

A new species of the centipede genus *Hessebius* Verhoeff, 1941 from Turkmenistan, Middle Asia (Chilopoda: Lithobiomorpha: Lithobiidae)

Новый вид многоножек-костянок рода *Hessebius* Verhoeff, 1941 из Туркменистана (Средняя Азия) (Chilopoda: Lithobiomorpha: Lithobiidae)

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КЛЮЧЕВЫЕ СЛОВА: многоножки, таксономия, иконография, “Центральная Азия”.

ABSTRACT. *Hessebius kopetdagicus* sp.n. is described based on five specimens of both sexes from Turkmenistan. The new species is similar to *H. multicalcaratus* Folkmanová, 1958, *H. scythodes* Volkova, 2016, and *H. zalesskajae* Farzalieva, 2017, but it differs well in the larger body (23–25 mm, vs. 9–21 mm in *H. multicalcaratus*, 14–16 mm in *H. scythodes*, and 14–19 mm in *H. zalesskajae*), and by the secondary sexual characters of ♂ legs 14 and 15: both femora of legs 14 and 15 shortened (about as long as prefemora), vs. femora 14 and 15 longer than prefemora in *H. multicalcaratus*, *H. scythodes*, and *H. zalesskajae*. The new species also shows a strongly swollen tibia 15 with a dark pore blot on the dorsal side and a deep anterodorsal depression merged with the lateral one, vs. tibia 15 is less strongly swollen and devoid of such anterodorsal depressions and pore blots in *H. multicalcaratus*, *H. scythodes*, and *H. zalesskajae*.

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РЕЗЮМЕ. По пяти экземплярам из Туркменистана описан *Hessebius kopetdagicus* sp.n. Новый вид близок к *H. multicalcaratus* Folkmanová, 1958, *H. scythodes* Volkova, 2016 и *H. zalesskajae* Farzalieva, 2017, но отличается большими размерами тела (23–25 мм против 9–21 мм у *H. multicalcaratus*, 14–16 мм у *H. scythodes* и 14–19 мм у *H. zalesskajae*), а также вторичными половыми признаками ног 14 и 15 самца: бёдра 14 и 15 короткие (примерно равны длине предбёдер), тогда как у *H. multicalcaratus*, *H. scythodes* и *H. zalesskajae* бёдра 14 и 15 длиннее предбёдер. Кроме того, у самцов нового вида сильно утолщены голени 15, на которых на дорсальной поверхности располагаются темное пятно с порами и глубокое антеродорсальное вдавление, которое продолжается на латеральную сторону, тогда как у *H. multicalcaratus*, *H. scythodes* и *H. zalesskajae* голени 15 менее утолщены, без таких углублений и пятен с порами.

Introduction

The genus *Hessebius* Verhoeff, 1941 was established by Verhoeff [1941] and originally included two species, *H. kosswigi* and *H. tauricus*, both from Turkey. Currently, the former species is considered a junior synonym of *H. barbipes* (Porat, 1893), while the latter one is a junior synonym of *Lithobius parvicornis* (Porat, 1893) [Zapparoli, 1999].

To date, *Hessebius* comprises 20 species ranging from Anatolia [Zapparoli, 1999] and northeastern Africa to eastern China [Ma *et al.*, 2009, 2014, 2018; Pei *et al.*, 2010, 2021; Qiao *et al.*, 2018, 2019], of which seven are known from Middle Asia: *H. barbipes* (Porat, 1893), *H. golovatchi* Farzalieva, 2017, *H. major* Folkmanová et Dobroruka, 1960, *H. perelae* Zaleskaja, 1978, *H. pervagatus* Zaleskaja, 1978, *H. plumatus* Zaleskaja, 1978, and *H. zalesskajae* Farzalieva, 2017 [Zaleskaja, 1978; Folkmanová, Dobroruka, 1960; Farzalieva, 2017; Dyachkov, 2020, 2022, 2023; Dyachkov *et al.*, 2022]. Further three species have been reported from adjacent areas: *H. longispinipes* Ma, Pei et Zhu, 2009, *H. multicalcaratus* Folkmanová, 1958, and *H. scythodes* Volkova, 2016 [Folkmanová, 1958; Pei *et al.*, 2010; Volkova, 2016; Dyachkov, 2019; Bragina *et al.*, 2020].

The present note describes a new species, *Hessebius kopetdagicus* sp.n., from Turkmenistan.

Material and methods

The material is deposited at the ZMMU collection (abbreviations explained below), non-type material is in the ZISP. The specimens were examined using Olympus stereo microscopes: SZX16 and BX51; photographs were taken with Olympus digital cameras: DP74 and XC50. SEM micrographs were obtained applying a Hitachi TM1000 scanning electron microscope at ISEA. For a more detailed study, the cephalic plate, forcipules, mandibles, and maxillary complex were mounted on permanent slides utilizing Euparal medium.

The counts of tergites and standardized terminology follow Bonato *et al.* [2010].



Fig. 1. Location of Kopet Dag Mts in Turkmenistan.

Рис. 1. Расположение гор Копетдаг в Туркменистане.

Total body length was measured from the anterior margin of the cephalic plate to the posterior margin of the postpedal tergite. The length of the tergites and sternites was measured from the middle of the front margin to the middle of the rear margin; the width of the tergites and sternites was measured on the widest part. Measurements were taken using FAST software version 1.0 [Vaganov *et al.*, 2021] and are given in mm.

Data on leg spinulation are presented in a tabular form. The number of coxal pores on legs 12–15 is given as a formula where a series of Arabic numerals indicates the number of pores from legs 12 to 15.

Locality data repeat the original labels, with additional information given in square brackets.

The map (Fig. 1) was generated using SimpleMappr software [Shorthouse, 2010].

Abbreviations: coll. — collector, ISEA — Institute of the Systematics and Ecology of Animals, Novosibirsk, Russia, ZISP — Zoological Institute Russian Academy of Sciences, Saint Petersburg, Russia, ZMMU — Zoological Museum of the Moscow State University, Moscow, Russia; morphology: a — anterior, C — coxa, D — dorsal, F — femur, m — median, P — prefemur, p — posterior, S/SS — sternite(s), T/TT — tergite(s), Ti — tibia, Tim — intermediate tergite, Tr — trochanter, Ts1 — tarsus 1, Ts2 — tarsus 2, Tsi — tarsi, V — ventral.

Taxonomy

Lithobiidae Newport, 1844
Genus *Hessebius* Verhoeff, 1941

Hessebius kopetdagicus sp.n.
Figs 1–8.

