

Taxonomic List of Benthic Macroinvertebrate Communities of Inland Standing Water Bodies in Bulgaria

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Abstract: Species diversity and distribution of benthic macroinvertebrates in 51 of the largest Bulgarian natural lakes and reservoirs were studied in 2011 and (or) 2012. This work presents the first comprehensive faunistic composition of Bulgarian standing water bodies. The up-to-date check-list includes 297 taxa belonging to 22 systematic groups. These include 146 taxa identified at the species level, 118 taxa identified at the generic level and 33 taxa identified at the level of superior taxa.

Keywords: benthic macroinvertebrates, taxa list, natural lakes, reservoirs, Bulgaria

Introduction

Faunistic studies of standing water bodies in Bulgaria date from the beginning of the previous century. Initially fragmented and concerning only some systematic groups, they have been followed by extensive studies on species composition and distribution of benthic macroinvertebrates. TRICHKOVA (2007) collated the available information on this topic into a comprehensive review on benthic fauna of non-lotic water basins in Bulgaria. Data on the zoobenthos of a group of protected wetlands in NE Bulgaria was published by KOVACHEV *et al.* (1999), including taxa of Diptera (*i.e.* Chironomidae), Bryozoa, Tricladida, Gastropoda, etc. STOICHEV (2001) reported new data on the zoobenthos of the Koprinka Reservoir.

During the last decade, extensive studies on inland waters in Bulgaria were conducted. As a result, the knowledge on some systematic groups has been updated. TRICHKOVA *et al.* (2009) summarised the information about the distribution of *Dreissena* spp. in the Bulgarian inland water bodies. UZUNOV (2010) presented the distribution of 130 aquatic oligochaetes. VARADINOVA *et al.* (2012) reported 238 macroinvertebrate taxa of the Srebarna Lake for more than a

ten-year period. TRICHKOVA *et al.* (2013a) summarised newly collected data on crayfish distribution, including *Astacus leptodactylus* Eschscholtz, 1823. TRICHKOVA *et al.* (2013b) studied the species diversity and distribution of benthic macroinvertebrates in reservoirs in North-Western Bulgaria. GEORGIEV, HUBENOV (2013) published an updated annotated check-list of freshwater gastropod fauna of Bulgaria, including the known standing waters localities. PRESOLSKA (2014) gives the current distribution of some mayflies (Ephemeroptera), inhabiting lentic water bodies. HUBENOV (2015) summarised the marine, brackish and freshwater invertebrate fauna of the water bodies along the Bulgarian Black Sea coast.

Since 2010, regarding the intercalibration procedure of standing water bodies in Bulgaria, extensive research throughout the country was conducted. This allowed preparing an updated list of their benthic fauna.

The aim of this paper is to provide a comprehensive and updated taxonomic check-list of the macroinvertebrate communities from different types of standing water bodies in Bulgaria.

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Material and Methods

Fifty-one reservoirs and natural lakes on the territory of Bulgaria were sampled. They belong to eco-regions 7 (Eastern Balkans) and 12 (Pontic Province) and fall into different watersheds: the Danube River catchment – 19 water bodies, the Black Sea basin – 17, the East-Aegean basin – nine, and the West-Aegean basin – six (Fig. 1). Information on typology, altitude, geographical coordinates and size (surface area) of each water body, as well as the year(s) of investigation is presented in Table 1.

For the purposes of the present study, a sampling of macroinvertebrate communities in the littoral zone of the studied lakes and reservoirs was carried out in 2011 and/or 2012 in compliance with the relevant standard EN ISO 5667–1:2006/AC: 2007.

In the shallow littoral areas up to 1-1.5 m (accessible coastal areas), the sampling was carried out with hydrobiological net according to ISO 7828:1985/ EN 27828:1994. The multi-habitat approach for zoobenthos samplings was applied following CHESHMEDJIEV *et al.* (2011) which is an adopted variance of multi-habitat sampling technique AQEM/STAR (after BARBOUR *et al.* 1999: AQEM/STAR methodology). Sampling sites were chosen to maximize habitat diversity.

In the shallower and accessible coastal areas a dredge (0.3 m frame) was used in addition to EN 27828:1994 with the relevant standard ISO 9391:1993.

In 2012, the above-mentioned standards were replaced by BS EN ISO 10870:2012.

The collected material was fixed with 4% formaldehyde *in situ* (EN ISO 5667–3:2003/AC:2007). After samples processing in the laboratory, the zoobenthic organisms were sorted by taxonomic groups and stored in 70% ethanol. The invertebrates were identified to the species level or to the nearest possible taxonomic level.

The nomenclature of taxa is according Fauna Europaea (2013).

Results and Discussion

Our summary list of aquatic macroinvertebrates includes a total of 297 taxa belonging to 22 systematic groups, referred to different taxonomic categories as follows: 146 taxa identified to the species level, 118 identified to the generic level, 26 – to the family level, two – to the ordinal level, four – to the class, and one to the phylum (Table 2). Most of the taxa recorded were inhabitants of both lentic and lotic waters, such as many of the oligochaetes, leeches and mayflies. Among the caddisflies, the species *Agraylea sexmaculata* Curtis, 1834, *Ecnomus tenellus* (Rambur, 1842), *Athripsodes bilineatus* (Linnaeus, 1758), *Cyrnus trimaculatus* (Curtis, 1834) and the genera *Oecetis* and *Mystacides* are typical for standing and slowly running waters (WARINGER, GRAF 2011).

Some of the aquatic snails, *i.e.* *Acroloxus lacustris* (Linnaeus, 1758), *Gyraulus albus* (O. F.

