

Earth Science & Climate Change

July 25-27, 2016 Bangkok, Thailand

Effects of environmental and biotic factors on carbon isotopic fractionation during decomposition of soil organic matter

Chen Zixun, Guoan Wang and Yufu Jia
China Agricultural University, China

Decomposition of soil organic matter (SOM) plays an important role in the global carbon cycle because the CO₂ emitted from soil respiration is an important source of atmospheric CO₂. Carbon isotopic fractionation occurs during SOM decomposition, which leads to ¹²C to enrich in the released CO₂ while ¹³C to enrich in the residual SOM. Understanding the isotope fractionation has been demonstrated to be helpful for studying the global carbon cycle. Soil and litter samples were collected from soil profiles at 27 different sites located along a vertical transect from 1200 to 4500 m above sea level (a.s.l.) in the south-eastern side of the Tibetan Plateau. Their carbon isotope ratios, C and N concentrations were measured. In addition, fiber and lignin in litter samples were also analyzed. Carbon isotope fractionation factor (α) during SOM decomposition was estimated indirectly as the slope of the relationship between carbon isotope ratios of SOM and soil C concentrations. This study shows that litter quality and soil water play a significant role in isotope fractionation during SOM decomposition, and the carbon isotope fractionation factor, α , increases with litter quality and soil water content. However, we found that temperature had no significant impact on the α variance.

Biography

Guoan Wang has completed his PhD from Institute of Geology and Geophysics, CAS and Post-doctoral studies from Peking University. He is currently a Professor at China Agricultural University, Beijing, China. His team research focuses on climate and environmental changes using carbon and nitrogen isotopes in plants and soils. He has published more than 20 papers in reputed journals and has been serving as an Editorial Board Member of repute.

gawang@cau.edu.cn

Notes: