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Weevils (Coleoptera: Curculionoidea) of the Stobrawski Landscape Park

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ABSTRACT. The work presents the results of faunistic and ecological studies on the weevils (Coleoptera: Curculionoidea without Scolytinae) of the Stobrawski Landscape Park. Between 2006-2008 more than 4 000 specimens representing 285 species of weevils were collected from nine types of plant communities. *Mesotrichapion punctirostre*, *Nanophyes brevis*, *Otiorhynchus lepidopterus*, *Phytobius leucogaster*, *Rhaphitropis marchicus* were collected for the first time in Lower or Upper Silesia. The geographical, habitat and food preferences of particular species are presented. The relationships between weevil species and the different habitats are analysed.

KEY WORDS: Coleoptera, Curculionoidea, Stobrawski Landscape Park, ecology, faunistic, Opole region, S Poland.

INTRODUCTION

The region of Silesia, in particular the areas located in the upper and central Odra (Oder) valley, has been quite selectively explored in coleopterological terms. The available data from the pre-war period relate mainly to the areas in the vicinity of Wroclaw, the Silesian Industrial Region and the Sudetes Mountains (in particular, the Śnieżnik Mountains and the Kłodzko Valley), where German researchers worked extensively at the turn of the 20th century. One of the first researchers, who worked in the vicinity of Racibórz, was August KELCH, who published his findings in a series of works (1830, 1846, 1848, 1852). The first checklist of beetles inhabiting these areas was completed by ROGER (1856), while further and more comprehensive studies were published in subsequent years (KELCH 1846,

GERHARDT 1910). Such studies have been scarce in the area of the present-day province of Opole, irrespective of the valuable objects of nature to be found there. Single mentions of beetles from this area come from towns and villages such as Chrząstowice, Krasiejów, Nysa, Kup (GERHARDT 1910), Góra Św. Anny (KOLBE 1927), and from the Biskupia Kopa in the Opawskie Mountains (KELCH 1846, GERHARDT 1890). Weevils have been studied in more detail only in modern times, mainly by KUŚKA (1973, 1977, 1999) and MAZUR (2005, 2006a, b, c, d, 2007, 2008). The Stobrawski Landscape Park has never been the object of detailed coleopterological studies; there are only a few reports concerning common or typical species (ŁĘGOWSKI & KUŃKA 2006, GONTARKA & BADORA 2003).

The Stobrawski Landscape Park (henceforth the 'SLP') is important both from the point of view of nature and landscape conservation as well as the protection of insects. It is a vast area abounding in numerous valuable habitats which may be important refuges of fauna.

METHODS

The field studies were conducted during the three growing seasons in 2006-2008, from April to October at intervals of about two weeks in 31 localities. The research was qualitative; therefore, in order to avoid unnecessary catching of insects, only a few representative specimens from the population of characteristic and identifiable species were recovered. If identification on site was impossible, a situation applicable to a large group of small or indistinctive species, all specimens were collected for later identification. The insects were collected using standard entomological methods. The plant communities represent the major types of vegetation in the SLP. The number of localities was found to be dependent on the area occupied by each type of vegetation in the SPK. The research material is deposited in the collections of the Department of Biosystematics, University of Opole. Each species was assigned a range element based on criteria proposed by MAZUR (2001). Food preferences were determined on the basis of the host plants of larval stages. In the case of monophages, only the Latin name of the host plant is given. In the case of poliphages and oligophages, the corresponding abbreviations are given (Table 6). Specific habitat preferences are assigned to each species on the basis of the environment of host plants and insects; the abbreviations used are shown in the table header (Table 6).

STUDY AREA

The SLP is located in the northern part of Opole Province (Fig. 1). It has a total area of approx. 530 sq. km, which makes it one of the largest landscape parks in Poland. It was established to protect forest and wetland areas in the lowland parts of Opole province. The entire park is part of the national ecological network ECONET-PL, partly as a nodal area (a

biocentre) of international importance (the Central Odra Valley – 17M), and partly as a nodal area of national importance (Stobrawsko-Turawskie Forests – 15K) (Liro 1995). One section of the park, the Grądy Odrzańskie (Odrzanskie Broadleaved Forests), is part of the Nature 2000 network (area PLB020002); it represents 15% of the total area of the SLP.

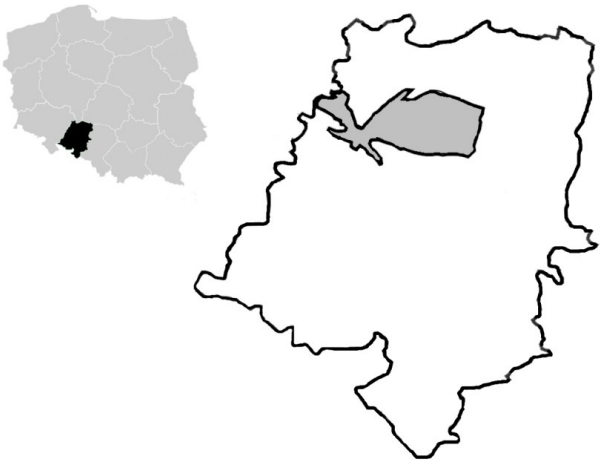

Fig. 1. Location of the Stobrawski Landscape Park.

The study covered the entire area of the SLP along with its representative plant communities (Fig. 2).

Alnion glutinosae – alder forests are found in the SLP near the Grądy Odrzańskie and fish ponds. Most of them, however, are anthropogenic and poorly developed. The study was conducted at five localities: 12, 13, 20, 23, 29.

Carpinion betuli – oak-hornbeam forest occurs throughout the entire area of the park; the most extensive and the best developed forests are found in the southern part in the Odra valley near Grądy Odrzańskie. The catches were made at ten localities: 3, 11, 12, 16, 17, 20, 21, 23, 28, 29.

Dicrano pinion – pine forests are the most commonly found forest communities in the SLP. In most cases, however, these are not artificial pine monocultures planted in oak-hornbeam habitats. Natural habitats for pine forests are located in the eastern part of the park, where sand dunes occur. Forests in the SLP are floristically poor and in many places covered with *Calamagrostis epigejos* and *Rubus* sp. The study was conducted at twelve localities: 1, 2, 5, 6, 7, 9, 11, 14, 15, 19, 23, 25, 31.

Salicion albae – riparian forests of this type are found mostly in the valley of the River Odra; these are thickets of willows and poplars in old river beds, reservoirs and ditches.

