

Freshwater Malacofauna of Upper Thracian Lowland (Southern Bulgaria)

Dilian G. Georgiev

Department of Ecology and Environmental Conservation, University of Plovdiv, 24 Tzar Assen Str., BG-4000 Plovdiv, Bulgaria;
E-mail: diliangeorgiev@abv.bg

Abstract. The study was carried out during a five-year period, from 18. 01. 2004 to 10. 10. 2011 from 53 localities at Upper Thracian Lowland. It summarized a total of 51 species of freshwater mollusks (39 species of snails and 12 species of mussels) reported for Upper Thracian Lowland from which 5 we consider not to occur in this area, 2 species names used before were misidentified and refer to other species, 5 were species reported before, but their occurrence in the area is under question, and 5 were new records for this geographic region. The most widely distributed species were *Physella acuta*, *Radix auricularia*, *Planorbis planorbis*, and *Unio pictorum*, the rest ones seemed to be rare or with low population densities in the area.

Key words: Gastropoda, Bivalvia, plain, distribution, habitats.

Introduction

The very first data on freshwater mollusks of Upper Thracian Lowland was given by HRISTOVITCH (1892) reporting *Lymnaea stagnalis* LAMARCK 1799 from two localities: near the village of Zlokuchene and Kovachevski Giol, both near Maritsa River.

After this publication the list of mollusk species recorded in the region grew by further works of the malacologists VAVRA (1893), YOURINITSCH (1906), HESSE (1911), HAAS (1911), WOHLBEREDT (1911), WAGNER (1927), BÜTTNER (1928), PETRBOK (1941), DRENSKI (1947), URBANSKI (1960), and some hydrobiologists as UZUNOV, KOVACHEV (1985), UZUNOV *et al.* (1998), RUSSEV *et al.* (1981, 1984) and others who provided information on zoobenthic communities and condition of their habitats.

The most interesting report from all these papers was the one of *Lymnaea (Gulnaria) auricularia* var. *ampla* HARTM. (= *Radix ampla* HARTMANN, 1821) by HESSE (1911), which record was omitted in the further literature published for Bulgaria.

In his work on Bulgarian freshwater malacofauna ANGELOV (2000) summarized all the informa-

tion available for the country. The author reported 9 exact localities in Upper Thracian Lowland: Floods at Maritsa River near Plovdiv (the richest in species recorded – 21): *Valvata piscinalis* (O. F. MÜLLER 1774), *Valvata cristata* (O. F. MÜLLER 1774), *Radix auricularia* (LINNAEUS 1758), *Stagnicola palustris* (O. F. MÜLLER 1774), *Stagnicola corvus* (GMELIN 1791), *Lymnaea stagnalis* LAMARCK 1799, *Planorbis planorbis* (LINNAEUS 1758), *Planorbis carinatus* O. F. MÜLLER 1774, *Anisus vortex* (LINNAEUS 1758), *Anisus leucostomus* (MILLET 1813), *Bathyomphalus contortus* (LINNAEUS 1758), *Gyraulus albus* (O. F. MÜLLER 1774), *Gyraulus piscinarum* BOURGUIGNAT 1852, *Gyraulus crista* (LINNAEUS 1758), *Hipppeutis complanatus* (LINNAEUS 1758), *Segmentina nitida* (O. F. MÜLLER 1774), *Planorbarius corneus* (LINNAEUS 1758), *Physa fontinalis* (LINNAEUS 1758), *Aplexa hypnorum* (LINNAEUS 1758), *Sphaerium corneum* (LINNAEUS 1758), *Pisidium amnicum* (O. F. MÜLLER 1774), Rice fields at Pazardzik: *Planorbarius corneus* (LINNAEUS 1758); Rice fields at Plovdiv (c): *Planorbarius corneus* (LINNAEUS 1758); Rice fields

at Yambol: *Planorbarius corneus* (LINNAEUS 1758), Marshes near Plovdiv: *Anodonta cygnaea* (LINNAEUS 1758), Tundza River near Yambol town: *Valvata piscinalis* (O. F. MÜLLER 1774); Maritsa River at Plovdiv: *Lithoglyphus naticoides* (C. PFEIFFER 1828) var. *apertus* KOBELT; Maritsa River at Harmanli: *Gyraulus laevis* (ALDER 1838); Thermal spring at a fish farm near Pyasachnik Dam: *Melanopsis parreyssi* PHILIPPI 1847.

