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On the occurrence and bioindicative value of several rare species of the family Tetratomidae and Melandryidae (Coleoptera) in Slovakia

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This paper deals with problems of the distribution, bionomy, vulnerability and bioindicative value of the beetle families Tetratomidae and Melandryidae (Coleoptera) in Slovakia. They are little known groups of beetles – only sporadic published records are available. Despite this fact, the majority of them rank among rare, relict, faunistically and zoogeographically remarkable species of a high level of endangerment. Two of them: *Abdera biflexuosa* CURT. and *Phloiotrya subtilis* (REITT.) are the first seriously localized records from Slovakia. The author also examines the ways of their protection and ecosozological applicability.

Key words: Tetratomidae, Melandryidae, distribution in Slovakia, bioindication, insect protection.

Introduction and methods

The attention of coleopterologists is usually oriented towards "attractive" groups (Buprestidae, Cerambycidae, etc.). The majority of others, including Melandryidae, are mostly overlooked (Tetratomidae are the former subfamily of Melandryidae). Despite this fact, the majority of them rank among rare and relict species of a narrow ecological amplitude. But this is the reason for their high vulnerability and endangerment as a result of anthropic pressure on the biosphere. In Czech and Slovak literature on insect genofund protection only a marginal attention is paid to Tetratomidae and Melaneryidae. Only PECINA (1983) mentions the high endangerment level of *Melandrya barbata* (F.) and other species of this family in general. NOVÁK and SPITZER (1982) and ŠKAPEC et al. (1992) do not mention any of them. In contract, in Germany up to 32 of them are listed among the more or less highly endangered species (ROPPEL, 1984). In Austria there are 16 (FRANZ, 1983) or up to 27 species (GEISER,1983).

In this paper I summarize the results of my entomological research mainly in Central Slovakia that was carried out during the last 14 years. It contains the remarkable findings of Tetratomidae and Melandryidae with zoogeographical, ecological and conservational notes. I applied current methods of collecting, especially individual collecting on old, damaged trees and shaking down the beetles from drying tree branches. All findings listed were mine, except where the names or abbreviations of different collectors are added. The material was determined according the key by KASZAB (1969). Published data and further findings are added only in the case of rare and faunistically significant species. The grid mapping code

of every locality is given only for the first time.

The following abbreviations (except the current ones) are used in this paper: B. B. – Banská Bystrica (7280)

NMP – National Museum, Praha

SNMB – Slovak National Museum, Bratislava

spec. – specimen (-s)

collectors:

FR. – Valerián FRANC

KB. – Vladimír KUBINEC

LC. – Tomáš LACKNER

LH. – Roman LOHAJ.

Finally I would like to thank all colleagues mentioned above who supplied me with their interesting and valuable records.

Results (Systematic review of species)

Tetratomidae

Mycetoma suturale (PANZ.) – the 'Badínsky prales' state nature reservation (7380), on the wood fungi *Ischnoderma benzoinum* (= *resinosum*) on a broken fir October 20, 1985, more than 10 spec., FR.; Zvolen – Sekier: Zálužná (7481c), on an old beech also on *Ischnoderma* October 19, 1986, 3 spec., FR. and October 3, 1989, 3 spec. under the same circumstances, KB. A primeval forest relict, living scattered, locally and rarely in mountainous regions of Europe. In Germany and Austria it is listed among the species approaching extinction. Only a few old records are available: ROUBAL (1936) mentions Vihorlat (710), Veľká Fatra (150), Tovarníky (7195), Inovec (7274), Vlára (6974) and Šalková (7281). It was also found near Bardejov: Magura (6693) December 1–4, 1975, 4 spec., JELÍNEK lgt., coll. NMP.

Melandryidae

Eustrophinae – this subfamily includes typical xylomycetophilous species.