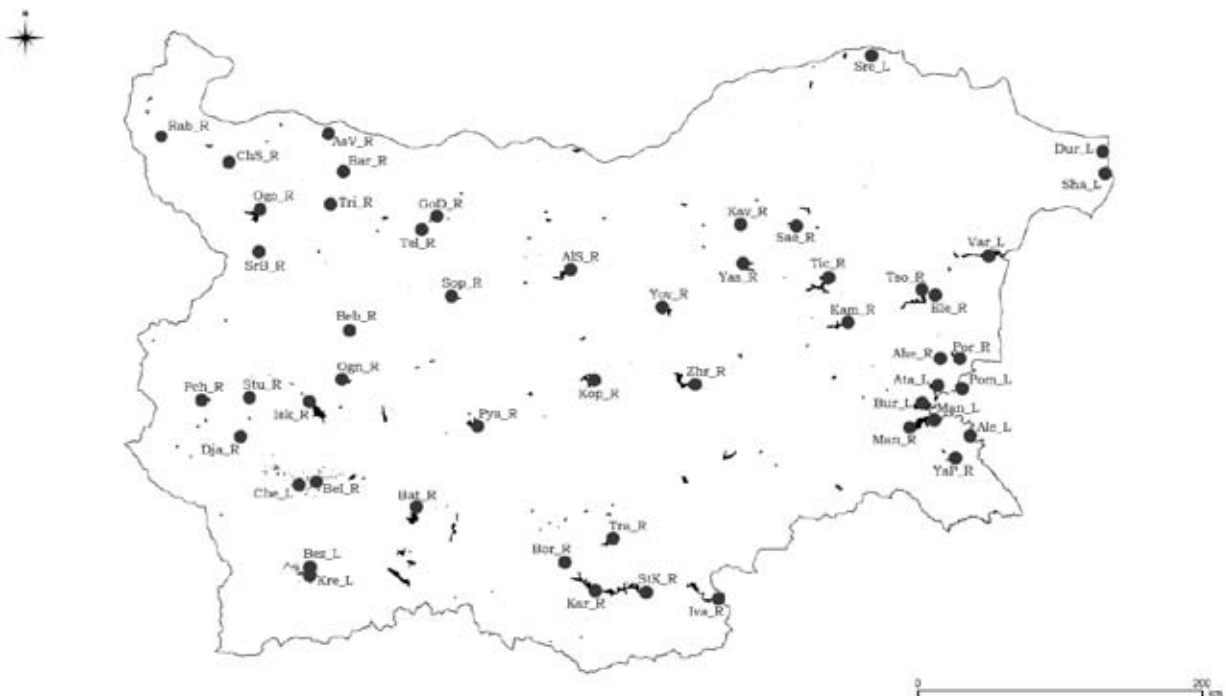


Fig. 1. Localities of the studied water bodies

Table 1. Characteristics of the water bodies (natural lakes and reservoirs) studied in Bulgaria in 2011-2012 for assessment of their macroinvertebrate benthic communities. (*These numbers refers to the numbers of localities in Table 2; **Codes of the water bodies, as in Fig. 1; ***Typology according the updated Management Plans of the Water Basin Districts in Bulgaria)

№*	Name	Code**	Eco-Region	Type***	Altitude (m a.s.l.)	Geographical coordinates		Surface area (km ²)	Sampling	
						Latitude, N	Longitude, E		2011	2012
1	Rabisha	Rab_R	12	L4	289	43°44'05.8"	22°35'36.5"	3.246	x	x
2	Christo Smiminski	ChS_R	12	L16	155.6	43°36'48.7"	23°00'34.8"	0.975	x	
3	Ogosta	Ogo_R	12	L14	186	43°23'34.23"	23°10'08.16"	23.6		x
4	Srechenska Bara	Sre_R	12	L16	446	43°12'31.28"	23°12'29.02"	0.84		x
5	Iskar	Isk_R	12	L11	817.5	42°26'54.6"	23°34'14.1"	30	x	x
6	Beli Iskar	Bel_R	12	L1	1878.2	42°08'08.7"	23°34'16.6"	0.813	x	
7	Asparuhov Val	Asp_R	12	L16	96.7	43°44'51.2"	23°37'19.8"	2.06	x	x
8	Tri kladenci	Tri_R	12	L10	156.3	43°26'01"	23°38'23.6"	1.202	x	
9	Barzina	Bar_R	12	L3	78.8	43°34'16.4"	23°43'17.7"	0.545	x	
10	Ognyanovo	Ogn_R	12	L2	622	42°36'39.09"	23°44'45.23"	1.788		x
11	Bebresh	Beb_R	12	L2	498.5	42°49'55.3"	23°47'03.8"	0.736	x	
12	Telish	Tel_R	12	L16	214.2	43°18'30.6"	24°14'13.7"	2.32	x	x
13	Gorni Dabnik	GoD_R	12	L14	173	43°22'26.55"	24°19'06.2"	11.8	x	x
14	Sopot	Sop_R	12	L12	360	43°00'22.18"	24°25'30.01"	5.350		x
15	Aleksandar Stamboliyski	ALS_R	12	L11	188.5	43°06'51.8"	25°08'43.8"	10.86	x	
16	Yovkovtisi	Yov_R	12	L2	335.92	42°55'08.1"	25°47'57.4"	5.745	x	x
17	Kavatsite	Kav_R	12	L12	201	43°20'08.1"	26°15'3.3"	0.59	x	x
18	Yastrebinno	Yas_R	12	L12	339.97	43°07'34.2"	26°17'59.1"	4.8	x	x
19	Saedinenie	Sae_R	12	L12	179	43°19'43.3"	26°36'12.8"	0.22		x
20	Ticha	Tic_R	12	L11	188.53	43°02'06.7"	26°40'40.5"	18.7	x	
21	Kamchia	Kam_R	12	L11	257.2	43°52'42.4"	26°55'5"	9.601	x	
22	Srebarna	Sre_L	12	L5	11	44°06'09.3"	27°03'54.4"	2	x	x
23	Mandra	Man_R	12	L7	4	42°24'08.9"	27°19'09.7"	32.6		x
24	Burgasko	Bur_L	12	L8	1	42°30'38.1"	27°22'03.3"	27.6		x
25	Tsonevo	Tso_R	12	L11	61	43°01'45.2"	27°24'21.8"	17.3		x

