

New data on the spider fauna (Arachnida: Aranei) of the East Kyzylkum Desert, Kazakhstan

Новые данные о фауне пауков (Arachnida: Aranei) восточной части пустыни Кызылкумы, Казахстан

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КЛЮЧЕВЫЕ СЛОВА: Araneae, новые находки, Средняя Азия, Казахстан.

ABSTRACT. A list of 54 spider species collected in the East Kyzylkum Desert (Kazakhstan) is provided. Of these species, 27 are recorded from Kyzylkum for the first time, and 10 are first found in Kazakhstan. Distribution of the species that are new to Kazakhstan is discussed. Two species are described as new: viz., *Anagraphis karamola* sp.n. (♂♀) and *Drassodes babenkoi* sp.n. (♂♀). A new combination is proposed: *Anagraphis tajikistanica* (Fomichev et Marusik, 2021) comb.n. (*ex Drassodex*).

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РЕЗЮМЕ. Приведен список из 54 видов пауков, собранных в восточной части пустыни Кызылкум (Казахстан). Из них 27 видов впервые отмечены в Кызылкумах, а 10 впервые обнаружены в Казахстане. Обсуждается распространение видов новых для Казахстана. Два вида описаны как новые: *Anagraphis karamola* sp.n. (♂♀) и *Drassodes babenkoi* sp.n. (♂♀). Предложена новая комбинация: *Anagraphis tajikistanica* (Fomichev, Marusik, 2021) comb.n. (*ex Drassodex*).

Introduction

The Kyzylkum Desert lies between Amu Darya and Syr Darya rivers, spreading across Kazakhstan, Uzbekistan and northern Turkmenistan and covering about 300,000 km². The desert is primarily confined to the middle subzone of temperate deserts, but in the south it transforms into subtropical deserts. The climate is sharply continental, with hot, dry summers and cold, low-snow winters. The average annual precipitation is

about 200 mm, falling in winter and spring. Formerly in the north-west the desert was bordered by Aral Sea, but now almost the entire territory of the dried Aral Sea constitutes an enclave of the Kyzylkum desert [Grigoriev, 1950; Yugai, 1964; Khasanov *et al.*, 2011; Shuiskaya *et al.*, 2012; Shomurovov, Khasanov, 2014].

The first spiders from Kyzylkum were described by Kroneberg [1875], who reported on 14 species from the eastern part of the desert and Syr Darya valley. Over a century later, the most detailed study of Kyzylkum spiders was carried out by T. Pavlenko on Barsakelmes Island (Aral Sea), where she recorded 107 species [Pavlenko, 1985], but many of the reported species were either provisionally identified or misidentified. A decade later, a paper summarising data on the araneofauna of the eastern part of the Kyzylkum desert within Kazakhstan was published [Zyuzin *et al.*, 1994], in which 168 species were listed. Since then, no special araneological studies have been carried out in East Kyzylkum. The aims of the present paper are (1) to provide new data on spiders from East Kyzylkum, (2) to describe two new species, and (3) to comment on all new findings.

Material and methods

Field works were carried out in the sandy desert with saxaul (*Haloxylon* sp.) in the periods: April 7–9 and October 13–19, 2023. Spiders were hand-collected and caught by pitfall traps. Several localities around Karamola Mt. (East Kyzylkum Desert, Kazakhstan) were surveyed:

1 — near main chink, i.e. a border scarp — escarpment — edging upland flat areas of the earth's surface, 42.277028°N 67.752556°E, 9.04.2023, coll. A. Yeszhanov;

2 — plain (=flatland), 42.14760°N 67.49031°E, 8.04.2023, coll. A. Yeszhanov;

3 — near Shardara water reservoir, 41.248611°N 67.90725°E, 7.04.2023, coll. A. Yeszhanov;

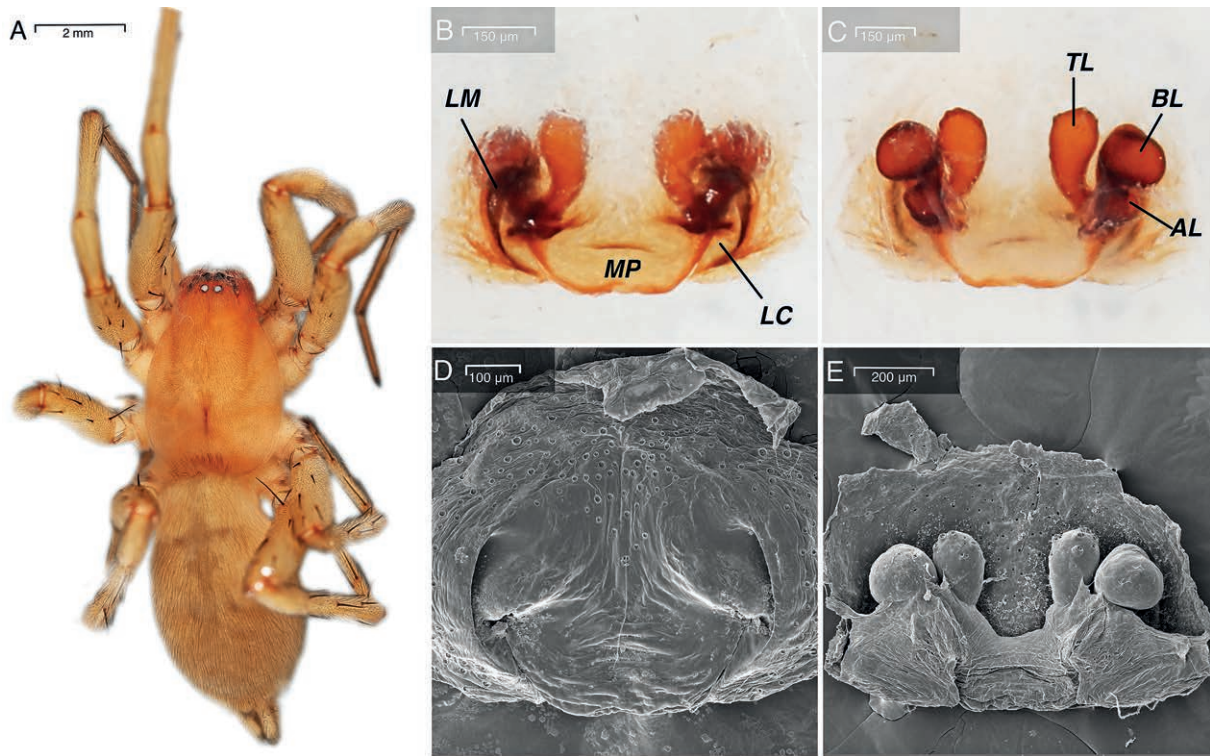


Fig. 1. Habitus (A) and epigyne of *Drassodes babenkoi* sp.n. (B–E) (paratype IZRK-238): B, D — ventral view, C, E — dorsal view. Abbreviations: AL — additional lobe of spermathecae; BL — basal lobe of spermathecae; LC — lateral cavity; LM — lateral epigynal margin; MP — median plate; TL — terminal lobe of spermathecae.

Рис. 1. Внешний вид (A) и эпигина *Drassodes babenkoi* sp.n. (B–E) (паратип IZRK-238): B, D — вентрально, C, E — дорсально. Со-кращения: AL — дополнительная доля сперматеки; BL — базальная доля сперматеки; LC — боковая полость; LM — латеральный край эпигины; MP — медиальная пластинка; TL — терминальная доля сперматеки.

- 4 — small chink, 42.233452°N 67.809256°E, 264–267 m, 13–16.10.2023, coll. L. Kim;
 5 — small chink, 42.233707°N 67.808363°E, 245–249 m, 14–16.10.2023, coll. L. Kim;
 6 — small chink, 42.233549°N 67.808945°E, 255–269 m, 14–16.10.2023, coll. L. Kim;
 7 — small chink, 42.232648°N 67.812832°E, 230–236 m, 14–16.10.2023, coll. L. Kim;
 8 — main chink, 42.280119°N 67.755423°E, 342–349 m, 17–19.10.2023, coll. L. Kim;
 9 — main chink, 42.279899°N 67.755806°E, 358 m, 17–19.10.2023, coll. L. Kim;
 10 — main chink, 42.280125°N 67.7580°E, 376 m, 16–19.10.2023, coll. L. Kim;
 11 — main chink, 42.277561°N 67.758065°E, 333 m, 17–19.10.2023, coll. L. Kim;
 12 — small chink, 42.233879°N 67.814442°E, 222 m, 13–16.10.2023, coll. L. Kim;
 13 — small chink, 42.23237°N 67.811458°E, 13–14.10.2023, coll. L. Kim.

A total of some 250 adult specimens were collected. The nomenclature follows WSC [2024]. The spider species that have been recorded in Kazakhstan for the first time are marked with asterisk (*); the species that have first been found in Kyzylkum are marked with double asterisk (**). The numbers in square brackets correspond to the collecting localities described above.

Type specimens have been deposited in the Institute of Zoology Republic Kazakhstan, Almaty (IZRK), the Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU), the Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZISP) and The Manchester

Museum, University of Manchester, UK (MMUE); voucher specimens are kept in IZRK.

Colour images were manually taken using a Canon EOS 5D Mark IV digital camera with a Canon MP-E 65 mm f/2.8 1-5x Macro lens and a Laowa 100mm f/2.8 2x Ultra Macro APO lens at the ZISP's Laboratory of Insect Taxonomy. SEM micrographs were made by means of a TESCAN MIRA3 LMH SEM microscope at the Joint Usage Center "Instrumental methods in ecology" A.N. Severtsov Institute of Ecology and Evolution, Moscow (IEE RAS).

Abbreviations used in the text: AER — anterior row of eyes; ALE — anterior lateral eye, AME — anterior median eye; Fm — femur; Mt — metatarsus; PER — posterior row of eyes; PLE — posterior lateral eye, PME — posterior median eye; Pt — patella; Tb — tibia; Tr — tarsus. Leg spination: a — apical, d — dorsal, pl and rl — pro- and retrolateral, v — ventral. All measurements in the text are in mm.

