

## PRELIMINARY MALACOLOGICAL SURVEY OF THE SITE OF COMMUNITY IMPORTANCE KAMENNÁ BABA (BRANISKO – BACHUREŇ)

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**Abstract:** Site of community importance (SCI) Kamenná Baba is due to its natural beauties one of the most beautiful and most interesting parts of the eastern Slovakia. Big part of the site represents the same-named National Nature Reserve. This site was included to the NATURA 2000 network due to the occurrence of several rare species, natural sceneries and biotops. Major part of site is situated in the north-eastern part of the Branisko Mts and minor part in the south-west part of the Bachureň Mts. These mountains are one of the least known areas from the malacological point of view. In september 2009 quantitative sampling supplemented with individual collection was carried out at several sites of the site Kamenná Baba. West Carpathian elements (*Clausilia dubia carpatica* Brancsik, 1888, *Petasina unidentata carpatica* (Poliński, 1929)) meet the elements with the centre in eastern part of Carpathians (*Perforatella dibothrion* (M. von Kima-kowicz, 1884), *Vestia gulo* (E. A. Bielz, 1859)) in this area. Several zoologically significant species such as *Pupilla sterrii* (Voith, 1840), *Pupilla triplicata* (Studer, 1820), *Vertigo alpestris* Alder, 1838, *Clausilia cruciata* (Studer, 1820), *Balea perversa* (Linnaeus, 1758) are present.

**Key words:** Mollusca, SCI Kamenná Baba, species protection, ecoelement, areotyp.

### INTRODUCTION

Submitted contribution presents historically first data about malacofauna of Bachureň Mts, to which the northern part of the study Site of community importance (SCI) Kamenná Baba extends. The southern part of the site, belongs to Branisko Mts. This part of the study site was designated as the National Nature Reserve Kamenná Baba. There is a lack of data about molluscs from both Bachureň Mts and Branisko Mts. Only a sporadic data obtained by J. Šteffek are available. A few of the recorded species have been mentioned in the description of natural characteristics of the both core areas as a part of the National Ecological Network of Slovakia – NECONET (KOREŇ & ŠTEFFEK 1996). In this monograph four Carpathian species recorded in the northern core area of Branisko Mts (Smrekovica) are mentioned – *Oxychilus orientalis* (Clessin, 1887), *Vestia turgida* (Rossmässler, 1836), *Faustina faustina*, *Monachoides vicinus*. In total five species

(*Vitrea transsylvanica*, *O. orientalis*, *Macrogastra plicatula*, *Cochlodina orthostoma* and *F. faustina*) have been found in the southern core area Slubica. On 4.7.1997 Šteffek recorded ten species (*Cochlicopa lubricella*, *Vertigo pusilla*, *Truncatellina cylindrica*, *Chondrina clienta*, *Vallonia costata*, *V. pulchella*, *Vitrea pellucida*, *Aegopinella pura*, *Punctum pygmaeum* and *Euomphalia strigella*) on a limestone cliff nearby the Jewish Cemetery in the village of Vyšný Slavkov. The most recent data about molluscs from the study area were collected from an analysis of a deposit of the Svinka stream in the vicinity of the Branisko settlement (leg. Šteffek, 13.9.2004). The following species were observed: *V. turgida*, *V. gulo*, *Laciniaria plicata*, *Perforatella dibothrion*, *Acicula parcelineata* (Clessin, 1911) etc.

### MATERIAL AND METHODS

A quantitative sampling was carried out at 6 localities of the study site in September 2009. Big snails

as well as slugs were collected and identified on the spot. After species identification the individuals were released to their natural habitat. Samples were processed in a standard way. For each site geographical coordinates, altitude and vegetation cover were identified.

