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The centipede community of a beech forest in Magura National Park, Poland

Abstract: As the result of a provisional study in 2001-2002 of the centipede fauna and community structure of a Carpathian *Dentario glandulosae-Fagetum* beech forest in the Magura National Park, Poland, 24 species or subspecies of *Chilopoda* have been revealed. This amounts to 41% of all centipede species currently reported from Poland. The most abundant and frequently encountered species are *Lithobius burzenlandicus* VERHOEFF (eudominant, euconstant), *L. mutabilis* L. KOCH and *Strigamia acuminata* (LEACH) (both eudominants, accessorial species). The community is characterised by a large proportion of woodland species (15) while the remaining forms are eurytopic. Among the most interesting records in the study area are the following mountain species rarely found in Poland: *Dicellophilus carniolensis* (C. L. KOCH), *Strigamia transsilvanica* (VERHOEFF), *Cryptops parisi* BROLEMANN, *Lithobius lucifugus* L. KOCH, *L. silvivagus* VERHOEFF, *L. matici* PRUNESCO and *Harpolithobius anodus* (LATZEL). The centipede population densities average 121 indiv./m^2, ranging between 46 and 217 indiv./m^2. Compared to other beech woodlands in Poland, the study forest is characterised by an exceptionally rich local fauna as well as the high centipede population densities. The community structure is very similar to that of the Carpathian beech forests in the Pieniny Mountains. The *Chilopoda* community features testify to the exceptional natural value of this area, which so far has never been studied in due detail.

Key words: *Chilopoda*, community analysis, beech forest, Poland

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INTRODUCTION

Most of the information about the *Chilopoda* occurring in southeastern Poland comes from the 19th century. West Beskid myriapods were the subject of a work by KARLIŃSKI (1883), while SIDORIAK (1899) collected material across the entire Beskid Range, including the Beskid Niski Mountains. HAASE (1880), in a work devoted to

Silesian myriapods, also listed several chilopod species found in the West Beskids. More recent data belong to RAFALSKI (1962), who confirmed the presence of *Dicellophilus carniolensis* at several sites in the East Beskids, to KACZMAREK (1977b, 1979, 1980), who compiled an updated list of the species encountered in the Beskid and Bieszczady mountains, and also to LEŚNIEWSKA (2000b), who refined the centipede fauna of the Bieszczady. No systematic research on the centipedes of the Beskid Niski has hitherto been conducted.

Figure. Geographic location of the beech forests under comparison (1 – Wielkopolska, 2 – Pieniny, 3 – Beskid Niski with MPN, 4 – Bieszczady, 5 – Roztocze)

The Magura National Park (henceforth: MNP) was established in 1995. It covers an area of 19 961 ha and, in terms of area, it is the fifth largest national park in Poland. Geographically, MNP encompasses the central part of the Beskid Niski Mountains, the lowest mountain belt of the Polish Carpathians (Figure). Studies of the geology, flora and fauna of this region point to the terrain's high natural value as well as to its unique character on the national scale. Research into centipedes, begun over two years ago, is intended to deepen our knowledge of the biodiversity of MNP, to contribute to studies on *Chilopoda* in various environments in the region, in particular in beech forests.

The objective of the present work is an initial analysis of centipede community structure in Carpathian beech forests (*Dentario glandulosae-Fagetum*) in the Beskid Niski Mountains in comparison with other centipede communities in Polish beech woodlands.

STUDY AREA, MATERIALS AND METHODS

Area description

MNP encompasses a well-preserved fragment of the Beskid Niski Mountains, the largest region within the Beskid belt. This is a region of medium and low mountains, ranging from their foothills, lying at a height of about 380-400 m above sea-level, to the peaks – only rarely reaching over 800m above sea-level. MNP lies in an area transitional between the Eastern and Western Carpathians. This is demonstrated by the character of the plant cover which shows here variable, idiosyncratic features. The vegetation of the MNP is marked by its well-preserved state. The park terrain lies in a woodland area, in which large oldgrowth treestands have been preserved. About 93% of the area of the park are wooded, the remaining 7% are fields, meadows and other wood-free land.

