



## Seasonal Dynamics of Soil Microbial Biomass Carbon under Different Forests of North Western Himalaya, India

Sharmistha Pal<sup>1,\*</sup>, Pankaj Panwar<sup>1</sup>, Nancy Loria<sup>1</sup>, M.R. Verma<sup>2</sup> and N.K. Sharma<sup>3</sup>

<sup>1</sup>ICAR-Indian Institute of Soil and Water Conservation, Research Center, Chandigarh-160 019, India

<sup>2</sup>ICAR-Indian Veterinary Research Institute, Izatnagar, Bareilly, Uttar Pradesh

<sup>3</sup>ICAR-Indian Institute of Soil and Water Conservation, Dehradun

E-mail: sharmistha.ars@gmail.com

---

**Abstract:** Present research was conducted to study the seasonal variation of soil microbial biomass carbon (MBC) in relation to soil depth under different forest based ecosystems of western Himalaya, India. Soil samples were collected randomly from each of the five land uses, in different seasons (i.e., rainy, winter and summer). Soil samples were collected in triplicate, from four different depths (0-15, 15-30, 30-45 and 45-60 cm), in every season. The chloroform fumigation extraction method was used to determine soil microbial biomass carbon. Irrespective of land uses, the highest value of soil microbial biomass carbon was observed during rainy season, followed by summer and minimum in winter. Microbial biomass carbon showed a strong positive correlation with soil organic carbon and soil moisture. MBC was highest in surface soil (0-15cm) of *Quercus* (572.9  $\mu\text{g g}^{-1}$  soil) forest and lowest in agricultural lands (262.2  $\mu\text{g g}^{-1}$  soil) at 45-60 cm depth. The effect of forest based ecosystems on soil microbial carbon was most prominent in surface soil and decreased as the soil depth increased.

**Keywords:** Himalaya, Microbial biomass carbon, Land use, Seasonal dynamics, Soil depth

---