Generally, they are poorly developed, and their typical places of occurrence have been replaced with meadows and afforestation of a different character. The catches were conducted at eight localities: 6, 11, 17, 18, 25, 27, 28, 30.

Arrhenatherion elatioris – the most common type of meadowland in the SLP. Many pastures and hay meadows also represent this type. These plant communities often form in the park on floodbanks at some distance from watercourses and rivers, often adjacent to Molinietalia meadows. The degree of their development in the SLP varies, depending on the type and intensity of use. The studies were conducted at nine localities: 4, 8, 12, 15, 17, 21, 2, 3, 25, 28.

Calthion palustris – these meadows are extensively used, mainly for grazing; they are regularly "uGraded", which is also the case with the meadows of the Molinion alliance, and fertilized meadows. They develop in similar locations as the aforementioned meadows, but they are found in more fertile habitats. They have little environmental value. The catches were carried out at five localities: 3, 5, 13, 19, 22.

Fig. 2. Study area and sampling sites together with their UTM codes (in parentheses): 1 – Czarna Woda (YS04); 2 – Dąbrówka Łubniańska (BB93); 3 – Grabczok (YS03);4 – Grabice (YS04); 5 – Jagienieckie Łąki (YS04); 6 – Kały (BB93); 7 – Karłowice (XS93); 8 – Kolonia Popielowska (XS93); 9 – Kosowce (YS13); 10 – Krogulna (XS94); 11 – Kuźnica Dąbrowska (XS95); 12 – Las Czapliniec (XS83); 13 – Lisie Łąki (XS84); 14 – Lubsza (XS74); 15 – Ładza (YS03); 16 – Murów (YS03); 17 – Nowe Kolnie (XS83); 18 – Pokój (XS94); 19 – Prążnica (YS03); 20 – Rogalice (XS84); 21 – Rybna (XS83); 22 – Siołkowickie Łąki (XS94); 23 – Stare Budkowice (BB93); 24 – Stare Kolnie (XS83); 25 – Stobrawa (XS83); 26 – Święciny (YS04); 27 – UE Stawki n. Nysą (XS83); 28 – Wielopole (XS93); 29 – Winna Góra (YS04); 30 – Wronów (XS83); 31 – Zagwiździe (YS04).

Molinion caeruleae – these meadows occur alognside watercourses and water bodies, but the vast majority are, to varying degrees, disturbed by frequent mowing, grazing and regular planting of different grass species (in particular, meadow foxtail – *Alopecurus pratensis*) and legumes. The catches were carried out at nine localities: 6, 7, 15, 17, 24, 25, 26, 28.

Onopordetalia acanthii – ruderal communities usually occupy small areas, e.g. fallow lands, slopes of flood banks (particularly those recently constructed or uGraded), roadsides and various mounds, always dry and exposed to the sun. The catches were carried out at five localities: 17, 23, 25, 28, 29.

Phragmition – rushes occur frequently on the banks of watercourses and rivers as well as other water bodies (mainly fish ponds). However, those near the ponds are often extensive monocultures of *Phragmites australis* with a small proportion of other plants, which is the result of intensive fishing activities and proximity to fertilized meadows and cultivated fields. The catches were conducted at seven localities with the best developed communities: 10, 17, 18, 19, 23, 28.

RESULTS AND DISCUSSION

As a result of the study, 4 051 specimens representing 285 species were collected, which represents approximately 30% of the weevil fauna of Poland. The number of specimens of each species collected in the plant communities is presented in Table 6.

Most of the forest community species were caught in oak-hornbeam forests (102 species), the fewest in alder forests (43 species). Relatively few species were found in pine forests (*Dicrano-Pinion*), but the largest percentage of them (37%) was specific to this environment and these species were not found anywhere else. Among the non-forest communities, the richest in terms of species found were meadows of the class *Arrhenatherion elatioris*, with 127 species, which accounted for more than 44% of all weevils found in the SLP. A comparable number of species were found in communities of the order *Onopordion acanthii*, where more than 28% of the species did not occur in any other community. A similar percentage (27%) of exclusive species was recorded in rush communities of the alliance *Phragmition*; only 37 species were found there, however, which is the lowest number found in any of the plant communities investigated.

Among all the forest communities analysed in this study, the largest numbers of species were collected in oak-hornbeam forest communities, the lowest numbers in alder communities (Table 6). The significant proportion of eurytopic species is remarkable. In forests of the alliances *Alnion glutinosae* and *Carpinion betuli*, the number of eurytopic species was the same as the number of mesophilous forest species. In the other two forest communities, woodland species were dominant (Table 1).

Table 1. The number of species with different habitat preferences from forest plant communities.

	Alnion glutinosae	***Carpinion betuli***	***Dicrano-Pinion***	***Salicion albae***
Eurytopic	19	39	12	20
Mesophilous of open areas	4	22	3	10
Mesophilous of forest areas	19	39	39	40
Hygrophilous	1	2	0	2
Xerothermic	0	0	0	0

In forests of the alliances *Alnion glutinosae* and *Carpinion betuli*, the species associated with herbaceous vegetation were prevalent, followed by dendrophilic species. In pine and riparian forests these proportions were reversed. The number of generalists in alder forests was high, which is evidence for the weak development of this forest type in the SLP (Table 2).

Table 2. The number of species with different food preferences from forest plant communities.

	Alnion glutinosae	***Carpinion betuli***	***Dicrano-Pinion***	***Salicion albae***
Monophagous	6	11	8	10
Oligophagous of herbaceous plants	12	42	8	16
Oligophagous of trees	9	19	22	26
Polyphagous of herbaceous plants	1	3	0	0
Polyphagous of trees	8	17	12	13
Generalist	16	10	7	10

The species common to all the forest communities were: five eurytopic species (including three poliphagous generalists – *Strophosoma melanogrammum*, *Phyllobius glaucus*, *Ph. maculicornis*, a herbaceous plant oligophage – *Ceutorhynchus obstrictus*, and one monophage of the common nettle – *Nedyus quadrimaculatus*), and seven mesophylic forest species: *Strophosoma capitatum*, *Deporaus betulae*, *Polydrusus tereticollis*, *Phyllobius argentatus*, *Ph. pyri*, *Acalyptus carpini*, *Tachyerges stigma* (Table 6).

As far as grasslands are concerned, species associated with herbaceous plants were dominant. The share of dendrophilic species did not exceed 10%, and these species constituted random elements. Eurytopic species accounted for approximately 30% of the weevils in their faunas (Table 3). Mesophilous species of open areas were dominant in meadows, which is especially evident in the case of fresh meadows and groups of ruderal communities. These species are mostly oligophages of the Papilinaceae, which are associated not only with the natural occurrence of this vegetation in this type of community, but also with its replanting by users of the land (Table 3).

