The millipede fauna of the Dráva region, southern Hungary (Diplopoda)

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Summarizing the data from the literature and pitfall traps used in 1993, and extensive collections since 1995, 30 millipede species are enumerated for the Dráva Region, at the southwestern border of Hungary. Of these, 15 species were already recorded in an earlier collection by Loksa (1981) in the juniper woodland of Barcs. The julid species *Unciger transsilvanicus* Verhoeff, 1899, proved to be new to the fauna of Hungary. *Brachydesmus attemsii* (Verhoeff, 1895), *Xestoiulus laeticollis dudichi* (Verhoeff, 1927), *Allajulus dicentrus* (Latzel, 1884) and *Polydesmus edentulus* C. L. Koch, 1847 were only known from one or two occurrences before. Two chordeumatid species listed by Loksa (*Melogona broelemanni* [Verhoeff, 1897] and *Ochogona caroli* [Rothenbühler, 1900]) could not been recollected. An attempt was made to show similarities between the different vegetational habitat types based on their millipede fauna, using cluster analysis on similarity coefficients of presence-absence data.

Keywords: millipede, Diplopoda, Hungary.

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Introduction

The Dráva Region is a predominantly pristine riverine forest belt along the River Dráva at the southern border of Hungary. It has recently (on the 17th of April, 1996) been designated as part of the "Duna-Dráva National Park" which is the sixth national park of Hungary, named after the two main rivers of the area (Fig. 1).

Zoological research in the Dráva Region was initiated four years ago, and partially summarised by a comprehensive volume (Uherkovich 1995). Investigation on millipedes has also been started, and the preliminary data showed interesting faunistic results (Korsós 1995).

Up to the beginning of the study reported in the present paper, 15 diplopod species were known from the region, collected mainly by pitfall traps (Loksa 1981). The present paper puts on record a total of 30 species, and their relationship to the different habitat types of the region is also examined.

Material and methods

The Dráva Region occurs in the southwestern counties Somogy and Baranya, from the village

Fig. 1. The Duna-Dráva National Park (black area) in the southern part of Hungary. The Dráva Region situates 120 km along the River Dráva

Tab. 1. List of millipede species found in the Dráva Region.

POLYXENIDA
1. *Polyxenus lagurus* (Linnaeus, 1758)

GLOMERIDA
2. *Glomeris hexasticha* Brandt, 1833

POLYZONIIDA
3. *Polyzonium germanicum* Brandt, 1837

CHORDEUMATIDA
4. *Craspedosoma rawlinsii* Leach, 1814
5. *Craspedosoma transsilvanicum* (Verhoeff, 1897)
6. *Mastigona bosniensis* (Verhoeff, 1897)
7. *Melogona broelemanni* (Verhoeff, 1897)+
8. *Ochogona caroli* (Rothenbühler, 1900)+

JULIDA
9. *Allajulus dicentrus* (Latzel, 1884)
10. *Brachyiulus bagnalli* (Brölemann, 1924)
11. *Cylindroiulus abaligetanus* (Verhoeff, 1901)
12. *Cylindroiulus boleti* (C. L. Koch, 1847)
13. *Cylindroiulus luridus* (C. L. Koch, 1847)
14. *Enantiulus nanus* (Latzel, 1884)
15. *Julus terrestris* Linnaeus, 1758
16. *Leptoiulus proximus* (Nemec, 1896)
17. *Megaphyllum projectum* Verhoeff, 1894
18. *Megaphyllum unilineatum* (C. L. Koch, 1838)
19. *Xestoiulus laeticollis dudichi* (Verhoeff, 1927)
20. *Nopoiulus kochii* (Gervais, 1847)
21. *Ommatoiulus sabulosus* (Linnaeus, 1758)
22. *Ophyiulus pilosus* (Newport, 1842)
23. *Unciger foetidus* (C. L. Koch, 1838)
24. *Unciger transsilvanicus* Verhoeff, 1899*

POLYDESMIDA
25. *Brachydesmus attemsii* (Verhoeff, 1895)
26. *Polydesmus collaris* C. L. Koch, 1847
27. *Polydesmus complanatus* (Linnaeus, 1761)
28. *Polydesmus denticulatus* C. L. Koch, 1847
29. *Polydesmus edentulus* C. L. Koch, 1847
30. *Strongylosoma stigmatosum* (Eichwald, 1830)

