

The spider collection (Arachnida: Araneae) of the Zoological Museum of the Iranian Research Institute of Plant Protection, with new species records for Iran

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Abstract. The spider collection of the Zoological Museum of the Iranian Research Institute of Plant Protection was studied during the summer of 2014. A total of 180 specimens, belonging to 25 families, 60 genera and 77 species were documented. Of these, the following nine species could be recorded from Iran for the first time: *Alopecosa schmidtii* (Hahn, 1835), *Anyphaena accentuata* (Walckenaer, 1802), *Crustulina sticta* (O. P.-Cambridge, 1861), *Enoplognatha mordax* (Thorell, 1875), *Ero tuberculata* (De Geer, 1778), *Salticus zebraneus* (C. L. Koch, 1837), *Pardosa aenigmatica* Tongiorgi, 1966, *Pardosa nebulosa* (Thorell, 1872) and *Tmarus piochardi* (Simon, 1866). Morphological and geographical data are provided for the newly recorded species. Two species (*P. aenigmatica* and *T. piochardi*) are illustrated and a map of localities is given.

Keywords: fauna, Lycosidae, museum collection, Thomisidae

Zusammenfassung. Die arachnologische Sammlung (Arachnida: Araneae) des Zoologischen Museums des iranischen Forschungsinstitutes für Pflanzenschutz, mit neuen Artnachweisen für den Iran. Im Sommer 2014 wurde die arachnologische Sammlung des Zoologischen Museums des iranischen Forschungsinstitutes für Pflanzenschutz untersucht. Insgesamt 180 Individuen, die sich auf 25 Familien, 60 Gattungen und 77 Arten verteilen, konnten dabei vorgefunden werden. Darunter befanden sich insgesamt neun Neufunde für den Iran: *Alopecosa schmidtii* (Hahn, 1835), *Anyphaena accentuata* (Walckenaer, 1802), *Crustulina sticta* (O. P.-Cambridge, 1861), *Enoplognatha mordax* (Thorell, 1875), *Ero tuberculata* (De Geer, 1778), *Salticus zebraneus* (C. L. Koch, 1837), *Pardosa aenigmatica* Tongiorgi, 1966, *Pardosa nebulosa* (Thorell, 1872) und *Tmarus piochardi* (Simon, 1866). Zur den Neufunden werden morphologische und geografische Angaben gemacht, für *P. aenigmatica* und *T. piochardi* werden Abbildungen präsentiert und eine Karte mit allen Fundorten der Museumssammlung wurde erstellt.

The department of Agricultural Zoology at the Iranian Research Institute of Plant Protection houses a museum with collections of different groups of animals, mainly ticks, mites, birds and rodents, but also a small collection of spiders. Specimens were mainly collected by Dr. Fariba Mozaffarian – now curator of Auchenorrhyncha, Insect Taxonomy Research Department – and Ms. Sahra Ghavami. Some of these specimens were previously reported as definite or probable misidentifications, e.g. *Dresserus*, Eresidae, known from Africa only, here identified as *Stegodyphus pacificus* and *Pardosa monticola*, Lycosidae, here identified as *P. buchari*, as suggested by Marusik et al. (2012). Furthermore, a considerable portion of the collection has never been cited before. Thus a comprehensive study on the identification of these specimens was carried out. As a result, new interesting data on numerous taxa that are new to the fauna of

the country were recovered and are reported and illustrated here.

Methods

The collection was thoroughly revised between July and September 2014. Examinations were carried out using a Nikon SMZ-645 stereomicroscope and digital images were captured with a Canon IXUS 300 HS camera. The epigyne of some of the female specimens were removed, cleared and cleaned with 10% KOH. Unlabelled and highly damaged specimens which were not suitable for scientific examination were discarded, and the remaining specimens were numbered and relabelled.

List of abbreviations. ZMP-AR: Zoological Museum of the Iranian Research Institute of Plant Protection, Araneae section; leg.: legit (collected); ♂: male(s); ♀: female(s). Nomenclature and global distribution patterns follow the World Spider Catalog (2014).

Results

A total of 180 specimens, belonging to 25 families, 60 genera and 77 species could be documented

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Fig. 1: Map of Iran, showing the localities where the specimens were collected (see Tab. 1)

(Tab. 1, Fig. 1). Data are given in as much detail as possible, for some records even the year is unknown, or only the province is known. Nine species are recorded from Iran for the first time (see below), and added to the checklist, which currently comprises of 521 species in 229 genera and 45 families (Zamani et al. 2015).