The drier and sunlit locations in the meadows of the alliance *Arrhenatherion elatioris* and the order *Onopordetalia acanthii* were the only places where xerothermic species were found. This is interesting in that grasslands, which for some of the species are not typical habitats, do not in fact occur in the SLP, and that communities resembling them are very rare and develop only locally, mostly on flood banks with adequate exposure to the sun.

The hygrophilous species occurred the most frequently in rush communities. Single species were found in moist and fresh meadows, but they were random elements in the latter (Table 3).

In all non-forest areas, oligophagous species associated with herbaceous vegetation were the most frequently collected; the presence of pure monophages was also reported, while the remaining groups were of marginal importance (Table 4).

Table 3. The number of species with different habitat preferences from non-forest plant communities.

	Arrhenaterion elatioris	***Calthion palustris***	***Molinion coerulea***	***Onopordetalia acanthii***	***Phragmition***
Eurytopic	35	15	14	19	8
Mesophilous of open areas	72	22	24	74	9
Mesophilous of forest areas	13	5	5	7	5
Hygrophilous	3	3	5	0	16
Xerothermic	5	0	0	7	0

There were only 11 species common to all types of meadows were and, with the exception of one (the dendrophile *Strophosoma capitatum* – commonly inhabiting nearby trees), were the common eurytopic and mesophylic species typical of open areas: Papilonaceae (*Sitona cylindricollis*, *S. macularius*, *Protapion apricans*), *Rumex* sp. (*Perapion curtirostre*), Cruciferae (*Ceutorhynchus obstrictus*, *C. pallipes*, *C. typhae*) and two monophages of *Urtica dioica* (*Nedyus quadrimaculatus*, *Taeniapion urticarium*).

Table 4. The number of species with different food preferences from non-forest plant communities.

	Arrhenaterion elatioris	***Calthion palustris***	***Molinion coerulea***	***Onopordetalia acanthii***	***Phragmition***
Monophagous	19	8	7	19	6
Oligophagous of herbaceous plants	82	29	35	72	23

Oligophagous of trees	7	1	1	2	3
Polyphagous of herbaceous plants	3	0	0	2	0
Polyphagous of trees	5	3	3	4	3
Generalist	10	3	2	9	3

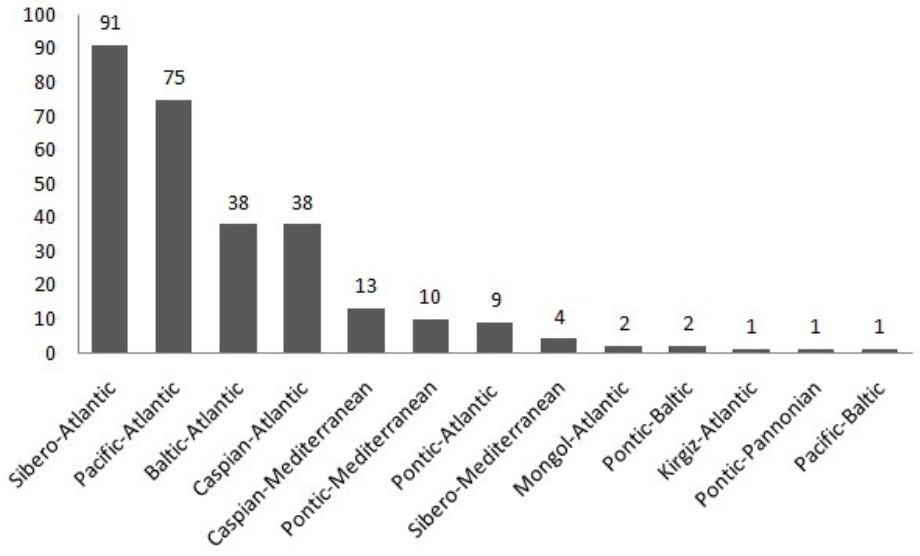

Fig. 3. Number of species with different range elements.

The fauna in the SLP was represented mainly by the ubiquitous Sibero- and Pacific-Atlantic elements, which together account for more than 58% of all species collected during this study. The Baltic-Atlantic and Caspian-Atlantic elements were also significant: approx. 27% of the species recorded belonged to these groups. The remaining elements were represented by single species (Fig. 3).

The proportions of individual elements varied depending on the communities analyzed. Nevertheless, the Sibero- and Pacific-Atlantic elements were always the dominant ones. The proportions of the remaining elements differed depending on the type of community. The percentage of individual range elements in all the environments in the SLP studied is presented in Table 5.

Table 5. Percentages of different range elements in the plant communities investigated: AG – *Alnion glutnosae*; CB – *Carpinion betuli*; DP – *Dicrano-Pinion*; SA – *Salicion albae*; AE – *Arrhenatherion elatioris*; CP – *Calthion palustris*; MC – *Molinion caeruleae*; OA – *Onopordion acanthii*; PH – *Phragmition.*

	AG	CB	DP	SA	AE	CP	MC	OA	PH
Sibero-Atlantic	40	35	46	32	32	24	35	31	32
Pacific-Atlantic	33	29	22	37	35	44	42	31	38
Baltic-Atlantic	21	12	20	11	12	16	13	7	8
Caspian-Atlantic	2	10	2	6	11	5	4	11	16
Caspian-Mediterranean	-	3	4	4	2	9	-	6	-
Pontic-Mediterranean	2	3	-	6	2	-	2	6	3
Pontic-Atlantic	2	5	2	4	2	2	2	6	-
Sibero-Mediterranean	-	-	-	-	2	-	-	1	3
Mongol-Atlantic	-	2	-	-	-	-	-	-	-
Pontic-Baltic	-	1	-	-	1	-	-	-	-
Kirgiz-Atlantic	-	-	-	-	1	-	-	1	-
Pontic-Pannonian	-	-	2	-	-	-	-	-	-
Pacific-Baltic	-	-	-	-	-	-	2	-	-

Table 6. List of weevils collected in the Stobrawski Landscape Park: AG – *Alnion glutnosae*; CB – *Carpinion betuli*; DP – *Dicrano-Pinion*; SA – *Salicion albae*; AE – *Arrhenatherion elatioris*; CP – *Calthion palustris*; MC – *Molinion caeruleae*; OA – *Onopordion acanthii*; PH – *Phragmition*.
Range: BT-AT – Baltic-Atlantic; CA-AT – Caspian-Atlantic; CA-ME – Caspian-Mediterranean; KI-AT – Kirgiz-Atlantic; MO-AT – Mongol-Atlantic; PA-BT – Pacific-Baltic; PC-AT – Pacific-Atlantic; PO-AT – Pontic-Atlantic; PO-BT – Pontic-Baltic; PO-ME – Pontic-Mediterranean; PO-PA – Pontic-Pannonian; SI-AT – Sibero-Atlantic; SI-ME – Sibero-Mediterranean.
Food: Latin name of plant – monophagous; OT – oligophagous on trees; PT – polyphagous on trees; G – generalist; OH – oligophagous of herbaceous plants; PH – polyphagous of herbaceous plants.
Habitat preferences: MF – mesophilous of forest areas; MO – mesophilous of open areas; KS – xerothermic; HI – hygrophilous; EU – eurytopic.

