

Spatiotemporal variation of benthic macroinvertebrates with respect to physicochemical characteristics of shallow sediments in Borala Wewa, Sri Lanka

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Benthic macroinvertebrates play a key role in freshwater ecosystems. Survival, distribution and abundance of benthic macroinvertebrates depend on the physicochemical characteristics of their environment. Responses of benthic macroinvertebrate communities to environmental changes are useful in assessing the impacts of different land uses and the impacts of addition of different types of pollutants to surface waters. This study assessed spatial and temporal variations in sediment quality and macroinvertebrate diversity at selected sites of Borala Wewa in Weligama. In ten selected sites in Borala Wewa, organic matter content, pH, percentage contents of sand, silt and clay in shallow sediments were measured. In addition, sediment samples were preserved using 5% Rose - Bengal solution and the diversity of the benthic macroinvertebrates were assessed using Shannon Wiener diversity index and species richness values. Spatial and temporal variations of sediment quality parameters were compared using ANOVA followed by Tukey's pairwise comparison. The correlation between sediment quality parameters and benthic macroinvertebrates species richness were assessed using Pearson's correlation analysis. Altogether 14 benthic macroinvertebrate species belonging to 11 families were recorded during this study. Among them were 7 species of gastropods belonging to 5 families, 6 species of annelids belonging to 4 families and two larval forms of family Chironomidae and family Ceratopogonidae belonging to Phylum Arthropoda were identified. Site 6, which was a cattle bathing site, was characterized by presence of pollutant tolerant macroinvertebrates such as *Faunus* sp., *Bithynia* sp. and *Chironomus* sp. Sediment pH, organic matter content and percentage sand content showed significant spatial variations but did not show significant temporal variations. However, significant spatial and temporal variations of the percentage clay and silt contents were identified. A significant correlation found only between sediment pH and the species richness of the benthic macroinvertebrates. Further long-term studies with more frequent sampling and increased number of replicates are needed to identify the trends of spatial and temporal variation of sediment quality characteristics and to identify pollution indicator species in shallow sediments of the Borala Wewa.

Keywords: Borala wewa, benthic macroinvertebrates, shallow sediments