Estimation of Soil Organic Carbon and its Fractions in Paddy growing soils of Northern Province of Sri Lanka

Yogenthiran, N.,[1] Ratnayake, R.[2] and Gnanavelrajah, N.[1]*

[1]*Department of Agricultural Chemistry, Faculty of Agriculture, University of Jaffna, Sri Lanka*

[2]*National Institute of Fundamental Studies, Kandy Sri Lanka*

**gnanavelrajah@yahoo.com*

Soil organic matter plays a vital role in the dry zone agriculture. Maintaining soil organic carbon not only enhances crop production but also helps to manage greenhouse effect. In this regard paddy growing soils favours accumulation of soil carbon because of flooded condition. In this study, total soil organic carbon and its fractions in paddy growing soils were estimated in the Northern Province of Sri Lanka.This study was carried out in Jaffna, Kilinochchi, Vavuniya, Mannar, Mullaitheevu districts of Northern Province of Sri Lanka. The great groups of paddy growing soils in the study area includes Calsic yellw latosols (Ustorthents), Low humic gley (Endoaqualfs) soils, yellow latosols (Ustorthents), Ggrummusols (Endoaquerts), Alluvial soils (Tropaquents), Sandy Regosols (Quartzipsamments) and Solodized Solonetz (Natraqualfs). Eighty four soil samples were collected from depths of 0-15 cm and 15-30 cm from the five districts of Northern region according to the percentages of paddy cultivation area. Total organic carbon and its fractions such as microbial biomass carbon, water soluble carbon and KMnO4 oxidizable carbon were analyzed. By overlaying the soil map and land use map in a GIS environment, extent of paddy soils in each soil great group in each district was estimated. Total organic carbon, microbial biomass carbon, water soluble carbon and KMnO4 oxidizable carbon in top soil were ranged from 0.31 - 4.73%, 0.001 - 0.069%, 0.001 -0.029% and 0.043 - 0.070% respectively. The total organic carbon in top soil of Jaffna, Killinochchi, Mannar, Mullaitheevu and Vavuniya were ranged from 0.46 - 2.73%, 0.31 - 2.75%, 1.41 - 2.97%, 0.79 - 2.07% and1.66 - 4.37% respectively. Using the average bulk density values for each great group soils, the total organic carbon, microbial biomass carbon, water soluble carbon and KMNO4 oxidizable carbon in paddy fields of Northern Province, were estimated as 6,045,299, 48,228, 43,671and 226,914 tons respectively at 0 -30 cm depth.

Keywords: Total organic carbon, Paddy soils, Microbial biomass carbon, Water soluble carbon