Species	Localities	Plant community	Range	Food	Habitat preferences
NEMONYCHIDAE					
Cimberis attelaboides	1, 5, 6, 15, 19, 25, 31	DP	PC-AT	*Pinus sylvestris*	MF

ANTHRIBIDAE					
Anthribus nebulosus	5, 14, 18, 28	CB, DP, SA	SI-AT	OT	MF
Platystomos albinus	18, 28	CB, SA	SI-AT	OT	MF
Bruchela rufipes	11, 17, 25	DP, OA	PO-AT	OH	MO
Dissoleucas niveirostris	21	CB	PC-AT	PT	MF
Rhaphitropis marchicus	14	CB	MO-AT	PT	MF
ATTELABIDAE					
Apoderus coryli	6, 11, 13, 18, 23, 25	AG, CB, SA	PC-AT	PT	MF
Attelabus nitens	18, 19	CB, DP	SI-AT	OT	MF
RHYNCHITIDAE					
Auletobius sanguisorbae	23	MC	PC-BT	*Sanguisorba officinalis*	MO
Byctiscus betulae	11, 18	CB, SA, PH	PC-AT	PT	MF
Byctiscus populi	17, 27	SA	PC-AT	OT	MF
Deporaus betulae	2, 6, 13, 15, 17, 18, 21, 25, 28, 30	AG, CB, DP, SA, PH	PC-AT	PT	MF
Involvulus cupreus	5	DP	PC-AT	PT	MF
Lasiorhynchites cavifrons	28	CB	CA-AT	OT	MF
Lasiorhynchites caeruleocephalus	23, 25	SA, OA	PO-ME	PT	MF
Neocoenorrhinus germanicus	8, 28	AE, OA	PC-AT	G	EU
Neocoenorrhinus pauxillus	17	OA	CA-ME	OT	MF
Tatianaerhynchites aequatus	18, 25, 28, 30	CB, DP	CA-AT	OT	MF
Temnocerus nanus	13, 25	AG, SA	SI-AT	PT	MF
Temnocerus tomentosus	17, 28	AE, PH	PC-AT	OT	MF
APIONIDAE					
Apion cruentatum	17, 21, 25, 26, 28	AE, MC, OA	SI-AT	OH	MO
Apion frumentarium	6, 8, 15, 17, 23, 24, 25, 26, 28, 30	AG, CB, AE, MC	CA-AT	OH	EU
Apion haematodes	23, 25	OA	CA-AT	*Rumex acetosella*	MO
Apion rubiginosum	28	AE	CA-AT	*Rumex acetosella*	MO

Pseudoperapion brevirostre	3, 5, 6, 7, 14, 15, 17, 21, 23, 25, 26, 28, 29	AG, CB, DP, AE, CP, MC, OA	PC-AT	OH	MO
Pseudostenapion simum	4, 7, 25, 26, 28	AE, MC, OA	PO-ME	OH	MO
Perapion curtirostre	5, 8, 13, 15, 17, 21, 22, 23, 25, 26, 28, 29	CB, AE, CP, MC, OA	PC-AT	OH	MO
Perapion marchicum	17, 23, 25, 29	OA,	PC-AT	*Rumex acetosella*	MO
Perapion oblongum	17, 21, 23	AE, OA	PC-AT	*Rumex acetosa*	MO
Perapion violaceum	2, 8, 15, 17, 21, 23, 26, 28	AE, MC, OA	SI-AT	OH	MO
Protapion apricans	3, 5, 6, 7, 8, 15, 17, 21, 23, 24, 25, 26, 28,	CB, SA, AE, CP, MC, OA	PC-AT	OH	MO
Protapion assimile	15, 17, 21, 23, 28, 29	SA, AE, OA	PC-AT	OH	MO
Protapion filirostre	8, 28	CB, AE, PH	PC-AT	OH	MO
Protapion fulvipes	6, 7, 15, 16, 23, 24, 25, 28	CB, DP, SA, AE, MC, OA, PH	PC-AT	OH	MO
Protapion nigritarse	4, 8, 17, 21, 23, 25, 28	CB, AE, OA	PC-AT	OH	MO
Protapion ononidis	8, 21, 28	AE	CA-AT	OH	MO
Protapion trifolii	2, 4, 6, 8, 17, 23, 28	SA, AE, OA	PC-AT	OH	MO
Pseudoprotapion astragali	4	AE	SI-AT	*Astragalus glycyphyllos*	EU
Catapion jaffense	7, 26, 28	MC	SI-AT	OH	MO
Catapion meieri	25	OA	PO-ME	*Trifolium hybridum*	MO
Catapion pubescens	21	CB	SI-AT	OH	MO
Catapion seniculus	17, 21, 28	AE, OA	SI-AT	OH	MO
Betulapion simile	1, 5, 23, 31	DP, OA	PC-AT	*Betula verrucosa*	EU
Synapion ebeninum	16, 17, 18, 21, 28	CB, OA	SI-AT	OH	EU
Ischnopterapion loti	4, 17, 23, 29	AE, OA	PC-AT	OH	MO
Ischnopterapion virens	6, 7, 8, 15, 21, 26, 28, 30	CB, SA, AE, MC	PC-AT	OH	MO

