

Optimization of liquid medium for high phosphate solubilization by *Serratia marcescens* strain AGKT4

ABSTRACT

This study is on the optimization of the medium for solubilization of phosphate based on the Box-Behnken design and response surface methodology. Optimization of the liquid medium for phosphate solubilization using *Serratia marcescens* strain AGKT4 was carried out by varying the concentrations of 3 ingredients; the fructose, peptone and inoculum size of bacteria. A mathematical model derived from the response surface methodology was then validated statistically for the target test variables. The highest phosphate solubilization in the medium was achieved at the optimal concentrations of fructose and peptone at 6% (w/v) and 0.6% (w/v), respectively. The maximum phosphate solubilization at these concentrations was 239.12 µg/mL. Under the same conditions, the bacterial growth in the medium was 9 log₁₀ CFU.

Keyword: Optimization; Phosphate-solubilizing bacteria; Box-Behnken; Bio-fertilizer