

FRESHWATER SNAILS (MOLLUSCA: GASTROPODA) OF BULGARIA: AN UPDATED ANNOTATED CHECKLIST

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ABSTRACT: The list of freshwater gastropods of Bulgaria, with data on their distribution, ecology and conservation status, was based on a critical overview of all available sources and unpublished materials. The total number of freshwater snail species hitherto recorded from Bulgaria is 120. Three species are regarded as extinct, two species were found only as subfossil remains. The most diverse families are Hydrobiidae (67 species), Planorbidae (15), and Lymnaeidae (11). The remaining families are represented by 1 to 4 species. Zoogeographical, ecological and conservation data are discussed.

KEY WORDS: Bulgaria, freshwater, distribution, ecology, conservation

INTRODUCTION

The Balkan malacofauna is much less well studied, compared to that of Western Europe, whereas at the same time it seems to be much richer (GLÖER & DIERCKING 2010, WELTER-SCHULTES 2012). New species are described every year, while many rare species are receding or becoming extinct. The need for updating country-wide and regional checklists is thus more urgent in the Balkans, compared to the other parts of Europe.

The studies on freshwater snails of Bulgaria started in the second half of the 19th c. (MOUSSON 1859). ANGELOV's (2000a) relatively recent synopsis, containing a catalogue of aquatic molluscs of the country

and data on their distribution, was soon followed by HUBENOV's (2005, 2007a) lists of the known Bulgarian species, with an emphasis on their distribution and ecology. More than 49 new species have been described since then (GEORGIEV 2011a, 2012d, GLÖER & GEORGIEV 2011, 2012, GEORGIEV & GLÖER 2013), and two have been recorded as new for the country (IRIKOV & GEORGIEV 2008, SCHNIEBS et al. 2012), while another two have been pronounced extinct (GEORGIEV 2010).

This updated list is based on a critical overview of the information on the freshwater gastropod fauna of Bulgaria.

MATERIAL AND METHODS

SOURCES

The literature survey included all the publications considering the Bulgarian freshwater gastropods from 1859 to 2013. The classification was based on GLÖER (2002), WALTHER et al. (2006) and GLÖER & DIERCKING (2010). These sources were also used for

the ecological categorisation of species. The authors' unpublished data from species diversity surveys in various regions in Bulgaria were also included for the purpose of comparison of the local faunas.

The zoogeographical categorisation of the species was based on distributional data from ZHADIN (1952), STAROBOGATOV (1970), WILLMANN & PIEPER (1978),

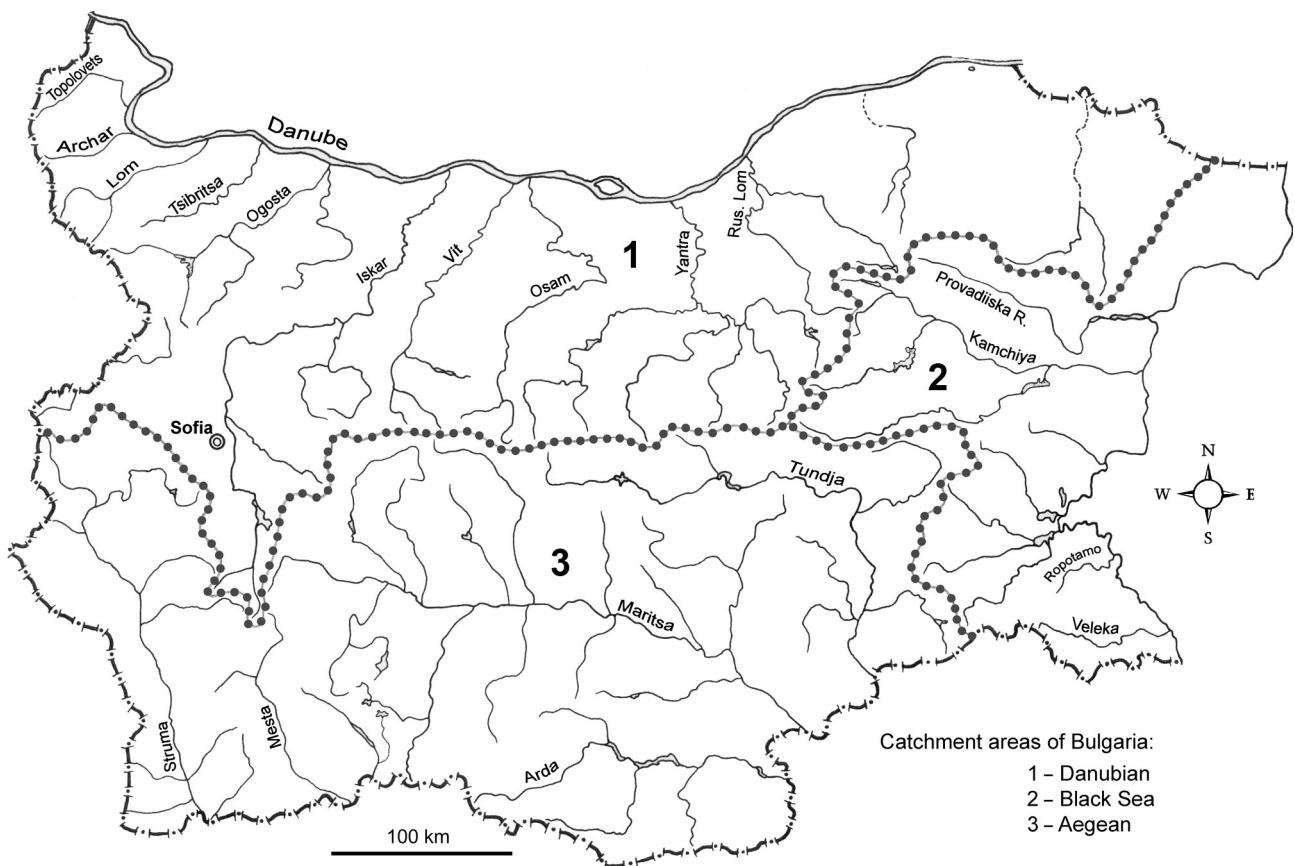


Fig. 1. Catchment areas

RADOMAN (1983), GROSSU (1986, 1987, 1993), STADNICHENKO (1984, 1990), BOLE & VELKOVRH (1986), BĂNĂRESCU (1990), FRANK et al. (1990), ANISTRATENKO & STADNICHENKO (1994), BOETERS (1998), ANGELOV (2000a), ANISTRATENKO & ANISTRATENKO (2001) and the following electronic sources: DAISIE (Delivering Alien Invasive Species Inventories for Europe), EOL (Encyclopedia of Life), EUNIS biodiversity database, Fauna Europaea, Global invasive species database, Global Names Index, ITIS (Integrated taxonomic information system), NEOBANIS (European Network on invasive Alien Species), PESI (A Pan-European Species directories Infrastructure) and WoRMS (World Register of Marine Species).

STRUCTURE OF THE LIST, ABBREVIATIONS AND SYMBOLS

Each species account includes its taxonomic name, references, distributional information according to catchment area and region of Bulgaria, and altitudinal range (in m a.s.l.); overall distribution, ecology and conservation status.

Catchment areas (Fig. 1):

1 – Danubian, 2 – Black Sea, 3 – Aegean region

Distribution (Fig. 2):

B – Black Sea Coast: **BN** – northern Black Sea Coast, **BS** – southern Black Sea Coast

D – Danubian Plain: **DE** – Eastern Danubian Plain, **DEL** – Ludogorie–Dobrudja District, **DEP** – Popovo–Provadiya District, **DM** – Middle Danubian Plain, **DW** – Western Danubian Plain

P – Transitional Region: **PB** – Tundja–Strandja Subregion, **PBB** – Bakadjik–Burgas District, **PBC** – Sakar Mts, **PBD** – Strandja–Derwent District, **PBS** – Strandja Mts, **PBT** – Sakar–Tundja District, **PK** – Kraishte–Konyavo District, **PKG** – Golo Bardo Mts, **PKK** – Kraishte, **PKQ** – Konyavska Planina Mts, **PKR** – Rui Mts, **PKV** – Verila Mts, **PKZ** – Zemenska Planina Mts, **PS** – Srednogorie–Podbalkan Subregion, **PSA** – Sarnena Gora, **PSC** – Sashtinska Sredna Gora, **PSI** – Ihtimanska Sredna Gora, **PSL** – Lozenska Planina Mts, **PSP** – Podbalkan Basins, **PSS** – Sredna Gora Mts, **PT** – Thracian Lowland, **PV** – Vitosha District, **PVL** – Lyulin Mts, **PVP** – Plana Mts, **PVS** – Sofia Basin, **PVV** – Vitosha Mts

R – Rila–Rhodope Massif: **RO** – Osogovo–Belasitsa Group, **ROB** – Belasitsa Mts, **ROG** – Ograzhden Mts, **ROM** – Maleshevska Planina Mts, **ROO** – Osogovska Planina Mts, **ROP** – Krupnik–Sandanski–Petrich Valley, **ROS** – Srednostrumska Valley, **ROT** – Boboshevo–Simitli Valley, **ROV** – Vlahina Planina Mts, **RP** – Rila–Pirin

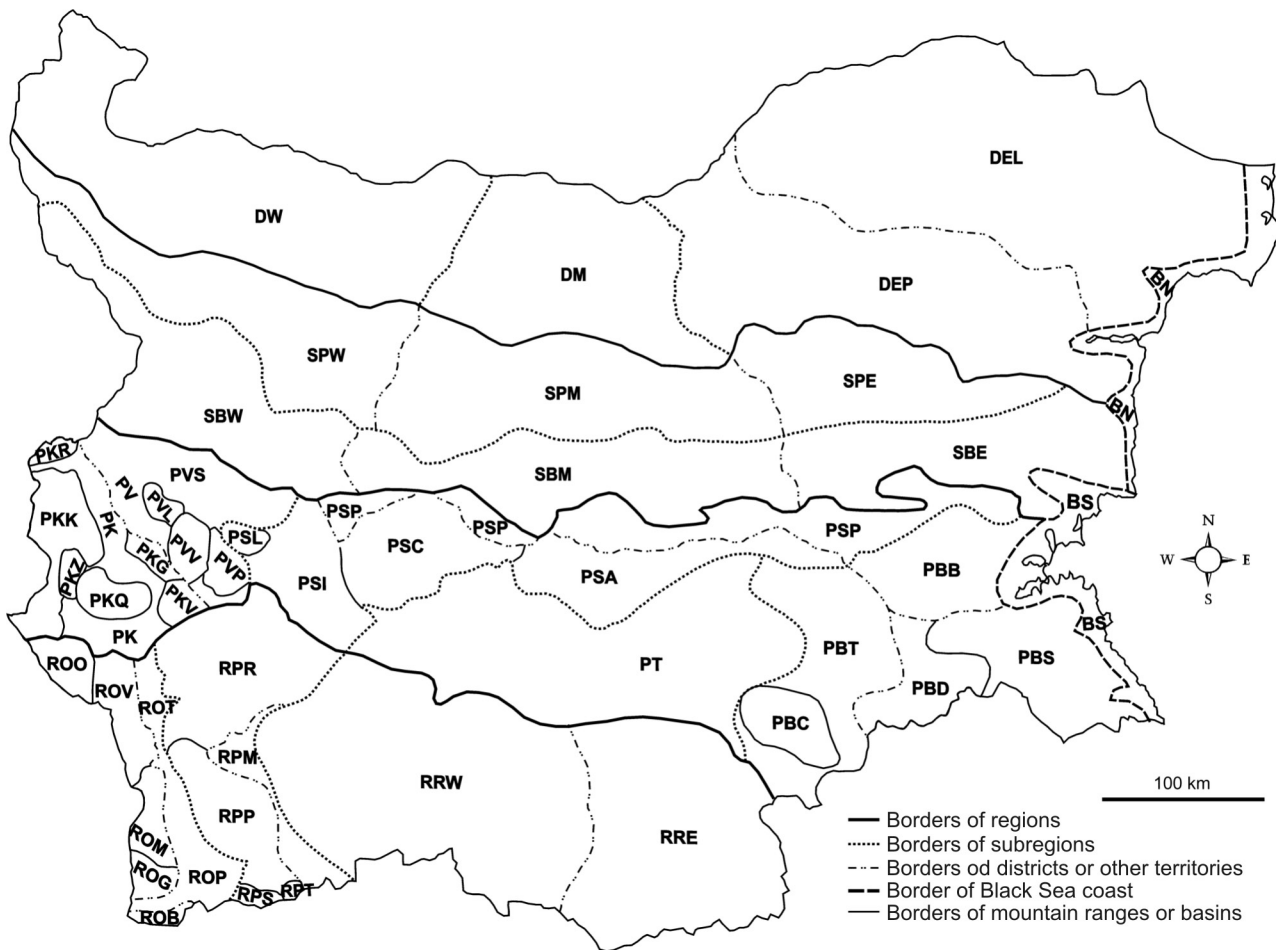


Fig. 2. Natural geographic territorial units in Bulgaria (for abbreviations – see the text)

Group, **RPM** – Mesta Valley, **RPP** – Pirin Mts, **RPR** – Rila Mts, **RPS** – Slavyanka Mts, **RPT** – Stargach Mts, **RR** – Rhodope Mts, **RRE** – Eastern Rhodope Mts, **RRW** – Western Rhodope Mts