Taxonomic part

Drassodes babenkoi Nekhaeva, sp.n.

Figs 1A–E, 2A–D, 3A–G.

TYPES. HOLOTYPE ♂ (IZRK-262), Kazakhstan, East Kyzylkum Desert, Karamola Mt., 42.279899°N 67.755806°E, 358 m, 17–19.10.2023, leg. L. Kim. — PARATYPES: 1 ♂ (IZRK-248), same locality, 42.233549°N 67.808945°E, 258 m, 14–16.10.2023, leg. L. Kim; 1 ♂ (IZRK-286), same locality, 42.233519°N 67.809487°E, 268 m, 14–16.10.2023, leg. L. Kim; 2 ♂♂ 3 ♀♀ (ZMMU, Ta-8488), same locality, 42.233879°N 67.814442°E, 222 m, 13–16.10.2023, leg. L. Kim; 2 ♂♂ (ZISP, ARA_ARA_0000775), same locality,

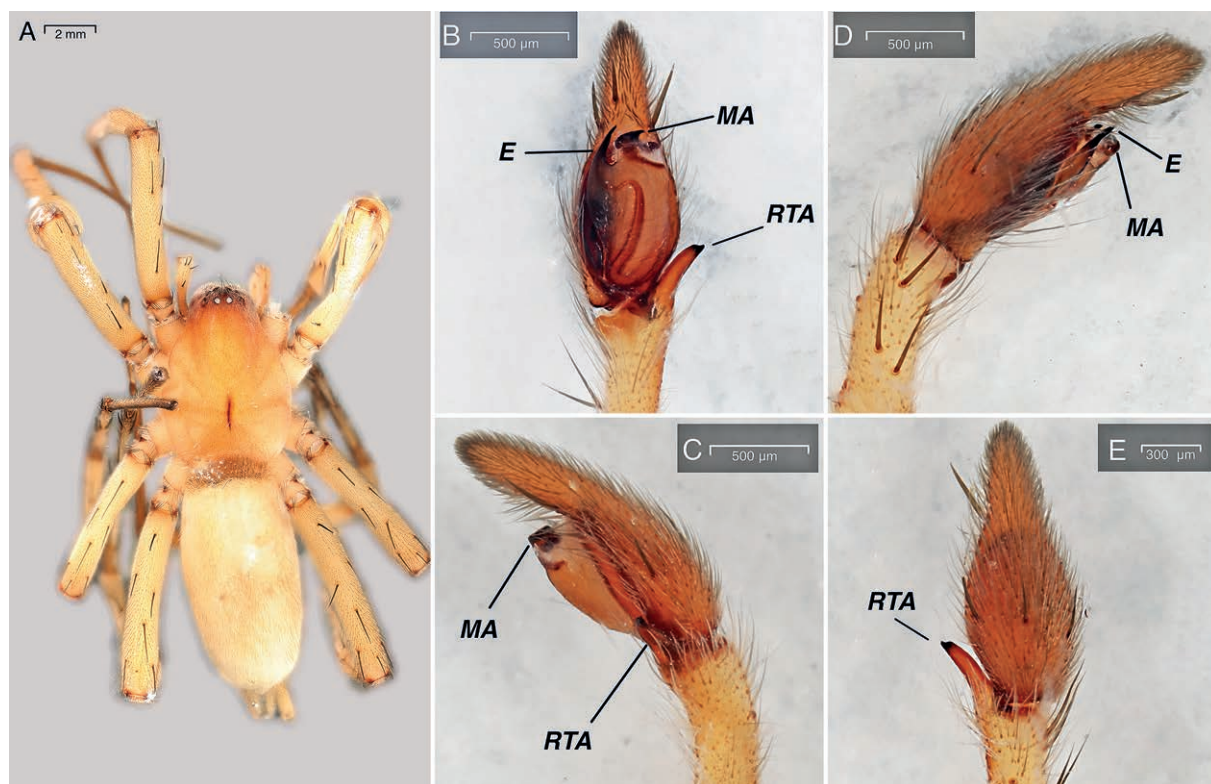


Fig. 2. Habitus (A) and male palp of *Drassodes babenkoi* sp.n. (B–E) (paratype ARA_ARA_0000776): B — ventral view, C — retrolateral view, D — prolateral view, E — dorsal view. Abbreviations: C — conductor; E — embolus; MA — median apophysis; RTA — retrolateral tibial apophysis.

Рис. 2. Внешний вид (A) и пальпа самца *Drassodes babenkoi* sp.n. (B–E) (паратип ARA_ARA_0000776): B, D — вентрально, C, E — дорсально. Сокращения: B — вентрально, C — ретролатерально, D — пролатерально, E — дорсально. Сокращения: C — кондуктор; E — эмболус; MA — медиальный отросток; RTA — ретролатеральный отросток голени.

14–16.10.2023, leg. L. Kim; 1 ♂ (ZISP, ARA_ARA_0000776), same locality, 42.233355°N 67.810754°E, 267 m, 14–16.10.2023, leg. L. Kim; 1 ♂ (ZMMU, Ta-8489), same locality, 42.23237°N 67.811458°E, 255–269 m, 14–16.10.2023, leg. L. Kim; 1 ♂ (MMUE, G7703.1), same locality, 42.283206°N 67.762826°E, 346 m, 17–19.10.2023, leg. L. Kim; 1 ♂ 2 ♀♀ (MMUE, G7703.2), same locality, 42.280125°N 67.7580°E, 376 m, 16–19.10.2023, leg. L. Kim; 1 ♀ (IZRK-51), same locality, 42.277028°N 67.752556°E, 9.04.2023, leg. A. Yeszhanov; 2 ♀♀ (IZRK-238), same locality, 42.233452°N 67.809256°E, 264 m, 13–16.10.2023, coll. L. Kim.

ETYMOLOGY. The species is named after my scientific supervisor and colleague Dr Anatoly Borisovich Babenko as a sign of deep respect and gratitude to him.

DIAGNOSIS. *Drassodes babenkoi* sp.n. is most similar to *D. jakkabagensis* Charitonov, 1946 from the mountains of southern Uzbekistan [Charitonov, 1946]. However, the males of *D. babenkoi* sp.n. can be distinguished by following characters: (1) RTA length in *D. babenkoi* sp.n. is at least 1/4 of cymbium length, while in *D. jakkabagensis* it is no less than 1/2 of cymbium (cf. Figs 2B, 3C and fig. 33 in Charitonov [1946]); (2) RTA apex in *D. babenkoi* sp.n. has a pronounced notch (Figs 2B, E, 3A, C, F, G), while in *D. jakkabagensis* it is uniformly oblique; (3) embolus in *D. babenkoi* sp.n. is short and bent (Figs 2B, 3C–D), while in *D. jakkabagensis* — straight and long; and (4) the medial apophysis in *D. babenkoi* sp.n. is short, broad and bent at 13 o'clock (Figs 2B, 3C–D), in *D. jakkabagensis* it is long and directed upwards, parallel to the embolus.

The females of *D. babenkoi* sp.n. can be distinguished as follows (cf. Fig. 1B–E and fig. 34 in Charitonov [1946]): (1) the free end of the medial plate in *D. babenkoi* sp.n. is straight (rounded in *D. jakkabagensis*), protruding beyond the lateral

margins of the epigyne (not so in *D. jakkabagensis*); (2) less than 1/2 basal lobe (BL) of spermathecae in *D. babenkoi* sp.n. lie above the lateral margins of epigyne, while additional lobes of spermathecae (AL) do not extend beyond them, in *D. jakkabagensis* spermathecae lie above the lateral margins of the epigyne; and (3) in *D. babenkoi* sp.n. terminal lobes (TLs) of spermathecae are spaced by 1.5 of their diameter (Fig. 1B, C), in *D. jakkabagensis* TLs are separated by about 0.5 of their diameter.

DESCRIPTION. Male (the holotype). Total length 10.9. Carapace 5.1 long, 3.4 wide; amber. Eye sizes and interdistances: AER width 0.93, PER width 1.15, AME 0.20, ALE 0.15, ALE-AME 0.05, AME-AME 0.15, PLE (oval) 0.13×0.15, PME 0.18, PLE-PME 0.25, PME-PME 0.13. Medial eyes field rectangular: length 0.6, width 0.5 anteriorly and 0.5 posteriorly. AME dark (“nocturnal”), other eyes — light (“diurnal”). Chelicerae brick-coloured, with 3 promarginal teeth (central tooth larger than two lateral), retromarginal tooth absent. Labium brick-coloured, Endites light brick-coloured, with white tips. Sternum amber, with brown borders. All legs amber. Leg formula: IV, I, II, III. Leg measurements: I 17.3 (4.7, 2.0, 4.2, 4.3, 2.1), II 16.5 (4.4, 2.0, 3.7, 4.2, 2.2), III 14.9 (4.0, 1.7, 3.2, 4.0, 2.0), IV 19.8 (5.0, 1.9, 4.2, 6.2, 2.5). Leg spination: Femur I, II d 1-1-1, rl 0-1-0, pl 1-1-1, III, IV d 1-1-1, rl 0-1-1, pl 0-1-1; Tibia I pl 1-0-1, v 2-2-2a, II pl 1-1-1, v 2-2-2a, III d 1-0-0, rl 1-1-1, pl 1-1-1, v 2-2-2a; IV d 1-1-0, rl 1-1-1, pl 1-1-1, v 2-2-2a; Metatarsus I pl 0-1-0, v 2-0-0, II pl 1-1-0, v 2-0-0, III, IV d 1-2-2, rl 1-1-1, pl 1-1-1; v 2-2-2a. Metatarsi I, II and tarsi I–IV with scopula. Abdomen length 5.8, 2.8 width; yellowish with a dense brush of setae anteriorly ventral. Palp as in Figs 2B–E, 3A–G; femur unmodified, with 1 dorsal and 4 prolateral spines;

