

## Beetles (Coleoptera) of the Veľká Fatra Mts with special reference to bioindicatively significant species

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**Abstract.** This paper deals with distribution, vulnerability and bioindicative value of the scarcer beetles (Coleoptera) in the Veľká Fatra Mts. Although this territory is very attractive, it has not been properly investigated from coleopterological point of view. My research of beetles in Veľká Fatra, carried out during the last two decades, brought more than 500 species. This paper includes 172 of them. Some of them are very rare and especially remarkable from zoogeographical point of view: *Rhysodes sulcatus*, *Liodopria serricornis*, *Benibotarus taygetanus*, *Mycetoma suturale*, *Zilora sericea*, *Melandrya barbata*, *M. dubia*, *Ditylus laevis*, *Brachyta interrogationis*, *Pseudogaurotina excellens*, etc. Despite this mountain complex is overtopping upper forest boundary, a lot of thermophilic species (including Mediterranean ones) occur in higher altitudes as well: *Staphylinus (Ocyopus) ophthalmicus*, *Lomechusa paradoxa*, *Maladera holosericea*, *Cicones undatus*, *Oodescelis polita*, *Anaesthesis testecea*, *Stenopterus rufus*, *Phytoecia nigripes*, *Antipus macropus*, etc.

**Key words:** Beetles (Coleoptera), Veľká Fatra Mts, bioindication, insect conservation

### Introduction and methods

Although the Veľká Fatra Mts ranks among the most attractive mountain massifs in Slovakia, the level of entomological research of this territory is not satisfactory. It also concerns the numerous order of beetles. With the exception of larger study by Valenčík (1980) only sporadic records of beetles from Veľká Fatra have been published. Therefore I would like to improve this data insufficiency. In this paper I summarise the results of my coleopterological research in Veľká Fatra, that was carried out during the last two decades. I applied current methods of collecting, especially sweeping the vegetation and individual collecting under the bark and in hollows of old trees. The material was identified according to the keys by Freude, Harde, Lohse (1964 – 1983) and the further accessible publications. All findings listed were mine, except where the name of different collector is added.

The research was carried out in the following sites (abbreviations are also used in the table 2):

**A** → the area of Krížna (1574 m a. s. l.) including the sites Turecká – Salašky, Ramžiná and Majerova skala. Habitats: older or up to ancient beech and mixed forests, forest clearings, meadows and rocky pastures.

**B** → ‘Hornojelenská dolina’ valley: a narrow karst valley with adjacent steep slopes. Habitats: littoral vegetation of the brook, older beech forest, open pine forest on the cliffs.

**C** → Zvolen: a mountain (1402 m a. s. l.) above the Donovaly tourist centre including SW ridge Motyčská hoľa. Habitats: older beech and spruce forests, subalpine rocky grasslands.

**D** → the area of Kozia skala: a steep rocky mountain (1202 m a. s. l.) above the Gaderská valley, including the branch western ridge Pekárova. Habitats: older open beech forest, shrubbery, rocky slopes and cliffs, screes and xerothermic grasslands.

**E** → Skalná: an impressive rocky massif (1297 m a. s. l.) between Dedošova and Selenecká valleys, including the ‘Padva’ Nature Reserve (below only “NR”). Habitats: older beech and mixed forests, pine forests on the cliffs, rocky grasslands.

**F** → surroundings of Harmanec village including lower parts of ‘Bystrická dolina’ valley. Habitats: older beech and mixed forests, meadows, littoral vegetation.

**G** → the further sites, especially mentioned by additional authors.

Zoogeographical grid-mapping codes of the sites are available in the table 1.

Table 1: Codes of the sites

Site:	Code:	Site:	Code:
‘Blatnická’ valley	7079b	‘Majerova skala’ mountain	7180b
‘Bystrická’ valley	7180c	‘Motyčská hoľa’ mountain	7181a
‘Dedošová’ valley	7080c	‘Necpalská’ valley	7079b, 7080a
‘Gaderská’ valley	7079b/d	‘Ostrá’ and ‘Tlstá’ mountains	7079d
‘Harmanec’ village	7280a/7180c	NR Padva + ‘Skalná’ mount.	7080c
‘Hornojelenská’ valley	7180b	‘Pekárova’ mountain	7079b/7080a
‘Jasenská’ valley	7080a	‘Salašky’ + ‘Ramžiná’	7180 centre
‘Japeň’ mountain	7180c/d	‘Selenecká’ valley	7080c
‘Kozia skala’ mountain	7079b	‘Staré Hory’ village	7180d
‘Lubochnianska’ valley	6980b,d	‘Zvolen’ mountain	7181a

## Results (Systematic review of species)

Systematic review of beetles is available in the table 2. This review includes infrequent or rare species, interesting from zoogeographical and/or ecological point of view. The species distinguished by numbers in front of their names deserve special mention concerning ecological circumstances and the date of collecting.

**1** – Kozia skala, under the stone in a xerothermic grassland 12<sup>th</sup> July 2001. **2** – Majerova skala, in the rotten stump of a fir 6<sup>th</sup> June 2001; Padva, in the wet detritus under stone 4<sup>th</sup> July 1993. **3** – Padva, in the rotten stump of a fir 1<sup>st</sup> July 1994. **4** – Padva, in the wet leaf litter 12<sup>th</sup> July 1987, M. Dolanský lgt. A very rare boreomontane species. **5** – swept from the vegetation at the foot of Majerova skala during a warm evening 25<sup>th</sup> July 1994. **6** – Turecká: Salašky, under the stone in a xerothermic pasture 27<sup>th</sup> May 2001, 2 individuals (below only “ind.”); Gaderská dolina 11<sup>th</sup> July 1974, M. Valenčík lgt. **7** – Turecká: Salašky, similar circumstances, 22<sup>nd</sup> June 1985. **8** – Hornojelenská dolina, under old timber near the brook 29<sup>th</sup> July 2001. A scattered and rare species of dark habitats. **9** – Kozia skala, among stones and detritus in a forest clearing 12<sup>th</sup> July 2001. **10** – Padva, swept from the vegetation 4<sup>th</sup> July 1996.

