

## Taxonomic notes on the genus *Turkozelo* Kovblyuk et Seyyar, 2009 (Aranei: Gnaphosidae)

## Таксономические заметки о роде *Turkozelo* Kovblyuk et Seyyar, 2009 (Aranei: Gnaphosidae)

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KEY WORDS: Araneae, new synonym, new combinations, spiders, south of Russia, Azerbaijan, Kazakhstan.

КЛЮЧЕВЫЕ СЛОВА: Araneae, новый синоним, новые комбинации, пауки, юг России, Азербайджан, Казахстан.

ABSTRACT. New data on the taxonomy of the genus *Turkozelo* Kovblyuk et Seyyar, 2009, including a synopsis and distribution map of all the known species, are provided. *Turkozelo mirandus* Ponomarev, 2011, syn.n. is synonymized with *Zelotes kazachstanicus* Ponomarev et Tsvetkov, 2006. Two new combinations are proposed: *Turkozelo kazachstanicus* (Ponomarev et Tsvetkov, 2006) comb.n., ex *Zelotes*; and *Turkozelo adullam* (Levy, 2009) comb.n., ex *Drassyllus*.

How to cite this paper: Ponomarev A.V., Mikhailov K.G., Shmatko V.Yu. 2021. Taxonomic remarks on the genus *Turkozelo* Kovblyuk et Seyyar, 2009 (Aranei: Gnaphosidae) // *Arthropoda Selecta*. Vol.30. No.1. P.113–118. doi: 10.15298/arthsel.30.1.10

РЕЗЮМЕ. Приведены новые данные по таксономии рода *Turkozelo* Kovblyuk et Seyyar, 2009, в том числе синопсис и карта распространения всех известных видов рода. *Turkozelo mirandus* Ponomarev, 2011, syn.n. синонимизирован с *Zelotes kazachstanicus* Ponomarev et Tsvetkov, 2006. Предложены две новые комбинации: *Turkozelo kazachstanicus* (Ponomarev et Tsvetkov, 2006), comb.n., ex *Zelotes*; и *Turkozelo adullam* (Levy, 2009), comb.n., ex *Drassyllus*.

### Introduction

The gnaphosid spider genus *Turkozelo* Kovblyuk et Seyyar, 2009, initially monotypic, was established for *T. microb* Kovblyuk et Seyyar 2009 from Turkey [Kovblyuk et al., 2009]. Later, *T. mirandus*

Ponomarev in Ponomarev et Dvadenko, 2011 was described from two males and three females from the south-eastern part of Rostov Area [Ponomarev, Dvadenko, 2011]. The species *Setaphis mcowani* Chatzaki et Russell-Smith, 2017 was described from a single female from Cyprus [Chatzaki, Russell-Smith, 2017]. Recently, based on examination of a series of both sexes from Greece, the latter species was transferred to *Turkozelo* [Chatzaki, 2018]. Two more species of this genus were described from both sexes: viz., *T. attavirus* Chatzaki, 2019 from Rhodos Island [Chatzaki, Van Keer, 2019], and *T. noname* Mazzia et Cornic, 2020 from south-eastern France [Mazzia, Cornic, 2020].

