

ABSTRACT

The Ecology of Selected Aquatic Insects in the Maracas River.

Lorraine Davina Maharaj.

Seasonal fluctuations in the composition and abundance of the macroinvertebrate fauna of the Maracas River were examined between December 1987 and January 1989. Additionally, the life-cycle patterns of the Elmidae (Coleoptera) and Helicopsychidae (Trichoptera) inhabiting the stream were investigated. Eight replicate benthic samples were taken monthly along with measurements of depth, temperature, current velocity and dissolved oxygen. Monthly light trapping for adult aquatic insects was done each month between January 1988 and January 1989. Water chemistry analyses were conducted once during the dry and once during the wet season. Monthly rainfall data for the area were obtained from the Division of Water Resources.

Benthic organisms from 15 orders and adults from 8 aquatic insect orders were collected. Abundances of most benthic groups increased to a maximum during the dry season, while peaks in emergence of adult aquatic insects occurred during the late dry/early wet season. The Bray-Curtis similarity terms analysis indicated high levels of similarity between dry and wet season samples and that seasonal differences were more the result of

changes in the average abundance of each taxon, rather than changes in species composition. Cluster analysis and MDS ordination demonstrated that these changes in abundance were well correlated with rainfall and current velocity which may have influenced benthic numbers either as a result of increased scouring, or by depletion of food resources during the wet season.

Life cycles of three species of Elmidae (*Hexacylloepus smithi* (Grouvelle), *Macrelmis clypeata* (Hinton) and *Microcyllloepus carinatus* Hinton) and one helicopsychid (*Helicopsyche margaritensis* Botosaneanu) were studied. Six instar stages of *H. smithi*, *M. carinatus* and *H. margaritensis* and eight stages of *M. clypeata* were identified. All four species were found to have two periods of first instar recruitment, one major period during the dry season and a second, smaller one during the wet season, suggesting bi-voltine life cycles. In all cases, maximum larval recruitment and abundance occurred during the dry season, possibly related to the increased availability of food material during this period.

Members of my family for their unfailing support, assistance and willingness to provide transportation and housing at odd hours of the night, especially during the writing-up stage.

Finally, I would like to thank the Fisheries Division, in particular, Mr Boris Fabrés, for assistance with computer-literature searches and for allowing me the use of computing, printing and photocopying facilities.