Taxonomic remarks on two Drassodes species (Araneae, Gnaphosidae) from Iran

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Abstract — During a survey of the gnaphosid spider fauna of Iran, two interesting species of Drassodes Westring 1851 were collected. Drassodes marusiki sp. n. (♂♀, Isfahan Province, central Iran) is described as new to science, and its relationship with the closely related D. bifidus Kovblyuk & Seyyar 2009 (Turkey) is discussed, and Drassodes robatus Roewer 1961, which was originally described from Afghanistan, is recorded for the fauna of Iran for the first time; a redescription for its male and the first description for its female are provided.

Key words — Fauna, ground spiders, new records, new species

Introduction

During the recent years, the Iranian spider fauna has been the subject of intensive studies. Special interest has been addressed to Gnaphosidae, which currently comprise 84 species belonging to 31 genera in this country, of which, two genera and four species are regional endemics (Zamani et al. 2019). Still, recent collecting efforts are continuing to yield new data on the species composition of this family in Iran.

Drassodes Westring 1851 is one of the largest genera of Gnaphosidae, with 162 valid species (WSC 2019), seven of which are currently known from Iran (Zamani et al. 2019). During the recent studies on the Iranian spider fauna, two interesting species of Drassodes were collected. One of them is new to science, and the other, Drassodes robatus Roewer 1961, is a new record for the Iranian fauna. The species, which was originally described on the basis of a male from surroundings of Robat Village, Ghazni Province, Afghanistan, is only known by two taxonomic entries (Roewer 1961; Murphy 2007). The males and the previously unknown female of this species have been found in several regions in Iran and are described and illustrated in this paper.

Material and Methods

SEM micrographs were made by means of a Hitachi TM3000 SEM microscope with BSE (back-scattered electrons) at the Perm State University. The stacks of color images were manually generated using an Olympus OMD EM-10 digital camera with a Panasonic Lumix H-H025 25 mm f/1.7 lens mounted on a Zeiss microscope. Digital images were prepared using Photoshop CS6 image stacking software. The maps were created using the webpage Simple-Mappr (online at http://www.simplemappr.net/).

The terminology of the Drassodes male palp and epigyne morphology as well as chaetotaxy of leg and palp follows those of Platnick & Shadab (1976) and Kovblyuk (2008). The following abbreviations are used in the text: a – apical; AER – anterior eyes row; ALE – anterior lateral eyes; AME – anterior median eyes; d – dorsal; PER – posterior eyes row; pl – prolateral; PLE – posterior lateral eyes; PME – posterior median eyes; rl – retrolateral; RTA – retrolateral tibial apophysis; v – ventral. Measurements are given in millimeters. Measurements are listed in the following sequence: average (minimum–maximum).

The studied material has been deposited in the following museums (curator mentioned in parentheses): MMUE = the Manchester Museum, University of Manchester, UK (D.V. Logunov); PSU = Zoological Museum of the Perm State University, Perm, Russia (S.L. Esyunin).

Taxonomic survey

Drassodes marusiki sp. n.

Figs 1A–C, 2A, B, 5

Type material. Holotype ♀ (MMUE) and paratype 1♂ (MMUE), IRAN: Isfahan Province, Qamsar & Barzok Protected Area, 55 km SW of Qamsar, 14 km NE Kamoo, near the road of Gargash observatory, 33°37'52"N 51°19’52"E, alt 2710 m., 19 May 2016; paratype 1♀ (PSU-8158), Qamsar & Barzok Protected Area, 55 km SW of Qamsar, 14 km NE Kamoo, Gargash Peak, 33°40’18"N 51°18’55"E, alt 3530 m., 19 May 2016 (all leg. P. Ponel).

Etymology. This species is named after our colleague and friend, Dr. Yuri M. Marusik, for his years of friendship.
On two Drassodes spp. from Iran and in recognition of his numerous contributions to the arachnology of Iran.

**Diagnosis.** Drassodes marusiki sp. n. is extremely similar to *D. bifidus* Kovblyuk & Seyyar 2009 (Figs 1D, E, 2C, D) from Turkey, but differs in the morphology of the copulatory organs.

Females of the new species are well distinguished from the Turkish species in the following characters: (1) the basal lobe of spermathecae (*BL*) is located above the lateral cavity (*LC*) in *D. marusiki* sp. n. (Fig. 2A), but it is almost entirely inside the lateral cavity in *D. bifidus* (Fig. 2C); (2) the *BL* and terminal lobe (*TL*) do not touch in *D. marusiki* sp. n. (Fig. 2B), as they do in *D. bifidus* (Fig. 2D); (3) the *BL* is almost half the size of the *TL* in *D. marusiki* sp. n., whereas in *D. bifidus* the two sets of spermathecal lobes are about the same size.

