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### The occurrence of phosphatic sands in Lakshadweep Islands

The Union Territory of Lakshadweep consists of an archipelago of 20 coral islands in the Arabian Sea and lie between 8°-12° North latitude and 71°-74° East longitude. They are about 200-400 km off the West Coast of Kerala. The extent of the islands varies from 0.09 sq. km as in Bitra to 4.84 sq. km. as in the largest island of Androth. Of the 20 islands only 10 are inhabited, with a high population density of 994 persons per sq. km. Coconut is the main stay of economy and ecology in these islands for centuries.

A detailed investigation of the characteristics of the soils was undertaken recently. These are highly calcareous, sandy and underlined by weathering limestone gravels at a depth varying from 60 to 100 cm. The depth of watertable in summer months varies from 0.4 to 3.5 m in the different islands. The topsoil is well supplied with organic matter.

The survey and chemical analysis revealed the occurrence of phosphate-rich top soil in isolated portions of Amini, Androth, Kalpeni, Kilton and Chetlat islands. These deposits vary in thickness between locations and do not exceed 60 cm depth. Also the phosphate content decreases with depth. The chemical nature of these phosphatic sands were determined on 13 air dry samples passed through 2 mm sieve. The standard chemical procedures of A. O. A. C.<sup>1</sup> and Jackson<sup>3</sup> were adopted for the analysis of the samples.

The pH of the samples from different locations of the five islands studied varies from 7.3 to 8.5. Androth, Kalpeni and Kilton islands are very rich in organic carbon (4.56% to 6.23%) and in the rest of the islands the organic carbon content varies from 1.09 per cent to 1.87 per cent.

The total P<sub>2</sub>O<sub>5</sub> per cent ranged between 6.9 to 18.3 in Amini, 8.7 to 10.5 in Androth, 24.3 in Kalpeni, 8.7 to 24.3 in Kilton and 15.1 to 16.5 in Chetlat. The organic P con-

tent ranged between 1.11 and 4.15% P<sub>2</sub>O<sub>5</sub>. The Ca-P content varied from 6.25% in Amini to 22.9% P<sub>2</sub>O<sub>5</sub> in Kilton.

The Phosphate fractionation reveals that most of the P is bound in the form of calcium and organic compounds. This lends support to the theory that such reserves of high phosphate deposits owe to Guano origin and were formed by the reaction of the droppings of piscivorous birds with limestone and preserved by the enriched organic matter in the topsoil. This process is even now active in a very small uninhabited island, Pitty, popularly known as bird island and declared as bird sanctuary.

Although major portion of the phosphate is bound with calcium, the solubility of phosphate in *IN* NH<sub>4</sub>Cl and neutral Ammonium citrate are quite considerable. The saloid bound P varies from 14 to 122 ppm. The Ammonium citrate soluble P varies from 23 to 35 per cent of the total P.

In actual values this ranged between 2.73 and 77.47% P<sub>2</sub>O<sub>5</sub>. The Aluminium bound phosphate ranged from 197 to 1666 ppm P, whereas iron bound phosphate was marginal varying from 6 to 120 ppm. P.

The available P status as measured by the conventional soil test method using Olsen's reagent (0.5 M NaHCO<sub>3</sub>, pH 8.5) is also high. The soluble P by this reagent varies from 40 to 274 ppm. It is interesting that in spite of the high CaCO<sub>3</sub> content the phosphate has not fully reverted back to highly insoluble forms of Calcium phosphate.

Although the manurial value of these sands for direct application as a phosphatic and calcium source in acid soils had been indicated by Datta *et al*<sup>2</sup> and Kurup and Koshy<sup>4</sup>, the commercial exploitation of this will have to be viewed against the far-reaching repercussions that will be set by upsetting the existing delicate equilibrium between the thin mantle of soil-sweet ground water and ecosystem.

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