Table 1. Continued

№*	Name	Code**	Eco-Region	Type***	Altitude (m a.s.l.)	Geographical coordinates		Surface area (km ²)	Sampling	
						Latitude, N	Longitude, E		2011	2012
26	Mandra	Man_L	12	L9	2	42°26'07.4"	27°27'07.7"	10		x
27	Eleshnitsa	Ele_R	12	L12	60	43°00'12.3"	27°28'02.2"	1.181		x
28	Atanasovsko	Ata_L	12	L10	-0.2	42°34'41.1"	27°29'26.2"	16.9	x	
29	Aheloi	Ahe_R	12	L16	144	42°42'40.8"	27°30'52.8"	0.97		x
30	Yasna Polyana	YaP_R	12	L12	94.96	42°15'16.1"	27°35'27.4"	2.317	x	
31	Poroi	Por_R	12	L16	32	42°43'09.3"	27°37'25.4"	4.55		x
32	Pomoritsko	Pom_L	12	L10	-0.8	42°34'21.4"	27°38'01.4"	6.7	x	
33	Alepu	Ale_L	12	L8	-0.1	42°21'58.9"	27°42'27.6"	0.14	x	x
34	Varnensko	Var_L	12	L9	1	43°11'45.8"	27°49'08.5"	17.4		x
35	Durankulak	Dur_L	12	L7	0.09 - 0.6	43°39'59.6"	28°33'50.9"	3.4	x	x
36	Shabla	Sha_L	12	L7	0.2 - 0.9	43°34'25.2"	28°34'01.8"	0.783	x	x
37	Ivaylovgrad	Iva_R	7	L11	130.75	41°35'7.7"	26°6'33.1"	15.1	x	
38	Zhrebecho	Zhr_R	7	L11	266.2	42°35'35.01"	25°57'3.9"	24.89	x	
39	Studen Kladenets	StK_R	7	L11	227.4	41°39'7.2"	25°33'35.8"	25.6	x	x
40	Trakiets	Tra_R	7	L15	247	41°50'29.9"	25°24'18.9"	8.2		x
41	Kardzhali	Kar_R	7	L11	331.5	41°37'41.8"	25°20'19.3"	16.07	x	
42	Koprinka	Kop_R	7	L11	391.7	42°36'46.6"	25°19'8.2"	11.2	x	
43	Borovitsa	Bor_R	7	L13	490	41°45'27.7"	25°08'35.2"	0.48		x
44	Pyasachnik	Pya_R	7	L15	290	42°24'12.2"	24°34'57.6"	9.1		x
45	Batak	Bat_R	7	L3	1106.1	41°57'36.8"	24°09'32.4"	22.08	x	x
46	Kremensko	Kre_L	7	L1	2310	41°42'22.2"	23°31'33.7"	0.196	x	
47	Bezbug	Bez_L	7	L1	2244	41°44'0.68"	23°31'27.0"	0.12		x
48	Chernoto	Che_L	7	L1	2302	42°07'37.8"	23°27'46.0"	0.05		x
49	Studena	Stu_R	7	L3	844.2	42°32'0.35"	23°08'37.3"	1.6	x	x
50	Djakovo	Dja_R	7	L13	664.63	42°21'19.5"	23°04'41.9"	2	x	x
51	Pchelina	Pch_R	7	L13	622.35	42°31'2.02"	22° 50' 37.8"	5.38	x	

Table 2. List of the taxa with name codes and localities

Taxa	Code	Localities
HYDROZOA		
<i>Hydra</i> sp.	Hydrind	39
TURBELLARIA		
<i>Dugesia gonocephala</i> (Duges, 1830)	Duge gon	51
<i>Dugesia tigrina</i> (Girard, 1850)	Duge tig	13, 15, 16, 22, 23, 27, 35, 36, 45
<i>Mesostoma</i> sp.	Mesoind	39
BRANCHIOBELLEA		
<i>Branchiobdella pentodonta</i> Whitmann, 1882	Bran pen	17, 30, 35, 50
NEMATODA - Indet.	Nematod	10, 33, 49, 50
OLIGOCHAETA		
<i>Aulodrilus limnobioides</i> Bretscher, 1899	Aulo lim	42, 50
<i>Aulodrilus plurisetus</i> (Piquet, 1906)	Aulo plu	6, 15, 37, 42, 45, 49
<i>Branchiura sowerbyi</i> Beddard, 1892	Bran sow	1, 2, 5, 7, 11, 12, 13, 15, 16, 20, 37, 39, 40
<i>Chaetogaster cristallinus</i> Vejdovsky, 1883	Chae cri	45
<i>Dero digitata</i> Oken, 1815	Dero dig	7, 9, 11, 15, 16, 17, 18, 19, 20, 22, 35, 39, 42, 45, 49, 50, 51
<i>Dero dorsalis</i> Ferroniere, 1889	Dero dor	4, 33
<i>Dero obtusa</i> Udekem, 1855	Dero obt	7, 17, 19, 22, 23, 33, 37, 40, 44, 45, 50
<i>Dero</i> (cf. <i>obtusa</i>) sp.	Derind1	3, 10, 29
<i>Dero</i> sp. (fragmented)	Derind2	33
<i>Embocephalus velutinus</i> (Grube, 1879)	Embo vel	48
<i>Enchytraeus albidus</i> Henle, 1837	Ench alb	28
Enchytraeidae gen. sp.juv.	fenchyt	33, 36, 46
<i>Ilyodrilus templetoni</i> (Southern, 1909)	Ilyo tem	16
<i>Limnodrilus claparedeanus</i> Ratzel, 1869	Limn cla	5, 10, 12, 14, 17, 18, 19, 23, 24, 39
<i>Limnodrilus hoffmeisteri</i> Claparede, 1862	Limn hof	2, 5, 9, 11, 16, 18, 19, 23, 24, 27, 38, 39, 40, 44, 45, 49
<i>Limnodrilus profundicola</i> (Verrill, 1871)	Limn pro	18, 20, 24
<i>Limnodrilus udekemianus</i> Claparede, 1862	Limn ude	9, 39
<i>Limnodrilus</i> sp.juv.	Limnind	3, 4, 5, 7, 10, 12, 13, 14, 15, 16, 17, 18, 19, 23, 24, 25, 27, 30, 33, 36, 37, 39, 40, 41, 42, 43, 44, 45, 49, 50
<i>Lumbriculus variegatus</i> (Müller, 1774)	Lumb var	46, 47, 48
<i>Marionina</i> sp.	Mariind	50
<i>Nais barbata</i> Müller, 1774	Nais bar	19, 23, 40
<i>Nais communis</i> Piquet, 1906	Nais com	20, 46
<i>Nais elinguis</i> Müller, 1774	Nais eli	38, 50
<i>Nais pardalis</i> Piquet, 1906	Nais par	19, 23, 38, 39, 41, 50
<i>Nais pseudobtusa</i> Piquet, 1906	Nais pse	30, 39, 50
<i>Nais simplex</i> Piquet, 1906	Nais sim	19, 22, 23, 38, 39, 45
<i>Nais variabilis</i> Piquet, 1906	Nais var	7, 9, 15, 19, 22, 25, 33, 37, 39, 40, 45, 50
<i>Ophidonais serpentina</i> (Müller, 1774)	Ophi ser	20, 22, 23, 25, 30, 45, 50
<i>Paranais frici</i> Hrabec, 1941	Para fri	36
<i>Potamothena hammoniensis</i> (Michaelsen, 1901)	Pota ham	24
<i>Pristina (Pristina) aequisetus</i> Bourne, 1891	Pris aeq	33, 40, 42
<i>Pristina (Pristinella) rosea</i> (Piquet, 1906)	Pris ros	19
<i>Psammoryctides albicola</i> (Michaelsen, 1901)	Psam alb	23, 33, 35, 38
<i>Psammoryctides barbatus</i> (Grube, 1861)	Psam bar	36
<i>Spirosperma ferox</i> Eisen, 1879	Spir fer	6
<i>Stylaria lacustris</i> (Linnaeus, 1767)	Styl lac	7, 15, 16, 22, 23, 29, 30, 33, 38, 40, 44, 45, 51
<i>Stylodrilus heringianus</i> Claparede, 1862	Stylher	6
<i>Tubifex tubifex</i> (Müller, 1774)	Tubi tub	9, 16, 18, 30, 36, 38, 39, 44, 45, 50
<i>Tubifex</i> sp.	Tubiind	17, 49
Tubificidae, gen. sp.juv.	ftubifi	11, 19, 22, 33
<i>Vejdovskyaella comata</i> (Vejdovsky, 1884)	Vejd com	12

