Species richness and β-diversity of aquatic macrophytes in the Upper Paraná River floodplain

Luis M. Bini¹, Sidinei M. Thomaz² and Débora C. Souza²

With 4 figures and 1 table

Abstract: In this paper, we estimated the aquatic macrophyte species richness in the Upper Paraná River floodplain using non-parametric estimators. Fifty species were recorded in intensive surveys of several floodplain habitats. Based on a random sample of 20 lagoons, 6 connected to the Paraná River, 6 to one tributary and 8 to another, all estimators gave values very similar to the “true” number of species recorded in intensive surveys. The comparison among the lagoons connected with these rivers showed that the species richness was different, after controlling for sampling effort. Correspondence analysis and Mantel’s test showed that the beta diversity was significantly higher among the groups of lagoons than within groups of lagoons connected with the same river. The high connectivity among the lagoons of the same river can account for such results. Within the groups of lagoons, the highest species turnover (beta diversity) was found for Paraná River lagoons, which are predominantly temporary and more variable. This result is in accordance with a general ecological prediction, which stresses that beta diversity should increase with environmental variability.

Key words: Non-parametric estimators, beta diversity, environmental variability.

Introduction

Aquatic macrophytes play a major role in the dynamics and structure of shallow floodplain water bodies (NEIFF 1978, 1986, JUNK 1986). Most studies on macrophyte communities in such ecosystems have described species assemblages (species inventories) and evaluated major functional properties of dominant species (such as primary production and decomposition; e.g. POTT et al. 1989, 1992, PAGIORO & THOMAZ 1999). However, the rich aquatic vegetation

Authors’ addresses: Departamento de Biologia Geral, Instituto de Ciências Biológicas, Universidade Federal de Goiás, Caixa postal 131, Goiânia, GO, 74001-970, Brazil. e-mail: bini@icbl.ufg.br
² Universidade Estadual de Maringá, NUPELIA, PEA, Av. Colombo, n. 5790, Maringá, PR, 87020-900, Brazil. e-mail: smthomaz@nupelia.uem.br

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DOI: 10.1127/archiv-hydrobiol/151/2001/511/0003-1136/01/0151-0511 $ 3.75
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