

DOMINANCY OF BEETLE FAMILIES AND SPECIES RECORDED IN FLOODPLAIN FOREST ECOTONE

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Abstract

Author monitored the occurrence of beetle families and species on ten points in floodplain forest marginal zone. He collected the numerous material containing knowledge about ecotone entomocenosis. At the same time the research brings the faunistic knowledge about beetle imagoes from Litovelské Pomoraví Protected Landscape Area. The survey of recorded families and species is in tab. 1–3.

Introduction

Ecotone represents the transition between various cenosis, where special marginal life condition area is effective. These conditions are related to the changes of ecological factors like temperature, light and humidity. Both cenosis are influenced in structure and function not only by both neighbouring habitats but also by migrating species from more or less distant areas. Dark outline of the forest margin serves for the insect space orientation and there comes to the considerable changes in species spectrum of the animals who live there temporarily or permanently (Cortier, Robert – 1952). So far there was paid a little attention to the research of beetle population and its seasonal quantitative changes in herbal and shrubs strata of these marginal habitats. Ščerbinovskij (1939) was catching weevils in various distances from the edge of the forest. Tischler (1950) made quantitative and qualitative macrofauna analyses of edafone in marginal forest zone. Novák, Skuhravý, Hrdý a Hůrka (1957) monitored the influence of HCH disperse on insect population living in marginal zone. Insect

hibernating in marginal zone of the forest were studied by Renken (1956). He focused mainly on fauna in soil and on its surface, springtails were observed by Richter (1966). Novák and Grenarová (1967) monitored by knock down method the density of different species of Coccinellidae in transition zone of woodland and meadow habitats. Ecological meaning of beetles was studied by Fuchs (1969). Population dynamics of beetles on the boundary of wood and meadow habitats was also the topic of Horčíčko (1979) work. Soil Nematoda in ecotons were observed by Háněl (1986), Testacea by Balík (1987), Oribatida by Starý (1987), Collembola and Protura by Eckschlagerová (1988). Dynamics of ecotone in space and time was observed by Delcourt P. and Delcourt H. (1992). Distribution and dynamics of soil organisms was observed by Rusek (1992). Hasík (1999) studied the beetle populations of meadows and forest margin.

The special kind of margin biocenosis like shrubs around fields or meadows, with meadow, field and wood elements were studied by Tischler (1948, 1950, 1951, 1958).

Material and methods

For the research of marginal zone in floodplain forest we selected 10 points, on which the material was collected in three week intervals by sweeping method. The chosen points were situated on the line between Litovel town and the village Mladeč in Protected Landscape Area Litovelské Pomoraví. The differences among the selected places were mainly in forest walls exposition.

The research of beetle imago cenosis in marginal forest zone was practised by sweeping of herbal strata by net with 45 cm in diameter on 60 cm long stick. The sampling was done during all vegetation season in afternoon hours.

Results

The survey of the data from flood-plain forest marginal zone is in tab. 1–3.

1. Dominancy of recorded families

The survey of recorded families in floodplain forest marginal zone brings tab. 1. Together 6455 beetle imagoes were collected, which belonged to 30 families. From the table is visible, that in 1994 there were 3397 specimens and in 1995 there were 3058 imagoes of Coleoptera order. While during first research year there were 26 families, during second year were only 24 families.

Generally eudominant were the families Curculionidae, Chrysomelidae, Coccinellidae and Cantharidae. Dominant were only the imagoes of the family Elateridae and subdominant were adults of the family Phalacridae, Nitidulidae and Cerambycidae. The rest 21 families were subprecedent.

In 1994 the eudominant families were Curculionidae, Chrysomelidae and Cantharidae. Subdominant were the representatives of the families Elateridae and Phalacridae.

As recedent there were only members of the family Malachiidae and Cerambycidae, the remaining 19 families were recedent.

In 1995 eudominant were again the families Curculionidae, Chrysomelidae, Coccinellidae and Cantharidae. As dominant there were the families Elateridae and Phalacridae, as subdominant appeared the families Nitidulidae, Malachiidae and Carabidae. The remaining 15 families were subrecedent.

Table 1 Survey of dominancy of beetle families recorded in floodplain forest ecotone

FAMILY	1994		1995		Total	
	Number	%	Number	%	Number	%
<i>Curculionidae</i>	1250	36.80	837	27.37	2087	32.33
<i>Chrysomelidae</i>	861	25.35	804	26.29	1665	25.79
<i>Coccinellidae</i>	444	13.07	440	14.39	884	13.69
<i>Cantharidae</i>	353	10.39	400	13.08	753	11.67
<i>Elateridae</i>	168	4.95	202	6.61	370	5.73
<i>Phalacridae</i>	102	3.00	153	5.00	255	3.95
<i>Malachiidae</i>	60	1.77	42	1.37	102	1.58
<i>Nitidulidae</i>	23	0.68	61	1.99	84	1.30
<i>Cerambycidae</i>	45	1.32	26	0.85	71	1.10
<i>Carabidae</i>	18	0.53	33	1.08	51	0.79
<i>Lagriidae</i>	24	0.71	18	0.59	42	0.65
<i>Staphylinidae</i>	5	0.15	10	0.33	15	0.23
<i>Dasytidae</i>	10	0.29	4	0.13	14	0.22
<i>Scaptidae</i>	8	0.24	1	0.03	9	0.14
<i>Pyrochroidae</i>	1	0.03	8	0.26	9	0.14
<i>Scarabaeidae</i>	2	0.06	6	0.20	8	0.12
<i>Byturidae</i>	6	0.18	2	0.07	8	0.12
<i>Anobiidae</i>	2	0.06	3	0.10	5	0.08
<i>Anthicidae</i>	5	0.15	0	0.00	5	0.08
<i>Buprestidae</i>	3	0.09	1	0.03	4	0.06
<i>Oedemeridae</i>	1	0.03	2	0.07	3	0.05
<i>Silphidae</i>	0	0.00	2	0.07	2	0.03
<i>Lathridiidae</i>	2	0.06	0	0.00	2	0.03
<i>Scaphidiidae</i>	0	0.00	1	0.03	1	0.02
<i>Lucanidae</i>	0	0.00	1	0.03	1	0.02
<i>Byrrhidae</i>	0	0.00	1	0.03	1	0.02
<i>Cleridae</i>	1	0.03	0	0.00	1	0.02
<i>Kateretidae</i>	1	0.03	0	0.00	1	0.02
<i>Endomychidae</i>	1	0.03	0	0.00	1	0.02
<i>Mycetophagidae</i>	1	0.03	0	0.00	1	0.02
Cellkem	3397	100.00	3058	100.00	6455	100.00

2. General species dominancy

One hundred ninety five species in total were recorded in herbal strata of floodplain forest ecotone (tab. 2). The most numerous and eudominant were the imagoes of the species *Rhagonycha fulva*, *Sitona lineatus*, *Oulema melanopus*, *Coccinella septempunctata* and *Apion apricans*. As subdominant there were 9 species – *Phyllotreta vittula*, *Psyllobora vigintiduopunctata*, *Apion virens*, *Oulema gallaeciana*, *Stilbus testaceus*,

Psylliodes chrysocephala, *Nedyus quadrimaculatus*, *Propylea quatuordecimpunctata* and *Athous vittatus*. Then 7 recedent species followed, *Athous haemorrhoidalis*, *Phyllobius pomaceus*, *Cantharis rustica*, *Chaetocnema concinna*, *Orsodacne cerasi*, *Apion trifolii* and *Phyllobius calcaratus*. The remaining 174 were subrecedent.