Stenopterapion tenue	4, 6, 23, 25, 28	SA, AE, OA	PC-AT	OH	MO
Cyanapion afer	21	CB	SI-AT	*Lathyrus pratensis*	MO
Cyanapion gyllenhalii	21	CB	PO-ME	OH	MO
Cyanapion spencii	8, 17, 28	AE	SI-AT	OH	MO
Mesotrichapion punctirostre	2	AE	SI-ME	OH	KS
Hemitrichapion pavidum	21	AE	SI-AT	*Coronilla varia*	MO
Holotrichapion aethiops	2, 28	AE	PC-AT	OH	MO
Holotrichapion pisi	2, 15	AE	PC-AT	OH	MO
Holotrichapion pullum	17	AE	PC-AT	OH	MO
Eutrichapion ervi	2, 8, 15, 17, 21, 28	CB, AE, OA	SI-AT	OH	EU
Eutrichapion viciae	2, 8, 17, 21, 23, 28	AE, OA	PC-AT	OH	EU
Eutrichapion vorax	21	CB	SI-AT	OH	EU
Oxystoma cerdo	17, 28, 29	AE, OA	PC-AT	OH	EU
Oxystoma craccae	8, 15, 23, 28	CB, AE	PC-AT	OH	EU
Oxystoma ochropus	28	AE, PH	SI-AT	OH	EU
Oxystoma pomonae	7, 15, 26, 28	AE, MC	SI-AT	OH	EU
Oxystoma subulatum	8, 13, 15, 26, 28	AG, CB, AE	PC-AT	OH	EU
Exapion fuscirostre	23	DP	BT-AT	*Sarothamnus scoparius*	EU
Taeniapion urticarium	5, 6, 13, 17, 18, 21, 22, 23, 25, 26, 28, 30	AG, CB, SA, AE, CP, MC, OA	PC-AT	*Urtica dioica*	EU
Melanapion minimum	6, 7, 11, 15, 27	SA, MC	SI-AT	OT	MF
Omphalapion dispar	17	OA	CA-ME	OH	MO
Omphalapion hookerorum	8, 15, 17, 23, 24, 28	AE, MC, OA, PH	SI-AT	OH	MO
Diplapion confluens	17	AE	CA-AT	OH	MO
Diplapion detritum	25	OA	CA-ME	OH	KS
Diplapion stolidum	4, 25, 28	AE	CA-AT	*Chrysanthemum leucanthemum*	MO
Ceratapion gibbirostre	13, 22	CP	SI-AT	OH	MO
Ceratapion onopordi	17, 18, 19, 21, 22, 28, 29, 30	AG, CB, AE, CP, OA	PC-AT	OH	MO
NANOPHYIDAE					
Nanomimus circumscriptus	19, 28	CP, PH	CA-AT	*Lythrum salicaria*	HI

Nanophyes brevis	24	PH	CA-AT	*Lythrum salicaria*	HI
Nanophyes marmoratus	3, 10, 13, 17, 22, 24, 28	CB, AE, CP, MC, PH	SI-AT	*Lythrum salicaria*	HI
CURCULIONIDAE					
Sitophilus granarius	8	AE	PC-AT	OH	MO
Notaris acridulus	17, 18, 28	AE, PH	SI-AT	*Glyceria aquatica*	HI
Notaris scirpi	10, 24, 28	PH	PC-AT	OH	HI
Tournotaris bimaculata	10, 24, 28	PH	PC-AT	OH	HI
Grypus equiseti	7, 25, 26	MC, PH	PC-AT	OH	HI
Tanysphyrus lemnae	10, 17, 24, 28	MC, PH	PC-AT	OH	HI
Otiorhynchus lepidopterus	5	CP	BT-AT	G	EU
Otiorhynchus ligustici	28	CB, AE	CA-AT	PH	EU
Otiorhynchus ovatus	5, 13, 17, 23, 28	AG, CB, SA, AE	SI-AT	G	EU
Otiorhynchus sulcatus	15, 23	AE	BT-AT	G	EU
Otiorhynchus raucus	18, 28	CB, AE	CA-AT	G	EU
Trachyphloeus aristatus	23	OA	SI-AT	G	MO
Trachyphloeus bifoveolatus	17, 23	OA	CA-AT	G	MO
Trachyphloeus scabriculus	23	OA	BT-AT	G	MO
Pseudomyllocerus sinuatus	24	PH	CA-AT	G	EU
Phyllobius arborator	1, 5, 15, 23, 25, 28	CB, DP, AE	BT-AT	PT	MF
Phyllobius argentatus	5, 6, 11, 13, 14, 16, 18, 22, 23, 25, 28	AG, CB, DP, SA, AE, CP, PH	PC-AT	PT	MF
Phyllobius glaucus	2, 3, 5, 6, 13, 14, 17, 18, 22, 25, 27, 28, 30	AG, CB, DP, SA, CP, MC	SI-AT	G	EU
Phyllobius maculicornis	2, 5, 13, 15, 17, 23, 25, 28	AG, CB, DP, SA, AE, CP, MC, OA	SI-AT	G	EU
Phyllobius oblongus	28	AE	SI-AT	G	EU
Phyllobius pomaceus	3, 13, 15, 17, 18, 25, 28	AG, CB, SA, CP, OA, PH	SI-AT	G	EU

Phyllobius pyri	5, 6, 7, 13, 15, 17, 28, 25, 28, 31	AG, CB, DP, SA, AE, CP, MC	SI-AT	PT	MF
Phyllobius vespertinus	6, 8, 18, 23, 30	AG, CB, AE, OA, PH	SI-AT	G	EU
Phyllobius virideaeris	23, 29	OA	SI-AT	OH	MO
Phyllobius viridicollis	13, 15, 19, 23	AG, CB, DP, OA	SI-AT	G	EU
Polydrusus cervinus	5, 11, 15, 18, 23, 25	CB, DP, SA, AE	SI-AT	PT	MF
Polydrusus flavipes	4	AE	CA-AT	OT	MF
Polydrusus formosus	19	DP	SI-AT	PT	MF
Polydrusus impar	1, 15, 19, 31	DP	BT-AT	OT	MF
Polydrusus mollis	1, 18, 23, 31	CB, DP, SA	SI-AT	PT	MF
Polydrusus pallidus	1, 5, 31	DP	BT-AT	OT	MF
Polydrusus picus	5, 13, 15, 29	AG, CB, DP, OA	SI-AT	PT	MF
Polydrusus pterygomalis	17, 18, 28	CB, SA	SI-AT	PT	MF
Polydrusus tereticollis	1, 6, 14, 15, 18, 21, 23, 28, 30, 31	AG, CB, DP, SA, MC, OA	SI-AT	PT	MF
Pachyrhinus mustela	2, 19, 31	DP	PO-PA	OT	MF
Liophloeus lentus	28	CB	PO-BT	OH	EU
Liophloeus tessulatus	18, 28	CB	PA-AT	OH	EU
Sciaphilus asperatus	17, 20, 22, 28	CB, SA, AE, CP	PO-AT	G	EU
Eusomus ovulum	17, 23, 28, 29	AE, OA	SI-AT	PH	KS
Brachysomus echinatus	11, 15, 18, 27, 28	CB, SA, AE	SI-AT	G	EU
Barypeithes pellucidus	18, 28	CB	BT-AT	PH	EU
Brachyderes incanus	5, 11, 19, 23, 25	CB, DP	PO-AT	*Pinus sylvestris*	MF
Strophosoma capitatum	5, 6, 11, 13, 14, 15, 16, 17, 18, 23, 25, 28, 29, 31	AG, CB, DP, SA, AE, CP, MC, OA	SI-AT	PT	MF
Strophosoma faber	17, 28	AE, OA	BA-AT	G	EU
Strophosoma melanogrammum	1, 6, 7,	AG, CB, DP, SA	BA-AT	G	EU
Sitona ambiguus	24, 25, 28	AE, MC	SI-AT	OH	MO
Sitona cambricus	13, 17	CP, MC	BT-AT	OH	MO

