collection Jacques Denis (in MNHNP); CHB=collection Hans-Jürgen Beck; CHS=collection Helmut Stumpf; CJB=collection Jan Bosselaers; CJBu=collection Jan Buchar; CJCL=collection Jean-Claude Ledoux; CJF=collection Jürgen Fischer; CJK=collection Johan Van Keer; CJFM=collection John & Frances Murphy; CJW=collection Jörg Wunderlich; CKH=collection Karl Herman Harms; CKT=collection Konrad Thaler; CPH=collection Peter Harvey; CPP=collection Piet Poot; CPS=collection Paul Selden; CRB=collection Robert Bosmans; CRJ=collection R. Jocqué; CSP=collection Stanislav Pekar; CTB=collection Theo Blick.

Legs: Co, Fe, Ti, Mt, Ta=coxa, femur, tibia, metatarsus, tarsus. Eyes and their position: AM=anterior median eyes; diameter taken as base for calculation of other distances, always=1.00; the absolute diameter (in mm) is given between brackets. AL, PM, PL=anterior lateral, posterior median and posterior lateral eyes; diameters expressed as fraction of AM diameter. a, b, c, d=distance between eyes: a=AM-AM; b=AM-AL, c=PM-PM; d=PM-PL, all expressed as fraction of AM diameter. MOQ=median ocular quadrangle (AW=anterior width, PW=posterior width, L=length).

Groups

Regarding male palps and female epigynes, the species of western and central Europe can be classified in the following groups:

elegans group:

Diagnosis: Males: Tibial apophysis much longer than wide, terminally toothed or recurved; retinaculum U-shaped, flat, distal part narrower and generally pointed; embolus with subterminal tooth. Females: Epigyne with wide, slit-like pit, separated from epigastric groove.

Species included: *Z. elegans* (Simon), *Z. affine* (Simon), *Z. beticum* Denis, *Z. diatretum* Denis, *Z. gracilitibiale* Denis, *Z. maculatum* (Simon), *Z. mallorca* Bosmans, *Z. marginiceps* Simon, *Z. pseudoelegans* Denis, *Z. murphyorum* Bosmans, *Z. vanimpei* Bosmans.

Distribution: Western Mediterranean.

germanicum group:

Diagnosis: Males: Tibial apophysis robust, as long as wide; retinaculum L-shaped, partly covered by protruding tegulum; embolus thread-like, hidden by tegulum. Females: Epigyne with postero-median incision, which limits a single pouch.

Species included: *Z. germanicum* (C. L. Koch), further species in the Balkans.

Distribution: Central and eastern Mediterranean.

pusio group:

Diagnosis: Males: Tibial apophysis as long as wide, recurved or with subterminal tooth; retinaculum U-shaped, distally pointed; tegulum bulging, partly covering embolus; embolus linear, without subterminal tooth. Females: Epigyne without pits, slit-like apertures, or ridges; often with postero-median incision.

Species included: *Z. pusio* Simon, *Z. emarginatum* (Simon), *Z. ruffoi* Caporiacco. Further species in the Balkans.

Distribution: Central and eastern Mediterranean.

rubidum group:

Diagnosis: Males: Tibial apophysis robust, as long as wide, mostly with subterminal tooth; retinaculum U-shaped, flat, distal part relatively wide; embolus wide, with subterminal tooth. Females: Epigyne with paired small pits (anchoring holes), often with antero-median ridge.

Species included: *Z. rubidum* Simon, *Z. alacre* (Simon), *Z. andalusiaceum* Jocqué, *Z. costablancae* Bosmans, *Z. couseransense* n. sp., *Z. fulvonigrum* (Simon), *Z. fuscum* (Simon), *Z. machadoi* Denis, *Z. minutum* Bosmans, *Z. timidum* (Simon), *Z. viduum* Denis.

Distribution: Western and central Mediterranean.

italicum group:

Diagnosis: Males: Tibial apophysis short, triangular, as wide or wider than long; retinaculum with basal part broader than triangular distal part; embolus without subterminal tooth, basal part often with ridges. Females: Epigyne without pit or slit-like apertures, with two parallel or converging chitinous sutures, limiting a square, trapezoid or triangular postero-median plate.

Species included: *Z. italicum* (Canestrini), *Z. caporiaccoi* Roewer, *Z. confusum* Denis, *Z. gallicum* (Simon), *Z. hamatum* Wiehle, *Z. isabellinum* (Simon), *Z. ludibundum* Simon, *Z. modestum* (Simon), *Z. nigriceps* (Simon), *Z. remotum* Denis, *Z. soror* (Simon), *Z. vicinum* Denis.

Distribution: Western and central Mediterranean.

styliferum group:

Diagnosis: Males: Tibial apophysis much longer than wide, terminally pointed or recurved, without teeth; retinaculum flat, distal part pointed, much wider than basal part; embolus with subterminal tooth. Females: Epigyne without pit or slit-like apertures, unchitinised or with poorly defined sutures limiting a square or rectangular plate.

Species included: *Z. styliferum* (Simon), *Z. algarvense* Bosmans, *Z. gregua* Bosmans, *Z. jozefienae* Bosmans, *Z. merlijni* Bosmans, *Z. rudyi* Bosmans, *Z. segurense* Bosmans.

Distribution: Western Mediterranean.

For the moment, *Z. frenatum* Simon and *Z. sardum* sp. n. are not classified in any group.

Description of species

The following species are included in this paper:

- Zodarion elegans* (Simon): p. 267
Zodarion gracilitibiale Denis: p. 270
Zodarion maculatum (Simon): p. 270
Zodarion pseudoelegans Denis: p. 270
Zodarion marginiceps Simon: p. 270
Zodarion frenatum Simon: p. 271
Zodarion sardum sp. n.: p. 273
Zodarion germanicum (C. L. Koch): p. 273
Zodarion pusio Simon: p. 274
Zodarion emarginatum (Simon): p. 276
Zodarion ruffoi Caporiacco: p. 276
Zodarion fulvonigrum (Simon): p. 277
Zodarion timidum (Simon): p. 277
Zodarion rubidum Simon: p. 277
Zodarion fuscum (Simon): p. 279
Zodarion couseransense sp. n.: p. 279
Zodarion nigriceps (Simon): p. 279
Zodarion soror (Simon): p. 280
Zodarion ludibundum Simon: p. 281
Zodarion caporiaccoi Roewer: p. 281
Zodarion hamatum Wiehle: p. 283
Zodarion italicum (Canestrini): p. 284
Zodarion confusum Denis: p. 288
Zodarion vicinum Denis: p. 288
Zodarion remotum Denis: p. 289
Zodarion gallicum (Simon): p. 290

***Zodarion elegans* (Simon, 1873) (Figs. 1–3, 77–78, Map 1)**

Enyo elegans Simon, 1873: 56; 1874: 244; Pavesi, 1875: 121; 1876: 435; 1880: 336; 1884: 451.

Zodarion (-um) elegans; Simon, 1885: 29; Chyzer & Kulczynski, 1897: 149; Simon, 1898: 2; 1899: 83; 1914: 227, 234; Reimoser, 1919: 132; Dalmas, 1922: 85; Reimoser, 1929: 206; 1930: 147; Bristowe, 1935: 754; Denis, 1933: 554; 1934a: 329; 1934b: 149; 1935b: 69; 1937a: 7; Caporiacco, 1949: 254; Kraus, 1955: 378; Kritscher, 1960: 103; Denis, 1967b: 36; Kritscher, 1969: 277; Canard, 1989: 19; Hansen, 1991: 12; Thaler & Zapparoli, 1993: 309.

Zodarion elegans simplicior Simon, 1914: 227, 234 (descr. ♀); Caporiacco, 1928: 126; Denis, 1936: 137; 1937a: 8; 1950: 77; 1967b: 36; Kritscher, 1969: 227. **Syn. n.**

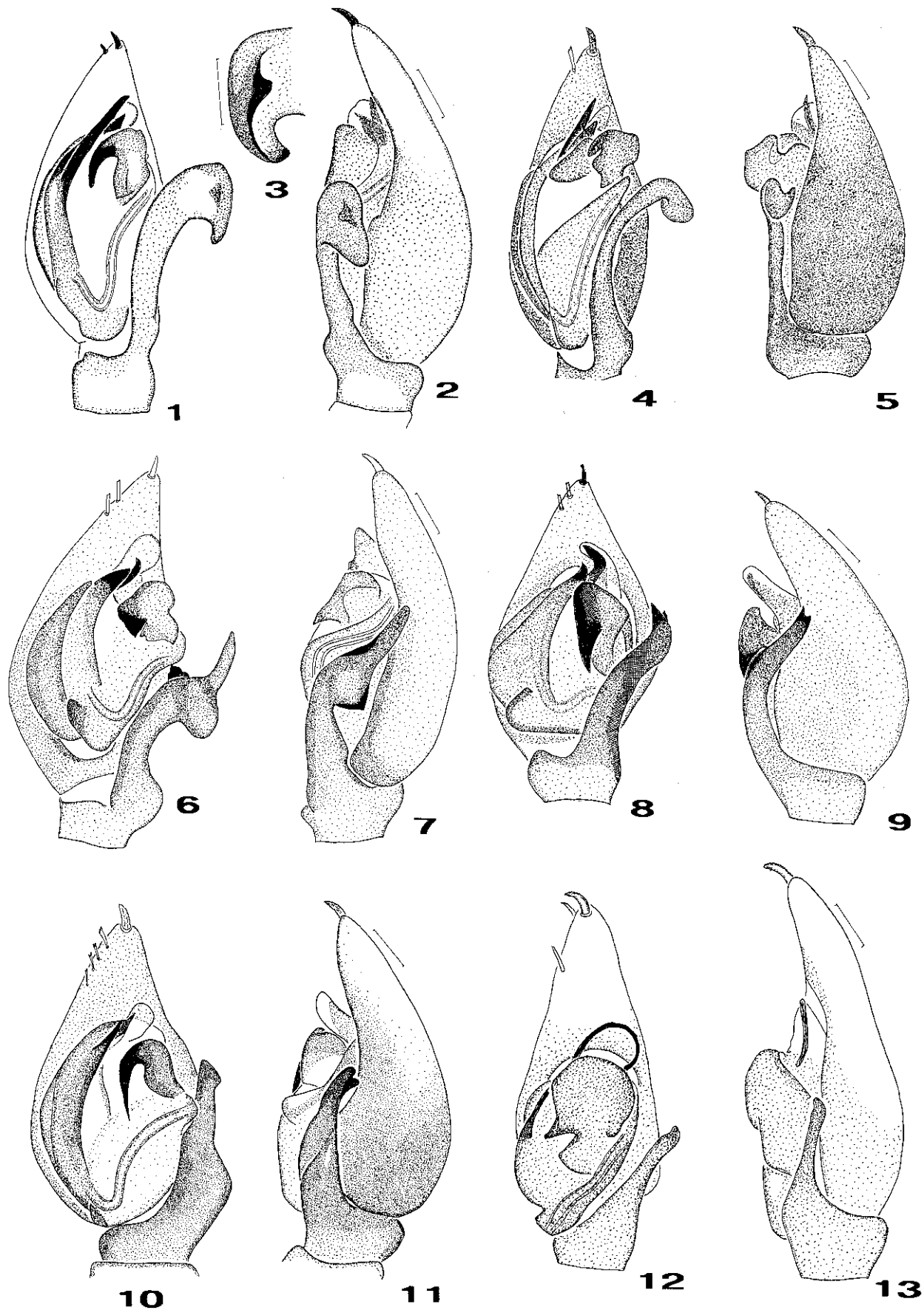
Zodarion elegans maculisternum Caporiacco, 1950: 68 (descr. ♀). **Syn. n.**

Type material: Type series of *Z. elegans*, several hundreds of ♂♂ and ♀♀, from “France, Corse” (MNHNP AR2853), examined. Female holotype of *Z. elegans simplicior* from France, Mont Lubéron (MNHNP 25212); 13 juvenile paratypes; examined.

Diagnosis: Easily recognised by the contrasting prosoma, and further by the long tibial apophysis with internal tooth in the male and the deeply incised posterior margin of the epigynal pit in the female.

Remarks: *Z. elegans simplicior* Simon and *Z. elegans maculisternum* Caporiacco are simply colour variations.

Description: Male: Total length 2.3–3.1; prosoma 1.32–1.64 long, 0.96–1.18 wide. Colour: Prosoma with dark brown cephalic part, and yellowish brown thoracic part; Fe I-II and small distal part of Fe III-IV dark



Figs. 1–13: Male palps. 1–3 *Zodarion elegans* (Simon). 1 Ventral view; 2 Retrolateral view; 3 Distal part of tibial apophysis, dorsal view. 4–5 *Zodarion gracilitibiale* Denis. 4 Ventral view; 5 Retrolateral view. 6–7 *Zodarion maculatum* (Simon). 6 Ventral view; 7 Retrolateral view. 8–9 *Zodarion pseudoelegans* Denis. 8 Ventral view; 9 Retrolateral view. 10–11 *Zodarion marginiceps* Simon. 10 Ventral view; 11 Retrolateral view. 12–13 *Zodarion frenatum* Simon. 12 Ventral view; 13 Retrolateral view. Scale lines=0.1 mm.

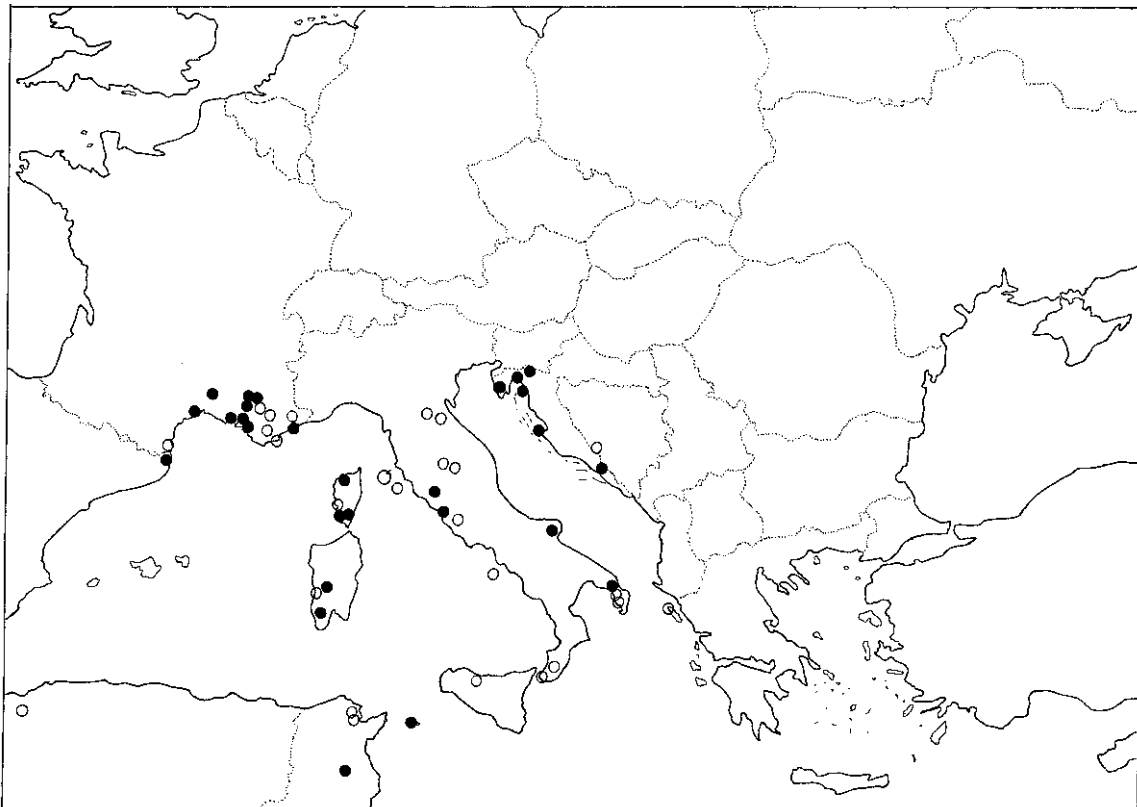
brown, other parts of legs pale yellowish; abdomen dark sepia, postero-dorsal spot and venter whitish. Eyes: AM=1 (0.11); AL=0.91, PM=0.57, PL=0.86; a=0.52, b=0.24, c=1.52, d=0.24; MOQ: AW=0.98PW, L=0.94PW. Palp (Figs. 1–3): Tibial apophysis strongly elongated, with large, rounded terminal knob with internal tooth; retinaculum with broad basal part, and small, pointed distal part; embolus terminally bifurcate.

Female: Total length 2.8–3.8; prosoma 1.42–1.68 long, 1.02–1.16 wide. Further as male. Epigyne (Fig. 77): With large median pit, posterior border of pit marked by a deep incision. Vulva (Fig. 78): Spermathecae complicated, with strong lateral lobe.

Other material examined and citations: SPAIN: *Gerona*: Empuria Brava, 1♂, along Rio Muga, 26 June 1995, R. Van Keer leg. (CJK). FRANCE: *Alpes maritimes*: Nice (Simon, 1914). *Basses Alpes*: Manosque (Simon, 1914). *Bouches du Rhone*: Camargue, 1♂ 2♀ sub *Z. elegans*, 1♂ sub *Z. elegans simplicior* (CJD; Denis, 1950); La Crau, 2♀, 8 April 1989, P. Poot leg. (CPP); Petite Camargue, 1♂, 15 May 1989, P. Poot leg. (CPP); Ulmet, dunes (Denis, 1950, sub *Z. e. simplicior*). *Corsica*: without further locality (Simon, 1873; Kraus, 1955); 1♂ 1♀, labelled “Corsica” (MCZ); 1♂ 1♀, labelled “typus-miss. E. Simon 1872” (MCSNG); Ajaccio (Simon, 1914); Baie de Tizzano, 1♀, July 1973, R. De Blauwe leg. (IRSNB); Bonifacio (Denis, 1937a); Sartène, 1♀ (MNHNP AR1528; Denis, 1937a); Cateri, 370 m, 1♀, 23 May 1995 (CRB). *Gard*: Anduze, 1♂, 26 August 1989, J. Van Keer leg. (CJK); Aramon, Moure Pluma, 1♂, 1 May 1990, J. C. Ledoux leg. (CJCL); Domazan, 1♂, June 1980, J. C. Ledoux leg. (CJCL). *Hérault*: Montpellier, Celleneuve, 1♀, 11 November 1962, J. C. Ledoux leg. (CJCL). *Pyrénées Orientales*: Banyuls (Denis, 1933, 1967b). *Var*: Callian (Denis, 1936, sub *Z. e. simplicior*); Collobrières (Simon, 1898); Fréjus, 2♀, September 1968, J. C. Ledoux leg. (CJCL); Port-Cros (Denis, 1934b). *Vaucluse*: E. Cavaillon, Courmarins, 1♂ 2♀, 14 September 1984, J. De Laet leg. (CRB); Mont Lubéron (Simon, 1914); Rousillon, 1♂, 16 May 1989, P. Poot leg. (CPP). ITALY: *Isola Pantelleria*, 1♀, July 1987, Hansen leg. (MCSNVn; Hansen, 1991). *Calabria*: Reggio di Calabria, Aspromonte (Denis, 1935b; Kritscher,

1960); Lazzaro (Kritscher, 1969, sub *Z. e. simplicior*). *Campania*: Isola Capri (Pavesi, 1875). *Romagna*: Forli: without further locality (Caporiacco, 1949); Monte Poggiolo (Caporiacco, 1949); Vecchiazzano (Caporiacco, 1949). *Lazio*: Roma: Palo Laziale, 1♂ 1♀, 1 October 1981, Calvario & Ruvolo leg. (CKT); Roma (Denis, 1935b). Viterbo: Canino, 1♀, pitfall in olive grove, August–September 1988, Zapparoli leg. (Thaler & Zapparoli, 1993; CKT). *Puglia*: Foggia: Monte Gargano, Carpino, 1♀, 16 September 1978 (CKT). Taranto: Falsone (Kritscher, 1969, sub *Z. elegans* and *Z. e. simplicior*); Mottola, 1♂ 2♀, 6 June 1962, H. Levi leg. (MCZ); Sava (Kritscher, 1969); Taranto (Kritscher, 1969, sub *Z. e. simplicior*). *Sardinia*: Domusnovas, 1♂ (CJW); Oristano (Denis, 1937a); Sorgono, 4 juv., sub *Z. nigriceps*, Reimoser det. (MCZ). *Sicily*: without further locality (Simon, 1873); Palermo (Pavesi, 1876). *Toscana*: Isola Giglio (Dalmas, 1922); Isola Capraja (Caporiacco, 1928). *Umbria*: Perugia (Caporiacco, 1950, sub *Z. e. simplicior*); Torricella near Lago Trasimeno (Caporiacco, 1950). CROATIA: *Dalmatia*: 1♂ 1♀, Schumacher-Spaney leg., 6 June 1911 (ZMB). *Istria*: S.E. Pula, 1♀, 26 June 1962, H. Levi leg. (MCZ). Buccari, near Rijeka, 7♂ 6♀ (IZPAN; Chyzer & Kulczynski, 1897); Carlopago (Chyzer & Kulczynski, 1897); Crkvenica (Chyzer & Kulczynski, 1897); Hum, Lissa (Reimoser, 1919); Split (Spalato), 1♂ (MNHNP AR2856; Denis, 1937a) and 1♂, 17 June 1962, H. Levi leg. (MCZ); Veglia, Island Krk, 4♂ (IZPAN); Vrana lake (Reimoser, 1929); Zara, Zadar, 7♂ (IZPAN); near Zadar, 2♀, 18 June 1962, H. Levi leg. (MCZ). GREECE: Corfu (Reimoser, 1930; Bristowe, 1935). ALGERIA: Oulad Messelem (Simon, 1899); Tlemcen (Denis, 1937a). TUNISIA: Bir-el-Buita (Pavesi, 1880); Djebel Ressay, 1♂, 22 February 1960 (AMNH); Kairouan, 3♂ 2♀ (MNHNP 22787) and 2♀, P. Santschi leg. (MNHNP 24144); La Goulette (Simon, 1885); Tunis (Pavesi, 1884).

