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Studies on leaf-beetles (Coleoptera, Chrysomelidae) from the upper Arieş river basin

Alexandru Crişan & Lucian Alexandru Teodor

Rezumat

Cercetări asupra crizomelidelor (Coleoptera, Chrysomelidae) din bazinul superior al Arieşului

Cercetări întreprinse în perioada 1997-2001 în aria bazinului superior al Arieşului au relevat prezența a 121 de specii de crizomelide din 40 de genuri aparținând la 10 subfamilii. Există deci o biodiversitate mare în cadrul acestui grup de coleoptere în aria cercetată, atât dacă ne referim la numărul de specii cât şi la repartiția acestora pe subfamilii. Această constatare este în acord cu bogăția vegetației şi varietatea peisajului. Subfamiliile cel mai bine reprezentate au fost Alticinae, cu 50 de specii şi Chrysomelinae cu 33 de specii, urmate de Cryptocephalinae cu 11 specii, Galerucinae cu 9 specii şi Cassidinae cu 8 specii. S-a remarcat prezența, cu număr mare de specii, a unor genuri mai rare ca *Gonioctena*, *Luperus* şi *Plateumaris*. Aproximativ 20 dintre speciile de crizomelide constatate în zonă pot fi considerate ca specii rare sasu foarte rare pentru fauna țării.

Keywords: leaf-beetles, upper Arieş river basin, faunistics, ecology

Few scientific data about leaf-beetle fauna in Romanian regions are known (Fleck 1905; Gruev et all. 1993; Ieniştea1968, 1974, 1975; Konnert-Ionescu 1963; Marcu 1927, 1928, 1936, 1957; Negru 1968; Negru & Roşca 1967; Panin 1951; Petri 1912; Roşca 1973, 1974, 1976; Ilie, 1999; Maican & Serafim 2001). For Transylvania and mostly for "Apuseni" mountains, leaf-beetle informations are also very rare (Seidlitz 1891; Peţri 1912; Konnert-Ionescu 1963; Roşca 1973, 1974; Szel et all.1995). Starting 1992 we initiated studies on leaf-beetles in different regions of the country and mostly in Transylvania (Crişan1993, 1994, 1995, Crişan & Teodor 1994, 1996; Crişan & Bonea, 1995; Crişan & Druguş 2001; Crişan et all., 1998, 1999, 2000).

Arieş river basin is an area not studied till now, concerning leaf-beetle fauna, so that we started an ample study on the biodiversity of this group in the mentioned zone, from which we present in this paper the situation of leaf-bee-

tle fauna in the upper Arieş river basin. This is a large mountain region situated between Arieş river springs and Câmpeni village, bordered by Bătrâna Mountains and Scărişoara Tableland in the Northern part and by Biharia Mountains and Metaliferi Mountains in the Southern part.

Arieş hygrographical basin contains, in this region, a number of vallies as: Gârda Seacă valley, Iarba Rea stream, Albacului valley, Arieşul Mic valley and Abrudului valley, each with many brooks and streams.

Material and methods

Using an entomological net we sampled the area, in an amount of 50 sweeps / sample, in different points of the region and different ecosystems and habitates as follows:

1. Arieş springs:
1.a. A *Sphagno-Piceetum* association with hygrophilous glades;
2. Around Arieşeni village:
2.a. A hygrophilous lawn;
2.b. A *Piceetum abietis* association;
2.c. The hygrophilous vegetation bordering the river (*Alneto-Salicetum* association);
3. An area between Arieşeni and Gârda de Sus villages:
3.a.A mezophilous pasture (*Lilio-Plantaginetum majoris* association) with *Festuca rubra* and *Agrostis tenuis* as major representative species;
3.b.A hygrophilous area bordering the river (*Salicetum capreaeae* association);
3.c. A lawn on Iarba Rea stream (*Nardo-Festucetum rubrae* association);
4. Close by Gârda de Sus village:
4.a. A *Piceeto-Fagetum* association, South-Western exposed;
4.b. An *Alnetum glutinosae* association bordering the river;
4.c.A chopped-wood, mezophilous area;
5. At Casa de Piatră, on Gârda Seacă valley:
5.a. A hygrophilous vegetation to the Coiba Mare cave;
5.b. *A Fageto-Piceetum* association, Estern exposed, not far from the cave, with best represented mezophilous herbous vegetation;
5.c. A pasture bordering the forest, with rare bushes and treees;
5.d. A *Salicetum* association bordering the valley;
5.e. A chopped forest on the left side of the valley, Western exposed;
5.f. A mezophilous lawn, Western exposed, with *Trifolium* species and also with *Salix caprea* and *Fagus sylvatica* bushes;
6. Along Gârda Seacă valley:
6.a. The hygrophilous vegetation nearby the valley (*Salicetum* association);
6.b. A mezophilous lawn, South-Western exposed;
6.c. A *Fagetum sylvaticae* association with best represented herbous vegetation;