Table 2. Continued

Taxa	Code	Localities
POLYCHAETA - Indet.	Polycha	26, 28, 32, 34
<i>Nereis</i> sp.	Nereind	32
HIRUDINEA - Indet.	Hirudin	3
<i>Erpobdella octoculata</i> (Linnaeus, 1758)	Erpo oct	9, 23, 51
<i>Glossiphonia complanata</i> (Linnaeus, 1758)	Clos com	5, 33
<i>Glossiphonia heteroclita</i> (Linnaeus, 1758)	Glos het	51
Glossiphoniidae, gen. sp.	fglossi	36
<i>Helobdella stagnalis</i> (Linnaeus, 1758)	Helo sta	11, 38, 47, 51
<i>Hemiclepsis marginata</i> (O. F. Müller, 1774)	Hemi mar	38, 51
<i>Hirudo verbana</i> Carena, 1820	Hirudo ver	22, 35
GASTROPODA		
<i>Acroloxus lacustris</i> (Linnaeus, 1758)	Acro lac	9, 33, 36
<i>Ancylus fluviatilis</i> O. F. Müller, 1774	Ancy flu	47
<i>Bithynia tentaculata</i> (Linnaeus, 1758)	Bith ten	22
<i>Bittium reticulatum</i> (da Costa, 1778)	Bitt ret	32
<i>Bittium</i> sp.	Bittind	35
cf. <i>Pusillina lineolata</i>	Pusiind	28
<i>Gyraulus albus</i> (O. F. Müller, 1774)	Gyra alb	51
<i>Gyraulus laevis</i> (Alder, 1838)	Gyra lae	22
<i>Gyraulus</i> sp.	Gyraind	3, 4, 14
<i>Hydrobia ventrosa</i> (Montagu, 1803)	Hydr ven	28, 32
<i>Lymnaea stagnalis</i> (Linnaeus, 1758)	Lymn sta	23
Lymnaeidae, gen. sp.	flymnae	33, 36
<i>Nassarius reticulatus</i> (Linnaeus, 1758)	Nass ret	32
Physidae, gen. sp.	fphysid	24
<i>Haitia acuta</i> (Draparnaud, 1805)	Hait acu	1, 7, 8, 9, 13, 16, 17, 18, 19, 23, 25, 29, 44, 51
<i>Planorbarius corneus</i> (Linnaeus, 1758)	Plan cor	22
<i>Planorbis</i> (<i>Planorbis</i>) <i>planorbis</i> (Linnaeus, 1758)	Plan pla	9, 33, 36
Planorbidae, gen. sp.	fplanor	33
<i>Radix</i> cf. <i>auricularia</i> (Linnaeus, 1758)	Radi aur	1, 5, 13, 27, 51
<i>Radix</i> cf. <i>balthica</i> (Linnaeus, 1758)	Radi bal	46
<i>Radix</i> cf. <i>labiata</i> (Rossmässler, 1835)	Radi lab	18
<i>Radix</i> sp.	Radiind	16, 22, 23, 25, 29, 35, 51
<i>Rissoa</i> cf. <i>splendida</i> Eichwald, 1830	Rissind	32
<i>Segmentina nitida</i> (O. F. Müller, 1774)	Segm nit	33
<i>Stagnicola palustris</i> (O. F. Müller, 1774)	Stag pal	22, 51
<i>Theodoxus fluviatilis</i> (Linnaeus, 1758)	Theo flu	23, 35, 36
<i>Valvata piscinalis</i> (O. F. Müller, 1774)	Valv pis	14
<i>Viviparus acerosus</i> (Bourguignat, 1862)	Vivi ace	1, 2, 5, 12, 13, 14, 15, 23, 31, 38, 42, 44, 50, 51
<i>Viviparus</i> sp.	Viviind	7
BIVALVIA		
<i>Abra ovata</i> (Philippi, 1836)	Abra ova	28, 32
<i>Anodonta</i> cf. <i>anatina</i> (Linnaeus, 1758)	Anod ana	5, 12, 17, 23, 40, 50, 51
<i>Anodonta</i> cf. <i>cygnea</i> (Linnaeus, 1758)	Anod cyg	12
<i>Anodonta</i> sp.	Anodind	45
<i>Cerastoderma</i> sp.	Ceraind	24, 34
<i>Cerastoderma glaucum</i> (Bruguière, 1789)	Cera gla	28, 32
cf. <i>Mytilaster lineatus</i>	Mytiind	32
<i>Corbicula fluminea</i> (O. F. Müller, 1774)	Corb flu	13
<i>Dreissena polymorpha</i> (Pallas, 1771)	Drei pol	1, 7, 10, 12, 13, 14, 15, 16, 23, 25, 27, 30, 31, 35, 36, 38, 40, 50, 51

