

**ISOLATION, CHARACTERIZATION AND DETERMINATION OF  
CELL CONCENTRATION IN SILICATE PRODUCING BACTERIA**

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**Final Year Project Report Submitted in  
Partial Fulfillment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Biology  
in the Faculty of Applied Sciences  
Universiti Teknologi MARA**

**JANUARY 2017**

## ABSTRACT

### ISOLATION, CHARACTERIZATION AND DETERMINATION OF CELL CONCENTRATION IN SILICATE PRODUCING BACTERIA

Silicate producing bacteria play an efficient role in soil by solubilizing the insoluble forms of minerals like magnesium trisilicate that exist in earth's crust. A total of five different bacteria were obtained and one of the isolated bacteria from bauxite soil sample known as the B1 bacteria was characterized by morphological observation, biochemical identification, screened for the solubilization of silicate on silicate medium besides the effect of cell concentration in enhancing the silicate absorption also being evaluated. All the five bacterial isolates were capable in solubilizing the insoluble minerals in medium. The most clear solubilization zone was observed in B1 and ST5 including the positive control (*Bacillus* sp.). The results show that B1 and ST5 give clear zone of solubilisation. B1 is Gram positive, aerobic, rod shape with endospore and capsule. ST5 is Gram negative, facultative anaerobic, rod in shape with endospore. Both are acid production and both exhibit the similar colony characteristics to silicate group bacteria. The biochemical tests indicate that the bacterial isolates are similar to genus *Bacillus*. The capability of bacterial isolates (B1 and ST5) to have absorbed silica to its cell wall by different concentration of bacterial cell which ranged from the optical density of 0.5, 1.0 and 1.5 shows there are no significance effect of different cell concentration at  $p \leq 0.05$  neither on silicate absorption nor weight of pelleted cell. B1 with the absorption of silicate up to 44.5 mM is the most prominent candidate to be silicate producing bacteria. The capability of silicate bacteria to consolidate sand can be use in ecological engineering purpose in the future and leading to biomineralization.

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