Microbially Induced calcite Precipitation (MICP) is a method for the production of cement based materials. It is naturally occurring biological proof that has various applications in remediated restoration of range of building materials. This research work deals the strength and durability characteristics of microbial cement mortars which are embedded by Enterobacter - FJ973549 (EB₁), Enterobacter - FJ973550 (EB₂), Enterococcus - FJ973551 (ECB) and Serratia - FJ973548 (SB) microorganism in different calcium sources. The crystalline phases of CaCO₃ crystal formation and surface morphology of cement mortar are investigated by X-ray diffraction (XRD) and Scanning Electron Microscope (SEM).

A growing demand for new materials leads to danger of premature depletion of the natural sources. An alternative is to use by products, provided their quality is improved. Microbially induced calcite in the form of calcium carbonate crystals on the surface of cement mortars by bacterial treatment confirms the increasing strength and durability of microbial cement mortars.

In the present study a noteworthy enhancement of compressive strength of 45% and tensile strength of 12% compared to control is observed in the bio curing cement mortar specimens embedded with EB₁ relative to control. Similarly the cement mortar specimen embedded with EB₂ shows higher compressive strength of 29% and tensile strength of 13% compared to control cement mortar specimen.
This method of implant semi-solid mixture on to the surface of cement mortar specimen shows significant effects such as decrease of permeability and capillary penetration. EB₂ embedded specimen show 56% decrease of water absorption and increase resistance to water penetration and acid resistance in the cement mortar specimen embedded with EB₁ and EB₂ shows 13 and 9 times reduction in water sorptivity coefficient respectively compared to control specimen.