

Evaluation of metal bioleaching property of *Actinomyces* sp. in waste foundry sand by *in vitro* method

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Metals can be leached either directly (physical contact between microorganisms and solid material) or indirectly. The removal of metals from these industrial wastes brings out detoxification of the residues and thus improves the quality of the environment. The waste foundry sand was analyzed for the presence of toxic metals, as the plant uptakes these toxic metals through their food chain which in turn may be harmful to the human beings. In this study *Hibiscus rosa sinensis* was grown on sand blends containing 50% of waste foundry sand (WFS) to assess the availability of SiO₂, Al, Ca, Mg, Pb, Cu and Zn. The chemical properties of treated and untreated waste foundry sand were observed. The analyzed data showed the level of untreated WFS Fe (76.36%), Ca (43.65%) and K (37.49%). *Actinomyces* sp. was isolated from WFS and identified and was used to bioleach the sand (treated) and was observed to reduce the level of metals present in WFS [Fe (26.54%), Ca (27.67%) and K(5.84%)] and untreated foundry sand had metal levels of [Fe(49.82%), Ca (15.98%) and K(31.65%)]. The treated and untreated sand was later used for growing *Hibiscus* plant sapling under controlled conditions and was analysed for the traces of metals absorbed by the plant. The presence of metals was calculated by Atomic Emission Spectroscopy technique that can determine concentration of trace to major elements. Our observations provide supportive document on bioleaching of WFS by *Actinomyces* sp. and was adequate in the growth of ornamental plant *Hibiscus rosa sinensis*.

Key words: Foundry sand, bioleaching, *Hibiscus rosa sinensis*, ICP-OES, heavy metals