Species new to the fauna of Iran

Anyphaenidae Bertkau, 1878

Anyphaena accentuata (Walckenaer, 1802)

Material. 1♀ (ZMP-AR-0087), Iran: *Mazandaran Province*, Chamestan (20), 2004, Ghavami leg.; 1♀1♂ (ZMP-AR-0096), IRAN: *Mazandaran Province*, Chamestan (20), 2004, Ghavami leg.

Diagnosis. Body length 4-9 mm. From the male pedipalps, this species can be distinguished by the presence of proximally long ventral spines on the femur, by two groups of short spines on the tibia and by a group of strong bristles near the tibial apophysis. Females of this species can be diagnosed by the anteriorly widened epigyneal fissure, by the pointed anterior border of the vulva and by the sharply concaved

margin of the sclerotized anterior pockets (Růžička 2001).

Distribution and remarks. This species is known from Europe to Central Asia, and represents here a new species record for the spider fauna of Iran. Previously, Marusik et al. (2014) predicted the presence of this species in Iran based on nine juvenile specimens collected in Golestan Province.

Lycosidae Sundevall, 1833

Alopecosa schmidti (Hahn, 1835)

Material. 3♂ (ZMP-AR-0085), Iran: *Tehran Province*, Sorkh-e-Hesar (23), 2007, Ghavami leg.

Diagnosis. Body length 10-11 mm in males, 14-18 mm in females. Males of this species are diagnosable by the large tegular apophysis which has a small hook at its tip and by the long embolus, which has a thin apical part and makes a loop in the middle section. Females can be distinguished by the epigyneal plate being as-long-as-wide, lacking pockets, and by the presence of broad ducts between the two pairs of receptacles (Almqvist 2005).

Distribution and remarks. Widely distributed in the Palaearctic, and representing here a new species record for the spider fauna of Iran.

***Pardosa aenigmatica* Tongiorgi, 1966** (Fig. 2)

Material. 1♀ (ZMP-AR-0064), Iran: *Ilam Province* (10), 2001, Khoramly leg.

Diagnosis. Body length 7 mm. This species is diagnosable from the closely related *P. naevia* by a

different body pattern, the size of the epigynum, and different conformation of the male pedipalp (Tongiorgi 1966, 1968).

Distribution and remarks. Previously known from Italy, Turkey and Azerbaijan, it is a new species record for the spider fauna of Iran. This is the south-eastern most record of the species across its whole range.

Tab. 1: Spider specimens of the Zoological Museum of the Iranian Research Institute of Plant Protection. *New to the fauna of Iran. Numbers of the collection sites refer to Fig. 1. IN = Inventory Number (ZMP-AR)

Taxa	IN	Available collection data
Agelenidae		
<i>Agelena labyrinthica</i> (Clerck, 1757)	0066	1♀, Golestan, Zanghian (6), 2001, Ghavami leg.
<i>Agelena orientalis</i> C. L. Koch, 1837	0067	1♂, Mazandaran, Amol (18), 2007, Ghavami leg.
Anyphaenidae		
<i>Anyphaena accentuata</i> (Walckenaer, 1802)*	0087, 0096	1♀, Mazandaran, Chahmestan (20), 2004, Ghavami leg.; 1♂, 1♀, ditto.
Araneidae		
<i>Agalenatea redii</i> (Scopoli, 1763)	0094	1♀, Golestan, Ramian (9), 23 Jun. 2005, Ghavami leg.
<i>Araneus angulatus</i> Clerck, 1757	0079	1♀, Mazandaran, Amol (18), 2007, Ghavami leg.
<i>Argiope bruennichi</i> (Scopoli, 1772)	0083	1♀, Mazandaran (20), Jul. 2005, Ghavami leg.
<i>Argiope lobata</i> (Pallas, 1772)	0076	1♀, Ardebil, Moghan (2), 2003, Ghavami leg.
<i>Cyclosa conica</i> (Pallas, 1772)	0098	1♀, Golestan (6), 2002, Ghavami leg.
<i>Hypsosinga pygmaea</i> (Sundevall, 1831)	0003, 0013, 0027	1♀, Gilan, Rasht (5), 28. June 1998, Mozaffarian leg.; Same, 18. Aug. 1996; 11♀, Same, 24. June 1996, Karimian leg.
<i>Neoscona adianta</i> (Walckenaer, 1802)	0001, 0028	2♀, Mazandaran, Tonekabon, Riceland (19), 6. Aug. 1996, Mozaffarian leg.; 1♂, Gilan, Rasht (5), 6. Aug. 1996, Mozaffarian leg.
<i>Neoscona subfusca</i> (C. L. Koch, 1837)	0026	2♂ 1♀, Markazi, Saveh (17), 17. Aug. 1998, Mozaffarian leg.

Taxa	IN	Available collection data
<i>Nuctenea umbratica</i> (Clerck, 1757)	0092	1 subad. ♀, Mazandaran, Amol (18), 2005, Ghavami leg.
<i>Singa lucina</i> (Audouin, 1826)	0071	1♀, Mazandaran, Amol (18), 2005, Ghavami leg.
Corinnidae		
<i>Castianeira arnoldii</i> Charitonov, 1946	0025, 0052	1♀, Markazi, Saveh (17), 19. Apr. 1998, Mozaffarian leg.; 1♂, Unknown.
Dictynidae		
<i>Dictyna latens</i> (Fabricius, 1775)	0080	1♀, Mazandaran, Ghaemshahr (20), 2004, Ghavami leg.
Eresidae		
<i>Stegodyphus pacificus</i> Pocock, 1900	0037, 0089	1♂, Qazvin, Tarom Sofla (21), 16. June 2006; 1♀, Gilan, Roodbar (5), 2002, Ghavami leg.
Eutichuridae		
<i>Cheiracanthium mildei</i> L. Koch, 1864	0029	1♀, Tehran, Tehran (23), 26. Apr. 1998, Farrokhi leg.
Filistatidae		
<i>Filistata insidiatrix</i> (Forsskål, 1775)	0086	1♀, Fars, Darab (4), Sep. 2004, Ghavami leg.
Gnaphosidae		
<i>Aphantaulax trifasciata</i> (O. P.-Cambridge, 1872)	0051	1♀, Fars, Nairiz (4), 4. Sep. 2004, Ghavami leg.
<i>Drassodes cupreus</i> (Blackwall, 1834)	0046	1♀, Semnan (22), 2006, Ghavami leg.
<i>Pterotricha loeffleri</i> (Roewer, 1955)	0088	1♂, Fars, Darab (4), 2004, Ghavami leg.
<i>Scotophaeus blackwalli</i> (Thorell, 1871)	0042	2♂, Tehran, Varamin (24), Ghavami leg.
<i>Scotophaeus scutulatus</i> (L. Koch, 1866)	0043	1♂, Tehran, Varamin (24), Ghavami leg.

