Diversity patterns of fish assemblages in the Lower Ntem River Basin (Cameroon), with notes on potential effects of deforestation

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With 5 figures and 6 tables in the text

Abstract: As part of an ongoing project on freshwater fish diversity and conservation of the Lower Ntem River Basin, a synecological study of fish assemblages was undertaken. Two different techniques were used to depict the structural and functional patterns of these fish assemblages: Canonical Correspondence Analysis, an appropriate ordination technique designed for finding the correspondence between physical factors in the environment and biotic factors in the communities, and cluster analysis. Results obtained show a change in both species richness and species composition along the longitudinal gradient. Upstream sites were characterized by a pattern of species addition, while intermediate and downstream sites showed a pattern of species loss and replacement. Measurements of habitat diversity revealed that opposite to depth variability, substrate diversity did not significantly increase downstream. The functional pattern of these fish assemblages almost conformed to the prediction of the River Continuum Concept, with an exception that species richness of invertivores did not increase significantly downstream. A model comprising catchment area, mean % canopy closure, substrate types and chemical variables accounted for 51% of the variation in community composition. Partial variance explained by forward selected environmental variables highlighted amongst others the importance of the bankside cover (mean % canopy closure) in the model. This statistical insight provide further evidence of the role played by this variable in the structure and function of stream fish communities. With regard to the ongoing deforestation in this area, the implications of these findings for the conservation of freshwater biodiversity are discussed.

Introduction

Understanding how community structures change spatially along environmental gradients continues to be a major interest in stream ecology, especially...