

Aquatic beetles (Coleoptera: Dytiscidae, Hydrophilidae, Heteroceridae) from the Mountain Badakhshan, Tajikistan

Водные жесткокрылые (Coleoptera: Dytiscidae, Hydrophilidae, Heteroceridae) Горного Бадахшана

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Ключевые слова: Dytiscidae, Hydrophilidae, Heteroceridae, новые находки, Таджикистан, Памир.

Abstract. An annotated list of aquatic beetle fauna of the Gorno-Badakhshan Autonomous Region of Tajikistan is given for the first time. Data on 13 species from the family Dytiscidae, six from the Hydrophilidae and one from the Heteroceridae are given. *Ilybius cinctus* Sharp, 1882, *Hydroporus transgrediens* Gschwendtner, 1923 and *Oreodytes alpinus* (Paykull, 1798) are new to the fauna of Tajikistan.

Резюме. В работе впервые дан аннотированный список фауны водных жуков Горно-Бадахшанской Автономной области Таджикистана. Приведены данные о 13 видах из семейств Dytiscidae, 6 — Hydrophilidae и 1 — Heteroceridae. *Ilybius cinctus* Sharp, 1882, *Hydroporus transgrediens* Gschwendtner, 1923 и *Oreodytes alpinus* (Paykull, 1798) впервые указываются для фауны Таджикистана.

Introduction

Aquatic Coleoptera are an important and integral component of aquatic ecosystems. The beetles are found in all types of freshwater bodies, but prefer shallow, standing and vegetated water bodies. There are approximately 115 species of aquatic beetles from 11 families in Tajikistan: Haliplidae — 2 species, Dytiscidae — 32 [Brekhov, 2007; Hájek, 2017, Nilsson, Hájek, 2021], Gyrinidae — 2 [Brekhov, 2007; Hájek, Fery, 2019], Helophoridae — 9, Spercheidae — 1, Hydrophilidae — 35 [Brekhov, 2007; Przewoźny, 2019; Sazhnev, 2020], Hydraenidae — 18 [Jäch, Skale, 2015], Scirtidae — 3 [Klausnitzer, 2009, 2016], Elmidae — 2 [Jäch, Kodada, 2016], Dryopidae — 1 [Kodada, Jäch, 2016] и Heteroceridae — 10 [Mascagni, 2016; Skalický, 2021].

Available data on the fauna of aquatic beetles of the Pamirs cover only the Pamir-Alai region [Hebauer, 1991; Brekhov, 2007; Klausnitzer, 2009; Fery, Šťastný, 2010]. There are no works devoted to the fauna of aquatic beetles of Gorno-Badakhshan. Only in the recent work

by A.A. Prokin, a new species of water beetle *Berosus* (*Enoplurus*) *litvinchuki* Prokin, 2018 [Prokin, 2018] was described.

The present work is devoted to representatives of three families of aquatic beetles of Gorno-Badakhshan Autonomous Oblast of Tajikistan. An annotated list of aquatic beetles (20 species from the families Dytiscidae, Hydrophilidae and Heteroceridae) is given below, with indication of places, dates of collections, number of specimens and general distribution.

Material and methodology

The material for this article was collected by the authors in 2021–2023 using standard methods of catching aquatic invertebrates in rivers and reservoirs of Gorno-Badakhshan: manual collection with a water net and strainer, by splashing and attraction to an artificial light source. The material was dissected and photographed using binocular microscopes Zeiss Stemi 2000-C and Altami PS0745-T. Identification was carried out according to the definitions and works of the following authors [Zaitzev, 1953; Gentili, Chiesa, 1976; Kirejchuk, 2001; Kirejtshuk, Shatrovskij, 2001; Fery, Petrov, 2005; Prokin, 2018; Litovkin et al., 2021] The material presented in this article is stored in the collections of the Siberian Zoological Museum of the Institute of Systematics and Ecology of Animals SB RAS (IS&EJ, Novosibirsk) and the Pamir Biological Institute named after Academician Kh. Yusufbekov (PBI, Khorog). In the material, the initials of the first author are not given, and those of the second — (DS).

The present work is registered in ZooBank (www.zoobank.org) under LSID urn:lsid:zoobank.org:pub:BA0EE1B6-3ADE-4EB4-96F1-AE6383E8572F.

