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RESEARCH ARTICLE

A new species of the genus *Glaphyrus* (subgenus *Eoglaphyrus*) (Coleoptera: Scarabaeoidea: Glaphyridae) from Tajikistan, with notes on *G.* (*E.*) *turkestanicus*

Новый вид рода *Glaphyrus* (подрод *Eoglaphyrus*) (Coleoptera: Scarabaeoidea: Glaphyridae) из Таджикистана с заметками о *G.* (*E.*) *turkestanicus*

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Abstract. *Glaphyrus mardjanyanae* **sp. nov.** from the Gorno-Badakhshan Autonomous Province of Tajikistan is described and illustrated. The new species belongs to the subgenus *Eoglaphyrus* Semenov, 1926, which so far had included two species, *G.* (*E.*) *turkestanicus* Semenov, 1889 from Tajikistan, Uzbekistan and northeastern Afghanistan, and *G.* (*E.*) *afghanistanicus* Skrylnik et Pak, 2021 from central Afghanistan. The diagnostic characters and a key to the species of *Eoglaphyrus* are given. A lectotype for *G. sogdianus* Semenov, 1892 is designated.

Резюме. Описан и проиллюстрирован *Glaphyrus mardjanyanae* **sp. nov.** из Горно-Бадахшанской автономной области Таджикистана. Новый вид относится к подроду *Eoglaphyrus* Semenov, 1926, включавшему до сих пор два вида – *G.* (*E.*) *turkestanicus* Semenov, 1889 из Таджикистана, Узбекистана и северного Афганистана и *G.* (*E.*) *afghanistanicus* Skrylnik et Pak, 2021 из центрального Афганистана. Приведены диагностические признаки и ключ для определения видов подрода *Eoglaphyrus*. Обозначен лектотип для *G. sogdianus* Semenov, 1892.

Key words: Tajikistan, Gorno-Badakhshan Autonomous Province, lectotype designation, Glaphyridae, *Glaphyrus*, *Eoglaphyrus*, new species

Ключевые слова: Таджикистан, Горно-Бадахшанская автономная область, обозначение лектотипа, Glaphyridae, *Glaphyrus*, *Eoglaphyrus*, новый вид

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Introduction

The genus *Glaphyrus* Latreille, 1802 includes 31 species and nine subspecies (Nikodým & Keith, 2007; Nikodým & Bezděk, 2016; Shokhin, 2019; Skrylnik & Pak, 2021) and is divided into three subgenera, *Glaphyrus* s. str., *Hemiglaphyrus* Cham-

penois, 1904 and *Eoglaphyrus* Semenov, 1926; the latter is distributed in the mountain systems of Central Asia and Afghanistan and so far had included two species, *G.* (*E.*) *turkestanicus* Semenov, 1889 from Tajikistan, Uzbekistan and northeastern Afghanistan, and *G.* (*E.*) *afghanistanicus* Skrylnik et Pak, 2021 from central Afghanistan. In the course of our studies of the taxonomy of the genus *Glaphyrus*, two specimens were found in southern Tajikistan, belonging to an undescribed species from the subgenus *Eoglaphyrus*. This species is described below. A lectotype is designated for *G. sogdianus* Semenov, 1892.

Material and methods

This study is based on the materials from the following collections: ISCR – personal collection of Igor Shokhin, Rostov-on-Don, Russia; IZAY – Institute of Zoology, Scientific Centre of Zoology and Hydroecology, National Academy of Sciences of Armenia, Yerevan, Armenia; MHNG – Muséum d'histoire naturelle de Genève, Geneva, Switzerland; MKCY – personal collection of Mark Kalashian, Yerevan, Armenia; MNHN – Muséum national d'Histoire naturelle, Paris, France; ZISP – Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia.

The study was conducted using a Micromed MC-2 Zoom and a MBS-10 stereomicroscopes. The measurements were taken using an ocular micrometer. Photographs were taken using a Canon EOS 800D digital camera equipped with a Canon MP-E65 mm f/2.8 1–5× macro lens and attached to a Stack Shot Macro Rail package (Cognisys Inc.); Helicon Focus Pro software was used for stacking the photos. The male genitalia were removed and prepared by standard methods; the endophalli were inflated according to Kasatkin (2006), with minor changes.

In citations of labels below, the following abbreviations are used: (h) – handwritten, (p) – printed; data of different labels are separated by a slash (/). If necessary, current geographical names as well as some other data are provided in square brackets ([ ]).

