

## A new genus of Oecobiinae (Araneae: Oecobiidae) from Iran and Central Asia

Alireza Zamani <sup>a</sup>, Yuri M. Marusik <sup>b,c,d</sup> and Alexander A. Fomichev <sup>d,e</sup>

<sup>a</sup>Zoological Museum, Biodiversity Unit, University of Turku, Turku, Finland; <sup>b</sup>Department of Zoology & Entomology, University of the Free State, Bloemfontein, South Africa; <sup>c</sup>Department of Biocenology, Institute for Biological Problems of the North FEB RAS, Magadan, Russia; <sup>d</sup>Department of Zoology and Physiology, Altai State University, Barnaul, Russia; <sup>e</sup>Department of Invertebrate Zoology, Tomsk State University, Tomsk, Russia

### ABSTRACT

A new genus, *Turanobius* **gen. n.** (Araneae: Oecobiidae: Oecobiinae), is described from Iran and Central Asia, comprising the following four species: *T. ferdowsii* (Mirshamsi, Zamani and Marusik, 2017) **comb. n.** (♂; Iran, Kazakhstan), *T. hissaricus* **sp. n.** (♂; Tajikistan), *T. leptonychus* **sp. n.** (♂♀; Tajikistan), and *T. tadzhikus* (Andreeva and Tyshchenko, 1969) **comb. n.** (♂♀; Tajikistan); both new combinations are ex. *Oecobius* Lucas, 1846. Known distribution records of all four species are mapped. Additionally, a discussion is presented on the taxonomy of *Oecobius* and the potential revalidation of several genera currently considered synonymous with it.

<http://www.zoobank.org/urn:lsid:zoobank.org:pub:82D1AB7B-551C-4F78-B344-01A26075505C>

### ARTICLE HISTORY

Received 20 December 2023  
Accepted 15 May 2024

### KEYWORDS

Kazakhstan; new combination; new species; Tajikistan; taxonomy; wall spiders

## Introduction

The spider family Oecobiidae Blackwall, 1862 is currently represented by 125 extant species in six genera and three subfamilies: *Oecobius* Lucas, 1846, *Paroecobius* Lamoral, 1981 and *Platoecobius* Chamberlin and Ivie, 1935 constitute the cribellate subfamily Oecobiinae Blackwall, 1862; *Urocteana* Roewer, 1961 and *Uroecobius* Kullmann and Zimmermann, 1976 comprise the ecribellate subfamily Uroecobiinae Kullmann and Zimmermann, 1976; and *Uroctea* Dufour, 1820 is the sole representative of the ecribellate subfamily Urocteinae Thorell, 1869 (Jocqué and Dippenaar-Schoeman 2006; WSC 2023). Members of the family can be found almost globally (although they are not present in the north Holarctic), and many of them are commonly found in and around human dwellings; a few species have managed to establish populations in areas outside of their natural ranges as a result of human-mediated introduction (eg Shear 1970; Henrard *et al.* 2014; Nakayama *et al.* 2016). However, Oecobiidae remains poorly studied in many regions, including Central Asia, from where only five species have been reported so far: *Oecobius ferdowsii* Mirshamsi, Zamani and Marusik, 2017, *O. nadiae* (Spassky, 1936), *O. przewalskyi* Hu and Li, 1987, *O. tadzhikus* Andreeva and Tyshchenko, 1969 and *Uroctea grossa* Roewer,

**CONTACT** Alireza Zamani  [zamani.alireza5@gmail.com](mailto:zamani.alireza5@gmail.com)

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1960 (Marusik *et al.* 2015; Fomichev 2022). In their redescription of *O. tadjikus* – a species known reliably only from Tajikistan – Marusik *et al.* (2015) expressed doubt regarding the generic placement of this species, as it possesses several unique features that are not recorded in other species of *Oecobius*, and suggested that it should most likely be classified in a separate genus. The discovery of *O. ferdowsii* – a closely related species described from Iran – provided additional support for this hypothesis (Zamani *et al.* 2017).

Recently, we had the opportunity to examine a series of Iranian and Central Asian oecobiids (including two new species) that possess a similar conformation of the copulatory organs to those of *O. ferdowsii* and *O. tadjikus*. In our opinion, the characters of these four species are sufficiently different from those of *O. cellariorum* (Dugès, 1836) – the type species of *Oecobius* – that designation of a new genus is necessary. In this paper, this new Oecobiinae genus and its two new species are described, new combinations are proposed for the two previously known species, and the distribution records of all four species are mapped. Additionally, the taxonomy of *Oecobius* and the boundaries of its subgroups are briefly discussed.

## Material and methods

Specimens were photographed using a Canon EOS 7D camera attached to an Olympus SZX16 stereomicroscope at the Zoological Museum of the University of Turku, and an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope at the Altai State University. Digital images were montaged using CombineZP and edited using CorelDraw graphic design software. Scanning electron microscopy images were obtained using a Hitachi TM-1000 scanning microscope at the Institute of Systematics and Ecology of Animals, Novosibirsk, Russia. Lengths of leg segments were measured on the dorsal side and are listed as: total length (femur, patella, tibia, metatarsus, tarsus). All measurements are in millimetres.

