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PROGRESS IN STUDIES ON MYRIAPODA AND ONYCHOPHORA

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# The Diplopoda and Chilopoda of selected ecotones in northwestern Poland

**Abstract:** The occurrence of representatives of Diplopoda and Chilopoda was studied in five ecotones in northwestern Poland. Barber's pitfall traps were used for fauna sampling through two consecutive vegetative seasons: 1996–1997. Among the Diplopoda most frequently captured, two species, *Julus scandinavius* and *Ommatoiulus sabulosus*, were dominant (47.2% and 34.2%, respectively) in nearly all plots. Representatives of the Chilopoda were caught in small numbers; the relatively most frequently captured were those species commonly occurring in Poland: *Lithobius mutabilis*, *L. forficatus* and *L. erythrocephalus*. The ecotones studied appear to have played a double role: they serve partly as a barrier and, also partly as a transit zone, because both the number of species and the population density were, generally higher.

**Key words**: Chilopoda, Diplopoda, ecotone, migration, barrier, transition zone

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## INTRODUCTION

The phenomena observed at the edge zones of both natural and man-transformed ecosystems have long been of interest to biologists. Increased in both species diversity and the density of the organisms living in these zones, e.g., at a forest edge, are believed to be associated with the so-called 'contact effect' (LEOPOLD 1930).

According to the definition of DI CASTRI *et al.* (1988), the ecotone is a zone subjected to both temporal and spatial change where exchange between the adjacent ecological systems takes place, both an exchange of species and an exchange of energy and matter. For some organisms, the ecotone is an absolute environmental barrier, while for others it is their basic place of dwelling.

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In the present paper, the ecotones analyzed were as follows: the edge zone of a meadow, the edge zone of a few-year old abandoned agricultural field; and a few-year old abandoned railway line together with its embankment, situated at the edge of a forest.

This work was part of a research program for establishing the field-forest borderlines, carried out by a team at the Department of Forest Protection and Ecology of WAU, a part of the faunistic material collected was Diplopoda and Chilopoda.

## MATERIAL AND METHODS

The present study project was conducted in the years 1996–1997 and it covered five ecotone plots n the Forest Districts Miastko and Przechlewo in northwestern Poland. In each ecotone zone studied, five pitfall traps were installed in each of six rows following the design of a 6x6m square grid. A total of 36 Barber's traps were thus installed. The first row of traps, denoted with the letter A, was each time situated in an open area, that is, it was the most distant from the ecotone forest stand. The consecutive rows of traps B, C and D were installed in the ecotone zone towards the forest. The last two rows, E and F, were installed in the forest stand belt next to the ecotone (Figure).

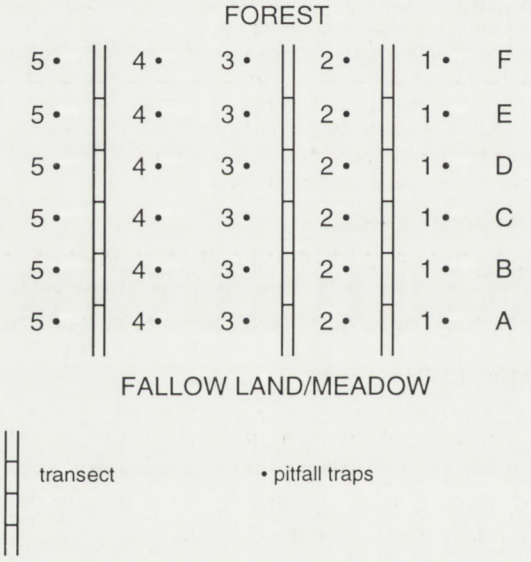


Figure Distribution map of transects in the study ecotones.

### Site descriptions

1. The study plot with *Sorbus aucuparia*, referred to as **Sa**, was located at the border with a fallow land in the area of Miastko Forest District. The stand consists of 55 years old Scots pine growing on post-agricultural land. The potential community is *Fago-Quercetum petreae*, altered however as a result of the pinetization process. The high fertility of the site is confirmed by the presence of the following plant species: *Sorbus aucuparia, Sambucus nigra, Quercus robur, Viburnum opulus*. The adjacent community is transitional in character, it is situated at the border with the forest, *Rhytidiadelphus squarosus-Campanula rotundifolia*, and is changing towards fallow land supporting a *Lolio-Cynasuretum* community.

2. The study plot with *Fagus sylvatica*, is referred to as **Fs**. This plot was located at the forest stand-fallow land border in the area of Miastko Forest District. The stand of

beech and oak is about 90 years old and represents a *Fago-Quercetum petreae* site. It borders onto fallow land. At the stand edge, a belt of birch-aspen is present; with spontaneous regeneration of beech and hornbeam invading the fallow, where at present a community of *Lolio-Cynasuretum* prevails.

3. The research plot with *Populus tremula*, referred to as **Pt**, was located at the border with a meadow in the area of Miastko Forest District. This 65-year old pine and birch stand represents a *Fago-Quercetum petreae* community, as can be judged from the herbaceous vegetation. This community has been transformed following the clear-cutting of the forest. Another community of transitional character is *Populus tremula-Holcus mollis*, which borders a managed meadow, the latter representing a *Lolio-Cynasuretum* community.

4. The research plot with *Cytisus scoparius*, referred to as **Cs**, was situated at the border of a forest and a managed meadow in the area of Miastko Forest District. The stand, comprising 25-year old pine and birch, is a juvenile *Fago-Quercetum petreae* community separated from the meadow by dense patches of broom (*Cytisus scoparius*). The managed meadow represents a *Lolio-Cynasuretum* community.

5. The research plot with *Pinus sylvestris*, referred to as **Ps**, was situated in the Przechlewo Forest District. The forest edge is in contact with the abandoned Miastko-Człuchów railway line. On the side of the railway embankment, there is a dense belt of 25 to 30-year old Scots pine supporting a *Leucobryo-Pinetum* community; this pine belt is separated from the stand and the railway by deforested fire breaks. On the slope of the hill, and along the abandoned railway line, there is a *Spergulo-vernalis-Corynephoretum* community.

## RESULTS

### The ecotone with *Sorbus aucuparia* (Sa)

In the ecotone zone where *Sorbus aucuparia* was the dominant plant, 48 Diplopoda individuals were captured, belonging to 6 species (Table I). Among them, there were two dominant species: *Polydesmus complanatus* and *Mastigophorophyllon saxonicum* (caught mainly in the autumn). Chilopoda were represented by a total of 39 individuals (7 species), with two dominants: *Lithobius curtipes* and *L. forficatus*. In the ecotone established at this plot the lowest number of Diplopoda was caught. The plant community is potentially *Fago-Quercetum petreae*, at present it contains a significant amout of pine (pinetization process) on abandoned agricultural land. Zone A, covered with grasses growing on the fallow, was characterized by the smallest number of diplopods and chilopods. Zones B, C and D combined are to be considered as transitional and partly also the E zone with a clear contact effect, i.e., an increased frequency of occurrence of individuals and species of Diplopoda and Chilopoda.

### The ecotone with *Fagus sylvatica* (Fs)

In the ecotone zone with *Fagus sylvatica* as the dominant plant species, 291 individuals of Diplopoda, representing 7 species, and 87 specimens of Chilopoda, of 9

Table I. Species of Diplopoda and Chilopoda found in the ecotone with *Sorbus aucuparia* (Sa).

| No | Species | Zones | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| | Diplopoda | | | | | | | |
| 1. | *Polydesmus complanatus* (LINNAEUS, 1761) | 2 | 6 | 4 | 7 | 7 | 5 | 31 |
| 2. | *Ommatoiulus sabulosus* (LINNAEUS, 1758) | | | | 1 | | | 1 |
| 3. | *Julus scandinavius* LATZEL, 1884 | 1 | | | | 1 | | 2 |
| 4. | *Mastigophorophyllon saxonicum* VERHOEFF, 1910 | | 2 | 5 | 3 | 2 | | 12 |
| 5. | *Proteroiulus fuscus* (AM STEIN, 1857) | | | | 1 | | | 1 |
| 6. | *Nopoiulus kochii* (GERVAIS, 1847) | | | | | | 1 | 1 |
| | Total: | 3 | 8 | 9 | 12 | 11 | 5 | 48 |
| | Chilopoda | | | | | | | |
| 1. | *Lithobius forficatus* (LINNAEUS, 1758) | | 2 | 2 | 4 | 3 | | 11 |
| 2. | *L. erythrocephalus* C. L. KOCH, 1847 | | | 1 | | 1 | | 2 |
| 3. | *L. crassipes* L. KOCH, 1862 | | 2 | 2 | 1 | 1 | 2 | 8 |
| 4. | *L. curtipes* C. L. KOCH, 1847 | | | 1 | 4 | 6 | 4 | 15 |
| 5. | *L. m. microps* MEINERT, 1868 | | 1 | | | | | 1 |
| 6. | *L. mutabilis* L. KOCH, 1862 | | 1 | | | | | 1 |
| 7. | *Geophilus proximus* C. L. KOCH, 1847 | | 1 | | | | | 1 |
| | Total: | | 7 | 6 | 9 | 11 | 6 | 39 |
| | Total Diplopoda and Chilopoda | | | | 87 | | | |

