

**THE VARIEGATED MUD-LOVING BEETLES (COLEOPTERA:
HETERO CERIDAE) OF KYRGYZSTAN**

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Summary. An annotated list of 12 species of Heteroceridae of Kyrgyzstan fauna is given. Two species, *Augyles turanicus* (Reitter, 1887) and *Heterocerus mus* Charpentier, 1965, are recorded from Kyrgyzstan for the first time. In addition, *Augyles sericans* (Kiesenwetter, 1843) is excluded from the fauna of this country and the records of two species from Kyrgyzstan need confirmation.

Key words: Coleoptera, Heteroceridae, fauna, new record, Central Asia.

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Резюме. Приведен аннотированный список 12 видов жуков-пилоусов фауны Кыргызстана. Впервые для страны указываются *Augyles turanicus* (Reitter, 1887) и *Heterocerus mus* Charpentier, 1965. Кроме того, *Augyles sericans* (Kiesenwetter, 1843) исключен из списка фауны, а указание еще двух видов из Кыргызстана нуждаются в подтверждении.

INTRODUCTION

Family Heteroceridae includes 5 genera and about 320–370 species worldwide (Mascagni, 2014; Skalický & Ezer, 2014). Adults and larvae of Heteroceridae construct tunnels in wet sand at the edges of streams, rivers, lakes and ponds, and in brackish mud flats (Vanin *et al.*, 2016).

First records of Heteroceridae from the “Kirghiz steppe” (Zaitzev, 1908; Jacobson, 1913, etc.) refer to the modern territory of Kazakhstan and Russia. The first list of nine species Heteroceridae of Kyrgyzstan in its modern borders was published by Ovchinnikov (1996) and provided by distribution data in the different parts of republic for *Augyles flavidus* (Rossi, 1794), *A. hispidulus* (Kiesenwetter, 1843), *A. sericans* (Kiesenwetter, 1843), *Heterocerus fenestratus* (Thunberg, 1784), *H. flexuosus* Stephens, 1828, *H. fossor* Kiesenwetter, 1843, *H. fuscus* Kiesenwetter, 1843, *H. obsoletus* Curtis, 1828 and *H. parallelus* Gebler, 1830. Later, *A. flavidus* was recorded from the Alai Mountain Range (Mascagni, 2003), a new species *A. gerdmuelleri* Skalický 2010 was described from the Naryn Oblast and *H. nepalensis* Mascagni, 1993, *H. virgatus* Mamitza, 1933 and *H. fenestratus* were found in the

vicinity of Issyk-Kul Lake (Skalický, 2010). In the Catalogue of Palaearctic Coleoptera (Mascagni, 2006, 2016) only *A. flavidus* is reported for Kyrgyzstan. However, some records require verification or they are questionable. The current list of 12 species of variegated mud-loving beetles of Kyrgyzstan is given below.

MATERIAL AND METHODS

The present paper is based on the material collected by the first author, the museum collections and materials provided by colleagues. Studied material is stored in the following collections: IBIW – Papanin Institute for Biology of Inland Waters (Borok, Russia); PCL – private collection of Stanislav Litovkin (Samara, Russia); MSPU – Moscow Pedagogical State University (Moscow, Russia).

Photographs of beetles were taken using a Nikon D3200 digital camera with attached microscope objective LOMO Plan 3.5×0.10. Photographs of the aedeagus were taken using a LOMO Biolam R-17 compound microscope with a Canon PowerShot A640 digital camera. Images were generated by using Helicon Focus 5.3 software and enhanced by using Adobe Photoshop CS3.

LIST OF THE SPECIES

Family Heteroceridae Macleay, 1825

Genus *Augyles* Schiodte, 1866

Augyles flavidus (Rossi, 1794)

MATERIAL EXAMINED. **Jalal-Abad Oblast:** Chatkal District, vicinity Sumsar, 41°13'54"N 71°19'00"E, 24.VI 2004, 33 ex. (A. Rubenets leg., IBIW); 5 km E Shekaftar, S Karyn-Kur, 41°13'28"N 71°23'26"E, 990 m, foothill desert, at light, 26–27.VI 2017, 1 ex. (S. Litovkin leg., PCL); 2 km S Sumsar, 41°11'52"N 71°18'27"E, 1017 m, clayish shore of stream, 5.VI 2018, 1 ex. (S. Litovkin leg., PCL); 5 km W Tash-Kumyr, 41°20'08"N 72°07'57"E, 766 m, hilly terrain, dry riverbed, at light, 16–17.VII 2017, 2 ♂ (S. Litovkin leg., PCL).