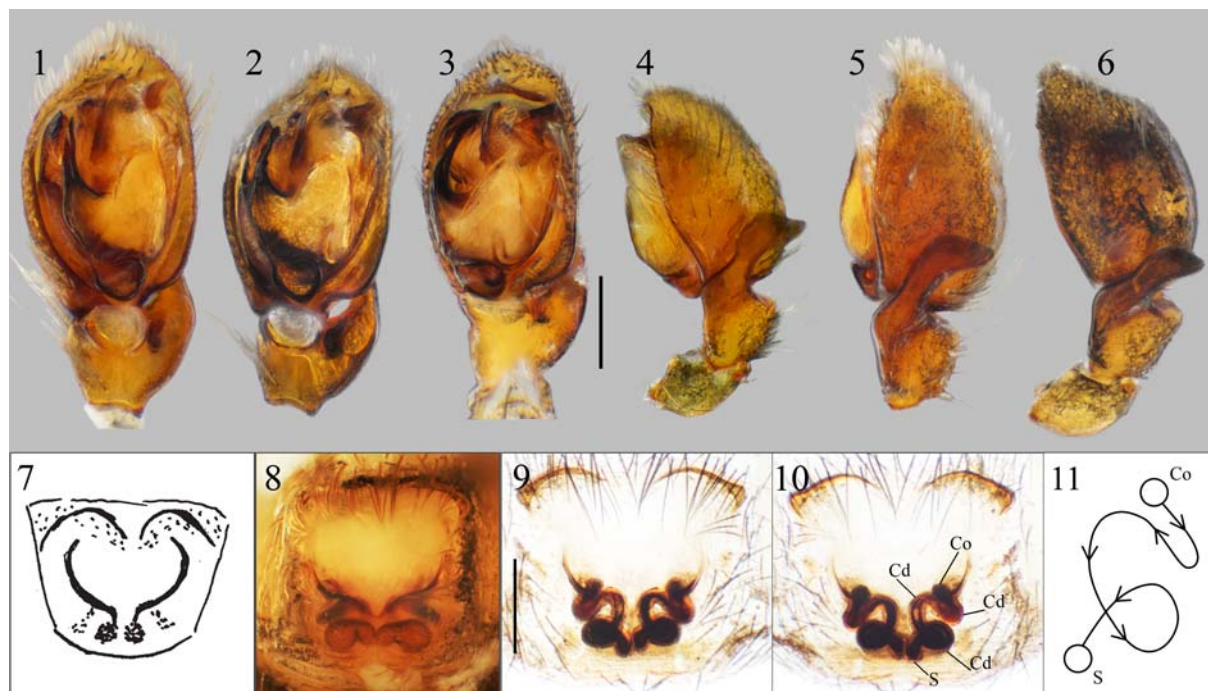
*Zelotes kazachstanicus* Ponomarev et Tsvetkov, 2006 was described from a single female from west Kazakhstan [Ponomarev, Tsvetkov, 2006]. A comparison of the type and additional materials on *Z. kazachstanicus* and *T. mirandus* has shown their identity.

*Drassyllus adullam* Levy, 2009 described from a single male from Israel [Levy, 2009] is shown to possess all the typical generic characters of *Turkozelo* and hence is to be transferred to it (see below).

In this paper, we aim to establish a new synonymy in *Turkozelo*, to propose two new combinations, to provide a synopsis of all the known *Turkozelo* species, and to map their distribution.

### Material and methods

The studied material is deposited in the Zoological Museum of the Moscow State University (ZMMU, curator: K.G. Mikhailov) and A.V. Ponomarev's personal collection (PC). Digital photographs were produced by using a camera SONY NEX-C3 attached to a MIKMED-6 optical micro-



Figs 1–11. Copulatory organs of *Turkozelotes kazachstanicus* (Ponomarev et Tsvetkov, 2006) comb.n. 1, 5, 8 — paratypes of *T. mirandus*; 7 — holotype of *T. kazachstanicus* (after Ponomarev & Tsvetkov [2006]); 2, 4 — Rostov Area; 3, 6 — Nakhichevan Republic; 9, 10 — Kustanay Area Kazakhstan: male palp ventral view (1–3) and lateral view (4–6); epigyne ventral view (7, 8); vulva, ventral (9) and dorsal views (10); schematic graph of the left copulatory duct (11). Scale: 1–6 — 0.25 mm; 7–10 — 0.2 mm. Cd — copulatory duct; Co — copulatory opening; S — spermatheca.

Рис. 1–11. Копулятивные органы *Turkozelotes kazachstanicus* (Ponomarev et Tsvetkov, 2006) comb.n. 1, 5, 8 — паратипы *T. mirandus*; 7 — голотип *T. kazachstanicus* (по: Пономарёв, Цветков, 2006); 2, 4 — Ростовская обл.; 3, 6 — Нахичеванская республика; 9, 10 — Кустанайская обл., Казахстан: пальпа самца вентрально (1–3) и латерально (4–6); эпигина вентрально (7, 8); вульва вентрально (9) и дорсально (10); схематическое изображение левого копулятивного протока (11). Масштаб: 1–6 — 0,25 мм; 7–10 — 0,2 мм. Cd — копулятивный проток; Co — копулятивное отверстие; S — сперматека.

scope at the Southern Scientific Centre of the Russian Academy of Sciences (Rostov-on-Don, Russia). The map is produced by using the online resource OpenStreetMap®, containing free data that are distributed by the OpenStreetMap Foundation (OSMF) via the Open Data Commons Open Database License (ODbL).

The terminology of the *Turkozelotes* male palp morphology follows Chatzaki [2018]. The following abbreviations are used in the figure plates: E — embolus; EmbB — embolar base; MA — median apophysis; TA — terminal apophysis; Tm — terminal membrane; p — embolar process; Cd — copulatory duct; Co — copulatory opening; S — spermatheca.

