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Abstracts

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Fresh pressmud (65-70%) of sulphitation process collected from M/s Sakthi Sugars Ltd., Sakthinagar, Tamil Nadu and other wastes were analyzed for physico-chemical properties using standard procedures. The results showed that the pressmud was neutral in reaction (pH 7.1), high in organic carbon content with wide C/N ratio (27.2), considerably high in total calcium (4.14%), magnesium (1.10%) and sulphur (1.26%) with appreciable amounts of nitrogen, phosphorus as well as micronutrients. Bagasse had the highest organic carbon content (38%) followed by coirpith (37.5%), sugarcane trash (36%) and the lowest value of 9.52% was observed in yeast sludge. Yeast sludge was found to be the richest source of nitrogen (1.67%), phosphorus (0.78%) and potassium contents (4.48%).

The basic organic material used for composting is pressmud. Rock phosphate used as inorganic additives. Two wind rows of two tons pressmud capacity were constructed on the cement platform of compost yard, M/s Sakthi Sugars Ltd., Sakthinagar using tractor with hydraulic un-loader attachment and other wastes were added, and mixed thoroughly using aerotiller. Then, weighed quantities of rock phosphate at the rate 5% of the pressmud on fresh weight basis were spread over the windows and again mixed well. After two days, composite microbial culture at 0.1% level (one litre per ton) was added and turnings were given up to 90 days and then allowed for curing.

Triplicates samples collected periodically during the composting process at an interval of 15 days up to 120 days were air-dried and ground to pass through a 1-mm sieve and utilized for analysis of pH, organic carbon, total, ammoniacal and nitrate nitrogen, humic substances and lignin and cellulose.

Results showed that the organic carbon and C/N ratio of the composting materials significantly decreased with time of decomposition. The C/N ratio decreased substantially up to 90 days and became comparatively stable later on. Compost that received RP showed higher potentialities in narrowing the C/N ratio than in the non-phosphated compost. Results of total nitrogen showed gradual increase in their content during composting while ammoniacal nitrogen increased up to 90 days of decomposition and later decreased considerably that coincides with the significant increase in nitrate nitrogen content of the composting mixes. However, the RP treated compost contained higher amount of all forms of nitrogen compared without RP. The lignin and cellulose content of compost mixtures decreased considerably with time and higher degree of degradation was noticed in compost with RP. The humic acid content increased consistently throughout the decomposing period whereas fulvic acid contents in composting mixes increased up to 60th day of decomposition and later, it decreased continuously. The addition of RP to composting materials enhanced the formation of both humic and fulvic acids with an increase in the polymerization rate.

The investigation revealed that the incorportion of rock phosphate into the composting organic materials increased nitrogen content with a favourable C/N ratio by enhancing the degree of decomposition besides improving the quality of the compost due to increased quantities of humic substances.

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Distribution of Free Iron and Aluminium Oxides in Soils on Different Geomorphic Conditions in North Karnataka

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The free iron oxide forms a part of the total iron content in soils, occurring as oxides and hydroxides as coatings on clay particle surfaces or in inter layer position. The distribution of pedogenic oxides and hydroxides of iron are indicators of the intensity of weathering and soil develoment. Dithionite extractable iron and aluminium are often considered as the indicator of the age of the soil. An attempt has been made in this paper to study the topographical influence on the distribution of iron and aluminium oxides.

The study area was Kumta taluk in Uttara Kannada district of Karnataka. Five pedons representing different geomorphic conditions namely hills,

plateau, escarpments, pediments, and valley were selected. These pedons were examined and described following stardard soil survey techniques. Horizon wise samples were collected and air-dried fine sieved (0.5 mm) samples were used for the analysis. Free iron (Fe_d) and aluminium (A_{ld}) oxides in soil were extracted using citrate-bicarboante-dithoinite procedure. Iron in the extract was determined colorimetrically with orthophenanthroline and aluminium by aluminon method, after digesting an aliquot of the extract with concentrated HNO_3 and H_2SO_4.

The high content of iron (2.28 to 10.98%) indicates that soils in this landscape are at an advanced stage of weathering. Bt horizons of all the pedons under study exhibited higher content of Fe_d, indicating the movement of iron along with the clay. The distribution pattern of Fe_d followed a trend close to that of clay. Among the physiographic units the valley pedon recorded highest Fe_d content owing to the removal of iron from higher topographic positions by erosion soon after weathering and its consequent deposition in the valley, which is facilitated by the higher mobility of iron. The content of Fe_d followed the order valley > hills > plateau > pediments > escarpments. The instability of soils on the escarpments and consequent high rate of erosion favored by the heavy rainfall (mean annual rainfall 3522 mm) presumed to be the factor for their very low Fe_d content. In case of dithionite extractable aluminium (Al_d) the content was more in surface horizons and a decreasing trend with depth was observed. Plateau pedon recorded the highest Al_d content and it was comparatively low in valley pedons due to low mobility of aluminium and consequent accumulation at the point of weathering.

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Influence of Long-term Application of Fertilizer and Manure on Organic, Inorganic and Total P and S Content in Typic Haplustert

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A long-term fertilizer experment is being conducted on Typic Haplustert of Jabalpur since last 3 decades with soybean-wheat-maize rotation (maize discontinued since, 1994) receiving 20:80:20, 120:80:20 and 80:60:20 as recommended dose of fertilizer (100% NPK) for soybean-wheat-maize fodder respectively with 50, 100, 150% NPK, 100% NPK + FYM, 100% NPK-S, 100% N, 100% NP and control along with other treatments. Inorganic, organic contents of P and S and their percentage of total was studied in surface soil. The result shows that increasing level of fertilizer application had resulted in increased inorganic, organic and total P and S contents. It was observed that organic P contents as percentage of total P under these treatments ranged between 54 and 57% indicating that a greater proportion of total P is retained in organic form. The inorganic P content under these treatments ranged between 42 and 43% which was relatively lower as compared to organic form which could probably be due to depletion of inorganic source by crops. However, in case of S, a reverse trend was observed as organic S as percentage of total varied from 28 to 30% whereas the variation in inorganic S as percentage of total S was 69 to 70% indicating that S added in the inorganic form is not easily converted to organic form. The data indicates existence of equilibrium between forms of nutrients. These results call for the step to be taken for better uilization of reservoirs of P and S of the soil to economize fertilizer use in intensively cropped soybean and wheat sequence.