S – Stara Planina Range: **SP** – Predbalkan (Pre-Balkan or foothills north of Stara Planina Mts), **SPW** – Western Predbalkan, **SPM** – Middle Predbalkan, **SPE** – Eastern Predbalkan, **SB** – Stara Planina (Balkan) Mts, **SBW** – Western Stara Planina Mts, **SBM** – Middle Stara Planina Mts, **SBE** – Eastern Stara Planina Mts

Conservation status:

BC – Bern Convention, **ESC** – Red List of threatened animals and plants in Europe, **HD** – Habitats Directive, **IUCN** categories (**DD** – Data Deficiency, **EX** – Extinct, **LC** – Least Concern, **NT** – Near Threatened, **VU** – Vulnerable), **RBBG** – Bulgarian Red Data Book

? – lack of information or doubt (possible misidentifications, no data, species with unclear taxonomic status, no anatomical studies, other)

CHECKLIST OF BULGARIAN FRESHWATER SNAILS

ORDO NERITOPSINA COX ET KNIGHT, 1960

Familia Neritidae Lamarck, 1809

Genus *Theodoxus* Montfort, 1810

1. *Theodoxus danubialis* (C. Pfeiffer, 1828)

Nerita danubialis (Mühlf.) – WOHLBEREDT (1911)

Theodoxus danubialis (C. Pfeiffer) – BÜTTNER (1928), PETRBOK (1941, 1947), DRENSKI (1947), VALKANOV (1957), URBAŃSKI (1960), ANGELOV et

al. (1963), RUSSEV (1966, 1968, 1979), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a)

Theodoxus danubialis var. *strangulatus* (Mühlf.) – WOHLBEREDT (1911), WAGNER (1927), BÜTTNER (1928), PETRBOK (1941), DRENSKI (1947)

Catchment areas – 1, 2

Distribution in Bulgaria – D, SP, B, 0–200

General distribution – Southeast European-Pontian, Caspian relict

Ecology – salinity limit 12‰, lithophilous, potamophilous, rhithrophilous

2. *Theodoxus fluviatilis* (Linnaeus, 1758)

Theodoxus euxinus (Clessin) – WESTERLUND (1886), ANGELOV (2000a), HUBENOV (2005, 2007a)

Neritina fluviatilis (L.) – HESSE (1913)

Theodoxus fluviatilis (L.) – WAGNER (1927), PETRBOK (1941, 1947), DRENSKI (1947), VALKANOV (1957), URBAŃSKI (1960), ANGELOV et al. (1963), JAECKEL (1967), FRANK et al. (1990), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a, c)

Theodoxus fluviatilis transversetaeniatus Wagner – WAGNER (1927)

Theodoxus fluviatilis var. *purpurata* Ziegler – PETRBOK (1941), VALKANOV (1957)

Theodoxus prevostianus C. Pfeiffer – GROSSU (1956)

Nerita fluviatilis (L.) – LIUTZKANOV (1990)

Catchment areas – 1, 2

Distribution in Bulgaria – D, SBE, B, PBS, 0–300

General distribution – European-Anatolian (?European),

Ecology – salinity limit 5–7‰ (?18‰), lithophilous, potamophilous, stagnant waters

3. *Theodoxus pallasi* Linholm, 1924

Theodoxus pallasi Lindholm – DRENSKI (1947), KANEVA-ABADZHIEVA (1957), ANGELOV (2000a), GENOV (2001), HUBENOV (2005, 2006a, 2007a, c, 2011a)

Catchment area – 2

Distribution in Bulgaria – B, 0–100,

General distribution – Ponto-Caspian, Caspian relict, subfossil

Ecology – salinity limit 14‰

Conservation – IUCN-EX, RBBG

Remarks – known only from shells

4. *Theodoxus transversalis* (C. Pfeiffer, 1828)

Theodoxus transversalis (C. Pfeiffer) – BÜTTNER (1928), PETRBOK (1941), DRENSKI (1947), RUSSEV (1957, 1966, 1979), URBAŃSKI (1960), ANGELOV et al. (1963), FRANK et al. (1990), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a), FEHÉR et al. (2012)

Catchment area – 1

Distribution in Bulgaria – D, 0–100

General distribution – Central and Southeast European

Ecology – potamophilous, lithophilous

Conservation – IUCN-EN, Directive 92/43, Natura 2000

ORDO ARCHITAENIOGLOSSA HALLER, 1890

Familia Viviparidae J. E. Gray, 1847

Subfamilia Viviparinae J. E. Gray, 1847

Genus *Viviparus* Montfort, 1810

5. *Viviparus acerosus* (Bourguignat, 1862)

Viviparus maritzanus Haas – HAAS (1911)

Vivipara acerosa Bourguignat – WOHLBEREDT (1911)

Vivipara maritzana Haas – HESSE (1913)

Viviparus acerosus (Bourguignat) – WAGNER (1927), DRENSKI (1947), RUSSEV (1979), FRANK et al. (1990), ANGELOV (1998, 2000a, b), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2012c)

Viviparus acerosus maritzanus (Haas) – BÜTTNER (1928)

Viviparus danubialis (Bourguignat) – PETRBOK (1941), RUSSEV (1979), FRANK et al. (1990), ANGELOV (2000a, b), HUBENOV (2005, 2007a)

Viviparus danubialis var. *penchianti* Bourguignat – RUSSEV (1979)

Viviparus danubialis var. *rumaelicus* Kobelt – RUSSEV (1979)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, SBE, PT, RRW, PSP, 0–1500

General distribution – South European (?Central and South European – introduced)

Ecology – potamophilous, stagnant waters

Conservation – IUCN-LC

6. *Viviparus contectus* (Millet, 1813)

Viviparus contectus (Millet) – DRENSKI (1947), JAECKEL (1967), RUSSEV (1979), FRANK et al. (1990), ANGELOV (1998, 2000a, b), HUBENOV (2005, 2006a, 2007a)

Catchment area – 1

Distribution in Bulgaria – D, 0–100

General distribution – West Eurosiberian

Ecology – potamophilous, stagnant waters, phytophilous, rare

Conservation – IUCN-LC

7. *Viviparus viviparus* (Linnaeus, 1758)

Viviparus viviparus var. *subfasciatus* Bourguignat – WESTERLUND (1886)

Viviparus viviparus (L.) – PETRBOK (1941), DRENSKI (1947), ANGELOV et al. (1963), RUSSEV (1966, 1979), JAECKEL (1967), NAIDENOV (1968), FRANK et al. (1990), ANGELOV (1998, 2000a, b), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2012c)

Viviparus fasciatus (Müller) – DRENSKI (1947)

Catchment areas – 1, 3

Distribution in Bulgaria – D, PVS, 0–600

General distribution – European

Ecology – pelophilous, potamophilous, stagnant waters

Conservation – IUCN-LC



Note: BOURGUIGNAT (1980) listed a species with unclear taxonomical status – *Vivipara amblya* Bourguignat, 1962 – for Bulgaria, without specifying its exact locality.

ORDO NEOTAENIOGLOSSA HALLER, 1892
Familia Melanopsidae H. et A. Adams, 1854
Subfamilia Melanopsinae H. et A. Adams, 1854
Genus *Melanopsis* A. Férussac, 1807

8. *Melanopsis parreyssi* Philippi, 1847

Melanopsis parreyssi Philippi – ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a, 2011b), GEORGIEV (2010, 2012c)
Catchment area – 3,
Distribution in Bulgaria – PT, 100–200
General distribution – Central and Southeast European, preglacial relict
Ecology – crenobiont, thermal waters
Conservation – IUCN-CR, ? EX

Genus *Esperiana* Bourguignat, 1877
Subgenus *Esperiana* Bourguignat, 1877

9. *Esperiana (Esperiana) esperi* (A. Férussac, 1823)

Melanopsis esperi (Férussac) – BÜTTNER (1928), PETRBOK (1941), DRENSKI (1947)
Fagotia esperi (Férussac) – VALKANOV (1957), URBAŃSKI (1960), RUSSEV (1966, 1968, 1979), FRANK et al. (1990), ANGELOV (2000a) HUBENOV (2005, 2006a, 2007a)
Catchment area – 1
Distribution in Bulgaria – D, 0–200
General distribution – Southeast European-Pontian, Caspian relict
Ecology – lithophilous, potamophilous, stagnant waters
Conservation – IUCN-LC

Subgenus *Microcolpia* Bourguignat, 1884

10. *Esperiana (Microcolpia) daudebartii* (Prevost, 1821)

Microcolpia acicularis Férussac – WOHLBEREDT (1911), WAGNER (1927), URBAŃSKI (1960)
Melanopsis acicularis daudebartii C. Pfeiffer – WAGNER (1927)
Hemisinus acicularis Férussac – PETRBOK (1931)
Fagotia acicularis var. *aciculella* Schm. – PETRBOK (1941)
Melanopsis acicularis (Férussac) – PETRBOK (1940), DRENSKI (1947)
Fagotia acicularis (Férussac) – RUSSEV (1966, 1968, 1979), FRANK et al. (1990)
Fagotia acicularis (Férussac) – ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a)
Catchment area – 1

Distribution in Bulgaria – D, 0–400
General distribution – Southeast European-Pontian, Caspian relict
Ecology – lithophilous, potamophilous
Conservation – IUCN-LC

Genus *Holandriana* Bourguignat, 1884

11. *Holandriana holandrii* (C. Pfeiffer, 1828)

Melania crassa var. *ovoidea* Bourguignat – WESTERLUND (1886)
Melania ovoidea Bourguignat – WOHLBEREDT (1911)
Amphimelania holandrii (C. Pfeiffer) – WAGNER (1927), PETRBOK (1941), RUSSEV (1979), FRANK et al. (1990), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a)
Bithynia bulgarica Drenski – DRENSKI (1947)
Catchment area – 1
Distribution in Bulgaria – D, SPW, 0–700
General distribution – Southeast European
Ecology – lithophilous, potamophilous (population density in Nishava River up to 3,000 ind./m²)
Conservation – IUCN-LC

Familia Pyrgulidae Brusina, 1881

Subfamilia Pyrgulinae Saurin, 1959

Genus *Turricaspia* B. Dybowski et Grochmalicki, 1915
Subgenus *Laevicaspia* B. Dybowski et Grochmalicki, 1917

12. *Turricaspia (Laevicaspia) lincta* (Milaschewitch, 1908)

Micromelania lincta Milaschewich – DRENSKI (1947), HUBENOV (2005, 2007a, c)
Turricaspia caspia lincta Milaschewich – GENOV (2001), GENOV & PEYCHEV (2001)
Turricaspia caspia Milaschewich – GENOV & PEYCHEV (2001)
Catchment areas – 1, 2
Distribution in Bulgaria – D, BN, 0–100
General distribution – Ponto-Caspian, Caspian relict, subfossil
Ecology – salinity limit 8‰, stagnant waters
Conservation – IUCN-LC
Remarks – known only from shells

Subgenus *Clessiniola* Lindholm, 1924

13. *Turricaspia (Clessiniola) variabilis* (Eichwald, 1838)

Clessiniola variabilis Eichwald – GENOV & PEYCHEV (2001), HUBENOV (2005, 2007a)
Catchment area – 1
Distribution in Bulgaria – D, 0–100
General distribution – Ponto-Caspian, Caspian relict, subfossil
Ecology – salinity limit 3‰
Conservation – IUCN-DD
Remarks – known only from shells

Familia Bithyniidae Troschel, 1857
Genus *Bithynia* Leach, 1818
Subgenus *Bithynia* Leach, 1818

14. *Bithynia (Bithynia) danubialis* Glöer et Georgiev, 2012

Bithynia danubialis – GLÖER & GEORGIEV (2012)
Catchment area – 1
Distribution in Bulgaria – D, 0–100
General distribution – regional endemic (possibly lower Danube)
Ecology – psammophilous-pelophilous, potamophilous

15. *Bithynia (Bithynia) tentaculata* (Linnaeus, 1758)

Bithynia tentaculata (L.) – HESSE (1916), WAGNER (1927), VALKANOV (1936, 1957), PETRBOK (1941), DRENSKI (1947), ANGELOV et al. (1963), RUSSEV (1966, 1968, 1979), FRANK et al. (1990), ANGELOV (1998, 2000a, b), HUBENOV (2005, 2007a, c), GLÖER & GEORGIEV (2012)

Catchment areas – 1, 2
Distribution in Bulgaria – D, PS, 0–200
General distribution – Western Palaearctic (?Holarctic – introduced)
Ecology – phytophilous, lithophilous, psammophilous, pelophilous, potamophilous, stagnant waters
Conservation – IUCN-LC

Note: *Bithynia leachi* (Sheppard, 1823) [= *Bithynia leachi* (Sheppard) – WAGNER (1927), VALKANOV (1936, 1957), PETRBOK (1941), DRENSKI (1947), ANGELOV et al. (1963), ANGELOV (2000a), HUBENOV (2005, 2007), *Bithynia viridis* Dup. var. *B. Moulinssii* (?) – HRISTOVITCH (1892), *Bithynia Leachii* (Sheppard) – HRISTOVITCH (1892)], previously reported from Bulgaria, probably does not occur in the country. It is a north-western European species with its southern distribution border in Hungary. A similar *B. transsylvanica* (Bielz, 1853) is likely to be found in the Bulgarian Danube and its tributaries, since it was recorded from the adjacent regions of Romania (GLÖER & FEHÉR 2004, GLÖER & SÎRBU 2006).