MATERIAL. Holotype ♂ (ZMMU Rc 8525), Turkm[enistan], Kopetdagh [or Kopet Dagh Mt.] Range, V.1988, coll. I.V. Muratov.

Paratypes: 2 ♂♂, 1 ♀ (ZMMU Rc 8407), same data as holotype.

Non-type material: 1 ♂ (ZISP MYR_CHI_0000267), [Turkmenistan], Gaudan, 1897, coll. E.M. Filippovich.

ETYMOLOGY. The specific name *kopetdagicus* refers to the *terra typica*.

DIAGNOSIS. A *Hessebius* 23–25 mm in body length; antennae with 20 articles; 4–5 ocelli in a single row; Tömösváry's organ small, as large as the nearest ocellus; 2+2 acute teeth and stout porodonts at dental margin of forcipular coxosternite; DCa developed from legs 13 and 14; 14F and 15F: shortened (about as long as 14P and 15P); ♂ legs 14 with P, F, Ti slightly incrassate, both Tsi slender, mesal side of Ti with a large dark pore blot with *ca* 50 setae; ♂ legs 15 with P, F, Ti strongly incrassate, both Tsi slender, F: almost flattened dorsally with a pair of weak dorsal and dorsolateral sutures, Ti: almost rectangular with a deep anterodorsal depression merging with lateral one, Ti flattened dorsally with a dark pore blot and *ca* 45–50 evenly spaced setae on dorsal side; legs 15 lacking accessory claws; coxal pores 4–5; male gonopod 1-segmented with 8–10 very thin and long setae; ♀ gonopod with 4+4 spurs and a bidentate claw, distodorsal outgrowth on article 2 armed with 3 thin and long dorsal setae, 3rd article with 3 thin and light dorsal setae.

DESCRIPTION. Holotype. Length, mm: body approx. 23, cephalic plate 2. Width, mm: cephalic plate 2.45; forcipular T 1.8, macroTT (Fig. 2A–D): T1 2.2, T3 2.3, T5 2.3, T7 2.5, T8 and 10 2.4, T12 2.6, T14 2.3, Tim 1.6.

Colouration: body dark yellow (70% in alcohol), cephalic plate slightly darker.

Both antennae broken off, composed of 14 (right) or 4 (left) articles, all articles slightly elongate, covered with dense, light, erect sensilla.

Cephalic plate (Fig. 3A): smooth and slightly convex, tiny setae scattered very sparsely over entire surface; several long setae located behind transverse suture; posterior margin slightly concave.

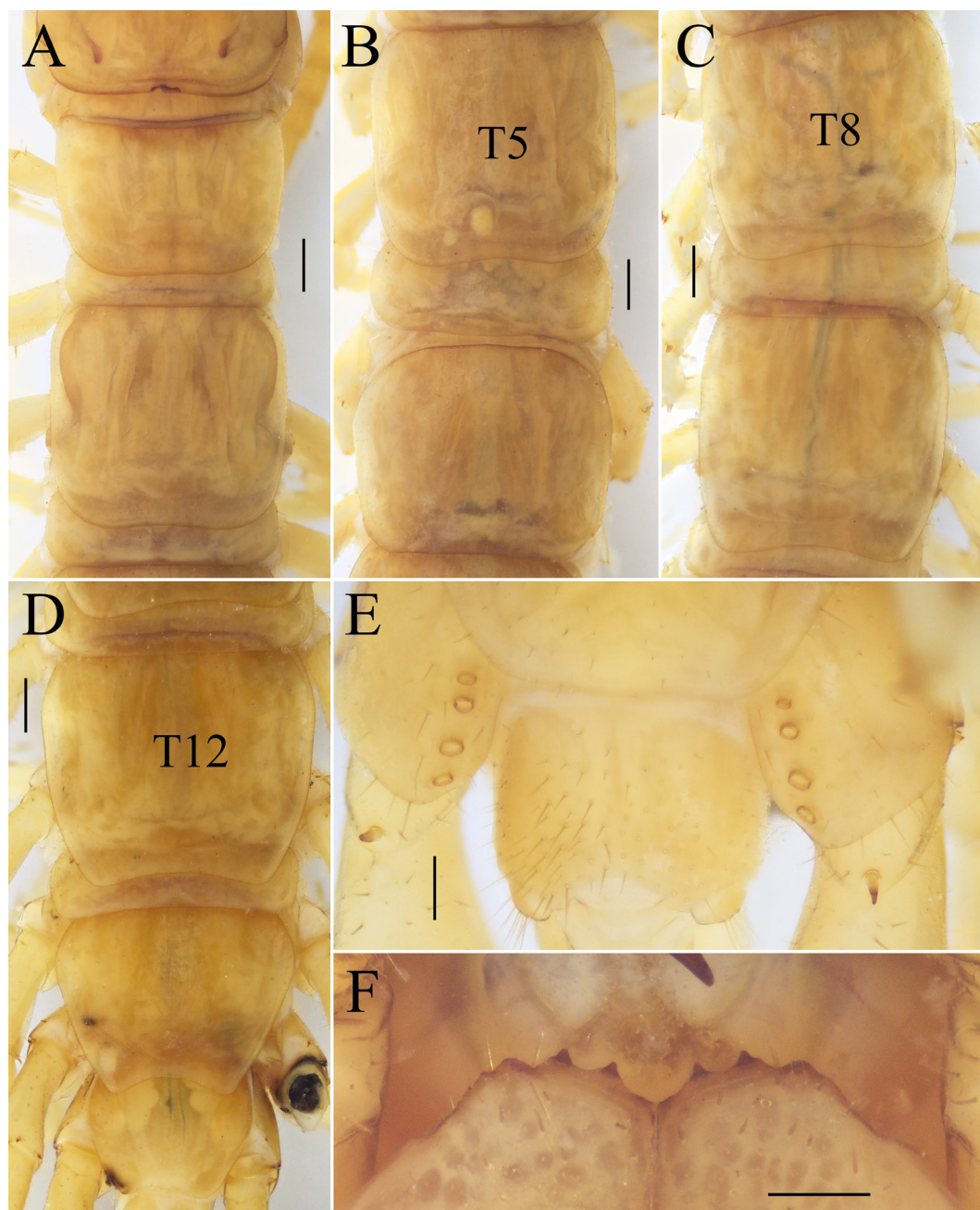


Fig. 2. *Hessebius kopetdagicus* sp.n. (holotype): A — tergites 1–4, dorsally; B — tergites 5–7, dorsally; C — tergites 8–10, dorsally; D — rear body fragment, dorsally; E — coxae of ultimate leg-bearing segment and postpedal segments, ventrally; F — dental margin of forcipular coxosternite, ventrally. Abbreviations: T5, T8, T12 — tergites 5, 8, and 12. Scale: 0.5 mm (A–D), 0.2 mm (E–F).

