

Ant-eating spiders (Araneae: Zodariidae) of Portugal: additions to the current knowledge

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Abstract

Three new species of zodariid spiders are described in this paper: *Amphileorus ungoliantae* sp. n. and *Zodarion bosmansi* sp. n. from southern Portugal, and *Zodarion atlanticum* sp. n. from central Portugal and the Azores. Additional records on another eight taxa from central and southern Portugal are given: *Amphileorus adonis*, *Zodarion alacre*, *Z. jozefienae*, *Z. lusitanicum*, *Z. maculatum*, *Z. merlijni*, *Z. styliferum*, and *Z. styliferum* forma *extraneum*. To date, there are 19 species (plus one form) of zodariid spiders known from Portugal.

Key words: *Amphileorus*, *Zodarion*, description, faunistics, distribution, Azores, Iberian

Introduction

With more than 750 species described so far, the family Zodariidae Thorell 1881 is one of the fifteen most species rich spider families. Representatives of this family are distributed over all continents, except Antarctica. Only four genera, *Amphileorus* Jocqué & Bosmans 2001, *Palaestina* O. P.-Cambridge 1872, *Selamia* Simon 1873 and *Zodarion* Walckenaer 1826, with about 80 species occur in Europe. One third of these species is restricted to the Iberian Peninsula (Platnick 2005).

The Portuguese (and Iberian) zodariid spider fauna was almost unknown until the revisions of Bosmans (1994), Alderweireldt & Bosmans (2001), Jocqué & Bosmans (2001) and Pekár et al. (2003), which revealed 17 species (plus one form) for Portugal. This paper adds three new species. The occurrence of *Z. segurense* Bosmans, issued in Pekár et al. (2003), is not supported.

This study is based on more than 2000 zodariid specimens collected during 2002 and 2003. The spiders were mainly collected by pitfall traps from three protected areas of continental Portugal, Parque Natural das Serras de Aire e Candeeiros, Reserva Natural do Paúl do Boquilobo (both in central Portugal, 2002) and Parque Natural do Vale do Guadiana (south-eastern Portugal, 2003). Some more individuals were collected in southern Portugal and in the Azores (island of Pico).

Several diagnostic characters of the male palp and epigyne are used to distinguish *Zodarion* and *Amphiledorus* spiders (Bosmans 1994; Pekár et al. 2003). The most important ones are the shape of tibial apophysis and embolus in males and the shape of epigyne in females. Juveniles can be recognised by their colour pattern, which is species specific (Pekár 2002).

Abbreviations: CPB = collection of P. A. V. Borges, Angra do Heroísmo; CPC = collection of P. Cardoso, Baixa da Banheira; CRB = collection of Robert Bosmans, Ghent; CSP = collection of S. Pekár, Brno; f = female, IRSNB = Institut Royal des Sciences Naturelles de Belgique, Bruxelles; j = juvenile; m = male, n = sample number; MNHN = Muséum national d'Histoire naturelle, Paris; SD = standard deviation, SMF = Senckenberg Museum, Frankfurt am Main.

Taxonomy

Amphiledorus adonis Jocqué & Bosmans 2001

(Fig. 1–3)

Diagnosis & Description. For male see Jocqué and Bosmans (2001), for female see Pekár et al. (2003).

Material examined. Beja district: Parque Natural do Vale do Guadiana, Corredoura (UTM 29SPB17) (all P. Cardoso leg., CPC): 16 July 2003, 1f; 13 August 2003, 1j; 24 September 2003, 1m+1j; 8 October 2003, 7m+7f; 22 October 2003, 7m+1j; 5 November 2003, 1m; 19 November 2003, 2m.

Distribution. Probably restricted to southern Portugal (Fig. 1–3).

