

Additional notes on the spider fauna of Turkey (Araneae)

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Abstract: This paper presents the results of recent field surveys and provides new data on the spider fauna of Turkey. The following 9 taxa are new records for Turkey: *Larinia chloris* (Audouin, 1826); *Macrothele* sp.; *Arctosa tbilisiensis* Mcheidze, 1946; *Pisaura consocia* (O. P.-Cambridge, 1872); *Prodidomus redikorzevi* Spassky, 1940; *Macaroeris flavicomis* (Simon, 1884); *Scytodes velutina* Heineken & Lowe, 1832; *Achaeridion conigerum* (Simon, 1914); and *Phoroncidia paradoxa* (Lucas, 1846). New locality data are provided for the following previously but rarely recorded species: *Spermophora senoculata* (Dugès, 1836); *Ariadna insidiatrix* Audouin, 1826; and *Segestria senoculata* (Linnaeus, 1758). Taxonomic, zoogeographical, and ecological data are given for each species.

Key words: Araneae, new record, spider, Turkey

Introduction

The world spider fauna comprises more than 42,055 described species, of which about 120 spider species are endemic to Turkey (Platnick, 2011). However, Turkish spiders have been poorly studied. Despite an increase in studies on Turkish spiders during recent years, there are still many regions of the country that remain insufficiently investigated. The first detailed list of Turkish spiders was compiled by Karol in 1967. The list included all published records for 302 spider species. In the following years, many

faunistic and ecological studies were conducted by both Turkish and foreign researchers in different localities in Turkey. In 2002, Bayram revised Karol's (1967) checklist and reported 520 species belonging to 162 genera from Turkey (Bayram, 2002). Later, a checklist of Turkish spiders was published by Topçu et al. (2005). To date, the total number of species of Araneae recorded from Turkey is 757, belonging to 265 genera and 48 families (Bayram et al., 2010). The real diversity of Turkish spider fauna is much higher, but it is still poorly known.

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The purpose of this study was to contribute to the knowledge base of Turkish spider diversity by adding new species records, and new locality data, as well as information about species morphology and zoogeographical remarks for each species.

Material and methods

The specimens were collected by authors from different regions of Turkey (Figure 1). The collection was performed by hand aspirator, sweeping net, and beating (bushes and trees). Specimens were preserved in alcohol + 5% glycerin. Digital images of the palps and epigynes were taken with a digital camera (Leica DFC290, Germany) that was connected to the optical tube of a stereomicroscope (Leica M205 C, Leica Microsystems GmbH, Wetzlar, Germany) and 5 to 15 photographs were taken in different focal planes and combined. The material was deposited in the Arachnological Museum of Kırıkkale University (KUAM, Department of Biology, Kırıkkale, Turkey), the Zoological Museum of Uludağ University

(ZMUU, Department of Biology, Bursa, Turkey), and the Museum of the Turkish Arachnological Society (MTAS, Ankara, Turkey). The taxonomy and general distribution of all of the species follows Platnick (2011). The spider specimens were identified according to Brignoli (1978), Levy (1986, 1999), Metzner (1999), Alderweireldt (2002), Huber (2002), Marusik (2009), and Nentwig et al. (2010). The following abbreviations are used: c, Circa; Dist., District; Prov., Province; and Vil., Village.

Results and discussion

Family: Araneidae Clerck, 1757

Larinia Simon, 1874

Larinia chloris (Audouin, 1826) (Figure 2)

Material examined: 3♀♀ (MTAS), Şanlıurfa Prov., Birecik Dist., c. 2 km south of Mezra Vil. (36°56'47"N, 37°01'20"E), 11.05.2006, leg. E.A. Yağmur.

General distribution: Middle East to Mozambique and India (Platnick, 2011).



Figure 1. The distribution of: *Larinia chloris* (1), *Macrothele* sp. (2), *Arctosa tbilisiensis* (3), *Spermophora senoculata* (4), *Pisaura consocia* (5), *Prodidomus redikorzevi* (6), *Macaroeris flavicomis* (7), *Scytodes velutina* (8), *Ariadna insidiatrix* (9), *Segestria senoculata* (10), *Achaeridion conigerum* (11), and *Phoroncidia paradoxa* (12) in Turkey.

