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THE WEEVILS (*Curculionoidea*) OF CALCACEROUS HABITATS OF THE VICINITY OF CHEŁM[1?]

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Summary. The paper presents study results referring to weevils inhabiting five objects (21 plant communities) occurring in lime habitats in the vicinity of Chełm as well as – for the full characterisation of the area – published data from the Żmudź and Zawadówka nature reserves. Insects were collected with the use of entomological scoop and sieve, as well as the Moericke and Barber traps. In general, 282 weevil species were found, encompassing 10716 specimens. The obtained results extended the list of weevil species of this area to 395. Among recorded taxa there were species known from a few study sites in Poland and they represented xerothermophilous forms mainly. Some of them belonged to vulnerable (VU) or endangered (EN) species.

Key words: *Coleoptera*, *Curculionoidea*, faunistics, ecology, species protection

INTRODUCTION

The area surrounding the city of Chełm is famous for the occurrence of very interesting flora rich in species of the southern or south-eastern geographical ranges. The interests of naturalists focusing on the objects with calciphilous and xerothermophilous vegetation date back to the 19th century when Maria Hempel found the carline thistle *Carlina onopordifolia* on Stawska Góra. Further studies led to discovering in this area many rare plant and animal species – some of them were included in the Polish Red Book of Plants and the Polish Red Book of Animals as vulnerable and endangered in a national scale. Studies on weevils of this area were initiated by Cmoluch [1958 1959, 1963, 1966, 1981, 1981a],

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and next were continued by Cmoluch and Łętowski [1976, 1981], Cmoluch and Minda-Lechowska [1977, 1981], Cmoluch *et al.* [1978], Łętowski [1980], Minda-Lechowska [1980], Łętowski and Staniec [1997], Minda--Lechowska and Łętowski [2000], Łętowski and Ptaszyńska [2006].

STUDY AREA

Entomological studies encompassed 7 objects with calciphilous vegetation – nature reserves mainly – and the number of study sites in every nature reserve was dependent on its size and phytosociological diversity. Not only were they typical, well-developed and characteristic to a particular object associations, but also patches of transitional communities at different stage of succession. Phytosociological affinity was assigned according to the papers of Fijałkowski and Izdebski [1957], Izdebski [1958], Izdebska [1969], Fijałkowski [1971], Matuszkiewicz [1982], as well as through taking 38 phytosociological photographs and 22 soil profiles. Their detailed characteristics were given in the paper by Grądziel [2000]. Those were – in the Brzeźno nature reserve – the following communities: *Cladietum marisci*, *Ribo nigri-Alnetum*, *Betulo-Salicetum repentis*, facies with *Salix rosmarinifolia*, *Inuletum ensifoliae* typicum, *Inuletum ensifoliae*, impoverished form, *Inuletum ensifoliae*, facies with *Tofieldia calyculata*, *Brachypodio-Teucrietum* (I); in the Bagno Serebryskie nature reserve – the following communities: *Cladietum davallianae*, *C. marisci*, synanthropic fallow community, *Brachypodio-Teucrietum*, facies with *Filipendula hexapetala*, *Brachypodio-Teucrietum*, facies with *Teucrium chamaedrys*, *Betulo-Salicetum repentis*, facies with *Salix rosmarinifolia* (II); in the Stawska Góra nature reserve – the following communities *Brachypodio-Teucrietum*, facies with *Carlina onopordifolia*, *Brachypodio-Teucrietum*, facies with *Prunus spinosa*, transitional community with *Picris hieracioides* and with elements of xerothermic grassland (from *Trifolio-Geranietea* class), coppice community from *Rhamno-Prunetea* class, *Brachypodio-Teucrietum*, facies with *Agropyron intermedium* (III); in the Wolwinów reserve: *Peucedano cervarie-Coryletum* with *Larix europaea*, *Peucedano cervarie-Coryletum* with *Cerasus fruticosa*, *Tilio-Carpinetum* (IV); in the planned Zawadówka reserve – community from the order *Caricetalia davallianae* with great share of *Schoenus ferrugineus*, *Betulo-Salicetum repentis*, typical form (with *Betula humilis*), *Molinietum medioeuropaeum*, *Brachypodio-Teucrietum*, community from the class *Festuco-Brometea* with large share of *Brachypodium pinnatum*, *Potentillo albae-Quercetum*, community from the order *Molinietalia* with a share of *Trollius europaeus* and *Aconitum variegatum* (V); in Żmudź reserve – the following communities: *Brachypodio-Teucrietum*, facies with *Linum flavum*, *Brachypodio-Teucrietum*, *Brachypodio-Teucrietum*,

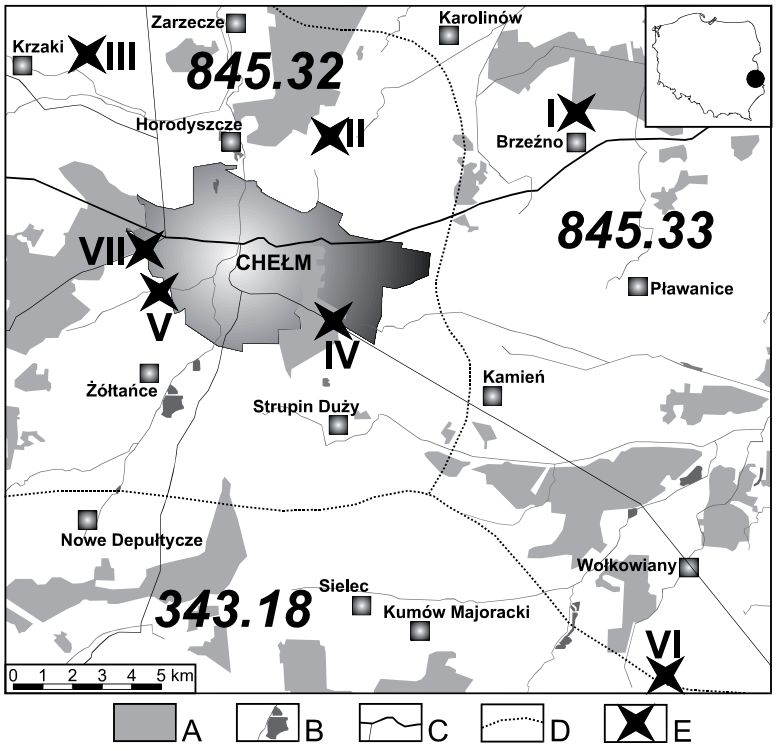

Fig. 1. Distribution of study sites: A – forests, B – water reservoirs, C – roads, D – region boundaries,

E – study sites

facies with *Prunus spinosa* and *Salvia pratensis*, *Brachypodio-Teucrietum* in initial stage with *Juniperus communis*, *Thalictro-Salvietum pratensis*, facies with *Cytisus nigricans*, forest anthropogenic community with *Larix europaea*, *Brachypodio-Teucrietum*, facies with *Senecio jacobaea* (VI); forest similar to *Tilio-Carpinetum* in Rudka (Forestry Góry) (VII). According to the current physiographic division of the country by Kondracki [2000], the Brzeźno, Bagno Serebryskie and Żmudź reserves are situated in the Dubienka Depression, but the Stawska Góra, and Wolwinów reserves as well as the planned Zawadówka reserve and the object in Rudka are part of Chełm Hills and they are mesoregions of Polesie (Fig. 1).

