

A New Species of *Troglohyphantes* (Araneae: Linyphiidae) from a Turkish Cave*

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Abstract

The spider family Linyphiidae comprises 104 species in Turkey that of them eight species are known from the caves, we recently started to conduct intensive taxonomic and faunistic studies on this family. The genus *Troglohyphantes* was described in 1882 by Joseph as a cave spider from Carniola in western Slovenia. Members of this genus inhabited cave environment, neighbouring habitat and some species of them are true troglobites. A new species of *Troglohyphantes* Joseph 1881 is described from Turkey. Differences between the new species and related species are discussed. *Troglohyphantes turcicus* sp. n. (Araneae: Linyphiidae) is described from Buzluk cave in Turkey. Drawing of characteristic features, the male palpal organs and the female genitalia are presented. Key to the species of *polyopthalmus* group is given including in *T. turcicus* sp. n.

Keywords

Linyphiidae; *Troglohyphantes*; New Species; Cave Spider; Turkey

1. Introduction

Cave dwelling spiders, as zoogeographic agents, are important for biospeleology [1]. The first study on cave dwelling spiders fauna of Turkey belongs to the French biospeleologist Fage [2], who revised cave dwelling spiders and described *Palliduphantes byzantinus* (Linyphiidae) as a new species dwelling in Yarımburgaz cave in İstanbul.

The spider family Linyphiidae consists of 104 species in Turkey [3] of these species, eight species are known from the caves, our study teams started detailed taxonomic and faunistic studies on this family [4]-[6]. The

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genus *Troglohyphantes* was created in 1882 by Joseph as a cave spider from Carniola in western Slovenia. The members of this genus inhabited cave environment and neighbouring habitat and some species of them are true troglobites [7] [8]. Although this genus is represented by 129 species in Palearctic region [9], there are only three species known from Turkey, *Troglohyphantes gladius* Wunderlich, 1995, *Troglohyphantes pisidicus* Brignoli, 1971, *Troglohyphantes karolianus* Topçu, Türkeş & Seyyar, 2008 [6] [10] [11]. In this study, we described a new species from Turkey.

2. Materials and Methods

The specimen was collected by hand from Buzluk cave in Bilecik province and preserved in 90% ethanol. All drawing were made by using SZX-16 Olympus stereomicroscope with a camera lucida, photographs of the distinguishing features were take by means of Olympus DP-25 stereocamera. All measurements are in millimetres and were taken with a millimetric ocular lens.

3. Results

Troglohyphantes turcicus sp. n.

Material: ♂ (NUAM), Turkey: Bilecik province, Camiliyayla village, Başhöyük, Buzluk cave, 39°48'N, 29°46'E, 1470 m., 13.IX.2011, (leg. A. Topçu & O. Seyyar), 1 ♂ holotype, 3 ♀ paratype (Figures 1-4).

Diagnosis: *Troglohyphantes turcicus* sp. n. belongs to the *polyophthalmus* group (Fage's group IV) (Deeleman-Reinhold, 1978) which has proximo-mesal part of cymbium consists of an upper and a lower protrusion,



Figure 1. *Troglohyphantes turcicus* sp. n. general view of female.



Figure 2. *Troglohyphantes turcicus* sp. n. general view of male.



Figure 3. *Troglolyphantes turcicus* sp. n. Cymbium.



Figure 4. *Troglolyphantes turcicus* sp. n. Cymbium.

apophysis or ridge, separated by a depression. Paracymbium with pocket (**Figure 5**). Radix with a distinct triangular sclerite on the ventral border, surface rough with hairs or papillae. Chelicera, including eliminating a large tooth, having three teeth (**Figure 6**).

Embolus with a dorsal bulge, bearing an apophysis, tip claw-like in most species. External branch of lamella clearly longer than internal branch, usually separated by an unsclerotized zone (**Figure 7**, **Figure 8**). Epigyne with a well developed scape, the length and wide of median plaque almost equal, not much wider than long on longer than wide, lateral plates with posterior lobes. Fertilization ducts not sclerotized (**Figure 9**, **Figure 10**).

