



---

## **ISOLATION OF EFFECTIVE BACTERIA FROM KARADIYANA DUMPING LEACHATE FOR BIOLOGICAL TREATMENT TO MINIMIZE ENVIRONMENTAL EFFECTS**

Godavilathanna S. and Pathmalal M.M.\*

Center for Water Quality and Algae Research, Department of Zoology, University of Sri Jayewardenepura,

Sri Lanka

pathmalal@sjp.ac.lk

---

### **ABSTRACT**

Landfilling of municipal waste is still a very important issue of the waste management system in Sri Lanka and the rest of the world. The generation of contaminated leachate remains an inevitable consequence of the existing waste disposal practice and the future landfills. The leachates are a mixture of high concentration of organic and inorganic contaminants and currently biodegradability of leachate can be taken as a very first step of an environmental risk assessment. The present study was to analyze water quality in leachate by means of physico-chemical parameters (BOD, COD, DO, pH, Temperature, Salinity, Conductivity, Nitrate-N, Orthophosphate, TDS) and isolation of bacteria for reduction of Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) using standard methods. In the study period mean temperature (28.33 °C-32.50 °C), pH (7.08-8.01), salinity (7.92-9.70), conductivity (11 854.67 μS/cm- 12 034.67 μS/cm), N-nitrate (0.81 mg/l -1.58 mg/l), Ortho phosphate (3.02 mg/l -9.11 mg/l), TDS (5245.16-10 627.50), DO (0.14 mg/l -0.67 mg/l), BOD (147 mg/l -166.4 mg/l) and COD (1630 mg/l -5800 mg/l) variation were recorded. Morphologically 10 different bacteria were isolated from the leachate samples and effectiveness of the bacteria in BOD and COD reduction were studied under different environmental conditions. Initial BOD and COD values in leachate samples were varied between 147.82 -166.40 mg/l and 1630.00 -5800.00 mg/l respectively. All the isolates were able to utilize DO as BOD more than 90% of initial value while only 5 isolates were able to reduce more than 50% of COD at 3 day of incubation. C7 bacterium stain show as the highest efficiency of oxygen utilization as BOD and COD reduction. High reduction ability of the bacterium in the leachate sample was obtained in the sample which placed in the natural environment without autoclave. Thus the result of the present study reveals that bacteria as an environmental friendly green solution for degrading organic content in the leachate sample to reduce BOD and COD in leachate effluent.

**Keywords:** Leachate, BOD, COD, Bacteria, Bioremediation