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TERRESTRIAL ISOPODS (ISOPODA: ONISCIDEA) OF BARANYA (CROATIA)

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Farkas, S. & Krčmar, S.: Terrestrial isopods (Isopoda: Oniscidea) of Baranya (Croatia). Vol. 13, No. 2., 161–170, 2004, Zagreb.

Pitfall samples were taken during summer 2003 in 25 habitats of the Baranya triangle (Croatia) to describe the isopod fauna. The 125 traps caught a total of 2,808 isopods belonging to 11 species: *Haplophthalmus danicus*, *Hyloniscus riparius*, *Platyarthrus hoffmannseggii*, *Cylisticus convexus*, *Porcellium collicola*, *Protracheoniscus politus*, *Trachelipus ratzeburgii*, *Trachelipus nodulosus*, *Trachelipus rathkii*, *Armadillidium vulgare* and *Armadillidium zenckeri*. The most characteristic species of the area are *A. vulgare*, *T. rathkii*, *P. collicola* and *H. riparius*. The composition of the isopod assemblage proved to be similar to that in the Hungarian part of the Drava lowland.

Key words: Oniscidea, Isopoda, woodlice, isopod assemblages, pitfall traps, species composition, regional distribution, Croatia

Farkas, S. & Krčmar, S.: Fauna kopnenih jednakonožaca (Isopoda: Oniscidea) Baranje (Hrvatska). Vol. 13, No. 2., 161–170, 2004, Zagreb.

Tijekom ljeta 2003. godine na 25 postaja u hrvatskom dijelu Baranje uzorkovana je fauna kopnenih Isopoda metodom lovnih posuda. Uzorkovano je 2808 jednakonožaca uporabom 125 lovnih posuda. Uzorkovane jedinke svrstane su u 11 vrsta: *Haplophthalmus danicus*, *Hyloniscus riparius*, *Platyarthrus hoffmannseggii*, *Cylisticus convexus*, *Porcellium collicola*, *Protracheoniscus politus*, *Trachelipus ratzeburgii*, *Trachelipus nodulosus*, *Trachelipus rathkii*, *Armadillidium vulgare* i *Armadillidium zenckeri*. S obzirom na učestalost i lokalno rasprostranjenje za područje Baranje su najkarakterističnije vrste: *A. vulgare*, *T. rathkii*, *P. collicola* i *H. riparius*. Kvalitativni sastav faune jednakonožaca hrvatskog djela Baranje vrlo je sličan, te se poklapa s većinom vrsta faune jednakonožaca nizinskog područja Drave u Mađarskoj.

Ključne riječi: Oniscidea, Isopoda, kvalitativni sastav, regionalno rasprostranjenje, Hrvatska

INTRODUCTION

Faunistic data of the terrestrial isopod fauna of Croatia are given in KARAMAN (1965–66, 1966) and PLJAKIČ (1970). POTOČNIK (1989) enumerated 115 woodlice species from the country partly from a resume of the references and partly from the author's own investigations. However, there are no data from the territory of the »Baranya-triangle«. This area situated in the Northeast part of Croatia is framed by the Danube and Drava rivers and the Croatian-Hungarian state border. In the summer of 2003 researchers of the University of Kaposvár and of J. J. Strossmayer University, Osijek started a cenological investigation to describe the isopod fauna of the Baranya triangle. The results of this research are given in this paper.

STUDY SITES

A UTM grid (10×10 km) constituted the basis for definition of the study sites (Fig. 1). The investigation was carried out in 25 study sites, in 14 UTM squares. Many isopod species live mainly in natural, wet places. However, this lowland territory is situated in the flood plain of two rivers suitable for agricultural use, so it is in need