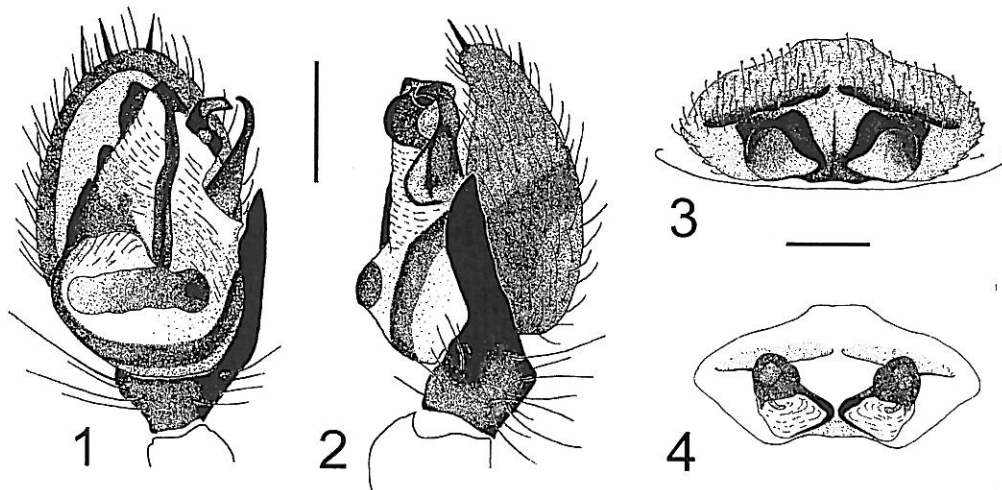
Amphiledorus ungoliantae sp. n.

(Figs 1–4, 14)

Type data. Holotype male: Beja district: Parque Natural do Vale do Guadiana, Corte da Velha (UTM 29SPB17), 20 December 2003, P. Cardoso leg.; paratype: 1f, same locality, 28 October 2003, P. Cardoso leg. Type material deposited in SMF.

Material used for comparison. *Amphiledorus balnearius*: Algeria, Altas Blideen, Chrea E., Pic Emir Abdelkader, 20 June 1987, 1m+2f, R. Bosmans leg. (CRB).

Diagnosis. This species is closely related to *Amphiledorus balnearius* Jocqué & Bosmans 2001 from which males are recognised by straight and broad tibial apophysis; females by shape of epigyne.



FIGURES 1–4. *Amphiledorus ungoliantae* sp. n. 1 male palp, ventral view. 2 male palp, retrolateral view. 3 epigyne, ventral view. 4 epigyne, dorsal view. Scale bars = 0.5 mm.

Description. *Male:* Total length 7.80 mm, prosoma 3.77 mm long, 2.57 mm wide. Cephalic part of prosoma tapering anteriorly. *Colour:* Prosoma dark brown with light brown stripe around fovea widening toward posterior part. Chelicerae brown. Sternum brown. Legs yellow but coxae greenish-brown. Opisthosoma dorsally brown with two larger anterior whitish spots, ventrally pale with few brown spots. *Palp* (Figs 12): tibia with broad apophysis, sharp on retrolateral side, cymbium oval with four distal spines. Tegulum strongly developed. Embolus long, slightly curved in the middle. Median apophysis long terminally hook-shaped, conductor hooked, distal tegular apophysis with paired protuberances.

Female: Total length 8.71 mm, prosoma 4.03 mm long, 2.61 mm wide. Cephalic part of prosoma not tapering. *Colour:* Prosoma yellow-brown. Legs yellow but coxae and femora greenish-brown. All other colour as in male. *Epigyne* (Figs 34): wider than long, posterior plate divided centrally, with two triangular pouches, anterior margin of plate with paired sclerotised lips.

Distribution. Known only from the type locality in southern Alentejo (Fig. 14).

Etymology. The specific name is a noun in apposition derived from the famous fictional spider, Ungoliant, described in the “Silmarillion” and later writings of J. R. R. Tolkien.

Zodarion alacre (Simon 1870)

(Fig. 15)

Diagnosis & Description. For both sexes see Bosmans (1994).