Taxa	IN	Available collection data	Taxa	IN	Available collection data
<i>Zelotes longipes</i> (L. Koch, 1866)	0035	1♂ 1♀, Markazi, Saveh (17), 6. June 1996, Mozaffarian leg.	<i>Pardosa nebulosa</i> (Thorell, 1872)*	0061	1♀, Khuzestan, Bagh Malek (14), 21. Aug. 1996, Kaibafvala leg.
Linyphiidae			<i>Pirata piraticus</i> (Clerck, 1757)	0016, 0019, 0021	3♀, Mazandaran, Tonekabon, Riceland (19), 6. Aug. 1996, Mozaffarian leg.; 1♂ 3♀, Gilan, Rasht (5), 28. June 1996, Mozaffarian leg.; 1♀ Mazandaran, Tonekabon (19), 19. Aug. 1996, Mozaffarian leg.
<i>Prinerigone vagans</i> (Audouin, 1826)	0056	1♂, Tehran, Varamin (24), 2006, Ghavami leg.	<i>Trochosa urbana</i> (O. P.-Cambridge, 1876)	0031, 0053	3♀, Alborz, Karaj (1), 28. June 1998, Mozaffarian leg.; 1♀, Mazandaran, Tonekabon (19), 18. June 2005; Mozaffarian leg.
<i>Tenuiphantes tenuis</i> (Blackwall, 1852)	0022	1♀, Markazi, Saveh (17), 19. Apr 1998, Mozaffarian leg.	<i>Wadicosa fidelis</i> (O. P.-Cambridge, 1872)	0030	1♂, Khuzestan, Ahvaz (13), 18. Jan. 2002
Lycosidae			Mimetidae		
<i>Alopecosa aculeata</i> (Clerck, 1757)	0058	2♀, Markazi, Saveh (17), Bahramishad leg.	<i>Ero cf. tuberculata</i> (De Geer, 1778)*	0069	1 subadult ♀, Mazandaran, Tonekabon (19), 2004, Ghavami leg.
<i>Alopecosa schmidti</i> (Hahn, 1835)*	0085	2♂, Tehran, Sorkhehesar (23), 3. June 2007, Ghavami leg.	Oecobiidae		
<i>Arctosa leopardus</i> (Sundevall, 1833)	0063	1♀, Ilam (10), 2001, Khoramli leg.	<i>Uroctea limbata</i> (C. L. Koch, 1843)	0073	2♀, Ilam, Dehloran (10), 2002
<i>Arctosa tbilisiensis</i> Mcheidze, 1946	0007, 0008, 0012, 0015	1♀, Alborz, Karaj (1), 20. Apr. 1998, Mozaffarian leg.; 3♀ 2♂, Markazi, Saveh, Yal Abad (17), 6. June 1998, Mozaffarian leg.; 4♀, Markazi, Saveh (17), 6. July 1999, Bahramishad leg.; 1♂, Gilan, Rasht (5), 28. June 1996, Mozaffarian leg.	Oxyopidae		
<i>Aulonia kratochvili</i> Dunin, Buchar & Absolon, 1986	0004, 0005	7♀, Markazi, Saveh (17), 6. June 1998, Mozaffarian leg.; 3♀, Alborz, Karaj (1), 20. Apr. 1998, Mozaffarian leg.	<i>Oxyopes heterophthalmus</i> (Latreille, 1804)	0093	1♀, Golestan (6), 2006, Ghavami leg.
<i>Hogna radiata</i> (Latreille, 1817)	0078	1♀, Markazi, Saveh (17), 25. July 1998, Mozaffarian leg.	<i>Oxyopes lineatus</i> Latreille, 1806	0038, 0062, 0082, 0090	1♂ 1♀, Golestan, Gonbad (7), Aug. 2006, Ghavami leg.; 1♂, Golestan, Gonbad Kavos (7), 1998, Khoramli leg.; 1♀, Khorasan, Ahmadabad (11), 2005, Ghavami leg.; 1♀, Ardebil, Moghan (2), 9. July 2004, Ghavami leg.
<i>Pardosa aenigmatica</i> Tongiorgi, 1966*	0064	1♀, Ilam (10), 2001, Khoramli leg.	Philodromidae		
<i>Pardosa agrestis</i> (Westring, 1861)	0011, 0017	1♀, Tehran (23), Mozaffarian leg.; 4♂ 2♀, Markazi, Saveh, Yal Abad (17), Bahramishad leg.	<i>Thanatus formicinus</i> (Clerck, 1757)	0070	1♀, Tehran, Varamin (24), 2004, Ghavami leg.
<i>Pardosa buchari</i> Ovtsharenko, 1979	0099	1♀, Golestan, Fazelabad (6), 20. July 2005, Ghavami leg.	<i>Thanatus vulgaris</i> Simon, 1870	0060	1♀, Golestan, Gonbad Kavos (7), 1999, Khoramli leg.
<i>Pardosa hortensis</i> (Thorell, 1872)	0036	3♂ 1♀, Khuzestan, Ahvaz (13), 18. Jan 2002	<i>Tibellus oblongus</i> (Walckenaer, 1802)	0059	1♀, Mazandaran, Tonekabon (19), 1996, Abdolhosseini leg.
<i>Pardosa italica</i> Tongiorgi, 1966	0065	2♀, Kohgiluyeh, Sarabvan-deh (16), 2001, Saedi leg.			



Fig. 2: *Pardosa aenigmatica* Tongiorgi, 1966: **A.** Habitus of female; **B.** Epigyne, ventral view; **C.** Vulva, dorsal view

Pardosa nebulosa (Thorell, 1872)

Material. 1♀ (ZMP-AR-0061), IRAN: *Khuzestan Province*: Bagh Malek (14), 21.Aug.96, Kaibafvala leg.