Table 2. Review of scarcer and bioindicatively significant beetles of the Velká Fatra Mts

Family/Species	Locality						
	A	B	C	D	E	F	G
<b>Rhysodidae</b>							
+ <i>Rhysodes sulcatus</i> (Fabricius, 1787)	♦						♦
<b>Carabidae</b>							
<i>Carabus obsoletus</i> Sturm,	♦		♦		♦	♦	
<i>Carabus glabratus</i> Paykull, 1790			♦				
1 <i>Carabus problematicus</i> Herbst, 1786				♦			
2 <i>Carabus irregularis</i> Fabricius, 1792	♦				♦		
+ <i>Carabus variolosus</i> Fabricius, 1787				♦			
<i>Carabus auronitens</i> Fabricius, 1992	♦		♦		♦	♦	
3 <i>Cychrus attenuatus</i> (Fabricius, 1792)					♦		
<b>Agyrtidae</b>							
4 <i>Pteroloma forstroemi</i> (Gyllenhal, 1810)					♦		
<b>Leiodidae</b>							
+ <i>Liodopria serricornis</i> (Gyllenhal, 1813)	♦						
5 <i>Leiodes cinnamomea</i> (Panzer, 1793)	♦						
<b>Staphylinidae</b>							
6 <i>Platydracus fulvipes</i> (Scopoli, 1763)	♦			♦			
<i>Staphylinus fossor</i> Scopoli, 1772	♦			♦			
<i>Staphylinus (Ocypus) macrocephalus</i> Grav., 1802	♦		♦				
7 <i>Staphylinus (Ocypus) ophthalmicus</i> Scopoli, 1763	♦						
8 <i>Staphylinus (Ocypus) ater</i> Gravenhorst, 1802		♦					
9 <i>Staphylinus (Ocypus) compressus</i> Marsham, 1802				♦			
<i>Philonthus marginatus</i> (Stroem, 1768)					♦		
+ <i>Lomechusa paradoxa</i> Gravenhorst, 1806			♦				
10 <i>Zyras haworthi</i> (Stephens, 1832)					♦		
<b>Pselaphidae</b>							
11 <i>Batrisus formicarius</i> Aubé, 1833		♦					
<i>Tyrus mucronatus</i> (Panzer, 1805)		♦					
<b>Clavigeridae</b>							
12 <i>Claviger testaceus</i> Preyssler, 1790				♦			
<b>Helodidae</b>							
<i>Helodes marginata</i> (Fabricius, 1798)		♦					
<b>Lucanidae</b>							
<i>Ceruchus chrysomelinus</i> (Hochenwarth, 1785)	♦				♦		
<i>Sinodendron cylindricum</i> (Linnaeus, 1758)	♦				♦	♦	
<b>Scarabaeidae</b>							
13 <i>Maladera holosericea</i> (Scopoli, 1772)		♦					
<i>Serica brunnea</i> (Linnaeus, 1758)	♦						
<i>Gnorimus nobilis</i> (Linnaeus, 1758)		♦		♦		♦	
<b>Byrrhidae</b>							
14 <i>Curimus erichsoni</i> Reitter, 1881					♦		
<b>Buprestidae</b>							
+ <i>Eurythyrea austriaca</i> (Linnaeus, 1767)	♦						
15 <i>Chrysobothris chrysostigma</i> (Linnaeus, 1758)							♦
<b>Elateridae</b>							
16 <i>Lacon fasciatus</i> (Linnaeus, 1758)				♦	♦		♦
+ <i>Lacon lepidopterus</i> (Panzer, 1801)					♦		
<i>Denticollis rubens</i> (Filler & Mitterpacher, 1783)	♦				♦		

Table 2 (continued)