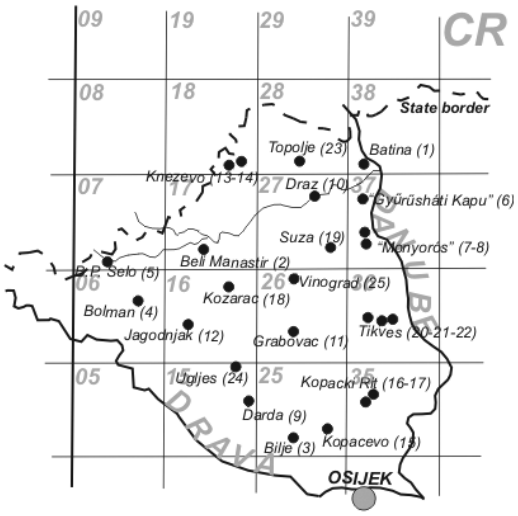

Fig. 1. Sampling sites in the »Baranya triangle«, Croatia.

of natural habitats. The most natural habitats suitable for sampling were woodlands (Tikveš, Grabovac, Kozarac, Haljevo, Kneževo) and nature protection areas (Kopački rit) but the extraordinarily dry summer of 2003 made sampling in these sites difficult as well. Synanthropic habitats were also examined (Batina, Suza, Kneževi Vinogradi). In some places (Kopački rit, Bilje) minefields held up the research. The

exact geographical co-ordinates of the sampling sites were determined by GPS (Magellan MAP 330). Vegetation type and other characteristics of the study sites are given in Tab. 1.

Tab. 1. List of sampling sites

	Place	Altitude-latitude (degree/min/sec)	UTM	Habitat
1	Batina	N 45°51′12″ E 018°51′13″	CR 38	Dry, weedy vegetation, bush of *Robinia pseudacacia, Sambucus nigra, Prunus spinosus* and *Vitis sp.*
2	Beli Manastir, Haljevo	N 45°44′17″ E 018°38′24″	CR17	Dry *Quercus* forest
3	Bilje	N 45°35′20″ E 018°44′41″	CR 25	Backwater of Drava, *Populus sp.* plantation, *Solidago sp.*
4	Bolman	N 45°43′22″ E 018°31′52″	CR 06	*Populus-Salix* grove, *Carex* sp.
5	Baranjsko Petro Selo	N 45°44′53″ E 018°27′53″	CR 07	Dry *Quercus* forest
6	Danube lowland 1 »Gyűrűsháti Kapu«	N 45°47′22″ E 018°49′58″	CR 37	*Populus* grove on the lowland of Danube
7	Danube lowland 2 »Monyorós 1«	N 45°45′20″ E 018°52′11″	CR 37	*Carex* field on the lowland of Danube
8	Danube lowland 3 »Monyorós 2«	N 45°45′20″ E 018°52′13″	CR 37	*Populus* forest with rotting trunks on the lowland of Danube
9	Darda	N 45°38′03″ E 018°41′19″	CR 15	*Salix* grove on the bank of a drying canal
10	Draž	N 45°49′13″ E 018°45′30″	CR 27	Dry *Robinia pseudacacia* forest with *Sambucus nigra*
11	Grabovac	N 45°41′27″ E 018°46′04″	CR 26	Wet spot with *Carex sp.* in a *Quercus* forest
12	Jagodnjak	N 45°41′13″ E 018°35′22″	CR 16	Bottom of a dried canal covered by *Salix sp., Prunus spinosus* and different weeds
13	Kneževo 1	N 45°52′10″ E 018°39′48″	CR 18	Dry *Robinia pseudacacia* forest
14	Kneževo 2	N 45°52′03″ E 018°39′57″	CR 18	Dry *Quercus* forest
15	Kopačevo	N 45°36′16″ E 018°47′49″	CR 25	*Populus sp.* plantation by the edge of the village
16	Kopački Rit 1 »Szakadás 1«	N 45°36′39″ E 018°48′16″	CR 35	Dry *Salix* grove in »Kopački rit«
17	Kopački Rit 2 »Szakadás 2«	N 45°36′36″ E 018°48′08″	CR 35	Dried bottom of a lake in »Kopački rit«
18	Kozarac	N 45°41′54″ E 018°40′51″	CR 16	Dry *Querus-Carpinus* forest
19	Suza	N 45°47′01″ E 018°47′09″	CR 27	*Populus* grove, under bark of rotting wood