6.d. The „Fileşti" glade, along Fileşti brook, mezohygrophilous to hygrophilous association, with rare bushes and trees;
7. An area between Gârda de Sus and Scărişoara villages:
7.a. A *Oxalo-Piceetum* mezophilous association, on the left side of Arieş river valley, a Western exposed slope;
8. Close by Albac village:
8.a. A mezophilous pasture in the Arieş river meadow;
9. The Arieşul Mic valley, upstream Avram Iancu village:
9.a. A *Fageto.Piceetum* association with *Vaccinium myrthilus*, *Oxalis acetosella*, *Rubus, Calamagrostis* etc.
9.b. A *Salicetum* hygrophilous association with a better represented herbous vegetation;
9.c. An *Alneto-Fagetum* association, generally mezo-hygrophilous;
9.d. A mezophilous lawn with *Genista sagitalis* as major species, Southern esposed slope;
10. The Abrudului valley, upstream Abrud village:
10.a. A mezophilous lawn;
10.b. A *Carpineto-Fagetum* association having small glades with bushes;
10.c. A mixed forest nearby Cărpiniş village, with a neighboring lawn;
10.d. A *Salicetum* association close by the valley;
11. Close by Câmpeni village:
11.a. A rare *Piceetum* forest with very small glades having herbous vegetation.

Collected insects were kept dry and identified in the laboratory, using different literature (Mohr, 1966; Panin, 1951; Kaszab 1962-1971; Kippenberg & Doberl, 1994; Schaufuss, 1915; Reitter, 1914; Rozner, 1996; Warchalowski, 1993).

Result, discussion and conclusions

The table below shows leaf-beetle biodiversity in the upper Arieş river basin, with data about the abundance in each of the capture places and ecosystems.

In the whole sampling period 1997-2001 we captured 885 leaf-beetle individuals in which we identified 121 species from 40 genera and 10 subfamilies. That represent a rich biodiversity, in accord with the vegetation diversity and the rich diversity of the habitates.

The best represented subfamilies, according to the number of captured species, were Alticinae, with 50 species and Chrysomelinae, with 33 species, followed by Cryptocephalinae, with 11 species, Galerucinae, with 9 species and Cassidinae, with 8 species (Fig. 1).

The better representation of same subfamilies with so different ecological demands shows that the area has many ecosystems and ecotones and,