Family/Species	Locality						
	A	B	C	D	E	F	G
17 <i>Diacanthous undulatus</i> (De Geer, 1774)					♦		
18 <i>Ctenicera heyeri</i> (Saxesen, 1838)							♦
<i>Ctenicera virens</i> (Schrank, 1781)				♦			
19 <i>Hypoganus inunctus</i> (Panzer, 1795)				♦			
<i>Anostirus purpureus</i> (Poda, 1761)		♦					
<i>Ampedus aethiops</i> (Lacordaire, 1835)			♦				
20 <i>Ampedus tristis</i> (Linnaeus, 1758)	♦						
<i>Sericus brunneus</i> (Linnaeus, 1758)				♦			
21 <i>Cardiophorus discicollis</i> (Herbst, 1806)				♦			
<b>Eucnemidae</b>							
22 <i>Microrhagus lepidus</i> Rosenhauer, 1847					♦		
<i>Drapetes biguttatus</i> (Piller & Mitterpacher, 1783)	♦						
<b>Lycidae</b>							
+ <i>Benibotarus taygetanus</i> (Pic, 1905)	♦						
<i>Pyropterus nigroruber</i> (De Geer, 1774)				♦			
23 <i>Platycis cosnardi</i> (Chevrolat, 1838)					♦		
<i>Platycis minutus</i> (Fabricius, 1787)		♦					
<i>Lopheros rubens</i> (Gyllenhal, 1817)			♦				
<b>Lampyridae</b>							
<i>Phosphaenus hemipterus</i> (Geoffroy, 1762)		♦		♦			
<b>Drilidae</b>							
24 <i>Drilus concolor</i> Ahrens, 1812		♦					
<b>Anobiidae</b>							
<i>Ptinomorphus imperialis</i> (Linnaeus, 1767)				♦			
<i>Xestobium plumbeum</i> (Illiger, 1801)				♦			
25 <i>Xestobium austriacum</i> Reitter, 1890					♦		
<b>Trogositidae</b>							
26 <i>Peltis grossa</i> (Linnaeus, 1758)	♦						
<i>Ostoma ferruginea</i> (Linnaeus, 1758)		♦		♦		♦	
<i>Thymalus limbatus</i> (Fabricius, 1787)	♦				♦	♦	
27 <i>Grynocharis oblonga</i> (Linnaeus, 1758)			♦				
<b>Cleridae</b>							
28 <i>Tillus elongatus</i> (Linnaeus, 1758)				♦	♦		
29 <i>Clerus mutillarius</i> Fabricius, 1775							♦
30 <i>Necrobia ruficollis</i> (Fabricius, 1775)				♦			
<b>Nitidulidae</b>							
<i>Ipidia binotata</i> Reitter, 1875	♦					♦	
31 <i>Amphotis marginata</i> (Fabricius, 1781)		♦					
32 <i>Cychramus variegatus</i> (Herbst, 1792)	♦						
<i>Cyllodes ater</i> (Herbst, 1792)		♦		♦			
33 <i>Thalycra fervida</i> (Olivier, 1790)	♦						
<i>Glischrochilus quadripunctatus</i> (Linnaeus, 1758)	♦		♦				
<i>Pityophagus ferrugineus</i> (Linnaeus, 1761)		♦					
<b>Cucujidae s. lat.</b>							
<i>Uleiota planata</i> (Linnaeus, 1761)		♦		♦		♦	
34 <i>Dendrophagus crenatus</i> (Paykull, 1799)			♦			♦	
35 <i>Cucujus cinnaberinus</i> (Scopoli, 1763)		♦					
+ <i>Cucujus haematodes</i> Erichson, 1845							♦

Table 2 (continued)

Family/Species	Locality						
	A	B	C	D	E	F	G
36 <i>Phloeostichus denticollis</i> Redtenbacher, 1842						♦	
<b>Cryptophagidae</b>							
<i>Antherophagus pallens</i> (Linnaeus, 1758)					♦		
<b>Biphyllidae</b>							
<i>Diplocoelus fagi</i> Guérin-Ménéville, 1844				♦			
<b>Erotylidae</b>							
37 <i>Tritoma bipustulata</i> Fabricius, 1775			♦				
<i>Triplax russica</i> (Linnaeus, 1758)					♦		
38 <i>Triplax rufipes</i> (Fabricius, 1775)				♦			
<i>Dacne rufifrons</i> (Fabricius, 1775)		♦					
<b>Endomychidae</b>							
39 <i>Lycoperdina bovistae</i> (Fabricius, 1792)	♦						
<i>Mycetina cruciata</i> (Schaller, 1783)						♦	
<i>Endomychus coccineus</i> (Linnaeus, 1758)	♦		♦		♦	♦	
<b>Coccinellidae</b>							
40 <i>Ceratomegilla alpina redtenbacheri</i> (Capra, 1928)	♦						
<i>Calvia decemguttata</i> (Linnaeus, 1767)	♦						
<b>Colydiidae</b>							
<i>Synchita humeralis</i> (Fabricius, 1792)				♦			
+ <i>Cicones undatus</i> (Guérin-Ménéville, 1844)							♦
<b>Mycetophagidae</b>							
<i>Mycetophagus multipunctatus</i> Fabricius, 1792	♦						
<b>Tetratomidae</b>							
<i>Tetratoma ancora</i> Fabricius, 1790	♦						
+ <i>Mycetoma suturale</i> (Panzer, 1797)	♦						
<b>Melandryidae</b>							
41 <i>Hallomenus binotatus</i> (Quensel, 1790)					♦		
<i>Orchesia minor</i> Walker, 1837		♦		♦			
42 <i>Orchesia undulata</i> Kraatz, 1853	♦					♦	
43 <i>Xylita livida</i> (Sahlberg, 1834)					♦		
44 <i>Serropalpus barbatus</i> (Schaller, 1783)	♦						
45 <i>Hypulus bifasciatus</i> (Fabricius, 1792)							♦
+ <i>Zilora sericea</i> (Sturm, 1807)							♦
+ <i>Melandrya barbata</i> (Fabricius, 1792)							♦
46 <i>Melandrya caraboides</i> (Linnaeus, 1761)	♦				♦		
47 <i>Melandrya dubia</i> (Schaller, 1783)	♦						
<i>Osphya bipunctata</i> (Fabricius, 1775)				♦			
<b>Rhipiphoridae</b>							
48 <i>Metoeus paradoxus</i> (Linnaeus, 1761)		♦					
<b>Oedemeridae</b>							
+ <i>Ditylus laevis</i> (Fabricius, 1792)							
49 <i>Nacerdes</i> (= <i>Xanthochroa</i> ) <i>carniolica</i> (Gistel, 1832)	♦						
50 <i>Calopus serraticornis</i> (Linnaeus, 1758)		♦					♦
<b>Pythidae</b>							
51 <i>Pytho depressus</i> (Linnaeus, 1767)							♦
<b>Meloidae</b>							
<i>Meloe violaceus</i> Marsham, 1802	♦					♦	
52 <i>Meloe rugosus</i> Marsham, 1802	♦						

