Ileperuma, O.A., Priyantha, N., Yatigammana, S.K. and Wijesundara, C. (editors) (2016): Symposium Proceedings, Fifth International Symposium on Water Quality and Human Health: Challenges Ahead, 05 & 06 August, PGIS, Peradeniya, Sri Lanka

PRELIMINARY FIELD DATA OF DISSOLVED OXYGEN PROFILES IN PADAVIYA RESERVOIR, SRI LANKA

C. Siriwardhana[1], A.T. Cooray[2*] and S. Liyanage[1]

[1]Department of Chemistry, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka.
[2]Central Instrumentation Facility, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka.

Dissolved oxygen (DO) concentration is one of the most important physicochemical parameters in aquatic systems that could significantly influence the overall quality of water. Dissolved oxygen profiles describe the variation of DO concentration along the gradient of the water column. Understanding the variation of DO in aquatic systems is important as it relates to other chemical characteristics of the system. Although DO profiles of lentic systems in other countries have been extensively studied, similar studies of reservoirs of Sri Lanka are limited. Therefore, the present study focused on the DO distribution in the Padaviya reservoir in the North Central Province of Sri Lanka. A preliminary study was carried out on 23rd January 2016, at 25 locations covering the entire reservoir using a field portable DO meter equipped with a probe having a 20 m cable. The probe was deployed to water body and data were collected at two feet depth intervals. According to field data, the average DO value at the surface of the reservoir was 8.1 (± 1.0) mg L^{-1} and varies in the range of 9.2 to 4.6 mg L^{-1}. The maximum surface DO concentration was observed at the middle section of the reservoir which has an average depth about 8.84 m and the minimum surface DO concentration was observed at the two water inlets of the reservoir which were shallow. The results suggest that the system contains a clinograde type DO profile with steep decline of DO after 4.57 m in Padaviya reservoir. The epilimnion, the upper most water column of the reservoir, had a DO value of ~ 8.1 mg L^{-1} and the hypolimnion, the bottom stratum of the water column, exhibits anoxic condition. The most important observation was the abrupt DO depletion between approximately 4.57 to 5.18 m. At this depth, DO values decreased from ~ 6.5 to ~ 0.4 mg L^{-1} within 0.61 to 0.91 m. This phenomenon could not be satisfactorily explained with the current data. It could be assumed that DO is consumed by the aerobic microbial mediated oxidation of organic matter and by the oxidation of chemical species such as Fe^{+2}, Mn^{2+} and NO_2^-. Further studies are underway with more data to explain these oxygen profiles in the Padaviya reservoir.

Authors acknowledge the financial support given by the University of Sri Jayewardenepura under the research grant ASP/01/RE/SCI/2015/26

Keywords: Dissolved oxygen, Padaviya reservoir, clinograde

atcooray@sjp.ac.lk