Troglolyphantes turcicus sp. n. similar to *gamsi* and *kordunlikanus*, but upper apophysis of the proximal-mesal and median part of cymbium protrusion (in lateral and dorsal aspect). Tip of embolus not claw, proximal of paracymbium indent to cymbium at the upper and middle part. Median apophysis more slope. The median part of epigyne exactly circle-shape and quite near to scape which part bent upward. In the vulvae, spermatecha bent to reverse of clock.

Etymology: The new species is named in honour of the country, Turkey.

Description: Holotype ♂, total length 3.00; cephalothorax 1.00 length, 1.20 wide, pale yellow, chelicera 1.10 length, 0.30 wide, yellow; sternum 0.85 length, 0.75 wide yellowish green, mandibula 0.45 length, 0.25 wide; opisthosoma 1.60 length, 1.10 wide pale brown, legs yellow.

Paratype ♀, total length 3.50; cephalothorax 1.50 length, 1.25 wide, pale yellow, chelicera 1.20 length, 0.35 wide, yellow; sternum 0.90 length, 0.75 wide yellowish green, mandibula 0.30 length, 0.25 wide; opisthosoma 2.25 length, 1.10 wide brown with median more light, legs yellow.

Spination of male legs; femur (3d, 1rl/4d, 1rl/2d, 2rl/3d); tibia (?/2rl, 7v/1d, 1rl, 5v/2d, 1rl, 5v); metatarsus (?/0/1d/1d/1rl).

Leg measurements of *Troglolyphantes turcicus* sp. n. is given (♂ and ♀) in **Table 1**.

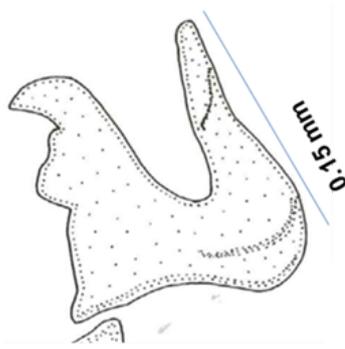


Figure 5. *Troglolyphantes turcicus* sp. n. paracymbium.



Figure 6. *Troglolyphantes turcicus* sp. n. Chelicerae.

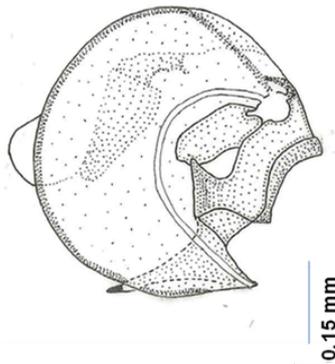


Figure 7. *Troglolyphantes turcicus* sp. n. Radix + embolus.

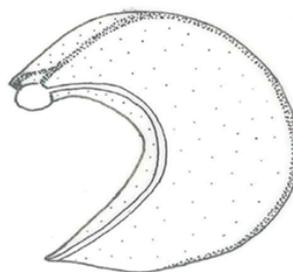


Figure 8. *Troglolyphantes turcicus* sp. n. Embolus.

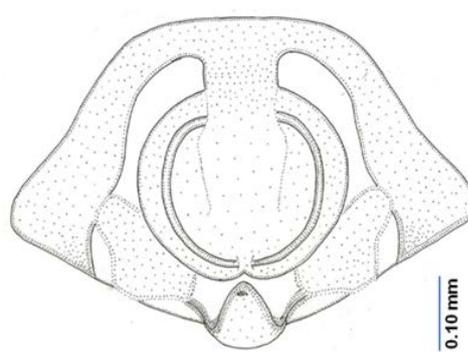


Figure 9. *Troglohyphantes turcicus* sp. n. epigyne of female.

