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SOIL ORGANIC CARBON IN BLUE CARBON ECOSYSTEMS OF NORTH WEST OF SRI LANKA

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Blue carbon ecosystems with intense carbon accumulation are a dynasty in atmospheric carbon mitigation. These ecosystems are highly encroached and polluted and has become defective in functioning. With the intention of identifying the current status of the soil carbon pools, available nutrient contents and other associated edaphic conditions in blue carbon ecosystems, sampling was conducted from the top layer of soil (0-15 cm from surface) in mangrove and saltmarsh ecosystems at Vidataltivu, Achchankulam, Naravillikulam and Umangri, in the Mannar District. Subsequently, these were analysed for available nitrate, phosphate, ammonium anions, Microbial Biomass Carbon, Permanganate oxidizable carbon and soil organic carbon (SOC). Principal Component (PC) analysis was performed to reveal the spatial heterogeneity of examined parameters in above mentioned ecosystems using Minitab 17. Results showed two significant PCs, in which the first PC represented an inverse gradient of SOC and pH (PC loadings for SOC = 0.54, Moisture content = 0.53 and pH = -0.38). A gradient of significantly low phosphate and nitrate availability with high EC level was featured by the second PC (PC loadings for nitrate = -0.65, phosphate = -0.51 and EC = 0.244; mean values for phosphate = 53.75 ± 10.60 mg kg^{-1}, nitrate = 1.95 ± 1.53 mg kg^{-1}, and EC = 7.70 ± 3.97 mS cm^{-1}, respectively). Well grown mangrove sites have adopted for lower availability of soil nutrients. Soil organic carbon ranged at the lowest level of less than 10% and the highest range of pH (7.8 - 8.5) was cited descriptively via clustering at the sites of mangrove invaded saltmarshes, mixed dry forests, grazing lands, and mid mangrove sites encroached by fishing industry and human dwellings. Highest SOC of more than 25% was found in areas where dense growth of mature *Avicennia* or *Rhizophora* spp. were present under persistent water logging conditions. Thus, we confirm that anthropogenic activities affect adversely on SOC stocking in considering blue carbon ecosystems.

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Keywords: Labile carbon, Mangroves and saltmarsh ecosystems, Microbial biomass carbon, Principal component analysis, Soil organic carbon