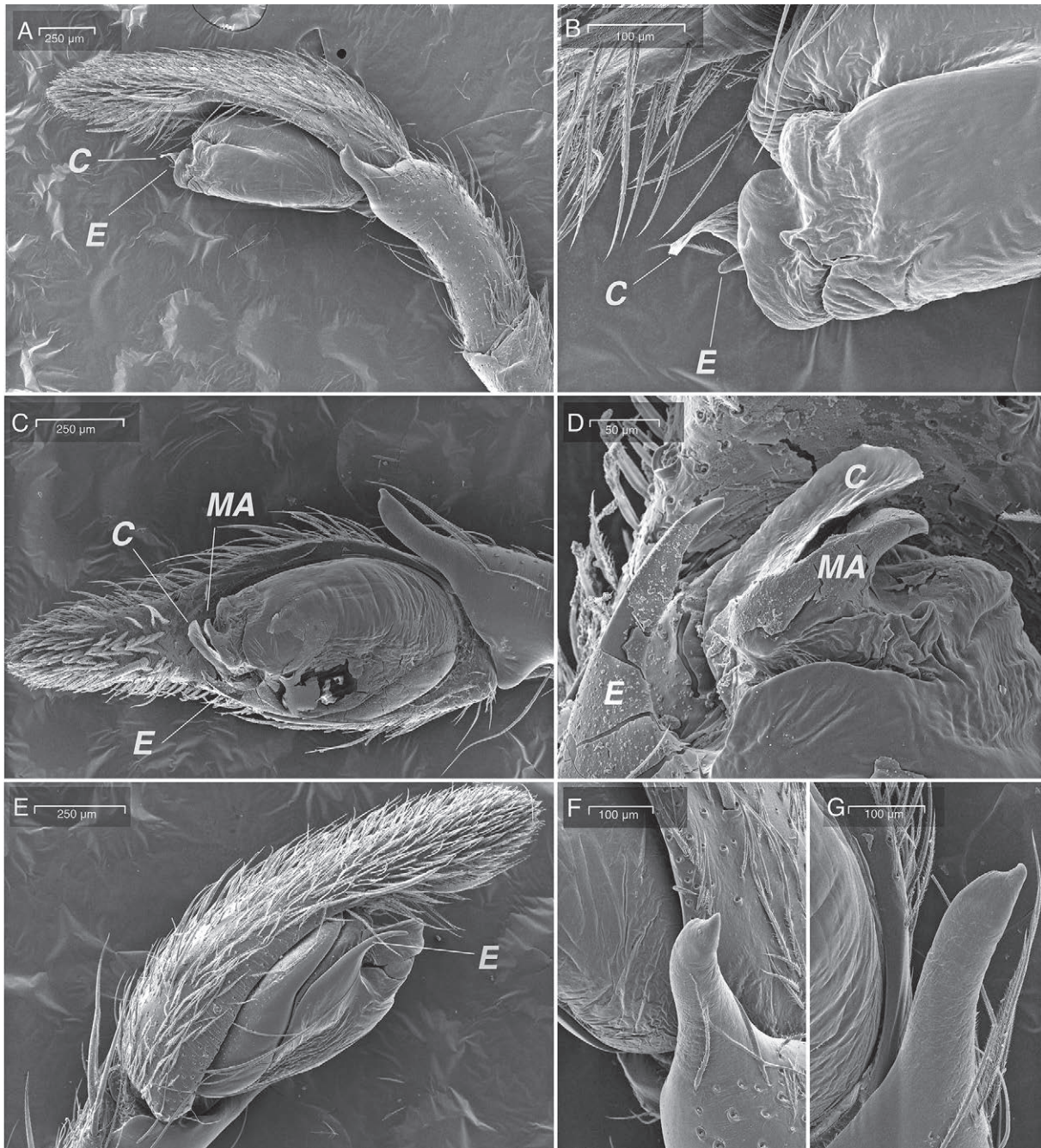


Fig. 3. Male palp of *Drassodes babenkoi* sp.n. (A–B, F — paratype ARA_ARA_0000776; C–D, G — holotype; E — paratype G7703.2): A — whole palp, retrolateral view; B — bulbous tip, retrolateral view; C — whole palp, ventral view; D — embolus, ventral view; E — whole palp, prolateral view; F — RTA, retrolateral view; G — RTA, ventral view. Abbreviations: C — conductor; E — embolus; MA — median apophysis; RTA — retrolateral tibial apophysis.

Рис. 3. Пальпа самца *Drassodes babenkoi* sp.n. (A–B, F — паратип ARA_ARA_0000776; C–D, G — голотип; E — паратип G7703.2): A — вся пальпа, ретролатерально; B — кончик бульбуса, ретролатерально; C — вся пальпа, вентрально; D — эмболюсный отдел, вентрально; E — вся пальпа, пролатерально; F — RTA, ретролатерально; G — RTA, вентрально. Сокращения: C — кондуктор; E — эмболюс; MA — медиальный отросток; RTA — ретролатеральный отросток голени.

tibia approximately half of cymbium length; RTA less than third of tibia length; RTA tip oblique and with notch; cymbium tip about 1/3 of cymbial length, with 3 spines ventrally and dorsally; tegulum oval, almost 1.5 times longer than wide; subtegulum not hidden by tegulum; median apophysis (MA) large and curved; conductor (C) wide, located above MA; embolus short, slightly curved in distal position.

Female (paratype, MMUE, G7703.2). Total length 10.3. Carapace 4.6 long, 3.1 wide; amber or yellowish. AER almost straight, distance between AME barely less than their diameter and twice large the distance between AME and ALE. PER slightly recurved, distance between PME slightly less than their diameter and twice less than between PME and PLE. Distance between ALE and PLE slightly shorter than ALE diameter.

Table 1. Length of leg segments in the paratypes of *Drassodes babenkoi* sp.n. (males, n=10 / females, n=7). Average±SE, range in parentheses.Таблица 1. Длина сегментов ног у паратипов *Drassodes babenkoi* sp.n. (самцы, n=10 / самки, n=7). Среднее значение±SE, диапазон в скобках.

	Femur	Patella	Tibia	Metatarsus	Tarsus
I	4.1±0.1 / 3.9±0.2 (3.7–4.8) / (3.4–5.0)	1.8±0.1 / 1.7±0.1 (1.3–2.2) / (1.3–2.0)	3.9±0.1 / 3.1±0.1 (3.5–4.5) / (2.7–3.6)	3.7±0.1 / 2.8±0.1 (3.2–4.5) / (2.3–3.3)	1.9±0.1 / 1.8±0.1 (1.5–2.2) / (1.6–2.0)
II	4.0±0.1 / 3.6±0.1 (3.6–4.3) / (3.4–4.0)	1.7±0.1 / 1.3±0.2 (1.4–2.3) / (0.7–2.0)	3.6±0.1 / 2.9±0.1 (3.0–4.3) / (2.5–3.2)	3.5±0.1 / 2.8±0.1 (3.0–4.2) / (2.3–3.2)	2.0±0.1 / 1.6±0.04 (1.8–2.3) / (1.5–1.8)
III	3.7±0.1 / 3.4±0.1 (3.0–4.4) / (3.2–3.5)	1.6±0.1 / 1.4±0.1 (1.2–2) / (1.0–1.8)	3.1±0.1 / 2.6±0.1 (2.7–3.5) / (2.3–3.0)	3.6±0.1 / 2.8±0.2 (3.0–4.2) / (1.8–3.1)	2.0±0.1 / 1.6±0.1 (1.5–2.4) / (1.5–2.0)
IV	4.8±0.1 / 4.7±0.2 (4.0–5.3) / (4.1–5.4)	1.9±0.1 / 1.8±0.1 (1.6–2.3) / (1.6–2.0)	4.2±0.1 / 3.7±0.1 (3.5–4.6) / (3.4–4.0)	5.4±0.1 / 4.8±0.2 (4.7–5.9) / (4.3–5.4)	2.3±0.1 / 1.9±0.1 (2.0–2.5) / (1.7–2.2)

Medial eyes field rectangular; distance between AME and PME longer than that between ALEs or PLEs. Chelicerae brick-coloured. Labium, endites and sternum light brick-coloured or brownish. All legs yellowish or yellowish grey. Leg formula: IV, I, III, II. Leg measurements: I 12.0 (3.5, 1.6, 3.0, 2.3, 1.6), II 11.1 (3.5, 0.7, 2.7, 2.6, 1.6), III 11.2 (3.2, 1.3, 2.4, 2.7, 1.6), IV 15.4 (4.1, 1.7, 3.5, 4.4, 1.7). Metatarsi I, II and tarsi I-IV with scopula. Leg spination: Femur I, II d 1-1-0, pl 1-1-1; III, IV d 1-1-1, rl 0-1-1, pl 0-1-1; Tibia I, II pl 0-0-1, v 2-2-0; III d 1-0-0, rl 1-1-1, pl 1-1-1, v 1-2-2a; IV d 1-1-0, rl 1-1-0, pl 1-1-1, v 2-2-2a; Metatarsus I, II v 2-0-0; III d 1-2-2, rl 1-1-1, pl 1-1-1, v 2-2-2a; IV d 2-2-2, rl 1-1-1, pl 1-1-1, v 2-2-2a. Abdomen 5.7 leng, 3.2 width; grayish, with grey hairs (Fig. 1A). Epigyne: median plate well separated from lateral margins (Fig. 1B, D). Spermathecae bilobed; the terminal lobe pear-shaped; the basal lobe fist-shaped, approximately of the same size as terminal lobe; additional lobe smallest (Fig. 2C, E).