Рис. 2. *Hessebius kopetdagicus* sp.n. (голотип): А — тергиты 1–4, дорсально; В — тергиты 5–7, дорсально; С — тергиты 8–10, дорсально; D — задний фрагмент тела, дорсально; E — тазики последнего сегмента с ногами и постпедальные сегменты, вентрально; F — зубной край кокостернита ногочелюстей, вентрально. Сокращения: T5, T8, T12 — тергиты 5, 8 и 12. Масштаб: 0,5 мм (А–D), 0,2 мм (E–F).

Ocelli: four on each side in a broken single row, anterior ocellus smaller than following ones, all ocelli rounded, domed, and translucent. Tömösváry's organ small, as large as the nearest ocellus, rounded, separated from the nearest ocellus by a distance about this ocellus diameter.

Forcipular segment: T partially covering T1; anterior margin of coxosternite broad, median diastema U-shaped; 2+2 acute identical teeth, porodonts fallen off. Shoulders sharply sloping behind porodonts (Fig. 2F). Long to short setae in anterior part

of ventral surface of coxosternite. Trochanteroprefemur, F, Ti and basal part of tarsungulum covered with few setae.

TT (Fig. 2A–D): almost smooth, sparsely setose along margins, with rounded posterior corners. Macro-TT poorly sinuate, micro-TT with almost straight posterior margins. T15 indistinct. Tim (Fig. 2D) with a sinuate caudal margin, length to width ratio *ca* 1:1.3.

SS: smooth with short and sparse setae, genital S densely setose; length to width ratio *ca*: S1, 1:1.2; S2, 1:1.3; S3 and

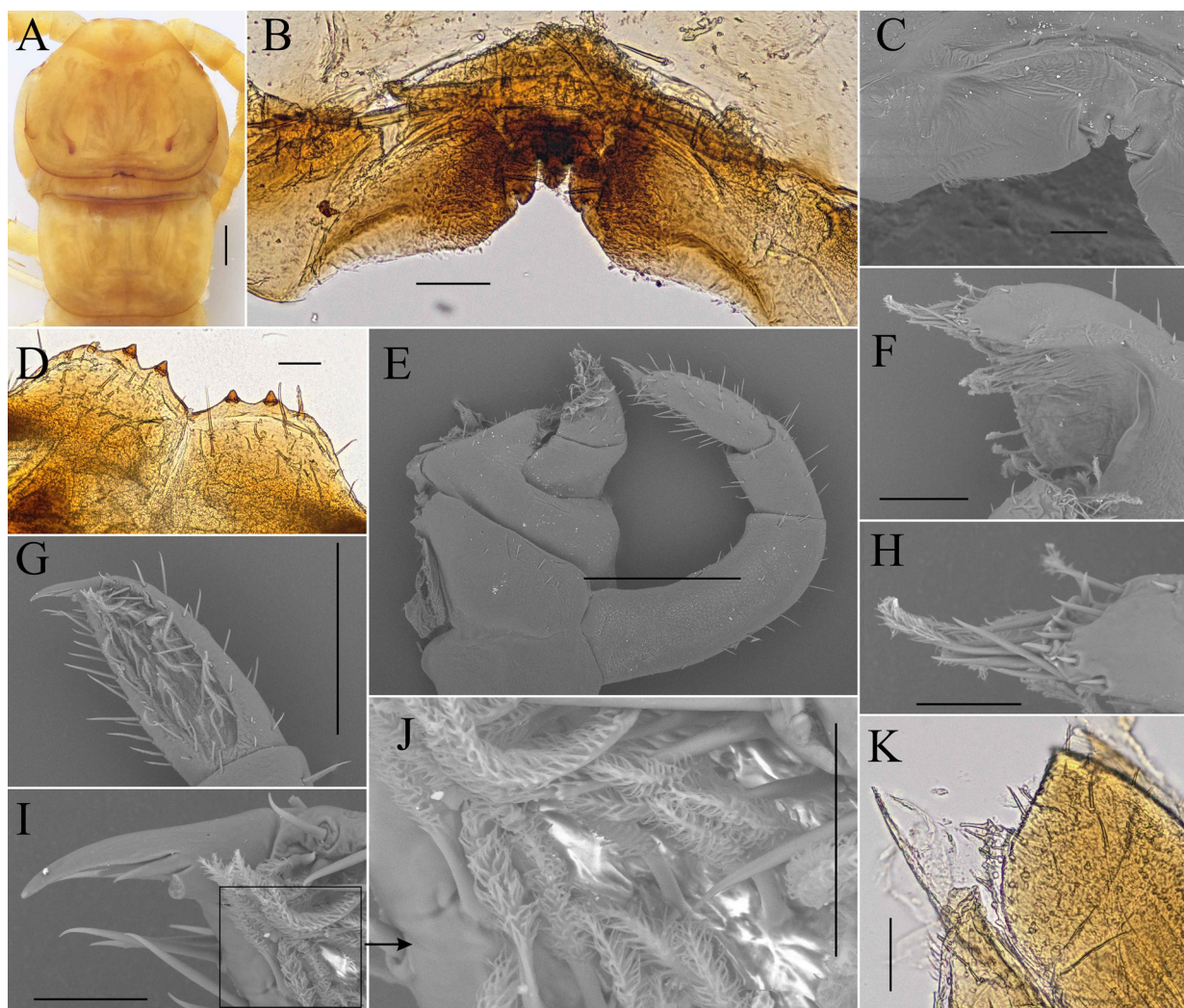


Fig. 3. *Hessebius kopetdagicus* sp.n. (A, holotype, dorsally; B–K, paratypes, ventrally): A — front body fragment; B, C — labrum; D — dental margin of forcipular coxosternite; E — right part of maxillary complex; F, K — terminal article of 1st maxillae; G — terminal article of 2nd maxillae; H — distal part of 1st maxillary terminal article; I — 2nd maxillary pretarsus; J — 2nd maxillary plumose setae. Scale: 0.5 mm (A, E), 0.1 mm (B–D, F, K), 0.05 mm (H–J).