In the year 1994 as dominant species appeared *Sitona lineatus*, *Phyllotreta vittula*, *Apion apricans*, *Rhagoxycha fulva*, *Oulema melanopus* and *Coccinella septempunctata*. Subdominant were the adults of the species *Psyllobora vigintiduopunctata*, *Apion virens*, *Oulema gallaeciana*, *Stilbus testaceus*, *Nedyus quadrimaculatus* and *Chaetocnema concinna*. As recedent there were 12 species – *Cantharis rustica*, *Phyllobius pomaceus*, *Propylea quatuordecimpunctata*, *Athous haemorrhoidalis*, *Athous vittatus*, *Orsodacne cerasi*, *Phyllobius calcaratus*, *Apion trifolii*, *Eusomus ovulum*, *Malachius bipustulatus*, *Grammoptera ruficornis* and *Apion fulvipes*. The rest of the 114 species were subrecedent.

In the year 1995 the dominant were the adults of following species – *Rhagoxycha fulva*, *Oulema melanopus*, *Psylliodes chrysocephala*, *Sitona lineatus* and *Coccinella septempunctata*. 8 species were subdominant – *Stilbus testaceus*, *Nedyus quadrimaculatus*, *Psyllobora vigintiduopunctata*, *Apion virens*, *Oulema gallaeciana*, *Propylea quatuordecimpunctata*, *Apion apricans* and *Athous vittatus*. As recedent appeared only 4 species – *Athous haemorrhoidalis*, *Meligethes coracinus*, *Phyllobius pomaceus* and *Cantharis rustica*. At the remaining 142 species the domination was under the level of 1 % and so it was subrecedent.

Table 2 Survey of domination of beetle species recorded in flood-plain forest ecotone

SPECIES	1994		1995		Total	
	Number	%	Number	%	Number	%
<i>Rhagoxycha fulva</i> (Scopoli, 1763)	229	6.74	293	9.58	522	8.09
<i>Sitona lineatus</i> (Linnaeus, 1758)	335	9.86	183	5.98	518	8.02
<i>Oulema melanopus</i> (Linnaeus, 1758)	223	6.56	261	8.53	484	7.50
<i>Coccinella septempunctata</i> (Linnaeus, 1758)	201	5.92	171	5.59	372	5.76
<i>Apion apricans</i> (Herbst, 1797)	233	6.86	101	3.30	334	5.17
<i>Phyllotreta vittula</i> (L. Redtenbacher, 1849)	286	8.42	28	0.92	314	4.86
<i>Psyllobora vigintiduopunctata</i> (Linnaeus, 1758)	160	4.71	138	4.51	298	4.62
<i>Apion virens</i> (Herbst, 1797)	155	4.56	135	4.41	290	4.49
<i>Oulema gallaeciana</i> (Heyden, 1870)	111	3.27	134	4.38	245	3.80
<i>Stilbus testaceus</i> (Panzer, 1797)	95	2.80	142	4.64	237	3.67
<i>Nedyus quadrimaculatus</i> (Linnaeus, 1758)	86	2.53	140	4.58	226	3.50
<i>Psylliodes chrysocephala</i> (Linnaeus, 1758)	0	0.00	226	7.39	226	3.50

<i>Propylea quatuordecimpunctata</i> (Linnaeus, 1758)	57	1.68	103	3.37	160	2.48
<i>Athous vittatus</i> (Fabricius, 1792)	56	1.65	73	2.39	129	2.00
<i>Athous haemorrhoidalis</i> (Fabricius, 1801)	56	1.65	56	1.83	112	1.74
<i>Phyllobius pomaceus</i> (Gyllenhal, 1824)	60	1.77	44	1.44	104	1.61
<i>Cantharis rustica</i> (Fallén, 1807)	60	1.77	40	1.31	100	1.55
<i>Chaetocnema concinna</i> (Marsham, 1802)	75	2.21	19	0.62	94	1.46
<i>Orsodacne cerasi</i> (Linnaeus, 1758)	55	1.62	18	0.59	73	1.13
<i>Apion trifolii</i> (Linnaeus, 1768)	46	1.35	23	0.75	69	1.07
<i>Phyllobius calcaratus</i> (Fabricius, 1792)	47	1.38	19	0.62	66	1.02
<i>Malachius bipustulatus</i> (Linnaeus, 1758)	37	1.09	20	0.65	57	0.88
<i>Eusomus ovulum</i> (Germar, 1824)	44	1.30	10	0.33	54	0.84
<i>Meligethes coracinus</i> (Sturm, 1845)	7	0.21	44	1.44	51	0.79
<i>Apion fulvipes</i> (Fourcroy, 1785)	34	1.00	13	0.43	47	0.73
<i>Grammoptera ruficornis</i> (Fabricius, 1781)	34	1.00	13	0.43	47	0.73
<i>Sitona hispidulus</i> (Fabricius, 1776)	33	0.97	12	0.39	45	0.70
<i>Lagria hirta</i> (Linnaeus, 1758)	24	0.71	18	0.59	42	0.65
<i>Cantharis fusca</i> (Linnaeus, 1758)	26	0.77	14	0.46	40	0.62
<i>Cantharis nigricans</i> (O. F. Müller, 1776)	23	0.68	16	0.52	39	0.60
<i>Kibunea minuta</i> (Linnaeus, 1758)	19	0.56	19	0.62	38	0.59
<i>Apion assimile</i> (Kirby, 1808)	20	0.59	14	0.46	34	0.53
<i>Phyllotreta nigripes</i> (Fabricius, 1775)	24	0.71	10	0.33	34	0.53
<i>Agriotes sputator</i> (Linnaeus, 1758)	18	0.53	15	0.49	33	0.51
<i>Phyllotreta atra</i> (Fabricius, 1775)	22	0.65	10	0.33	32	0.50
<i>Axinotarsus ruficollis</i> (Olivier, 1790)	23	0.68	8	0.26	31	0.48
<i>Apion pisi</i> (Fabricius, 1801)	18	0.53	12	0.39	30	0.46
<i>Crepidodera aurata</i> (Marsham, 1802)	6	0.18	22	0.72	28	0.43
<i>Cantharis livida</i> (Linnaeus, 1758)	11	0.32	16	0.52	27	0.42

<i>Chaetocnema arida</i> (Foudras, 1859)	22	0.65	3	0.10	25	0.39
<i>Sitona humeralis</i> (Stephens, 1831)	20	0.59	4	0.13	24	0.37
<i>Amara familiaris</i> (Duftschmid, 1813)	7	0.21	14	0.46	21	0.33
<i>Apion violaceum</i> (Kirby, 1808)	20	0.59	0	0.00	20	0.31
<i>Sitona sulcifrons</i> (Thunberg, 1798)	12	0.35	7	0.23	19	0.29
<i>Olibrus aeneus</i> (Fabricius, 1792)	6	0.18	11	0.36	17	0.26
<i>Sciaphilus asperatus</i> (Bonsdorf, 1785)	4	0.12	13	0.43	17	0.26
<i>Athous bicolor</i> (Goeze, 1777)	6	0.18	10	0.33	16	0.25
<i>Ceutorhynchus pleurostigma</i> (Marsham, 1902)	2	0.06	14	0.46	16	0.25
<i>Phyllobius pyri</i> (Linnaeus, 1758)	2	0.06	14	0.46	16	0.25
<i>Chrysolina staphylea</i> (Linnaeus, 1758)	0	0.00	15	0.49	15	0.23
<i>Sitona macularis</i> (Marsham, 1902)	13	0.38	2	0.07	15	0.23
<i>Axinotarsus pulicarius</i> (Fabricius, 1775)	0	0.00	14	0.46	14	0.22
<i>Dasytes plumbeus</i> (O. F. Müller)	10	0.29	4	0.13	14	0.22
<i>Hypera nigrirostris</i> (Fabricius, 1775)	8	0.24	6	0.20	14	0.22
<i>Meligethes aeneus</i> (Fabricius, 1775)	10	0.29	4	0.13	14	0.22
<i>Sitona lepidus</i> (Gyllenhal, 1834)	12	0.35	2	0.07	14	0.22
<i>Longitarsus melanocephalus</i> (De Geer, 1775)	5	0.15	6	0.20	11	0.17
<i>Poecilus cupreus</i> (Linnaeus, 1758)	1	0.03	10	0.33	11	0.17
<i>Adalia bipunctata</i> (Linnaeus, 1758)	3	0.09	7	0.23	10	0.15
<i>Cassida rubiginosa</i> (O. F. Müller, 1776)	2	0.06	8	0.26	10	0.15
<i>Glischrochilus quadripustulatus</i> (Linnaeus, 1758)	4	0.12	6	0.20	10	0.15
<i>Phyllobius argentatus</i> (Linnaeus, 1758)	5	0.15	5	0.16	10	0.15
<i>Rhagonycha elongata</i> (Fallén, 1807)	1	0.03	9	0.29	10	0.15
<i>Sitona puncticollis</i> (Stephens, 1831)	5	0.15	5	0.16	10	0.15
<i>Adrastus limbatus</i> (Fabricius, 1776)	0	0.00	9	0.29	9	0.14
<i>Anaspis frontalis</i> (Linnaeus, 1758)	8	0.24	1	0.03	9	0.14

