

ABSTRACT

Diatoms are known to be sensitive and reliable indicators of organic pollution, and as such are often employed in water monitoring schemes. This study investigated the nature of the periphytic diatom communities of two small rivers in southwestern Jamaica. The South Elim River is a typical, small tropical river, while the North Elim River suffers from periodic episodes of intense pollution by rum distillery effluent.

Temperature, dissolved oxygen, pH, conductivity and suspended solids were recorded in the North and South Elim Rivers, over a two year period (April 1998 to March 2000) and were analysed using a One-Way ANOVA to elucidate seasonal (wet and dry) as well as effluent related trends. Biological data were obtained over a one year period (April 1999 to March 2000), using glass slides as artificial substrates for diatom community growth over periods ranging from 1 to 7 weeks. Glass slides were scraped and the periphytic material cleaned using the Nitric Acid Oxidation method. Species identification and enumeration were conducted, and values were obtained for several community parameters, including total diatom abundance, total diatom biovolume, species diversity, species dominance and a Pollution Tolerance Index.

The study identified the main forcing factors affecting diatom community structure and composition within the North and South Elim Rivers, and demonstrated the usefulness of periphytic diatoms and diatom communities as indicators of freshwater pollution.