The other data given by the same author about mollusks distribution in Upper Thracia does not contain exact localities but river stretches or areas around/or the whole rivers: Floods at Maritsa River: *Viviparus viviparus* (LINNAEUS 1758), *Viviparus maritzanus* Haas 1911 and *Viviparus acerosus* var. *maritzanus* (HAAS 1911) reported from Maritsa River at Plovdiv (DRENSKI, 1947) were not confirmed by ANGELOV (2000), *Radix ovata* (DRAPARNAUD 1801), *Acroloxus lacustris* (LINNAEUS 1758), *Musculium lacustre* (O. F. MÜLLER 1774); Middle part of Maritsa River: *Sphaerium rivicola* (LAMARCK 1818); Lower part of Maritsa River: *Planorbarius corneus* (LINNAEUS 1758), *Unio pictorum* (LINNAEUS 1758), *Unio crassus* RETZIUS 1783; Tundza River up to Yambol: *Unio pictorum* (LINNAEUS 1758); Lower part of Tundza River: *Unio tumidus* PHILIPSSON 1788, *Unio crassus* RETZIUS 1783; Tundza River: *Stagnicola corvus* (GMELIN 1791). As very frequent in Bulgaria found throughout the country were reported *Galba truncatula* (O. F. Müller 1774) and *Physella acuta* (DRAPARNAUD 1805).

HUBENOV (2005b, 2007) provided actual summarized and some original data on both terrestrial and freshwater mollusks of Bulgaria, including distributional, zoogeographical and ecological information.

After ANGELOV (2000) and HUBENOV (2005b) few more papers were published considering the snails and mussels of the region. HUBENOV (2002, 2005a) reported the invasive Zebra Mussel *Dreissena polymorpha* (PALLAS 1771) for Ovcharitsa Dam and it was the first record of this species for Bulgarian Aegean Sea basin.

GEORGIEV (2006) classified *Planorbis carinatus* as very rare in south-eastern Bulgaria, with a single finding by the author at Potoka River, west from Plovdiv.

GEORGIEV (2008) reported for Dunda River at village of Trankovo *Galba truncatula*, *Anisus spirorbis* and *Gyraulus albus*.

GLÖER & GEORGIEV (2009) described a new Hydrobiid species named *Grossuana thracica* from the spring at the entrance of the only cave in Upper Thracian Lowland – Chirpan Bunar, near the village of Bolyarino. GEORGIEV (2011) recorded a new locality of this species at Tri Voditsi fish farms, from where *Sadleriana virescens bulgarica* was previously reported by WAGNER (1927), a species with unclear taxonomical status.

VASILEVA *et al.* (2009, 2011) and VASILEVA (2011) studied the communities of freshwater gastropods on aquatic vegetation of some stagnant basins at Upper Thracia.

SCHNIEBS *et al.* (2012) reported *Stagnicola montenegrinus* GLÖER ET PEŠIĆ 2009 for the floods of Maritsa River at Plovdiv and provided morphological, anatomical and molecular information about the species.

In a period of more than 100 years there were any global and detailed faunistic studies on the freshwater malacofauna of Upper Thracia, and many species according to old literature sources were believed to occur in the region even aquatic ecosystems were dramatically changed and some even have collapsed due to water pollution during the years (UZUNOV, KOVACHEV, 1985, UZUNOV *et al.*, 1998, GECHIEVA, YURUKOVA, 2008, GEORGIEVA *et al.* 2010, PETROVA *et al.* 2011, YANCHEVA *et al.* 2011). Many habitats as the so often ‘floods of Maritsa River’ mentioned by ANGELOV (2000) were destroyed by activities of river beds cleaning, and many new ones appear as the old sand pits around same river (HUBENOV 2005b). Also a lot of microdams and canals for irrigation needs were built on the plain.

Many species reported for the lowland previously were not studied anatomically and its occurrence (and even their existence at all) in the region is under question.

This paper is intended to: (i) revise all the literature published for Upper Thracian Lowland considering freshwater malacofauna, and (ii) to provide original data on the species diversity, habitats and distributions of the species.

Material and Methods

The study was carried out during a five year period, from 18. 01. 2004 to 10. 10. 2011 from 53 localities in Upper Thracian Lowland (Table 1). The living snails were collected and preserved in 75%

Table 1. Collection localities during present study. Legend: N – locality number, UTM – UTM-grid 10x10 km, DG – Dilian Georgiev, SS – Slaveya Stoycheva, DB – Dimitar Bechev, IT – Ivaylo Trifonov.

