

Occurrence of Branchiobdellidae (Annelida) on freshwater crayfish in Croatia

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Introduction

Branchiobdellids of genus *Branchiobdella* Odier, 1823 have been scarcely studied in Croatia and there are very few data on them found in literature. In order to improve the general knowledge on the occurrence of the various species of branchiobdellidans on freshwater crayfish in Croatia, we extracted and determined branchiobdellidan specimens out of our crayfish collection (made between years 1995 and 2004). This collection includes native and alien crayfish species distributed within Croatia: *Astacus astacus*, *Astacus leptodactylus*, *Austropotamobius pallipes*, *Austropotamobius torrentium*, and *Orconectes limosus*.

Material and methods

After the extraction of branchiobdellidan specimens, they were dehydrated in graded ethanol solutions, cleared in methyl salicylate, infiltrated with Canada balsam and mounted on slides under a cover glass (Gelder pers. comm., Gelder 1994, 1999). The animals were identified according to Karaman (1967) and Gelder (1994). Number of branchiobdellidans found (and determined) per crayfish population varied greatly (between 1 and more than 50).

Results and discussion

This research included 50 different crayfish populations, and branchiobdellidans were isolated from 38 of them. In this research the following branchiobdellidan species were identified: *Branchiobdella parasita* (Fig 1), *B. pentodonta* (Fig 2), *B. balcanica* (Fig 3), *B. hexodonta* (Fig 4) and *B. italica* (Fig 5). The presence of branchiobdellidan species on different crayfish species is given in Table 1. The distribution of different branchiobdellidan species on *Astacus astacus* (14 populations), *Austropotamobius pallipes* (15 populations) and *A. torrentium* (19 populations) in Croatia is shown in Figures 6-8. We found no branchiobdellidans on *Astacus leptodactylus* (one population). On the few available preserved specimens of *Orconectes limosus* (one population) there was only one branchiobdellid found which exact determination could not be made with absolute certainty. There were also few localities where branchiobdellidans have not been found (Fig 6-8). It seems that different fixatives used in preservation of crayfish specimens caused changes in branchiobdellidans morphology, making some of them undeterminable.

Table 1. The presence of branchiobdellidan species on different crayfish species in Croatia

Crayfish sp.	Branchiobdellidan sp.				
	<i>Branchiobdella parasita</i>	<i>Branchiobdella pentodonta</i>	<i>Branchiobdella balcanica</i>	<i>Branchiobdella hexodonta</i>	<i>Branchiobdella italica</i>
<i>Astacus astacus</i>	+	+	+	+	-
<i>Astacus leptodactylus</i>	-	-	-	-	-
<i>Austropotamobius pallipes</i>	-	-	-	-	+
<i>Austropotamobius torrentium</i>	+	+	-	+	-
<i>Orconectes limosus</i>	only one specimen - not enough data for exact determination				

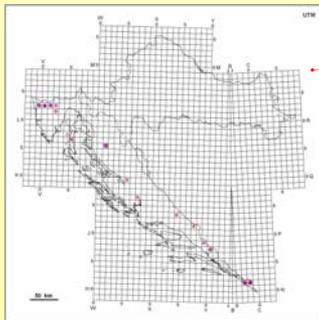


Fig 6. The distribution of different branchiobdellidan species on *Austropotamobius pallipes* in Croatia

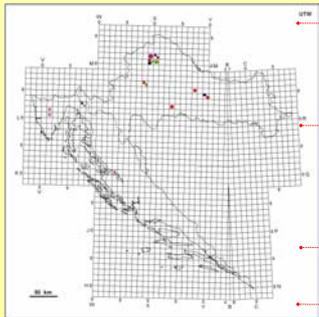


Fig 7. The distribution of different branchiobdellidan species on *Astacus astacus* in Croatia

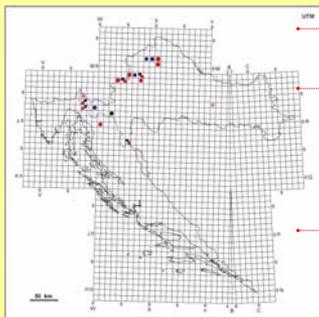


Fig 8. The distribution of different branchiobdellidan species on *Austropotamobius torrentium* in Croatia

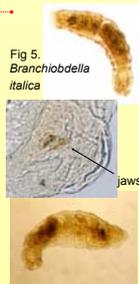


Fig 5.
Branchiobdella italica

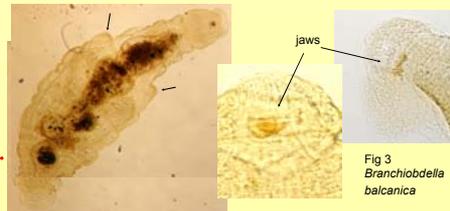


Fig 3
Branchiobdella balcanica

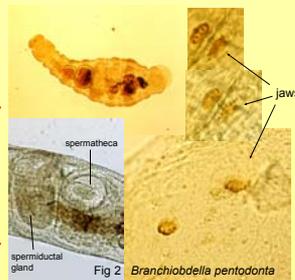


Fig 2
Branchiobdella pentodonta

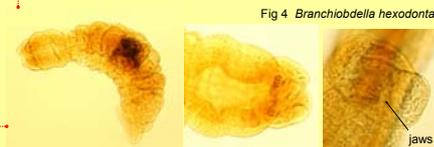


Fig 4
Branchiobdella hexodonta

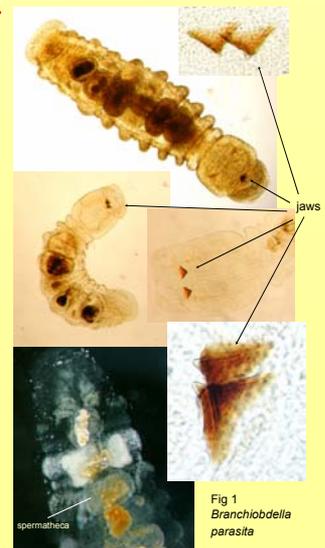


Fig 1
Branchiobdella parasita

Conclusion

Results of our base-line study give preliminary picture of branchiobdellidans' presence on crayfish and their distribution within freshwater habitats in Croatia and further research will be continued in future.

Bibliography

- Gelder, S. R. (1994) A report on branchiobdellidans (Annelida: Clitellata) and a taxonomic key to the species in northern Italy, including the first record of *Cambarincola mesochoreus* on the introduced American red swamp crayfish
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