

Darkling beetles (Coleoptera, Tenebrionidae) of Slovakian fauna and their ecosozological value

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Abstract: The author deals with distribution, ecology and conservation problems of darkling beetles (Tenebrionidae) in Slovakia. This paper includes remarkable records of scarcer tenebrionid beetles from Slovakia, carried out during the last two decades. Ecosozological status in accessible Red Lists throughout Europe is discussed here as well.

Key words: Tenebrionidae, Coleoptera, Slovakia, biomonitoring, insect protection

Introduction

Tenebrionidae are usually dark coloured beetles living in arid (sub)tropic regions especially, but nearly 100 species occur in Central Europe as well. This family ranks among less known groups of beetles, they are mentioned in faunistic papers rather sporadically. On the other hand, the majority of darkling beetles rank among infrequent species of a wide ecological amplitude (they are often wingless), and then they may be used as the bioindicators of well-preserved ecosystems. Tenebrionidae are often mentioned in accessible Red Lists throughout Europe. Preview of separate species' ecosozological status in European countries is available in the table 1.

Material and methods

In this paper I summarise the results of my entomological research mainly in Central Slovakia that was carried out during the last two decades. I applied current methods of collecting, especially individual collecting on the soil surface and under the bark of damaged fungi-infected trees. All findings listed were mine, except where the names of different collectors are added. The beetles were identified according to the key by Picka (1978). Ecosozological status of tenebrionid-beetles was discussed according to the Red List of Great Britain (Hyman, Parsons, 1992), Norway (Skauge et al., 1992), Sweden (Ehnström, Gärdenfors, Lindelöw, 1993), Finland (Rassi et al., 1992), Denmark (Asbirk, Sogaard, 1991), Germany (Geiser et al., 1984), Austria (Franz, 1983) and Slovakia (Jedlička et al., 1995; Holecová, Franc, 2001). Zoogeographic categorisation of Slovakian Tenebrionidae is worked up in the table 2. Published data and further findings are added only in the case of rare and faunistically significant species. Old records before the Second World War are not mentioned. Finally I would like to thank all colleagues mentioned below for their interesting and valuable records.

Results (Systematic review of species)

Gnaptor spinimanus – a very local Ponto-Mediterranean species of xerothermic grasslands. Although a relatively large number of old records is available (Roubal, 1936; Picka, 1978), recently it occurs only in a few isolated places. Recent records: NR Hegyfark (8177c)* 30th April 1994, 4 individuals (below only “ind.”) V. Franc lgt. et coll.; from this site is also mentioned by Majzlan et Rychlík (1997); Pereš (8277a) May 1997 (Majzlan, 1998). This rare stenotopic wingless beetle ranks among highly vulnerable insects!

Oodescelis polita – a relatively rare species of xerothermic grasslands and dealpine rocky slopes as well. Recent records: Štiavnické vrchy Mts.: Nature Reserve (below only “NR”) Holík (7679a) 15th June 1984, Podbrezová (7183c) 14th May 1989, 3 ind.; Plášťovce (7879b) 11th April 1992, 2 ind.; NR Manínska tiesňava (6877c) 30th April 1993, Zvolen – Neresnická dolina (7480b) 12th March 1995, Veľká Fatra Mts. – Pekárova (7079b) 16th June 2001, Veľká Fatra Mts. – Kozia skala (7079b) 12th July 2001,

* the grid mapping code of every locality is given only for the first time. The date of collecting is specified if the source allows it.

Tab. 1. Preview of Slovakian Tenebrionidae and their ecosozological status throughout Europe