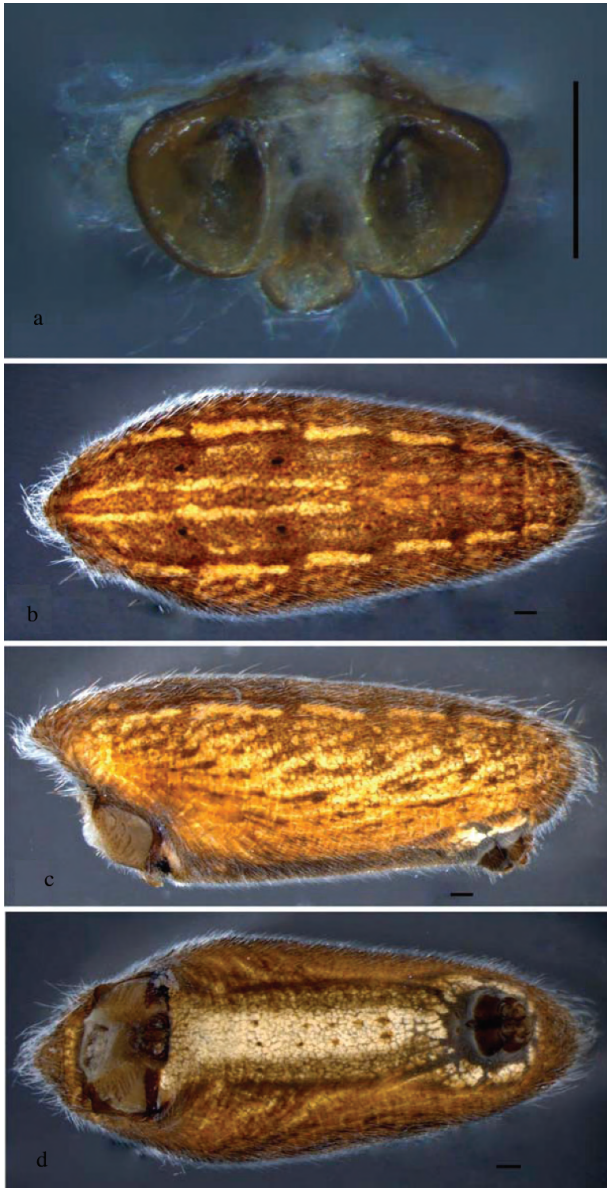


Figure 2. *Larinia chloris*: (a) Epigynum, ventral view; (b) abdomen, dorsal view; (c) abdomen, lateral view; and (d) abdomen, ventral view. Scale lines: 0.2 mm.

Comments: New genus and species records for the spider fauna of Turkey.

The generic concepts of *Larinia* Simon, 1874 and its related groups were revised by Grasshoff (1970a, 1970b, 1970c, 1971), who split the “*Larinia* group” into 8 genera: *Larinia*; *Drexelia* McCook, 1892; *Lipocrea* Thorell, 1878; *Siwa* Grasshoff, 1970; *Paralarinia* Grasshoff, 1970; *Faradja* Grasshoff, 1970; *Mahembea* Grasshoff, 1970; and *Lariniaria* Grasshoff,

1970. From the *Larinia* group, only 1 species, *Lipocrea epeiroides* (O. P. Cambridge, 1872), has been recorded from Turkey recently (Kunt et al., 2010). *Larinia* has a worldwide distribution and includes 55 described species (Platnick, 2011). Detailed information and a description of *Larinia chloris* were given by Levy (1986), based on specimens from Israel. The color, pattern, and other characters of our female specimens are similar to those of the Israeli specimens. The epigyne bears funnel-shaped copulatory openings and slender scape. The epigynal structures of our samples are in good conformation with the Israel samples illustrated by Levy (1986). Levy (1986) indicated that adult specimens were found in Israel at humid sites from May to July. The specimens from Turkey were collected in May from a locality close to the Fırat (Euphrates) River. The Turkish specimens represent the northernmost record of its known zoogeographical range.

Family: Hexathelidae Simon, 1892

***Macrothele* Ausserer, 1871**

Macrothele sp. (Figure 3)



Figure 3. *Macrothele* sp.: Habitus, dorsal view. Scale line: 2 mm.

Material examined: 1 subadult ♀ (MTAS), Antalya Prov., Alanya Dist., Taşatan Plateau (36°40'14.64"N, 32°10'12.60"E), 9.06.2010, leg. A. Kızıltuğ.

Comments: New family and genus records for the spider fauna of Turkey.

The mygalomorph spiders were previously represented in Turkey by 3 families: Ctenizidae (1 species), Nemesiidae (3 species), and Theraphosidae (2 species). This new record increases the number of mygalomorph spider families found in Turkey to

4. Unfortunately, our specimen was not mature and so it could not be identified to species. However, the glabrous and elevated caput and the numerous cuspules on the labium indicated that our sample belongs to the genus *Macrothele*, which belongs in Hexathelidae.

Family: Lycosidae Sundevall, 1833

Arctosa C. L. Koch, 1847

Arctosa tbilisiensis Mcheidze, 1946 (Figure 4)

