



Influence of manuring of microbial activity and organic matter decomposition in rice soil

H.K.SENAPATI, A.K. DASH AND R.ACHARYA

ABSTRACT

A field experiment was conducted in the central farm of OUAT during 2005-2008 with rice-rice cropping sequence using inorganic, organic and integration of both type of fertilizers. The soil samples after completion of *Rabi* rice crop was taken for present study purpose. Due to application of readily available sources of energy along with organic nutrients the microbial population in soil was increased which influenced the microbial decomposition process. The rate of organic matter decomposition was studied by incubation method, from the result it was observed that during fifth week of incubation with dextrose the highest value of 21.98 mg carbon / 100g soil was obtained in silicate slag (Soil conditioner) treated plot, where as lowest value was observed with unamended soil of control plot. On the other hand the highest population counts of 13.7×10^7 number of bacteria and 3.14×10^6 number of fungi were observed in FYM treated plot where as the highest of 2.6×10^5 number of actinomycetes were observed in silicate slag treatment .

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Key words : Manuring, Microbial activity, Organic matter decomposition, Rice-rice cropping system.

INTRODUCTION

Degradation of organic matter in soil is mainly biochemical in nature involving hydrolysis and oxidation brought about by various hydrolytic enzymes liberated by microorganisms. The actinomycetes participated mostly in decomposition of resistant components of plant residues and formation of humus. In general the bacterial and fungal population immediately proliferated upon organic amendments (Fraser *et al.*, 1988). Nitrogen @ 10 mg per kg of soil significantly improved the bacterial and fungal population where as @ 15 mg per kg of soil improved actinomycetes population and increased dose of phosphorus increased microbial population during all growth stages (Singh *et al.*, 1998). Application of farm yard manure (FYM) increased total population of soil microbes (Chandrayan *et al.*, 1980; Kukreja *et al.*, 1991). The highest microbial biomass was observed under the

integrated usage of organic manure (FYM) + inorganic fertilizers (NPK) (Santhy *et al.*, 1999). Continuous use of FYM along with optimum level of NPK increased the organic carbon content of soil (Santhy *et al.*, 2000). The rate of respiration (*i.e.* CO₂ evolution) from soil can be related to microbial biomass as an indicator of microbial activity (Nanda *et al.*, 1988)

MATERIALS AND METHODS

The present investigation was conducted in the E block of OUAT, Bhubaneswar, Research Station in medium land during 2005-08 *Rabi* with rice as the test crop as per the treatments presented in Table 1. There were 12 treatments with 4 replications under Randomised Block Design (RBD). The initial soil sample was collected and analyzed as per the procedures of Jackson (1973)

Correspondence to :

A.K. DAS, Department of Soil Science and Agricultural Chemistry, Orissa University of Agriculture and Technology, BHUBANESWAR (ORISSA) INDIA

Authors' affiliations:

H.K.SENAPATI AND R.ACHARYA, Department of Soil Science and Agricultural Chemistry, Orissa University of Agriculture and Technology, BHUBANESWAR (ORISSA) INDIA