Table 2. Continued

Taxa	Code	Localities
<i>Loripes</i> sp.	Loriind	25
<i>Mya arenaria</i> (Linnaeus, 1758)	Mya aren	34
Mytilidae, gen. sp.	fmytili	34
<i>Pseudanodonta</i> sp.	Pseuind	13, 14, 17, 18, 25, 27, 31, 45, 50
<i>Sinanodonta woodiana</i> (Lea, 1834)	Sina woo	27
<i>Sphaerium</i> sp.	Sphaind	33, 48
Sphaeriidae, gen. sp.	fsphaer	6, 11, 46
<i>Unio</i> cf. <i>pictorum</i> (Linnaeus, 1758)	Unio pic	1, 45
<i>Unio</i> cf. <i>tumidus</i> Philipson, 1788	Unio tum	1, 23
<i>Unio</i> sp.	Unioind	13
Unionidae, gen. sp.	funioni	11
CRUSTACEA		
ISOPODA		
<i>Asellus aquaticus</i> (Linnaeus, 1758)	Asel aqu	9, 10, 22, 23, 33, 35, 36, 45
<i>Idotea baltica basteri</i> (Pallas, 1772)	Idot bal	26
<i>Jaera sarsi</i> Valkanov, 1936	Jaer sar	35, 36
<i>Limnomysis benedeni</i> Czerniavsky, 1882	Limn ben	25, 28, 32, 35, 36, 38
<i>Sphaeroma serratum</i> (Fabricius, 1787)	Spha ser	32
AMPHIPODA		
cf. <i>Jassa ocia</i>	Jassind	26
<i>Corophium curvispinum</i> Sars, 1895	Coro cur	35, 36
<i>Corophium</i> sp.	Coroind	28, 32, 35, 36, 39
<i>Crassikorophium bonellii</i> (Milne-Edwards, 1830)	Cras bon	34
<i>Deshayesorchestia deshayesii</i> (Audouin, 1826)	Desh des	34
<i>Dikerogammarus haemobaphes</i> (Eichwald, 1841)	Dike hae	35, 36
<i>Dikerogammarus</i> sp.	Dikeind	13, 25, 35
<i>Gammarus aequicauda</i> (Martynov, 1931)	Gamm aeq	28, 32
<i>Gammarus</i> cf. <i>arduus</i>	Gamm ard	20
<i>Gammarus komareki</i> Schäferna, 1922	Gamm kom	23
<i>Gammarus subtypicus</i> Stock, 1966	Gamm sub	33, 36
<i>Gammarus</i> sp.	Gammind	4, 22
<i>Niphargus bulgaricus</i> Andreev, 2001	Niph bul	36
<i>Obesogammarus crassus</i> (Sars, G. O. 1894)	Obes cra	35, 36
<i>Orchestia gammarellus</i> (Pallas, 1766)	Orch gam	35
<i>Pontogammarus robustiodes</i> (Sars, 1846)	Pont rob	23, 29, 31, 35
<i>Pontogammarus</i> sp.	Pontind	23, 34
Gammaridae, gen. sp.	fgammar	36
DECAPODA		
<i>Astacus leptodactylus</i> Eschscholtz, 1823	Asta lep	1, 7, 11, 12, 16, 17, 25, 30, 35, 45, 50
<i>Macrobrachium sintangense</i> (De Man, 1898)	Macr sin	34
<i>Palaemon adspersus</i> Rathke, 1837	Pala ads	26
<i>Palaemon serratus</i> (Pennant, 1777)	Pala ser	28
<i>Potamon ibericum</i> (Bieberstein, 1808)	Pota ibe	27
<i>Rhithropanopeus harrisii</i> (Gould, 1841)	Rhit har	26
HYDRACARINA - Indet.	Hydraca	7, 33, 36, 37, 39, 41, 42, 45, 49, 50, 51
INSECTA		
EPHEMEROPTERA		
<i>Caenis horaria</i> (Linnaeus, 1758)	Caen hor	3, 4, 10, 13, 45, 49, 50
<i>Caenis macrura</i> Stephens, 1835	Caen mac	3, 4, 7, 10, 13, 29, 30, 39, 40, 41, 43, 49, 50
<i>Caenis robusta</i> Eaton, 1884	Caen rob	7, 22, 29, 33, 39, 50, 51
<i>Cloeon dipterum</i> (Linnaeus, 1761)	Cloe dip	2, 4, 7, 8, 9, 19, 22, 23, 29, 33, 39, 40, 44, 49, 51

Table 2. Continued

Taxa	Code	Localities
<i>Ecdyonurus (Ecdyonurus) sp.</i>	Ecdind1	45, 50
<i>Ecdyonurus (Helvetoraeticus) sp.</i>	Ecdind2	47
<i>Ecdyonurus epeorides</i> Demoulin, 1955	Ecdy epe	48
ODONATA		
<i>Aeshna sp.</i>	Aeshind	50, 51
<i>Anax imperator</i> Leach, 1815	Anax imp	26, 33, 36
<i>Calopteryx splendens</i> (Harris, 1782)	Calo spl	19
<i>Cercion sp.</i>	Cercind	36
<i>Coenagrion puella</i> (Linnaeus, 1758)	Coen pue	15, 22
<i>Coenagrion sp.</i>	Coenind	13, 16, 17, 19, 23, 25, 29, 36, 37, 39, 44
Coenagrionidae, gen. sp.	fcoenag	19, 36
Cordulegastridae, gen. sp.	fcoerul	23
<i>Cordulia aenea</i> (Linnaeus, 1758)	Cord aen	33
<i>Cordulia sp.</i>	Cordind	8
<i>Enallagma sp.</i>	Enalind	24
<i>Erythromma najas</i> (Hansemann, 1823)	Eryt naj	9, 15, 22
<i>Erythromma sp.</i>	Erytind	24
<i>Gomphus vulgatissimus</i> (Linnaeus, 1758)	Gomp vul	5, 11, 23, 43
<i>Gomphus sp.</i>	Gompind	22, 50
<i>Ischnura elegans</i> (van der Linden, 1820)	Isch ele	1, 19, 22, 23, 35, 36, 39
<i>Libellula depressa</i> Linnaeus, 1758	Libe dep	3
<i>Libellula sp.</i>	Libeind	8, 11, 16, 17, 26
<i>Onychogomphus forcipatus</i> (Linnaeus, 1758)	Onyc for	3, 11
<i>Orthetrum cancelatum</i> (Linnaeus, 1758)	Orth can	13, 15, 17, 23
<i>Orthetrum sp.</i>	Orthind	7, 29, 45
<i>Platycnemis pennipes</i> (Pallas, 1771)	Plat pen	17, 23, 35, 36, 39
<i>Pyrrhosoma nymphula</i> (Sulzer, 1776)	Pyrr nym	17, 33, 51
<i>Pyrrhosoma sp.</i>	Pyrrind	7, 9, 22, 25, 33, 45, 50
<i>Sympecma sp.</i>	Symind1	23, 45
<i>Sympetrum sp.</i>	Symind2	22
PLECOPTERA		
<i>Leuctra sp.</i>	Leucind	37
<i>Nemoura sp.</i>	Nemoind	46
<i>Perla pallida</i> Guérin-Méneville, 1838	Perl pal	48
COLEOPTERA - Indet.		
<i>Berosus sp.</i>	Beroind	8
Dryopidae, gen. sp.	fdryopi	39
<i>Dytiscus marginatus</i> Linnaeus, 1758	Dytu mar	33
Dytiscidae, gen. sp.	fdytisc	50
<i>Elodes sp.</i>	Elodind	22
<i>Enochrus sp.</i>	Enocind	51
<i>Gerris sp.</i>	Gerrind	8, 9
<i>Gyrinus sp.</i>	Gyriind	22
<i>Haliphus sp.</i>	Haliind	22, 23 33, 47, 51
<i>Hydraena sp.</i>	Hydind1	22
<i>Hydrochus sp.</i>	Hydind1	8
Hydrophilidae, gen. sp.	fhydrop	22
<i>Hydrophilus sp.</i>	Hydrind	17, 22, 33
<i>Laccobius sp.</i>	Laccind	22
<i>Limnoporus rufoscutellatus</i> (Latreille, 1807)	Limn ruf	9
<i>Platambus maculatus</i> (Linnaeus, 1758)	Plat mac	46

