

***Vitrea transsylvanica* – the new species of a Carpathian snail in the Bohemian Forest**

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Abstract

An empty shell of the Carpathian snail *Vitrea transsylvanica* was found on the Věvec Mt. in the Bohemian Forest foothills in 1999. Relatively dense population of this snail was confirmed during more detailed exploration of the site in 2001. This species has been hitherto known from the territory of the Czech Republic only from the outside mountain ranges of northern Moravia and Silesia, where its local populations have been in contact with a continuous area of occurrence in the Carpathians. Furthermore, this species is known from several isolated localities in southern Moravia, in Bohemia it concerns occurrences in vicinity of the town of Česká Třebová and in the region of the Ještěd Mt. Our findings represent the third isolated area of occurrence in Bohemia.

Key words: Gastropoda, *Vitrea transsylvanica*, faunistics, species distribution

INTRODUCTION

During a pilot malacozoological survey of the Bohemian Forest foothills in 1999, the Carpathian snail *Vitrea transsylvanica* (Clessin, 1877) was recorded by direct picking on the Věvec Mt. Therefore, we carried out a detailed survey of this locality in 2001. Its main result represented discovery of a relatively dense population of this species in a community containing also several other species of terrestrial snails interesting for such a type of stand. The classic direct picking was combined with a mixed sampling of soil litter from some preliminary selected promising microhabitats.

V. transsylvanica inhabits humid mountainous forests where it lives on the ground under dead leaves and wood (LOŽEK 1956). Its centre of distribution is in the oreophyticum (LOŽEK 2000a). This is the Carpathian species distributed through Slovakia, Poland, Ukraine, and Romania to Bulgaria, isolated populations live in Germany (Oberbayern) and Austria (Nord-Tirol) (KERNEY & al. 1983). In the Czech Republic it commonly lives in the mountain ranges of Silesia and Northeastern Moravia. These occurrences correspond with the continuous area of distribution – Moravskoslezské Beskydy Mts. (MÁCHA 1987), Hrubý Jeseník Mts. (MÁCHA 1970), and surroundings of the town of Vizovice (LOŽEK 1958). MÁCHA (1997) recapitulates all known occurrences in the region of Northern Moravia and Silesia. In other parts of Moravia this species occurs only sporadically: in surroundings of the town of Moravská Třebová (HRUBÝ 1966), the abyss bottom of Macocha and the glen of Pustý žleb in the Moravian Carst (LOŽEK 1952, KROUPA 1973), and the Javořina virgin forest in the Bílé Karpaty Mts. (2000, M. Horskák lgt.). LOŽEK's (1948) findings from surroundings of the town of Česká Třebová,

which was after longer period (in 1967) verified by BRABENEC (1978), were of great zoogeographical importance as the first record in Bohemia and the most western occurrence of this species then. An entirely isolated occurrence in the region of the Ještěd Mts. (in 1964) reported BRABENEC (1977) and LOZEK (1988). Moreover, fossil postglacial shells were also found at this locality (MATĚ & LOZEK 1989). Since 1978, *V. transsylvanica* has not been found on the Bohemian territory. The present status of its distribution on the territory of the Czech Republic is schematically shown in Fig. 1.

This species is ranked in the list of Czech snails as a critically endangered species (JUŘÍKOVÁ & al. 2001) in particular due to the fact that Bohemia represents the very edge of its distribution area. Similarly, its spot occurrence in Germany causes its ranking into category R – species with a geographic restriction in the German red list (JUNGLUTH & VON KNORRE 1998).

SITE DESCRIPTION

The Větec Mt. (762.5 m a.s.l.) is located in South Bohemia in the central foothills of the Bohemian Forest only 5 km out of the Šumava Protected Landscape Area. This hill is situated ca 3.5 km south-east of the village of Čkyně and 6 km north-east of the town of Vimperk. The larger northern part of the forest, where *V. transsylvanica* occurs, belongs to the mapping quadrant No. 6849.

From the geological point of view, the Větec Mt. occurs in the so-called Monotonous Group of Moldanubicum. It is built up by a small massif of biotite granite, thus it differs geologically from the surrounding gneisses and migmatites. In the east-west direction of the mountain, there is a dyke of amphibol-biotite porphyry of syenite composition, which reaches width of several metres only. This rock is generally richer in some important elements than the surrounding rock types do (CaO, MgO, P₂O₅, Cr₂O₃). The uranium contents, usually unmeasurable in most Moldanubian rocks, shows elevated concentration in the syenitic porphyry (about 20 ppm U) (1 ppm ≈ 0.0001 wt. %). Also radiometric data from other occurrences of this rock type witness about higher concentration of radiogenic elements in the syenitic porphyry.