20	Tikveš 1	N 45°41′44″ E 018°49′41″	CR 36	Dry *Quercus* forest
21	Tikveš 2	N 45°41′46″ E 018°49′41″	CR 36	Dry *Quercus* forest
22	Tikveš 3	N 45°41′52″ E 018°49′41″	CR 36	Bush of *Phragmites communis* and *Prunus spinosus*
23	Topolje	N 45°51′52″ E 018°45′34″	CR 28	Bank of the backwater of Danube, *Salix* grove and *Phragmites communis*
24	Uglješ	N 45°39′37″ E 018°38′56″	CR 15	Bank of a canal covered with different shrubs
25	Kneževi Vinogradi	N 45°45′42″ E 018°45′18″	CR 26	Dry, weedy vegetation, bush of *Robinia pseudacacia, Prunus spinosus* and *Solidago sp.*

METHODS

In total, 125 pitfall traps were exposed on July 29–30, 2003, in 25 different study sites of the investigated area (5 in each; the distances between the traps were 1.5–2 m). The plastic glasses used as traps had a diameter of 8 cm and a height of 12 cm, and were half filled with 65% ethylene-glycol. The traps were exposed for two weeks. They were emptied and picked up on August 14–15, 2003. No other collecting methods were applied. To calculate the relative abundance, the total number of individuals of a species was divided by the total number of the whole material. The regional distribution value of a species is the number of occurrences among the study sites (ranging from 1 to 25). As the results are based on a short sampling period, the material is not sufficient for a detailed statistical analysis. The collected specimens were kept in 75% ethyl-alcohol.

RESULTS

List of species

The codes of sampling sites are given in italics. Distribution of the individual species in Baranya is given in Figs. 2–12.

Trichoniscidae

***1. Haplophthalmus danicus* Budde-Lund, 1880** (Fig. 2)

19: 1♂, 1♀;

2. Hyloniscus riparius (C.L. Koch, 1838) (Fig. 3)

4: 2♂, ***10♀;*** *8*: 1♀; *9*: 8♀; *11*: 2♀; *12*: 2♂, ***6♀;*** *18*: 2♀; *19*: 3♀; *20*: 1♀; *24*: 2♂, 1♀;

Squamiferidae

3. *Platyarthrus hoffmannseggii* Brandt, 1833 (Fig. 4)

15: 1♂, 3♀;

Cylisticidae

***4. Cylisticus convexus* (De Geer, 1778)** (Fig. 5)

1: 1♂, 2♀; *11*: 1♂, 1♀; *20*: 3♂, 4♀;

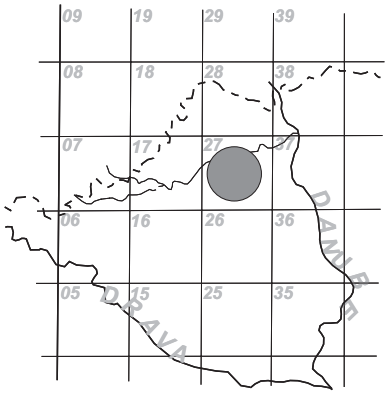

Fig. 2. *Haplophthalmus danicus* Budde-Lund, 1880

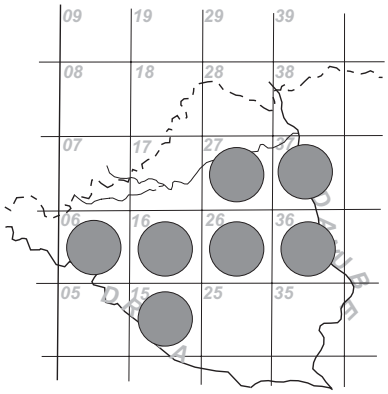

Fig. 3. *Hyloniscus riparius* (C.L. Koch, 1838)