№	Date	Locality	UTM	GPS co-ordinates	Leg.
1	18.01.2004	Maritza River near village of Biser	MG13	-	DG
2	06.2004	Kanal in Vinitza Forest near village of Vinitza	LG46	-	DG
3	24.07.2004	Tundza River, Ormana area, north of Yambol town	MH50	N42 31 33.4 E26 31 59.5	DG
4	08.05.2005	Stara Reka River near village of Novo Selo	KG96	N42 06 12.8 E24 29 12.7	DG
5	09.05.2005	Kanal north of village of Brestovitsa	LG06	N42 05 30.5 E24 35 02.1	DG
6	12.05.2005	Jurta Dam near village of Liubenova Mahala	MG19	-	DG
7	13.05.2005, 15.01.2011	Rozov Kladenets Dam	MG06	N42 09 10.8 E25 54 11.6	DG
8	13.05.2005	Microdam near the resort of TEC "Galabovo"	MG06	-	DG
9	14.05.2005	Microdam near village of Trankovo, Radnevo town district	MG08	-	DG
10	15.05.2005	Potoka River, near village of Voysil	LG07	-	DG
11	23.05.2005	Stryama River at village of Gorna Mahala	LH10	N42 26 29.1 E24 46 37.5	DB
12	09.07.2005	Cherkezitsa River near village of Bogdanitsa	LG36	-	DG
13	01.10.2005	Golyama Reka River near Radievski Dam	LG18	-	DG
14	01.10.2005	Golyama Reka River near village of Golyamo Asenovo	LG96	-	DG
15	08.10.2005	Potoka River near village of Kostievo	LG07	-	DG
16	08.10.2005	Irrigation kanals north of Plovdiv city	LG17	-	DG
17	09.10.2005	Microdam near village of Konush, Plovdiv city district	LG35	-	DG
18	02.11.2005	Kanal near village of Hristianovo	LG89	-	DG
19	26.11.2005	Kanal east of Stamboliiski town	LG06	-	DG
20	13.01.2006	Toploto ezero area, Ovcharitza Dam	MG27	N42 15 34.1 E26 08 35.7	SS
21	18.03.2006	Deposits, Maritza River near round road west of Plovdiv city	LG16	N42 09 03.0 E24 40 37.0	DG, SS
22	15.05.2006	Vacha River near village of Yoakim Gruevo	KG96	-	DG
23	05.11.2008	River in village of Staro Jelezare	LH00	-	DG
24	11.11.2008	Pyasachnik Dam	LG09	-	DG, SS
25	07.12.2008	River at village of Zlatna Livada	LG76	-	DG
26	20.03.2009	Microdam in village of Stransko	LG86	-	DG
27	20.03.2009	Merichlerska River, south of Merichleri town	LG76	N42 06 58.0 E25 29 47.8	DG
28	06.05.2009	Ovcharitsa Dam near the dam wall	MG27	-	DG
29	18.06.2010	Rice fields and kanals near village of Tsalapitsa	LG07	-	DG
30	26.11.2010	Sazliika River near village of Kolarovo	LG98	N42 19 51.1 E25 43 34.8	DG
31	26.11.2010	Rice fields and kanals south of village of Kolarovo	LG98	N42 19 21.6 E25 44 30.7	DG
32	29.11.2010	Microdam near village of Zagore	LG98	N42 20 39.4 E25 39 59.9	DG
33	29.11.2010	River near village of Opan	LG97	N42 13 25.2 E25 40 52.4	DG
34	29.11.2010	Small river near village of Byalo Pole	LG96	N42 09 44.8 E25 43 07.1	DG
35	29.11.2010	Small river and water source near village of Vasil Levski	LG96	N42 06 46.8 E25 46 22.1	DG
36	29.11.2010	Water source east of village of Bashtino	LG96	N42 06 27.0 E25 45 39.4	DG
37	29.11.2010	Microdam near village of Bashtino	LG96	N42 06 33.1 E25 44 34.8	DG

Table 1. Continued.

