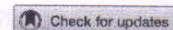




ARTICLE



## Citric acid loaded nano clay polymer composite for solubilization of Indian rock phosphates: a step towards sustainable and phosphorus secure future

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### ABSTRACT

Non-renewable nature of rock phosphate (RP) reserves coupled with open ended nature of P cycle makes it imperative for maximum utilization of available P resources. In this context, use of Indian RPs from Purulia and Udaipur along with citric acid loaded nanoclay polymer composite (CA-NCPC) as P source to costly diammonium phosphate (DAP) was investigated through an incubation experiment followed by a greenhouse experiment with wheat-rice cropping sequence in a Luvisol (pH 5.14, available P 13.5 mg kg<sup>-1</sup>). Soil available P, crop yield parameters and dynamics of soil P fractions were taken to judge the efficacy of CA-NCPC in solubilizing RPs. Application of CA-NCPC and DAP resulted in 82% and 69% increase in available P over control, respectively under incubation study. Direct effect of treatment receiving CA-NCPC + RP on yield and P uptake by wheat was comparable with DAP but residual impact of CA-NCPC + RP (16.7 g pot<sup>-1</sup>) was better than DAP (13.8 g pot<sup>-1</sup>) in rice. The changes in inorganic P fractions were also significant as inclusion of RP increased calcium-P from 16.1 to 61.5 mg kg<sup>-1</sup>. Results indicated potentiality of RPs treated with CA-NCPC as an alternate P source which could prove promising amidst P scarcity.

### ARTICLE HISTORY

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### KEYWORDS

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