### Characteristics of the study area

The site of community importance Kamenná Baba (Fig. 1) with an area of 339.98 ha is situated between two orographic units Branisko and Bachureň divided by the road linking villages Lačnov and Lipovce. Geological basement is composed mostly of dolomites – core part of the Branisko Mts is overlain by nappes of dolomites from the Cretaceous period. The part of the area located in the Bachureň Mts consists of dolomites which arise from the Tertiary Inner Carpathian flysch belt. The altitude varies from 545 m to 995 m. Dominant morphological – morphometrical landform type is medium and strongly dissected upland. Prevailing soil types are cambisols. The average annual air temperature is 2–6 °C. Average annual precipitation varies between 600 mm and 800 mm (MIKLÓS & HRNČIAROVÁ 2002). In the area calciphilous beech forests predominate, more locally, relict forests with *Pinus sylvestris* occur. Forests coverage is more than 90 % of the territory. Fauna and flora linked to the rocky formations is a specific feature of the SCI Kamenná Baba.

Locality 1: 49°3'27.8" N, 20°55'32.6" E, the stony gate "Vrátnica", dolomite bed-rock, altitude 800 m,

*Fagus sylvatica*, *Pinus sylvestris*, *Picea abies*, *Abies alba*, *Acer platanoides*.

Locality 2: 49°3'30.5" N, 20°55'50.9" E, the Lačnov canyon, dolomite cliff, altitude 610 m, *Sambucus* sp., *Asplenium trichomanes*, *A. viridis*.

Locality 3: 49°3'28" N, 20°55'57.5" E, the Lačnov canyon, floodplain of the Lačnov brook, altitude 600 m, *Cirsium* sp., *Lycopus* sp., *Urtica dioica*, *Petasites* sp.

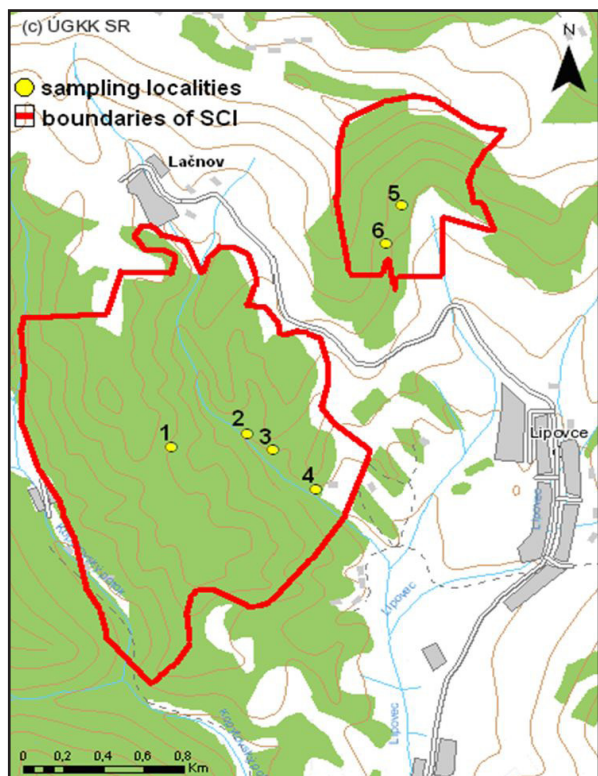
Locality 4: 49°3'21.5" N, 20°56'8.4" E, the Lačnov canyon, steep slope under the dolomite cliff, altitude 625 m, *Fagus sylvatica*, *Pinus sylvestris*, *Picea abies*, *Euonymus* sp.

Locality 5: 49°4'11.5" N, 20°56'25.5" E, surroundings of the Zlá diera cave, altitude 785 m, beech forest, *Corylus* sp.

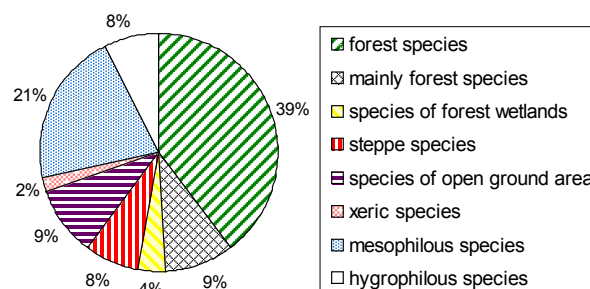
Locality 6: 49°4'4.7" N, 20°56'22.3" E, xerothermic limestone rocks, altitude 805 m, *Fagus sylvatica*, *Corylus* sp., *Betula* sp., *Larix decidua*, *Asplenium ruta-muraria*.