species, were captured. All three dominant Diplopoda species, *Ommatoiulus sabulosus*, *Julus scandinavius*, and *M. saxonicum*, were also frequent in the transitional zone BCD. In the oak-beech forest stand (zone EF), the frequency of occurrence of both myriapod groups was decreased (Table II).

**The ecotone with *Populus tremula* (Pt)**

In this ecotone zone, with *Populus tremula*, a total of 873 Diplopoda individuals were caught, representing 8 species, and only 10 individuals of Chilopoda, representing 5 species. The clear dominants were *J. scandinavius* and *O. sabulosus*. Somewhat less frequent were *M. saxonicum*, *P. complanatus* and *Leptoiulus proximus* (Table III).

In the zone (earlier an arable field) consisting of a grass community, the number of Diplopoda captured was the lowest, with no Chilopoda at all. In the second zone (BCD and partly in E), all transitional in character, the "contact effect" was the most pronounced, supporting both the maximum number of individuals and the highest species diversity.

In zone F, the core part of the forest stand supporting a pine-birch forest *Fago-Quercetum-petreae* in character, a drop in the number of Diplopoda captures was observed.

Table II. Species of Diplopoda and Chilopoda found in the ecotone with *Fagus silvatica* (Fs).

| No | Species | Zones | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| | Diplopoda | | | | | | | |
| 1. | *Polydesmus complanatus* | | 1 | 1 | 5 | 1 | | 8 |
| 2. | *Ommatoiulus sabulosus* | 16 | 38 | 28 | 18 | 8 | 20 | 128 |
| 3. | *Julus scandinavius* | 8 | 18 | 35 | 18 | 13 | 15 | 107 |
| 4. | *Mastigophorophyllon saxonicum* | | 7 | 9 | 10 | 6 | 3 | 35 |
| 5. | *Leptoiulus proximus proximus* (NĚMEC, 1896) | | 1 | | 1 | 3 | 1 | 6 |
| 6. | *Cylindroiulus* sp. | | | 2 | 4 | | | 6 |
| 7. | *Polydesmus denticulatus* C. L. KOCH, 1847 | | | 1 | | | | 1 |
| | Total: | 24 | 65 | 76 | 56 | 31 | 39 | 291 |
| | Chilopoda | | | | | | | |
| 1. | *Lithobius forficatus* | 1 | 1 | | 1 | | 1 | 4 |
| 2. | *L. erythrocephalus* | 3 | 10 | 4 | 6 | 1 | 1 | 25 |
| 3. | *L. mutabilis* | 6 | 8 | 2 | 11 | 7 | 7 | 41 |
| 4. | *L. crassipes* | | | 1 | 1 | 2 | 1 | 5 |
| 5. | *L. calcaratus* C. L. KOCH, 1844 | 1 | | 2 | | | | 3 |
| 6. | *L. muticus* C. L. KOCH, 1847 | | 1 | 2 | 1 | | 1 | 5 |
| 7. | *L. agilis* C. L. KOCH, 1844 | | | | | 1 | | 1 |
| 8. | *L. lapidicola* MEINERT, 1872 | 1 | | | | | | 1 |
| 9. | *Geophilus proximus* | | 1 | 1 | | | | 2 |
| | Total: | 12 | 21 | 12 | 20 | 11 | 11 | 87 |
| | Total Diplopoda and Chilopoda | | | | 378 | | | |

**The ecotone with *Cytisus scoparius* (Cs)**

This ecotone zone with *Cytisus scoparius* was the richest habitat for Diplopoda. A total of 1034 individuals representing 12 species were caught. Chilopoda were infrequent with 14 specimens representing 4 species (Table IV). Regardless of the ecotone zone, the dominants were *J. scandinavius* and *O. sabulosus*. In addition, *P. complanatus*, *L. proximus* and *M. saxonicum* were frequent. In the A zone located in a managed meadow (abandoned arable field), the lowest numbers of Diplopoda individuals and species were observed. In zones B, C and, partly, D, with the presence of *Cytisus scoparius* and *Rubus idaeus*, the largest number of individuals and a total of 7 Diplopoda species were found. It is noteworthy that, in zone D, typical forest species emerged: *Proteroiulus fuscus* and *Polyzonium germanicum*; while in zone E, *Nemasoma varicorne*. Also, in the core part of the stand, growing as a juvenile *Fago-Quercetum petreae* community, the above Diplopoda were frequent.