Material examined. Évora district: Valverde da Mitra (UTM 29SNC86), 1 October 2003, 12j, S. Pekár leg (CSP). Beja district: Parque Natural do Vale do Guadiana (all P. Cardoso leg., CPC, unless otherwise stated): Corredoura (UTM 29SPB17), 9 April 2003, 1m; Ribeira de Limas (UTM 29SPB28), 4 June 2003, 2m+5f; 24 September 2003, 7j, S. Pekár leg (CSP); Mértola (UTM 29SPB16), 29 May 2003, 5f; 30 July 2003, 2f. Leiria district: Parque Natural das Serras de Aire e Candeeiros (all P. Cardoso leg., CPC): Santo António (UTM 29SND27), 21 May 2002, 3m; 4 June 2002, 1m+1f; Vale Garcia (UTM 29SND37), 7 May 2002, 3m; 21 May 2002, 4m; 4 June 2002, 1m; 18 June 2002, 1f; 2 July 2002, 1f; 16 July 2002, 2f; 13 August 2002, 4f.

Distribution. Widespread in Portugal (Fig. 15).

Zodarion atlanticum sp. n.

(Figs 5–8, 16)

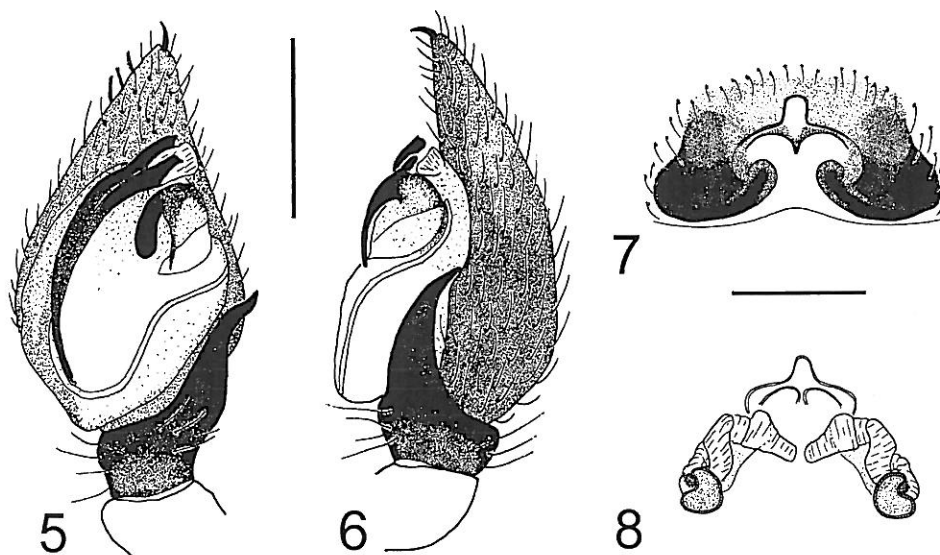
Type data. Holotype male: Azores, Pico, Madalena, 3 June 2004, leg. S. Pekár et M. Hrušková; paratypes: 2f, same data. Type material deposited in SMF.

Other material examined. Leiria district: Parque Natural das Serras de Aire e Candeeiros (all P. Cardoso leg., CPC): Bairro (UTM 29SND37), 18 June 2002, 2m; Barrenta (UTM 29SND28), 2 July 2002, 1m; Santarém district: Reserva Natural do Paúl do Boquilobo: Paúl do Boquilobo (UTM 29SND36), 10 April 2002, 1j; 24 April 2002, 3j; 8 May 2002, 5j; 22 May 2002, 27m; 5 June 2002, 67m+6f; 18 June 2002, 57m+4f; 2 July 2002, 2m+1f; 16 July 2002, 2m+15f+15j; 30 July 2002, 2f+62j; 14 August 2002, 39j; 27 August 2002, 2f+47j; 10 September 2002, 33j; 24 September 2002, 57j; 8 October 2002, 34j; 22 October 2002, 2j; 5 November 2002, 3j. Azores: Faial, Cabeço do Fogo, 17 September 1999, 2f+1j, P. A. V. Borges leg. (CPB); Pico, Madalena, 5 June 2004, 8m+14f, leg. S. Pekár et M. Hrušková (CSP).