MATERIALS AND METHODS

The phytocenoses given above were fixed study areas in which entomological material was collected for 3 years by standard entomological quantitative methods. In general, in the years 1996–1998, 550 quantitative samples were col-

lected with the use of entomological scoop, as well as 50 samples with the use of entomological sieve. Additionally, the material from 1204 Barber's traps and 230 Moericke's traps was analysed. Moreover, in the discussed period, qualitative samples were also taken from the study areas mentioned above.
The collected entomological materials were analysed by giving: the number of species (N), the number of individuals (n`), individual dominance (D). The obtained values of dominance degree were grouped in five classes: eudominants (>10%), dominants (5.1–10%), subdominants (2.1–5%), recedents (1–2%) and subrecedents (<1%). Moreover, the collected material was analysed in terms of ecology and zoogeography [Pawłowski 1967, Czechowski and Mikołajczyk 1981, Petryszak 2004]. The average number of specimens collected in 25 sweeps of entomological scoop in communities of herbaceous plants and forest ground cover was taken as the measurement of the number of individuals (n`).

RESULTS

In the material collected by methods mentioned above 10 716 specimens representing 282 weevil species were caught. Among the studied objects the most diversified and rich fauna of the areas was found in the planned Zawadówka nature reserve. In general, 193 weevil species (1787 ind.) were caught. The highest number of species and specimens was collected in loose oak forests (97 spec., 625 ind.), and the lowest one – in the community of sedges from the order *Caricetalia davallianae* (15 spec., 31 ind.). The poorest fauna of weevils – in terms of quality and quantity – was observed in the Wolwinów nature reserve and in dry-ground forest in Rudka (Forestry Góry). During the three-year period, 51 to 58 species were found, encompassing 474 to 497 specimens. In particular objects the following results were obtained:

The Brzeźno nature reserve (study site I)

In seven selected areas, with the use of entomological scoop, in 72 samples, 1372 specimens of weevils belonging to 107 species were collected in general. 101 species occurred in quantitative samples (1322 ind.), the other 6 species were present in qualitative ones. Those were: *Temnocerus longiceps*, *Apion cruentatum*, *A. rubens*, *Pseudostenapion simum*, *Holotrichapion aethiops*, *Omphalapion laevigatum*. The poorest fauna was found in *Cladietum marisci* community, where 5 species with the number of 12 specimens were collected. A weevil found in six communities, except for *Cladietum marisci*, was *Sitona lineatus*, the most numerous was *Catapion jaffense*, dominating in the communities of the class *Festuco-Brometea*. It is a thermophilous oligophage occurring in the whole country on herbaceous vegetation. *Phyllobius viridicollis* also reached high numbers – it is a polyphagous species feeding on herbaceous plants, bushes and trees, that has been known from a few sites in the country. Rare species found at

this study site included: *Auletobius sanguisorbae*, *Pseudoprotapion elongatulum*, *Squamapion elongatum*, *Ceratapion basicorne*, *Nanophyes circumscriptus*, *Otiorhynchus multipunctatus*, *Polydrusus pterygomalis*, *Tychius schneideri*, *Curculio rubidus*, *Hypera fuscocinerea*, *Neophytobius quadrinodosus*, *Datonychus derennei*, *Gymnetron melanarium*, *Orchestes jota*, *Pseudorchestes ermischi* (Photo 1), *P. pratensis*, *Rhamphus oxyacanthae*. The studies presented in the paper extended the list of species found in that nature reserve significantly – 55 new species were added to the list (Tab. 1, Fig. 2) in comparison to the data of Cmoluch [1989].

The Bagno Serebryskie nature reserve (study site II)

In this object weevils were collected at six study sites. The use of entomological scoop only was strictly dependent on hydrological conditions in this object. High water level during springtime did not allow to use Barber's and Moericke's traps. In 58 entomological scoop samples 1214 specimens representing 76 species were found. The poorest fauna was in the community *Cladietum marisci* – 9 spec., 31 ind. The most numerous taxa at all study sites were: *Catapion jaffense* and
Protapion assimile which comprised over 50% of all individuals picked up in this object. Worth mentioning is the presence of rarely found *Auletobius sanguisorbae* (Photo 2) in the community *Betulo-Salicetum repentis* facies with *Salix rosmarinifolia.* It is a monophagous species living on great burnet *Sanguisorba officinalis*, distributed in the whole country and typical of moist meadows. Moreover, the rare species category was represented by *Temnocerus nanus*, *Exapion corniculatum*, *Pseudoprotapion elongatulum*, *Ceratapion basicorne*, *Tychius schneideri*, *Sibinia sodalis*, *Gymnetron veronicae*, *Pseudorchestes pratensis, Rhamphus subaeneus* (Tab. 1, Fig. 3).

The Stawska Góra nature reserve (study site III)

At five areas 102 species were recorded, identified from 2482 specimens. The collection of insects gathered with entomological scoop (54 samples) amounted to 84 species with the number of 1675 specimens. 688 individuals representing 54 species were caught into Barber's traps. Moreover, in spring and autumn, the entomological sieve was used (38 samples), which resulted in collecting 27 species with the number of 119 specimens.

Among analysed objects, the assemblages of weevils of plant communities in Stawska Góra had the highest number of individuals. The most numerous taxon was *Pseudoprotapion ergenense* (Photo 3), biologically associated with *Astragalus onobrychis*, *A. danicus* and *Onobrychis viciaefolia*, a xerothermophilous oligophage, rarely found in Poland and endangered by extinction (EN) as well. Its population in this object has remained at high level of numbers and it can be regarded as characteristic species for this reserve. To the group of very numerous species belonged also *Brachysomus setiger*, a weevil with similar

Table 1. Weevils (*Coleoptera*, *Curculionoidea*) of nature reserves Błota Serebryskie and Brzeźno

Species/Study site	Błota Serebryskie													Brzeźno												
	I		II		III		IV		V		VI		Σ	VII		VIII		IX		X		XI		XII		XIII		Σ
	N	n'	N	n'	N	n'	N	n'	N	n'	N	n'		N	n'	N	n'	N	n'	N	n'	N	n'	N	n'	N	n'	
Rhynchitidae																											
**Auletobius sanguisorbae* (Schrank)			1	0.01	1	+	2	0.04			2	0.04	6			1	+	1	+									2
**Temnocerus nanus* (Payk.)											1	0.02	1														
Apionidae																											
Aspidapion radiolus (Marsh.)			1	0.01									1													2	0.02	2
Perapion curtirostre Germ.									1	0.04			1			3	0.02											3
Perapion marchicum (Herbst)											1	0.02	1														
Exapion difficile Herbst																2	0.01											2
**Exapion corniculatum* (Germ.)					38	0.25							38														
Exapion formaneki Wagn.																		1	+									1
**Pseudoprotapion elongatulum* Desbr.					29	0.2							29							3	0.09	2	0.02	1	0.02	2	0.02	8
Melanapion minimum Herbst.																7	0.05	6	0.05			1	+	2	0.03			16
Kalcapion pallipes Kirby																2	0.01					2	0.02			1	+	5
Squamapion atomarium Kirby					12	0.07			2	0.08	1	0.02	15							1	0.03	1	+	3	0.05	1	+	6
**Squamapion elongatum* Germ.																				5	0.16	5	0.04			3	0.03	13