The MNP lies within two vegetation belts. The submontane belt, reaching to 530m above sea-level, covers about half the area of the park. Fragments of natural woodland plant

communities have been preserved here: oak-hornbeam forest, Carpathian alder forest, marsh alder forest as well as alder and ash forest, *Carici remotae-Fraxinetum*. A large area is occupied by fir and fir-spruce forests as well as artificial treestands dominated by pine.

The lower subalpine zone, ranging from 530m up to the peaks, takes the form of islands, covering the upper parts of the mountains. The lower subalpine zone is dominated by fertile Carpathian beech forests. Fir and fir-spruce woodlands are fairly common, as are artificial stands with the predominance of pine and birch (FALIŃSKI 1975, MICHALIK 1981, 1995, DENISIUK et al. 1990).

The research was conducted in the lower subalpine zone, in the terrain supporting a Carpathian beech forest, *Dentario glandulosae-Fagetum*. The beech forest flora is characterised by a large proportion of oak-hornbeam forest species, e.g. *Carex pilosa*, *Stellaria holostea*, *Galium schultesii*. Research took place in the sub-category of typical fresh beech forest, distinguished by the dominance of *Dentaria glandulosa* and *Symphytum cordatum* on the forest floor.

All three sites selected for research (UTM: EV 37) were characterised by a thick litter layer as well as the presence of numerous fallen logs and tree stumps. Beeches grow to 35m and have straight trunks there. The tree group structure is multi-generational and multi-layered. Certain tree groupings are of middle-age.

Methods

The study was carried out in June–July 2001 and in August 2002. In terms of a quantitative analysis, a 1m² litter-soil sample was taken at each of the three sites. The samples were taken using a 25 cm square frame. At each site, 16 samples were taken to a depth of 25 cm, together with the litter layer. In total, 3 square metres of litter-soil samples were taken. In addition, a quality test was conducted: sieving the litter and litter-soil tests. All samples were hand-sorted.

A complementary qualitative method was painstaking searching – individuals found under the bark of fallen branches and tree stumps, under stones, moss and all other microhabitats populated by centipedes.

Analytical methods

The standard analytical coefficients were applied (BALOGH 1958, GÓRNY & GRÜM 1993; MAGURRAN 1996): Dominance (*D*), Population density, Frequency (*Fr*), Shannon index of diversity (*H'*), Pielou's index of evenness (*J*), Morisita's coefficient as modified by Horn (*M*).

RESULTS

Abundance and density

In the course of testing, 796 individuals belonging to 24 species or subspecies of *Chilopoda* were found (Tables I & II). The centipedes represent all three orders occurring in Poland: *Lithobiomorpha* (15 species or subspecies), *Geophilomorpha* (7 species), and *Scolopendromorpha* (2 species). 264 individuals could not be identified – primarily larval and juveniles instars as well as, in a few cases, damaged individuals (Table II).

The following densities were obtained for each site: 46, 99, and 217 ind./m², respectively. Thus the average density was 121 ind./m².

Table I. Centipede species composition in beech woodlands of selected areas of Poland.

