

Faunistical and ecological study on leaf-beetles (Coleoptera: Chrysomelidae) in Sălard area, Mureş county, Romania

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Summary

An amount of 23 species of leaf-beetles, from 5 subfamilies, were identified in a research carried out in Sălard area, Mureş county, Romania, in 5 types of habitats here registered. Ecological parameters as frequency, abundance, dominance, constancy and ecological index concerning the group, are given and discussed.

Keywords: leaf-beetles, Chrysomelidae, Mureş, Romania

This paper deals with a part of the researches on leaf-beetles started by us in the upper basin of Mures river, in order to complete the relatively scarce data on the group in our country, excepting those of the last decade (BOBĂRNAC 1974; BALOG & AL. 1997; CRIŞAN 1993A, B, 1994, 1995, 2004, 2006A, B; CRIŞAN & TEODOR 1994, 2003, 2005; CRIŞAN & BONEA 1995; CRIŞAN & DRUGUŞ 2001; CRIŞAN & AL. 1998, 1999, 2000, 2003; FLECK 1905; GRUEV & AL. 1993; IENIŞTEA 1974; IENIŞTEA & NEGRU 1975; KONNERT-IONESCU 1963, MAICAN & SERAFIM 2001; MARCU 1927, 1928, 1936, 1957; NEGRU 1968, NEGRU & ROŞCA 1967; ROŞCA 1974, 1976; SEIDLITZ 1891; SZEL & AL., 1995), so as the lack of information about leaf-beetles of this zone. The study of this beetle group is important, as it offers information on habitat diversity status, as well because the leaf-beetle group contains herbivorous insects, most of these specialized on different plant groups and having different demands regarding the habitat conditions.

Material and methods

The material presented in this paper was collected in Sălard zone, Mureş county, an area situated in Toplita-Deda defile, with altitudes between 400 and 1600 m. The observation and sampling points were situated at about 700 m altitude, in the proximity of Sălard brook, in the spruce area. Five types of habitats, characteristic to the area, were identified and sampled, each 5 times. The studied habitats were:

1. Hay-land at the spruce forest limit, an area with grasses and herbs, dominated by the species: *Dactylis glomerata*, *Festuca pallens*, *Bromus*

sterilis, *Agrostis rupestris*, *Agrostis tenuis*, *Trifolium pratense*, *Ranunculus acris*, *Campanula patula*, *Geranium pratense*, *Salvia glutinosa*, *Mentha longifolia*, and small bushes of *Vaccinium myrtyllus*. The area is cut through by a forest road, frequently used, such as the human impact is quite high.

2. A riverside coppice situated nearby the Sălard brook, on the left side, a compact bushes area in which the human impact is low. The vegetation is dominated by species of *Salix*, *Betula*, *Alnus*, *Corylus* and some hygrophilous herbs mixed with species of *Carex*.

3. A hygrophilous forest of *Salix*, *Betula*, *Alnus* and *Robinia* species, on the left side of Sălard brook, with few herbs and grasses.

4. A glade situated between the forest limit and the riverside coppice, at the limit of Sălard brook, mostly mezo-hygrophilous area with many grasses and herbs as: *Rumex acetosa*, *Chenopodium album*, species of *Dryopteris* and *Phyllitis*.

5. Trees at the spruce forest limit, a mezophilous area constituting an extension to a high altitude of the forest situated nearby the Sălard brook, with the same species of *Salix*, *Populus*, *Betula*, and *Alnus*, mixed with spruce trees, in some places. The material was collected with a sweep net, 25 sweeps (about 10 square meters) per sample. In the case of the trees we used the entomological umbrella. Collected material was put in 70% alcohol and labeled. The insects were dried before the identification, in order to display the natural colors. Identifications were made by stereo-microscope using specific literature (KASZAB 1962-1971; KIPPENBERG & DOBERL 1994; MOHR 1966; PANIN 1951; PETRI 1912; WARKALOWSKY 1993, 2003).