*New to the fauna of Hungary
+Collected only by Loksa (1981)

Örtilos to Drávaszabolcs about 120 km along the River Dráva (Fig. 1). The National Park established here includes several formerly protected areas, e.g., the juniper woodland of Barcs. Forests of the region can be grouped into three major vegetation types which can also be observed as zones of increasing distance from the river: willow (Salicetum triandrae) and willow-poplar (Salicetum albae-fragilis) forests (commonly called "softwood" groves; they are frequently flooded in early spring), and drier "hardwood" groves, such as oak-ash-elm (Fraxino pannonicae-Ulmetum), alder (Dryopteridi-Alnetum), or hornbeam-oak forests (Querco-Carpinetum).

Collections were carried out in 20 different localities in 1993 (pitfall traps), and then systematically since 1995 (pitfall traps, sieving, hand collecting). The material is shared between the Hungarian Natural History Museum, Budapest, and the natural history department of the local county museum (Janus Pannonius Museum, Pécs). Records were also put on 10 x 10 km UTM grid maps in order to be able to use them in national and international mapping projects.

Analysis of presence-absence data was carried out calculating Jaccard's binary similarity coefficients, and a dendrogram was computed with cluster analysis (weighted pair group average method) by using Multivariate Statistical Package Version 2.1 (Kovach 1986–1993).

Results and discussion

Faunistics

Altogether 30 millipede species were found in the Dráva Region (Tab. 1) which comprises about one third of the Hungarian diplopod fauna (cf. Korsós 1994). One species, *Unciger transsilvanicus*, proved to be new to the fauna of Hungary. *Allajulus dicentrus* formerly was only mentioned by Attems (1927) from "Westungarn", and its occurrence in Hungary was recently proved by a collecting trip of the British Myriapod Group (Korsós et al. 1997). It was also mentioned by Sziráki (1966) in his thesis about the identification of female millipedes, but without further detail of the occurrence. Mršić (1994) has data on this species only from the western part of Croatia, far from the Hungarian border. *Unciger transsilvanicus*, on the other hand, was not included in the catalogue of millipedes of former Yugoslavia

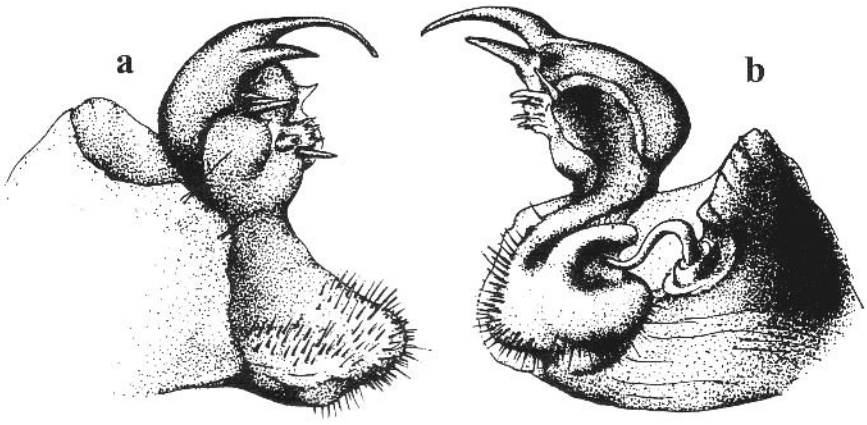

Fig. 2. *Brachydesmus attemsii* (Verhoeff, 1895), male gonopod, from the oak forest at Vajszló, UTM grid YL-38 (drawing by Kornélia Janisch)

(Strasser 1971), is missing from neighbouring Croatia (Mršić 1994), but was recorded from Serbia by Mršić (1985).

Three species of millipedes of the region (*Melogona broelemanni*, *Ochogona caroli*, *Nopoiulus kochii*) were only found by Loksa (1981: the first one as ssp. *gebhardti* Loksa, 1955) in the Barcs Landscape Protection Area, and have not yet been recollected. While the two chordeumatidans, together with *Craspedosoma transsilvanicum* forma *barcsicum* Loksa, 1981, need further evaluation, to find *Nopoiulus kochii*, having a tendency for synanthropy as well, is probably only question of time.

