The application of ^{13}C pulse labeling in the partitioning of soil respiration in a *Leymus chinensis* steppe in Inner Mongolia, China

GENG Yuanbo, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Science, Beijing 100101, China

Abstract (300 word limit)

In this study, we researched the soil respiration distinction with ^{13}C pulse labeling technique combining static chamber-Keeling plot method in the *Leymus chinensis* grassland in Xinlin River basin, Inner-Mongolia. During the observation period, the $\delta^{13}C$ value of soil respiration averaged (-17.8±0.8) ‰, which was at the range of -20.7‰~-15.7‰; $\delta^{13}C$ of microbial respiration averaged (-21.3±0.5) ‰, ranging from-22.5‰~-19.0‰. Roots do not reflect newly assimilated C since they have long residence time. The contribution of root respiration to soil respiration averaged (30±6) %, ranging from 7%~69%. The fraction of root respiration to soil respiration began to increase from the middle of July and reached its peak value until the middle of August. Then, it gradually decreased.

Key words: ^{13}C pulse labeling; *Leymus chinensis* steppe; partitioning of soil respiration

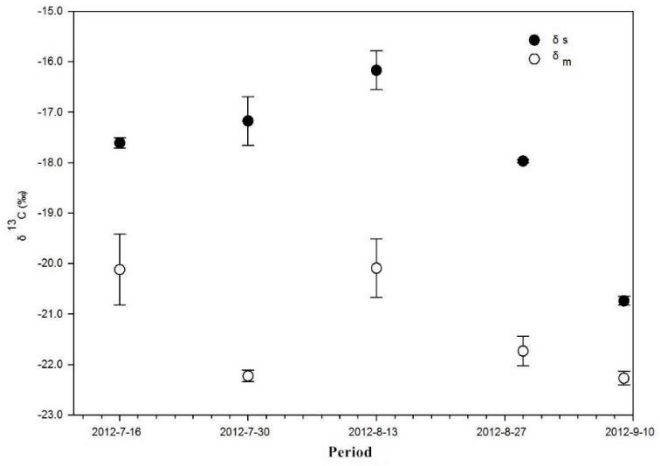


Fig.1 The $\delta^{13}C$ of the soil respiration and the soil microbial respiration during observation period

Image

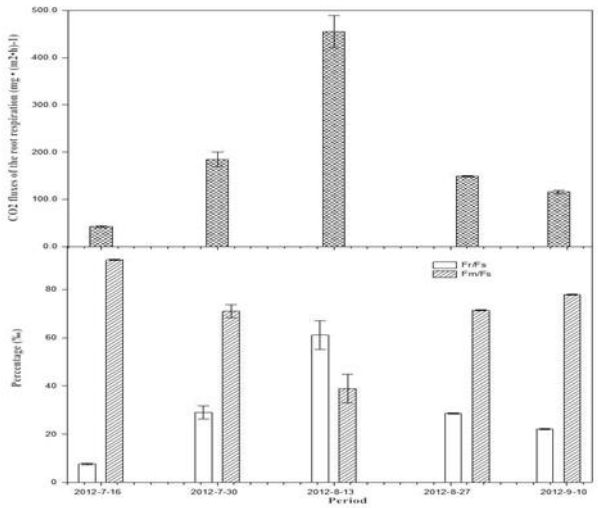


Fig.2 The CO2 fluxes of root respiration and the proportion of root respiration and soil microbial respiration accounting for soil respiration during observation period

Recent Publications (minimum 5)

1. GENG YuanBo, LUO GuangQiang & YUAN GuoFu(2010). CH_4 uptake flux of *Leymus chinensis* steppe during rapid growth season in Inner Mongolia, China. SCIENCE CHINA Earth Sciences, 53(7): 977-983.
2. GENG Yuanbo, LUO Guangqiang(2011). Influencing factors and partitioning of respiration in a *Leymus chinensis* steppe in Xilin River Basin, Inner Mongolia, China. Journal of Geographical Sciences, 21(1): 163-175.
3. GENG Yuan-bo, SHI Jing-jing(2012). Application of the carbon isotope in the partitioning of soil respiration in grassland. Scientia Agricultura Sinica, 45(17):3541-3550. (In Chinese with English abstract)
4. WANG Song, GENG Yuan-bo*, MU Yue(2016). Responses of aboveground net primary productivity of typical steppe to climate change —a simulation based on CENTURY Model. Acta Prataculturae Sinica, 25(12):4-13.(In Chinese with English abstract)
5. SHI Jing-jing, GENG Yuan-bo*(2014). Study on the distinguishing of root respiration from soil microbial respiration in a *Leymus chinensis* Steppe in Inner Mongolia, China. Environmental Science, 35(1): 341-347. (In Chinese with English abstract)



Biography (150 word limit)

GENG Yuanbo has his expertise in nutrient elements cycle (C, N, Mn etc.) in grassland ecosystem and the carbon emission in cement production. He partitioned soil respiration in steppe by root biomass exponential regression method and stable carbon isotope ^{13}C pulse labeling method in the Xilin River Basin, Inner Mongolia, China. He researched CO_2 emission factors from cement industry and corrected CO_2 emission classification in cement production process.

Email: gengyb@igsnrr.ac.cn

Notes/Comments