Рис. 3. *Hessebius kopetdagicus* sp.n. (A, голотип, дорсально; B–K, паратипы, вентрально): A — передняя часть тела; B, C — лабрум; D — зубной край кокостернита ногочелюстей; E — правая часть максиллярного комплекса; F, K — терминальный членик первых максилл; G — терминальный членик вторых максилл; H — дистальная часть терминального членика первых максилл; I — претарзус вторых максилл; J — перистые сетки вторых максилл. Масштаб: 0,5 мм (A, E), 0,1 мм (B–D, F, K), 0,05 мм (H–J).

SS9–10, 1:1.1; S4, 1:1.25; S5–6 and S8, 1:1; S7, 0.9:1; S11–12, 0.7:1; S13, 0.65:1; S14, 0.6:1; S15, 0.55:1; posterior margin of SS 2–14 with short sutures.

Legs: robust, covered with short and sparse setae, Tsi of legs 1–13 densely setose on ventral side, P, F, and Ti of legs 14 and 15 more densely setose on ventral and lateral sides than on dorsal side. Tarsal articulation distinct on legs 1–15, Ts1 longer than Ts2. Legs 1–14 with anterior and posterior accessory claws; legs 15 lacking accessory claws (Fig. 7E). Leg plectrotaxy as in Table 1. DCA starting with legs 14.

Legs 14 (Figs 5A, 6A–F, 7C–D, F): all segments covered with pores on mesal and ventral sides; P, F, Ti slightly incrassate, both Tsi slender; F: shortened (about as long as P); mesal side of Ti with a large dark pore blot with *ca* 50 setae: about 40 setae placed centrally and about 10 setae on peripheral sides of pore blot.

Legs 15 (Figs 5A–H, 7A–B): F, Ti and both Tsi covered with pores on ventral and mesal sides; P, F, Ti strongly incrassate, both Tsi slender; F: shortened (about as long as P) and almost flattened dorsally, with a pair of weak dorsal and dorsolateral sutures (indicated by arrows in Fig. 5G–H); Ti: almost rectangular with a deep anterodorsal depression merging with lateral one, flattened dorsally, with a dark pore blot, *ca* 45–50 evenly spaced setae on dorsal side.

Coxal pores small or large, generally rounded, separated from one another by a distance about 2–3 times greater than their own diameter, formula 55(4)5(4)4 (Fig. 2E).

Gonopod (Fig. 2E) 1-segmented, with 8–10 very thin and long setae placed at gonopodal middle.

Intraspecific variations. Most characters as in holotype, except as follows.

♂. Body up to 25 mm long. Antennae with 20 articles. Ocelli: 4–5 in a single broken row (Fig. 8G), a pair of anterior ocelli

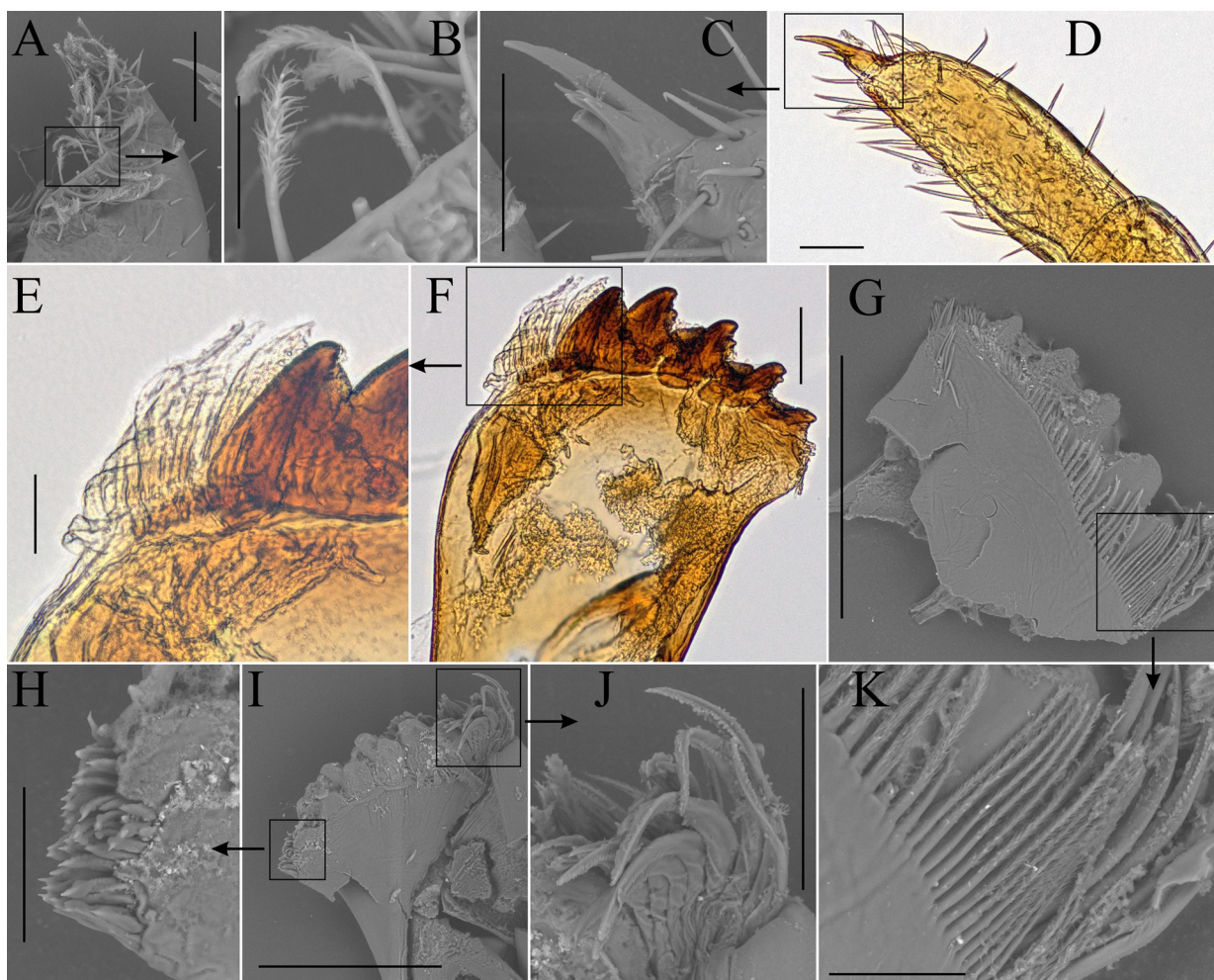


Fig. 4. *Hessebius kopetdagicus* sp.n. (paratypes): A — terminal article of 1st maxillae, ventrally; B — 1st maxillary plumose bristles, ventrally; C — 2nd maxillary pretarsus, ventrally; D — terminal article of 2nd maxillae, ventrally; E, J — mandibular aciculae, antero-dorsally; F, I — mandible, antero-dorsally; G — mandible, anteroventrally; H — mandibular pulvilli, antero-dorsally; K — setae along mandibular teeth, anteroventrally. Scale: 0.1 mm (A, C, F, J), 0.03 mm (B, G, I), 0.05 mm (E, H, K).