Species	Brief characteristic of ecology	Ecosozological status								
		GB	N	Sw	F	Dk	G	A	Sk ₁	Sk ₂
<i>Gnaptor spinimanus</i> (Pallas, 1781)	epigeic xth.								E	E
<i>Blaps abbreviata</i> Ménétré, 1836	phytodetritophilic, ± synanthropic							V		
<i>B. abdita</i> Picka, 1978	≡							V		
<i>B. halophila</i> Fisher von Waldheim, 1822	≡							V		
<i>B. lethifera</i> Marsham, 1802	≡		Ex [?]	V		V	V			
<i>B. milleri</i> Seidlitz, 1893	≡							CD		
<i>B. mortisaga</i> (Linnaeus, 1758)	≡		Ex [?]	E	Ex	E				
<i>B. mucronata</i> Latreille, 1804	≡		I							
<i>B. sinuatocollis</i> Solier, 1848	≡									
<i>Oodescelis polita</i> (Sturm, 1804)	epigeic xth.							V		
<i>Pedinus fallax</i> Mulsant, 1853	≡									+V
<i>P. femoralis</i> (Linnaeus, 1767)	≡						E	CD		
<i>Melanimon tibiale</i> (Fabricius, 1781)	psamophilic		V					CD		
<i>Gonocephalum pusillum</i> (Fabricius, 1791)	psamophilic, xth.						Ex	CD		V
<i>G. pygmaeum</i> (Fabricius, 1791)	≡							V		+V
<i>Opatrum riparium</i> L. G. Scriba, 1796	xth. + litoricolous					V	V			
<i>O. sabulosum</i> (Linnaeus, 1761)	epigeic xth.	N								
<i>Leichenium pictum</i> (Fabricius, 1801)	psamophilic							E	E	E
<i>Crypticus quisquilius</i> (Linnaeus, 1761)	epigeic xth.	N			D					
<i>Bolitophagus interruptus</i> Illiger, 1800	xylomycetophilic						Ex	V		V
<i>B. reticulatus</i> (Linnaeus, 1767)	≡	R				D	R			
<i>Eledonoprius armatus</i> (Panzer, 1799)	≡			E		Ex	Ex	V		V
<i>Eledona agaricola</i> (Herbst, 1783)	≡	N	R			D				
<i>Diaperis boleti</i> (Linnaeus, 1756)	≡	V				D				
<i>Neomida haemorrhoidalis</i> (Fabricius, 1787)	≡		V	V	V	Ex	E	CD		
<i>Scaphidema metallicum</i> (Fabricius, 1792)	xylomycetophilic, detritophilic	N								
<i>Platydema dejaeni</i> Laporte de Castelnau & Brullé, 1831	xylomycetophilic							E		
<i>P. violaceum</i> (Fabricius, 1790)	≡	E		V	E	V		CD		
<i>Alphitophagus bifasciatus</i> (Say, 1823)	detritophilic									
<i>Pentaphyllus testaceus</i> (Hellwig, 1792)	xylomycetophilic			CD	R	V	R	CD	R	
<i>P. chrysomeloides</i> (Rossi, 1792)	≡							E		
<i>Myrmecoxenus picinus</i> (Aubé, 1850)	detritophilic									
<i>M. subterraneus</i> Chevrolat, 1835	myrmecophilic									
<i>M. vaporariorum</i> Guérin-Ménéville, 1843	detritophilic								R	
<i>Gnathocerus cornutus</i> (Fabricius, 1798)	synanthropic									
<i>Lyphia tetrphylla</i> (Fairmaire, 1856)	≡									
<i>Tribolium castaneum</i> (Herbst, 1797)	≡									
<i>T. confusum</i> Jacquelin du Val, 1868	≡									
<i>T. destructor</i> Uyttenboogaart, 1933	≡									
<i>T. madens</i> (Charpentier, 1852)	xylodetritophilic									
<i>Palorus depressus</i> (Fabricius, 1790)	≡						R			
<i>P. ratzeburgi</i> (Wissmann, 1848)	synanthropic						V			
<i>P. subdepressus</i> (Wollaston, 1864)	≡, xylodetritophilic									
<i>Uloma culinaris</i> (Linnaeus, 1758)	xylomycetophilic		IK	CD			V			
<i>U. rufa</i> (Piller & Mitterpacher, 1783)	≡						V			
<i>Alphitobius diaperinus</i> (Panzer, 1797)	synanthropic									
<i>A. laevigatus</i> (Fabricius, 1781)	≡									
<i>Diaclina fagi</i> (Panzer, 1799)	xylomycetophilic							CD		V
<i>Diaclina testudinea</i> (Piller & Mitterpacher, 1783)	xylomycetophilic, detritophilic							V		
<i>Corticeus unicolor</i> Piller & Mitterpacher, 1783	subcortical myce- tophil + predator	R	V	CD						
<i>C. bicolor</i> (Olivier, 1790)	subcortical bark- beetle predator		V	CD		E	R			