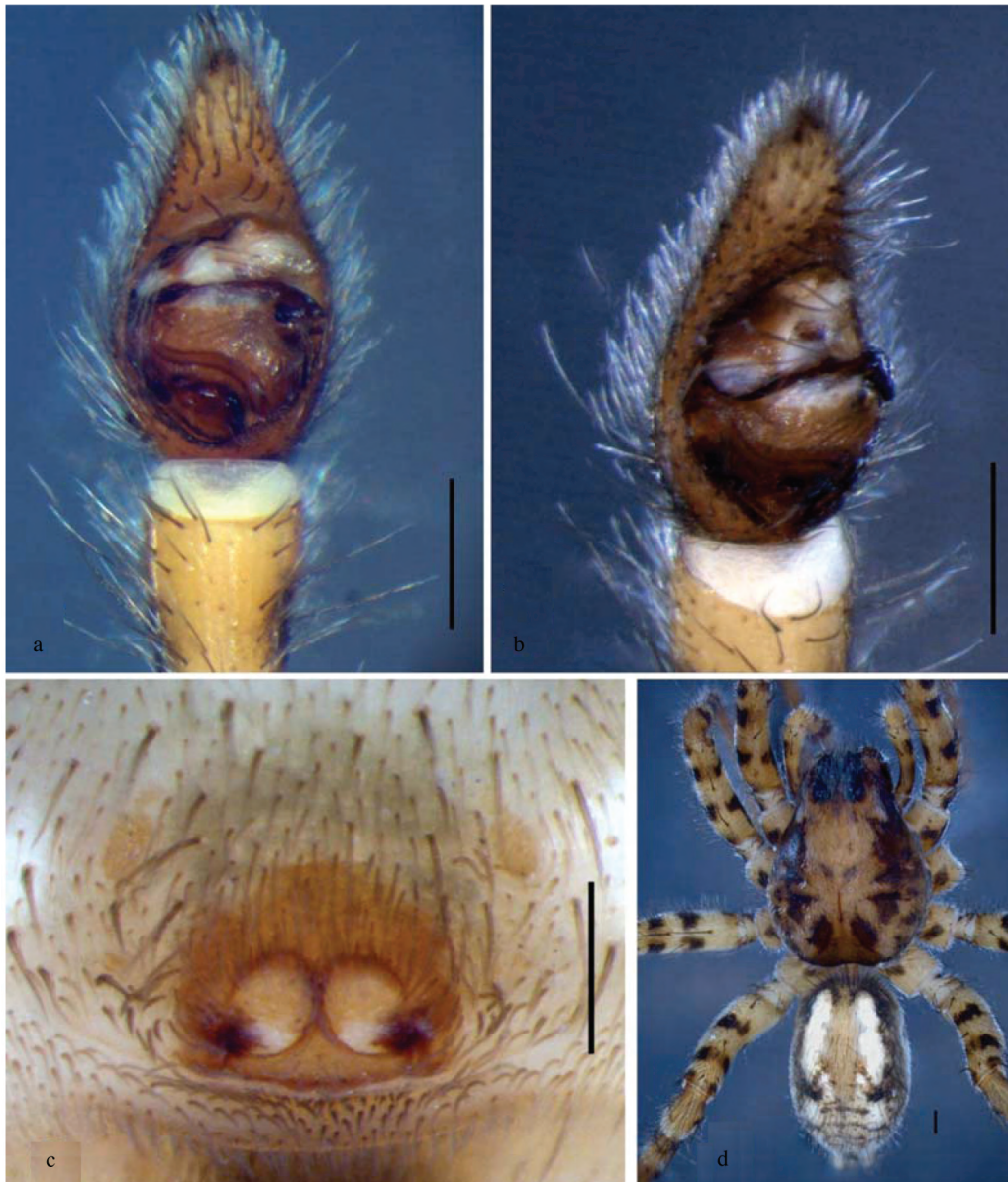


Figure 4. *Arctosa tbilisiensis*: (a) Male palp, ventral view; (b) male palp, retrolateral view; (c) epigynum, ventral view; and (d) male habitus. Scale lines: 0.2 mm.

Material examined: 2♀♀, 1♂ (MTAS), Adıyaman Prov., Koru Vil. (37°50'3.60"N, 38°18'56.00"E), 18.04.2008, leg. E.A. Yağmur; 1♂ (MTAS), Batman Prov., Kozluk Dist., c. 3.5 km east of Çayhan Vil. (38°09'45.01"N, 41°37'14.15"E), 12.06.2010, leg. E.A. Yağmur.

General distribution: Bulgaria, Greece to Georgia (Platnick, 2011).

Comments: New record for the spider fauna of Turkey.

The spider genus *Arctosa* C. L. Koch, 1847 currently includes 171 described species. To date, 9 *Arctosa* species have been reported from Turkey (Bayram et al., 2010; Platnick, 2011). The first Turkish record of *Arctosa* was by Simon (1879), who recorded *Arctosa perita* (Latreille, 1799) from İstanbul. *Arctosa tbilisiensis* can be easily distinguished from all other known members of the genus by the typical shape of the median apophysis in the male palp and by the shape of the median septum of the epigyne in females. In addition, the striking color pattern of the abdomen is remarkable (Alderweireldt, 2002).

A. tbilisiensis was redescribed by Alderweireldt (2002), who mentioned that it appeared to have a typical Ponto-Caspian distribution, occurring on both sides of the Black Sea, with records from Georgia, Azerbaijan, Russia, Bulgaria, and Greece. The specimens collected from the southeastern Anatolian region represent the southernmost distribution record for this species.

Family: Pholcidae C. L. Koch, 1850

***Spermophora* Hentz, 1841**

Spermophora senoculata (Dugès, 1836)

Material examined: 3♀♀, 2♂♂ (MTAS), İzmir Prov., Kemalpaşa Dist., Vişneli Vil. (38°20'46.62"N, 27°25'16.26"E), 05.06.2009, leg. K.B. Kunt; 1♀, 2♂♂ (MTAS), Konya Prov., Beyşehir Dist., Kurucuova Vil., İnönüini Cave (37°40'31.90"N, 31°22'15.10"E), 27.06.2010 (MTAS), leg. R.S. Kaya & K.B. Kunt; 2♀♀, 3♂♂ (MTAS), Muğla Prov., Milas Dist., Kızıkkışlacık Vil. (37°16'38.80"N, 27°33'47.97"E), 01.07.2010, leg. M. Elverici.

General distribution: Holarctic (Platnick, 2011).

Comments: The pholcid spider *S. senoculata* has records from the United States, southern Europe,

northern Africa, and eastern Asia (China, Korea, and Japan). In the USA, this spider seems to be a common synanthropic species, yet our knowledge about its natural history rests mostly on some basic observations (Huber, 2002).

Until now, it has been rarely collected in Turkey. The first Turkish record was from Antalya (1 ♀, Antalya Prov., Korkuteli Dist., 28.04.1973, leg. Brignoli) by Brignoli (1978). Later, it was collected in the buildings of Bursa Province (Kaya and Uğurtaş, 2007). Old and new records of this species from southern Marmara and the Aegean and Mediterranean coastal regions demonstrate its widespread nature within the country.

Although this common spider species was previously recorded from Turkey, we included it here in order to draw attention to its ecological and environmental tolerances. During our survey, specimens were collected from different localities of Turkey: İzmir, İnönüini Cave (Konya), and Kızıkkışlacık (Muğla). The specimens from İnönüini Cave were collected from their webs, which had been constructed in the cracks and crevices of the walls; whereas the specimens of Kızıkkışlacık were collected from cavities found on large rock formations at the surface and from the undersides of large stones found in olive tree plantations, which are considerably hotter and drier places than the cave environments.

