CONTRIBUTION TO THE KNOWLEDGE OF EDAPHIC AND SUBTERRANEAN COLEOPTERA FROM THE CLOŞANI KARSTIC AREA (OLTENIA, ROMANIA) – WITH SPECIAL REFERENCES ON THE MESOVOID SHALLOW SUBSTRATUM

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Les auteurs présentent les résultats des recherches effectuées sur la faune de coléoptères édaphiques et souterraines de la région karstique de Cloşani (Olténie, Roumanie). Ces résultats sont concrétisés dans l'identification de 70 espèces (récoltées pour la plupart du milieu souterrain superficiel). À la liste de la faune on ajoute des données concernant la chorologie et les biotopes dans lesquels ont été signalées les espèces.

1. INTRODUCTION

The geographic situation of Oltenia, its local climate and the profusion of the karstic phenomena have drawn the attention of biospeleologists since the beginning of the last century. Among the first authors who treated the diversity and features of the invertebrate subterranean fauna from South-western Romania, worth mentioning are C.N. IONESCU (1914), R. JEANNEL and E. RACOVITZA (1929), J. MALLASZ (1929). Particularly, the subterranean beetles from Oltenia were studied by R. JEANNEL (1924, 1928 a, b, 1930, 1931), J. MALLASZ (1929, 1930) followed by M.AL. IENIŞTEA (1955) and V. DECU (1959, 1961, 1962). In the year 1964 D. DANCĂU and I. TABACARU compiled a valuable synthesis on the biospeleological researches in Oltenia and Banat. A first note on the mesovoid shallow substratum (superficial subterranean environment – S.S.E.) of Romania was published by C. JUBERTHIE and collab. (1981). This paper represents our contribution to the knowledge of the coleoptera fauna from the edaphic and subterranean environments of the Cloşani karstic area (the first faunal list of Coleoptera occurred in the subterranean superficial environment of Romania).

2. MATERIAL AND METHODS

During October 1999–April 2002 we placed in the edaphic and subterranean superficial environments (also called *Mesovoid shallow substratum* – M.S.S.) nine Barber traps to sampling invertebrate fauna. Among these, seven traps were placed from 40 to 70 cm depth in the subterranean superficial environment (Fig. 1), having in view the collecting of fauna from all M.S.S. types (depending on the relation between the organo-mineral layer and the bed-rock) (Fig. 2).

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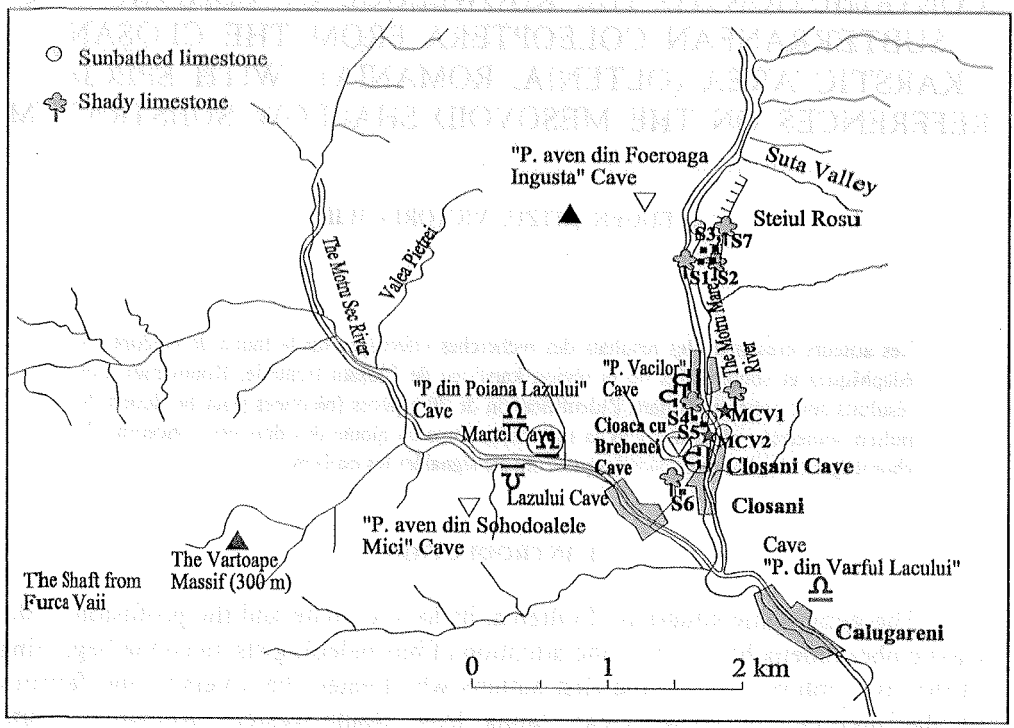

Fig. 1 – The collecting sites for edaphic and subterranean Coleoptera from the Cloşani karstic area: S1-S7 sampling sites in S.S.E. and edaphon; MCV-pitfalls in artificial cavities.