Squamapion flavimanum GYLL.																							7	0.06	4	0.06	3	0.03	14
Squamapion vicinum KIRBY	1	0.01			1	+			2	0.08			4			1	+								8	0.13	6	0.05	15
Squamapion hoffmanni (WAGN.)					1	+							1																
* *Ceratapion basicorne* (ILLIG.)							1	0.02					1					1	+										1
Omphalapion hookerorum KIRBY														1	0.03														1
Catapion jaffense DESBR.	1	0.01	41	0.60	291	16.52							333			2	0.01	9	0.08	42	0.38	22	0.20	7	0.11	47	0.42	129
Catapion pubescens KIRBY					3	0.07							3													1	+	1
Catapion seniculus KIRBY	1	0.01									2	0.04	3			1	+			2	0.06			3	0.05	2	0.02	8
Ischnopterapion modestum (GERM.)											2	0.04	2															
Ischnopterapion loti KIRBY	4	0.04			1	+	2	0.04	51	0.90	3	0.05	61							1	0.03							1
Oxystoma subulatum KIRBY																5	0.04	4	0.04					1	0.02	2	0.02	12
Oxystoma craccae (L.)			1	0.01									1			1	+											1
Oxystoma cerdo GERST.																2	0.01			1	0.03					1	+	4
Stenopterapion tenue KIRBY					2	0.01	1	0.02	2	0.08			5					1	+									1
Cyanapion gyllenhalii KIRBY																				1	0.03					2	0.02	3
Cyanapion platalea GERM.			1	0.01					2	0.08	1	0.02	4			3	0.02	2	0.02	4	0.12	1	+	1	0.02	1	+	12
Cyanapion columbinum GERM.			2	0.02									2			2	0.01	1	+								3
Cyanapion spencii KIRBY																1	+			1	0.03					1	+	3
Hemitrichapion pavidum GERM.									3	0.13			3											2	0.03	1	+	3
Eutrichapion vorax HERBST																										1	+	1
Holotrichapion ononis KIRBY			2	0.02	12	0.07							14			2	0.01	5	0.04	33	1.03	12	0.11	6	0.09	29	0.26	87
Betulapion simile KIRBY											1	0.02	1	1	0.03	28	0.20	31	0.28	2	0.06	1	+	2	0.03	4	0.04	69
Eutrichapion viciae (PAYK.)							1	0.02	9	0.38	8	0.14	18			12	0.11	4	0.04	6	0.19	6	0.09	6	0.09	10	0.09	44

Pseudoprotapion astragali (Payk.)					1	+							1																	
Ischnopterapion virens Herbst	2	0.02			1	+	1	0.02	6	0.25	2	0.04	12			4	0.03						2	0.03			6	
Protapion apricans Herbst									3	0.13			3	1	0.03	3	0.03	1	+	1	0.03				1	+	7	
Protapion assimile Kirby			52	0.76	254	1.72							306							4	0.04	3	0.05				7	
Protapion filirostre Kirby					2	0.01							2			2	0.01	1	+	1	0.03						4	
Protapion fulvipes (Geoffr.)																38	0.27	15	0.13	9	0.28	1	+	2	0.03		65	
Protapion nigritarse Kirby																		1	+								1	
Protapion ononidis Gyll.			6	0.09	56	0.37			1	0.04			63			1	+			4	0.12	4	0.04	3	0.05	4	0.04	16	
Protapion trifolii (L.)																17	0.12	2	0.02	1	0.03	8	0.07			3	0.03	31	
Nanophyidae																														
**Nanophyes circumscriptus* Aubé																1	+										1	
Nanophyes marmoratus (Goeze)	8	0.09	24	0.35					15	0.63	5	0.09	52	8	0.25	8	0.06	17	0.15	1	0.03			6	0.09	1	+	41	
Curculionidae																														
°**Otiorhynchus multipunctatus* (Fabr.)																		1	+								1	
Otiorhynchus ligustici (L.)									1	0.04			1																	
Phyllobius viridicollis (Fabr.)									10	0.41	1	0.02	11			23	0.16	8	0.07	51	1.59			12	0.19	16	0.14	110	
Phyllobius glaucus (Scop.)			2	0.02									2																	
°**Polydrusus pterygomalis* (Boh.)																4	0.03									6	0.05	10	
Polydrusus confluens Steph.																				47	1.47	1	+			10	0.09	58	
Polydrusus inustus Germ.																3	0.02	1	+	1	0.03	3	0.03	3	0.05	7	0.06	18	

°*Polydrusus*														1	+													1
picus (Fabr.)																													
Eusomus ovulum Germ.														3	0.02	1	+	2	0.06	5	0.04	1	0.02	4	0.04	13			
Sciaphilus																												3	
asperatus (Bonsd.)																													
Parafoucartia squamulata (Herbst)																		2	0.06	1	+	7	0.11	3	0.03	13			
Barynotus														1	+											1			
obscurus																													
(Fabr.)																													
Sitona griseus (Fabr.)			1	0.01									1	1	+									1	+	2			
Sitona crinitus			1	0.01					1	0.04			2							2	0.02			1	+	3			
(Herbst)																													
Sitona			1	0.01									1					1	0.03							1			
cylindricollis (Fahr.)																													
Sitona																2	0.02					3	0.05			5			
hispidulus (Fabr.)																													
Sitona														2	0.01									1	+	3			
humeralis																													
Steph.																													
Sitona														3	0.02			2	0.06	1	+					6			
languidus																													
Gyll.																													
Sitona																		1	0.03							1			
lepidus Gyll.																													
Sitona	11	0.12	9	0.13	33	0.22	4	0.15	5	0.20	9	0.16	71	2	0.01	21	0.19	12	1.0	22	0.20	10	0.16	51	0.46	118			
lineatus (L.)																													
Sitona longulus Gyll.																2	0.02	1	0.03							3			
Sitona puncticollis			2	0.03	2	0.01					1	0.02	5					1	0.03	1	+			2	0.02	4			
Steph.																													
Sitona sulcifrons											1	0.02	1	1	+	5	0.04	3	0.09	1	+	4	0.06	5	0.04	19			
(Thunb.)																													
Sitona suturalis Steph.					8	0.06	2	0.04	1	0.04			11	33	0.24	7	0.06	1	0.03	2	0.02	1	0.02	4	0.04	48			
Sitona tibialis (Herbst)														10	0.07	5	0.04	27	0.84	13	0.12			17	0.15	72			
Sitona	1	0.01	1	0.01	2	0.01			22	0.92			26																
waterhousei Walt.																													
Tanymecus																				1	+	1	0.02	1	+	3			
palliatus																													
(Fabr.)																													
**Larinus brevis*																		1	0.03					1	+	2			
(Herbst)																													
Larinus planus (Fabr.)							1	0.02					1			1	+									1			
°*Dorytomus rufatus*			1	0.01									1																
(Bed.)																													
°*Acalyptus carpini*											1	0.02	1	1	+	1	+									2			
(Fabr.)																													
Tychius					6	0.03							6																
aureolus Kiesenw.																													
Tychius					1	+			2	0.08	1	0.02	4			1	+									1			
junceus																													
(Reich)																													