Family: Pisauridae Simon, 1890

***Pisaura* Simon, 1885**

Pisaura consocia (O. P.-Cambridge, 1872) (Figures 5, 6, and 7a-7d)

Material examined: 5♀♀, 3♂♂ (MTAS), Hatay Prov., Hassa Dist., c. 5 km east of Koruhöyük Vil. (36°49'23.51"N, 36°34'52.22"E), 10.09.2010, leg. E.A. Yağmur.

General distribution: Israel, Lebanon, and Syria (Platnick, 2011).

Comments: New record for the spider fauna of Turkey.

Pisaura is a relatively small genus of medium- to large-sized spiders. Females may exceed 14 mm in body length (Levy, 1999). The current world list of spiders includes 333 pisaurid species in 52 genera (Platnick, 2011).

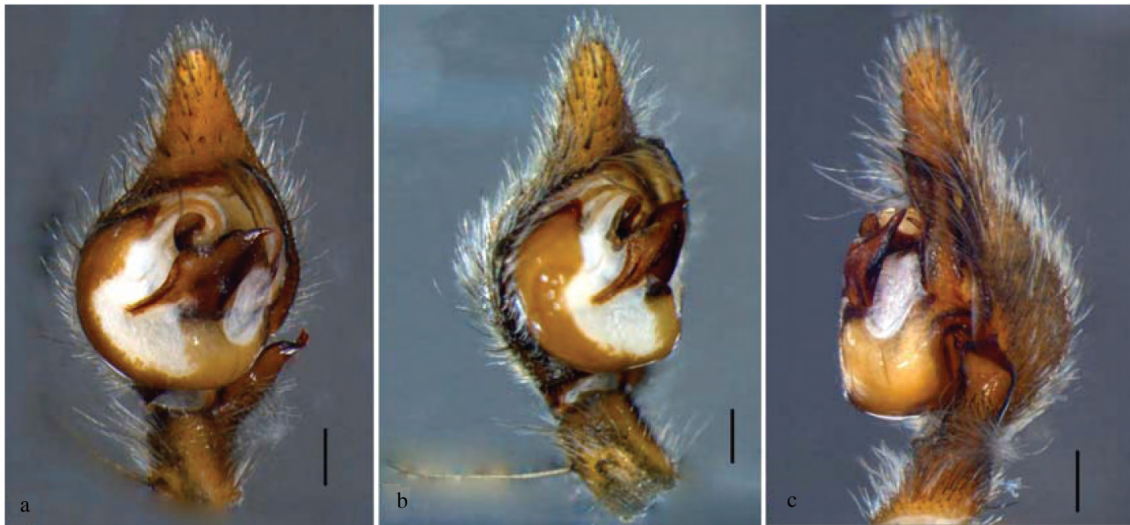


Figure 5. *Pisaura consocia*: (a) Male palp, ventral view; (b) male palp, retrolateral view; and (c) male palp, lateral view. Scale lines: 0.2 mm.

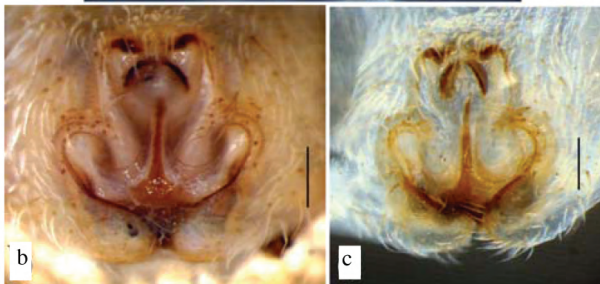
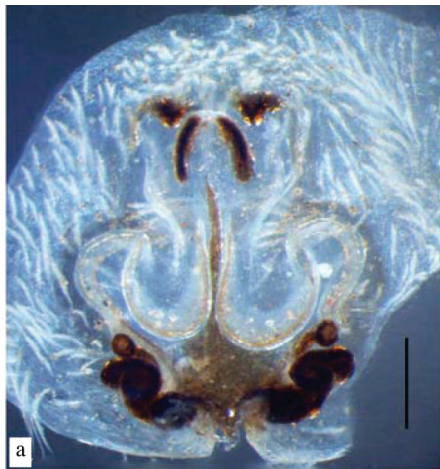


Figure 6. *Pisaura consocia*: (a) Epigynum, dorsal view; (b) epigynum, ventral view; and (c) epigynum, ventral view (after maceration). Scale lines: 0.2 mm.

Hitherto, only the Palaearctic spider species *P. mirabilis* (Clerck, 1757) was known from Turkey. The distribution range of *P. consocia* is limited to the Middle East and is rare in collections. *P. consocia* can be easily distinguished from the widespread *P. mirabilis* by the general body pattern, shape of the tibial apophysis and sclerites of the male palpus, and by the shape of the epigynal plate and spermathecae in females (Figures 7e-7h and 8).

Family: Prodidomidae Simon, 1884

***Prodidomus* Hentz, 1847**

Prodidomus redikorzevi Spassky, 1940 (Figure 9)

Material examined: 3♀ (MTAS), Şanlıurfa Prov., Birecik Dist., c. 2 km north of Yukarı Habip Vil. (37°8'49.00"N, 37°59'56.00"E), 24.09.2009, leg. E.A. Yağmur.

General distribution: Kazakhstan and Turkmenistan (Platnick, 2011).

Comments: New record for the spider fauna of Turkey.