Distribution (Map 1): A female from Spain (Pozuelo de Calatrava, NMB) identified as *Z. elegans* (Fuente, 1898) appears to belong to *Z. styliferum* (Bosmans, 1994). Its presence in Spain was however recently confirmed by Van Keer’s capture in Gerona in the north-east. The two females cited by Kritscher (1960) from the south of Italy belong to *Z. frenatum*. Drensky’s citations (1936) from Bulgaria refer to *Z. pirini* Drensky



Map 1: Distribution of *Zodarion elegans* (Simon). Black circles=verified records; white circles=unverified records.

(Deltshev, 1987). Reimoser's citation (1930) from Greece, Corfu requires confirmation. There are no recent records of the species in Algeria, and the cited specimens could not be verified. Citations from Portugal (Vieira, 1893; Bacelar, 1928), the Netherlands (Van Hasselt, 1898) and Palestine (Bodenheimer, 1935) are also considered incorrect.

I have examined material from NE Spain, SE France, Corsica, central and S. Italy, Croatia and Tunisia. The distribution area of this species is thus not so wide as supposed, as citations from central Spain, Bulgaria and probably Algeria and Greece are likely to be incorrect.

***Zodarion gracilitibiale* Denis, 1934** (Figs. 4–5, Map 2)

Zodarion gracilitibiale Denis, 1934a: 330 (descr. ♂); 1935c: 107; 1937a: 34.

Type material: Lectotype ♂ from France, Var, La Garde near Toulon (MNHNP), by present designation; 3♂ paralectotypes, same data (MNHNP). In the original description, Denis (1934a) mentions the same 4 males and indicates that he selected one as "type"; apparently this has not been done, as the four males are together in the same tube.

Diagnosis: Easily recognised by the elongated, terminally recurved, toothless tibial apophysis. Several closely related, undescribed species occur in North Africa.

Description: Male: Total length 2.5–3.4; prosoma 1.50–1.86 long, 1.02–1.30 wide. Colour: Prosoma dark brown, striae and margin nearly black; legs yellowish brown, Fe I and basal part of Fe II–IV blackish brown;

abdomen dorsally dark sepia-brown, with rounded whitish oval spot above spinnerets. Eyes: AM=1 (0.1); AL=PM=PL=0.7; a=0.6, b=0.4, c=1.4, d=0.3. Palp (Figs. 4–5): Tibial apophysis strongly elongated, its tip recurved and with anterior concavity; retinaculum broad, with small mesal incision; embolus pointed, accompanied by a longer, sharper embolar tooth.

Female: Unknown.

Other material examined: None.

Distribution (Map 2): Only known from the type locality in the Var department in France.

***Zodarion maculatum* (Simon, 1870)** (Figs. 6–7, 79–80)

Enyo maculata Simon, 1870: 146.

Zodarion maculatum; Bosmans, 1994: 127.

Description: See Bosmans (1994). Palp: Figs. 6–7. Epigyne, vulva: Figs. 79–80.

Distribution: NW Morocco, S. Spain, Portugal, Sicily.

***Zodarion pseudoelegans* Denis, 1933** (Figs. 8–9, 83–84)

Zodarion marginiceps pseudoelegans Denis, 1933: 555.

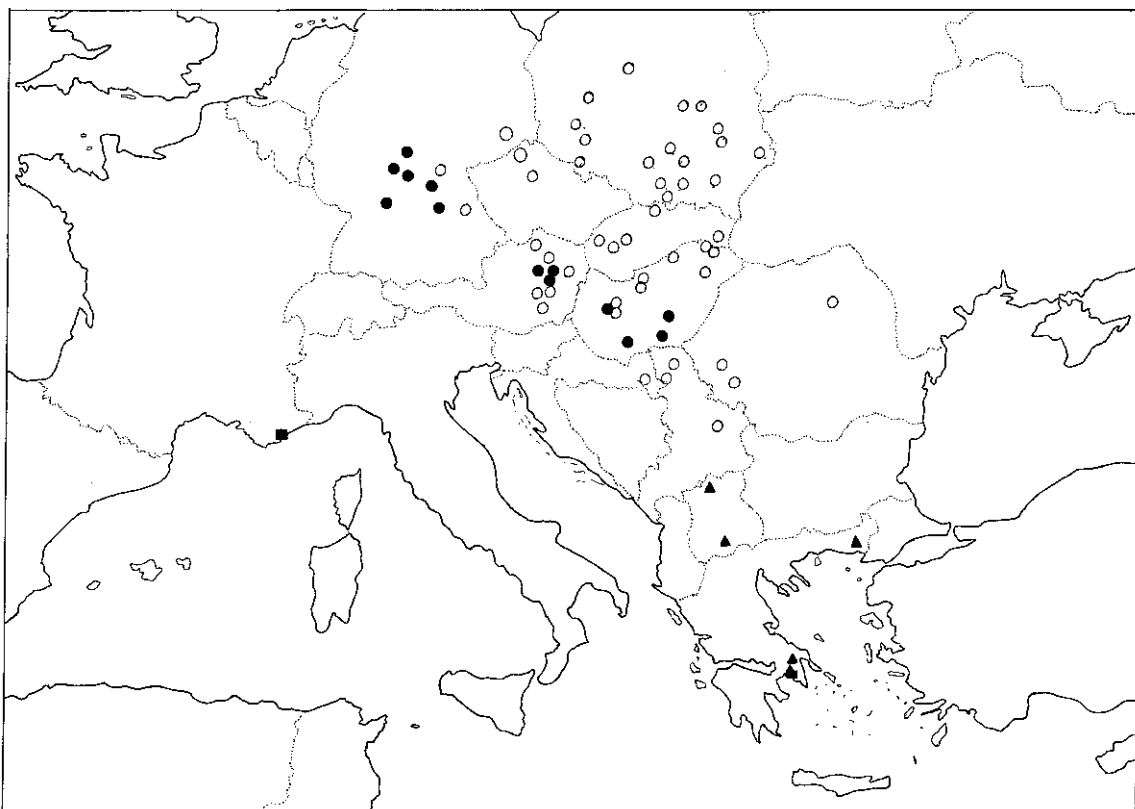
Zodarion pseudoelegans; Bosmans, 1994: 124.

Description: See Bosmans (1994). Palp: Figs. 8–9. Epigyne, vulva: Figs. 83–84.

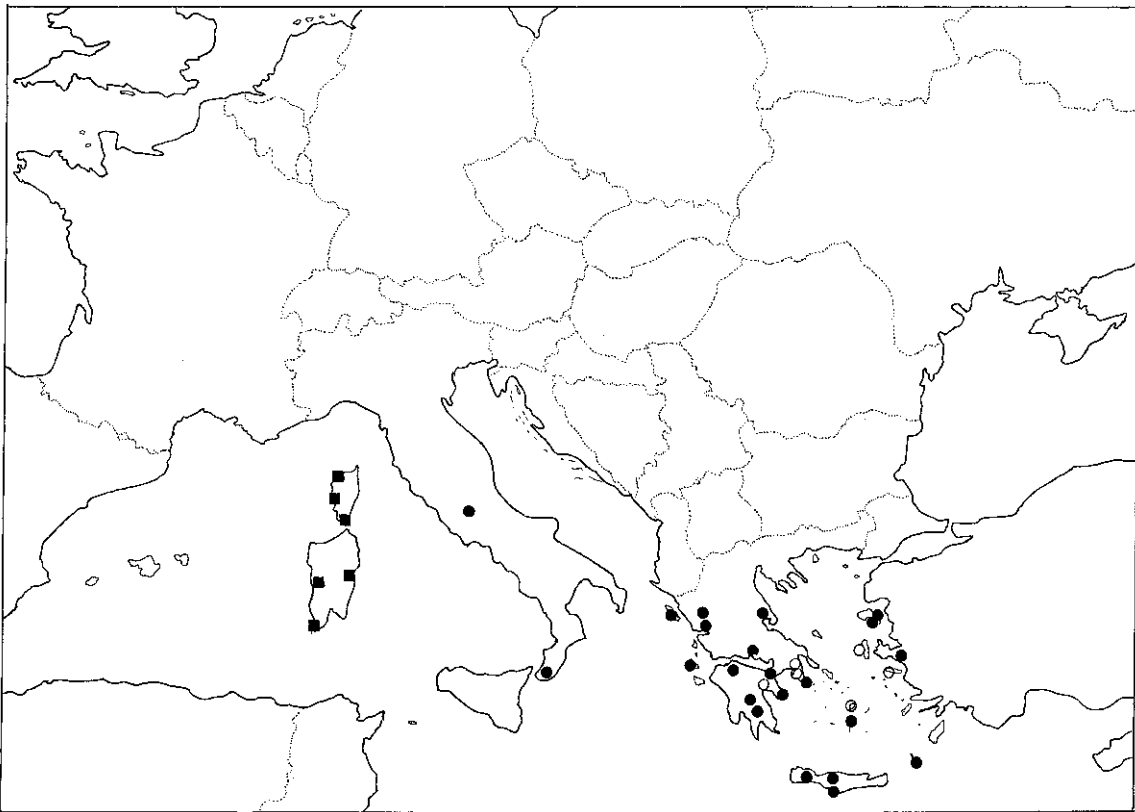
Distribution: SE France, NE Spain, Ibiza.

***Zodarion marginiceps* Simon, 1914** (Figs. 10–11, 81–82)

Zodarion marginiceps Simon, 1914: 228; Bosmans, 1994: 122.



Map 2: Distribution of *Zodarion gracilitibiale* Denis (square) and *Z. germanicum* (C. L. Koch) (circles and triangles). Black circles and square=verified records; white circles=unverified records; triangles=doubtful records.



Map 3: Distribution of *Zodarion frenatum* Simon (circles) and *Z. nigriceps* (Simon) (squares). Black circles and squares=verified records; white circles=unverified records.

Description: See Bosmans (1994). Palp: Figs. 10–11. Epigyne, vulva: Figs. 81–82.

Distribution: Eastern and central Pyrénées.

***Zodarion frenatum* Simon, 1884** (Figs. 12–13, 85–86, Map 3)

Zodarion (-um) *frenatum* Simon, 1884: 336 (descr. ♂); Fage, 1921: 174 (descr. ♀); Bristowe, 1935: 754; Drensky, 1936: 30; Denis, 1937a: 39; Hadjissarantos, 1940: 33; Wunderlich, 1980a: 240; Thaler & Zapparoli, 1993: 309.

Zodarion (-um) *creticum* Roewer, 1928: 119 (descr. ♂); Denis, 1937a: 42; Hadjissarantos, 1940: 33.

Zodarion rhodiense rhodiense Caporiacco, 1948: 47 (♀ only).

Zodarion italicum; Caporiacco, 1929: 230; Kritscher, 1958: 569 (misidentifications).

Zodarion elegans; Kritscher, 1960: 106 (misidentification).

Zodarion ionicum Brignoli, 1984: 314 (descr. ♀). **Syn. n.**

Type material: Holotype ♂ of *Z. frenatum* from Greece, Naxos (Coll. Keyserling; not examined); 1 subadult ♂ (MNHNP AR2850). Holotype ♂ of *Z. creticum* from Crete, Khamia, Omalos (ZMF, examined; Roewer, 1928; Wunderlich, 1980a). Holotype ♀ of *Z. ionicum* from Greece, Kefallinia, Agona, road to Livadion (MHNG; examined). Paratypes of *Z. ionicum*: Samos: between Dichalia and Agrilion, 1♀ (Coll. Brignoli, not examined; Brignoli, 1984); Corfu: SE Kassiope, 1♀ (MHNG, examined); Epiro: Arta, near Anemorakhi, 1♀ (MHNG, examined); Peloponnisos: Akhaia, gola di Kalavrita, 1♀ (MHNG, examined).

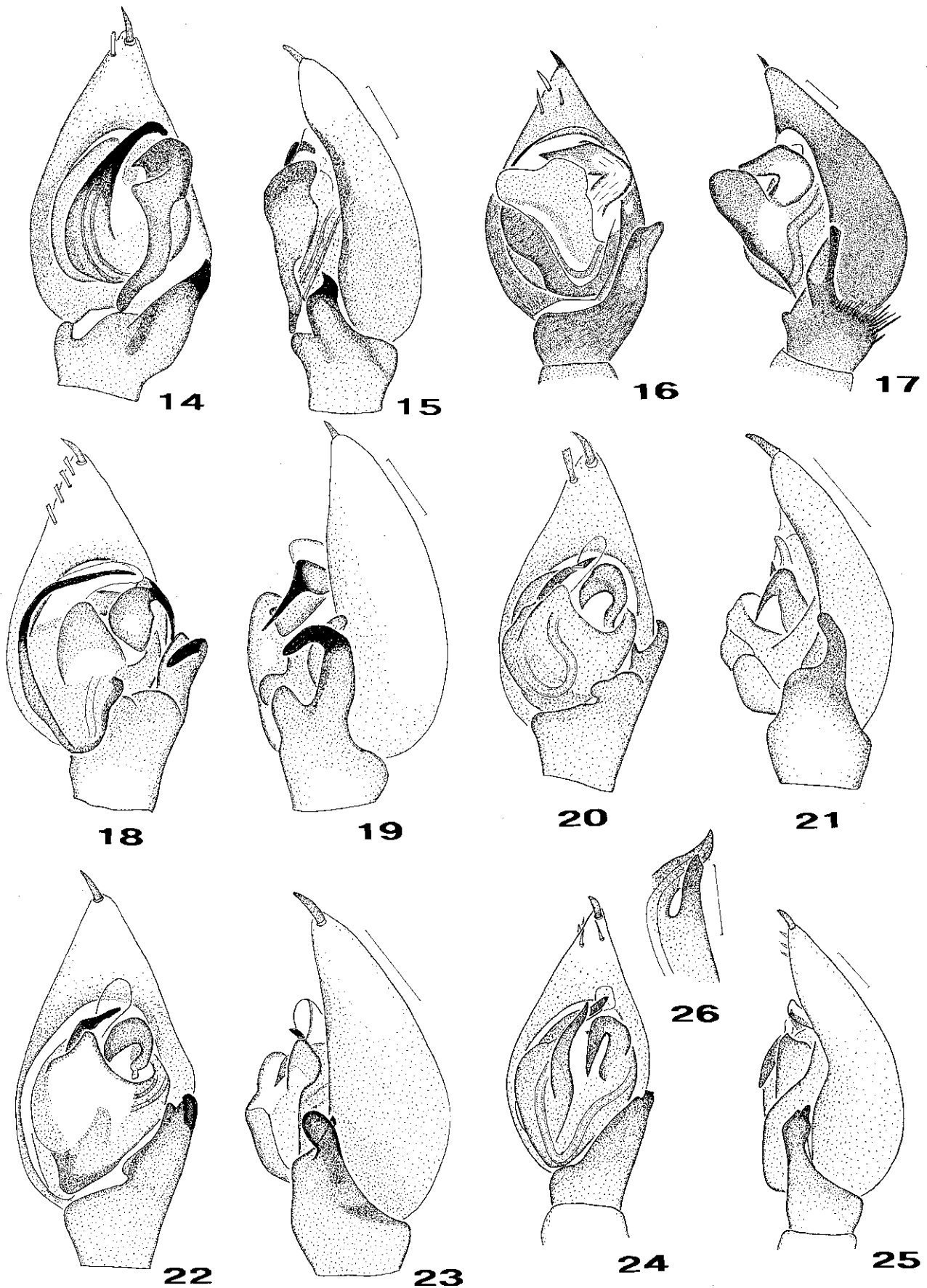
Diagnosis: This large species is easily recognised by the V-shaped dark spot on the prosoma. Males are also distinguished by the long and linear tibial apophysis, the

very large retinaculum and the linear embolus. Females are recognised by the absence of pits or depressions in the epigyne, and by the widely separated, small spermathecae.

Remarks on synonymy and misidentifications: In this revision of the genus *Zodarion*, Denis (1937a) states that the female of *Z. frenatum* is unknown. However, already in 1921, Fage had described the female and illustrated the epigyne. This had been overlooked by Denis, and hence Brignoli (1984) described the “unknown” female as *Zodarion ionicum*; this therefore becomes a junior synonym of *Z. frenatum*. Caporiacco’s figure of the female of *Z. rhodiense* (1948) undoubtedly also refers to *Z. frenatum*. In a footnote (page 48), Caporiacco writes that the specimen cited by him from Koschino (Chios) as *Z. italicum* in 1929 belongs to the same species; *Z. frenatum* thus occurs on Chios as well.

Description: Male: Total length 2.8–3.6; prosoma 1.42–1.82 long, 1.07–1.36 wide. Colour: Prosoma yellowish brown, eye region and V-shaped spot on cephalic part dark brown. Fe I-II dark brown, laterally streaked with yellowish orange; other segments and legs III-IV yellowish orange. Abdomen dark purplish brown, subterminal elongated spot, oblique lateral stripe and venter cream white. Eyes: AM=1 (0.12); AL=0.75, PM=0.58, PL=0.58; a=0.58, b=0.25, c=2.08, d=0.5; MOQ: AW=0.84PW, L=0.82PW. Palp (Figs. 12–13): Tibial apophysis long and linear with blunt tip. Retinaculum with wide, flattened basal part, distal part with sharp tooth. Embolus linear, nearly semi-circular.

Female: Total length 3.6–5.6; prosoma 1.51–2.21 long, 1.10–1.54 wide. Further as male. Epigyne (Fig. 85):



Figs. 14–26: Male palps. 14–15 *Zodarium sardum*, sp. n. 14 Ventral view; 15 Retrolateral view. 16–17 *Zodarium germanicum* (C. L. Koch). 16 Ventral view; 17 Retrolateral view. 18–19 *Zodarium pusio* Simon. 18 Ventral view; 19 Retrolateral view. 20–21 *Zodarium emarginatum* (Simon). 20 Ventral view; 21 Retrolateral view. 22–23 *Zodarium ruffoi* Caporiacco. 22 Ventral view; 23 Retrolateral view. 24–26 *Zodarium fulvonigrum* (Simon). 24 Ventral view; 25 Retrolateral view; 26 Terminal part of embolus, ventral view. Scale lines=0.1 mm.

Without pits or depressions. Median plate whitish, oval, anteriorly bordered by a semi-circular, hardly chitinised suture. Vulva (Fig. 86): Spermathecae small, bilobed, separated by twice their maximal diameter.

Other material examined and citations: GREECE: *Argolis:* Thermissa, 7♂ 1♀, in pitfalls in abandoned field, 25 June 1993, N. Chatelet leg. (CRB). *Attica:* Marathon; Melissa; Pikermi; Barei; Pschikon (all Hadjissarantos, 1940); Podoniftos, Tourkolimano, Dairion (all Hadjissarantos, 1940, sub *Z. creticum*); Thoriko, 3♂ 4♀, P. Goemaere leg. (CRB). *Crete:* Iraklion: Matala, 3♀, in maquis near sea, 9 April 1995, Jan Bosselaers leg. (CJB); Rethimnon: Melidoni, 1♀, 16 March 1981 (CCD). *Epiro:* Xerovouni (NMW; Kritscher, 1958, sub *Z. italicum*). *Cyclades:* Naxos (Fage, 1921); Paros, 4♀, Gück & Steinmetz leg.; Santorini, 1♂, Schmallfusz leg. (CJW). *Fokis:* 2 km E. of Itea, 6♀, 28 April–2 May 1994, A. Noordam leg. (CAN). *Lesbos:* Vatera, sand beach, 1♀, 24 May 1994, A. Noordam leg. (CAN); Mytilini, 1♀, 26 May 1994, A. Noordam leg. (CAN). *Macedonia:* without locality (Fage, 1921). *Peloponnisos:* *Argolis:* Navplios (Bristowe, 1935); Korinthia: Loutraki, 1♀, 24 April 1994, E. Heiss leg. (CKT); Sparti: Taigetos, Anavriti, 1200 m, 1♀, 29 April 1994, E. Heiss leg. (CKT); Taigetos, M. Pan i Giatrissa, 1100 m, 1♀, B. Knoflach & K. Thaler leg. (CKT). *Rhodos:* without further data, ♀ (Caporiacco, 1948, sub *Z. rhodiense*). *Sporades:* Karpathos: southern part of island, 1♀, 18 April 1984 (CCD); Chios (Koschino) (Caporiacco, 1929, sub *Z. italicum*). *Thessalia:* Magnisia: Volos, 1♀ (Fage, 1921; MNHNP 2851). ITALY: *Calabria:* Aspromonte, 2♀ (NMW; Kritscher, 1960, sub *Z. elegans*), *Lazio:* Viterbo: Viterbo, 5♂ 1♀, pitfalls in olive grove, August–September 1988 (CKT; Thaler & Zapparoli, 1993). TURKEY: S. Izmir, between Selçuk and Kuşadası, 3♂ 1♀, 2 July 1968, R. De Blauwe leg. (IRSNB).

Distribution (Map 3): Southern Italy, Greece, W. Turkey.

Zodarion sardum, sp. n. (Figs. 14–15, Map 4)

Zodarion vicinum; Wunderlich, 1973: 171 (descr. ♂).

Type material: Holotype ♂ from Sardinia, H. Malicky leg. (SMF 28305; Wunderlich, 1973).

Remarks: Wunderlich (1973) described with doubt a male from Sardinia as the unknown male of *Z. vicinum*. It appears now that it concerns a new species, described below.

Diagnosis: The male of this species is easily distinguished by the elongated basal part of the retinaculum. It is closely related to *Z. aculeatum* Chyzer, from which it differs by the minutely denticulated median part of the retinaculum.

Etymology: The species is named after the type locality, Sardinia.