The list of aquatic beetles collected from the Mountain Badakhshan, Tajikistan

Dytiscidae Leach, 1815

Agabus (Gaurodytes) basalis (Gebler, 1829)

Fig. 1.

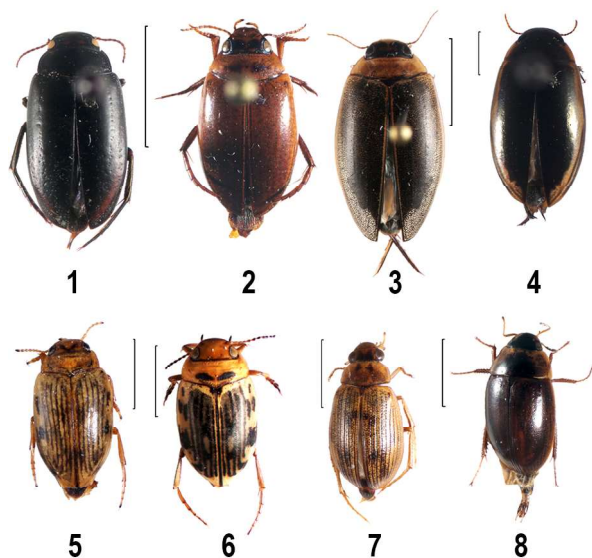
Material. *Rushanskii raion*: Khufdara gorge: tract Bashur, brook, h~2237 m, 37°52.22' N, 71°37.86' E, 2.VII.2021, N. Khairulaev leg. — 2♂♂; kishlak Khuf, water bodies, h~2830 m, 37°50.1' N, 71°39' E, 4.VII.2021 — 2♂♂, 3♀♀, ibidem, aryk, h~2792 m, 37°50.4' N, 71°39.35' E — 1♂♂, ibidem, h~2835 m, 37°50.25' N, 71°39.46' E, 4.VII.2021 — 1♂♂ (DS), ibidem, streams in meadow, h~2810 m, 37°51.143' N, 71°39.414' E — 2♀♀ (DS), ibidem, h~2839 m, 37°50.092' N, 71°39.185' E, 7.VII.2022 — 1♀ (DS) ibidem, h~2872 m, 37°50.268' N, 71°38.949' E, 9.VII.2022 — 1♂♂ (DS); tract Kjojdar, h~2835 m, 37°50.096' N, 71°39.118' E, 4.VII.2022 — 1♂♂, 1♀ (DS). *Shugnanskii raion*: 2.3 km SE of Barchadev village, Bijondara gorge, flowing puddle, h~2658 m, 37°17.33' N, 71°31.23' E, 7.VII.2021 — 1♀; vicinity of Varshez village, Dizahdara gorge, h~3227 m, 14.VII.2021 — 1♀ (DS). *Roshtkalinskii raion*: Bodomdara gorge: waterlogged brook, h~2856 m, 37°10.123' N, 71°53.306' E, 5.VII.2022 — 1♀; same place, h~3000 m, 37°08.23' N, 71°51.712' E, 5.VII.2022 — 1♂♂. *Isbkashimskii raion*: vicinity of Dasht village, h~2571 m, 36°40.765' N, 72°41.404' E, 7.VIII.2022 — 2♂♂.

Distribution. Altai, Kyrgyzstan, Uzbekistan, Tajikistan, Western Mongolia, North-Western China (Xinjiang).

Agabus (Gaurodytes) dichrous Sharp, 1878

Fig. 2.

Material. *Roshtkalinskii raion*: Bodomdara gorge: waterlogged brook, h~2856 m, 37°10.123' N, 71°53.306' E, 5.VII.2022 — 2♂♂, Shivoz kishlak, marshy brook, h~2808 m, 37°50.1' N, 71°39.0' E, 29.VII.2021 — 1♂♂, 1♀, ibidem, 5.VII.2022 — 4♂♂, 6♀♀ (DS), ibidem,



Figs 1–8. External appearance of aquatic beetles collected from the Mountain Badakhshan in Tajikistan. 1 — *Agabus basalis* (Gebler); 2 — *Agabus dichrous* Sharp; 3 — *Rhantus suturalis* (W.S. MacLeay); 4 — *Ilybius cinctus* Sharp; 5 — *Oreoedtes alpinus* (Paykull); 6 — *Nebrioporus airumulus* (Kolenati); 7 — *Berosus litvinchuki* Prokin; 8 — *Enochrus fuscipennis* (Thomson). Scale bars: 1–3 — 5 mm, 4–8 — 2 mm.