Measurements of other paratypes. Males (n=10). Total length 9.5±0.2 (range 8.4–11.2). Carapace 4.4±0.1 (4.0–5.1) long, 3.0±0.1 (2.6–3.5) wide. Abdomen length 5.1±0.2 (4.2–6.1), width 2.5±0.1 (2.1–3.1). Females (n=7). Total length 10.3±0.2 (range 9.7–11.2). Carapace 4.8±0.2 (4.2–5.4) long, 3.3±0.1 (3.0–3.9) wide. Abdomen 5.6±0.2 (4.5–6.2) leng, 3.4±0.1 (3.0–4.0) width. Leg measurements presented in the Table 1. Leg spination: Femur I, II d 1-1-1 or 1-1-0, rl 0-1-0 or 0-0-0, pl 1-1-1 or 0-1-1, III, IV d 1-1-1, rl 0-1-1, pl 0-1-1 or 1-1-1; Tibia I, II pl 1-0-1 or 0-0-1 or 1-1-1, v 2-2-2a (in female 2-2-0 or 2-2-1a), III, IV d 1-0-0 or 1-0-1 or 1-1-0, rl 1-1-1 or 0-1-1 or 1-1-0, pl 1-1-1, v 2-2-2a or 1-2-2a; Metatarsus I, II pl 0-1-0 or 1-1-0 or 0-0-0, rl 0-0-0 or 0-1-0, v 2-0-0, III, IV d 1-2-2 or 2-2-2, rl 1-1-1, pl 1-1-1; v 2-2-2a.

DISTRIBUTION. Only the type locality: East Kyzylkum Desert (Kazakhstan).

Genus *Anagraphis* Simon, 1893

Type species: *Anagraphis pallens* Simon, 1893 from South Africa.

DIAGNOSIS. Medium-sized, yellowish spiders. Eyes nearly same size, round. Labium wider than long. Chelicerae with 3 promarginal and 2 retromarginal teeth. Trochanters notched. Male abdomen without a scutum. Male palp with short and bifid retrolateral tibial apophysis (RTA). RTA with at least one sharp tooth, the remaining teeth either sharp or rounded. Tegulum oval. Sperm duct transverse, embolus long and thread-like, with a basal extension. Conductor long, transparent. Median apophysis short, distinct. Epigyne with a median depression and median septum at its base. Transverse edges and median part sclerotized. Spermathecae with two chambers [Levy, 1999; Chatzaki *et al.*, 2002a; Murphy, 2007].

COMMENTS. The unique features of the anterior lateral spinnerets have been used to unite the genera *Anagraphis*, *Drassodex* Murphy, 2007 and *Talanites* Simon, 1893 into the informal *Anagraphis*-group [Murphy, 2007]. However, these features, as noted by Hervé *et al.* [2009], appear to be plesiomorphic and therefore the selected group is potentially non-monophyletic. Despite some similar somatic and genitalic features (bifid RTA, coiled embolus (in *Anagraphis* and *Drassodex*) and the cheliceral dentition (3 pro- and 2 retromarginal teeth), the debate about the relationships of these genera remains open [Hervé *et al.*, 2009]. Moreover, the copulatory organs of the genus *Drassodex* stand out among all Gnaphosidae: males have a large corkscrew-shaped embolus forming, together with the haematodocha, an embolar spiral that ascends spirally upwards along one or two axes; terminal part of the coil is simple or is equipped with an embolar apophysis protruding forward [Hervé *et al.*, 2009].

A recently described male of *Drassodex tajikistanicus* Fomichev et Marusik, 2021 from Tajikistan has a bifid RTA typical of the *Anagraphis*-group. However, the authors noted that the generic placement of *D. tajikistanicus* should be considered provisional, because the species has a simple embolus lacking coils unlike in all other congeners [Fomichev, Marusik, 2021]. In addition, the median apophysis in *D. tajikistanicus* is almost straight and pointed [Fomichev, Marusik, 2021], while in other *Drassodex* it is thick, hook-shaped, directed inwards or prolaterally [Hervé *et al.*, 2009]. In the original description of *D. tajikistanicus* [Fomichev, Marusik, 2021: fig. 4], the distal transparent conductor is clearly visible. The listed features, as well as the presence a rounded subtegulum in *D. tajikistanicus* (absent in *Drassodex*) and the transverse sperm duct (*vs.* vertical in *Drassodex*), are diagnostic characteristic of the genus *Anagraphis* and its type species *A. pallens* in particular. Therefore, a new combination is proposed for the species: *Anagraphis tajikistanica* (Fomichev, Marusik, 2021) **comb.n.**

Anagraphis karamola Nekhaeva, sp.n.

Figs 4A–G, 5A–D.

TYPES. HOLOTYPE ♂ (IZRK-244.1), Kazakhstan, East Kyzylkum desert, Karamola Mt., 42.233707°N 67.808363°E, 249 m, pitfall traps, 14–16.10.2023, leg. L. Kim. – PARATYPES: 1 ♂ (IZRK-244.2), same data as for the holotype; 1 ♀ (IZRK-250), same locality, 42.233549°N 67.808945°E, 258 m, 14–16.10.2023, leg. L. Kim; 1 ♂ (ZMMU, Ta-8490), same locality, 42.23237°N 67.811458°E, 255–269 m, 14–16.10.2023, leg. L. Kim; 1 ♂ (ZMMU, Ta-8491), same locality, 42.280119°N 67.755423°E, 348 m, 17–19.10.2023, leg. L. Kim; 1 ♂ (MMUE, G7703.3), same locality, 42.280125°N 67.7580°E, 376 m, 17–19.10.2023, leg. L. Kim; 1 ♂ (MMUE, G7703.4), same locality, 42.233423°N 67.811949°E, 255 m, 14–16.10.2023, leg. L. Kim; 2 ♂♂ (ZISP, ARA_ARA_0000777), same locality, 42.277561°N 67.758065°E, 333 m, 17–19.10.2023, leg. L. Kim.

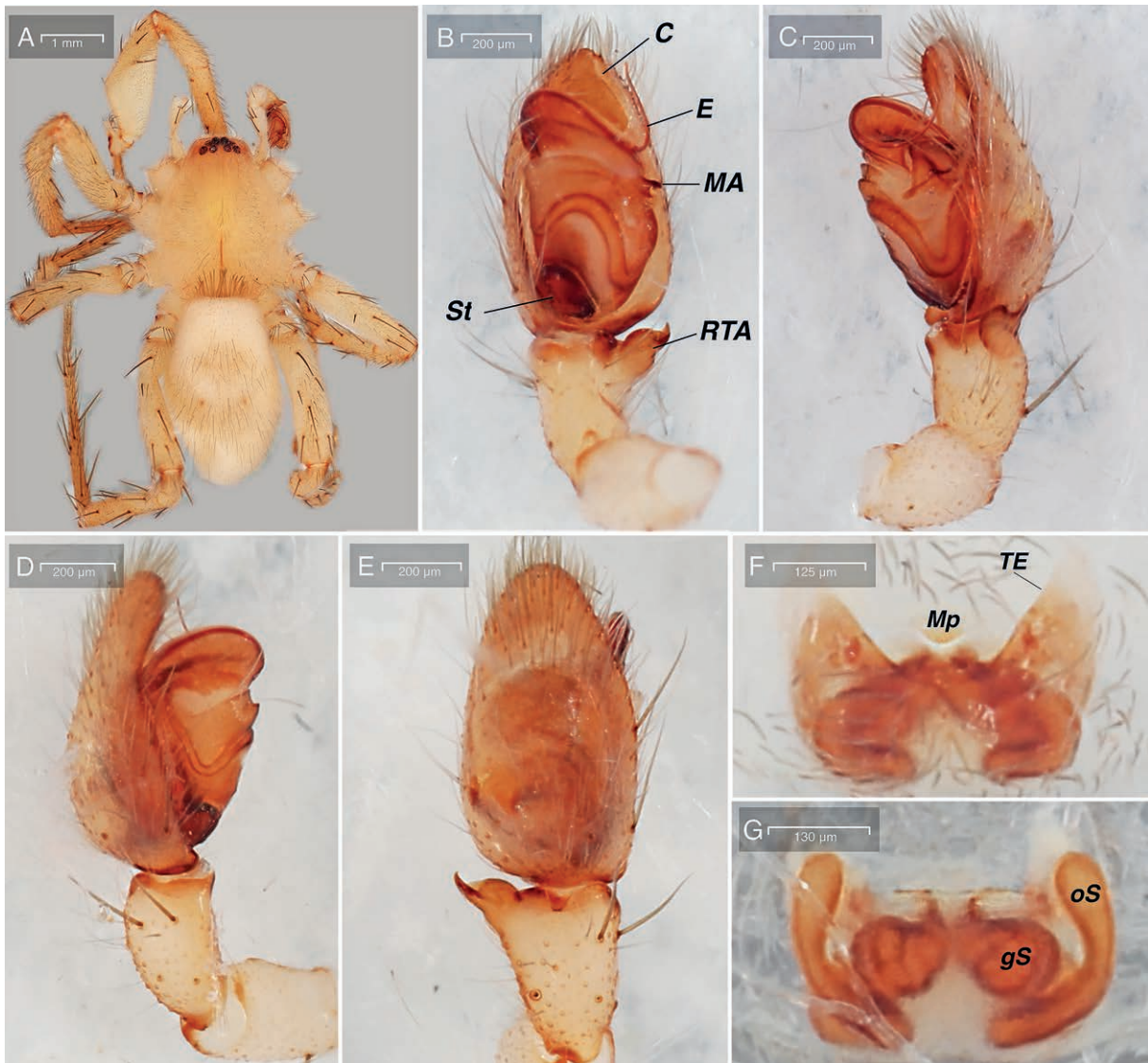


Fig. 4. Habitus and copulatory organs of *Anagraphis karamola* sp.n. (A–E — holotype; F–G — paratype): A — male habitus; B — whole palp, ventral; C — whole palp, retrolateral; D — whole palp, prolateral; E — whole palp, dorsal; F — epigyne, ventral; G — epigyne, dorsal. Abbreviations: C — conductor; E — embolus; gS — globular chamber of spermatheca; MA — median apophysis; Mp — epigyne median part; oS — oblong chamber of spermatheca; RTA — retrolateral tibial apophysis; TE — transverse edges of median depression.