<i>Adalia decempunctata</i> (Linnaeus, 1758)	4	0.12	4	0.13	8	0.12
<i>Apion onopordi</i> (Kirby, 1808)	8	0.24	0	0.00	8	0.12
<i>Byturus ochraceus</i> (L. G. Scriba, 1790)	6	0.18	2	0.07	8	0.12
<i>Mogulones symphyti</i> (Bedel, 1885)	1	0.03	7	0.23	8	0.12
<i>Phyllobius maculicornis</i> (Germar, 1824)	0	0.00	8	0.26	8	0.12
<i>Phyllobius oblongus</i> (Linnaeus, 1758)	5	0.15	3	0.10	8	0.12
<i>Stenocorus meridianus</i> (Linnaeus, 1758)	5	0.15	3	0.10	8	0.12
<i>Asiorestia ferruginea</i> (Scopoli, 1763)	2	0.06	5	0.16	7	0.11
<i>Brumus quadripustulatus</i> (Linnaeus, 1758)	5	0.15	2	0.07	7	0.11
<i>Ceutorhynchus erysimi</i> (Fabricius, 1787)	2	0.06	5	0.16	7	0.11
<i>Curculio glandium</i> (Marsham, 1802)	0	0.00	7	0.23	7	0.11
<i>Denticollis linearis</i> (Linnaeus, 1758)	3	0.09	4	0.13	7	0.11
<i>Tachyporus hypnorum</i> (Fabricius, 1775)	5	0.15	2	0.07	7	0.11
<i>Apion seniculus</i> (Kirby, 1808)	6	0.18	0	0.00	6	0.09
<i>Cantharis fulvicollis</i> (Fabricius, 1792)	1	0.03	5	0.16	6	0.09
<i>Cantharis obscura</i> (Linnaeus, 1758)	0	0.00	6	0.20	6	0.09
<i>Epithris pubescens</i> (Koch, 1803)	6	0.18	0	0.00	6	0.09
<i>Eusphalerum adustum</i> (Heer, 1839)	0	0.00	6	0.20	6	0.09
<i>Phyllotreta nemorum</i> (Linnaeus, 1758)	4	0.12	2	0.07	6	0.09
<i>Pyrochroa serraticornis</i> (Scopoli, 1763)	1	0.03	5	0.16	6	0.09
<i>Scymnus auritus</i> (Thunberg, 1795)	6	0.18	0	0.00	6	0.09
<i>Anthicus atherinus</i> (Linnaeus, 1761)	5	0.15	0	0.00	5	0.08
<i>Athous subfuscus</i> (O. F. Müller, 1767)	0	0.00	5	0.16	5	0.08
<i>Ceutorhynchus obstructus</i> (Marsham, 1802)	0	0.00	5	0.16	5	0.08
<i>Crepidodera aurea</i> (Geoffroy, 1785)	1	0.03	4	0.13	5	0.08
<i>Liophloeus lentus</i> (Germar, 1824)	0	0.00	5	0.16	5	0.08
<i>Nothodes parvulus</i> (Panzer, 1799)	2	0.06	3	0.10	5	0.08

<i>Phyllotreta striolata</i> (Fabricius, 1803)	0	0.00	5	0.16	5	0.08
<i>Psylliodes napi</i> (Fabricius, 1792)	2	0.06	3	0.10	5	0.08
<i>Adrastus rachifer</i> (Fourcroy, 1785)	3	0.09	1	0.03	4	0.06
<i>Agrilus graminis</i> (Laporte de Castelnau et Gory, 1837)	3	0.09	1	0.03	4	0.06
<i>Agriotes obscurus</i> (Linnaeus, 1758)	2	0.06	2	0.07	4	0.06
<i>Aphodius prodromus</i> (Brahm, 1790)	0	0.00	4	0.13	4	0.06
<i>Epurea depressa</i> (Illiger, 1798)	0	0.00	4	0.13	4	0.06
<i>Fastuolina fastuosa</i> (Scopoli, 1763)	0	0.00	4	0.13	4	0.06
<i>Grammoptera abdominalis</i> (Stephens, 1831)	0	0.00	4	0.13	4	0.06
<i>Hyperaspis campestris</i> (Herbst, 1783)	1	0.03	3	0.10	4	0.06
<i>Chilocorus bipustulatus</i> (Linnaeus, 1758)	0	0.00	4	0.13	4	0.06
<i>Chrysolina sturmi</i> (Westhoff, 1882)	1	0.03	3	0.10	4	0.06
<i>Longitarsus anchusae</i> (Paykull, 1799)	1	0.03	3	0.10	4	0.06
<i>Scymnus rubromaculatus</i> (Goeze, 1777)	3	0.09	1	0.03	4	0.06
<i>Stenurella melanura</i> (Linnaeus, 1758)	3	0.09	1	0.03	4	0.06
<i>Trechus quadristriatus</i> (Schrank, 1781)	4	0.12	0	0.00	4	0.06
<i>Amara similata</i> (Gyllenhal, 1810)	3	0.09	0	0.00	3	0.05
<i>Aphthona euphorbiae</i> (Schrank, 1781)	0	0.00	3	0.10	3	0.05
<i>Calvia quatuordecimpunctata</i> (Linnaeus, 1758)	1	0.03	2	0.07	3	0.05
<i>Calvia quindecimguttata</i> (Fabricius, 1777)	1	0.03	2	0.07	3	0.05
<i>Dalopius marginatus</i> (Linnaeus, 1758)	1	0.03	2	0.07	3	0.05
<i>Demetrias atricapilus</i> (Linnaeus, 1758)	0	0.00	3	0.10	3	0.05
<i>Gastrophysa viridis</i> (De Geer, 1775)	1	0.03	2	0.07	3	0.05
<i>Hermeophaga mercurialis</i> (Fabricius, 1792)	2	0.06	1	0.03	3	0.05
<i>Chaetocnema aridula</i> (Gyllenhal, 1827)	3	0.09	0	0.00	3	0.05
<i>Linnaeidea aenea</i> (Linnaeus, 1758)	0	0.00	3	0.10	3	0.05
<i>Meligethes anthracinus</i> (Brisout de Barneville, 1863)	0	0.00	3	0.10	3	0.05