Рис. 1–8. Внешний вид водных жуков, собранных в Горном Бадахшане Таджикистана. 1 — *Agabus basalis* (Gebler); 2 — *Agabus dichrous* Sharp; 3 — *Rhantus suturalis* (W.S. MacLeay); 4 — *Ilybius cinctus* Sharp; 5 — *Oreoedtes alpinus* (Paykull); 6 — *Nebrioporus airumulus* (Kolenati); 7 — *Berosus litvinchuki* Prokin; 8 — *Enochrus fuscipennis* (Thomson). Масштаб: 1–3 — 5 мм, 4–8 — 2 мм.

h~2808 m, 37°11.3' N, 71°52.1' E, 29.VII.2021 — 1♀, ibidem, waterlogged stream, h~2808 m, 37°11.307' N, 71°52.206' E, 5.VII.2022 — 2♂♂, 6♀♀; Bodomdara gorge: puddle on stream, h~2856 m, 37°10.123' N, 71°53.306' E, 5.VII.2022 — 1♂♂, ibidem, waterlogged stream, h~3000 m, 37°08.23' N, 71°51.712' E, 5.VII.2022 — 2♂♂, 3♀♀. *Shugnanskii raion*: vicinity of Varshez village, hole near the bridge, h~3196 m, 37°42.134' N, 72°23.85' E, 14.VII.2021 — 3♂♂, 3♀♀; 3.5 km NW of Jelondi village, Tuguzbulak river, h~3498 m, 37.59°N, 72.556°E, 18.VII.2018 — 3♂♂, 1♀; SE of Bogevo village, Bogevdara gorge, h~2700 m, 37°30.7' N, 71°12.9' E, 28.VII.2021, V.K. Zinchenko — 1♀. *Rushanskii raion*: Khufdara gorge, Khuf village, water bodies, h~2830 m, 37°50.1' N, 71°39' E, 4.VII.2021 — 3♂♂, 2♀♀, same place, puddles, h~2819 m, 37°50.149' N, 71°39.256' E, 7.VII.2022 — 1♀, 1♂♂, ibidem, meadow, h~2809 m, 37°50.22' N, 71°39.278' E, 7.VII.2022 — 2♂♂, 4♀♀ (VZ, DS), ibidem, dam, h~2837 m, 37°50.095' N, 71°39.18' E, 7.VII.2022 — 2♂♂, 2♀♀, ibidem, h~2863 m, 37°50.226' N, 71°38.972' E, 9.VII.2022 — 1♂♂ (DS), ibidem, h~2839 m, 37°50.092' N, 71°39.185' E, 7.VII.2022 — 2♂♂, 1♀ (DS), ibidem, h~2801 m, 37°50.148' N, 71°39.249' E, 7.VII.2022 — 3♀♀ (DS); tract Kjojdar, h~2835 m, 37°50.096' N, 71°39.118' E, 4.VII.2022 — 4♀♀ (DS), same place, h~2830 m, 37°50' N, 71°39' E, 4.VII.2022 — 1♂♂, 3♀♀ (DS), same place, h~2840 m, 37°50.097' N, 71°39.185' E, 8.VII.2022 — 4♂♂ (DS). *Isbkashimskii raion*: vicinity of Ishkashim village, h~2740 m, 36°40.837' N, 72°15.786' E, 10.VIII.2022 — 1♀ (DS); vicinity of Dasht village, h~2571 m, 36°40.765' N, 72°41.404' E, 7.VIII.2022 — 4♂♂, 2♀♀ (DS).

Distribution. Southern Russia, Kazakhstan, Kyrgyzstan, China (Sichuan, Xinjiang), Mongolia, Afghanistan, Tajikistan.

Ilybius cinctus Sharp, 1882

Fig. 4.

Material. *Isbkashimskii raion*: vicinity of Zumudg village, water body, h~2740 m, 36°55.807' N, 72°12.378' E, 10.VIII.2022 — 1♀.