Material used for comparison. *Zodarion costablancae*: Spain, Valencia, Bellus, 7 June 1994, 1m+2f, R. Bosmans leg. (CRB); Tarragona, L'Ampolla, 6 August 2000, 1f, R. Bosmans leg. (CRB). *Zodarion machadoi*: Spain, Pontevedra, Puerto de Fuentedria, 13 August 1994, 1f, R. Bosmans leg. (CRB); Portugal, Vila do Conde, 1m+1f (MNHN, AR9951). *Zodarion viduum*: Portugal, Trás-os-Montes, Viveiro, 16 August 1992, 1f, R. Bosmans leg. (CRB); Portugal, Porto, Lisboa, 2f (MNHN, AR1518).

Diagnosis. This species belongs to the „*rubidum*“ group *sensu* Bosmans (1997). It is closely related to *Z. viduum* Denis 1937, *Z. costablancae* Bosmans 1994 and *Z. machadoi* Denis 1939. Males of this species are distinguished from these species by shape of tibial apophysis, which is wide at base and gradually tapering towards tip. Females differ in shape of postero-lateral margins of epigynal plate that are convergent.

Description. *Male.* Total length 2.39 mm (SD=0.14, n=10), prosoma 1.25 mm (SD=0.06, n=10) long, 0.87 (SD=0.03, n=10) wide. *Colour:* Prosoma, chelicerae and sternum brown. Legs yellow but femora I and II brown. Opisthosoma dorsally dark sepia with one whitish spot above spinnerets, ventrally pale. *Palp* (Figs 56): tibial apophysis broad gradually tapering, curved antero-dorsally, distally pointed. Basal part of bulbus protruding. Retinaculum with distal end rounded and flattened. Embolus and disal tegular apophysis straight and truncate.



FIGURES 5–8. *Zodarion atlanticum* sp. n. 5 male palp, ventral view. 6 male palp, retrolateral view. 7 epigyne, ventral view. 8 vulva, dorsal view. Scale bars = 0.25 mm.

Female. Total length 3.19 mm (SD=0.32, n=10), prosoma 1.34 mm (SD=0.08, n=10) long, 0.92 (SD=0.06, n=10) wide. *Colour:* as in males but femora III and IV distally light brown. *Epigyne* (Figs 78): with two pouches. Anterior margin with a wedge-shaped structure. Posterior margins convergent. Width of epigynal plate twice as long as distance between inner ends of postero-lateral margins.

Distribution. In continental Portugal it is known from the centre of the country, in the Azores from Pico and Faial islands (Fig. 16).

Etymology. The name is an adjective derived from the Atlantic Ocean in whose proximities it is found.

***Zodarion bosmansi* sp. n.**
(Figs 9–12, 17)

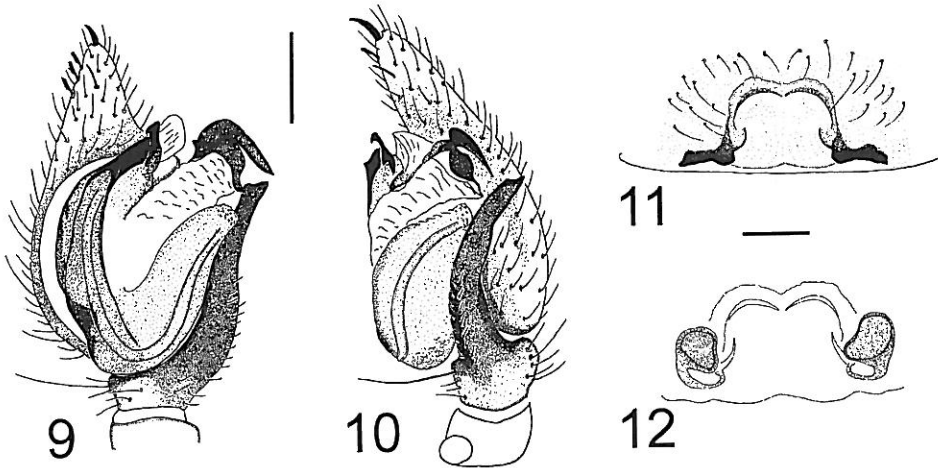
Z. segurense: Pekár et al., 2003: 393–394, fig. 15 (misidentification).

