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Analysis of physical parameters and microbial contaminations in selected drinking water sources in and around Kandy city

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Background: The rapid growth of population and unethical practices by humans have led to no access for safe drinking water. Therefore, many people rely on natural water bodies for their daily necessities. Kandy city has a population of about 98,828. Many of them enjoy water on tap provided by the national water supply, while some depends on natural water bodies especially in certain suburbs.

Objective: The study aimed to analyse drinking water samples from different sources in and around Kandy city limits to assess the physical parameters and to detect the presence of *Escherichia coli* comparing with the recommended Sri Lankan Standard values (SLS).

Methods & Materials: Thirty water samples (3 samples each, approximately 300 mL) from five household wells (One open and four close), a tube well, a fountain, a household tap, Mahaweli river and a rainwater sample (open ground) were collected into clean, sterilized bottles, stored at +4 °C in an insulating Rigi-foam box and was transported to the laboratory within 24 hours. The locations were selected covering Kandy city limits and the suburbs approximately 3-4 km away from city. Physical parameters tested were temperature (measured at the collecting site itself), pH, and chlorine concentration. Microbial and chemical analysis of the samples were carried out in the microbiology laboratory of the Business Management School, Department of School of Science. Samples were tested for *E. coli* using standard bacteriological methods and confirmation was done using Polymerase Chain Reaction with species specific primers.

Results: Temperature of collected samples ranged from 30-31 °C. The pH of samples collected from wells ranged in between 5.83-7.44, while those from tube well, fountain, rainwater, tap water and river were 5.88, 6.34, 5.37, 5.63 and 5.32 respectively. The chlorine concentrations of all were below 5 ppm. All samples collected were positive for coliform bacterial contamination. Confirmatory tests proved the presence of *E. coli*.

Conclusion: It could be stated that optimum physical conditions are present in the selected water bodies for growth and survival of *E. coli*.