DISTRIBUTION. Kyrgyzstan: North Kirgizia (Ovchinnikov, 1996, as *Heterocerus campestris* Motsch.); Osh Oblast, Alai Mountain Range, 10 km N Daraut Kurgan, Tengizbai Pass, 3000–3800 m (Mascagni, 2003). *Augyles flavidus* is distributed in Africa, South of Eastern Europe, Middle East, Caucasus, Central Asia, (Mascagni, 2006). Therefore, the records of this species from Siberia and the Russian Far East (Mascagni, 2016) are erroneous and require confirmation. The record of *Heterocerus (Littorimus) flavidus* from “Kirg.” (“Кирг.”) (Jacobson, 1913) refers to the Kirghiz steppe.

NOTES. The finding of this species on the Tengizbai Mountain Pass at the altitudes of 3000–3800 m above sea level (Mascagni, 2003) is the highest registered locality for the family Heteroceridae. Most likely, the record corresponds to the lower range of the indicated heights. A new material is needed to confirm the occurrence of Heteroceridae in such extreme environments.

Augyles gerdmuelleri Skalický, 2010

MATERIAL EXAMINED. No specimens examined by authors.

DISTRIBUTION. Endemic to Kyrgyzstan.

NOTES. The species was described from Kyrgyzstan, Naryn Oblast, Terek Valley NW Durbeldzin [= Baetov; ~41°21'N 74°53'E (*authors note*)], 2000 m, 27–28.VII 2009 based on 2 males and 10 females (Skalický, 2010).

***Augyles turanicus* (Reitter, 1887)**

Figs 1–3

MATERIAL EXAMINED. **Jalal-Abad Oblast:** 5 km E Shekaftar, S Karyn-Kur, 41°13'28"N 71°23'26"E, 990 m, foothill desert, at light, 26–27.VI 2017, 58 ex. (S. Litovkin leg., PCL); 10 km NW Jalal-Abad, 40°56'00"N 72°53'20"E, 917 m, hilly terrain, pistachio woodlands, at light, 15–16.VII 2017, 1 ex. (S. Litovkin leg., PCL). **Osh Oblast:** 1.5 km N Nayman Reservoir, 40°21'45"N 72°21'49"E, 1228 m, pasture, at light, 7–8.VII 2017, 2 ex. (S. Litovkin leg., PCL).

DISTRIBUTION. North Africa, Middle East, Caucasus, Central Asia (Mascagni, 2016), Ciscaucasia in Russia (Sazhnev & Ilyina, 2017). Here this species is recorded from Kyrgyzstan for the first time.

***Augyles* sp.**

MATERIAL EXAMINED. **Jalal-Abad Oblast:** Suzak District, 10 km NW Jalal-Abad, 40°55'57"N 72°53'35"E, 810 m, 13.VII 2000, 3 ♀ (G.A. Anufriev & D.V. Potanin leg., IBIW).

NOTES. This species is similar to *Augyles turanicus*, but differs by wider body, by blurry pattern and by wrinkled microsculpture on the elytra.