Eustrophus dermestoides (F.) – is mentioned in papers more frequent than most. It occurs irregularly, but sometimes in a large number in some bracket fungi (mainly in *Laetiporus sulphureus* and also in *Meriphilus*, *Grifola* spp., etc.), often together with the darkling beetle *Eledona agaricola* (HBST.) (Tenebrionidae). In Germany it is surprisingly listed among strongly endangered species. A lot of older and also recent records are available. It often lives in groves and alluvial forests and occasionally also in secondary anthropogenous biotopes: Dobrá Niva (7580), in the *Laetiporus* fungi on an old cherry tree in a balk between fields May 18, 1985, several spec., FR. It also flies towards UV light: Vrbovka (7882), July 1, 1989, FR.

Hallomenus binotatus (QUENS.) – occurs irregularly and rarely on wood fungi (Polyporales) in well preserved forests at intermediate altitudes. In Austria it is listed among endangered species. A lot of older records are available, but recently it is usually found sporadically and singularly: Zvolen (7480), in the *Laetiporus* fungi on a willow in the alluvial grove near the river Hron July 5, 1980, FR. (this locality is totally destructed now!); Badín (7380), accidentally under an old fir bark July 28, 1981, FR.; Nová Sedlica (6901), July 23, 1987, DANĚK lgt. et coll.; Zvolen – Poštárka (7480), on wood fungi (*Polyporus*) on an old oak May 24, 1992, FR. Only one numerous finding has been made: Turček – Špicatá (7279), on wood fungi (*Poria* sp.) on a broken fir July 20, 1992, more than 10 spec., FR.

Melandryinae

Orchesia blandula BRANCS. – occurred sporadically but not rarely in well preserved mountain forests. Plenty of older records in collections and papers are available (ROUBAL, 1936), but recently it has been found only singularly and rarely: Poľana (7383), on a spruce stem June 2, 1980, BRUTOVSKÝ lgt. et coll., FR. rev. In Austria it is considered to be a missing species.

Anisoxya fuscula (ILLIG.) – occurs sporadically and rarely in well preserved warmer forests. In Germany it is listed among strongly endangered species. Several recent findings have been made, always on drying branches of deciduous trees: Vinné (7197d), June 16, 1989, 2 spec., ZBUZEK lgt. et coll.; Zvolen – Poštárka, on oak branches July 5, 1989, FR.; Príbelce (7781), on oak branches on a xerothermic slope May 31, 1990 together with *Abdera biflexuosa* CURT., FR.; B. B. – Urpín, on beech branches June 12, 1993, FR.; Košecké Podhradie (7076a), on oak branches June 21, 1993 together with a very rare anthribid-beetle *Choragus horni* WOLF., FR.

Abdera (Carida) affinis (PAYK.) – occurs sporadically and very rarely in well preserved forests of lower and intermediate altitudes. Only a few old records are available: Bolešov, Vlára, Zvolen (ROUBAL, 1936); Hronská Breznica (7480) May 27, 1932, 5 spec. and B. B. – 'Patrovlas', June 1932, ROUBAL lgt., coll. SNMB. In Germany and Austria it is listed among strongly endangered species. I have recorded only one recent finding: B. B. – Urpín, on a damaged drying beech August 27, 1987, 2 spec., KB.

Abdera (Carida) flexuosa (PAYK.) – lives in well preserved forests mainly at intermedi-

ate altitudes. It occurs sporadically and rarely; ROUBAL (1936) mentions only two old records from Bolešov. It was also found in Svätojurský Šúr (7769) April 30, 1968, 14 spec., JELÍNEK lgt., coll. NMP. It is listed among strongly endangered species in Germany and Austria. Recent findings: Kremnické vrchy – Mláčik (7380), under the bark of a beech in the old primeval Abieto-Fagetum May 24, 1989, FR.; Kysuce – Veľká Rača (6679c), in a decaying beech stem June 13, 1989, 2 spec., FR. It was also found in Svätojurský Šúr (7769) April 30, 1968, 14 spec., JELÍNEK lgt., coll. NMP.

Abdera (Wanachia) triguttata (GYLL.) – occurs very sporadically-and-rarely in similar habitats to *A. flexuosa*. It is also listed among strongly endangered species in Austria. Only one old record from Bolešov is accessible (ROUBAL, 1936). I can mention only two recent findings: Medzilaborce – Palota (6797), on fir branches June 26, 1990, KODADA lgt. et coll.; Petrovce (7299), on beech branches June 20, 1993, 3 spec., LC.

