

Effect of Initial pH on Calcium Carbonate Mineralisation Induced by *Bacillus amyloliquefaciens* U7.

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Aim of the study: The aim of this research is to determine the role of initial pH of the carbonate producing medium on bacteriologically induced calcium carbonate mineralisation.

Material and Methods: In this study, local ureolytic *Bacillus amyloliquefaciens* U7 strain from the culture collection of Pamukkale University, Faculty of Arts&Sciences, Bacteriology Laboratory isolated from the calcareous soil of Denizli was used in order to determine the effect of initial pH on microbiologically induced calcium carbonate production (MICP). U7 was inoculated in Ferris's carbonate producing medium (CPM) which was comprised of 25 mM CaCl₂, 25 mM NaHCO₃, 333 mM Urea and 3 g/l nutrient broth. The initial pH of the medium was adjusted over the range of pH:6.00-10.00 (Ph: 6.00, 6.50, 7.00, 8.00, 9.00, 10.00). Calcium carbonate amount was calculated by EDTA titrimetric method in 1st, 5th, 7th, 10th and 14th days. The medium with highest calcium carbonate production rate was centrifuged and calcium carbonate minerals were collected and dried. Calcium carbonate profile was analysed by Scanning Electron Microscopy (SEM).

Results: At a result of this research, initial pH of the medium was detected to have crucial effect on MICP and on the amount of produced calcium carbonate. Highest calcium carbonate production rate was observed in pH: 6.50 in 5th day (1.954 g/l). Calcium carbonate production was drastically decreased over pH: 7.00. Incubation period was also found to have effect on MICP. Optimum incubation time for calcium carbonate production was detected as 5 days and diminishing on this rate were observed after 5 days of incubation. Calcium carbonate minerals collected from the optimum MICP medium (pH:6.50, 5th day) was investigated by scanning electron microscopy and calcium carbonate minerals were observed as trigonal calcite and spherical vaterite crystals.

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