No.	Species	Wielkopolska	Pieniny	Roztocze	Beskid Niski
1	*Harpolithobius anodus* (LATZEL, 1880)		+		+
2	*Lithobius borealis* MEINERT, 1868	+			+
3	*Lithobius cyrtopus* LATZEL, 1880			+	+
4	*Lithobius erythrocephalus schuleri* VERHOEFF, 1925		+		+
5	Lithobius forficatus *(LINNAEUS, 1758)*	+	+	+	+
6	*Lithobius lapidicola* MEINERT, 1872	+	+	+	+
7	*Lithobius lucifugus* L. KOCH, 1862				+
8	*Lithobius matici* PRUNESCO, 1966				+
9	*Lithobius mutabilis* L. KOCH, 1862	+	+	+	+
10	*Lithobius muticus* C. L. KOCH, 1847		+		+
11	*Lithobius piceus* L. KOCH, 1862	+	+	+	+
12	*Lithobius silvivagus* VERHOEFF, 1925				+
13	*Lithobius tenebrosus setiger* KACZMAREK, 1977		+		+
14	*Lithobius burzenlandicus* VERHOEFF, 1931		+		+
15	*Lithobius microps* MEINERT, 1868			+	+
16	*Geophilus flavus* (DE GEER, 1783)	+		+	+
17	*Geophilus carpophagus* LEACH, 1814				+
18	*Geophilus insculptus* ATTEMS, 1895				+
19	*Strigamia acuminata* (LEACH, 1814)	+	+	+	+
20	*Strigamia crassipes* (C. L. KOCH, 1835)	+	+		+
21	*Strigamia transsilvanica* (VERHOEFF, 1935)		+		+
22	*Dicellophilus carniolensis* (C. L. KOCH, 1847)				+
23	*Cryptops hortensis* LEACH, 1814	+	+		+
24	*Cryptops parisi* BROLEMANN, 1920				+
25	*Lithobius agilis* C. L. KOCH, 1847	+		+	
26	*Lithobius erythrocephalus erythrocephalus* C. L. KOCH, 1847	+		+	
27	*Lithobius tricuspis* MEINERT, 1872	+			
28	*Lithobius melanops* NEWPORT, 1845	+		+	
29	*Lithobius tenebrosus tenebrosus* MEINERT, 1872	+			
30	*Lithobius pelidnus* HAASE, 1880	+			
31	*Lithobius biunguiculatus* LOKSA, 1947		+		
32	*Lithobius crassipes* L. KOCH, 1862	+			
33	*Lithobius curtipes* C. L. KOCH, 1847	+		+	
34	*Geophilus proximus* C .L. KOCH, 1847		+		
35	*Geophilus truncorum* (BERGSÖ, MEINERT, 1866)	+	+		
36	*Strigamia pusilla perkeo* (VERHOEFF, 1935)		+		
37	*Schendyla nemorensis* (C. L. KOCH, 1837)	+		+	
	Total species	19	17	13	24

Dominance and frequency

The dominance structure displays a clear-cut prepotency of a single species. This was, in all cases, *Lithobius burzenlandicus* (Table II), followed by either *L. mutabilis* or *Strigamia acuminata* as eudominants. At Site 2, both latter species obtained a similar value of the dominance coefficient. Similarly, in the case of combined data, the first place in the dominance structure was taken by *Lithobius burzenlandicus*, followed by *L. mutabilis* and *Strigamia acuminata*. At Site 2, *Cryptops parisi* was eudominant. Dominants in individual samples were *Lithobius muticus* and *L. cyrtopus*, whilst the subdominants include *L. microps*, *Geophilus insculptus*, *Cryptops parisi*, *Lithobius*

muticus, *L. erythrocephalus*, *L. tenebrosus setiger*, *Geophilus carpophagus*, *Strigamia crassipes*, *S. acuminata* and *Cryptops hortensis*. The remaining species form recedents and subrecedents in the community structure.

Analysing the frequency (Table II), the most abundant species in the study area can be seen as also the most predominant. *Lithobius burzenlandicus* in all positions belonged to euconstants or constants, whereas *Strigamia acuminata* and also *Lithobius mutabilis* to constants or accessorial species. All remaining forms are accidental in the terrain under study.

Table II. Dominance – *D* (%), frequency - *F* (%), values of *H'*, *Hmax*, *J*, and number of individuals and species of *Chilopoda* in the Carpathian beech forests of MNP.