Type data. Holotype male: Beja district: Parque Natural do Vale do Guadiana, Algodôr (UTM 29SPB07), 16 July 2003, P. Cardoso leg.; paratypes: same locality, 27 August 2004, 2f, P. Cardoso leg. Type material deposited in SMF.

Material used for comparison. *Zodarion segurense*: male holotype, Spain, Jaén, Sierra de Segura, Segura, 25 May 1980, R. Jocqué leg. (IRSNB).

Remark. In our previous paper (Pekár et al. 2003) we noted some dissimilarities between this species and a closely related *Z. segurense* Bosmans. As the type material of *Z. segurense* was not available, we could not designate a new species.

Diagnosis. This species is closely related to *Z. segurense* and *Z. lusitanicum* but it is markedly larger. Males of *Z. bosmansii* are further distinguished from these two species by shape of distal end of tibial apophysis, which is terminally truncate and by tip of embolus that is hooked. Females differ in shape of frontal margin of epigyne, which has paired sclerotised lips.

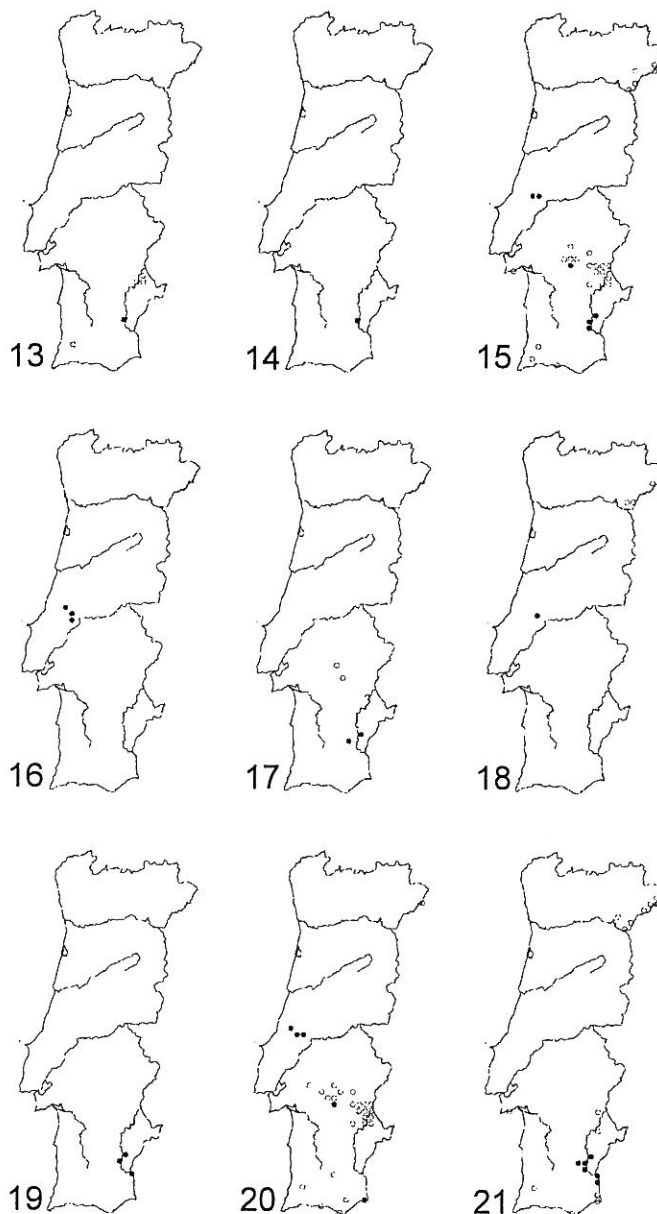


FIGURES 9–12. *Zodarion bosmansii* sp. n. 9 male palp, ventral view. 10 male palp, retrolateral view. 11 epigyne, ventral view. 12 vulva, dorsal view. Scale bars = 0.25 mm.