**Abbreviations: Eyes:** **ALE** – anterior lateral eye, **AME** – anterior median eye, **PLE** – posterior lateral eye, **PME** – posterior median eye. **Spinnerets:** **ALS** – anterior lateral spinneret, **PLS** – posterior lateral spinneret, **PMS** – posterior median spinneret.

**Depositories:** **ISEA** – Institute of Systematics and Ecology of Animals, Novosibirsk, Russia (G.N. Azarkina); **MMUE** – Manchester Museum of the University of Manchester, United Kingdom (D.V. Logunov); **ZISP** – Zoological Institute, St. Petersburg, Russia (A.A. Nekhaeva); **ZMFUM** – Zoological Museum of Ferdowsi University of Mashhad, Mashhad, Iran (O. Mirshamsi); **ZMUT** – Zoological Museum of the University of Turku, Turku, Finland (V. Vahtera).

Family OECOBIIDAE Blackwall, 1862

Subfamily OECOBIINAE Blackwall, 1862

Genus *Turanobius* Zamani, Marusik & Fomichev **gen. n.**

**Type species.** *Oecobius tadjikus* Andreeva and Tyshchenko, 1969.

**Etymology.** A combination of Turan – a historical region in Central Asia – and *Oecobius*; gender masculine.

**Diagnosis.** The males of the new genus differ from those of *Oecobius* sensu stricto by having two anterior loops and one prolateral loop of spermophor (vs one anteroprolateral and no prolateral loop), and bifurcate radix (vs non-bifurcate). The females of the new genus differ from those of *Oecobius* sensu stricto by having a kind of scape, under which the copulatory openings are located (vs no scape).

**Description.** Total length 2.18–2.88 in males, 2.15–3.08 in females. Male palp: bulb longer than wide; spermophor forms two semiround loops in the anterior part: pro- (*Pl*) and retrolateral (*Rl*), and one deep posteroprolateral (*Pp*); radix (*Ra*) with bifurcate tip; terminal apophysis (*Ta*) large and broad; basoprolateral part of tegulum with extension (*Te*) bearing extra loop and anteroprolateral part of radix with extension (*Re*) directed over tegular extension. Epigyne: epigynal plate slightly wider than long, weakly sclerotised; anterior half with rounded curved wrinkles; posterior part with kind of scape (*Sc*), well sclerotised, with copulatory openings located under it; insemination ducts (*Id*) long, almost parallel, well visible through integument; receptacles composed of three parts: oval chamber (*Or*), wide tubular part (*Tr*) and weakly sclerotised sac part (*Sr*); fertilisation chamber (*Fc*) transverse, longer than wide, with thinning in median part, foot-like in posterior view.

**Composition.** Four species: *T. ferdowsii* (Mirshamsi, Zamani and Marusik, 2017) comb. n., *T. hissaricus* sp. n., *T. leptonychus* sp. n., and *T. tadjhikus* (Andreeva and Tyshchenko, 1969) comb. n.

**Distribution.** North-eastern Iran, south-western and southern Kazakhstan, south-western and western Tajikistan; most likely also present in Turkmenistan (see ‘Comments’ under *T. tadjhikus*) (Figures 35, 36).

*Turanobius tadjhikus* (Andreeva and Tyshchenko, 1969) **comb. n.**

(Figures 1, 2, 8–10, 23–28)

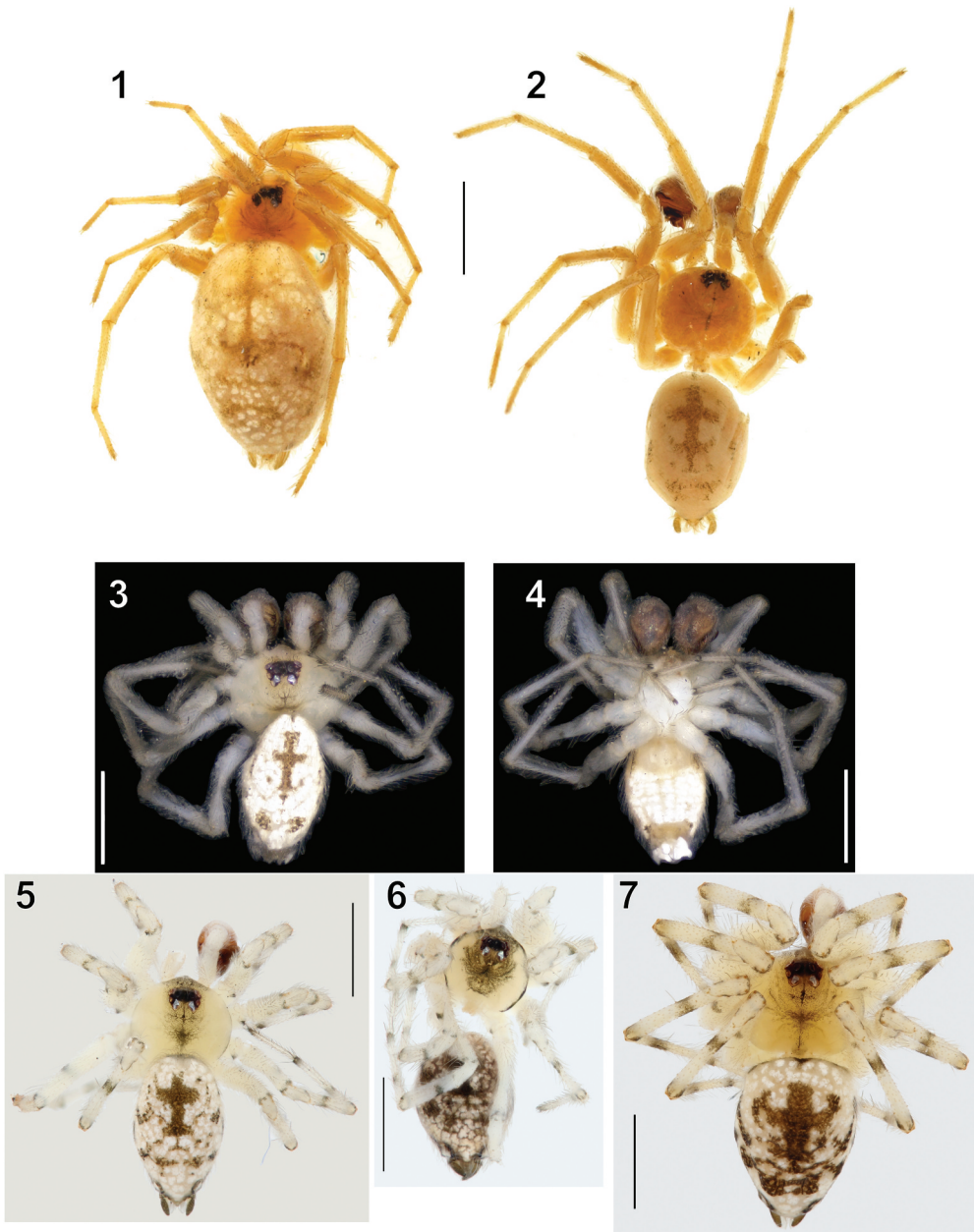
*Oecobius tadjhikus* Andreeva and Tyshchenko, 1969: 376, fig. 3 (♂♀).