Diagnosis. Body length 8-9 mm. This species is diagnosable by a tegular apophysis of the male which forms a lamella, by the lateral longitudinal bands on the prosoma which are distinctly jagged laterally, and by the anteriorly forked median band of the female epigyne (Nentwig et al. 2015).

Distribution and remarks. This species has a Palearctic distribution and is a new record for the fauna of Iran.

Mimetidae Simon, 1881

Ero cf. tuberculata (De Geer, 1778)

Material. 1 subadult ♀ (ZMP-AR-0069), IRAN: *Mazandaran Province*: Tonekabon (19), 2004, Ghavami leg.

Diagnosis. Body length 3 mm in males, 3-4 mm in females. This species can be diagnosed by the epigyne of the female, which lacks a dividing structure in the middle of the opening, and has a heart-shaped median part, and by the conformation of the cymbium and paracymbium of the male palp (Le Peru 2011).

Distribution and remarks. Widely distributed in the Palearctic, representing a new genus and species record for the spider fauna of Iran. This record should, however, be considered provisional, as the identification is based on the morphology of the habitus and carapace and abdominal pattern of a single

subadult female specimen (e.g. the four tubercles and the dark median stripe on the opisthosoma and the colouration of the sternum).

Salticidae Blackwall, 1841

Salticus zebraneus (C. L. Koch, 1837)

Material. 1♀ (ZMP-AR-0041), IRAN: *Golestan Province* (6), 2004, Ghavami leg.

Diagnosis. Body length 3.4-4.1 mm in males, 3.6-4.8 mm in females. This species can be diagnosed by the non-bifurcated tip of the embolus and by the pointed tip of the palpal tibial apophysis of males, and in females by the wider-than-long epigyneal plate and by the visibility of the straight parts of the copulatory ducts through the integument (Almqvist 2006).

Distribution and remarks. Widely distributed in the Palearctic and a new species record here for the spider fauna of Iran.

Theridiidae Sundevall, 1833

Crustulina sticta (O. P.-Cambridge, 1861)

Material. 1♂ (ZMP-AR-0023), IRAN: *Alborz Province*: Karaj (1), 16/Apr/1998, Mozaffarian leg.

Diagnosis. Body length 2.5-3 mm in males, 2.5-3.5 mm in females. This species can be diagnosed by the narrow distal part of the cymbium, by the sickle-shaped basal portion of the embolus, which bears several denticles, and by the undivided basal apophysis of males, and also by the abdominal patterns of females (Le Peru 2011).

