

Microbial enzyme based biosensor for determination of inorganic phosphate content as an essential soil fertility index

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ABSTRACT

Phosphorus is generally categorized into three major classes' likely inorganic phosphate, organic phosphate and orthophosphate. Inorganic phosphate is one of the most significant key players in the agricultural sector which directly or indirectly improve the soil fertility, cultivation efficacy and crop production. Higher amount of inorganic phosphate in soil alters its texture including soil acidification and soil curst formation along with minimization of organic residues and humus content. Extended amount of soil acidification reduces the crop productivities, enhances toxicity and reduces the ability to restore several macro-nutrients in the soil. Hence, inorganic phosphate balance in the soil is utmost essential soil fertility index towards gross agricultural development in nation like India where phosphate fertilizers are indiscriminately used in agricultural fields. Based on this current scenario, current study proposes on microbial alkaline phosphatase based phosphate biosensor application for soil inorganic phosphate determination. Phosphate Solubilizing Microbes (PSB) release alkaline phosphatases which catalyze the conversion of p-nitrophenyl phosphate to a colored product p-nitro phenol. This reaction is being stamped down in presence of elevated amount of inorganic phosphate present in the soil.

Keywords: Biosensor, phosphate solubilizing microbes, alkaline phosphatases, inorganic phosphate.