**The ecotone with *Pinus sylvestris* (Ps)**

In the ecotone zone of the *Leucobryo-Pinetum* community with *Pinus sylvestris*, a total of 210 Diplopoda individuals were collected, representing 3 species, and 29 Chilopoda specimens of 5 species; of the latter group, *L. forficatus* was dominant (Table V).

Table III. Species of Diplopoda and Chilopoda found in the ecotone with *Populus tremula* (Pt).

| No | Species | Zones | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| | Diplopoda | | | | | | | |
| 1. | *Polydesmus complanatus* | 1 | | 5 | 19 | 7 | 10 | 42 |
| 2. | *Ommatoiulus sabulosus* | 22 | 19 | 40 | 71 | 47 | 5 | 204 |
| 3. | *Julus scandinavius* | 33 | 68 | 124 | 90 | 108 | 95 | 518 |
| 4. | *Mastigophorophyllon saxonicum* | 7 | 6 | 10 | 16 | 13 | 11 | 63 |
| 5. | *Leptoiulus proximus proximus* | | 2 | 12 | 5 | 10 | 4 | 33 |
| 6. | *Cylindroiulus* sp. | | | 1 | 1 | 1 | 6 | 9 |
| 7. | *Polyzonium germanicum* BRANDT, 1837 | 1 | | 1 | | 1 | | 3 |
| 8. | *Ophyiulus fallax* (MEINERT, 1868) | | | 1 | | | | 1 |
| | Total: | 64 | 95 | 194 | 202 | 187 | 131 | 873 |
| | Chilopoda | | | | | | | |
| 1. | *Geophilus proximus* | | | 1 | | | | 1 |
| 2. | *Lithobius curtipes* | | | | | 1 | | 1 |
| 3. | *L. mutabilis* | | | | 2 | 1 | | 3 |
| 4. | *L. forficatus* | | | | 1 | | | 1 |
| 5. | *L. erythrocephalus* | | 2 | | 1 | | 1 | 4 |
| | Total: | | 2 | 1 | 4 | 2 | 1 | 10 |
| | Total Diplopoda and Chilopoda | | | | 883 | | | |

Among the Diplopoda, *O. sabulosus* was dominant, found in all zones, from A through F. This species is characterized by its tendency towards migration to open areas. This last feature is the reason why this species was especially abundant in zone A, i.e., nearly half of all individuals captured in the zone (in turf on the hill and abandoned railway line). This was the zone where two other species were captured, *P. fuscus* and *Cylindroiulus* sp., both were absent from the remaining zones.

In zones B and C, (both in a juvenile pine forest and separated from turf by a ploughed fire-break which served as a natural barrier preventing Myriapoda migrations), the numbers of individuals were clearly depressed, although higher than those in the DEF old-growth stand. Chilopoda were more frequent in zones B to E. The fact that this ecotone type did not support an increased species diversity of Diplopoda was remarkable, while in the open zone A half of all individuals were caught. The situation was the reverse in the predatory Chilopoda.

## DISCUSSION

During the two vegetative seasons covered by the present study, a total of 2456 Diplopoda and 179 Chilopoda individuals were captured using pitfall traps in five different ecotone zones (Table VI). Diplopoda were represented by 13 species, of which two, *Julus scandinavius* and *Ommatoiulus sabulosus*, were dominant in nearly all of the plots, with their shares amounting to 47.2% and 34.2%, respectively.

Table IV. Species of Diplopoda and Chilopoda found in the ecotone with *Cytisus scoparius* (Cs).