The major part of the Větec Mt., including the top-hill area, is forested with natural mixed scree forests, relict pine stands, and Norway spruce plantations. *V. transsylvanica* inhabits here eventhe debris forests on the upper NW slope of the hill (49°06'04.21" N; 13°51'59.08" E), where rocky formations up to 15 m high occur. One part of the canopy consists of same proportions of both norway spruce (*Picea abies*) and silver fir (*Abies alba*). Towards the north the scree grades into a block field where the above mentioned tree species are complemented with rowan ash (*Sorbus aucuparia*) and hazel (*Corylus avellana*). A bush storey on both stands is formed by red-berried elder (*Sambucus racemosa*) and black-berried honeysuckle (*Lonicera nigra*). The herb layer is dominated by dog's mercury (*Mercurialis perennis*) and wood-sorrel (*Oxalis acetosella*), a little sparsely as well fescue (*Festuca altissima*), woodruff (*Galium odoratum*), heath dog violet (*Viola canina*) and nettle (*Urtica dioica*) occur in lower amounts. The altitude of the occurrences of *V. transsylvanica* range from 730 to 750 m a.s.l. at this locality.

RESULTS

In total 31 species of terrestrial snails were detected (Table 1) at the Větec Mt. The species *Helicigona lapicida* (Linné, 1758), which was found out by direct picking in debris only in 1999, was not included into Table 1. In the snail assemblage under study strictly forest spe-

Table 1. – List of species sampled May 3, 2001 on the locality Věneč Mt. (numbers of living snails/empty shells are in parentheses).

Species	direct picking		litter sifting	
	individuals (n)	relative abundance (%)	individuals (n)	relative abundance (%)
<i>Carychium tridentatum</i> (Risso, 1826)	5 (5/0)	0.91	98 (57/41)	25.65
<i>Acanthinula aculeata</i> (O. F. Müller, 1774)	–	–	8 (5/3)	2.09
<i>Columella edentula</i> (Draparnaud, 1805)	3 (2/1)	0.55	58 (18/40)	15.18
<i>Vertigo pusilla</i> O. F. Müller, 1774	1 (0/1)	0.18	6 (0/6)	1.57
<i>Ena montana</i> (Draparnaud, 1801)	1 (0/1)	0.18	1 (1/0)	0.26
<i>Clausilia dubia</i> Draparnaud, 1805	9 (9/0)	1.65	–	–
<i>Alinda biplicata</i> (Montagu, 1803)	46 (46/0)	8.41	–	–
<i>Punctum pygmaeum</i> (Draparnaud, 1801)	4 (1/3)	0.73	18 (3/15)	4.71
<i>Discus rotundatus</i> (O. F. Müller, 1774)	35 (26/9)	6.40	4 (3/1)	1.05
<i>Discus ruderatus</i> (A. Férussac, 1821)	18 (16/2)	3.29	–	–
<i>Euconulus fulvus</i> (O. F. Müller, 1774)	1 (0/1)	0.18	1 (0/1)	0.26
<i>Vitrina pellucida</i> (O. F. Müller, 1774)	5 (0/5)	0.91	1 (0/1)	0.26
<i>Semilimax semilimax</i> (J. Férussac, 1802)	10 (0/10)	1.83	1 (0/1)	0.26
<i>Vitrea subrimata</i> (Reinhardt, 1871)	37 (6/31)	6.76	6 (1/5)	1.57
<i>Vitrea transsylvanica</i> (Clessin, 1877)	3 (0/3)	0.55	3 (1/2)	0.79
<i>Aegopinella nitens</i> (Michaud, 1831)	132 (101/31)	24.13	124 (43/81)	32.46
<i>Aegopinella pura</i> (Alder, 1830)	21 (3/18)	3.84	32 (5/27)	8.38
<i>Perpolita hammonis</i> (Ström, 1765)	3 (1/2)	0.55	1 (0/1)	0.26
<i>Oxychilus depressus</i> (Sterki, 1880)	10 (2/8)	1.83	–	–
<i>Limax cinereoniger</i> Wolf, 1803	19 (19/0)	3.47	–	–
<i>Malacolimax tenellus</i> (O. F. Müller, 1774)	3 (3/0)	0.55	–	–
<i>Lehmannia marginata</i> (O. F. Müller, 1774)	24 (24/0)	4.39	–	–
<i>Arion subfuscus</i> (Draparnaud, 1805)	10 (10/0)	1.83	–	–
<i>Petasina unidentata</i> (Draparnaud, 1805)	26 (11/15)	4.75	5 (2/3)	1.31
<i>Monachoides incarnatus</i> (O. F. Müller, 1774)	19 (4/15)	3.47	–	–
<i>Urticicola umbrosus</i> (C. Pfeiffer, 1828)	13 (5/8)	2.38	2 (0/2)	0.52
<i>Isognomostoma isognomostomos</i> (Schröter, 1784)	65 (54/11)	11.88	13 (3/10)	3.40
<i>Causa holosericea</i> (Studer, 1820)	20 (8/12)	3.66	–	–
<i>Cepaea hortensis</i> (O. F. Müller, 1774)	2 (1/1)	0.37	–	–
<i>Helix pomatia</i> Linné, 1758	2 (0/2)	0.37	–	–
Total	547	100	382	100

