生态学报 2007 27 (2007-07): 2922～2928 ISSN: 1004-616x CN: 44-1063/R

研究论文

大气CO_2升高和蚯蚓活动对土壤C、N的影响

宋琰, 肖能文, 戈峰*

中国科学院动物研究所, 北京100080

收稿日期 2006-12-13 修回日期 2007-5-30 网络版发布日期: 2007-7-25

摘要 以加倍CO_2浓度(750μmol/mol)处理和正常CO_2浓度(370μmol/mol)生长下的棉花凋落叶为试验材料，以威廉腔蚓Metaphire guillemi (Michaelsen, 1895)和不同的CO_2浓度(750μmol/mol和370μmol/mol)为作用因子，分析了蚯蚓、CO_2浓度通过叶片分解对土壤C、N含量的影响。结果表明:接种蚯蚓和加入凋落叶的联合作用对有机C有显著提高作用。接种蚯蚓对土壤全N含量影响不显著，但 CO_2浓度升高和蚯蚓联合作用对土壤全N含量有显著影响。CO_2、叶片、蚯蚓3因子联合作用对土壤C、N含量有显著提高作用，且与蚯蚓和叶片联合作用对土壤C、N含量的影响相比，其效果更显著。结果显示，CO_2浓度的升高通过改变植物凋落物C含量及其营养成分，影响了其潜在的降解有效性，同时大气CO_2浓度的升高影 响凋落物在蚯蚓体内降解过程，从而对凋落物的有效降解产生显著影响，最终改变土壤C、N含量。

关键词 蚯蚓 _ 土壤生态 _ CO_2浓度 _ C _ N

分类号 Q143

Influence of earthworm on C & N content in soil under elevated CO_2

SONG Yan, XIAO Neng-Wen, GE Feng*

Institute of Zoology, Chinese Academy of Sciences, Beijing 100080, *China*

Abstract The influence of earthworm and elevated CO_2 on cotton leaf decomposition and C and N transformation in the soil by the 56 days experiment treated with earthworm under different levels of CO_2 were analyzed. The effect of different levels of CO_2, cotton leaf and their interactions on C content in soil was not significant, while interaction of earthworm and cotton leaf was significant. Earthworm didn't influence the N content solely, but the combined effect of elevated CO_2 and earthworm could influence the N content. The interaction of CO_2, earthworm and leaf was more significant than that of earthworm and leaf. Our results indicated that the elevated CO_2 made the component of litter decomposition easier and improved the ability of decomposition and transformation of litter through earthworm, resulted in the change of C and N content in soil.

Key words earthworm _ soil ecology _ CO_2 _ C _ N

DOI

通讯作者 戈峰 gef@ioz.ac.cn