Рис. 4. *Hessebius kopetdagicus* sp.n. (паратипы): А — терминальный членик первых максилл, вентрально; В — перистые сетки первых максилл, вентрально; С — претарзус вторых максилл, вентрально; D — терминальный членик вторых максилл, вентрально; E, J — ацикулы мандибулы, антеро-дорсально; F, I — мандибула, антеро-дорсально; G — мандибула, антеро-вентрально; H — пульвиллы мандибулы, антеро-дорсально; K — сетки вдоль зубцов мандибулы, антеро-вентрально. Масштаб: 0,1 мм (А, С, F, J), 0,03 мм (В, G, I), 0,05 мм (E, H, K).

smaller than following ones. Porodonds at dental margin of coxosternum stout. Posterior margin of SS 2–13 with short sutures. DCA developed from legs 13 on. Leg plectrotaxy as in Tab. 2.

♀. Body 23 mm long.

Labrum as on Fig. 3B–C. Gnathal edge of mandible with numerous pulvilli, 5 pairs of well-developed teeth and 12–14 rather thick and serrate aciculae (Fig. 4E–J); numerous plumose bristles along teeth on ventral side (Fig. 4G, K). First maxillae: edge with more than 30 plumose bristles and simple setae (Figs 3E–H, K, 4A–B). Second maxillary telopodite (Figs 3G–J, 4C–D) with bristles, both simple and plumose, at tip (more than 45 plumose bristles on internal side).

Legs 14 and 15 lost.

Gonopod with 4+4 strong acute spurs (inner spurs smaller than outer ones; Fig. 8A–F) and a bidentate, pointed and curved claw (additional claw small, indicated by an arrow in Fig. 8A, D, F); length of distodorsal outgrowth of article 2, 0.2 mm, armed with three thin and long dorsal setae, article 3 with three very

thin and light dorsal setae (setae on 2nd and 3rd articles indicated by arrows in Fig. 8C).

DISTRIBUTION. Turkmenistan.

REMARKS. The new species is similar to *H. multicalcaratus*, *H. scythodes* and *H. zaleskajae*, but differs well in the larger body (23–25 mm, vs 9–21 mm in *H. multicalcaratus*, 14–16 mm in *H. scythodes*, and 14–19 mm in *H. zaleskajae*), and by the secondary sexual characters of ♂ legs 14 and 15: both F14 and 15 shortened (about as long as P), vs F longer than P14 and 15 in *H. multicalcaratus*, *H. scythodes*, and *H. zaleskajae*. The new species also has 15Ti with a deep anterodorsal depression merging with the lateral one, 15Ti also flattened dorsally with a dark pore blot, vs 15Ti less strongly swollen without such anterodorsal depressions and pore blots in *H. multicalcaratus*, *H. scythodes* and *H. zaleskajae*.

A full list of the differences between *Hessebius* species with 4–5 ♀ gonopodal spurs and swollen ♂ legs 15 is given in Table 3.

