

## Description of a new *Zodarion Walckenaer*, 1826 from Turkey (Zodariidae; Araneae)

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**Abstract:** A new species of *Zodarion Walckenaer*, 1826 is described based on material collected in the Marmara region of Turkey. Morphological and diagnostic characters and illustrations of the genitalia of both sexes are presented, and the differences with the closely related *Zodarion turcicum* Wunderlich, 1980 are pointed out.

**Key words:** Ant-eating spiders, Central Anatolia, Marmara region, new species, Zodariinae

The spider genus *Zodarion* Walckenaer, 1826 includes 138 species, which are distributed throughout the Mediterranean basin (Platnick, 2013) but have limited distribution areas. *Zodarion* species can be distinguished from other zodariids by having a number of combined characters: 3 tarsal claws, 8 eyes, spineless legs, the anterior spinnerets on a common base, and the shape of the genital organs. They can be found in all types of habitats including arid regions. They are specialised ant-eaters and construct igloo-shaped retreats (Jocqué, 1991).

The first *Zodarion* species was reported from Turkey by Nosek (1905), who described the new species *Z. thoni* Nosek, 1905. Several other new spider species from Barut Mountain (Lifos), in the Erciyes Mountains (Kayseri Province), were published in that paper. Thirty years later, Caporiacco (1935) cited *Z. graecum* (C.L. Koch, 1843) from Turkey; 34 years after that, Karol (1969) reported *Z. morosum* Denis, 1935 from Ankara. Wunderlich (1980) described 3 new species from Bolu-Abant: *Z. abantense* Wunderlich, 1980; *Z. korgei* Wunderlich, 1980; and *Z. turcicum* Wunderlich, 1980. Another addition to the Turkish fauna was given by Bosmans (1997), reporting *Z. frenatum* Simon, 1884 as a new species from İzmir. Bosmans (2009) added 3 more species in a regional revision of the genus, describing *Z. deltshevi* Bosmans, 2009 and *Z. van* Bosmans, 2009 as new species from Turkey and reporting the first Asian record of *Z. granulatum* Kulczyński, 1908 from Van.

The spider checklist for Turkey also includes *Zodarion gallicum* (Simon, 1873), *Z. germanicum* (C.L. Koch, 1837),

and *Z. rubidum* Simon, 1914. These species were first cited by Bayram (2002) and later included in catalogues of the spiders of Turkey (Topçu et al., 2005; Bayram et al., 2013). According to Bosmans (1997, 2009), however, the distribution ranges of these species do not reach Turkey. When these species were cited from Turkey in the past, the taxonomy of the Mediterranean *Zodarion* species was poorly known and many misidentifications occurred (Bosmans 1997, 2009). *Zodarion gallicum*, *Z. germanicum*, and *Z. rubidum* appear to have much smaller distribution areas than previously thought and appear to be limited to West and Central Europe. Until evidence is presented, these species have to be deleted from the Turkish spider list. Consequently, 10 species of *Zodarion* are actually known to occur in Turkey. However, this is probably an underestimation when the diversity of *Zodarion* species in neighbouring countries is considered: 11 species in Bulgaria, 35 in Greece, 2 in Armenia, 2 in Georgia, and 6 in Azerbaijan (Otto and Tramp, 2011; van Helsdingen, 2012).

The purpose of this study is to describe and illustrate a new *Zodarion* species on the basis of both male and female sexual characters.

The specimens were collected from the Marmara and Central Anatolia regions of Turkey by means of pitfall traps and preserved in 70% ethanol. All measurements are in mm. Measurements of the eyes are as in Bosmans (2009). The following abbreviations are used in the text: AL, anterior lateral eyes; AM, anterior median eyes; PL, posterior lateral eyes; PM, posterior median eyes; a, b, c,

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d, distance between eyes: a = AM-AM, b = AM-AL, c = PM-PM, d = PM-PL; MOQ, median ocular quadrangle; AW, anterior width; PW, posterior width; L, length; Fe, femur; AUZM, Anadolu University Zoological Museum (Eskişehir, Turkey); CRB, collection of Robert Bosmans (Ghent, Belgium).

