

## ABSTRACT

Factors affecting urea adsorption and urease activity in several Trinidad soils with contrasting properties were investigated. Soil factors which promote urea adsorption i.e., high organic carbon and clay contents were also associated with high urease activity. However, low soil pH had a detrimental effect on urease activity but at the same time it facilitated the urea adsorption process.

Michaelis constant ( $K_m$ ) of soil urease for the different soils were variable. Fine textured soils with high organic carbon content showed higher  $K_m$  values than coarse textured soils. The free energy of activation of urease was almost similar for different soils but entropy of activation, enthalpy of activation and activation energy differed considerably.

Amendment of soil with glucose or animal manure increased urease activity considerably. However, the induced urease activity diminished with time and also with toluene treatment. Toluene treatment in urease assay resulted in both increases and decreases in activity depending upon the soil type. The treatment reduced the difference between the urease activity of air-dry and field moist samples.

Different methods of soil storage influenced more markedly the urease activity of fine textured soils with high moisture contents than coarse textured soils. Preservation of field-moist samples by

refrigeration at 4 C was found to be the most appropriate method of storing soil samples for urease assay.

2,5-dimethyl-p-benzoquinone was the most effective urease inhibitor and the magnitude of inhibition persisted for longer periods compared to other quinones tested. Naturally occurring tannins in bark extract of *Terminalia arjuna* produced considerable inhibition. Among several plant protection chemicals investigated Parathion, Nemagon and Thiram produced significant inhibition of soil urease activity, whereas herbicide treatment resulted in both increases and decreases in enzyme activity depending on the soil characteristics.