No.	Species	Site								Number of individuals in general (in qualitative and quantititative tests)
		2001 Site 1		2002 Site 2		2002 Site 3		2001 and 2002 combined		
		D	F	D	F	D	F	D	F	
1	*Harpolithobius anodus*			0.7	6.2			0.4	2.1	3
2	*Lithobius borealis*			0.7	6.2			0.4	2.1	4
3	*Lithobius cyrtopus*			0.7	6.2	5.7	12.5	1.9	6.2	6
4	*L. erythrocephalus schuleri*	2.2	6.2					0.4	2.1	29
5	*Lithobius forficatus*			1.3	12.5			0.8	4.2	13
6	*Lithobius lapidicola*			0.7	6.2			0.4	2.1	2
7	*Lithobius lucifugus*									2
8	*Lithobius matici*									2
9	*Lithobius mutabilis*	28.3	31.2	16	62.5	8.6	250	16.3	39.6	89
10	*Lithobius muticus*	8.7	18.7	2.0	18.7			2.6	12.5	27
11	*Lithobius piceus*			0.7	6.2			0.4	2.1	4
12	*Lithobius silvivagus*			1.3	12.5			0.8	4.2	4
13	*Lithobius tenebrosus setiger*	2.2	6.2			1.4	6.2	0.8	4.2	28
14	*Lithobius burzenlandicus*	34.8	56.2	57.3	93.7	48.5	87.5	51.5	79.2	201
15	*Lithobius microps*	4.3	12.5					0.8	4.2	7
16	*Geophilus flavus*									9
17	*Geophilus carpophagus*	2.2	6.2					0.4	2.1	1
18	*Geophilus insculptus*			2.0	18.7	4.3	12.5	2.3	10.4	8
19	*Strigamia acuminata*	2.2	6.2	15.3	56.2	25.7	56.2	15.9	39.6	66
20	*Strigamia crassipes*	2.2	6.2					0.4	2.1	4
21	*Strigamia transsilvanica*					1.4	6.2	0.4	2.1	1
22	*Dicellophilus carniolensis*									2
23	*Cryptops hortensis*	2.2	6.2					0.4	2.1	1
24	*Cryptops parisi*	10.9	18.7	1.3	12.5	2.9	12.5	3.4	14.6	19
-	*Lithobius species*									260
-	*Strigamia species*									3
-	*Cryptops species*									1
	Number of individuals	46		217		99		362		796
	Number of species (in quantitative and qualitative tests)	22		14		8		24		24
	H'	3.4		2.2		2.1		3.1		
	H_{max}	4.5		3.8		3.0		4.6		
	J(%)	77.1		56.8		69.2		67.2		

Species diversity

The Shannon index of diversity (*H'*) (Table II) ranged from 2.1 to 3.4 at particular sites, amounting to 3.1 for combined data. The values of Pielou's index of evenness (*J*) varied from 56.8 to 77.1% in individual samples, being 67.2% for combined data.

Zoogeographical and ecological analyses

In the study centipede community, most of the species are forest-dwellers (15, or 63%), nine (38%) are montane species, whilst the remaining centipedes are eurytopic and synanthropic forms common in Poland (Table III). From a zoogeographical point of view, the most numerous group (16, or 67%) is composed of European species. Carpathian species are relatively common (5, or 21%), while each of the remaining three species represents its own distribution pattern, i.e. Mediterranean, West Palaearctic or Euro-Siberian.

