土 壤 学 报
ACTA PEDOLOGICA SINICA
Turang xuebao

王春燕,陈秋波,袁 坤,李光明,杨礼富,王真辉.橡胶林土壤呼吸速率及其与土壤温湿度的关系[J].土壤学报,2013,50(5):974-983.Wang Chunyan,Chen Qiubo,Yuan Kun,Li Guangming,Yang Lifu and Wang Zhenhui.Soil respiration rate and its relationship with soil temperature and moisture in rubber plantations[J].Acta Pedologica Sinica,2013,50(5):974-983

橡胶林土壤呼吸速率及其与土壤温湿度的关系

Soil respiration rate and its relationship with soil temperature and moisture in rubber plantations

二维码（扫一下试试看！）

投稿时间： 2012-10-10 最后修改时间： 2013-04-07

DOI：10.11766/trxb201210100401

中文关键词： 橡胶林 土壤呼吸速率 土壤温度 土壤湿度

Key Words:Rubber plantation Soil respiration rate Soil temperature Soil moisture

基金项目:中央级公益性科研院所基本科研业务费专项资金项目(XJSYWFZX2008-18，XJSYWFZX2009-30)资助

作者	单位	E-mail
王春燕	中国热带农业科学院橡胶研究所/国家农业部儋州热带作物科学观测实验站	wyling123@163.com
陈秋波	中国热带农业科学院橡胶研究所/农业部儋州热带作物科学观测实验站	
袁 坤	中国热带农业科学院橡胶研究所/国家农业部儋州热带作物科学观测实验站	
李光明	中国热带农业科学院橡胶研究所/国家农业部儋州热带作物科学观测实验站	
杨礼富	中国热带农业科学院橡胶研究所/国家农业部儋州热带作物科学观测实验站	
王真辉	中国热带农业科学院橡胶研究所/农业部儋州热带作物科学观测实验站	wzh-36@163.com

摘要点击次数: 270

全文下载次数: 124

中文摘要:

利用Li-6400光合仪研究4 a、12 a和19 a橡胶林的土壤呼吸及其各组分(微生物呼吸、根系呼吸、凋落物呼吸)呼吸速率的日变化和年变化特征，探索土壤温度和湿度对土壤呼吸速率的影响。结果表明: 不同树龄橡胶林土壤呼吸速率在全天观测期间，出现最大值和最小值的时刻有很大差异，但在9:00~11:00时刻的测定值均接近日均值；在不同树龄橡胶林中各组分呼吸速率日变化大小虽不一致，但均表现为凋落物呼吸速率最小。4 a、12 a和19 a橡胶林土壤呼吸速率均有明显的月变化，月均值分别是2.45、2.63和2.96 μmol m^{-2} s^{-1}；最大值出现在7月和8月，最小值出现在2月和3月；不同树龄橡胶林土壤呼吸速率月变化相互间差异不显著；土壤微生物呼吸占土壤呼吸的比例最高(为43.6%)，根系呼吸次之(为36.1%)，凋落物呼吸较小(为20.4%)。土壤呼吸速率与土壤温度之间具有显著的指数函数关系，但与土壤湿度的相关性不显著，从而得知海南橡胶林土壤温度与土壤呼吸速率有着密切的关系，土壤水分与土壤呼吸速率可能没有直接的关系。

Abstract:

To determine impacts of soil temperature and soil moisture regimes on soil respiration, daily and annual variation patterns of total soil respiration rate and its components, i.e. soil microbial respiration rate, soil root system respiration rate, and litter respiration rate in rubber plantations, 4 a, 12 a and 19 a old separately, were investigated with a Li-6400 portable photosynthesis system. Results show that during a day of observation, the appearance of peak and valley of soil respiration rate varied sharply from plantation to plantation different in age. However, the values obtained between 9:00 and 11:00 were all quite close to the daily mean values of soil respiration.. Although daily variations of the components differed in extent with age of the plantation, the component of litter respiration rate was the lowest in any case. Obvious monthly variations of soil respiration were found in rubber plantations, 4 a, 12 a and 19 a old, with the mean rate being 2.45, 2.63 and 2.96 μmol m^{-2} s^{-1}, respectively, and the maximum value recorded in July or August and the minimum in February or March. No significant difference was observed in monthly variation of soil respiration between rubber plantations different in age. Soil microbial respiration accounted for 43.6% of the total soil respiration, being the highest, and was followed by root system respiration (36.1%) and litter respiration (20.4%). A remarkable exponential relationship was found between soil respiration rate and soil temperature, but not so as such was between soil respiration rate and soil moisture. It is, therefore, concluded that soil respiration is closely related to soil temperature, but may not be directly related to soil moisture in rubber plantations in Hainan.

查看全文 查看/发表评论 下载PDF阅读器

您是本站第286282位访问者
Copyright©2008 土壤学报版权所有
地址：南京市北京东路71号 邮编：210008 Email:actapedo@issas.ac.cn
技术支持：北京勤云科技发展有限公司京ICP备09084417号