### RESULTS AND DISCUSSION

During a two-day preliminary survey of the SCI Kamenná Baba 53 species of mollusks were recorded in total number of 1246 individuals (Tab. 1). Limestone–dolomite geological base contributes to relatively high diversity of molluscs in the area. In the northern part, dolomites are gradually covered by the paleogene sandstones of the flysch belt which is mostly poor on mollusks. In flysch, molluscs particularly occur in the riparian vegetation in alluvial plains of rivers. According to ecoelements identified by Lisický (Fig. 2) (sensu LISICKÝ 1991) the majority of recorded species belongs to forest ecoelements (28 species). The study area represents the easternmost occurrence of a small epilithic gastropod *Pyramidula pusilla* in Slovakia. It is also the second easternmost occurrence of another epilithic species *Chondrina clienta*. The easternmost locality of this species is in Humenský Sokol National Nature Reserve which is a part of Vihorlat Mts. Two of the observed forest species (*Vestia gulo*, *Monachoides vicinus*) indicate forest wetlands.



**Figure 1.** The Site of the community importance Kamenná Baba with selected localities of sampling.



**Figure 2.** Ecological groups of molluscs in study area (sensu LISICKÝ 1991).

**Table 1.** Mollusks of the Site of community importance Kamenná Baba (Branisko – Bachureň).

**Ecotypes** (sensu LISICKÝ 1991): 1 forest species – SI; 2 mainly forest species – SI(AG), SIth; 3 species of forest wetlands – SIh; 4 steppe species – ST, STp; 5 species of open ground area – PT, PT(SI), SIS; 6 xeric species – XR, 7 mesophilous species – AG, AGp, SIp; 8 hygrophilous species – HG; AG – agricolae, HG – hygricolae, PT – patenticolae, SI – silvicolae, p – petrophilous, th – thamnophilous.

**Areotypes** (sensu LISICKÝ 1991): I.b – Holarctic, I.c – Palaearctic; II.a – Euro-Siberian, II.e – European, II.f – West Palearctic; III.c – Atlantic; IV.a – Central European, IV.b – Central and East European, IV.e – Central and Southeast European, IV.f – Moetic-Central European, IV.g – Balthic-Dacian and Central European, IV.j – Peripannonian; V.a – Carpathian, V.b – Alpine-Carpathian, V.h – West Carpathian; VI.c – Alpine and Southeast European, VI.d – Mediterranean and Alpine; VIII.a – Central European and Meridional, VIII.b – Alpine-Meridional.

