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Chapter - 3

Isolation and Characterization of Calcite Solubilizing Strain from Marble Slurry Dumped in Sukher, Udaipur (Raj.) India

Harshada Joshi and Sakshi Devda

Abstract

The wastage of marble industry in the form of marble slurry causes serious environmental problems. Dumping of slurry results in loss of soil fertility and texture which negatively affects the crop yield. The slurry flows with rain water and contaminates water bodies. The fine particles present in slurry also contaminates air and results in several breathing disorders. Besides utilization of slurry in bulk, the bacteria that can degrade marble slurry can provide an efficient solution to this problem. The objective of the present study was to isolate and screen the calcite solubilizing bacteria from marble slurry collected from dumping yard in Sukher, Udaipur, India. The enumeration of bacteria from marble slurry sample was done on nutrient agar using standard plate count method. Isolation was done on calcite agar medium supplemented with 0.1% CaCO_3 using pour plate method. The plates were incubated at 37 °C for 10 days. Cultural, morphological, biochemical and molecular characterization of the isolate was performed. The mean total bacterial count observed for marble slurry sample collected was 9.43×10^5 CFU/ml. A total number of 18 bacterial isolates were recovered on calcite agar. Only one isolate namely isolate CS6 produced clear-halo zone around the colony and hence was considered to have calcite-solubilizing activity. The maximum diameter of clear zone 20 mm (excluding colony diameter) was observed at 37 °C after 10 days of incubation period. On the basis of cultural, morphological, biochemical and molecular characterization isolate CS6 was identified as *Exiguobacterium aquaticum* CS6 (Accession no. MK353511). Because of efficient calcium carbonate dissolution the isolate may be applied to manage calcareous soil.

Keywords: calcite solubilizing bacteria, marble slurry, calcite solubilizing activity, total bacterial count, calcareous soil etc.