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# Effects of hospital wastewater on plankton diversity and microbial density in Nilwala river, Matara

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This study was focused on assessing the effects of hospital wastes received from General Hospital Matara on the plankton diversity and coliform density in Nilwala River. Water, sediment and plankton samples were collected from the two sites located before the entry of the wastewater discharging canal (upstream) and the three sites located after the entry of the wastewater discharging canal (downstream) biweekly from February – April, 2012. Physicochemical characteristics of water were determined in three replicates of the water column at each site.

Nitrate (Na Sallicilate method), Phosphate (Ascorbic Acid method), TDS (gravimetric method) and Cu concentrations (AAS, Varian 220) in sediment were significantly ($p < 0.05$) different between the downstream and upstream sites. However, Cu concentration in surface water, DO, Temperature and pH did not vary significantly between the two major sampling sites ($p > 0.05$).The mean values of nitrate and phosphate concentrations at the sites located downstream were 0.05 ± 0.01 mg/l and 0.08 ± 0.03 mg/l respectively. The mean values of TDS were 528.4 ± 152.5 mg/l and 756 ± 163.5 mg/l at the upstream sites and downstream sites respectively explains the presence of more organic matter in the hospital wastewater.

Total coliform density (MPN/100 ml) was significantly different between upstream and downstream ($p < 0.05$) and their abundance was relatively low downstream, most probably due to the presence of disinfectants in hospital wastewater. Although it is expected that hospital wastewater contains organic and inorganic pollutants, zooplankton (0.99 ± 0.1) and phytoplankton diversity (0.87 ± 0.1) did not vary significantly between upstream and downstream sites ($p > 0.05$). The abundance of *Paramecium* sp. and shrimp larvae were relatively higher at the downstream sites suggesting that they can be used as possible biological indicators for the effects of hospital wastewater in the river.

Keywords: Hospital wastewater, coliform, nitrate, phosphate, plankton

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