Sitona cylindricollis	5, 7, 8, 17, 21, 24, 26, 28	AE, CP, MC, OA	PC-AT	OH	EU
Sitona griseus	1	DP	BT-AT	OH	EU
Sitona hispidulus	15, 21, 23, 28	AE	PC-AT	OH	MO
Sitona humeralis	6, 8, 14, 15, 17, 18, 28	AG, CB, SA, AE, OA	PO-ME	OH	MO
Sitona languidus	17, 23	OA	PO-AT	OH	KS
Sitona lepidus	14, 21, 28	CB, AE	PC-AT	OH	MO
Sitona lineatus	13, 15, 17, 21, 23, 28, 29	AE, CP, MC, OA	PC-AT	OH	MO
Sitona macularius	3, 5, 6, 7, 8, 15, 17, 22, 23, 24, 25, 28, 29,	CB, SA, AE, CP, MC, OA	PC-AT	OH	MO
Sitona puncticollis	8, 17, 26, 28	AE, MC, OA	CA-AT	OH	MO
Sitona regensteinensis	23	DP	BA-AT	OH	EU
Sitona striatellus	29	OA	PO-ME	OH	MO
Sitona sulcifrons	6, 8, 15, 17, 21, 23, 24, 25, 26, 28, 29	CB, SA, AE, MC, OA	PC-AT	OH	MO
Sitona suturalis	8, 17, 24, 25, 29, 28	CB, AE, MC, OA	PC-AT	OH	MO
Sitona waterhousei	25	OA	PO-AT	OH	MO
Tanymecus palliatus	2, 15, 28	AE	SI-AT	PH	EU
Hypera contaminata	23	OA	PO-ME	*Lathyrus tuberosus*	MO
Hypera meles	2, 17	AE, PH	PC-AT	OH	MO
Hypera nigrirostris	2, 17, 28, 29	AE, OA	SI-AT	OH	MO
Hypera plantaginis	25, 28, 29	AE, OA	CA-AT	OH	MO
Hypera postica	4, 8, 19, 28, 29	AE, CP, OA	PC-AT	OH	MO
Hypera rumicis	17	MC	PC-AT	OH	MO
Hypera suspiciosa	2, 4, 15	AE	SI-AT	OH	MO
Hypera viciae	2, 4, 8, 23, 25, 28, 29	AE, OA, PH	SI-AT	OH	MO
Limobius borealis	23	OA	CA-AT	OH	MO
Larinus brevis	5, 13, 22	OA	PC-AT	OH	KS
Larinus planus	5, 22, 28	AE, CP	CA-AT	OH	MO
Larinus sturnus	23	OA	CA-AT	OH	MO
Larinus turbinatus	5	CP	CA-ME	OH	MO
Lixus bardanae	23	OA	CA-AT	OH	MO
Lixus iridis	10, 17, 24, 28	PH	CA-AT	OH	HI
Rhinocyllus conicus	3, 5, 22	CP	CA-ME	OH	MO

Bothynoderes affinis	23	OA	SI-AT	PH	MO
Cleonis pigra	23	OA	PC-AT	OH	MO
Magdalis armigera	28	CB	SI-AT	OT	MF
Magdalis duplicata	5, 18, 19, 31	CB, DP, CP	SI-AT	OT	MF
Magdalis frontalis	31	DP	SI-AT	*Pinus sylvestris*	MF
Magdalis linearis	19	DP	SI-AT	*Pinus sylvestris*	MF
Magdalis memnonia	19	DP	SI-AT	OT	MF
Magdalis nitida	13	AG	SI-AT	OT	MF
Magdalis violacea	7, 31	DP	SI-AT	OT	MF
Hylobius abietis	1, 5, 15, 19, 23, 31	DP	SI-AT	OT	MF
Pissodes castaneus	15	DP	SI-AT	OT	MF
Pissodes pini	19, 23, 31	DP	SI-AT	OT	MF
Pissodes piniphilus	23	DP	SI-AT	OT	MF
Trachodes hispidus	2	DP	BT-AT	PT	MF
Anoplus plantaris	6, 23	AG, OA	SI-AT	OT	MF
Anoplus roboris	4, 6, 13, 17, 18, 23, 25	AG, CB, SA, AE, CP, MC	BT-AT	*Alnus glutinosa*	MF
Cossonus cylindricus	28	CB	SI-AT	PT	MF
Cossonus linearis	14	CB	SI-AT	OT	MF
Stereocorynes truncorum	15	CB	CA-AT	PT	MF
Rhyncolus ater	14, 18, 28, 30	CB, SA	SI-AT	PT	MF
Bagous glabrirostris	10, 18, 28	PH	CA-AT	OH	HI
Bagous subcarinatus	17	PH	CA-AT	OH	HI
Bagous tempestivus	17	PH	SI-AT	OH	MO
Bagous tubulus	17	PH	BT-AT	OH	HI
Archarius crux	6, 11, 30	SA	PC-AT	OT	MF
Archarius pyrrhoceras	11, 18, 23, 28	CB, DP, SA, AE	CA-ME	OT	MF
Archarius salicivorus	6, 11, 17, 28	SA	SI-AT	OT	MF
Curculio betulae	13, 25	AG, SA	SI-AT	OT	MF
Curculio glandium	5, 18, 25, 27, 28, 30	CB, SA, AE	CA-AT	OT	MF
Curculio nucum	18	CB	CA-AT	*Corylus avellana*	MF
Curculio pellitus	18, 23, 28	CB, DP, SA	CA-ME	OT	MF
Curculio venosus	5	CB	CA-AT	OT	MF
Orthochaetes setiger	21	CB	BT-AT	PH	MO
Dorytomus filirostris	18, 28	SA	PO-ME	OT	MF
Dorytomus melanophthalmus	6, 17, 18, 25, 27, 30	AG, SA	BT-AT	OT	MF
Dorytomus rufatus	18, 27, 28	SA	CA-AT	OT	MF

