

## Two new records of jumping spiders from Turkey and a new locality of *Heliophanus feltoni* (Araneae: Salticidae)

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**Abstract.** Three species from three different genera of jumping spiders (Salticidae) were collected from Kahramanmaraş, Turkey. Two species are reported from the country for the first time: *Leptorchestes peresi* (Simon, 1868) (♂, ♀) and *Talavera petrensis* (C. L. Koch, 1837) (♂, ♀). The third species, *Heliophanus feltoni* Logunov, 2009, was described from Kayseri and Niğde provinces in Turkey, and the record from Kahramanmaraş represents the southeasternmost locality currently known. The characteristic features of all three species are described and figured.

**Keywords:** *Leptorchestes*, Mediterranean, new record, *Talavera*, faunistics

**Zusammenfassung. Zwei neue Springspinnennachweise aus der Türkei und ein neuer Fundort von *Heliophanus feltoni* (Araneae: Salticidae).** Drei Arten aus drei Springspinnengattungen (Salticidae) wurden in Kahramanmaraş (Türkei) gesammelt. Zwei sind Neunachweise für das Land: *Leptorchestes peresi* (Simon, 1868) (♂, ♀) und *Talavera petrensis* (C. L. Koch, 1837) (♂, ♀). Von *Heliophanus feltoni* Logunov, 2009 ist es der südöstlichste Fundort in der Türkei. Die charakteristischen Merkmale der drei Arten werden beschrieben und dargestellt.

Salticidae is the largest family of spiders, with 6337 described species (World Spider Catalog 2021). Currently, 453 species belonging to 63 genera from this family are known in Europe, North Africa and the Caucasus (Nentwig et al. 2021). In Turkey, the number of Salticidae species has increased to 145 from 134 due to recent studies (Logunov 2015, Coşar & Varol 2016, Yalçın et al. 2016, Kirazci et al. 2017, Topçu & Demircan 2018, Topçu & Demircan-Aksan 2020, Danişman et al. 2021). According to current data, eight salticid species have so far been recorded only from Turkey: *Aelurillus alboclypeus* Azarkina & Komnenov, 2015, *Euophrys fucata* (Simon, 1868), *Habrocestum nigristernum* Dalmás, 1920, *Heliophanus feltoni* Logunov, 2009, *Heliophanus konradthaleri* Logunov, 2009, *Pseudomogrus zaraensis* (Logunov, 2009), *Salticus resilli* Logunov, 2015, *Synageles karaman* Topçu & Demircan-Aksan, 2020.

Here, two members of the salticid fauna of Turkey are presented and described in detail: *Leptorchestes peresi* (Simon, 1868) and *Talavera petrensis* (C. L. Koch, 1837). Both are new records for the country and bring the total number of salticids known from Turkey to 147 species. Furthermore, the southeasternmost record of the *Heliophanus feltoni* Logunov, 2009, a species potentially endemic to Turkey, is presented.

### Material and methods

Spiders were collected in the Kahramanmaraş province of Turkey, with an aspirator. Specimens were photographed using a Canon EOS 250D camera attached to the Leica S8APO stereo microscope. The number of photos taken varies according to the size of the species (usually ranging between 5 and 15). Images were stacked using 'Combine ZM' image stacking software and edited with the 'Photoshop CC 2019' software. The female copulatory organs were dissected, cleaned, and kept in lactic acid for 2–3 days. The map of spe-

cies distribution was prepared using SimpleMappr program (Shorthouse 2010). Specimens are deposited in the Arachnological Museum of Kırıkkale University (KUAM). All measurements are in millimetres. Abbreviations: **ALE** – anterior lateral eyes, **AME** – anterior median eyes, **Fe** – femur, **PLE** – posterior lateral eyes, **PME** – posterior median eyes, **Pa** – patella, **Ta** – tarsus, **Ti** – tibia, **Mt** – metatarsus.

### Results

***Heliophanus feltoni* Logunov, 2009** (Figs 1-2, 9)

**Material examined.** 2 ♂♂, TURKEY, Kahramanmaraş Province, Nurhak District, Ağcaşar Village (38.07972°N, 37.28611°E, 1406 m a.s.l.), 6. Jul. 2019. İ. Coşar leg., on uncultivated meadow in dry shrublands, from leaf litter.

**Species identification.** The male of *H. feltoni* differs from other congeners in Turkey by the hook-shaped femoral apophysis and structure of two tibial apophyses.

