

On the Freshwater Snails of Strandzha Mountains and its Adjacent Coastal Area

Dilian Georgiev^{*1}, *Teodora Trichkova*², *Milcho Todorov*², *Ivaylo Dedov*³

¹University of Plovdiv, Faculty of Biology, Department of Ecology and Environmental Conservation, 24 Tzar Assen Str., BG-4000 Plovdiv, BULGARIA

²Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 1 Tsar Osvoboditel Blvd., 1000 Sofia, BULGARIA

³Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, 2 Gagarin Street, 1113 Sofia, BULGARIA

*Corresponding author: diliangeorgiev@gmail.com

Abstract. Six species of freshwater snails were newly recorded to the area of Strandzha Mts (Bulgaria): *Acroloxus lacustris*, *Anisus spirorbis*, *Aplexa hypnorum*, *Planorbarius corneus*, *Gyraulus albus*, and *G. laevis*. An updated check list was provided for this area containing a total of 27 species. The sum of the Palearctic and Holarctic species is highest in number (34%) but the percentage of local endemics is high too (27%). These endemics inhabit a few very restricted spring sites in the karstic regions of the mountains and belong to the genera *Bythinella*, *Radomaniola* and *Strandzha*.

Key words: freshwater, snails, Balkan Peninsula, Strandzha Mountains, diversity, distribution, zoogeography.

Introduction

The freshwater snails of Strandzha Mts. are not studied in detail. A review of all published literature was done (Valkanov, 1957; Lyutskanov, 1990; Angelov, 2000; Damyanov & Liharev, 1975; Georgiev & Glöer, 2013; Georgiev & Hubenov, 2013; Georgiev, 2014). Till now a total of 21 species of freshwater snails (Mollusca, Gastropoda) have been known from Strandzha Mts. and its adjacent coastal area.

Material and Methods

Data were collected from published sources and field surveys. A portion of the materials were collected in the course of the

Ecologia Balkanica
<https://ecologia-balkanica.com>

project "Joint Monitoring for Environmental Protection in BSB countries" in various habitats in Strandzha Mts. New collections in the area were carried out by the authors mainly during various projects between 2009 and 2021. One single record from 1993 was also added. The snails were hand-collected as well as by a standard hydrobiological net.

The zoogeographical groups are considered according to Georgiev (2014). The following abbreviations are used: LE – local endemic, EuA – European-Anatolian, P – Palearctic, H – Holarctic, MSEu – middle-south European, EuS – European-Siberian, EM – East Mediterranean, Eu – European, A – alien to Bulgaria and Europe.

Union of Scientists in Bulgaria – Plovdiv
University of Plovdiv Publishing House

Results and Discussion

Six species of freshwater snails were newly recorded to the area of Strandzha Mts:

Acroloxus lacustris (Linnaeus, 1758): 06.08.2011, Fakyiska River near Varovnik Village, N42 13 22.7 E27 11 33.5, T. Trichkova, M. Todorov leg., det.

Anisus spirorbis (Linnaeus, 1758): 29.09.2011, Arkutino Lake, N42 19 55.2 E27 43 34.1, T. Trichkova, M. Todorov leg., det.

Aplexa hypnorum (Linnaeus, 1758): 23-29.05.1993, Veleka River (?), near Sinemorets Village, coordinates not known, P. Mitov leg., I. Dedov det.;

Planorbarius corneus (Linnaeus, 1758): 06.08.2011, Fakyiska River near Varovnik Village, N42 13 22.7 E27 11 33.5, T. Trichkova, M. Todorov leg., det.

Gyraulus albus (O. F. Müller 1774): 08.06.2009, a small river at Popski Beach near Tsarevo Town, N42 10 12.4 E27 49 25.9, D. Georgiev leg., det.

Gyraulus laevis (Alder, 1838): 03.10.2012, Ropotamo River, "Velyov Vir" reservation, N42 17 59.1 E27 42 37.3, T. Trichkova, M. Todorov leg., det.

One new locality of the invasive *Potamopyrgus antipodarum* (J. E. Gray, 1843) was recorded during present study: a small river near the village of Brodilovo, 10.6.2021, N42 05 15.6 E27 51 08.3, D. Georgiev leg., det.

After our study a total of 27 species of freshwater snails were known from Strandzha Mts.

Updated check list of the freshwater snails of

Strandzha Mountains

(The newly recorded species are marked with an asterisk and are in bold)