Dorytomus taeniatus	27, 28	SA, PH	SI-ME	OT	MF
Dorytomus tortrix	27, 30	SA	CA-AT	*Populus tremula*	MF
Dorytomus tremulae	27	SA	SI-AT	OT	MF
Ellescus bipunctatus	13	AG	PC-AT	OT	MF
Ellescus scanicus	30	SA	PC-AT	OT	MF
Acalyptus carpini	13, 15, 27	AG, CB, DP, SA	PC-AT	OT	MF
Lignyodes enucleator	17, 28	SA	CA-AT	OT	EU
Tychius aureolus	17, 28	AE, OA	KI-AT	OH	KS
Tychius breviusculus	17	OA	PC-AT	OH	MO
Tychius crassirostris	17	OA	CA-AT	OH	MO
Tychius junceus	17, 21	AE, OA	SI-AT	OH	MO
Tychius medicaginis	17	AE, OA	CA-AT	OH	KS
Tychius meliloti	14, 17, 21, 24, 26, 29	CB, AE, MC, OA	PC-AT	OH	MO
Tychius parallelus	1, 23	DP	BA-AT	OH	EU
Tychius picirostris	2, 8, 14, 15, 17, 18, 21, 22, 23, 24, 28	CB, SA, AE, CP, OA, PH	PC-AT	OH	MO
Tychius quinquepunctatus	2, 3, 6, 7, 13, 15, 17, 21, 23, 24, 26, 28	AE, CP, MC, OA	PC-AT	OH	MO
Tychius schneideri	17	AE, OA	PO-AT	*Anthylis vulneraria*	KS
Tychius stephensi	4, 8, 17, 21, 23, 2, 29	AE, OA	SI-AT	OH	MO
Sibinia pellucens	17, 23	OA	CA-AT	OH	MO
Sibinia pyrrhodactyla	17, 23, 25, 28	AE, OA	BT-AT	OH	MO
Sibinia viscariae	17	AE	SI-AT	OH	MO
Anthonomus phyllocola	19, 31	DP	SI-AT	OT	MF
Anthonomus rectirostris	5, 6, 11, 23, 25, 28	CB DP, SA	PC-AT	OT	MF
Anthonomus rubi	11, 21, 27, 28	CB, DP, SA, AE	SI-AT	OT	MF
Brachonyx pineti	1, 2, 5, 18, 19, 23, 31	AG, DP	SI-AT	*Pinus sylvestris*	MF
Bradybatus kellneri	28	CB	CA-AT	OT	MF
Gymnetron beccabungae	28	AE	BT-AT	OH	HI
Gymnetron melanarium	2, 15, 21, 23, 28	CB, AE, OA	BT-AT	OH	MO
Gymnetron rostellum	2, 17, 28	AE	PO-BA	OH	MO
Mecinus labilis	8, 28	AE	BA-AT	*Plantago lanceolata*	MO
Mecinus pascuorum	3, 4, 5, 8, 13, 17, 22, 23, 28	AE, CP, OA	CA-ME	*Plantago lanceolata*	MO

Mecinus pyraster	22	CP	CA-ME	OH	MO
Miarus ajugae	2, 4, 8, 28	AE	SI-ME	OH	MO
Rhinusa asellus	23	OA	CA-ME	OH	MO
Rhinusa bipustulata	17, 23	OA	SI-AT	OH	MO
Rhinusa tetra	17, 23	AE, OA	SI-ME	OH	MO
Cionus hortulanus	21, 23, 25	AE, OA	SI-AT	OH	MO
Cionus scrophulariae	14, 18	CB	SA-AT	OH	EU
Cionus thapsus	23	OA	CA-AT	OH	MO
Cionus tuberculosus	21, 28	CB, AE	SI-AT	OH	EU
Stereonychus fraxini	6, 17, 18, 28	CB, SA	PO-ME	*Fraxinus excelsior*	EU
Isochnus populicola	17, 19, 27	SA, CP	PC-AT	OT	MF
Orchestes jota	4, 15, 17, 25, 28	DP, SA, AE	PC-AT	OT	MF
Orchestes rusci	6, 15, 25	DP, SA	PC-AT	OT	MF
Orchestes testaceus	18, 21	AG, CB	BT-AT	OT	MF
Rhamphus oxyacanthae	28	CB	BT-AT	OT	MF
Rhamphus pulicarius	6, 27	SA	PC-AT	OT	MF
Tachyerges salicis	5, 27, 28	CB, SA, AE	PC-AT	OT	MF
Tachyerges stigma	2, 5, 6, 17, 18, 25, 27, 28, 31	AG, CB, DP, SA	PC-AT	OT	MF
Baris artemisiae	17, 23, 28, 29	AE, OA	SI-AT	OH	MO
Limnobaris t-album	3, 7, 19, 22, 24, 25, 28	CP, MC, PH	SI-AT	OH	HI
Mononychus punctumalbum	10, 17, 18, 19, 28	AG, SA, PH	BT-AT	*Iris pseudoacorum*	HI
Marmaropus besseri	17, 21, 23, 28	AE, OA	BT-AT	OH	MO
Phytobius leucogaster	18	SA, PH	SI-AT	OH	HI
Pelenomus quadrituberculatus	13	CP	PC-AT	OH	MO
Pelenomus waltoni	15, 22	CP, MC	PC-AT	OH	MO
Rhinoncus bruchoides	3, 5, 15, 25, 28	CB, AE, CP, OA	PC-AT	OH	MO
Rhinoncus castor	5, 17, 19, 23 28	AE, CP, OA	PC-AT	*Rumex acetosella*	MO
Rhinoncus pericarpius	3, 7, 15, 17, 17, 23, 25, 26, 28, 30	AG, CB, SA, AE, CP, MC, PH	PC-AT	OH	EU
Rhinoncus perpendicularis	6, 18, 23, 24, 28, 30	AG, CB, AE, MC, OA, PH	PC-AT	OH	MO
Rutidosoma globulus	18	AG	PC-AT	OT	MF