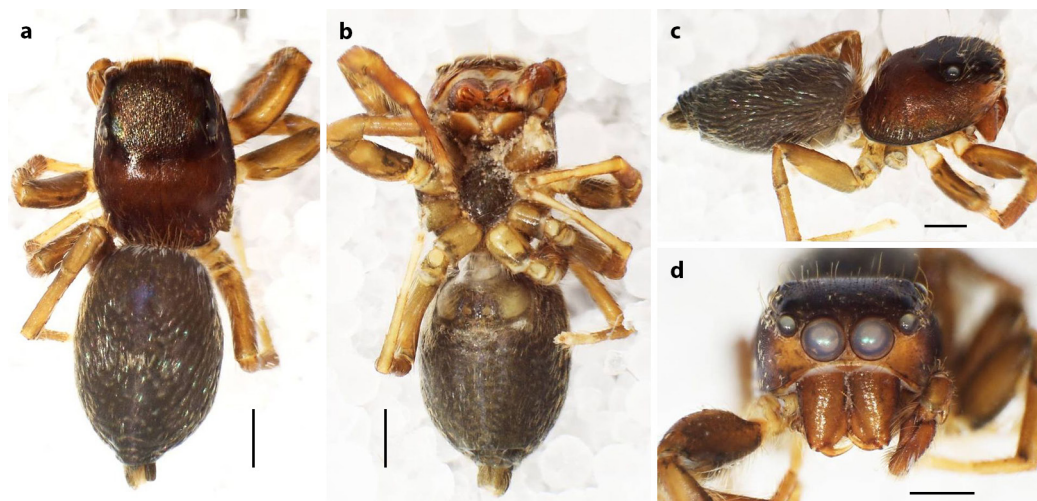
**Distribution.** *Heliophanus feltoni* is only known from Turkey. This species was previously recorded from Kayseri and Niğde provinces in the Central Anatolia Region (Logunov 2009, Nentwig et al. 2021, World Spider Catalog 2021, Fig. 9).

**Male description.** Carapace brown, eye area black, covered with short dark hairs (Fig. 1a, c-d). AME surrounded by white hairs (Fig. 1d). Clypeus narrow, light brown, with long black hairs. Chelicerae dark brown (Fig. 1d). Opisthosoma blackish brown, covered with short light-coloured hairs (Fig. 1a-c). Metatarsus and tarsus yellow, the remaining part of legs brown, covered with short light-coloured hairs (Fig. 1b). Pedipalp dark brown, dorsally covered with long light brown hairs (Fig. 1d). Femoral apophysis hook-shaped (Fig. 2a-b). Bulb wide with two posterior protrusions (Fig. 2a, c-d). Embolus long and curved (Fig. 2a, c-d). Palpal tibia with two tibial apophyses, one thorn-like, the other one tongue-like (Fig. 2c-d). Measurements: Total length 3.80. Prosoma 1.80 long, 1.30 wide, 0.90 high. Opisthosoma 2.0 long, 1.30 wide, 1.10 high. Ocular area 1.10 long. Sternum 0.70 long, 0.50 wide. Eye diameter and inter-distances: AME: 0.35, ALE: 0.15, PME: 0.05, PLE: 0.15, AME-AME: 0.05, AME-ALE: 0.05, PME-PME: 0.85, PME-PL: 0.25, PLE-ALE: 0.45. Leg formula IV, I, III, II. Leg measurements: I. Leg; Fe: 1.0, Pa: 0.55, Ti: 0.75, Mt: 0.55, Ta: 0.40, Total: 3.25; II. Leg:

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**Fig. 1:** *Heliophanus feltoni*, male habitus. **a.** dorsal view; **b.** ventral view; **c.** lateral view; **d.** frontal view (scale: 0.5 mm)

Fe: 0.85, Pa: 0.45, Ti: 0.60, Mt: 0.50, Ta: 0.40, Total: 2.80; III. Leg: Fe: 1.0, Pa: 0.45, Ti: 0.65, Mt: 0.60, Ta: 0.50, Total: 3.20; IV. Leg: Fe: 1.25, Pa: 0.50, Ti: 0.80, Mt: 0.80, Ta: 0.50, Total: 3.85.

***Leptorchestes peresi* (Simon, 1868)** (Figs 3-5, 9)

**Material examined.** 1 ♂, 2 ♀♀, TURKEY, Kahramanmaraş Province, Onikişubat District (37.75666°N, 36.68166°E, 665 m a.s.l.), 6. Sep. 2019, İ. Coşar leg., on a clearing in a mixed wood, from stony area.