Registered data were statistically analyzed with ecological indexes as: absolute abundance (A.A), as a percent ratio of the number of individuals of a species and the number of the samples taken; the dominance (D.), as a percent ratio between the number of individuals of a species and the total number of leaf-beetles individuals in a studied habitat; the frequency (F), as a percent ratio between the number of samples in which a species is present and the total number of samples taken in a habitat; the constancy, as an expression of the frequency values, in which F= 0-25% –accidental species, F= 25.1-50% –accessory species, F= 50.1-75% -con-

stant species and F= 75.1-100% - euconstant species. We also analyzed the biotope index (W), as a multiply of constancy and dominance of a species, indicating the position of each species in a studied biocenosis. Data were grouped in a complex taxonomical table.

Results and discussion

We identified 86 leaf-beetles individuals in the samples collected in Sălard area, on a single sample day. Altogether 23 species from 5 subfamilies were identified (Table 1).

Table 1

List of the leaf-beetles species and number of individuals identified in Sălard area.

No.	Sub-family, species	Ecological character	Number of individuals per habitat*					
			Total	1	2	3	4	5
	Zeugophorinae (Boving et. Craighead, 1931)							
1	<i>Zeugophora flavicollis</i> (Marsham, 1862)	mezophilous	1	-	-	-	-	1
	Cryptocephalinae (Gyllenhal, 1813)							
2	<i>Cryptocephalus</i> (<i>Cryptocephalus</i>) <i>decemmaculatus</i> (Linnaeus, 1758)	mezo-hygrophilous	1	-	-	1	-	-
	Chrysomelinae (Latreille, 1802)							
3	<i>Chrysolina</i> (<i>Ovostoma</i>) <i>globipennis</i> (Suffrian, 1851)	mezophilous	1	1	-	-	-	-
4	<i>Chrysolina</i> (<i>Menthastriella</i>) <i>herbacea</i> (Duftschmid, 1825)	mezophilous	10	4	3	-	3	-
5	<i>Chrysolina</i> (<i>Euchrysolina</i>) <i>graminis</i> (Linnaeus, 1758)	mezo-hygrophilous	6	-	1	2	1	2
6	<i>Chrysolina</i> (<i>Erythrochrysa</i>) <i>polita</i> (Linnaeus, 1758)	mezo-hygrophilous	5	2	1	-	2	-
7	<i>Chrysolina</i> (<i>Sphaeromela</i>) <i>varians</i> (Schaller, 1783)	mezophilous	2	-	-	-	2	-
8	<i>Gastrophysa viridula</i> (De Geer, 1775)	mezophilous	1	-	-	-	1	-
9	<i>Plagioderia versicolora</i> (Laicharting, 1781)	mezophilous	1	-	1	-	-	-
10	<i>Linaeidea</i> (<i>Linaeidea</i>) <i>aenea</i> (Linnaeus, 1758)	mezophilous	1	-	-	-	-	1
11	<i>Gonioctena</i> (<i>Gonioctena</i>) <i>interposita</i> (Franz et Palmen, 1950)	mezophilous	3	-	-	1	-	2
12	<i>Gonioctena</i> (<i>Gonioctena</i>) <i>linneana</i> (Schrank, 1781)	mezophilous	12	1	3	5	-	3
13	<i>Gonioctena</i> (<i>Gonioctena</i>) <i>quinquepunctata</i> (Fabricius, 1787)	mezophilous	1	-	-	1	-	-
14	<i>Phratora</i> (<i>Phratora</i>) <i>tibialis</i> (Suffrian, 1851)	mezophilous	2	-	-	2	-	-
15	<i>Phratora</i> (<i>Phratora</i>) <i>vitellinae</i> (Linnaeus, 1758)	mezo-hygrophilous	9	-	4	3	-	2
16	<i>Phratora</i> (<i>Chaeroceta</i>) <i>vulgatissima</i> (Linnaeus, 1758)	mezophilous	5	-	2	1	-	2
	Galerucinae (Latreille, 1802)							