Distribution. Steppes of SE Europe, Transcaucasia, Kazakhstan, Central Asia, Pribaikalia, Transbaikalia, Mongolia, China.

Platambus semenowi Jakovlev, 1897

Fig. 9.

Material. *Rushanskii raion*: Khufdara gorge, kishlak Khuf, on light, h~2835 m, 37°50.25' N, 71°39.46' E, 6–10.VII.2022 — 26♂♂, 35♀♀.

Distribution. Kyrgyzstan, Tajikistan.

Platambus sogdianus Jakovlev, 1897

Fig. 10.

Material. Khorog, Botanical garden, by light, h~2250 m, 37.48°N, 71.598°E, 13.VII.2018 — 1♀. *Rushanskii raion*: Khufdara gorge, Khuf village, by light, h~2835 m, 37°50.25' N, 71°39.46' E, 3–4, 6–9.VII.2022 — 15♂♂, 22♀♀.

Distribution. Kyrgyzstan, Kazakhstan, Uzbekistan, Tajikistan, Afghanistan, Pakistan, Nepal, Kashmir.

Rhantus suturalis (W.S. MacLeay, 1825)

Fig. 3.

Material. *Rushanskii raion*: kishlak Yanshorv, water body, h~2512 m, 38°17.47' N, 72°20.28' E, WZ, 21.VII.2022 — 1♀.

Distribution. Widespread in the Palearctic, as well as in Southeast Asia, Australia and New Zealand.

Hydroglyphus geminus (Fabricius, 1792)

Fig. 11.

Material. *Isbkashimskii raion*: vicinity of Zumudg village, water body, h~2740 m, 36°55.83' N, 72°12.4' E, 23.VII.2021 — 3♂♂, 4♀♀.

Distribution. All Palearctic.

Hydroporus transgrediens Gschwendtner, 1923

Fig. 12.

Material. *Rushanskii raion*: Khufdara gorge, Khuf village: water bodies, h~2830 m, 37°50.1' N, 71°39' E, 4.VII.2021 — 5♂♂, 3♀♀, ibidem,

streams in meadow, h~2809 m, 37°50.22' N, 71°39.278' E, 7.VII.2022 — 1♂, ibidem, h~2863 m, 37°50.226' N, 71°38.972' E, 9.VII.2022 — 3 ex. (DS), ibidem, h~2839 m, 37°50.092' N, 71°39.185' E, 7.VII.2022 — 2♂♂, 3♀♀ (DS), ibidem, h~2840 m, 37°50.097' N, 71°39.185' E, 8.VII.2022 — 1♀, 3 ex. (DS); tract Kjojdar, h~2835 m, 37°50.096' N, 71°39.118' E, 4.VII.2022 — 1♀ (DS), same place, h~2830 m, 37°50' N, 71°39' E, 4.VII.2022 — 3♂♂, 2♀♀ (DS). **Roshtkalinskiy raion:** Bodomdara gorge, waterlogged brook, h~2856 m, 37°10.123' N, 71°53.306' E, 5.VII.2022 — 2♂♂, 2♀♀. **Shugnanskiy raion:** 3.5 km NW of Jelondi village, Tuguzbulak river, h~3498 m, 37.59°N, 72.556°E, 18.VII.2018 — 1♀♀.

Distribution. Armenia, Azerbaijan, Georgia, Ukraine, southern Russia, Iran, Kyrgyzstan, Turkmenistan, Turkey. New species for the fauna of Tajikistan.

Hydroporus sp.
of the *H. memnonius*-group

Fig. 13.

Material. *Rushanskii raion:* Khufdara gorge, Khuf village, dam, h~2837 m, 37°50.095' N, 71°39.18' E, 7.VII.2022 — 1♀.

Note. Further research is required to better define the species.

Hydroporus pr. *recidivus*
Gschwendtner, 1923

Fig. 14.

Material. *Rushanskii raion:* Basid village, waterlogged stream, h~2353 m, 38°06.56' N, 72°09.804' E, 22.VII.2022 — 2♂♂, 5♀♀; Khufdara gorge, Khufvillage, *Shugnanskiy raion:* SE of Bogevo village, Bogevdara gorge, h~2700 m, 37°30.7' N, 71°12.9' E, 28.VII.2021 — 1♂.

Distribution. Uzbekistan, Tadjikistan, ?Turkmenistan, China (Xinjiang).