Table 2. Continued

Taxa	Code	Localities
<i>Platambus</i> sp.	Platind	5, 51
HETEROPTERA		
<i>Aphelocherius</i> sp.	Apheind	24
<i>Arctocorixa</i> sp.	Arctind	33, 35, 51
<i>Callicorixa</i> sp.	Callind	9
<i>Corixa affinis</i> Leach, 1817	Coriind	8, 33
Corixidae, gen. sp.	fcorixi	22, 24, 44
<i>Hebrus</i> sp.	Hebrind	29
<i>Hydrometra stagnorum</i> (Linnaeus, 1758)	Hydr sta	13, 33
<i>Ilyocoris cimicoides</i> (Linnaeus, 1758)	Ilyo cim	21, 22, 23, 33, 36, 51
<i>Ilyocoris</i> sp.	Ilyoind	33
<i>Mesovelia furcata</i> Mulsant & Rey, 1852	Meso fur	51
<i>Micronecta</i> sp.	Micind1	7, 8, 12, 13, 19, 23, 37, 39, 40, 41, 42, 44, 45, 49, 50, 51
<i>Microvelia</i> sp.	Micind2	9, 21
Naucoridae, gen. sp.	fnaucor	29
<i>Nepa cinerea</i> Linnaeus, 1758	Nepa cin	33, 36
<i>Notonecta viridis</i> Delcourt, 1909	Noto vir	9
<i>Notonecta</i> sp.	Notoind	28, 36
<i>Plea</i> sp.	Pleaind	51
<i>Ranatra (Ranatra) linearis</i> (Linnaeus, 1758)	Rana lin	33
<i>Sigara</i> sp.	Sigaind	8
Veliidae, gen. sp.	fveliind	39
TRICHOPTERA		
<i>Agraylea sexmaculata</i> Curtis, 1834	Agra sex	39
<i>Athripsodes bilineatus</i> (Linnaeus, 1758)	Athr bil	3
<i>Athripsodes</i> sp.	Athrind	11, 23
Brachycentridae, gen. sp.	fbrachy	45
<i>Ceraclea</i> sp.	Ceraind	50
<i>Chaetopteryx fusca</i> Brauer, 1857	Chae fus	47
<i>Cheumatopsyche lepida</i> (Pictet, 1834)	Cheu lep	39
<i>Crunoecia</i> sp.	Crunind	47
<i>Cyrnus trimaculatus</i> (Curtis, 1834)	Cyrn tri	5
<i>Cyrnus</i> sp.	Cyrmind	46
<i>Ecnomus tenellus</i> (Rambur, 1842)	Ecno ten	1, 2, 5, 9, 12, 13, 14, 15, 17, 19, 22, 23, 25, 29, 35, 36, 37, 38, 40, 42, 43, 49, 50
<i>Holocentropus picicornis</i> (Stephens, 1836)	Holo pic	11
<i>Holocentropus stagnalis</i> (Albarda, 1874)	Holo sta	43
<i>Hydropsyche contubernalis</i> McLachlan, 1865	Hydr con	17
Hydropsychidae, gen. sp.	fhydrop	37
Limnephilidae, gen. sp.	flimnep	47
<i>Mystacides azureus</i> (Linnaeus, 1761)	Myst azu	4, 49, 50
<i>Mystacides</i> sp.	Mystind	7, 50
<i>Oecetis</i> (cf. <i>lacustris</i>) sp.	Oeceed	33
<i>Oecetis furva</i> (Rambur, 1842)	Oece fur	37, 51
<i>Oecetis lacustris</i> (Pictet, 1834)	Oece lac	11
<i>Orthotrichia costalis</i> (Curtis, 1834)	Orth cos	19
<i>Tinodes</i> (cf. <i>rostocki</i>) sp.	Tinoind	49
<i>Triaenodes bicolor</i> (Curtis, 1834)	Tria bic	4, 7, 22
MEGALOPTERA		
<i>Sialis lutaria</i> (Linnaeus, 1758)	Sial lut	46, 47, 48
DIPTERA		
Ceratopogonidae		

Table 2. Continued

Taxa	Code	Localities
<i>Bezzia</i> sp.	Bezzind	1, 12, 20, 22, 29, 36, 39, 42, 50
<i>Culicoides</i> sp.	Culiind	3, 4, 9, 19, 22, 24, 29, 33, 39, 40, 50
<i>Sphaeromias</i> sp.	Sphaind	9
Chaoboridae		
<i>Chaoborus crystalinus</i> (De Geer, 1776)	Chao cry	8, 17, 33
<i>Chaoborus</i> sp.	Chaoind	9, 33
Chironomidae		
<i>Brilla modesta</i> (Meigen, 1830)	Bril mod	16
<i>Brilla</i> sp.	Brilind	7, 12, 16, 37
<i>Chironomus aprilius</i> Meigen, 1830	Chir apr	32
<i>Chironomus</i> gr. <i>plumosus</i> (Linnaeus, 1758)	Chirgplu	11, 12, 15, 19, 22, 29, 33, 35, 36, 39, 41, 42, 50, 51
<i>Chironomus</i> gr. <i>riparius</i> Meigen, 1804	Chirgrip	1, 3, 5, 6, 7, 8, 10, 12, 13, 14, 18, 19, 22, 23, 26, 29, 33, 35, 37, 39, 40, 41, 43, 44, 45, 46, 47, 49, 50
<i>Chironomus salinarius</i> Kieffer in Thienemann, 1915	Chir sal	32
<i>Chironomus</i> sp.	Chirind	3, 5, 7, 14, 22, 26, 27, 29, 32, 33, 39, 41, 43, 44, 48
<i>Cricotopus</i> (C.) <i>algarum</i> (Kieffer, 1911)	Cric alg	4, 12, 13, 18, 23, 24, 26, 36, 39, 50
<i>Cricotopus</i> (C.) <i>biformis</i> Edwards, 1929	Cric bif	2, 9
<i>Cricotopus</i> (L.) <i>sylvestris</i> (Fabricius, 1794)	Cric syl	3, 4, 5, 9, 14, 18, 19, 20, 22, 30, 35, 36, 39, 42, 50
<i>Cricotopus</i> sp.	Cricind	3, 4, 7, 13, 14, 17, 18, 23, 30, 35, 39, 43, 50
<i>Cryptochironomus</i> gr. <i>defectus</i> Kieffer, 1913	Crypgdef	2, 5, 10, 12, 13, 15, 16, 17, 22, 23, 24, 28, 33, 36, 37, 40, 41, 42, 43, 44, 45, 46, 49
<i>Cryptochironomus</i> sp.	Crypind	7, 10, 12, 15, 16, 18, 24, 28, 33, 37, 41, 44, 48
<i>Demicryptochironomus</i> sp.	Demyind	7
<i>Diamesa</i> sp.	Diamind	2, 5
<i>Dicrotendipes</i> gr. <i>nervosus</i> (Staeger, 1839)	Dicrgner	5, 16, 39, 49
<i>Dicrotendipes</i> sp.	Dicrind	5, 16, 17, 30, 39, 43
<i>Endochironomus</i> sp.	Endoind	19, 22, 33, 36
<i>Eukiefferiella gracei</i> (Edwards, 1929)	Euki gra	11, 13, 37
<i>Eukiefferiella</i> sp.	Eukiind	7, 37, 40, 43
<i>Glyptotendipes glaucus</i> (Meigen, 1818)	Glyp gla	12, 13, 22, 23, 33, 36
<i>Glyptotendipes</i> gr. <i>gripenkoveni</i> (Kieffer, 1913)	Glypggri	5, 8, 9, 22, 32, 36, 36, 39, 45, 51
<i>Glyptotendipes</i> sp.	Glypind	5, 9, 19, 21, 32, 33, 39, 51
<i>Larisa</i> sp.	Lariind	15
<i>Orthocladius</i> sp.	Orthind	37, 41
<i>Polypedilum</i> sp.	Polyind	36
<i>Tanytarsus</i> gr. <i>gregarius</i> Kieffer, 1909	Tanyggre	3, 5, 10, 11, 14, 17, 19, 20, 27, 37, 40, 43, 45, 48, 49
<i>Tanytarsus</i> sp.	Tanyind	3, 7, 10, 11, 13, 14, 17, 19, 20, 21, 29, 33, 40, 45
<i>Tvetenia</i> gr. <i>calvescens</i> (Edwards, 1929)	Tvetgcal	7, 12, 45
<i>Tvetenia</i> sp.	Tvetind	12, 18, 39, 43, 45
Chironomidae, gen. sp.	fchiron	3, 4, 10, 19, 22, 23, 24, 33, 38, 43, 48, 49, 50
Culicidae		
<i>Aedes</i> sp.	Aedeind	8
<i>Anopheles</i> sp.	Anopind	9
Dixidae		
<i>Dixella</i> sp.	Dixeind	9
Empididae, gen. sp.	fempidi	22
Ephydriidae		
<i>Ephydra</i> sp.	Ephyind	22
<i>Paracoenia fumosa</i> (Stenhammar, 1844)	Para fum	22
Limoniidae		
<i>Erioptera</i> sp.	Erioind	44
<i>Helius longirostris</i> (Meigen, 1818)	Heli lon	24

