# ENUMERATION OF HETEROTROPHIC, IRON-PRECIPITATING BACTERIA IN THE SOIL SAMPLES COLLECTED FROM URBAN WASTE DUMPING SITES, MATARA DISTRICT, SRI LANKA

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Heterotrophic, iron-precipitating bacteria are capable of using organic radicals from soluble organic iron salts. This is widely applied in the removal of iron from organic solutions and during the decomposition of organic iron compounds, ionic iron is released. The current study was designed to enumerate heterotrophic iron-precipitating bacteria in soil samples, collected from urban waste dumping sites in eight locations, in the Matara district, Sri Lanka. Generally, the identified area was almost flat and there were no complex topographic features. Surface soil, separately sampled from three sampling sites at each location, were used as the test samples. The pH value of each collected sample was recorded. Each soil sample (1.00 g) was added to sterilized water (9.0 mL), followed by tenfold serial dilutions. For the enumeration of the total viable heterotrophic iron-precipitating bacteria, serially diluted samples were pour-plated with Ferric Ammonium Citrate Nitrate Agar. All soil samples were analysed in duplicated agar plate-based assays and the number of colonies was counted after incubation of the plates at room temperature for 2-3 days. Quantitative determinations were made based on colony-forming units per gram (CFU $g^{-1}$) of soil and expressed with 95% confidence interval limits. Further, the bacterial colony counts per gram of each soil sample were arranged in a completely randomized design and One-way analysis of variance was applied with Tukey's multiple comparison test. The results showed that the counts were significantly different among locations. The significantly highest counts were reported for the dumping sites at Walgama (pH 7.15) and Walpala (pH 6.90) areas and the relevant counts were recorded as $3.492\times10^5$ CFU $g^{-1}$ and $3.442\times10^5$ CFU $g^{-1}$, respectively. The lowest count was recorded at the dumping site near Dikwella lagoon (pH 8.95). The study demonstrates the dispersion of heterotrophic, iron-precipitating bacteria in urban waste dumping sites, within the selected region, indicating that high counts were reported in near-neutral soil environments. The current findings would serve as a baseline for the further expansion of the research topic towards the application of these bacteria, for the removal of iron from accumulated organic waste.

Keywords: Heterotrophic, Iron-precipitating, Colony-forming units, One-way analysis of variance

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