Description. *Male*: Total length 4.08 mm (SD = 0.31, n = 10), prosoma 2.03 mm (SD = 0.14, n = 10) long, 1.58 mm (SD = 0.14, n = 10) wide. *Colour*: Prosoma and chelicerae light brown, legs yellow. Sternum yellow with thin brown margin. Opisthosoma dorsally sepia brown, ventrally pale. *Palp* (Figs 9–10): tibial apophysis long and gently curved, terminally truncate. Retinaculum (unnaturally expanded) with distal sharp tooth, embolus hooked, distal tegular apophysis broad and flattened.

Female. Total length 4.84 mm (SD = 0.45, n = 10), prosoma 2.33 mm (SD = 0.13, n = 10) long, 1.71 mm (SD = 0.15, n = 10) wide. *Colour*: as in males. *Epigyne* (Figs 11–12): median plate wider than long, anterior margin well marked with paired sclerotised lips. Openings at lateral margins.

Material examined. Beja district: Parque Natural do Vale do Guadiana (all P. Cardoso leg., CPC): Algodôr (UTM 29SPB07), 30 July 2003, 1f; 13 August 2003, 1m+1f; 27 August 2003, 1m+1f; Ribeira de Limas (UTM 29SPB28), 16 July 2003, 1f; 30 July 2003, 8m+2f; 13 August 2003, 1f.



FIGURES 13–20. Distribution of zodariid spiders in Portugal. 13 *Amphileidorus adonis*. 14, *Amphileidorus ungoliantae*. 15 *Zodarion alacre*. 16 *Zodarion atlanticum*. 17 *Zodarion bosmansii*. 18 *Zodarion lusitanicum*. 19 *Zodarion merlijni*. 20 *Zodarion styliferum*. 21 *Zodarion styliferum* f. *extraneum*. Current (full symbols) and previous (empty symbols) records.

Distribution. Known only from southern Alentejo in Portugal (Fig. 17).

Etymology. The name is a noun in genitive case, dedicated to Robert Bosmans, who made the extensive revision of this genus.

Zodarion jozefienae Bosmans 1994

Diagnosis & Description. For both sexes see Pekár et al. (2003).

Material examined. Beja district: Parque Natural do Vale do Guadiana (all P. Cardoso leg., CPC, unless otherwise stated): Algodôr (UTM 29SPB07), 27 August 2003, 2m; Braçiais (UTM 29SPB26), 4 June 2003, 1m+1f; 9 June 2003, 7m+1f; 18 June 2003, 7m+7f; 21 June 2003, 7m+1f+1j, S. Pekár leg. (CSP); 2 July 2003, 47m+16f+22j; 16 July 2003, 17m+9f+4j; 30 July 2003, 11m+2f+1j; 13 August 2003, 11m+22f; 27 August 2003, 26m+17f; 5 September 2003, 12f, S. Pekár leg. (CSP); 10 September 2003, 12m+13f; 12 September 2003, 8m+2f+8j, S. Pekár leg. (CSP); 24 September 2003, 17m+14f+1j; Mesquita (UTM 29SPB35), 21 June 2003, 1m+2f, S. Pekár leg. (CSP); Ribeira de Limas (UTM 29SPB28), 13 August 2003, 1f.

Distribution. In Portugal known only from Alentejo and Algarve.

Zodarion lusitanicum Cardoso 2003

(Fig. 18)

Diagnosis & Description. For both sexes see Pekár et al. (2003).

Material examined. Leiria district: Parque Natural das Serras de Aire e Candeeiros (all P. Cardoso leg., CPC): Vale Garcia (UTM 29SND37), 30 July 2002, 2m+2f; 13 August 2003, 2m.

Distribution. It is probably restricted to central and northern Portugal (Fig. 18).

Zodarion maculatum (Simon 1870)

Diagnosis & Description. For both sexes see Bosmans (1994).