Table 2 (continued)

Family/Species	Locality						
	A	B	C	D	E	F	G
53 <i>Mylabris polymorpha</i> (Pallas, 1771)				♦			
<b>Salpingidae</b>							
<i>Rabocerus foveolatus</i> (Ljungh, 1823)	♦						
<i>Salpingus planirostris</i> (Fabricius, 1787)		♦		♦			
<i>Salpingus ruficollis</i> (Linnaeus, 1761)	♦						
<b>Alleculidae</b>							
54 <i>Allecula morio</i> (Fabricius, 1787)	♦						
55 <i>Prionychus melanarius</i> (Germar, 1813)							♦
<i>Gonodera luperus</i> (Herbst, 1783)				♦			
56 <i>Pseudocistela ceramboides</i> (Linnaeus, 1758)	♦						
<i>Isomira murina</i> (Linnaeus, 1758)				♦		♦	
57 <i>Mycetochara axillaris</i> (Paykull, 1799)		♦					
<i>Podonta nigrita</i> (Fabricius, 1794)						♦	
58 <i>Cteniophus sulphureus</i> (Linnaeus, 1758)							♦
<b>Tenebrionidae</b>							
+ <i>Oodescelis polita</i> (Sturm, 1807)				♦			♦
59 <i>Bolitophagus interruptus</i> Illiger, 1800				♦			
<i>Diaperis boleti</i> (Linnaeus, 1756)						♦	
<i>Uloma culinaris</i> (Linnaeus, 1758)	♦					♦	
<b>Cerambycidae</b>							
<i>Prionus coriarius</i> (Linnaeus, 1758)		♦					
<i>Isarthron</i> (= <i>Tetropium</i> ) <i>castaneum</i> (Fabricius, 1787)				♦			
<i>Arhopalus ferus</i> (Mulsant, 1839)		♦					
<i>Cerambyx scopolii</i> Füssly, 1775				♦			
60 <i>Rosalia alpina</i> (Linnaeus, 1758)		♦		♦		♦	
61 <i>Aromia moschata</i> (Linnaeus, 1758)		♦					
62 <i>Stenopterus rufus</i> (Linnaeus, 1767)	♦						
+ <i>Rhopalopus ungaricus</i> (Herbst, 1784)			♦	♦			
63 <i>Callidium coriaceum</i> (Paykull, 1800)				♦			♦
64 <i>Semanotus undatus</i> (Linnaeus, 1758)							♦
<i>Anaglyptus mysticus</i> (Linnaeus, 1758)		♦					
65 <i>Chlorophorus herbsti</i> (Brahm, 1790)				♦			♦
66 <i>Cyrtoclytus capra</i> (Germar, 1824)							♦
<i>Clytus lama</i> Mulsant, 1847				♦		♦	
<i>Oxymirus cursor</i> (Linnaeus, 1758)	♦		♦			♦	
67 <i>Pachyta lamed</i> (Linnaeus, 1758)				♦			
+ <i>Brachyta interrogationis</i> (Linnaeus, 1758)							
<i>Evodinus clathratus</i> (Fabricius, 1792)	♦		♦	♦		♦	
+ <i>Pseudogaurotina excellens</i> (Brancsik, 1874)							
<i>Pedostrangalia pubescens</i> (Fabricius, 1787)				♦	♦		
68 <i>Lepturobosca virens</i> (Linnaeus, 1758)				♦			
69 <i>Judolia sexmaculata</i> (Linnaeus, 1758)					♦		
<i>Anoplodera</i> (= <i>Leptura</i> ) <i>sexguttata</i> (Fabricius, 1775)		♦					
<i>Stictoleptura</i> (= <i>Leptura</i> ) <i>scutellata</i> (Fabricius, 1781)		♦				♦	
70 <i>Leptura</i> (= <i>Strangalia</i> ) <i>aurulenta</i> Fabricius, 1792		♦					
<i>Leptura</i> (= <i>Strangalia</i> ) <i>quadrifasciata</i> Linnaeus, 1758				♦		♦	
71 <i>Lamia textor</i> (Linnaeus, 1758)				♦			

Table 2 (continued)

Family/Species	Locality						
	A	B	C	D	E	F	G
<i>Monochamus sartor</i> (Fabricius, 1787)	♦				♦		
72 <i>Anaesthethis testacea</i> (Fabricius, 1781)				♦			
<i>Pogonocherus hispidulus</i> (Piller & Mitterpacher, 1783)				♦			
73 <i>Pogonocherus decoratus</i> Fairmaire, 1855				♦			
<i>Acanthoderes clavipes</i> (Schrank, 1781)		♦				♦	
74 <i>Acanthocinus griseus</i> (Fabricius, 1792)							♦
75 <i>Acanthocinus reticulatus</i> (Razoumowski, 1789)							♦
<i>Saperda scalaris</i> (Linnaeus, 1758)				♦			
<i>Stenostola dubia</i> (Laicharting, 1784)				♦			
76 <i>Oberea pupillata</i> (Gyllenhal, 1817)						♦	
77 <i>Phytoecia nigripes</i> (Voët, 1778)	♦						
<i>Phytoecia cylindrica</i> (Linnaeus, 1758)				♦			
<b>Chrysomelidae</b>							
<i>Liliocerris meridigera</i> (Linnaeus, 1758)		♦		♦		♦	
+ <i>Antipus macropus</i> (Illiger, 1800)							♦
78 <i>Coptocephala rubicunda</i> (Laicharting, 1781)	♦						
<i>Cryptocephalus biguttatus</i> (Scopoli, 1763)	♦			♦			
<i>Cryptocephalus pini</i> (Linnaeus, 1758)				♦			
<i>Cassida azurea</i> Fabricius, 1801				♦			
<b>Anthribidae</b>							
<i>Platyrhinus resinus</i> (Scopoli, 1763)		♦					
<i>Anthribus albinus</i> (Linnaeus, 1758)				♦		♦	
<i>Brachytarsus nebulosus</i> (Forster, 1771)				♦			
<b>Curculionidae</b>							
<i>Chonostrophus tristis</i> (Fabricius, 1794)				♦			
<i>Plinthus fischeri</i> Germar, 1824	♦		♦				
<i>Acalles hypocrita</i> Boheman, 1837				♦			