Tychius lineatulus Steph.																										1	+	1
Tychius meliloti Steph.									2	0.08			2			1	+							1	0.02			2
Tychius picirostris (Fabr.)									8	0.33	1	0.02	9			1	+	1	+	1	0.03	1	+	2	0.03			6
**Tychius schneideri* (Herbst)											1	0.02	1							2	0.06			1	0.02			3
Tychius stephensi Schoenh.			1	0.01	2	0.01							3															
Sibinia pellucens (Scop.)									1	0.4			1															
**Sibinia sodalis* Germ.	2	0.02											2															
Anthonomus rubi (Herbst)																		1	+									1
°**Curculio rubidus* (Gyll.)																1	+	1	+	1	0.03							3
°*Archarius pyrrhoceras* Marsh.											3	0.05	3													1	+	1
°*Archarius salicivorus* Payk.																1	+											1
°*Magdalis duplicata* Germ.																						1	+					1
°*Lepyrus capucinus* (Schall.)																1	+											1
Hypera arator (L.)			1	0.01									1															
**Hypera fuscocinerea* (Marsh.)																				1	0.03							1
Hypera nigrirostris (Fabr.)																						1	+					1
Hypera plantaginis (Deg.)									2	0.08	1	0.02	3															
Hypera postica (Gyll.)									2	0.08			2															
Hypera suspiciosa (Herbst)			2	0.03			1	0.02	1	0.04	3	0.05	7			5	0.03	4	0.04	2	0.06	2	0.02	4	0.06	6	0.05	23
Hypera viciae (Gyll.)											1	0.02	1															
Limnobaris dolorosa (Goeze)			6	0.09					1	0.04			7	1	0.03			4	0.04	1	0.03							6
Limnobaris talbum (L.)			2	0.03									2											1	0.02			1
Pelenomus comari (Herbst)																2	0.01											2

Pelenomus quadricorniger (Colonn.)							1	0.04			1																			
Neophytobius quadrinodosus (Gyll.)														1	+															1
Rhinoncus castor (Fabr.)																										1	+			1
Ceutorhynchus contractus (Marsh.)							1	0.04			1					1	+					1	0.02							2
Ceutorhynchus erysimi (Fabr.)							1	0.04	1	0.02	2																			
Ceutorhynchus floralis (Payk.)																						1	0.02							1
Ceutorhynchus sulcicollis (Payk.)	2	0.03									2																			
Glocianus distinctus (Ch. Bris.)							1	0.04			1																			
Datonychus derennei (Guill.)																1	+	1	0.03											2
Trichosirocalus troglodytes (Fabr.)							2	0.08			2																			
Mecinus pascuorum (Gyll.)			1	+			1	0.04			2																			
Gymnetron labile (Herbst)							2	0.08			2																			
Gymnetron melanarium (Germ.)																		1	0.03	2	0.02			1	+					4
Gymnetron veronicae (Germ.)							2	0.08			2																			
Miarus ajugae (Herbst)																				1	+			1	+					2
°*Anoplus Plantaris* (Naez.)									1	0.02	1			2	0.01															2
°Orchestes jota (Fabr.)														2	0.01															2
Pseudorchestes sp.									1	0.02	1															4	0.04			4
Pseudorchestes ermischi (Dieckm.)																		1	0.03							1	+			2
Pseudorchestes pratensis (Germ.)			14	0.10					1	0.02	15			29	0.21	7	0.06	2	0.06	3	0.03	1	0.02	13	0.72	55				
°*Tachyerges salicis* (L.)							2	0.08	1	0.02	3			3	0.03	2	0.02			1	+					6				
°*Tachyerges stigma* (Germ.)									2	0.04	2			4	0.03	1	+							1	+	6				
°*Isochnus populicola* (Silfv.)																1	+									1				

°**Rhamphus oxyacanthae* (Marsh.)										1	+	4	0.04					5
°**Rhamphus subaeneus* (Illig.)						1	0.02	1										
Σ	31	163	774	16	169	61		**1214**	12	291		187		289	141	113	289	**1322**

Explanations: I, VII – *Cladietum marisci,* II – *Caricetum davalianae,* III – synanthropic fallow community, IV – *Brachypodio-Teucrietum* facies with *Filipendula hexapetala*, V – *Brachypodio-Teucrietum* f. with *Teucrium chamaedrys*, VI, IX – *Betulo-Salicetum repentis*, f. with *Salix rosmarinifolia*, VIII – *Ribo nigri-Alnetum*, X – *Inuletum ensifoliae* f. *typicum,* XI – *Inuletum ensifoliae* in impoverished form, XII – *Inuletum ensifoliae* f. with *Tofieldia calyculata,* XIII – *Brachypodio-Teucrietum*, * – rare species,° – dendrophilous species, N – number of specimens, n' – number of individuals (+ < 0.01)

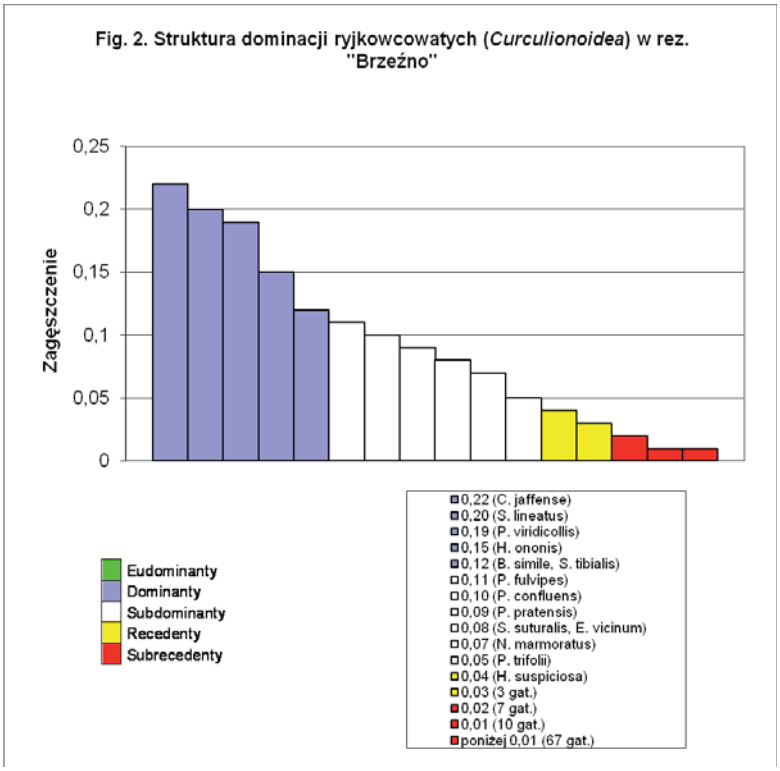

Fig. 2. Domination structure of *Curculionoidea* in nature reserve Brzeźno

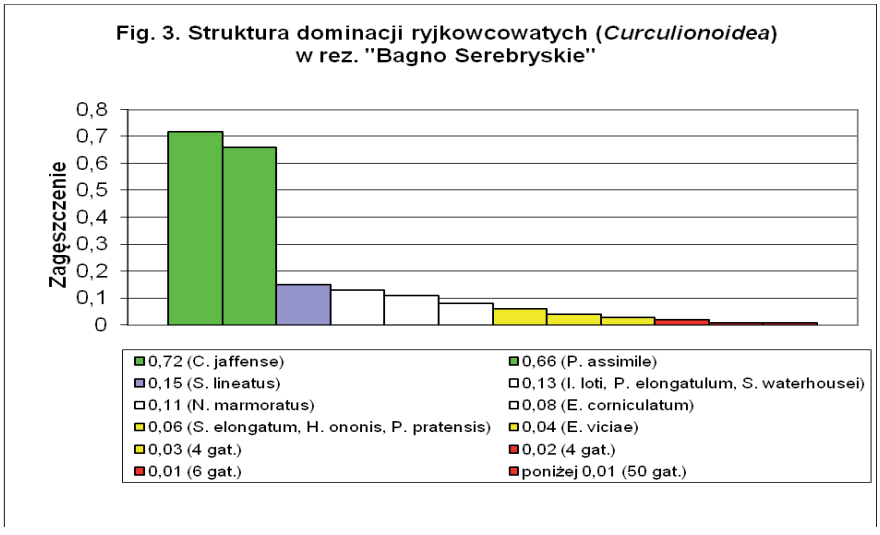

Fig. 3. Domination structure of *Curculionoidea* in nature reserve Bagno Serebryskie

able 2. Weevils (*Coleoptera*, *Curculionoidea*) of nature reserves Wolwinów and Stawska Góra, and the site in Góry Forestry District (Rudka)