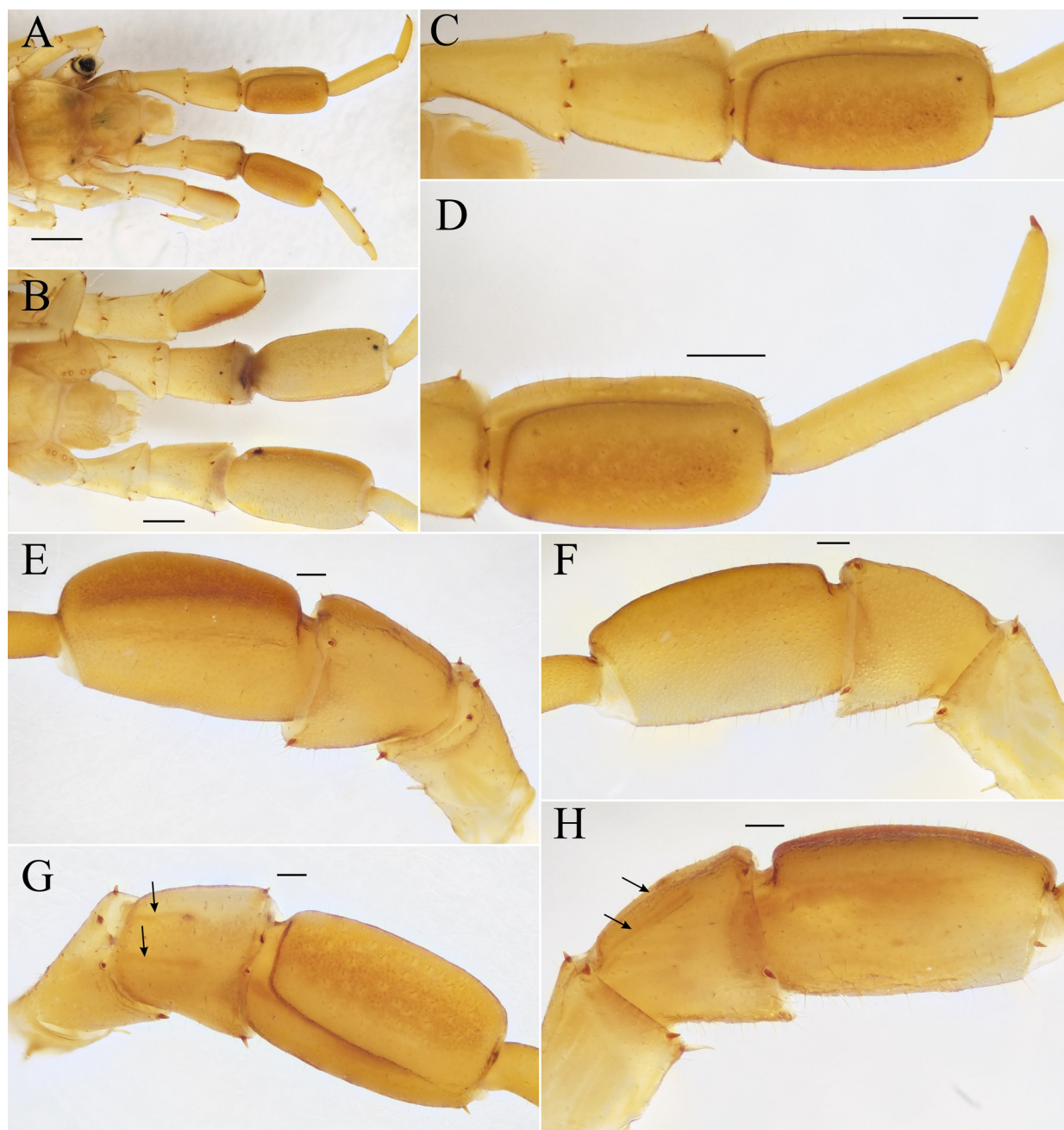


Fig. 5. *Hessebius kopetdagicus* sp.n. (A–D, holotype; E–H, male paratypes): A, B — rear body fragment, dorsally and ventrally; C — prefemur, femur, and tibia of right leg 15, dorsally; D — tibia and tarsi of right leg 15, dorsally; E, F — prefemur, femur, and tibia of left leg 15, laterally and mesally; G, H — prefemur, femur, and tibia of left leg 15, dorsolaterally and laterally. Scale: 1 mm (A–B), 0.5 mm (C–D), 0.2 mm (E–H).

Рис. 5. *Hessebius kopetdagicus* sp.n. (A–D, голотип; E–H, самец, паратипы): A, B — задняя часть тела, дорсально и вентрально; C — предбедро, бедро и голень правой ноги 15-й пары, дорсально; D — голень и лапки правой ноги 15-й пары, дорсально; E, F — предбедро, бедро и голень левой ноги 15-й пары, латерально и изнутри; G, H — предбедро, бедро и голень левой ноги 15-й пары, дорсо-латерально и латерально. Масштаб: 1 мм (A–B), 0,5 мм (C–D), 0,2 мм (E–H).

Conclusions

The lithobiomorph centipede fauna of Turkmenistan presently comprises six species: *Hessebius barbipes* (Porat, 1893), *H. kopetdagicus* sp.n., *Lithobius icis* Zaleskaja, 1978, *L. juniperius* Zaleskaja, 1978, *L. vinciguerrae* Silvestri, 1895, and *L. viriatus* Sseliwanoff, 1881 [Zaleskaja, 1978; Dyachkov *et al.*, 2022; Dyachkov,

2024]. Three geophilomorph and one lithobiomorph species known from the Eastern Mediterranean have recently been reported from the area under consideration [Dyachkov, 2024]. Further new lithobiomorph species, as well as species known from the adjacent territories, especially from the Hyrcanian ecoregion [Dyachkov *et al.*, 2023] and from all over Iran [Zarei *et al.*, 2020] may well be expected to occur also in Turkmenistan.

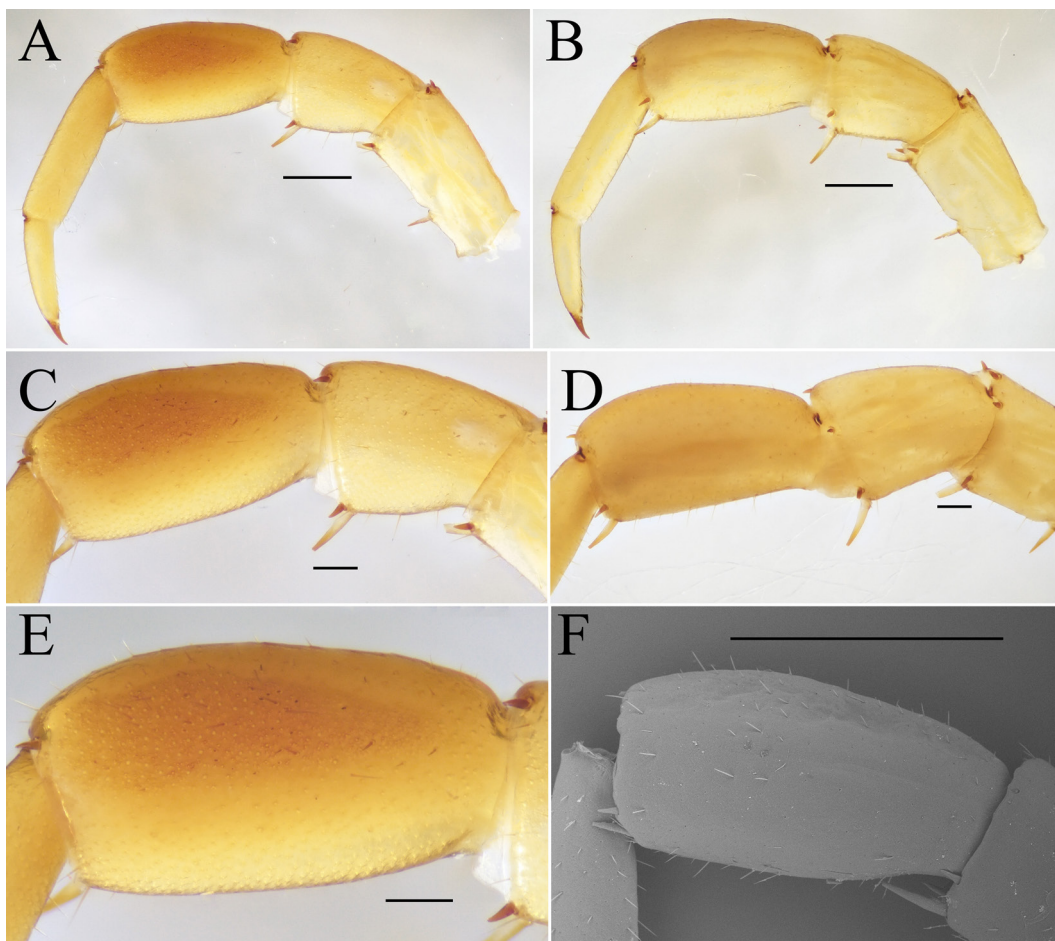


Fig. 6. *Hessebius kopetdagicus* sp.n. (male paratype): A, B — leg 14, mesally and laterally; C, D — femur and tibia of leg 14, laterally and mesally; E, F — tibia of leg 14, mesally and laterally. Scale: 1 mm (F), 0.5 mm (A–B), 0.2 mm (C–E).

Рис. 6. *Hessebius kopetdagicus* sp.n. (самец, паратип): А, В — 14-я нога, изнутри и латерально; С, D — бедро и голень ноги 14-й пары, латерально и изнутри; Е, F — голень ноги 14-й пары, изнутри и латерально. Масштаб: 1 мм (F), 0,5 мм (А–В), 0,2 мм (С–Е).