Abdera (Abdera) quadrifasciata CURT. – occurs very sporadically and rarely in xerothermic oak forests. Only one old record is accessible – ROUBAL (1936) mentions only Trenčín – Istebník (7074) and he also found it in Hronská Breznica, sine dat. (coll. SNMB). Recently I have recorded more findings: Plášťovce (7879) June 21, 1984, FR.; Čebovce (7781) June 2, 1990 and May 30, 1993, 3 spec., FR.; Borša (7596c), 3 spec. on birch branches, June 1993, LH. et LC.; Pravica (7682) June 12, 1993, FR.; Horné Vestenice (7276) July 6, 1993, FR.; Budča, 19 July 1993, FR. (it is one of the northernmost localities in the whole range). It was also recently found in Jelenec (7675) June 3, 1983, RIČL lgt. et coll. and Štúrovo – Hegyfarok (8177) June 20, 1986, RÉBL lgt. et coll. It seems that it is quite widely distributed in xerothermic oak forests of southern Slovakia, but its localities deserve protection at all events. It is listed among strongly endangered species in Austria. In Germany it is considered to be a species approaching extinction.

Abdera (Abdera) biflexuosa CURT. – occurs very locally and rarely in the warmest xerothermic biotopes. Data concerning its occurrence in Slovakia are not available. ROUBAL (1936) mentions only one old finding from Ukraine (Kuzy). KASZAB (1969) places it in brackets as an uncertainly verified species for Central Europe. It is also missing in the Checklist of Czechoslovak Beetles (JELÍNEK et al., 1993). Recent findings: Horné Plachtince (7781) May 30, 1990, P. ZAHRADNÍK lgt., coll. P. ZAHRADNÍK et NMP; Príbelce, on drying oak branches May 31, 1990, FR.; Čebovce, together with *Abdera quadrifasciata* and a very rare eucnemid-beetle *Dromaeolus barnabita* (VILLA) May 30, 1993, 2 spec., FR. and KB. A new species for Slovakia!

Dircaea australis FAIRM. – is a primeval relict found in the best preserved forests and groves at lower altitudes. It occurs very locally-and-rarely. ROUBAL (1936) mentions only two old records: Vihorlat (710) and Detva (7482). HAVELKA (1964) adds Vtáčnik (280), under the beech bark, July 1958, 2 spec., HAVELKA lgt. et coll. It was also found in Hronský Beňadik (7677) July 6, 1954, in Remetské Hámre (7199) July 29, 1961 and in Štúrovo May 4, 1964, MAIDL lgt., coll. SNMB. In Germany it is considered to be a missing or extinct species. In Austria it is listed among strongly endangered species. Recent findings: Dobrá Niva, under the bark of an old solitary oak July 20, 1984, 2 spec., FR. and July 6, 1986, KB.; Hronský Beňadik, accidentally on vegetation in xerothermic oak forest June 20, 1987, FR.; Žiar nad Hronom (7379), on a dying beech July 26, 1992, 5 spec., M. ŠIŠKA lgt. et coll., 1 spec. in coll. mea; Čierny Balog – Vydrovo (7283), in the pheromon trap for *Ips typographus* (L.) August 15, 1993, D. BRUTOVSKÝ lgt. et coll.

Phloiotrya subtilis (REITT.) – occurs extremely sporadically and rarely in well preserved regions of Europe, probably mainly at medial altitudes. JELÍNEK (in JELÍNEK et al., 1993) mentions only an unverified record from Moravia. KASZAB (1969) also mentions its occurrence in Moravia but he notes that it is exceptable also in the Carpathians. LOHAJ (in litt.) proves its occurrence in Slovakia: Ladomirov (7099d), on a drying birch June 26, 1993, LH.; Nová Sedlica (6901), on a drying hazel-nut tree July 12, 1990, G. DUNAY lgt. et coll. There are the first seriously documented records for Slovakia.