Genus *Heterocerus* Fabricius, 1792

***Heterocerus fenestratus* (Thunberg, 1784)**

MATERIAL EXAMINED. **Issyk-Kul Oblast:** near Issyk-Kul Lake, 5 km S Balykchi, 42°23'03"N 76°11'10"E, 1615 m, at light, 8–9.VII 2018, 2 ex. (S. Litovkin leg., PCL). **Jalal-Abad Oblast:** 5 km W Tash-Kumyr, 41°20'08"N 72°07'57"E, 766 m, hilly terrain, dry riverbed, at light, 15–16.VI 2017, 4 ex. (S. Litovkin leg., PCL); same locality data, but 16–17.VII 2017, 15 ex. (S. Litovkin leg., PCL); 10 km WNW Tash-Kumyr, 41°23'15"N 72°06'05"E, 1012 m, hilly terrain, steppe, at light, 17–18.VI 2017, 1 ex. (S. Litovkin leg., PCL); Chatkal District, vicinity Sumsar, 41°13'54"N 71°19'00"E, 24.VI 2004, 26 ex. (A. Rubenets leg., IBIW); 5 km E Shekaftar, S Karyn-Kur, 41°13'28"N 71°23'26"E, 990 m, foothill desert, at light, 26–27.VI 2017, 85 ex. (S. Litovkin leg., PCL). **Osh Oblast:** Ozgur environs, bank of Akbura River, 40°24'52"N 72°52'23"E, 1127 m, near small pool, 6.VII 2017, 1 ex. (S. Litovkin leg., PCL); Nayman Reservoir, 40°20'31"N 72°22'22"E, 1200 m, muddy shore, 21–23.VI 2017, 10 ex. (S. Litovkin leg., PCL); 1.7 km N Nayman Reservoir, 40°21'53"N 72°21'39"E, 1240 m, small residual pools in dry streambed, 8.VII 2017, 1 ex. (S. Litovkin leg., PCL); same locality data, but 27.V 2018, 1 ex. (S. Litovkin leg., PCL); 1.5 km N Nayman Reservoir, 40°21'45"N 72°21'49"E, 1228 m, pasture, at light, 8–9.VII 2017, 7 ex. (S. Litovkin leg., PCL); Almalyk, 40°23'04"N 72°42'31"E, 1290 m, pasture, at light, 2–3.VII 2018, 20 ex. (S. Litovkin leg., PCL). **Talas Oblast:** Kirov Reservoir, ~1 km N Kyzyl-Adyr, 42°38'10"N 71°36'03"E, 891 m, 11.VI 2016, 1 ex. (D. Palatov leg., IBIW).

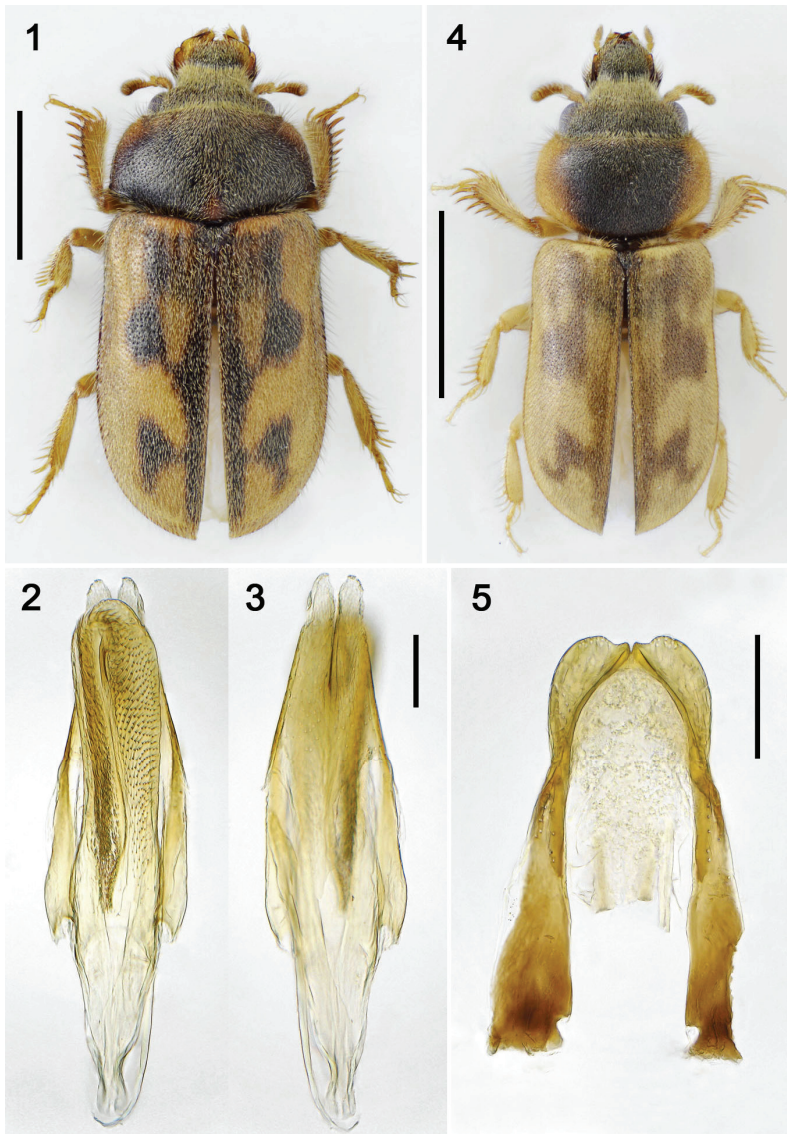
DISTRIBUTION. Kyrgyzstan: North Kirghizia, Issyk-Kul hollow, Inner and Central Tien-Shan (Ovchinnikov, 1996, as *Heterocerus laevigatus* Panz.); Issyk-Kul Lake environs (Skalický, 2010). It is a widespread Holarctic species, also known from the Oriental region (Charpentier, 1979; Mascagni, 2003, 2016; King & Lago, 2012).