№	Date	Locality	UTM	GPS co-ordinates	Leg.
38	20.04.2006,29.11.2010	Lake Martvitsata near village of Zlato Pole	LG95	N42 02 04.7 E25 42 53.8	DG
39	29.11.2010	River passing through village of Dobritch	LG75	N42 01 32.5 E25 31 27.5	DG
40	27.12.2003,06.12.2010	Bedečka River, "Krairechen" park, Stara Zagora city	LH80	N42 26 12.9 E25 38 28.0	DG
41	08.12.2010	Microdam "Chirpan" near Chirpan town	LG67	N42 09 44.8 E25 18 48.7	DG
42	11.11.2008, 09.12.2010	Floods of Maritsa River, near the railway bridge, Plovdiv city	LG17	N42 09 13.5 E24 43 34.8	DG
43	11.12.2010	Mechka River at the bridge of Parvomay town	LG56	N42 04 26.3 E25 11 49.0	DG
44	11.12.2010	Canal north of village of Skobelevo	LG66	N42 05 59.2 E25 21 28.2	DG
45	03.2010	Canal near village of Belozem	LG37	-	DG
46	4/30/2011	Suha Reka River near village of Byaga	KG86	-	DG
47	7/28/2011	Water source between village of Rainovo and Simeonovgrad	LG95	-	IT
48	8/15/2011	Stryama River south of village of Trilistnik	LG27	N42 11 56.8 E24 53 19.3	DG
49	8/27/2011	Tundza River, north of Elhovo town	MG67	-	DG
50	9/20/2011	Mouth of Merichlerska River, near Maritza River	LG85	N42 04 03.7 E25 38 07.1	DG
51	10/7/2011	River at the village of Golyam Dol	LG58	N42 20 02.3 E25 13 20.4	DG
52	10/9/2011	Blatnitsa River at village of Lyubenets	MG19	N42 22 08.4 E25 57 48.2	DG
53	10/10/2011	Martinka River at village of Dimitrievo	LG87	N42 11 10.5 E25 33 17.6	DG

ethanol. The shells were collected by sieving river deposits by 1x1 and 2x2 mm mesh width sieves. The dissections and measurements were carried out by means of CETI stereo microscope and an eye-piece micrometer. The nomenclature and the species determinations followed GLÖER (2002), GLÖER, MEIER-BROOK (2003).

Results and Discussion

Species diversity

The study summarized a total of 51 species of freshwater mollusks (39 species of snails and 12 species of mussels) reported for Upper Tracian Lowland from which 5 were considered not to occur in the area, 2 species names used before were misidentified and refer to other species, 5 were species reported before, but their occurrence in the area is under question, and 5 were new records for this geographic region.

Misidentified species. According to ANGELOV (2000) the species *Viviparus maritzanus* reported by Haas (1911) for the region is a synonym of *V. acerosus* which we found to live in few localities.

The species *Sadleriana bulgarica* (described as *Lithoglyphus virescens bulgaricus* by WAGNER 1927) we consider as not useful, because our investigations

showed that in all the localities reported for it were inhabited by a variety of species from two genera with similar shell morphology as *Grossuana* and *Radomaniola* (see WAGNER's drawings pl. XIII, Fig. 85-88), and because WAGNER (1927) did not provide any anatomical data for the original description it is not known to which species or genus the '*Sadleriana bulgarica*' could be related.

Species previously reported but now considered not to occur at the area. Five species were believed not to occur in Upper Thracia. *Radix balthica* was reported with its synonym *R. ovata* for the floods of Maritsa River but was never proven anatomically. Some forms of the most widely distributed in Bulgaria *R. auricularia* can resemble the shell of the species discussed (and also the *Radix lagotis* (SCHRANK 1803)) so we suppose that all these reports due to misidentifications, as for example the record in Sarnena Sredna Gora Mts. of GEORGIEV (2005). The only *Radix* we found in southern Bulgaria (not only Upper Thracia) in many localities studied were *R. auricularia* and *R. labiata* the first dominating in the lowlands, the second in the mountains and hilly areas.

The other species from the genus, *Radix ampla*, is similar in shell morphology to some forms of *R. auricularia* with large aperture. Such forms we regis-

Table 2. Freshwater malacofauna of Upper Thracian Lowland (Southern Bulgaria). Legend: lit. – species not found during present study but reported in the literature, L – lakes, M – marshes and river floods, LD – large dams, MD – micro dams, R – rivers, RF – rice fields, SP – springs and water sources, C – canals, ? – Species which occurrence at the area is under question, † – not occurring at the area, nv – misidentified species, * – new record.