Phloiotrya vaudoueri MULS. – is a typical primeval relict found in warm old deciduous forests. It occurs very locally-and-rarely. Only a few old records are available: Trenčín (7174a), Trenčian. Teplice, Košice (7293), Zlaté Moravce (7676) (ROUBAL, 1936). In Germany and Austria it is listed among the species approaching extinction. Newer findings: B. B. – Urpín, on an old drying beech July 12, 1981, FR.; Dobrá Niva, on an old solitary oak July 31, 1981, 2 spec., FR. and July 5, 1988, KB.; Budča, on an old oak August 16, 1985, KB; Petrovce, under the bark of a beech July 27, 1990, LH. It is also one of the highly endangered beetles in Slovakia – its abundance has noticeably decreased as a consequence of one-sided productional forestry procedures.

Phloiotrya rufipes (GYLL.) is a much more frequent species and it lives on drying branches of deciduous trees, often of the hazel-nut tree (*Corylus avellana*) although nobody mentions it in accessible papers.

Xylita laevigata (HELL.) – is a boreomontane species occurring irregularly and rarely in older conifer forests of intermediate and higher altitudes. It sometimes rises up to the upper forest boundary. Meanwhile its biotopes are mostly not strongly affected by human activity, but they obviously deserve conservationists' attention. A relatively large number of older and recent records are available, nevertheless it is usually found singularly. More findings are known from Nízke Tatry – Prašivá (7181b), on old dying spruces July 15, 1982, 2 spec., FR., July 5, 1991, 2 spec., KB. and May 21, 1993 (just hatched), FR.

Xylita livida (SAHLB.) ranks among the relatively frequent species especially at intermediate altitudes of Slovakia. It highly prefers damaged, dying firs and a lot of old and also recent records are available. Therefore it is surprisingly listed among species going extinct in Germany. Actually, firs have been almost disappeared there. But it is not right to regard its nearly frequent occurrence in Slovakia positively, because it is only a temporary state that is a consequence of proceeding perishing of firs!

Hypulus bifasciatus (F.) – occurs irregularly and very rarely in well preserved warmer forests and groves. Although a relatively large number of older records are available, at present it is usually found singularly and its abundance is noticeably decreasing. In Germany it is listed among the species approaching extinction. In Austria it is considered to be a strongly endangered species. Recent findings: Vidová (Slov. or.) May 27, 1974, MAIDL lgt., coll. SNMB; Veľká Fatra – Blatnica (7079), June 1974, M. VALENČÍK lgt. et coll. (VALENČÍK, 1980); Jelenec, on dying oak branches June 6, 1978, J. STREJČEK lgt. et coll. (STREJČEK, 1988); Budča, on tough oak fungi (*Fomes* sp.) June 10, 1981, FR.; Zádielska planina (7390d), in an old damaged cherry-tree May 5, 1990, 3 spec., LH.; Veľký Blh (7586), on oak branches May 17, 1993, KB.; Poľana – Žiarec, on rotten oak branches June 19, 1993, FR.

Hypulus quercinus (QUENS.) is a more frequent species than the preceding one, but its biotopes deserve conservationists' attention as well.

Zilora sericea (STURM) – is a primeval relict of old, well preserved forests at intermediate altitudes. It occurs very sporadically and rarely. ROUBAL (1936) mentions only one old record from B. B. (May 2, 1932). JELÍNEK found it in Zborov near Bardejov (6693) December 5, 1975, 4 spec. (coll. NMP). In Germany and Austria it is listed among strongly endangered species. It seems that it is rare and little known mainly due to its very hidden bionomy. Recent findings were made mostly under and in the bark of damaged old firs: Veľká Fatra – Japeň (7180), June 28, 1980, KB.; Badín, pupae before hatching out May 9, 1981, FR.; Sitno (7579c), under the bark of a damaged birch (!) June 15, 1984, FR.; B. B. – Baranovo (7280b), May 8, 1983, 2 spec. and November 18, 1989, 1 spec., FR.; Bardejov – Stebnická magura (6693), October 10, 1992, about 20 spec., LH. and LC.; Košice – Čermeľ (7293a), October 1991, 6 spec., LH. and LC.

