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### **Assessing the environmental stress in the Diyawannawa wetland using macro-benthic molluscan diversity based Abundance-Biomass Curves**

B. K. A. Bellanthudawa and W.M.D.N. Wijeyaratne\*

*Department of Zoology and Environmental Management, Faculty of Science, University of Kelaniya.*

The present study assessed the variation of macrobenthic molluscan abundance and biomass with spatial variation of water and shallow sediment quality parameters in the rehabilitated and non-rehabilitated regions of the Diyawannawa wetland. Six sampling sites, reflecting various land uses in the non-rehabilitated (Site A,B,C) and rehabilitated (Site D,E,F) areas of the Diyawannawa wetland, were selected. At each site, DO, nitrate concentration, total phosphate (TP) concentration, BOD<sub>5</sub>, COD, chlorophyll-a (Chl-a) concentration of water, sediment conductivity, sediment pH, sediment percentage organic matter (%OM), sand%, silt%, clay%, and abundance and biomass of macrobenthic molluscs were recorded. Sampling was done from April to October 2016. One way ANOVA followed by Tukey's pairwise comparison was used to assess the spatial variation of water and sediment quality parameters. The correlation between macrobenthic mollusc abundance and water and sediment quality parameters were determined by Pearson's correlation analysis. Abundance-Biomass Comparison (ABC) Curves of molluscs were plotted. The significantly high mean abundance of *Bithynia tentaculata* (35), *Melanoides turbeculata* (5), *Lamellidens marginalis* (3) and *Pila globosa*(2) were recorded in site F, of the rehabilitated area where there was a significant input of solid waste, runoff sediments and organic matter. A significant spatial variation of nitrate N, COD, BOD<sub>5</sub>, Chl-a, DO, % sand, % OM, sediment pH, and conductivity was recorded in rehabilitated sites. Significantly high mean nitrate, Chl - a, COD, and % OM were recorded in site F. *Bithynia tentaculata* and *Pila globosa* showed a significant positive correlation with shallow water Chl - a, nitrate content, TP, COD and BOD<sub>5</sub>; *Bithynia tentaculata* was the biomass dominant species in all sampling sites. The highest and lowest percentage of biomass of *Bithynia tentaculata* was recorded in Site F (78.13 %) and in Site B (41.40%) respectively. The ABC curves indicated Site A as a typical unstressed site while Site F as a heavily stressed site. All the other sampling sites were moderately stressed and the level of disturbance varied among the sites. Further based on water and sediment quality data, it can be concluded that most of polluted sites (Sites E and F) are in moderate to heavily stressed condition, while comparatively less polluted sites (Sites A to D) are in unstressed to moderate stressed condition.

**Keywords:** *Bithynia tentaculata*, Abundance biomass curves, correlation, Water quality.

[dimuthu.wijeyaratne@kln.ac.lk](mailto:dimuthu.wijeyaratne@kln.ac.lk)

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