

## Check list of the Bulgarian minor freshwater snails (Gastropoda: Risooidea) with some ecological and zoogeographical notes

DILIAN GEORGIEV

Department of Ecology and Environmental Conservation, Faculty of Biology, University of Plovdiv, 24, Tzar Assen Str., BG-4000 Plovdiv, Bulgaria, diliangeorgiev@abv.bg

**Abstract.** A synopsis and critical overview of all the literature on the freshwater minor snails (Gastropoda: Risooidea) of Bulgaria was made. A check list of 49 species known till now in the country with the ecological and zoogeographical categories to which the species belong was provided.

**Key words:** Hydrobiidae, species, diversity, Bulgaria, Balkans.

### Introduction

The beginning of the research on the freshwater minor snails in Bulgaria (Gastropoda: Risooidea: *Hydrobiidae*: *Tateinae*, *Belgrandiinae*, *Amnicolinae*, *Hydrobiinae*) started with the work of Wagner (1927). It continued till present with the papers of Glöer & Georgiev (2011), Georgiev & Glöer (2011), Georgiev (2011a, 2011b, 2011c) when it was evident that the country is a hot spot of species radiation, having a lot of endemic species and even few endemic genera.

The aim of this study was to collect all the information on the Bulgarian genera and species of the minor freshwater snails published, and to provide an adequate check list of species known till now occurring in the country which will help the future studies.

The check list was made with a critical overview on all the published papers for Bulgaria (Wagner 1927, Angelov 1959, 1965, 1967, 1972, 1976, 2000, Pinter 1968, Radoman 1983, Hubenov 2005, 2006, Glöer & Pešić 2006, Irikov & Georgiev 2008, Glöer & Georgiev 2009, 2011, Georgiev & Glöer 2011, Georgiev 2009, 2011a, 2011b, 2011c) and also a few summary works considering this group of aquatic snails on larger areas (Radoman 1983, Hershler & Ponder 1984, Kabat & Hershler 1993, Glöer 2002, Arconada & Ramos, 2003). The classification of Glöer (2002) was accepted for this paper.

As it was known that all the Bulgarian species from this taxonomic group are rheophilic species we divided the ecological groups considering the habitats: rivers and streams (RS), springs (SP), and cave running waters (CA). The zoogeographical categories were as follows: invasive (IN), European (EU), endemic for a particular geographic region (EG), local endemic (EL).

### Check list of the species

Family *Hydrobiidae* Troschel, 1857

Subfamily *Tateinae* Thiele, 1925

*Potamopyrgus* Stimpson, 1865

*Potamopyrgus antipodarum* (J. E. Gray, 1843) – IN, RS

Subfamily *Belgrandiinae* De Stefani, 1877

*Belgrandiella* (A. Wagner, 1927)

*Belgrandiella hessei* A. Wagner, 1927 – EL, CA

*Belgrandiella angelovi* Pinter, 1968 – EG, SP  
*Belgrandiella pussila* Angelov, 1959 – EL, CA  
*Belgrandiella bulgarica* Angelov, 1972 – EL, CA  
*Belgrandiella bureschi* Angelov, 1976 – EL (EG?), SP (CA?)  
*Belgrandiella zagoraensis* Glöer & Georgiev, 2009 – EG, SP  
*Belgrandiella dobrostanica* Glöer & Georgiev, 2009 – EG, SP  
*Belgrandiella bachkovoensis* Glöer & Georgiev, 2009 – EL (EG?), SP  
*Belgrandiella pandurskii* Georgiev, 2011 – EG, SP and CA  
*Belgrandiella stanimirae* Georgiev, 2011 – EL (EG?), CA (SP?)