Species	Locality	L	M	LD	MD	R	RF	SP	C
Gastropoda									
<i>Viviparus viviparus</i> (Linnaeus 1758) ?	lit.		*						
<i>Viviparus acerosus</i> (Bourguignat 1862)	45		*						*
<i>Viviparus maritzanus</i> Haas 1911 nv	lit.		*						
<i>Valvata piscinalis</i> (O. F. Müller 1774)	15, 40, 42					*			
<i>Valvata cristata</i> (O. F. Müller 1774) ?	lit.					*			
<i>Bythinia rumelica</i> Wohlberedt 1911 †	lit.					*			
<i>Lithoglyphus naticoides</i> (C. Pfeiffer 1828) †	lit.					*			
<i>Melanopsis parreyssi</i> Philippi 1847 †	lit.							*	
<i>Bythinella valkanovi</i> Glöer & Georgiev 2011	lit.							*	
<i>Belgrandiella zagoraensis</i> Glöer & Georgiev 2009	lit.							*	
<i>Grossuana thracica</i> Glöer & Georgiev 2009	lit.							*	
<i>Sadleriana virescens bulgarica</i> (Wagner 1927) nv	lit.							*	
<i>Potamopyrgus antipodarum</i> (Gray 1843)* ?	21					*			
<i>Acroloxus lacustris</i> (Linnaeus 1758)	40		*			*			
<i>Lymnaea stagnalis</i> Lamarck 1799	2, 14, 16, 29, 38, 42	*	*			*	*		*
<i>Stagnicola palustris</i> (O. F. Müller 1774) ?	lit.		*			*			
<i>Stagnicola corvus</i> (Gmelin 1791) ?	lit.		*			*			
<i>Stagnicola montenegrinus</i> Glöer & Pešić 2009	29, 42		*				*		*
<i>Radix auricularia</i> (Linnaeus 1758)	3, 6, 8, 9, 11, 14, 18, 28, 29, 31, 32, 38, 40, 42	*	*	*	*	*	*	*	*
<i>Radix labiata</i> (Rossmässler, 1835)*	46					*			
<i>Radix balthica</i> (Linnaeus 1758) †	lit.					*			
<i>Radix ampla</i> Hartmann 1821 †	lit.					*			
<i>Galba truncatula</i> (O. F. Müller 1774)	22, 25, 28, 40, 42		*	*		*			
<i>Planorbarius corneus</i> (Linnaeus 1758)	9, 15, 16, 19, 29, 32, 42, 45		*		*	*	*		*
<i>Planorbis planorbis</i> (Linnaeus 1758)	2, 5, 7, 15, 18, 22, 23, 27, 33, 36, 39, 41, 42, 43	*	*	*	*	*	*	*	*
<i>Planorbis carinatus</i> O. F. Müller 1774	lit.					*			
<i>Anisus spirorbis</i> (Linnaeus 1758)	21		*			*			
<i>Anisus vortex</i> (Linnaeus 1758)	21, 42		*			*			
<i>Anisus leucostoma</i> (Millet 1813)	lit.					*			
<i>Bathyomphalus contortus</i> (Linnaeus 1758)	lit.					*			
<i>Gyraulus albus</i> (O. F. Müller 1774)	25, 31, 40		*			*	*		
<i>Gyraulus laevis</i> (Alder 1838)	lit.								
<i>Gyraulus piscinarum</i> Bourguignat 1852	lit.					*			
<i>Gyraulus crista</i> (Linnaeus 1758)	lit.					*			
<i>Segmentina nitida</i> (O. F. Müller 1774)	12, 22					*			
<i>Hippeutis complanatus</i> (Linnaeus 1758)	lit.					*			
<i>Physa fontinalis</i> (Linnaeus 1758)	41				*				
<i>Physella acuta</i> (Draparnaud 1801)	1, 4, 6, 7, 8, 9, 13, 15, 17, 20, 23, 25, 26, 27, 28, 29, 31, 32, 36, 37, 38, 39, 40, 41, 42, 47	*	*	*	*	*	*	*	*

Table 2. Continued.