Taxonomic part

Order **Coleoptera**

Family **Glaphyridae**

Subfamily **Glaphyrinae**

Genus ***Glaphyrus*** Latreille, 1802

Subgenus ***Eoglaphyrus*** Semenov, 1926

***Glaphyrus* (*Eoglaphyrus*) *mardjanyanae* sp. nov.**
(Figs 1–3, 7, 9, 11, 13, 17)

Holotype. Male, **Tajikistan**, *Gorno-Badakhshan Autonomous Prov.*, "Darvaz 1200 [m a.s.l.] Nulvand / Tdzhn. 27.6.[19]75 [Iablokoff-Khnzorian leg., according to handwriting; h, Cyrillic script] / HOLOTYPE, Glaphyrus (Eoglaphyrus) mardjanyanae sp. n., Ghrejyan, Kalashian, Shokhin det., 2022 [p, red paper]" (IZAY). Specimen with slightly damaged pronotum and protibiae.

Paratype (*allotype*). Female, **Tajikistan**, *Gorno-Badakhshan Autonomous Prov.*, "Pamir, Nulvand, 28.VI.1975, M. Mardjanyan [leg.] [h, Cyrillic script] / Glaphyrus turcestanicus Sem. [h] det. O. N. Kabakov [p] 2003 [h] / ALLOTYPE, Glaphyrus (Eoglaphyrus) mardjanyanae sp. n., Ghrejyan, Kalashian, Shokhin det., 2022 [p, red paper]" (ZISP).

Description. *Male*. Body rather slender and flattened (Figs 1, 2, 7); length 12.6 mm, width 5.5 mm.

Coloration. Head, pronotum and scutellum dark metallic coppery red, with darkened clypeus; antennomere 1 black with fine reddish tint, following antennomeres blackish. Elytra light reddish brown with indistinct golden tint. Thorax coppery red. Basal portions of femora dark brown with more or less distinct coppery red reflection; other femora, tibiae and tarsi brown; tarsomeres of posterior tarsi darkened distally. Abdomen light brown.

Clypeus slightly widened anteriorly, with nearly straight lateral margins; anterior margin with strong medial and less protruding lateral teeth directed upwards. Surface of clypeus with dense, moderately rough punctures. Medially, clypeus with distinct carina continuing posteriorly from median tooth and nearly reaching fronto-clypeal suture, that being somewhat hidden by sculpture but visible. Punctation of frons slightly rougher than on clypeus; vertex medially nearly glabrous,

with single rough punctures. Frons with dense irregular long brownish setae. Antennomere 1 large, distinctly curved, swollen distally, with dense long light brownish setae; antennomere 2 about 0.33 times as long as antennomere 1, swollen, with few setae shorter than in antennomere 1; antennomeres 3–7 with sparse short fine setae; antennal club subglobose, subequal in length to antennomeres 4–7 combined, with sparse short oblique setae. Mandibles with large dorsal tooth. Last segment of maxillary palps slightly narrowed distally, with truncate apex.

Pronotum moderately convex, widest at posterior one-fifth of length, with lateral margins widely arcuate, slightly convergent anteriorly and very slightly convergent posteriorly to obtuse posterior angles. Anterior margin nearly regularly arcuately concave, with weakly separated, shiny edging; posterior margin medially angularly arcuate, laterally very weakly sinuate, with shiny edging separated by distinct deep groove narrowly continued anteriorly along lateral margins and nearly reaching anterior angles. Disc anteriorly and laterally with dense rough punctures and long sinuous brownish hairs directed mainly laterally and posteriorly, with brushes of dense short thick brown setae near anterior angles. Posteriorly, about two-fifths of disc almost glabrous, with sparse rough punctures along median part of posterior margin. Surface very finely reticulate, moderately shiny. Scutellum small, microreticulate.

Elytra moderately, nearly regularly convex, with suture slightly elevated in anterior three-fifths of length, with lateral margins widely arcuate; elytral apices widely separate, each protruded into short, smoothly emerging but distinct tooth. Elytra with rather dense and small punctures being slightly rougher basally and laterally and with long yellowish adpressed setae directed posteriorly and somewhat laterally. Surface of elytra finely reticulate, with silky lustre. Epipleurae separated by sharp distinct carina nearly reaching apical teeth of elytra. Pygidium and propygidium with dense long adpressed yellowish setae nearly completely hiding finely and densely punctate surface.

