

## Data on the recent mollusc fauna of the Fekete Hill (Villány Hills, S Hungary)

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**Abstract:** Mollusc assemblages of the Fekete Hill (5 sampling areas) were analysed on the basis of 20 soil samples taken in the years 1997–1999. The author presents data on the mollusc fauna of the Fekete Hill with new localities of some species.

### Introduction

The present paper is aimed to give data on the terrestrial mollusc fauna of the Fekete Hill situated in Villány Hills, S Hungary. Previously A. Gebhardt investigated the area, his re-ideated material is presented by Varga (1988). Some sporadic data are also available in Pintér et al. (1979).

### Study area, sampling and data analyses

The field surveys were carried out in 1997–1999. Fekete Hill is protected area belonging to the Duna–Dráva National Park (UTM code: BR98) where five different habitats were sampled quantitatively with four equal volume soil samples per areas (1 l soil from a 20 cm \* 20 cm quadrat). The sampling areas are the following (see Fig. 1.):

Area 1: sparse and open rocky grassland on Triassic dolomite (*Chrysopogono-Festucetum dalmaticae*) exposed to the S (Borhidi–Dénes 1997).

Area 2: bottom of some clumps of trees, transitional covered vegetation on Triassic dolomite exposed to the S.

Area 3: ecoton-like ridge region, closed *Aconito anthorae-Fraxinetum orni* association on Triassic dolomite exposed to the N.

Area 4: closed oak forest (*Orno-Quercetum pubescentis*) association on Triassic dolomite exposed to the S.

Area 5: closed oak-hornbeam forest (*Asperulo taurinae-Tilietosum*) on Pleistocene loess exposed to the N.

The soil sampling was completed with picking up some single individuals. The soil samples were washed on 0,8 mm mesh. This material contained both living and dead individuals. The selected malacological material was identified according to Kerney et al. (1983) and Soós (1943). The aggr. (aggregatum) signal were used in the case of the genus *Truncatellina* when the shells were broken so much that they were unidentifiable (Table 1.). The number of apexes were counted in order to estimate the number of individuals per sample.

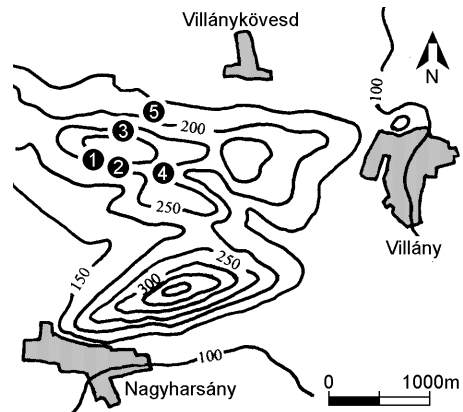


Fig. 1. Map of the Fekete Hill with the location of the sampling areas (1–5).

**Table 1.:** Distribution of the species among the sampling areas. First number means the number of individuals per area (data of 4 soil samples are drawn together), number after '/' mark means the spatial constancy of the species among the soil samples (between 1 and 4). Single number means that only one soil sample was taken from the given area. +: individuals that were collected independently of the soil samples, x: *Limax cinereoniger*, \*: species with the occurrence mentioned by Varga (1988).