No.	Sub-family, species	Ecological character	Number of individuals per habitat*					
			Total	1	2	3	4	5
17	<i>Galerucella (Neogalerucella) lineola</i> (Fabricius, 1781)	mezophilous	1	-	-	1	-	-
18	<i>Lochmea capreae</i> (Linnaeus, 1758)	mezophilous	4	-	2	-	-	2
	Halticinae Newman, 1834							
19	<i>Altica oleracea</i> (Linnaeus, 1758)	mezophilous	2	1	-	-	1	-
20	<i>Asiorestia ferruginea</i> (Scopoli, 1763)	mezophilous	1	1	-	-	-	-
21	<i>Crepidodera aurata</i> (Marsham, 1862)	mezo-hygrophilous	14	-	5	4	-	5
22	<i>Chaetocnema (Tlanoma) semicoerulea</i> (Koch, 1803)	mezo-hygrophilous	1	-	1	-	-	-
	Cassidinae (Gyllenhal, 1813)							
23	<i>Cassida (Odontionycha) viridis</i> (Linnaeus, 1758)	mezo-hygrophilous	2	1	-	-	1	-

* The numbers of habitats correspond to those given in "material and methods"

The distribution of leaf-beetles according to species, number of individuals, and the ecological the habitats was different, both in the case of the parameters (Table 2).

Table 2

Number of individuals and ecological parameters of leaf-beetles species in Sälard area, according to the major types of the investigated habitats

No.	Subfamily, species	Herbs and grasses				Bushes and trees			
		No. ind.	A %	D %	F %	No. ind.	A %	D %	F %
	Zeugophorinae (Boving & Craighead, 1931)								
1	<i>Zeugophora flavicollis</i> (Marsham, 1862)	-	-	-	-	1	2.08	1.16	4
	Cryptocephalinae (Gyllenhal, 1813)								
2	<i>Cryptocephalus (Cryptocephalus) decemmaculatus</i> (Linnaeus, 1758)	1	1.25	1.16	4	1	2.08	1.16	4
	Chrysomelinae (Latreille, 1802)								
3	<i>Chrysolina (Ovostoma) globipennis</i> (Suffrian, 1851)	1	1.25	1.16	4	-	-	-	-
4	<i>Chrysolina (Menthastrilla) herbacea</i> (Duftschmid, 1825)	10	12.5	11.62	20	-	-	-	-
5	<i>Chrysolina (Euchrysolina) graminis</i> (Linnaeus, 1758)	-	-	-	-	6	12.5	6.97	16
6	<i>Chrysolina (Erythrochrysa) polita</i> (Linnaeus, 1758)	5	6.25	5.19	12	-	-	-	-
7	<i>Chrysolina (Sphaeromela) varians</i> (Schaller, 1783)	2	2.50	2.33	8	-	-	-	-
8	<i>Gastrophysa viridula</i> (De Geer, 1775)	1	1.25	1.16	4	-	-	-	-
9	<i>Plagioderma versicolora</i> (Laicharting, 1781)	1	1.25	1.16	4	1	2.08	1.16	4
10	<i>Linaeidea (Linaeidea) aenea</i> (Linnaeus, 1758)	-	-	-	-	1	2.08	1.16	4
11	<i>Gonioctena (Gonioctena) interposita</i> (Franz et Palmen, 1950)	1	1.25	1.16	4	2	4.17	2.33	8
12	<i>Gonioctena (Gonioctena) linneana</i> (Schrank, 1781)	1	1.25	1.16	4	11	23.75	13.95	16
13	<i>Gonioctena (Gonioctena) quinquepunctata</i> (Fabricius, 1787)	-	-	-	-	1	2.08	1.16	4

No.	Subfamily, species	Herbs and grasses				Bushes and trees			
		No. ind.	A %	D %	F %	No. ind.	A %	D %	F %
14	<i>Phratora (Phratora) tibialis</i> (Suffrian, 1851)	-	-	-	-	2	4.17	2.33	4
15	<i>Phratora (Phratora) vitellinae</i> (Linnaeus, 1758)	-	-	-	-	9	18.75	14.51	12
16	<i>Phratora (Chaeroceta) vulgatissima</i> (Linnaeus, 1758)	-	-	-	-	5	10.42	5.81	8
	Galerucinae (Latreille, 1802)								
17	<i>Galerucella (Neogalerucella) lineola</i> (Fabricius, 1781)	-	-	-	-	1	2.08	1.16	4
18	<i>Lochmea capreae</i> (Linnaeus, 1758)	-	-	-	-	4	8.33	4.65	8
	Halticinae Newman, 1834								
19	<i>Altica oleracea</i> (Linnaeus, 1758)	2	2.50	2.32	8	-	-	-	-
20	<i>Asiolestia ferruginea</i> (Scopoli, 1763)	1	1.25	1.16	4	-	-	-	-
21	<i>Crepidodera aurata</i> (Marsham, 1862)	-	-	-	-	14	29.17	16.28	12
22	<i>Chaetocnema (Tlanoma) semicoerulea</i> (Koch, 1803)	1	1.25	1.16	4	1	2.08	1.16	4
	Cassidinae (Gyllenhal, 1813)								
23	<i>Cassida (Odontionycha) viridis</i> (Linnaeus, 1758)	2	2.25	2.33	8	-	-	-	-