*Oecobius tadjhikus*: Andreeva 1976: 22, figs 19–22 (♂♀); Marusik et al. 2015: 198, figs 1–12 (♂♀); Fomichev 2022: 104, fig. 2A–E (♂).

**Type material.** Holotype ♀ (ZISP), TAJIKISTAN: *Khatlon Region*: Chiluchor Chashma, 37.294194°N, 68.039306°E, under stones on slope, 8 May 1965 (E. Martynova). Paratypes: 1♂ 1♀ 3 juv. (ZISP), same data as for the holotype [examined].

**Other material.** TAJIKISTAN: *Khatlon Region*: 1♂ (MMUE), Shaartuz district, Babatag Mt. ridge, 37.075806°N, 68.019611°E, 427 m, under bushes, 20 April 2015 (Y.M. Marusik).

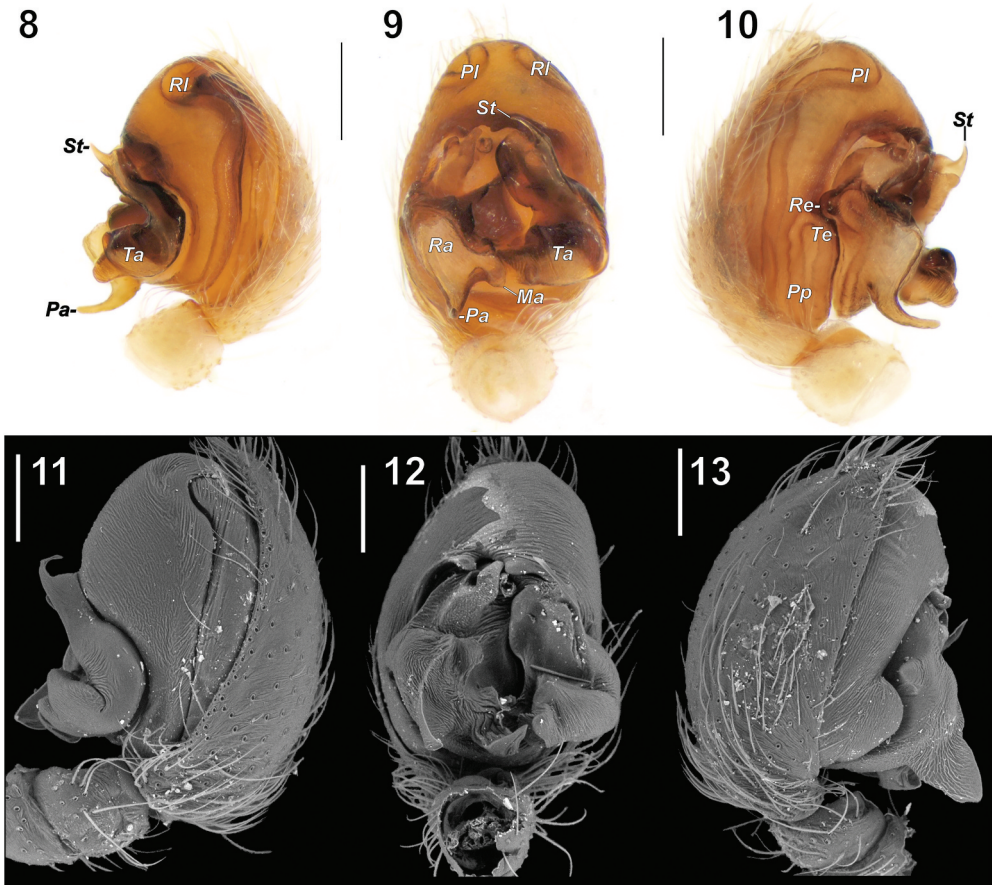
**Diagnosis.** The male of *T. tadjhikus* differs from those of the congeners by the mesal arm of the radix shorter than the thin prolateral one (vs both arms of equal lengths and/or broad), and by having the longest prolateral loop of the spermophor (3 times longer than wide, vs < 3) (see Figures 9, 15, 17, 19 and 10, 20–22). The female of *T. tadjhikus* differs from that of *T. leptonychus* sp. n. by the length/width ratio of the area formed between the insemination ducts (ca. 3, vs 5; see Figures 23, 29).



**Figures 1–7.** General appearance of *Turanobius tadzhikus* comb. n. (1, 2), *T. ferdowsii* comb. n. (3, 4), *T. leptonychus* sp. n. (5, 6) and *T. hissaricus* sp. n. (7). 2–5, 7 – male; 1, 6 – female. 1–3, 5–7 – dorsal; 4 – ventral. 1, 2 and 3, 4 reproduced from Marusik *et al.* (2015) and Fomichev (2022), respectively. Scale bars: 1 mm.

**Description.** See Marusik *et al.* (2015).

**Distribution.** Confidently known only from the south-western part of Khatlon Region in south-western Tajikistan (Andreeva and Tyshchenko 1969; Andreeva 1975, 1976; present



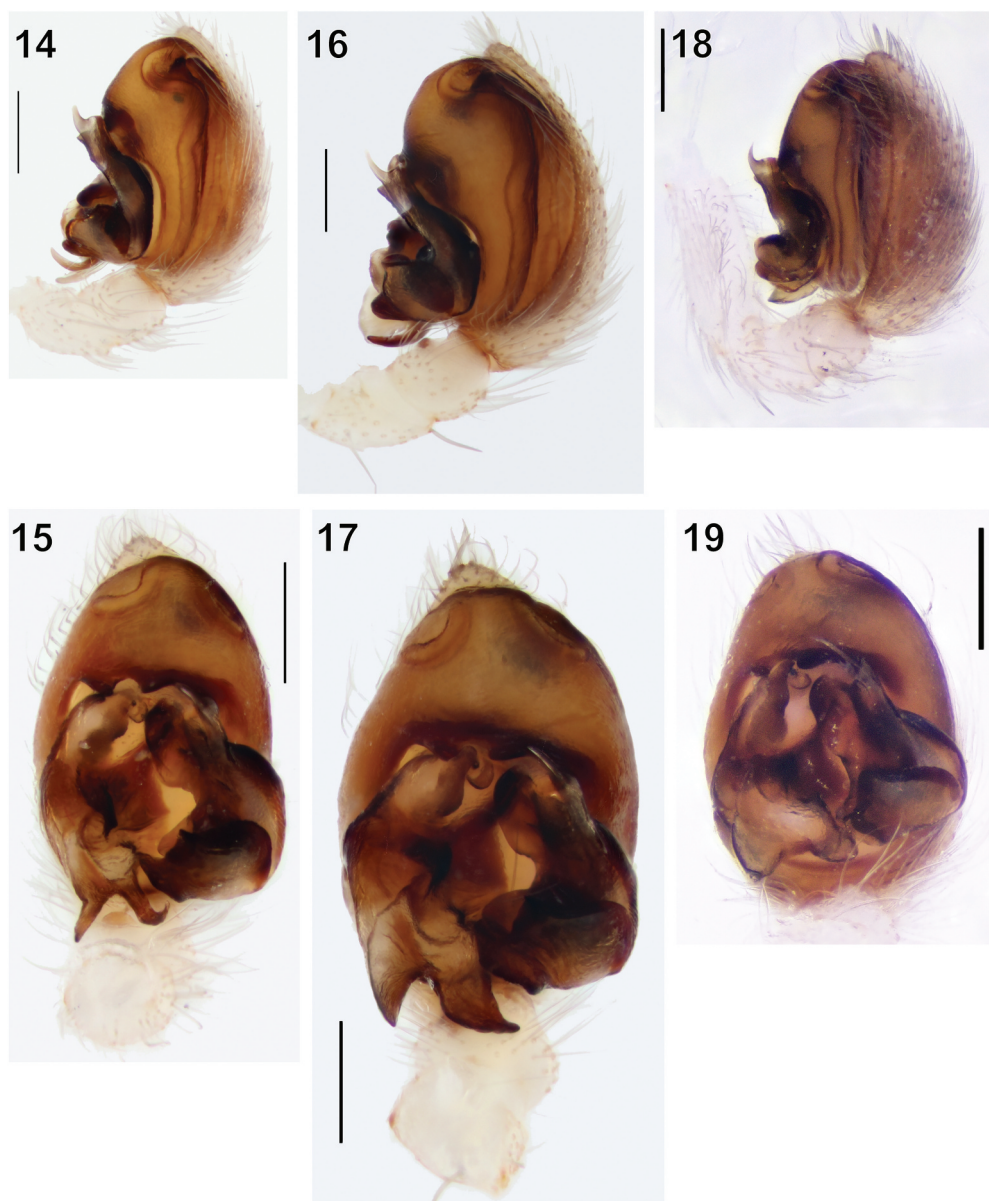
**Figures 8–13.** Male palp of *Turanobius tadzhikus* comb. n. (8–10) and *T. ferdowsii* comb. n. (11–13). 8, 11 – retrolateral; 9, 12 – ventral; 10, 13 – prolateral. Abbreviations: *Ma* – mesal arm of the radix, *Pa* – prolateral arm of the radix, *PI* – prolateral loop of the spermophor, *Pp* – posteroprolateral loop of the spermophor, *Ra* – radix, *Re* – extension of radix, *RI* – retrolateral loop of the spermophor, *St* – subterminal apophysis, *Ta* – terminal apophysis, *Te* – extension of tegulum. 8–10 and 11–13 reproduced from Marusik *et al.* (2015) and Fomichev (2022), respectively. Scale bars: 8–10 = 0.2 mm; 11–13 = 0.15 mm.

material) (Figures 35, 36). In our opinion, the records of this species from Turkmenistan by Mikhailov and Fet (1994) are misidentifications and may belong to *T. ferdowsii* comb. n. (see also Marusik *et al.* 2015; Fomichev 2022). The record from Gandzhina (Tajikistan) by Andreeva (1976) is based on juvenile specimens and is therefore also doubtful; it is possible that these specimens belong to *T. leptonychus* **sp. n.**, which has been collected from a nearby locality (Figure 36).

*Turanobius ferdowsii* (Mirshamsi, Zamani and Marusik, 2017) **comb. n.**  
(Figures 3, 4, 11–13, 18, 19, 2 2)

*Oecobius ferdowsii* Mirshamsi, Zamani and Marusik, in Zamani *et al.* 2017: 333, fig. 2A–D (♂; ♀ mismatched per Zamani and Marusik 2023: 1697).

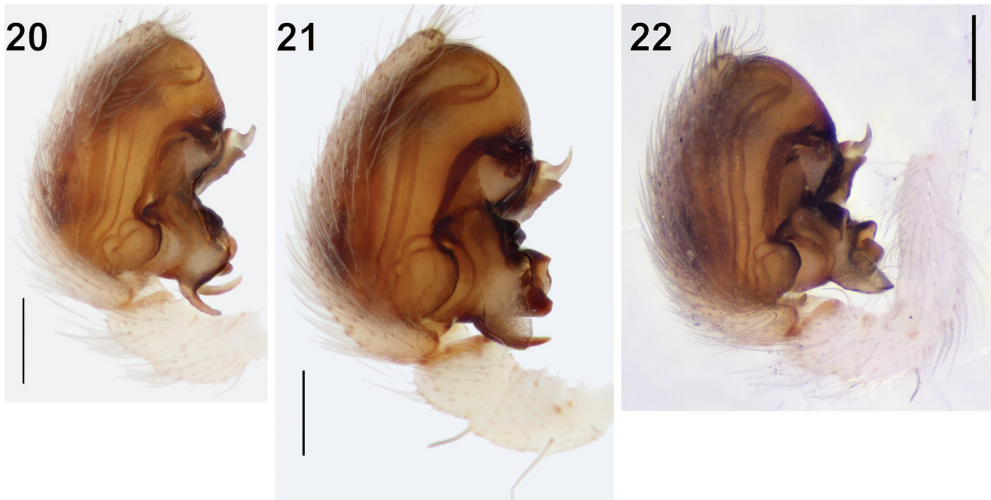
*Oecobius ferdowsii*: Fomichev 2022: 104, fig. 1A–H (♂).



**Figures 14–19.** Male palp of *Turanobius leptonychus* **sp. n.** (14, 15), *T. hissaricus* **sp. n.** (16, 17) and *T. ferdowsii* **comb. n.** (18, 19). 14, 16, 18 – retrolateral; 15, 17, 19 – ventral. 18, 19 reproduced from Fomichev (2022). Scale bars: 0.2 mm.

**Type material.** Holotype ♂ (ZMFUM), IRAN: *Razavi Khorasan Province*: Mashhad, 36.395833°N, 59.388333°E, 20 June 2015 (M. Hatami) [not examined].

**Other material.** KAZAKHSTAN: *Mangystau Region*: 1♂ (ISEA), Ustyurt Plateau, Mamekkazgan Guard Post, near Karazhar Well, 43.407778°N, 54.559444°E, inside building,



**Figures 20–22.** Male palp of *Turanobius leptonychus* **sp. n.** (20), *T. hissaricus* **sp. n.** (21) and *T. ferdowsii* **comb. n.** (22), prolateral. 22 reproduced from Fomichev (2022). Scale bars: 0.2 mm.

80 m, 14 April 2018 (A.A. Fomichev); *Turkistan Region*: 1♂ (ZMUT), near Arys River, 42.323667°N, 69.528417°E, 24 April–5 May 1988 (D.V. Logunov).

**Diagnosis.** The male of *T. ferdowsii* differs from those of the congeners by the arms of radix relatively short, blunt, and of equal size (vs long, pointed, of different sizes) (see Figures 9, 15, 17, 19).

**Description.** For male, see Zamani *et al.* (2017) and Fomichev (2022). The female is currently unknown (see ‘Comments’).