Material examined. Évora district: Évora, Valverde da Mitra (UTM 29SNC86), 7 October 2003, 10m+8f, S. Pekár leg. (CSP).

Distribution. In Portugal known from its southern part.

Zodarion merlijni Bosmans 1994
(Fig. 19)

Diagnosis & Description. For male see Bosmans (1994), for female see Pekár et al. (2003).

Material examined. Beja district: Parque Natural do Vale do Guadiana (all P. Cardoso leg., CPC, unless otherwise stated): Corredoura (UTM 29SPB17), 21 May 2003, 2m; Mesquita (UTM 29SPB35), 20 June 2003, 1f. S. Pekár leg. (CSP); Ribeira de Limas (UTM 29SPB28), 21 May 2003, 13m+9f; 6 June 2003, 8m+11f; 18 June 2003, 1m+2f; 2 July 2003, 2f.

Distribution. In Portugal found only in Alentejo, always close to the Guadiana River (Fig. 19).

Zodarion styliferum (Simon 1870)
(Fig. 20)

Diagnosis & Description. For both sexes see Bosmans (1994) and Pekár et al. (2003).

Material examined. Évora district: Valverde da Mitra (UTM 29SNC86), 16 June 2003, 3f, S. Pekár leg. (CSP); 3 October 2003, 8m+7f+5j, S. Pekár leg. (CSP); Leiria district: Parque Natural das Serras de Aire e Candeeiros (all P. Cardoso leg., CPC): Bairro (UTM 29SND37), 21 May 2002, 1m; 30 July 2002, 1m; Mira d'Aire (UTM 29SND27), 13 August 2002, 1m; Santo António (UTM 29SND27), 21 May 2002, 14m+10f; 4 June 2002, 2m+3f; São Mamede (UTM 29SND18), 21 May 2002, 1j; 4 June 2002, 3m; Vale Garcia (UTM 29SND37), 26 March 2002, 2m+6j; 9 April 2002, 4m+1f+5j; 23 April 2002, 9m+3f+7j; 7 May 2002, 14m+5f+7j; 21 May 2002, 30m+8f+7j; 4 June 2002, 49m+21f+7j; 18 June 2002, 25m+32f+4j; 2 July 2002, 49m+68f+27j; 16 July 2002, 12m+36f+26j; 30 July 2002, 24m+62f+80j; 13 August 2002, 10m+63f+101j; 27 August 2002, 18f+77j; 10 September 2002, 15f+42j; 24 September 2002, 1f; 8 October 2002, 10m+4f; 22 October 2002, 1m; 5 November 2002, 1m. Faro district, Manta Rota (UTM 29SPB31), 15 October 2003, 4m+7f+7j, S. Pekár leg. (CSP).

Distribution. Widespread in Portugal (Fig. 20).

Zodarion styliferum forma *extraneum* Denis 1935
(Fig. 21)

Diagnosis & Description. For both sexes see Pekár et al. (2003).

Material examined. Beja district: Parque Natural do Vale do Guadiana, (all P. Cardoso leg., CPC, unless otherwise stated): Aldogôr (UTM 29SPB07), 30 July 2003, 6m+6f; Corredoura (UTM 29SPB17), 26 March 2003, 1m+2f; Corte da Velha (UTM 29SPB17),

28 October 2003, 3f, S. Pekár leg. (CSP); Mesquita (UTM 29SPB35), 20 June 2003, 2m+3f, S. Pekár leg. (CSP); 25 September 2003, 8f+1j, S. Pekár leg. (CSP); 15 October 2003, 3f, S. Pekár leg. (CSP); Mértola (UTM 29SPB16), 24 May 2003, 2f; 29 May 2003, 4m+10f; 30 July 2003, 1m+2f; Ribeira de Limas (UTM 29SPB28), 24 September 2003, 1m+1j, S. Pekár leg. (CSP). Faro district: near Alcoutim (UTM 29SPB34), 12 October 2003, 7m+2f+1j, S. Pekár leg. (CSP).

Distribution. It probably occurs across the whole country (Fig. 21).

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