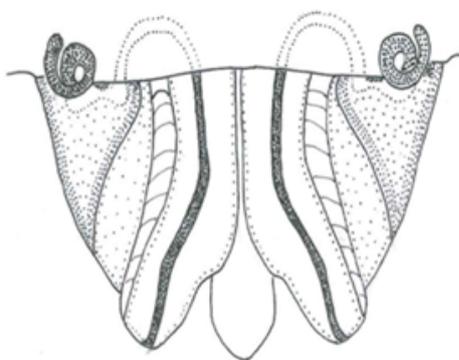


Figure 10. *Troglohyphantes turcicus* sp. n. vulvae of female.

Identification key for the *Troglohyphantes* species belongs to the *polyophthalmus* group

- | | | |
|----|--|---------------------------------------|
| 1a | All femora without dorsal spines | <i>inermis</i> |
| 1b | At least femora I-III with 1 dorsal spine | 2 |
| 2a | Tibia I and II with ventral spines; all tibiae with lateral spines. Anterior metatarsi with 1 or more lateral spines | <i>gamsi</i> |
| 2b | Tibia I and II without ventral spines | 3 |
| 3a | Tibia IV with lateral spines. Eyes reduced | <i>polyophthalmus, scientificus</i> |
| 3b | Tibia IV without lateral spines | 4 |
| 4a | Anterior metatarsi with 1 or more lateral spines | <i>karawankorum, typhlonetiformis</i> |
| 4b | No lateral spines on the metatarsi, only dorsal spines. Tibia I with 1 prolateral and 1 retrolateral spine. Upper apophysis of the proximo-mesal part of cymbium tilted up (in lateral aspect). External branch of lamella with two large teeth proximal to the U and none on the distal arm. Epigyne with posterior lobes of lateral plates rounded, posterior plate concave | <i>kordunlikanus</i> |
| 4c | No lateral spines on the metatarsi, only dorsal and retrolateral spines. Upper apophysis of the proximo-mesal and median part of cymbium protrusion (in lateral and dorsal aspect). External branch of lamella clearly longer than internal branch, usually separated by an unsclerotized zone. Epigyne with a well developed scape, not much wider than long on longer than wide, lateral plates with posterior lobes | <i>turcicus</i> |

As a result of the study a new species of *Troglohyphantes* Joseph 1881 is described from Turkey. Differences between the new species and related species are discussed. This species differs from other species by Upper apophysis of the proximo-mesal and median part of cymbium protrusion (in lateral and dorsal aspect) and epi-

Table 1. Leg measurements in mm of the ♂ and ♀ from *Troglohyphantes turcicus* sp. n.

| ♂ | I | II | III | IV |
|------------|------|------|------|------|
| Coxa | 0.40 | 0.50 | 0.60 | 0.40 |
| Femur | 2.00 | 1.85 | 1.60 | 2.20 |
| Patella | 0.35 | 0.45 | 0.35 | 0.45 |
| Tibia | ? | 1.70 | 1.30 | 1.95 |
| Metatarsus | ? | 1.60 | 1.20 | 1.95 |
| Tarsus | ? | 1.05 | 1.05 | 1.05 |
| Total | 2.75 | 7.15 | 6.10 | 8.00 |
| ♀ | I | II | III | IV |
| Coxa | 0.55 | 0.40 | 0.55 | 0.60 |
| Femur | 1.60 | 1.95 | 1.50 | 2.00 |
| Patella | 0.55 | ? | 0.20 | 0.30 |
| Tibia | 2.00 | ? | 0.95 | 1.65 |
| Metatarsus | 1.55 | ? | 1.25 | 1.85 |
| Tarsus | 1.00 | ? | 0.80 | ? |
| Total | 7.20 | 2.35 | 5.25 | 6.40 |

gyne with a well developed scape, not much wider than long on longer than wide, lateral plates with posterior lobes.

Acknowledgements

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Abbreviations

Leg measurements:

cx: coxa;

fm: femur;

pt: patella;

tb: tibia;

mt: metatarsus;

ta: tarsus.

Spination of male legs:

d: dorsal;

rl: retrolateral;

v: ventral.

Eye measurement:

pm: posterior median;

pl: posterior lateral;

am: anterior median.

NUAM: Arachnology Museum of the Niğde University.