cies prevailed (52%), among them several more sensitive species were present too (e.g. *A. aculeata*, *D. ruderatus*, *C. holosericea*, and *V. transsylvanica*). Also predominately woodland species, occurring occasionally in open or semio-open mesic habitats, are well represented (19%), e.g. *A. biplicata*, *C. hortensis* as well as *H. pomatia* which is common in shrubs. The group of mesophilous and mostly catholic species (e.g. *P. pygmaeum*, *P. hammonis*) was similarly abundant (19%). Predominantly hygrophilous species (6%; *C. tridentatum* and *C. edentula*) and species of damp forest habitats (3%; only *U. umbrosus*) were rather rare. Ecological groups were distinguished according to LOŽEK (1964) and LISICKÝ (1991).

A. nitens was the most dominant species both by direct picking and by litter sifting (24% and 32%, respectively; Table 1). While individuals of *A. biplicata* (8%), *D. rotundatus* (6%), *V. subrimata* (7%) and *I. isognomostomos* (12%) were most often found by direct picking, small-sized species, such as *C. tridentatum* (26%), *C. edentula* (15%) and *A. pura* (8%) predominated in litter sifting. More details are given in Table 1. From an ecological point of view, strictly forest species (*V. subrimata*, *A. nitens*, *A. pura*, and *I. isognomostomos*) were dominant in the snail assemblage in samples taken by both direct picking and litter sifting whereas predominantly hygrophilous species (*C. tridentatum* and *C. edentula*) dominated in litter sifting only.

Vitrea transsylvanica was found at the locality studied first time on March 24, 1999 (1 shell, L. Dvořák lgt. et coll.). On May 3, 2001 3 shells were recorded by direct picking and 1 living snail and 2 shells by litter sifting (all specimens L. Dvořák & M. Horsák lgt., M. Horsák coll).

DISCUSSION AND CONCLUSIONS

The discovery of *Vitrea transsylvanica* in a marginal part of the Bohemian Forest is noticeable predominantly from zoogeographical aspect, because this is one of the westernmost localities in its area of distribution. Moreover, this very isolated population is situated closer to other isolated populations (Northern Bohemia, the Alps) than to its main range in the Carpathians (Fig. 1), whose western border is ca 250 km away. This isolated occurrence could be explained by two different theories. A more probable option is that this local population is connected with the Alpine occurrences (Oberbayern, Nord-Tirol – KERNEY & al. 1983), whereas the other isolated localities in the Czech Republic are rather connected with occurrences in the Carpathian region (*V. LOŽEK* – pers. comm.). As less probable appears the expansion of this species into the marginal part of the Bohemian Forest in connection with that of other

