ABSTRACT

Zooplankton as indicators of water quality in mangrove lagoons - South Coast, Jamaica.

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Mangrove lagoon waters are highly productive and valuable ecosystems. There is a paucity of studies on zooplankton in these areas. Extensive work has, however, been done on water quality monitoring in Jamaican bays, but tends to concentrate on the more open deeper waters. Findings are then usually extrapolated to include the mangrove lagoons or mangrove dominated areas of the bay. Mangrove lagoon waters, however, have natural low light conditions, high turbidity, high detrital and microbial activities, and high concentrations of polyphenolic compounds (leached from mangrove detritus). These conditions would, therefore, influence the physico-chemical parameters and, hence, the biological parameters of these waters. This study was aimed at assessing the appropriateness of using various traditional water quality monitoring indices and the zooplankton community to properly characterize the waters of mangrove lagoons.

Sampling was conducted routinely every four weeks at nine stations on the South Coast of Jamaica from October, 1999 to September, 2000. Some physico-chemical parameters (namely: depth, temperature, salinity, dissolved oxygen, pH, particulate organic matter, and Reduction / Oxidation Potential - REDOX) and biological indices (such as: species composition, and abundances of selected taxonomic groups and species) were employed to assess these communities. Also, community coefficients (JCC and PSC) and Principal Components Analyses assessed similarities among the various stations. Vertical / oblique hauls were taken using a 100 µm mesh aperture (0.2 m hoop diameter) net to collect zooplankton samples and a Hydrolab® Surveyor IV® Water Quality Data System was used to collect physico-chemical data *in situ*.

Approximately 81 zooplankton taxa were collected of which the group Copepoda (49 species) and the group 'Larvae' (28 species) were most dominant for most stations. The group Harpacticoida (from the copepods) contained the most unidentified species. Mean abundances for the stations ranged between 789 animals m^{-3} (at a pristine station) and 114,970 animals m^{-3} (at a highly productive station).

Results indicate that the traditional water quality monitoring indices could be used to adequately describe the communities of these mangrove lagoon waters. Also, it was shown that the zooplankton community could be used to show the differences of these various water qualities. However, it was observed that rainfall, particulate organic matter, and REDOX were not useful / adequate indicators of water quality in these areas. 'Larvae' and the calanoid copepod

Dio*ithona oculata* were dominant zooplankton species possibly characterizing these mangrove lagoon waters. Also, the community indices showed similarities among most stations with all experiencing varying levels of eutrophication. However, further research on the impact of the benthos, polyphenolic compounds, and the benthic and epibenthic communities will be required in order to fully characterize these communities.

Keywords: Zooplankton; mangrove lagoon waters; South Coast of Jamaica.