Nebriporus airumulus (Kolenati, 1845)

Fig. 6.

Material. *Rushanskii raion:* Vomar village, h~1972 m, 36°56.417' N, 71°35.212' E, 26.VIII.2021 — 1m (DS). *Isbkashimskii raion:* vicinity of Zumudg village, water body, h~2740 m, 36°55.83' N, 72°12.4' E, 23.VII.2021 — 2♂♂; vicinity of Dasht village, h~2571 m, 36°40.765' N, 72°41.404' E, 7.VIII.2022 — 1♂, 2♀♀ (DS).

Distribution. Steppe zone from Eastern Europe to China.

Oreodytes alpinus (Paykull, 1798)

Fig. 5.

Material. *Shugnanskiy raion:* 3.5 km NW of Jelondi village, Tuguzbulak river, h~3498 m, 37.59°N, 72.556°E, 18.VII.2018 — 1♀; vicinity of Varshez village, hole near the bridge, h~3196 m, 37°42.134' N, 72°23.85' E, 14.VII.2021 — 1♀.

Distribution. Northern Europe Siberia to Kamchatka, Sakhalin and Primorye, Mongolia. New species for the fauna of Tajikistan.

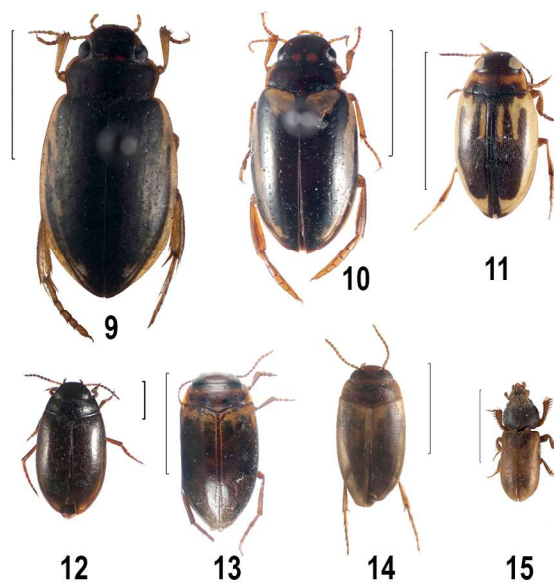
Hygrotus (Leptolambus) impressopunctatus
(Schaller, 1783)

Material. *Isbkashimskii raion:* vicinity of Zumudg village, h~2740 m, 36°55.807' N, 72°12.378' E, 9.VIII.2022 — 2♂♂, 2♀♀, same place, h~3187 m, 36°55.913' N, 72°15.786' E, 10.VIII.2022 — 3♂♂, 2♀♀ (DS). *Roshtkalinskiy raion:* Bodomdara, Shivoz village, waterlogged stream, h~2808 m, 37°11.307' N, 71°52.206' E, 5.VII.2022 — 2♂♂, 7♀♀, same place, 5.VII.2022 — 1♂, 4♀♀ (DS). *Murghabskii raion:* vicinity of Bulunkul village, sazy, h~3753 m, 37°42.16' N, 72°56.72' E, 16.VI.2021 — 2♀♀ (VZ, DS).

Distribution. All Palaearctic, North America.

Hydrophilidae Latreille, 1802
Berosus (Enoplorus) litvinchuki Prokin, 2018

Material. *Isbkashimskii raion:* vicinity of Zumudg village, water body, h~2740 m, 36°55.83' N, 72°12.4' E, 23.VII.2021 — 1♂, 1♀, same



Figs 9–15. External appearance of aquatic beetles collected from the Mountain Badakhshan in Tajikistan. 9 — *Platambus semenowi* Jakovlev; 10 — *Platambus sogdianus* Jakovlev; 11 — *Hydroglyphus geminus* (Fabricius); 12 — *Hydroporus transgrediens* Gschwendtner; 13 — *Hydroporus* sp. of the *H. memnonius* group; 14 — *Hydroporus ?recidivus* Gschwendtner; 15 — *Augyles flavidus* (Rossi). Scale bars 9–10 — 5 mm, 12–15 — 2 mm.