Рис. 4. Внешний вид и копулятивные органы *Anagraphis karamola* sp.n. (A–E — голотип; F–G — паратип): A — внешний вид самца; B — вся пальпа, вентрально; C — вся пальпа, ретролатерально; D — вся пальпа, пролатерально; E — вся пальпа, дорсально; F — эпигина, вентрально; G — эпигина, дорсально. Сокращения: C — кондуктор; E — эмболус; gS — круглая камера сперматеки; MA — медиальный отросток; Mp — средняя часть эпигины; oS — продолговатая камера сперматеки; RTA — ретролатеральный отросток голени; TE — края медиальной депрессии.

ETYMOLOGY. The specific epithet is a noun in apposition taken from Karamola Mt. (East Kyzylkum, Kazakhstan) from where the new species was collected.

DIAGNOSIS. The male palp of *A. karamola* sp.n. is extremely similar to that of *A. tajikistanica* comb.n. The new species can be distinguished by the following characters (cf. Figs 4B–C, E, 5A, D and figs 2, 4, 5–8 in Fomichev & Marusik [2021]): (1) RTA inferior prong in *A. karamola* sp.n. wider and more rounded, and superior prong much curved, unlike in *A. tajikistanica*; (2) in *A. karamola* sp.n., RTA directed outward, while in *A. tajikistanica* upward; (3) subtegulum triangular in *A. karamola* sp.n. vs. rounded in *A. tajikistanica*; (4) in *A. karamola* sp.n., median apophysis like an isosceles triangle,

while almost straight in *A. tajikistanica*; (5) *A. karamola* sp.n. basal extension of the embolus at least 1.5 times greater than in *A. tajikistanica*.

The female of *A. karamola* sp.n. is most similar to that *A. ochracea* (L. Koch, 1867) (cf. Figs 4F–G and figs 5–7 in Chatzaki *et al.* [2002a]), but can be distinguished by: (1) V-shaped median depression (U-shaped in *A. ochracea*); (2) barely noticeable median septum (prominent in *A. ochracea*); (3) triangular epigyne median part (Mp) (rectangular *A. ochracea*); (4) ratio of spermathecal chambers sizes (oblong chambers twice as long as round chamber diameter in *A. karamola* sp.n. vs. oblong chambers do not exceed the diameter of round chambers in *A. ochracea*).

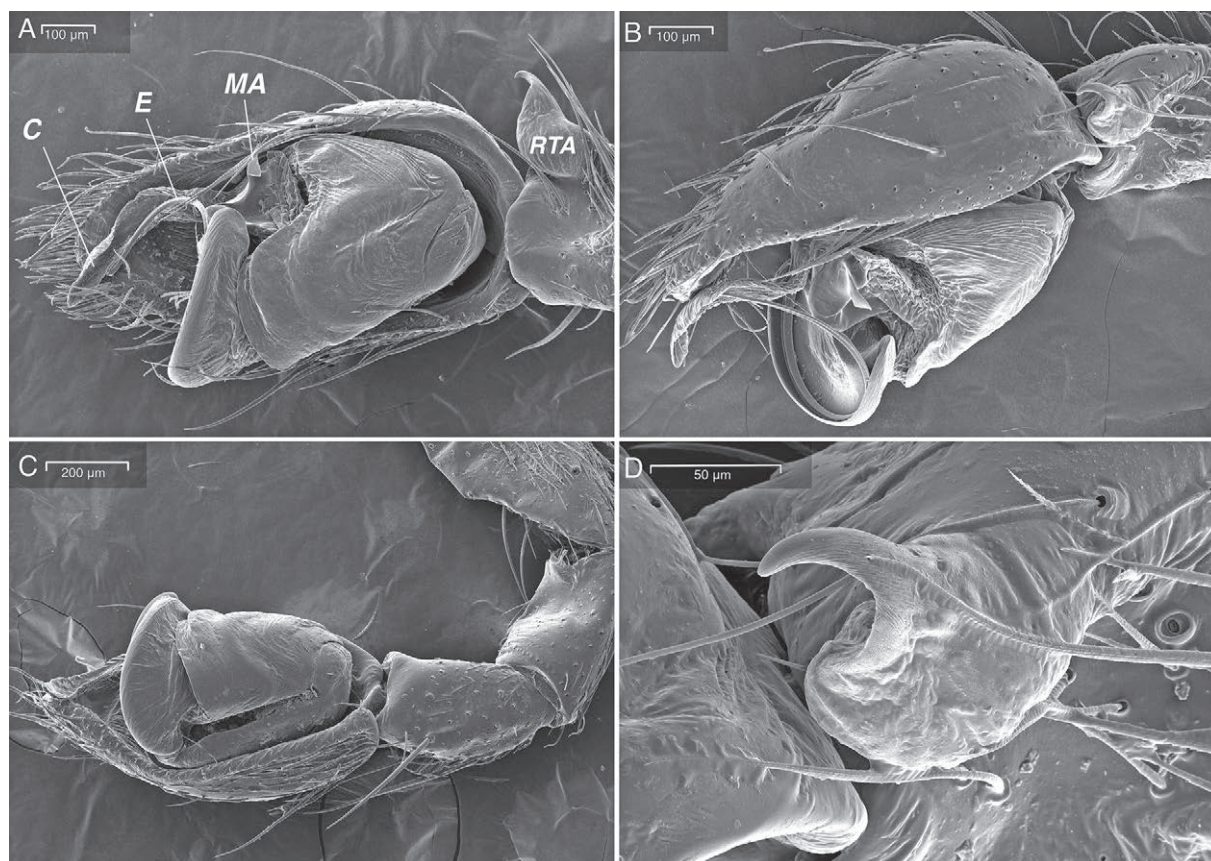


Fig. 5. Male palp of *Anagraphis karamola* sp.n. (A — holotype; B, D — paratype Ta-8490; C — paratype IZRK-244.4): A — whole palp, ventral; B — whole palp, retrolateral; C — whole palp, prolateral; D — RTA, retrolateral view. Abbreviations: C — conductor; E — embolus; MA — median apophysis; RTA — retrolateral tibial apophysis.

Рис. 5. Пальпа самца *Anagraphis karamola* sp.n. (A — голотип; B, D — паратип Та-8490; C — паратип IZRK-244.4): A — вся пальпа, вентрально; B — вся пальпа, ретролатерально; C — вся пальпа, пролатерально; D — RTA, ретролатерально. Abbreviations: RTA — ретролатеральный отросток голени. Сокращения: C — кондуктор; E — эмболос; MA — медиальный отросток; RTA — ретролатеральный отросток голени.

REMARKS. Both species mentioned above, *A. karamola* sp.n. and *A. tajikistanica* comb.n. are extremely close to *A. aculeata* (Charitonov, 1946), described from the vicinity of Yakkabag (Uzbekistan) from a single male [Charitonov, 1946: sub *Talanites* a.]. A characteristic body colouration, the absence of scutum in males, leg spination, the number of cheliceral teeth, and the absence of preening comb on third and fourth metatarsi were the reasons for transferring the latter species to the genus *Anagraphis* and its synonymy with *A. pallens* [Khasayeva, Huseynov, 2017]. Unfortunately, the authors did not compare these two species directly, as the type specimen of *Talanites aculeatus* was not found in the arachnological collection of the Perm State University (S.L. Esyunin, pers. comm.). Yet, the illustration of palp from the original description of *T. aculeatus* [Charitonov, 1946: fig. 43] in general corresponds to those of *A. pallens* provided by Levy [1999: fig. 3] and Chatzaki *et al.* [2002b: fig. 3]. Perhaps the only difference that can be noticed in Kharitonov's figure is the direction of RTA and the shape of its lower tooth: in *A. aculeata* RTA is directed vertically upwards and its lower tooth has a rounded shape (as in *A. tajikistanica* comb.n.), while in *A. pallens* RTA is directed at 13 o'clock and its lower tooth is pointed. However, the shape and proportions of the expanded sclerotized base of the filiform embolus and the shape of the median apophysis, bent towards itself, coincide in the figures of *A. aculeata* and

A. pallens. Thus, at the moment there are hardly any grounds for the revalidation of *A. aculeata*.

The species discussed above can be distinguished by the shape of median apophysis (isosceles triangle in *A. karamola* sp.n., almost straight in *A. tajikistanica*, rectangular almost bent on itself in *A. pallens*); yet, *A. karamola* sp.n. has the strongest RTA with a wide rounded lower tooth and upper tooth shaped as a cat's claw, as well as the most massive basal embolar extension. The female of *A. karamola* sp.n. differs from that of *A. pallens* in the same characters as *A. ochracea* (see Diagnosis).

DESCRIPTION. Male (the holotype). Total length 5.5. Carapace length 2.5, width 2.0; sand color. Eye sizes and inter-distances: AER width 0.48, PER width 0.63, AME 0.10, ALE 0.09, ALE-AME 0, AME-AME 0.08, PLE 0.09, PME 0.09, PLE-PME 0.1, PME-PME 0.15. Medial eyes field trapezoid: length 0.28, width 0.28 anteriorly and 0.34 posteriorly. AME dark ("nocturnal"), other eyes — light ("diurnal"). Chelicerae sand-coloured, with 3 promarginal teeth and 2 retromarginal tooth. Labium and endites sand color. Sternum yellowish. All legs yellowish. Leg formula: IV, I, II, III. Leg measurements: I 9.4 (2.5, 1.4, 2.4, 1.8, 1.3), II 7.7 (2.0, 1.0, 1.9, 1.7, 1.1), III 7.1 (1.8, 1.0, 1.5, 1.9, 0.9), IV 10.0 (2.5, 1.0, 2.0, 2.8, 1.7). Leg spination: Femur I, II d 1-1-1, pl 0-1-1; III, IV d 1-1-1, pl 0-1-1, rl 0-1-1; Tibia I, II pl 1-0-1, v 2-2-2a; III d 1-1-0, pl 1-1-1, rl 1-1-1, v 2-2-2a; IV d 0-1-1, pl 1-1-1, rl 1-1-1, v 2-2-2a; Meta-

Table 2. Length of leg segments in paratypes *Anagraphis karamola* sp.n. (males, n=7). Average±SE, range in parentheses.
Таблица 2. Длина сегментов ног у паратипов *Anagraphis karamola* sp.n. (самцы, n=7). Среднее значение±SE, диапазон в скобках.

