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Effect of Manures and Amorphous Aluminosilicates on Amount and Stability of Adsorbed Humus on Coarse and Fine Clay of Different Soils from Long-term Fertilizer Experiment

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Abstract–*The present investigation was carried out to study the amount and stability of adsorbed humus against thermal and microbial decomposition in relation to nature and source of humus as well as amorphous aluminosilicate (AAS) content in coarse and fine clay. Three different organic manures namely farmyard manure (FYM), biogas slurry (BGS) and a decomposed green manure* Daincha *(Susana aculeata) compost (GMC) were taken for extraction of fulvic and humic acid from them. Clay samples separated from four soils of long term fertilizer experiment belonging to the orders of Inceptisol, Mollisol, Vertisol and Alfisol were fractionated into coarse clay (0.2-2mm)(CC) and fine clay (< 0.2 mm) (FC) each of which was again subdivided into two fractions one with amorphous aluminosilicates (AAS) and another without AAS. Humic acid (HA) and fulvic acid (FA) from different sources were mixed with different clay samples and shaken for 24 hours. The prepared clay-humus complexes were incubated for stability studies against microbial decomposition using mixed fungus culture of Trichoderma receeii and Aspergillous awamori. Thermal stability of clay-humus complexes were studied by incubating at 55 ^{o} C and determining organic carbon content at 10 days interval. Statistical analysis with respect of the amount of humus adsorbed followed the sequences: a) Vertisol- clay> Inceptisol- clay> Mollisol- clay = Alfisol- clay. b) FC >CC >CC minus AAS > FC minus AAS ; c) BGS-humus > FYM-humus > GMC-humus and d) HA > FA. With respect to stability against both microbial and thermal decomposition the common sequences of stability observed were a) FC >CC >CC minus AAS > FC minus AAS, b) BGS-humus > FYM –humus > GMC-humus and c) HA > FA.*

Key words: Stability, humus, clay, amorphous aluminosilicate biogas slurry, farmyard manure, green manure compost