Membrane of hind wings gradually darkening from base to apex; veins in bending zone wide and dark (Fig. 9).

Thorax ventrally with dense long sinuous brownish yellow hairs. Metathorax medially with dense rough punctures, smoothed laterally. Protibiae proximal to lateral teeth (damaged in holotype) with nearly straight, irregularly serrate outer margin. Metafemora (Fig. 11) moderately thickened, with irregular, rather sparse rasp-shaped punctures bearing long yellowish hairs. Trochanter (Fig. 13) rather wide, with posterior margin slightly convex.

Abdomen with rather dense, moderately small and shallow punctures bearing long yellowish hairs hiding integument along lateral and posterior margins of ventrites. Ventrite 5 with distinct glabrous callosity and with row of fine short hairs posterior to it.

Paramera and endophallus as in Fig. 17.

Female. Body (Fig. 2) length 10.8 mm, width 5.5 mm. Head, pronotum anteriorly and laterally golden-green, clypeus darkened, disc of pronotum and scutellum golden-red, elytra yellow with fine greenish reflection, femora brown with indistinct reddish tint, tibiae and tarsi light brown, lateral teeth of protibiae and tarsomeres of hind tarsi blackened distally.

Clypeus with teeth slightly more pronounced than in male.

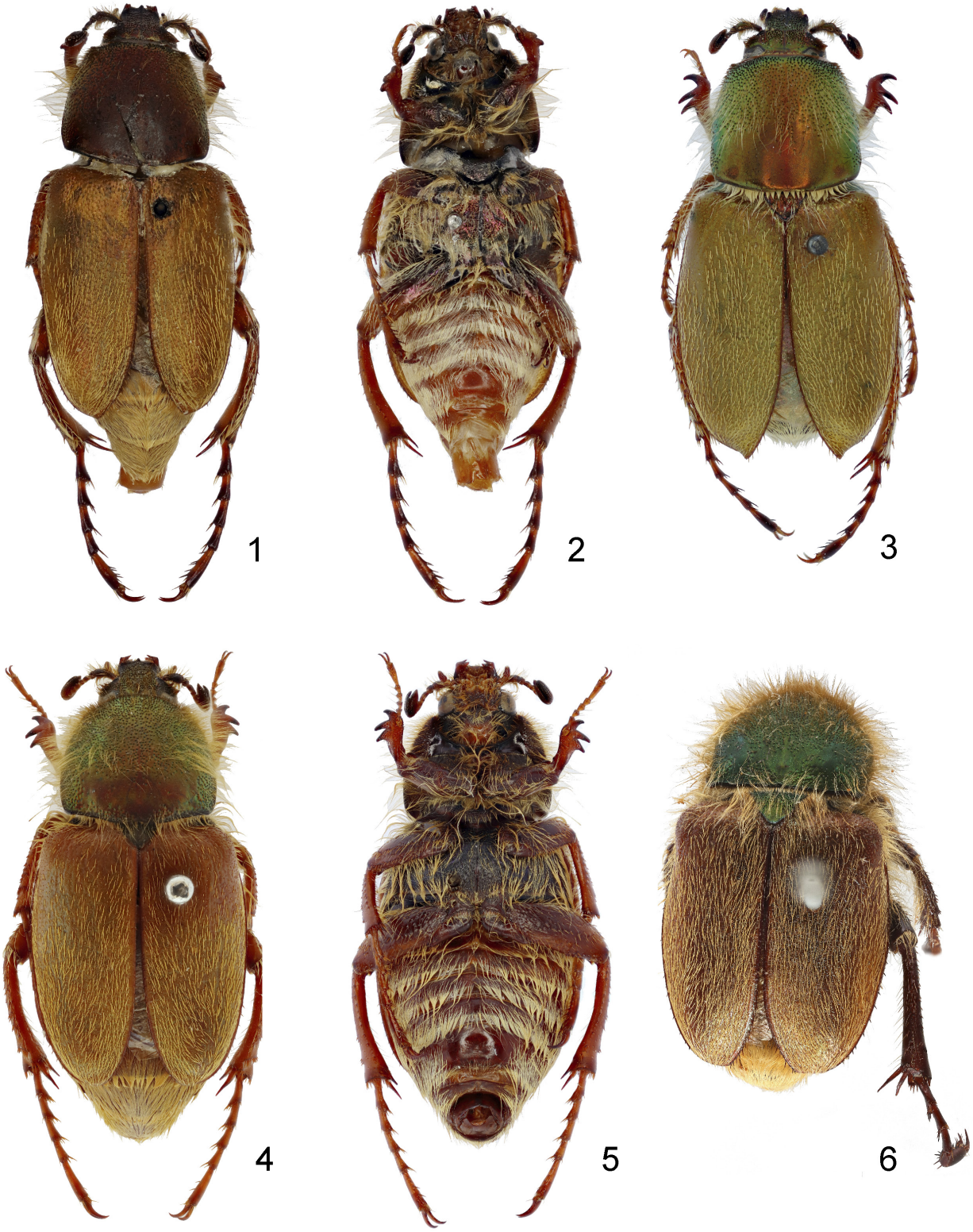
Pronotum wider than in male; punctation of head and pronotum finer and sparser, pubescence also sparser and somewhat shorter than in male.

