

## Effective Utilization of Eppawala Rock Phosphate using Natural Microbe Cultures (*Jeevamrutham*)

D.N.M. Weerasooriya<sup>1\*</sup>, C.P. Udawatte<sup>2</sup>, P.I. Yapa<sup>3</sup>, and E.P.N. Udayakumara<sup>2</sup>

<sup>1</sup>Faculty of Graduate studies, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

<sup>2</sup>Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

<sup>3</sup>Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

\*neleekha@gmail.com

Phosphorus, is one of the most demanding essential nutrients for crops that is usually supplied through fertilizers. Sri Lanka has a rock phosphate deposit at Eppawala, which can be utilized as a source of phosphorus fertilizer after increasing its water-soluble phosphate. Biological processes such as microbial activities are economically and environmentally more suitable than the chemical processes in increasing the water-soluble phosphate of Rock Phosphate. *Jeevamrutham* is a mixture of microorganisms which contains high microbial activities. This study investigates the suitability of *Jeevamrutham* to increase the phosphate solubility of High-Grade Eppawala Rock Phosphate (HERP) both at laboratory and field levels. Five different microbial inoculums (*Jeevamrutham*) were prepared using soils taken from undisturbed Eco systems (Sinharaja and Badagamuwa forests, Nonperial Pine, Girandurukotte Teak, and Diyathalawa Turpentine plantations), Cow dung, Sugar, Gliricidia and Natural water. In a laboratory experiment, HERP was treated within columns. Available Phosphorus content of each sample was determined within 2 months in 7 days intervals. In a field experiment *Zeamays* was planted in treated plots with three different ways such as five different *Jeevamrutham* + HERP, Five different *Jeevamrutham*, and HERP. The plants which were grown in untreated soil were considered as the controlled. Available P<sub>2</sub>O<sub>5</sub>%, pH, and Organic matter content of soil were determined within 3 months in 14 days intervals. The average biomass of each plot was determined after 3 months. The laboratory experiment revealed that the available P<sub>2</sub>O<sub>5</sub>% of all treated samples were significantly higher (P<0.05) than the controlled samples in every week. It was evident from the field experiment that the available P<sub>2</sub>O<sub>5</sub>% of soil and average biomass of crops were significantly higher (P<0.05) in *Jeevamrutham* + HERP treated plots than that of the other treatments. The highest biomass was resulted in the Nonperial pine forest's soil based *Jeevamrutham* + HERP treated Crops. The organic matter content of all treatments was significantly lesser (P<0.05) than the controlled while pH was retained at 5.1-7.2 range. *Jeevamrutham* has increased the water-soluble phosphate in HERP and *Jeevamrutham* treated HERP can be used as a phosphorus fertilizer for short term perennial crops in Sri Lanka.

**Keywords:** *Jeevamrutham*, HERP, Water soluble phosphate