<i>Otiorhynchus scaber</i> (Linnaeus, 1758)	2	0.06	1	0.03	3	0.05
<i>Sitona cylindricollis</i> (Fahraeus, 1840)	1	0.03	2	0.07	3	0.05
<i>Stenocarus ruficornis</i> (Stephens, 1831)	3	0.09	0	0.00	3	0.05
<i>Stenostola ferrea</i> (Schrank, 1776)	1	0.03	2	0.07	3	0.05
<i>Agrypnus murinus</i> (Linnaeus, 1758)	0	0.00	2	0.07	2	0.03
<i>Anchomenus dorsalis</i> (Pontoppidan, 1763)	0	0.00	2	0.07	2	0.03
<i>Apion urticarium</i> (Herbst, 1784)	1	0.03	1	0.03	2	0.03
<i>Calvia decemguttata</i> (Linnaeus, 1767)	0	0.00	2	0.07	2	0.03
<i>Ceutorhynchus pallidactylus</i> (Marsham, 1802)	0	0.00	2	0.07	2	0.03
<i>Cidnopus pilosus</i> (Leske, 1785)	1	0.03	1	0.03	2	0.03
<i>Corticarina gibbosa</i> (Herbst, 1793)	2	0.06	0	0.00	2	0.03
<i>Cryptocephalus rufipes</i> (Goeze, 1777)	0	0.00	2	0.07	2	0.03
<i>Hypera meles</i> (Fabricius, 1792)	1	0.03	1	0.03	2	0.03
<i>Hypera zoila</i> (Scopoli, 1763)	0	0.00	2	0.07	2	0.03
<i>Lignyodes enucleator</i> (Panzer, 1798)	0	0.00	2	0.07	2	0.03
<i>Longitarsus luridus</i> (Scopoli, 1763)	2	0.06	0	0.00	2	0.03
<i>Longitarsus pratensis</i> (Panzer, 1794)	2	0.06	0	0.00	2	0.03
<i>Loricera pilicornis</i> (Fabricius, 1775)	1	0.03	1	0.03	2	0.03
<i>Magdalis armigera</i> (Fourcroy, 1785)	1	0.03	1	0.03	2	0.03
<i>Metacantharis haemorrhoidalis</i> (Fabricius, 1792)	1	0.03	1	0.03	2	0.03
<i>Phyllobius cloropus</i> (Linnaeus, 1758)	2	0.06	0	0.00	2	0.03
<i>Ptinomorphus imperialis</i> (Linnaeus, 1767)	0	0.00	2	0.07	2	0.03
<i>Rhinoncus perpendicularis</i> (Reich, 1797)	1	0.03	1	0.03	2	0.03
<i>Rutpela maculata</i> (Poda, 1761)	1	0.03	1	0.03	2	0.03
<i>Schizotus pectinicornis</i> (Linnaeus, 1758)	0	0.00	2	0.07	2	0.03
<i>Stegobium paniceum</i> (Linnaeus, 1758)	2	0.06	0	0.00	2	0.03
<i>Valgus hemipterus</i> (Linnaeus, 1758)	1	0.03	1	0.03	2	0.03

<i>Zacladus geranii</i> (Paykull, 1800)	0	0.00	2	0.07	2	0.03
<i>Agriotes ustulatus</i> (Schaller, 1783)	1	0.03	0	0.00	1	0.02
<i>Amara aulica</i> (Panzer, 1797)	0	0.00	1	0.03	1	0.02
<i>Amara consularis</i> (Duftschmid, 1812)	1	0.03	0	0.00	1	0.02
<i>Anthonomus pyri</i> (Kollar, 1837)	1	0.03	0	0.00	1	0.02
<i>Aphodius distinctus</i> (O. F. Müller, 1776)	0	0.00	1	0.03	1	0.02
<i>Apion elongatum</i> (Desbrochers, 1891)	0	0.00	1	0.03	1	0.02
<i>Apion vicinum</i> (Kirby, 1808)	0	0.00	1	0.03	1	0.02
<i>Barypeithes chevrolati</i> (Boheman, 1843)	0	0.00	1	0.03	1	0.02
<i>Bembidion lampros</i> (Herbst, 1784)	1	0.03	0	0.00	1	0.02
<i>Bembidion quadrimaculatum</i> (Linnaeus, 1761)	0	0.00	1	0.03	1	0.02
<i>Brachypterus urticae</i> (Fabricius, 1792)	1	0.03	0	0.00	1	0.02
<i>Byrrhus pilula</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Cantharis lateralis</i> (Linnaeus, 1758)	1	0.03	0	0.00	1	0.02
<i>Carabus coriaceus</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Cassida nobilis</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Cassida viridis</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Clytus arietis</i> (Linnaeus, 1758)	1	0.03	0	0.00	1	0.02
<i>Coccinella quinquepunctata</i> (Linnaeus, 1758)	1	0.03	0	0.00	1	0.02
<i>Endomychus coccineus</i> (Linnaeus, 1758)	1	0.03	0	0.00	1	0.02
<i>Hadrobregmus pertinax</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Hypera postica</i> (Gyllenhal, 1813)	1	0.03	0	0.00	1	0.02
<i>Chrysolina geminata</i> (Paykull, 1799)	1	0.03	0	0.00	1	0.02
<i>Chrysolina varians</i> (Schaller, 1783)	1	0.03	0	0.00	1	0.02
<i>Meligethes difficilis</i> (Heer, 1841)	1	0.03	0	0.00	1	0.02
<i>Meligethes lepidii</i> (Miller, 1852)	1	0.03	0	0.00	1	0.02
<i>Mycetophagus quadripustulatus</i> (Linnaeus, 1767)	1	0.03	0	0.00	1	0.02

<i>Nicrophorus fossor</i> (Erichson, 1837)	0	0.00	1	0.03	1	0.02
<i>Oedemera femorata</i> (Scopoli, 1763)	1	0.03	0	0.00	1	0.02
<i>Oedemera podagrariae</i> (Linnaeus, 1767)	0	0.00	1	0.03	1	0.02
<i>Oedemera virescens</i> (Linnaeus, 1767)	0	0.00	1	0.03	1	0.02
<i>Olibrus bimaculatus</i> (Küster, 1848)	1	0.03	0	0.00	1	0.02
<i>Onthophagus verticicornis</i> (Laicharting, 1781)	1	0.03	0	0.00	1	0.02
<i>Oplosia fennica</i> (Paykull, 1880)	0	0.00	1	0.03	1	0.02
<i>Phosphuga atrata</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Phyllobius arborator</i> (Herbst, 1797)	0	0.00	1	0.03	1	0.02
<i>Phytoecia pustulata</i> (Schränk, 1776)	0	0.00	1	0.03	1	0.02
<i>Platycerus caraboides</i> (Linnaeus, 1758)	0	0.00	1	0.03	1	0.02
<i>Podagrica fuscicornis</i> (Linnaeus, 1766)	0	0.00	1	0.03	1	0.02
<i>Pyrochroa coccinea</i> (Linnaeus, 1761)	0	0.00	1	0.03	1	0.02
<i>Scaphidium quadrimaculatum</i> (Olivier, 1790)	0	0.00	1	0.03	1	0.02
<i>Scymnus nigrinus</i> (Kugelan, 1794)	0	0.00	1	0.03	1	0.02
<i>Sermylassa halensis</i> (Linnaeus, 1767)	1	0.03	0	0.00	1	0.02
<i>Sphaeroderma testaceum</i> (Fabricius, 1775)	0	0.00	1	0.03	1	0.02
<i>Tachyporus obtusus</i> (Linnaeus, 1767)	0	0.00	1	0.03	1	0.02
<i>Tachyporus solutus</i> (Erichson, 1839)	0	0.00	1	0.03	1	0.02
<i>Tilloidea unifasciata</i> (Fabricius, 1787)	1	0.03	0	0.00	1	0.02
<i>Titthaspis sedecimpunctata</i> (Linnaeus, 1758)	1	0.03	0	0.00	1	0.02
Total	3397	100.00	3058	100.00	6455	100.00

3. Total dominance inside different main families

The dominance of different species inside different families brings the table 3.