Note: Abbreviations of the ecological parameters correspond to those presented in “material and methods”

Although in each of the 5 investigated habitats 7-10 leaf-beetle species were registered. the species belong to different sub-families according to the general ecological demands of each subfamily. The number of individuals. the abundance. frequency and dominance showed the same trend.

The fact that in different habitats exist also uncharacteristic leaf-beetle species can be explained by the existence of some bushes and trees in the lawns and glades. and by the existence of some

herbs and grasses in the forests. The rainfall regime which can change the mezophilous character of the habitats in a mezo-hygrophilous one. for a time. influenced also the spread and the density of different leaf-beetles species. This fact is better reflected by the distribution on subfamilies of the leaf-beetle species recorded in Salard area (Fig.1.). in which Chrysomelinae subfamily with dominant mezo-hygrophilous species had significantly highest number of species.

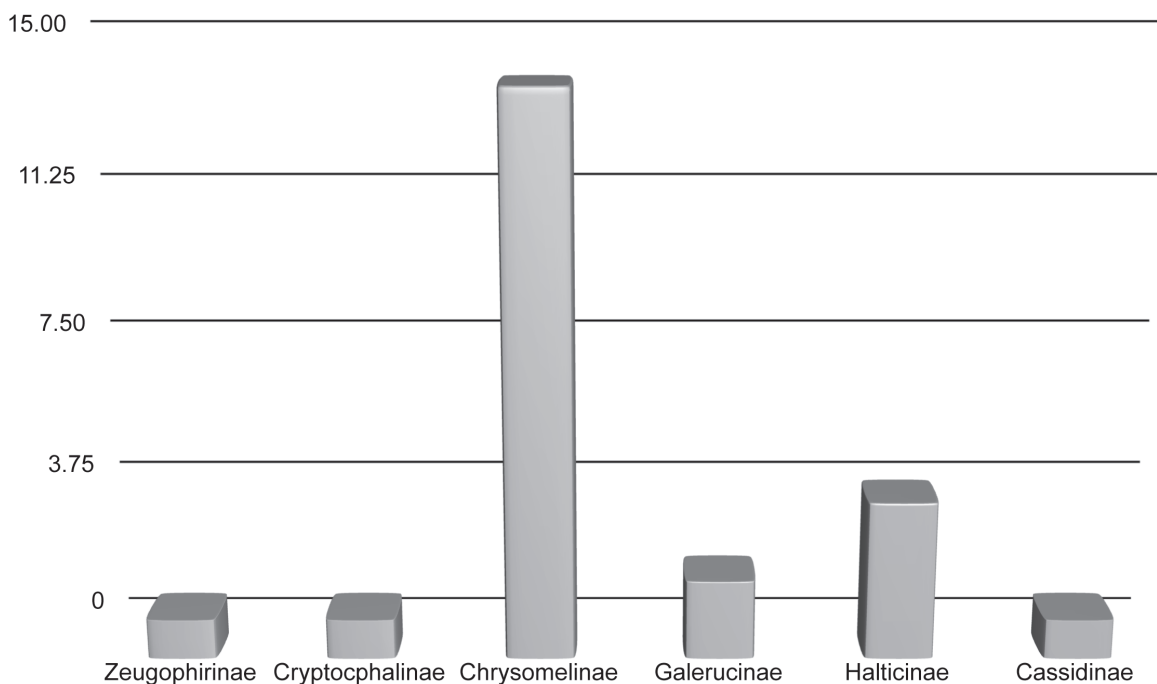


Fig. 1. Distribution on subfamilies of the leaf-beetles species recorded in Sălard area.

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Received: 24.11.2007

Accepted: 14.12.2007

Printed: 28.10.2008