

# The communities of the beetles (Coleoptera) of Veporské vrchy

Vladimír Langraf & Janka Schlarmannová

*Department of Zoology and Anthropology, Faculty of Natural Sciences UKF, Nábřežie mládeže  
91, SK-949 74 Nitra; vladimir.langraf@ukf.sk, jschlarmannova@ukf.sk*

**Abstract:** The main aim of the work was to gain the information about the beetles coenosis structures (Coleoptera) from Veporské vrchy. We gained the specimens by using ground traps, which were placed in the middle of each biotope. As a fixing liquid we used 36% formaldehyd. The collection of the traps was realised in regular 2 – weeks long intervals in the time from 26. 4. 2013 to 24. 10. 2013. Together, we collected 83 individuals of the beetles belonging to 19 species and 8 families.

**Key words:** Coleoptera, fauna, biotope, Utekáč.

## Introduction

Utekáč is a small village spreading in the lowland of Veporské vrchy along the river Rimavice a it is also the part of Slovenské rudohorie. This territory has never been documented in detail. That is the main reason why the fauna in this territory has not also been researched. Therefore, we focused on this territory and also contributed to enrich our knowledge of the beetles communities (Coleoptera). The knowledge of the beetles (Coleoptera) and their spreading in the surroundings of Veporské vrchy are described by Franc (1995, 2001, 2010, 2012); Müllerová (2013); Vician (2007); Vician Ed. (2008a, 2008b, 2011).

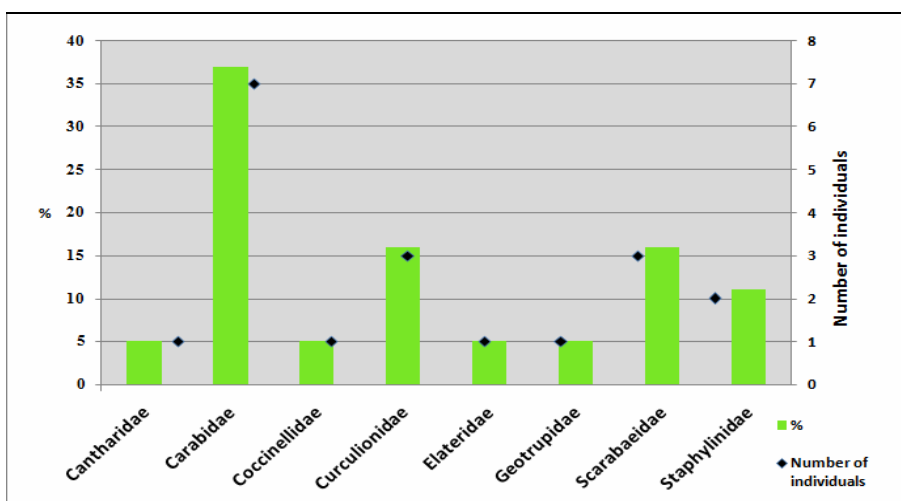
## Materials and methods

We realised the collection of the beetles in days from 26. 4. 2015 to 24. 10. 2013 in regular 2-weeks long intervals. We gained the specimens by using the ground traps (NOVÁK Ed., 1969) which were placed in the middle of each biotope. As a fixing liquid we used 36% formaldehyd. We determined the studying material according the works: Bej-Bienko Ed. (1962); Kult (1947); Zahradník (2008). The research was realised in 3 biotopes:

- 1) Spruce forest in the territory of Farkaška – it lies 570 metres above the sea level. (48°36'31"S 19°47'38"V);
- 2) Meadow in the territory of Lichovo – it lies 556 metres above the sea level. (48°36'30"S 19°48'35"V);
- 3) Bank growth near the river Rimavica – it lies 433 metres above the sea level. (48°36'29"S 19°47'57"V).

## Results and Discussion

On the studying biotopes – spruce forest, meadow, and riparian growth of the river Rimavica – we gained 83 individual beetles belonging to 19 species and 8 families: Cantharidae, Carabidae, Coccinellidae, Curculionidae, Elateridae, Geotrupidae, Scarabaeidae and Staphylinidae. The most frequently occurring the representatives of the Carabidae family (37 % from the whole number). The least frequently occurred the representatives of the Coccinellidae family (5 % from the whole number) Elateridae (5 % from the whole number) and Geotrupidae (5 % from the whole number) (Fig. 1.). The family with the highest number of individuals was represented by Carabidae (49 individuals) and Curculionidae (15 individuals). The families with the lowest number of individuals were Cantharidae (1 individual), Coccinellidae (1 individual) and Elateridae (1 individual).



**Fig. 1.** Expression of the dominance of the families on the research territory.

From the results of our work we found that the highest number of individuals 44, belonging to 7 species and 3 families was found in the spruce forest biotope. The lowest number of individuals we found in the riparian biotope of the river Rimavica (10), belonging to 5 species and 4 families (Tab. 1). We found the same results as the work of Müllerová (2013) and Franc (2001, 2010) in the case of *Carabus nemoralis*. In compare with the knowledge of Vician (2008b, 2011), we caught 3 same species: *Carabus violaceus*, *Poecilus cupreus*, *Pseudoophonus rufipes*. The previous research realised in the nearby surroundings by Franc (2001), showed the same result in the case of two species *Geotrupes stercorosus* and *Staphylinus erythropterus*. The *Carabus hortensis* was corresponding with the work of Müllerová (2013). The research of Vician (2007), focused on the family Curculionidae, had the same species *Liophloeus tessulatus*. The gained species from the family Carabidae, we divided according to Hůrka, Veselý & Farkač (1996) into the bioindicative group R (relict), A (adaptable) and E (euryopic).

The most individuals were from the group A: *Abax parallelepipedus*, *Carabus hortensis*, *Carabus nemoralis*, *Carabus violaceus*. To the group E belong the species: *Poecilus cupreus* and *Pseudoophonus rufipes*. The group R was represented by *Carabus problematicus*.

**Tab. 1.** Systematic list of the found species

Encearment: N – number of individuals, D (%) – domination, F (%) – frequency

Family	Spruce forest			Meadow			Bank growth of the river Rimavica		
	N	D	F	N	D	F	N	D	F
<i>Species</i>									
<b>Cantharidae</b>									
<i>Cantharis rustica</i> FALLÉN, 1807	-	-	-	1	3.45	7.69	-	-	-
<b>Carabidae</b>									
<i>Abax parallelepipedus</i> PILLER & MITTER- PACHER, 1783	11	25	46	-	-	-	-	-	-
<i>Carabus hortensis</i> LINNAEUS, 1758	9	20	54	-	-	-	-	-	-
<i>Carabus nemoralis</i> O. F. MÜLLER, 1764	10	23	31	-	-	-	-	-	-
<i>Carabus problematicus</i> HERBST, 1786	1	3	7.7	-	-	-	-	-	-
<i>Carabus violaceus</i> LINNAEUS, 1758	9	20	46	-	-	-	-	-	-
<i>Poecilus cupreus</i> LINNAEUS, 1758	-	-	-	2	6.9	15.4	2	20	7.7
<i>Pseudoophonus rufipes</i> DE GEER, 1774	-	-	-	5	17.3	23.1	-	-	-
<b>Coccinellidae</b>									
<i>Coccinella septempunctata</i> LINNAEUS, 1758	-	-	-	1	3.45	7.69	-	-	-
<b>Curculionidae</b>									
<i>Liophloeus tessulatus</i> BEDEL, 1886	-	-	-	-	-	-	2	20	15.4
<i>Otiorhynchus ovatus</i> LINNAEUS, 1758	-	-	-	12	41.4	23.1	-	-	-
<i>Otiorhynchus singularis</i> LINNAEUS, 1758	1	3	7.7	-	-	-	-	-	-
<b>Elateridae</b>									
<i>Agrypnus murinus</i> LINNAEUS, 1758	-	-	-	1	3.45	7.69	-	-	-

**Tab. 1.** (continued)

Family	Spruce forest			Meadow			Bank growth of the river Rimavica		
	N	D	F	N	D	F	N	D	F
<i>Species</i>									
<b>Geotrupidae</b>									
<i>Geotrupes stercorosus</i> LINNAEUS, 1758	3	7	15	-	-	-	-	-	-
<b>Scarabaeidae</b>									
<i>Amphimallon solstitiale</i> LINNAEUS, 1758	-	-	-	1	3.45	7.69	-	-	-
<i>Cetonia aurata</i> LINNAEUS, 1758	-	-	-	-	-	-	1	10	7.69
<i>Phyllopertha horticola</i> LINNAEUS, 1758	-	-	-	1	3.45	7.69	2	20	7.69
<b>Staphylinidae</b>									
<i>Philonthus decorus</i> STEPHENS, 1829	-	-	-	1	3.45	7.69	-	-	-
<i>Staphylinus erythropterus</i> LINNAEUS, 1758	-	-	-	4	13.75	7.69	3	30	7.69
<b>Summary</b>	44			29			10		

## Conclusions

From the results, we count out the species diversity ( $H = 1.078$ ), which was the highest in the meadow biotope and the lowest in the riparian biotope ( $H = 0.558$ ), which was influenced by antropogenous influences. We used the Shannon – Wiener index (Losos et al., 1984). The value of the species diversity of the biotope meadow is possibly caused by the fact, that it is eaten by cattle and the ground is rich in humus. The highets value of equitability (Losos et al., 1984) was found on the meadow biotope ( $E = 0.968$ ), where 29 found individuals were equally placed among 10 species. The more markably representative was the dominant species *Otiorynchus ovatus*. The lowest value of equitability was found in the biotope river ( $E = 0.501$ ), where the found 10 individuals were inequally spread among 5 species. The more markably representative species was *Staphylinus erythropterus*.

The highest frequency and domination (Losos et al., 1984) were shown by the species *Abax parallelepipedus* ( $F = 46\%$ ,  $D = 25\%$ ), *Carabus hortensis* ( $F = 54\%$ ,  $D = 20\%$ ) belonging to the family Carabidae. These species are connected with the forest biotopes of all the types from lowlands to the mountain degree. The next species was *Otiorynchus ovatus* ( $F = 23\%$ ,  $D = 41\%$ ) belonging to the family Curculionidae, which is present from lowlands to mountain degree. In its food, it prefers leaves of the plants *Fragaria*, *Rubus* (which were very frequent on the meadow) and in the forest it was *Quercus*, *Picea*, *Abies*.

A very interesting and faunistically important finding is the discovery of species *Carabus problematicus* in the spruce forest in Farkaška territory. It is spread over a very

large part of Europe. The centre of the research is in the western Europe. In the north, it ranges north of the Arctic Circle. It is also widely spread on the British Isles (England, Wales, Scotland, Ireland). It is present from June to September in dry, open pine forests. It is situated near the mountains. It is missing in lowlands. The local occurrence was found in Malá Fatra, Strečno, Ponitrie – Sokolec, Žiar nad Hronom (Majzlan, 1999), Veľká Fatra (Franc, 2002). It is the very important indicator of natural health of forest ecosystems.

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