Comparative study on physicochemical parameters in the rehabilitated and un-rehabilitated regions of Diyawanna Lake wetland, an urban wetland in the western province of Sri Lanka

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Present study was carried out with the objective of comparing some selected physicochemical parameters in the rehabilitated and un-rehabilitated areas of Diyawanna lake wetland, an urban wetland in the administrative capital of Sri Lanka, Sri Jayawardenepura, Kotte to determine the current physicochemical status of water after its rehabilitation carried out in 2013. Sampling was done in March, May, July, September and November 2015 to cover the inter-monsoonal and monsoonal periods. Two sampling sites from un-rehabilitated area and three sampling sites from rehabilitated area were selected for the study considering the area and land use patterns of the riparian environment. The ranges of the mean values of different physicochemical parameters studied at each site were as follows. Surface water temperature 30.04-$31.43\ ^{\circ}C$; pH 5.9-7.11; Total dissolved solids content 126.4-194.3 mgL^{-1}; Conductivity 253.7-$272.4\ \mu scm^{-1}$; Secchi depth 53-72 cm; Depth 91.7-157.8 cm; Dissolved oxygen content 4.45-7.14 mgL^{-1}; Biological oxygen demand (BOD5) 2.26-5.08 mgL^{-1}; Nitrate content 0.27-0.56 mgL^{-1}; Total dissolved phosphorus (TDP) content 0.022-0.038 mgL^{-1} and Total phosphorus content (TP) 0.031-0.064 mgL^{-1}. Mean values for surface water temperature, TDS content, and conductivity were not significantly different among sites ($p > 0.05$). Mean values for BOD5, nitrate and TP contents were significantly higher in the rehabilitated area than in the un-rehabilitated area. This may be due to nutrient enrichment of the rehabilitated area through urban runoff and domestic household wastes. Therefore, in addition to removing aquatic macrophytes such as *Hydrilla* sp. and *Eichhornia crassipes* at fortnightly intervals by mechanical means, action may also be taken to reduce nutrient enrichment of the rehabilitated area of the wetland, which will ultimately contribute to reduce eutrophication and retard the growth of these macrophytes as well as the possibility of occurrence of fish kills in future.

Keywords: Physicochemical parameters, Diyawanna Lake wetland, macrophytes, eutrophication