Males of these two species can be distinguished by the tip of the RTA, which is bifurcated in *D. bifidus* (Figs 1E, d), but obliquely truncate, without noticeable bifurcation in *D. marusiki* sp. n. (Figs 1B, C). In addition, the embolus is shorter and basally wider in *D. marusiki* sp. n. compared to those of *D. bifidus* (see Figs 1B, E).

*Drassodes marusiki* sp. n. and *D. bifidus* are apparently closely related to three species: *D. archibensis* Ponomarev & Alieva 2008 and *D. dagestanus* Ponomarev & Alieva 2008, recently described from the Caucasus, and the Mediterranean *D. albicans* (Simon 1878). The male of the new species differs from them in the form of the embolus, which is strongly thicker in *D. archibensis* (Ponomarev & Alieva 2008: fig. 1), much thinner in *D. dagestanus* (Ponomarev & Alieva 2008: fig. 3) and fully straight in *D. albicans* (Chatzaki et al. 2002: 615 and figs 29, 31). The shape of the spermathecal lobes of *D. marusiki* sp. n. are identical to those of *D. dagestanus*, however, these species differ in the relative position of the *BL*, in *D. dagestanus*, being located within the limits of the lateral cavity (Ponomarev & Alieva 2008: fig. 6), like those in *D. bifidus*.

**Description.** Female (holotype). Total length 6.9. Carapace length 2.8, width 1.8; yellow with dark thin setae. The height...
(0.06 mm) of the clypeus is half the diameter of the AME. Ocular field yellow; width of slightly recurved AER 0.56, slightly procurved PER 0.66. Medial eyes field almost square: length 0.31, width 0.28 anteriorly and 0.27 posteriorly. Eye sizes: ALE (oval) 0.14×0.07, AME 0.14, PLE (triangular) 0.13×0.08, PME 0.11. AME–AME almost touching, AME–AME and PME–PME separated by less than their diameter, PME–PLE – by more than their diameter: AME–AME 0.01, AME–AME 0.04, PLE–PME 0.14, PME–PME 0.06.

Chelicerae with numerous long setae on the front surface. Cheliceral furrow with 3 large teeth (2 apical teeth large, third basal small) on the promargin and 1 small tooth on retromargin edges. Labium, maxillae, pedipalps and legs yellow. Palpal femur with one dorsal median long seta and with transverse distal row of 3 setae; patella with one lateral (pl 0-1-0) seta; tibia with two dorsal (d 0-1-1) and four lateral (pl 2-0-2) setae. Sternum yellow covered with long dark setae.

Leg formula IV>II>I>III. Leg measurements are given in the Table 1. Leg spination: Femora I d 1-1-0, pl 0-0-1; II d 1-1-0, pl 0-1-1; III d 1-1-0, pl 0-1-1, rl 0-1-1; IV d 1-1-1, pl 0-1-1, rl 1-1-1, v 2-2-2a; Metatarsi I and II v 2-0-0; III pl 1-2-2, rl 1-2-2, v 2-2-2a; IV d 1-0-0, pl 1-2-2, rl 1-2-2, v 2-2-2a. Metatarsi I and II and all tarsi with scopula. Tarsus not modified.

Abdomen length 4.1; grey-yellow covered with darker thin setae; spinnerets dark-yellow.; length/width ratio – 2.4: length 0.60, width 0.25.

Female (paratype). Total length 8.0. Carapace length 3.8, width 2.5; yellow-brown. Chelicerae and labium brown; maxillae light-brown. Palp bicolored: femur and patella yellow, tibia and tarsus brown. Sternum yellow-brown covered with long black setae. Legs yellow with brownish metatarsi. Leg spination (right III and left IV only): Femora III d 1-1-1, pl 0-1-1, rl 0-1-1; IV d 1-1-1, pl 0-1-1, rl 0-1-1; Tibiae III pl 0-0-0, pl 1-1-1, rl 1-1-1, v 2-2-2a; IV d 1-1-0, pl 1-1-1, rl 1-1-1, v 2-2-2a; Metatarsi III pl 1-2-2, rl 1-2-2, v 2-2-2a; IV d 1-0-0, pl 1-2-2, rl 1-2-2, v 2-2-2a. Tarsus IV clearly arched in the apical part.