Description: Male: Total length 2.7; prosoma 1.47 long, 1.10 wide. Colour: Prosoma yellowish orange with small grey spots before fovea; legs yellowish orange; abdomen dark sepia-brown, venter and large postero-dorsal spot whitish. Eyes: AM=1 (0.1); AL=PM=PL=0.55; a=0.6, b=0.2, c=2, d=0.4; MOQ: AW=0.82PW, L=0.94PW. Palps (Figs. 14–15): Tibial apophysis pointed, subterminally curved; retinaculum with strong, basal prolongation; embolus gradually narrowing, rounded terminally.

Female: Unknown.

Other material examined: None.

Distribution: Only known from the type locality: Sardinia, Italy.

Zodarion germanicum (C. L. Koch, 1837) (Figs. 16–17, 87–88, Map 2)

Lucia germanica C. L. Koch, 1837: 20.

Argus germanica; Walckenaer, 1841: 508.

Enyo germanica; C. L. Koch, 1843: 80; Kulczynski, 1872: 3; Simon, 1873: 62; Kulczynski, 1876: 51.

Zodarion (-um) germanicum; Chyzer & Kulczynski, 1897: 148; Kulczynski, 1898: 13; Bösenberg, 1902: 220; Roewer, 1928: 119; Drensky, 1928: 187; Stojicevic, 1929: 41; Schenkel, 1929: 335; Nielsen, 1932: 106; Denis, 1937a: 35; Balogh, 1938: 259; Hadjissarantos, 1940: 34; Stadler & Schenkel, 1940: 9; Balogh & Loksa, 1946: 12; Tretzel, 1952: 96; Wiehle, 1953: 47; Wiehle & Franz, 1954: 476; Kritscher, 1955: 2; Buchar, 1961: 97; Miller, 1971: 57; Malicky, 1972: 115; Staręga, 1976: 239; 1983: 168, 222; 1984: 84, 127; Svaton, 1984: 233; Bauchhenss & Scholl, 1985: 11; Gajdos, 1987a: 214; 1987b: 52; Horak, 1987: 176; 1988: 197; Wozny *et al.*, 1988: 75; Thaler & Noflatscher, 1990: 172; Gajdos, 1992: 118.

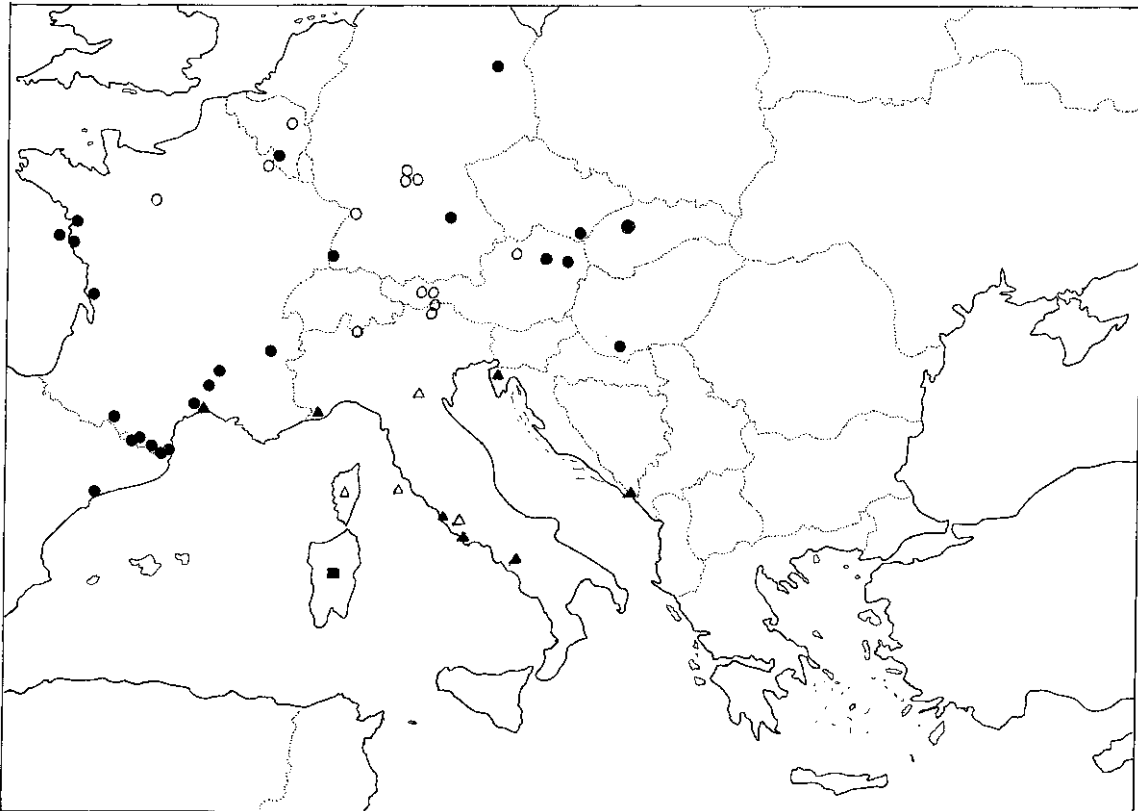
Type material: I consider specimens from the type locality identified by C. L. Koch as part of the type series. They are as follows: Germany, Bayern: Nürnberg, 1♂ (MNHNP, donated by C. L. Koch); idem, 1♂ 1♀ (NMW, donated by C. L. Koch).

Diagnosis: Males of this species are easily recognised by the bulging tegulum, and the L-shaped retinaculum; females by the shape of the postero-median incision of the epigyne.

Description: Male: Total length 3.6–3.8; prosoma 1.70–1.82 long, 1.22–1.30 wide. Colour: Prosoma dark brown. Legs: coxae and trochanters pale yellowish brown; femora dark brown, other segments yellowish brown, often with darker spots and streaks. Abdomen dark sepia-brown, venter whitish. Eyes: AM=1 (0.1); AL=PM=PL=0.6; a=0.7, b=0.3, c=2.2, d=0.6; MOQ: AW=0.87PW, L=0.72PW. Palp (Figs. 16–17): Tibia dorsally with some stout spines, its apophysis slightly curved and bluntly pointed. Tegulum strongly protruding, partly covering retinaculum and embolus; retinaculum L-shaped; embolus thread-like.

Female: Total length 3.8–4.8; prosoma 1.80–1.96 long, 1.32–1.34 wide. Further as male. Epigyne (Fig. 87). With large, postero-median incision; postero-median plate, at its dorsal side strongly excavated and forming a large pouch. Vulva (Fig. 88): Spermathecae rather wide, separated by 1.5 × their diameter, connected by semi-circular ducts to the copulation pores.

Other material examined and citations: GERMANY: Without exact locality, 1♂ 2♀ (MCZ). *Baden-Württemberg:* Vaihingen-Enz (CEB; Bauchhenss & Scholl, 1985). *Bayern:* Mittelfranken: Eltersdorf (Denis, 1937a); Erlangen, 2♂ 2♀ (AMNH; Tretzel, 1952); Erlangen, Tennenhohe, 2♂ 1♀ (CJF); Roth in Franken (Bellman, 1984). *Oberfranken:* Frankischer Schweiz (CTB; Bösenberg, 1902, Wiehle, 1953). *Oberpfalz:* Regensburg (C. L. Koch, 1837). *Unterfranken:* Gemünden, Karsbach, 4♂, 14 June–10 July 1991 (CHS); Kitzingen, Hellmitzheim, 70♂ 10♀, 28 April–6 July 1990 (CHS); Klosterforst, 1♀, 26 May–26 June 1987 (CHS); Schwanberg, 1♀ 1 July–3 August 1987 (CHS); Steinbachtal (Stadler & Schenkel, 1940); Steinbach/Main, 5♂ 2♀, June 1980 (ZMH; Bauchhenss & Scholl, 1985); Volkach/Main, 4♂ 2♀, 29 April–28 July 1984. *Dresden:* Lausitz, 1♂, Zimmermann leg. (ZMB). *POLAND:* According to Staręga (1984) in Częstochowa, Jelenia Góra, Kielce, Kalisz, Kraków, Lublin, Nowy Sącz, Poznań, Siedlce, Toruń, Warszawa, Walbrzych and Wrocław. *Schlesien:* Spindelmühle, 1♂, F. Dahl leg. (ZMB). *Riesengebirge:* 4♀ (NMB; Schenkel, 1929), 1♀, Nielsen leg. (MNHNP; Nielsen, 1932). *Galicia, Skaly Panienskie:* Radwanowice (Kulczynski, 1872); Rządki gatunek,



Map 4: Distribution of *Zodarion sardum*, sp. n. (square), *Z. pusio* Simon (triangles) and *Z. rubidum* (circles). Black square, circles and triangles=verified records; white circles and triangles=unverified records.

Bielany (Kulczynski, 1876). *Sudety Zachodnie*: Karkonosze (Schenkel, 1929); Pogorza Walbrzyskiego (Wozny *et al.*, 1988). *Pieniny*: Czertezik; Długi Gronik (Staręga, 1972). *Facimiech*: Sokolocia; Trzy Konrony; Zawiesy; Podlazel (Staręga, 1976). *Siedlce*: Bialki (Staręga, 1984). *Torun*: Zakladow, Torun-Glinki (Staręga, 1984). AUSTRIA: *Bürgenland*: Ruster, N. Grundgraben, 1♂, 7 September 1963 (NMW); Leithagebirge: 150–400 m (Kulczynski, 1898); Martalwald, 1♂, 25 May 1969, Grüber leg. & det. (NMW). *Nieder Osterreich*: Anninger (Kulczynski, 1898); Dürnstein, Wachau, 3♂ 1♀ (Malicky, 1972; CJW); Gaisberge (Kulczynski, 1898); Hündsheimerberg (Malicky, 1972); Lindkogel (Kulczynski, 1898); Mahlzeitenberg (Malicky, 1972); Pfarrenzgraben bei Purbach (Wiehle & Franz, 1954); Wien, Leopoldsberg, 220 m, 3♂ 2♀ (NMW); idem, Kulczynski, 1898; Mödling, Kalandenberg, 3♂ 2♀ (NWM); Wiener Wald, Königstetten, 1♂, 22 June 1975 (NWM); Wiener Wald, Gieszhübel NW Mödling (Wiehle & Franz, 1954). *Steiermark*: Graz, Kansel (Horak, 1987); Semmering, Adlitzgraben (Wiehle & Franz, 1954); Weiz, Weissklamm, Raabklamm (Horak, 1988); Wetzelsdorf bei Graz (Wiehle & Franz, 1954). CZECH REPUBLIC: *Ceвероcesk*: Luzicke (Bösenberg, 1902). *Středočesk*: Doutnac, near Karlstejn (Buchar, 1961). SLOVAKIA: *Vápadoslovenska*: Hrdovicka-Tribec mountains, N. Nitra (Gajdos, 1992); Stiavnica Hills, Holik (Gajdos, 1987); Veclar natural reserve, between Obyce and Jedleve Kostolany (Gajdos, 1987). *Stredoslovenska*: Malá Fatra: Stahrad, Haj, Plesec (Svaton, 1984). *Vychodoslovenska*: Cejkov (=Czêke) (Chyzer & Kulczynski, 1897). HUNGARY: *Bacs-Kiskun*: Kecskemet, Wegry, 4♂ 7♀ (IZPAN; Chyzer & Kulczynski, 1897). *Borsod-Abauj-Zemplen*: Satoraljaújhegy (Chyzer & Kulczynski, 1897); Szeplalom (Chyzer & Kulczynski, 1897). *Budapest*: Budapest (Chyzer & Kulczynski, 1897). *Csongrád*: Tömörkény, Ujmazori-erdő, 1♂, pitfall in *Quercus* forest, 4 June 1994 (CPS). *Fejér*: Mariavölgy (Chyzer & Kulczynski, 1897). *Heves*: Matra Kékes mountains (Chyzer & Kulczynski, 1897). *Hajdu-Bihar*: Hajduhadhazteglas (Chyzer & Kulczynski, 1897). *Pécs*: Mecsek Mts., Orfű, Pécsi-to, 1♂, pitfall in mixed deciduous woodland, 3 June 1994 (CPS). *Pest*: Szigetmonostor (Balogh & Loksa, 1946). *Veszprém*: Almadi; Varpalota (Chyzer & Kulczynski, 1897; 15 km NE lake Balaton, August 1991 (CTB). *Vas*: Köszezer mountains, Güns (Balogh, 1938). ROMANIA: *Transylvania*: Hatszeg (Chyzer &

Kulczynski, 1897); Seica Mare (Weiss, 1976). *Banat*: Mehadia (Chyzer & Kulczynski, 1897); Bogoltin (Chyzer & Kulczynski, 1897). CROATIA: *Slavonia*: Vrdnik (Chyzer & Kulczynski, 1897); Djakovo (Chyzer & Kulczynski, 1897). *Sirmie*: Fruska Gora (Chyzer & Kulczynski, 1897). SERBIA: Dubrovniza, near Pogarewaz (Stojicevic, 1929); Rogot, near Krguejevaz (Stojicevic, 1929). MACEDONIA: Gengeli, Pricep (Stojicevic, 1929). GREECE: *Attika*: Athens, Acropolis (Roewer, 1928); Parnis Oros (Hadjissarantos, 1940). *Thraiki*: Dede-Agatsch (Drensky, 1928).

Distribution (Map 2): Central Europe. Verified records are known from southern Germany in the west to Hungary in the east. Simon's (1873) citations of juvenile specimens from the Alpes Maritimes in France are probably incorrect, as he did not repeat this locality in 1914. I consider the citations in Macedonia (Stojicevic, 1929) and Greece (Drensky, 1928; Hadjissarantos, 1940; Roewer, 1928) as doubtful; they need confirmation.

Zodarion pusio Simon, 1914 (Figs. 18–19, 89–90, Map 4)

Zodarion pusio Simon, 1914: 229, 235 (descr. ♂, non ♀); Dalmas, 1922: 85; Denis, 1933: 555; 1935b: 67; 1937a: 29 (descr. ♂, non ♀); Kritscher, 1969: 277; Canard, 1989: 19; Pesarini, 1991: 8 (descr. ♂, ♀); 1993: 6.

Zodarion neapolitanum Denis, 1935b: 73 (descr. ♀, non ♂).

Type material: Lectotype ♂ from Italy, Lazio, Roma, by present designation (MNHNP 7465; Simon, 1914).

Diagnosis: This species is recognised by its pale colour; males are further distinguished by the hooked tibial apophysis, females by the wide, median epigynal ducts turning to the antero-lateral spermathecae.

Remarks: In his original description, Simon (1914) mentions three localities: Rome, Banyuls and Nice.

Simon already doubted the conspecificity of this material: "Je ne suis pas absolument certain que le mâle et la femelle décrits ci-dessus appartiennent bien à la même espèce". Specimens from these three localities are present in the MNHNP and are considered to represent the type series; it appears they belong to three different species, and their identity is discussed below.

The material from Rome is a male agreeing completely with Simons' fig. 470 of the male palp and is thus selected here as lectotype. The material from Nice consists of a male and a female belonging to *Z. ruffoi*, which was described by di Caporiacco (1951) from Puglia in Italy. Finally, the material from Banyuls, cited also by Denis (1933, 1937a), is a female of *Z. rubidum*.

The female of *Z. pusio* was thus unknown for a long time. It has already been described, but as the female of *Z. neapolitanum*. The male and female of this species also appeared to be incorrectly matched. Recently, Pesarini (1991) also confirmed the identity of the correct female of *Z. pusio*.

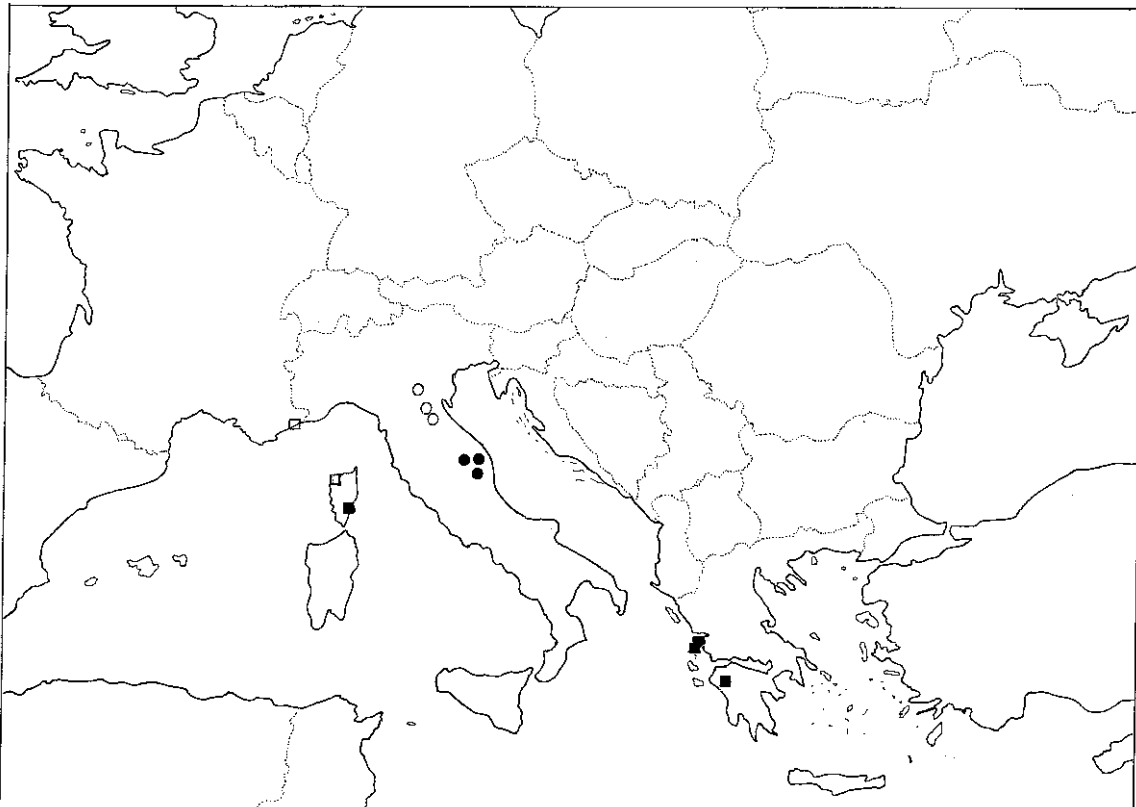
In the same paper, Pesarini synonymised *Z. pusio* and *Z. punicum*, a species described by Denis (1937a) from Tunisia. I was not able to examine the types of *Z. punicum*, and nor was Pesarini; he based the synonymy on Denis' figures alone. In my large collection from Algeria, I have a species which is very closely related to *Z. pusio*, differing by a shorter tibial hook, and a more rounded tegular bulge, as in Denis' figures of *Z. punicum*. I consider these specimens to belong to *Z. punicum*, and the synonymy proposed by Pesarini is therefore

rejected. The species will be described in a paper on North African *Zodarion* species.

Description: Male: Total length 1.7–2.2; prosoma 1.00–1.08 long, 0.72–0.84 wide. Colour: Prosoma yellowish orange, with black ocular area; legs pale yellowish; abdomen violet-brown, sides, venter and postero-dorsal spot whitish. Eyes: AM=1 (0.5); AL=PM=PL=0.5; a=0.3, b=0.2, c=1.4, d=0.2; MOQ: AW=0.96PW, L=0.79PW. Palp (Figs. 18–19): Tibial apophysis very characteristic, with large ventro-lateral lobe, and strong, recurved terminal tooth with distinct basal incision; tegulum bulging; distal part of retinaculum a slender, pointed tooth, embolus narrow and linear, rather long.

Female: Total length 2.6–3.0; prosoma 1.08–1.18 long, 0.72–0.78 wide. Further as male. Epigyne (Fig. 89): Postero-median part with two dark spots, connected by broad, curved ducts to spermathecae. Vulva (Fig. 90): Spermathecae rounded, separated by $2.5 \times$ their diameter.

Other material examined and citations: FRANCE: *Corsica* (Denis, 1937a). *Hérault*: Port-la-Nouvelle, 1♂ 1♀, in dune area, 6 April 1995, R. Jocqué leg. (CRJ). ITALY: *Calabria*: Reggio di Calabria: Lazzaro (Kritscher, 1969). *Campania*: Napoli: Napoli, 1♀ (MNHNP 6347; Denis, 1935b, sub *Z. neapolitanum*). *Emilia Romagna*: Ferrara: Ferrara (Pesarini, 1991). *Lazio*: Latina: S. Felice Circeo, 1♂, 17 May 1962, H. Levi leg. (MCZ). Viterbo: Tarquinia, 1♂, 2 April 1977, W. Gstader leg. (CKT). *Liguria*: Imperia: Toro Faraldi, 2♂, pitfall trap in *Phragmites*, 5 July 1992, E. Stöckli leg. (comm. E. Hänggi). *Toscana*: Isola Giglio, 1♂ (MCSNG; Dalmas, 1922). BOSNIA: Neum, 11♂ 1♀, 4 May 1988, P. Poot leg. (CPP, CRB). CROATIA: *Istria*: Rovinj, 1♀, 27 July 1968, and 1♀, 7 August 1965, K. Thaler leg. (CKT).



Map 5: Distribution of *Zodarion emarginatum* (Simon) (squares) and *Z. caporiaccoi* Roewer (circles). Black circles and squares=verified records; white circles and squares=unverified records.

Distribution (Map 4): The species occurs in the coastal areas of France, Italy, Croatia and Bosnia.

***Zodarion emarginatum* (Simon, 1873)** (Figs. 20–21, Map 5)

Enyo emarginata Simon, 1873: 61 (descr. ♂, ♀); 1874: 250.
Zodarion emarginatum; Simon, 1914: 229, 235; Denis, 1937a: 30;
 Canard, 1989: 19.
Zodarion mahnerti Brignoli, 1984: 325 (descr. ♂). **Syn. n.**

Type material: Holotype ♂ of *Z. emarginatum* from France, Corsica, Porto Vecchio (MNHNP 289); examined. Paratype ♀ without abdomen, same data. Holotype ♂, three ♂ paratypes of *Z. mahnerti* from Greece, Ithaca, monastery Panaghia, Penarakia above Exoghi, 19 April 1972, V. Mahnert leg. (Brignoli, 1984; MHNG); 1 paratype labelled MHNG Io 72/95 examined. Paratype ♂ *Z. mahnerti* from Greece, Peloponnisos, surroundings of university of Patras, 30 March 1971, V. Mahnert leg. (Gr. 71-47 MHNG); examined. Paratype ♂ *Z. mahnerti* from Greece, Leucade, road between Lazarata and Chortata, 15 April 1972, B. Hauser leg. (Gr. 72-39 MHNG); examined.