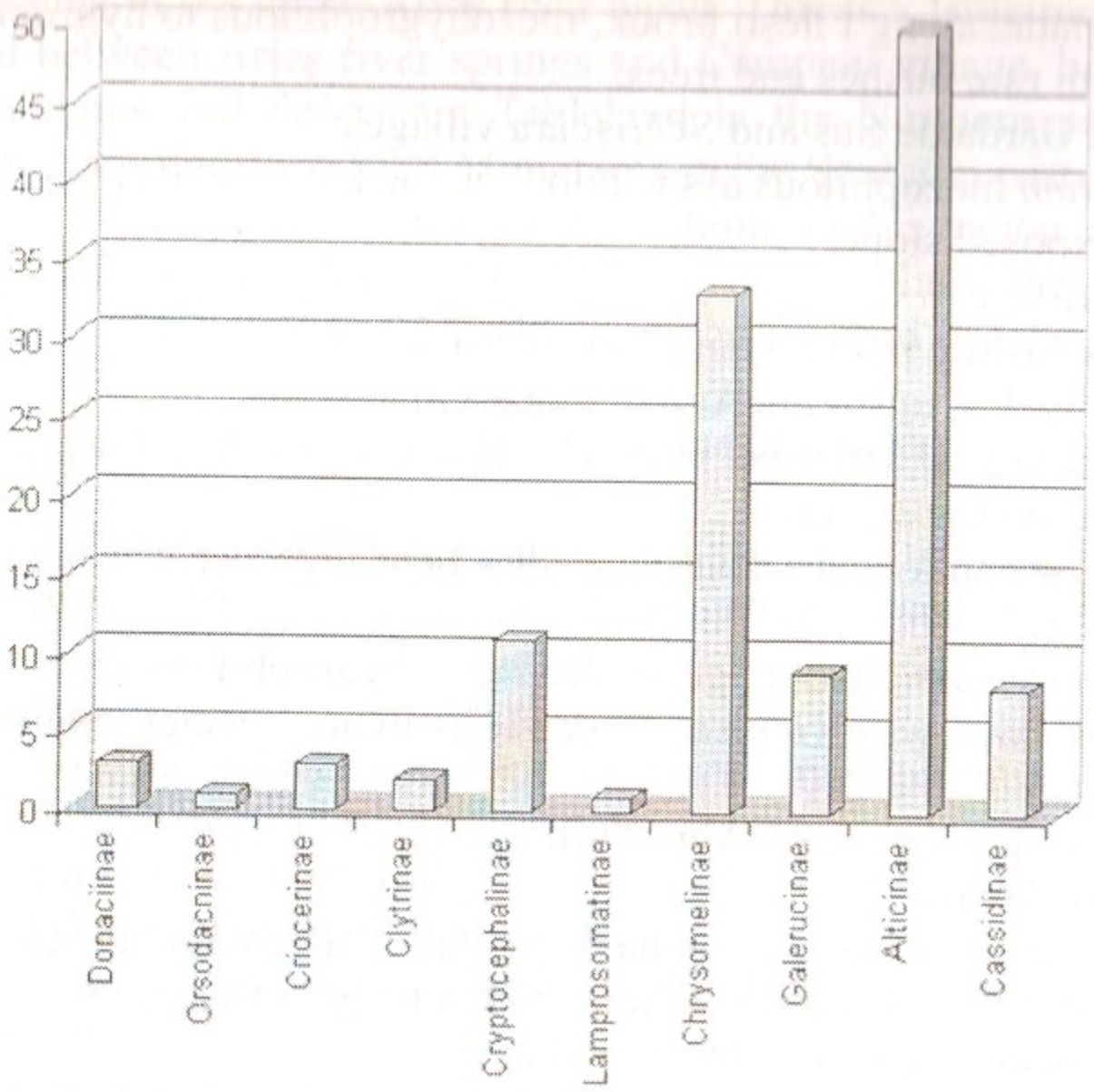

Fig. 1. Diagram of the representation of leaf-beetle subfamilies, according to the number of collected species in the upper Arieş river basin

generally, many different habitates which offer best ecological conditions to different leaf-beetle species.

The genera better represented in the leaf-beetle fauna of the upper Arieş river basin were: *Longitarsus*, with 13 species, *Cryptocephalus*, with 10 species, *Chrysolina*, with 9 species, *Phyllotreta, Chaetocnema* and *Cassida*, each with 8 species.

It is more important, in this context, to show that same genera, who have generally few species in other areas, have had a great biodiversity in the upper Arieş river basin. So are: *Gonioctena* (genus rare in Transylvanian regions), who had 5 species, *Luperus*, with 4 species and *Plateumaris* with 3 species.

The most abundent species were: *Phyllotreta nemorum*, in a mezophilous lawn on the Arieşul Mic valley, with 49 collected individuals; *Phyllotreta armoraciae*, in a lawn on Iarba Rea stream, with 41 collected individuals; *Chrysomela vigintipunctata* , in a *Alneto-Salicetum* association on Gârda Seacă valley, with 39 collected individuals;*Batophila fallax*, in a *Oxalo-Piceetum* association between Gârda de Sus and Scărişoara villages, with 34 collected individuals *Cryptocephalus moraei*, at „Casa de Piatră", with 20 collected individuals; *Chrysolina varians* in a *Fagetum* association along Gârda Seacă valley, with 14 collected individuals, etc.

Some of leaf-beetles collected in the upper Arieş river basin are rare or very rare species in the romanian fauna, as are: *Coptocephala unifasciata*, species more frequent in the South-Estern part of the country,*Cryptocephalus frenatus*, *Chrysolina geminata*, all the 5 collected *Gonioctena* species, *Longitarsus quadripunctatus, Hermeophaga mercurialis, Batophila rubi, Orestia alpina, Hipuriphilla moderi, Minota carpathica, Mantura obtusata, Chaetocnema semicoerulea, Sphaeroderma rubidum, Dibolia rugulosa* etc.

The above discussed considerations on leaf-beetle biodiversity and the vegetation diversity, added with the beauty of the landscapes, make from the upper Arieş river basin an interesting area, both for science and tourism, demanding conservative activities.

