BIOLOGICAL ASPECTS OF THE SPINICAUDATA (BRANCHIOPODA, DIPLOSTRACA) IN THE LARGEST ALLUVIAL WETLAND IN CROATIA

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ABSTRACT

Lonjsko Polje (Croatia) is among the largest alluvial wetlands in Europe. Temporary ponds that are the natural habitat for spinicaudatan branchiopods are very abundant in the area. We determined the time of occurrence, length of the life span, and the sexual structure and habitat characteristics of populations of Spinicaudata. Research took place from May to December 2004 at five sites. Three spinicaudatans were found: *Cyzicus tetracerus* (Krynicki, 1830) in spring (May to July) and autumn (late October), *Eoleptestheria ticinensis* (Balsamo-Crivelli, 1859) in spring (mid-May) and *Leptestheria dahalacensis* (Rüppell, 1837) in summer (mid-July). The length of their life span was 2-4 weeks. The populations of *Cyzicus tetracerus*, *Eoleptestheria ticinensis*, and *Leptestheria dahalacensis* consisted of males and females in an approximately 1 : 1 sex ratio. Ecological aspects of the habitat, including physico-chemical characteristics of the water as well as the structure and abundance of the associated fauna, were also observed.

RÉSUMÉ

Lonsko Polje (Croatie) compte parmi les zones humides alluviales les plus vastes d'Europe. Les mares temporaires, qui sont l'habitat naturel des branchiopodes Spinicaudata, sont très nombreuses dans cette région. Nous avons déterminé la période de présence, la longévité, la structure sexuelle et les caractéristiques de l'habitat des populations de Spinicaudata. Cette recherche a été réalisée de mai à décembre 2004 sur cinq sites. Trois Spinicaudata ont été trouvés : *Cyzicus tetracerus* (Krynicki, 1830) au printemps (mai à juillet) et en automne (fin octobre), *Eoleptestheria ticinensis* (Balsamo-Crivelli, 1859) au printemps (mi-mai), et *Leptestheria dahalacensis* (Rüppell, 1837) en été (mi-juillet). Leur temps de vie était de 2 à 4 semaines. Les populations de *Cyzicus tetracerus*, *Eoleptestheria ticinensis* et *Leptestheria dahalacensis* étaient composées de mâles et de femelles dans le sex-ratio d'approximativement 1 : 1. Les aspects écologiques de l'habitat, incluant les caractéristiques physico-chimiques de l'eau ainsi que la structure et l'abondance de la faune associée, ont été également observés.

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INTRODUCTION

Lonjsko Polje (Croatia) is one of the largest alluvial wetlands in Europe, and on the Ramsar list of wetlands of international importance (Ramsar, 2005). Temporary ponds, the natural habitats of Spinicaudata, are abundant in that periodically inundated area. In this study, the term "temporary pond" was defined as: a body of standing water, between 25 m^2 and 2 ha in surface area, which usually holds water from 1 to 4 months a year, and thus remains dry for most of the year (Nicolet et al., 2004). The spinicaudatans of Croatia have largely been neglected in the past, and data are generally scattered (Daday de Dées, 1923; Marinček & Valvajter, 1979; Marinček & Petrov, 1985, 1991, 1992b). Until now, there have been no records of spinicaudatans from Lonjsko Polje.

The community structure of spinicaudatan populations is the main indicator of the mode of reproduction, which in this group of clam shrimps varies widely, depending on the species. If males exceed or equal females in abundance, the obligatory sexual mode of reproduction is present in the population. This mode has been reported for nearly all species of the Cyzicidae and the Leptestheridae (cf. Sassaman, 1995). When males are present, but rare, a mixed mating system of sexual and parthenogenetic reproduction is suggested, which has been observed in some species of the Limnadiidae. A total absence of males indicates an obligatory parthenogenetic mode of reproduction, as reported for *Cyzicus gynecia* (Mattox, 1950) (Cyzicidae), for undescribed species of the genus *Leptestheria* from Colombia, as well as for some populations of Australian *Limnadia* species, and for all species of *Eulimnadia*, where, if present, males are very rare (Sassaman, 1995).

The purpose of this study was to analyse the occurrence of clam shrimps in relation to physical and chemical parameters of temporary ponds in Lonjsko Polje, in order to determine the association of groups of species with a set of basic environmental variables. Furthermore, some aspects of the population dynamics and of the associated fauna assemblage, that were both investigated during this study, contribute to the overall knowledge on the Spinicaudata. Considering the great variety in modes of reproduction within the spinicaudatan group, this research has also been conducted to determine the dominant mode of reproduction in the spinicaudatans that inhabit the area of 'Lonjsko Polje' (part of the Pannonian region). In addition, the growth of *Cyzicus tetracerus* (Krynicki, 1830) has been described for the first time.