Diagnosis: This species is diagnosed by its small size, and by the wide tibial apophysis with subterminal tooth and basal crest. The female paratype has no abdomen and therefore cannot be diagnosed.

Remarks: I could not find any differences between the palps of *Z. emarginatum* and *Z. mahnerti*, and I therefore consider them as synonyms.

Description: Male: Total length 1.2–1.6; prosoma 0.66–0.75 long, 0.52–0.54 wide. Colour: Prosoma yellow-

ish brown, marbled with brown; legs yellowish; abdomen dark purplish brown, venter and small postero-dorsal spot whitish. Eyes: AM=1 (0.06); AL=PM=PL=0.66; a=0.33, b=0.25, c=1, d=0.25. Palp (Figs. 20–21): Tibia with large apophysis, terminally bluntly pointed, with subterminal tooth and basal crest; tegulum strongly developed, bulging, covering basal part of embolus; retinaculum U-shaped, with narrow basal part and broader, pointed distal part; embolus short, subterminally twisted, terminally pointed.

Female: Not examined. The type series only contains a cephalothorax of a female. Recently, Canard (1989) cited males and a female from Corsica, but this material was unavailable. Epigyne: Figured by Denis (1937a, fig. 43); it seems similar to *Z. gallicum*, but with the spermathecae away from the epigastric furrow.

Other citations: FRANCE : Haute Corse: Galéria, Fango, 3♂ 1♀, 22 September 1987 (Canard, 1989). Alpes Maritimes: Embouchure du Var (Simon, 1914).

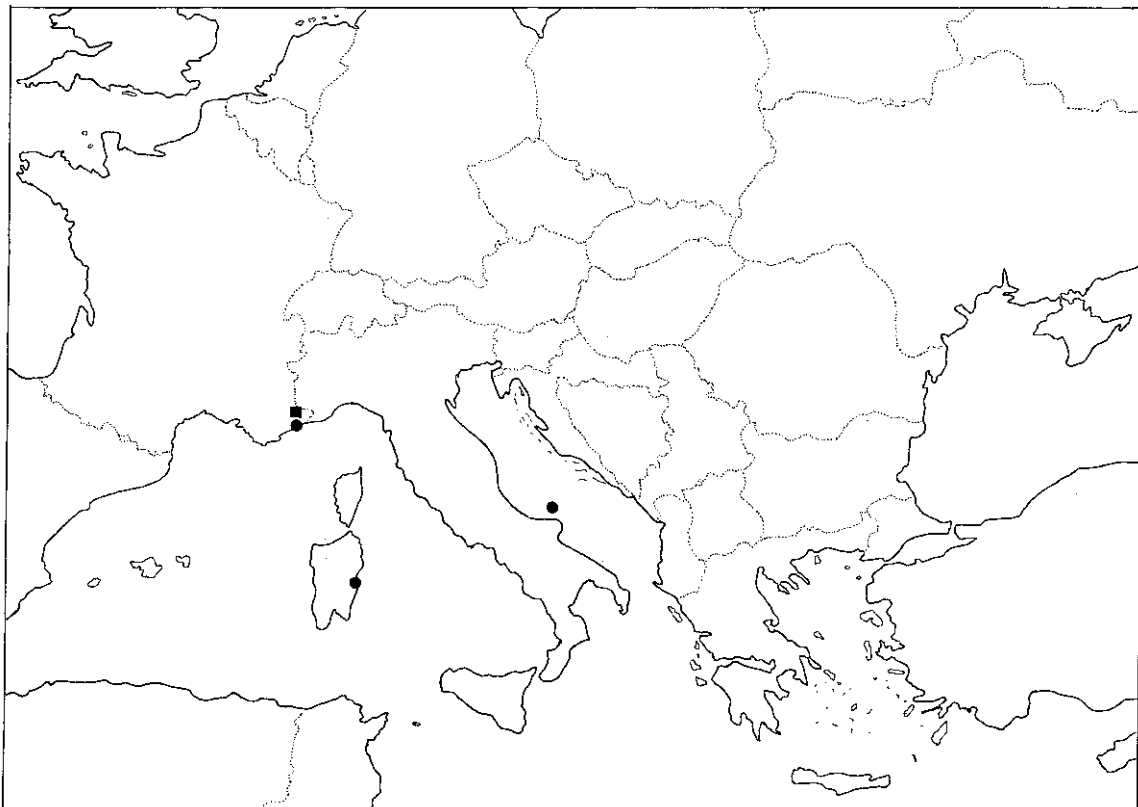
Distribution (Map 5): The south of France, Corsica, Greece.

***Zodarion ruffoi* Di Caporiacco, 1951** (Figs. 22–23, 91–92, Map 6)

Zodarion ruffoi Di Caporiacco, 1951: 76 (descr. ♀).

Type material: Holotype ♀ from Italy, Puglia, Isola de Tremiti, S. Domino, 10–12 May 1948, Ruffo leg. (MCSNVr); examined.

Diagnosis: *Z. ruffoi* is recognised by its small size; males are also diagnosed by the relatively short and broad tibial apophysis with subterminal tooth and the



Map 6: Distribution of *Zodarion ruffoi* Caporiacco (circles) and *Z. fulvonigrum* (Simon) (square). All verified records.

triangular distal part of the retinaculum, and females by the posteriorly incised epigyne with rounded spermathecae.

Remarks: The species was only known from one female, illustrated by a sketch of the epigyne by Caporiacco (1951). The holotype was examined, and it is identical to a female collected in Sardinia. A male collected at the same site agrees in size but differs in colour from the female. Their conspecificity requires confirmation. A male and a female from Nice were also found with the type of *Z. pusio* (MNHNP 26275).

Description: Male: Total length 1.5–1.8; prosoma 0.80–0.82 long, 0.56–0.60 wide. Colour: Prosoma brown suffused with dark brown, forming anastomosing spots towards the margin. Legs: femora brown, patellae and tibiae yellowish brown, metatarsi and tarsi yellowish. Abdomen including venter dark purplish brown, only spinnerets and surrounding area whitish. Eyes: AM=1 (0.055); AL=PM=PL=0.8; a=0.5, b=0.3, c=1.5, d=0.3; MOQ: AW=0.80PW, L=0.82PW. Palp (Figs. 22–23): Tibial apophysis with broad retrolateral apophysis, terminally rounded and with small mesal tooth. Retinaculum with narrow base and typical, triangular distal part. Bulbus with anterior bulge. Embolus rounded terminally, with indistinct subterminal dilatation.

Female: Total length 1.8–2.0; prosoma 0.78–0.82 long, 0.56–0.59 wide. Colour: Differing from male in following aspects: distinctly paler; prosoma yellowish brown, femora not darkened, abdomen ventrally whitish. Epigyne (Fig. 91): Posterior margin strongly incised, with rounded spermathecae and ducts parallel to incision shining through. Vulva (Fig. 92): Spermathecae separated by 1.5 × their diameter.

Other material examined and citations: FRANCE: Alpes maritimes: Nice, 1♂ 1♀ (sub *Z. pusio*, MNHNP 26275; Simon, 1914). ITALY: Sardinia: Baunei, 1♂ 1♀, May (CJW).

Distribution (Map 6): Known from the Islands Tremiti and Sardinia in Italy and from Nice in France.

Zodarion fulvonigrum (Simon, 1874) (Figs. 24–26, Map 6)

Enyo fulvonigra Simon, 1874: 251.

Zodarion fulvonigrum; Simon, 1914: 233, 234; Denis, 1937a: 11.

Type material: Holotype ♂ from France, Alpes Maritimes: St. Martin-Vésubie (MNHNP 300; examined); 4 juvenile paratypes.

Diagnosis: The male of this species is recognised by the strong, basal tooth of the embolus.

Remarks: Vogel's citation (1968) from U.S.A., Pennsylvania concerns *Z. rubidum* (Bosmans, 1994).

Description: Male: No measurements were taken. Colour: Prosoma pale reddish brown; Fe I–II reddish brown, Fe III–IV and other segments yellowish brown; abdomen dark sepia. Palp (Figs. 24–26): Tibial apophysis strong, slightly curved, terminally bluntly incised. Retinaculum slender, proximal part rectangular, distal part forming an elongated triangular tooth. Embolus terminally ending in two teeth, one bluntly pointed and

somewhat shorter, the other pointed and slightly curved, representing the sperm duct tooth.

Female: Unknown.

Other material examined: None.

Distribution (Map 6): The south of France, only known from the type locality.

Zodarion timidum (Simon, 1874) (Figs. 27–29, 93–94)

Enyo timida Simon, 1874: 249.

Zodarion timidum; Bosmans, 1994: 130.

Description: See Bosmans (1994). Palp: Figs. 27–29. Epigyne, vulva: Figs. 93–94.

New material examined, not mentioned in Bosmans, 1994: FRANCE: Gard: Aramon, Moure Pluma, 1♂, 10 June 1988, J. C. Ledoux leg. (CJCL).

Distribution: The south of France and the extreme north-east of Spain.

Zodarion rubidum Simon, 1914 (Figs. 30–32, 95–96, 101–102, Map 4)

Zodarion rubidum Simon, 1914: 233; Pesarini, 1993: 6; Bosmans, 1994: 132; Pekar, 1994: 97.

Zodarion fulvonigrum; Vogel, 1968: 96 (misidentification).

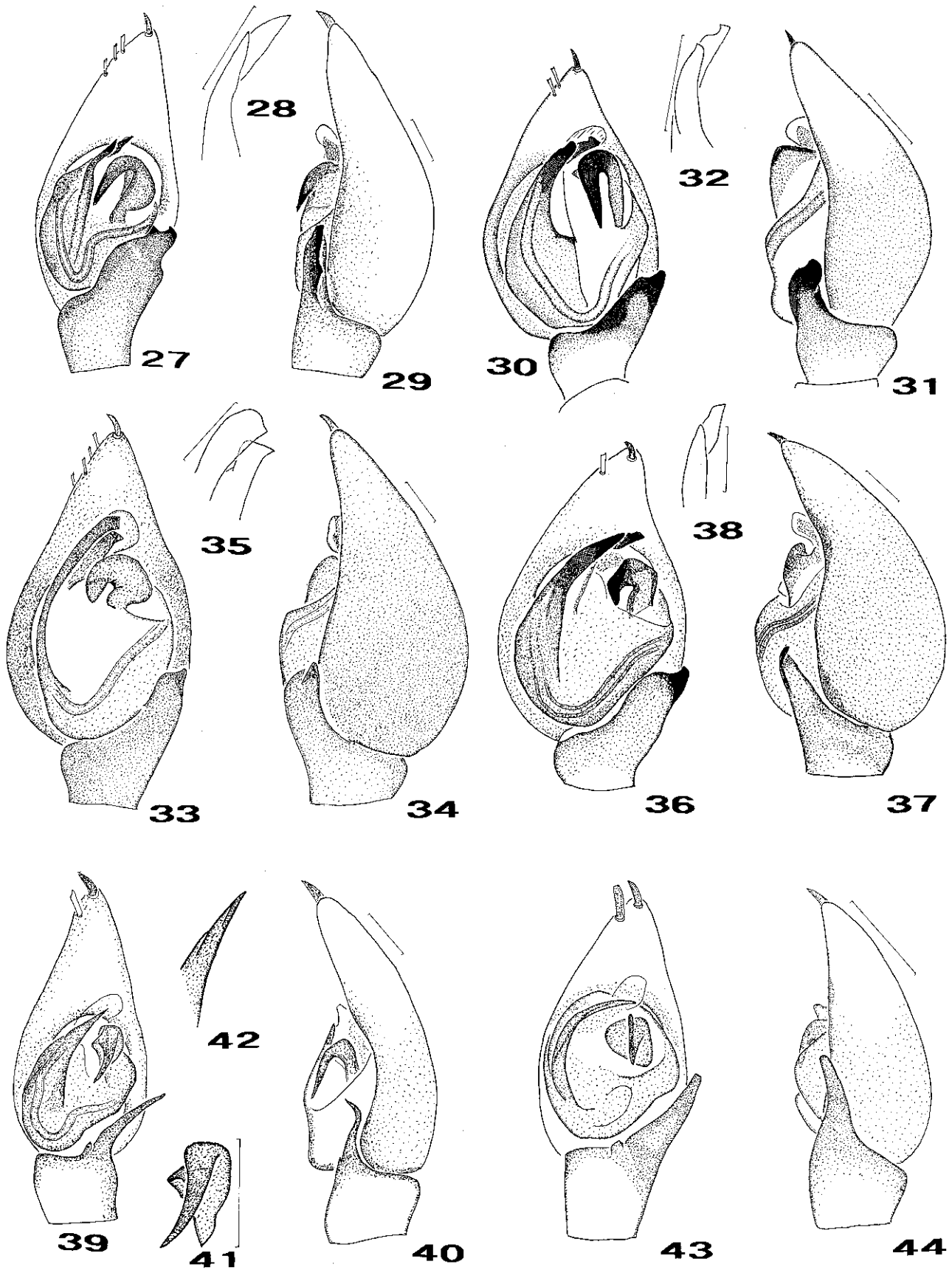
Zodarion pusio Simon, 1914: 229 (descr. ♀, non ♂); Denis, 1937a: 29 (descr. ♀, non ♂).

Remarks: The type series of *Zodarion pusio* contained females of two different species, as explained above, and neither of them appeared to be the correct female. The female illustrated by Simon (1914) and Denis (1937a) is in fact *Z. rubidum*.

Pesarini (1993) attributed Simon's (1914) citation of *Zodarion pusio* from Rome to *Z. rubidum*, but this is incorrect as pointed out above. So far, *Z. rubidum* has only been captured in the northern Italian provinces of Trentino-Alto Adige and Lombardia.

Description: See Bosmans (1994). Palp: Figs. 30–32. Epigyne, vulva: Figs. 95–96, 101–102. The epigyne can be somewhat variable, due to differences in pigmentation.

New material examined, not mentioned in Bosmans (1994): FRANCE: Ardèche: St. Martin d'Ardèche, 1♂ 1♀, B. Raphael leg. (CJCL). Pyrénées Orientales: Argelès, forêt de la Massane, font des Allemands, 1♀, 2 June 1994, J. C. Ledoux leg. (CJCL); Nohèdes: canal de Jujois, serrat del Clottin, 1900 m, 1♀, 23 May 1994, J. C. Ledoux leg. (CJCL); Carbodell, 1♀, 25 July 1973, J. C. Ledoux leg. (CJCL); rec de les Gerseres, 1280 m, 2♂, 18 April 1994, J. C. Ledoux & G. Pinault leg. (CJCL); Roques Nègres, 1♀, 19 April 1994, J. C. Ledoux & G. Pinault leg. (CJCL); Banyuls, 1♀ (sub *Z. pusio*, MNHNP 12842; Simon, 1914). GERMANY: Baden-Württemberg: between Karlsruhe and Rastadt, Rheinstetten-Morsch, 1♂, 18 May 1992, K. Harms leg. (CKH); Kaiserstuhl, 1♂ (CJW). Bayern: Unterfranken: Würzburg, several localities, 1988–1992 (CHS); Kitzingen, 1990 (CHS); Gemünden, 10♂, 1991 (CHS). ITALY: Lombardia: Brescia: Montorfano; Raffa del Garda (Pesarini, 1993). Sondrio: Tirano (Pesarini, 1993). AUSTRIA: Nieder-Österreich: Pürgstall, 1♂ 3♀, Ressler leg. (CJW). CZECH REPUBLIC: Jiří Morava: Vátae Písky, 1♂ 1♀, in pitfalls, 10 July 1991, Absolon leg. (CSP). SLOVAKIA: Stredne Slovensko: Nováky, halda Bane Nováky, 21♂ 5♀, in pitfall traps, 1 April 1989–31 October 1992, Pekar leg. (CSP). HUNGARY: Pécs: Mecsek Mts., Orfű, Pécsi-to, 1♂, pitfall in mixed deciduous woodland, 3 June 1994 (CPS).



Figs. 27–44: Male palps. 27–29 *Zodarion timidum* (Simon). 27 Ventral view; 28 Retrolateral view; 29 Terminal part of embolus, ventral view. 30–32 *Zodarion rubidum* Simon. 30 Ventral view; 31 Retrolateral view; 32 Terminal part of embolus, ventral view. 33–35 *Zodarion fuscum* (Simon). 33 Ventral view; 34 Retrolateral view. 35 Terminal part of embolus, ventral view. 36–38 *Zodarion couseransense*, sp. n. 36 Ventral view; 37 Retrolateral view; 38 Terminal part of embolus, ventral view. 39–42 *Zodarion nigriceps* (Simon). 39 Ventral view; 40 Retrolateral view; 41 Retinaculum, ventral view; 42 Terminal part of embolus, ventral view. 43–44 *Zodarion soror* (Simon). 43 Ventral view; 44 Retrolateral view. Scale lines=0.1 mm.

Distribution (Map 4): Germany, Belgium, Switzerland, Austria, Hungary, Czech Republic, Slovakia, France, N. Italy, NE Spain and USA, probably introduced. New to Hungary.

***Zodarion fuscum* (Simon, 1870)** (Figs. 33–35, 97–98)

Enyo fusca Simon, 1870: 100.

Zodarion fuscum; Bosmans, 1994: 133.

Zodarion machadoi; Wunderlich, 1991: 31 (misidentification).

Description: See Bosmans (1994). Palp: Figs. 33–35. Epigyne, vulva: Figs. 97–98.

New material examined, not mentioned in Bosmans (1994): SPAIN: Santander: Altamira, 1♀ (Wunderlich, 1991, sub *Z. machadoi*; CJW).

Remarks: This locality fits completely in the known distribution area of *Z. fuscum*, and considerably reduces the range of *Z. machadoi* to NW Portugal and S. Spain.

Distribution: N. Spain and SW France.

***Zodarion couseransense*, sp. n.** (Figs. 36–38, 99–100, Map 7)

Type material: Holotype ♂ from France, Ariège, Val de Riberot, 7 km south of Castillon-en-Couserans, 4 June 1991, D. Jones leg.; paratypes 2♂ 2♀ 2 subadults, same data; deposited in AMNH and in CJD.

Diagnosis: Closely related to *Z. rubidum*, but differing by its larger size, the smaller retinaculum, the absence of the medio-lateral concavity in the embolus of the male palp, and by the disposition of the epigynal pits and the absence of an anterior procurved ridge in the epigyne.

Etymology: The species was discovered in the region Le Couserans, hence the name *couseransense*.

Description: Male: Total length 3.2 (3.0–3.4); prosoma 1.58 (1.52–1.60) long, 1.20 (1.12–1.20) wide. Colour: Prosoma yellowish to orange-brown, eye region, striae and margin darkened. Legs pale yellowish to yellowish orange, femora and tibiae more or less infuscated, in one specimen femora dark brown with pale lateral streaks; abdomen dark sepia-brown, transverse ventral spot and opercula cream-white. Eyes: AM=1 (0.9); AL=0.8, PM=PL=0.8; a=0.7, b=0.3, c=2, d=0.3; MOQ: AW=0.74PW, L=0.71PW. Palp (Figs. 36–38): Tibial apophysis broad, triangular, terminally bluntly pointed and slightly curved; distal part of retinaculum bluntly pointed, smaller than basal part; embolus without baso-lateral tooth, with terminal and subterminal teeth.

Female: Total length 3.8–4.0; prosoma 1.62–1.66 long, 1.18–1.22 wide. Further as male. Epigyne (Fig. 99): Median plate rectangular, in middle with two oblique semicircular pits, anteriorly with angular chitinous ridge. Vulva (Fig. 100): Spermathecae small and relatively widely separated, connected by semicircular copulatory ducts to basal part of postero-median plate.

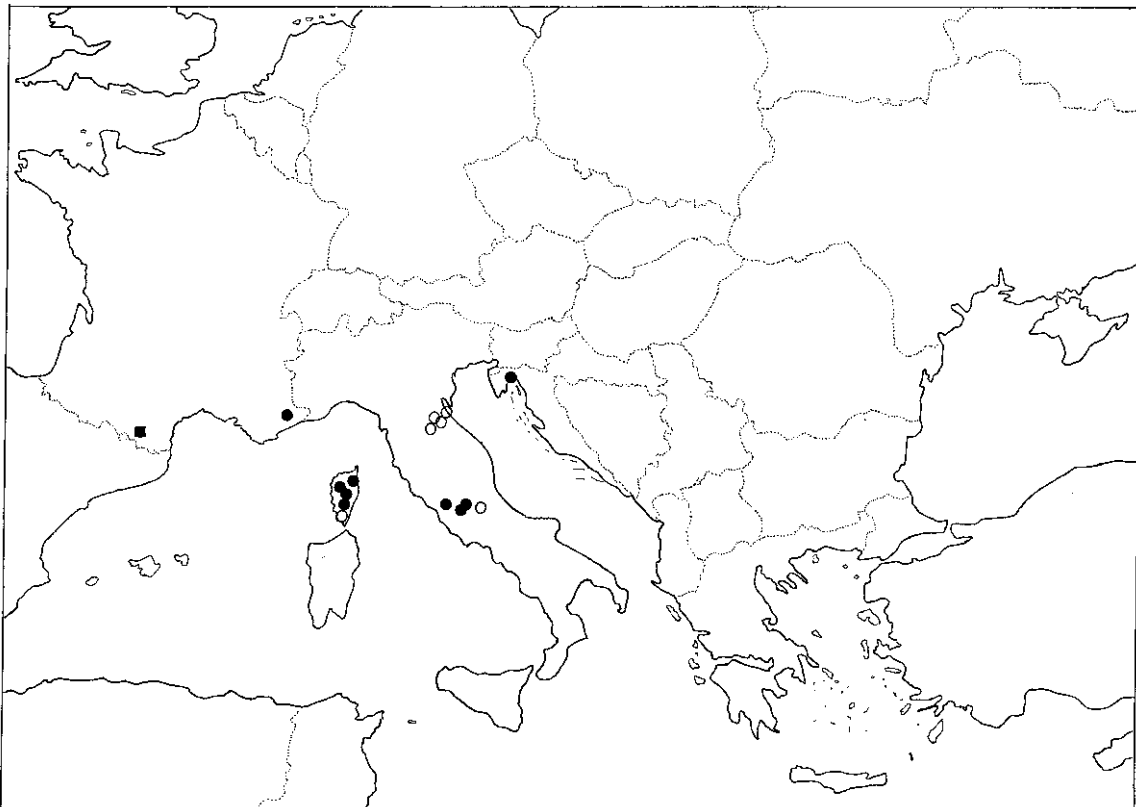
Other material examined: None.