## Taxonomic part

### *Turkozelotes* Kovblyuk et Seyyar in Kovblyuk, Seyyar, Demir et Topçu, 2009

Type species *Turkozelotes microb* Kovblyuk et Seyyar, 2009, by monotypy.

DIAGNOSIS. See Kovblyuk et al. [2009] and Chatzaki [2018]. It should be noted that Chatzaki [2018] indicated the multipartite spermathecae to be a diagnostic character of *Turkozelotes*. However, according to our data (Figs 10, 11) and those of Mazzia & Cornic [2020: 39, figs 4A,C], the spermathecae of at least in two species (viz., *T. kazachstani-*

*cus* and *T. noname*) are unipartite.

COMPOSITION. Six species are included (Table): *T. adullam* (Levi, 2009), comb.n., *T. attavirus* Chatzaki, 2019, *T. kazachstanicus* (Ponomarev et Tsvetkov, 2006), comb.n., *T. microb* Kovblyuk et Seyyar 2009, *T. mccowani* (Chatzaki et Russell-Smith, 2017), and *T. noname* Mazzia et Cornic, 2020.

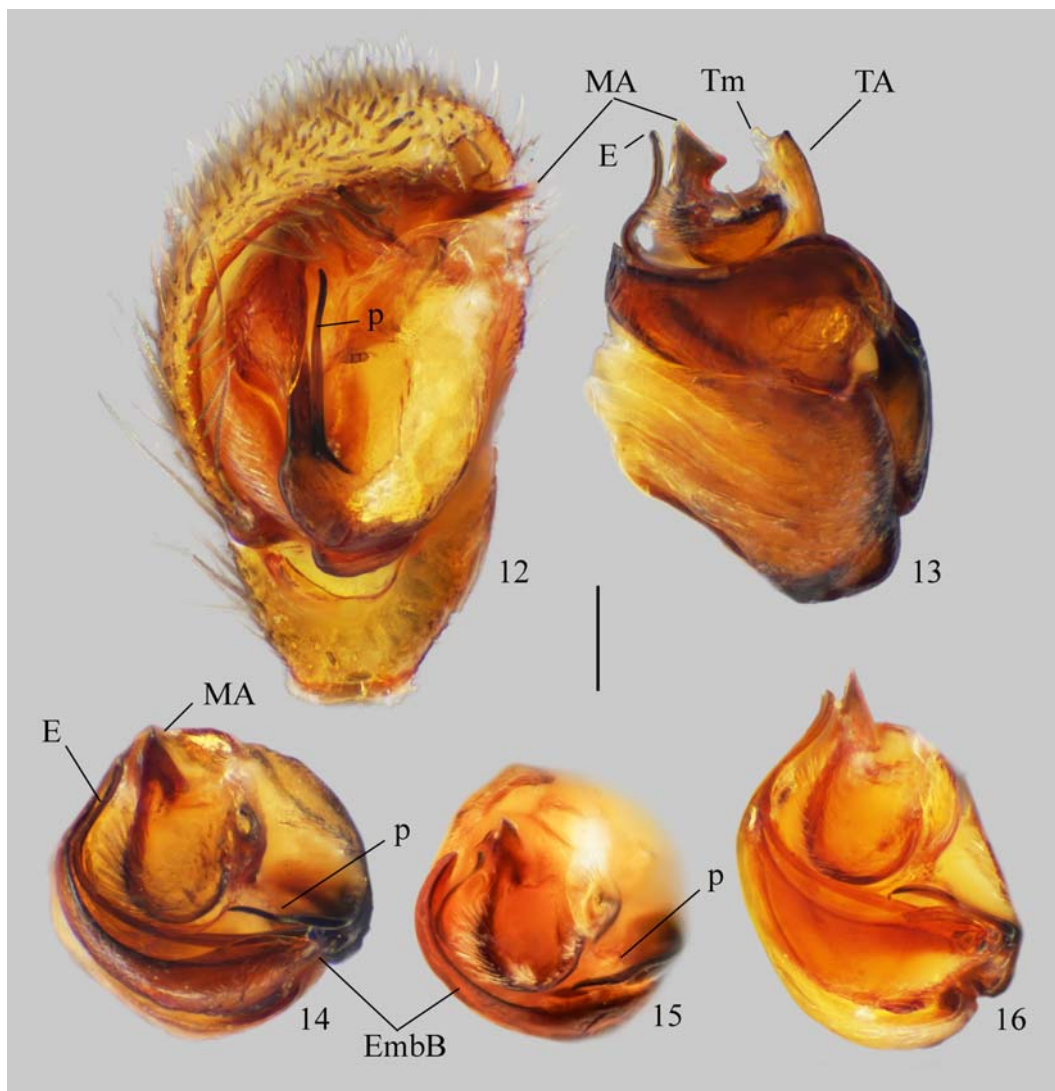
DISTRIBUTION. The region of Ancient Mediterranean: from the east Mediterranean to north Kazakhstan, and southward to south Iran (Table, Map).