Subgenus *Codiella* Locard, 1894

16. *Bithynia (Codiella) rumelica* Wohlberedt, 1911

Bithynia rumelica Wohlberedt – WOHLBEREDT (1911), GEORGIEV (2010, 2012c)

Bithynia leachi rumelica (Wohlberedt) – DRENSKI (1947)
Bithynia leachi (Sheppard) – ANGELOV (2000a)

Catchment area – 3
Distribution in Bulgaria – PT, RRW, 0–300
General distribution – ?regional endemic
Ecology – thermophile, thermal waters, ?crenobiont
Conservation – ?EX

Familia Hydrobiidae Troschel, 1857
Subfamilia Tateinae Thiele, 1925
Genus *Potamopyrgus* Stimpson, 1865

17. *Potamopyrgus antipodarum* (J. E. Gray, 1843)

Potamopyrgus antipodarum (J. E. Gray) – IRIKOV & GEORGIEV (2008), GEORGIEV (2011a, 2012c)

Catchment area – 3
Distribution in Bulgaria – PT, RRW, 0–700
General distribution – New Zealand (Subcosmopolitan – introduced species)
Ecology – invasive alien species, eurybiont, salinity limit 17‰, potamophilous, stagnant waters

Subfamilia Belgrandiinae De Stefani, 1877

Genus *Belgrandiella* A. Wagner, 1927

18. *Belgrandiella angelovi* Pintér, 1968

Belgrandiella angelovi Pintér – PINTÉR (1968), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a), GLÖER & GEORGIEV (2009), GEORGIEV (2011a, b, d)

Catchment area – 3
Distribution in Bulgaria – SBM, SBE, 200–600
General distribution – regional endemic
Ecology – ?crenobiont
Conservation – IUCN-VU

19. *Belgrandiella bachkovoensis* Glöer et Georgiev, 2009

Belgrandiella bachkovoensis Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a)

Catchment area – 3
Distribution in Bulgaria – RRW, 300–400
General distribution – local endemic
Ecology – rheophilous
Conservation – IUCN-CR

20. *Belgrandiella bulgarica* Angelov, 1972

Belgrandiella bulgarica Angelov – ANGELOV (1972, 2000a), BERON (1994), HUBENOV (2005, 2006a, 2007a), BERON et al. (2009), GEORGIEV (2011a, d)

Catchment area – 1
Distribution in Bulgaria – SBM, 400–500
General distribution – local endemic
Ecology – rheophilous, stygobiotic
Conservation – IUCN-VU

21. *Belgrandiella bureschi* Angelov, 1976

Belgrandiella bureschi Angelov – ANGELOV (1976, 2000a), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2011a, d)

Catchment area – 1
Distribution in Bulgaria – SBW, 800–1,000
General distribution – local endemic
Ecology – rheophilous, stygobiotic, thermal waters
Conservation – IUCN-VU
Remarks – known only from shells



- 22. *Belgrandiella dobrostanica*** Glöer et Georgiev, 2009
Belgrandiella dobrostanica Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a, d)
Catchment area – 3
Distribution in Bulgaria – RRW, 800–1,500
General distribution – regional endemic
Ecology – calciphilous, rheophilous, troglophilous
Conservation – IUCN-VU
- 23. *Belgrandiella hessei*** A. Wagner, 1927
Belgrandiella hessei Wagner – PETRBOK (1941), DRENSKI (1947), PINTÉR (1968), BERON (1994), RAYCHEV (1997a), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a), BERON et al. (2009), GEORGIEV (2011a, b, d)
Paladilchia (Belgrandiella) hessei (Wagner) – URBANŃSKI (1960)
Catchment area – 1, ?
Distribution in Bulgaria – SBW, 400–500
General distribution – local endemic
Ecology – stygobiotic
Conservation – IUCN-VU
Remarks – known only from shells
- 24. *Belgrandiella maarensis*** Georgiev, 2013
Belgrandiella maarensis Georgiev – GEORGIEV (2013)
Catchment area – 1
Distribution in Bulgaria – SPM, 100–200
General distribution – local endemic
Ecology – calciphilous, rheophilous, stygobiotic
- 25. *Belgrandiella pandurskii*** Georgiev, 2011
Belgrandiella pandurskii Georgiev – GEORGIEV (2011a, d), GEORGIEV (2011d), GEORGIEV & GLÖER (2013)
Catchment area – 1
Distribution in Bulgaria – SPM, 100–300
General distribution – regional endemic
Ecology – calciphilous, crenobiont, troglophilous, rheophilous,
- 26. *Belgrandiella pusilla*** Angelov, 1959
Belgrandiella pusilla Angelov – ANGELOV (1959, 2000a), PINTÉR (1968), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2011a, b, d)
Catchment area – 1, ?
Distribution in Bulgaria – SBW, 400–600
General distribution – local endemic
Ecology – stygobiotic
Conservation – IUCN-VU
Remarks – known only from shells
- 27. *Belgrandiella stanimirae*** Georgiev, 2011
Belgrandiella stanimirae Georgiev – GEORGIEV (2011a, c)
Catchment area – 1
Distribution in Bulgaria – SBM, 500–600
- General distribution – ?local endemic
Ecology – stygobiotic
- 28. *Belgrandiella zagoraensis*** Glöer et Georgiev, 2009
Bythinella austriaca (Frauenfeld) – GEORGIEV (2005a)
Belgrandiella zagoraensis Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a, d, 2012b, c)
Catchment area – 3
Distribution in Bulgaria – PSA, 200–500
General distribution – regional endemic
Ecology – calciphilous, crenobiont, rheophilous
Conservation – IUCN-VU
- Genus *Pontobelgrandiella* Radoman, 1978
- 29. *Pontobelgrandiella nitida*** (Angelov, 1972)
Belgrandiella nitida Angelov – ANGELOV (1972)
Pontobelgrandiella nitida (Angelov) – RADOMAN (1978, 1983), WILLMANN & PIEPER (1978), BERON (1994), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a), SZAROWSKA (2006), BERON et al. (2009), GEORGIEV (2011d, 2013)
Catchment area – 1
Distribution in Bulgaria – SBM, 300–400
General distribution – ?regional endemic
Ecology – stygobiotic, rheophilous
Conservation – IUCN-VU
- 30. *Pontobelgrandiella tanevi*** Georgiev, 2013
Pontobelgrandiella tanevi Georgiev – GEORGIEV (2013)
Catchment area – 1
Distribution in Bulgaria – SPM, 0–100
General distribution – local endemic
Ecology – troglophilous
- Genus *Bythiospeum* Bourguignat, 1882
- 31. *Bythiospeum bureschi*** (A. Wagner, 1927)
Paladilhiopsis bureschi Wagner – WAGNER (1927), PETRBOK (1941), DRENSKI (1947), ANGELOV (2000a), HUBENOV (2005, 2007a)
Paladilchia (Paladilhiopsis) bureschi (Wagner) – URBANŃSKI (1960)
Saxurinator bureschi (Wagner) – SCHÜTT (1970), RADOMAN (1983), BERON et al. (2009)
Paladilhiopsis bureschi copiosus Angelov – ANGELOV (1972)
Saxurinator buresi (Wagner) – BERON (1994)
Saxurinator copiosus (Angelov) – BERON (1994), BERON et al. (2009)
Paladilhiopsis buresi (Wagner) – HUBENOV (2006a)
Bythiospeum bureschi (Wagner) – GEORGIEV (2011c, d), GEORGIEV & GLÖER (2011)
Bythiospeum copiosus (Angelov) – GEORGIEV (2011a, c), GEORGIEV & GLÖER (2013)
Catchment area – 1
Distribution in Bulgaria – SBW, 400–500

General distribution – local endemic
Ecology – stygobiotic
Remarks – known only from shells

32. *Bythiospeum devetakium* Georgiev et Glöer, 2013
Bythiospeum devetakium Georgiev et Glöer – GEORGIEV & GLÖER (2013)

Catchment area – 1
Distribution in Bulgaria – SPM, 0–100
General distribution – regional endemic
Ecology – calciphilous, stygobiotic, rheophilous

33. *Bythiospeum dourdeni* Georgiev, 2012
Bythiospeum dourdeni Georgiev – GEORGIEV (2012d)

Catchment area – 1
Distribution in Bulgaria – SBM, 500–600
General distribution – local endemic
Ecology – stygobiotic
Remarks – known only from shells

34. *Bythiospeum kolevi* Georgiev, 2013
Bythiospeum kolevi Georgiev – GEORGIEV (2013)

Catchment area – 1
Distribution in Bulgaria – SPM, 300–400
General distribution – local endemic
Ecology – stygobiotic

35. *Bythiospeum pandurskii* Georgiev, 2012
Bythiospeum pandurskii Georgiev – GEORGIEV (2012d)

Catchment area – 1
Distribution in Bulgaria – SBW, 400–500
General distribution – local endemic
Ecology – stygobiotic

36. *Bythiospeum simovi* Georgiev, 2013
Bythiospeum simovi Georgiev – GEORGIEV (2013)

Catchment area – 1
Distribution in Bulgaria – SPW, 200–300
General distribution – local endemic
Ecology – stygobiotic
Remarks – known only from shells

37. *Bythiospeum stoyanovi* Georgiev, 2013
Bythiospeum stoyanovi Georgiev – GEORGIEV (2013)

Catchment area – 1
Distribution in Bulgaria – SPM, 0–100
General distribution – local endemic
Ecology – stygobiotic

38. *Bythiospeum* sp.
Bythiospeum copiosus (Angelov) – GEORGIEV (2011a)

Catchment area – 1
Distribution in Bulgaria – SPW, 200–300
General distribution – known only from spring Glava Panega, town of Zlatna Panega
Remarks – known only from shells

Genus *Balkanospeum* Georgiev, 2012

39. *Balkanospeum schniebsae* (Georgiev, 2011)
Bythiospeum schniebsae Georgiev – GEORGIEV (2011a, c)

Balkanospeum schniebsae (Georgiev) – GEORGIEV (2012a)
Catchment area – 1
Distribution in Bulgaria – SBM, 300–400
General distribution – local endemic
Ecology – calciphilous, stygobiotic, rheophilous

Genus *Devetakia* Georgiev et Glöer, 2011

40. *Devetakia krushunica* Georgiev et Glöer, 2011
Devetakia krushunica Georgiev et Glöer – GEORGIEV & GLÖER (2011, 2013), GEORGIEV (2011a, 2012a)

Catchment area – 1
Distribution in Bulgaria – SPM, 100–200
General distribution – local endemic
Ecology – stygobiotic

41. *Devetakia mandrica* Georgiev, 2012
Devetakia mandrica Georgiev – GEORGIEV (2012a)

Catchment area – 1
Distribution in Bulgaria – SPM, 100–200
General distribution – local endemic
Ecology – calciphilous, stygobiotic, rheophilous

42. *Devetakia pandurskii* Georgiev et Glöer, 2011
Devetakia pandurskii Georgiev et Glöer – GEORGIEV & GLÖER (2011), GEORGIEV (2011a, 2012a)

Catchment area – 1
Distribution in Bulgaria – SPM, 100–200
General distribution – local endemic
Ecology – stygobiotic
Remarks – known only from shells

Genus *Cavernisa* Radoman, 1978

43. *Cavernisa zaschevi* (Angelov, 1959)
Belgrandiella zaschevi Angelov – ANGELOV (1959), WILLMANN & PIEPER (1978)

Paladilhia (Belgrandiella) zaschevi (Angelov) – JAECKEL (1967)

Cavernisa zaschevi (Angelov) – RADOMAN (1978), PANDOURSKII (1993), BERON (1994), HUBENOV (2006a), BERON et al. (2009), CUTTELOD et al. (2011), GEORGIEV (2011a)

Cavernisa zaschevia (Angelov) – RADOMAN (1983)
Cavernista zaschevi (Angelov) – ANGELOV (2000a), HUBENOV (2005, 2007a)

Catchment area – 1
Distribution in Bulgaria – SBW, 400–500
General distribution – local endemic
Ecology – calciphilous, stygobiotic, rheophilous,
Conservation – IUCN-VU

Genus *Iglica* Wagner, 1927**44. *Iglica acicularis*** Angelov, 1959

Iglica acicularis Angelov – ANGELOV (1959, 2000a), HUBENOV (2005, 2006a, 2007a), CUTTELOD et al. (2011), GEORGIEV (2011a)

Catchment area – 1, ?

Distribution in Bulgaria – SBW, 400–500

General distribution – local endemic

Ecology – calciphilous, stygobiotic, rheophilous

Genus *Hauffenia* Pollonera, 1898**45. “*Hauffenia*” *lucidula*** (Angelov, 1967)

Horatia (Hauffenia) lucidulus (Angelov) – ANGELOV (1967, 2000a), CUTTELOD et al. (2011)

“*Hauffenia*” *lucidula* (Angelov) – BODON et al. (2001)

Horatia lucidulus (Angelov) – HUBENOV (2005, 2006a, 2007a, 2011d)

Hauffenia lucidula (Angelov) – GEORGIEV (2011a)

Catchment area – 2

Distribution in Bulgaria – BN, 0–100

General distribution – local endemic

Ecology – salinity limit 1‰, crenobiont, stygobiotic

Conservation – IUCN-CR, RBBG.

