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Assessing the soil microbial biomass carbon status of *chena* cultivation systems in Mihintale, Sri Lanka

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Chena cultivation, considered one of the oldest forms of agricultural practices in Sri Lanka, is done for crop cultivation and it serves as a main economic pillar for rural communities. *Chena* cultivation systems in the Mihintale division are characterized by their originality and adherence to traditional practices and the systems exhibit variations in crop types and different management practices. Soil microbial biomass carbon (MBC) is part of soil organic carbon in live microbes, representing a significant carbon pool and a key indicator of soil microbial activity and soil health. *Chena* cultivation degrades native vegetation and is considered an unsustainable agriculture practice. Therefore, this study aims to assess the microbial biomass carbon of soils in *Chena* cultivation systems in the Mihintale division, Anuradhapura, Sri Lanka. Soil samples were collected from 16 predetermined sites to a depth of 0-15 cm across the *Chena* cultivation lands within the Mihintale division using a stratified random sampling method. Using standard protocols, soil samples were analyzed for soil moisture content, bulk density, MBC, soil pH, and electrical conductivity (EC). The results indicate a significant variation in soil MBC and EC across the different sites. The MBC varied within the range of 0.037% to 0.859% and most of the EC values were scattered within the range of 10.68 µS/cm to 47.90 µS/cm. Pearson correlation analysis revealed a significant negative correlation (correlation coefficient=-0.002) between MBC and EC which could be attributed to the potential inhibitory effect of higher salt concentrations on microbial activity. Similar studies have reported that the MBC for paddy soil ranges from 0.001% to 0.17% and for forest soil from 0.045 % to 0.823 %. The findings of this study are vital for sustainable soil management practices to maintain soil health and improve soil fertility and productivity in *Chena* cultivation systems.

Keywords: *Chena cultivation lands, electrical conductivity, microbial activity, soil health, soil organic carbon*