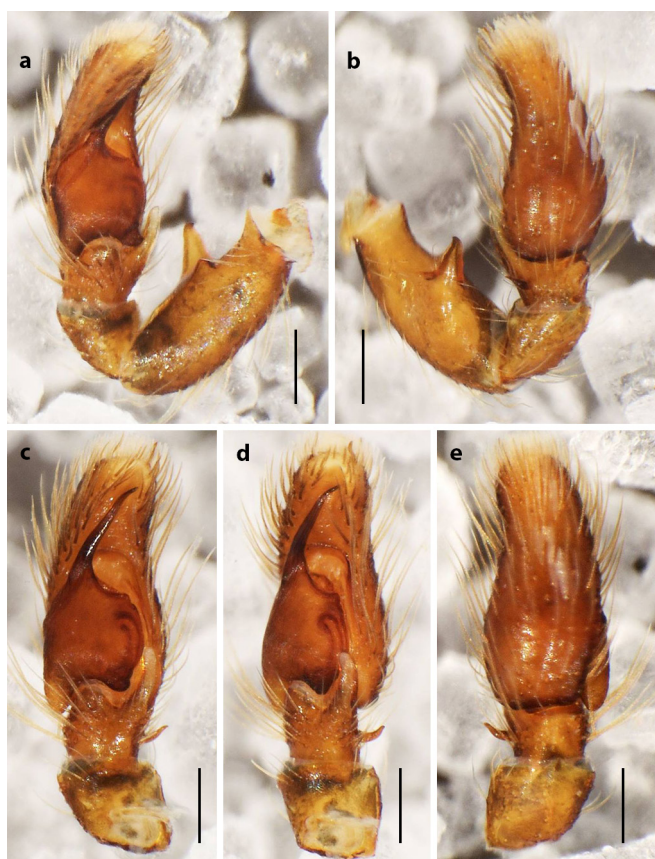
**Species identification.** In addition to *Leptorchestes peresi* there are three species of this genus currently known from Turkey: *Leptorchestes berolinensis* (C. L. Koch, 1846), *Leptorchestes mu-*

*tilloides* (Lucas, 1846) and *Leptorchestes sikorskii* Prószyński, 2000. It resembles *L. mutilloides* and *L. sikorskii*, but can be distinguished from them by having a tibial apophysis with a few small teeth and its tip curved like a hook. The female of this species differs from the latter two by the presence of strongly sclerotized flat verges posterior to the copulatory openings.

**Distribution.** *Leptorchestes peresi* has been recorded from Mediterranean Europe (France, Greece, Italy, Portugal, Spain) and North Africa (Algeria) (Nentwig et al. 2021, World Spider Catalog 2021) and it is herein recorded for the first time in Turkey (Fig. 9). Additionally, this represents the first record for Asia and the easternmost record in the hitherto known distribution.

**Male description.** Carapace light brown. PLE surrounded by black hairs (Fig. 3e). Around the AME covered with short white hairs (Fig. 3f). Clypeus narrow, light brown. Chelicerae brown, with short dark hairs (Fig. 3e-f). Sternum light brown (Fig. 3b). Opisthosoma greyish brown, with white ring-like pattern in the middle. The middle of the opisthosoma knuckled (Figs 3a, e). Coxa, patella, and tibia of the first leg yellow, other segments light brown. Patella and tibia prolaterally with brown line. Leg II yellow, only coxa white. Leg III light brown. Leg IV light brown, only coxa white (Fig. 3a-b). Pedipalp dark brown. Palpal bulb wide. The base of the embolus wide, its tip thin. Tibial apophysis of pedipalp with pointed tip laterally, extended and with a few tooth-like protrusions (Fig. 4b-c, e). Measurements: Total length 5.20. Prosoma 2.40 long, 1.30 wide, 0.90 high. Opisthosoma 2.80 long, 1.40 wide, 1.20 high. Ocular area 1.0 long. Sternum 1.20 long, 0.50 wide. Eye diameter and inter-distances: AME: 0.30, ALE: 0.10, PME: 0.05, PLE: 0.15, AME-AME: 0.05, AME-ALE: 0.02, PME-PME: 0.90, PME-PLE: 0.60, PLE-ALE: 0.80. Leg formula IV, I, III, II. Leg measurements: I. Leg: Fe: 1.40, Pa: 0.70, Ti: 1.40, Mt: 0.70, Ta: 0.50, Total: 4.70; II. Leg: Fe: 1.0, Pa: 0.60, Ti: 1.0, Mt: 0.60, Ta: 0.50, Total: 3.70; III. Leg: Fe: 1.10, Pa: 0.50, Ti: 0.90, Mt: 0.80, Ta: 0.50, Total: 3.80; IV. Leg: Fe: 1.50, Pa: 0.60, Ti: 1.50, Mt: 1.20, Ta: 0.50, Total: 5.30.