Species	Brief characteristic of ecology	Ecosozological status								
		GB	N	Sw	F	Dk	G	A	Sk ₁	Sk ₂
<i>Corticeus bicoloroides</i> Roubal, 1933	subcortical bark-beetle predator									
<i>C. fasciatus</i> Fabricius, 1790	≡			V			R			
<i>C. fraxini</i> (Kugelann, 1794)	≡		V		D		R			V
<i>C. linearis</i> (Fabricius, 1790)	≡						R			
<i>C. longulus</i> (Gyllenhal, 1827)	≡		V		D		R			V
<i>C. pini</i> (Panzer, 1799)	≡						E	CD		V
<i>C. suberis</i> (Lucas, 1846)	≡						Ex			V
<i>C. suturalis</i> (Paykull, 1800)	≡, boreomontane		V	CD						V
<i>C. versipellis</i> (Baudi di Selve, 1876)	≡						Ex			V
<i>Menophilus cylindricus</i> (Herbst, 1784)	saproxylophilic			V			Ex	CD		+E
<i>Tenebrio molitor</i> Linnaeus, 1758	synanthropic, etc.									
<i>T. obscurus</i> Fabricius, 1792	≡, saproxylophilic			V	Ex					
<i>T. opacus</i> Duftschmid, 1812	saproxylophilic			E		V	V	V		
<i>Neatus picipes</i> (Herbst, 1797)	≡						V			
<i>Bius thoracicus</i> (Fabricius, 1792)	≡, boreomontane	R		CD			Ex	Ex	Ex	E
<i>Laena reitteri</i> Weise, 1877	xylodetritophilic									LR
<i>L. viennensis</i> (Sturm, 1807)	≡, xth.								E	V
<i>Probaticus subrugosus</i> (Duftschmid, 1812)	epigeic xth.									E
<i>Cylindronotus dermestoides</i> (Illiger, 1798)	saproxylophilic						R			
<i>C. laevioctostriatus</i> (Goeze, 1777)	≡						R			
<i>C. (Stenomax) aeneus</i> (Scopoli, 1863)	≡									

≡ – the same, detto; **xth.** – xerothermic, xerothermophilic; **protected species** in Slovakia are written **bold**.
Ecosozological categories: **Ex** – extinct, **E** – endangered, **V** – vulnerable, **R** – rare, **D** – decreasing, **CD** – care demanding, **I** – indeterminate, **IK** – insufficiently known, **LR** – lower risk

Table 2. Zoogeographical categorisation of Tenebrionidae occurring in Slovakia

Zoogeographical category	Species	Total Number
± Cosmopolitan	<i>Alphitophagus bifasciatus</i> , <i>Gnathocerus cornutus</i> , <i>Tribolium castaneum</i> , <i>T. confusum</i> , <i>T. madens</i> , <i>T. destructor</i> , <i>Palorus ratzeburgi</i> , <i>P. subdepressus</i> , <i>Alphitobius diaperinus</i> , <i>A. laevigatus</i> , <i>Tenebrio molitor</i> , <i>T. obscurus</i>	12
Eurosiberian	<i>Melanimon tibiale</i> , <i>Opatrum sabulosum</i> , <i>Crypticus quisquilius</i> , <i>Boletophagus reticulatus</i> , <i>Platydemia dejeani</i> , ⁽¹⁾ <i>Myrmecoxenus subterraneus</i> , <i>Corticeus fraxini</i> , ⁽¹⁾ <i>C. linearis</i> , <i>C. longulus</i> , ⁽¹⁾ <i>Neatus picipes</i>	10
European	<i>Blaps lethifera</i> , ⁽²⁾ <i>Opatrum riparium</i> , <i>Eledonoprius armatus</i> , <i>Eledona agaricola</i> , <i>Diaperis boleti</i> , ⁽²⁾ <i>Neomida haemorrhoidalis</i> , ⁽³⁾ <i>Scaphidema metallicum</i> , ⁽⁴⁾ <i>Platydemia violaceum</i> , <i>Pentaphyllus testaceus</i> , <i>Palorus depressus</i> , ⁽³⁾ <i>Uloma culinaria</i> , ⁽³⁾ <i>U. rufa</i> , <i>Corticeus unicolor</i> , <i>C. bicolor</i> , <i>C. bicoloroides</i> (?), <i>C. fasciatus</i>	16
Ponto-Mediterranean	<i>Gnaptor spinimanus</i> , <i>Blaps abbreviata</i> , <i>B. halophila</i> , <i>B. mortisaga</i> , <i>Pedinus femoralis</i> , <i>P. fallax</i> , <i>Probaticus subrugosus</i>	7
(Sub)Mediterranean	<i>Blaps mucronata</i> , <i>Gonocephalum pusillum</i> , <i>G. pygmaeum</i> , <i>Leichenum pictum</i> , <i>Pentaphyllus chrysomeloides</i> , <i>Myrmecoxenus vaporariorum</i> , <i>Diaclina fagi</i> , <i>D. testudinea</i> , <i>Corticeus pini</i> , <i>C. suberis</i> , <i>Menophilus cylindricus</i> , <i>Laena viennensis</i>	12
Central-European	<i>Blaps abdita</i> , <i>B. milleri</i> , <i>B. sinuatocollis</i> , <i>Oodescelis polita</i> , <i>Boletophagus reticulatus</i> , <i>Corticeus versipellis</i> , <i>Tenebrio opacus</i> , <i>Cylindronotus dermestoides</i> , <i>C. laevioctostriatus</i> , <i>C. (Stenomax) aeneus</i>	10
Eastern-Carpathian	<i>Laena reitteri</i>	1
Boreomontane	<i>Corticeus suturalis</i> , <i>Bius thoracicus</i>	2
Adventitious*	<i>Lyphia tetrphylla</i>	1