Table III. Ecological and zoogeographical classifications of *Chilopoda* species

No.	Species	Ecological charcterostics
1	*Harpolithobius anodus*	forest, mountain, Southeast European
2	*Lithobius borealis*	eurytopic, European
3	*Lithobius cyrtopus*	forest, mountain, Central European
4	*Lithobius erythrocephalus schuleri*	forest, mountain, Carpathian and Alpine
5	*Lithobius forficatus*	eurytopic, West Palaearctic
6	*Lithobius lapidicola*	eurytopic, European
7	*Lithobius lucifugus*	forest, mountain, European
8	*Lithobius matici*	forest, mountain, Carpathian
9	*Lithobius mutabilis*	forest, European
10	*Lithobius muticus*	eurytopic, Central European
11	*Lithobius piceus*	forest, Central European
12	*Lithobius silvivagus*	forest, mountain, Carpathian
13	*Lithobius tenebrosus setiger*	forest, mountain, Carpathian
14	*Lithobius burzenlandicus*	forest, mountain, Carpathian
15	*Lithobius microps*	eurytopic, synanthropic, European
16	*Geophilus flavus*	eurytopic, synanthropic, Euro-Siberian
17	*Geophilus carpophagus*	forest, synanthropic at the northern limit of its range; European, North African
18	*Geophilus insculptus*	forest, European
19	*Strigamia acuminata*	forest, European, introduced into North America
20	*Strigamia crassipes*	eurytopic, European
21	*Strigamia transsilvanica*	forest, mountain, European mountains (Carpathians, Alps, Sudeten), Japan
22	*Dicellophilus carniolensis*	forest, Mediterranean, introduced into California and Japan
23	*Cryptops hortensis*	eurytopic, European
24	*Cryptops parisi*	eurytopic, Cantral and southern European, in the north introduced into greenhouses

DISCUSSION

Among the 24 species or subspecies, the majority have been recorded in the Beskid Niski Mountains for the first time, simply because of the absence of any earlier data. The species *L. lucifugus* has been reported from Poland for the first time (LEŚNIEWSKA & TABORSKA 2002).

Among the most interesting species rarely found in Poland, there are montane forms like *Harpolithobius anodus*, *Lithobius lucifugus*, *L. matici*, *L. silvivagus*, *Geophilus insculptus*, *Strigamia transsilvanica*, *Dicellophilus carniolensis* and *Cryptops parisi*. Among these species, *Lithobius matici* has hitherto been recorded in the Bieszczady Mountains only, while *L. silvivagus* and *Dicellophilus carniolensis* in the Bieszczady Mountains and a few localities in the West Beskids (LEŚNIEWSKA 2000b). So far *Cryptops parisi* has only been known in Lower Silesia and the West Sudetens (KACZMAREK 1980), while *Strigamia transsilvanica* in the Roztocze as well as the Pieniny (KACZMAREK & LEŚNIEWSKA 1998, LEŚNIEWSKA 1999).

In Europe, centipede communities of various types of forest have been studied, among others, by LOKSA (1966), WIGNARAJAH & PHILLIPSON (1977), ALBERT (1979, 1982), GEOFFROY (1979), FRÜND (1987, 1991), KOS (1996), TUF (2000), LOCK et al. (2001). As regards the Polish woodlands, several recent works concern the centipede communities of different forest types (KACZMAREK 1977a, 1989, WYTWER 1990, 1992, 1995, 2000), including beech forests (LEŚNIEWSKA 1997, 1999, 2000a).

Against a background of the centipede communities in other Polish beech woodlands (LEŚNIEWSKA 2000a) (Table I), the beech forest under study is characterised by the highest number of species or subspecies of centipedes. It is noteworthy that such a high diversity was revealed after only a short, preliminary study. It seems thus quite plausible that there are further centipede species to be found in MNP.

Only five species, *Lithobius forficatus*, *L. lapidicola*, *L. mutabilis*, *L. piceus* and *Strigamia acuminata*, have been found in all of the Polish beech forests surveyed to date (Table I). All these species commonly occur in Polish forests of various types (KACZMAREK 1952, 1964, 1977a, 1989, WYTWER 1990, 1992), of which *Lithobius forficatus* is also common in urban areas (WYTWER 1995, LEŚNIEWSKA 1996). Further five species have only been encountered in the mountain beech forests of the Beskid Niski Mountains and the Pieniny. Two species not yielded yet in the other prospected beech forests are typical of the Roztocze and Beskid Niski forests, and only one of Wielkopolska and the Beskid Niski Mountains (Table I).