Distribution (Map 7): Only known from the French Pyrénées.

***Zodarion nigriceps* (Simon, 1873)** (Figs. 39–42, 105–106, Map 3)

Enyo nigriceps Simon, 1873: 58; 1874: 246.

Zodarion nigriceps; Simon, 1914: 228, 234; Denis, 1935b: 66; 1937a: 8; Canard, 1989: 19.



Map 7: Distribution of *Zodarion couseransense*, sp. n. (square) and *Z. gallicum* (Simon) (circles). Black circles and square=verified records; white circles=unverified records.

Type material: France: Corsica: 21♂ 24♀, type series (MNHN); 2♀, labelled "Typus ric. da Simon 1872, Corse", most probably part of the type series (MCSNG).

Diagnosis: This species is easily recognised by the contrasting colour pattern of both prosoma and legs. Juveniles can be distinguished from the similarly coloured *Z. elegans* by the darkened tibiae. By the genital organs, the species is furthermore distinguished by the needle-like tibial apophysis of the male palp, and the very small spermathecae of the female epigyne.

Description: Male: Total length 2.4–2.9; prosoma 1.28–1.50 long, 0.99–1.10 wide. Colour: Prosoma with cephalic part dark brown to blackish, somewhat paler between eye region and fovea, thoracic part yellowish white; legs with white coxae, Fe dark brown, Ti brown to dark brown, Mt and Ta yellowish brown; abdomen dorsally glossy black, venter and rounded postero-dorsal spot whitish. Eyes: AM=1 (0.95); AL=PM=0.8, PL=0.7; a=0.6, b=0.3, c=1.7, d=0.4; MOQ: AW=0.81PW, L=0.81PW. Palp (Figs. 39–42): Tibial apophysis strongly elongated, needle-like, pointed in antero-lateral direction; cymbium elongated, bulbus occupying only half its length; retinaculum with slender, gently curved tooth, 5× as long as wide; embolus gradually narrowing from its base, nearly straight, terminally pointed.

Female: Total length 2.9–3.9; prosoma 1.32–1.50 long, 0.96–1.08 wide. Further as male. Epigyne (Fig. 105): Median plate trapezoid, with transverse median darker stripe. Vulva (Fig. 106): Spermathecae remarkably small.

Other material examined and citations: FRANCE: Corsica: without further locality (Simon, 1873, 1914); 1♀, idem, L. Peeters leg. (IRSNB); Corse du Sud: Ajaccio, Port de Chiavari, 20 m, 1♂, K. Thaler leg. (CKT); Bonifacio, 1♂ 1♀ (MNHN; Denis 1937a). Haute Corse: Calvi, 2♂, 15 May 1982, M. D'Hulster leg. (CRB). ITALY: Sardinia: Baunei, 3♀, May 1991 (CJW); Isola Vacca, 1♂, Fea leg. (MCSNG; Pavesi, 1876); Oristano, 9 juv. ♂, 15 October 1938 (NMW).

Distribution (Map 3): Corsica, Sardinia. Van Hasselt's (1898) citation from the Netherlands is most probably incorrect.

Zodarium soror (Simon, 1873) (Figs. 43–44, 103–104, Map 8)

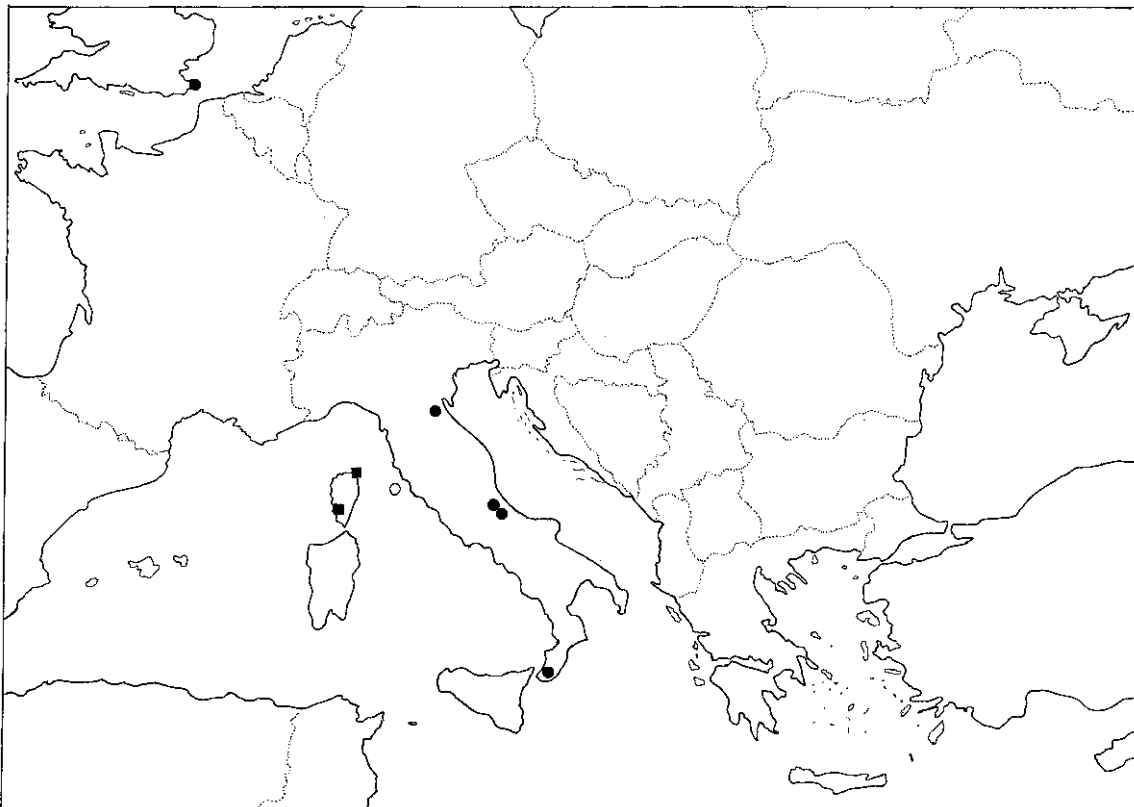
Enyo soror Simon, 1873: 60 (descr. ♂, ♀).

Zodarium soror; Simon, 1914: 235; Denis, 1935a: 58; 1937a: 31; Drensky, 1936: 31; Nicolic & Polenec, 1981: 29; Deltshv, 1987: 22; Canard, 1989: 19.

Type material: Holotype ♂ from France, Corsica, Ajaccio, Campo di l'Oro (MNHN 312); examined.

Remarks: Simon (1914) indicates in a footnote that the female of this species was accidentally lost. Yet Denis (1935a) figures an epigyne of a female which he claims to be *Z. soror*. Its large size (3 mm) indicates that its conspecificity with the minute male of *Z. soror* is doubtful. I examined the specimen, and it belongs to *Z. gallicum*. I describe here a female from Corsica which most possibly belongs to *Z. soror*. J. A. Murphy (in litt.) collected both sexes together in Corsica.

Diagnosis: This species is recognised by its gently curved, nearly linear embolus and by the postero-medial incision of the epigyne.



Map 8: Distribution of *Zodarium soror* (Simon) (squares) and *Z. vicinum* Denis (circles). Black circles and squares=verified records; white circle=unverified record.

Description: Male: Total length 1.5; prosoma 0.73 long, 0.54 wide. Colour: As *Z. italicum*. Palp (Figs. 43–44): Tibial apophysis triangular, rather elongated, terminally rounded; retinaculum with broad basal part and small, triangular distal part, three times as long as wide; embolus nearly linear, gently curved, terminally rounded.

Female: Total length 3.3–3.4; prosoma 1.28–1.48 long, 0.90–1.02 wide. Epigyne (Fig. 103): With strong, postero-median incision. Vulva (Fig. 104): Spermathecae very small, separated by $4 \times$ their diameter.

Other material examined: FRANCE: Haute Corse, 1♀, J. Van Keer leg.

Distribution (Map 8): Verified material has been examined only from Corsica. The citations of Fuente (1898) from Spain, and of Drensky (1936) and Nicolic & Polenec (1981) from Yugoslavia are considered incorrect.

***Zodarion ludibundum* Simon, 1914** (Figs. 45–48, 107–108, Map 9)

Enyo italica (non Canestrini); Simon, 1874: 248 (descr. ♂, non ♀).

Zodarion ludibundum Simon, 1914: 231.

Zodarion simoni Denis, 1935a: 54 (descr. ♂); 1937a: 32; Canard, 1989: 19. **Syn. n.**

Zodarion sabbadinii Pesarini, 1993: 7 (descr. ♂♀). **Syn. n.**

Type material: I consider a tube labelled “Corse AR 303” (MNHNP) as the type series; it contains 2♂ 3♀. The only ♂ corresponding with Simon’s description is here selected as lectotype. The remaining specimens belong to three different species: 2♀ of *Z. ludibundum*, 1♂ of *Z. gallicum* and 1♀ of *Z. italicum*. The 2♀ of *Z. ludibundum* become paralectotypes.

Denis selected the same male as holotype of his *Z. simoni*; this specimen thus is at the same time lectotype of *Z. ludibundum* and holotype of *Z. simoni*.

Remarks: Simon’s (1914) fig. 469 of the male palp and the description in the text clearly concern a species with an elongated tibial apophysis. In the key, he indicates the following differences from *Z. gallicum*: “Apophyse tibiale noire et grêle dès la base, au moins quatre fois plus longue que large, vue en dessous dirigée en avant le long du bord tarsal, à peine divergente, droite, un peu recourbée seulement à la pointe”. There is only one specimen in the type series corresponding with this description, and this specimen must be selected as lectotype.

Denis (1935a) describes a species (which I consider to be *Z. gallicum*) with short tibial apophysis as *Z. ludibundum*; his incorrect interpretation has been followed by all subsequent authors.

Pesarini’s (1993) *Z. sabbadinii* is obviously a synonym of *Z. ludibundum*. His excellent description corresponds completely with the present redescription of *Z. ludibundum*.

Diagnosis: *Zodarion ludibundum* is closely related to *Z. modestum* from Spain. Males of *Z. ludibundum* are recognised by the gently curved, gradually narrowing embolus, and the small retinaculum, females by the transverse dark stripe in the median plate of the epigyne.

Description: Male: Total length 2.2–4.4; prosoma 1.04–2.06 long, 0.78–1.50 wide. Colour: As *Z. italicum*. Palp (Figs. 45–48): Tibial apophysis rather long, gradually narrowing, pointed terminally; basal part of retinaculum rectangular, distal part pointed, curved in postero-mesal direction; embolus gently curved, gradually narrowing with pointed tip.

Female: Total length 3.0–5.3; prosoma 1.10–1.92 long, 0.76–1.32 wide. Further as male. Epigyne (Fig. 107): With two oblique comma-shaped stripes, often with a transverse, darker median stripe between them. Vulva (Fig. 108): Spermathecae large, separated by only $1.5 \times$ their maximal diameter.

Other material examined and citations: ITALY: Sicily: Madonie: Torre Montaspro (Pesarini, 1993, sub *Z. sabbadinii*). ALGERIA (all specimens in CRB): *Wil. Aïn Defla*: Bethia, 800 m, 1♀, stones in open *Pinus halepensis* forest, 6 May 1989; Djebel Zaccar, S. Aïn n’Sour, 900 m, 3♂, stones in *Quercus ilex* forest, 18 May 1988. *Wil. Blida*: Atlas Blidéen, Chréa, 1290 m, 1♂ 1♀, pitfall in *Cedrus atlantica* forest, 9 May 1988; idem, Meurdja, 950 m, 4♂ 1♀, pitfalls in *Quercus ilex* forest, 15 June 1982; Blida, Oued el Kebir, 2♂ 1♀ (MNHNP 5651); Oued Djer, forêt des Soumatas, 220 m, 6♂, pitfalls in *Pistacea lentisca* maquis, 18 June 1989; Zeralda, 5 m, 1♂, pitfalls in maquis in dunes, 27 May 1988. *Wil. Boumerdes*: Réghaia, coastal marsh of Oued Réghaia, 7♂ 4♀, in pitfalls, 13 June 1988. *Wil. Chleff*: 5 km W. of Damous, 5 m, maquis of *Pistacea lentisca* in dunes, 17 April 1987; Damous, 50 m, 1♀, pitfall in *Pinus halepensis* forest, 20 January 1990; El Marsa, 50 m, 2♂, pitfalls in maquis in dunes, 25 May 1990; Baie des Souhalia, 10 m, 1♂ 4♀, stones in *Pinus halepensis* forest, 7 May 1989. *Wil. M’sila*: Kalaa Beni Hammad, 980 m, 1♀, stones in grassland, 28 April 1988. *Wil. Tipasa*: Douaouda, Oued Mazafran, 50 m, 2♂ 1♀, pitfalls in *Populus alba* forest, 6 May 1987; Sidi Fredj, 25 m, 3♀, pitfalls in dense *Pinus halepensis* forest, 10 April 1987.

Distribution (Map 9): Known from Corsica, Sicily and Algeria. In Algeria, it was only collected in the extreme north, from Ech Chelff in the west to M’sila in the east.

***Zodarion caporiaccoi* Roewer, 1942** (Figs. 49–52, 109–110, Map 5)

Zodarion denisi Caporiacco, 1940: 17 (descr. ♂); preoccupied Spassky, 1938.

Zodarion caporiaccoi Roewer, 1942: 366 (nom. nov.).

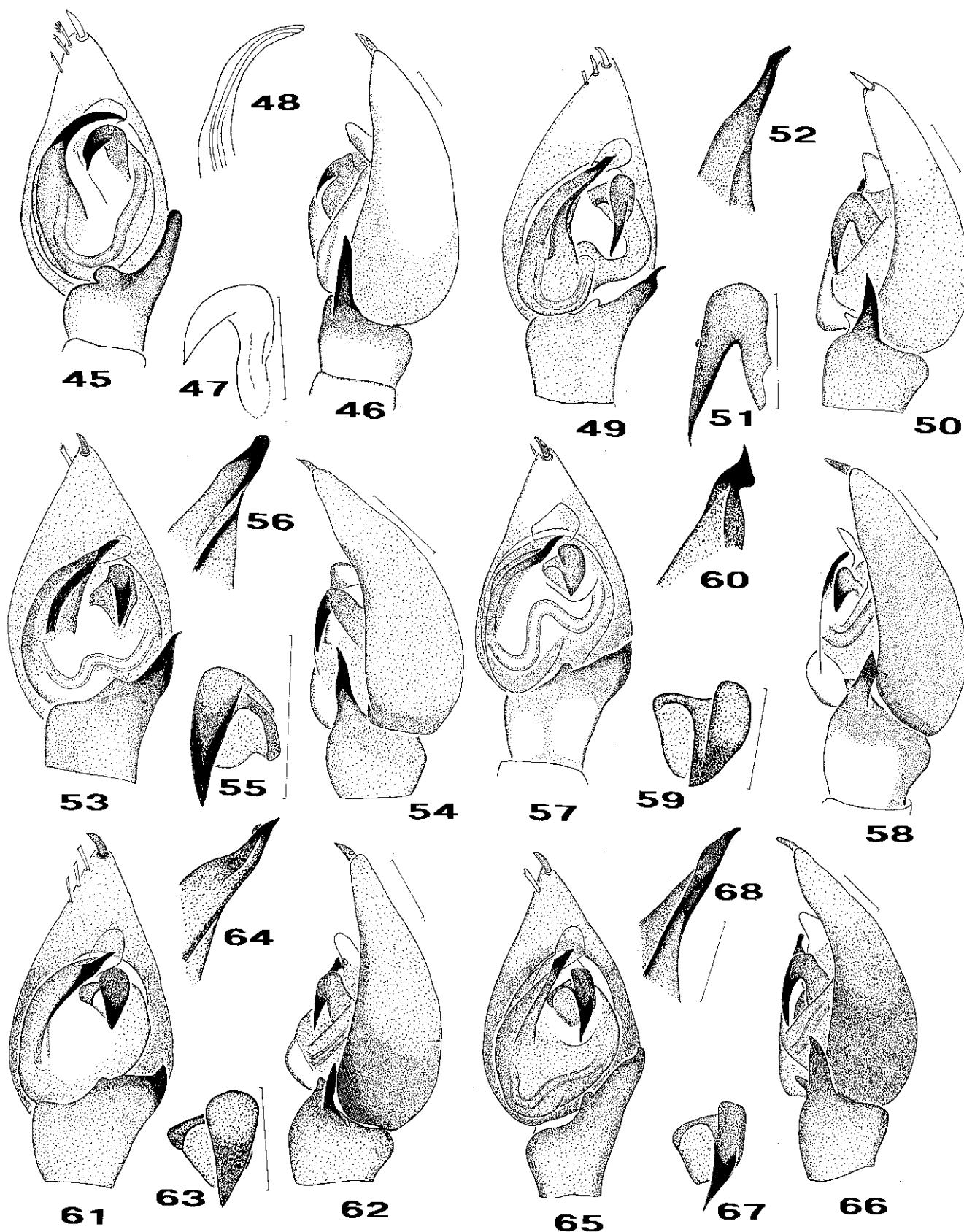
Zodarion confusum; Caporiacco, 1949: 253 (misidentification).

Type material: Holotype ♂ from Italy, Verona, Mizzole, Cancellò; not examined, disposition unknown.

Diagnosis: A species of the *italicum* group, closely related to *Z. hamatum* by the curved tip of the tibial apophysis, but differing by the longer distal part of the retinaculum, and the narrower tip of the embolus. Females are closest to *Z. gallicum*, *Z. remotum* and especially *Z. vicinum*, and differ by the nearly square postero-median plate with lateral ducts to the spermathecae.

Remarks: The type specimen was not available for study, but Caporiacco’s figure of the male palp in ventral view clearly shows a terminally curved tibial apophysis and long distal part of the retinaculum. This permits the identification of specimens from Central Italy as *Z. caporiaccoi*.

Description: Male: Total length 1.8–3.1; prosoma 0.91–1.42 long, 0.70–1.04 wide. Colour: As *Z. italicum*. Eyes: AM=1 (0.6); AL=0.7, PM=PL=0.8; a=0.3, b=0.2, c=1, d=0.2; MOQ: AW=0.87PW, L=0.94PW.



Figs. 45–68: Male palps. 45–48 *Zodarium ludibundum* Simon. 45 Ventral view; 46 Retrolateral view; 47 Retinaculum, ventral view; 48 Terminal part of embolus, ventral view. 49–52 *Zodarium caporiaccoi* Roewer. 49 Ventral view; 50 Retrolateral view; 51 Retinaculum, ventrolateral view; 52 Terminal part of embolus, ventral view. 53–56 *Zodarium hamatum* Wiehle. 53 Ventral view; 54 Retrolateral view; 55 Retinaculum, ventrolateral view; 56 Terminal part of embolus, ventral view. 57–60 *Zodarium italicum* (Canestrini). 57 Ventral view; 58 Retrolateral view; 59 Retinaculum, ventral view; 60 Terminal part of embolus, retrolateral view. 61–64 *Zodarium confusum* Denis. 61 Ventral view; 62 Retrolateral view; 63 Retinaculum, ventral view; 64 Terminal part of embolus, ventral view. 65–68 *Zodarium vicinum* Denis. 65 Ventral view; 66 Retrolateral view; 67 Retinaculum, ventral view; 68 Terminal part of embolus, ventral view. Scale lines=0.1 mm.

Palp (Figs. 49–52): Tibial apophysis triangular, terminally distinctly curved in antero-lateral direction; distal part of retinaculum much longer than basal part, slightly curved and sharply pointed; embolus with broad base, gradually narrowing, subterminally slightly curved, terminally pointed.

Female: Total length 2.4–3.2; prosoma 0.91–1.41 long, 0.70–0.98 wide. Further as male. Epigyne (Fig. 109): Median plate nearly square, laterally flanked by two transverse triangles or rectangles of variable size and pigmentation, sometimes partly covered by integument posterior to epigastric furrow. Vulva (Fig. 110): Spermathecae nearly round, connected to antero-lateral part of median plate.

Material examined and citations: ITALY: *Abruzzi:* Teramo: Civitella del Tronto, Colle S. Nicola, 1♂, in pitfall, 11 April 1980; 9♂, 13 June 1980; 26♂ 15♀, 1 July 1980; 12♂ 2♀, 7 August 1980; Monte dei Fiori, diut. Guazzano, fra Garrufo e Machia da Sole, 820 m, 1♂, in pitfall, 13 May 1980, Bologna *et al.* leg. (CFG; CRB); Gran Sasso, 1600 m, 1♀, July (CJW). *Veneto:* Verona: Mizzole, Cancellò, type locality (Caporiacco, 1940). *Emilia Romagna:* Forlì: Bertinoro (Caporiacco, 1949, sub *Z. confusum*); Castelraniero (Caporiacco, 1949, sub *Z. confusum*).

Distribution: (Map 5): Central Italy.

