

Treasures of the Western Carpathian spring fens

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STUDIED AREA AND SITES

In the Western Carpathian landscape, spring fens (groundwater-fed wetlands with vegetation characterized mainly by high proportions of mosses) are a quite frequent habitat, due to the geomorphological characteristics and hydrological conditions of this area. The entire variability of fens, in terms of mineral richness, the main ecological gradient, can be found in this region (from the extremely rich tufa-forming fens to poor acid *Sphagnum*-fens). Altogether 158 treeless spring fen sites have been investigated through the Western Carpathians (Fig. 1) and many populations of several rare and highly endangered species have been found (e.g. *Vertigo moulinsiana*, *Vertigo angustior*, *Cochlicopa nitens*, *Vallonia enniensis*) including two glacial relict species (*Vertigo geyeri* and *Pupilla alpicola*), which are the only species exclusively inhabiting fens.

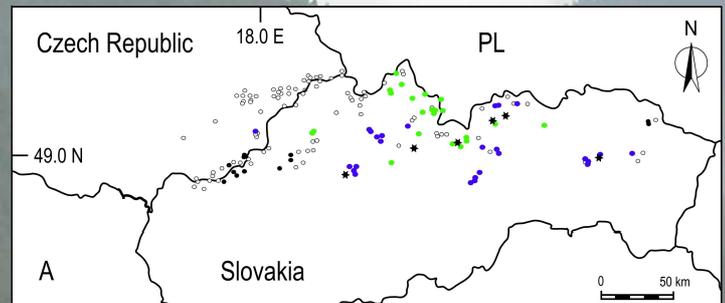


Figure 1. Distribution of all 158 studied fen sites with shown records of *P. alpicola* (blue points), *V. geyeri* (green points), both species (black stars), and *V. moulinsiana* (black points).



Vertigo geyeri is an exclusive inhabitant of treeless fens with a rather large ecological amplitude regarding the calcium gradient. It only avoids the most calcium rich travertine salt fens and poor *Sphagnum*-fens.
Shell up to 1.8 mm.

- Annex II, IUCN, Red Book, Red List
- a rare relict from wet phases of glacials
- 28 sites



Cochlicopa nitens is a rare species which inhabits only very few well preserved fens. It is also known from floodplain forests and other adjacent wetland habitats. Within fens, it is limited to calcareous fens where it seems to be a relict.
Shell up to 7.0 mm.

- IUCN, Red Book, Red List
- 3 sites



Vertigo angustior is a typical umbrella species living mostly on wetlands. In the study area the majority of its populations inhabit treeless fens. This species occurs only at calcium-rich fens mostly where tufa precipitates and is common in these types of fens.
Shell up to 1.8 mm.

- Annex II, IUCN, Red List
- 88 sites

Vertigo moulinsiana inhabits fens and also other lowland wetlands. However, the majority of Slovak populations is known from fens. Within the studied sites it is an exclusive inhabitant of calcareous fens, but only in warm areas.
Shell up to 2.5 mm.

- Annex II, IUCN, Red Book, Red List
- a rare relict from Middle Holocene
- 13 sites



Pupilla alpicola is an exclusive inhabitant of treeless and extremely calcareous fens. This species builds up very rich populations also in travertine salt fens, which are unfavourable for the majority of common fen snail fauna.
Shell up to 3.3 mm.

- Red Book, Red List
- a rare glacial relict
- 32 sites



Vallonia enniensis is a rare species typically living in calcium-rich wet lowland meadows often with higher salinity, but many of its meadow sites have been lost. Though rarely, it is also found in calcareous fens.
Shell up to 2.4 mm.

- IUCN, Red Book, Red List
- 5 sites



THE THREATS FOR FEN BIODIVERSITY AND RARE SPECIES

Fens are directly threatened by many negative anthropogenic changes (drainage, construction, afforestation, agriculture, etc.). One of the most serious changes for fen habitats are changes in hydrological conditions, because as many studies have shown the restoration of hydrologically degraded sites is almost impossible. Fen sites have also started to be endangered by successional changes, because over the last 50 years, people have abandoned traditional ways of land use (extensive grazing and regular mowing for hay-making). As traditional farming is no longer profitable, the maintenance of the fen biodiversity and the future of highly endangered species closely depends on conservation management practices.