NOTES. The note "Kirg." in the Jacobson's Catalog (1913) refers to the Kirghiz steppe.

***Heterocerus flexuosus* Stephens, 1828**

MATERIAL EXAMINED. **Issyk-Kul Oblast:** Issyk-Kul District, Grigorievka N Issyk-Kul Lake, 11.VII 1984, 1 ex. (M. Danilevsky leg., MSPU); near Issyk-Kul Lake, 5 km S Balykchi, 42°23'03"N 76°11'10"E, 1615 m, at light, 8–9.VII 2018, 1 ex. (S. Litovkin leg., PCL).

DISTRIBUTION. Kyrgyzstan: areas around Fergana Valley (Ovchinnikov, 1996). This species is widespread in the Palearctic region and reaching to Afrotropical region (Mascagni, 2016). But the *Heterocerus flexuosus* species complex is require revision.



Figs 1–5. Habitus and genitalia of Heteroceridae. 1–3 – *Augyles turanicus*, male (vicinity of Shekaftar): 1 – body, dorsal view; 2–3 – aedeagus; 4, 5 – *Heterocerus mus*, male (vicinity of Tash-Kumyr): 4 – body, dorsal view; 5 – tegmen. Scale bars for Figs 1, 4 = 1 mm, for Figs 3, 5 = 0.1 mm.

***Heterocerus fuscus* Kiesenwetter, 1843**

MATERIAL EXAMINED. **Issyk-Kul Oblast:** near Issyk-Kul Lake, 5 km S Balykchi, 42°23'03"N 76°11'10"E, 1615 m, at light, 8–9.VII 2018, 5 ex. (S. Litovkin leg., PCL).

DISTRIBUTION. Kyrgyzstan: North Kirghizia and Issyk-Kul hollow (Ovchinnikov, 1996). Europe, Turkey, Iran, Central Asia, Siberia (Mascagni 2006, 2016; Efimov & Litovkin, 2015; Prokin *et al.*, 2016).

NOTES. The records “Kirgisias” (Zaitsev, 1908) and “Kirg.” in the Catalog of Jacobson (1913) refer to the Kirghiz steppe.

***Heterocerus obsoletus* Curtis, 1828**

MATERIAL EXAMINED. **Issyk-Kul Oblast:** Issyk-Kul District, Grigorievka N Issyk-Kul Lake, 11.VII 1984, 1 ex. (M. Danilevsky leg., MSPU). **Jalal-Abad Oblast:** 5 km W Tash-Kumyr, 41°20'08"N 72°07'57"E, 766 m, hilly terrain, dry riverbed, at light, 15–16.VI 2017, 2 ex. (S. Litovkin leg., PCL); 5 km E Shekaftar, S Karyn-Kur, 41°13'28"N 71°23'26"E, 990 m, foothill desert, at light, 26–27.VI 2017, 1 ex. (S. Litovkin leg., PCL).

DISTRIBUTION. Kyrgyzstan: North Kirghizia (Ovchinnikov, 1996). Europe, Middle East, Caucasus, Central Asia, Siberia, Mongolia (Efimov & Litovkin, 2015; Mascagni, 2016).

NOTES. The records “Kirgisias” (Zaitsev, 1908) and “Kirg.” in the Catalog of Jacobson (1913) refer to the Kirghiz steppe.

***Heterocerus parallelus* Gebler, 1830**

MATERIAL EXAMINED. **Issyk-Kul Oblast:** Issyk-Kul District, Grigorievka N Issyk-Kul Lake, 11.VII 1984, 1 ex. (M. Danilevsky leg., MSPU).

DISTRIBUTION. Kyrgyzstan: North Kirghizia and areas around Fergana Valley (Ovchinnikov, 1996, as *Heterocerus parallelus* Kryn.). Europe, Lebanon, Central Asia, southern Siberia, Mongolia (Mascagni, 2016).

NOTES. The record of this species from “Kirgiz.” in the Catalog of Jacobson (1913) refers to the Kirghiz steppe.