**Female description:** Carapace light brown. PLE surrounded by black hairs (Fig. 3g). AME surrounded with short white hairs (Fig. 3h). Clypeus narrow, light brown. Chelicerae shorter compared to male's, brown with short dark hairs (Figs 3g-h). Sternum light brown (Fig. 3d). Opisthosoma



**Fig. 2:** *Heliophanus feltoni*, male, pedipalp. **a.** ventral view; **b.** dorsal view (2a, 2b with palpal femur); **c.** ventral view; **d.** ventroretrolateral view; **e.** dorsal view (scale: 0.2 mm)

greyish brown, with white ring-like pattern in the middle. The middle of the opisthosoma knuckled (Figs 3b, g). Coxa, patella, and tibia on the first leg yellow, other segments light brown. Leg II yellow, only coxa white. Leg III light brown. Coxa, patella, and tibia on the Leg III light brown, other segments yellow. Leg IV light brown, only coxa white (Figs 3c-d). Epigyne strongly sclerotized. The copulatory openings located anteriorly. Flat verges on the posterior of the copulatory openings strongly sclerotized. Spermathecae complex. Epigyne and vulva as in Fig. 5. Measurements: Total length 5.40. Prosoma 2.40 long, 1.40 wide, 0.90 high. Opisthosoma 3.0 long, 1.50 wide, 1.40 high. Ocular area 1.0 long. Sternum 1.25 long, 0.50 wide. Eye diameter and inter-distances: AME: 0.35, ALE: 0.15, PME: 0.05, PLE: 0.20, AME–AME: 0.05, AME–ALE: 0.02, PME–PME: 1.20, PME–PLE: 0.70, PLE–ALE: 0.95. Leg formula IV, I, III, II. Leg measurements: I. Leg: Fe: 1.40, Pa: 0.70, Ti: 1.30, Mt: 0.70, Ta: 0.50, Total: 4.60; II. Leg: Fe: 1.10, Pa: 0.60, Ti: 0.90, Mt: 0.60, Ta: 0.50, Total: 3.70; III. Leg: Fe: 1.20, Pa: 0.60, Ti: 0.90, Mt: 0.80, Ta: 0.50, Total: 4.0; IV. Leg: Fe: 1.70, Pa: 0.70, Ti: 1.60, Mt: 1.10, Ta: 0.60, Total: 5.70.

