



961/E2

**General water quality parameters of hospital wastewater from three selected hospitals,
Sri Lanka**

D.M.W.K. Dissanayaka,^{1,2} C.S. Kalpage,³ and M. Vithanage^{1,4}

¹*Environmental Chemodynamics Project, National Institute of Fundamental Studies, Hantana Road,
Kandy, Sri Lanka*

²*Postgraduate institute of Science, University of Peradeniya, Peradeniya, Sri Lanka*

³*Department of Chemical and Process Engineering, University of Peradeniya, Peradeniya, Sri Lanka*

⁴*Office of the Dean, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri
Lanka*

Most of the hospitals in Sri Lanka discharge wastewater directly to the environment without much treatment. Hence, the objective of the study was to assess the general water quality parameters of three selected hospitals in Sri Lanka, Kandy General Hospital, Badulla General Hospital, and Diyathalawa Base Hospital, in order to understand the status of pollution via wastewater discharge. Five sampling points were selected in each hospital where the point source pollutants released (KGH-01 to KGH-05, BGH-01 to BGH-05, and DBH-01 to DBH-05). Hospital wastewater (HWW) samples were collected at regular interval for 3 consecutive months. Different physiochemical parameters were measured at the site, viz., pH, temperature, electrical conductivity (EC), total dissolved solids (TDS), and dissolved oxygen (DO). The samples were then transported to the laboratory for the testing of total suspended solids (TSS), total solids (TS), volatile solids (VS), volatile suspended solids (VSS), biological oxygen demand (BOD₅), chemical oxygen demand (COD), chloride, nutrients (P and N), Cr(VI), and heavy metals (Ni, Zn, Pd, Mn), and also pathological contaminants (Coliform). The pH of the samples ranged from slightly acidic to highly basic; 6.3 to 9.7. BOD₅ values ranged from 20 to 1900 mg/L, the highest being reported at Kandy (however, lesser values were reported from Diyathalawa), whereas COD ranged from 150 to 1200 mg/L. The maximum nitrate concentration was <250 mg/L NO₃⁻N, while the nitrite concentration reached even up to 2.4 mg/L, indicating redox conditions. The highly toxic hexavalent chromium Cr(VI) concentration ranged well above the WHO permissible levels, ranging 0.051 mg/L - 0.225 mg/L. Heavy metals were well below the maximum tolerance limits set by Central Environmental Authority, except for Zn, which was 2-3 higher in some samples. Volatile Organic Compounds, which are considered to be carcinogenic, mutagenic and teratogenic, were reported from all hospital waste waters. Biological analysis indicated very high concentrations of total coliform and *E. coli*. The results indicate that the wastewater from these hospitals urgently needed to be treated before being discharged into the environment, since the HWW directly discharges into the water sources used for water supply.

Acknowledgements: International Foundation for Science, Sweden has provided funds for the research.

wasantha.dissanayaka888@gmail.com

+94 714407013