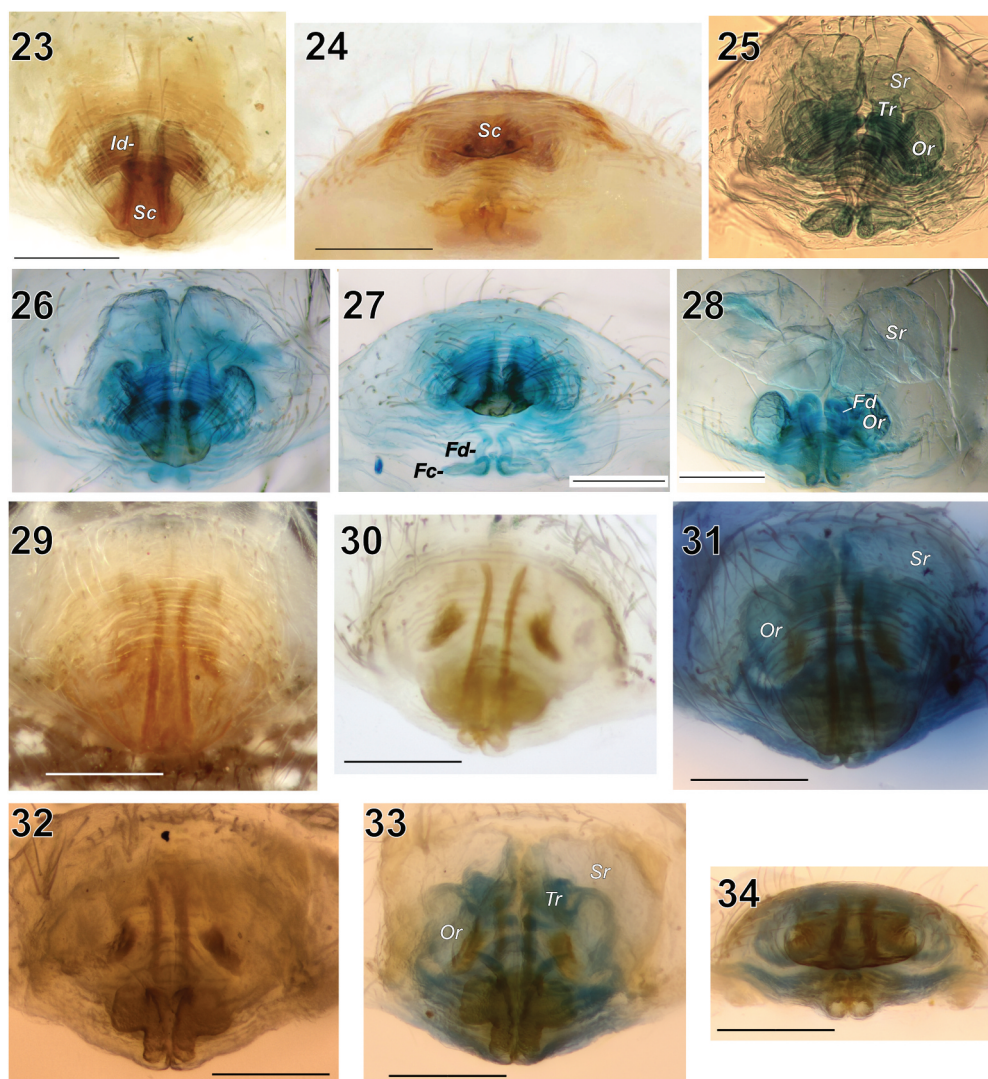
**Comments.** Zamani and Marusik (2023) found that the females described and listed as belonging to this species by Zamani *et al.* (2017) were mismatched. These specimens were described as a separate species, *Oecobius melanocephalus* Zamani and Marusik, 2023. Following this, the specimen illustrated in fig. 3A of Zamani and Bosselaers (2020) belongs to *O. melanocephalus*.

**Distribution.** Known from Razavi Khorasan Province in north-eastern Iran and Mangystau and Turkistan regions in south-western and southern Kazakhstan (Zamani *et al.* 2017; Fomichev 2022; present study). It is possible that the doubtful records of *T. tadjikus* from Turkmenistan (Mikhailov and Fet 1994) belong to this species (Figure 35).

*Turanobius leptonychus* Zamani, Marusik & Fomichev **sp. n.**

(Figures 5, 6, 14, 15, 20, 29–34)

**Type material.** Holotype ♂ (ZMMU), *TAJIKISTAN: Khatlon Region*: env. of Khuruson, 38.179056°N, 68.661694°E, clay cliff, 724 m, 3 May 2015 (Y.M. Marusik). Paratypes: 8♂1♀ (ZMMU), same data as for the holotype; 1♂ (MMUE), *TAJIKISTAN: Khatlon Region*: deep



**Figures 23–34.** Epigyne of *Turanobius tadzhikus* comb. n. (23–28) and *T. leptonychus* sp. n. (29–34). 23, 29 – intact, ventral; 24 – intact, posterior; 25, 28, 32, 33 – macerated, dorsal; 26, 30, 31 – macerated, ventral; 27, 34 – macerated, posterior. Abbreviations: *Fc* – fertilisation chamber, *Fd* – fertilisation duct, *Id* – insemination duct, *Or* – oval chamber of the receptacle, *Sc* – scape, *Sr* – sack-like chamber of the receptacle, *Tr* – tubular part of the receptacle. 23–28 reproduced from Marusik *et al.* (2015). Scale bars: 0.2 mm.

clay canyon on road from Pyandzh Town to Pyandzh Karatau Mt. ridge, 37.298611°N, 69.159194°E, 430 m, 4 May 2015 (Y.M. Marusik).