***Talavera petrensis* (C. L. Koch, 1837) (Figs 6–9)**

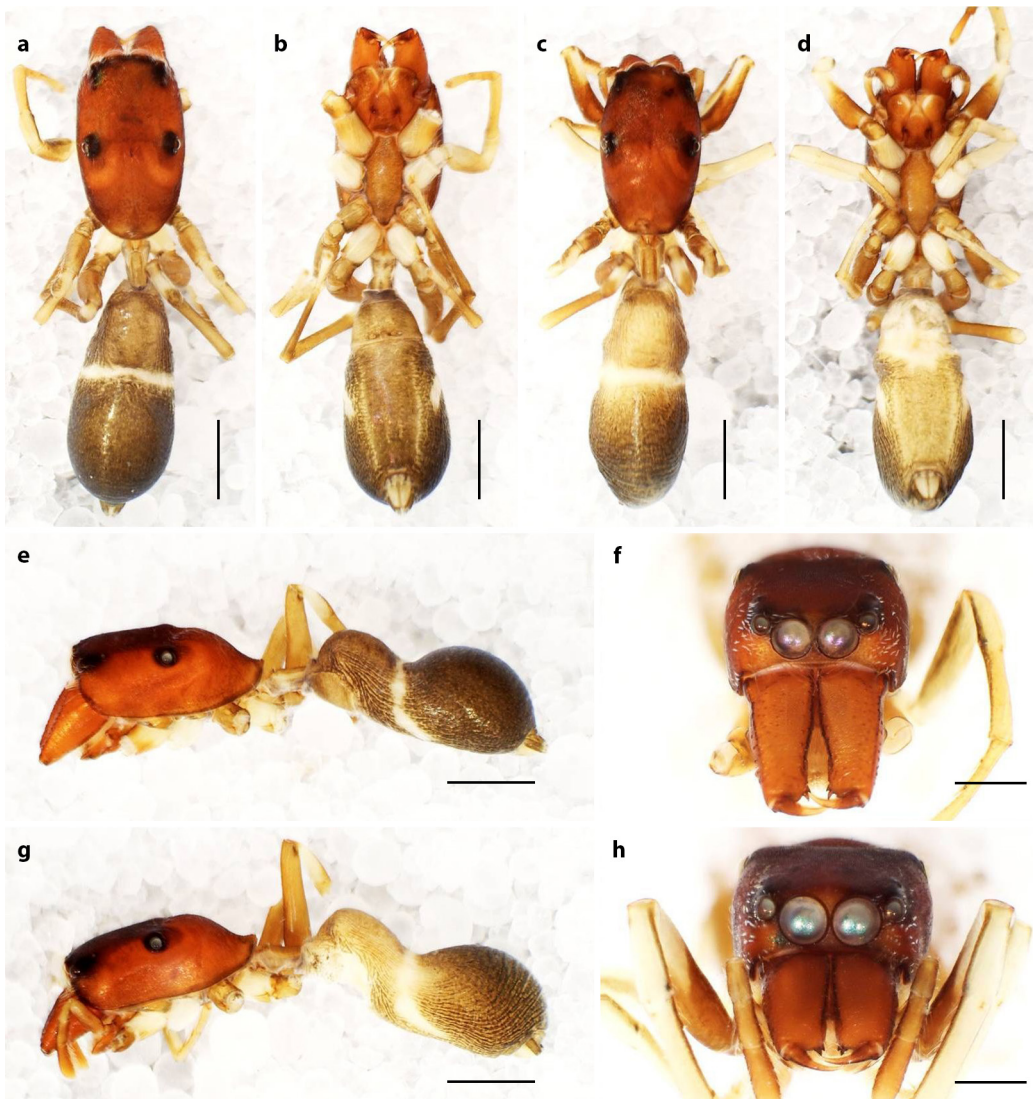
**Material examined.** 1 ♂, 2 ♀♀, TURKEY, Kahramanmaraş Province, Türkoğlu District (37.24888°N, 36.77666°E, 496 m

a.s.l.), 25. Sep. 2020, İ. Coşar leg., in dry mixed forest areas, under stones.

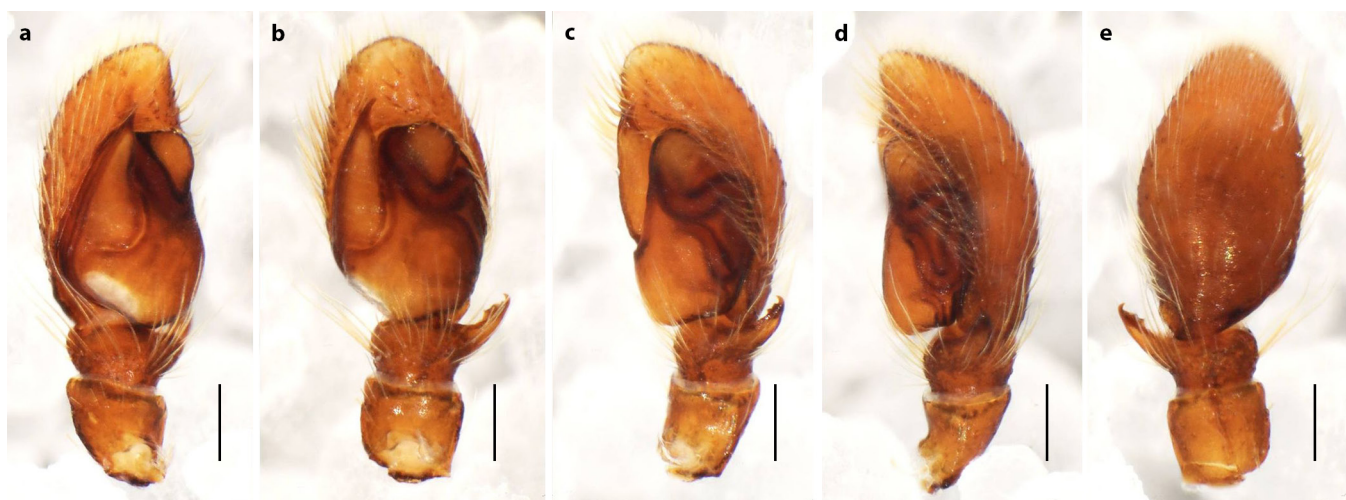
**Species identification.** The male of this species differs from males of *Talavera aequipes* (O. Pickard-Cambridge, 1871) and *T. aperta* (Miller, 1971) in Turkey by the shape of the embolus, which is coiled characteristically. Females of *T. petrensis* can be distinguished from the other two species by having an epigyne with a strongly sclerotized edge.

