

Micro-mammalia monitoring in the Western Carpathians, The Grapa Nature Reserve

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Abstract. This report summarizes the results of small terrestrial mammal monitoring that took place at Grapa National Reserve during the spring and autumn seasons in 2022. The reserve is a fragment of primeval forest with well-preserved native forest structures. During a total of 11 days of trapping, individuals of 5 rodent species were captured – *Myodes glareolus*, *Apodemus flavicollis*, *Apodemus sylvaticus*, *Mus musculus*, *Muscardinus avellanarius*.

Key words: micro-mammalia, zoological monitoring, Grapa National Reserve, Tatra Mountains

Characteristics of the site

Sample capture took place within the Grapa nature reserve. The reserve has an area of 408,600 m² and is near the cadastral village of Tatranská Javorina. The reserve was established in 1991 by The Decree of the Slovak Commission for the Environment on state nature reserves and protected sites in Tatra National Park. Slovak legislation, through Law 543/2002 on nature and landscape protection, provides five levels of territorial protection. The extent of restrictions increases with increasing degrees of protection. The fifth, most stringent level of protection is in place for the Grapa nature reserve. Within the reserve, the subject of these measures is a young (40-80 years) forest stand, that is significant in phytocenological and florogenetic terms. A mosaic of the most diverse forest communities can be found here, as well as trees older than 100 years in smaller quantities. The reserve is populated by the typical fir-spruce community of the Western Carpathians, on a base of Hutian claystone formation and a predominance of sandstones (SAŽP 2021; ŠGÜDŠ 2017). The structure of the primeval forest is favourable, and there is large amount of deadwood of varying degrees of decay (www.pralesy.sk 2022). The locality is minimally altered by human activity. Historically, there has been a prevalence of logging in the cadastral area of Tatranská Javorina (Marhefka *et al.* 2021), leading to structural changes

in forest stands. The shortcoming of this approach is the change to wood composition due to selective harvesting of beech, maple, and yew. Both beech and maple are currently being extensively regenerated, while spruce is being less-extensively regenerated (www.pralesy.sk 2022).

The presumed species of small mammals present in the reserve prior to our study were *Myodes glareolus* (Rodentia: Cricetidae), *Apodemus sylvaticus* (Rodentia: Muridae), and *Microtus subterraneus* (Rodentia: Cricetidae).

Research methodology

This study was conducted in the Grapa national reserve to observe what micro-mammalia are present at this location. Sherman traps were placed in three parallel lines. In the lower line there were 52 traps, with 45 in middle line, and 28 in upper line, placed approximately 15 m apart from each other. Traps were filled with straw and feed, such as apples, pork meat, and rodent mix.

The first trapping exercise took place in the spring of 2022 (April 5-7). Trap checking was conducted every five hours during the day and every three hours during the night and early morning (3:00, 6:00, 9:00, 14:00, 19:00 and 24:00) by groups of two people. Any trapped animals were carefully put inside a plastic bag for species determination and then released at the same location. If it was not possible to determine species in the dark, animals were placed in a cotton bag and transported to the laboratory for more accurate identification. Species were identified through determination keys or the professional expertise of professor RNDr. Marián Janiga, CSc. Afterward, animals were released at the capture site during the next trap check.

We repeated the sampling exercise during the autumn of 2022 (October 11-14, 18-21). During the first week, traps were placed in approximately the same transects as during the spring trapping season; during the second week, the first line was moved approximately 50 m parallel from the location of the third line in the previous trapping. We placed the same number of traps in each line. Sherman traps were used, as well as 15 wooden traps, and 18 wire traps with a different trigger mechanism. The traps were checked every 4-5 hours. We collected samples of hair for future toxicological research. This fur also served to identify any individuals that had been previously captured.

Conclusion

During spring sampling, 20 small mammal individuals were trapped – 17 bank vole (*Myodes glareolus*), and 3 individuals of wood mouse (*Apodemus sylvaticus*). The small number of trapped individuals was likely due to an unexpected snowfall before trapping (Table 1).

In autumn, in contrast to spring, Muridae predominated. 17 individuals of the genus *Apodemus* were trapped, as well as one house mouse (*Mus musculus*) (Rodentia: Muridae) was found. Only a single bank vole was found, and the presence of one hazel dormouse (*Muscardinus avellanarius*) (Rodentia: Gliridae) was also confirmed (Table 1).

Absence of the order Insectivora among trapped individuals was surprising, because occurrence of the family Soricidae was expected. Our previous experience with sampling of small terrestrial mammals indicated that shrews are more commonly trapped in winter months. Additionally, due to the large number of traps, a higher number of captured individuals was expected. During previous trapping events for toxicological research, the trapping success rate (i.e., the number of individuals divided by the number of traps) in October was up to 40%. A systematic sampling would be required to determine whether this low trapping success rate is a consequence of the generally low population density at the site, or a consequence of advancing climate change and increased temperature and drought (Dhawan *et al.* 2018; Selås *et al.* 2019), and the associated decline in food or increasing prevalence of parasites.

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Family	Name	Quantity	Season
Cricetidae	<i>Myodes glareolus</i>	17	Spring
		1	Autumn
Muridae	<i>Apodemus sylvaticus</i>	3	Spring
	<i>Apodemus</i> sp.	17	Autumn
	<i>Mus musculus</i>	1	Autumn
Gliridae	<i>Muscardinus avellanarius</i>	1	Autumn

Table 1. Summary of small terrestrial mammal individuals found in traps.

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