The first Turkish record of the spider family Prodidomidae was by Topçu et al. (2005), who recorded *Anagraphis pallens* Simon, 1893. However, spider genus *Anagraphis* was transferred to Gnaphosidae (Platnick and Baehr, 2006). Later, *Prodidomus amaranthinus* (Lucas, 1846) was recorded from Turkey (Topçu and Türkeş, 2010). Here, we add

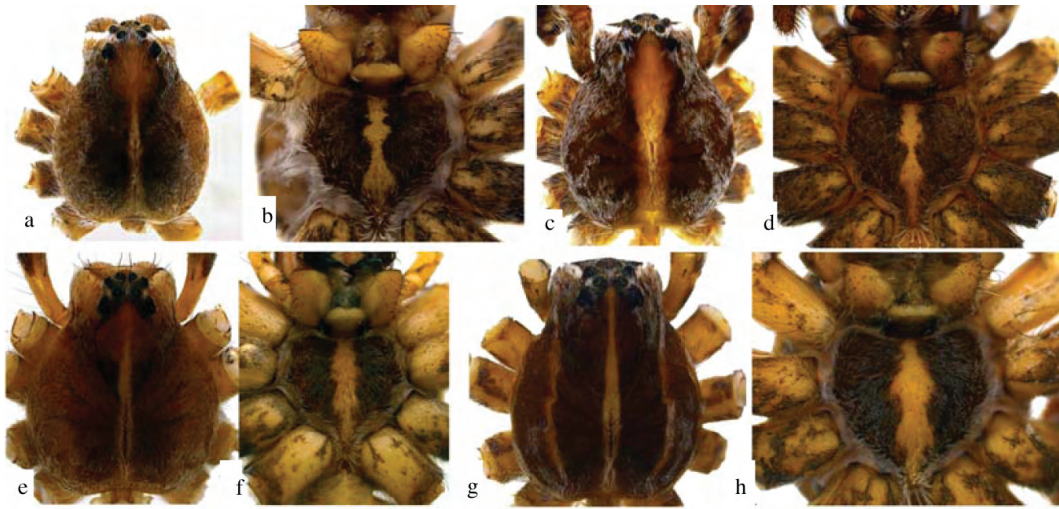


Figure 7. *Pisaura consocia*: (a) carapace of female; (b) sternum of female; (c) carapace of male; (d) sternum of male *Pisaura mirabilis*; (e) carapace of female; (f) sternum of female; (g) carapace of male; and (h) sternum of male.



Figure 8. *Pisaura mirabilis*: (a) Male palp, ventral view; (b) male palp, retrolateral view; (c) male palp, nearly lateral view; (d) epigynum, ventral view; (e) epigynum, ventral view (after maceration); and (f) epigynum, dorsal view. Scale lines: 0.2 mm.

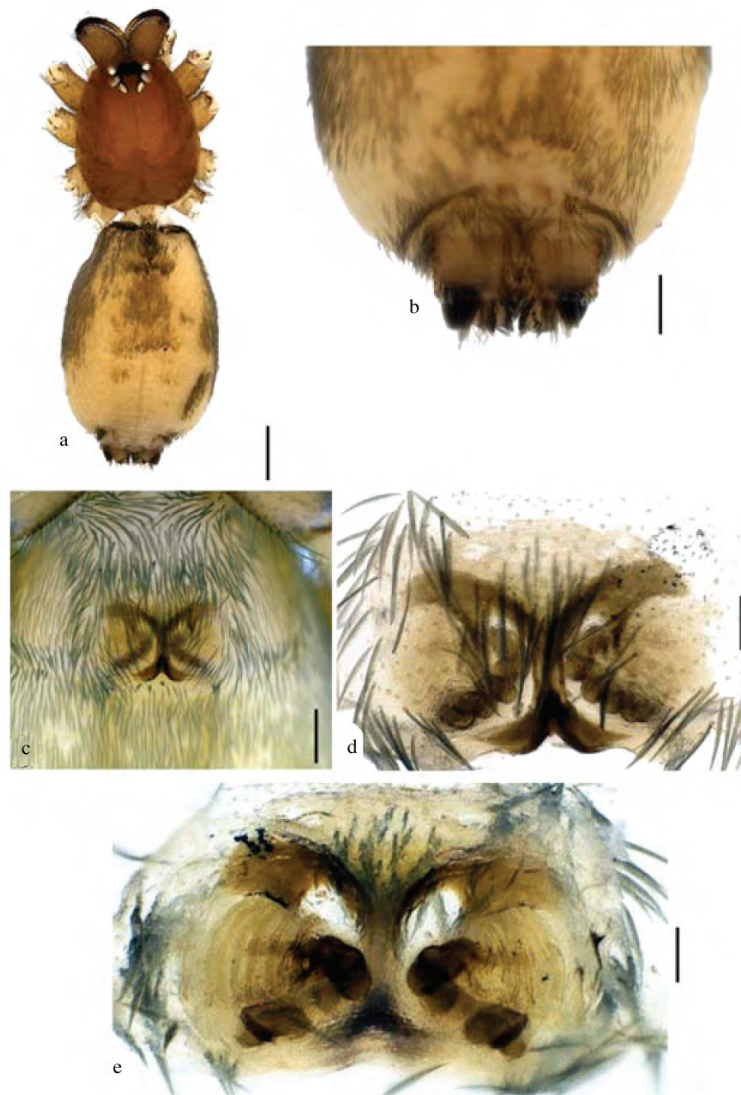


Figure 9. *Prodidomus redikorzevi*: (a) Habitus; (b) spinnerets; (c) epigynum, ventral view; (d) epigynum, ventral view (after maceration); and (e) epigynum, dorsal view. Scale lines: a, 0.5; b, 0.25 mm; c, d, and e, 0.1 mm.