In the majority of European deciduous woodlands where quantitative analyses have been conducted, the leading, dominant species is *L. mutabilis*. This is the case, for example, in beech forests in Germany (ALBERT 1982, FRÜND 1987, POSER 1988), in the oak-hornbeam forests in Wielkopolska (KACZMAREK 1989), in linden-oak-hornbeam and thermophilous oak forests in Mazovia (WYTWER 1990), and also in the beech forests of Wielkopolska and the Roztocze (LEŚNIEWSKA 1997, 1999, 2000a). In contrast, in the Beskid Niski beech forests under study, the mountain species *L. burzenlandicus* is always superdominant. This very species also dominates the Pieniny Carpathian beech woodlands (LEŚNIEWSKA 1999, 2000a).

A characteristic feature of centipede communities is, a high dominance coefficient value shared by two or three species. This is the way as observed in Germany (ALBERT 1982), where *L. mutabilis* and *L. curtipes* codominate. These very two species dominate the linden-oak-hornbeam and thermophilous oak forests of Mazovia (WYTWER 1990), the oak–hornbeam forest of Wielkopolska (KACZMAREK 1977a, 1989) and beech forest of the Roztocze. In German beech forests (FRÜND 1987), the three

dominant species are *L. mutabilis*, *L. curtipes* and *Strigamia acuminata*. In the Wielkopolska beech forest, the dominant species are *Lithobius mutabilis*, *Geophilus flavus* and *Schendyla nemorensis* (LEŚNIEWSKA 1997). In the study beech forest, the second and third places in the dominance structure are taken up by *Lithobius mutabilis* and *Strigamia acuminata*. The remaining species show a minimal share in the dominance structure.

When comparing the dominance structure of *Chilopoda* populations in the study area with that in the beech forests of Pieniny, Roztocze and Wielkopolska, Morisita's index as modified by Horn (Table IV) shows the relations that might have been expected. Thus, the *Chilopoda* community of the Carpathian beech forest in the Beskid Niski Mountains is the most similar to that of the Carpathian beech forests in Pieniny (Morisita's index 0.81). Both communities compared live in mountain forests, in both the same three species are domitants and, finally, both communities share the highest number of species. Hardly surprisingly, the centipede communities of the Beskid Niski beech forests and the lowland beech forests of Wielkopolska (Morisita index, 0.29) appear to be the most different.

Table IV. Values of Morisita's index of similarity of dominance structures, modified by Horn (*Mo*) for centipede communities in beech forests of selected regions of Poland

	Wielkopolska	Roztocze	Pieniny	Beskid Niski
Wielkopolska	X			
Roztocze	0.92	X		
Pieniny	0.45	0.43	X	
Beskid Niski	0.29	0.31	0.807	X

Mo≤0.33 0.33<*Mo*≤0.66 *Mo*>0.66

The population densities revealed in the present are generally comparable with those in most of the other European forests (BORNEBUSCH 1930, WIGNARAJAH & PHILLIPSON 1977, GEOFFROY 1979, ALBERT 1982, DUNGER 1983, FRÜND 1987, 1991, KOS 1996, LEŚNIEWSKA 1997, 1999, 2000a).

A comparison of the species composition of *Chilopoda* in the Beskid Niski and Bieszczady (Table V) looks particularly interesting. The Bieszczady centipedes, geographically neighbouring the Beskid Niski, display a marked difference in relation to other areas of Poland. In these mountains, rare or endemic species have been documented. Among these is *Lithobius matici*, a form, as the current research shows, present also in the Beskid Niski. In general, both these regions share 19 chilopod species, including *Dicellophilus carniolensis* which, in Poland, occurs only there, the montane *Harpolithobius anodus*, *Lithobius burzenlandicus*, *Lithobius erythrocephalus schuleri* and *L. tenebrosus setiger*. In the Bieszczady, eight species occur which have not been recorded in the Beskid Niski. In this group, in addition to such rare species as *L. aeroginosus luciae* or *L. biunguiculatus*, both *L. agilis* and *Schendyla nemorensis* are also common, whose presence in the Beskid Niski area is highly probable. Particular attention should be paid to the occurrence in the Beskid Niski of species not found in the Bieszczady yet. These are first of all *Strigamia transsilvanica*, *Cryptops parisi*,

Geophilus insculptus, Lithobius lucifugus. It is noteworthy that the above species are rare, being of particular value to the study community.

