

**SOLUBILIZATION OF PHOSPHORUS FROM DIFFERENT  
PHOSPHORUS SOURCES BY USING PHOSPHORUS SOLUBILIZING  
BACTERIA ASSOCIATED WITH RUBBER**

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Phosphorus (P) is a vital macro nutrient in rubber (*Hevea brasiliensis* L.) plant for its optimum growth and yield. Even though, there is high amount of P in soil of the most rubber plantations, this element is in an unavailable form to plants due to formation of insoluble complexes of P with Al or Fe. Hence, use of phosphate solubilizing microorganisms (PSM) has become a very interesting option to improve P availability of soil leading to reduction of application of phosphate chemical fertilizer. Therefore, this study was conducted to isolate the phosphorus solubilizing bacteria (PSB) associated with rubber rhizosphere. The isolated bacteria were enumerated on Pikovskayas (PVK) medium and evaluated for their effectiveness on solubilization of insoluble inorganic compounds, Calcium Hydrogen Phosphate ( $\text{CaHPO}_4$ ) and Tri Calcium Phosphate ( $\text{Ca}_3(\text{PO}_4)_2$ ) in solid and liquid media. The solubilizing ability was measured in the solid media by using Solubilization Index (SI). In the liquid media soluble P and pH were measured on 3<sup>rd</sup> and 7<sup>th</sup> day after inoculation. Out of 24 isolated bacterial strains, eleven isolates were selected on the basis of effectively appearing the halo zone in  $\text{CaHPO}_4$  solid medium and subsequently introduced into the liquid medium. The medium with  $\text{Ca}_3(\text{PO}_4)_2$  showed less halo appearing compared to  $\text{CaHPO}_4$ . All bacteria showed improvement of soluble P in the liquid medium compared to the solid medium. In  $\text{CaHPO}_4$  medium, a negative correlation could be observed between pH value and soluble P with time. However, this pattern could not be observed with  $\text{Ca}_3(\text{PO}_4)_2$  medium.  $\text{CaHPO}_4$  liquid medium showed a significant P solubilization ( $P < 0.005$ ) than  $\text{Ca}_3(\text{PO}_4)_2$  on 3<sup>rd</sup> and 7<sup>th</sup> day respectively. PSB3 was the most effective P solubilizer in the  $\text{CaHPO}_4$  ( $P < 0.005$ ). Hence, more studies are required prior to come up with a concrete conclusion on PSB on solubilization of P.

**Keywords:** Phosphorus solubilizing bacteria, Phosphorus solubilization, Rubber plantation, Tri calcium phosphate