Рис. 9–15. Внешний вид водных жуков, собранных в Горном Бадахшане Таджикистана. 9 — *Platambus semenowi* Jakovlev; 10 — *Platambus sogdianus* Jakovlev; 11 — *Hydroglyphus geminus* (Fabricius); 12 — *Hydroporus transgrediens* Gschwendtner; 13 — *Hydroporus* sp. из группы *H. memnonius*; 14 — *Hydroporus ?recidivus* Gschwendtner; 15 — *Augyles flavidus* (Rossi). Масштаб: 9–10 — 5 мм, 12–15 — 2 мм.

place, h~2740 m, 36°55.807' N, 72°12.378' E, 9.VIII.2022 — 3♂♂ (DS).

Distribution. Azerbaijan, Kazakhstan, Uzbekistan, Tajikistan.

Enochrus (Lumetus) fuscipennis
(Thomson, 1884)

Fig. 8.

Material. *Rushanskii raion:* Khuf village, water bodies, h~2801 m, 37°50.148' N, 71°39.249' E, 7.VII.2022 — 1♂, 1♀ (DS), same place, meadow, streams, h~2809 m, 37°50.22' N, 71°39.278' E, 7.VII.2022 — 1♀.

Distribution. Widespread in Palaearctic, eastwards to Hebei province in China, northern Africa, Georgia, Turkmenia, Tajikistan.

Enochrus (Lumetus) quadripunctatus
(Herbst, 1797)

Material. *Rushanskii raion:* Khuf village, water bodies, h~2830 m, 37°11.3' N, 71°52.1' E, 4.VII.2021 — 1♂, ibidem, puddles, h~2819 m, 37°50.149' N, 71°39.256' E, 7.VII.2022 — 7♂♂, 3♀♀, ibidem, meadow, streams, h~2809 m, 37°50.22' N, 71°39.278' E, 7.VII.2022 — 5♂♂, 2♀♀ (VZ, DS), same, h~2863 m, 37°50.226' N, 71°38.972' E, 9.VII.2022 — 1♂, 1♀ (DS), ibidem, h~2801 m, 37°50.148' N, 71°39.249' E, 7.VII.2022 — 1♂, 2♀♀ (DS), ibidem, h~2839 m, 37°50.098' N, 71°39.185' E, 7–8.VII.2022 — 2♂♂, 1♀ (DS). *Isbkashimskii raion:* Avj village, 10.VI.2023 — 1♂, 2♀♀ (DS).

Distribution. Almost all Palaearctic.

Hydrobius fuscipes (Linnaeus, 1758)

Material. *Isbkashimskii raion:* h~2740 m, 36°55.807' N, 72°12.378' E, 9.VIII.2022 — 1♀ (DS).

Distribution. Palaearctic and North America.

Laccobius (Microlaccobius) pr. sublaevis
Shalberg, 1900

Material. *Isbkashimskii raion*: Avdzh village, 10.VI.2023 — 1♂, 2♀♀ (DS).

Distribution. Kazakhstan, Kyrgyzstan, Tajikistan.

Note. It is necessary to compare with precisely defined specimens from other regions.

Laccobius (Microlaccobius) pr. orientalis
Knisch, 1924

Material. *Rushanskii raion*: Basid village, waterlogged stream, h~2354 m, 38°06.56' N, 72°09.755' E, 21.VII.2022 — 1♂.

Distribution. Nepal, India Turkmenistan, Tajikistan.

Note. Additional material is needed for a more precise identification.

Heteroceridae MacLeay, 1825
Augyles flavidus (Rossi, 1794)

Fig. 15.

Material. *Rushanskii raion*: Khufdara gorge, Khuf village, on light, h~2835 m a.s.l., 37°50.25' N, 71°39.46' E, 8–9.VII.2022 — 1♂.

Distribution. South of Eastern Europe, Mediterranean, Transcaucasia, Central Asia, North Africa [Mascagni, 2016; Sazhnev, 2018].

Note. Among the above-mentioned species, two species of the genus *Hydroporus* Clairville and two species of the genus *Laccobius* Erichson remained undetermined.

Discussion

Thus, 20 species of aquatic beetles from the families Dytiscidae, Hydrophilidae and Heteroceridae have been found in the studied area, which is approximately one third of the fauna of aquatic hardworms of mountain Badakhshan. According to publications from the regions adjacent to the study area, there should be at least 60–70 species of water beetles in the territory of GBAO.

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