Table 1

List of the species of Chrysomelidae captured in the upper Arieş river basin

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
I Donaciinae KIRBY, 1837				
Plateumaris (Iuliusiana) consimilis (SCHRANK, 1781)	17 05 97 01 08 98	2 1	0,23 0,11	- 5.a. - 11.a.
Plateumaris (Iuliusiana) braccata (SCOPOLI, 1772)	02 06 00	3	0,34	- 2.c.
Plateumaris (Plateumaris) sericea (LINNAEUS, 1761)	01 08 98	1	0,11	- 5.d.
II Orsodacninae THOMSON, 1859				
Orsodacne cerasi (LINNAEUS, 1758)	02 06 01 01 06 01 26 07 01	1 2 1	0,11 0,23 0,11	- 5.b. - 6.a. - 6.a.
III Criocerinae LATREILLE, 1807				
Oulema (Oulema) melanopus (LINNAEUS, 1758)	17 05 97 17 05 97 25 06 98 25 06 98 02 06 00 02 06 00 01 06 00	2 1 1 2 2 2 2	0,23 0,11 0,11 0,23 0,23 0,23 0,23	- 6.b. - 6.d.. - 10.a. - 10.c. - 3.a. - 9.b. - 5.d.
Oulema (Haspidolema) galleciana (HEYDEN, 1870)	02 06 98 02 06 00	1 1	o,11 0,11	- 10.d. - 3.a.
Oulema (Haspidolema) erichsoni (SUFFRIAN,1841)	03 06 00 01 06 01	1 1	0,11 0,11	- 8.a. - 6.b.
IV. Clytrinae KIRBY 1837				
Smaragdina salicina (SCOPOLI, 1763)	24 05 98	2	0,23	- 10.b.
Coptocephala unifasciata SCOPOLI, 1763	02 06 01 19 08 01	1 2	0,11 0,23	-5.c. -9.c.
V. Cryptocephalinae GYLLENHAL, 1813				

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Pachybrachys simuatus Mulsant & Rey, 1854	24 06 98	1	0,11	- 4.c.
Cryptocephalus (Burlinius) querceti Suffrian, 1848	02 06 98	1	0,11	- 4.c.
Cryptocephalus (Burlinius) ocellatus Drapiez, 1819	24 06 98	2	0,23	- 4.b.
Cryptocephalus (Cryptocephalus) sericeus (Linnaeus, 1758)	24 06 98 27 07 00 26 07 00 02 06 01 02 06 01 01 06 01	2 5 1 7 1 2	0,23 0,56 0,11 0,79 0,11 0,23	- 2.a. - 5.f. - 6.c. - 9.d. - 9.b. - 6.a.
Cryptocephalus (Cryptocephalus) moraei (Linnaeus, 1758)	02 06 00 03 06 00 26 06 00 27 07 00 27 07 00 27 07 00 02 06 01 18 08 01 19 08 01	1 4 3 20 1 2 2 1 1	0,11 0,45 0,34 2,26 0,11 0,23 0,23 0,11 0,11	- 3.a.. - 3.c.. - 6.a. - 5.f. - 6.d. - 6.c. - 9.d. - 5.f. - 9.d..
Cryptocephalus (Cryptocephalus) hippochoeridis (Linnaeus, 1758)	02 06 00 01 06 01 02 06 01	2 1 3	0,23 0,11 0,34	- 3.a.. - 6.a. - 9.d.
Cryptocephalus (Cryptocephalus) bipunctatus (Linnaeus, 1758)	02 06 00 03 06 00 02 06 01	1 8 1	0,11 0,90 0,11	- 3.a. - 3.c. - 9.d.
Cryptocephalus (Cryptocephalus) violaceus Laicharting, 1781	03 06 00 02 06 01 01 06 01	1 2 2	0,11 0,23 0,23	- 3.c. - 9.d. - 6.b.
Cryptocephalus (Cryptocephalus) frenatus Laicharting, 1781	27 07 00	3	0,34	- 6.d.
Cryptocephalus (Cryptocephalus) quadripunctatus Richter, 1820	01 06 01	21	2,37	- 6.b.
Cryptocephalus (Homalopus) coryli (Linnaeus, 1758)	01 06 01	6	0,68	- 6.c.
VI. Lamprosomatinae Lacordaire, 1848				
Omorphus (Omorphus) concolor Sturm, 1807	24 05 98	2	0,23	- 10.c.
VII. Chrysomelinae Latreille, 1802				
Leptinotarsa decemlineata (Say, 1824)	02 06 01	1	0,11	- 9.b.
Chrysolina (Erythrochrysa) polita (Linnaeus, 1758)	25 05 98 25 06 98 02 06 01 01 06 01	4 3 2 2	0,45 0,34 0,23 0,23	- 10.d. - 10.d. - 9.a. - 5.e..