Note: According to BODON et al. (2001) the generic position of the species is unclear.

Genus *Insignia* Angelov, 1972**46. *Insignia macrostoma*** Angelov, 1972

Insignia macrostoma Angelov – ANGELOV (1972, 2000a), BERON (1994), HUBENOV (2005, 2006a, 2007a), BERON et al. (2009), CUTTELOD et al. (2011), GEORGIEV (2011a)

Catchment area – 1

Distribution in Bulgaria – SBM, 400–500

General distribution – local endemic

Ecology – crenobiont, stygobiotic

Conservation – IUCN-VU

Remarks – known only from shells

Genus *Plagigeyeria* Tomlin, 1930**47. *Plagigeyeria procerula*** (Angelov, 1965)

Plagigeyeria galidini procerulus Angelov – ANGELOV (1965, 2000a)

Plagigeyeria galidini procerula Angelov – SCHÜTT (1972)

Plagigeyeria procerula Angelov – HUBENOV (2005, 2006a, 2007a), GEORGIEV (2011a)

Catchment area – 1

Distribution in Bulgaria – SBW, SKO, 500–600

General distribution – local endemic

Ecology – crenobiont, stygobiotic

Genus *Radomaniola* Szarowska, 2006**48. *Radomaniola bulgarica*** Glöer et Georgiev, 2009

Radomaniola bulgarica Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a, 2012b)

Catchment area – 3

Distribution in Bulgaria – PSA, 300–400

General distribution – local endemic

Ecology – calciphilous, crenobiont, rheophilous, thermal waters

49. *Radomaniola rhodopensis* Glöer et Georgiev, 2009

Radomaniola rhodopensis Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a), GEORGIEV & GLÖER (2013)

Catchment area – 3

Distribution in Bulgaria – RRW, 700–800

General distribution – local endemic

Ecology – calciphilous, crenobiont, rheophilous

Conservation – IUCN-VU

50. *Radomaniola strandzhica* Georgiev et Glöer, 2013

Radomaniola strandzhica Georgiev et Glöer – GEORGIEV & GLÖER (2013)

Catchment area – 2

Distribution in Bulgaria – PBS, 200–300

General distribution – local endemic

Ecology – calciphilous, crenobiont, rheophilous

Genus *Grossuana* Radoman, 1973**51. *Grossuana angeltsekovi*** Glöer et Georgiev, 2009

Sadleriana virescens bulgarica (Wagner) – ANGELOV (2000a)

Grossuana angeltsekovi Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a, b, c, 2012a)

Catchment area – 3

Distribution in Bulgaria – RRW, RPP, 200–800

General distribution – regional endemic

Ecology – calciphilous, crenobiont, rheophilous

52. *Grossuana aytosensis* Georgiev, 2012

Grossuana aytosensis Georgiev – GEORGIEV (2012a)

Catchment area – 2

Distribution in Bulgaria – SBE, 100–200

General distribution – local endemic

Ecology – calciphilous, crenobiont, rheophilous

53. *Grossuana codreanui* (Grossu, 1946)

Paladilhioopsis codreanui Grossu – GROSSU (1946)

Pseudamnicola codreanui (Grossu) – GROSSU (1956), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a, 2011c)

Grossuana serbica codreanui (Grossu) – RADOMAN (1973, 1983)

Grossuana codreanui (Grossu) – SZAROWSKA et al. (2007), ZETTLER (2008), GLÖER & GEORGIEV (2009), GEORGIEV (2011a, 2012a)

Catchment areas – 1, 2, 3
 Distribution in Bulgaria – B, 0–100
 General distribution – regional endemic
 Ecology – calciphilous, crenobiont, rheophilous

54. *Grossuana derventica* Georgiev et Glöer, 2013
Grossuana derventica Glöer et Georgiev – GLÖER & GEORGIEV (2013)

Catchment area – 3
 Distribution in Bulgaria – PBD, 100–200
 General distribution – local endemic
 Ecology – calciphilous, troglphilous, rheophilous

55. *Grossuana radostinae* Georgiev, 2012
Grossuana radostinae Georgiev – GEORGIEV (2012a)

Catchment area – 2
 Distribution in Bulgaria – SBE, 100–200
 General distribution – local endemic
 Ecology – calciphilous, rheophilous

56. *Grossuana slavyanica* Georgiev et Glöer, 2013
Grossuana slavyanica Glöer et Georgiev – GLÖER & GEORGIEV (2013)

Catchment area – 3
 Distribution in Bulgaria – RPS, 700–800
 General distribution – local endemic
 Ecology – calciphilous, rheophilous

57. *Grossuana thracica* Glöer et Georgiev, 2009

Lithoglyphus (Lithoglyphoides) virescens bulgaricus Wagner – WAGNER (1927)

Sadleriana virescens bulgarica (Wagner) – URBAŃSKI (1960), ANGELOV (2000a)

Grossuana thracica Glöer et Georgiev – GLÖER & GEORGIEV (2009), GEORGIEV (2011a, b, c, 2012a, c), GEORGIEV & GLÖER (2013)

Catchment area – 3
 Distribution in Bulgaria – PT, PSA, 100–300
 General distribution – regional endemic
 Ecology – calciphilous, crenobiont, rheophilous
 Conservation – IUCN-CR

Note: Based on shell morphology, WAGNER (1927) described *Pseudamnicola consociella euxina* from a spring near the Devnya River and Aladzha monastery, NE Bulgaria. According to ZETTLER (2008) it could be a *Grossuana* species, but the lack of any anatomical data makes its status unclear.

Genus *Gloeria* Georgiev, Dedov et Cheshmedyev, 2012

58. *Gloeria bulgarica* Georgiev, Dedov et Varadinova, 2012

Gloeria bulgarica Georgiev, Dedov et Varadinova – GEORGIEV et al. (2012)

Catchment area – 3
 Distribution in Bulgaria – RPS, 600–700

General distribution – local endemic
 Ecology – calciphilous, crenobiont, rheophilous

Genus *Strandzhia* Glöer et Georgiev, 2011

59. *Strandzhia bythinellopenia* Georgiev et Glöer, 2013
Strandzhia bythinellopenia Georgiev et Glöer – GEORGIEV & GLÖER (2013)

Catchment area – 2
 Distribution in Bulgaria – PBS, 100–200
 General distribution – local endemic
 Ecology – calciphilous, rheophilous

Genus *Balkanica* Georgiev, 2011

60. *Balkanica yankovi* Georgiev, 2011
Balkanica yankovi Georgiev – GEORGIEV (2011a, c)

Catchment area – 1
 Distribution in Bulgaria – SBM, 300–400
 General distribution – local endemic
 Ecology – stygobiotic

Subfamilia Amnicolinae Tryon, 1862

Genus *Bythinella* Moquin-Tandon, 1856

61. *Bythinella aneliae* Georgiev et Stoycheva, 2011
Bythinella aneliae Georgiev et Stoycheva – GEORGIEV & STOYCHEVA (2011), GEORGIEV (2011a)

Catchment area – 3
 Distribution in Bulgaria – SBM, 1,000–1,500
 General distribution – local endemic
 Ecology – rheophilous

62. *Bythinella angelovi* Glöer et Georgiev, 2011

Bythinella austriaca (Frauenfeld) – ANGELOV (2000a)
Bythinella angelovi Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)

Catchment area – 3
 Distribution in Bulgaria – PSC, 1,000–1,500
 General distribution – local endemic
 Ecology – crenobiont, rheophilous

63. *Bythinella dedovi* Glöer et Georgiev, 2011

Bythinella dedovi Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)

Catchment area – 2
 Distribution in Bulgaria – PBS, 200–300
 General distribution – local endemic
 Ecology – calciphilous, rheophilous

64. *Bythinella dierckingi* Glöer et Georgiev, 2011

Bythinella dierckingi Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)

Catchment area – 3
 Distribution in Bulgaria – RRW, 1,000–1,500
 General distribution – local endemic
 Ecology – crenobiont, rheophilous



- 65. *Bythinella elenae*** Glöer et Georgiev, 2011
Bythinella elenae Glöer & Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)
Catchment area – 2
Distribution in Bulgaria – PBS, 400–500
General distribution – local endemic
Ecology – calciphilous, crenobiont, rheophilous
- 66. *Bythinella gloeeri*** Georgiev, 2009
Bythinella gloeeri Georgiev – GEORGIEV (2009, 2011a, c), GLÖER & GEORGIEV (2011)
Catchment area – 3
Distribution in Bulgaria – RRW, 800–1,000
General distribution – local endemic
Ecology – calciphilous, stygobiotic, rheophilous
Conservation – IUCN-CR
- 67. *Bythinella hansboetersi*** Glöer et Pešić, 2006
Bythinella hansboetersi Glöer et Pešić – GLÖER & PEŠIĆ (2006), FALNIOWSKI et al. (2009, 2012), GEORGIEV (2009, 2011a, c), GEORGIEV & STOYCHEVA (2011), GLÖER & GEORGIEV (2011), FALNIOWSKI & SZAROWSKA (2012)
Catchment area – 1
Distribution in Bulgaria – SBM, >2,000
General distribution – local endemic
Ecology – crenobiont, rheophilous
Conservation – IUCN-NT
- 68. *Bythinella izvorica*** Glöer et Georgiev, 2011
Bythinella izvorica Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a), GEORGIEV & GLÖER (2013)
Catchment area – 2
Distribution in Bulgaria – PBS, 200–300
General distribution – local endemic
Ecology – calciphilous, rheophilous
- 69. *Bythinella kleptuzica*** Glöer et Georgiev, 2011
Bythinella kleptuzica Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)
Catchment area – 3
Distribution in Bulgaria – RRW, 700–800
General distribution – local endemic
Ecology – calciphilous, crenobiont, rheophilous
- 70. *Bythinella margritae*** Glöer et Georgiev, 2011
Bythinella margritae Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)
Catchment area – 2
Distribution in Bulgaria – PBS, 100–200
General distribution – local endemic
Ecology – calciphilous, rheophilous
- 71. *Bythinella markovi*** Glöer et Georgiev, 2009
Bythinella markovi Glöer et Georgiev – GLÖER & GEORGIEV (2009, 2012), GEORGIEV (2009, 2011a, c)
Catchment area – 3
Distribution in Bulgaria – RRW, 800–1,000
General distribution – local endemic
Ecology – calciphilous, stygobiotic, rheophilous
Conservation – IUCN-CR
- 72. *Bythinella ravnogorica*** Glöer et Georgiev, 2009
Bythinella ravnogorica Glöer et Georgiev – GLÖER & GEORGIEV (2009, 2011), GEORGIEV (2009, 2011a, c)
Catchment area – 3
Distribution in Bulgaria – RRW, 1,000–1,500
General distribution – local endemic
Ecology – calciphilous, crenobiont, rheophilous, ?stygobiotic
- 73. *Bythinella rhodopensis*** Glöer et Georgiev, 2011
Bythinella rhodopensis Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)
Catchment area – 3
Distribution in Bulgaria – RRW, 1,500–2,000
General distribution – local endemic
Ecology – calciphilous, rheophilous
- 74. *Bythinella rilaensis*** Georgiev et Glöer, 2013
Bythinella rilaensis Georgiev et Glöer – GEORGIEV & GLÖER (2013)
Catchment area – 3
Distribution in Bulgaria – PRP, 700–800
General distribution – local endemic
Ecology – rheophilous, ?crenobiont
- 75. *Bythinella slaveyae*** Glöer et Georgiev, 2011
Bythinella slaveyae Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)
Catchment area – 3
Distribution in Bulgaria – ROB, 600–700
General distribution – local endemic
Ecology – crenobiont, rheophilous
- 76. *Bythinella smolyanica*** Glöer et Georgiev, 2011
Bythinella austriaca (Frauenfeld) – RAYCHEV (1997b), ANGELOV (2000a)
Bythinella smolyanica Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a)
Catchment area – 3
Distribution in Bulgaria – RRW, 1,000–1,500
General distribution – local endemic
Ecology – rheophilous
- 77. *Bythinella srednogorica*** Glöer et Georgiev, 2009
Bythinella cf. *opaca* – GEORGIEV & STOYCHEVA (2008)
Bythinella opaca – GEORGIEV & STOYCHEVA (2009)
Bythinella srednogorica Glöer et Georgiev – GLÖER & GEORGIEV (2009, 2011), GEORGIEV (2011a, d), GEORGIEV & STOYCHEVA (2011), FALNIOWSKI et al. (2012), FALNIOWSKI & SZAROWSKA (2012), GEORGIEV & GLÖER (2013)

Catchment area – 3

Distribution in Bulgaria – PSA, 300–400

General distribution – local endemic

Ecology – rheophilous

78. *Bythinella stoychevae* Georgiev, 2011

Bythinella stoychevae Georgiev – GEORGIEV (2011a, c)

Catchment area – 3

Distribution in Bulgaria – RRW, 1,000–1,500

General distribution – local endemic

Ecology – calciphilous, stygobiotic, rheophilous

79. *Bythinella valkanovi* Glöer et Georgiev, 2011

Bythinella austriaca (Frauenfeld) – ANGELOV (2000a)

Bythinella valkanovi Glöer et Georgiev – GLÖER & GEORGIEV (2011), GEORGIEV (2011a, 2012c)

Catchment area – 3

Distribution in Bulgaria – PT (foothills of RRW), 400–500

General distribution – local endemic

Ecology – crenobiont, rheophilous, thermal waters

80. *Bythinella walkeri* Glöer et Georgiev, 2009

Bythinella walkeri Glöer et Georgiev – GLÖER & GEORGIEV (2009, 2011), GEORGIEV (2011a, c)

Catchment area – 3

Distribution in Bulgaria – RPR, 800–1,000

General distribution – local endemic

Ecology – rheophilous

Conservation – IUCN-DD

Subfamilia Hydrobiinae Troschel, 1857

Genus *Hydrobia* Hartman, 1821

81. *Hydrobia acuta* Draparnaud, 1805

Hydrobia acuta Drap. – WAGNER (1927), PETRBOK (1941), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a, c), GEORGIEV (2011a)

Catchment area – 2

Distribution in Bulgaria – B, PBS, 0–100

General distribution – Mediterranean-Lusitanian (?Holomediterranean)

Ecology – euryhaline (salinity 1–60‰), stagnant waters

Conservation – IUCN-LC

Note: Included in ANGELOV's (2000a) list of freshwater molluscs as "saltwater species which is able to survive at low salinity (up to 1‰)". The author also mentioned *Hydrobia* records from some inland streams and springs by PETRBOK (1941), DRENSKI (1947) and RUSSEV (1979); those were a result of misidentification.