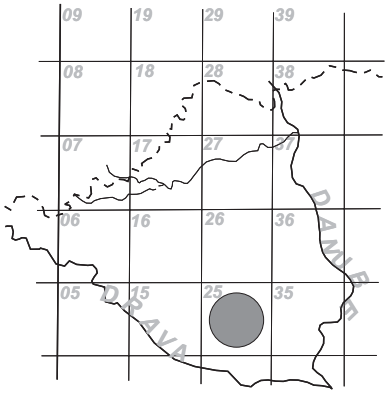

Fig. 4. *Platyarthrus hoffmannseggii* Brandt, 1833

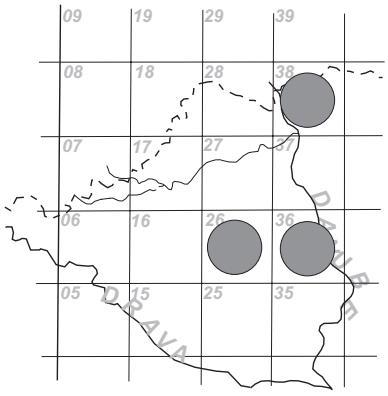

Fig. 5. *Cylisticus convexus* (De Geer, 1778)

Trachelipodidae

***5. Porcellium collicola* (Verhoeff, 1907)** (Fig. 6)

1: 1♂; *2*: 3♂, 14♀; *4*: 3♂, 16♀; *5*: 4♂, 94♀; *6*: 1♀; *10*: 4♀; *13*: 2♂, 113♀; *14*: 2♂, 12♀; *15*: 3♂, 10♀; *18*: 7♂, 23♀; *19*: 1♂, 1♀; *20*: 1♀; *21*: 5♀; *23*: 2♂, 5♀; *24*: 1♂, 8♀; *25*: 6♀;

***6. Protracheoniscus politus* (C.L. Koch, 1841)** (Fig. 7)

2: 1♂, 3♀; *18*: 8♂, 7♀;

***7. Trachelipus ratzeburgii* (Brandt, 1833)** (Fig. 8)

6: 1♀; *15*: 1♂; *19*: 1♀; *20*: 1♂;

***8. Trachelipus nodulosus* (C.L. Koch, 1838)** (Fig. 9)

6: 1♀; *9*: 6♀; *10*: 2♀; *12*: 4♂, 3♀; *13*: 5♂, 19♀; *14*: 1♂, 2♀; *15*: 7♂, 7♀; *17*: 1♀; *20*: 1♂, 14♀; *21*: 3♂, 1♀; *22*: 6♂, 13♀; *23*: 2♂, 5♀; *24*: 1♀; *25*: 12♂, 54♀;

9. ***Trachelipus rathkii* (Brandt, 1833)** (Fig. 10)

2: 1♀; *3*: 5♂, 27♀, 2 juv; *4*: 7♂, 6♀; *6*: 1♂, 18♀; *7*: 17♂, 34♀; *8*: 39♂, 54♀; *9*: 1♂; *11*: 6♀; *15*: 1♂; *16*: 7♂, 14♀; *18*: 13♂, 13♀; *20*: 12♂, 15♀; *21*: 57♂, 93♀; *22*: 2♀; *23*: 2♂, 4♀; *24*: 18♂, 39♀;

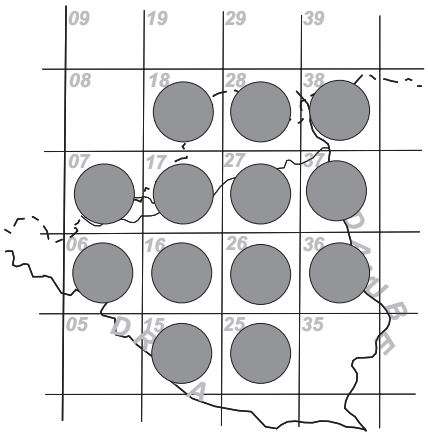

Fig. 6. *Porcellium collicola* (Verhoeff, 1907)