***Heterocerus mus* Charpentier, 1965**

Figs 4–5

MATERIAL EXAMINED. **Jalal-Abad Oblast:** 5 km W Tash-Kumyr, 41°20'08"N 72°07'57"E, 766 m, hilly terrain, dry riverbed, at light, 16–17.VII 2017, 2 ♂, 4 ♀ (S. Litovkin leg., PCL).

DISTRIBUTION. This species was described from Chad (Charpentier, 1965) and distributed in Afrotropical region, Middle East, Central Asia, Pakistan and India (Skalický, 2001; Mascagni, 2016).

NOTES. Here this species is recorded from Kyrgyzstan for the first time.

***Heterocerus nepalensis* Mascagni, 1993**

MATERIAL EXAMINED. No specimens examined by authors.

DISTRIBUTION. Kyrgyzstan: environs of Issyk-Kul Lake (Skalický, 2010). Oriental Region, Hong Kong, Nepal, Pakistan, Turkmenistan (Mascagni, 2016).

NOTES. The species was recorded from Turkmenistan without an exact locality (Mascagni 2006, 2016). Issyk-Kul Lake in Kyrgyzstan is the northernmost finding of the species and located at a significant distance from the main known range.

***Heterocerus virgatus* Mamitza, 1933**

MATERIAL EXAMINED. Thailand: Prov. Nakhon Ratchasima, 14°16'40"N 102°25'29"E, 250 m, 9–13.VII 2013, 1 ♂ (A. Korshunov leg., PCL).

DISTRIBUTION. Kyrgyzstan: environs of Issyk-Kul Lake (Skalický, 2010). Oriental region, South China, Nepal, Pakistan (Mascagni, 2016).

NOTES. Issyk-Kul Lake in Kyrgyzstan is the northernmost finding of the species and located at a significant distance from the main known range. This species is firstly recorded herein from Thailand.

DOUBTFUL RECORDS FROM KYRGYZSTAN

***Augyles hispidulus* (Kiesenwetter, 1843)**

NOTES. This species distributed in Europe, Middle East, Central Asia (Mascagni, 2003, 2006, 2016). The record “Kirg.” for “*Heterocerus (Littorimus) hispidulus* Kies.” in the Jacobson's Catalog (1913) refers to the Kirghiz steppe (Kazakhstan or Russia). Records from the south Siberia and the Russian Far East (Jacobson, 1913; Egorov, 1989; Kirejtshuk, 2001) should be attributed to other species of the *Augyles cribratellus* species group (*sensu* Charpentier, 1965). The record of this species from Issyk-Kul hollow in Kyrgyzstan (Ovchinnikov, 1996) require verification.

***Heterocerus fossor* Kiesenwetter, 1843**

NOTES. This species distributed in Europe, Turkey, Iran, Kazakhstan, Tajikistan, Siberia (Mascagni, 2006, 2003, 2016). The record “Kirg.” for this species in the Jacobson's Catalog (1913) refers to the Kirghiz steppe. It was recorded from Kyrgyzstan (North Kirghizia, Issyk-Kul hollow and Inner Tien-Shan) by Ovchinnikov (1996), but these records require verification.

***Augyles sericans* (Kiesenwetter, 1843)**

NOTES. This species is known from Europe, Caucasus, Middle East (Zaitsev, 1946; Mascagni, 2016; Sazhnev & Shapovalov, 2016). The record of *A. sericans* from Fergana Valley in Kyrgyzstan (Ovchinnikov, 1996) as well as other records of this species from Central Asia (e.g. Jacobson, 1913) are doubtful. This species can be confused with other *Augyles* species and we exclude it from the fauna of Kyrgyzstan.

CONCLUSION

Thus, the mud-loving beetle fauna of Kyrgyzstan includes 12 species. The occurrence of *Heterocerus fossor* and *Augyles hispidulus* in Kyrgyzstan requires confirmation. The record of *A. sericans* from Kyrgyzstan is doubtful. Moreover, a few species of Heteroceridae may be found in Kyrgyzstan, for example *Micilus minutissimus* (Sahlberg, 1900), *Heterocerus heydeni* Kuwert, 1890 and *Augyles dilutissimus* (Reitter, 1887). *Heterocerus heydeni* was recorded from Alai Mountain Range in the former Fergana Oblast (Zaitzev, 1908; Jacobson, 1913) and this record may refer to the modern territory of Kyrgyzstan. *Augyles dilutissimus* is known from Western China (Xinjiang), Tajikistan, Turkmenistan (Mascagni, 2016) and Kazakhstan (collection of the first author) and may be also found in Kyrgyzstan.

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