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Chrysolina (Ovostoma) olivieri olivieri (BEDEL, 1892)	24 05 98 02 06 98 24 06 98 27 07 00 02 06 01	1 1 1 1 1	0,11 0,11 0,11 0,11 0,11	- 10.b. - 4.a. - 4.b. - 5.f. - 9.b.
Chrysolina (Minckia) chalcites GERMAR, 1824	24 05 98	1	0,11	- 10.c.
Chrysolina (Sphaeromela) varians SCHALLER, 1783	24 05 98 01 06 98 26 06 98 25 06 98 03 06 00 27 07 00 26 07 00	1 3 3 2 1 4 14	0,11 0,34 0,34 0,23 0,11 0,45 1,58	- 10.a. - 11.a. - 10.b. - 10.d. - 7.a.. - 5.c. - 6.c.
Chrysolina (Colaphosoma) sturmi (WESTHOFF, 1882)	02 06 98 02 06 01	1 2	0,11 0,23	- 10.d. - 9.c.
Chrysolina (Menthastriella) herbacea DUFTSCHMID, 1825	27 07 00 02 06 01 01 06 01	1 5 7	0,11 0,56 0,79	- 6.d. - 9.b. - 5.a.
Chrysolina (Hypericia) geminata PAYKULL, 1799	01 06 01	1	0,11	- 6.b.
Chrysolina (Colaphodes) haemoptera LINNAEUS, 1758	01 06 01	1	0,11	- 5.c.
Chrysolina (Fastuolina) fastuosa (SCOPOLI, 1763)	02 06 98 27 05 98	1 2	0,11 0,23	- 4.c. - 10.b.
Oreina (Oreina) alpestris alpestris SCHUMMEL, 1844	02 06 98	9	1,01	- 10.d..
Oreina (Oreina) viridis viridis DUFTSCHMID, 1825	27 07 00	14	1,58	- 5.a.
Oreina (Allorina) caerulea (OLIVIER, 1790)	25 06 98 25 06 98	1 5	0,11 0,56	- 10.b. - 10.a.
Oreina (Allorina) bidentata BONTEMS, 1981	02 06 01	4	0,45	- 9.c.
Oreina (Chrysochloa) cacaliae SCHRANK, 1785,var. senecionis SCHUMMEL, 1843	25 06 98 01 06 01 01 06 01	5 2 2	0,56 0,23 0,23	- 10.d. - 6.a. - 5.a..
Colaphus sophiae SCHALLER, 1783	01 06 01	1	0,11	- 5.e..
Gastrophysa viridula (DE GEER, 1775)	25 05 98 02 06 98 02 06 01	3 1 1	0,34 0,11 0,11	- 10.c. - 10.d. - 9.b.
Phaedon (Phaedon) armoraciae (LINNAEUS, 1758)	17 05 97	1	0,11	- 6.a.
Phaedon (Phaedon) armoraciae L. var. *salicinus* HEER	17 05 97	1	0,11	- 6.a.
Phaedon (Phaedon) cochleariae (FABRICIUS, 1792)	17 05 97 02 06 00 02 06 00	1 6 3	0,11 0,68 0,34	- 6.a. - 4.b. - 2.c.