P. redikorzevi to the Turkish spider list. *P. redikorzevi* was originally described by Spassky (1940), based on a female from southern Turkmenistan. Later, it was recorded from Kazakhstan (Mikhailov, 1997). However, Marusik (2009) described the unknown male of this species and redescribed the female based on specimens collected from Turkmenistan, Iran, and Azerbaijan. Although we could not collect any male samples, the morphological and genitalia features of our samples are the same as the samples collected

from Baku (Azerbaijan) (see Marusik, 2009). It can be easily distinguished from *P. amaranthinus* by the structures of the vulvae (Figure 10).

Family: Salticidae Blackwall, 1841

***Macaroeris* Wunderlich, 1992**

Macaroeris flavicomis (Simon, 1884) (Figure 11)

Material examined: 4♀♀ (ZMUU), Bursa Prov., Campus of Uludağ University (40°13'24.67"N, 28°51'59.75"E), 18.07.2002, leg. R.S. Kaya.



Figure 10. *Prodidomus amaranthinus*: (a) Habitus; (b) spinnerets; (c) epigynum, ventral view; (d) epigynum, ventral view (after maceration); and (e) epigynum, dorsal view. Scale lines: a, 0.5; b, 0.25 mm; c, d, and e, 0.1 mm.



Figure 11. *Macaroeris flavicomis*. Scale line: 1 mm.

General distribution: Greece, Ukraine (Platnick, 2011).

Comments: New genus and species records for the spider fauna of Turkey.

This species was originally described under the genus *Dendryphantes* by Simon (1884) and transferred into genus *Macaroeris* by Metzner (1999), based on the habitus and epigynal structures. The jumping spider *M. flavicomis* is here recorded from Turkey for the first time, representing both new genus and species records for the country. This species differs from the widespread *M. nidicolens* by the general habitus as well as in epigynal structures.

Family: Scytodidae Blackwall, 1864

Scytodes Latreille, 1804

Scytodes velutina Heineken & Lowe, 1832 (Figures 12 and 13a)

Material examined: 3♀♀, 2♂♂ (MTAS), İzmir Prov., Karaburun Dist., Parlak Vil. (38°35'59"N, 26°23'17"E), 17.01.2009, leg. E.A. Yağmur; 1♀ (KUAM), Muğla Prov., Datça Dist. (36°44'27.00"N, 27°40'29.00"E), 25.10.2010, leg. T. Danışman.

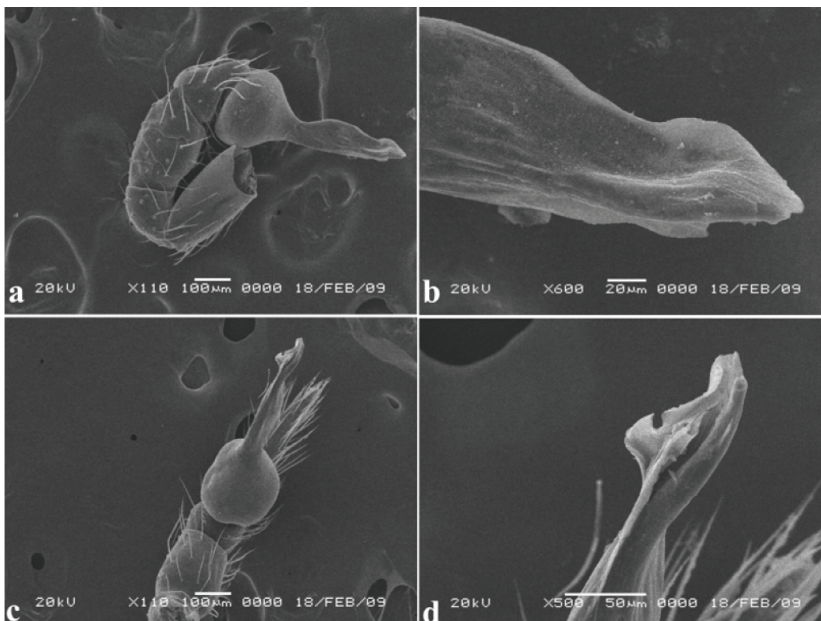


Figure 12. *Scytodes velutina*: (a) Male palp (cymbium broken), lateral view; (b) tip of male palp, lateral view; (c) male palp, perspective from below; and (d) tip of male palp, perspective from below.

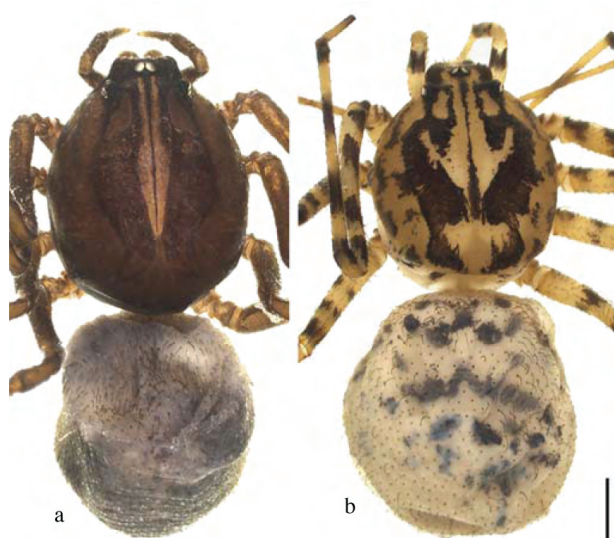


Figure 13. (a) *Scytodes velutina*, habitus of female; and (b) *Scytodes thoracica*, habitus of female. Scale line: 1 mm.