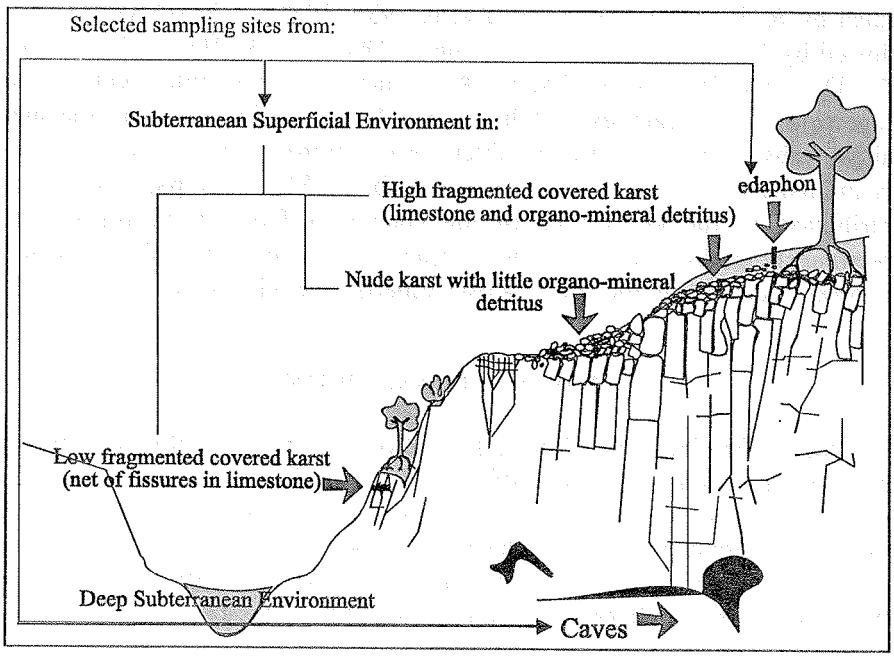

Fig. 2 – Schematic representation of the collecting sites relying on the relation between soil and limestone.

In the period from April to November 2001, besides the Barber traps placed in S.S.E (M.S.S.), we digged two artificial cavities at the slopes base, in the fissured limestone penetrated by the roots of plants. The artifficial cavities (0.8 and 2 m depth) were situated at 3 m, respectively 2 m below the soil level and inside them we placed traps following the model described by NITZU (1997). An original type of trap (NITZU, 2001, p. 151) was used to capture fauna directly from fissures. This consists in an elastic collecting tube, introduced in limestone fissures and attached (at the external end) to a container with ethyl alcohol, and olfactic attractant (Fig. 3).

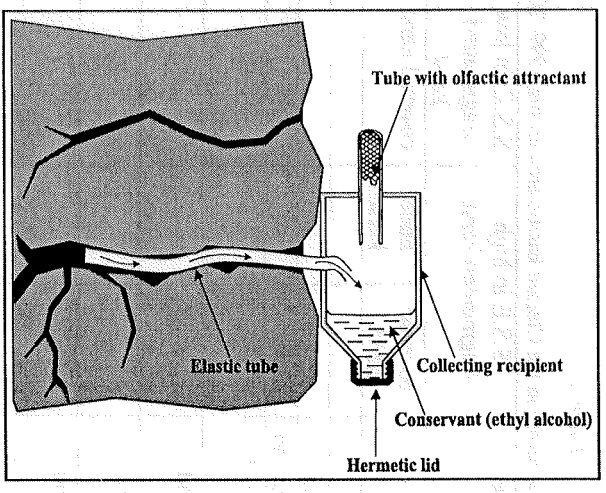

Fig. 3 – Schematic representation of the original traps used for collecting fauna from the net of fissures in limestone.

3. DISCUSSIONS

The values of temperature and relative humidity recorded in the collecting sites (2001, October 09) are listed in Table 1. The species of Coleoptera (70 species) collected (preponderantly from M.S.S.) are presented in Table 2. Obviously, this list is far from being representative for the real biodiversity of the Cloşani karstic area, but offers some interesting faunal data. Thus, besides six hypogean endemic species for Oltenia (among them 5 are troglobiont forms), two species (*Metophthalmus hungaricus* and *Hylaia rubricollis*) were considered up to now as Banatian endemites. Worth mentioning is also the occurrence of some endemic species for the Carpathians (*Trechus cardioderus cardioderus, Cryptophagus deubeli*), rare species with Balkano-Carpathian range (*Corticus diabolicus*), Alpino-Carpatho-Balkanian range (*Euconnus motschulskyi*), or with Alpino-Carpatho-Ilirian range (*Euconnus oblongus*). Among the hypogean species, besides troglobiont forms [*Duvalius spinifer, D. spiessi, D. oltenicus* (collected from the deep fissures in limestone) *Closania winkleri, Sophrochaeta oltenica*], some rare (*Anommatus duodecimstriatus, Leptinus testaceus*) or new described species (*Anommatus oltenicus*) were collected from the M.S.S.