Species/Study site	Wolwinów							Stawska Góra														Leśnictwo Góry					
	I		II		III		Σ	IV		V		VI		VII		VIII		B	S	Σ		IX		M	B	Σ
	N	n’	N	n’	N	n’		N	n’	N	n’	N	n’	N	n’	N	n’	N	N			N	n’	N	N	
Rhynchitidae																											
°*Neocoenorrhinus germanicus* (Herbst)			1	+			1					1	0.01							1				1		1
Attelabidae																											
°*Deporaus betulae* (L.)																								1		1
* °*Attelabus nitens* (Scop.)																								1		1
°*Apoderus coryli* (L.)			1	+			1																	1		1
Apionidae																											
Aspidapion radiolus (Marsh.)																						1	+			1
Taeniapion urticarium (Herbst)																						2	+	1		3
Pseudoperapion brevirostre (Herbst)										1	0.01							1		2						
Pseudostenapion simum (Germ.)			1	+			1	1	0.01			1	0.01	1	0.01			1		4						
Perapion curtirostre Germ.					1	+	1																				
Melnapion minimum (Herbst)														2	0.02					2							
Squamapion elongatum (Germ.)								3	0.03	1	0.01	2	0.02	4	0.05			1		11						
Squamapion flavimanum Gyll.					1	+	1	3	0.03	13	0.15	1	0.01	5	0.06	3	0.04			25						
Squamapion vicinum (Kirby)								2	0.01											2						
Squamapion atomarium (Kirby)										1	0.01	1	0.01			5	0.06			7						
Squamapion cinereaceum (Wenck.)																1	0.01			1						
Ceratapion onopordi (Kirby)														1	0.01			3		4		1	+			1
Ceratapion austriacum (Wagner)			4	0.04			4																				
Ceratapion carduorum (Kirby)																		1		1							
Omphalapion laevigatum (Payk.)			1	+			1																		1	1	
Omphalapion dispar (Germ.)																		1		1							
Omphalapion hookerorum Kirby																		1		1		1	+			1	
Apion cruentatum Walt.										1	0.01									1							
Aizobius sedi (Germ.)			1	+			1																				
Exapion difficile (Herbst)												1	0.01			1	0.01			2							
Exapion corniculatum (Germ.)								2	0.02	56	0.63	10	0.11	40	0.50	25	0.31			133							
Exapion elongatulum (Desbr.)								3	0.03	17	0.19	14	0.16	15	0.19	7	0.09	22	3	81							
Catapion pubescens Kirby			2	0.02			2																				
Catapion seniculus Kirby			3	0.03			3	1	0.01	1	0.01	1	0.01	6	0.07					9							
Oxystoma craccae (L.)					4	0.03	4					1	0.01							1		4	0.01	1		5	
Oxystoma cerdo (Gerst.)												1	0.01							1							
Oxystoma pomonae (Fabr.)																						2	+	1		3	
Ischnopterapion loti (Kirby)								4	0.04	1	0.01							1		6							
Stenopterapion meliloti (Kirby)												1	0.01					10		11							
* *Stenopterapion intermedium* (Epp.)								1	0.01	1	0.01							6		8							
Stenopterapion tenue Kirby	2	0.01	5	0.04			7			2	0.02	2	0.02	1	0.01	1	0.01	1		7							
Cyanapion platalea Germ.					2	0.02	2					2	0.02							2							
Cyanapion columbinum Germ.	15	0.17	49	0.43	46	0.38	111			1	0.01	1	0.01	2	0.02	1	0.01			5		2	+			2	
Cyanapion spencii (Kirby)														1	0.01					1							
Hemitrichapion reflexum (Gyll.)								15	0.16	24	0.27			2	0.02	5	0.06	12	2	60							
Hemitrichapion pavidum Germ.	8	0.09	12	0.11			20					8	0.09	5	0.06	2	0.02	1		16							

Holotrichapion pullum (Gyll.)			1	+	1	+	2																							
Holotrichapion ononis Kirby			6	0.05			6																							
°*Betulapion simile* Kirby	2	0.01	3	0.03			5																		88	0.34	11		99	
Eutrichapion ervi (Kirby)																									1	+			1	
Eutrichapion viciae (Payk.)	17	0.19	2	0.02	25	0.21	44	4	0.04	4	0.04	15	0.17	6	0.07	7	0.09			36				18	0.07	1	3	22	
Ischnopterapion virens Herbst	2	0.01	1	+	10	0.08	13			6	0.06	4	0.04	3	0.04			1		14				4	0.01			4	
**Pseudoprotapion ergenense* (Beck.)								271	2.82	62	0.70	71	0.80	82	1.01	153	1.91	22	1	662									
Protapion apricans Herbst	8	0.09	17	0.15	11	0.09	36	9	0.09	4	0.04	2	0.02	1	0.01			1	1	19				33	0.13	1		34	
Protapion fllirostre Kirby			2	0.02	14	0.12	16	2	0.01	1	0.01	1	0.01	1	0.01	8	0.1			13				2	+			2	
Protapion fulvipes (Geoffr.)	6	0.07	4	0.04	15	0.12	25	2	0.01			3	0.03	2	0.02			1		8				56	0.21	1	1	58	
Protapion nigritarse Kirby																								1	+			1	
Protapion ononidis Gyll.																								1	+			1	
Protapion trifolii (L.)	2	0.01	1	+	1	+	4																	1	+			1	
Protapion dissimile (Germ.)					4	0.04	4																							
Nanophyidae																														
Nanophyes marmoratus (Goeze)			1	+	1	+	2																							
Curculionidae																														
* °*Otiorhynchus fullo* (Schrank)			1	+			1																							
Otiorhynchus raucus (Fabr.)	2	0.01					2											95	17	112			1	1	2					
Otiorhynchus ovatus (L.)																		26	5	31										
Otiorhynchus ligustici (L.)																		6		6										
°*Phyllobius oblongus* (L.)																4	0.05			4										
°*Phyllobius argentatus* (L.)																		13	1	14				3	0.01	1		4		