Table 1. *Hessebius kopetdagicus* sp.n. (holotype): plectrotaxy.

Таблица 1. *Hessebius kopetdagicus* sp.n. (голотип): распределение шипов.

Leg pairs	V					D				
	C	Tr	P	F	Ti	C	Tr	P	F	Ti
1	–	–	mp	amp	m	–	–	ap	ap	a
2–12	–	–	mp	amp	am	–	–	ap	ap	ap
13	–	m	amp	amp	am	–	–	amp	ap	ap
14	–	m	amp	amp	am	a	–	amp	ap	p
15	–	m	amp	amp	–	a	–	amp	ap	–

Table 2. *Hessebius kopetdagicus* sp.n. (paratypes): plectrotaxy.

Таблица 2. *Hessebius kopetdagicus* sp.n. (паратипы): распределение шипов.

Leg pairs	V					D				
	C	Tr	P	F	Ti	C	Tr	P	F	Ti
1	–	–	mp	amp	m	–	–	p	ap	a
2–6	–	–	mp	amp	am	–	–	ap	ap	ap
7–9	–	–	mp	amp	am	–	–	amp	ap	ap
10–12	–	–	amp	amp	am	–	–	amp	ap	ap
13	–	m	amp	amp	am	a	–	amp	ap	ap
14	–	m	amp	amp	am	a	–	amp	ap	p
15	–	m	amp	amp	–	a	–	amp	ap	–

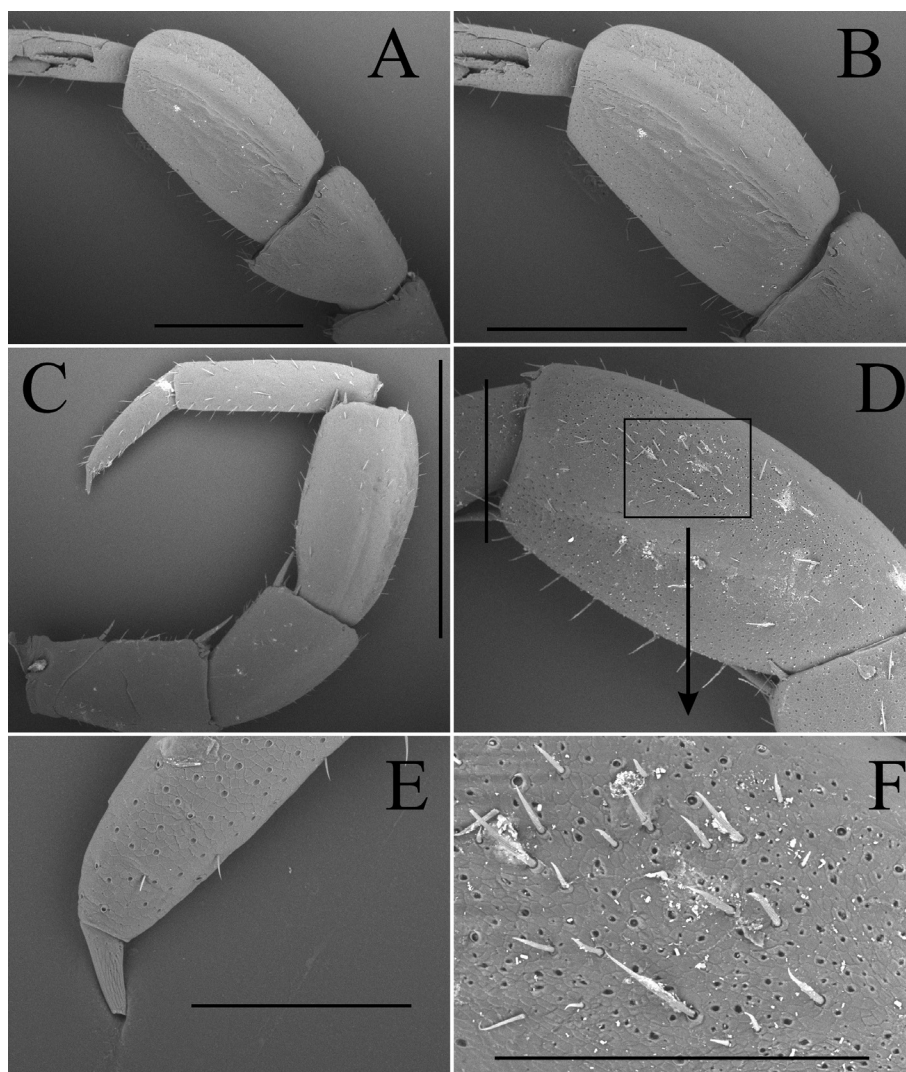


Fig. 7. *Hessebius kopetdagicus* sp.n. (male paratype): A — femur and tibia of leg 15, laterally; B — tibia of leg 15, laterally; C — leg 14, mesally; D — tibia of leg 14, mesally; E — pretarsus of leg 15, laterally; F — surface of tibia of leg 14, mesally. Scale: 2 mm (C), 1 mm (A, B), 0.5 mm (D), 0.3 mm (E, F).

Рис. 7. *Hessebius kopetdagicus* sp.n. (самец, паратип): А — бедро и голень ноги 15-ой пары, латерально; В — голень ноги 15-й пары, латерально; С — 14-я нога, изнутри; D — голень ноги 14-й пары, изнутри; Е — претарзус ноги 15-й пары, латерально; F — поверхности голени ноги 14-й пары, изнутри. Масштаб: 2 мм (С), 1 мм (А, В), 0,5 мм (D), 0,3 мм (Е, F).

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Table 3. Differences between *Hessebius multicalcaratus* Folkmanová, 1958, *H. perelae* Zaleskaja, 1978, *H. scythodes* Volkova, 2016, *H. zaleskajae* Farzalieva, 2017, and *H. kopetdagicus* sp.n.
Таблица 3. Различия между *Hessebius multicalcaratus* Folkmanová, 1958, *H. perelae* Zaleskaja, 1978, *H. scythodes* Volkova, 2016, *H. zaleskajae* Farzalieva, 2017 и *H. kopetdagicus* sp.n.