Elytra wider than in male, their apices protruded into distinct blunt teeth. Surface of elytra similar to that in male, but sculpture with microreticulation slightly smoother and pubescence slightly sparser and shorter.

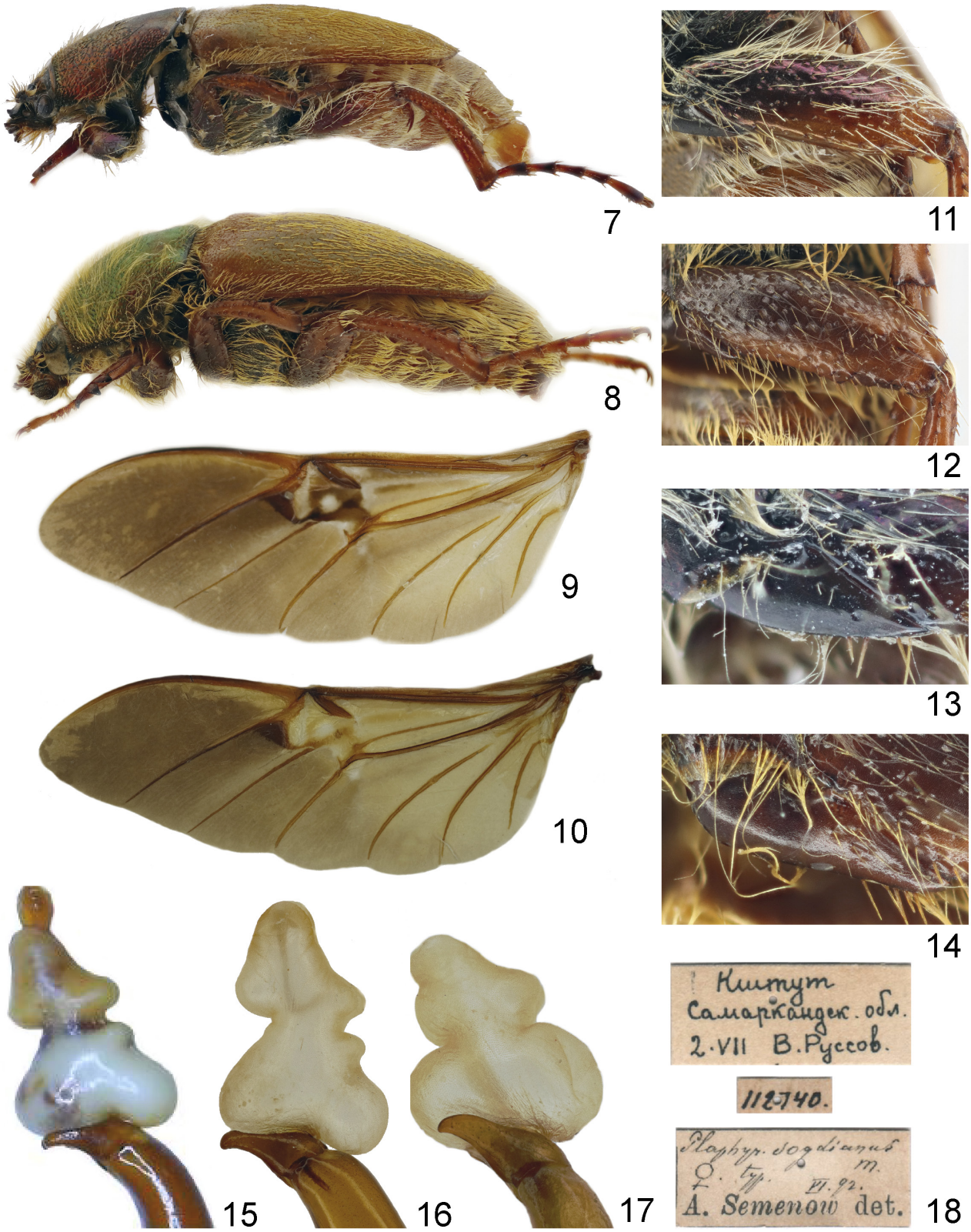
Ventrite 5 without callosity, apex of abdomen retracted under elytra; in dorsal view, apex of pygidium not reaching elytral apices.

