

Isolation and Urease Activity of *Bacillus amyloliquefaciens* U7

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Aim of the study: Microbially induced calcium carbonate precipitation (MICCP) is a natural biological process in which microbes produce different carbonate polymorph as a result of their metabolic activities. This technology has been widely explored and promising in various applications especially in civil engineering. Although, different groups of microorganisms involved in this process, calcium carbonate precipitation by urea hydrolysis is the simplest and most widely used method. Therefore, identification and characterization of urease positive bacteria have been great attention in these days. In this regard, the aim of this study is to identification of urease positive bacteria that can be used for calcium precipitation.

Material and Methods: Calcium rich soil samples were collected from Denizli, Turkey. Isolation of bacteria was performed and the colonies were transferred onto Urea agar base, urease selective medium, to check the production of urease. Isolates designated as U7 were selected for further studies based on their ability to produce urease qualitatively. 16S rRNA gene was amplified to identify the bacterial isolate. The urease enzyme activities of bacteria were determined by phenol-hypochlorite method reading of colour at 630 nm in spectrophotometer.

Results: The nucleotide Blast results showed the isolates belong to *Bacillus* genus. Test bacterium was 100% identical to *Bacillus amyloliquefaciens* U7 (GenBank: CP006952.1) (Life Sciences Research and Application Center, Gazi University. It was gram positive rods. Urease enzyme activity of this bacterium was found to be 243.7 nmole/min/mg protein. All this results put the hypothesis that this urease positive may be used in various processes such as bio-deposition in soil and sand materials, bio-mineralization in cementitious materials and restoration of limestone buildings. In order to test this hypothesis, several different experiments have been still continuing.

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