A sporadic and rare species, beginning myrmecophile.

**11** – Hornojelenská dolina, in the colony of *Lasius brunneus* under the bark of a damaged beech 29<sup>th</sup> April 2001. **12** – Kožia skala, in the colony of *Lasius niger* in a xerothermic rocky slope 15<sup>th</sup> June 1994, 2 ind. A very remarkable finding of this blind and wingless, strictly myrmecophilic beetle. **13** – Hornojelenská dolina, in a leaf litter near the root of an old dying pine 29<sup>th</sup> April 2001. A remarkable finding of this quite thermophilic species of sandy grasslands! **14** – Padva, under the moss pillow on a large stone 4<sup>th</sup> June 1996. **15** – I. Halaša in accessible materials does not localise it precisely: Velká Fatra, 30<sup>th</sup> June 1979. **16** – Ľubietovská dolina 24<sup>th</sup> June 1989, P. Zach lgt. **17** – Padva, under the bark of a damaged spruce 1<sup>st</sup> July 1994. **18** – V. Rakšáni found several ind. in Blatnická and Dedošova valleys, June–August 1974 – 1976 (Valenčík 1980). A rare mountain species. **19** – Pekárova, in a rotten beech 16<sup>th</sup> June 2001. **20** – Majerova skala, under the bark of a dying spruce 1<sup>st</sup> July 1993. A rare boreomontane species.

**21** – Kožia skala, swept from the vegetation 12<sup>th</sup> July 2001. A remarkable finding of thermophilic species. **22** – Skalná, on a damaged dying beech 1<sup>st</sup> July 1994.

A scarce species of primeval deciduous forests. **23** – Padva, on the vegetation 12<sup>th</sup> July 1987, M. Dolanský lgt. **24** – Hornojelenská dolina, swept from the vegetation 26<sup>th</sup> May 2001. An infrequent species of warmer deciduous forests, larvae are predators of little snails approaching parasitism. **25** – Skalná, under the bark of a rotten fir 1<sup>st</sup> July 1994, 3 ind. A rare boreomontane species. **26** – Krížna: Ramžiná, under the bark of rotten beech 13<sup>th</sup> October 2001. **27** – Motyčská hoľa, under the bark of a damaged beech 29<sup>th</sup> July 2001. **28** – Kozia skala, on a dying beech 15<sup>th</sup> June 1994; Skalná, the same 1<sup>st</sup> July 1994 (a remarkable record from mountain altitudes!). **29** – Selenecká dolina, May 1974 – 1976 (Valenčík 1980). A very remarkable finding of this species of warm deciduous forests. **30** – Gaderská dolina, June 1974 – 1976 (Valenčík 1980). A scattered and rare thermophilic species.

**31** – Hornojelenská dolina, in the colony of *Lasius fuliginosus* in the hollow beech 26<sup>th</sup> May 2001. **32** – Krížna: Ramžiná, in the fungus *Hericinum flagellum* on an old fir 13<sup>th</sup> October 2001. **33** – Majerova skala, swept from the vegetation of a forest clearing during a warm afternoon 24<sup>th</sup> August 1994. **34** – Zvolen, under the bark of a rotten fir 1<sup>st</sup> December 1991, 3 ind.; Harmanec, July 1982, J. Lakota lgt. A rare boreomontane species. **35** – Hornojelenská dolina, under the bark of a damaged beech 29<sup>th</sup> April 2001. Despite this species is protected by ‘Natura 2000’ in Europe, it is widespread in Slovakia. **36** – Bystrická dolina, under the bark of a dying beech 23<sup>rd</sup> October 1988. A rare species of primeval forests. This finding is remarkable, because it highly prefers sycamore (*Acer pseudoplatanus*). **37** – Motyčská hoľa, under the bark of a drying beech with the fungi *Schizophyllum commune* 29<sup>th</sup> July 2001. A remarkable finding in mountain altitudes. **38** – Kozia skala, on an old beech with the bracket fungi (*Pleurotus* sp.) 3<sup>rd</sup> August 2001, 3 ind. **39** – Krížna: Ramžiná, in the fungus *Geastrum sessile* 13<sup>th</sup> October 2001, 2 ind. **40** – Majerova skala, 22<sup>nd</sup> June 1985. A rare mountain ladybird.