Hind legs distinctly shorter than in male. Hind femora not thickened.

Comparison. By the structure of elytra with well pronounced epipleural carina, the new species belongs to the subgenus *Eoglaphyrus*, which so far had included two species, *G.* (*E.*) *turkestanicus* Semenov, 1889 and *G.* (*E.*) *afghanistanicus* Skrylnik et Pak, 2021 (comparison with the latter is made mainly based on the detailed description). Both species can be easily distinguished from the new one by the larger, wider and more



Figs 1–6. *Glaphyrus* (*Eoglaphyrus*) spp., habitus. **1–3**, *G.* (*E.*) *mardjanyanae* **sp. nov.** (1, 2 – holotype, male; 3 – allotype, female); **4–6**, *G.* (*E.*) *turkestanicus* Semenov, 1889 (4, 5 – male from "Turkestan; 6 – lectotype of *G. sogdianus* Semenov, 1892, male). Dorsal (1, 3, 4, 6) and ventral (2, 5) views.



Figs 7–18. *Glaphyrus* (*Eoglaphyrus*) spp. **7**, **9**, **11**, **13**, **17**, *G.* (*E.*) *mardjanyanae* **sp. nov.** (holotype, male); **8**, **10**, **12**, **14**, **16**, *G.* (*E.*) *turkestanicus* Semenov, 1889 (male from "Turkestan"); **15**, *G.* (*E.*) *afghanistanicus* Skrylnik et Pak, 2021 (from Skrylnik & Pak, 2021); **18**, *G. sogdianus* Semenov, 1892, labels of lectotype. Habitus laterally (7, 8); hind wings (9, 10); metafemur (11, 12); trochanter (13, 14); paramera and endophallus (15–17).

convex body [in *G.* (*E.*) *turkestanicus* (Figs 4–6, 8), the length of body in the male is 13.5–20.4 mm, the width is 6.1–9.2 mm, and 13.0–18.2 mm and 6.8–9.0 mm in the female, respectively; in *G.* (*E.*) *afghanistanicus* (see Skrylnik & Pak, 2021, figs 1–8), according to the description, the length of body in the male is 15.8–20.3 mm, the width is 7.1–8.3 mm, and 13.2–17.6 mm and 6.5–8.8 mm in the female, respectively]. The pronotum in both species is wider, its pubescence in the males is distinctly longer and denser than in *G.* (*E.*) *mardjanyanae* **sp. nov.** and a glabrous area in the posterior third of pronotal disc is smaller; in the females, punctation is denser than in the new species and the glabrous area is also smaller. The apices of the elytra of males in both *G.* (*E.*) *turkestanicus* and *G.* (*E.*) *afghanistanicus* are rounded or very slightly angulate; in the females, the apices are very slightly angulate, without teeth. *Glaphyrus* (*E.*) *turkestanicus* differs also in the somewhat narrower hind wings with the less pronounced veins in the bending zone (Fig. 10). The trochanters in both species are slightly longer and narrower, with a weakly curved posterior margin [*G.* (*E.*) *turkestanicus*: Fig. 14; for *G.* (*E.*) *afghanistanicus*, see Skrylnik & Pak, 2021, fig. 19]. The hind femora are somewhat thicker than in the new species, with denser and larger flat punctures (Fig. 12). The new species differs from two others also in the structure of endophallus [in *G.* (*E.*) *turkestanicus*, Fig. 16; in *G.* (*E.*) *afghanistanicus*, Fig. 15]. A simplified key for identification of the species of *Eoglaphyrus* is given below.