Melandrya barbata (F.) – is a primeval relict of the best preserved forests mainly at medial altitudes. It occurs very sporadically and rarely. In Germany and Austria it is listed among strongly endangered species. ROUBAL (1936) mentions only several old records: Inovec, Košice, Bratislava (7868), Vlára. It was also found near Žilina ("Krivánske lesy") June 18, 1908, in Hronská Breznica May 18, 1925, ROUBAL lgt., coll. SNMB and in Rožňava (sine dat.) HAJNÝ lgt., coll. SNMB. I have made only two recent findings: Veľká Fatra– Japeň, accidentally under the bark of a spruce stump June 28, 1980, FR.; Poľana – Žiarec, a damaged dead specimen under the bark of a beech stump April 4, 1993, FR.

Melandrya dubia (SCHALL.) – occurs irregularly and rarely in old, well-preserved forests from hilly to mountainous regions. In Germany and Austria it is also listed among strongly endangered species. It seems that its range is a bit more continuous than in the case of *Melandrya barbata*. Recent findings: Livovská Huta (6792), under the bark of an old fir June 5, 1986, KB.; Poľana – Hrončecký grúň (7383a), on a damaged maple tree June 27, 1986, FR.; Kysuce – Veľká rača, in the decaying wood of an old beech June 13, 1989, 2 spec., FR., 1 spec. in coll. J. KORŇAN; Vihorlat – Pirnagov vŕšok (7197d), in a rotten birch stem May 18, 1991, several pupae and hatching out adults together with a bit more frequent species *Melandrya caraboides* (L.), LH.; Dobrá Niva, accidentally on a wooden pole fence near an old oak grove during a warm sunny day May 22, 1992, 2 spec., FR., 1 spec. in coll. D. FARBIAK (this contradicts the opinion of ROUBAL (1936) who mentions that it is a crepuscular species); Poľana – Žiarec, June

Table 1. Biotopic amplitude and bioindicative significance of Tetratomidae and Melandryidae in Slovakia.

Species	Biotopic types							Bioind.	
	A	B	C	D	E	F	G	sig.	Note
Tetratoma ancora F.		–	–	+	+	–		LS	
Tetratoma desmaresti LATR.		+						S	extremely rare (1
Tetratoma fungorum F.		–		+	+	–		S	
Mycetoma suturale (PANZ.)				+	+			HS	
Eustrophus dermestoides (F.)	–	+	+					LS	
Hallomenus axillaris (ILL.)		+	–	+	+	–		S	little known, rare
Hallomenus binotatus (QNS.)		+	+	+	+	–		S	
Orchesia acicularis RTT.		+	+					S	(2
Orchesia micans (PANZ.)		+	–	+	+	–		S	
Orchesia blandula BRANCS.		–	–	+	+	+		S	very rare
Orchesia fasciata (ILL.)	–	+	–	–				S	
Orchesia minor WALK.		+	–	+	+	–		LS	
Orchesia undulata KR.		–		+	+	–		S	
Anisoxya fuscula (ILL.)	–	+	–	+	–			S	
Abdera affinis (PAYK.)		+	–	+	–			S	
Abdera flexuosa (PAYK.)		–	+	+	+			S	
Abdera triguttata (GYLL.)		–		+	+			HS	very rare
Abdera quadrifasciata CURT.	+							S	(3
Abdera biflexuosa CURT.	+							S	
Dircaea australis FAIRM.	+	+	–	–	–			HS	
Phloiotrya rufipes (GYLL.)	–	+	–	+	–			S	(3
Phloiotrya subtilis (RTT.)		+						HS	extremely rare
Phloiotrya vaudoueri MULS.	+	+	–	–				HS	
Xylita laevigata (HELL.)					–	+	–	S	
Xylita livida (SAHLB.)				–	+	+		LS-S	
Serropalpus barbatus (SCH.)				–	+	+		LS-S	
Hypulus bifasciatus (F.)	–	+	+	–				S-HS	
Hypulus quercinus (QNS.)	–	+	–	+				S	
Zilora sericea (STURM)				–	+	–		HS	
Melandrya barbata (F.)		–	–	+	–			HS	
Melandrya caraboides (L.)		+	–	+				S	
Melandrya dubia (SCH.)		+	–	+	+	–		HS	
Phryganophilus ruficollis (F.)					+	+		HS	extremely rare (4
Conopalpus testaceus (OL.)		+	–	+	–			S-HS	
Osphya bipunctata (F.)	–	+	–	–	–			LS	

