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Longitudinal zonation patterns and determinants in Decapoda (Crustacea) in rivers of Palawan Island, Philippines

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with 5 figures, 4 tables and 2 appendices

Abstract: This study presents the first data of longitudinal zonation in crustaceans from streams in the Philippines. Two small rivers in Palawan including their estuaries and a riverine cave are compared concerning their Decapoda assemblages. One of them, the Cabayugan or "Underground" River was sampled in seven stations along its course. The biotic data were obtained with colonization samplers at two distinct sub-habitats of each stream section and additionally with drift nets, which were used at all freshwater sites. Likely due to this combined approach, the study revealed the comparably high number of thirty-five species of Decapoda belonging to 10 families including 9 Atyidae, 8 Palaemonidae and 7 Grapsidae. Among these there is also a recently described *Parathelphusa* sp. and some taxa not previously recorded from Palawan. The longitudinal zonation patterns are illustrated by species congruity curves and Detrended Correspondence Analyses (DCA). The latter were correlated with the following environmental variables: water temperature, pH, electrical conductivity, dissolved oxygen, BOD, stream width, stream order, water depth, discharge, altitude, site distance from estuary and source as well as various descriptive variables for substrates and stream hydraulics. The DCA produced best results when pooled data of colonization and drift were used and when mass occurrences of juveniles were excluded from the ordination. Topographic features such as altitude, distance from the estuary and stream width were found to be the major determinants for decapod zonation in these streams. The diversity (Shannon-Wiener and species richness) was highest at estuarine sites and lowest in an anthropogenically altered middle stream course. A complete species turn over from the headwater to the estuary was observed for the Cabayugan River when unidentifiable juveniles had been excluded. Since many of the recorded species are amphidromous or potamodromous, the role of the river course as a passage appeared to be functioning.

Key words: biodiversity, tropical stream, freshwater crab, freshwater shrimp, estuary.

Introduction

Studies about longitudinal zonation of macroinvertebrate communities in streams from headwater to estuary are scarce in tropical Asia (DUDGEON 1999). This statement applies especially for crustacean assemblages. Some zonal distribution patterns of decapods in streams are provided by STARMÜHLNER (1984) for Sri Lanka and BISHOP (1973) for Malaya.

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