Species	Locality	L	M	LD	MD	R	RF	SP	C
<i>Aplexa hypnorum</i> (Linnaeus 1758)	lit.					*			
Bivalvia									
<i>Unio pictorum</i> (Linnaeus 1758)	16, 24, 30, 32, 42, 48, 49, 50, 51, 53				*	*			*
<i>Unio tumidus</i> Philipsson 1788	3, 44					*			*
<i>Unio crassus</i> Retzius 1783 ?	lit.					*			
<i>Anodonta cygnaea</i> (Linnaeus 1758)	6, 7, 10, 38, 39, 43, 50, 52	*	*			*			*
<i>Anodonta anatina</i> (Linnaeus 1758)*	38	*							
<i>Dreissena polymorpha</i> (Pallas 1771)	7, 28		*						
<i>Sphaerium rivicola</i> (Lamarck 1818)	lit.					*			
<i>Sphaerium corneum</i> (Linnaeus 1758)	21					*			
<i>Musculium lacustre</i> (O. F. Müller 1774)	18, 40					*			
<i>Pisidium amnicum</i> (O. F. Müller 1774)	lit.					*			
<i>Pisidium personatum</i> Malm 1855*	40					*			
<i>Pisidium casertanum</i> (Poli 1791)*	40					*			

tered (by both morphological and anatomical investigations) to inhabit Maritsa River at Plovdiv from where the *Radix ampla* was possibly wrongly reported by HESSE (1911). Even we consider that *R. ampla* does not occur in Southern Bulgaria its occurrence in the country could not be excluded, especially at Danube and its drainage system near Romania, from where it was reported by GLÖER & SIRBU (2006).

As the previous species discussed and the *Lithoglyphus naticoides* does not occur in any locality in South Bulgaria and is distributed only in Danube and its tributaries, as also stated HUBENOV (2005b). Possibly in the past times when Maritsa River had clean waters this species could survive there as it was reported by WAGNER (1927) but became extinct.

GEORGIEV (2010) did not found any population of *Melanopsis parreyssi* in the thermal springs around Pyasachnik Dam mentioned by ANGELOV (2000) and considered this species extinct from Bulgarian fauna.

Bythinia rumelica WOHLBEREDT (1911) reported also by some authors as *B. leachi* (SHEPPARD, 1823) was registered by a single empty shell in the deposits of Maritsa River at Plovdiv by HESSE (1911). Possibly this species became extinct at its type locality at Krichim (Georgiev, 2010).

Species which occurrence at the area is under question. *Viviparus viviparus* (LINNAEUS 1758) is similar in shell morphology with the young of

Viviparus acerosus (which in our opinion is the most widely distributed Viviparid snail in Bulgaria) but has an obtuse apex. Possibly all the old literature refer to the last species but *V. viviparus* prefers streams of flowing water and surf zones of lakes (GLÖER 2002) which dominate at the plain so its occurrence there could not be excluded for sure.

The invasive *Potamopyrgus antipodarum* (GRAY 1843) has a wide ecological tolerance and its occurrence in Maritsa River can be expected, but it was only found by an empty shell during our study at this locality.

The widely distributed in N Palearctic *Stagnicola palustris* (O. F. MÜLLER 1774) and *Stagnicola corvus* (GMELIN 1791) could be expected in some regions of Bulgaria but during our investigations only the *Stagnicola montenegrinus* GLÖER & PEŠIĆ 2009 was found, and it is possible that all the old reports of Stagnicolids for Upper Thracian Lowland in actuality refer to this species.

Unio crassus is possibly restricted at the southernmost areas of South Bulgaria (GEORGIEV 2005) but could occur and in some areas of Upper Thracia.

New records for the study area. The species *Potamopyrgus antipodarum*, *Radix labiata* (ROSSMÄSSLER, 1835), *Anodonta anatina* (LINNAEUS 1758), *Pisidium personatum* Malm 1855, and *Pisidium casertanum* (POLI 1791) were found for the first time in Upper Thracian Lowland (the first only by an empty shell in river deposits).

Distribution

At the beginning of XX century *Physella acuta* being a species with wide ecological tolerance began expanding European freshwater habitats (DRENSKI 1947), and now it is one of the commonest species of all aquatic snails of Bulgaria. Together with this species and *Radix auricularia* (LINNAEUS 1758), *Planorbis planorbis* (LINNAEUS 1758), and *Unio pictorum* (LINNAEUS 1758) seemed to be the most widely distributed taxa in Upper Thracian Lowland. The rest of the species were registered in 1 to 8 localities, or even not found during the present study, and we consider them as rare or with low population densities, which makes their collection on the terrain difficult (Table 2).