**Pontobelgrandiella** Radoman, 1978

*Pontobelgrandiella nitida* (Angelov, 1972) – EL, CA

**Bythiospeum** Bourguignat, 1882

*Bythiospeum bureschi* (A. Wagner, 1927) – EL, CA  
*Bythiospeum copiosus* (Angelov, 1972) – EG, CA  
*Bythiospeum schniebsae* Georgiev, 2011 – EL, CA

**Devetakia** Georgiev & Glöer, 2011

*Devetakia krushunica* Georgiev & Glöer, 2011 – EL, CA  
*Devetakia pandurskii* Georgiev & Glöer, 2011 – EL, CA

**Cavernisa** Radoman, 1978

*Cavernisa zaschevi* (Angelov, 1959) – EL, CA

**Iglica** Wagner, 1927

*Iglica acicularis* Angelov, 1959 – EL, CA

**Hauffenia** Pollonera, 1898

*Hauffenia lucidula* (Angelov, 1967) – EL, CA

**Insignia** Angelov, 1972

*Insignia macrostoma* Angelov, 1972 – EL, CA

**Plagigeyeria** Tomlin, 1930

*Plagigeyeria procerula* (Angelov, 1965) – EL, CA

**Radomaniola** Szarowska, 2006

*Radomaniola bulgarica* Glöer & Georgiev, 2009 – EG, SP  
*Radomaniola rhodopensis* Glöer & Georgiev, 2009 – EG, SP

**Grossuana** Radoman, 1973

*Grossuana cordeanui* (Grossu, 1946) – EG, SP  
*Grossuana thracica* Glöer & Georgiev, 2009 – EG, SP  
*Grossuana angeltsekovi* Glöer & Georgiev, 2009 – EG, SP

**Balkanica** Georgiev, 2011

*Balkanica yankovi* Georgiev, 2011 – EL, CA

**Sadleriana** Clessin, 1890

*Sadleriana virescens bulgarica* (Wagner, 1927) ? – EL, SP

**Remark:** this species was not proven anatomically and is with unclear taxonomical status.

Subfamily **Amnicolinae** Tryon, 1862

**Bythinella** Moquin-Tandon, 1856

*Bythinella hansboetersi* Glöer & Pešić, 2006 – EL, SP  
*Bythinella markovi* Glöer & Georgiev, 2009 – EL, CA  
*Bythinella srednogorica* Glöer & Georgiev, 2009 – EL, SP  
*Bythinella ravnogorica* Glöer & Georgiev, 2009 – EL, SP  
*Bythinella walkeri* Glöer & Georgiev, 2009 – EL, SP  
*Bythinella gloeeri* Georgiev, 2009 – EL, CA  
*Bythinella stoychevae* Georgiev, 2011 – EL, CA  
*Bythinella aneliae* Georgiev & Stoycheva, 2011 – EL, SP

*Bythinella valkanovi* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella smolyanica* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella elenae* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella dedovi* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella izvorica* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella margritae* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella kleptuzica* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella rhodopensis* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella dierkingi* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella slaveyae* Glöer & Georgiev, 2011 – EL, SP  
*Bythinella angelovi* Glöer & Georgiev, 2011 – EL, SP

Subfamily **Hydrobiinae** Troschel, 1857

**Hydrobia** Hartman, 1821

*Hydrobia acuta* Draparnaud, 1805 – EU, RS

As a result of the synopsis made we register a total of 49 species of minor freshwater snails, and one species with unclear taxonomical status. The dominate genera were *Bythinella* and *Belgrandiella* with 19 (39% from all) and 10 (20% from all) species respectively. All the rest of the genera were only with 1 to 3 known species.

From all species 96% were endemics, with 5 endemic genera (*Pontobelgrandiella*, *Cavernisa*, *Insignia*, *Devetakia*, and *Balkanica*), one species was with European distribution and one was invasive (2% each).

Most of the species known till now inhabit spring waters (28; 57%), and cave running waters (20; 41%) from which some representatives of the genus *Belgrandiella* inhabit both habitats. Only two species occur in rivers and streams (4%).

On the basis of the current knowledge of this group of snails we consider that if future studies continued in detail the list of species could double or triple as many of the caves and springs are still not investigated in large territories as Stara Planina, Kraishte, Vitoshka, Rila, and Pirin mountains.

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