

## CHANGES OF SOIL MICROBIAL BIOMASS UNDER DIFFERENT LAND USE PATTERNS IN REDDISH BROWN EARTH SOIL

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This study was conducted to investigate the response of soil microbial biomass (SMB) mainly in terms of microbial biomass carbon (MBC) in surface and sub-surface layers of reddish brown earth (RBE) soil under four different land uses (LUs) i.e. forest, conventional agricultural land, organic agricultural land, and home garden. The composite soil samples were collected from the top (0-15 cm) and subsoil (15-30 cm) of each LU and analysed for MBC, microbial activity, and certain physicochemical properties of soil pH, organic matter (OM), and moisture content. The MBC values in surface soils (ranging between 0.68-0.74 mg g<sup>-1</sup>) were not showing any significant difference ( $p>0.05$ ) among the forest, home garden, and organic land. However, the MBC (0.79±0.061 mg g<sup>-1</sup>) was significantly highest in forest sub-surface soil. The lowest ( $p>0.05$ ) MBC was recorded with conventional agricultural land in both surface (0.571±0.04 mg g<sup>-1</sup>) and sub-surface (0.356±0.06 mg g<sup>-1</sup>) soils. Overall, the MBC decreased significantly with soil depth but showed an insignificant increase in the forest soil which corresponds to moisture content. The microbial activity was significantly higher in organic land for both surface and sub-surface soils. The OM was also significantly higher in forest soils for both surface and sub-surface. However, the soil pH was not significantly different ( $p>0.05$ ) among the different LUs. Moreover, the MBC was positively correlated with OM and negatively correlated with soil pH for two soil layers. It can be concluded that LUs and soil depth are significantly influenced by MBC by representing SMB in two soil layers of these study sites. Further studies are needed to evaluate the temporal variation of SMB under different LUs in RBE soils.

**Keywords:** Land use patterns, Microbial activity, Microbial biomass carbon, Surface and sub-surface soils