References

- ANGELOV A. 2000. Mollusca (Gastropoda et Bivalvia) aquae dulcis, catalogus Faunae Bulgaicae. Pensoft & Backhuys Publing, Sofia, Leiden, 54 p.
- BÜTTNER K. 1928. Beitrag zur Molluskenfauna Bulgariens. – *Jahresbericht des Vereins für Naturkunde zu Zwickau*, 1926/1928: 12-20.
- DRENSKI P. 1947. Synopsis and distribution of fresh-water Mollusca in Bulgaria. – *Annuaire de L'Université de Sofia*, **43** (3): 33-54.
- GECHEVA, G., L. YURUKOVA 2008. Chlorophyll response of aquatic moss *Fontinalis antipyretica* Hedw. to Cu, Cd and Pb contamination ex situ. – In: I. Velcheva, Tsekov A. (Eds.): Proceedings of Anniversary Scientific Conference of Ecology, November 1, 2008, Plovdiv, Bulgaria, 293-299.
- GEORGIEVA N., Z. YANEVA, L. DOSPATLIEV 2010. Analyses of natural water quality in Stara Zagora region according to the parameters sulfates and chlorides. – *Trakia Journal of Science*, **8** (2): 517-524.
- GEORGIEV D. 2005. The mollusks (Mollusca: Gastropoda et Bivalvia) of Sakar Mountain (Southern Bulgaria): A Faunal Research. – *Scientific Studies of the University of Plovdiv, Biology, Animalia*, **41**: 5-12.
- GEORGIEV D. 2006. A Contribution to the Knowledge of Malacofauna of Sveti Iliiski Heights (South-Eastern Bulgaria). – *Scientific Studies of the University of Plovdiv, Biology, Animalia*, **42**: 13-20.
- GEORGIEV D. 2008. Habitat Distribution of the Land Snails in One Village Area of Upper Thracian Valley (Bulgaria). – In: Velcheva I., A. Tsekov (Eds.): Anniversary Scientific Conference of Ecology, Proceedings, 1 November 2008, Plovdiv, 147-151.
- GEORGIEV D. 2010. In Search of the Thermal Springs Species *Bithynia rumelica* and *Melanopsis parreyssi* in Bulgaria. – *Tentacle*, **18**: 16-17.
- GEORGIEV D. 2011. New localities of four Bulgarian Hydrobiidae species (Gastropoda: Rissooidea). – *Zoonotes*, **16**: 1-4.
- GLÖER P. 2002. Die Süßwassergastropoden Nord- und Mitteleuropas. ConchBooks Publishing, 327 p.
- GLÖER P., C. MEIER-BROOK 2003. Süßwassermollusken – Ein Bestimmungsschlüssel für die Bundesrepublik Deutschland. Deutscher Jugendbund für Naturbeobachtung (Hrsg.), Hamburg, 13. neubearbeitete, Auflage, 134 p.
- GLÖER P., D. GEORGIEV 2009. New Rissooidea from Bulgaria (Gastropoda: Rissooidea). – *Mollusca*, **27** (2): 123-136.
- GLÖER P., I. SIRBU 2006. New freshwater mollusks species found in the Romanian fauna. – *Heldia*, **6** (5/6): 229-238.
- HAAS F. 1911. Bulgarische Najaden. – *Abhandlungen der Naturforschenden Gesellschaft zu Görlitz*, **27**: 235-238.
- HESSE P. 1911. Zur Kenntnis der Molluskenfauna von Ostrumelien. – *Nachrichtsblatt der Deutschen malakozoologischen Gesellschaft*, **43**: 142-155.
- HRISTOVITCH G. 1892. Materials for studying the Bulgarian fauna. – *Sbornik narodni umotvorenia*, **8**: 337-346. (In Bulgarian).
- HUBENOV Z. 2002. Technological problems concerning Zebra mussel *Dreissena polymorpha* in Maritsa-East 2 TPP. – *Historia naturalis bulgarica*, **15**: 139-141. (In Bulgarian).
- HUBENOV Z. 2005a. *Dreissena* (Bivalvia: Dreissenidae) – Systematics, Autochthonous and Anthropogenic Areas. – *Acta zoologica bulgarica*, **57** (3): 259-268.
- HUBENOV Z. 2005b. Malacofaunistic diversity of Bulgaria. – In: Current state of Bulgarian biodiversity – problems and perspectives, Petrova A. (Ed.) Bulgarian Bioplatform, Sofia, 199-246. (In Bulgarian).
- HUBENOV Z. 2007. Fauna and zoogeography of marine, freshwater, and terrestrial mollusks (Mollusca) in Bulgaria. – In: Fet, V., A. Popov (Eds.): Biogeography and ecology of Bulgaria. Springer, Dordrecht, 141-198.
- PETROVA S., B. NIKOLOV, V. YANCHEVA, I. VELCHEVA 2011. (In press). Biotesting of contaminated waters from Topolnitsa River Basin. – *Travaux Scientifiques – Biologie*.
- RUSSEV B., Y. UZUNOV, S. KOVACHEV, I. YANEVA, L. IVANOVA 1981. Tendencies of the changes of the saprobiological condition of Maritsa River. – *Hydrobiologia*, **14**: 51-64. (In Bulgarian).
- RUSSEV B., M. NIKOLOVA, M. DIMITROVA 1984. Tendencies of the changes of hydrobiological and saprobiological condition of Tundza River. I. – *Hydrobiologia*, **22**: 59-73. (In Bulgarian).