**41** – Skalná, in the bracket fungi (*Polyporus* sp.) on a decaying beech stem 4<sup>th</sup> July 1996, 2 ind. **42** – Majerova skala, under the bark of a damaged beech 22<sup>nd</sup> June 1985; Bystrická dolina, the same circumstances 23<sup>rd</sup> October 1988. **43** – Padva, under the bark of a rotten fir 4<sup>th</sup> July 1996. **44** – Majerova skala, a rotten fir 1<sup>st</sup> July 2001. **45** – Blatnická dolina, June 1974 – 1976 (Valenčík 1980). A rare species of warmer deciduous forests. **46** – Padva, on a dying fungi-infected beech 12<sup>th</sup> July 1987, 1<sup>st</sup> July 1994 and 4<sup>th</sup> July 1996; Majerova skala, the same circumstances 6<sup>th</sup> June 2001, 2 very large ♀. **47** – Majerova skala, under the bark of a rotten beech 1<sup>st</sup> July 2001. A scarce species of primeval forests! **48** – Hornojelenská dolina, swept from the vegetation in a forest clearing 29<sup>th</sup> July 2001. A remarkable finding of this little-known species, larvae parasite in the wasp nests. **49** – flown towards UV light in a forest clearing at a foot of Majerova skala 25<sup>th</sup> July 1994. A little-known nocturnal species, formerly has been considered to be extremely rare. **50** – Donovaly, in the pheromone trap for bark beetles 9<sup>th</sup> June 1980, D. Brutovský lgt.; Hornojelenská dolina, under the bark of a rotten pine 29<sup>th</sup> April 2001.

**51** – Ostrá, July 1974 – 1976 (Valenčík 1980). A rare species, found only sporadically. **52** – Turecká: Salašky, a rocky pasture 13<sup>th</sup> October 2001. **53** – Gaderská dolina, June 1974 – 1976, several ind. V. Rakšáni lgt. (Valenčík 1980). An utmost remarkable, but also dubious record of thermophilic Mediterranean species! **54** – Majerova skala, under the bark of a rotten fir 1<sup>st</sup> July 2001. **55** – Blatnická dolina, September 1974 – 1976 (Valenčík 1980). **56** – flown towards UV light in a forest



clearing at a foot of Majerova skala 25<sup>th</sup> July 1994. An infrequent species with nocturnal activity. **57** – Hornojelenská dolina, under the bark of a damaged, fungi-infected lime 3<sup>rd</sup> July 1986, 2 ind. **58** – Ľubochňianska dolina, a pitfall trap, 1980 (Kleinert 1986). **59** – Gaderská dolina, July 1974 – 1976 (Valenčík 1980). A rare species of older deciduous forests. **60** – Hornojelenská dolina, on a damaged beech 29<sup>th</sup> July 2001; Gaderská dolina, on cut beech stems and stumps 12<sup>th</sup> July 2001, several ind.; Harmanec 18<sup>th</sup> July 1985.

**61** – Hornojelenská dolina, on an Umbelliferae flower near the brook 29<sup>th</sup> July 2001. **62** – Majerova skala, swept from the vegetation on the top cliff terrace 24<sup>th</sup> August 1994. Its occurrence in mountain environment is very remarkable! **63** – Jasenská dolina, on a spruce, June 1987, I. Halaša lgt.; Kozia skala, on a dying spruce 15<sup>th</sup> June 1994. A rare boreomontane species. **64** – Blatnická dolina, August 1974 – 1976, V. Rakšáni lgt. (Valenčík 1980). **65** – Gaderská and Selenecká valleys, July 1974 – 1976 (Valenčík 1980). **66** – Necpalská dolina, on an Umbelliferae flower 28<sup>th</sup> July 1991, R. Reitmeier lgt.; Ľubochňa (the valley?) 7<sup>th</sup> August 1991, 3 ind., D. Farbiak lgt. **67** – Gaderská dolina, July 1974 – 1976, J. Lukáš lgt. (Valenčík 1980). **68** – Gaderská dolina, on an Umbelliferae flower 12<sup>th</sup> July 2001. **69** – NR Padva, July 1974 – 1976, J. Lukáš lgt. (Valenčík 1980). **70** – Hornojelenská dolina, in flight during a warm afternoon 29<sup>th</sup> July 2001.

**71** – Gaderská dolina, July 1974 – 1976 (Valenčík 1980). A rare species of alluvial forests. **72** – Pekárova, swept from the vegetation in an open shrubby beech-and-oak forest 16<sup>th</sup> June 2001. A scattered thermophilic species of Southern and Central Europe; its occurrence in mountain complex of Veľká Fatra is very remarkable! **73** – Pekárova, on drying branches of a pine 12<sup>th</sup> July 2001. **74** – Blatnická dolina, August 1974 – 1976 (Valenčík 1980). A rare species of conifer forests. **75** – Staré Hory, bred ex larva from a fir 24<sup>th</sup> July 1984 (hatched 16<sup>th</sup> November 1984), D. Brutovský lgt. **76** – Bystrická dolina, knocked down from the branches of *Lonicera xylosteum* 15<sup>th</sup> July 1981. A scattered and rare species, mentioned from Veľká Fatra already by Heyrovský (1955). **77** and **78** – the same as in 62.

The following scarce species (marked by “+” in the table 2) deserve special mention. Their distribution in the territory of Slovakia and ecosozological status (below only “ESS”) in separate European countries are discussed below. There were compared the data from the Red List of Slovakia (Holecová, Franc 2001), Austria (Franz 1983, Geiser 1983), Germany (Geiser et al. 1984), Denmark (Asbirk, Sogaard 1991), Finland (Rassi et al. 1992), Sweden (Ehnström, Gärdenfors, Lindelöv 1993) and Great Britain (Hyman, Parsons 1992, 1994).