*Turkozelotes kazachstanicus* (Ponomarev et Tsvetkov, 2006) **comb.n. ex *Zelotes***  
Figs 1–16, Map.

*Zelotes kazachstanicus* Ponomarev, Tsvetkov, 2006: 13, fig. 24 (♀); holotype ♀ in ZMMU, examined.

*Turkozelotes mirandus* Ponomarev in Ponomarev, Dvadenko, 2011: 108, figs 1–2 (♂♀), type series in ZMMU, examined. **Syn.n.**

TYPES. *Zelotes kazachstanicus*: Holotype ♀ (ZMMU, epigyne lost), Kazakhstan, Atyrau Area, c. 2 km NW of Makhambet Vil. (47.733824°N; 51.574143°E), left bank of Ural River, supra-flood-plain terrace with pigweed *Anabasis aphylla*, 14.06.1987, A.V. Ponomarev. — *Turkozelotes mirandus*: Holotype ♂ (ZMMU), Russia, Rostov Area, Remontnoe Distr., Krasnopartisanskii Vil., Kurnikov Liman, salt marsh (46.348939°N; 43.215931°E), 21.05.2009, A.V. Ponomarev. Paratypes: 1 ♂, 2 ♀♀ (PC, 18.37.1/1), same locality as of the holotype, 25.06.2010, A.V. Ponomarev; 1 ♀ (ZMMU), Russia, Rostov Area, Orlovskii Distr., Manytch Vil.,



Figs 12–16. Male palp (12) and bulbus (13–16) of *Turkozeloetes kazachstanicus* (Ponomarev et Tsvetkov, 2006) comb.n. from Rostov Area: 12 — ventro-apical view; 13 — dorsal view; 14, 15 — apical view, different angles; 16 — dorso-apical view. Scale: 0.25 mm. E — embolus; EmbB — embolar base; MA — median apophysis; TA — terminal apophysis; Tm — terminal membrane; p — embolar process.

Рис. 12–16. Пальпа самца (12) и бульбус (13–16) *Turkozeloetes kazachstanicus* (Ponomarev et Tsvetkov, 2006) comb.n. из Ростовской области: 12 — вентро-апикально; 13 — дорсально; 14, 15 — апикально, разные ракурсы; 16 — дорсо-апикально. Масштаб: 0,25 мм. E — эмболос; EmbB — база эмболоса; MA — медианный апофиз; TA — терминальный апофиз; Tm — терминальная мембрана; p — отросток эмболоса.

shore of Lake Gruzskoe, salt marsh (46.429876°N; 42.710919°E), 26.05.2010, A.V. Ponomarev.

OTHER MATERIAL. RUSSIA: 1 ♂ (PC: 18.37.1/2), Rostov Area, Orlovskii Distr., Manytch Vil., Manytch-Gudilo Lake, Vodnyi Island (46.8°N; 42.833333°E), salt marsh, 9.05.2012, Z.G. Prichutova; 2 ♂♂, 2 ♀♀ (ZMMU), 2 ♂♂, 1 ♀ (PC: 18.37.1/3), same locality, salt marsh, 25.06-19.08.2016, E. Eremenko. — KAZAKHSTAN: 3 ♀♀ (PC: 18.37.1/4), Kostanay Area, Altyn Dala Nature Reserve, Rakhmet (49.267778°N; 65.274167°E), bank of Uly-Zhilanshi River, salt marsh, 18.05.2014, T.M. Bragina. — AZERBAIJAN: 1 ♂ (PC: 18.37.1/5), Nakhichevan, Sharur Dist., shore of Arpachay Reservoir (39.176467°N; 45.365239°E), 4.05.2018, N.Yu. Snegovaya.

