

**Research Article**

***BELGRANDIELLA PETROVI* N. SP. – A NEW SPECIES FROM A SPRING  
CAVE IN BULGARIA (GASTROPODA: HYDROBIIDAE)**

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Article History: Received 10<sup>th</sup> December 2013; Accepted 9<sup>th</sup> March 2014; Published online 25<sup>th</sup> March 2014

**ABSTRACT**

In this paper I describe a new stygobiotic species of *Belgrandiella* from Bulgaria: Chuchura cave near Velchovtsi area of the village of Stantchov Han, Tryavna district, Stara Planina Mt, N42 47 58.0 E25 34 23.7, 573 m alt. This is one of the smallest species of this genus known till now in the country.

**Key words:** Stygobiotic species, Chuchura cave, snail, Bulgaria.

**INTRODUCTION**

The genus *Belgrandiella* Wagner, 1927 (Gastropoda: Risooidea) consisting of small freshwater snails is one of the most diverse genera from the Risooidea superfamily in Bulgaria having 12 species known till now, all local or regional endemics (Georgiev, 2011a, 2012b, 2013). There are two ecological groups of species from the genus: stygobiotic (*Belgrandiella hessei* Wagner, 1927, *Belgrandiella pusilla* Angelov, 1959, *Belgrandiella bulgarica* Angelov, 1972, *Belgrandiella bureschi* Angelov, 1976, *Belgrandiella stanimirae* Georgiev, 2011, *Belgrandiella hubenovi* Georgiev, 2012, *Belgrandiella maarensis* Georgiev, 2013) and spring-living species (Wagner, 1927; Angelov, 1959, 1972, 1976; Pintér, 1968; Hubenov, 2005, 2007; Glöer & Georgiev, 2009; Georgiev, 2011b, c, d, 2012, 2013).

In this paper I describe a new stygobiotic species of *Belgrandiella* collected from a cave in Stara Planina, Bulgaria.

**MATERIAL AND METHODS**

The shells were collected by sieving the cave river deposits by 1x1 and 2x2 mm mesh width sieves. The material from the smaller meshed sieve was then brought to the laboratory and dried. After it was again put into water and the floating shells were collected by a strainer and small brush. The measurements were carried out by means of CETI stereo microscope and an eye-piece micrometer, and photographs were made with camera system with a digital adapter. The material is stored in the Hungarian Natural History Museum (HNHM), Budapest.

**Abbreviations used:** H - shell height, W - shell width, AH - aperture height, AW - aperture width, LH - last whorl height.

**RESULTS**

Genus *Belgrandiella* Wagner, 1927

**Type species:** *Belgrandia kusceri* Wagner, 1914  
*Belgrandiella petrovi* n. sp.

**Material examined:** 3 shells, 25.6.2012, from the type locality, Dilian Georgiev Leg.

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**Holotype:** H = 1.65 mm, W = 0.86 mm, AH = 0.63 mm, AW = 0.66 mm, LH = 1.12 mm, 2 ex., HNHM 99881.

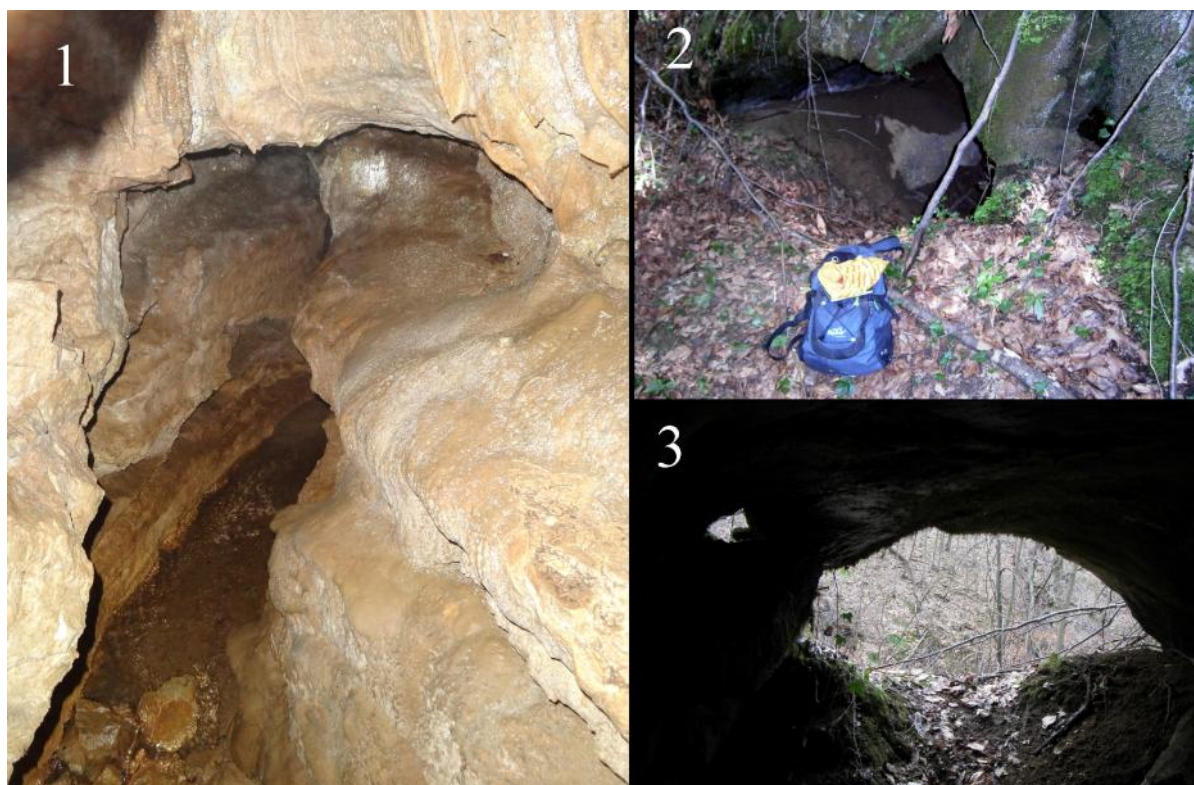
**Paratypes:** 2 ex., HNHM 99882.