(1) its large range is apparently discontinuous

(3) occurs also in West Siberia

*originally holarctic

(2) occurs in North Africa as well

(4) missing in Balkan region

Muránska planina Mts. – NR Šarkanica (7286a) 2nd June 2002, everything V. Franc lgt. et coll.; Veľká Fatra Mts. – NR Tlstá (7079d) 6th August 1975, and Chočské vrchy Mts. – NR Veľký Choč (6882a/c) 10th July 1977, 4 ind. (a very remarkable record from subalpine altitude!) V. Rakšáni lgt. et coll.; Zvolen – Poštárka (7480b) 25th May 1988 and Slovenský kras – Hrhov (7390c/d) 22nd June 1991, A. Krištín lgt. et coll.; Plešivská planina – Zvonárka (7388d) (Vondřejc, Vondřejcová, 1988), Pohranice (7576c), a xerothermic grassland near the stone-pit (Majzlan, Cunev, 1998).

Pedinus femoralis – occurs scattered in xerothermic slopes on both carst and volcanic substrata. Recent records: NR Boky (7480a) 1st April 1989, NR Čabrad' (7780d) 8th April 1989, 2 ind.; Plášťovce, 11th April 1992, 2 ind.; Horné Vestenice (7276c/d) 2nd May 1993, Cerová vrchovina Mts. – Bagóova skala (7785b/d) 6th May 1995, Dolné Vestenice (7276c) 18th May 2002, everything V. Franc lgt. et coll.; NR Sedlisko (7573a/c) (Valenčík, 1979), NR Veľký vrch ((7376d), May 1997 (Cunev, Majzlan, 1998), Nová Vieska – NR Drieňová hora (8176b) (Majzlan, Rychlík, 1998), NR Čachtický hradný vrch (7272d), May 1999 (Majzlan, Štepanovičová, Fedor, 2000).

Gonocephalum pusillum – a rare Mediterranean species of xerothermic, especially sandy grasslands. In Southern Slovakia it reaches the northern boundary of its range. Recent records: Selešťany (7982a) 15th April 1990, 2 ind.; NR Hegyfarok, 2nd May 1992; Šurice (7785c) 22nd April 1995 and Gemerské Dechtáre (7786a/c) 6th May 1995, everything V. Franc lgt. et coll.; Jurský Šúr (7769a/c) 15th May 1990, I. Halaša lgt. et coll.; Malá Bara (7696b) 15th April 1994, R. Lohaj lgt. et coll.; NR Sedlisko (Valenčík, 1979), Žibrica (7674b) and Pohranice, a xerothermic grassland near the stone-pit (Majzlan, Cunev, 1998); Balvany – Kameničná (8174c), August 1999 (Majzlan, Fedor, Rychlík, 2000).