Subfamilia Lithoglyphinae Troschel, 1857

Genus *Lithoglyphus* Hartman, 1821

82. *Lithoglyphus naticoides* (C. Pfeiffer, 1828)

Lithoglyphus penchiati Bourguignat – BOURGUIGNAT (1870), WOHLBEREDT (1911)

Lithoglyphus naticoides (C. Pfeiffer) – HESSE (1913), ANGELOV (2000a), GENOV & PEYCHEV (2001), HUBENOV (2005, 2006a, 2007a, c), GEORGIEV (2012c)

Lithoglyphus naticoides apertus Küster – WAGNER (1927)

Lithoglyphus naticoides naticoides (C. Pfeiffer) – PETRBOK (1941, 1947), DRENSKI (1947), VALKANOV (1957), RUSSEV (1966, 1979), FRANK et al. (1990)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, BN, 0–200

General distribution – Southeast European-Pontian, Caspian relict

Ecology – salinity limit 3‰, calciphilous, lithophilous, potamophilous, rheophilous

Conservation – IUCN-LC

83. *Lithoglyphus pyramidatus* von Möllendorf, 1873

Lithoglyphus pyramidalis Müller – DRENSKI (1947), VALKANOV (1957), RUSSEV (1966, 1979), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a)

Catchment area – 1

Distribution in Bulgaria – D, 0–100

General distribution – East European-Anatolian

Ecology – lithophilous, potamophilous, rheophilous, rithrophilous, rare

ORDO ECTOBRANCHIA P. FISCHER, 1884

Familia Valvatidae J. E. Gray, 1840

Genus *Valvata* Müller, 1773

Subgenus *Valvata* Müller, 1773

84. *Valvata (Valvata) cristata* O. F. Müller, 1774

Valvata cristata (Müller) – WOHLBEREDT (1911), HESSE (1913), WAGNER (1927), PETRBOK (1941, 1947), ANGELOV (1956, 2000a, b), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2012b, c)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, SBW, SBE, PT, 0–200

General distribution – West Eurosiberian

Ecology – salinity limit 0.5‰, phytophilous, potamophilous, stagnant waters, rare

Conservation – IUCN-LC

Subgenus *Tropidina* H. et A. Adams, 1854

85. *Valvata (Tropidina) macrostoma* (Mörch, 1864)

Valvata pulchella (Studer) – ANGELOV (1960, 2000a), FRANK et al. (1990), HUBENOV (2005, 2006a, b, 2007a)

Valvata macrostoma Mörch – JAECKEL (1967)



Cincinna pulchella (Studer) – PINTÉR (1974)
Catchment areas – 1, 3
Distribution in Bulgaria – D, RRW, 0–1,500
General distribution – ?disjunct Eurosiberian
Ecology – phytophilous, stagnant waters, rare
Conservation – IUCN-LC

Subgenus *Cincinna* Hübner, 1810

86. *Valvata (Cincinna) piscinalis* (O. F. Müller, 1774)
Valvata piscinalis (Müller) – WESTERLUND (1886), HESSE (1911, 1913), WOHLBEREDT (1911), WAGNER (1927), PETRBOK (1941, 1947), DRENSKI (1947), VALKANOV (1957), ANGELOV (1960, 1998, 2000a, b), ANGELOV et al. (1963), RUSSEV (1966, 1979), FRANK et al. (1990), HUBENOV (2005, 2006a, b, 2007a), GEORGIEV (2005a, 2012b, c), VASILEVA et al. (2011)
Cincinna piscinalis var. *antiqua* Sowerby – ZILCH & JAECKEL (1962), JAECKEL (1967)
Catchment areas – 1, 2, 3
Distribution in Bulgaria – D, SP, SB, PVV, PVS, RRE, RRW, PT, 0–1,500
General distribution – West and Central Palaearctic (introduced all over Holarctic)
Ecology – salinity limit 0.4‰, xenosaprobic, pelophilous, phytophilous, stagnant waters
Conservation – IUCN-LC

Genus *Borysthenia* Linholm, 1913

87. *Borysthenia naticina* (Menke, 1845)
Valvata naticina Menke – FRANK et al. (1990), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a)
Catchment area – 1
Distribution in Bulgaria – D, 0–100
General distribution – Central and East European
Ecology – lithophilous, psammophilous, pelophilous, potamophilous, rare
Conservation – IUCN-LC

ORDO PULMONATA CUVIER IN BLAINVILLE, 1814
Subordo Basommatophora Keferstein, 1864
Familia Acroloxidae Thiele, 1931
Genus *Acroloxus* H. Beck, 1838

88. *Acroloxus lacustris* (Linnaeus, 1758)
Ancylus lacustris (L.) – BÜTTNER (1928), DRENSKI (1947)
Acroloxus lacustris (L.) – ANGELOV (1956, 1998, 2000a, b), ANGELOV et al. (1963), GEORGIEV (2005a, 2012c), HUBENOV (2005, 2006a, 2007a), GEORGIEV & STOYCHEVA (2009)
Catchment areas – 1, 3
Distribution in Bulgaria – D, SP, PSA, PSC, RRE, RRW, 0–1,000
General distribution – Holoeurosiberian
Ecology – phytophilous, stagnant waters
Conservation – IUCN-LC

Familia Lymnaeidae Rafinesque, 1815
Subfamilia Lymnaeinae Rafinesque, 1815
Genus *Galba* Schrank, 1803

89. *Galba truncatula* (O. F. Müller, 1774)
Limnaea bulgarica Bourguignat – BOURGUIGNAT (1881)
Limnaea exigua Bourguignat – BOURGUIGNAT (1881)
Limnaea varnensis Bourguignat – BOURGUIGNAT (1881)
Limnaea truncatula Müller – KOBELT (1898), HESSE (1913)
Galba truncatula (Müller) – HESSE (1911), WAGNER (1927), BÜTTNER (1928), PETRBOK (1941), DRENSKI (1947), KOZAROV et al. (1955), VALKANOV (1957), ANGELOV et al. (1963), RUSSEV (1964, 1979), RUSSEV & YANEVA (1975), ANGELOV (1998, 2000a, b), GEORGIEV (2005a, b, 2008, 2012c), HUBENOV (2005, 2006a, b, 2007a, b), GEORGIEV & STOYCHEVA (2009)
Limnaea (Fossaria) truncatula Müller – WOHLBEREDT (1911)
Catchment areas – 1, 2, 3
Distribution in Bulgaria – D, SP, SB, PVV, PVS, PT, B, PBS, PBC, PBT, RRE, RRW, RPR, RPP, ROO, RPM, RPS, 0–2,000
General distribution – Holarctic
Ecology – eurybiont, pelophilous, phytophilous, rhithrophilous, potamophilous, stagnant waters

Genus *Stagnicola* Jeffreys, 1830

90. *Stagnicola corvus* (Gmelin, 1791)
Lymnaea palustris var. *corvus* Gmelin – WOHLBEREDT (1911)
Lymnaea corvus Gmelin – HESSE (1916)
Lymnaea palustris corvus Gmelin – WAGNER (1927)
Galba palustris var. *corvus* (Gmelin) – BÜTTNER (1928), DRENSKI (1947)
Stagnicola palustris var. *corvus* (Gmelin) – PETRBOK (1941), VALKANOV (1957)
Stagnicola corvus (Gmelin) – FRANK et al. (1990), ANGELOV (1998, 2000 a, b), HUBENOV (2005, 2006a, 2007a)
Catchment areas – 1, 2, 3
Distribution in Bulgaria – D, PT, B, 0–200
General distribution – ?Holopalaeartic
Ecology – phytophilous, stagnant waters
Conservation – IUCN-LC

91. *Stagnicola montenegrinus* Glöer et Pešić, 2009
Stagnicola montenegrinus Glöer et Pešić – SCHNIEBS et al. (2011), GEORGIEV (2012c)
Catchment area – 3
Distribution in Bulgaria – PT, 100–400
General distribution – Balkan endemic
Ecology – stagnant waters
Conservation – IUCN-NT

92. *Stagnicola palustris* (O. F. Müller, 1774)

Limnaea palustris var. *vulnerata* Küst. – WESTERLUND (1886)

Limnaea berlani Bourguignat – BOURGUIGNAT (1881), KOBELT (1898)

Limnaea palustris (Müller) – HESSE (1911, 1916), DRENSKI (1947)

Limnaea (Lymnophysa) palustris (Müller) – WOHLBEREDT (1911)

Lymnophysa palustris vulneratus Küst. – WAGNER (1927)

Galba palustris Müller *typica* – BÜTTNER (1928), ANGELOV et al. (1963)

Stagnicola palustris (Müller) – PETRBOK (1941), RUSSEV & YANEVA (1975), RUSSEV (1979), FRANK et al. (1990), ANGELOV (2000a, b), HUBENOV (2005, 2006b, 2007a)

Stagnicola palustris var. *vulnerata* Küst. – PETRBOK (1941), DRENSKI (1947)

Stagnicola palustris var. *berlani* Bourguignat – PETRBOK (1941), DRENSKI (1947), JACKIEWICZ (1962), HUBENOV (2006a, b)

Galba glabra (Müller) – RUSSEV (1979)

Catchment areas – 1, 3

Distribution in Bulgaria – D, PVS, PT, RRW, 0–600

General distribution – Holarctic

Ecology – eurybiont, phytophilous

Conservation – IUCN-LC

93. *Stagnicola turricula* (Held, 1836)

Stagnicola turricula (Held) – RUSSEV (1966, 1979), FRANK et al. (1990), ANGELOV (2000a, b), HUBENOV (2005, 2006a, 2007a)

Catchment area – 1

Distribution in Bulgaria – D, 0–100

General distribution – Holopalaeartic

Ecology – pelophilous, phytophilous, rare

Conservation – IUCN-LC

Note: We regard this species as one of unclear taxonomic status. According to some authors (BARGUES et al. 2001, WELTER-SCHULTES 2012) it is a synonym of *Stagnicola palustris* but it was listed as a separate species in GLÖER (2002) and CUTTELOD et al. (2011). However the taxonomy of lymnaeids is quite disputable (KRUGLOV 2005, SCHNIEBS et al. 2011, 2012), and here we have chosen to follow the old “classical” taxonomy.