With the only previous myriapodological work in the region done by Loksa (1981), 15 species of Diplopoda were enumerated until 1993. The finding of other 15 species new to the region proves the necessity of specialist collections; pitfall traps can only sample a limited section of the total millipede fauna. Before the present study, the valid subspecies *Xestoiulus laeticollis dudichi* (= *Microiulus laeticollis dudichi*) was known only from a single locality in Bátorliget, western Hungary (Loksa 1953, Korsós 1991). Loksa (1962) described *Brachydesmus attemsii tenkesensis* from Tenkes Hill, close to the Dráva region, but the subspecies up to now has not been refound. The specimens collected now (Fig. 2) agree well with the nominal form, and I think that the stated characteristics of *tenkesensis* are within the variation range of the species. *Polydesmus* (Loksa 1961) and Szakonyfalu (as *Polydesmus edentulus bidentatus* forma *hungarica* Loksa, 1958), both in western Hungary. Another uncommon species, *Cylindroiulus abaligetanus*, was recently revised in the *C. horvathi* group (Korsós & Read 1994), it was only found in one locality.

Habitat analysis

After compiling the presence-absence matrix of the 30 species in 20 different localities (Tab. 2), a dendrogram was constructed to illustrate the relationship between the vegetational habitat types based on their millipede fauna (Fig. 3). Although the vegetation groups defined for the region by Kovács & Kárpáti (1973) are not clearly supported by the occurrences of the diplopod species, certain similarities between the habitats can be observed. Localities 9, 16 and 13, for example, are all characterised by the Querco-Carpinetum plant association, and are grouped together based on their millipede fauna as well. Locality 17 (Salicetum triandrae) goes with them too, however, though it is the only example of this vegetation type in the analysis. Several other Querco-Carpinetum associations (localities 8, 12, and 19) appeared, on the other hand, not together, which shows that the millipede fauna of a certain habitat is not always determined