Gonocephalum pygmaeum – a sporadic and very rare Mediterranean species, obviously living in similar habitats as the preceding one. Only one recent record is available: Pereš, sandy grassland, May 1997, 5 ind. (Majzlan, 1998). The first record for the Slovakian fauna! Its distribution in Slovakia remains to be open question, because this little-known species may be overlooked and confused with *G. pusillum*. Nevertheless, its ecosozological status should be estimated as “V”.

Bolitophagus interruptus – a rare species of old warmer deciduous and mixed forests. It occurs under the bark of old trees with soft-fleshed bracket fungi. Recent records: Poniky – Pôľč (7281d) 11th June 1984, NR Mláčik (7380c), unidentifiable rotten bracket fungi, 24th May 1989; Polkanová (7180d), on the bracket fungus *Ischnoderma benzoinum* on an old fir, 12th July 1992; Vlkanová (7380b), under the bark of a damaged oak with mycelium, 20th March 1993, 8 ind.!.; NR Baranovo (7280b), on an old beech with the bracket fungus *Polyporus squamosus*, 27th May 1999, everything V. Franc lgt. et coll.; Veľká Fatra – lower part of the Gaderská dolina valley (7079b/d) (Valenčík, 1980); Leopoldov (7572b/d) 15th April 1980, M. Osvald lgt. et coll.; Slaská (7379a) 1st May 1993, 15 ind.!, M. Šiška lgt. et coll.; NR Mäsiarsky bok (7580d/7680b) 2nd May 1993, V. Kubinec lgt. et coll. It is noticeable that in Germany it is considered to be an extinct species.

Eledonoprius armatus – a very rare species of old warm deciduous forests. It occurs sporadically under the bark of old damaged trees (especially oaks) infected by mycelium and soft-fleshed bracket fungi. Recent records: NR Boky, 18th March 1990, V. Kubinec lgt. et coll.; NR Čabrad', 30th April 1990, V. Franc lgt. et coll.; Malé Karpaty Mts. – Chtelnická dolina valley (7471b), 28th October 1997, L. Jurga lgt. et coll. Several further records are available only in old publications. It is necessary to emphasize that it belongs among highly endangered or even extinct species in several countries of Europe (see the table 1).

Neomida haemorrhoidalis – occurs sporadically and rarely on rotten fungi-infected stems in old warmer deciduous forests. Recent records: NR Boky, 22nd November 1980; NR Čabrad', 23rd June 1987; Zvolen – Sekier: Zálužná (7481a/c) 20th June 1992, 2 ind.; Strážovské vrchy Mts. – NR Podhradská lesostep (7076a) 21st June 1993; NR Pohanský hrad (7785d) 7th May 1995; NR Mäsiarsky bok, 15th June 1986, everything V. Franc lgt. et coll.; Úkropová (7475c), July 1986 (Majzlan, Košíček, 1986); Vtáčnik Mts. – Lomská dolina valley (7377c/7477a) (Cunev, 1996); NR Gaštanica (7575c), June 1997 (Cunev, 1998). This noticeable species, considered to be an “Urwaldrelikt” – an ancient forest relict (Kaszab, 1969) – is apparently decreasing in the western part of its range (see the table 1). It ought to perspectively be listed in the Red List of Slovakian beetles as well.

Platydemia dejeani – a rare species of old deciduous forests, living in similar habitats as the preceding one. Recent records: NR Baranovo, 27th July 1980; Zvolen – Sekier: Zálužná, 8th August 1981, 17th June 1985 and 11th June 1989; Veľký Blh – NR Vereš (7586d) 17th May 1993; Poľana Mts. – Žiarec (7382a)

19th June 1993, everything V. Franc lgt. et coll.; Remetské Hámre (7199a) July 1959, several ind. (Gottwald, 1963); the valley of the Hunták brook (7674b), April 1994 (Cunev, 1997). This apparently decreasing species deserves more attention of conservationists.