Epigyne: median plate (MP) well separated from semilunar lateral margins (LM, Fig. 2A). Spermathecae bilobed; the terminal lobe (TL) drop-shaped; the basal lobe (BL) oval, smaller than TL; additional lobe (AL) smallest (Fig. 2B).

Male. Total length 7.0. Carapace length 3.3, width 2.3; yellow with brownish cephalic area; covered with small dark setae. Ocular field blackish; posterior eyes row 1.3 times wider than the anterior eyes row (AER 0.64, PER 0.83). Median eyes field rectangular: length 0.41, width 0.34. Eye sizes: ALE (oval) 0.15×0.08, AME 0.14, PLE (triangular) 0.13×0.10, PME (oval) 0.13×0.08. AME–AME almost touching, AME–AME and PME–PME separated by less than their diameter, PME–PLE – by more than their diameter: AME–AME 0.02, AME–AME 0.10, PLE–PME 0.18, PME–PME 0.07. Chelicerae length 1.2, brown granulate on the front surface. Cheliceral furrow with 3 teeth (teeth are smaller than those of the female) on the promargin and 1 small tooth on retromargin edges. Labium and maxillae brown. Sternum yellow-brown with brown rim.

Legs yellow with brownish metatarsi. Leg measurements are given in Table 1. Leg spination (leg I absent): femora II d 1-1-0, pl 0-1-1; III d 1-1-1, pl 0-1-1, rl 0-1-1; IV d 1-1-0, pl 0-2-1, rl 0-1-1; Tibiae II v 2-2-0; III d 1-0-0, pl 1-1-1, rl 1-1-1, v 2-2-2a; IV d 1-0-1, pl 1-1-1, rl 1-(1+1)-1, v 2-2-2a; Metatarsi II v 2-0-0; III d 1-0-1, pl 1-1-1, rl 1-(1+1)-1, v 2-2-2a; IV pl 1-2-2, rl (2+2)-(2+1)-2, v 3-(2+2)-2a. Tarsus IV clearly arched in the apical part. Metatarsi II and all tarsi with scopula.

Abdomen length 3.7, dusty white with dark tip; covered with dark setae. Anterior lateral spinnerets cylindrical; length/width ratio – 2.8: length 0.71, width 0.25.

Palp. Palpal femur with one dorsal median long seta and with transverse distal row of 3 setae; Patella with one dorsal (d 0-1-0) seta; Tibia with two dorsal (d 0-1-1) and four lateral (pl 1-1-1) setae. Sternum yellow-brown covered with long dark setae. Ocular field blackish; posterior eyes row 1.3 times wider than the anterior eyes row (AER 0.64, PER 0.83). Median eyes field rectangular: length 0.41, width 0.34. Eye sizes: ALE (oval) 0.15×0.08, AME 0.14, PLE (triangular) 0.13×0.10, PME (oval) 0.13×0.08. AME–AME almost touching, AME–AME and PME–PME separated by less than their diameter, PME–PLE – by more than their diameter: AME–AME 0.02, AME–AME 0.10, PLE–PME 0.18, PME–PME 0.07. Chelicerae length 1.2, brown granulate on the front surface. Cheliceral furrow with 3 teeth (teeth are smaller than those of the female) on the promargin and 1 small tooth on retromargin edges. Labium and maxillae brown. Sternum yellow-brown with brown rim.

Abdomen length 3.7, dusty white with dark tip; covered with dark setae. Anterior lateral spinnerets cylindrical; length/width ratio – 2.8: length 0.71, width 0.25.

Palp. Palpal femur with one dorsal median long seta and with transverse distal row of 3 setae; Patella with one dorsal (d 0-1-0) seta; Tibia with one dorsal (d 0-1-1) and four lateral (pl 0-2-2) setae (Fig. 1A).

Palpal tibia (without RTA) two time shorter than cymbium (Fig. 1A). RTA as long as half the tibia; tip of RTA slightly curved, AME–AME and PME–PME separated by less than their diameter, PME–PLE – by more than their diameter: AME–AME 0.02, AME–AME 0.10, PLE–PME 0.18, PME–PME 0.07. Chelicerae length 1.2, brown granulate on the front surface. Cheliceral furrow with 3 teeth (teeth are smaller than those of the female) on the promargin and 1 small tooth on retromargin edges. Labium and maxillae brown. Sternum yellow-brown with brown rim.

Distribution. Type locality only (Fig. 5).

Table 1. Length of leg segments in Drassodes marusaki sp. n.

