

<https://doi.org/10.22364/iarb.2022.03>

Investigation of occurrence of specially protected whorl snails *Vertigo* spp. in the habitats of EU importance

Digna Pilāte¹, Voldemārs Spuņģis^{2*}, Agnija Skuja², Dāvis Ozoliņš²

¹ Latvian State Forest Research Institute “Silava”

² Institute of Biology, University of Latvia

* Corresponding author: voldemars.spungis@lu.lv

Abstract: In Latvia the conservation status is described as unfavourable bad for three whorl snail species: *Vertigo angustior*, *V. geyeri* and *V. genesii*. Therefore we studied the malacofauna and assessed the species' occurrence in specially protected habitats of EU importance with different management practices.

Key words: *Vertigo angustior*, *V. geyeri* and *V. genesii*, *V. moulinsiana*

Introduction

In Latvia, the following four specially protected *Vertigo* species from Annex II of the Habitats Directive occur: *Vertigo angustior*, *V. genesii*, *V. geyeri* and *V. moulinsiana*. According to the report of the European Commission on the conservation status of specially protected species of EU importance for 2013 and 2018, in Latvia the conservation status is described as unfavourable bad for three species: *V. angustior*, *V. geyeri* and *V. genesii* (Rudzīte et al., 2010). The aim of this study was investigation of the malacofauna and the assessment of species occurrence in specially protected habitats of EU importance with different management practices.

Materials and Methods

Sampling was performed in accordance with the methods of the Latvian Natura 2000 sites invertebrate monitoring (compiled in 2013), method BEZ2: examination of whorl snail habitats. Survey sites were selected from maps, based on presence of potentially suitable habitats and previously known species localities. For the selection

of potentially suitable habitats, available habitat survey protocols from 2017–2019 from the project “Nature Census” (“Dabas skaitīšana”) were used. The selection of the sampling sites and number of samples was left to an expert. The investigation was carried out at ten specially protected nature territories and eight habitats of EU importance from 2019 to 2021 (Table 1).

Table 1. Habitats of EU importance, number of collected samples and number of samples, where especially protected whorl snail species were found (*Vertigo angustior* – *V. ang.*, *V. geyeri* – *V. gey.*, *V. genesii* – *V. gen.*)

Habitat of EU importance	Number of collected samples	<i>V. ang.</i>	<i>V. gey.</i>	<i>V. gen.</i>
2190 Humid dune slacks	9	0	0	0
6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)	13	9	8	1
6450 Northern boreal alluvial meadows	7	2	0	0
7140 Transition mires and quaking bogs	3	2	2	0
7160 Fennoscandian mineral-rich springs and springfens	6	2	1	0
7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	2	0	1	0
7220 Petrifying springs with tufa formation (<i>Cratoneurion</i>)	5	1	1	0
7230 Alkaline fens	8	8	7	0
Total	53	24	20	1

Results and discussion

In the investigated habitats, three specially protected whorl snail species were found: *V. angustior*, *V. genesii* and *V. geyeri*. *V. genesii* is considered very rare in Latvia and during our study was found associated with only one habitat type – 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*). This species *V. genesii* usually in EU is related with habitat type 7230 Alkaline fens un 7220 Petrifying springs with tufa formation (*Cratoneurion*). *V. angustior* and *V. geyeri* were more common and found in almost all studied habitats, but more often in 6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) and 7230 Alkaline fens, as well as in 7140 Transition mires and quaking bogs. *Vertigo* was absent in habitat 2190 Humid dune slacks. This habitat is apparently the least suitable for *Vertigo* species in Latvia, although the association of this habitat with *V. angustior* has been reported in the literature (Cameron et al., 2003). Studies on the occurrence of protected whorl snail species in this habitat have yet to be continued.

Several factors influencing the quality of *Vertigo* habitats and the occurrence were identified during the investigation: 1) overgrowth of the habitat with shrubs/trees because of non-management or natural succession; 2) changes in the hydrological regime due to melioration; 3) regular mowing or intensive grazing. Good populations were found in habitats with no management activities for the last ten years despite the overgrowth. However, removal of overgrowth could improve the population status of the species. It is recommended to plan mowing adaptively: to divide the managed area into several patches and to mow each of them every few years. In addition, grazing must be extensive.

Acknowledgement

Project “Sampling and investigation of mollusc (Mollusca) species” (No LU ZD2019/20912 (7.7/246/2019) was implemented according to the request of the Nature Conservation Agency of Republic of Latvia.

References

- Cameron, R. A. D., Colville, B., Falkner, G., Holyoak, G. A., Hornung, E., Killeen, I. J., Moorkens, E. A., Pokryszko, B. M., Proschwitz, T. von, Tattersfield, P. & Valovirta, I. 2003. Species accounts for snails of the genus *Vertigo* listed in Annex II of the Habitats Directive: In Speight, M. C. D., Moorkens, E. A. & Falkner, G. (Eds) “Proceedings of the Workshop on Conservation Biology of European *Vertigo* Species”. Dublin, 2002. Helda: 151–170.
- Rudzīte, M., Dreijers, E., Ozoliņa-Moll, L., Parele, E., Pilāte, D., Rudzītis, M., Stalažs, A. 2010. A Guide to the Molluscs of Latvia. LU Akadēmiskais apgāds, Riga, 252 pp.