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Plagiodera versicolora (LAICHARTING, 1781)	02 06 98 24 06 98 02 06 01	2 1 7	0,23 0,11 0,79	- 4.b. - 4.b. - 9.c.
Chrysomela (Stricherus) vigintipunctata (SCOPOLI, 1763)	17 05 97 17 05 97 24 05 98 24 06 98	21 18 1 2	2,37 2,03 0,11 0,23	- 6.a. - 6.d. - 10.d. - 4.b.
Chrysomela (Pachylina) collaris (LINNAEUS, 1758)	17 05 97 02 06 98 01 06 98	8 1 1	0,90 0,11 0,11	- 6.a. - 4.b. - 11.a.
Linaeidea (Linaeidea) aenea (LINNAEUS, 1758)	02 06 98 02 06 98 02 06 98 24 06 98 25 06 98	1 2 4 3 1	0,11 0,23 0,45 0,34 0,11	- 4.a. - 4.c. - 4.b. - 4.b. - 10.d.
Gonioctena (Goniomena) intermedia HELLIESEN, 1913	17 05 97 01 06 01	1 1	0,11 0,11	- 6.d. - 6.b.
Gonioctena (Gonioctena) nivosus (SUFFRIAN, 1851)	02 06 98	1	0,11	- 4.b.
Gonioctena (Gonioctena) linnaeanna (SCHRANK, 1781)	24 06 98	2	0,23	- 4.a.
Gonioctena (Gonioctena) viminalis (LINNAEUS, 1758)	17 05 97 02 06 01	2 1	0,23 0,11	- 6.d. - 9.b.
Gonioctena (Gonioctena) rufipes (DE GEER, 1775)	02 06 01 01 06 01	2 1	0,23 0,11	- 9.b. - 6.a.
Phratora (Phratora) vittelinae (LINNAEUS, 1758)	17 05 97 25 05 98 02 06 98 01 06 98	2 6 6 8	0,23 0,68 0,68 0,90	- 6.a. - 10.d. - 4.b. - 11.a.
Phratora (Phratora) atrovirens CORNELIUS, 1857	17 05 97	1	0,11	- 6.a.
Phratora (Phratora) laticollis (SUFFRIAN, 1851)	02 06 98 26 06 00 27 07 00 01 06 01 01 06 01	5 3 3 7 2	0,56 0,34 0,34 0,79 0,23	- 4.b. - 6.a. - 6.d. - 6.a. - 5.d.
Phratora (Chaeroceta) vulgatissima (LINNAEUS, 1758)	17 05 97 24 05 98 03 06 00 01 06 01	1 2 2 7	0,11 0,23 0,23 0,79	- 5.d. - 10.c. - 7.a. - 6.a.
VIII. Galerucinae LATREILLE, 1802				
Galerucella (Neogalerucella) lineola (FABRICIUS, 1781)	01 06 01	1	0,11	- 6.a.
Galerucella (Neogalerucella) tenella (LINNAEUS, 1761)	01 06 01	1	0,11	- 6.c.
Galerucella (Neogalerucella) calmariensis (LINNAEUS, 1758)	01 06 01	1	0,11	- 6.a.

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Galeruca (Galeruca) tanaceti (LINNAEUS, 1758)	25 06 98 27 07 00	1 9	0,11 1,01	- 10.c. - 5.c.
Galeruca (Galeruca) pomonae (SCOPOLI, 1763)	27 07 00	1	0,11	- 5.c.
Lochmea capreae (LINNAEUS, 1758)	17 05 97 10 06 01	1 1	0,11 0,11	- 5.d. - 6.a.
Luperus viridipennis (GERMAR, 1824)	02 06 98	2	0,23	- 10.c.
Luperus xanthopoda (SCHRANK, 1781)	24 06 98	1	0,11	- 4.b.
Luperus lyperus (SULTZER, 1776)	02 06 00 03 06 00 02 06 00 02 06 00	1 2 4 5	0,11 0,23 0,45 0,56	- 2.b. - 3.c. - 1.a. - 2.b.
IX. Alticinae KUTSCHERA, 1859				
Phyllotreta flexuosa (ILLIGER, 1794)	17 05 97	1	0,11	- 6.a.
Phyllotreta cruciferae (GOEZE, 1777)	17 05 97	1	0,11	- 6.c.
Phyllotreta undulata (KUTSCHERA, 1860)	17 05 97 25 06 98	2 1	0,23 0,11	- 5.e. - 10.c.
*Phyllotreta ochripes (*CURTIS, 1837)	02 06 00 02 06 00	1 1	0,11 0,11	- 3.a.. - 1.a..
Phyllotreta nigripes (FABRICIUS, 1775)	02 06 00	1	0,11	- 1.a.
Phyllotreta armoraciae (KOCH, 1803)	03 06 00	41	4,63	- 3.c.
Phyllotreta nemorum (LINNAEUS, 1758	02 06 01	49	5,54	- 9.d.
Phyllotreta atra (FABRICIUS, 1775)	01 06 01	2	0,23	- 5.c.
Aphthona venustula (KUTSCHERA, 1861)	17 05 97 17 05 97	1 1	0,11 0,11	- 6.c. - 5.f..
Aphthona stussineri WEISE, 1888	17 05 97	8	0,90	- 6.c..
Aphthona ovata FOUDRAS, 1861	17 05 97 17 05 97 03 06 00	1 1 3	0,11 0,11 0,34	- 5.e. - 6.d. - 7.a.
Aphthona coerulea (GEOFFROY, 1785)	01 06 01 02 06 01	1 1	0,11 0,11	- 5.f.. - 9.b.
Longitarsus (Longitarsus) brunnaeus (DUFTSCHMID, 1825)	17 05 97 03 06 00 26 06 00 19 08 01 02 06 01 01 06 01	9 1 1 2 4 2	1,01 0,11 0,11 0,23 0,45 0,23	- 6.c.. - 3.c. - 6.a. - 9.d. - 5.d. - 6.b.