Platydema violaceum – appears more frequently than *P. dejeani*, but nevertheless ranks among decreasing species, especially in the landscape with intensive forestry. It prefers the soft-fleshed fungus *Hirneola auricula-judae*. Recent records: NR Boky, 7th April 1984, several ind. (observed later as well); Plášťovce, 11th April 1992; Vlkanová, 20th March 1993; Strážovské vrchy Mts. – Hradištnica (7276c/d) 13th June 2002; Bystrická vrchovina Mts. – Stará Kopa (7281c) 14th June 2002, everything V. Franc lgt. et coll.; Bratislava (7868), under the bark of old poplars (Majzlan, 1991); Nitra – NR Zobor (7674d) May 1992 (Černý, Šafanda, 1997); NR Gaštanica, June 1997 (Cunev, 1998). This formerly quite frequent species is evidently decreasing in Northern and Western Europe.

Alphitobius diaperinus – this sporadic and rare beetle is considered to be a synanthropic species, nevertheless it may occur in warm open woodlands under the bark of old fungi-infected trees, on rotten debris, etc. Recent records: Banská Bystrica – Jakub (7280b), under the bark of an old willow stem 27th June 1980; Vrbovka (7982a), flown towards UV-light 6th August 1990, both records V. Franc lgt. et coll.; Bratislava, under the bark of *Celtis occidentalis* (Majzlan, 1991); Nitra – NR Zobor (Majzlan, Rychlík, 1985); NR Červený rybník (7468b) (Majzlan, Rychlík, 1995).

Diaclina fagi – occurs sporadically and very rarely under the bark of old deciduous trees, especially if they are infected by fungi. This Mediterranean species is still missing in the ‘Catalogue of Coleoptera’ (Roubal, 1936), the first record has been published by Havelka (1964): “Belanské kopce” (it means contemporary NR Hegyfárok), May 1950, 2 ind., J. Marek lgt. Recent records: Dobrá Niva (7580b) 16th July 1983; Plášťovce, 16th April 1989, 2 ind.; NR Hegyfárok, 30. 4. 1994, everything found on old damaged solitary oaks, V. Franc lgt. et coll.; Hontianske Nemce (7779b), 20th August 1986 in the pheromon trap for bark beetles, D. Brutovský lgt. et coll. It indicates well-preserved warm open woodlands with prevailing Pannonian fauna.

Diaclina testudinea – a scattered and infrequent species of warm open woodlands, accidentally appearing in old gardens, parks, vineyards, etc. It occurs under the bark of old damaged trees (may be fungi-infected), or in rotten debris. Recent records: Dobrá Niva, 1st May 1983, 2 ind. and 25th March 1989; Plášťovce, under rotten wood in a vineyard 3rd June 1985 and under the bark of an old solitary oak 16th April 1989; Kiarov (7882c) in a willow stump 26th June 1989; Gemerské Dechtáre, under the bark of dying solitary beech 24th May 1996, everything V. Franc lgt. et coll.; Plavecký Štvrtok (7667b), in an old pine stump together with the longhorn beetle *Ergates faber* 21st April 1985, A. Krištín lgt. et coll.; Bratislava – Karlova Ves (7868a), in a hollow willow 10th July 1989, 2 ind., I. Halaša lgt. et coll.; Bratislava, under the bark of a chestnut (Majzlan, 1991); Veľaty (7495d) in the hollow of a lime 20th July 1990, R. Lohaj lgt. et coll.; Tlmače (7777a) 25th March 1993 and Bratislava – Petržalka (7868d) 17th April 1993, 3 ind., D. Farbiak lgt. et coll.; Somotor (7596d) in a hollow lime 3rd April 1994, T. Lackner lgt. et coll.; NR Hegyfárok (Majzlan, Rychlík, 1997). This remarkable species in favourable conditions may also live in urban environments.

Corticus pini – a sporadic and utmost rare species of well-preserved mixed forests of lower mountain altitudes. It obviously lives under the conifer-tree bark as a bark-beetle predator, like the relatives. Only one old record by Brančík (Roubal, 1936) is available, but no concrete locality is mentioned. Recent record: NR Baranovo, under the bark of a fir together with bark beetles *Pityokteines curvidens* 15th May 1990, 2 ind., V. Franc lgt. et coll. It is the first properly localised record for the territory of Slovakia! This species with hidden way of life may be overlooked and confused with the other rare species of this genus.