Table 2. Continued

Taxa	Code	Localities
<i>Helius</i> sp.	Heliind	33, 35
<i>Limnophila</i> sp.	Limnind	23, 35
<i>Limonia</i> sp.	Limoin	8, 9, 16, 33, 36
<i>Ormosia lineata</i> (Meigen, 1804)	Ormo lin	22
Limoniidae, gen. sp.	flimoni	22
Pediciidae		
<i>Dicranota bimaculata</i> (Schummel, 1829)	Dicr bim	47
Psychodidae		
<i>Psychoda alternata</i> (Say, 1824)	Psyc alt	22
<i>Psychoda</i> sp.	Psycind	8, 22, 44
<i>Tonnoriella pulchra</i> (Eaton, 1893)	Tonn pul	9
Psychodidae, gen. sp.	fpsycho	24, 44
Rhagionidae		
<i>Chrysopilus</i> sp.	Chryind	23
Scathophagidae, gen. sp.	fscatho	44
Stratiomyidae		
<i>Oxycera</i> sp.	Oxycind	36
<i>Stratiomys</i> sp.	Straind	8, 32
Tabanidae		
<i>Tabanus</i> sp.	Tabaind	8, 20
Tipulidae		
<i>Tipula</i> sp.	Tipuind	8
ARACHNIDA	Arachni	7, 8, 9, 28, 33, 35, 51

Müller, 1774), *Lymnaea stagnalis* (Linnaeus, 1758), *Haitia acuta* (Draparnaud, 1805), *Planorbarius corneus* (Linnaeus, 1758), *Planorbis* (*P.*) *planorbis* (Linnaeus, 1758), *Radix* cf. *auricularia* (Linnaeus, 1758), *R.* cf. *labiata* (Rossmässler, 1835), *Valvata piscinalis* (O. F. Müller, 1774), also inhabit standing or more rarely slowly running clean waters as described by WELTER-SCHULTES (2012). According to the same author, *Gyraulus laevis* (Alder, 1838) and *Hydrobia ventrosa* (Montagu, 1803) were found in fiords, coastal waters, quiet estuaries, drainage ditches in coastal marshes, as *Segmentina nitida* (O. F. Müller, 1774) and *Stagnicola palustris* (O. F. Müller, 1774) are typical for mostly permanent and silent waters with high humid content.

Considerably less in number were the obligatory lentic organisms such as *Anodonta* cf. *anatina* (Linnaeus, 1758), *A.* cf. *cygnea* (Linnaeus, 1758) (Bivalvia) and the caddisfly *Orthotrichia costalis* (Curtis, 1834). It should be noted that the presence of rheobionts (for example ecdyonurids of the subgenus *Helvetoraeticus*, some stoneflies and caddisflies and the alderfly *Sialis lutaria* (Linnaeus, 1758) in the littoral of the studied alpine lakes in Rila and Pirin Mts. is most probably due to the proximity with the outlets of the lakes, where their typical habitats are. We recorded the mysids *Jaera sarsi* Valkanov,

1936 and *Rhithropanopeus harrisii* (Gould, 1841), which are brackish forms (HUBENOV 2015).

In the studied water bodies, the following invasive species were found: *Branchiura sowerbyi* Beddard, 1892 (Oligochaeta) (GEORGIEVA *et al.* 2012), *Corbicula fluminea* (O. F. Müller, 1774) (HUBENOV *et al.* 2013), *Dreissena polymorpha* (Pallas, 1771) (TRICHKOVA *et al.* 2009), *Sinanodonta woodiana* (Lea, 1834) (HUBENOV 2006), *Mya arenaria* (Linnaeus, 1758) (GOLEMANSKY 2007).

Concerning the conservation status of benthic macroinvertebrates, these were predominantly widespread and abundant species, which belong to the category “Least Concern”. However, few of the recorded taxa are included in different IUCN categories. The stonefly *Perla pallida* Guérin-Méneville, 1838 was not reported from the Rilska River watershed since 1968. The species is classified “Vulnerable” according to the IUCN criteria (TYUFEKCHIEVA 2014). This is its first finding in the Chernoto Lake (Rila Mts.).