Species	Ecotype LISICKÝ '91	Areotype LISICKÝ '91	localities					
			1	2	3	4	5	6
<i>Aegopinella pura</i> (Alder, 1830)	1 SI	II.e	3	1	29	-	8	-
<i>Cochlodina laminata</i> (Montagu, 1803)	1 SI	II.e	2	1	-	-	-	-
<i>Macrogastera plicatula</i> (Draparnaud, 1801)	1 SI	II.e	1	4	-	-	-	-
<i>Malacolimax tenellus</i> (O. F. Müller, 1774)	1 SI	II.e	-	1	1	-	-	-
<i>Vertigo pusilla</i> O. F. Müller, 1774	1 SI	II.e	-	13	2	-	3	2
<i>Acanthinula aculeata</i> (O. F. Müller, 1774)	1 SI	II.f	1	1	1	1	1	-
<i>Bulgarica cana</i> (Held, 1836)	1 SI	IV.a	-	-	-	-	2	-
<i>Ena montana</i> (Draparnaud, 1801)	1 SI	IV.a	-	-	-	-	1	-
<i>Isognomostoma isognomostomos</i> (Schröter, 1784)	1 SI	IV.a	2	2	1	-	1	-
<i>Clausilia cruciata</i> (Studer, 1820)	1 SI	IV.b	1	-	-	-	-	-
<i>Cochlodina orthostoma</i> (Menke, 1828)	1 SI	IV.g	-	1	-	-	-	10
<i>Discus perspectivus</i> (Megerle et von Mühlfeld, 1816)	1 SI	IV.j	-	-	9	-	-	-
<i>Bielzia coerulans</i> (M. Bielz, 1851)	1 SI	V.a	-	-	-	-	2	-
<i>Faustina faustina</i> (Rossmässler, 1835)	1 SI	V.a	4	8	1	2	8	-
<i>Perforatella dibothrion</i> (M. von Kimakowicz, 1884)	1 SI	V.a	-	-	-	-	2	-
<i>Vitrea transsylvanica</i> (Clessin, 1877)	1 SI	V.a	-	-	-	-	3	-
<i>Eucobresia nivalis</i> (Dumont et Mortillet, 1854)	1 SI	V.b	-	-	4	-	2	-
<i>Petasina unidentata carpatica</i> (Poliński, 1929)	1 SI	V.h	-	2	2	-	-	-
<i>Daudebardia brevipes</i> (Draparnaud, 1805)	1 SI	VIII.a	-	-	-	-	1	-
<i>Daudebardia rufa</i> (Draparnaud, 1805)	1 SI	VIII.a	-	-	-	-	2	-
<i>Vitrea diaphana</i> (S. Studer, 1820)	1 SI	VIII.b	1	-	-	-	-	-
<i>Oxychilus glaber</i> (Rossmässler, 1835)	2 SI(AG)	IV.e	-	-	-	1	1	-
<i>Alinda biplicata</i> (Montagu, 1803)	2 SI(AG)	IV.f	9	7	-	110	4	-
<i>Vitrea crystallina</i> (O. F. Müller, 1774)	2 SI(HG)	II.e	2	-	-	-	-	-
<i>Aegopinella minor</i> (Stabile, 1864)	2 SIth	IV.h	-	1	-	-	-	-
<i>Cochlodina cerata</i> (Rossmässler, 1836)	2 SIth	V.a	3	-	-	-	-	-
<i>Monachoides vicinus</i> (Rossmässler, 1842)	3 SIh	V.a	1	2	1	2	-	-
<i>Vestia gulo</i> (E. A. Bielz, 1859)	3 SIh	V.a	-	1	11	28	-	-
<i>Pupilla sterrii</i> (Voith, 1840)	4 ST	I.c	-	3	-	-	-	-
<i>Pupilla triplicata</i> (S. Studer, 1820)	4 ST	VIII.a	-	7	-	-	-	13
<i>Chondrina clienta</i> (Westerlund, 1883)	4 STp	VI.c	-	-	-	3	-	-
<i>Pyramidula pusilla</i> (Vallot, 1801)	4 STp	VI.d	18	34	-	170	-	6
<i>Pupilla muscorum</i> (Linnaeus, 1758)	5 PT	I.b	-	-	-	1	-	-
<i>Vallonia pulchella</i> (O. F. Müller, 1774)	5 PT	I.b	1	-	-	12	-	15