Scleropterus serratus	18	AG	BT-AT	PH	EU
Tapeinotus sellatus	10, 15, 24, 26, 28	CB, MC, PH	SI-AT	OH	HI
Amalus scortillum	17	AE	SI-AT	OH	MO
Micrelus ericae	13, 15, 23	AG, DP	BT-AT	OH	EU
Trichosirocalus barnevillei	8, 17, 23	AE, OA	SI-AT	*Achillea millefolium*	MO
Trichosirocalus troglodytes	17, 28	AE, OA	BT-AT	*Plantago lanceolata*	MO
Zacladus geranii	28	CB	SI-AT	OH	EU
Nedyus quadrimaculatus	2, 3, 4, 5, 6, 7, 13, 14, 15, 16, 17, 18, 21, 22, 23, 25, 26, 27, 28, 29, 30	AG, CB, DP, SA, AE, CP, MC, OA, PH	SI-AT	*Urtica dioica*	EU
Coeliastes lamii	11, 18, 20, 30	AG, CB, SA	PO-AT	OH	EU
Calosirus terminatus	6	MC	BT-AT	OH	EU
Ceutorhynchus alliariae	18	CB, SA	BT-AT	*Alliaria officinalis*	EU
Ceutorhynchus assimilis	2, 8, 15, 17, 21, 23, 28, 29, 30	CB, AE, OA	SI-AT	OH	EU
Ceutorhynchus chalybaeus	18	CB	MO-AT	OH	EU
Ceutorhynchus constrictus	6, 7, 18, 22, 24, 27, 28	AG, CB, SA, AE, CP, MC, PH	BT-AT	*Alliaria officinalis*	EU
Ceutorhynchus dubius	23	OA	CA-ME	*Berteroa incana*	MO
Ceutorhynchus erysimi	2, 8, 19, 21, 23, 28, 29	CB, AE, CP, OA	PC-AT	OH	EU
Ceutorhynchus griseus	17, 23, 29	OA	CA-AT	OH	MO
Ceutorhynchus hirtulus	23	AE	CA-AT	*Erophila verna*	MO
Ceutorhynchus obstrictus	2, 5, 11, 13, 17, 18, 24, 25, 28, 30	AG, CB, DP, SA, AE, CP, MC, OA	BT-AT	OH	EU
Ceutorhynchus pallidactylus	2, 14, 21, 23, 28, 30	CB, SA, AE	CA-ME	OH	EU
Ceutorhynchus pallipes	2, 6, 7, 8, 13, 15, 16, 17, 18, 21, 23, 24, 25, 28	CB, AE, CP, MC, OA	SI-AT	OH	EU

Ceutorhynchus pulvinatus	21, 23	AE, OA	SI-AT	OH	MO
Ceutorhynchus pumilio	15, 23	MC, OA	BT-AT	*Teesdalea nudicaulis*	MO
Ceutorhynchus roberti	16, 17, 18, 26	CB, SA, MC	PO-AT	*Alliaria officinalis*	EU
Ceutorhynchus syrites	15, 23	AE, OA	SI-AT	OH	MO
Ceutorhynchus typhae	3, 5, 8, 13, 14, 17, 18, 23, 25, 28, 29, 30	AG, CB, SA, AE, CP, MC, OA	PC-AT	OH	EU
Parethelcus pollinarius	13, 22, 28, 30	CB, SA, AE, CP	BT-AT	*Urtica dioica*	EU
Glocianus punctiger	23, 29	OA	PC-AT	*Taraxacum officinale*	MO
Hadroplontus litura	22, 28	AE, CP	BT-AT	OH	MO
Datonychus melanostictus	17	PH	PO-ME	OH	MO
Mogulones asperifoliarum	8, 17, 18, 23, 28	AG, AE, OA	SI-AT	OH	EU
Mogulones geographicus	23	OA	CA-ME	*Echium vulgare*	MO
Microplontus millefolii	17	AE	BT-AT	*Tanacetum vulgare*	MO
Microplontus triangulum	23, 29	OA	SI-AT	*Achillea millefolium*	MO

CONCLUDING REMARKS

The research on weevils found in the Stobrawski Landscape Park enabled 285 species representing about 30% of Poland's weevil fauna to be identified. In comparison with other such Parks, this number is comparable, but not distinctive. The study revealed five species new to the fauna of Lower (*Mesotrichapion punctirostre*, *Nanophyes brevis*, *Otiorhynchus lepidopterus*) or Upper Silesia (*Phytobius leucogaster*); in addition, *Rhaphitropis marchicus* had never before been recorded in either part of Silesia. The presence was confirmed of many species, for which the last reports can be regarded as historical; the most interesting of these are *Lasiorhynchites caeruleocephalus*, *Trachyphloeus scabriculus*, *Pseudomyllocerus sinuatus*, *Polydrusus flavipes*, *Sitona regensteinensis*, *Bagous subcarinatus*, *Tychius parallelus*.

The research on weevils in the SLP is the first of its kind in this location and has filled a gap in research on weevils in this part of the Silesian Lowland. The research also confirmed

the value of the SLP as an important element in the regional network of protected areas.

The richest plant communities in terms of species were fresh meadows (*Arrhenaterion elatioris*) and ruderal communities (*Onopordetalia acanthii*), where a total of 58% of all the species identified were collected. The species-richest forest communities were oak-hornbeam forests (*Carpinion betuli*). The lowest number of species were found in rush communities: their weevil fauna was the least similar to those of the communities. The highest percentage (37%) of exclusive species was recorded in the pine forests.

In terms of habitat preferences, over 40% of the weevil fauna in the SLP are mesophilous species of open areas, whereas xerothermic species accounted for the smallest percentage. As far as nutritional preferences are concerned, nearly half of all the species were oligophages associated with herbaceous plants; at the same time, oligophages associated with herbaceous plants accounted for the smallest share in the total fauna.

The backbone of the SLP fauna are broad-range species covering the entire Palaearctic (Pacific-Atlantic element) and the Euro-Siberian elements (Sibero-Atlantic), which is typical of Poland's fauna.

The weevil fauna of the plant communities in the SLP that were not included in this study requires further research to be conducted in the future. This applies in particular to farmland as well as plant communities within the park's boundaries in the form of single patches with small surface areas. This may yield more reports of new species in the SLP. Regular studies of the weevil fauna in the already examined communities is also desirable, as they will enable observation of the changes that will occur as a result of the changing ways in which the different types of meadows and forests are used. This is particularly important in protected areas, nature reserves and Natura 2000 sites.

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