***Zodarion hamatum* Wiehle, 1964** (Figs. 53–56, 111–112, Map 10)

Zodarion hamatum Wiehle, 1964: 641 (descr. ♂); Wunderlich, 1980b: 116 (descr. ♀); Noflatscher, 1988: 151; Thaler & Noflatscher, 1990: 172; Noflatscher, 1990: 65; 1991: 82.

Type material: Holotype ♂, 1 juvenile paratype, from Slovenia, Mount Nanos (SMF 16581); not examined.

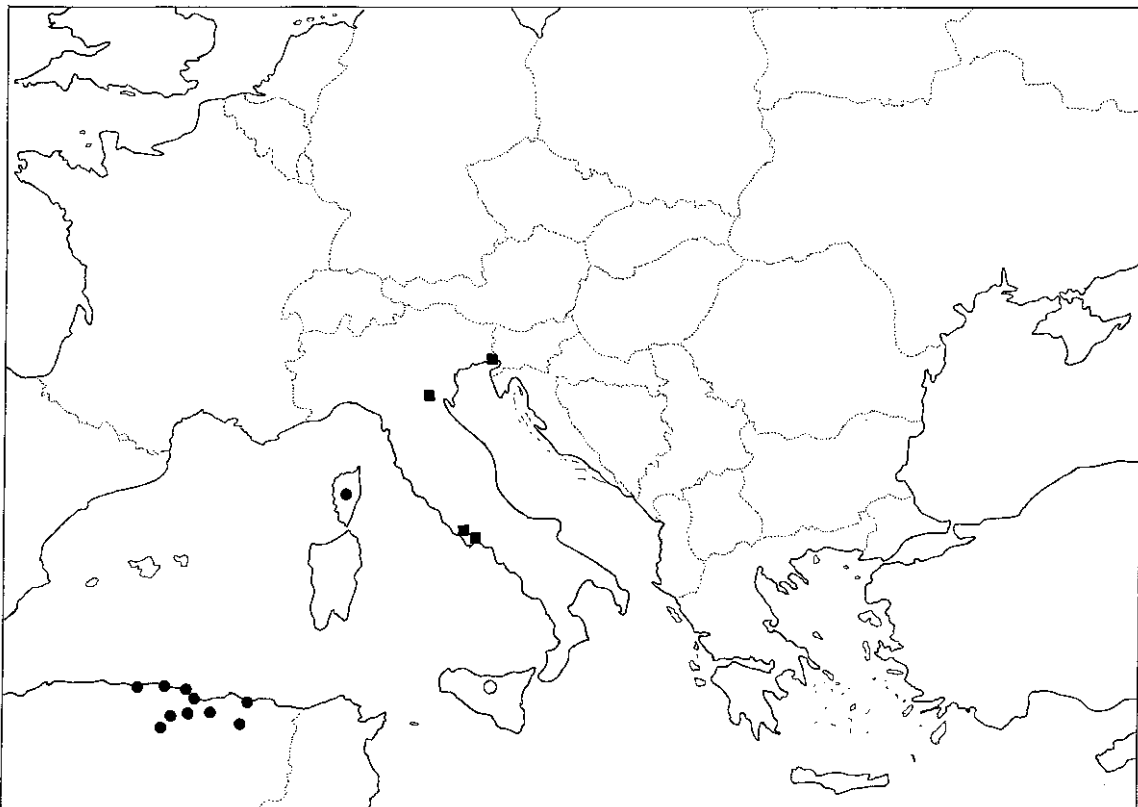
Diagnosis: A species of the *italicum* group, diagnosed by the elongated tibial apophysis, short distal tooth of the retinaculum, relatively voluminous tip of the embolus, and the narrow, trapezoid median plate of the epigyne.

Description: Male: Total length 1.8–2.3; prosoma 1.04–1.24 long, 0.76–0.90 wide. Colour: As *Z. italicum*. Palp (Figs. 53–56): Tibial apophysis elongated, terminally curved; distal part of retinaculum slightly longer than basal part, sharply pointed; embolus with broad base, gradually narrowing, terminal part rather voluminous, with rounded tip.

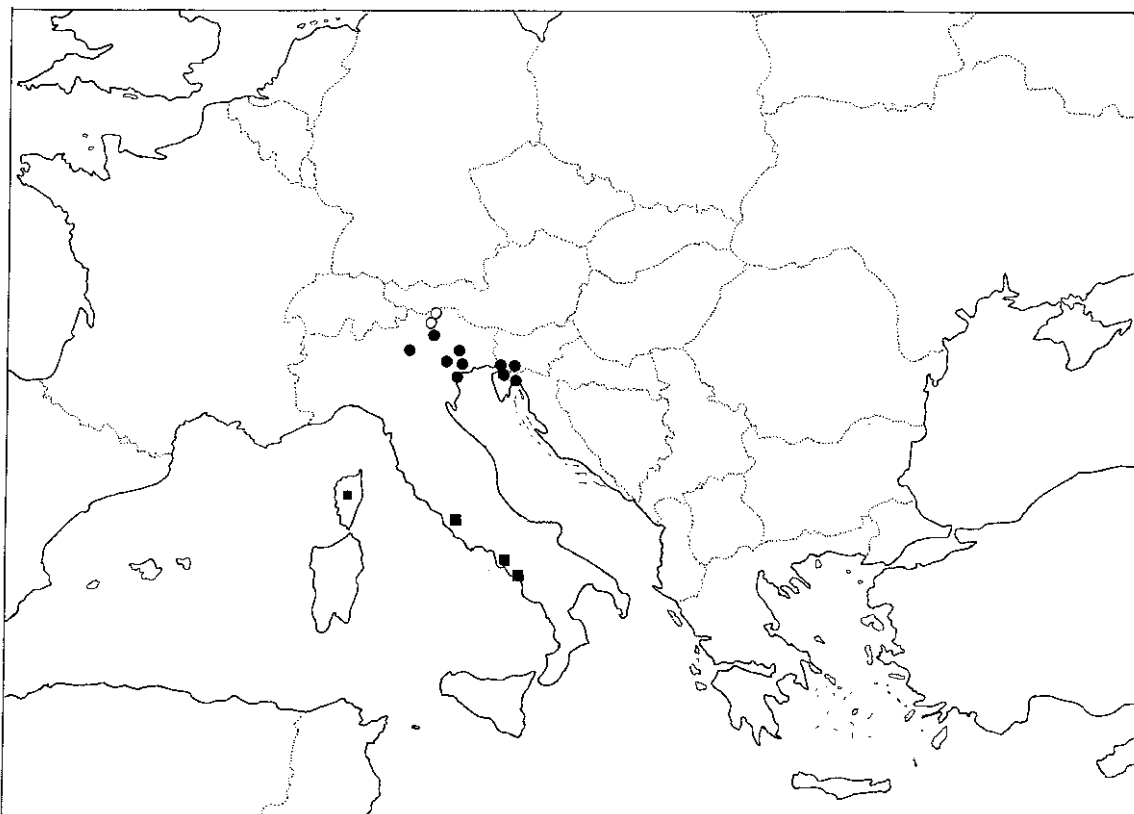
Female: Total length 2.3–3.8; prosoma 1.20–1.24 long, 0.76–0.90 wide. Further as male. Epigyne (Fig. 111): Median plate trapezoid, much wider than long, with lateral margins strongly chitinised. Vulva (Fig. 112): Spermathecae circular, connected by strongly widened ducts to antero-lateral part of median plate.

Material examined and citations: ITALY: *Trentino-Alto Adige:* Bolzano: Albein (Noflatscher, 1988); Castelfeder (Noflatscher, 1990; Thaler & Noflatscher, 1990); Neustift, 5♂ 2♀ (Noflatscher, 1991). Trento: Borgo-Valsugana, 1♀, 24 September 1965, K. Thaler leg. (CKT); Lago di Garda, Riva, 1♀, 30 May 1963, K. Thaler leg. (CKT). *Friuli Venezia Giulia:* Friuli: Bosco di Lison, 1♀, 23 June 1986, Paoletti leg. (CKT); Carpeneto, 2♂ 1♀, 23 March 1986, Paoletti leg. (CKT); Roveredo, 1♀, Verhoeff leg., sub *Z. germanicum* (ZHHM). Trieste: Prosecco, 240 m, 2♂, in pitfalls, 1 August–1 September 1991 (CFG); Roiano, 120 m, 1♂ 1♀, 28 April 1992, Gasparo leg. (CFG). *Veneto:* Treviso: Palu, Quartier del Piave, 1989–1990, Targa leg. (CKT); Riete, 1990–1991, 2♂, Schirotto & Paoletti leg. (CKT). Venezia: Venezia, Giardino biennale, 154♂ 52♀ (MCSNVn). CROATIA: Buccari, 1♀ (IZPAN). SLOVENIA: Postojna, Mount Nanos (Wiehle, 1964); Istria, Mount Slavnik (Wunderlich, 1980b).

Distribution (Map 10): N. Italy, Slovenia, Croatia.



Map 9: Distribution of *Zodarion ludibundum* Simon (circles) and *Z. confusum* (squares). Black circles and squares=verified records; white circle=unverified record.



Map 10: Distribution of *Zodarion hamatum* Wiehle (circles) and *Z. remotum* Denis (squares). Black circles and squares=verified records; white circles=unverified records.

***Zodarion italicum* (Canestrini, 1868)** (Figs. 57–60, 113–114, Map 11)

Enyo italica Canestrini, 1868: 196; Simon, 1873: 60 (descr. ♀, non ♂); 1874: 248.

Enyo gallica Simon, 1873: 64 (descr. ♂, non ♀); 1874: 247; 1876: 135; Lucas, 1878: 193; Simon, 1879: 20; Lucas, 1882: 192; Becker, 1896: 180.

Zodarion (-um) italicum; Chyzer & Kulczynski, 1897: 150 (descr. ♀, non ♂); Simon, 1914: 230, 234; Caporiacco, 1926: 234; 1929: 230; Denis, 1935a: 52; 1935b: 72; Caporiacco, 1936: 345; Denis, 1937a: 22; 1939a: 74; Caporiacco, 1940: 17; Denis, 1946: 36; Caporiacco, 1949: 253; Denis, 1959: 136; 1964a: 240; 1964b: 108; 1966: 165; Kritscher, 1969: 277; Wunderlich, 1973: 172; 1980b: 113; Brignoli, 1983: 563; Harvey & Murphy, 1985: 4; Müller, 1985: 44; Siepe, 1985: 283; Roberts, 1987: 172; Bosmans, 1988: 4; Thaler & Notflatscher, 1990: 172; Noflatscher, 1990: 65; Blick & Scheidler, 1991: 54; Noflatscher, 1991: 82; Baert *et al.*, 1992: 42; Hänggi, 1992: 72; Renner, 1992: 24; Renner & Kiechle, 1992: 243; Pesarini, 1993: 10; Roberts, 1995: 100.

Zodarion (-um) gallicum; Chyzer & Kulczynski, 1897: 150; Lessert, 1904: 295; 1910: 86; Simon, 1914: 231, 235 (descr. ♂, non ♀); Schenkel, 1923: 82; Denis, 1935a: 51; 1935b: 72; 1937a: 24; 1937b: 169; 1938: 63; 1939a: 74; 1939b: 106; 1941: 158; 1943: 105; Vogelsanger, 1944: 188; Denis, 1954: 90; 1964a: 240; 1966: 165; 1967a: 9; Maurer, 1978: 19; Gonseth, 1985: 79; Hänggi, 1987: 190; Kobel-Lamparsky, 1987: 10; Hänggi, 1988: 57; Lunau & Rupp, 1988: 73; Cotti, 1989: 24; Maurer & Hänggi, 1990: 40; Heimer & Nentwig, 1991: 54; Hänggi, 1992: 72; Pesarini, 1993: 10; Roberts, 1995: 100 (all misidentifications).

Zodarion ludibundum; Denis, 1937a: 26 (misidentification).

Zodarion germanicum; Misiach, 1977: 138 (misidentification).

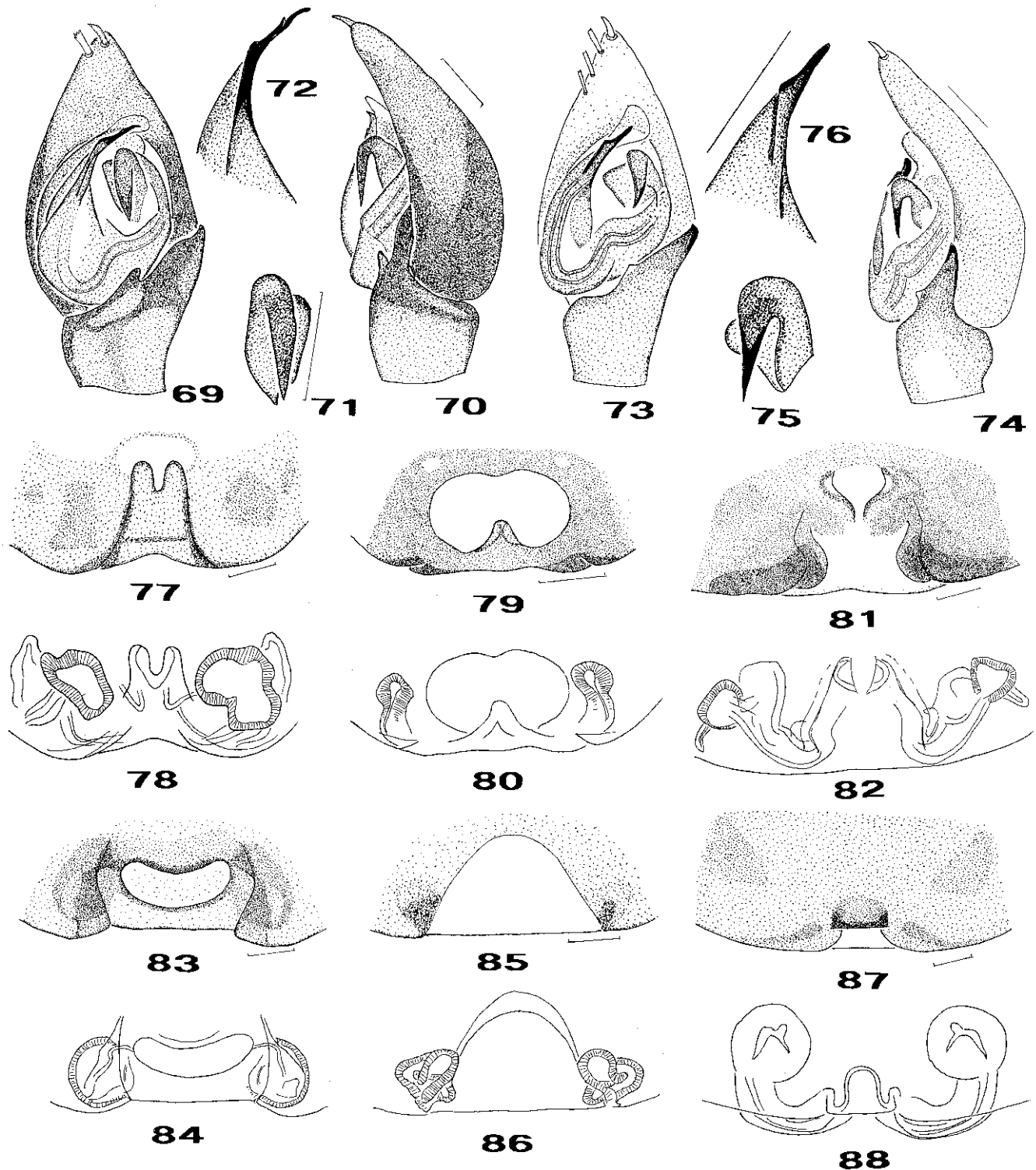
Type material: Brignoli (1983) figured a female from Canestrini's collection in the Istituto di Biologia

animale dell'Università di Padua, which he considered "probabilmente tipica". The specimen could not be examined but his drawings leave no doubt about the identity of this female. I consider it as the lectotype of *Z. italicum*. An examined male from the Koch collection, probably sent to Koch by Canestrini, deposited in the BMNH is designated here as paralectotype (BMNH 1919.9.18.5994).

Diagnosis: Males of the *italicum* group all possess a triangular tibial apophysis with basal tooth; this is often transparent, and is easily overlooked. Some authors have erroneously tried to differentiate *Z. italicum* and *Z. gallicum* using this character. *Z. italicum* is best distinguished from related species by the broad distal part of the retinaculum and by the recurved tip of the embolus. Females are distinguished by the trapezoid epigynal plate, limited at each side by a comma-shaped structure, and by the oval spermathecae with large atria.

Remarks: Recent figures of *Z. gallicum* in Heimer & Nentwig (1991), Pesarini (1993) and Roberts (1995) all concern *Z. italicum*.

Description: Male: Total length 1.56–2.90; prosoma 0.90–1.40 long, 0.64–1.04 wide. Colour: Prosoma brown to dark brown, with variable dark markings; legs yellowish orange, femora often with dark markings; abdomen dorsally dark purplish brown, ventrally uniformly pale yellowish. Eyes: AM=1 (0.08); AL=0.9, PM=PL=0.75; a=0.5, b=0.4, c=1.75, d=0.4; MOQ: AW=0.85PW, L=0.81PW. Palp (Figs. 57–60): Tibia with triangular apophysis, ventrally with blunt basal tooth; retinaculum triangular, 1.75 × as wide as long;



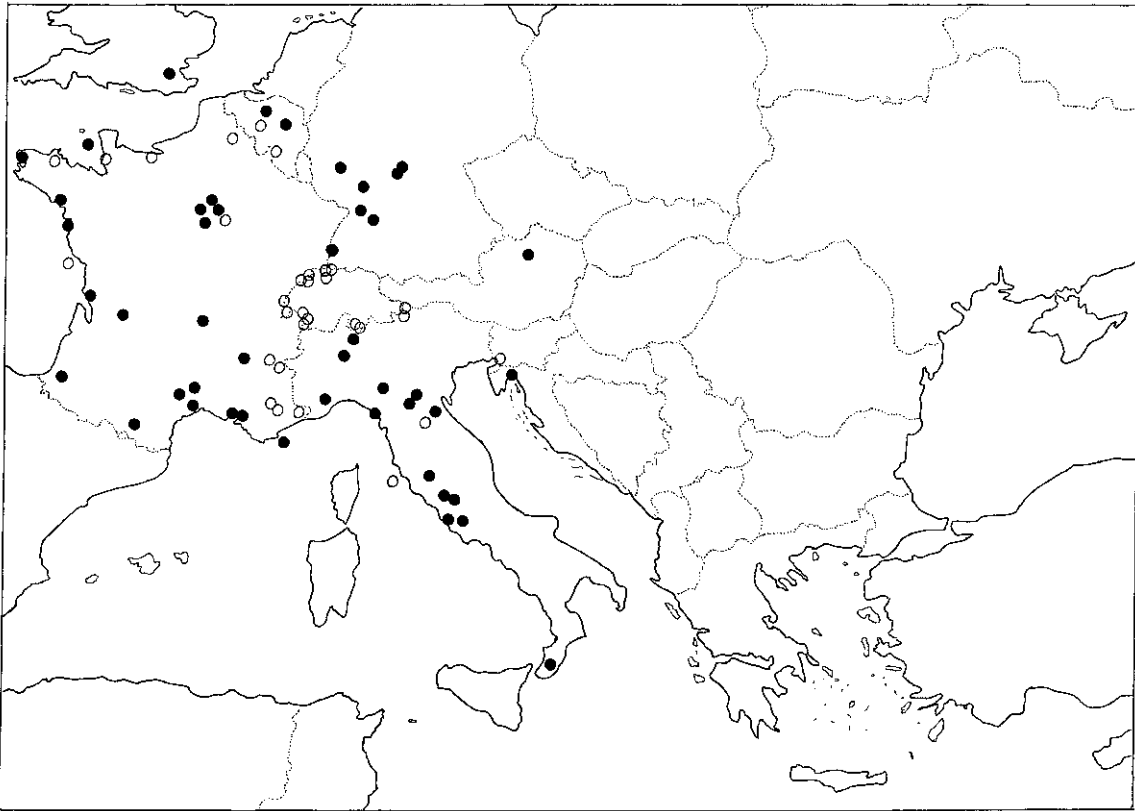
Figs. 69–88: **69–72** *Zodarion remotum* Denis. **69** Male palp, ventral view; **70** Male palp, retrolateral view; **71** Retinaculum, ventral view; **72** Terminal part of embolus, ventral view. **73–76** *Zodarion gallicum* (Simon). **73** Male palp, ventral view; **74** Male palp, retrolateral view; **75** Retinaculum, ventrolateral view; **76** Terminal part of embolus, ventral view. **77–78** *Zodarion elegans* (Simon). **77** Epigyne; **78** Vulva. **79–80** *Zodarion maculatum* (Simon). **79** Epigyne; **80** Vulva. **81–82** *Zodarion marginiceps* Simon. **81** Epigyne; **82** Vulva. **83–84** *Zodarion pseudoelegans* Denis. **83** Epigyne; **84** Vulva. **85–86** *Zodarion frenatum* Simon. **85** Epigyne; **86** Vulva. **87–88** *Zodarion germanicum* (C. L. Koch). **87** Epigyne; **88** Vulva. Scale lines=0.1 mm.

embolus with narrow base and subterminally bent, terminally curved in dorsal direction, as seen in anterolateral view.

Female: Total length 2.1–4.3; prosoma 1.02–1.50 long, 0.70–1.08 wide. Further as male. Epigyne (Fig. 113): Median plate very broad, trapezoid, with open antero-median connection to integument; laterally

limited by large, comma-shaped sutures. Vulva (Fig. 114): Spermathecae oval, with large atria on anterior surface, separated by $1.75 \times$ their diameter.