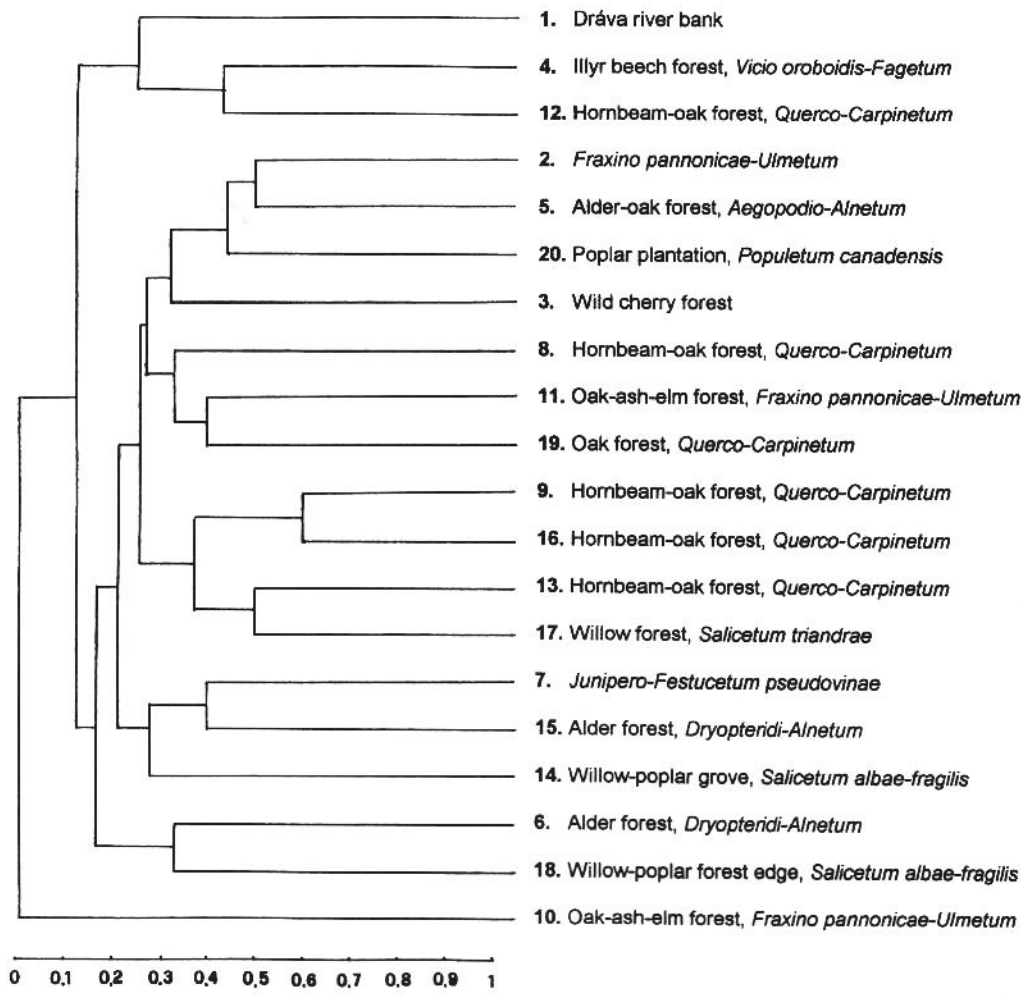

Fig. 3. Dendrogram showing the similarities of the 20 different habitat types based on their millipede fauna (for further explanation see text)

by the plant association in question.

Other examples point to the typical "hardwood" forests such as the pairs of localities 2 and 5, or 7 and 15. Locality 20 is a poplar plantation, but relatively recent, as can be seen from its similarity to the species rich hardwood forests. Its soil still keeps the potential to maintain the former edaphic invertebrate fauna.

Locality 4 at Bélavár is considered as the most valuable part of the National Park, due to its isolated, azonal beech forest (Vicio oroboidis-Fagetum). *Allajulus dicentrus* was found here. Locality 10, on the other hand, is an example of a typical Southern European plant association, Fraxino pannonicae-Ulmetum forest, which stands alone in the dendrogram possibly due to the relatively small sample size. Other habitats with similar plant associations (localities 2 and 11) are grouped elsewhere, which leads to the conclusion again, that the knowledge of the plant association of a given habitat type is insufficient to identify its millipede (and other soil invertebrate) fauna.

References

Attems, C. 1927. Über palaearktische Diplopoden. V. Revision mehrerer Iulidengattungen und neue Arten. — Arch.

Vegetation types of the localities	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1. Dráva river bank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	X	-	-	-	-	X	-	-	-	X
2. Fraxino pannonicae-Ulmetum	-	X	-	-	-	-	-	-	-	-	-	X	-	-	X	X	X	-	-	-	X	-	-	-	-	-	-	-	-	-
3. Wild cherry forest	-	-	X	X	-	-	-	-	-	-	-	X	-	-	-	X	X	-	-	-	-	-	-	-	-	-	X	-	-	
4. Illyr beech forest	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	X
5. Alder-oak forest	-	-	-	-	-	-	-	-	-	-	-	X	X	-	X	X	X	-	-	-	-	-	X	-	-	-	-	-	-	-
6. Alder forest	-	-	-	X	X	-	X	X	-	-	-	X	-	X	X	-	X	-	-	X	X	-	-	-	-	-	X	X	X	-
7. Junipero-Festucetum pseudovinae	-	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	-	-
8. Hornbeam-oak forest	X	X	-	X	-	-	-	-	-	-	-	X	X	-	-	-	X	X	-	-	X	-	X	-	-	-	X	-	-	X
9. Hornbeam-oak forest	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-
10. Oak-ash-elm forest	-	-	X	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11. Oak-ash-elm forest	-	-	-	-	-	-	-	-	-	X	-	X	-	-	-	-	X	X	-	-	-	X	-	-	-	-	X	-	-	-
12. Hornbeam-oak forest	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	X	X	X	-	-	-	X	-	-	-	-	-	-	-	-
13. Hornbeam-oak forest	-	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-
14. Willow-poplar grove	-	X	-	-	X	X	-	-	-	-	-	X	-	-	X	-	-	-	X	-	-	-	-	-	-	X	X	-	-	-
15. Alder forest	-	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
16. Hornbeam-oak forest	X	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-
17. Willow forest	-	-	-	-	X	X	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	-	-	-	X	-	-	-	-
18. Willow-poplar forest edge	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	X	X	X	X	-
19. Oak forest	-	-	-	-	X	-	-	-	-	-	-	X	X	-	-	-	X	-	-	-	-	X	X	-	X	-	X	-	-	-
20. Poplar plantation	-	-	-	-	X	X	-	-	-	X	-	X	-	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-