**Distribution.** Europe to Central Asia, China (World Spider Catalog 2021).

**Male description.** Carapace yellowish-brown, its sides dark brown and covered with short light-coloured hairs. The eye area blackish-brown, densely covered with long white hairs (Fig. 6a). AME and ALE surrounded by short white hairs. Clypeus low. Chelicerae bright light yellow (Fig. 6g). Opisthosoma brown, with spot-like yellow pattern, and covered with short light-coloured hairs (Fig. 6a). Legs yellowish-brown, with short dark hairs (Fig. 6a-b). Pedipalp light brown, with long white hairs, spermophore clearly visible, bulb wide and protruding proximally, embolus thin and curved clockwise (Fig. 7). Measurements: Total length 2.50. Prosoma 1.30 long, 1.0 wide, 0.60 high. Opisthosoma 1.20 long, 0.90 wide, 0.80 high. Ocular area 0.80 long. Sternum 0.50 long, 0.40 wide. Eye diameter and inter-distances: AME: 0.20, ALE: 0.15, PME: 0.05, PLE: 0.70, AME–AME: 0.02, AME–ALE: 0.05,



**Fig. 3:** *Leptorchestes peresi*, habitus, male. **a.** dorsal view; **b.** ventral view; **e.** lateral view; **f.** frontal view. Female. **c.** dorsal view; **d.** ventral view; **g.** lateral view; **h.** frontal view (a-e, g scale: 1.0 mm; f, h scale: 0.5 mm)



**Fig. 4:** *Leptorchestes peresi*, male, pedipalp. **a.** ventroprolateral view; **b.** ventral view; **c.** ventroretrolateral view; **d.** retrolateral view; **e.** dorsal view (scale: 0.2 mm)

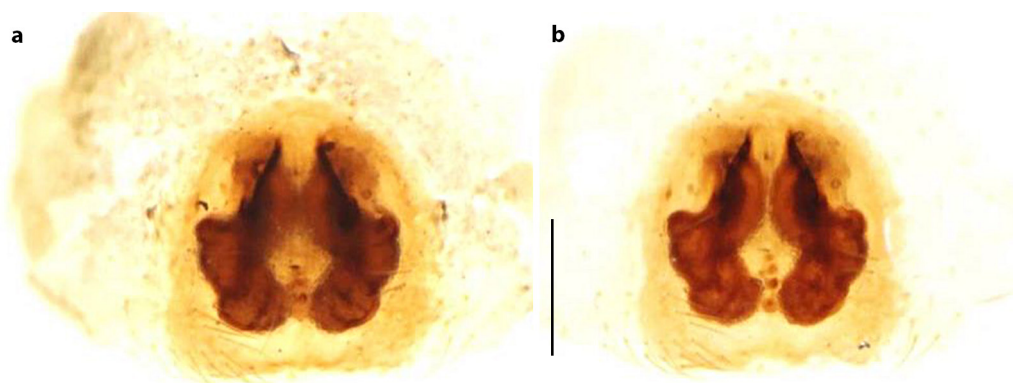
PME–PME: 0.70, PME–PLE: 0.12, PLE–ALE: 0.30. Leg formula IV, III, I, II. Leg measurements: I. Leg: Fe: 0.65, Pa: 0.30, Ti: 0.50, Mt: 0.35, Ta: 0.25, Total: 2.05; II. Leg: Fe: 0.55, Pa: 0.25, Ti: 0.40, Mt: 0.30, Ta: 0.25, Total: 1.75; III. Leg: Fe: 0.80, Pa: 0.35, Ti: 0.55, Mt: 0.40, Ta: 0.30, Total: 2.40; IV. Leg: Fe: 0.70, Pa: 0.35, Ti: 0.55, Mt: 0.50, Ta: 0.35, Total: 2.45.

