

Biochemical Properties of Roi Et and Phimai Soil Receiving  
Organic Fertilizers

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Abstract

A laboratory experiment on changes in chemical and biochemical properties of Roi Et and Phimai paddy soil receiving organic fertilizer was conducted at both under aerobic and anaerobic condition. The organic fertilizers used were fresh Sesbania rostrata, rice straw and cow dung. The soil samples incubated at field capacity were analyzed for cumulative  $\text{CO}_2$ ,  $\text{NH}_4^+$  and  $\text{NO}_3^-$  in the soil of 0-2.5 and 2.5-5 cm depth. While the same treatments incubated at closed submerged condition were analyzed for pH,  $\text{NH}_4^+$ ,  $\text{Mn}^{2+}$ ,  $\text{Fe}^{2+}$  and organic acid.

In both soils incorporation of organic fertilizer increased  $\text{NH}_4^+$  concentration in both aerobic and anaerobic conditions. Decomposition of organic fertilizer increased in this order : Sesbania > rice straw > cow dung. The amount of  $\text{CO}_2$  and  $\text{NH}_4^+$  were higher in Phimai paddy soil than in Roi et soil.  $\text{NO}_3^-$  was found to increase while  $\text{NH}_4^+$  was found to decrease in aerobic soil indicated nitrification.

After submerging the soil, pH,  $\text{NH}_4^+$ ,  $\text{Mn}^{2+}$  and  $\text{Fe}^{2+}$  rised. This occured more intense in Phimai than in Roi Et soil, especial-ly, when organic fertilizers were incorporated. Successive managanous and ferrous formation indicate manganese reduction and ferric reduction in submerged soil. Only acetic acid was detected as an intermediate product of organic matter decomposi-tion. The amount of this acid increased to the maximum, 1.5 mM/100g soil from Sesbania treatment, and finally decresed to the lowest amount at 24 day.