*Rhysodes sulcatus* – Majerova skala, a dead specimen (elytrae and pronotum) in a rotten fir 1<sup>st</sup> July 2001, V. Franc lgt.; Polkanová (7180d), in a pheromone trap for bark beetles 5<sup>th</sup> June 1986, D. Brutovský lgt. A very rare species of (sub)mountain ancient forests. Several records especially from primeval-forest reserves are available. ESS: Slovakia – Vulnerable (V), Germany – ‘Ausgestorben oder verschollen’<sup>(1)</sup> (Aov), Sweden – Extinct (Ex). In Great Britain it had been documented only from prehistoric age (Kirby, Drake 1993).

*Carabus variolosus* – Gaderská dolina, a branch valley below Skalná, in a wet leaf litter near the brook 1<sup>st</sup> July 1994. A rare species of forest wetlands, especially known from Eastern Slovakia. It ranks among wingless beetles and therefore is

considered to be a significant bioindicator. ESS: Slovakia – Lower Risk, Austria and Germany – ‘Stark gefährdet’<sup>2</sup> (Sg).

*Liodopria serricornis* – Krížna: Ramžiná, swept from the vegetation in an ancient forest during a warm afternoon 1<sup>st</sup> August 1993. A very rare species of primeval forests. The further recent records: Poľana Mts – NR Hrončok (7382b) 17<sup>th</sup> July 1986 and NR Pri Bútľavke (7382 centre) 17<sup>th</sup> July 1993, V. Franc lgt. T. Jászay (in litt.) found it near Spišské Vlachy: “Za horou” (7090) 19<sup>th</sup> July 1990, 2 ind. ESS: Slovakia and Finland – V, Germany – ‘Vom Aussterben bedroht’<sup>3</sup> (VAb), Sweden: E.

*Lomechusa paradoxa* – Zvolen, in the colony of *Myrmica* sp. in a rocky pasture (approximately 1060 m a. s. l.) 28<sup>th</sup> April 2001, 3 ind. A sporadic and rare species of xerothermic habitats, occurring in southern regions of Slovakia especially. Mentioned finding in mountain altitude is very remarkable! ESS: Denmark – Decreasing (D), Great Britain – Indeterminate.

*Eurythyrea austriaca* – Majerova skala, a dead specimen under the bark of a dead fir 1<sup>st</sup> July 2001. A rare species of primeval forests, highly preferring firs. Although it is known from relatively large number of records from Slovakia, it deserves attention of conservationists at least because is considered to be extinct in some of neighbouring countries. ESS: Slovakia – V, Austria and Germany – Aov → Ex.

*Lacon lepidopterus* – Kožia skala, under the bark of a dying fir 15<sup>th</sup> June 1994 and Skalná (NR Padva), the same circumstances 1<sup>st</sup> July 1994. A rare species of primeval forests, formerly had been considered to be very rare. It occurs in a large number of sites in Slovakia. Nevertheless, it deserves attention of conservationists, because is highly threatened or even extinct in several European countries. ESS: Slovakia – V, Germany – Aov → Ex, Denmark – Ex, Sweden and Finland – E.

*Benibotarus taygetanus* – Majerova skala, swept from the vegetation in an ancient forest 1<sup>st</sup> July 2001. It occurs sporadically and very rarely in primeval forests. Only a few recent records are available: Poľana Mts – NR Hrončok 17<sup>th</sup> July 1986 and NR Pri Bútľavke 17<sup>th</sup> July 1993, Strážovské vrchy Mts – ‘Hradištnica’ valley (7276c) 19<sup>th</sup> June 2002, V. Franc lgt. ESS: Slovakia – V, Germany – VAb → E.

*Cucujus haematodes* – Ľubochnianska dolina, in the pheromone trap for bark beetles 24<sup>th</sup> June 1989, P. Zach lgt. Valenčík (1980) mentions several findings from Dedošova dolina and Tlstá, summer 1974 – 1976. A rare boreomontane species, known from scattered records from mountainous regions of Slovakia. ESS: Slovakia – V, Finland – Ex.

*Cicones undatus* – Japeň, knocked down from the branches of a sycamore 12<sup>th</sup> July 1988, 2 ind., V. Kubinec lgt. It occurs sporadically and rarely in old deciduous forests. Only a few recent records are available: Plášťovce (7879b), on drying branches of an oak 26<sup>th</sup> May 1992, 7 ind.; Starohorské vrchy Mts – Baranovo (7280b), under

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1 it appears to be extinct (Ex) according to IUCN criteria

2 it appears to be vulnerable (V) according to IUCN criteria

3 it appears to be endangered (E) according to IUCN criteria

the bark of a sycamore 21<sup>st</sup> November 1992, 3 ind., V. Franc lgt. ESS: Slovakia – V, Great Britain – E. Mentioned finding from Japeň (approximately 1050 m a. s. l.) is very remarkable!

*Mycetoma suturale* – Krížna: Ramžiná, on the bracket fungi *Ischnoderma benzoinum* growing on rotten beeches 13<sup>th</sup> October 2001, more than 100 ind.!, 3 of them in coll. mea. Although it is considered to be a rare species, locally it may be abundant. In Slovakia it has a relatively big amount of suitable habitats – ancient beech forests. ESS: Austria – Sg → V, Germany VAb → E.

