

鄱阳湖苔草湿地非淹水期CO<sub>2</sub>释放特征胡启武<sup>1,2\*</sup>, 幸瑞新<sup>1</sup>, 朱丽丽<sup>1</sup>, 吴琴<sup>1</sup>, 尧波<sup>1</sup>, 刘影<sup>1</sup>, 胡斌华<sup>3</sup>

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Characteristics of CO<sub>2</sub> emission from *Carex*-dominated wetland in Poyang Lake in non-flooded period.HU Qi-wu<sup>1,2</sup>, XING Rui-xin<sup>1</sup>, ZHU Li-li<sup>1</sup>, WU Qin<sup>1</sup>, YAO Bo<sup>1</sup>, LIU Ying<sup>1</sup>, HU Bin-hua<sup>3</sup>

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**摘要** 2009年9月至2010年4月非淹水期, 在鄱阳湖南矶湿地国家级自然保护区, 选择以灰化苔草为建群种的洲滩湿地, 设置土壤-植物系统(TC)、剪除植物地上部分(TJ)2个试验处理(分别代表生态系统和土壤呼吸), 利用密闭箱-气相色谱法测定了非淹水期鄱阳湖苔草湿地CO<sub>2</sub>释放通量。结果表明: 苔草湿地生态系统呼吸与土壤呼吸均具有明显的季节变化模式, 释放速率变化范围分别为89.57~1243.99和75.30~960.94 mg CO<sub>2</sub> · m<sup>-2</sup> · h<sup>-1</sup>, 土壤呼吸占生态系统呼吸的比例为64%(39%~84%); 土壤温度是苔草湿地CO<sub>2</sub>通量的主要控制因子, 可以解释呼吸速率80%以上的变异; 生态系统呼吸与土壤呼吸的温度敏感性指数(Q<sub>10</sub>)分别为3.31和2.75, 且冬季的Q<sub>10</sub>值明显高于春秋季节; 土壤水分与CO<sub>2</sub>释放速率之间未达到显著相关; 非淹水期, 鄱阳湖苔草湿地是大气CO<sub>2</sub>的汇, 其强度为1717.72 g C · m<sup>-2</sup>。

**关键词:** 鄱阳湖 湿地 生态系统呼吸 土壤呼吸 Q<sub>10</sub>

**Abstract:** By using static chamber/gas chromatography, the CO<sub>2</sub> fluxes in a *Carex cinerascens*-dominated wetland in the Poyang Lake Nanji Wetland National Nature Reserve were measured in non-flooded period (from September 2009 to April 2010). Two treatments were installed, *i.e.*, soil-plant system (TC) and aboveground plant removal (TJ), representing ecosystem respiration and soil respiration, respectively. There was an obvious seasonal variation in the ecosystem respiration and soil respiration. The respiration rate in treatment TC ranged from 89.57 to 1243.99 mg CO<sub>2</sub> · m<sup>-2</sup> · h<sup>-1</sup>, and that in TJ was from 75.30 to 960.94 mg CO<sub>2</sub> · m<sup>-2</sup> · h<sup>-1</sup>. Soil respiration accounted for 39%-84% of ecosystem respiration, with an average of 64%. Soil temperature was the main factor controlling the ecosystem respiration and soil respiration, explaining more than 80% of the respiration variance. The temperature coefficient (Q<sub>10</sub>), an index of temperature sensitivity for respiration, was 3.31 for ecosystem respiration and 2.75 for soil respiration. The Q<sub>10</sub> value was higher in winter than in autumn and spring. No significant correlation was observed between soil moisture and CO<sub>2</sub> fluxes. In non-flooded period, the *C. cinerascens*-dominated wetland acted as a carbon sink of atmospheric CO<sub>2</sub>, with a carbon uptake of 1717.72 g C · m<sup>-2</sup>.

**Key words:** Poyang Lake wetland ecosystem respiration soil respiration Q<sub>10</sub>

## 引用本文:

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