**Taxonomy**

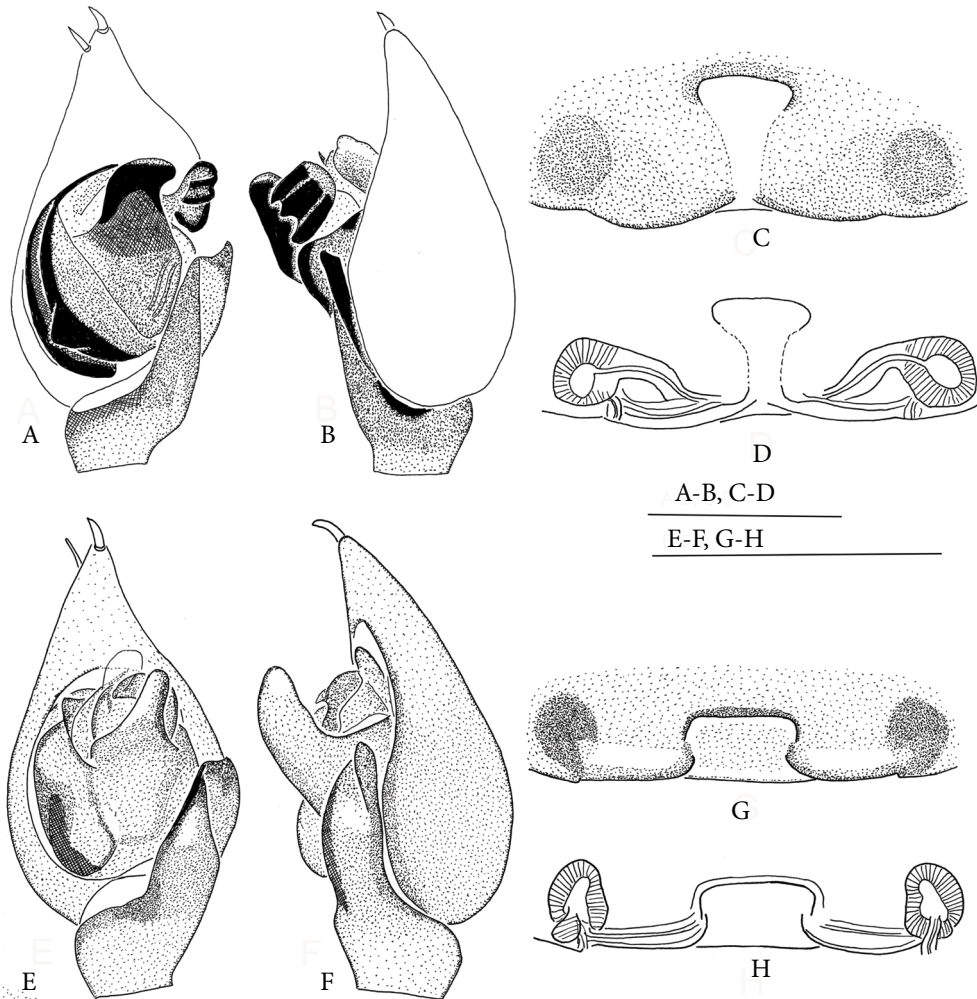
***Zodarion bigaense* sp. nov. (Figures 1A-D)**

**Type material:** Holotype: ♂ (AUZM) Turkey, Çanakkale Province, Biga District, Karabiga town (40°22'38.58"N, 27°18'14.99"E), 03 May 2009–03 October 2009, S.V. Varlı leg. Paratypes: 5 ♂♂, 3 ♀♀ (4 ♂♂, 2 ♀♀ in AUZM, 1 ♂, 1 ♀ in CRB), same data as holotype; 1 ♀ (AUZM), Bursa Province, Nilüfer District, Ayvaköy (40°7'27.96"N, 28°42'6.30"E), 02 July 2009, K.B. Kunt leg.; 3 ♂♂, 4 ♀♀ (AUZM), Eskişehir Province, Meşelik Area (39°43'31.05"N, 30°29'43.17"E), 26 September 2010–02

November 2010, R.S. Özkütük leg.; 1 ♂, 2 ♀♀ (AUZM), Ankara Province, Yenimahalle District, Türkkonut, Dodurga village (39°49'16.20"N, 32°40'5.90"E), 08 July 2011–06 September 2011, K.B. Kunt leg.

**Etymology:** The specific epithet is an adjective referring to the type locality of the new species.

**Diagnosis:** *Zodarion bigaense* sp. nov. is a member of the *germanicum* group and is closely related to *Z. turcicum* Wunderlich, 1980. Males differ from the latter species by having a more pointed tibial apophysis, a larger tegular apophysis, and 3 large teeth on the median apophysis (Figures 1A and 1B); in *Z. turcicum*, only 2 large teeth and some smaller teeth are present (Figures 1E and 1F). Females differ from those of *Z. turcicum* by the more anterior position of the anteromedian depression and the relatively larger and closer-set spermathecae (Figures 1C and 1D, *Z. bigaense* sp. nov.; Figures 1G and 1H, *Z. turcicum*).



**Figure 1.** *Zodarion bigaense* sp. nov. A) Male palp, ventral view; B) Male palp, retrolateral view; C) Epigyne; D) Vulva – *Z. turcicum* Wunderlich, 1980; E) Male palp, ventral view; F) Male palp, retrolateral view; G) Epigyne; H) Vulva. Scale bars: 0.5 mm.

