

B-63: Electron microscopic study of the natural dissolution of Eppawela rock phosphate in soil

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The effect of soil acidity on dissolution of Eppawela rock phosphate (ERP) was compared with a well known rock phosphate source, Gafsa using electron microscopy. Perspex slides (5 x 5 cm) were coated with Araldite gum and Gafsa and ERP spread evenly over the slides and buried in a field experiment which was started in 1978 at Macaulay Research Institute, Aberdeen. The soil treatments included the range of phosphorus and acidity levels with a rye grass/clover sward. Lime was used to maintain soil pH at different levels. Plots receiving one of 2 levels of phosphate (nil and 4 g P as TSP) or at 2 levels of acidity (4.8 and 6.0 in 0.01 M CaCl₂) were selected for the study. Although, Gafsa is a homogeneous product, ERP is heterogeneous in relation to its mineralogy and consists mainly of 2 phosphate minerals viz. Chloroapatite and Crandalite. Apatite particles of Gafsa were subject to disintegration in soil due to both chemical and biological processes. Soil acidity seems to be more influential on dissolution of ERP, but 2 main minerals present in the material reacted in different ways indicating their preference to dissolve at different pH levels which makes the overall effect of soil acidity complicated. But, no fungi was associated with either Crandalite or Chloroapatite particles suggesting that ERP dissolves predominantly due to chemical action. However, positive influence of the increased time factor on dissolution of particles of ERP indicated the suitability of the material for perennial crops.