**Female description.** Carapace yellowish-brown, sides dark brown covered with short light-coloured hairs. Eye area blackish-brown, densely covered with long white hairs (Fig. 6c). AME and ALE surrounded by short white hairs. Clypeus low. Chelicerae yellowish-brown (Fig. 6h). Opisthosoma brown, with spot-like yellow pattern, covered with short light-coloured hairs (Fig. 6c). Legs yellowish-brown, with short dark hairs (Fig. 6c-d). Epigyne broad, spiral-shaped, its edges strongly sclerotized. Spermathecae shaped like a waning-moon, copulatory ducts spirally twisted (Fig. 8). Measurements: Total length 3.40. Prosoma 1.50 long, 1.10 wide, 0.65 high. Opisthosoma 1.90 long, 1.30 wide, 0.95 high. Ocular area 0.90 long. Sternum 0.60 long, 0.45 wide. Eye diameter and inter-distances: AME: 0.25, ALE: 0.15, PME: 0.05, PLE: 0.12, AME–AME: 0.02, AME–ALE: 0.05, PME–PME: 0.75, PME–PLE: 0.12, PLE–ALE: 0.30. Leg formula IV, III, I, II. Lengths of legs: I. Leg: Fe: 0.70, Pa: 0.40, Ti: 0.50, Mt: 0.35, Ta: 0.30, Total: 2.25; II. Leg: Fe: 0.60, Pa: 0.25, Ti: 0.40, Mt: 0.35, Ta: 0.30, Total: 1.90; III. Leg: Fe: 0.90, Pa: 0.40, Ti: 0.50, Mt: 0.45, Ta: 0.35, Total: 2.60; IV. Leg: Fe: 0.85, Pa: 0.35, Ti: 0.60, Mt: 0.50, Ta: 0.40, Total: 2.70.

### Discussion

In the two species newly recorded for Turkey, the specimens' morphometric features and the general appearance differ slightly from specimens known from other areas. European *Leptorchestes peresi* specimens are larger and darker in comparison to the specimens from Turkey (Metzner 1999, Wesołowska & Szeremeta 2001). In all specimens of *Talavera petrensis* the colour of the body and folium was a little darker compared to the colour known from European specimens (Prószyński et al. 2018). However, the conspecificity of the Turkish specimens with the European ones in case of the two species is unequivocal, based on the structure of the copulatory organs and overall appearance. Logunov (2009) described *Heliophanus feltoni* from males in the Kayseri and Niğde provinces of Turkey, but did not give any information about the habitat. The new record comes from a meadow in shrubland. This species might potentially be endemic to Turkey.

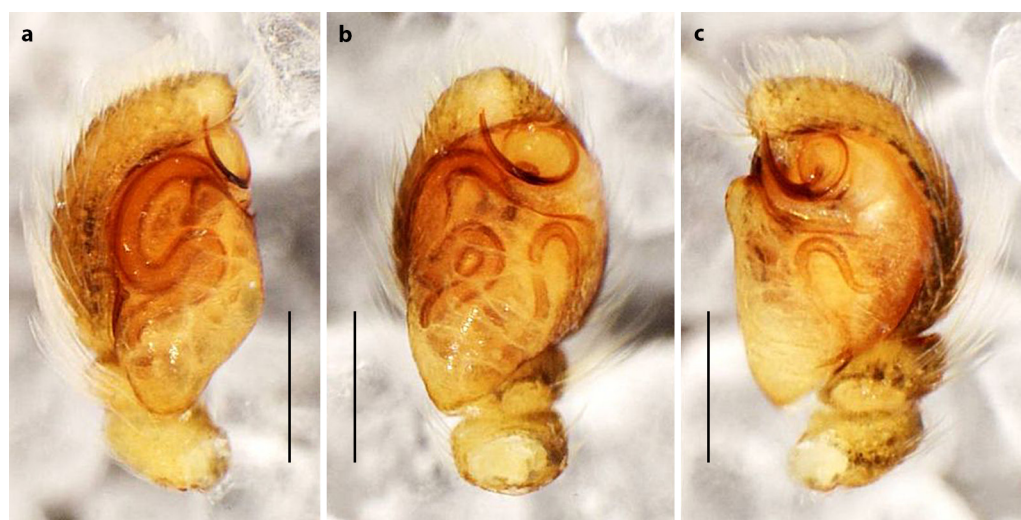
With this study, the total number of Salticidae recorded from Turkey increases to 147. The known salticid fauna of Turkey appears to be rich. However, taking into account the very high number of species in the neighbouring countries, which have considerably smaller areas, e.g. Greece (153), Bulgaria (91), Cyprus (57), Georgia (54) and Armenia (41) (Bosmans et al. 2019, Otto 2020, Nentwig et al. 2021), many more new species records can be expected from Turkey. However, the spider diversity in many areas of Turkey has not been completely studied and the species number of Turkish salticids is