Genus *Radix* Montfort, 1810

94. *Radix auricularia* (Linnaeus, 1758)

Limnaea auricularia (Drap.) – HRISTOVITCH (1892), HESSE (1913)

Limnaea auricularia (L.) – HESSE (1911), DRENSKI (1947), VALKANOV (1957), NAIDENOV (1968)

Radix auricularius (L.) – WAGNER (1927)

Radix auricularia (L.) – BÜTTNER (1928), VALKANOV (1936), PETRBOK (1941), ANGELOV (1956, 1998, 2000a, b), ANGELOV et al. (1963), RUSSEV (1966, 1979), FRANK et al. (1990), GEORGIEV (2005a, 2012b, c), HUBENOV (2005, 2006a, 2007a, c), GEORGIEV & STOYCHEVA (2009), GLÖER & GEORGIEV (2009), VASILEVA et al. (2009, 2011), VASILEVA (2012)

Radix ovata (Drap.) – GEORGIEV (2005b)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, SBE, PSC, PSA, PVV, PVS, PT, B, PBS, PBD, PBD, PBC, RRW, 0–1,500

General distribution – Holopalaeartic

Ecology – salinity limit 3–6‰, pelophilous, phytophilous, potamophilous, rhithrophilous, stagnant waters

Conservation – IUCN-LC

95. *Radix balthica* (Linnaeus, 1758)

Limnaea limosa var. *thermalis* L. – HRISTOVITCH (1892)

Limnaea ovata (Drap.) – WOHLBEREDT (1911), NAIDENOV (1968)

Radix ovata (Drap.) – WAGNER (1927), VALKANOV (1932), PETRBOK (1941), DRENSKI (1947), ANGELOV (1956, 1998, 2000a, b), ZASHEV & ANGELOV (1959), RUSSEV (1966), FRANK et al. (1990), HUBENOV (2005, 2006a, b, 2007c)

Radix ovata var. *fontaneus* Charpentier – PETRBOK (1941)

Radix balthica (L.) – GEORGIEV (2012c)

Catchment areas – 1, 3

Distribution in Bulgaria – D, SP, ?RRE, ?RRW, 0–2,500

General distribution – Holopalaeartic

Ecology – salinity limit 10‰, eurybiont, phytophilous, stagnant waters

Conservation – IUCN-LC

96. *Radix labiata* (Rossmässler, 1835)

Radix pereger (Müller) – WAGNER (1927), KOZAROV et al. (1955), ANGELOV et al. (1963)

Radix peregra (Müller) – BÜTTNER (1928), PETRBOK (1941), ARNDT (1943), RUSSEV (1964, 1966, 1979), RUSSEV & YANEVA (1975), FRANK et al. (1990), ANGELOV (1998, 2000a, b), YANEVA et al. (2001), KIRIN et al. (2003), HUBENOV (2005, 2006a, b, 2007a, b), GEORGIEV (2006), DEDOV & MITEV (2011)

Limnaea (Radix) peregra (Müller) – DRENSKI (1947)

Radix labiata (Rossm.) – GEORGIEV & STOYCHEVA (2009), GEORGIEV (2012c)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, SB, PVV, PVS, PT, B, PBS, RRE, RRW, RPR, RPP, ROO, RPM, RPS, 0–2,300

General distribution – West Palaeartic (?Holopalaeartic)

Ecology – eurybiont, pelophilous, phytophilous

Conservation – IUCN-LC

**97. *Radix lagotis*** (Schrank, 1803)

Radix lagotis (Schrank) – WOHLBEREDT (1911),
PETRBOK (1941), ANGELOV (2000a)

Limnaea lagotis Schrank – HESSE (1913)

Radix ovatus lagotis Schrank – WAGNER (1927)

Catchment area – 1

Distribution in Bulgaria – PKK, 600–700

General distribution – European (?Holopalaeartic)

Ecology – pelophilous, phytophilous, stagnant waters

Conservation – IUCN-DD

Genus *Myxas* G. B. Sowerby, 1822

98. *Myxas glutinosa* (O. F. Müller, 1774)

Myxas glutinosa (Müller) – RUSSEV et al. (1994),
HUBENOV (2005, 2006a, 2007a)

Catchment area – 1

Distribution in Bulgaria – D, 0–100

General distribution – Central and North European
(?West Eurosiberian)

Ecology – β -mesosaprobic, oligosaprobic,
rhithrophilous, stagnant waters

Conservation – BC, CORINE, ESC, IUCN-LC

Genus *Lymnaea* Lamarck, 1799

99. *Lymnaea stagnalis* (Linnaeus, 1758)

Limnaea stagnalis (L.) – HRISTOVITCH (1892), HESSE
(1911), ANGELOV (1956), ANGELOV et al. (1963)

Limnaea stagnalis var. *major* Kobelt – HRISTOVITCH
(1892)

Limnaea (Lymnus) stagnalis var. *ampliata* Clessin –
WAGNER (1927)

Limnaea stagnalis var. *ampliata* Clessin – BÜTTNER
(1928)

Lymnaea stagnalis (L.) – PETRBOK (1941), DRENSKI
(1947), VALKANOV (1957), RUSSEV (1966, 1979),
NAIDENOV (1968), FRANK et al. (1990), ANGELOV
(1998, 2000a, b), HUBENOV (2005, 2006a, 2007a)

Lymnaea stagnalis var. *ampliata* Clessin – PETRBOK
(1941)

Lymnaea stagnalis var. *turgida* Menke – PETRBOK
(1941)

Limnaea stagnalis var. *subulata* Westerlund – ANGELOV
(1956)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, PVS, PT, PKK, 0–1 – 000

General distribution – Holarctic

Ecology – salinity limit 7‰, eurybiont, pelophilous,
phytophilous, potamophilous, stagnant waters

Conservation – IUCN-LC

Familia Physidae Fitzinger, 1833

Subfamilia Physinae Fitzinger, 1833

Genus *Physa* Draparnaud, 1801

100. *Physa fontinalis* (Linnaeus, 1758)

Physa fontinalis (L.) – HRISTOVITCH (1892), HESSE
(1911), WAGNER (1927), BÜTTNER (1928),
VALKANOV (1936, 1957), PETRBOK (1941),
DRENSKI (1947), ANGELOV (1956, 1998, 2000a, b),
ANGELOV et al. (1963), RUSSEV & YANEVA (1975),
RUSSEV (1979), FRANK et al. (1990), HUBENOV
(2005, 2006a, b, 2007a), GEORGIEV (2012c)

Physa fontinalis var. *succinea* Hesse – HESSE (1913),
PETRBOK (1941)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, PVV, PVS, PT, B, RRE,
RRW, 0–500

General distribution – Holarctic

Ecology – β -mesosaprobic, phytophilous,
potamophilous, stagnant waters, rare

Conservation – IUCN-LC

Genus *Physella* Haldeman, 1842

101. *Physella acuta* (Draparnaud, 1805)

Physa dalmatina Küster – WAGNER (1927), PETRBOK
(1941)

Physa acuta (Drap.) – BÜTTNER (1928), DRENSKI
(1947), ANGELOV et al. (1963), RUSSEV (1979)

Physella acuta (Drap.) – RUSSEV & YANEVA (1975),
YANEVA (1989), FRANK et al. (1990), ANGELOV
(1998, 2000a, b), YANEVA et al. (2001), GEORGIEV
(2005a, b, 2006, 2012b, c), HUBENOV (2005,
2006a, b, 2007a), GEORGIEV & STOYCHEVA (2009),
VASILEVA (2011), VASILEVA et al. (2011)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, SB, PVV, PVS, PT, B,
PBS, PBD, PBC, PBT, RRE, RRW, RPR, RPP, ROO,
RPM, ROP, 0–1,500

General distribution – North American
(Subcosmopolitan – introduced species)

Ecology – invasive alien species, α - β -mesosaprobic,
eurybiont, pelophilous, phytophilous,
potamophilous, stagnant waters

Conservation – IUCN-LC

Subfamilia Aplexinae Starobogatov, 1967

Genus *Aplexa* Fleming, 1820

102. *Aplexa hypnorum* (Linnaeus, 1758)

Aplexa hypnorum (L.) – HESSE (1911), WAGNER
(1927), PETRBOK (1941), DRENSKI (1947),
ANGELOV (2000a), HUBENOV (2005, 2006a,
2007a), GEORGIEV & STOYCHEVA (2009),
GEORGIEV (2012c)

Physa hypnorum L. – HESSE (1913)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – SP, SBE, PSC, PT, 0–600
 General distribution – Holarctic
 Ecology – α -mesosaprobic, pelophilous, stagnant waters, rare
 Conservation – IUCN-LC

Familia Planorbidae Rafinesque, 1815
 Subfamilia Buliniinae P. Fischer et Crosse, 1880
 Genus *Planorbarius* Duméril, 1806

103. *Planorbarius corneus* (Linnaeus, 1758)
Planorbis corneus Poir. – HRISTOVITCH (1892)
Planorbis corneus L. – HESSE (1911), VALKANOV (1936)
Planorbis (Spirodiscus) corneus var. *ammonoceras* Westerlund – WOHLBEREDT (1911)
Planorbis (Spirodiscus) corneus var. *banaticus* Lang. – WOHLBEREDT (1911)
Coretus corneus (L.) – WAGNER (1927), PETRBOK (1941), ANGELOV et al. (1963), RUSSEV (1966)
Coretus corneus L. – BÜTTNER (1928)
Planorbis (Coretus, Planorbarius) corneus L. – DRENSKI (1947)
Coretus corneus var. *albinus* Westerlund – PETRBOK (1941), VALKANOV (1957)
Coretus corneus var. *ammonoceras* Westerlund – PETRBOK (1941), VALKANOV (1957)
Coretus corneus var. *banaticus* Lang. – PETRBOK (1941)
Planorbis corneus maritzanus Drenski – DRENSKI (1947)
Coretus corneus var. *megistus* Bourguignat – PETRBOK (1941)
Coretus corneus var. *minor* Westerlund – PETRBOK (1941)
Planorbis corneus typicus – DRENSKI (1947)
Planorbarius corneus (L.) – RUSSEV (1979), FRANK et al. (1990), ANGELOV (1998, 2000a, b), HUBENOV (2005, 2006a, b, 2007a, c)
 Catchment areas – 1, 2, 3
 Distribution in Bulgaria – D, PSA, PVS, PT, B, 0–500
 General distribution – West Eurosiberian
 Ecology – salinity limit 5‰, α - β -mesosaprobic, phytophilous, potamophilous, stagnant waters
 Conservation – IUCN-LC

Subfamilia Planorbinae Rafinesque, 1815
 Genus *Planorbis* Müller, 1773

104. *Planorbis carinatus* O. F. Müller, 1774
Planorbis carinatus (Müller) – HRISTOVITCH (1892), DRENSKI (1947), RUSSEV (1979), FRANK et al. (1990), ANGELOV (1998), ANGELOV (2000a, b), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2006)
Tropidiscus carinatus (Müller) – PETRBOK (1941)
 Catchment areas – 1, 2, 3
 Distribution in Bulgaria – D, SP, SB, PVV, PVS, PT, B, PBS, RRE, RRW, RPM, ROP, 0–300
 General distribution – West Eurosiberian
 Ecology – pelophilous, phytophilous, stagnant waters, rare
 Conservation – IUCN-LC

105. *Planorbis planorbis* (Linnaeus, 1758)
Planorbis marginatus (Drap.) – VAVRA (1893), KOBELT (1898), HESSE (1916)
Planorbis rotundatus – VAVRA (1893)
Planorbis umbilicatus Müller – VAVRA (1893), WOHLBEREDT (1911), HESSE (1911, 1913)
Planorbis (Tropidiscus) umbilicatus – WOHLBEREDT (1911)
Planorbis planorbis (L.) – WAGNER (1927), BÜTTNER (1928), VALKANOV (1936, 1957), DRENSKI (1947), ANGELOV et al. (1963), RUSSEV & YANEVA (1975), RUSSEV (1979), YANEVA (1989), FRANK et al. (1990), ANGELOV (1998, 2000a, b), YANEVA et al. (2001), HUBENOV (2005, 2006a, b, 2007a, c), GEORGIEV (2006, 2012c), GEORGIEV & STOYCHEVA (2008), DEDOV & MITEV (2011)
Tropidiscus marginatus (Drap.) – PETRBOK (1941)
Tropidiscus marginatus f. *ecarinatus* Westerlund – PETRBOK (1941)
Tropidiscus marginatus filocincta Westerlund – PETRBOK (1941)
Tropidiscus marginatus f. *submarginata* Jan. – PETRBOK (1941)
Tropidiscus planorbis L. – ANGELOV (1956)
Planorbis carinatus (Müller) – GEORGIEV (2005a, b)
Planorbis planorbis var. *submarginatus* (Cristofori et Jan) – GEORGIEV (2006)
 Catchment areas – 1, 2, 3
 Distribution in Bulgaria – D, SP, SB, PVV, PVS, PT, B, PBS, PBD, PBC, PBT, RRE, RRW, RPR, RPP, ROO, RPM, ROP, 0–1,500
 General distribution – Holarctic
 Ecology – salinity limit 1.5‰, eurybiont, pelophilous, phytophilous, stagnant waters
 Conservation – IUCN-LC
 Genus *Anisus* S. Studer, 1820
 Subgenus *Anisus* S. Studer, 1820

106. *Anisus (Anisus) leucostoma* (Millet, 1813)
Planorbis leucostoma Millet – HESSE (1911, 1913)
Paraspira leucostoma Millet – WAGNER (1927)
Anisus leucostomus (Millet) – GEORGIEV & STOYCHEVA (2009), ANGELOV (1998, 2000a, b), HUBENOV (2005, 2006a, 2007a)
Anisus leucostoma (Millet) – GEORGIEV (2012c)
 Catchment areas – 1, 3
 Distribution in Bulgaria – D, PSC, PT, 0–1,000 (1,700)
 General distribution – West and Central Eurosiberian (?West and Central Palaearctic)
 Ecology – phytophilous, stagnant waters
 Conservation – IUCN-LC