	Femur	Patella	Tibia	Metatarsus	Tarsus
I	2.2±0.1 (1.8–2.4)	1.2±0.1 (0.9–1.3)	2.2±0.1 (1.7–2.4)	1.8±0.1 (1.5–1.9)	1.1±0.04 (0.9–1.2)
II	1.9±0.1 (1.6–2.1)	1.0±0.1 (0.6–1.2)	1.7±0.1 (1.3–1.8)	1.4±0.1 (1.1–1.6)	1.0±0.02 (0.9–1.0)
III	1.7±0.1 (1.4–1.9)	0.9±0.03 (0.7–1.0)	1.4±0.1 (1.1–1.8)	1.7±0.1 (1.4–1.9)	0.9±0.04 (0.7–1.0)
IV	2.3±0.1 (1.9–2.4)	1.0±0.05 (0.8–1.2)	1.9±0.1 (1.6–2.1)	2.5±0.1 (2.0–2.8)	1.2±0.1 (0.9–1.6)

tarsus I v 2-2-0, II pl 1-0-0, v 2-2-0; III, IV d 0-2-0, pl 1-1-2, rl 1-1-2, v 2-2-2a. Dorsal side of legs with numerous long setae. Abdomen length 3.0, width 1.7; yellowish, with a dense brush of setae anteriorly ventral. Palp as in Figs 4B–E, 5A–D; femur unmodified, with 3 dorsal and 1 prolateral spines; cymbium slightly elongated; tibial apophysis bifurcated, inferior prong rounded, superior prong claw-shaped; tegulum oval, almost twice longer than wide; subtegulum triangular; sperm duct transverse; median apophysis (MA) like isosceles triangle at the base of which downward-pointing tooth; embolus long, thread-like, with a wide basal extension; conductor transparent, large, distally situated (Figs 4B, C; 5A, B).

Female (paratype, IZRK-250). Total length 4.1. Carapace length 1.8, width 1.5; sand color. Eye sizes and interdistances: AER width 0.41, PER width 0.55, AME 0.08, ALE (oval) 0.08x0.09, ALE-AME 0.03, AME-AME 0.06, PLE 0.08, PME 0.06, PLE-PME 0.09, PME-PME 0.14. Medial eyes field trapezoid: length 0.24, width 0.23 anteriorly and 0.29 posteriorly. AME dark (“nocturnal”), other eyes — light (“diurnal”). Chelicerae sand color, with 3 promarginal teeth and 2 retromarginal tooth. Labium and endites sand-coloured. Sternum yellowish. All legs yellowish. Leg formula: IV, I, II, III. Leg measurements: I 6.2 (1.8, 1.0, 1.6, 1.1, 0.7), II 5.0 (1.3, 0.8, 0.9, 1.2, 0.8), III 4.9 (1.3, 0.7, 1.0, 1.2, 0.7), IV 6.7 (1.7, 0.8, 1.5, 1.9, 0.8). Leg spination: Femur I d 1-1-0, pl 0-1-1; II d 1-1-1, pl 0-1-1; III, IV d 1-1-1, pl 0-1-1, rl 0-0-1; Tibia I, II v 2-2-0; III d 0-1-0, pl 1-1-1, rl 1-1-1, v 2-2-2a; IV d 0-1-1, pl 1-1-1, rl 1-1-1, v 2-2-2a; Metatarsus I, II v 2-2-0, III, IV d 0-2-0, pl 1-1-2, rl 1-1-2, v 2-2-2a. Dorsal side of legs with numerous long setae. Abdomen length 2.3, width 1.5; yellowish, with a dense brush of setae ventro-anteriorly. Epigyne: median depression V-shaped; transverse edges sclerotized; median part triangular and short, sclerotized; spermathecae partially visible under median depression ventrally (Fig. 4F). Vulva: spermathecae with two chambers (globular and oblong); oblong chambers length is more than 2 times diameter round chambers; oblong chambers border round chambers both sides; globular chambers vaguely structured inside (Fig. 4G).

Measurements of other paratypes (males, n=7). Total length 5.1±0.3 (range 3.9–5.9). Carapace 2.4±0.1 (1.9–2.7) long, 1.9±0.1 (1.5–2.0) wide. Leg measurements presented in the Table 2. Leg spination: Femur I, II d 1-1-1, rl 0-0-0 or 0-0-1 or 0-1-0, pl 0-1-1, III, IV d 1-1-1, rl 0-1-1 or 1-1-1, pl 0-1-1 or 1-0-1; Tibia I, II pl 1-0-1 or 1-1-1 or 0-0-1 or 1-1-0, v 2-2-2a; III, IV d 0-1-0 or 1-1-1, rl 1-1-1, pl 1-1-1, v 2-2-2a; Metatarsus I, II pl 0-0-0 or 0-1-0 or 1-0-0, v 2-2-0; III, IV d 0-2-0, rl 1-1-2, pl 1-1-2, v 2-2-2a. Dorsal side of legs with numerous long setae. Abdomen length 2.7±0.2 (2.0–3.3), width 1.8±0.1 (1.3–2.0).

DISTRIBUTION. Only the type locality: East Kyzylkum Desert (Kazakhstan).

Species list

ARANEIDAE

Aculepeira armida (Audouin, 1826)

MATERIAL. 1 ♀ [1].

DISTRIBUTION. West Palaearctic [Mikhailov, 2022; WSC, 2024]

Aculepeira packardii (Thorell, 1875)**

MATERIAL. 2 ♀♀ [2]; 1 ♀ [1].

DISTRIBUTION. Holarctic [Dondale *et al.*, 2003].

REMARKS. The species is first recorded from Kyzylkum.

Araniella villanii Zamani, Marusik et Šestáková, 2020**

MATERIAL. 1 ♂ [12].

DISTRIBUTION. Southwest Iran, eastern Kazakhstan and northern India [Zamani *et al.*, 2020b].

REMARKS. The species is first recorded from Kyzylkum.

CHEIRACANTHIIDAE

Cheiracanthium erraticum (Walckenaer, 1802)**

MATERIAL. 1 ♀ [12].

DISTRIBUTION. Trans-Palaearctic boreo-nemoral [Marusik *et al.*, 2000].

REMARKS. The species is first recorded from Kyzylkum.

Cheiracanthium pennyi O. Pickard-Cambridge, 1873**

MATERIAL. 1 ♂ [3].

DISTRIBUTION. West Palaearctic) subboreal [Sozontov, Eshyunin, 2022].

REMARKS. The species is first recorded from Kyzylkum.

DESIDAE

Paracedicus gennadii (Fet, 1993)*

Fig. 6A–C.

MATERIAL. 2 ♂♂ [4].

DISTRIBUTION. Turkmenistan, SE Iran [Fet, 1993; Zamani *et al.*, 2016].

REMARKS. This is the first record of the species from Kazakhstan. The new record from East Kyzylkum represents the northernmost locality of the species' range.

Cedicoides cf. parthus (Fet, 1993)**

MATERIAL. 1 ♀ [12].

DISTRIBUTION. Turkmenistan, Kazakhstan [Fet, 1993; Mikhailov, 2022].



Fig. 6. *Paracedicus gennadii* (A–C), *Asiabodus asiaticus* (D–E, G–H) and *Minosia simeonica* (F, I) scanning electron micrographs: A, D — palp, ventral; B, G — palp, retrolateral; C — patellar apophyses, retrolateral; E, F — epigyne, ventral; H, I — epigyne, dorsal.

Рис. 6. *Paracedicus gennadii* (A–C), *Asiabodus asiaticus* (D–E, G–H) и *Minosia simeonica* Levy, 1995 (F, I) сканирующие электронные фотографии: A, D — палпа, вентрально; B, G — палпа, ретролатерально; C — отростки голени палпы, ретролатерально; E, F — эпигина, вентрально; H, I — эпигина, дорсально.

REMARKS. During clearing the endogyne from soft tissue, the receptaculae became deformed. However, in general, the structure of the endogyne resembles the drawing from the original description of the species [Fet, 1993]. The species is first recorded from Kyzylkum.

EUAGRIDAE

Phyioschema raddei Simon, 1889

MATERIAL. 1 ♀ 1juv [1].

DISTRIBUTION. From the east coast of the Caspian Sea to the Tian Shan, Pamir and Karakorum mountains [Schwendinger, Zonstein, 2011].

FILISTATIDAE

Zaitunia maracandica (Charitonov, 1946)

MATERIAL. 2 ♀♀ [1].

DISTRIBUTION. Uzbekistan and southern Kazakhstan [Zonstein, Marusik, 2016].

GNAPHOSIDAE

Asiabadus asiaticus (Charitonov, 1946) *

Fig. 6D–E, G–H.

MATERIAL. 1 ♂ [5]; 1 ♂ 2 ♀♀ [10]; 1 ♂ [12].

DISTRIBUTION. The species was described from the foothills of southern Uzbekistan [Charitonov, 1946], and was also known from Turkmenistan and Afghanistan [Roewer, 1961; Ovtsharenko, Fet, 1980].

REMARKS. This is the first record of the species from Kazakhstan. The new record from East Kyzylkum represents the northernmost locality of the species' range.

Berlandina plumalis (O. Pickard-Cambridge, 1872)

MATERIAL. 1 ♂ 1 ♀ [1].

DISTRIBUTION. From West Africa to Afghanistan [Zamani *et al.*, 2015].

Fedotovia uzbekistanica Charitonov, 1946

MATERIAL. 3 ♂♂ [2]; 1 ♂ [1].

DISTRIBUTION. Kazakhstan, Uzbekistan, Tajikistan and Afghanistan [Fomichev, Marusik, 2015].

