

SCOPE OF THE INVESTIGATION:

The estimation of urease activity carried out in different soils from various parts of the globe and its correlation with other soil properties reveals that such studies have paramount contributions in understanding the potentialities of any soil.

No work has yet been done in estimating the urease activity in soils from different parts of Orissa to screen their fertility for better edaphic pursuits. The experiments designed in this investigation are an attempt to streamline an estimation of urease activity of the soils and to examine if there is any correlation of its values with soil fertility.

In Orissa, 8 different soil groups are available, viz. a) Red loam soils and red sandy soils, b) Laterite soils, c) Red and yellow soils, d) Coastal alluvials including saline soils, e) Deltaic soils, f) Black soils, and g) Brown forest soils (Anonymous, 1981). The soil map (Fig.1) shows their distribution and the locations of sampling.

Attempts have been made to study the range of urease activity and the possible correlation of the same with various soil physico-chemical characteristics such as percentage of organic carbon and nitrogen, pH cation exchange capacity, texture-cum-surface area and the soil nutrient such as available phosphorus and amino acids.

The soil elemental constituents primarily determine the chemical nature of soil surface. Besides, some of the elements significantly influence, soil urease activity than others. Determination of their relative status was therefore essential in assessing their contribution in controlling the urease activity.

In addition to urease, some other soil enzymes, such as dehydrogenase, β -glucosidase, cellulase, invertase and amylase also been estimated. The activity correlation of these enzymes with urease and certain other characteristics were determined for ascertaining their possible significance in soil fertility. ✓

The soil that supports vegetation has a tendency to harbour a significant amount of microflora in their rhizospheres. An attempt has been made to find out the magnitude of increase in the rate of urease activity and the locus of the same, i.e., whether they remain free or being immobilized. For this purpose, the rhizospheres of some common weeds were explored.

In developed soils many of the enzymes are held to stability by immobilization. Attempts were made to understand the possible mechanism responsible for this phenomenon by irradiating the soil to gamma irradiations. The different components like organic carbon compounds, urease, metallic ions etc. so produced on γ -irradiation were subjected to determination of several parameters, which showed active unsaturation in organic compounds decrease and so also the urease activity. The metallic ions subsequent to irradiation were determined to ascertain their association with organic matter and apparent contribution to soil fertility.