Curculionidae

Inside the family Curculionidae there were 50 species recorded, from which 4 were eudominant – *Sitona lineatus*, *Apion apricans*, *Apion virens* and *Nedyus quadrimaculatus*. There were 6 subdominant species – *Phyllobius pomaceus*, *Apion trifolii*, *Phyllobius*

calcaratus, *Eusomus ovulum*, *Apion fulvipes* and *Sitona hispidulus*. Then 3 recedent species followed – *Apion assimile*, *Apion pisi* and *Sitona humeralis*. The rest of the 37 species were subrecedent.

In the year 1994 38 species were recorded, from which 3 species were eudominant – *Sitona lineatus*, *Apion apricans* and *Apion virens*. Imagoes of the species *Nedyus quadrimaculatus* were dominant. As subdominant appeared the adults of the species *Phyllobius pomaceus*, *Phyllobius calcaratus*, *Apion trifolii*, *Eusomus ovulum*, *Apion fulvipes* and *Sitona hispidulus*. Recedent were the imagoes of the species *Sitona humeralis*, *Apion violaceum*, *Apion assimile*, *Apion pisi* and *Sitona macularis*. Remaining 23 species were subrecedent.

In 1995 again the imagoes of the species *Sitona lineatus* were eudominant, followed by adults of the species *Nedyus quadrimaculatus*, *Apion virens* and *Apion apricans*. Only 1 species was dominant, the imagoes of *Phyllobius pomaceus*. Subdominant were the species *Apion trifolii* and *Phyllobius calcaratus*. Eight species recedent – *Apion assimile*, *Phyllobius pyri*, *Ceutorhynchus pleurostigma*, *Apion fulvipes*, *Sciaphilus asperatus*, *Apion pisi*, *Sitona hispidulus* and *Eusomus ovulum*. The remaining 28 species were subrecedent.

Chrysomelidae

During two research years 38 species were collected. Eudominant were the species *Oulema melanopus*, *Phyllotreta vittula*, *Oulema galleciana* and *Psylliodes chrysocephala*. Dominant were the imagoes of *Chaetocnema concinna*, subdominant *Orsodacne cerasi* and *Phyllotreta nigripes*. Three species in total were recedent – *Phyllotreta atra*, *Crepidodera aurata* and *Chaetocnema arida*. Remaining 27 species were subrecedent.

In the year 1994 26 species were recorded, eudominant were only *Phyllotreta vittula*, *Oulema melanopus* and *Oulema galleciana*. Dominant were the adults of *Chaetocnema concinna*, *Orsodacne cerasi*. Imagoes of the species *Phyllotreta nigripes*, *Phyllotreta atra* and *Chaetocnema arida* were subdominant. The rest of the 19 species were subrecedent.

In the year 1995 there were eudominant again 3 species, *Oulema melanopus*, *Psylliodes chrysocephala* and *Oulema galleciana*. The subdominant species followed – *Phyllotreta vittula*, *Crepidodera aurata*, *Chaetocnema concinna*, *Orsodacne cerasi*. The subdominant species – *Chrysolina staphylea*, *Phyllotreta nigripes*, *Phyllotreta atra* and *Cassida rubiginosa*. The rest of 19 species were subrecedent.

Coccinellidae

During the years 1994 and 1995 16 species of coccinellids were collected. Within this family 3 species were eudominant – *Coccinella septempunctata*, *Psyllobora vigintiduopunctata* and *Propylea quatuordecimpunctata*. The imagoes of the species *Adalia bipunctata* resulted as recedent and remaining 12 species were subrecedent.

In the year 1994 13 species were recorded, when eudominant were the species of *Coccinella septempunctata*, *Psyllobora vigintiduopunctata* and *Propylea quatuordecimpunctata*. The adults of the species *Scymnus auritus* and *Brumus quadripustulatus* were recedent, other 8 species were subrecedent.

In the year 1995 there were again eudominant the imagoes of the species *Coccinella septempunctata*, *Psyllobora vigintiduopunctata* and *Propylea quatuordecimpunctata*, recedent were the adults of *Adalia bipunctata* and the rest 9 species were subrecedent.

Cantharidae

Together 10 species were recorded, from which eudominant were *Rhagonycha fulva* and *Cantharis rustica*, followed by 2 dominant species, *Cantharis fusca* and *Cantharis nigricans*, the species *Cantharis livida* was subdominant. Imagoes of the species *Rhagonycha elongata* were recedent and remaining 4 species were subrecedent.

In 1994 9 species were caught, eudominant ones were *Rhagonycha fulva* and *Cantharis rustica*, dominant were *Cantharis fusca* and *Cantharis nigricans*, imagoes of the species *Cantharis livida* resulted as subdominant and the rest 4 species were subrecedent.

In 1995 there were recorded also 9 species in herbal strata of floodplain forest also but the domination was slightly different. As eudominant appeared *Rhagonycha fulva* and *Cantharis rustica* subdominant were *Cantharis nigricans*, *Cantharis livida*, *Cantharis fusca* and *Rhagonycha elongata*. *Cantharis obscura* and *Cantharis fulvicollis* were recedent and two species were subrecedent.

Elateridae

With use of described collection method 15 species were recorded in 1994 and 1995 in total. Eudominant were the species *Athous vittatus*, *Athous haemorrhoidalis* and *Kibunea minuta*. Dominant were the imagoes of *Agriotes sputator*, subdominant were the imagoes *Athous bicolor* and *Adrastus limbatus*. Recedent were the species *Denticollis linearis*, *Athous subfuscus*, *Nothodes parvulus*, *Agriotes obscurus* and *Adrastus rachifer*. The remaining 4 species were subrecedent.

In the year 1994 there were 12 species caught, eudominant were *Athous vittatus*, *Athous haemorrhoidalis*, *Kibunea minuta* and *Agriotes sputator*. The adults of *Athous bicolor* resulted as subdominant, the recedent ones were the species *Denticollis linearis*, *Adrastus rachifer*, *Nothodes parvulus*, *Agriotes obscurus* and three species were subrecedent.

In 1995 14 species were collected, while eudominant were the species *Athous vittatus* and *Athous haemorrhoidalis*, dominant were *Kibunea minuta* and *Agriotes sputator*. Subdominant were the species *Athous bicolor*, *Adrastus limbatus*, *Athous subfuscus*, and recedent were *Denticollis linearis* and *Nothodes parvulus*. Five species were subrecedent.

Phalacridae

This family was represented by 3 species in total, from which adults of the species *Stilbus testaceus* appeared generally and also in different years as eudominant

Malachiidae

This family was represented by 3 species in total, the most frequent were *Malachius bipustulatus*.

Nitidulidae

The family Nitidulidae was represented by seven species from which significantly numerous were the imagoes of *Meligethes coracinus*.

Cerambycidae

Inside the family the most frequent were the specimens of the species *Grammoptera ruficornis*.

Within other families the number of recorded specimens was low, the survey is in table 3.