COMMENTS. As indicated above, the holotype female of *Z. kazachstanicus* lacks the epigyne, which is a key taxonomic character. Yet, we have synonymized *T. mirandus* with *Z. kazachstanicus* and established a new combination

*Turkozeloetes kazachstanicus* comb.n. due to the following reasons: the conformation of the epigyne of *Z. kazachstanicus* (as seen in Fig. 7, and based on the first author's memory) is identical to that of the paratype of *T. mirandus* (Fig. 8); the female body size (body 3.4–3.7 mm long, carapace 1.4–1.5 mm long and 1.1 mm wide); the body colouration (carapace brown to dark grey, with yellow patches, abdomen grey); the same leg armature (two pairs of ventral spines on metatarsi I and II); identical eye shape, size and position (small eyes situated compactly, both eye rows straight, median eyes of the second row elongate-oval); and finally the same habitat preferences (saline biotopes).

A comparison of the male palp conformation of *T. kazachstanicus* (Figs 1–6, 12–16) with that of *T. mccowani* (cf. figs 58–67 in Chatzaki [2018]) has shown no differences in the shape of tibial apophyses. In *T. kazachstanicus*, the



Map. Distribution of the *Turkozelotes* species: *T. microb* (filled circle), *T. adallum* comb.n. (rhomb), *T. attavirus* (open square), *T. kazachstanicus* comb.n. (filled square), *T. mccowani* (triangle), *T. noname* (open circle). After Levy [2009]; Kovblyuk *et al.* [2009]; Chatzaki & Russell-Smith [2017]; Chatzaki [2018]; Chatzaki & van Keer [2019]; Zamani *et al.* [2018, 2019, 2020]; Mazzia & Cornic [2020] and present data.

Карта. Распространение видов *Turkozelotes*: *T. microb* (залитый круг), *T. adallum* comb.n. (ромб), *T. attavirus* (незалитый квадрат), *T. kazachstanicus* comb.n. (залитый квадрат), *T. mccowani* (треугольник) и *T. noname* (незалитый круг). По Levy [2009]; Kovblyuk *et al.* [2009]; Chatzaki & Russell-Smith [2017]; Chatzaki [2018]; Chatzaki & van Keer [2019]; Zamani *et al.* [2018, 2019, 2020]; Mazzia & Cornic [2020] и оригинальные данные.

tibial apophysis varies in its shape (Figs 4–6). It is possible that such/similar variation also exists in *T. mccowani* but was not indicated by Chatzaki [2018], who studied a long series of males. The bipartite spermathecae are described for the females of *T. mccowani*: “spermathecae with ventral bean-shaped chambers (S1 in Fig. 27) and with dorsal round chambers (S2 in Fig. 28) leading to coiled tubular copulatory ducts” [Chatzaki, Russell-Smith, 2017: 247]. In *T. kazachstanicus*, the spermathecae are small, rounded, unipartite (Figs 9, 10), but could look like bipartite in ventral view (Fig. 8) due to a loop-like sinuous duct that is better visible in dorsal view (Figs 10, 11). In addition, the position of epigynal anterior margins (“pockets”) is slightly different in two species. Based on the mentioned differences, it seems safe not to synonymize *T. mccowani* with *T. kazachstanicus* for the time being. A definite decision can be drawn after a direct comparison of the types and additional Mediterranean materials on *T. mccowani*.

**HABITAT.** Russia, Rostov Area: salt marshes. Kazakhstan, northern Caspian Region: saline biotopes along Ural River; Kostanai Area: saline biotopes along Uly-Zhilanshi River.

**DISTRIBUTION.** Russia: Rostov Area; Kazakhstan: northern Caspian Region, the south part of Kostanai Area; Azerbaijan: Nakhichevan; Iran: Ilam Province (Map).

*Turkozelotes adullam* (Levy, 2009) **comb.n.**  
ex *Drassyllus*  
Map.

*Drassyllus adullam* Levy, 2009: 4, figs 4–5 (♂); holotype ♂ in the Hebrew University of Jerusalem (HUJ15529), not examined.

**COMMENTS.** As stated in the original description [Levy, 2009: 5], “the palpus with the median trajectory of the embolus and the shape of the tibial apophysis in particular, clearly distinguish *D. adullam* from all other *Drassyllus* species”. Based on the original figure [Levy, 2009, fig. 4], the retrolateral position of embolic origin, its trajectory (embolus crosses tegulum from its dorsal side, running towards its retrolateral side), the male palpal tibia protruding retrolatead and the wide tibial apophysis unambiguously indicate the affiliation of this species with *Turkozelotes*; hence a new combination is proposed: *Turkozelotes adullam* comb.n. This species is close to *T. kazachstanicus* and *T. mccowani*, but can be easily distinguished from both by the smaller size and the shape of the male palp tibial apophysis; yet, the embolic origin and trajectory [Levy, 2009, fig. 4] are very similar to those of *T. kazachstanicus* [Ponomarev, Dvadenko, 2011, fig. 1a–b].