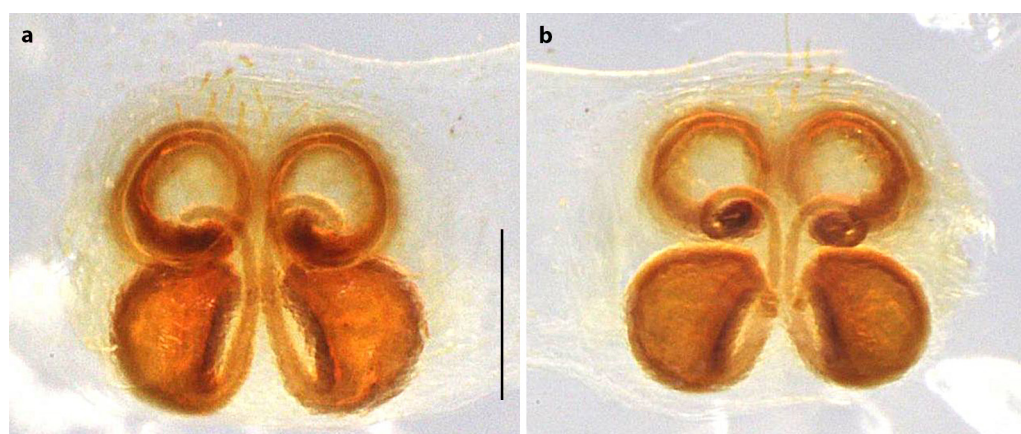
**Fig. 5:** *Leptorchestes peresi*, female, **a.** epigyne, ventral view, **b.** vulva, dorsal view (scale: 0.2 mm)



**Fig. 6:** *Talavera petrensis*, habitus, male. **a.** dorsal view; **b.** ventral view; **e.** lateral view; **g.** frontal view. Female. **c.** dorsal view; **d.** ventral view; **f.** lateral view; **h.** ocular area frontal view (scale: 0.5 mm)

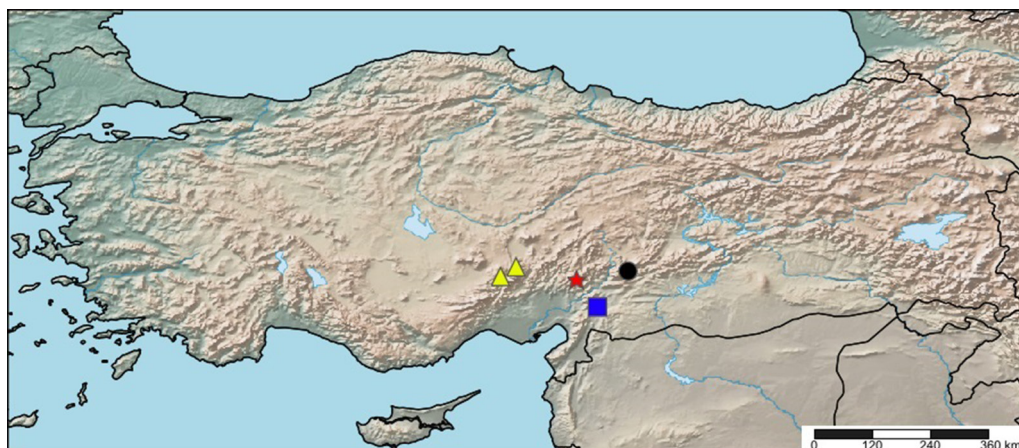


**Fig. 7:** *Talavera petrensis*, male pedipalp. **a.** retrolateral view; **b.** ventral view; **c.** ventroprolateral view (scale: 0.2 mm)



**Fig. 8:** *Talavera petrensis*, female, epigyne/vulva. **a.** ventral view; **b.** dorsal view (scale: 0.2 mm)

**Fig. 9:** Distribution of the species reported from Turkey: *Heiliophanus feltoni* (black circle: authors' record, yellow triangle: Logunov 2009), *Leptorchestes peresi* (red star) and *Talavera petrensis* (blue square) (source: simplemappr.net)



supposed to be much higher. Thus, it is necessary to conduct more faunistic studies, but also detailed taxonomic research, especially in eastern Black Sea, eastern Anatolian and south-eastern Anatolian Region, which have hitherto been neglected by most arachnologists.

#### Acknowledgments

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