New taxa of subterranean freshwater snails from Bulgaria
(Gastropoda, Hydrobiidae)

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Abstract
Two new genera, i.e. Kolevia gen. nov. and Microstygia gen. nov., in addition to the five subterranean species were described here as new for science: Kolevia bulgarica n. gen. n. sp., Microstygia deltchevi n. gen. n. sp., Bythiospeum iltchoi n. sp., Belgrandiella lomica n. sp., and Belgrandiella delevae n. sp. The type species of the new genera are designated, holotypes of the new species are depicted, and a map with the sampling sites is provided.

Key words: stygobiotic, subterranean, snails.

Introduction
For a long time the Bulgarian stygobiotic snail fauna was poorly known (Angelov 2000). After an intensive research by authors after 2009 many new species were described from particular regions of the country as West Rhodopes Mts., Central and Western Stara Planina Mts., and its north foothills, known as “Predbalkan” (Georgiev & Hubenov 2013). However some geographical regions remained unexplored.

In this paper we describe new taxa of snails from subterranean waters of such areas (western mountainous regions near the Serbian border, Danube plain and East Stara Planina Mts.), and one from the relatively known Vrachanski Balkan Mts. (part of Western Stara Planina) (Fig. 1). Two of the new species were representatives of unknown genera described here as new.

Material and Methods
The shells were collected by sieving the spring deposits by sieves. The measurements were carried out by means of ZEISS stereo microscope and an eye-piece micrometer. The photographs were taken with a digital camera system (LEICA).

The material is stored in the Senckenberg Naturhistorische Sammlung Dresden (SNSD), Germany and in the collection of the authors. Abbreviations used: H - shell height, W - shell width.
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**Figure 1.** Collection sites of the new hydrobiid species in Bulgaria: 1: Kalna Matnitsa spring; 2: Spring on the left bank of Yablanitsa River; 3: Water source near Beli Lom River; 4: Stream flowing from village of Golyamo Gradishte at its inflow in Kalakoch River; 5: Lednika Cave, Kotel town area.

**Systematics**

Class **Gastropoda** Cuvier, 1795

Order **Neotaenioglossa** Haller, 1892

Family **Hydrobiidae** Troschel, 1857

Genus **Kolevia** gen. nov.

**Type species**: *Kolevia bulgarica* n. gen. n. sp.

**Diagnosis**: The shell is white, conical to ovate-conical with 5 whorls having fine growth lines and deep suture. The apex is rounded to relatively sharp. The aperture is ovoid with simple lip having brownish periphery. The umbilicus is slit-like. The operculum and the soft body are unknown.

**Etymology**: The genus is named after Iltcho Kolev who collected the type species.

**Differentiating features**: In *Graziana* Radoman, 1975 the aperture is elongated ovate and not as broad as it is in *Kolevia* n. gen. The shells of *Cavernisa* Radoman, 1978 are broader by nearly the same shell height. In addition *Cavernisa* has an open umbilicus.
Kolevia bulgarica n. sp.  
(Fig. 2)

**Type series:** Holotype: H = 2.0 mm, W = 1.0 mm, SNSD Moll S7892, 06.08.2014, Iltcho Kolev leg.  
Paratypes: 16 shells SNSD Moll S7893, 4 shells coll. Glöer

**Locus typicus:** Kalna Matnitsa spring, below Toshkova Dupka cave, Vrachanski Balkan Mts., Bulgaria, N43 15 54.31 E23 20 50.93, 253 m alt. (Fig. 1)

**Etymology:** Named after the country where the species lives.

**Description:** The shell is white, conical to ovate-conical with 5 whorls having fine growth lines and deep suture. The apex is rounded to relatively sharp. The aperture is ovoid with simple lip having brownish periphery. The umbilicus is slit-like. The operculum and the soft body are unknown. H = 8.9 mm, W = 2.4 mm.

**Habitat and ecology:** Stygobiotic species.

**Distribution:** Known only from its type locality.

Genus *Microstygia* gen. nov.

**Type species:** *Microstygia deltchevi* n. sp.

**Diagnosis:** The shell is white, elongate-conical to almost cylindrical with 4 whorls having fine growth lines and deep suture. The apex is strongly rounded. The aperture is ovoid with a simple lip having relatively thickened edge. The umbilicus is open. The operculum and the soft body are unknown.

**Etymology:** From “micro” and “Styx River”, meaning micro inhabitant of subterranean waters.

**Differentiating features:** The new genus is most similar morphologically with *Bythiospeum* Bourguignat, 1882 and *Paladilhiopsis* Pavlovic, 1913. From both it differs by its rounded apex and broad embryonic whorls. In addition from the first it differs by its open umbilicus and from the second by the lack of spiral lines microsculpture on the shell crossing the growth striate.

*Microstygia deltchevi* n. sp.  
(Figs. 3-4)

**Type series:** Holotype: H = 1.25 mm, W = 0.6 mm, SNSD Moll S7894, 20.08.2014, Dilian Georgiev leg.

**Locus typicus:** Spring on the left bank of Yablanitsa River, southwest of village of Bankya, Tran town area, Bulgaria, N42 50 53.3 E22 40 43.7, 640 m alt. (Fig. 1).

