

ABSTRACT

The effects of urban and agricultural runoff on benthic macroinvertebrates in the Upper Rio Minho, Jamaica. W.I.

Benthic macroinvertebrates are directly influenced by alterations in stream water quality and land use patterns. These communities were used in this study of the upper regions of the Rio Minho and its tributary the Rio Mahoe (located in Clarendon, Jamaica). The area through which the Rio Minho flows consists of extensive farmlands, where citrus and sugar cane are the two main crops cultivated. Other anthropogenic influences include sand mining, while urban runoff and various domestic activities are responsible for inputs of organic matter. Agricultural practices have probably led to the eutrophication of the river and this is apparent by extensive growths of *Cladophora* and *Elodea*. Nutrient pollution is probably the most significant feature in this location. Five sites were studied, four on the Rio Minho and one on the Rio Mahoe which was intended act as a reference site. Various physiochemical parameters were measured at each site from June 2001 through to September 2002. Benthic macroinvertebrates were collected by kick sampling at monthly intervals. It was found that temperature conductivity, and dissolved oxygen were the parameters that varied significantly between sites. The two nutrient measured phosphate and nitrate were elevated at all sites. Benthic macroinvertebrate communities were dominated by grazers which were better adapted to survive in a nutrient enriched area; these included the families Thiaridae and Elmidae. Community structure analysis was based on the use of diversity indices as well as evenness and taxonomic richness. The Rio Mahoe was found to have the best water quality based on the indices calculated, while Menhinick's index was the best predictor of water quality. This was based on the comparison of cluster analysis of sites using this index with cluster analysis using physiochemical variables.

**Keywords: land use, nutrient enrichment, benthic macroinvertebrates,
Rio Minho, Jamaica**