### Description

**Measurements:** Male: total length 3.5–4.4; carapace 1.70–2.42 long, 1.20–1.71 wide. Female: total length 4.3–5.0; carapace 1.92–2.11 long, 0.82–1.42 wide.

**Colour:** Male: Prosoma dark brown, thoracic region paler with darkened anastomosing striae; chelicerae, endites, and sternum brown to dark brown; legs: coxae and tarsi yellowish white, Fe dark brown, basal part of Fe III–IV often yellowish brown, tibiae and metatarsi yellowish brown; abdomen dorsally dark sepia, small posterodorsal spot, oblique lateral incision and venter whitish. Female: generally as male, but somewhat paler and with less-contrasting leg segments.

**Eyes (male):** AM = 1 (0.1); AL = 0.9; PM = 0.45; PL = 0.8; a = 0.8; b = 0.55; c = 2.35; d = 0.7; MOQ: AW = 0.82 PW; L = 0.88 PW.

**Palp (Figures 1A and 1B):** Tibial apophysis elongated, twice as long as the tibial diameter, with a deep longitudinal groove and a blunt tip; tegulum with large tegular apophysis, situated in the anteromedian part of the bulb, strongly protruding in an anterolateral direction; median apophysis (retinaculum) located just behind the tegular apophysis, ending with 3 large, black teeth; embolus with

a rounded knob at its base, gradually narrowing and terminally pointed.

**Epigyne:** With large anteromedian depression, only anterior and lateral margins chitinised; posterior margin of epigyne slightly incised (Figure 1C). Spermathecae rounded, separated by 2.5 times their diameter (Figure 1D).

The Turkish *Zodarion* species belong predominantly to the *germanicum* species group, with 4 species (Bosmans, 2009). Numerically, the *germanicum* group is followed by the *lutipes* and *thoni* groups, each with 2 Turkish species. The description of *Z. bigaense* sp. nov. raises the number of Turkish *Zodarion* species from 11 to 12. As most species of the genus have relatively small distribution ranges, the future discovery in Turkey of additional previously described or new species is to be expected.

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### References

- Bayram A (2002). Distributions of Turkish spiders. In: Demirsoy A, editor. Zoogeography of Turkey. Ankara, Turkey: Meteksan Publications, pp. 638–657 (in Turkish).
- Bayram A, Kunt KB, Danişman T (2013). The Checklist of the Spiders of Turkey. Version 2013. Online at <http://www.spidersofturkey.com> (accessed 9 March 2013).
- Bosmans R (1997). Revision of the genus *Zodarion* Walckenaer, 1833, part II. Western and Central Europe, including Italy (Araneae: Zodariidae). Bull Br Arachnol Soc 10: 265–294.
- Bosmans R (2009). Revision of the genus *Zodarion* Walckenaer, 1833, part III. South East Europe and Turkey (Araneae, Zodariidae). Contrib Nat Hist 12: 211–295.
- Caporiacco L di (1935). Escursione del Prof. Nello Beccari in Anatolia Aracnidi. Monit Zool Ital 46: 283–289 (in Italian).
- Jocqué R (1991). A generic revision of the spider family Zodariidae (Araneae). Bull Am Mus Nat Hist 201: 1–160.
- Karol S (1969). Eine wenig bekannte Art der Gattung *Zodarion* (Arachnida: Araneae: Zodariidae). Senckenb Biol 50: 201–203 (in German).
- Nosek A (1905). Araneiden, Opilionen und Chernetiden. In: Penther, A, Zederbauer, E. Ergebnisse einer naturwissenschaftlichen Reise zum Erdschias-Dagh (Kleinasien). Ann naturh Hofmus Wien 20: 114–154 (in German).
- Otto S, Tramp S (2011). Caucasian Spiders: A Faunistic Database on the Spiders of the Caucasus (Version 2.0 Beta). Online at <http://db.caucasus-spiders.info> (accessed 9 March 2013).
- Platnick NI (2013). The World Spider Catalog, Version 13.5, American Museum of Natural History. Online at <http://research.amnh.org/iz/spiders/catalog> (accessed 9 March 2013).
- Topçu A, Demir H, Seyyar O (2005). A checklist of the spiders of Turkey. Serket 9: 109–140.
- van Helsdingen P (2012). Fauna Europaea: Araneae. Fauna Europaea Version 2.5. Online at <http://www.faunaeur.org> (accessed 9 March 2013).
- Wunderlich J (1980). Zur Gattung *Zodarion* Walckenaer 1847 mit Neubeschreibungen (Arachnida: Araneae: Zodariidae). Senckenb Biol 60: 229–240 (in German).

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