| No | Species | Zones | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| | Diplopoda | | | | | | | |
| 1. | *Polydesmus complanatus* | | 26 | 5 | 21 | 17 | 9 | 78 |
| 2. | *Ommatoiulus sabulosus* | 34 | 94 | 77 | 45 | 38 | 22 | 310 |
| 3. | *Julus scandinavius* | 25 | 149 | 167 | 70 | 50 | 71 | 532 |
| 4. | *Mastigophorophyllon saxonicum* | 2 | 10 | 5 | 5 | 4 | 3 | 29 |
| 5. | *Leptoiulus proximus proximus* | 1 | 13 | 23 | 12 | 11 | 10 | 70 |
| 6. | *Proteroiulus fuscus* | | | | 8 | | | 8 |
| 7. | *Nemasoma varicorne* C. L. KOCH, 1847 | | | | | 1 | | 1 |
| 8. | *Cylindroiulus* sp. | | 1 | 1 | | | | 2 |
| 9. | *Polyzonium germanicum* | | | | 1 | | | 1 |
| 10. | *Polydesmus denticulatus* | | | | | 1 | | 1 |
| 11. | *Ophyiulus fallax* | | | | | | 1 | 1 |
| 12. | *Blaniulus guttulatus* (FABRICIUS, 1798) | | 1 | | | | | 1 |
| | Total: | 62 | 294 | 278 | 162 | 122 | 116 | 1034 |
| | Chilopoda | | | | | | | |
| 1. | *Lithobius forficatus* | | 1 | | 2 | 4 | | 7 |
| 2. | *L. erythrocephalus* | | | 3 | | | | 3 |
| 3. | *L. mutabilis* | | | | 1 | 1 | | 2 |
| 4. | *L. crassipes* | | | | | 1 | 1 | 2 |
| | Total: | | 1 | 3 | 3 | 6 | 1 | 14 |
| | Total Diplopoda and Chilopoda | | | | 1048 | | | |

Table V. Species of Diplopoda and Chilopoda found in the ecotone with *Pinus silvestris* (Ps).

| No | Species | Zones | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | |
| | Diplopoda | | | | | | | |
| 1. | *Ommatoiulus sabulosus* | 96 | 38 | 24 | 9 | 27 | 3 | 197 |
| 2. | *Proteroiulus fuscus* | 8 | | | | | | 8 |
| 3. | *Cylindroiulus* sp. | 4 | | | | 1 | | 5 |
| | Total: | 108 | 38 | 24 | 9 | 28 | 3 | 210 |
| | Chilopoda | | | | | | | |
| 1. | *Lithobius forficatus* | 1 | 3 | 6 | 4 | 4 | 3 | 21 |
| 2. | *L. muticus* | 1 | | | 1 | | | 2 |
| 3. | *L. erythrocephalus* | | 1 | 1 | | 2 | | 4 |
| 4. | *L. crassipes* | | | | | 1 | | 1 |
| 5. | *Geophilus proximus* | | 1 | | | | | 1 |
| | Total: | 2 | 5 | 7 | 5 | 7 | 3 | 29 |
| | Total Diplopoda and Chilopoda | | | | 239 | | | |

Table VI. Species of Diplopoda and Chilopoda found in all study ecotones (Sa, Fs, Pt, Cs, Ps).

| No | Species | Ecotones | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Sa | Fs | Pt | Cs | Ps | |
| | Diplopoda | | | | | | |
| 1. | *Julus scandinavius* | 2 | 107 | 518 | 532 | – | 1159 |
| 2. | *Ommatoiulus sabulosus* | 1 | 128 | 204 | 310 | 197 | 840 |
| 3. | *Mastigophorophyllon saxonicum* | 12 | 35 | 63 | 29 | – | 139 |
| 4. | *Leptoiulus proximus proximus* | – | 6 | 33 | 70 | – | 109 |
| 5. | *Polydesmus complanatus* | 31 | 8 | 42 | 78 | – | 159 |
| 6. | *Cylindroiulus* sp. | – | 6 | 9 | 2 | 5 | 22 |
| 7. | *Proteroiulus fuscus* | 1 | – | – | 8 | 8 | 17 |
| 8. | *Polyzonium germanicum* | – | – | 3 | 1 | – | 4 |
| 9. | *Ophyiulus fallax* | – | – | 1 | 1 | – | 2 |
| 10. | *Polydesmus denticulatus* | – | 1 | – | 1 | – | 2 |
| 11. | *Blaniulus guttulatus* | – | – | – | 1 | – | 1 |
| 12. | *Nemasoma varicorne* | – | – | – | 1 | – | 1 |
| 13. | *Nopoiulus kochii* | 1 | – | – | – | – | 1 |
| | Total: | 48 | 291 | 837 | 1034 | 210 | 2456 |
| | Chilopoda | | | | | | |
| 1. | *Lithobius forficatus* | 11 | 4 | 1 | 7 | 21 | 44 |
| 2. | *L. erythrocephalus* | 2 | 25 | 4 | 3 | 4 | 38 |
| 3. | *L. mutabilis* | 1 | 41 | 3 | 2 | – | 47 |
| 4. | *L. muticus* | – | 5 | – | – | 2 | 7 |
| 5. | *L. lapidicola* | – | 1 | – | – | – | 1 |
| 6. | *L. crassipes* | 8 | 5 | – | 2 | 1 | 16 |
| 7. | *L. curtipes* | 15 | – | 1 | – | – | 16 |
| 8. | *L. calcaratus* | – | 3 | – | – | – | 3 |
| 9. | *L. microps microps* | 1 | – | – | – | – | 1 |
| 10. | *L. agilis agilis* | – | 1 | – | – | – | 1 |
| 11. | *Geophilus proximus* | 1 | 2 | 1 | – | 1 | 5 |
| | Total: | 39 | 87 | 10 | 14 | 29 | 179 |