Tab. 2. Presence-absence matrix of 30 millipede species at 20 different localities. Species (numbers correspond to Tab. 1)

Naturg. 92A:116–253.

Korsós, Z. 1991. The centipede and millipede fauna of the Bátorliget Nature Reserves (Chilopoda and Diplopoda). Pp. 259–266 *in* Mahunka, S. (Ed.): The Bátorliget Nature Reserves - after forty years, 1990. 848 pp. Budapest.

Korsós, Z. 1994. Checklist, preliminary distribution maps, and bibliography of millipedes in Hungary (Diplopoda). — Miscnea zool. hung. 9:29–82.

Korsós, Z. 1995. Contribution to the knowledge of the millipede fauna of the Dráva Region (Diplopoda). Preliminary data. — Studia Pannonica, (A) Series Historico-Naturalis 8:31–36 (in Hungarian, with English summary).

Korsós, Z. & Read, H.J. 1994. Revision of the *horvathi* group and description of a new species of *Cylindroiulus* (Diplopoda: Julidae). — J. nat. Hist. 28:841–852.

Korsós, Z., Read, H J., Barber, A D., Gregory, S J., Hornung, E., Jones, R E., Kime, R D. & Lewis, J G E. 1997. Report on a collecting trip of the British Myriapod Group to Hungary in 1994. — Annls hist.-nat. Mus. natn. hung. 89. Budapest. (in press)

Kovach, L W. 1986–1993. Multivariate Statistical Package MVSP Plus Version 2.1.

Kovács, M. & Kárpáti, I. 1973. Die Vegetation der Überschwemmungsauen der Mur und der Drau. — Földrajzi Értesitö 22(1):21–31 (in Hungarian, with German summary).

Loksa, I. 1953. Millipede fauna of Bátorliget, Diplopoda. Pp. 178–181 *in* Székessy, V. (Ed.): The fauna and flora of Bátorliget. 486 pp. Budapest (in Hungarian).

Loksa, I. 1958. Eine neue Form von *Polydesmus (Acanthotarsius) edentulus bidentatus* Verh. aus Ungarn, und Beiträge zur Mikroskulptur der Polydesmiden. — Opuscula zoologica Budapest 2:49–54.

Loksa, I. 1961. Die Arthropoden des Kovácsi-Berges. — Állattani Közlemények 46:65–80 (in Hungarian, with German summary).

Loksa, I. 1962. Einige neue und wenig bekannte Diplopoden aus Ungarn. — Ann. Univ. Sci. Budapest 5:157–170.

Loksa, I. 1981. The Diplopoda- and Chilopoda-fauna of Juniper Woodland of Bares, Hungary. — Studia Pannonica, (A) Series Historico-Naturalis 2:45–52 (in Hungarian, with English summary).

Mršić, N. 1985. Contribution to the knowledge of diplopods (Myriapoda: Diplopoda) of Serbia. I. — Bull. Nat. Hist. Mus., Belgrade 40B:143–168.

Mršić, N. 1994. The Diplopoda (Myriapoda) of Croatia. — Razprave IV. razreda SAZU 35(12):219–296.

Strasser, K. 1971. Diplopoda. — Catalogus Faunae Jugoslaviae, III/4. 50 pp. Ljubljana.

Sziráki, Gy. 1966. Identification key to the millipede females of Hungary. — Univ. Dr. Thesis, Eötvös Loránd University. 52 pp. Budapest (in Hungarian).

Uherkovich, Á. (Ed.) 1995. The fauna of the Dráva Region, I. — Studia Pannonica, (A) Series Historico-Naturalis, No. 8. 210 pp. (in Hungarian, with English summaries).