Table V. Occurence of *Chilopoda* in Bieszczady and Beskid Niski

No.	Species	Bieszczady	Beskid Niski
1	*Schendyla nemorensis*	+	
2	*Dicellophilus carniolensis*	+	+
3	*Geophilus carpophagus*	+	+
4	*Geophilus flavus*	+	+
5	*Clinopodes linearis*	+	
6	*Strigamia acuminata*	+	+
7	*Strigamia crassipes*	+	+
8	*Strigamia pusilla perkeo*	+	
9	*Cryptops hortensis*	+	+
10	*Harpolithobius anodus*	+	+
11	*Lithobius aeruginosus luciae*	+	
12	*Lithobius agilis*	+	
13	*Lithobius biunguiculatus*	+	
14	*Lithobius burzenlandicus*	+	+
15	*Lithobius cyrtopus*	+	+
16	*Lithobius erythrocephalus schuleri*	+	+
17	*Lithobius forficatus*	+	+
18	*Lithobius lapidicola*	+	+
19	*Lithobius matici*	+	+
20	*Lithobius microps*	+	+
21	*Lithobius mutabilis*	+	+
22	*Lithobius muticus*	+	+
23	*Lithobius nodulipes*	+	
24	*Lithobius piceus*	+	+
25	*Lithobius silvivagus*	+	+
26	*Lithobius tenebrosus setiger*	+	+
27	*Lithobius curtipes*	+	
28	*Lithobius borealis*		+
29	*Strigamia transsilvanica*		+
30	*Cryptops parisi*		+
31	*Geophilus insculptus*		+
32	*Lithobius lucifugus*		+
	Number of species	27	24

Further research can be expected to reveal new data concerning the species list and community structure in the neighbouring beech forests as well as other plant communities in the Beskid Niski Mountains.

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STRESZCZENIE

[Tytuł: Zgrupowanie pareczników lasu bukowego w Magurskim Parku Narodowym, Polska]

W wyniku wstępnych badań prowadzonych w latach 2001-2002 w buczynie karpackiej *Dentario glandulosae-Fagetum* na terenie Magurskiego Parku Narodowego, stwierdzono występowanie 24 gatunków i podgatunków pareczników. Stanowi to 41% wszystkich gatunków *Chilopoda* znanych z terenów Polski. Najliczniejszymi i najczęstszymi gatunkami buczyny są kolejno: *Lithobius burzenlandicus* (superdominant, eukonstant), *L. mutabilis*, *Strigamia acuminata* (eudominanty, gatunki akcesoryczne). Zgrupowanie charakteryzuje się dużym udziałem gatunków leśnych (15). Pozostałe gatunki są eurytopami. Stwierdzono występowanie rzadkich w Polsce następujących gatunków górskich: *Dicellophilus carniolensis*, *Strigamia transsilvanica*, *Cryptops parisi*, *Lithobius lucifugus*, *L. silvivagus*, *L. matici*, *Harpolithobius anodus*.

Średnie zagęszczenie pareczników wyniosło 121 os/m^2 (w zakresie 46-217).

W porównaniu z innymi lasami bukowymi w Polsce buczynę w MPN cechują wyjątkowo wysoka liczba gatunków oraz wysokie zagęszczenia pareczników. Struktura zgrupowania jest zbliżona do struktury zgrupowania *Chilopoda* buczyny karpackiej w Pieninach.