Niphargus bulgaricus Andreev, 2001 was described from surface waters from the Bolata Marsh (NE Bulgaria; ANDREEV 2001). During the present study, it was found also in the Shabla Lake (Table 1), which is the second known locality of the species. It can be referred to the organisms with high conservational significance.

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References

- ANDREEV, S. 2001. *Niphargus bulgaricus* sp. n. et deux espèces nouvelles pour la faune de Bulgarie – *Niphargopsis trispinosus* Dancau et *Gammarus roeseli* Gervais (Amphipoda, Gammaridae, Niphargidae). – *Historia naturalis bulgarica*, **13**: 79–87.
- GEORGIEV, D., Z. HUBENOV 2013. Freshwater snails (Mollusca: Gastropoda) of Bulgaria: an updated annotated checklist. – *Folia Malacologica*, **21** (4): 237–263.
- GEORGIEVA, G., E. VARADINOVA, Y. UZUNOV 2012. Distribution of non-indigenous tubificid worm *Branchiura sowerbyi* (Beddard, 1892) in Bulgaria. – *Journal of BioScience and Biotechnology*, SE/ONLINE: 105–113.
- GOLEMANSKY, V. 2007. Biodiversity and Ecology of the Bulgarian Black Sea Invertebrates. – *Biogeography and Ecology of Bulgaria*, Monographiae Biologicae, **82**: 537–554.
- HUBENOV, Z. 2006. *Anodonta (Sinanodonta) woodiana* (Lea, 1834) (Mollusca: Bivalvia: Unionidae) – a New Invasive Species for the Bulgarian Malacofauna. – *Acta zoologica bulgarica*, **58** (1): 37–42.
- HUBENOV, Z. 2015. Species composition of the free living multicellular invertebrate animals (Metazoa: Invertebrata) from the Bulgarian sector of the Black Sea and the coastal brackish basins. – *Historia naturalis bulgarica*, **21**: 49–168.
- HUBENOV, Z., T. TRICHKOVA, L. KENDEROV, D. KOZUHAROV 2013. Distribution of *Corbicula fluminea* (Mollusca: Corbiculidae) over an Eleven-Year Period of its Invasion in Bulgaria. – *Acta zoologica bulgarica*, **65** (3): 315–326.
- KOVACHEV, S., S. STOICHEV, V. HAINADJEVA 1999. The zoobenthos of several lakes along the Northern Bulgarian Black sea coast. – *Lauterbornia*, **35**: 33–38.
- PREZOLSKA, Y. 2014. Composition, distribution and ecology of Ephemeroptera (Insecta) in Bulgaria. – PhD thesis, Sofia, IBER, BAS, 367 p. (in Bulgarian, English Summary).
- STOICHEV, S. 2001. The zoobenthos from Koprinka Reservoir, Central Bulgaria. – *Lauterbornia*, **40**: 39–42.
- TRICHKOVA, T. 2007. Zoobenthos of non-lotic Bulgarian Wetlands. – In: Michev, T. M., M. P. Stoineva (eds.): *Inventory of Bulgarian Wetlands and their Biodiversity. Part 1: Non-Lotic Wetlands*. – Publ. House Elsi-M, Sofia, 185–196.
- TRICHKOVA, T., D. KOZUHAROV, Z. HUBENOV, S. CHESHMEDJIEV, I. BOTEV, M. ZIVKOV, L. POPA, O. POPA 2009. Current distribution of *Dreissena* species in the inland waters of Bulgaria. – *Ecology & Safety*, **3** (1): 507–516.
- TRICHKOVA, T., I. BOTEV, Z. HUBENOV, L. KENDEROV, M. TODOROV, D. KOZUHAROV, CH. DELTSHEV, L. FÜREDER 2013a. Freshwater Crayfish (Decapoda: Astacidae). Distribution and Conservation in Bulgaria. – International Association of Astacology, 2076–4332, (Online) doi:10.5869/fc.2013.v19-2.243.
- TRICHKOVA, T., V. TYUFEKCHIEVA, L. KENDEROV, Y. VIDINOVA, I. BOTEV, D. KOZUHAROV, Z. HUBENOV, Y. UZUNOV, S. STOICHEV, S. CHESHMEDJIEV 2013b. Benthic Macroinvertebrate Diversity in Relation to Environmental Parameters, and Ecological Potential of Reservoirs, Danube River Basin, North-West Bulgaria. – *Acta zoologica bulgarica*, **65** (3): 337–348.
- TYUFEKCHIEVA, V. 2014. Composition, distribution and ecology of Plecoptera (Insecta) in Bulgaria. – PhD thesis, Prof. “Marin Drinov” Publ. House, Sofia, 372 p. (in Bulgarian, English Summary).
- UZUNOV, Y. 2010. Aquatic Oligochaets (Oligochaeta Limicola, Annelida: Aphanoneura, Oligochaeta, Branchiobdellea. – *Catalogus Faunae Bulgaricae*, **7**, Professor Marin Drinov Academic Publishing House, Sofia, 119 p.
- VARADINOVA, E., P. BORISOVA, L. PECHLIVANOV, Y. UZUNOV 2012. Macroinvertebrate communities of the Srebarna Lake Biosphere Reserve: Species Diversity, Abundance and Modelling of the Ecological Status. – In: Uzunov, Y., B. Georgiev, E. Varadinoiva, N. Ivanova, L. Pehlivanov, V. Vasilev (eds.) *Ecosystems of the Biosphere Reserve Srebarna Lake*, Sofia, “Professor Marin Drinov” Academic Publishing House, 218 p.
- WARINGER, J., W. GRAF 2011. Atlas der mitteleuropäischen Köcherfliegenlarven/Atlas of Central European Trichoptera Larvae, 468 p.
- WELTER-SCHULTES, F. W. 2012. European non-marine molluscs, a guide for species identification. – Planet Poster Editions, Göttingen, 679 p.
- BS EN ISO 10870:2012. Water quality – Guidance for the selection of sampling methods and devices for benthic macroinvertebrates in fresh waters.
- EN 27828:1994. Water quality – Methods of biological sampling – Guidance on handnet sampling of aquatic benthic macroinvertebrates (ISO 7828:1985).
- EN 27828:1994. Water Quality – Sampling in deep waters for macroinvertebrates – Guidance on the use of colonization, qualitative and quantitative samplers (ISO 9391:1993).
- EN ISO 5667-3:2003/AC: 2007. Water quality – Sampling – Part 3: Guidance on the preservation and handling of water samples.
- EN ISO 5667-1:2006/AC:2007. Water quality – Sampling – Part 1: Guidance on the design of sampling programmes and sampling techniques.
- FAUNA EUROPAEA WEB SERVICE 2013. Fauna Europaea version 2.6 [online]. <http://www.faunaeur.org>.

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