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### 亚热带稻田生态系统CO<sub>2</sub>通量特征分析

### Characteristic analysis of CO<sub>2</sub> fluxes from a rice paddy ecosystem in a subtropical region

关键词: [稻田生态系统](#) [CO<sub>2</sub>通量](#) [特征分析](#)

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摘要: 为评价稻田生态系统大气CO<sub>2</sub>的收支状况,2008~2009年江西省农业气象试验站利用涡度相关技术对稻田生态系统的CO<sub>2</sub>通量进行了为期一年的连续观测.对观测的数据进行处理和分析表明:在生长季,稻田生态系统CO<sub>2</sub>通量总体表现为负值,为CO<sub>2</sub>的汇.稻田生态系统CO<sub>2</sub>通量具有明显的日变化特征,白天净吸收CO<sub>2</sub>的量大于夜间呼吸释放CO<sub>2</sub>的量.水稻拔节到乳熟阶段吸收CO<sub>2</sub>的效率以及分蘖至抽穗期CO<sub>2</sub>的净固定量均明显高于生长初期和生长后期.在非生长季的10月中旬晚稻收获后至次年4月,除了3月稻田生态系统略向大气吸收CO<sub>2</sub>外,其余各月份均向大气释放CO<sub>2</sub>,非生长季稻田生态系统为大气CO<sub>2</sub>的源.在一个年周期内,进一步累加生长季稻田净吸收和非生长季净释放的CO<sub>2</sub>量可知,试验区稻田生态系统从大气中净吸收CO<sub>2</sub>的量为14.35t·hm<sup>-2</sup>,其中早稻吸收CO<sub>2</sub>为8.81t·hm<sup>-2</sup>,晚稻吸收CO<sub>2</sub>为11.71t·hm<sup>-2</sup>,非生长季向大气释放CO<sub>2</sub>为6.17t·hm<sup>-2</sup>,稻田生态系统总体表现为CO<sub>2</sub>的汇.

**Abstract:** In order to evaluate carbon source or sink strength,CO<sub>2</sub> fluxes from a paddy ecosystem were continuously measured using the eddy covariance technique over the course of a year. During a cropping paddy season,the summation of CO<sub>2</sub> fluxes from paddy ecosystem was negative and the paddy ecosystem was a carbon dioxide sink. Distinct CO<sub>2</sub> fluxes characteristic of diurnal variation were observed. The net absorptive capacity of CO<sub>2</sub> in the day was much more than CO<sub>2</sub> release in the night. The absorbed efficiency of CO<sub>2</sub> from rice elongating stage to milk stage was higher than other stages. The net carbon dioxide fixation from tillering stage to flowering stage was much more than other stages. During a non-cropping paddy season,i.e.,from late October(after the rice harvest) to the following year in April,the paddy ecosystem absorbed a small quantity of CO<sub>2</sub> only in March,while in other months it released CO<sub>2</sub>,becoming a carbon source. The paddy ecosystem absorbed 14.35 t·hm<sup>-2</sup> of CO<sub>2</sub> from the atmosphere over a year,including 8.81t·hm<sup>-2</sup> of CO<sub>2</sub> absorbed by early season rice and 11.71 t·hm<sup>-2</sup> by late season rice. Although the paddy ecosystem released 6.17 t·hm<sup>-2</sup> of CO<sub>2</sub> during a non-cropping paddy season,it was an overall carbon dioxide sink for the atmosphere.

**Key words:** [paddy ecosystem](#) [CO<sub>2</sub> fluxes](#) [characteristic analysis](#)

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