Minosia simeonica Levy, 1995*

Fig. 6F, I.

MATERIAL. 1 ♀ [6]; 1 ♀ [7]; 3 ♀♀ [8].

DISTRIBUTION. Israel, Iran [Levy, 1995; Sadeghi *et al.*, 2016].

REMARKS. This is the first record of the species from Kazakhstan. The discovery of the species in Kyzylkum expanded its range by 5° to the north and 9° to the east compared to the earlier findings in Iran [Sadeghi *et al.*, 2016].

Marinarozelotes cf. mutabilis (Simon, 1878)

MATERIAL. 1 ♂ [1].

REMARKS. The species is close to *M. mutabilis*, but the process of the palpal tibia, the embolic shape and the structure of median apophysis are different. This specimen appears to belong to an undescribed species.

Nomisia aussereri (L. Koch, 1872)

MATERIAL. 1 ♀ [12].

DISTRIBUTION. From Northern Africa to Mongolia [Tuneva, 2003; Chatzaki, 2010].

Nomisia conigera (Spassky, 1941)**

MATERIAL. 1 ♂ 1 ♀ [1].

DISTRIBUTION. Turkey, Caucasus, Central Asia [Chatzaki, 2010; Mikhailov, 2022].

REMARKS. The species is first recorded from Kyzylkum.

Nomisia negebensis Levy, 1995*

Fig. 7A, D.

MATERIAL. 12 ♀♀ [10].

DISTRIBUTION. Israel, Iran [Levy, 1995; Sadeghi *et al.*, 2016].

REMARKS. This is the first record of the species from Kazakhstan. The discovery of the species in Kyzylkum expanded its range by 5° to the north and 8° to the east compared to the earlier findings in Iran [Sadeghi *et al.*, 2016].

Synaphosus turanicus Ovtsharenko, Levy et Platnick, 1994

MATERIAL. 1 ♂ [1].

DISTRIBUTION. Central Asia [Ovtsharenko *et al.*, 1994; Marusik, Fomichev, 2016].

Zelotes anatolyi Fomichev et Marusik, 2021*

MATERIAL. 1 ♂ [1].

DISTRIBUTION. Tajikistan [Fomichev, Marusik, 2021].

REMARKS. The male palp of our specimen fully corresponds to the images presented in original description [Fomichev, Marusik, 2021]. This is the second find of the species since its description and the first registration of the species on the territory of Kazakhstan.

LINYPHIIDAE

Agyneta fuscipalpus (C.L. Koch, 1836)

MATERIAL. 1 ♂ [5]; 1 ♂ [6]; 1 ♂ [7].

DISTRIBUTION. Widespread in the southern Palearctic Region, from Europe and North Africa in the west to China in the east [Tanasevitch, 2010].

Microlinyphia pusilla (Sundevall, 1830)

MATERIAL. 1 ♀ [2].

DISTRIBUTION. Circum-Holarctic polyzonal [Sozontov, Eshyunin, 2022].

Styloctetor lehtineni Marusik et Tanasevitch, 1998*

Fig. 7B–C.

MATERIAL. 1 ♀ [4]; 1 ♂ [6].

DISTRIBUTION. Siberian hypoarctic [Marusik, Tanasevitch, 1998; Khruleva *et al.*, 2022].

REMARKS. This is the first record of the species from Kazakhstan. The new record from East Kyzylkum extends the known species range by 10° to the south.

It is worth mentioning that the male of *S. lehtineni* we collected has a broadly conical hump on carapace. There is a densely bristled groove at the top of the hump. This feature was not mentioned in the original description [Marusik, Tanasevitch, 1998].

Styloctetor logunovi (Eskov et Marusik, 1994)*

MATERIAL. 1 ♀ [1].

DISTRIBUTION. From the south-west of Eastern Siberia and the mountains of Southern Siberia to the south of Mongolia [Marusik, Tanasevitch, 1998; Mikhailov, 2022]. The southernmost record of the species is known from Iran [Zamani *et al.*, 2020a].

REMARKS. The epigyne of our specimen fully corresponds to the figures presented by Zamani *et al.* [2020]. This is the first record of the species from Kazakhstan.

LYCOSIDAE

Lycosa cf. uzbekistanica Logunov, 2023*

MATERIAL. 2 ♂♂ [4]; 3 ♂♂ 3 juv. [10]; 13 ♂♂ 31 ♀♀ [12]; 5 ♂♂ 7 ♀♀ [13].

REMARKS. This is the first record of the species in Kazakhstan. The species was recently described based on two females from Uzbekistan. The copulatory organs of the females collected fit those of the paratype [Logunov, 2023L figs. 152–153], but differ from those of the holotype [Ibid: figs. 150–151]. Thus, either the original description of *L. uzbekistanica* included females of two close but different species, or the observed differences reflect a wide intraspecific variation. This matter, as well as a description of the male, will be addressed in detail elsewhere.

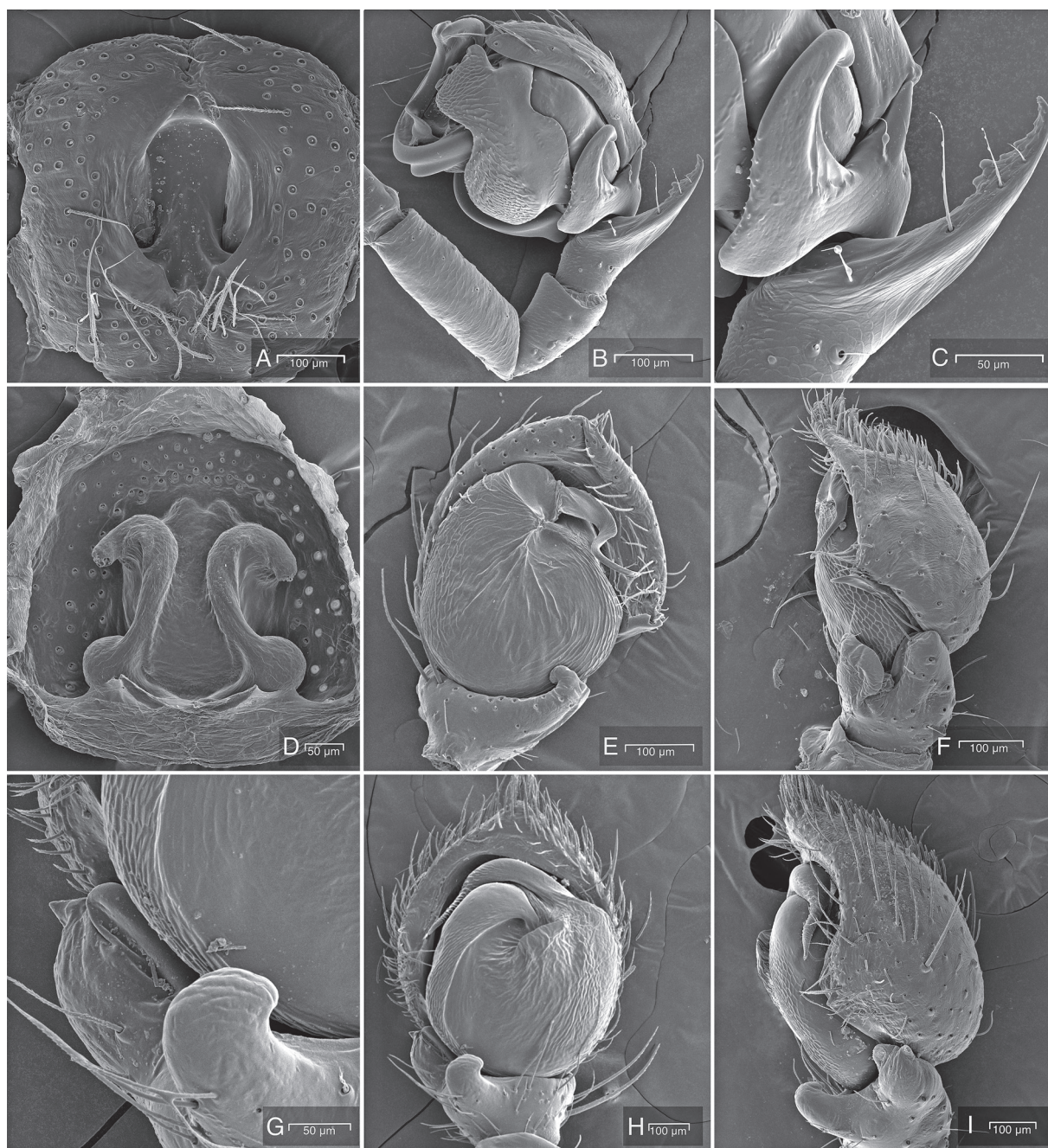


Fig. 7. *Nomisia negebensis* (A, D), *Styloctetor lehtineni* (B–C), *Psammitis minor* (E–F) and *Xysticus turkmenicus* (G–I) scanning electron micrographs: A — epigyne, ventral; B, F, I — palp, retrolateral; C — paracymbium and patellar apophysis, retrolateral; D — epigyne, dorsal; E, H — palp, ventral; G — patellar apophysis, ventral.

Рис. 7. *Nomisia negebensis* (A, D), *Styloctetor lehtineni* (B–C), *Psammitis minor* (E–F) и *Xysticus turkmenicus* (G–I) сканирующие электронные фотографии: A — эпигина, вентрально; B, F, I — пальпа, ретролатерально; C — парацимбиум и отросток голени пальпы, ретролатерально; D — эпигина, дорсально; E, H — пальпа, вентрально; G — отростки голени пальпы, вентрально.

Pardosa gromovi Ballarin, Marusik, Omelko
et Koponen, 2012**

MATERIAL. 1 ♂ [1].

DISTRIBUTION. SE Kazakhstan [Ballarin *et al.*, 2012].

REMARKS. The species is first recorded from Kyzylkum.

Pardosa jaikensis Ponomarev, 2007**

MATERIAL. 2 ♀♀ [3].

