

Carbon dynamics in soil as affected by microbial activity

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Soil can act as carbon (C) pool in global cycle. C stored in soil is mostly in the form of stable humic substances estimated as about double of atmospheric CO₂. Soil is the important place for bioproduction, but nowadays under environmental stress by human impacts such as soil contamination, salinization, and other soil degradations. Soil microbial biomass, defined holistically as the living component of soil organic matter is actively involved in biogeochemical processes that occur in soil microniches of soils. These processes include organic matter decomposition, microbial oxidoreduction, and cycling of C, N, and plant nutrients. The nature and extent of these biogeochemical processes cannot be approximated without understanding the involvement of microorganisms in these processes. Microbially-mediated biogeochemical processes, such as photosynthesis, organic matter decomposition and nutrient immobilization, lead to increases in the content of microbial biomass, while processes, such as biomass turnover and mineralization, lead to its decrease. In addition, the level of microbial biomass in soil ecosystem is affected by many biotic and abiotic factors, such as N fertilization, organic matter applications, soil type, and even elevated CO₂ in the atmosphere.