The following species were frequent: *Polydesmus complanatus* (6.5%) [particularly so in the ecotones with *Sorbus aucuparia* (Sa), *Cytisus scoparius* (Cs) and *Populus tremula* (Pt)]; and *Mastigophorophyllon saxonicum* (5.7%) [most frequent during the autumn]; and *Leptoiulus proximus* (4.4%).

The dominants, *J. scandinavius* and *O. sabulosus*, are known to have migrating tendencies and appear to be especially strongly inclined to migrate to open areas through transitional communities. These two species were the most abundant (also with a high proportion of juveniles), in the ecotones with *Cytisus scoparius*, *Populus tremula* and *Fagus sylvatica*.

When considering the possibilities for species exchange, both in terms of population density and biomass, as well of energy exchange between communities, the ecotone zone plays a double role. For some species, it can be a migration barrier, for others it can also be a transition zone (ŁUCZAK *et al.* 1995). The latter role of an ecotone was observed, e.g., for 5 Diplopoda species in the ecotone with *Cytisus scoparius* (Cs), for 3 species in the ecotone with *Populus tremula* and for 2 species in the ecotone with *Fagus sylvatica* (Fs).

As an example of a specific barrier, the ecotones with *Pinus sylvestris* and *Sorbus aucuparia* can be mentioned. It is unclear, however, whether it is the poor and uniform habitat of a *Leucobryo-Pinetum* community or the establishment of a *Sorbus aucuparia* ecotone in a potential *Fago-Quercetum petreae* community that is a barrier to diplopod migrations. Chilopoda, being predators, occurred in far smaller numbers and, often only single individuals were found. Only three species, *Lithobius mutabilis, L. forficatus,* and *L. erythrocephalus,* the most common in the Polish fauna (KACZMAREK 1979), were found frequently in the present study. The ecotone with *Fagus sylvatica* was, for most of the Chilopoda species recorded, a transit zone and it was this ecotone where they occurred most frequently. Unlike Diplopoda, Chilopoda were also found in higher numbers in the ecotones with *Pinus sylvestris* and *Sorbus aucuparia.*

Among the Diplopoda, it is mostly the Julida species, in particular *Julus scandinavius, Ommatoiulus sabulosus, Ophyiulus fallax, Cylindroiulus* sp. (Julidae), *Proteroiulus fuscus, Blaniulus guttulatus, Nopoiulus kochii* (Blaniulidae), and *Nemasoma varicorne* (Nemasomatidae), that dominate the fauna of the ecotone. This is remarkable, yet hardly surprising. It agrees well with evidence that it is the juloid morphotype that appears the best adapted to various adverse environments (KIME & GOLOVATCH 2000).

## CONCLUSIONS

1. In the ecotones under study, a total of 2456 individuals, from 13 Diplopoda species, were identified, as well as 179 specimens of Chilopoda belonging to 11 species.

2. In richer ecotones (Cs, Pt and Fs), *Julus scandinavius* and *Ommatoiulus sabulosus* (both Diplopoda, Julidae) were clearly dominant. The highest number of individuals and the highest species diversity also characterized these ecotones. The border effect in these ecotones was pronounced best.

3. Of the Chilopoda, three species, all most common in the Polish fauna, *Lithobius mutabilis, L. forficatus,* and *L. erythrocephalus,* were found the most frequently occurring in the bulk of the ecotones under study.

4. The ecotones with *Fagus sylvatica* and *Sorbus aucuparia* were distinctive because of their wider species spectra and higher levels of Chilopoda abundance.

5. The ecotones partly serve as a migration barrier, partly a transition zone, for the principal taxa of Diplopoda and Chilopoda, because in an ecotone zone both their abundance and density are generally increased.

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