DISTRIBUTION. Caucasus, western Kazakhstan, Iran and Altai Territory [Ponomarev, 2007; Zamani *et al.*, 2019; Fomichev, 2022].

REMARKS. The species is first recorded from Kyzylkum.

Pardosa nebulosa (Thorell, 1872)

MATERIAL. 1 ♀ [3].

DISTRIBUTION. West Palaearctic [Esyunin *et al.*, 2007].

LIOCRANIDAE

Mesiotelus kulczynskii Charitonov, 1946*

MATERIAL. 1 ♀ [10].

DISTRIBUTION. N Iran, Turkmenistan, Uzbekistan, Kyrgyzstan [Mikhailov, Fet, 1986; Zamani *et al.*, 2022a; Mikhailov, 2022].

REMARKS. This is the first record of the species in Kazakhstan.

PALPIMANIDAE

Palpimanus sp.

MATERIAL. 1 ♀ 4 juv. [1].

REMARKS. There are no males in our material, so it is difficult to accurately identify the species. Mikhailov [2022] indicated that only *Palpimanus sogdianus* Charitonov, 1946 is known from Kazakhstan. However, Fomichev *et al.* [2023] clarified that this species is confined to eastern Uzbekistan (from the western spurs of the Hissar Mts.). Hence, the records of *P. gibbulus* Dufour, 1820 from the Kyzylkum desert [Kroneberg, 1875: 43; Zyuzin *et al.*, 1994: 6] need verification.

PHILODROMIDAE

Philodromus cespitum (Walckenaer, 1802)**

MATERIAL. 1 ♀ [12].

DISTRIBUTION. Circum-Holarctic polyzonal [Sozontov, Esyunin, 2022].

REMARKS. The species is first recorded from Kyzylkum.

Rhysodromus cf. *timidus* (Szita et Logunov, 2008)

MATERIAL. 1 ♀ [2].

REMARKS. This specimen has an area with bristles in front of the spinnerets. However, the shape of this area, as well as the epigyne, does not correspond to that of *R. timidus* (see Logunov *et al.* [2011: figs 1–4]). Apparently, this specimen belongs to an undescribed species; more specimens of both sexes are required to prove or reject this assumption.

Thanatus fabricii (Audouin, 1826)

MATERIAL. 1 ♀ [1].

DISTRIBUTION. From the Canary Islands East to Tajikistan [Lyakhov, 2000].

Thanatus kitabensis Charitonov, 1946

MATERIAL. 1 ♂ 11 ♀♀ [1]; 1 ♀ [2].

DISTRIBUTION. Turanian [Lyakhov, 2000].

Thanatus pictus L. Koch, 1881

MATERIAL. 1 ♀ [4].

DISTRIBUTION. West Palaearctic subboreal [Kastrygina, Kovblyuk, 2013].

REMARKS. The species is first recorded from Kyzylkum.

PHOLCIDAE

Pholcus ponticus Thorell, 1875**

MATERIAL. 1 ♂ [10].

DISTRIBUTION. Distributed from the Mediterranean to NW China [Huber, 2011; WSC, 2024].

REMARKS. The species is first recorded from Kyzylkum.

PRODIDOMIDAE

Prodidomus redikorzevi Spassky, 1940

MATERIAL. 1 ♂ 1 ♀ [1].

DISTRIBUTION. Turkey, Azerbaijan, Iraq, Iran, Turkmenistan, S Kazakhstan [Marusik, 2010; Kunt *et al.*, 2012].

SALTICIDAE

Aelurillus dubatolovi Azarkina, 2003**

MATERIAL. 1 ♂ 1 ♀ [8]; 4 ♂♂ 1 ♀ [10].

DISTRIBUTION. Central Asia [Azarkina, 2003].

REMARKS. The species is first recorded from Kyzylkum.

Chalcoscirtus zyuzini Marusik, 1991**

MATERIAL. 2 ♀♀ [1].

DISTRIBUTION. S Kazakhstan, Uzbekistan, Tajikistan [Logunov, Marusik, 1999].

REMARKS. The species is first recorded from Kyzylkum.

Mogrus larisae Logunov, 1995

MATERIAL. 1 ♂ 4 ♀♀ [1]; 3 ♀♀ [3].

DISTRIBUTION. Central Asia [Logunov, 1995].

Pellenes geniculatus (Simon, 1868)

MATERIAL. 1 ♀ [1].

DISTRIBUTION. From France to Central Asia [Logunov *et al.*, 1999].

Salticus dzhungaricus Logunov, 1992

MATERIAL. 1 ♂ [2].

DISTRIBUTION. Kazakhstan, Turkmenistan [Logunov, Rakov, 1998].

THERIDIIDAE

Asagena semideserta (Ponomarev, 2005)**

MATERIAL. 1 ♂ [1].

DISTRIBUTION. West and South Kazakhstan, Western Mongolia [Marusik *et al.*, 2016].

REMARKS. The species is first recorded from Kyzylkum. The new record represents the southernmost locality of the species' range.

Enoplognatha gershomi Bosmans et Van Keer, 1999

MATERIAL. 3 ♀♀ [1].

DISTRIBUTION. Israel, Iraq, South Kazakhstan, Turkmenistan and Uzbekistan [Zamani, Marusik, 2022].

Enoplognatha mediterranea Levy et Amitai, 1981*

MATERIAL. 3 ♀♀ [1].

DISTRIBUTION. From Greece to Israel, the Caucasus and Iran [Levy, Amitai, 1981; Bosmans, Van Keer 1999; Huseynov, Marusik 2008; Zamani *et al.*, 2022b;].

REMARKS. Record of *E. mediterranea* from Kazakhstan extends the known species range to more than 10° to the east. The species is first recorded from Kyzylkum and Kazakhstan.

Latrodectus tredecimguttatus (Rossi, 1790)

MATERIAL. 1 ♀ [10].

DISTRIBUTION. Mediterranean, Ukraine, Caucasus, Russia (Europe to South Siberia) Ner East, Central Asia, Xinjiang, steppe habitats of semi-desert areas [Zhu, 1998; Zamani *et al.*, 2014].

Steatoda albomaculata (De Geer, 1778)

MATERIAL. 1 ♀ [1]; 1 ♀ [2]; 1 ♀ [3].

DISTRIBUTION. Circum-Holarctic polyzonal [Sozontov, Esyunin, 2022].

Steatoda paykulliana (Walckenaer, 1806)

MATERIAL. 1 ♂ 1 ♀ [3].

DISTRIBUTION. West Palaearctic [Levy, 1998b].

THOMISIDAE

Ozyptila lugubris (Kroneberg, 1875)

MATERIAL. 1 ♀ [1]; 1 ♂ [4]; 1 ♂ [8]; 1 ♂ [9]; 7 ♂♂ 3 ♀♀ [10].

DISTRIBUTION. From South Kazakhstan to northern Iran [Marusik, Mikhailov, 2021].

Psammitis minor (Charitonov, 1946)

Fig. 7E–F.

MATERIAL. 6 ♂♂ 3 ♀♀ [4]; 2 ♂♂ [5]; 6 ♂♂ 1 juv. [6]; 2 ♂♂ 1 ♀ 2 juv. [7]; 5 ♂♂ [8]; 4 ♂♂ [10]; 2 ♂♂ 1 ♀ [12].

DISTRIBUTION. Central Asia [Marusik, Logunov, 1990; Mikhailov, 2022].

Synema utotchkini Marusik et Logunov, 1995**

MATERIAL. 1 ♂ [3].

DISTRIBUTION. From Turkey to South Siberia and Central Asia [Fomichev, 2022; WSC, 2024].

REMARKS. The species is first recorded from Kyzylkum.

Xysticus pseudocristatus Azarkina et Logunov, 2001**

MATERIAL. 1 ♂ [1].

DISTRIBUTION. Central Asian subboreal [Azarkina, Logunov, 2001].

REMARKS. The species is first recorded from Kyzylkum.

Xysticus turkmenicus Marusik et Logunov, 1995**

Fig. 7G–I.

MATERIAL. 1 ♂ [9].

DISTRIBUTION. South of Central Asia [Marusik, Logunov, 1995].

REMARKS. The species is first recorded from Kyzylkum.

Conclusion

A total of 54 species belonging to 16 families have been identified in the studied material. Four additional families (Hersiliidae, Oecobiidae, Dictynidae and Oxyopidae) were represented only by juveniles. The largest species number was represented by Gnaphosidae (12), Theridiidae (6), Salticidae, Thomisidae and Philodromidae (5 species each). The remaining families were represented by 1–4 species. Two species of the Gnaphosidae have been described as new: *Drassodes babenkoi* sp.n. (♂♀) and *Anagraphis karamola* sp.n. (♂♀). Two other species are likely to also be new: viz., *Marinarozelotes* cf. *mutabilis* (Gnaphosidae), *Rhysodromus* cf. *timidus* (Philodromidae). Unfortunately, both of them are represented by single specimens. Of the collected species, 27 have been first found in Kyzylkum, and 10 species (*Asiabadus asiaticus*, *Enoplognatha mediterranea*, *Lycosa* cf. *uzbekistanica*, *Mesiotelus kulczynskii*, *Minosia*

simeonica, *Nomisia negebensis*, *Styloctetor lehtineni*, *S. logunovi*, *Zelotes anatolyi*, *Paracedicus gennadii*) have been recorded from Kazakhstan for the first time.

The findings of four species are of particular interest. *M. simeonica* and *N. negebensis* expanded their ranges by 5° to the north and 8–9° to the east compared to the earlier findings in Iran [Sadeghi *et al.*, 2016]. The range of *E. mediterranea* was also expanded by 8°–10° to the east. The East Kyzylkum desert represents the southernmost locality of *S. lehtineni* (south by 10°). Finally, *P. gennadii*, *A. asiaticus*, *Z. anatolyi* and *A. semideserta* are also shown to have slightly wider ranges than was previously thought (for the latter species. Eastern Kyzylkum is the southernmost limit of its range, and for all others it is the northernmost limit).

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