**Etymology:** The species is named after the arachnologist and speleologist Assoc. Prof. Christo Deltchev (National Natural History Museum, Sofia) for his contributions in studies of the Bulgarian caves and cave fauna.

**Description:** The shell is very small, elongate-conical to almost cylindrical with 4 slightly rounded whorls that have shining surface. The apex is rounded, the umbilicus is wide open. The aperture is ovoid with a simple lip having relatively thickened edge. The operculum and the soft body are unknown. H = 1.25 mm, W = 0.6 mm.

**Differentiating features:** Comparing to all known *Bythiospeum* species from Bulgaria (Georgiev & Glöer 2013) and Serbia (Radoman 1983), *Microstygia deltchevi* n. sp. differs from all by its very round apex and wide open umbilicus. In addition this species has very small shell (H < 1.3 mm).

**Habitat and ecology:** Stygobiotic species found only as empty shells among sand deposits of a spring emerging from rocks, at a river bank. The area was occupied by broad leaf forest dominated by *Fagus sylvatica*, *Carpinus* sp., and *Alnus glutinosa*. Shells were found together with those of *Bythiospeum juliae* Georgiev & Glöer, 2015 and *Devetakia veselinae* Georgiev & Glöer, 2015 (also type locality of these species).

**Distribution:** Known only from its type locality.

Genus *Bythiospeum* Bourguignat, 1882

*Bythiospeum iltchoi* n. sp.

(Fig. 5)

**Type series:** Holotype: H = 2.1 mm, W = 0.9 mm, SNSD Moll S7895, 08.08.2012, Iltcho Kolev leg. Paratypes: 8 shell SNSD Moll S7896, 2 shells coll. Glöer.

**Locus typicus:** Water source near Beli Lom River at village of Pisanets, Danube River plain, Bulgaria, N43 40 01.74 E26 10 23.42, 101 m alt. (Fig. 1)
Etymology: The species is named after Iltcho Kolev who collected the species.

Description: The shell is elongate-conical, thin walled, consisting of 4-4.5 whorls, with fine growth lines and clear suture. The aperture is small, ovoid, with thin simple lip, umbilicus is closed. H = 2.0-2.1 mm, W = 0.9 mm.

Differentiating features: The new species is most similar with *Bythiospeum simovi* Georgiev, 2013 (Georgiev & Glöer 2013) from which it differs by the smaller whorl number and the closed umbilicus.

Habitat and ecology: Stygobiotic species found as empty shells in spring waters.

Distribution: Known only from its type locality.

Genus *Belgrandiella* (Wagner, 1927)

*Belgrandiella lomica* n. sp.

(Fig. 6)

**Type series:** Holotype: H = 2.1 mm, W = 1.2 mm, SNSD Moll S7897, 04.06.2014, Iltcho Kolev leg., Paratype: 1 shell SNSD Moll S7898.

**Locus typicus:** Deposits of a small stream flowing from village of Golyamo Gradishte at its inflow in Kalakoch River near village of Krepeha, Danube River plain, Bulgaria, N43 27 55.49 E26 06 38.86, 203 m alt. (Fig. 1)

Etymology: The species is named after the Rusenski Lom River in which catchment area the species was found.

Description: The shell is relatively large, ovate, white with 4-4.5 slightly rounded, fast growing whorls that have shining surface and clear suture. The aperture is ovoid with thick aperture edge. The umbilicus is slit-like. The soft body and operculum are unknown. H = 2.1 mm, W = 2.1 mm.

Differentiating features: The new species is most similar with *Belgrandiella pandurskii* Georgiev, 2011 from which it differs by its more flatter whorls, not so deep suture, and thicker aperture edge. In addition *B. lomica* n. sp. was not found living in surface spring waters, in contrast with *B. pandurskii*.

Habitat and ecology: Stygobiotic species found as empty shells in spring waters.

Distribution: Known only from its type locality.

*Belgrandiella delevae* n. sp.

(Fig. 7)

**Type series:** Holotype: H = 1.85 mm, W = 1.0 mm, SNSD Moll S7899, Stanimira Deleva leg. Paratypes: 1 shell SNSD Moll S7900.

**Locus typicus:** Lednika Cave, Zlosten area, near Kotel town, East Stara Planina Mts., Bulgaria, E26 30 46.08, N42 56 00.96 (Fig. 1).

Etymology: The species was named after Stanimira Deleva who collected the species.
Description: The shell is white, elongate-ovoid with 4 fast growing whorls that have rough eroded areas. The aperture is ovoid with simple thick aperture edge. The umbilicus is closed. The soft body is white. Eyes are big and well visible. The penis is elongate-conical with tapered apex. The operculum is red. H = 1.85-1.9 mm, W = 1.0 mm.

Differentiating features: The new species is most similar with Belgrandiella petrovi Georgiev, 2014 from which it differs by its more cylindrical and bigger shell, and its not so thick aperture edge.

Habitat and ecology: Stygobiotic species found in cave running waters from stones.

Distribution: Known only from its type locality.

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References