



Dynamics of colonization and the collapse of a macrophyte community during the formation of a tropical reservoir

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With 4 figures and 2 tables

Abstract: The macrophyte community usually colonizes the littoral zone of both natural and man-made freshwater ecosystems. The hypothesis of this study is that after damming, the formation of a lentic environment favors free-floating macrophyte development. This study aimed at describing the patterns of disappearance and colonization of aquatic macrophytes due to the formation of a tropical reservoir (São Paulo State, Brazil). The reservoir of the Hydroelectric Power Plant Piraju was formed in September, 2002 and a total of 21 surveys were performed to identify the aquatic macrophytes before and after the reservoir formation. The most frequent families were Pontederiaceae, Typhaceae and Cyperaceae. Thirty taxa were identified and only *Egeria densa* disappeared after the reservoir formation. Episodes of intense blooms or great dispersions of macrophyte were not observed during the study period. The macrophyte assessment and their location suggest the predominance of a steady-state condition in the Piraju Reservoir. Low nutrient availability and the predominance of a high flow velocity contributed to the stability of this community. The predominance of free-floating species was not confirmed. However, four temporal standards of macrophyte colonization were observed. The patterns varied from continuous growth during macrophyte proliferation to the disappearance of species.

Key words: succession patterns, lentic environment, aquatic biodiversity, *Eichhornia azurea*, *Typha domingensis*.

Introduction

The littoral zone of lentic systems is usually colonized by a macrophyte community. The morphological and physiological adaptations of these plants have established distinct ecological types (e.g. free-floating, emergent and submerged) to successfully prevail within an aquatic environment. The diversity and abundance of aquatic plants are regulated by: (i) environmental abiotic characteristics associated with intra and inter-specific relations (e.g. herbivory); (ii) the position in distinct layers in the water column and

(iii) the availability and stoichiometry of nutrients in the water and sediment (Ali et al. 1999, Clayton & Edwards 2006, Xing et al. 2013).

Different factors (i.e., environmental conditions and biotic interactions) affect the composition and temporal and spatial distribution of macrophyte assemblage. The physical and chemical factors controlling the status of macrophyte (i.e., presence and abundance) in lotic environments are water velocity and discharge, characteristics of substrate, radiation and nutrient availability (Franklin et al. 2008, Mebane et al. 2014). In lentic systems, these factors are distinct according to the macrophyte life form. The growth

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