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Detection of *E. coli* O-157 in Polluted Cannels of Colombo District , Sri Lanka

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Abstract

Water pollution is one of a major ecological circumstance in Sri Lanka, particularly in metropolitan areas that are subjected for rapid urbanization and poor waste management practices. Colombo is the capital city of the country which contains a number of polluted canals due to the extensive population density causing for spreading of diverse diseases among the community. The direct discharge of solid waste, toilet effluents to canals causing for contamination of canal water from pathogenic microorganisms. Therefore, the polluted canals of the Colombo city can be act as carrier to distribute number of waterborne diseases among the community. Further, out of different water borne pathogenic microorganisms *Escherichia coli* O157 considers as a specific strain of *E. coli* due to its potential to causes serious illness in humans by producing Shiga toxin that causes Hemolytic Uremic Syndrome in human. Therefore, this study aimed to look for the presence of the *E. coli* O157 strain of *E. coli* in polluted canals in Colombo, Sri Lanka. In the study, 20 water samples were collected from different polluted canals, including Hamilton, Wellawatta, Karadiyana, Dehiwala in the Colombo area. Then the samples were transported to the laboratory under cooling conditions, and they were enumerated using the membrane filter method. The filtered samples were then cultured on Membrane Lactose Glucuronide Agar (MLAG) and Eosine Methylene Blue (EMB) agar plates to isolate *E. coli*. Five *E. coli* isolates were taken from each sample for DNA extraction. Further, the presence of *E. coli* was determined by DNA Extraction, the Freeze-thaw method, followed by PCR amplification of the *Eae* genes using specific primers. *Eae* gene is one of the virulent gene which can be used to detect *E. coli* O157. From 20 tested samples, three samples were positive for the *E. coli* O157 in Karadiyana, Wellawatta and Dehiwala canals respectively. The findings suggest that canal water could be a source of *E. coli* O157 contamination, emphasizing the importance of ongoing monitoring and the deployment of appropriate measures to prevent contamination and limit public health hazards.

Keywords: *Escherichia coli* O157, Water quality, Canal water, Virulent *Eae* gene