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Longitarsus (Longitarsus) nigrofasciatus (GOEZE 1777)	17 05 97 17 05 97 24 05 98 03 06 00 02 06 00 03 06 00 02 06 00	1 2 1 4 1 1 2	0,11 0,23 0,11 0,45 0,11 0,11 0,23	- 6.d. - 5.f.. - 10.d -1.a. - 2.c. - 3.c.. - 3.a.
Longitarsus (Longitarsus) holsaticus (LINNAEUS, 1758)	17 05 97	1	0,11	- 5.f.
Longitarsus (Longitarsus) lycopi (FOUDRAS, 1860)	24 05 98 02 06 98 02 06 01	1 1 1	0,11 0,11 0,11	- 10.a. - 4.c. - 6.a..
Longitarsus (Longitarsus) rubellus (FOUDRAS, 1860)	02 06 00 01 06 01 19 08 01	2 1 1	0,23 0,11 0,11	- 3.a. - 6.b. - 9.d.
Longitarsus (Longitarsus) obliteratus (ROSENHAUER, 1847)	03 06 00 18 08 01 18 08 01	1 1 1	0,11 0,11 0,11	- 3.c. - 5.f.. - 9.d.
Longitarsus (Longitarsus) apicalis (BECK, 1817)	20 07 00	1	0,11	- 6.c.
Longitarsus (Longitarsus) jacobeae (WATERHOUSE, 1858)	19 08 01	1	0,11	- 9.b..
Longitarsus (Longitarsus) ballotae (MARSHAM, 1802)	19 08 01	1	0,11	- 9.d.
Longitarsus (Longitarsus) tabidus (FABRICIUS, 1775)	01 60 01 19 08 01	2 1	0,23 0,11	- 5.f. - 9.c.
Longitarsus (Longitarsus) pulmonariae WEISE, 1893	19 08 01	1	0,11	- 9.d.
Longitarsus (Longitarsus) melanocephalus (DE GEER, 1775)	01 06 01 01 06 01 02 06 01 19 08 01	1 1 8 2	0,11 0,11 0,90 0,23	-5.d. - 6.a. - 9.d. - 9.d.
Longitarsus (Longitarsus) quadriguttatus (PONTOPPIDAN, 1763)	01 06 01	1	0,11	- 5.f.
Altica oleracea (LINNAEUS, 1758)	17 05 97 17 05 97 03 06 00 03 06 00 01 06 01 02 06 01	4 2 2 1 1 1	0,45 0,23 0,23 0,11 0,11 0,11	- 6.c.. - 5.e.. - 7.a. - 3.c.. - 6.b. - 9.b.
Hermaeophaga mercurialis (FABRICIUS, 1792)	03 06 00	7	0,79	- 7.a.
Batophila rubi (PAYKULL, 1799)	17 05 97 17 05 97	7 1	0,79 0,11	- 5.e. - 6.d.
Batophila fallax WEISE, 1888	01 06 98 02 06 00 03 06 00 03 06 00	7 9 34 1	0,79 1,01 3,84 0,11	- 11.a. - 2.b. - 7.a. - 3.c.