Sampling area	1	2	3	4	5
<i>Cochlicopa lubricella</i> (Porro, 1838)	1/1	–	1/1	10/3	–
<i>Truncatellina cylindrica</i> (Férussac, 1807)	44/4	–	33/3	104/3	–
<i>Truncatellina claustralis</i> (Gredler, 1856)	–	–	17/1	53/3	–
<i>Truncatellina aggr.</i>	36/4	–	54/3	163/3	–
<i>Granaria frumentum</i> (Draparnaud, 1801)	125/4	–	32/4	66/3	–
<i>Vallonia costata</i> (O. F. Müller, 1774)	–	–	–	6/2	–
<i>Vallonia pulchella</i> (O. F. Müller, 1774)*	4/2	–	3/2	117/3	–
<i>Acanthinula aculeata</i> (O. F. Müller, 1774)	–	1/1	42/3	20/4	–
<i>Chondrula tridens</i> (O. F. Müller, 1774)*	–	–	–	6/3	–
<i>Ena obscura</i> (O. F. Müller, 1774)	–	–	5/2	–	–
<i>Zebrina detrita</i> (O. F. Müller, 1774)	155/4	–	53/4	10/3	–
<i>Punctum pygmaeum</i> (Draparnaud, 1801)	1/1	–	77/3	79/4	1/1
<i>Vitrina pellucida</i> (O. F. Müller, 1774)*	–	3/2	3/1	1/1	–
<i>Vitrea contracta</i> (Westerlund, 1871)	1/1	–	–	6/2	–
<i>Aegopinella minor</i> (Stabile, 1864)*	1/1	54/4	56/3	31/4	5/3
<i>Oxychilus inopinatus</i> (Uliény, 1887)	13/2	–	1/1	–	–
<i>Daudebardia rufa</i> (Draparnaud, 1805)	3/2	–	8/2	–	–
<i>Limacidae</i>	–	1/1	1/1	2/1	x
<i>Euconulus fluvus</i> (O. F. Müller, 1774)	–	–	–	1/1	–
<i>Ceciloides acicula</i> (O. F. Müller, 1774)	–	–	5/1	11/3	–
<i>Cochlodina laminata</i> (Montagu, 1803)	–	–	1/1	1/1	+
<i>Laciniaria plicata</i> (Draparnaud, 1801)	–	–	1/1	2/1	–
<i>Helicella obvia</i> (Menke, 1828)	149/3	1/1	11/3	7/2	–
<i>Euomphalia strigella</i> (Draparnaud, 1801)*	+	3/3	25/4	13/4	11/3
<i>Cepaea vindobonensis</i> (Férussac, 1821)	1/1	–	1/1	1/1	–
<i>Helix pomatia</i> Linnaeus, 1758	1/1	3/3	5/3	5/4	3/1
Sum total (from 4 soil samples)	535	66	435	715	20

Similarity of the species composition was calculated by the Matusita quantitative dissimilarity index, and the similarity structure was analysed by Principal Coordinate Analysis (PCoA). The NuCoSA package (Tóthmérész 1993) were used for the computations.

The traditional Shannon and Simpson diversity indices were used (the base number of logarithm was 10), and we also calculated the evenness based on the Shannon diversity. The Simpson index is more sensible to the abundant species than the Shannon index which is more sensible to the rare species. The evenness gives information about the abundance structure of the assemblages.

## Results

During the three year survey of the Fekete Hill 1.771 individuals of 25 mollusc species were collected from 20 soil samples (Table 1.). On the basis of these data the rocky grassland (Area 1) is dominated by *Zebrina detrita*, *Granaria frumentum*, *Helicella obvia* and *Truncatellina cylindrica*. The dominant species of the rocky grasslands are the same as on the neighbouring Szársomlyó (Sólymos 1996). The transitional like Area 2 has very poor fauna with common species like *Euomphalia strigella* and *Aegopinella minor*. The fauna of the closed oak-hornbeam forest (Area 5) is similar to Area 2 and the oak-hornbeam forest on the N slope of Szársomlyó (Sólymos–Nagy 1997). *Truncatellina claustralis* occurred in the closed areas of S slope and the ridge region of the Fekete Hill (Area 3 and 4). On Szársomlyó, we can find three *Truncatellina* species (*T. cylindrica*, *T. callicratis* (Scacchi, 1833), *T. claustralis*) (Kovács–Richnovszky 1989, Sólymos–Nagy 1997), contrary to the sampled areas of the Fekete Hill. *Ena obscura* and *Daudebardia rufa* were rarely found in some samples (Area 1 and 3). Area 4 is very similar to Area 3 with some species being characteristic to both areas. These are *Acanthinula aculeata* and *Punctum pygmaeum*. Clausiliidae snails occurred the areas with closed vegetation (Area 3, 4 and 5). Both *Cochlodina laminata* and *Laciniaria plicata* is infrequent. Few shells of Limacidae slugs came out from soil samples, and living specimens of *Limax cinereoniger* Wolf, 1803 were found on the N slope of Fekete Hill (Area 5).