Table 1

Edaphic and subterranean Coleoptera occurred in the Cloşani karstic area during 1999–2002

Taxon	Chorotype	S.S.E in high fragmented karst		S.S.E. in low fragmented karst	Caves	Edaphon
		covered karst	nude karst	covered karst		
1. Fam. Carabidae						
Cychrus semigranosus Palliardi, 1825	E. European					+
Notiophilus rufipes Curtis, 1829	Turanico-European	+				+
Trechus cardioderus cardioderus Putzeys, 1870	Carpathian end.					+
Duvalius (Duvaliotes) spinifer spinifer Jeannel, 1928	Oltenian end.				+ P. Martel	
Duvalius (Duvaliotes) spiessi Jeannel et Mallasz, 1928	Oltenian end.				+ P. Martel	
Duvalius (Duvaliotes) oltenicus Jeannel, 1928	Oltenian end.				+ Cioaca cu Brebenei	
Bembidion (Peryphus) tetracolum Say, 1823	Euro-Siberian					+
Tachyta nana (Gyllenhal, 1810)	Holarctic					+
Amara aenea (De Geer, 1774)	W-Palearctic					+
Stomis pumicatus (Panzer, 1796)	Euro-Caucasian	+				+
Abax parallelepipedus (Piller et Mitterpacher, 1783)	European	+		+		+
Abax parallelus (Duftschmid, 1812)	European			+		+
Anchus (Anchomenus) ruficornis (Goeze, 1777)	W-Holarctic				+ P. Râpa Vânătă	+ ripicolous

Taxon	Chorotype	S.S.E in high fragmented karst		S.S.E. in low fragmented karst	Caves	Edaphon
		covered karst	nude karst	covered karst		
2. Fam. Staphilinidae						
Micropeplus porcatus (Paykull, 1789)	Euro-Mediterranean			+		+
Proteinus brachypterus (Fabricius, 1792)	Euro-Siberian	+				
Omalium rivulare (Paykull, 1792)	Euro-Mediterranean	+				+
Lathrimaeum melanocephalum (Illiger, 1794)	European					+
Oxytelus sculpturatus Gravenhorst, 1806	Palearctic	+		+		+
Medon brunneus (Erichson, 1839)	Euro-Caucasian					+
Medon ferrugineus (Erichson, 1840)	Euro-Balkanian			+		+
Stenus asphaltinus Erichson, 1840	European		+			+
Philonthus chalceus Stephens, 1832	Euro-Siberian	+				
Gabrius lividipes (Baudi, 1848)	Euro-Caucasian					+
Quedius mesomelinus (Marsham, 1802)	European		+	+	+ P.Isverna P.Cloşani	
Quedius puncticollis (Thomson, 1867)	European	+				
Quedius nigriceps (Kraatz, 1857)	European					+
Quedius cinctus (Paykull, 1790) R !	Euro-Mediterranean					+
Corodalia obscura (Gravenhorst, 1802)	Euro-Mediterranean (also in Canare and Azore isl.)	+				
Falagria thoracica Curt.	European	+				
Philhygra rugulosa Heer, 1839 (= *P. brissouti* Harold, 1866)	Alpino-Carpathian		+	+		
Bessobia occulata (Erichson, 1837)	E.European (+Balk.)	+				