**DISTRIBUTION.** Israel: Adullam Reserve [Levy, 2009] (Map).

## Discussion

To date, six species of *Turkozelotes* have been described (Table). Of them, *T. mccowani* is likely to be a junior synonym of *T. kazachstanicus*, but a re-examination of the type material of both species as well as additional Mediterranean materials on *T. mccowani* is required. In the description of *T. noname*, Mazzia, Cornic [2020] indicated that in its copulatory organs this species is similar to *T. kazachstanicus* and

Table. Species composition and distribution of *Turkozelo* Kovblyuk et Seyyar, 2009. Таблица. Видовой состав и распространение *Turkozelo* Kovblyuk et Seyyar, 2009.

Species name	Sexes known	Zoogeographical regions			References
		Mediterranean	Eastern European	Irano-Turan	
<i>T. adullam</i> (Levy, 2009), comb.n.	♂	Israel			Levy, 2009
<i>T. attavirus</i> Chatzaki, 2019	♂♀	Greece (Rhodes)			Chatzaki, Van Keer, 2019
<i>T. kazachstanicus</i> (Ponomarev et Tsvetkov, 2006), comb.n.	♂♀		Russia (Rostov Area)	Kazakhstan (Atyrau and Kostanay areas); Azerbaijan (Nakhichevan); Iran (Ilam Province)	Ponomarev, Tsvetkov, 2006; Ponomarev, Dvadenko, 2011; Zamani <i>et al.</i> , 2018; present data
<i>T. mccowani</i> (Chatzaki et Russel-Schmidt, 2017)	♂♀	Cyprus; Greece		Iran (Kurdistan, Fars provinces)	Chatzaki, Russel-Schmidt, 2017; Chatzaki, 2018; Zamani <i>et al.</i> , 2019, 2020
<i>T. microb</i> Kovblyuk et Seyyar, 2009	♂♀	Turkey (Adana Province); Greece			Kovblyuk <i>et al.</i> , 2009; Chatzaki, 2018
<i>T. noname</i> Mazzia et Cornic, 2020	♂♀	France (Provence-Alpes-Côte d'Azur)			Mazzia, Cornic, 2020

*T. mccowani* but different from *T. attavirus* and *T. microb*. Yet, *T. adullam* is also close to *T. kazachstanicus* and *T. mccowani*. Therefore, it is safe to propose two species groups within *Turkozelo* based on the structure of copulatory organs: the *kazachstanicus* group consisting of *T. adullam*, *T. kazachstanicus*, *T. mccowani* and *T. noname* which possess the large, broadened apically and directed dorsad male palp tibial apophysis, the large and wide epigynal groove and two widely separated epigynal “pockets” (=anterior margins); and the *attavirus* group containing *T. attavirus* and *T. microb* and having the comparatively small, directed apicad male palp tibial apophysis, the small epigynal groove that is slightly longer than wide (or slightly wider than long) and the anterior hood situated at the anterior part of the epigyne.

The genus is distributed mainly in the region of Ancient Mediterranean (Map); only *T. kazachstanicus* is known outside its limits, being reported from the vast area from Armenian Upland to north-west Kazakhstan. The species from the *kazachstanicus* group define the limits of the generic range: *T. noname* — the western, *T. kazachstanicus* — the northern and the eastern, *T. adullam* — the southern.

**Acknowledgements.** We are deeply obliged to T.M. Bragina (Kostanai Pedagogical Institute, Kostanai, Kazakh-

stan), E.A. Eremenko (Southern Federal University, Rostov-on-Don, Russia), Z.G. Prishutova (Rostov-on-Don, Russia), N.Yu. Snegovaya (Institute of Zoology NAS of Azerbaijan, Baku Azerbaijan) for the material provided for our study. S.L. Eshyunin (Perm State University, Perm, Russia) is especially acknowledged for taxonomical consultation.

Study of A.V. Ponomarev and V.Yu. Shmatko is supported with Southern Scientific Centre of the Russian Academy of Sciences Project No. AAAA-A19-119011190176-7. The work of K.G. Mikhailov is supported by MSU Zoological Museum State Program.

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*Responsible editor D.V. Logunov*