**Etymology.** The specific epithet is a combination of the Greek terms *lepto-* (meaning ‘thin’) and *-onychus* (meaning ‘clawed’), referring to the shape of the extension of terminal apophysis of the male palp.



**Figures 35–36.** Distribution records of the species of *Turanobius* gen. n. Square – *T. tadzhikus* comb. n.; diamond – *T. ferdowsii* comb. n.; inverted triangle – *T. leptonychus* sp. n.; triangle – *T. hissaricus* sp. n.; ? – doubtful records. The square box in Figure 35 encloses the area of Figure 36.

**Diagnosis.** The male of this species differs from the congeners by having thin and sharply pointed radical arms which are equal in length (see [Figures 9, 15, 17, 19](#)). The female of *T. leptonychus* sp. n. can be distinguished from that of *T. tadzhikus* by the length/width ratio of the area formed between the insemination ducts (ca. 5, vs 3; see [Figures 29, 23](#)).

**Description.** Male (holotype). Habitus as in [Figure 5](#). Total length 2.37. Carapace 0.95 long, 1.03 wide. AME 0.08, ALE 0.10, PME 0.11, PLE 0.06. Carapace, sternum, chelicerae, labium and maxillae light yellowish beige; carapace with dark markings medially; sternum with dark greyish marginal bands. Legs coloured as carapace, with distinct dark greyish annulations. Abdomen dorsally mottled with white guanine spots and dark brown median pattern and scattered patches, ventrally light beige with black markings medially and posteriorly. ALS and PLS dark greyish dorsally and pale beige ventrally, PMS uniformly pale beige. Measurements of legs: I: 3.49 (0.95, 0.34, 0.74, 0.78, 0.68), II: 3.49 (0.96, 0.35, 0.77, 0.79, 0.62), III: 3.60 (0.99, 0.37, 0.83, 0.86, 0.55), IV: 3.99 (1.08, 0.39, 0.89, 0.98, 0.65).

Palp as in [Figures 14, 15, 20](#); prolateral loop (*Pl*) short, ca. 1.5 times longer than wide; radical arms thin finger-like, several times longer than wide, subequal in length.

Female. Habitus as in [Figure 6](#). Total length 2.15. Carapace 0.85 long, 0.90 wide. AME 0.10, ALE 0.11, PME 0.08, PLE 0.06. Colouration as in male, dark markings more prominent. Measurements of legs: I: 3.02 (0.84, 0.38, 0.61, 0.67, 0.52), II: 3.23 (0.96, 0.33, 0.66, 0.66, 0.62), III: 3.18 (0.91, 0.33, 0.70, 0.74, 0.50), IV: 3.57 (1.06, 0.33, 0.77, 0.85, 0.56).

Epigyne as in [Figures 29–34](#); epigynal plate ca. 1.25 times wider than long; anterior half with roundly curved transversal wrinkles; insemination ducts visible through integument, long, parallel; length/width ratio of rectangular area formed between insemination ducts ca. 5; ‘scape’ in macerated epigyne ([Figures 30–34](#)) somewhat T-shaped; sac parts of receptacles large, rounded, and contiguous ([Figures 32, 33](#)).

**Distribution.** Known only from the listed localities in Khatlon Region, south-western Tajikistan ([Figures 35, 36](#)).

*Turanobius hissaricus* sp. n.

(Figures 7, 16, 17, 21)

**Type material.** Holotype ♂ (ZMMU), TAJIKISTAN: *Region of Republican Subordination: Hissar Mts., Romit State Nature Reserve, 1.5 km W of Soni Vill., 38.833333°N, 69.433333°E, 1750 m, 5 July 2019 (S.L. Zonstein).*

**Etymology.** The specific epithet refers to the type locality of the new species in the Hissar mountain range.

**Diagnosis.** The male of the new species differs from those of the congeners by the arms of radix wide and sharply pointed, with the mesal one longer than the prolateral one (vs arms thin, or blunt, or equal in size, or mesal one shorter; see Figures 9, 15, 17, 19).

**Description.** Male. Habitus as in Figure 7. Total length 2.88. Carapace 1.05 long, 1.30 wide. AME 0.10, ALE 0.11, PME 0.11, PLE 0.07. Carapace, sternum, chelicerae, labium and maxillae light yellowish beige; carapace with faint dark markings medially. Legs coloured like carapace, with distinct dark greyish annulations. Abdomen dorsally mottled with white guanine spots and dark brown median pattern and scattered patches and stripes, ventrally light beige with black markings posterolaterally. ALS and PLS dark greyish dorsally and pale beige ventrally, PMS uniformly pale beige. Measurements of legs: I: 4.46 (1.25, 0.43, 0.97, 0.98, 0.83), II: 4.63 (1.26, 0.46, 0.98, 1.09, 0.84), III: 4.90 (1.30, 0.43, 1.08, 1.22, 0.87), IV: 4.90 (1.39, 0.34, 1.16, 1.19, 0.82).

Palp as in Figures 16, 17, 21; radix with broad wide finger-like arms of almost same length; prolateral loop of spermophor ca. 1.67 times longer than wide.