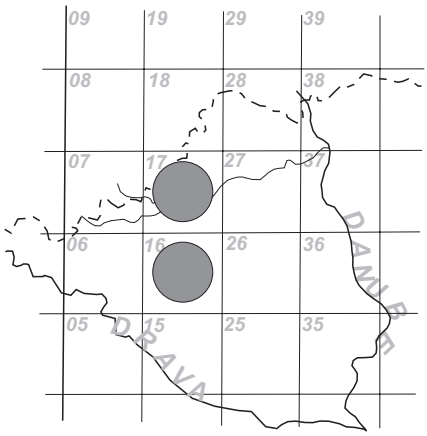

Fig. 7. *Protracheoniscus politus* (C.L. Koch, 1841)

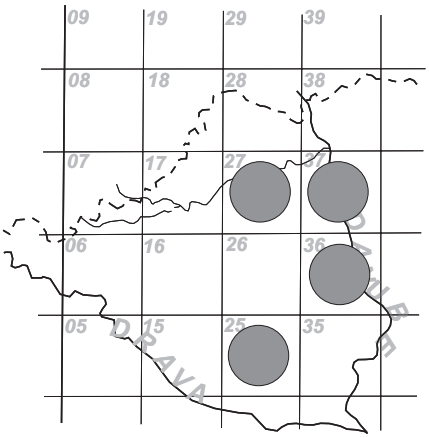

Fig. 8. *Trachelipus ratzeburgii* (Brandt, 1833)

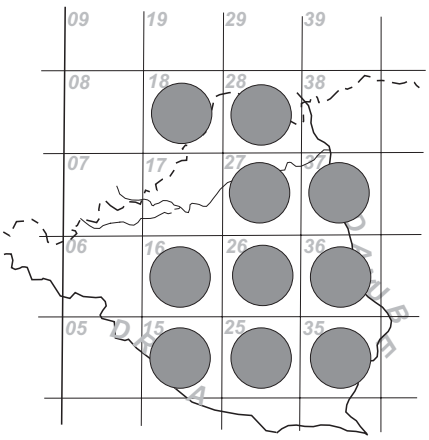

Fig. 9. *Trachelipus nodulosus* (C.L. Koch, 1838)

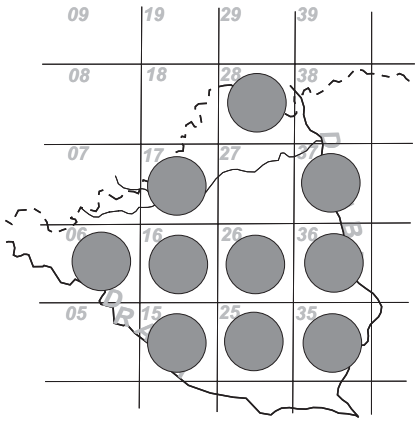

Fig. 10. *Trachelipus rathkii* (Brandt, 1833)

Armadillidiidae

***10. Armadillidium vulgare* (Latreille, 1804)** (Fig. 11)

1: 1♂, 4♀, 20 juv; *2*: 1♂, 2♀; *3*: 4♂, 6♀, 5 juv; *4*: 25♂, 46♀, 118 juv; *5*: 116♂, 226♀, 12 juv; *8*: 2 juv; *9*: 2♀; *10*: 49♂, 109♀, 47 juv; *11*: 8♂, 17♀, 90 juv; *12*: 6♂, 8♀, 3 juv; *13*: 1♀; *14*: 10♂, 11♀, 1 juv; *15*: 2♂, 3 juv; *18*: 3♂, 3♀, 1 juv; *19*: 20♂, 49♀, 13 juv; *20*: 1♂; *22*: 8♂, 7♀; *23*: 54♂, 150♀, 187 juv; *24*: 25♂, 23♀, 42 juv; *25*: 23♂, 40♀, 17 juv;