Characters	Species				
	<i>H. multicalcaratus</i>	<i>H. perelae</i>	<i>H. scythodes</i>	<i>H. zaleskajae</i>	<i>H. kopetdagicus</i> sp.n.
Body size, mm	9–21	22–24	14–16	14–19	23–25
Ocelli	3–6 in 2 rows	4–5 in 2 rows	6 in 2 rows	6–9 in 2–3 rows	4–5 in a single row
Tömösváry's organ	?	very small	as large as adjoining ocellus	very small, smaller than nearest ocellus	as large as nearest ocellus
Male legs 14	P, F slightly dilated, P with a small dorsal sulcus	P, F, Ti slightly swollen	P, F, Ti strongly broadened	noticeably thickened	F shortened (about as long as P); P, F, Ti slightly incrassate, both Tsi slender; mesal side of Ti with a large dark pore blot with <i>ca.</i> 50 setae
Male legs 15	P, F slightly dilated, P with small dorsal sulcus	P, F, Ti strongly swollen	P, F, Ti strongly broadened	noticeably thickened, F and Ti slightly flattened dorsally, F with a dorsal suture	F shortened (about as long as P); F, Ti strongly incrassate, both Tsi slender; F: almost flattened dorsally with a pair of weak dorsal and dorsolateral sutures; Ti: almost rectangular, with a deep anterodorsal depression merging with lateral one, Ti flattened dorsally with <i>ca.</i> 45–50 evenly spaced setae on a dark pore blot
Spurs of female gonopod	4–5	5+5	4+4	4+4	4+4
2 nd female gonopodal article	with 3 dorsal thin setae	8 dorsal setae	?	6–7 long setae	3 thin and long dorsal setae
Female gonopodal claw	bidentate; 2–4 dorsal setae	simple	bidentate	bidentate, 2 nd denticle very small; 3 long setae	bidentate; 3 thin and light dorsal setae
Source	Folkmanová, 1958; Zaleskaja, 1978; Dyachkov, 2019	Zaleskaja, 1978; Dyachkov, 2019	Volkova, 2016	Farzalieva, 2017	present study

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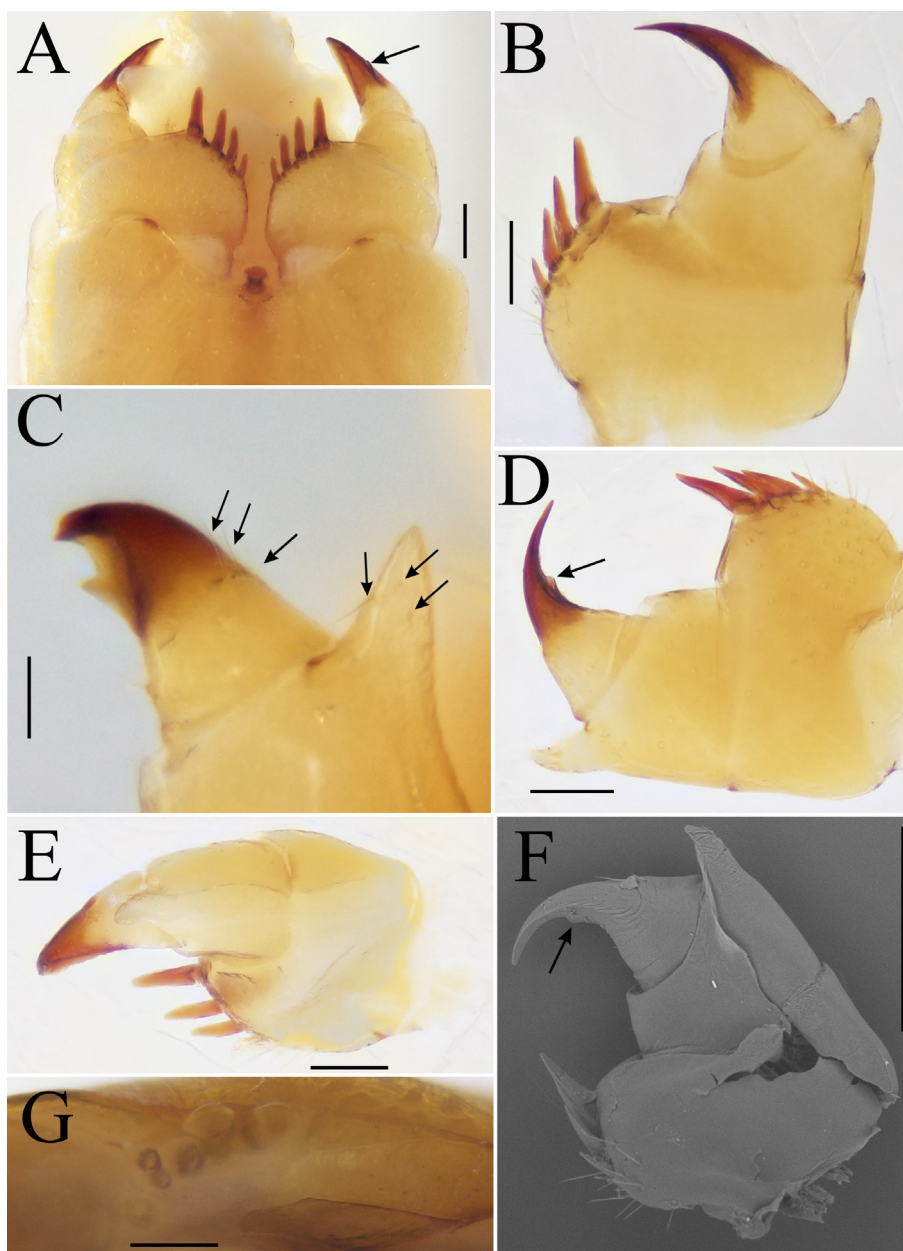


Fig. 8. *Hessebius kopetdagicus* sp.n. (paratypes: G, ♂; A–F, ♀): A — ♀ gonopods, ventrally; B, F — left gonopod, dorsomesally; C — distodorsal outgrowth of gonopodal article 2 and claw, dorsally; D, E — left gonopod, laterally and dorsally; F — left gonopod, mesally; G — ocelli, laterally. Scale: 0.1 mm (C), 0.2 mm (A–B, D–E, G), 0.5 mm (F).

Рис. 8. *Hessebius kopetdagicus* sp.n. (паратипы: G, ♂; A–F, ♀): A — гонопод ♀, вентрально; B, F — левый гонопод, дорсально и изнутри; C — дистодорсальный вырост второго членика гонопода и коготь гонопода, дорсально; D, E — левый гонопод, латерально и дорсально; G — глазки, латерально. Масштаб: 0,1 мм (C), 0,2 мм (A–B, D–E, G), 0,5 мм (F).

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