Female. Unknown.

**Distribution.** Known only from the type locality in Romit State Nature Reserve, western Tajikistan (Figures 35, 36).

## Discussion

In this paper, a new genus of Oecobiidae comprising four species (including two newly described ones) was described. The range of the genus spans from north-eastern Iran to south-western Kazakhstan in the north and extends to south-western Tajikistan in the east. Given the limited geographical distribution of most of the species treated in this paper, we believe that the records of *T. tadhikus* from Turkmenistan (Mikhailov and Fet 1994) are likely due to misidentifications. It is more plausible that these records either pertain to *T. ferdowsii* or represent an entirely new species. Furthermore, the probability of discovering additional species or records of this genus in Uzbekistan and northern Afghanistan is quite high.

*Oecobius* currently comprises a large number of species that, despite being rather uniform in general appearance, can clearly be classified within several groups based on the conformation of their copulatory organs. The genus currently has seven generic synonyms, one of which (*Omanus* Thorell, 1869) is not mentioned in the World Spider Catalog (WSC 2023). Two of these synonyms, *Phanerecobius* Kishida, 1943 and *Tiroecobius* Kishida, 1947, are generic

nomina nuda (Ono 2009; Santos *et al.* 2009). Amongst the remaining five genera, the synonymy of *Ambika* Lehtinen, 1967 is well justified, as its type species, *O. putus* O. Pickard-Cambridge, 1876, has a similar conformation of the copulatory organs to those of *O. cellariorum*, the type species of *Oecobius* (Shear 1970).

The synonymy of three remaining genera should be reinvestigated. Shear and Benoit (1974) synonymised *Maitreja* Lehtinen, 1967, primarily on the basis of the probable synonymy of its type species, *O. marathaus* Tikader, 1962, with *O. cellariorum*. This was a reasonable assumption, as at the time of the publication of Shear and Benoit (1974) the copulatory organs of *O. marathaus* were known only from a very schematic drawing of the epigyne in the original description by Tikader (1962). Since then, however, this species has been well illustrated in nine publications (WSC 2023). It is now evident that this species clearly displays a different conformation of the copulatory organs from those of *O. cellariorum*, and can be considered within the same group as *O. amboseli* Shear and Benoit, 1974 and perhaps *O. affinis* O. Pickard-Cambridge, 1872 and *O. cambridgei* Wunderlich, 1995.

The synonymy of *Thalamia* Hentz, 1850 (type *Thalamia parietalis* Hentz, 1850 = *Oecobius navus* Blackwall, 1859) by Shear (1970) is also problematic: not only does *O. navus* have a different conformation of the copulatory organs than that of *O. cellariorum*, it can clearly be considered to fall within a large group of similar species, including those endemic to the Canary Islands (Wunderlich 1987, 1992, 1995, 2011). *Omanus* (type *O. navus* Blackwall, 1859) is another generic synonym of *Oecobius*, and the type of Omanoidae Thorell, 1869, a synonym of Oecobiidae (Thorell 1869; Lehtinen 1967). The synonymy of neither the genus nor the family is mentioned in WSC (2023). Should *Thalamia* be revalidated, *Omanus* would unquestionably fall into its junior synonymy.

The synonymy of *Tarapaca* Lehtinen, 1967 (type *Oecobius nieborowskii* Kulczyński, 1909) should also be reinvestigated, as its type species is distributed outside of the natural range of *Oecobius* *sensu stricto*.

In our opinion, the natural range of *Oecobius* *sensu stricto* includes Africa, Mediterranean Basin, Caucasus, and the Middle East to India. Considering the similarities in the conformation of their copulatory organs, the following species can tentatively be considered as members of *Oecobius* *sensu stricto*: *O. albipunctatus* O. Pickard-Cambridge, 1872; *O. alhoutyae* Wunderlich, 1995; *O. cellariorum*; *O. fahimii* Zamani and Marusik, 2018; *O. ilamensis* Zamani, Mirshamsi and Marusik, 2017; *O. melanocephalus*; *O. pasargadae* Zamani and Marusik, 2023; *O. pasteuri* Berland and Millot, 1940; *O. putus*; *O. rhodiensis* Kritscher, 1966; *O. teliger* O. Pickard-Cambridge, 1872; *O. templi* O. Pickard-Cambridge, 1876; *O. trimaculatus* O. Pickard-Cambridge, 1872; *O. zagros* Zamani and Marusik, 2023. We posit that the remaining species presently considered in *Oecobius* may be more appropriately classified within other genera. This paper represents the initial phase of a comprehensive effort aimed at refining the classification of Oecobiinae. The proper delineation of these putative groups will be defined through a comprehensive taxonomic revision of the generic classification in this subfamily, a process currently underway.

## Acknowledgements

YMM is grateful to Ilari Eerikki Säcksjärvi and Seppo Koponen for arranging his stay in Turku. We thank Mikhail Omelko (Vladivostok, Russia) and another, anonymous reviewer for their comments on the manuscript.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

The research of Alireza Zamani was supported by a grant from the Turku University Foundation [ID 081820].

## ORCID

Alireza Zamani  <http://orcid.org/0000-0002-8084-9666>

Yuri M. Marusik  <http://orcid.org/0000-0002-4499-5148>

Alexander A. Fomichev  <http://orcid.org/0000-0001-9268-622X>

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