*Zilora sericea* – Japeň, under the bark of a dying fungi-infected fir 28<sup>th</sup> June 1980, V. Kubinec lgt. A very scarce species of primeval forests. Several recent records from Slovakia are available: Kremnické vrchy Mts – NR Badínsky prales (7380a) 9<sup>th</sup> May 1981, Štiavnické vrchy Mts – NR Sitno (7579c) 15<sup>th</sup> June 1984, Starohorské vrchy Mts – NR Baranovo 8<sup>th</sup> May 1983, 2 ind., V. Franc lgt.; Bardejovské vrchy Mts – Magura (6693) 10<sup>th</sup> October 1992, about 20 ind.!, Košice – Čermel' (7293a) October 1991, 6 ind., R. Lohaj et T. Lackner lgt. ESS: Slovakia – V, Austria and Germany – Sg → V.

*Melandrya barbata* – Japeň, under the bark of a spruce stump 28<sup>th</sup> June 1980. It occurs sporadically and extremely rarely in primeval forests. Only one additional recent record is available: Poľana Mts – Žiarec (7382a), a damaged dead specimen under the bark of a beech stump 4<sup>th</sup> April 1993, V. Franc lgt. ESS: Slovakia, Finland, Sweden and Great Britain – E, Denmark – V, Austria and Germany – Sg → V.

*Ditylus laevis* – a very rare Euro-Siberian species of primeval forests, larvae are living in wet wood in mountain brooks. Documented by numerous series from Veľká Fatra (I. Halaša lgt.), but the author of this record refuses to publish detailed information about its site. Unfortunately, it is a result of commercial-entomologists' activity in Slovakia and neighbouring countries. ESS: Slovakia and Finland – V, Austria and Germany – VAb → E, Sweden – Ex.

*Oodescelis polita* – Pekárova 16<sup>th</sup> June 2001 and Kozia skala 12<sup>th</sup> July 2001, V. Franc lgt.; Tlstá 6<sup>th</sup> August 1975 and Ostrá 10<sup>th</sup> August 1975, V. Rakšáni lgt. A rare species of xerothermic grasslands, getting up to dealpine rocky slopes as well. Known from numerous records from southern regions of Slovakia. Its relict occurrence in the mountain altitudes of Veľká Fatra is very remarkable (it is a wingless beetle). ESS: Austria – Sg → V.

*Rhopalopus ungaricus* – Gaderská dolina, on the vegetation under the group of old sycamores 12<sup>th</sup> July 2001, V. Franc lgt.; Zvolen, accidentally on the vegetation near the top 17<sup>th</sup> August 1989, D. Brutovský lgt. A very rare species of primeval (sub)mountain forests of Europe, larvae highly prefer sycamore (*Acer pseudoplatanus*). A protected species in Slovakia. ESS: Slovakia: V, Germany – Sg → V, Austria – D.

*Brachyta interrogationis* – a very rare boreomontane species, it ranks among protected insects in Slovakia. Although one numerous finding from summer 2001 is available, it would be risky to publish detailed data. ESS: Slovakia: V, Germany – Sg → V.

*Pseudogaurotina excellens* – a very rare relict species of mountain forests, endemic for the Carpathians. Several recent records from Veľká Fatra are available, but it would be very risky to publish detailed data. Although it is strictly protected in Slovakia and the whole Europe, commercial “entomologists” still destroy its habitat – old shrubs of *Lonicera nigra* are often damaged, branches with larvae and pupae are cut and it does not matter that this activity is carrying out in strict reserves mainly! ESS: Slovakia – E (critically endangered).

*Antipus macropus* – Blatnická dolina, 10<sup>th</sup> July 1976, M. Valenčík lgt., coll. Nature History Museum Hlohovec. A rare thermophilic Mediterranean species, known from several sites in southern Slovakia. Its occurrence in the mountain region of Veľká Fatra is utmost remarkable, although it has not recently been documented from the warmest sites. ESS: Slovakia – V, Austria – VAb → E.

## Conclusions

I have documented more than 500 beetle species from the Veľká Fatra Mts, 172 of them rank among scarce species of well-preserved mountain forests, including *Rhysodes sulcatus*, *Liodopria serricornis*, *Lacon lepidopterus*, *Benibotarus taygetanus*, *Mycetoma suturale*, *Zilora sericea*, *Melandrya barbata*, *M. dubia*, *Ditylus laevis*, *Rhopalopus ungaricus*, *Brachyta interrogationis*, *Pseudogaurotina excellens*, etc. Warm limestone substratum and climatic-and-ecological inversion allow that a lot of thermophilic species get up to surprisingly high altitudes, including *Staphylinus ophthalmicus*, *Lomechusa paradoxa*, *Claviger testaceus*, *Maladera holosericea*, *Hypoganus inunctus*, *Triplax rufipes*, *Cicones undatus*, *Oodescelis polita*, *Anaesthesis testacea*, *Stenopterus rufus*, *Phytoecia nigripes* etc. The review of beetles is only preliminary, of course, and it will be supplemented by the further investigation.

Mentioned beetles prove very high biological-and-ecological diversity of this national park. By the way, well-preserved or up to primeval structure of these habitats is a consequence of wild and steep relief of rocky slopes in the Veľká Fatra Mts. Nevertheless, effective nature conservation management of this territory will not be simple and lacking conflicts, because it will be necessary to control:

- development of intensive forestry in less-extreme slopes with all the consequences, mainly clean-cutting wood exploitation and conversion of natural forests towards monocultures;
- afforestation of “sterile” rocky-and-scrub slopes;
- inappropriate pasture, especially large-number bovine pasture in mountain grasslands with shallow unstable soil (risk of erosion);
- expansion of tourist centres, rope-ways and ski tracks;
- illegal collecting by commercial entomologists.

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