***11. Armadillidium zenckeri* Brandt, 1833** (Fig. 12)

7: 1♂; *8*: 14♂, 9♀; *24*: 9♂, 29♀, 11 juv;

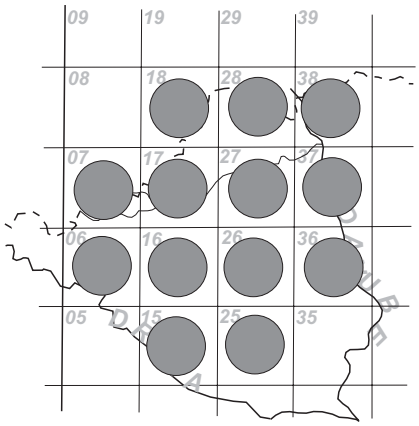

Fig. 11. *Armadillidium vulgare* (Latreille, 1804)

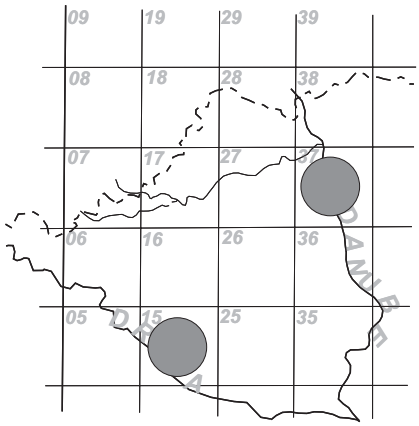

Fig. 12. *Armadillidium zenckeri* Brandt, 1833

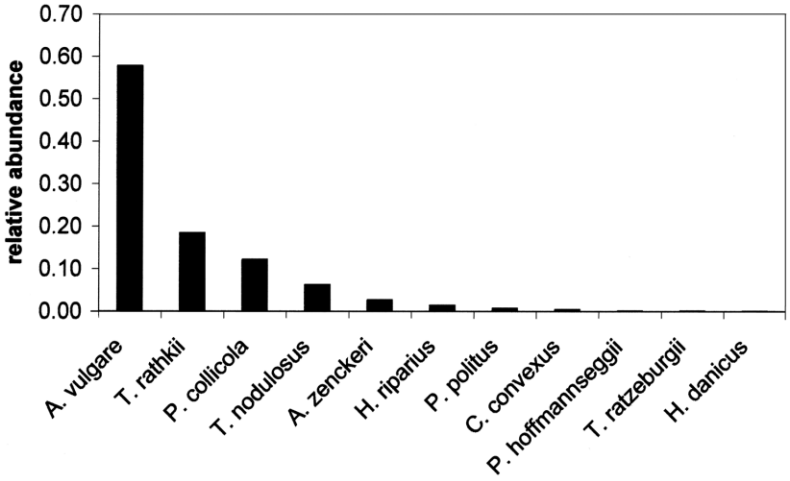

Fig. 13. Relative abundance of the species.

The 125 traps caught a total of 2,808 individuals belonging to 11 species. Most of them were *Armadillidium vulgare* (relative abundance: 0.57), *Trachelipus rathkii* (0.18), and *Porcellium collicola* (0.12) (Fig. 13.). These three species had the highest regional distribution value: *A. vulgare* came up in 20 (80%), *T. rathkii* and *P. collicola* in 16 (64%) of the 25 study sites (Tab. 2.).

Tab. 2. Regional distribution of the species.

		Number of study sites where a species was found
1.	***Armadillidium vulgare***	20
2.	***Trachelipus rathkii***	16
3.	***Porcellium collicola***	16
4.	***Trachelipus nodulosus***	14
5.	***Hyloniscus riparius***	9
6.	***Trachelipus ratzeburgii***	4
7.	***Armadillidium zenckeri***	3
8.	***Protracheoniscus politus***	2
9.	***Cylisticus convexus***	3
10.	***Platyarthrus hoffmannseggii***	1
11.	***Haplophthalmus danicus***	1