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Asiorestia ferruginea (SCOPOLI, 1763)	02 06 98 24 06 98 02 06 00 26 06 00	1 5 3 3	0,11 0,56 0,34 0,34	- 4.c. - 4.c. - 3.a. - 5.d.
Asiorestia femorata (GYLLENHAL, 1813)	02 06 00	2	0,23	- 2.c.
Orestia alpina (GERMAR, 1824)	02 06 00	1	0,11	- 1.a.
Hippuriphila moderi (LINNAEUS, 1761)	01 06 98 02 06 98	1 4	0,11 0,45	- 10.b. - 10.c.
Crepidodera aurata (MARSHAM, 1802)	17 05 97 17 05 97 03 06 00 26 06 00 01 06 01 02 06 01 01 06 01	2 4 4 3 14 4 2	0,23 0,45 0,45 0,34 1,58 0,45 0,23	- 6.a. - 5.e.. - 7.a. - 6.a. - 6.a. - 9.c. - 5.d.
Crepidodera aurea (GEOFFROY, 1785)	24 05 98 26 06 00 10 06 01	1 1 3	0,11 0,11 0,34	- 10.d. - 6.a. - 6.a.
Minota carpathica HIEKERTINGER, 1911	01 06 01	3	0,34	- 5.c.
Mantura mathewsi (CURTIS, 1833)	03 06 00	2	0,23	- 3.c.
Mantura chrysanthemi (KOCH, 1803)	17 05 97 25 05 98 01 06 01	1 12 1	0,11 1,36 0,11	- 6.a. - 10.d. - 6.a.
Mantura obtusata GYLLENHAL, 1813	02 06 00	2	0,23	- 3.a.
Chaetocnema (Tlanoma) concinna (MARSHAM, 1802)	24 05 98 02 06 01 02 06 01	1 3 1	0,11 0,34 0,11	- 10.a. - 9.b. - 5.d.
Chaetocnema (Tlanoma) heikertingeri LJUBISCHEV, 1963	03 06 00 03 06 00	1 1	0,11 0,11	-1.a.. - 3.c.
Cheetocnema (Tlanoma) schefferi (KUTSCHERA, 1864)	02 06 00	2	0,23	- 2.b.
Chaetocnema (Tlanoma) semicaerulea (KOCH, 1803)	02 06 00 01 06 01	1 1	0,11 0,11	- 1.a.. - 5.b.
Chaetocnema (Tlanoma) tibialis (ILLIGER, 1807)	02 06 01	15	1,69	- 9.c.
Chaetocnema (Tlanoma) clorophana DUFTSCHMID, 1825	01 06 01 01 06 01	2 3	0,23 0,34	- 5.b.. - 6.b.
Chaetocnema (Chaetocnema) arenacea (ALLARD, 1860)	02 06 00 02 06 00 01 06 01 01 06 01 02 06 01	1 1 1 1 10	0,11 0,11 0,11 0,11 1,13	- 2.a.. - 3.a. - 6.b. - 5.b. - 9.c..
Chaetocnema (Chaetocnema) obesa (BOIELDIEU, 1859)	01 06 01 02 06 01	5 6	0,56 0,68	- 5.e. - 9.d..

Taxa	Date of capture	Nr. ind.	Abd. %.	Code of place and habitate*
Sphaeroderma rubidum (GRAELLS, 1825)	25 06 98	5	0,56	- 10.a.
Dibolia (Dibolia) timida (ILLIGER, 1807)	01 06 01 19 08 01	1 1	0,11 0,11	- 5.d.. - 9.b..
Dibolia (Dibolia) rugulosa REDTENBACHER, 1848	02 06 01	1	0,11	- 9.b..
X. Cassidinae GYLLENHAL, 1813				
Cassida (Odontionycha) viridis LINNAEUS, 1758	25 05 98 02 06 98 01 06 98 24 06 98 02 06 00 01 06 01	7 7 4 5 1 1	0,79 0,79 0,45 0,56 0,11 0,11	- 10.d. - 4.c. - 11.a. - 4.c. - 7.a. - 6.a.
Cassida (Cassida) nebulosa LINNAEUS, 1758	17 05 97	1	0,11	- 6.b.
Cassida (Cassida) vibex LINNAEUS, 1767	25 05 98	2	0,23	- 10.d..
Cassida (Cassida) rubiginosa O.F. MÜLLER, 1776	02 06 98 02 06 98 02 06 00	1 3 1	0,11 0,34 0,11	- 4.c. - 10.c. - 7.a.
Cassida (Cassida) berolinensis SUFFRIAN, 1844	26 06 98	2	0,23	- 10.d.
Cassida (Cassida) pannonica SUFFRIAN, 1844	25 06 98 02 06 00 02 06 00	1 1 1	0,11 0,11 0,11	- 10.a.. - 3.a. - 1.a.
Cassida (Cassida) panzeri WEISE, 1907	19 08 01	1	0,11	- 9.d.
Cassida (Cassida) lineola CREUTZER, 1799	01 06 01	4	0,45	- 6.b.

Nr. ind.= Number of collected individuals; **Abd.**= relative abundance
* Explanation of the codes like in "Material and methods"

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Alexandru Crişan, Lucian Alexandru Teodor
Universitatea „Babeş-Bolyai" Cluj-Napoca
Facultatea de Biologie şi Geologie
Cctedra de Zoologie
Str. Clinicilor Nr. 5-7, Cluj-Napoca

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