A – xerothermic forests, forest-steppe biotopes, B – temperate deciduous forests, Bioind. sig. – bioindicative significance, C – alluvial forests and groves, D – deciduous forests on rocky-and-scree substrata (Tilieto-Aceretum, etc.), E – beech and mixed forests (mainly Abieto-Fageta) at medial altitudes, F – mountain mixed and prevailingly conifer forests, G – boreal climate forests approaching upper forest boundary, HS – highly significant, LS – lesser significant, S – significant, + – prefered biotope, – – occasional occurrence, (1 – Only one old record is available: Zvolen, May 1955, A. OLEXA lgt. et coll. (NOHEL, 1975). It needs verification. (2 – little known, wrongly identifiable, (3 – more frequent than it is known, (4 – Only one old record is available: Malá Fatra – Rozsutec (6780), on a broken beech 7 June 1962, O. MAJZLAN lgt. et coll. (MAJZLAN, 1974).

6, 1993, 1 spec. on beech branches also during a sunny day and 1 spec. in a pheromon trap for *Ips typographus* (L.), FR.

Osphyinae

Conopalpus testaceus (OLIV.) – lives irregularly and rarely in well preserved forests mainly in hilly regions. In Germany and Austria it is listed among strongly endangered species. It occurs in two forms: *f. flavicollis* GYLL. and *f. typica* which is ostensibly a bit rarer. ROUBAL (1936) mentions only a few old records: Malé Karpaty – Píla (7669) (*f. flavicollis*) and Inovec, several authors (both forms). It was found also in Sitno – Holík (7679) sine dat., ROUBAL lgt., coll. SNMB. Recent findings: Zemplín (7596), on a willow June 20, 1991, *f. typica*, KB.; Zvolen – Sekier: Zálužná, on drying hornbeam branches June 20, 1992, 3 spec. *f.*

typica, FR.; B. B. – Baranovo, on a drying beech branches June 25, 1992, 2 spec. *f. flavicollis*, FR.; Petrovce, on beech branches June 22, 1993, LC.

Conclusions

In this paper data concerning the distribution, ecology and conservation problems of several Tetratomidae and Melandryidae in Slovakia are available. I have not mentioned either more frequent species or rare ones which are not recently verified by accessible material of referred collectors. It will be useful to give the brief review of Tetratomidae and Melandryidae hitherto known from Slovakia and to sketch their biotopic amplitude and bioindicative significance (Tab. 1).

A large majority of Tetratomidae and Melandryidae have a wide ecosozological applicability especially as bioindicators of well preserved and valuable ecosystems; but they also indicate primeval fragments and microrefugia in the exploited and urbanized landscape. We can see that the majority of findings listed in this paper were made in protected territories or in ones that are appropriate and exceptable for territorial protection. But Tetratomidae and Melandryidae are mostly highly endangered species. This is caused especially by:

1. 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.

2. Gradual vanishing of alluvial forests which is caused mainly by agricultural ground expansion and absurd river-bank regulation and finally also by water pollution (unfortunately, ratification of the Ramsar convention on wetland protection by the former ČSFR in 1990 has not been introduced in practice up to now).

3. Destruction of forest fragments and dispersed vegetation in the agricultural and urbanized landscape.

4. Cutting down or even burning old and hollow trees in cities and suburban areas. Filling the hollows of old trees with wooden, concrete or other materials, which is current in urban parks and alleys is also very hurtful for the stenotopic arboricolous synusia of insects and other animals.

Finally I would like to emphasize that effective territorial protection of valuable and endangered biotopes is the most important for real genofund conservation. It is necessary to assure it appropriately on the legislative level and also in the practical action of conservational bodies. Then we could be able to stop the sad tradition of listing of disappearing species.

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