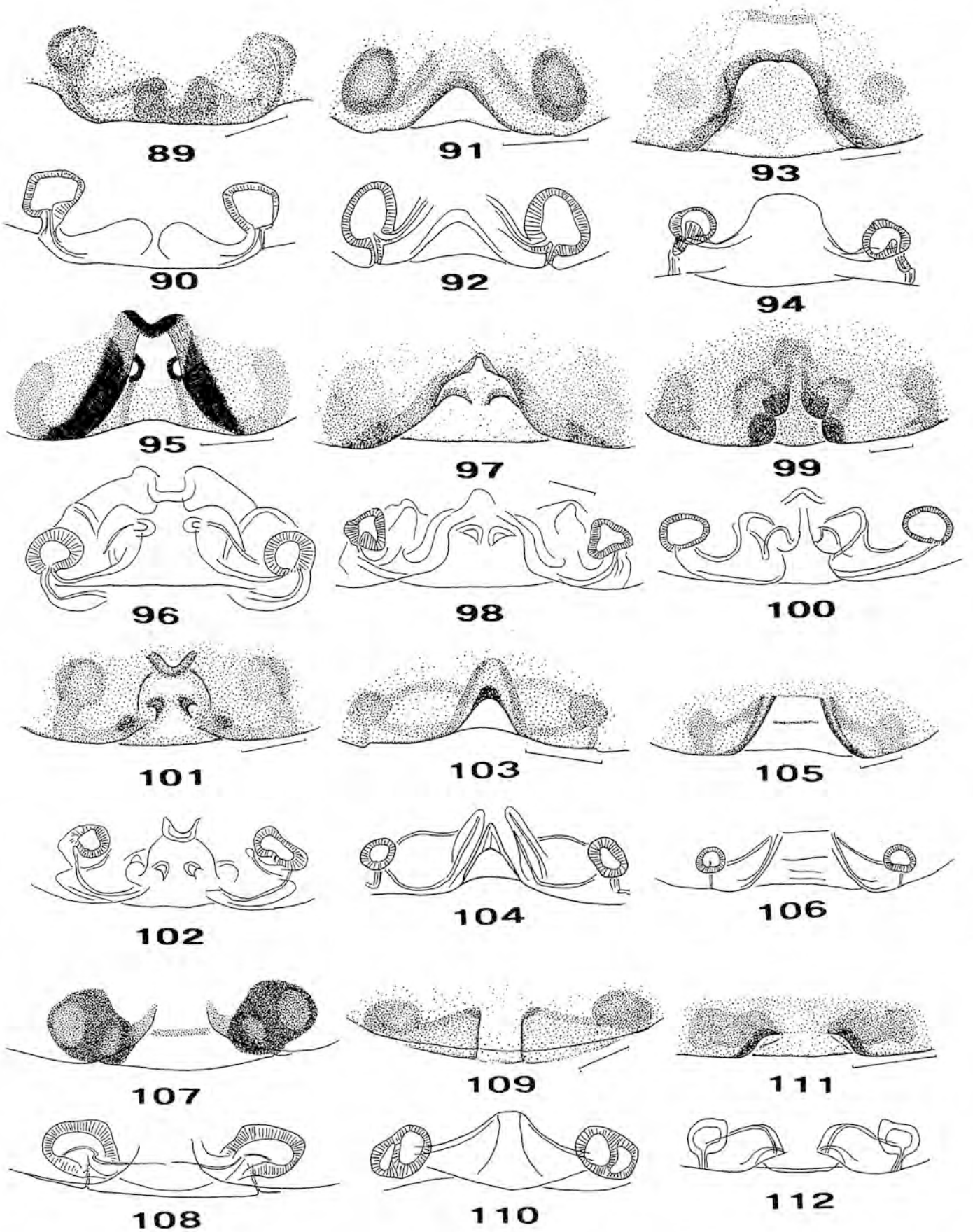
Other material examined and citations: FRANCE: “Gallia méridionale”, 3♀ (MNHNP 304); “Gallia Corsica”, 54♂ 76♀ in type series of *Z. gallicum* (MNHNP 2866); “Gallia”, 29♂ 17♀ (MNHNP 25309); Coll. Kulczynski, 2♀, labelled “France” (IZPAN). *Alpes Maritimes:*



Map 11: Distribution of *Zodarion italicum* (Canestrini). Black circles=verified records; white circles=unverified records.

without further locality (Simon, 1914). *Ardèche*: Charmes, 3♀, April 1984, Sciaky leg. (MSNM; Pesarini, 1993). *Ariège*: Le Portel, 1♂, February 1960 (CJD, MNHNP sub *Z. gallicum*). *Basses Alpes*: Digne (Simon, 1914; Denis, 1937a); Moustière-Ste-Marie (Müller, 1985). *Bouches du Rhone*: without further locality (Simon, 1914); Petite Camargue, 2♂ 9♀, 15 May 1989, and 2♂, 17 October 1989 (CPP); St.-Martin de Crau, 1♀, 19 May 1986, and 2♂, 7 April 1989 (CPP). *Calvados*: Honfleur (Simon, 1879, sub *E. gallica*). *Charente maritime*: Île de Ré (Simon, 1876, sub *E. gallica*); St.-Palais, 1♂ (MNHNP). *Corrèze*: Brive, 1♂, September 1975 (sub *Z. gallicum*, BMNH). *Côtes-du-Nord*: Pontrioux (Lucas, 1878, sub *E. gallica*; Denis, 1938, idem). *Dordogne*: Les Eyzies, 1♂, 17 July 1979, 1♀, 23 July 1980, J. C. Ledoux leg. (CJCL). *Finistère*: Île de Sein, Pointe de Lervilly, 7♂ (CJD, MNHNP; Denis, 1939b, sub *Z. gallicum*). *Gard*: Aramon, Le Moulon, 3♂ 1♀, 17 November 1990, J. C. Ledoux leg. (CJCL); Aramon, Croix de Courtet, 1♂ 1♀, 5 June 1993, J. C. Ledoux leg. (CJCL); Sylvérial, 1♀, 17 April 1989 (CPP). *Hautes Alpes*: Briançon (Simon, 1914; Denis, 1937a). *Haute Garonne*: Forêt de la Bouconne, 1 ♀ (CJD, MNHNP). *Haute Savoie*: Petit-Salève (Lessert, 1904, sub *Z. gallicum*). *Hérault*: Montpellier, 1♀ (Denis, 1937a, sub *Z. ludibundum*); Montpellier, domaine de la Valette, 1♀, 14 March 1961, J. C. Ledoux leg. (CJCL). *Isère*: Le Bourg d'Oisans; Le Sappey (Simon, 1874, sub *E. gallica*). *Landes*: without further locality (Simon, 1874, sub *E. gallica*); Le Muret, 1♀, 23 July 1985 (CRB). *Loire Atlantique*: Préfailles (Lucas, 1882, sub *E. gallica*; Denis, 1938, 1967a, idem). *Lor*: Causses (Denis, 1937a, sub *Z. gallicum*). *Lozère*: Florac, 1♂ 2♀ (CJD, MNHNP; Denis, 1939a). *Manche*: Granville; St. Pair (Lucas, 1878, sub *E. gallica*). *Nord*: Douchy (Denis, 1943, sub *Z. gallicum*). *Puy de Dôme*: St. Nectaire, 2♂, J. Hublé leg. (CRB). *Seine*: Paris (Simon, 1873, sub *E. gallica*); Bois de Boulogne (Simon, 1873, sub *E. gallica*); La Varenne (Simon, 1874, sub *E. gallica*). *Seine et Oise*: Lardy (Denis, 1937a, sub *Z. gallicum*); Maisons-Lafitte, 1♀ (CJD; Denis, 1937a, sub *Z. gallicum*); Saclas (Denis, 1937a, sub *Z. gallicum*); Versailles, 1♂ (CJD; Denis, 1937a, sub *Z. gallicum*). *Seine et Marne*: Fontainebleau (Simon, 1874, sub *E. gallica*). *Var*: Port Cros, 1♀ (CJD, MNHNP; Denis, 1937b, sub *Z. gallicum*). *Vaucluse*: without further locality (Simon, 1914); Mondragon, étang de l'île Vieille, 5♂, April 1987, J. Coffin leg. (CJCL); Sorgues, 3♂, 18 April 1970, 1♂, 14 May 1971, 1♀, 19 June 1971, 1♀, 7 November 1971, J. C. Ledoux leg. (CJCL). *Vendée*: La

Belle Henriette (Denis, 1964a); forêt de la Tranche, 9♂ 13♀ (CJD, MNHNP; Denis, 1946); Longeville, 1♀ (CJD, MNHNP; Denis, 1946, 1959, 1964a, 1964b, 1966); Île d'Yeu, 6♂ 6♀ (CJD, MNHNP; Denis, 1941, sub *Z. gallicum*). *Corsica*: 1♀, in type series of *Z. ludibundum* (MNHNP 303); Campo di l'Oro (Simon, 1914; Denis, 1937a). *ITALY*: *Calabria*: Reggio di Calabria: Aspromonte, 1♀, 1906 (NMW); Aspromonte, P. Scirocco (Kritscher, 1969). *Emilia Romagna*: Modena: Modena, 1♀ (Canestrini, 1868; Brignoli, 1983; lectotype); idem, 1♂ (coll. Koch, BMNH 1919.9.18.5994; paralectotype). Forlì: Forlì, 1♀, Paoletti & Bressan leg. (CKT); idem, 2♂ 1♀, Paoletti & Celano leg. (CKT); Virano, along Montone (Caporiacco, 1926, 1940). *Piacenza*: Badagnano, 1♂ 1♀, 17 April 1983, Pavesi leg. (MSNM; Pesarini, 1993). *Lazio*: Viterbo: Monte Cimino, M. Venere, E. slope, Cereta, 560 m, 8♂ 4♀, 23 April–24 September 1986; M. Cimino, Poggio Nibbio, SW slope, Cerreta, 580 m, 1♂, 25 May 1986, and 1♀, 23 August 1985, Pedulla & Relloni leg. (CFG). *Roma*: Palo Laziale, 6♂ 15♀, June–November 1981, Calvario & Ruvo leg. (CFG); Villa Pamphili, 1♂, 6 February 1975, Sacco & Colonelli leg. (CFG). *Liguria*: La Spezia: La Spezia, 1♂ (CJW). *Savona*: Gioglio di Toirano, 800 m, 1♂ 1♀, 17 September 1983 (CFG). *Lombardia*: Milano: Besate Ticino, 5♂ 2♀, September 1990, Pasquet leg. (MSNM; Pesarini, 1993). *Varese*: Monte Chiurarella, 1♀, 24 July 1987, Baratelli leg. (MSNM; Pesarini, 1993); Monte Martica, 1♂, 26 August 1988, Baratelli leg. (MSNM; Pesarini, 1993). *Toscana*: Arezzo: Pergine Valdarno, 1♂, December 1926 (MZSF; Caporiacco, 1936). *Trentino-Alto Adige*: Guntzschna (Thaler & Noflatscher, 1990); Mitterberg (Noflatscher, 1991); Saben (Noflatscher, 1990). *Umbria*: Perugia: Lippiano (Caporiacco, 1936). *Veneto*: Verona: near Verona, Bertacchina (Caporiacco, 1940); Villafranco, 3♂, 12 June 1982, Daccordi leg. (MSNM; Pesarini, 1993). *GREAT BRITAIN*: *Jersey*: 1♀ (CJD, MNHNP); Millbrook, Coronation Park, 1♂ 2♀, 17 July 1950 (BMNH); St. Lawrence, Sanctuary Road, 15 February 1950 (BMNH). *Essex*: Grays area, 1♂ 1♀, 28 May 1985 (CJFM; Harvey & Murphy, 1985; Roberts, 1987). *BELGIUM*: *Antwerpen*: Mechelen, 1♂, 18 June 1995, K. Van Keer leg. (CJK). *Brabant*: Forêt de Soignes (Becker, 1896, sub *Enyo gallica*). *Liège*: Antheit, 2♀, terrain rudéral, 30 September 1990 (CRB); idem, 504♂ 145♀, in pitfalls (Baert *et al.*, 1992). *Namur*: Nismes (Bara, 1985). *GERMANY*: *Baden-Württemberg*: Brühl, Mannheim, 1♂, 13 July 1988 (CHS); Hartheim-Bremgarten (Siepe, 1985); Kaiserstuhl, 3♂ 2♀, A. Kobel leg. (Misiach,



Figs. 89–112: **89–90** *Zodarion pusio* Simon. **89** Epigyne; **90** Vulva. **91–92** *Zodarion ruffoi* Caporiacco. **91** Epigyne; **92** Vulva. **93–94** *Zodarion timidum* (Simon). **93** Epigyne; **94** Vulva. **95–96, 101–102** *Zodarion rubidum* Simon. **95, 101** Epigyne; **96, 102** Vulva. **97–98** *Zodarion fuscum* (Simon). **97** Epigyne; **98** Vulva. **99–100** *Zodarion couseransense*, sp. n. **99** Epigyne; **100** Vulva. **103–104** *Zodarion soror* (Simon). **103** Epigyne; **104** Vulva. **105–106** *Zodarion nigriceps* (Simon). **105** Epigyne; **106** Vulva. **107–108** *Zodarion ludibundum* Simon. **107** Epigyne; **108** Vulva. **109–110** *Zodarion caporiaccoi* Roewer. **109** Epigyne; **110** Vulva. **111–112** *Zodarion hamatum* Wiehle. **111** Epigyne; **112** Vulva. Scale lines=0.1 mm.

1977, sub *Z. germanicum*; Kobel-Lamparsky, 1987; Lunau & Rupp, 1988, sub *Z. gallicum*; Wunderlich, 1980b; CJW); Karlsruhe, 115 m, 1♀, in garden, 18 August 1984 (CKH); 10 km SW of Karlsruhe, Rheinstetten-Morsch, 110 m, 1♂ 1♀, 23 May 1979, 1♀, 18 June 1993, and 1♀, 15 April 1989 (CKH); Pforzheim, Birkenfeld, 1♂, 3 May 1992 (CJW); Stuttgart (Renner & Kiechle, 1992). *Rheinland-Pfalz*: Gemünden: Aschenroth, 8♂ 3♀, May–November 1987 (CHS). *Bayern*: Unterfranken: Karlstadt, Grainberg/Kalbenstein (CHS); Randersacker, Sonnenstuhl (CHS); Rottenbauer, Herchelhof (CHB); Veitshöchheim, 115♂ 48♀, 28 April–16 November 1991 (CHS); Würzburg, Groszmannsdorf, 1♂, 12 June–23 July 1991 (CHS). SWITZERLAND: *Aargau*: Sisseln (Maurer & Hänggi, 1990, sub *Z. gallicum*). *Basel*: Basel, Lenzgasse (Schenkel, 1923); Pratteln, Zur Lindengruben (Hänggi, 1988, sub *Z. gallicum*). *Bern*: Grossen Moos (Hänggi, 1987, sub *Z. gallicum*). *Genève*: Chêne, bords de la Seime; Peney; Versoix; Presinge (Lessert, 1910, sub *Z. gallicum*). *Jura*: Courrèndlin, 1♂ (Maurer & Hänggi, 1990, sub *Z. gallicum*). *Neuchâtel*: Cornaux (Gonseth, 1985, sub *Z. gallicum*). *Tessin*: Locarno (Vogelsanger, 1944, sub *Z. gallicum*); Melido, Bodio (Maurer & Hänggi, 1990, sub *Z. gallicum*); Monte Generoso (Cotti, 1989, sub *Z. gallicum*); Monte San Giorgio (Maurer & Hänggi, 1990; Hänggi, 1992, sub *Z. gallicum*). *Waadt*: Buchillon (Denis, 1937a, sub *Z. gallicum*). *Wallis*: Brentjong along Rhone (Maurer & Hänggi, 1990, sub *Z. gallicum*); Martigny (Vogelsanger, 1944, sub *Z. gallicum*); near Saillon, May–June 1990 (CTB). AUSTRIA: Nieder Österreich: Pürgstaln, 1♀, Ressel leg. (CJW). SLOVENIA: Istria: Mount Slavnik (Wunderlich, 1980b). Kubed, 1♀, 8 August 1974, Polenc leg. (CJW). CROATIA: Rijeka, Buccari, 1♀ (IZPAN); Chyzer & Kulczynski, 1897; idem, 1♀ (ZHHM, sub *Z. gallicum*).

Distribution (Map 11): Known from France, Great Britain, Belgium, Germany, Switzerland, Austria, Italy, Slovenia and Croatia.

Specimens from SE France (Banyuls sur Mer, Denis, 1937a) are juveniles and perhaps incorrect. Kritscher's (1958) citation from Greece, Xerovouni concerns *Z. frenatum*. Caporiacco's citation (1929) of a female from the Greek island of Chios was corrected by himself (1948) to a female of *Z. rhodiense*, but this is in fact the female of *Z. frenatum*, as pointed out above. Drensky's citations (1936) from Bulgaria also concern other species (Deltshev, 1987).

***Zodarium confusum* Denis, 1935** (Figs. 61–64, 115–116, Map 9)

Zodarium confusum Denis, 1935b: 75 (descr. ♀); 1937a: 26.

Type material: Holotype ♀ of *Z. confusum* from Italy, Romagna, 15 October 1938 (NMW, sub *Z. italicum*); examined.

Remarks: Caporiacco (1949) figured a male which he considered to be the unknown male of *Z. confusum*. However, I studied males collected together with females and these have a short tibial apophysis, different from the long tibial apophysis with twisted tip as figured by Caporiacco. This male could concern either *Z. hamatum* or *Z. caporiaccoi*, both with long tibial apophysis; judging by the length of the distal part of the retinaculum, it probably concerns *Z. caporiaccoi*, and I therefore attribute Caporiacco's description to that species.

Diagnosis: A species of the *italicum* group, very close to *Z. italicum*, differing by the less curved terminal part of the embolus, the very short tibial apophysis, the relatively short triangular distal part of the retinaculum and the diamond-shaped median plate of the epigyne.

Description: Male: Total length 2.2–2.9; prosoma 1.04–1.38 long, 0.81–1.00 wide. Colour: As *Z. italicum*. Palp (Figs. 61–64): Tibial apophysis short, with very broad base; basal and distal part of retinaculum of equal length, distal part triangular; embolus with relatively narrow base, terminally pointed.

Female: Total length 2.6–4.4; prosoma 1.26–1.90 long, 0.84–1.18 wide. Further as male. Epigyne (Fig. 115): Median plate narrow, trapezoid; antero-laterally limited by an oblique stripe enclosing the plate completely. Vulva (Fig. 116): Spermathecae widely separated, small and rounded.

Other material examined and citations: ITALY: *Lazio*: Latina: M. Ausoni, Monte S. Biagio, 150 m, 14♂ 10♀, 26 February–30 May 1988, Angeloni leg. (CFG and CRB); M. Aurunci, Campodimele, M. Faggeto, 740 m, 10♂ 18♀, 26 February–30 May 1988, Angeloni leg. (CFG and CRB); M. Aurunci, Campodimele, S. Onofrio, 44♂ 26♀, 26 February–30 May 1988, Angeloni leg. (CFG, CRB). *Trieste*: Costa dei Barbari, Sistiana, 5–10 m, 1♂ 1♀, 15 September 1982, Gasparo leg. (CFG).

Distribution (Map 9): Central and NE Italy.

***Zodarium vicinum* Denis, 1935** (Figs. 65–68, 117–118, Map 8)

Zodarium italicum; Dalmas, 1922: 85 (misidentification).

Zodarium vicinum Denis, 1935b: 73 (descr. ♀); 1937a: 26; Snazell & Bosmans, 1997: 285.

Zodarium obscurum Denis, 1935b: 75 (descr. ♂).

Type material: Denis (1935b) re-examined Dalmas' (1922) material from Isola Giglio in Toscana, Italy, identified as *Z. italicum*, and decided they belong to two different, new species. The type series of *Z. vicinum* is according to Denis (op. cit.) composed of 2♀ (MCSNG); the type specimen of *Z. obscurum* is a male, also from Isola Giglio (MCSNG). None of them is available for study. This material probably only carries Dalmas' labels of *Z. italicum*.

Remarks: I could not examine the type series from Isola Giglio, but a female from Italy, Aspromonte (NMW), identified by Denis together with the type series, indicated its identity. I presume that Denis' *Z. obscurum*, also from Isola Giglio, and only known from the male, is the male of *Z. vicinum*.

The male incorrectly described by Wunderlich (1973) as the male of *Z. vicinum* concerns a new species, which is described earlier in this paper as *Z. sardum*.

Diagnosis: This species is closely related to *Z. italicum*, differing by the longer distal part of the retinaculum, and the less strongly twisted terminal part of the embolus. Females of *Z. vicinum* are easily distinguished from *Z. italicum*, but may be confused with *Z. caporiaccoi*; they can be recognised by the larger median plate and by the wide ducts to the spermathecae.

Description: Male: Total length 2.1–2.8; prosoma 1.10–1.36 long, 0.84–0.94 wide. Colour: As *Z. italicum*. Eyes: AM=1 (0.1); AL=PM=PL=0.55; a=0.6, b=0.2, c=2, d=0.4; MOQ: AW=0.82PW, L=0.94PW. Palp (Figs. 65–68): Tibial apophysis triangular, with relatively large basal tooth. Retinaculum with relatively long and pointed distal part. Embolus with strong longitudinal crest and subterminal incision.

Female: Total length 2.7–3.8; prosoma 1.30–1.56 long, 0.74–1.05 wide. Further as male. Epigyne (Fig. 117): Median plate an elongated rectangle, with wide lateral ducts visible through integument. Vulva (Fig. 118): Spermathecae oval, widely separated.

Material examined and citations: ITALY: *Abruzzi:* Pescara: Lettomanopello, SW Chieti, 750 m, 1♂ 8♀, K. Thaler leg. (CKT, CRB); Montagna della Maiella, Pretoro, Passo Lanciano, 900 m, 1♀, K. Thaler leg. (CKT). *Calabria:* Reggio di Calabria: Aspromonte, 1♀ (NMW; Denis, 1935b). *Emilia Romagna:* Forlì: Forlì, 1♂, 1991, Paoletti & Bressan leg. (CKT); idem, 16♂ 8♀, 1992, Paoletti & Celano leg. (CKT, CRB). *Toscana:* Isola Giglio (Dalmas, 1922). GREAT BRITAIN: Kent: Dover, Shakespeare Cliff, 2♂ 1♀, in pitfalls, 24 June 1987, and 4♂ 7♀, under stones, 8 June 1991, R. Snazell leg. (CRS, CRB; Snazell & Bosmans, 1997).