- 107. *Anisus (Anisus) septemgyratus*** (Rossmässler, 1835)
Planorbis septemgyratus Rossm. – HESSE (1916)
Paraspira septemgyratus Rossm. – WAGNER (1927),
PETRBOK (1941), VALKANOV (1957), ANGELOV
(1998)
Anisus septemgyratus Rossm. – ANGELOV (2000a, b),
HUBENOV (2005, 2006a, 2007a)
Catchment areas – 1, 2
Distribution in Bulgaria – D, SBE, B, 0–400
General distribution – West and Central Eurosiberian
(?European)
Ecology – salinity limit 8‰, α - β -mesosaprobic,
eurybiont, phytophilous, stagnant waters, rare
Conservation – IUCN-LC
- 108. *Anisus (Anisus) spirorbis*** (Linnaeus, 1758)
Planorbis (Gyrorbis) spirorbis L. – WOHLBEREDT (1911)
Paraspira spirorbis (L.) – PETRBOK (1941)
Planorbis (Anisus) spirorbis Troschel – DRENSKI (1947)
Anisus spirorbis (L.) – RUSSEV (1966, 1979), FRANK et
al. (1990), ANGELOV (1998, 2000a, b), HUBENOV
(2005, 2006a, 2007a), GEORGIEV (2008, 2012c)
Catchment areas – 1, 2, 3
Distribution in Bulgaria – D, SP, PVV, B, 0–500
General distribution – West and Central Palaearctic
Ecology – α - β -mesosaprobic, phytophilous, stagnant
waters, rare
Conservation – IUCN-LC
- Subgenus *Disculifer* C. Boettger 1944
- 109. *Anisus (Disculifer) vortex*** (Linnaeus, 1758)
Planorbis vortex L. – HESSE (1911), WOHLBEREDT
(1911)
Spiralina vortex L. – BÜTTNER (1928), ANGELOV
(1956), ANGELOV et al. (1963)
Anisus (Disculifer) vortex L. – VALKANOV (1936)
Planorbis (Spiralina) vortex Linné – DRENSKI (1947)
Anisus vortex L. – ANGELOV (1998, 2000a, b),
HUBENOV (2005, 2006a, 2007a, c), GEORGIEV
(2012c)
Catchment areas – 1, 2, 3
Distribution in Bulgaria – D, PVS, B, 0–600
General distribution – West and Central Eurosiberian
Ecology – salinity limit 8‰, α - β -mesosaprobic,
phytophilous, potamophilous, stagnant waters,
rare
Conservation – IUCN-LC
- 110. *Anisus (Disculifer) vorticulus*** (Troschel, 1834)
Spiralina vorticulus Troschel – BÜTTNER (1928)
Diplodiscus vorticulus (Troschel) – PETRBOK (1941)
Anisus vorticulus (Troschel) – ANGELOV (1998, 2000a,
b), HUBENOV (2005, 2006a, 2007a)
Catchment areas – 1, 2
Distribution in Bulgaria – D, PVS, B, 0–600
- General distribution – West and Central Eurosiberian
(?West Eurosiberian)
Ecology – pelophilous, phytophilous, rhithrophilous,
stagnant waters, rare
Conservation – HD, Natura 2000, IUCN-NT
- Genus *Bathyomphalus* Charpentier, 1837
- 111. *Bathyomphalus contortus*** (Linnaeus, 1758)
Bathyomphalus contortus L. – HESSE (1911), WAGNER
(1927), BÜTTNER (1928), ANGELOV (2000a),
HUBENOV (2005, 2006a, 2007a, c), GEORGIEV
(2012c)
Catchment areas – 1, 3
Distribution in Bulgaria – PT, B, 0–600 (1,800)
General distribution – Holoeurosiberian
Ecology – salinity limit 8‰, α - β -mesosaprobic,
phytophilous, stagnant waters, rare
Conservation – IUCN-LC
- Genus *Gyraulus* Charpentier, 1837
Subgenus *Gyraulus* Charpentier, 1837
- 112. *Gyraulus (Gyraulus) albus*** (O. F. Müller, 1774)
Planorbis albus Müller – HESSE (1911)
Gyraulus albus (Müller) – WAGNER (1927), BÜTTNER
(1928), PETRBOK (1941), ANGELOV (1956),
ANGELOV et al. (1963), RUSSEV (1966, 1979),
RUSSEV & YANEVA (1975), YANEVA (1989), FRANK
et al. (1990), ANGELOV (1998, 2000a, b), YANEVA et
al. (2001), GEORGIEV (2005a, 2012b, c), HUBENOV
(2005, 2006a, b, 2007a, c)
Catchment areas – 1, 3
Distribution in Bulgaria – D, SP, PSA, PT, B, RRW,
0–1,500
General distribution – Holarctic
Ecology – salinity limit 8‰, phytophilous,
potamophilous, stagnant waters, rare
Conservation – IUCN-LC
- Subgenus *Torquis* Dall, 1905
- 113. *Gyraulus (Torquis) laevis*** (Alder, 1838)
Gyraulus laevis (Alder) – ANGELOV (1960), RUSSEV
(1979), FRANK et al. (1990), ANGELOV (1998,
2000a, b), HUBENOV (2005, 2007a)
Catchment areas – 1, 3
Distribution in Bulgaria – D, PVS, PT, 0–600
General distribution – Holarctic (?European)
Ecology – phytophilous, potamophilous, stagnant wa-
ters, rare
Conservation – IUCN-LC

Subgenus *Armiger* W. Hartmann, 1843

114. *Gyraulus (Armiger) crista* (Linnaeus, 1758)

Armiger crista (L.) – VALKANOV (1934), PETRBOK (1941)

Planorbis (Armiger) crista (L.) – VALKANOV (1957)

Gyraulus crista f. *nautilus* (L.) – RUSSEV (1979)

Gyraulus crista (L.) – FRANK et al. (1990), ANGELOV (1998, 2000a), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2005a, 2012c)

Gyraulus crista f. *spinulosus* (L.) – ANGELOV (2000a)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, PSA, PVV, PVS, PT, B, RRW, 0–1,500

General distribution – Holarctic

Ecology – salinity limit 1.5‰, α - β -mesosaprobic, phytophilous, potamophilous, stagnant waters

Conservation – IUCN-LC

Subgenus *Lamorbis* Starobogatov, 1967

115. *Gyraulus (Lamorbis) piscinarum* Bourguignat, 1852

Gyraulus piscinarum Bourguignat – WESTERLUND (1885), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2012c)

Gyraulus piscinarum minima Bourguignat – PETRBOK (1941)

Catchment areas – 2, 3

Distribution in Bulgaria – PBS, 0–100

General distribution – East Mediterranean

Ecology – phytophilous, potamophilous, stagnant waters

Conservation – IUCN-NA

Genus *Hippeutis* Charpentier, 1837

116. *Hippeutis complanatus* (Linnaeus, 1758)

Hippeutis complanatus (L.) – HESSE (1911), WAGNER (1927), BÜTTNER (1928), PETRBOK (1941), ANGELOV (1998, 2000a), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2012c)

Planorbis (Hippeutis) complanatus (L.) – DRENSKI (1947)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, PVV, PVS, PT, B, PBS, ROP, 0–600

General distribution – West and Central Palaearctic

Ecology – α -mesosaprobic, phytophilous, stagnant waters, rare

Conservation – IUCN-LC

Genus *Segmentina* Fleming, 1818

117. *Segmentina nitida* (O. F. Müller, 1774)

Segmentina nitida f. *clessiniana* Müller – WESTERLUND (1885)

Planorbis nitidus (Müller) – HESSE (1911, 1913)

Segmentina nitida (Müller) – WAGNER (1927), BÜTTNER (1928), VALKANOV (1935, 1957), PETRBOK (1941), ANGELOV (1956, 1998, 2000a, b), ANGELOV et al. (1963), HUBENOV (2005, 2006a, 2007a), GEORGIEV (2006, 2012c)

Segmentina nitida var. *distinguenda* Gredl. – ANGELOV (1956)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, PVV, PVS, PT, B, PBS, RRE, RRW, 0–1,500

General distribution – West and Central Palaearctic

Ecology – α - β -mesosaprobic, phytophilous, potamophilous, stagnant waters

Conservation – ESC, CORINE, IUCN-LC

Familia Ferrissiidae Walker, 1917

Genus *Ferrissia* Walker, 1903

118. *Ferrissia fragilis* (Tryon, 1863)

Ferrissia wautieri (Mirolli) – ANGELOV (1983, 2000a)

Ferrissia clessiniana (Jickeli) – HUBENOV (2005, 2006a, 2007a)

Catchment areas – 1, 2

Distribution in Bulgaria – PVS, B, 0–600

General distribution – North American (Subcosmopolitan – introduced)

Ecology – eurybiont, phytophilous, stagnant waters

Conservation – IUCN-DD

Familia Ancyliidae Rafinesque, 1815

Genus *Ancylus* Müller, 1773

119. *Ancylus fluviatilis* O. F. Müller, 1774

Ancylus fluviatilis Müller – HRISTOVITCH (1892), WAGNER (1927), VALKANOV (1934), PETRBOK (1941), ANGELOV et al. (1963), RUSSEV (1964), RUSSEV & YANEVA (1975), YANEVA (1989), YANEVA et al. (1998, 2001), GEORGIEV (2005a, b, 2012b, c), HUBENOV (2005, 2006a, b, 2007a), GEORGIEV & STOYCHEVA (2009)

Ancylus fluviatilis var. *gibbosus* Bourguignat – WOHLBEREDT (1911)

Ancylastrum fluviatile L. – BÜTTNER (1928)

Ancylastrum fluviatile var. *phrygium* Clessin – BÜTTNER (1928)

Ancylus fluviatilis gibbosus Bourguignat – PETRBOK (1941), DRENSKI (1947)

Ancylus (Ancylastrum) fluviatilis Müller – DRENSKI (1947)

Catchment areas – 1, 2, 3

Distribution in Bulgaria – D, SP, SB, PVV, PVS, PT, B, PBS, PBD, PBT, RRE, RRW, ROP, 0–2,300

General distribution – West Palaearctic

Ecology – xenosaprobic-oligosaprobic, crenobiont, lithophilous, potamophilous, rheophilous

Conservation – IUCN-LC

**120. *Ancylus recurvus* Martens, 1873**

Ancylus recurvus Parrm – WAGNER (1927), PETRBOK (1941), ANGELOV (2000a), HUBENOV (2005, 2006a, 2007a)

Ancylus recurvus Martens – GLÖER & GEORGIEV (2011)

Catchment areas – 1, 3

Distribution in Bulgaria – SBM, PSD, RRW, 100–800

General distribution – Northeast Mediterranean

Ecology – calciphilous, crenobiont, rare

Note: According to ALBRECHT et al. (2006) all records of *A. recurvus* probably refer to an array of species among which *Ancylus pileolus* Férrusac, 1822 is the most frequent.

DISCUSSION**GENERAL REMARKS**

The total number of freshwater snail species recorded hitherto from Bulgaria is 120. Three species (*Th. pallasii*, *B. rumelica* and *M. parreyssi*) are regarded as extinct, and two species were found only as subfossil remains (*T. lincta* and *T. variabilis*), but are likely to occur in the Bulgarian part of the Danube, since there exist records from the adjacent areas of Romania (CIOBOIU 2006). Some other species, for example *Bithynia transsilvanica* (Bielz, 1853), *Radix ampla* (Hartmann, 1821) and *Gyraulus acronicus* (A. Férrusac, 1807), have been recorded from south Romania but never found in Bulgaria (GLÖER & SÎRBU 2006, CIOBOIU 2006). Their occurrence in the country is also likely.

The Hydrobiidae are the most diverse family (67 known species, 56% of freshwater snail fauna); they are followed by Planorbidae (15; 12%), and Lymnaeidae (11; 9%). The remaining families are represented by 1–4 species and constitute 1–3% of the freshwater snail fauna (Fig. 3). Most hydrobiid

genera in Bulgaria are represented by one species each. Some of the genera are endemic to the country (*Balkanospeum*, *Cavernisa*, *Insignia*, *Balkanica*, *Gloeria*, *Strandzhia*) (Fig. 4). *Bythinella*, with its 20 species (29% of all hydrobiids) and *Belgrandiella* (11 species, 16%) are the most speciose; they are followed by *Bythiospeum* (8 species, 12% – one still unidentified, probably new, referred to as *Bythiospeum* sp. in GEORGIEV 2013), and *Grossuana* (7 species, 10%).

The regions richest in species are the Danube River valley, Pre-Balkan area, West Rhodopes Mts, West Stara Planina Mts, Upper Thracian Lowland and the Black Sea coastal area. The hydrobiids are represented by many species in the West Rhodopes, West Stara Planina and the Pre-Balkan region. The members of Neritidae, Viviparidae, Melanopsidae, Bithyniidae, Pyrgulidae, and the genus *Lithoglyphus*, occur mainly in north Bulgaria, and especially in its low-altitude parts.

The altitudinal range of freshwater snails in Bulgaria is 0 to 2,300 m a.s.l. The species richness decreases gradually with increasing altitude (Fig. 5).