**Trachyphloeus alternans* Gyll.												5	0.05					13		18										
**Trachyphloeus aristatus* (Gyll.)												6	0.06					47	2	55										
Trachyphloeus bifoveolatus (Beck)					3	0.02	3											2		2										
°*Polydrusus cervinus* (L.)																		5		5	1	+	1					2		
Polydrusus confluens Steph.										2	0.02	4	0.04			16	0.20			22	5	0.02						5		
Polydrusus inustus Germ.								20	0.21	11	0.12	20	0.23	11	0.14	5	0.06	2		69										
°*Polydrusus picus* (Fabr.)																					1	+	1					2		
°*Polydrusus mollis* (Ström)																								1				1		
Eusomus ovulum Germ.								5	0.05	5	0.05	18	0.20	3	0.04	3	0.04	2		36										
Sciaphilus asperatus (Bonsd.)			2	0.02			2														8	0.03		2	10					
Brachysomus echinatus (Bonsd.)																					7	0.03		23	30					
**Brachysomus setiger* Boh.								4	0.04									258	5	267										
Parafoucartia squamulata (Herbst)										1	0.01			4	0.05	3	0.04			8										
**Barynotus obscurus* (Fabr.)																		1		1										
°*Strophosoma capitatum* (Deg.)	4	0.05			42	0.35	46														66	0.25	11	6	83					
Sitona crinitus (Herbst)			1	+			1	9	0.09	4	0.04	7	0.08					5	2	27	1	+		1	2					
Sitona cylindricollis Fabr.										1	0.01	2	0.02					10	4	17										
Sitona hispidulus (Fabr.)										1	0.01	1	0.01					2		4	1	+						1		
Sitona humeralis Steph.								1	0.01	1	0.01	4	0.04			4	0.05	24	9	43										
Sitona inops Schoenh.								3	0.03					2	0.02			4		9										
Sitona languidus Gyll.			4	0.04	1	+	5			1	0.01	9	0.10	13	0.16	1	0.01	32	8	64										
Sitona lepidus Gyll.	1	+	1	+			2																							
Sitona lineatus (L.)	4	0.05	12	0.11	1	+	17	11	0.11	16	0.18	9	0.10	21	0.26	10	0.12	18	33	118	4	0.01			4					

Sitona longulus Gyll.																		1		1										
Sitona puncticollis Steph.							2	0.02	1	0.01	1	0.01	1	0.01	5	0.06	1	2	13										
Sitona sulcifrons (Thunb.)	4	0.05	6	0.05			10	26	0.27	10	0.11	6	0.06	8	0.10	5	0.06	4	1	60	4	0.01			4					
Sitona suturalis Steph.																		2	1	3	2	+			2					
Sitona tibialis (Herbst)			34	0.30			34	26	0.27	44	0.50	41	0.46	32	0.40	18	0.22	14	3	178										
Sitona waterhousei Walt.								7	0.07			1	0.01							8										
Lixus subtilis Boh.														1	0.01					1										
Larinus brevis (Herbst)								3	0.03			4	0.04					1		8										
Larinus planus (Fabr.)																					1	+			1					
Larinus turbinatus Gyll.												1	0.01							1										
Cleonis pigra (Scop.)																		1		1										
Dorytomus taeniatus (Fabr.)					1	+	1																							
*° *Lignyodes enucleator* (Panz.)												1	0.01							1										
Tychius breviusculus Desbr.								2	0.02	2	0.02	2	0.02			3	0.04	1		10										
Tychius junceus (Reich.)																			5	5										
Tychius medicaginis Ch. Bris.												1	0.01	3	0.04	2	0.02	1		7										
Tychius meliloti Steph.								4	0.04	2	0.02	2	0.02	1	0.01					9										
Tychius picirostris (Fabr.)			1	+			1					2	0.02						1	2	1	+			1					
Tychius polylineatus (Germ.)												1	0.01							1										
Tychius quinquepunctatus (L.)												3	0.03	1	0.01	1	0.01			5										
Tychius schneideri (Herbst)												1	0.01							1										
Tychius stephensi Schoenh.					1	+	1	8	0.08	2	0.02	3	0.03	1	0.01	5	0.06	1		20										
Tychius trivialis Boh.														3	0.04			1		4										

Sibinia pyrrhodactyla (Marsh.)										1	0.01								2	3										
Sibinia subelliptica (Desbr.)																1	0.01			1										
Anthonomus rubi (Herbst)																1	0.01			1										
°*Brachonyx pineti* (Payk.)					2	0.02	2																							
°*Curculio glandium* Marsh.																					3	0.01	1		1					
°*Archarius pyrrhoceras* Marsh.																					1	+	1	1	3					
*° *Magdalis carbonaria* (L.)																					2	+			2					
°*Magdalis ruficornis* (L.)														1	0.01					1										
Trachodes hispidus (L.)																								1	1					
Hypera adspersa (Fabr.)								1	0.01											1										
Hypera ardator (L.)								1	0.01			1	0.01	1	0.01	1	0.01		2	6										
Hypera nigrirostris (Fabr.)			1	+			1									1	0.01		1	2										
Hypera postica (Gyll.)														1	0.01			2	5	8	1	+			1					
Hypera rumicis (L.)																			1	1										
Hypera suspiciosa (Herbst)			1	+			1													1	1	+			1					
Hypera viciae (Gyll.)																		1		1										
Acalles camelus (Fabr.)																					8	0.03	1		9					
*° *Acalles echinatus* (Germ.)					3	0.02	3														1	+			1					
Limnobaris dolorosa (Goeze)																					6	0.02			6					
Corysomerus capucinus (Beck)												1	0.01																	
Rhinoncus bruchoides (Herbst)					8	0.07	8																							
Rhinoncus castor (Fabr.)																1	0.01			1										
Rhinoncus pericarpius (L.)												1	0.01																	
Rhinoncus perpendicularis (Reich)			1	+			1																							
Tapinotus sellatus (Fabr.)																					2	+			2					

**Phrydiuchus topiarius* (Germ.)																			1		1										
**Thamiocolus signatus* Gyll.								2	0.02			1	0.01								3										
Ceutorhynchus assimilis (Payk.)																						3	0.01			3					
Ceutorhynchus cochleariae (Gyll.)																						3	0.01			3					
Ceutorhynchus contractus (Marsh.)			1	+	2	0.02	3															1	+			1					
Ceutorhynchus erysimi (Fabr.)	1	+					1			1	0.01										1										
Ceutorhynchus floralis (Payk.)			2	0.02	4	0.03	6							1	0.01						1	2	+			2					
Ceutorhynchus obstrictus (Marsh).			7	0.06			7																								
Ceutorhynchus rapae (Gyll.)			1	+			1												1		1										
**Oprohinus suturalis* (Fabr.)														1	0.01						1										
Glocianus punctiger (Gyll.)																			2	1	3	2	+			2					
**Datonychus derennei* (Guill.)												1	0.01						1		2										
**Datonychus paszlavszkyi* (Kuthy)												1	0.01								1										
Microplontus campestris (Gyll.)																				1	1										
**Mogulones pallidicornis* (Goug. et Bris.)																						2	+			2					
**Stenocarus cardui* (Herbst)										1	0.01			1	0.01						2										
Nedyus quadrimaculatus (L.)																						52	0.02			52					
**Gymnetron melanarium* (Germ.)												1	0.01								1										
Miarus ajugae (Herbst)								2	0.02			5	0.05								4										
Cionus tuberculosus (Scop.)																						1	+			1					
Orchestes rusci (Herbst)																							+		1	2					
	Σ	78	193		203		**474**	460		304		311		291		309		**688**	**119**	**2482**	415			**41**	**41**	**497**					

Explanations: I – *Peucedano cervariae-Coryletum*, facies with *Cerasus fruticosa*, II – *Peucedano cervariae-Coryletum*, f. with *Larix europaea*, III, IX – *Tilio – Carpinetum*, IV – *Brachypodio-Teucrietum*, f. with *Carlina onopordifolia*, V – *Brachypodio-Teucrietum*, f. with *Prunus spinosa*, VI – transitional assemblage with *Picris hieracioides* and with elements of xerothermic coppice from the class *Trifolio-Geranietea*, VII – *Rhamno-Prunetea*, VIII – *Brachypodio-Teucrietum*, f. with *Agropyron intermedium*,* – rare species, ° – dendrophilous secies, N – number of specimens, n' – number of individuals (+ < 0.01), M – Moerick's traps (hornbeam, lime, oak), B – Barbera's traps, S – sito ent.