- SCHNIEBS K., P. GLÖER, D. GEORGIEV, A. HUNDSDOERFER 2012. (In press). First record of *Stagnicola montenegrinus* GLÖER & PEŠIĆ, 2009 (Mollusca: Gastropoda: Lymnaeidae) in Bulgaria and first molecular genetic analyses of this species. – *Northwestern Journal of Zoology*.
- URBAŃSKI J. 1960. Beiträge zur Molluskenfauna Bulgariens (excl. Clausiliidae). – *Bulletin de la Société des Amis des Sciences et des Lettres de Poznań*. Serie D, **1**: 69-110.
- UZUNOV Y., S. KOVACHEV 1985. Macroinvertebrate communities structures in the Maritsa River under human impact. – *Hydrobiologia*, **24**: 33-47.
- UZUNOV Y., S. KOVACHEV, K. KUMANSKI, J. LUDSKANOVA-NIKOLOVA 1998. Aquatic ecosystems of the Aegean and Black Sea basins. – In: Bulgaria's Biological diversity: Conservation Status and Needs Assessment, vol. I and II: 293-318.
- VASILEVA S., D. GEORGIEV, G. GEČEVA 2009. Aquatic Macrophytes as Microhabitats of *Radix auricularia* (Gastropoda: Pulmonata): A Case Study from Southeast Bulgaria. – *Ecologia Balkanica*, **1**: 91-94.
- VASILEVA S., D. GEORGIEV, G. GEČEVA 2011. On the Communities of Freshwater Gastropods on Aquatic Macrophytes in Some Water Basins of Southern Bulgaria. – *Ecologia Balkanica*, **3** (1): 11-17.
- VASILEVA S. 2011. Shell size of the freshwater snail *Physella acuta* (Draparnaud, 1805) collected from water vegetation in South-East Bulgaria. – *Ecologia Balkanica*, **3**(2): 61-64.
- VAVRA W. 1893. Ein Beitrag zur Kenntnis der Süßwasserfauna von Bulgarien. – *Gesellschaft der Wissenschaften*, Bd. XLVI, Prag, 4 p.
- WAGNER A. 1927. Studien zur Molluskenfauna der Balkanhalbinsel mit besonderer Berücksichtigung Bulgariens und Thraziens, nebst monographischer Bearbeitung einzelner Gruppen. – *Annales Zoologici Musei Polonici Historie Naturalis*, **6** (4): 263-399.
- WOHLBEREDT O. 1911. Zur Molluskenfauna von Bulgarien. – *Abhandlungen der Naturforschenden Gesellschaft zu Görlitz*, **27**: 167-234.
- YANCHEVA V., S. PETROVA, I. VELCHEVA, E. GEORGIEVA 2011. (In press). A review of ecological status of Topolnitsa River catchment area and Topolnitsa Dam. – *Travaux Scientifiques – Biologie*.
- YOURINITSCH S. 1906. Notes sur les Bivalves d'eau douce de Bulgarie. – *Annuaire de l'université de Sophia*, **2**: 61-67.

Received: 31.01.2012
Accepted: 18.04.2012