Taxon	Chorotype	S.S.E in high fragmented karst		S.S.E. in low fragmented karst	Caves	Edaphon
		covered karst	nude karst	covered karst		
Ischnoglosa prolixa (Gravenhorst, 1802)	Euro-Caucasian	+				+
Ocalea badia Erichson, 1837	W. Palearctic	+				+
Oxypoda rufa Kraatz, 1856	Euro-Caucasian	+				
Oxypoda opaca (Gravenhorst, 1802)	Euro-Siberian		+			
Aleochara ripicola Mulsant Rey, 1874	Palearctic	+				+
Aleochara curtula (Goeze, 1777)	Palearctic			+		+
Bolitochara obliqua Erichson, 1837	Centr.-E. European	+				
Bryaxis reitteri (Saulcy, 1875)	E. European		+			
Bryaxis glabricollis (Schm.-G., 1838)	European		+			+
Bryaxis nodicornis (Aube, 1833)	European	+	+			+
3. Fam. Scydmaenidae						
Euconnus (Tetramelus) oblongus (Sturm, 1838)	Alpino-Carpatho-Ilirian	+				
Cladoconnus motschulskyi (Sturm)	Alpino-Carpatho-Balkanian	+				
4. Fam. Silphidae						
Phosphuga atrata Linnaeus , 1785	Euro-Siberian			+		+
5. Fam. Catopidae						
Ptomaphagus subvillosus (Goeze, 1777)	Centr.-E. European	+				
Catops picipes (Fabricius, 1792)	Euro-Mediterranean	+				
Catops subfuscus Kellner, 1846	Centr.-E. European			+		
Catops grandicollis Erichson, 1837	European			+		
Sciodrepoides watsoni (Spence, 1815)	Euro-Siberian			+		+
Choleva spadicea (Sturm, 1839)		+				

Taxon	Chorotype	S.S.E in high fragmented karst		S.S.E. in low fragmented karst	Caves	Edaphon
		covered karst	nude karst	covered karst		
Closania winkleri Jeannel, 1928	Oltenian end.				+ P. CSER, P. Râpa Vânătă, P. Martel, P. Closani	
Sophrochaeta subaspera Jeannel, 1928 *Sophrochaeta oltenica* Jeannel et Mallasz, 1930	Oltenian end.				+ P. Râpa Vânătă, P. Cioaca cu Brebenei	
6. Fam. Liodidae						
Agathidium laevigatum Erichson, 1848	Euro-Caucasian			+		
7. Fam. Leptinidae						
Leptinus testaceus Muller, 1817	Euro-Caucasian	+				
8. Fam. Corylophidae						
Sericoderus lateralis Gyllenhal, 1827	Palearctic	+				
9. Fam. Ptiliidae						
Acrotrichis atomaria De Geer, 1774	Euro-Caucasian	+				+
10. Fam. Nitidulidae						
Epurea melanocephala (Marsham)	Euro-Siberian	+				+
11. Fam. Cryptophagidae						
Cryptophagus deubeli Ganglbauer, 1897	Carpathian	+		+		
Cryptophagus nitidulus Millière, 1852	E. European	+				
Cryptophagus cellaris (Scopoli, 1763)	European		+			
Cryptophagus dentatus (Herbst, 1793)	Palearctic		+			+

Taxon	Chorotype	S.S.E in high fragmented karst		S.S.E. in low fragmented karst	Caves	Edaphon
		covered karst	nude karst	covered karst		
12. Fam. Rhizophagidae						
Rhizophagus ferrugineus (Paykull, 1800)	European	+				
Rhizophagus parallelocollis Gyllenhal, 1827	European			+		
13. Fam. Lathridiidae						
**Metophthalmus hungaricus* Reitter, 1908	Banat*	+				
14. Fam. Colydiidae						
Corticus diabolicus Schaufuss, 1862	Balkano-Carpathian	+				
15. Fam. Anommatidae						
Anommatus duodecimstriatus (Muller, 1821)	Euro-Caucasian	+				
**Anommatus oltenicus* Nitzu, 2003	Oltenian end.	+				
16. Fam. Endomychidae						
**Hylaia rubricollis* (Germar, 1817)	Banat*	+			+ P. CSER	
Mycetaea hirta (Marsham, 1802)	Euro-Caucasian		+			
17. Fam. Elateridae						
Dima elateroides Charpentier, 1825	European	+				+
18. Fam. Chrysomelidae						
Timarcha tenebricosa (Fabricius, 1775)				+		
Mantura obtusata (Gyllenhal, 1813)	Euro-Siberian	+				+
19. Fam. Curculionidae						
Acalles echinatus Germar, 1824	European	+	+			+

Table 2

Four abiotic factors recorded for the sampling units. S1-S7 – pitfalls in M.S.S.(S.S.E.) and edaphon, MCV1-MCV2- pitfalls in artificial cavities; CK-covered karst, NK-nude karst, E-edaphon

	S1	S2	S3	S4	S5	S6	S7	MCV1	MCV2
Type of environment	CK	CK	NK	CK	NK	E	E	CK	CK
Relative altitude (in m)	10	15	13	20	20	10	15	–	–
Depth of placement to the soil level) (m)	–0.5	–0.7	–0.3	–0.7	–0.5	–0.4	–0.4	–3	–1
Temperature (°C)	11.3	10.7	12	10.3	11	13.8	12	11	9.8
Relative humidity (%)	74.5	79.6	71.3	81.2	76.3	78.8	73.3	75.4	79.2

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