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<tr>
<th>Leg</th>
<th>Femur</th>
<th>Patella</th>
<th>Tibia</th>
<th>Metatarsus</th>
<th>Tarsus</th>
<th>Total length</th>
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<tbody>
<tr>
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<td>6.6</td>
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<td>2.0</td>
<td>2.4</td>
<td>1.1</td>
<td>9.1</td>
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</table>

Paratype male

| I   | 2.5 | 1.4 | 2.2 | 2.0 | 1.3 | 9.4 |
| II  | 2.3 | 1.2 | 1.7 | 1.9 | 1.1 | 8.1 |
| III | 2.9 | 1.2 | 2.4 | 3.0 | 1.2 | 10.7 |
On two *Drassodes* spp. from Iran

**Fig. 3.** *Drassodes robatus* Roewer 1961: A – male palp, prolateral view, B – male palp, ventral view, C – femur of male palp, prolateral view, D – tarsus IV of male, lateral view, E, F – epigyne, dorsal and ventral views, correspondingly. Scale bars: 1 mm (A, C, D) and 0.1 mm (B, E, F). Abbreviations: *BL* – basal lobe of spermathecae; *C* – conductor; *dS* – distal group of spines; *E* – embolus; *FD* – fertilization duct; *LC* – lateral cavity; *LM* – lateral epigynal margin; *MA* – median apophysis; *MP* – median plate; *RTA* – retrolateral tibial apophysis; *TL* – terminal lobe of spermathecae.
Fig. 4. Male *Drassodes robatus* Roewer 1961, scanning electron micrographs: A – palp, ventral view, B – tip of palpal tibia, lateral view, C, D – femur of palp and its tip, prolateral view, E – chelicera, frontal view, F – cheliceral projection with two teeth, showing setae with tubercu-
losed base (tbS). Scale bars: 1 mm (C, E) and 0.1 mm (A, B, D, F). Abbreviations: dS – distal group of spines; E – embolus; RTA – retrolateral tibial apophysis.
**Table 2.** Length of leg segments in *Drassodes robatus* Roewer 1961 (average, range in parentheses)

<table>
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<th>Leg</th>
<th>Femur</th>
<th>Patella</th>
<th>Tibia</th>
<th>Metatarsus</th>
<th>Tarsus</th>
<th>Total length</th>
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<td>(mm)</td>
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**Male (n = 5)**

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**Female (n = 2)**

**Drassodes robatus** Roewer 1961

*Figs. 3A–F, 4A–F, 6*

*Drassodes robatus*: Murphy 2007: 55, fig. 446 (♂).

**Material examined.** 1♂, 1♀ (PSU-8162), IRAN: Kord-estan Province: Oramanat, Golangan, near the border with Iraq, May 2017 (leg. A. Zamani); 1♂ (PSU-8164), Semnan Province: Shahrud (leg. A. Zamani); 1♂ (MMUE), 1♀, 1♀ (PSU-8161), Isfahan Province: Qamsar, 55 Km SW of Qamsar, Gargash Mts, 19 May 2016, (leg. P. Ponel); 1♂, 1♀ (PSU-8174), Isfahan Province: Qamsar, 55 Km SW of Qamsar, Gargash Mts, 19 May 2016 (leg. P. Ponel); 2♂ (PSU-8163), Zanjan Province: 1♂, Mahneshan, Ghehsaajuogh Vil., 36°35'2.4"N 47°34'4.8"E, 25 April 2017 (leg. L. Karami).
Description. Male. Total length 8.6 (7.5–9.8). Carapace length 3.9 (3.3–4.2), width 2.8 (2.2–3.1); yellow with brownish or brown pars cephalica; covered with scattered dark setae. Clypeus with a row of 6 long black setae. The height (0.13 mm) of the clypeus is approximately equal to the diameter of the AME. Ocular field blackish; posterior eyes row 1.3 times wider than the anterior eyes row (AER 0.70, PER 0.91). Median eyes field rectangular: length 0.45, width 0.39. Eye sizes: ALE (oval) 0.14×0.10, AME 0.14, PLE (oval) 0.14×0.10, PME 0.15. Interdistances: ALE–AME 0.04, AME–AME 0.11, PLE–PME 0.20, PME–PME 0.06. All eyes pearly white except for AME which are black. Chelicerae length 1.9 (1.1–2.4), from dark brown to yellow-brown with numerous long setae on the front surface. Cheliceral furrow with projection on the promargin (Fig. 4E) with 2 (Fig. 4F) or 3 teeth (fig. 446 in Murphy (2007)). Retromargin edges with 2 very small teeth (sometimes invisible). Promarginal edges covered with setae on tuberculosed base (tbS, Fig. 4F). Labium and maxillae from brown to yellow-brown (maxillae with white tip) (fig. 446 in Murphy (2007)). Sternum from yellow-brown to yellow with dark or brown rim covered with dense (along the edges and rarely at the center) dark long thin setae.