**Table 1.** Continued.

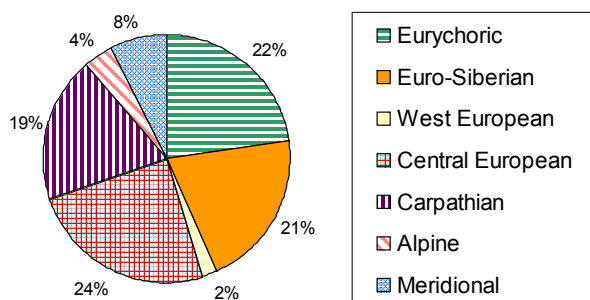
Species	Ecotype LISICKÝ '91	Areotype LISICKÝ '91	localities					
			1	2	3	4	5	6
<i>Truncatellina cylindrica</i> (A. Férussac, 1807)	5 PT	II.e	2	7	-	8	-	100
<i>Vallonia costata</i> (O. F. Müller, 1774)	5 PT(SI)	I.b	-	24	17	36	-	3
<i>Euomphalia strigella</i> (Draparnaud 1801)	5 SIS	IV.b	-	-	-	-	-	1
<i>Cochlicopa lubricella</i> (Rossmässler 1834)	6 XR	I.b	-	-	-	-	1	-
<i>Cochlicopa lubrica</i> (O. F. Müller 1774)	7 AG	I.b	-	1	8	-	-	-
<i>Euconulus fulvus</i> (O. F. Müller 1774)	7 AG	I.b	-	8	9	2	3	2
<i>Perpolita hammonis</i> (Ström 1765)	7 AG	I.c	-	1	5	-	-	-
<i>Punctum pygmaeum</i> (Draparnaud 1801)	7 AG	I.c	9	51	4	27	30	35
<i>Vitrina pellucida</i> (O. F. Müller 1774)	7 AG	I.c	-	25	12	2	6	2
<i>Vitrea contracta</i> (Westerlund 1871)	7 AG	II.e	-	-	-	-	2	-
<i>Balea perversa</i> (Linnaeus 1758)	7 AGp	III.c	-	-	-	3	-	-
<i>Vertigo alpestris</i> Aalder 1838	7 Slp	I.c	-	60	-	20	-	-
<i>Clausilia dubia dubia</i> Draparnaud 1805	7 Slp	IV.a	1	-	-	10	4	1
<i>Laciniaria plicata</i> (Draparnaud 1801)	7 Slp	IV.a	-	4	-	-	1	-
<i>Clausilia dubia carpatica</i> Brancsik 1888	7 Slp	V.a	-	18	-	-	-	-
<i>Columella edentula</i> (Draparnaud 1805)	8 HG	I.b	-	-	12	-	-	-
<i>Succinella oblonga</i> (Draparnaud 1801)	8 HG	II.a	-	-	18	-	-	-
<i>Carychium tridentatum</i> (Risso 1826)	8 HG	II.e	1	6	17	-	1	-
<i>Vertigo substriata</i> (Jeffreys 1833)	8 HG	IV.b	-	-	9	-	-	-
Total			62	294	173	438	89	190

Notable is occurrence of two relict steppe species – *Pupilla sterrii* and *P. triplicata* which were found on the top dolomite cliffs of the Lačnov canyon and limestone rocks close to the Zlá diera cave. These xerophilous species live in the vicinity of species primarily inhabiting boreal taiga such as *Vertigo alpestris* and *Clausilia cruciata*. On the dolomite cliffs in the middle of the Lačnov canyon occurs sparsely ribbed subspecies *Clausilia dubia carpatica* with scattered area of occurrence in Slovakia. This subspecies has been recorded on travertine of Dreveník (ŠTEFFEK 1988) as well. In older forests

remained several typical primeval forest species – *Bulgarica cana*, *Clausilia cruciata* which climb up the trees in a rainy weather.

From the zoogeographical point of view the attention should be given to Carpathian species *Perforatella dibothrion* with the centre of occurrence in the Eastern Carpathians. Here, in surrounding forests it reaches the west boundary of its natural distribution area. Notable is also a presence of atlantic species *Balea perversa* recorded on dolomite rocks in the Lačnov canyon. In Slovakia, this species lives predominantly on castle ruins, e.g. Sitno (ŠTEFFEK 1986), Šášov (LISICKÝ 1979). Very rarely it occurs in natural biotopes, e.g. Vtáčnik (ŠTEFFEK 2005), Szaboova skala (LOŽEK 1962). Record from the SCI Kamenná Baba is its easternmost occurrence in Slovakia. The closest known locality of the species are rocks of the Spiš castle (ŠTEFFEK et al. 2008). A list of areotypes (sensu LISICKÝ 1991) recorded in study area is shown on Fig. 3.

As a result of another research carried out close to the study area several species were recorded. These species are likely to be present in the SCI Kamenná Baba as well. From the zoogeographical point of view it is noteworthy to mention presence



**Figure 3.** Zoogeographical groups of molluscs in study area (sensu LISICKÝ 1991).

of the following two West European species – *Discus rotundatus* (O. F. Müller, 1774) and *Cepaea hortensis* (O. F. Müller, 1774). While the first one reaches its eastern boundary of natural area in here, the latter tends to be invasive as confirmed by its wide distribution in urban areas over last decade. In fluvial deposit of the Kopytovský brook close to the southern boundary of the study area *Cecilioides acicula* was observed. It is a late-Holocene soil-dwelling species which had been expanding to Slovakia from the south during the Wallachian colonization.

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