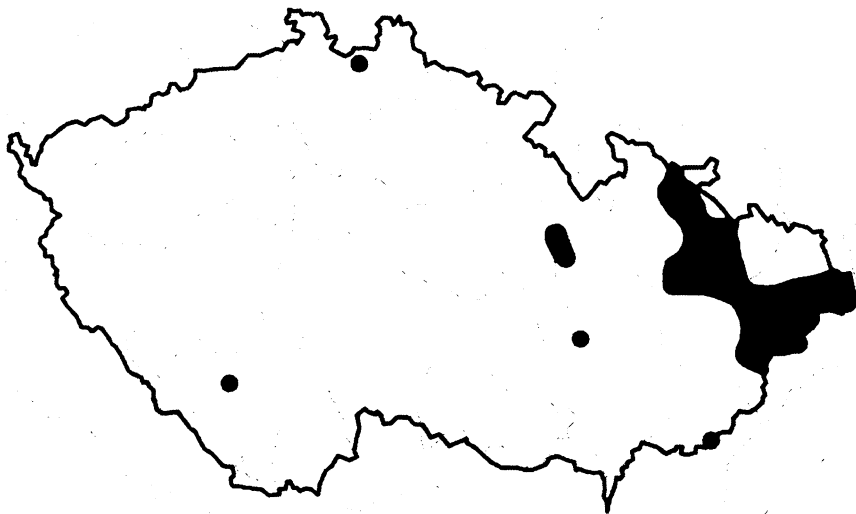


Fig. 1. – Schematic map of the present distribution of *Vitrea transsylvanica* (Clessin) in the Czech Republic.

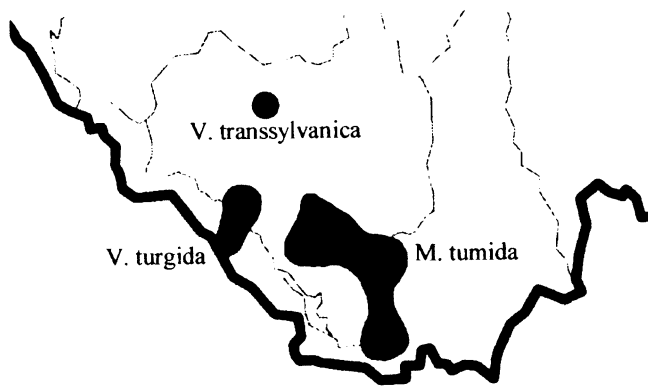


Fig. 2. – Schematic map of the present distribution of three Carpathian snail species (*Vitrea transsylvanica*, *Vestia turgida*, and *Macrogastra tumida*) in the Bohemian Forest.

Carpathian species, such as *Macrogastra tumida* (Rossmässler, 1836) and *Vestia turgida* (Rossmässler, 1836), into this region. *V. transsylvanica* could appear here during the Holocene climatic optimum likewise in the Moravian Karst (LOŽEK 2000b).

Furthermore, our finding is notable also from some ecological aspects of the stand itself and especially of its wider surroundings. Generally dryer character of this locality documents the presence of subxerothermous habitats in the adjacent area. While in the Carpathians this snail occurs in humid habitats within larger forest complexes, in our case it occurs in relatively small forest stand on the northwestern slope of the Věneč Mt. surrounded with spruce forests plantations and relict pine stands. Of interest is also the isolation of the Věneč Mt. from the Bohemian Forest itself, where the species would be expected at relevant stands at higher altitudes.

As mentioned above, three Carpathian species have been documented from the Bohemian Forest at present; however, with no overlap of their local limited areas of distribution (Fig. 2). *V. turgida* was found in a narrow strip between the Boubín Mt., the town of Strážný and the Studená Vltava river (LOŽEK 1998), *M. tumida* is species a characteristic of the Želnavské hory mountain range, Blanský les Mts., surroundings of the Libín Mt. and of the Vltava river valley downstream of the town of Vyšší Brod (LOŽEK 1998) and *V. transsylvanica* is known only from the only above described locality so far. In the West Carpathians, however, the ranges of the three snails in question are more or less identical and in a number of cases all three species live together.

APPENDIX – INTERESTING FINDING OF SPECIES *COLUMELLA ASPERA*

On the southwestern slope of the Věneč Mt. (mapping quadrant Nr. 6949) is situated a relict dry pine wood on rocky substrate. Although the snail species *Columella aspera* Waldén, 1966 is known predominantly from damp or even peat habitats it was found also here by the standard method of picking, therefore sweeping of bilberry (*Vaccinium myrtillus*), where it occurs most often (HLAVÁČ & HORSÁK 2001). Originally, only two localities of this species were known from the territory of Bohemia; however, during last three years it was found on several dozens of localities concentrated especially in mountain regions of Southwest Bohemia (e.g. Bohemian Forest, Novohradské hory Mts., Brdy Mts.). According to the present know-

ledge, the easternmost locality of *C. aspera* in the Czech Republic is situated in Žďárské vrchy PLA in Dářko National Nature Reserve (August, 29, 2001, M. Horskák Igt. et coll.).

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