Distribution. The Pamir Mountains in the Gorno-Badakhshan Autonomous Province of Tajikistan.

Habitat. Unknown.

Etymology. The new species is dedicated to the blessed memory of our friend and colleague, former curator of the Invertebrates collection of IZAY, Dr Margarit Mardjanyan, with our love and good remembrances.

Glaphyrus (*Eoglaphyrus*) *turkestanicus* Semenov, 1889

(Figs 4–6, 8, 10, 12, 14, 16, 18)

Glaphyrus turkestanicus Semenov, 1889: 195; Champenois, 1898: 346; Champenois, 1903: 140 (key), 147 (notes); Reitter, 1903: 136; Medvedev, 1960: 279 (key), 300 (redescription).

Glaphyrus sogdianus Semenov, 1892: 477; Champenois, 1898: 346 (*G. turkestanicus*, ?var.); Champenois, 1903: 140 (key), 147 (notes; *G. turkestanicus*, var.); Semenov, 1903: 245; Reitter, 1903: 136 (*G. turkestanicus*, var.); Semenov, 1926: 51 (*G. turkestanicus*, syn.); Medvedev, 1960: 279 (key), 302 (redescription; *G. turkestanicus*, ab.).

Type material examined. *Holotype of Glaphyrus turkestanicus*. Female, **Tajikistan**, *Sughd Prov.*, "ot Yabana do Gusara [between Yaban and Gusar] 28.V.[18]88, A. Semenow [leg.] [h, Cyrillic script] / Glaphyrus turkestanicus m. typ. ♀ un. A. S. I.89 [h] / Glaphyr. turkestanicus m. ♀. Typ. XI.98 [h] A. Semenov det. [p] / Holotype *Glaphyrus turkestanicus* Semenov, 1889, Ghrejyan, Kalashian, Shokhin det., 2022 [p, red paper]" (ZISP).

Lectotype of Glaphyrus sogdianus (designated here). Male, **Tajikistan**, *Sughd Prov.*, "Kshtut [Kul'yali], Samarkandsk. obl. 2.VII.[1878, added according to original description], V. Russow [leg.] [h, Cyrillic script] / 112740 [h] / Glaphyr. sogdianus m. ♀. typ. VI.92. A. Semenov det. [p]" (ZISP).

Paralectotypes of Glaphyrus sogdianus. 7 males: label with same data as for lectotype / numbers 112731, 112732, 112734, 112736, 112738, 112739, 112741, respectively [p] / "Glaphyr. sogdianus m. ♀. VI.92. [h] A. Semenov det. [p]" (ZISP).

All types of *G. sogdianus* with label: "Lectotype (Paralectotype, respectively): *Glaphyrus sogdianus* Semenov, 1892, design. Ghrejyan, Kalashian, Shokhin, 2022 [p, red paper]".

Additional material examined. Without locality designation: "Turkestan, Reitter [p] / Museum Paris, 1993 Coll. J. Baraud [p]", 1 male (MNHN); "Turkestan [h] / Museum Paris, 1942, Coll. Dr. A. Chobaut [p] / Glaphyrus turkestanicus Sem. [h] J. Baraud det. 1987 [p]", 1 male (MNHN); "Turkestan, Reitter / Glaph. turkestanicus a. purpuricollis nov. Petrovitz [p, red paper] / coll. Petrovitz [p] / MNHG, ENTO, 00084552 [p]", 1 male (MHNG); "Turkestan [h] / Glaphyrus turkestanicus sogdianus Sem. [h] V. Lutshnik d. [p]", 2 males (ISCR); "Haberhauer, Turkestan 89 [p] / Glaphyrus turkestanicus Sem. det. Petrovitz [p] / coll. Petrovitz [p]", 1 male (MHNG); "Turkestan [p] / Museum Paris, Collection Ernest André, 1914 [p]", 1 male (MNHN). **Uzbekistan**: "Samarkand [h] / Museum Paris, ex. Coll. R. Oberthur [h] / turkestanicus Semenow v. sogdianus Semenow ♂ [h]", 1 male (MNHN); "Serafschan [Zarafshon], fl. Sching, Glasunov 1892 [p] / Glaphyr. sogdianus m. ♂. XI.98. [h] A. Semenov det. [p]", 2 males (ZISP); same data label / "Glaphyr. turkestanicus m. ♀. XI.98 [h] A. Semenov det. [p]", 1 female (ZISP); "Bukhara, Kempir-tepe, 20.5.1910, Zarudny [h, Cyrillic script]", 2 males (ZISP). **Tajikistan**:

Gorno-Badakhshan Autonomous Prov.: "Khorog, Botsad [Botanical Garden], Pamir. 19.6.[19]75 [Iablokoff-Khnzorian leg., according to handwriting; Cyrillic script]", 6 males, 1 female (MKCY); same data, but M. Mardjanyan leg., 1 male, 1 female (IZAY); Roshtqala, 7.VII.1988, V. Prasolov leg., 2 males, (MKCY); *Khatlon Prov.*, Shurabad, 2000–2500 m, 3–4.VII.2003, A. Perepechaenko leg., 2 males (IZAY); same data label, 1 female (ISCR). **Afghanistan**, *Badakhshan Prov.*, "Shiva [Kol-e Shewah lake] 2500 m, 12.7.[19]53. Klapperich [leg.] [p] / Glaphyrus turkestanicus Semenow, D. Keith det. 2003 [p]", 3 females (MNHG).

Distribution. Southeastern Uzbekistan, Tajikistan, northeastern Afghanistan.

Notes. Semenov (1889) described *Glaphyrus turkestanicus* based on a single female from "Turkestan: promontoria montium Zerafschanensium inter Jaban et Gussar" (currently in Zeravshan River valley in Tajikistan). Later, Semenov (1892) described *G. sogdianus* from almost the same locality, "Turkestan occid.: vallis fl. Zerafschan: Pendshakent et Kshtut", based on ten specimens considered as females. One of these syntypes is designated here as a lectotype to maintain nomenclatural stability in the taxonomically complicated group. Champenois (1898, 1903), after studying the types of both taxa provided to him by Semenov himself, established that types of *G. sogdianus* are actually males and considered *G. sogdianus* as a variety of *G. turkestanicus* with the reddish elytra having a weak green tint while the latter form has the green elytra. Reitter (1903) accepted Champenois' opinion. Initially, Semenov (1903) disagreed with Champenois, but in the later work (Semenov, 1926) he also considered *G. sogdianus* as a variety of *G. turkestanicus*. Actually, the coloration of elytra in *G. turkestanicus* varies from red to nearly metallic green, with all intermediate states, and Medvedev (1960) when downgrading *G. sogdianus* to the status of aberration did not use this character to distinguish both forms and provided only the coloration of legs as a distinguishing character, which in fact is also variable.

Key to the species of the subgenus *Eoglaphyrus*

1(4). Larger, body longer than 13.0 mm, wider and more convex (Figs 4–6, 8). Pronotum wider, with pubescence in male distinctly longer and denser, glabrous area in posterior third of pronotal disc smaller; in female, punctation of pronotum denser, glabrous area smaller. Elytral apices rounded or very slightly angulate in male, and very slightly angulate, without tooth in female. Trochanters slightly longer and narrower, with weakly curved posterior margin (Fig. 13).

2(3). Clypeus square, with clear longitudinal carina reaching transversal carina between eyes. Thick erect setae near anterior angles of pronotum yellowish, only slightly darker than surrounding hairs. Pubescence of elytra rufous. Body length in male 15.8–20.3 mm, in female 13.2–17.6 mm. Endophallus as in Fig. 15 ..... ***G. (E.) afghanistanicus****

3(2). Clypeus barrel-shaped, with unclear longitudinal carina not reaching transversal carina between eyes. Thick erect setae near anterior angles of pronotum brownish, contrasting sharply with surrounding light hairs. Pubescence of elytra yellow. Body length in male 13.5–20.4 mm, in female 13.0–18.2 mm. Endophallus as in Fig. 16 ..... ***G. (E.) turkestanicus***

4(1). Smaller, body length 12.6 mm in male, 10.8 mm in female, narrower and less convex (Figs 1, 4, 7). Pronotum narrower, with pubescence in male distinctly shorter and sparser, glabrous area in posterior third of pronotum larger; in female, punctation sparser, glabrous area larger. Elytral apices protruded into short, smoothly emerging tooth in male and protruded into distinct blunt tooth in female. Trochanters shorter, with posterior margin slightly convex (Fig. 13). Endophallus as in Fig. 17 ..... ***G. (E.) mardjanyanae* sp. nov.**

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*Included in the key according to the description (Skrylnik & Pak, 2021).

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