Distribution (Map 8): Known only from southern Italy and from SE England, where it was possibly introduced.

***Zodarium remotum* Denis, 1935** (Figs. 69–72, 119–120, Map 10)

Zodarium remotum Denis, 1935a: 56 (descr. ♀); 1937a: 27 (descr. ♂); Canard, 1989: 19.

Zodarium neapolitanum Denis, 1935b: 73 (descr. ♂, non ♀); 1937a: 28. Syn. n.

Type material: Holotype ♀ of *Z. remotum* Denis, 1935a from Corsica (BMNH 5592.5993, sub *Z. italicum*); examined. The male in the same tube was first identified by Denis (1935a) as *Z. ludibundum*, but later (1937a) as the male of *Z. remotum*. Lectotype ♂ of *Z. neapolitanum*, by present designation, from Italy, Campania, Napoli (MNHNP 6347, sub *Z. gallicum*); a female in the same tube belongs to *Zodarium pusio*. The two tubes with the type material only contain labels of

Z. gallicum or *Z. italicum*, but the other data agree with the data in Denis' papers.

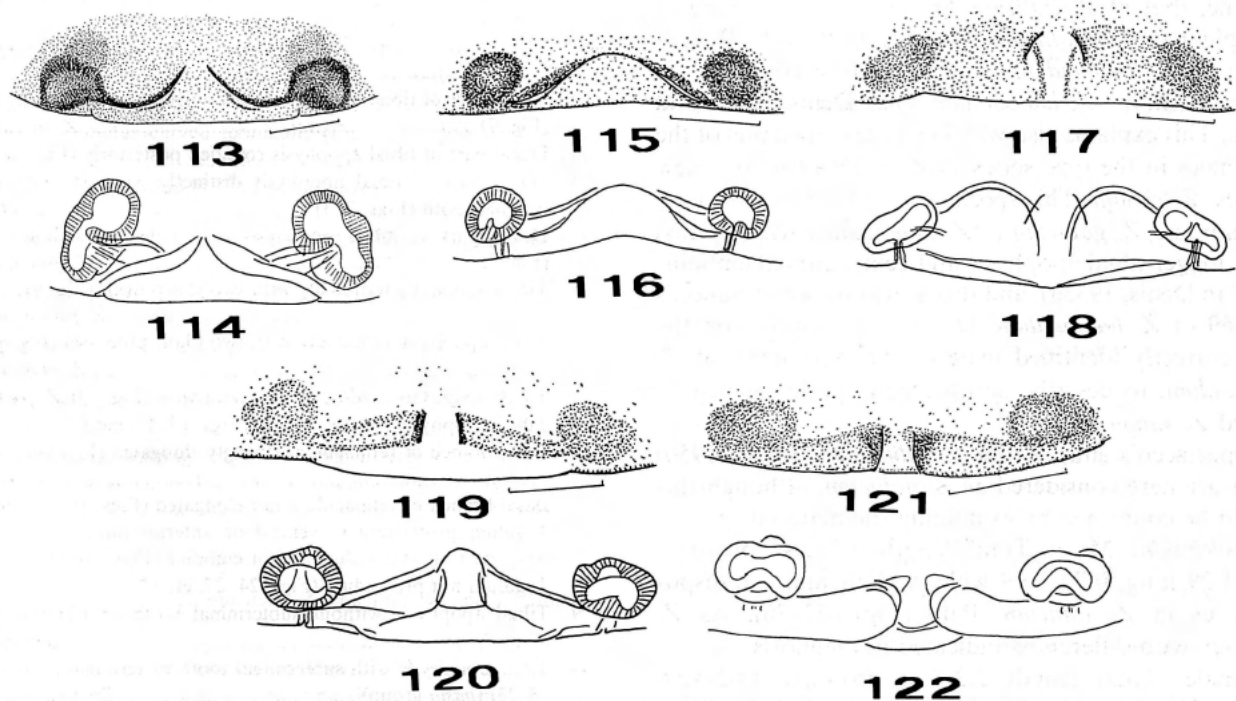
Diagnosis: This species is closest to *Z. gallicum* and differs by the larger basal tooth of the tibial apophysis, the protruding tegulum, the straight distal part of the retinaculum, and the differently shaped terminal part of the embolus in the male, and by the median plate being more to the anterior part of the epigyne in the female.

Remarks: In his paper on the *Zodarium* species of Italy, Denis (1935b) refers to his paper on the *Zodarium* species of France (Denis, 1935a). I consider the latter paper as published first, and hence *Z. neapolitanum* becomes a junior synonym of *Z. remotum*. They are male and female of the same species, as confirmed by captures of both sexes together.

Description: Male: Total length 2.1–2.8; prosoma 0.98–1.08 long, 0.74–0.78 wide. Colour: As *Z. italicum*. Palp (Figs. 69–72): Tibial apophysis broad at its base, with large basal tooth, terminally bluntly pointed; tegulum protruding in mesal direction; distal part of retinaculum as long as basal part, straight, strongly pointed; embolus with broad base, abruptly narrowing and becoming needle-like.

Female: Measurements: Total length 3.3–3.4; prosoma 1.32–1.40 long, 0.88–1.00 wide. Further as male. Epigyne (Fig. 119): Posterior median plate rectangular, much longer than wide, with only anterior part of lateral margins chitinised, this part connected by oblique stripe to spermathecae. Vulva (Fig. 120): Spermathecae circular, separated by 2.5 × their maximal diameter.

Other material examined and citations: FRANCE: Corsica: 1♂ (BMNH, together with holotype of *Z. remotum*). ITALY: *Campania:* Salerno: Ravello near Amalfi, 220 m, 2♂ 2♀, 3 June 1962, H. Levi leg. (AMNH and CRB). *Lazio:* Roma: Palestrina, 1♂ (IZPAN).



Figs. 113–122: 113–114 *Zodarium italicum* (Canestrini). 113 Epigyne; 114 Vulva. 115–116 *Zodarium confusum* Denis. 115 Epigyne; 116 Vulva. 117–118 *Zodarium vicinum* Denis. 117 Epigyne; 118 Vulva. 119–120 *Zodarium remotum* Denis. 119 Epigyne; 120 Vulva. 121–122 *Zodarium gallicum* (Simon). 121 Epigyne; 122 Vulva. Scale lines=0.1 mm.

Distribution (Map 10): Known from central Italy and from Corsica.

***Zodarion gallicum* (Simon, 1873)** (Figs. 73–76, 121–122, Map 7)

Enyo gallica Simon, 1873: 64 (descr. ♀, non ♂); 1874: 247

Zodarion gallicum; Simon, 1914: 231, 235 (descr. ♀, non ♂); Canard, 1989: 19.

Zodarion italicum; Chyzer & Kulczynski, 1897: 150 (descr. ♂, non ♀) (misidentification).

Zodarion ludibundum; Denis, 1935a: 53; 1937a: 26; Caporiacco, 1949: 253; 1950: 68 (misidentifications).

Zodarion soror; Denis, 1935a: 58 (descr. ♀; misidentification).

Type material: Tube 2866 (MNHNP) labelled “Gallia Corse” is considered here as the type series. A male lectotype is hereby selected; paralectotypes are 22♂ 46♀ of *Z. gallicum*; 54♂ and 76♀ in the same tube belong to *Z. italicum*.

Diagnosis: Closely related to *Z. italicum* in size and colour, and hence often confused. Males are best distinguished by the narrower tooth of the retinaculum with mesal concavity, and the embolus with much broader base with subterminal angularity and straight tip. Females are more easily distinguished by the relatively narrow median plate, more or less separated from the epigastric furrow (depending on the general expansion of the abdomen), and the very simple spermathecae.

Remarks: For a long time, I doubted the validity of *Z. gallicum* (Bosmans, 1988). Simon (1914) indeed states: “Je ne trouve aucun caractère constant pour séparer les mâles des *Z. italicum* et *gallicum*”. Females however can be separated easily, as indicated in Simon’s key; his figure 481 of the epigyne leaves no doubt about its identity. Denis’ later figures (1935a, 1937a) and also the one of Chyzer & Kulczynski (1897) clearly show another epigyne, that of *Z. italicum*. Simon’s original figure of the epigyne of *Z. gallicum* agrees perfectly with Denis’s figure of *Z. ludibundum*, and I therefore conclude: *Z. gallicum* Simon = *Z. ludibundum sensu* Denis, 1935a and 1937a. This explains also why Denis described one of the two males in the type series of *Z. ludibundum* as a new species: *Z. simoni*. This species is distinguished from *Z. italicum* and *Z. gallicum* (= *Z. ludibundum sensu* Denis) by its longer tibial apophysis and gently curved embolus (fig. 7 in Denis, 1935a), and this is also shown in Simon’s fig. 469 of *Z. ludibundum*. Denis thus simply took the only correctly identified male of the type series of *Z. ludibundum*, to describe another new species, which he named *Z. simoni*.

Caporiacco’s citations of *Z. ludibundum* (1949, 1950) hence are here considered as *Z. gallicum*, although this should be confirmed by examining the material.

Description: Male: Total length 1.7–2.4; prosoma 0.92–1.29 long, 0.70–0.99 wide. Colour and eye disposition as in *Z. italicum*. Palp (Figs. 73–76): As *Z. italicum*, with differences indicated in diagnosis.

Female: Total length 2.2–3.6; prosoma 1.02–1.66 long, 0.76–1.04 wide. Further as male. Epigyne (Fig. 121); Median plate nearly rectangular, poorly delimited, connected by elongated transverse darker area to region

of spermathecae. Vulva (Fig. 122); Spermathecae oval with very small, dorsally situated atria.

Other material examined and citations: FRANCE: “Gallia”, 8♂ 15♀ (MNHNP 25309). *Basses Alpes*: La Palud, Gorge de Verdin, 1♂, H. Müller leg. (CJW). *Corsica*: 1♂ in type series of *Z. ludibundum* (MNHNP 303); 1♀, sub *Z. italicum* (IRSNB); Ajaccio, Campo di l’Oro (Simon, 1874); Casabianca, Col de St. Antonio, 890 m, 1♀, mixed *Castanea sativa* forest, 22 May 1995, R. Bosmans leg. (CRB); Castirla, 345 m, 1♂ 1♀, in litter of *Quercus suber* forest, 22 May 1995, R. Bosmans leg. (CRB); Corte, 410 m, 7♂ 16♀, grassland on slopes of citadel, 25 May 1995, R. Bosmans leg. (CRB); Ziccavo, 730 m, 2♀, in maquis with scattered *Castanea sativa*, 26 May 1985, R. Bosmans leg. (CRB). ITALY: *Emilia Romagna*: Forlì: Farazzano, Meldola (Caporiacco, 1949, sub *Z. ludibundum*); Forlì (Caporiacco, 1949, sub *Z. ludibundum*); San Benedetto in Alpe (Caporiacco, 1949, sub *Z. ludibundum*). Ravenna: Pineta di Classe (Caporiacco, 1949, sub *Z. ludibundum*). Lazio: Viterbo: Canino, 1♀, November–December 1988, 2♀, May–June 1989, and 1♂ 2♀, 1990, Zapporoli leg. (CKT); Monte Cimini, Poggio Nibbio, SW slope, Castagneto, 550 m, 2♂ 2♀, 25 June–24 October 1986, S. Pedulla & R. Relloni leg. (CFG, CRB); Monte Venere, 520 m, 1♂, 25 May 1986 (CFG). Umbria: Rieti: Torricella (Caporiacco, 1950, sub *Z. ludibundum*). CROATIA: Buccari near Rijeka, 1♂ (IZPAN; Chyzer & Kulczynski, 1897); idem, 1♀ (ZHHM).

Distribution (Map 7): The distribution of this species has to be redefined. Citations from Belgium, Germany, Switzerland, Bulgaria and Greece are incorrect. Verified material has been examined from SE France, Corsica, Italy and Croatia.

Key to the *Zodarion* species of Western and Central Europe

Males

1. Tibial apophysis slender, in lateral view more than twice as long as tibia’s diameter (*elegans* group) (Figs. 2, 5, 7, 9, 11).....2
- Tibial apophysis robust, less than twice as long as tibia’s diameter (Figs. 13, 15, etc.).....6
2. Distal part of tibial apophysis recurved or curved upwards (Figs. 2, 5, 7).....3
- Distal part of tibial apophysis gently curved, terminally incised (Figs. 9, 11).....5
3. Distal part of tibial apophysis posteriorly with rectangular tooth (Fig. 7).....*Z. maculatum*
- Distal part of tibial apophysis rounded posteriorly (Figs. 2, 5).....4
4. Distal part of tibial apophysis distinctly widened, with sharp internal tooth (Figs. 2, 3).....*Z. elegans*
- Distal part of tibial apophysis less widened, without tooth (Fig. 5).....*Z. gracilithibiale*
5. Tibial apophysis terminally with two sharp teeth (Fig. 9).....*Z. pseudoelegans*
- Tibial apophysis terminally with two blunt processes (Fig. 11).....*Z. marginiceps*
6. Tibial apophysis needle-like in lateral view (Fig. 13).....*Z. frenatum*
- Tibial apophysis not needle-like (Figs. 15, 17, etc.).....7
7. Basal branch of retinaculum strongly elongated (Fig. 14).....*Z. sardum*
- Basal branch of retinaculum not elongated (Figs. 16, 18, etc.).....8
8. Tegulum protruding in ventral or anterior direction, covering basal part of retinaculum and/or embolus (Figs. 16, 18, 20, 22).....9
- Tegulum not protruding (Figs. 24, 27, etc.).....12
9. Tibial apophysis without subterminal tooth or terminal hook (Fig. 17).....*Z. germanicum*
- Tibial apophysis with subterminal tooth or terminal hook (Figs. 18–23) (*pusio* group).....10
10. Tibial apophysis with strong terminal hook (Figs. 18, 19).....*Z. pusio*
- Tibial apophysis with subterminal tooth (Figs. 20, 22).....11

11. Tibial apophysis longer than tibia's diameter (Fig. 21)
*Z. emarginatum*
 — Tibial apophysis as long as tibia's diameter (Fig. 23).....*Z. ruffoi*
12. Tibial apophysis with subterminal concavity; embolus terminally accompanied by a secondary tooth (Figs. 24, 27, 30, 33, 36) (*rubidum* group)13
 — Tibial apophysis without subterminal concavity, triangular or linear; a single embolar tooth (Figs. 39, 43, etc.) (*italicum* group).....17
13. Tooth accompanying embolus very long, differentiated from basal part of embolus (Figs. 24, 25).....*Z. fulvonigrum*
 — Tooth accompanying embolus short (Figs. 27, 30, 33, 36)14
14. Tibial apophysis terminally with two teeth, and a subterminal, dorso-lateral tooth (Figs. 27, 29).....*Z. timidum*
 — Tibial apophysis terminally incised but without subterminal tooth (Figs. 31, 34, 37).....15
15. Base of embolus with medio-lateral concavity; retinaculum much longer than wide, with basal and distal branches strongly elongated (Fig. 30).....*Z. rubidum*
 — Base of embolus without medio-lateral concavity; retinaculum as long as wide, branches less elongated (Figs. 33, 36).....16
16. Embolar teeth nearly of equal length (Fig. 35).....*Z. fuscum*
 — Dorsal embolar tooth longer than ventral one (Fig. 38)
*Z. couseransense*
17. Cephalic part of carapace dark, thoracic part whitish.....
*Z. nigriceps*
 — Cephalic and thoracic parts brown to dark brown18
18. Tibial apophysis elongated (Figs. 44, 46); embolus narrow and gently curved (Figs. 43, 45).....19
 — Tibial apophysis triangular (Figs. 50, 54, 58, etc.); embolus thick, with ridges or subterminal teeth (Figs. 49, 53, 57, etc.)20
19. Distal branch of retinaculum pointed in posterior direction; embolus narrow from its base (Fig. 43)*Z. soror*
 — Distal part of retinaculum directed in postero-mesal direction; embolus with broader base (Fig. 45).....*Z. ludibundum*
20. Tip of tibial apophysis extremely narrow, curved outwards in ventral view (Figs. 49, 53).....21
 — Tip of tibial apophysis not differentiated thus (Figs. 57, 61, etc.)22
21. Distal part of retinaculum distinctly longer than basal part, 4 × as long as wide (Fig. 51).....*Z. caporiaccoi*
 — Distal part of retinaculum as long as basal part, 3 × as long as wide (Fig. 55)*Z. hamatum*
22. Distal part of retinaculum wide, less than twice as long as wide (Figs. 59, 63).....23
 — Distal part of retinaculum narrow, 3–4 × as long as wide (Figs. 67, 71, 75)24
23. Tip of embolus curved terminally (Fig. 60): retinaculum as in Fig. 59*Z. italicum*
 — Tip of embolus straight (Fig. 64); retinaculum as in Fig. 63
*Z. confusum*
24. Embolus with oblique ridge, terminally relatively thick (Figs. 65, 68).....*Z. vicinum*
 — Embolus without oblique ridge, terminally relatively narrow (Figs. 69, 73).....25
25. Basal part of tegulum bulging in mesal direction (Fig. 69); mesal margin of distal part of retinaculum straight or convex (Fig. 71); tip of embolus as in Fig. 72, but sometimes broken off
*Z. remotum*
 — Tegulum less bulging (Fig. 73); mesal margin of distal part of retinaculum concave (Fig. 75); tip of embolus as in Fig. 76.....
*Z. gallicum*
3. Posterior margin of epigynal pit with rectangular median process (Fig. 77).....*Z. elegans*
 — Posterior margin of epigynal pit with triangular median process (Fig. 79).....*Z. maculatum*
4. Postero-median plate of epigyne large and white, semicircular (Fig. 85).....*Z. frenatum*
 — Postero-median plate small (Figs. 87, 89, etc.).....5
5. Posterior margin of epigyne with median incision (Figs. 87, 91, 103)6
 — Epigyne not incised posteriorly (Figs. 89, 93, 95, 97, 99, 101, 105, 107, etc.).....8
6. Postero-median incision angular (Fig. 87).....*Z. germanicum*
 — Postero-median incision rounded (Figs. 91, 103)7
7. Postero-median incision anteriorly not limited by a pouch (Fig. 91).....*Z. ruffoi*
 — Postero-median incision anteriorly limited by a pouch (Fig. 103)*Z. soror*
8. Epigyne hardly chitinised, without oblique or straight paired sutures (Fig. 89).....*Z. pusio*
 — Epigyne with chitinised sutures, limiting a square, trapezoid or triangular postero-median plate (Figs. 81, 93, 95, 97, 99, 101, 105, 107, etc.).....9
9. Anterior margin of postero-median plate of epigyne well-marked by chitinous ridges, notches or pouches (Figs. 81, 93, 95, 97, 99, 101)10
 — Anterior margin of postero-median plate in open (rarely closed) connection with the anterior integument, only flanked by lateral ridges (Figs. 105, 107, 109, etc.)14
10. Postero-median plate without paired pouches, its anterior border gently rounded (Fig. 93)*Z. timidum*
 — Postero-median plate with anterior or median pouches (Figs. 81, 95, 97, 99, 101).....11
11. Pouches having anterior position, openings in mesal direction, not preceded by a notch (Fig. 81)*Z. marginiceps*
 — Pouches having different position (Figs. 95, 97, 99, 101).....12
12. Postero-median plate triangular (Figs. 95, 101).....*Z. rubidum*
 — Postero-median plate trapezoid (Figs. 97, 99)13
13. Epigyne as in Fig. 97*Z. fuscum*
 — Epigyne as in Fig. 99.....*Z. couseransense*
14. Cephalic part of carapace dark, thoracic part whitish.....
*Z. nigriceps*
 — Cephalic and thoracic parts brown to dark brown15
15. Posterior median plate trapezoid or triangular (Figs. 107, 111, 113, 115).....16
 — Posterior median plate square or rectangular (Figs. 109, 117, 119, 121)19
16. Posterior median plate much wider than long, trapezoid, its lateral margins well marked by dark stripes (Fig. 111).....
*Z. hamatum*
 — Posterior median plate not trapezoid, lateral margins less marked (Figs. 107, 113, 115).....17
17. Spermathecae with antero-mesal atria, clearly visible through integument (Figs. 113, 114).....*Z. italicum*
 — Spermathecae without antero-mesal atria (Figs. 107–108, 115–116)18
18. Spermathecae large, separated by 1.5 × their diameter (Figs. 107–108).....*Z. ludibundum*
 — Spermathecae small, separated by 3 × their diameter (Figs. 115, 116).....*Z. confusum*
19. Postero-median plate relatively small, as long as wide, lateral darker stripes narrow, parallel to epigastric furrow (Fig. 121).....
*Z. gallicum*
 — Postero-median plate larger, lateral stripes oblique, more separated from epigastric furrow (Figs. 109, 117, 119).....20
20. Lateral stripes narrow, forming an acute angle with epigastric furrow (Fig. 119).....*Z. remotum*
 — Lateral stripes wider, often darkened by amorphous plugs (Figs. 109, 117).....21
21. Lateral stripes with straight anterior margin (Fig. 109).....
*Z. caporiaccoi*
 — Lateral stripes with convex anterior margin (Fig. 117).....
*Z. vicinum*
- Females* (females of *Z. emarginatum*, *Z. gracilitibiale*, and *Z. sardum* are unknown)
1. Epigyne with distinct median pit (Figs. 77, 79, 83).....2
 — Epigyne without or with indistinct pit (Figs. 81, 85, etc.).....4
2. Median pit sausage-like, without postero-median incision (Fig. 83)*Z. pseudoelegans*
 — Median pit with postero-median incision (Figs. 77, 79).....3

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