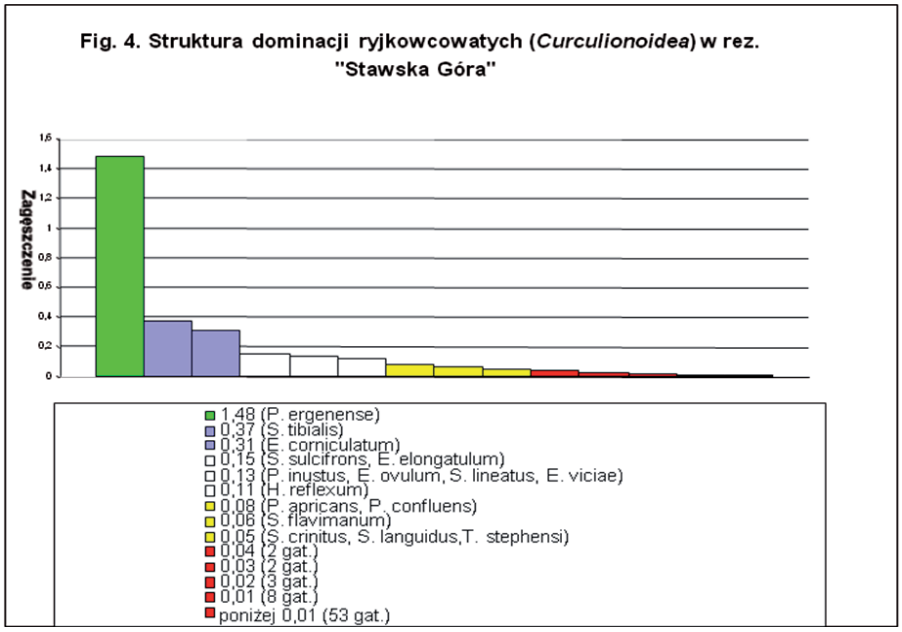

Fig. 4. Domination structure of *Curculionoidea* in nature reserve Stawska Góra

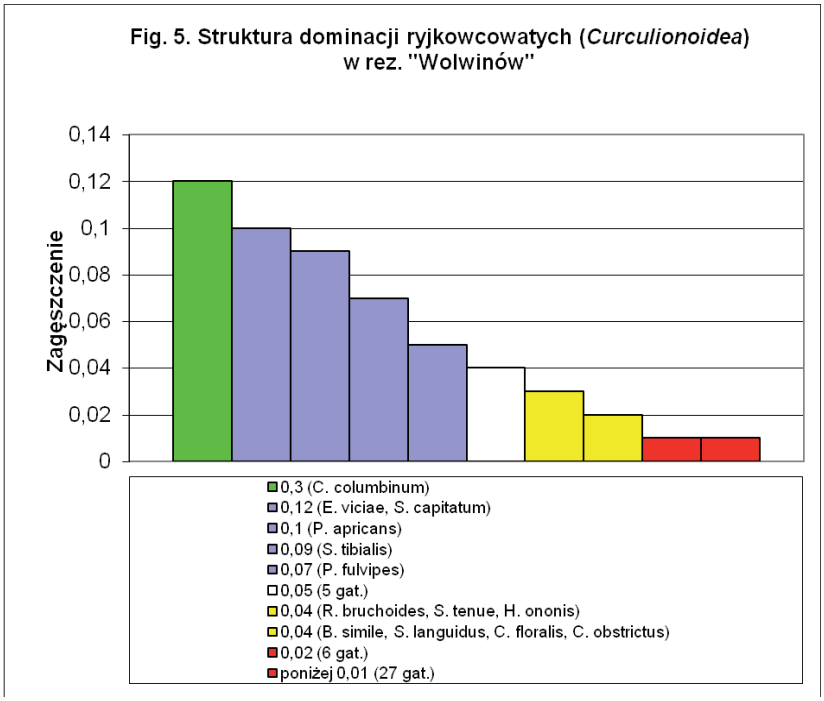

Fig. 5. Domination structure of *Curculionoidea* in nature reserve Wolwinów

environmental preferences and known from a few regions of the country. As for the new species from the reserve, worth mentioning is a thermophilous and rare forest species – *Lignyodes enucleator,* a monophage feeding on ash *Fraxinus excelsior.* Moreover, this category of species included also: *Squamapion cineraceum*, *Exapion corniculatum*, *Stenopterapion intermedium*, *Hemitrichapion reflexum*, *Trachyphloeus alternans*, *T. aristatus*, *Barynotus obscurus*, *Lixus subtilis*, *Larinus brevis*, *Tychius polylineatus*, *T. schneideri*, *T. trivialis*, *Sibinia subelliptica*, *Phrydiuchus topiarius, Thamiocolus signatus, Oprohinus suturalis*, *Datonychus derennei*, *D. paszlavszkyi* (EN), *Stenocarus cardui*, *Gymnetron melanarium*. The weevils recorded in this object were, in a large percentage, thermophilous and xerophilous forms. In comparison to data of Cmoluch [1963], an increase in number of species and specimens as well has been observed in this group of insects (Tab. 2, Fig. 4).

The Wolwinów nature reserve (study site IV)

The insects were collected at three areas – in 37 entomological scoop samples 51 species were found, belonging to 474 specimens. Among weevils gathered in this object the most faunistically valuable were *Ceratapion austriacum* (Photo 4) and *Otiorhynchus fullo* (Photo 5). Both belong to xerothermophilous elements and they are rarely (locally) found in Poland. First one is a monophage living on *Centaurea scabiosa*, the second one belongs to poliphages associated with common pear, blackthorn and common lilac. The list of rare species in this reserve was complemented with the herbaceous oligophage *Aizobius sedi* and mould eating *Acalles echinatus*.

The assemblages of weevils in this object were characterised by little diversity and low numbers. The dominating form in all of them was *Cyanapion columbinum*. This apion is distributed almost all over the country, however, it is rarely recorded. Its feeding and breeding spectrum covers *Lathyrus silvestris*, *L. heterophyllus* and *L. latifolius*, this species is also a numerous element of light coppices (Tab. 2, Fig. 5).