Legs yellow. Leg formula IV>I>II>III. Leg measurements are given in the Table 2. Leg spination is typical for the genus Drassodes, but variable: Femora I and II d 1-1-0, pl 0-0(1)-1; III d 1-1(2)-1, pl 0-1-1, rl 0-1(0)-1; IV d 1-1-1, pl 0-1-1, rl 0-1-1; Tibiae I and II v 0-1-0; Metatarsi I and II v 1-0-0. Tibiae and metatarsi III, IV with numerous setae; the number and position of the setae varies: Tibia III d 1-0-0, pl 1-1-1, rl 1-1-1, v 1(2)-1(2)-2a; IV d 0-1-1, pl 1-1-1, rl 1-1-1, v 1(2)-2(1)-2a; Metatarsus III d 1-0(1)-0(1), pl 1(2)-2(1)-2(1), rl 1(2)-1(2)-2(1), v 2-2-2a; IV d 1-0-0, pl 1-2(1)-2(1), rl 1-2(1)-2(1), v 2-2-2a. Tarsus not modified typically; but may be with poorly resolved (tarsus III) or inconspicuously (tarsus IV) bent (one male), or clearly arched in the apical part (Fig. 3d) (one male). Metatarsi I and II and all tarsi with scopula.

Abdomen length 4.6(4.1–5.5); from grey to grayish yellow (more dark on apical third) with darker lanceolate spot; covered with sparse dark setae and dense gray thin hairs. Anterior lateral spinnerets cylindrical; length/width ratio – 3.3(2.8–4.0): length 0.85(0.77–0.95), width 0.26(0.22–0.29).

Palp. Palpal femur with one dorsal median long seta and distal group of thicker and shorter setae (about 15). The distal setae located on the dorsal and prolateral surfaces of the femur (dS, Figs 3A, C) (in two males this group is divided into two – dorsodistal and median prolateral ones; Figs 4C, D). Tibia with one dorsal (d 1-0-0) and four (rl 2-0-2) prolateral setae. Male palp tibia longer (1.3 times) than the cymbium (Fig. 3A). RTA short, slightly curved at the top with median projection, carrying small teeth (Figs 3B, 4A, B).
Embols short, laterally curved, in distal position (E, Figs 3B, 4A). Median apophysis minute, hooked, situated approximately at midline of genital bulb (MA, Figs 3B, 4A). Vertical part of seminal duct curved (Fig. 3B).

Female. Total length 15.1 (13.8–16.3). Carapace length 5.8, width 3.6 (3.5–3.7); yellow or brown with brown or dark-brown head. Ocular field blackish, width of AER 1.30, PER 1.75. Medial eyes field almost square: length 0.7, width 0.6. Eye sizes: ALE (oval) 0.25×0.10, AME 0.18, PLE (oval) 0.23×0.13, PME 0.23. Eyes of anterior row and median eyes of posterior row close together; median and lateral eyes of posterior row widely separated from each other: ALE – AME 0.18, AME – PME 0.20, PLE – PME 0.58, PME 0.18. All eyes pearly white except for AME which are black. Chelicerae from brown to dark-brown (almost black) with numerous long setae on the front surface. Cheliceral furrow with 3 teeth (2 apical large teeth, third basal small) on the promargin and 2 small teeth on retromargin edges. Labium with 3 teeth (2 apical large teeth, third basal small) on the ventral margin in D. auriculoides or with small teeth in D. angulus (see correspondingly figs 42, 54 and 66 in Platnick & Shadab (1976)).

Female of D. robatus is characterized by the shape of epigyne, which is somewhat similar to those of D. lapidosus (Walckenaer 1802) and D. unicolor (O. Pickard-Cambridge 1872), but well distinguished by the shape of the median plate: with obvious lateral angles in D. robatus (Fig. 3f), but rounded in D. lapidosus (for example fig. 6 in Bolzern & Hänggi (2006)) and D. unicolor (fig. 25 in Levy (2004)).

Murphy (2007: 55) notes that some species of “Drassodes Group” have “curved, flexible tarsi”. The author (ibid.) also suggested that “it seems possible that not all species within a genus or, indeed, all specimens within a species, possess these flexible tarsi”. Our material demonstrates that the “curved tarsi” characteristic is not a species attribute, but reflects differences within the species.

Distribution. East Afghanistan, Iran – first record (Fig. 6).

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