**Locus typicus:** Chuchura cave near Velchovtsi area of the village of Stantchov Han, Tryavna district, Stara Planina Mt, N42 47 58.0 E25 34 23.7, 573 m alt. (Figure 1).

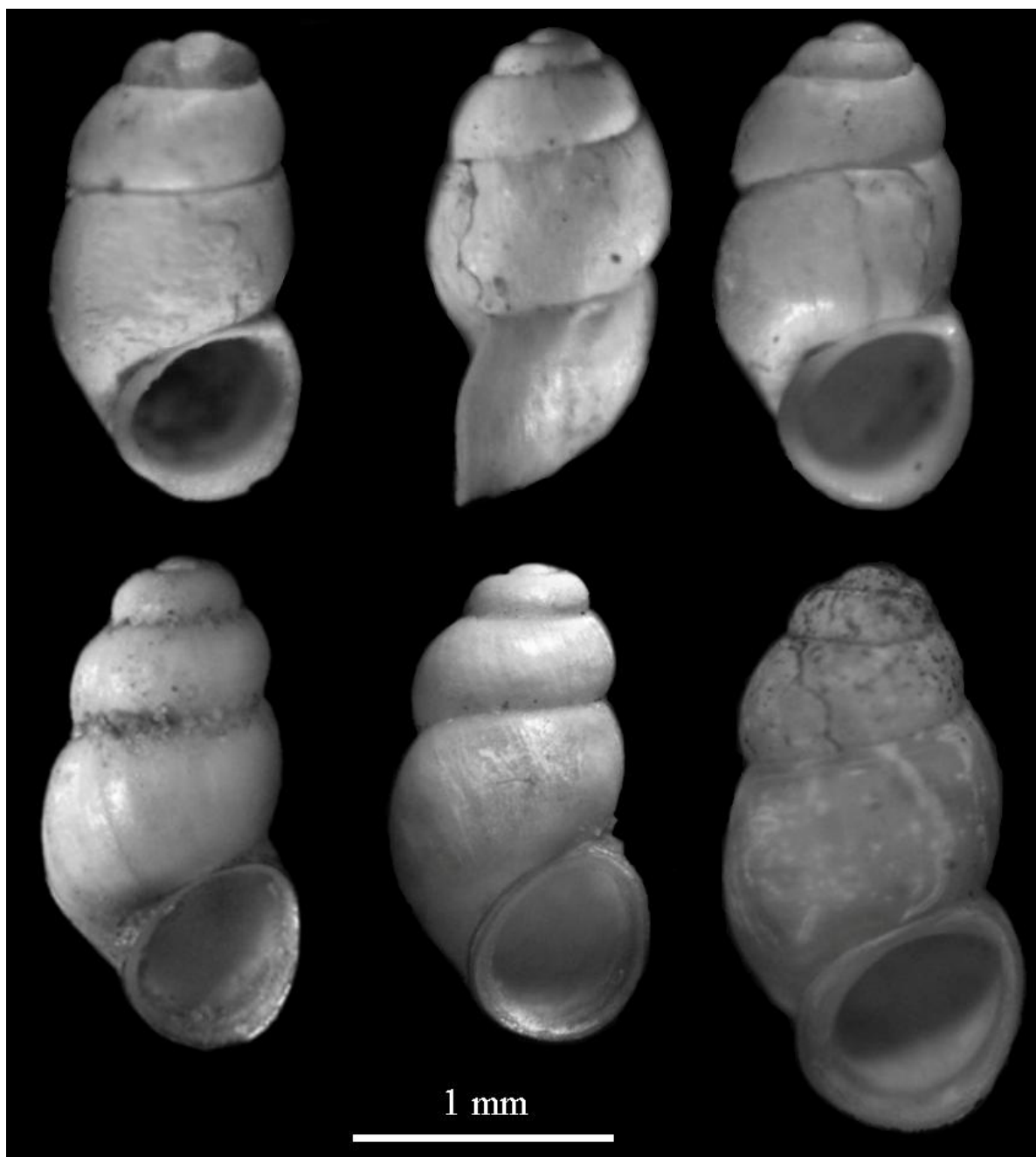
**Description:** The shell is very small ( $H < 1.7$  mm), ovoid-cylindrical with 4 slightly rounded whorls that have shining surface with fine growth lines. The shell surface in all specimens collected had some areas with irregular ridges and furrows, and looked eroded. The apex is rounded; the umbilicus is slit-like. The aperture is ovoid with