The planned Zawadówka nature reserve (study site V)

Curculionids were obtained from seven areas with the use of entomological scoop, Barber's and Moericke's traps. In the three-year period, 1787 specimens representing 193 species were caught with the methods mentioned above (the highest number of species among all of the analysed objects). In 67 entomological scoop samples 1599 specimens belonging to 155 species were collected. From 100 Barber's traps 87 individuals belonging to 24 species were isolated. In 50 Moericke's traps (50) exposed on oaks, hawthorns, water elders and willows, 101 specimens were collected representing 31 species. High habitat diversity of the object was reflected in the qualitative structure of weevil fauna – besides species of open habitats (like meadows and fields) as well as forest ones, xero-

Photo 1. *Pseudorchestes ermischi*

Photo 2. *Auletobius sanguisorbae*

Photo 3. *Pseudoprotapion ergenense*

Photo 4. *Ceratapion austriacum*

Photo 5. *Otiorhynchus fullo*

Photo 6. *Ethelcus denticulatus*

Photo 7. *Stenopterapion intermedium*

Photo 8. *Attelabus nitens*

thermophilous and higrophilous taxa were also present. The occurrence of high number of weevils (31 species) with narrow ecological plasticity (stenotopes), represented by higrophilous and xerothermophilous ones, was also worth mentioning. The most numerous taxa in all of the communities were: *Pseudoperapion brevirostre* – widely distributed all over Poland, living in thermophilous communities on *Hypericum perforatum*, *H. hirsutum*, *H. humifusum* as well as *Ceratapion onopordi*, *Hemitrichapion pavidum*, *Nanophyes marmoratus*, *Polydrusus inustus*, *Strophosoma capitatum*, *Sitona lineatus*, *S. sulcfrons*, *S. suturalis* and *Limnobaris dolorosa.* Detailed characteristics of the fauna of this object is given in the paper of Minda-Lechowska and Łętowski [2000] (Photo 6).

The Żmudź nature reserve (study site VI)

The studies covered seven areas in which 135 species with the numbers of 2406 individuals were recorded. In entomological scoop samples 111 species were found, represented by 1799 specimens. From 720 Barber's traps 470 individuals belonging to 53 species were isolated. Moericke's traps in the number of 100 were hanged up on cherry trees, oaks, larches, pines and common junipers. They provided 104 specimens encompassing 24 species. Moreover, entomological sieve was also used in taking 12 samples of litter, in which 33 specimens representing 10 weevil species were found.

In the studied object there were curculionids which have been known from a few study sites in the country and sometimes threatened or endangered of extinction. They were as follows: *Exapion corniculatum*, *Ceratapion austriacum*, *Stenopterapion intermedium* (Photo 7), *Mesotrichapion punctirostre*, *Hemitrichapion reflexum*, *Pseudoprotapion ergenense* (EN), *Otiorhynchus velutinus*, *Larinus brevis*, *Lixus angustus* (VU), *Larinus brevis*, *L. turbinatus*, *Pseudocleonus cinereus* (EN), *Tychius schneideri*, *Magdalis phlegmatica*, *Liparus coronatus* (EN), *Datonychus paszlavszky* (EN), *Microplontus millefolii*, *Stenocarus cardui*, *Pseudorchetes ermischi*.

The most numerous curculionids in all of the communities were: *Sitona striatellus*, *Eusomus ovulum*, *Polydrusus inustus*, *Parafoucartia squamulata* and *S. lineatus*. Except for the last taxon, these are thermophilous and locally abundant and their numbers in the discussed nature reserve comprised 50% of the sum of collected beetles in this study site. Detailed characteristics of this object was elaborated by Łętowski and Ptaszyńska [2006].

Rudka – Forestry Góry (study site VII)

Curculionids were caught in dry-ground forest, very similar to *Tilio-Carpinetum* with predominance of oaks in the tree stand. The collecting methods were as follows: in ground cover – entomological scoop and Barber's traps, in tree crowns – Moericke's traps. In general, by all means mentioned above, 497 specimens representing 58 species were collected. In 26 entomological scoop sam-

ples 49 species were recorded (415 ind.), in 160 Barber's traps – 11 species (41 ind.), in 80 Moericke's traps – 21 species (41 ind.). Traps were exposed on oaks, hornbeams and limes. In this faunal assemblage, the forms known from a few study sites in Poland included: dendrophiles – *Attelabus nitens* (Photo 8) and *Magdalis carbonaria*, a mould eater – *Acalles echinatus*, and a forest herbaceous monophage – *Mogulones pallidicornis*.
The most numerous forms in this study site were: *Betulapion simile*, *Protapion fulvipes*, *Strophosoma capitatum* and *Nedyus quadrimaculatus* (Tab. 2, Fig. 6).

CONCLUSIONS

In the literature referring to weevils of the studied regions, the data on the occurrence of 170 species of these beetles is available. The conducted studies in the objects mentioned above resulted in recording 282 species and extended the list of taxa from this area to 395 species**.**
The most valuable objects in terms of faunistics were two nature reserves: Żmudź and Stawska Góra which had very interesting, mainly xerothermophilous, weevil fauna with threatened or endangered of extinction taxa. Therefore, within the areas of these two reserves, active nature protection should be continued so that the herbaceous or coppice xerothermic communities will not undergo the process of succession.
The plant community assembling the highest number of weevils species was *Brachypodio-Teucrietum* association (tor grass and wall germander), where – on 9 research stations – 1589 specimens, representing 135 species (about 48% of species number) were collected. In that faunistic association dominated *Sitona lineatus*, *S. tibialis* and *Eusomus ovulum*. The first species represent paleartic element, and the other two eurocaucasian elements. The highest number and diversity of weevils in these plant association were observed in Żmudź nature reserve (92 species, 999 specimens), including 21 species of rare weevils recorded from several localities in Poland only. Those are: *Auletobius sanguisorbae*, *Ceratapion basicorne*, *Exapion corniculatum*, *Stenopterapion intermedium*, *Hemitrichapion reflexum*, *Mesotrichapion punctirostre*, *Pseudoprotapion elongatulum*, *P. ergenense*, *Squamapion elongatum*, *S. cineraceum*, *Otiorhynchus fullo*, *Polydrusus pterygomalis*, *Brachysomus setiger*, *Larinus brevis*, *Lixus angustus*, *Tychius schneideri*, *Sibinia subelliptica*, *Stenocarus cardui*, *Gymnetron veronicae*, *Pseudorchestes ermischi* and *P. pratensis* (Tab. 1, 2).

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RYJKOWCOWATE (*Curculionoidea*) SIEDLISK WĘGLANOWYCH OKOLIC CHEŁMA

Streszczenie. Zaprezentowano wyniki dotyczące ryjkowcowatych bytujących w pięciu obiektach (21 zbiorowiskach) występujących na siedliskach wapiennych w okolicach Chełma oraz dla pełnej charakterystyki obszaru uwzględniono opublikowane dane dotyczące rezerwatów Żmudź i Zawadówka. Owady pozyskiwano czerpakiem i sitem entomologicznym oraz stosując pułapki Barbera i Moerickego. Łącznie zebrano 282 gatunki ryjkowcowatych, które skupiały 10 716 okazów. Uzyskane wyniki rozszerzyły listę gatunków ryjkowcowatych tego obszaru do 395. Wśród odnotowanych taksonów wystąpiły gatunki znane z nielicznych stanowisk w kraju i były to głównie ryjkowcowate kserotermofilne. Część z nich to gatunki narażone (VU) lub zagrożone (EN) wyginięciem.

Słowa kluczowe: *Coleoptera*, *Curculionoidea*, faunistyka, ekologia, ochrona gatunkowa