## Discussion

Pintér et al. (1979) mentions the occurrence of *Orcula dolium* (Draparnaud, 1801) on the Fekete Hill. The species haven't been found during the three year investigation. In Gebhardt's collection there are some species that were not found recently: *Aegopinella resmanni* (Westerlund, 1883), *Bradybaena fruticum* (O. F. Müller, 1774), *Clausilia dubia* Draparnaud, 1805, *Cochlicopa lubrica* (O. F. Müller, 1774) and *Zonitoides nitidus* (O. F. Müller, 1774) (Varga 1988). Table 1. shows the species that have not been mentioned by previous works.

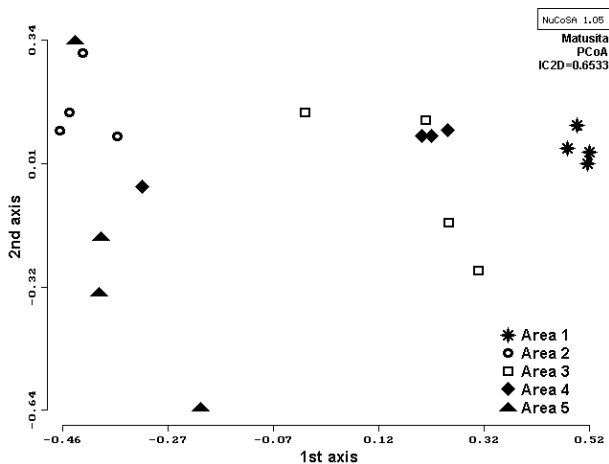


Fig. 2. Ordination of the studied mollusc assemblages (soil samples) by Principal Coordinate Analysis (PCoA). The Matusita dissimilarity index was applied. Information content in 2 dimensions: 0.6533

The multivariate statistical analysis shows (Fig. 2.) that the soil samples from Area 1 are very similar to each other and these are segregated from the others in a compact way. Soil samples from Area 3 and Area 4 are similar to each other and both are relatively dispersed. Soil samples of Area 2 are similar to the samples from Area 5, but without as large dispersion as Area 5 has.

Areas with very poor mollusc fauna (Area 2 and 5) are segregated from the diverse areas. Area 1 (rocky grassland) is a distinct group with a moderately diverse fauna where some frequent species rules the assemblages (Simpson diversity is higher than Shannon). Area 3 and Area 4 are the most diverse areas on Fekete Hill with the highest number of species and high diversity values (Shannon index is higher than Simpson). The high evenness value of Area 5 might be false because of the low number of individuals. Excluding Area 5, the evenness values are getting lower in the following way: Area 3 – Area 4 – Area 1 – Area 2. Concerning the Shannon and the Simpson index the trend is the same.

I am planning further comparative examinations in Villány Hills connected to the "Botanical and zoological researches in the Villány Hills" project coordinated by Janus Pannonius Museum and Duna–Dráva National Park.

**Table 2.:** Diversity statistics of the studied mollusc assemblages. The base number of logarithm was 10, the evenness value and the effective number of species were calculated by the Shannon diversity

Sampling area	1	2	3	4	5
Number of species	14	7	22	23	4
Number of individuals	535	66	435	715	20
Simpson diversity	0.7734	0.3287	0.8971	0.8711	0.6421
Shannon diversity	0.7245	0.3371	1.0697	1.0130	0.4820
Evenness	0.6321	0.3989	0.7968	0.7439	0.8005

### Acknowledgements

I would like to thank Z. Varga and P. Sümegei for their helpful comments, T. Deli for advices and his help in identification, A. Dénes and A. Nagy giving their help during the field works and sampling, Á. Uherkovics for some bibliography and the Duna–Dráva National Park for the permissions. The research was partly supported by the "Students for Science" section of the Pro Renovanda Cultura Hungariae Foundation.

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