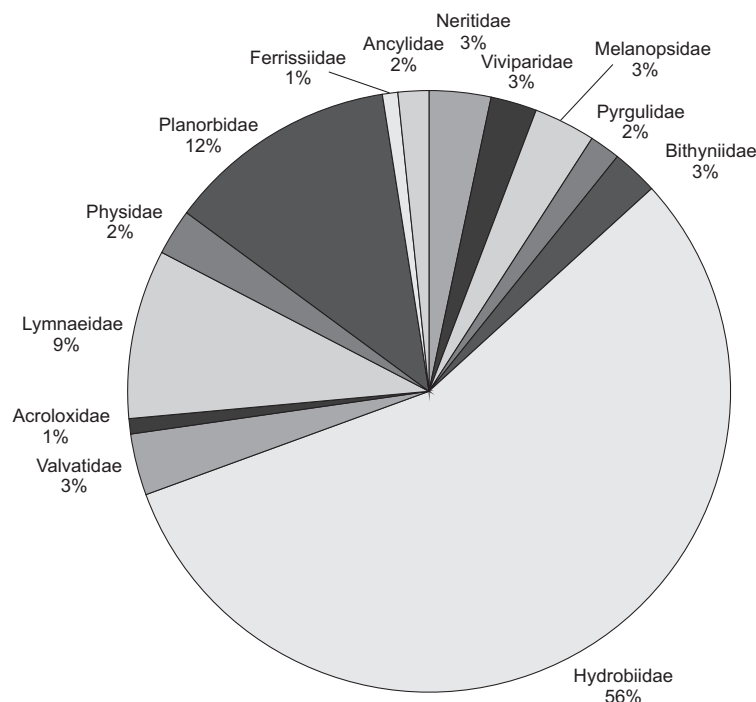


Fig. 3. Species richness of the Bulgarian freshwater snail families

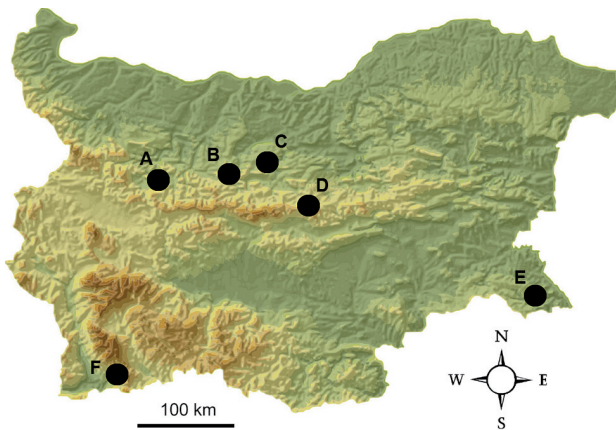


Fig. 4. Localities of endemic hydrobiid genera in Bulgaria: A – *Cavernisa*, B – *Insignia*, *Pontobelgrandiella*, C – *Devetakia*, D – *Balkanospium*, *Balkanica*, E – *Strandzhia*, F – *Gloria*

The majority of species inhabit the lower-altitude parts of the country – valleys, lowlands and hilly areas, and few reach high altitudes (*Galba truncatula*, *Radix labiata*, *Ancylus fluviatilis*). Some of the spring snails (*Bythinella*, e.g. *B. hansboetersi*, *B. ravnogorica*, *B. aneliae*) are high mountain species living at altitudes of 1,000 to more than 2,000 m a.s.l. The altitudinal ranges of most other Bulgarian hydrobiids are between 100 and 800 m a.s.l.

The qualitative similarity of the freshwater snail faunas of the main geographical regions of Bulgaria is in most cases small. The fauna of the West Stara Planina Mts is the most specific. This is due to the presence of many endemic hydrobiids, and the absence of the widely distributed, lowland species (most planorbids and lymnaeids).

The most widely distributed species in Bulgaria, in terms of both geographical regions and altitude, are *Galba truncatula*, *Radix auricularia*, *Physella acuta* and *Planorbis planorbis*. Besides the local hydrobiid endemics (with 1–3 localities), *Viviparus contectus*, *Borysthenia naticina*, *Anisus vorticulus*, *Gyraulus piscinarum*, *Radix lagotis*, *Myxas glutinosa*, *Ferrissia fragilis* and *Ancylus recurvus* can be regarded as rare.

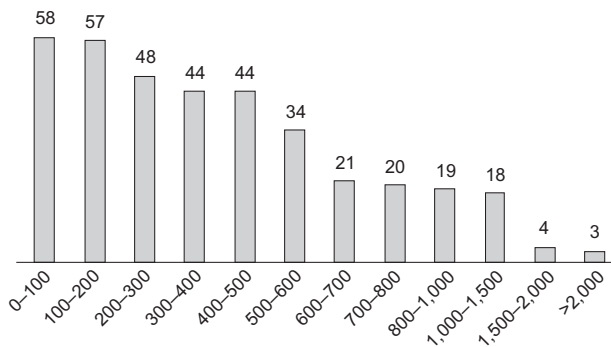


Fig. 5. Species richness of the freshwater snails of Bulgaria at different altitudes (numbers of species shown above columns)

ZOOGEOGRAPHICAL CHARACTERISTICS OF THE FAUNA

For the purposes of this paper, the freshwater snails of Bulgaria were assigned to 32 zoogeographical categories, combined in four larger groups (Table 1). The first group includes species which are distributed both in the Palaearctic region and outside it. This group (10 species – 8.4%) comprises four zoogeographical categories. *Potamopyrgus antipodarum*, *Physella acuta* and *Ferrissia fragilis* are alien species whose secondary ranges include Bulgaria. Native species, widely distributed in Bulgaria (*Galba truncatula*, *Planorbis planorbis* and *Gyraulus crista*), are poorly represented in the Black Sea basin rivers. Because of its heterogeneity and the small number of species, this category is not important for the zoogeographical characteristics of the country. According to STADNICHENKO (1990), the range of *Aplexa hypnorum* is longitudinally disjunct, with a gap in Siberia. ZHADIN (1952) and FRANK et al. (1990) regard it as a Holarctic species.

The second group, with 12 species (10.1%), includes species distributed in more than one of the Palaearctic subregions but not found outside the Palaearctic region. Most of them are Holopalaearctic, with fewer West and Central Palaearctic species, found in all three catchment areas (Table 1). The group includes the palaeolimnetic *Bithynia tentaculata* and *Valvata piscinalis*. Pulmonates constitute the majority of the group and are best represented in the Danube area. *Radix auricularia* and *R. labiata*, which occur all over the country, have the widest distribution. *R. labiata* and *R. balthica* are found in all the altitudinal zones, whereas *Bithynia tentaculata* and *Stagnicola turricula* occur only in one zone. The lymnaeids are the most numerous (4) among the Palaearctic species.

Thirty one species (26.1%) represent the group of species confined to one Palaearctic subregion (Table 1). The group includes species with Eurosiberian and Mediterranean distribution (discounting endemics).

The Eurosiberian group includes 19 (16.0%) species (Table 1), with mainly European, West Eurosiberian and West and Central Eurosiberian distributions. Seven of them are found exclusively in Europe, three being widely distributed and four having limited ranges (Table 1). Finding the rare Central and North European *Myxas glutinosa* in the Skomlya River in Northwest Bulgaria (RUSSEV et al. 1994) is of great interest. Five species have been reported only for the Danube region. *Theodoxus transversalis* and *Viviparus acerossus* are regarded as Danube-Don endemics (ZHADIN 1952, STAROBOGATOV 1970). The recent data on their distribution do not support this view. Eurosiberian species in the Danube area are twice more numerous than in the other catchment areas. Two of them (*Anisus leucostoma* and *Bathyomphalus*



Table 1. Zoogeographical characteristic of the Bulgarian freshwater snails. Numbers of species for parts of the range resulting from introduction and resulting from possible changes given in brackets

Zoogeographical categories	Total number	Danube Basin	Black Sea Basin	Aegean Basin
Species distributed in Palaearctic and beyond it	10	9	6	9
Subcosmopolitan	(3)	(2)	(2)	(2)
New Zealand-European (introduced)	1			1
North American-European (introduced)	2	2	2	1
Holarctic	7 (10)	7 (10)	4 (7)	7 (9)
Species distributed only in Palaearctic	109	68	34	55
PALAEARCTIC TYPE	12	12	10	10
Holopalaearctic	5 (8)	5 (8)	3 (5)	4 (6)
West and Central Palaearctic	4 (5)	4 (5)	4	4 (5)
West Palaearctic	3	3	3	2
EUROSIBERIAN TYPE	19	18	7	12
Holoeurosiberian	2	2		2
West and Central Eurosiberian	3	3	2	2
West Eurosiberian	5 (7)	5 (7)	3 (4)	4
Disjunct Eurosiberian	1	1		1
European-Anatolian	1	1	1	
East European-Anatolian	(1)	(1)		
European	3 (5)	3 (5)	1 (2)	2 (3)
Central and North European	1	1		
Central and South European	(1)	(1)	(1)	(1)
Central and East European	1	1		
Central and Southeast European	2	1		1
MEDITERRANEAN TYPE	12	9	7	4
Lusitanian-Mediterranean (marine-brackish)	1		1	
Holomediterranean	(1)		(1)	
East Mediterranean	1		1	1
Northeast Mediterranean	1	1		1
South European	1	1	1	1
Southeast European-Pontian	4	4	2	1
Southeast European	1	1		
Ponto-Caspian	3	2	2	
Endemics and subendemics, total	66	29	10	29
Balkan subendemic	(1)	(1)		
Balkan endemic	3	2	1	2
Regional endemic	10 (11)	4 (5)		6
Local endemic	53 (55)	23 (25)	9 (10)	21 (22)
Relicts, total	8	6	4	2
Caspian relict	7	6	4	1
Preglacial relict	1			1
Total GASTROPODA	120	77	40	64

contortus) are found in a few altitudinal zones, and nine species occur only in one zone. The planorbids, with their seven species, are best represented among the Eurosiberian taxa. *Melanopsis parreyssi* (preglacial relict with Central and Southeast European distribution, regarded as Pannonian endemic) is probably extinct in Bulgaria.

The Mediterranean group includes 12 taxa (10.1%) (Table 1). All of its members (except *Hydrobia acuta*, a predominantly brackish Lusitanian-Mediterranean form) have Ponto-Mediterranean distribution. Nine species, distributed in the lowest stretches of the rivers of the Danube and Black Sea catchment areas, are regarded as Caspian relicts. Their absence in the rivers of the Aegean basin is explained by their origin and association with the Ponto-Caspian basin (ZHADIN 1952, STAROBOGATOV 1970, BĂNĂRESCU 1990). Most of the Mediterranean species occur in the Danube and Black Sea catchment areas.

ENDEMICIS AND RELICTS

The endemics include species which are not found outside the Balkan Peninsula. They are divided into Balkan (more than one Balkan country), Bulgarian (Bulgaria only), regional (more than one locality in a region), and local (one locality) species. Endemics are of high conservation value in the evaluation of any territory, and reflect the unique character of a fauna. The 66 endemic species (55.5% of all species; Table 1) in the Bulgarian fauna represent palaeo- and mesolimnic families. The local endemics (53 species, 44.5%) are the most numerous, followed by the regional endemics (10 species, 8.4%). Most of the local

endemics (58 species) are found in the Danube and Aegean catchment areas (Table 1) and only 10 occur in the Black Sea catchment area. The Stara Planina Mts, Pre-Balkan and Rhodope Mts are the regions with the greatest numbers of endemic species; they also hold the main speciation centres. Among the Balkan endemics, *Grossuana codreanui* was recorded from Romania, Bulgaria and Serbia (probably more than one species was recorded under the name); *Lithoglyphus pyramidatus* is known from the environs of the town of Lom on the Danube (regarded also as subendemic); *Stagnicola montenegrinus* is new for Bulgaria and till now found only along the Maritsa and Tundzha rivers (SCHNIEBS et al. 2012). *Melanopsis parreyssi* is regarded as a Lower Danube (regional) endemic. Most of the hydrobiids are endemic, with 53 local and eight regional endemic species described from Bulgaria. The rate of endemism of this family in Bulgaria is very high – 95.5%.

The relict gastropod fauna is a result of a complex palaeoclimatic and palaeogeographical changes from the Tertiary to the present. According to their origin, the relicts are preglacial (*Melanopsis parreyssi*, found in a thermal spring at the Pyaschnik Reservoir) and Caspian (7 species, associated with the Ponto-Caspian brackish region; STAROBOGATOV 1970, BĂNĂRESCU 1990, RUSSEV et al. 1998). Their ranges are Southeast European-Pontian (*Theodoxus danubialis*, *Esperiana esperi*, *E. daudebartii* and *Lithoglyphus naticoides*) and Ponto-Caspian (*Theodoxus pallasi*, *Turricaspia lincta*, *T. variabilis*). Relicts are of high conservation importance and contribute to the specificity and uniqueness of the fauna.

Table 2. Conservation status of Bulgarian freshwater snails

Category	Total number	Danube Basin	Black Sea Basin	Aegean Basin
Rare	17	17	9	12
Regionally Extinct	3		1	2
IUCN, total	65	51	26	40
IUCN-CR	6		1	5
IUCN-EN	1	1		
IUCN-VU	11	7		4
IUCN-NT	4	3	2	2
IUCN-LC	39	37	22	28
IUCN-DD	4	3	1	1
Bern Convention	1	1		
Habitats Directive	2	2	1	
Natura 2000	2	2	1	
CORINE	2	2	1	1
ESC	2	2	1	1
RBBG	3		2	



CONSERVATION ISSUES

Rare (stenoecious) species. This category includes taxa with few populations or known from a single locality only, as well as some species which, though found all over Bulgaria, usually occupy specific habitats. Negative microclimate changes, environmental pollution, and habitat disturbance cause their extinction or shrinkage of their ranges. Seventeen species (14.3%) are considered rare (discounting the subterranean forms); they are found in all three catchment areas (Table 2), the Danube basin being the richest in this respect.

Endangered species and taxa with high conservation value. Conservation value varies among species. It is especially high when supported by more than one criterion (e.g. rare and endemic, rare and relict, etc.). Sixty-five species (54.5%) of the Bulgarian freshwater snails are included in the IUCN, two – in the Habitats Directive, Natura 2000, CORINE and ESC each; three – in the Red Book of the Republic of Bulgaria and one – in the Bern Convention (Table 2).

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