a simple, thick lip, twisted in a profile view. The operculum and the soft body are unknown. H = 1.65-1.67 mm, W = 0.86-0.89 mm, AH = 0.63 mm, AW = 0.66-0.68 mm, LH = 1.12-1.19 mm, W/H = 0.51-0.53, AH/H = 0.38, LH/H = 0.67-0.71.

**Differential diagnosis:** From all the Bulgarian species of the genus *Belgrandiella* with its thick lip edge and areas of rough eroded shell surface, the new species is most similar and most close living to *Belgrandiella stanimirae* Georgiev, 2011c with which it differs by its smaller shell, more fast growing whorls, smoother shell surface, twisted aperture lip periphery in a profile view, and smaller AH/H ratio (Figure 2).



**Figure 1.** The type locality of *Belgrandiella petrovi* n. sp. - the Chuchura cave: 1- the small stretch of the cave stream reachable from inside, 2- the cave entrance, 3 – the cave entrance from inside (Photographs 1 and 3 made by Elena Stoeva).



**Figure 2.** *Belgrandiella petrovi* n. sp. from the Chuchura cave: 1- holotype, 2 - paratype, compared with other stygobiotic species from the same genus with similar shape or size: 3 – *B. hubenovi* (the water cave of vill. Musina, holotype), 4 – *B. maarensis* (Urushka Maara cave, holotype), 5 – *B. stanimirae* (Zmeyova Dupka cave, holotype).

**Etymology:** The new species was named after my colleague and friend Boyan Petrov (National Museum of Natural History, Bulgaria), alpinist, speleologist and zoologist who sent me many coordinates of interesting caves, and himself contributed so much in studies of the Bulgarian cave fauna.

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

**Ecology:** The Chuchura cave is a very small and narrow cave. The length of it extends no more than 15-20 meters, situated in a limestone area of a *Fagus silvatica* forest near a small stream where the cave spring inflows. Its entrance is

about 2 meters wide and 1-1.5 meters high. The species possibly lives deep underground, and only empty shells are brought in the short a few meters, narrow cave stream with a sandy bottom and few small stones inside, all checked carefully for living snails. In the stream deposits there were also found empty shells of *Bythiospeum dourdeni* Georgiev 2012 (type locality of this species) and other, unknown *Belgrandiella* species.

## DISCUSSION

As Georgiev (2012) stated, the systematic position of the genus *Belgrandiella* Wagner, 1927 is disputable. It was referred by various authors to different family groups as Hydrobiidae (Kabat and Hersler, 1993; Angelov, 2000; Arconada and Ramos, 2003), Orientalinidae (Radoman, 1983) or Belgrandiellidae (Starobogatov *et al.*, 2004). The genus consists of minute Risoid snails with different shell shapes, mainly ovoid-conical but also conical or ovoid, different umbilicus (from completely closed to widely open), and different penis morphology (simple long, simple short, conical or triangular, or same shape but with one small lobe on the left side). It can be supposed that *Belgrandiella* is a complex of more still undefined genera. It can be suggested that in future studies species have to be assigned to the genus *Belgrandiella* having characters similar to those of the type species *B. kusceri*. It was quite well described by Radoman (1983): “Shell very hard, conical or conical-ovoid, with rather pointed apex and tumid whorls, the last of them being specially strongly developed. Aperture ovoid, its columellar margin being intimately applied to the shell wall, so that it is almost reduced to a callus. The outer aperture lip rather thick with formed “pouner” on its upper end. Umbilicus practically closed. Operculum yellowish (this is a subterranean form)...”, and also: “Penis is elongated, well developed, with a prolonged point, and a characteristic backward turned, hook-shaped outgrowth”.

However it is a very hard task and sometimes is impossible for the explorers to research and even reach the habitats of some of the stygobiotic species. The same situation present with the newly described *Belgrandiella petrovi* n. sp. – the underground stream area is not accessible from the Chuchura cave, and also there are no other known water caves in this mountain massif which can provide some more shell materials or live specimens by their underground connected waters with the type locality. Even this species possibly will never be seen alive and its anatomy will never be studied, the knowledge that endemic stygobiotic snails live in Chuchura cave will support the conservation of this vulnerable, underground ecosystem and the karstic area of the region as a whole.

## ACKNOWLEDGMENTS

I am grateful to Elena Stoeva (NGO Green Balkans, Stara Zagora, Bulgaria) for the two pictures of the inside area of the Chuchura cave. I also acknowledge Vesela Yancheva for the technical assistance in formatting the manuscript.

## CONFLICT OF INTEREST

The author declares that there are no conflicts of interest associated with this article.

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