General distribution: Mediterranean, Cape Verde Islands (Platnick, 2011).

Comments: New record for the spider fauna of Turkey.

Up to now, only *Scytodes thoracica* (Latreille, 1802) was known from Turkey (Bayram et al., 2010). The first record of this species was given by Kulczyński (1903) from İstanbul (Burgazada = Antigoni), but according to our observations and collections we can

conclude that *S. thoracica* is widespread throughout Turkey. *S. velutina* was recorded from Portugal (including Madeira and the Selvagens Islands), Spain (including the Balearic Islands), France (including Corsica Island), Italy (including Sicily and the Sardinia Islands), Greece, Malta, Crete, and the Islands of the Aegean Sea (Helsdingen, 2010). In fact, it is not unexpected to find *S. velutina* in Turkey, taking into consideration its known distribution range. The specimens collected from Turkey represent the easternmost distribution record for this species. *S. velutina* can be easily distinguished from *S. thoracica* by the blackish body color (Figure 13) and short and blunt embolus of the male palpus.

Family: Segestriidae Simon, 1893

***Ariadna* Audouin, 1826**

Ariadna insidiatrix Audouin, 1826 (Figure 14)

Material examined: 1♀ (ZMUU), Bursa Prov., Nilüfer Dist., Uluabat Lake, Manastır Island (40°09'56"N, 28°38'19"E), 14.10.2004, leg. R.S. Kaya.

General distribution: Mediterranean (Platnick, 2011).

Comments: The first record of *A. insidiatrix* in Turkey (İstanbul-Şile) was given by Roewer (1959), but in that paper he did not provide any information about the specimens or figure the genitalia (see Roewer, 1959; page 5). Since then, there have been no published records of this species from Turkey. In

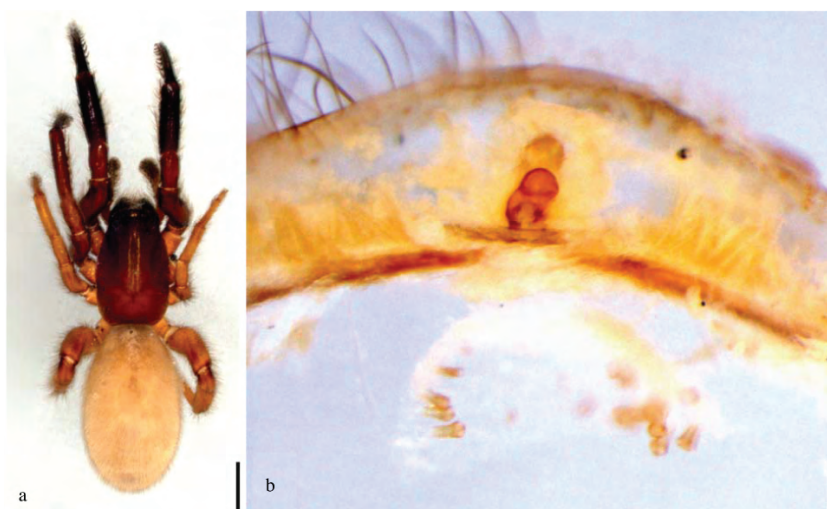


Figure 14. *Ariadna insidiatrix*: (a) Habitus of female; and (b) Vulva, dorsal view. Scale lines: a, 0.5 mm and b, 0.1 mm.

our survey, 1 female was collected from under a stone on Manastır Island in Uluabat Lake.

***Segestria* Latreille, 1804**

Segestria senoculata (Linnaeus, 1758) (Figure 15)

Material examined: 6♀♀, 1♂ (MTAS), Konya Prov., Derebucak Dist., Çamlık Town, Körükini Cave (37°20'34.24"N, 31°37'37.49"E), 14.07.2010, leg. M. Elverici.

General distribution: Palaearctic (Platnick, 2011).

Comments: *S. senoculata* was hitherto only reported from Turkey by Brignoli (1978). However, all records of Brignoli (1978) from Bolu, Kastamonu, and Amasya were based on immature specimens. The author determined the immature specimens to species level using the chaetotaxy of the legs (see Brignoli, 1978; page 485). Our specimens are the first adult male and female records of this species in Turkey.

Family: Theridiidae Sundevall, 1833

***Achaeridion* Wunderlich, 2008**

Achaeridion conigerum (Simon, 1914) (Figure 16)

Material examined: 2♀♀ (KUAM), Antalya Prov., Serik Dist., Aspendos ancient city (36°56'11.73"N, 31°10'27.82"E), 06.05.2005, leg. T. Danişman; 2♀♀ (KUAM), Antalya Prov., Serik Dist. (36°55'13.68"N,

31°2'43.70"E), 20.05.2006, leg. T. Danişman; 1♀ (KUAM), Antalya Prov., Manavgat Dist., Beşkonak Vil. (37°9'40.25"N, 31°11'33.84"E), 20.10.2006, leg. T. Danişman.

General distribution: Europe and Russia (Platnick, 2011).

Comments: New genus and species records for the spider fauna of Turkey.

The spider genus *Achaeridion* comprises only 1 species which is distributed in Europe (Wunderlich, 2008). *A. conigerum* was considered under different genera by different authors, but this spider was transferred into *Achaeridion* and the genus was created based on the following characters by Wunderlich (2008): trichobotrium present on metatarsus III; opisthosoma at least as high as long, bearing a dorsal-posterior hump; median apophysis sickle-shaped; embolus short, straight, and with tiny cusps; and epigyne not sclerotized, with a distinct opening. Here we presented the pictures of the habitus and epigyne of the female samples (Figure 16).