Neritidae

Theodoxus fluviatilis (Linnaeus, 1758) - EuA

Bythinellidae

Bythinella dedovi Glöer & Georgiev, 2011 - LE

Bythinella elenae Glöer & Georgiev, 2011 - LE

Bythinella izvorica Glöer & Georgiev, 2011 - LE

Bythinella margaritae Glöer & Georgiev, 2011 - LE

Bythinella temelkovi Georgiev & Glöer, 2014 - LE

Hydrobiidae

Radomaniola strandzhica Georgiev & Glöer, 2013 - LE

Strandzhia bythinellopenia Georgiev & Glöer, 2013 - LE

Tateidae

Potamopyrgus antipodarum (J. E. Gray, 1843) - A

Lymnaeidae

Galba truncatula (O. F. Müller, 1774) - P

Radix auricularia (Linnaeus, 1758) - P

Radix balthica (Linnaeus, 1758) - P

Radix labiata (Rossmässler, 1835) - MSEu

Acroloxidae

****Acroloxus lacustris*** (Linnaeus, 1758) - EuS

Physidae

****Aplexa hypnorum*** (Linnaeus, 1758) - H

Physella acuta (Draparnaud, 1805) - A

Planorbidae

Ancylus fluviatilis (O.F. Müller, 1774) - Eu

****Anisus spirorbis*** (Linnaeus, 1758) - P

Anisus vorticulus (Troschel, 1834) - EuS

Ferrissia fragilis (Tryon, 1863) - A

****Gyraulus albus*** (O. F. Müller 1774) - H

****Gyraulus laevis*** (Alder, 1838) - H

Gyraulus piscinarum (Bourguignat, 1852) - EM

Hippetis complanatus (Linnaeus, 1758) - P

****Planorbarius corneus*** (Linnaeus, 1758) - EuS

Planorbis planorbis (Linnaeus, 1758) - H

Segmentina nitida (O. F. Müller, 1774) - P

With its unique geographical location and geology, Strandzha Mountains have a specific complex of freshwater snail species, taking into account their distribution (Fig. 1). The percentage of Palearctic and Holarctic species is typically the highest (34%), followed by local endemics which percentage is also high (27%). The endemics inhabit a few very small spring sites in the karstic regions of the mountains. These are mainly representatives of the genus *Bythinella* (5 recently described species), one species of *Radomaniola*, and one of *Strandzhia* (the only known species from this genus). The other

zoogeographical categories are represented with a low percentage and are relatively evenly distributed. However some parts of the

mountains still remain unexplored, especially its underground waters where some more local endemics of Rissooidea could be found.

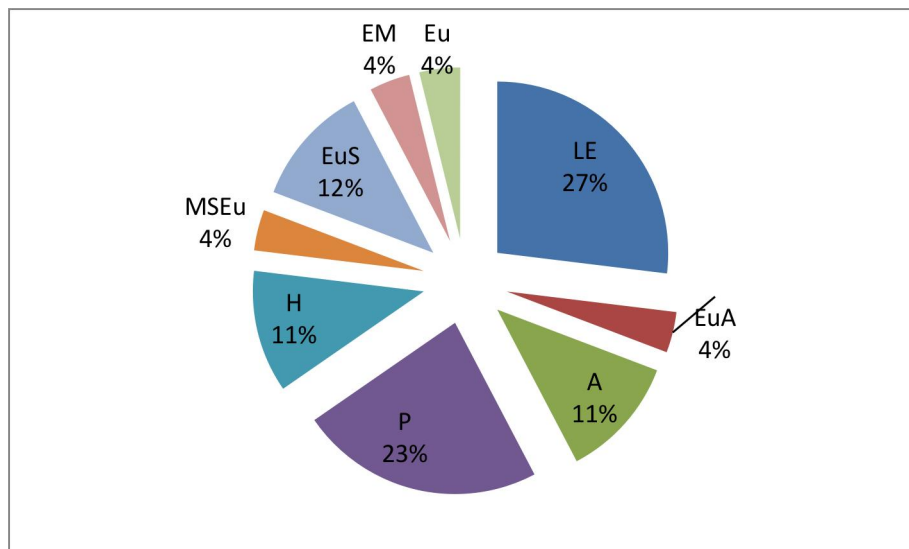


Fig. 1. Zoogeographical structure of the freshwater snail complex known from Strandzha Mountains and its adjacent coastal area.

Acknowledgements. Part of the trips of D. Georgiev were financed by project "BSB ECO MONITORING - 884" Joint Monitoring for Environmental Protection in BSB countries (2020-2022). The contents of this short note are the sole responsibility of the authors and do not necessarily reflect the views of the European Union. We thank Prof. Plamen Mitov for the provided specimens of *A. hypnorum*.

References

- Angelov, A. (2000). *Mollusca (Gastropoda et Bivalvia) aquae dulcis, catalogus Faunae Bulgaicae*. Pensoft & Backhuys Publishing, Sofia, Leiden.
- Georgiev, D. (2014). *The Freshwater Snails of Bulgaria*. Plovdiv University Press. (In Bulgarian).
- Georgiev, D. & Glöer, P. (2013). Identification key of the Rissooidea (Mollusca: Gastropoda) from Bulgaria with a description of six new species and one new genus. *North-Western Journal of Zoology*, 9(1), 103–112.
- Georgiev, D. & Glöer, P. (2014). A new species of *Bythinella* from Strandzha Mountain, SE Bulgaria (Gastropoda: Rissooidea). *Ecologica Montenegrina*, 1(2), 78-81. doi: [10.37828/em.2014.1.10](https://doi.org/10.37828/em.2014.1.10).
- Georgiev, D. & Hubenov, Z. (2013). The freshwater snails (Mollusca: Gastropoda) of Bulgaria: updated checklist of species and distributional data. *Folia Malacologica*, 21(4), 237-263. doi: [10.12657/folmal.021.026](https://doi.org/10.12657/folmal.021.026).
- Glöer, P. & Georgiev, D. (2011). Bulgaria, a hot spot of biodiversity (Gastropoda: Rissooidea)? *Journal of Conchology*, 40(5), 1-16.
- Lyutskanov, D. (1990). Size-weight characteristic of the representatives of the genus *Theodoxus* Montfort in Veleka River. *Travaux Scientifiques, Université de Plovdiv "Paisii Hilendarski", Biologie, Animalia*, 28(6), 11-25. (In Bulgarian).
- Valkanov, A. (1957). Katalog unserer Schwarzmeerfauna. *Trudove na Morskata Biologichna Sluzhba, Varna*, 19, 1-62. (In Bulgarian, Russian and German summary).

Received: 06.06.2022

Accepted: 30.07.2022