Table 3 Survey of domination of the species in different families recorded in ecotone of foodplain forest

FAMILY SPECIES	1994		1995		Total	
	Number	%	Number	%	Number	%
<i>Curculionidae</i>						
<i>Sitona lineatus</i> (Linnaeus, 1758)	335	26.80	183	21.86	518	24.82
<i>Apion apricans</i> (Herbst, 1797)	233	18.64	101	12.07	334	16.00
<i>Apion virens</i> (Herbst, 1797)	155	12.40	135	16.13	290	13.90
<i>Nedyus quadrimaculatus</i> (Linnaeus, 1758)	86	6.88	140	16.73	226	10.83
<i>Phyllobius pomaceus</i> (Gyllenhal, 1824)	60	4.80	44	5.26	104	4.98
<i>Apion trifolii</i> (Linnaeus, 1768)	46	3.68	23	2.75	69	3.31
<i>Phyllobius calcaratus</i> (Fabricius, 1792)	47	3.76	19	2.27	66	3.16
<i>Eusomus ovulum</i> (Germar, 1824)	44	3.52	10	1.19	54	2.59
<i>Apion fulvipes</i> (Fourcroy, 1785)	34	2.72	13	1.55	47	2.25
<i>Sitona hispidulus</i> (Fabricius, 1776)	33	2.64	12	1.43	45	2.16
<i>Apion assimile</i> (Kirby, 1808)	20	1.60	14	1.67	34	1.63
<i>Apion pisi</i> (Fabricius, 1801)	18	1.44	12	1.43	30	1.44
<i>Sitona humeralis</i> (Stephens, 1831)	20	1.60	4	0.48	24	1.15
<i>Apion violaceum</i> (Kirby, 1808)	20	1.60	0	0.00	20	0.96
<i>Sitona sulcifrons</i> (Thunberg, 1798)	12	0.96	7	0.84	19	0.91
<i>Sciaphilus asperatus</i> (Bonsdorf, 1785)	4	0.32	13	1.55	17	0.81
<i>Phyllobius pyri</i> (Linnaeus, 1758)	2	0.16	14	1.67	16	0.77
<i>Ceutorhynchus pleurostigma</i> (Marshall, 1802)	2	0.16	14	1.67	16	0.77

<i>Sitona macularis</i> (Marsham, 1902)	13	1.04	2	0.24	15	0.72
<i>Sitona lepidus</i> (Gyllenhal, 1834)	12	0.96	2	0.24	14	0.67
<i>Hypera nigrirostris</i> (Fabricius, 1775)	8	0.64	6	0.72	14	0.67
<i>Phyllobius argentatus</i> (Linnaeus, 1758)	5	0.40	5	0.60	10	0.48
<i>Sitona puncticollis</i> (Stephens, 1831)	5	0.40	5	0.60	10	0.48
<i>Apion onopordi</i> (Kirby, 1808)	8	0.64	0	0.00	8	0.38
<i>Phyllobius oblongus</i> (Linnaeus, 1758)	5	0.40	3	0.36	8	0.38
<i>Phyllobius maculicornis</i> (Germar, 1824)	0	0.00	8	0.96	8	0.38
<i>Mogulones symphyti</i> (Bedel, 1885)	1	0.08	7	0.84	8	0.38
<i>Curculio glandium</i> (Marsham, 1802)	0	0.00	7	0.84	7	0.34
<i>Ceutorhynchus erysimi</i> (Fabricius, 1787)	2	0.16	5	0.60	7	0.34
<i>Apion seniculus</i> (Kirby, 1808)	6	0.48	0	0.00	6	0.29
<i>Liophloeus lentus</i> (Germar, 1824)	0	0.00	5	0.60	5	0.24
<i>Ceutorhynchus obstrictus</i> (Marsham, 1802)	0	0.00	5	0.60	5	0.24
<i>Otiorhynchus scaber</i> (Linnaeus, 1758)	2	0.16	1	0.12	3	0.14
<i>Sitona cylindricollis</i> (Fahraeus, 1840)	1	0.08	2	0.24	3	0.14
<i>Stenocarus ruficornis</i> (Stephens, 1831)	3	0.24	0	0.00	3	0.14
<i>Apion urticarium</i> (Herbst, 1784)	1	0.08	1	0.12	2	0.10
<i>Phyllobius cloropus</i> (Linnaeus, 1758)	2	0.16	0	0.00	2	0.10
<i>Lignyodes enucleator</i> (Panzer, 1798)	0	0.00	2	0.24	2	0.10
<i>Magdalis armigera</i> (Fourcroy, 1785)	1	0.08	1	0.12	2	0.10
<i>Hypera meles</i> (Fabricius, 1792)	1	0.08	1	0.12	2	0.10
<i>Hypera zoila</i> (Scopoli, 1763)	0	0.00	2	0.24	2	0.10
<i>Rhinoncus perpendicularis</i> (Reich, 1797)	1	0.08	1	0.12	2	0.10
<i>Zacladus geranii</i> (Paykull, 1800)	0	0.00	2	0.24	2	0.10
<i>Ceutorhynchus pallidactylus</i> (Marsham, 1802)	0	0.00	2	0.24	2	0.10
<i>Apion elongatulum</i> (Desbrochers, 1891)	0	0.00	1	0.12	1	0.05

<i>Apion vicinum</i> (Kirby, 1808)	0	0.00	1	0.12	1	0.05
<i>Phyllobius arborator</i> (Herbst, 1797)	0	0.00	1	0.12	1	0.05
<i>Barypeithes chevrolati</i> (Boheman, 1843)	0	0.00	1	0.12	1	0.05
<i>Anthonomus pyri</i> (Kollar, 1837)	1	0.08	0	0.00	1	0.05
<i>Hypera postica</i> (Gyllenhal, 1813)	1	0.08	0	0.00	1	0.05
Chrysomelidae						
<i>Oulema melanopus</i> (Linnaeus, 1758)	223	25.90	261	32.46	484	29.07
<i>Phyllotreta vittula</i> (L. Redtenbacher, 1849)	286	33.22	28	3.48	314	18.86
<i>Oulema gallaeciana</i> (Heyden, 1870)	111	12.89	134	16.67	245	14.71
<i>Psylliodes chrysocephala</i> (Linnaeus, 1758)	0	0.00	226	28.11	226	13.57
<i>Chaetocnema concinna</i> (Marsham, 1802)	75	8.71	19	2.36	94	5.65
<i>Orsodacne cerasi</i> (Linnaeus, 1758)	55	6.39	18	2.24	73	4.38
<i>Phyllotreta nigripes</i> (Fabricius, 1775)	24	2.79	10	1.24	34	2.04
<i>Phyllotreta atra</i> (Fabricius, 1775)	22	2.56	10	1.24	32	1.92
<i>Crepidodera aurata</i> (Marsham, 1802)	6	0.70	22	2.74	28	1.68
<i>Chaetocnema arida</i> (Foudras, 1859)	22	2.56	3	0.37	25	1.50
<i>Chrysolina staphylea</i> (Linnaeus, 1758)	0	0.00	15	1.87	15	0.90
<i>Longitarsus melanocephalus</i> (De Geer, 1775)	5	0.58	6	0.75	11	0.66
<i>Cassida rubiginosa</i> (O. F. Müller, 1776)	2	0.23	8	1.00	10	0.60
<i>Asiorestia ferruginea</i> (Scopoli, 1763)	2	0.23	5	0.62	7	0.42
<i>Epitrix pubescens</i> (Koch, 1803)	6	0.70	0	0.00	6	0.36
<i>Phyllotreta striolata</i> (Fabricius, 1803)	0	0.00	5	0.62	5	0.30
<i>Crepidodera aurea</i> (Geoffroy, 1785)	1	0.12	4	0.50	5	0.30
<i>Psylliodes napi</i> (Fabricius, 1792)	2	0.23	3	0.37	5	0.30
<i>Chrysolina sturmi</i> (Westhoff, 1882)	1	0.12	3	0.37	4	0.24
<i>Fastuolina fastuosa</i> (Scopoli, 1763)	0	0.00	4	0.50	4	0.24
<i>Phyllotreta nemorum</i> (Linnaeus, 1758)	4	0.46	2	0.25	6	0.36