Corticus longulus – a scattered and very rare species of well preserved forests, a bark-beetle predator on the conifers. Only several old dateless records are available (Picka, 1978). Recent records: Malacky (7568c), under the bark of an oak! 8th July 1990; Kremnička (7380b), under the bark of a pine 10th October 1993; Banská Bystrica – Urpín (7280d) under the bark of a pine together with the bark beetle *Ips sexdentatus* 7th March 1998, 2 ind., everything V. Franc lgt. et coll. Ecosozological status and conservation problems of the species from this genus remain to be open problem due to their hidden bionomy.

Menephilus cylindricus – a very local-and-rare species of warm open woodlands and pasture forests. It lives under the bark of ancient solitary oaks. Only two old dateless records are accessible: Bratislava,

Laco lgt. and Zvolen, Olexa lgt. (Picka, 1978). Recently it is known only from the single locality: Dobrá Niva, 14th July 1985, 2 ind. and 13th July 1994, V. Franc lgt. et coll.; later collected by D. Farbiak. This extremely vulnerable beetle, considered to be an ancient forest relict (Kaszab, 1969) deserves strict protection!

Tenebrio obscurus – an infrequent, partially synanthropic species, which may also occur under the bark of old trees, etc. Recent records: Zvolen – Sekier: Zálužná, under the bark of an old oak 7th July 1982; Trnava (7671) on the pigeon dung on the base of the church wall 1st July 1987, several ind.; Kiarov, under the bark of a willow stump 30th June 1989; Hriňová – Javorinka (7383c) under the decaying spruce timber 5th August 1989; Strážovské vrchy Mts. – Prostredná dolina (7276c) under the bark of an old oak 2nd July 2002, everything V. Franc lgt. et coll.; Nitra – NR Zobor (Valenčík, 1991); the valley of the Hunták brook, July 1994 (Cuney, 1997).

Tenebrio opacus – occurs locally and rarely under the bark of old dying oaks in well-preserved warm deciduous forests. Recent records: NR Boky 22nd November 1980 and 2nd May 2002, NR Čabrad' 8th April 1989, Veľký Blh – NR Vereš 25th April 1992, everything V. Franc lgt. et coll.; NR Jurský Šúr (7769c) 20th May 1989, 2 ind., I. Halaša lgt. et coll.; NR Sedlisko (Valenčík, 1979). It indicates the well preserved ancient oak forests of Central Europe.

Neatus picipes – an infrequent species of old warm deciduous forests. It especially occurs under the bark of old dying trees (especially oaks, but also willows, chestnuts, etc.). Recent records: Kiarov, under the bark of an old willow 30th June 1989; later found on old oaks only: Želiezovce (7977b/d) 5th June 1989; Malacky, 8th July 1990; Plášťovce, 11th April 1992; NR Boky, 2nd May 2002, everything V. Franc lgt. et coll.; Žirany – Vápeník (7675a) 22nd April 1992 (Černý, Šafanda, 1997).

Conclusions

Tenebrionidae often rank among rare and faunistically significant species. A range of some of them is apparently discontinuous, several ones occur only in a few isolated places. Approximately one half of them may be used as bioindicators of well-preserved and valuable habitats, but also microrefugia in the exploited and urbanised landscape. We can see that the majority of findings listed in this paper were made in nature reserves or in the sites that are appropriate and exceptable for territorial protection. But Tenebrionidae are often threatened by various kinds of human activity, including especially:

- intensive forestry with all the consequences, mainly degradation of natural forests towards monocultures and the selective cutting of old, damaged and hollow trees which are still regarded as the reservoirs of so-called pests;
- pasture intensification (extensive pasture use is acceptable or even very necessary in a lot of places), and, on the other side, afforestation of “sterile” steppes and rocky slopes;
- application of agro-chemicals in the fields and pastures;
- field enclosure and degradation of dispersed vegetation in the landscape;
- burning out the vegetation of xerothermic habitats;
- purposeless and absurd burning out of old and hollow trees (ancient oaks with very scarce fauna near Dobrá Niva and elsewhere are often burnt out by shepherds!);
- illegal collecting of commercial “entomologists”.

Finally I would like to emphasize that effective territorial protection of valuable and threatened habitats is the most important for real genofund conservation. It does not concern only Tenebrionidae, but almost all stenotopic insects and the other invertebrates.

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