DISCUSSION

The 11 species account for 9% of the isopod fauna of Croatia and all of them are already known from the country (POTOČNIK, 1989). The low number of species could be explained by four reasons. (1) Some important characteristics of the area (agricultural activities, secondary and/or weedy vegetation, frequent disturbances, plain landscape with similar habitats) are not favourable for sensitive woodlice species. (2) With the sampling method applied we are able to collect mobile, active species but the small, cryptozoic isopods (for example *Trichoniscus pusillus*, *Haplophthalmus* species) that live under the bark of rotting trees or under stones, are missing from the collected material or are underestimated. They are very sensitive to the relative humidity of the air so they rarely leave their microhabitats. (3) During the extraordinary dry and hot summer 2003 many streams went dry, the water level of the lakes dropped by 60–70 cm so the wetland habitats where many isopod species usually live, became unsuitable for them. (4) Some species (for example *Porcellio scaber*) living in synanthropic habitats, in yards and cellars, were not collected.

Between 1995–98, FARKAS (1999) carried out general faunistic research with pitfall trapping in 71 sampling sites of the Drava lowland in Hungary. The sampling period was longer and the number of study sites was higher in that research, so it is difficult to compare in detail our data with those, but some basic similarities could be found. From the 15 species he referred to during the research, we found 10 in the Baranya triangle too. The 5 species not found are missing because of the reasons mentioned above. In the Hungarian part of Baranya the most widely distributed and most abundant species were *A. vulgare*, *P. collicola* and *T. rathkii*, as in the Baranya triangle. Thus we can establish that these three species are the most characteristic ones for the north side of the Drava lowland. *Hyloniscus riparius* also belongs to this group but this species is usually underestimated in pitfall trapped material. FARKAS (in press) pointed this out from the 62% of the 75 piece 10 × 10 km UTM unit that covers Somogy County in Hungary. *T. ratzeburgii* and *P. politus* live mainly in woodland habitats. In Hungary, FARKAS (1999) sampled 44 forest habitats (*Quercus*, *Populus*, *Pinus*, *Alnus*, *Robinia*) and found *T. ratzeburgii* in 15 of them. In Croatia this species was found in the Danube lowland, Kopačevo, Suza and Tikveš. The number of individuals was low in all these three areas. It is remarkable that altogether 19 specimens of *P. politus* came from two habitats only. This species is a constant and dominant element of Hungarian *Quercus* forests. In numbers it usually exceeds 60% of the isopod assemblages of those habitats. Further investigation is needed to explain its low proportion or absence in our studied localities. The isopod assemblages in the Drava lowland in Hungary usually consist of 4 or 5 species (FARKAS, 1999). In the Baranya triangle individual assemblages were represented only by 3 or 4 species, which is probably also connected with the short sampling period.

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SAŽETAK

Fauna kopnenih jednakonožaca (Isopoda: Oniscidea) Baranje (Hrvatska)

S. Farkas & S. Krčmar

U fauni kopnenih jednakonožaca Hrvatske utvrđeno je 115 vrsta (KARAMAN, 1965–66,1966; PLJAKIČ, 1970; POTOČNIK, 1989). Međutim, postoje područja u Hrvatskoj u kojima nisu obavljana uzorkovanja kopnenih jednakonožaca, a jedno od takvih područja je i Baranja. Tijekom ljeta 2003. godine obavljena su uzorkovanja uporabom 125 lovnih posuda na 25 postaja koje pokrivaju 14 polja na UTM mreži Hrvatske. Uzorkovano je 2808 jedinki koje su svrstane u 11 vrsta. Najbrojnije vrste su: *Armadillidium vulgare* s (57%), *Trachelipus rathkii* s (18%) i *Porcellium collicola* (12%). Navedene vrste utvrđene su na većini postaja. *A. vulgare* utvrđena je na 20 (80%), a *T. rathkii* i *P. collicola* na 16 (64%) od 25 istraživanih postaja. Utvrđene vrste jednakonožaca čine 9% faune kopnenih jednakonožaca Hrvatske.