<i>Longitarsus anchusae</i> (Paykull, 1799)	1	0.12	3	0.37	4	0.24
<i>Gastrophysa viridis</i> (De Geer, 1775)	1	0.12	2	0.25	3	0.18
<i>Linnaeidea aenea</i> (Linnaeus, 1758)	0	0.00	3	0.37	3	0.18
<i>Aphthona euphorbiae</i> (Schrank, 1781)	0	0.00	3	0.37	3	0.18
<i>Hermeophaga mercurialis</i> (Fabricius, 1792)	2	0.23	1	0.12	3	0.18
<i>Chaetocnema aridula</i> (Gyllenhal, 1827)	3	0.35	0	0.00	3	0.18
<i>Cryptocephalus rufipes</i> (Goeze, 1777)	0	0.00	2	0.25	2	0.12
<i>Longitarsus brunneus</i> (Duftschmid, 1825)	2	0.23	0	0.00	2	0.12
<i>Longitarsus pratensis</i> (Panzer, 1794)	2	0.23	0	0.00	2	0.12
<i>Chrysolina geminata</i> (Paykull, 1799)	1	0.12	0	0.00	1	0.06
<i>Chrysolina varians</i> (Schaller, 1783)	1	0.12	0	0.00	1	0.06
<i>Sermylassa halensis</i> (Linnaeus, 1767)	1	0.12	0	0.00	1	0.06
<i>Podagrica fuscicornis</i> (Linnaeus, 1766)	0	0.00	1	0.12	1	0.06
<i>Sphaeroderma testaceum</i> (Fabricius, 1775)	0	0.00	1	0.12	1	0.06
<i>Cassida nobilis</i> (Linnaeus, 1758)	0	0.00	1	0.12	1	0.06
<i>Cassida viridis</i> (Linnaeus, 1758)	0	0.00	1	0.12	1	0.06
Coccinellidae						
<i>Coccinella septempunctata</i> (Linnaeus, 1758)	201	45.27	171	38.86	372	42.09
<i>Psyllobora vigintiduopunctata</i> (Linnaeus, 1758)	160	36.03	138	31.36	298	33.71
<i>Propylea quatuordecimpunctata</i> (L, 1758)	57	12.83	103	23.41	160	18.1
<i>Adalia bipunctata</i> (Linnaeus, 1758)	3	0.67	7	1.59	10	1.13
<i>Adalia decempunctata</i> (Linnaeus, 1758)	4	0.90	4	0.90	8	0.91
<i>Brumus quadripustulatus</i> (Linnaeus, 1758)	5	1.13	2	0.46	7	0.79
<i>Scymnus auritus</i> (Thunberg, 1795)	6	1.35	0	0.00	6	0.68
<i>Scymnus rubromaculatus</i> (Goeze, 1777)	3	0.67	1	0.23	4	0.45
<i>Hyperaspis campestris</i> (Herbst, 1783)	1	0.23	3	0.68	4	0.45
<i>Chilocorus bipustulatus</i> (Linnaeus, 1758)	0	0.00	4	0.9	4	0.45

<i>Calvia quatuordecimpunctata</i> (Linnaeus, 1758)	1	0.23	2	0.46	3	0.34
<i>Calvia quindecimguttata</i> (Fabricius, 1777)	1	0.23	2	0.46	3	0.34
<i>Calvia decemguttata</i> (Linnaeus, 1767)	0	0.00	2	0.46	2	0.23
<i>Scymnus nigrinus</i> (Kugelan, 1794)	0	0.00	1	0.23	1	0.11
<i>Coccinella quinquepunctata</i> (Linnaeus, 1758)	1	0.23	0	0.00	1	0.11
<i>Tytthaspis sedecimpunctata</i> (Linnaeus, 1758)	1	0.23	0	0.00	1	0.11
Cantharidae						
<i>Rhagonycha fulva</i> (Scopoli, 1763)	229	64.87	293	73.25	522	69.32
<i>Cantharis rustica</i> (Fallén, 1807)	60	17.00	40	10.00	100	13.28
<i>Cantharis fusca</i> (Linnaeus, 1758)	26	7.37	14	3.50	40	5.31
<i>Cantharis nigricans</i> (O. F. Müller, 1776)	23	6.52	16	4.00	39	5.18
<i>Cantharis livida</i> (Linnaeus, 1758)	11	3.12	16	4.00	27	3.59
<i>Rhagonycha elongata</i> (Fallén, 1807)	1	0.28	9	2.25	10	1.33
<i>Cantharis fulvicollis</i> (Fabricius, 1792)	1	0.28	5	1.25	6	0.80
<i>Cantharis obscura</i> (Linnaeus, 1758)	0	0.00	6	1.50	6	0.80
<i>Metacantharis haemorrhoidalis</i> (Fabricius, 1792)	1	0.28	1	0.25	2	0.27
<i>Cantharis lateralis</i> (Linnaeus, 1758)	1	0.28	0	0.00	1	0.13
Elateridae						
<i>Athous vittatus</i> (Fabricius, 1792)	56	33.33	73	36.14	129	34.86
<i>Athous haemorrhoidalis</i> (Fabricius, 1801)	56	33.33	56	27.72	112	30.27
<i>Kibunea minuta</i> (Linnaeus, 1758)	19	11.31	19	9.41	38	10.27
<i>Agriotes sputator</i> (Linnaeus, 1758)	18	10.71	15	7.43	33	8.92
<i>Athous bicolor</i> (Goeze, 1777)	6	3.57	10	4.95	16	4.32
<i>Adrastus limbatus</i> (Fabricius, 1776)	0	0.00	9	4.46	9	2.43
<i>Denticollis linearis</i> (Linnaeus, 1758)	3	1.79	4	1.98	7	1.89
<i>Athous subfuscus</i> (O. F. Müller, 1767)	0	0.00	5	2.48	5	1.35
<i>Nothodes parvulus</i> (Panzer, 1799)	2	1.19	3	1.49	5	1.35

<i>Agrypnus murinus</i> (Linnaeus, 1758)	0	0.00	2	0.99	2	0.54
<i>Agriotes obscurus</i> (Linnaeus, 1758)	2	1.19	2	0.99	4	1.08
<i>Adrastus rachifer</i> (Fourcroy, 1758)	3	1.79	1	0.50	4	1.08
<i>Dalopius marginatus</i> (Linnaeus, 1758)	1	0.60	2	0.99	3	0.81
<i>Cidnopus pilosus</i> (Leske, 1785)	1	0.60	1	0.50	2	0.54
<i>Agriotes ustulatus</i> (Schaller, 1783)	1	0.60	0	0.00	1	0.27
Phalacidae						
<i>Stilbus testaceus</i> (Panzer, 1797)	95	93.14	142	92.81	237	92.94
<i>Olibrus aeneus</i> (Fabricius, 1792)	6	5.88	11	7.19	17	6.67
<i>Olibrus bimaculatus</i> (Küster, 1848)	1	0.98	0	0.00	1	0.39
Malachiidae						
<i>Malachius bipustulatus</i> (Linnaeus, 1758)	37	61.67	20	47.62	57	55.88
<i>Axinotarsus ruficollis</i> (Olivier, 1790)	23	38.33	8	19.05	31	30.39
<i>Axinotarsus pulicarius</i> (Fabricius, 1775)	0	0.00	14	33.33	14	13.73
Nitidulidae						
<i>Meligethes coracinus</i> (Sturm, 1845)	7	30.43	44	72.13	51	60.71
<i>Meligethes aeneus</i> (Fabricius, 1775)	10	43.48	4	6.56	14	16.67
<i>Glischrochilus quadripunctatus</i> (Linnaeus, 1758)	4	17.39	6	9.84	10	11.90
<i>Epurea depressa</i> (Illiger, 1798)	0	0.00	4	6.56	4	4.76
<i>Meligethes anthracinus</i> (Brisout, 1863)	0	0.00	3	4.92	3	3.57
<i>Meligethes difficilis</i> (Heer, 1841)	1	4.35	0	0.00	1	1.19
<i>Meligethes lepidii</i> (Miller, 1852)	1	4.35	0	0.00	1	1.19
Cerambycidae						
<i>Grammoptera ruficornis</i> (Fabricius, 1781)	34	75.56	13	50.00	47	66.20
<i>Stenocorus meridianus</i> (Linnaeus, 1758)	5	11.11	3	11.54	8	11.27
<i>Grammoptera abdominalis</i> (Stephens, 1831)	0	0.00	4	15.38	4	5.63
<i>Stenurella melanura</i> (Linnaeus, 1758)	3	6.67	1	3.85	4	5.63