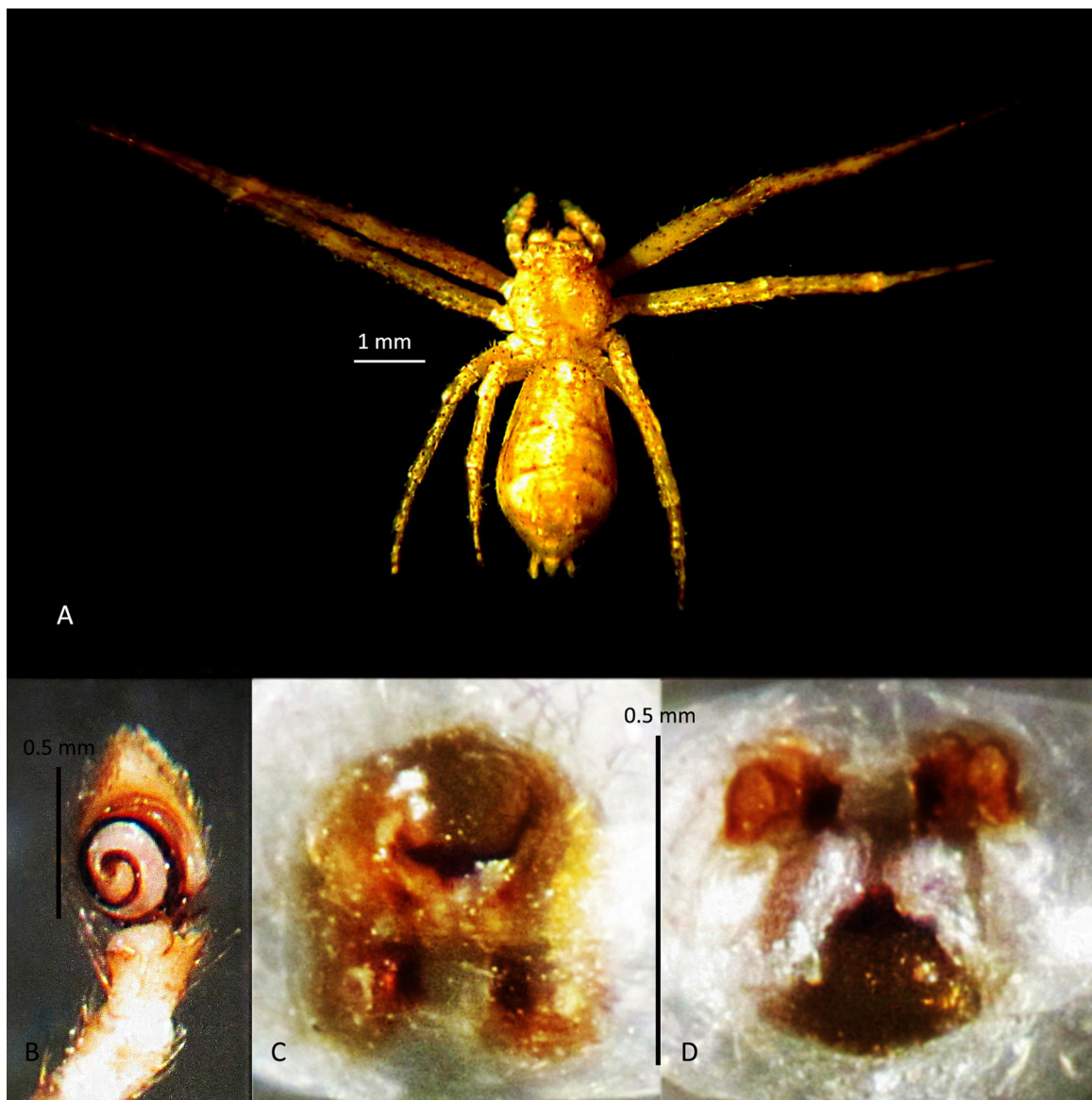


Fig. 3: *Tmarus piochardi* (Simon, 1866): **A.** Habitus of female; **B.** Male palp, ventral view; **C.** Epigyne, ventral view; **D.** Vulva, dorsal view

Distribution and remarks. Widely distributed in the Holarctic, representing a new genus and species record for the spider fauna of Iran.

***Enoplognatha mordax* (Thorell, 1875)**

Material. 1♂ (ZMP-AR-0040), IRAN: *Ardebil Province*: Moghan (2), 2005, Ghavami leg.

Diagnosis. Body length 3-3.5 mm in males, 4-4.5 mm in females. Males of this species can be diagnosed by the palpal tibia which is about the same

length as the cymbium, by the pointed paracymbium which is apically on the retrolateral side, by the semicircular thin embolic tip, and by the presence of a tooth on the conductor. Females are diagnosed by their distinct epigyneal opening form (Almquist 2005).

Distribution and remarks. Widely distributed in the Palearctic and a new species record here for the spider fauna of Iran.

Thomisidae Sundevall, 1833

Tmarus piochardi (Simon, 1866) (Fig. 3)

Material. 8♀ 4♂ (ZMP-AR-0002), IRAN: *Markazi Province*: Saveh (17), Jul/1998, Mozaffarian leg.

Diagnosis. Body length 4.5–5 mm in males, 4.5–7 mm in females. This species can be diagnosed by the shape of the tibial apophysis and by the lack of a tegular apophysis in males, and by the funnel-shaped structure on the epigyneal plate of females (Levy 1973).

Distribution and remarks. This species has a largely Mediterranean distribution, but has also been recorded from Yemen and India (Bayram et al. 2007). It is a new species record here for the spider fauna of Iran.

Discussion

As a result of examining this collection, two genera and nine species were recorded for the spider fauna of Iran for the first time, increasing the number of spider genera and species known for this country to 231 and 530, respectively. Obtaining such a result from this relatively small-sized collection – and by comparing the number of species known from Iran with some adjacent and nearby countries (e.g., Azerbaijan, with about 720 species (Otto 2014); Turkey with more than 1013 species (Bayram et al. 2014); Kazakhstan with more than 966 species (Mikhailov 2013)) – implies that the spider fauna of Iran remains poorly known and would benefit from further detailed taxonomic and faunistic studies in the future.

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