***Phoroncidia* Westwood, 1835**

Phoroncidia paradoxa (Lucas, 1846) (Figure 17)

Material examined: 1♀ (MTAS), Hatay Prov., Samandağ Dist., Batıayaz (İkizköprü) Vil.



Figure 15. *Segestria senoculata*: (a) Habitus of male; (b) male palp, lateral view; (c) male palp, different position; and (d) male palp, different position. Scale lines: a, 0.5 mm; b, c, and d, 0.25 mm.

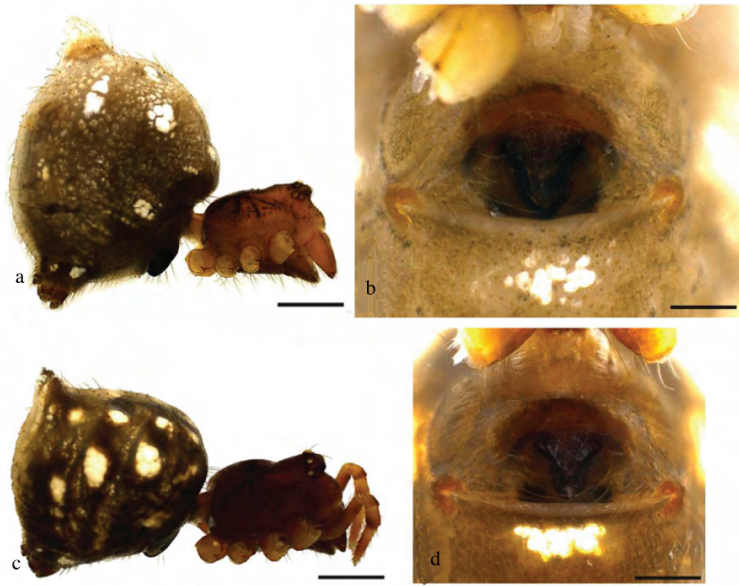


Figure 16. *Achaeridion conigerum*: (a) Habitus of first female, lateral view; (b) epigynum of first female, ventral view; (c) habitus of second female, lateral view; and (d) epigynum of second female. Scale lines: a and c, 1 mm; b and d, 0.25 mm.

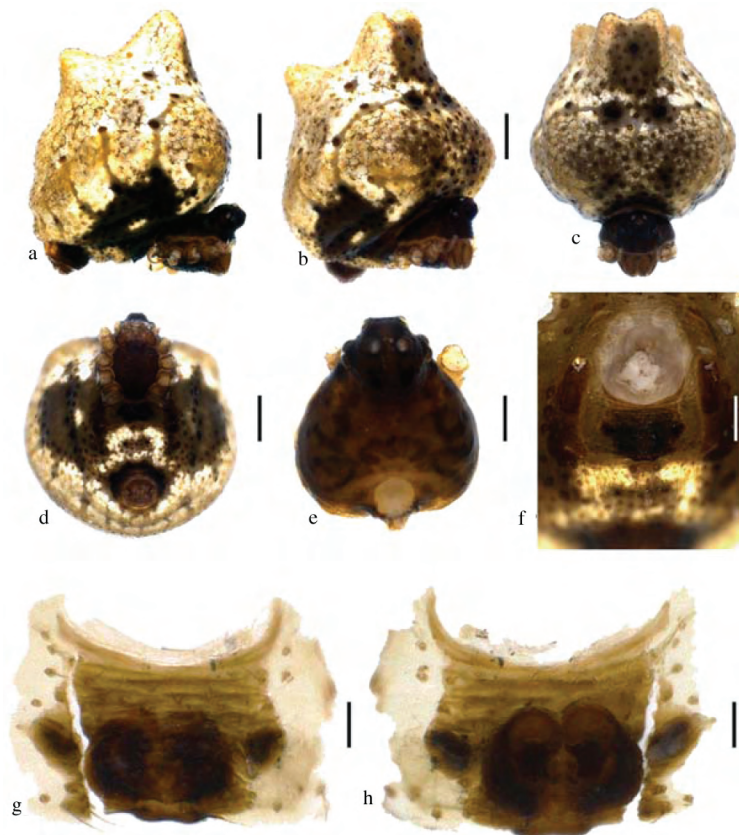


Figure 17. *Phoroncidia paradoxa* (female): (a) Habitus, lateral view; (b) habitus, nearly lateral view; (c) habitus, anterior view; (d) habitus, ventral view; (e) carapace, dorsal view; (f) general appearance of epigynum, ventral view; (g) epigynum, ventral view (after maceration); and (h) epigynum (dorsal view). Scale lines: a, b, c, and d, 0.25 mm; e and f 0.1 mm; g and h, 0.05 mm.

(36°10'38.08"N, 35°59'25.40"E), 27.04.2009, leg. K.B. Kunt; 1♀ (MTAS), Hatay Prov., Samandağ Dist., Batıyaz (İkizköprü) Vil. (36°10'38.08"N, 35°59'25.40"E), 10.04.2010, leg. E.A. Yağmur.

General distribution: Europe, North Africa (Platnick, 2011).

Comments: New genus and species records for the spider fauna of Turkey.

Phoroncidia comprises 74 species and is distributed widely in the Oriental, Palaearctic, Ethiopian, and Neotropical regions (Platnick, 2011). *Phoroncidia* species are small spiders, less than 2 mm long. The genus differs from other members of the family by having paired abdominal humps and a projected eye region above the clypeus. Although we did not collect any male specimen, the epigynal structures and vulvae of our samples are in good conformation with the samples illustrated by Vanuytven (1991).

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