<i>Stenostola ferrea</i> (Schrank, 1776)	1	2.22	2	7.69	3	4.23
<i>Rutpela maculata</i> (Poda, 1761)	1	2.22	1	3.85	2	2.82
<i>Clytus arietis</i> (Linnaeus, 1758)	1	2.22	0	0.00	1	1.41
<i>Oplosia fennica</i> (Paykull, 1880)	0	0.00	1	3.85	1	1.41
<i>Phytoecia pustulata</i> (Schrank, 1776)	0	0.00	1	3.85	1	1.41
Carabidae						
<i>Amara familiaris</i> (Duftschmid, 1813)	7	38.89	14	42.42	21	41.18
<i>Poecilus cupreus</i> (Linnaeus, 1758)	1	5.56	10	30.30	11	21.57
<i>Trechus quadristriatus</i> (Schrank, 1781)	4	22.22	0	0.00	4	7.84
<i>Amara similata</i> (Gyllenhal, 1810)	3	16.67	0	0.00	3	5.88
<i>Demetrias atricapilus</i> (Linnaeus, 1758)	0	0.00	3	9.09	3	5.88
<i>Loricera pilicornis</i> (Fabricius, 1775)	1	5.56	1	3.03	2	3.92
<i>Anchomenus dorsalis</i> (Pontoppidan, 1763)	0	0.00	2	6.06	2	3.92
<i>Carabus coriaceus</i> (Linnaeus, 1758)	0	0.00	1	3.03	1	1.96
<i>Bembidion lampros</i> (Herbst, 1784)	1	5.56	0	0.00	1	1.96
<i>Bembidion quadrimaculatum</i> (Linnaeus, 1761)	0	0.00	1	3.03	1	1.96
<i>Amara consularis</i> (Duftschmid, 1812)	1	5.56	0	0.00	1	1.96
<i>Amara aulica</i> (Panzer, 1797)	0	0.00	1	3.03	1	1.96
Lagriidae						
<i>Lagria hirta</i> (Linnaeus, 1758)	24	100.00	18	100.00	42	100.00
Staphylinidae						
<i>Tachyporus hypnorum</i> (Fabricius, 1775)	5	100.00	2	20	7	46.67
<i>Eusphalerum adustum</i> (Heer, 1839)	0	0.00	6	60	6	40.00
<i>Tachyporus obtusus</i> (Linnaeus, 1767)	0	0.00	1	10	1	6.67
<i>Tachyporus solutus</i> (Erichson, 1839)	0	0.00	1	10	1	6.67
Dasytidae						
<i>Dasytes plumbeus</i> (O. F. Müller, 1776)	10	100.00	4	100.00	14	100.00

Scraptiidae						
<i>Anaspis frontalis</i> (Linnaeus, 1758)	8	100.00	1	100.00	9	100.00
Pyrochroidae						
<i>Pyrochroa serraticornis</i> (Scopoli, 1763)	1	100.00	5	62.5	6	66.67
<i>Schizotus pectinicornis</i> (Linnaeus, 1758)	0	0.00	2	25	2	22.22
<i>Pyrochroa coccinea</i> (Linnaeus, 1761)	0	0.00	1	12.5	1	11.11
Scarabaeidae						
<i>Aphodius prodromus</i> (Brahm, 1790)	0	0.00	4	66.67	4	50.00
<i>Valgus hemipterus</i> (Linnaeus, 1758)	1	50.00	1	16.67	2	25.00
<i>Onthophagus verticicornis</i> (Laicharting, 1781)	1	50.00	0	0.00	1	12.50
<i>Aphodius distinctus</i> (O. F. Müller, 1776)	0	0.00	1	16.67	1	12.50
Byturidae						
<i>Byturus ochraceus</i> (L. G. Scriba, 1790)	6	100.00	2	100.00	8	100.00
Anobiidae						
<i>Ptinomorphus imperialis</i> (Linnaeus, 1767)	0	0	2	66.67	2	40.00
<i>Stegobium paniceum</i> (Linnaeus, 1758)	2	100.00	0	0.00	2	40.00
<i>Hadrobregmus pertinax</i> (Linnaeus, 1758)	0	0	1	33.33	1	20.00
Anthicidae						
<i>Anthicus atherinus</i> (Linnaeus, 1761)	5	100.00	0	0.00	5	100.00
Buprestidae						
<i>Agrilus graminis</i> (Laporte de Castelnau et Gory, 1837)	3	100.00	1	100.00	4	100.00
Oedemeridae						
<i>Oedemera femorata</i> (Scopoli, 1763)	1	100.00	0	0.00	1	33.33
<i>Oedemera podagrariae</i> (Linnaeus, 1767)	0	0	1	50.00	1	33.33
<i>Oedemera virescens</i> (Linnaeus, 1767)	0	0	1	50.00	1	33.33
Silphidae						
<i>Phosphuga atrata</i> (Linnaeus, 1758)	0	0.00	1	50.00	1	50.00

<i>Nicrophorus fossor</i> (Erichson, 1837)	0	0.00	1	50.00	1	50.00
Lathridiidae						
<i>Corticara gibbosa</i> (Herbst, 1793)	2	100.00	0	0.00	2	100.00
Scaphidiidae						
<i>Scaphidium quadrimaculatum</i> (Olivier, 1790)	0	0.00	1	100.00	1	100.00
Lucanidae						
<i>Platycerus caraboides</i> (Linnaeus, 1758)	0	0.00	1	100.00	1	100.00
Byrrhidae						
<i>Byrrhus pilula</i> (Linnaeus, 1758)	0	0.00	1	100.00	1	100.00
Cleridae						
<i>Tilloidea unifasciata</i> (Fabricius, 1787)	1	100.00	0	0.00	1	100.00
Kateretidae						
<i>Brachypterus urticae</i> (Fabricius, 1792)	1	100.00	0	0.00	1	100.00
Endomychidae						
<i>Endomychus coccineus</i> (Linnaeus, 1758)	1	100.00	0	0.00	1	100.00
Mycetophagidae						
<i>Mycetophagus quadripustulatus</i> (Linnaeus, 1767)	1	100.00	0	0.00	1	100.00

Discussion

The edges of forest create a special habitat, where meadow and field species occur together with the elements living in herbal strata or on shrubs and trees of the forest margin. This marginal effect is very significant (Schwerdtfeger, 1963). Approaching insects mostly stay on the forest margin wall and towards the wood interior the density is lower (Tichler, 1950). Together eudominant and dominant families represented 5759 imagoes, which is 89,22 % of all collected specimens. These were representatives of only five families (Curculionidae, Chrysomelidae, Coccinellidae, Cantharidae and Elateridae). Remainig 25 families created only 10,88 %. These families are highly numerous also on other places like meadows, lucerne and shamrock fields.

The number of eudominant and dominant species was the same as at the families (*Rhagonycha fulva*, *Sitona lineatus*, *Oulema melanopus*, *Coccinella septempunctata* and *Apion apricans*). These five species represented 34,55 % and the rest 190 species created 65,45 %. *Rhagonycha fulva* is very common species on flowers of the family

Apiaceae and species of the genus *Achillea* (Fleischer, 1927–1930). At the end of June it is the most common species of the whole family (Freude, Harde, Lohse, 1979). *Sitona lineatus* is the species which often occurs on plant species of the family Fabaceae. Imagoes of the species *Oulema melanopus* can be the serious grain pest, but it is also frequent in meadows. Adults of the *Coccinella septempunctata* frequently occurs everywhere in open countryside (Hodek, 1973). The species *Apion apricans* is classified as a pest in smamrock fields. The species spectrum introduced by Hasík (1999) is similar in main features, but certainly the composition of herbal strata in observed habitats plays an important role.

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