

研究报告

## 热带山地雨林尖峰栲边材液流及其与环境因子的关系

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**摘要** 应用热扩散法, 采用ICT-2000TE环境与蒸腾系统同步监测了热带山地雨林尖峰栲边材液流速率和环境因子的变化. 结果表明: 尖峰栲边材液流速率的变化规律是晴天为单峰曲线、阴雨天气为双峰或多峰曲线. 边材液流速率与太阳辐射、空气温度、蒸汽压亏缺、林内风速呈极显著正相关, 与空气相对湿度呈极显著负相关. 在旱季监测期间, 其与土壤温度呈极显著正相关、与土壤湿度相关不显著; 而在雨季, 其与土壤湿度呈极显著正相关, 与土壤湿度相关不显著, 说明降雨过程对边材液流影响较大. 建立了旱季和雨季监测期间的边材液流与环境因子多元线性回归模型, 经过 $F$ 值检验, 达极显著水平. 旱季、雨季监测期间尖峰栲单株平均蒸腾量分别为 $103.5$ 和 $41.3 \text{ kg} \cdot \text{d}^{-1}$ , 单位林地面积蒸腾量分别为 $1.94$ 和 $0.77 \text{ mm} \cdot \text{d}^{-1}$ .

**关键词** [边材液流密度](#) [环境因子](#) [蒸腾](#) [尖峰栲](#) [热带山地雨林](#)

分类号

## *Castanopsis jianfengensis* sap flow and its relationships with environmental factors in tropical montane rainforest.

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### Abstract

By the method of thermal dissipation and using ICT-2000TE apparatus made in Australia, the *Castanopsis jianfengensis* sap flow and the variations of environmental factors in a mixed tropical montane rainforest at Jianfengling Nature Forest Reserve ( $18^{\circ}36'N$ ,  $108^{\circ}52'E$ , 860 m altitude) were measured synchronously during the dry and rainy seasons, 2002. The results showed that the sap flow density of *C. jianfengensis* exhibited mono-peak pattern in clear days and multi-peak pattern in cloudy or rainy days. Sap flow density had significant positive correlations with solar radiation, air temperature, vapor pressure deficit and wind speed, but negative correlation with air relative humidity. In dry season, sap flow density was positively correlated with soil temperature but less correlated with soil moisture, while it was in adverse in rainy season, indicating that rainfall had a greater influence on the sap flow. The linear regression patterns between sap flow and environmental factors were built, which all met the significance at 0.01 level with  $F$  test. The mean transpiration rate of *C. jianfengensis* was  $103.5 \text{ kg} \cdot \text{d}^{-1}$  and  $41.3 \text{ kg} \cdot \text{d}^{-1}$  for whole tree, and  $1.94 \text{ mm} \cdot \text{d}^{-1}$  and  $0.77 \text{ mm} \cdot \text{d}^{-1}$  for the stand in dry and rainy season, respectively.

**Key words** [sap flow density](#) [environmental factor](#) [transpiration](#) [Castanopsis jianfengensis](#) [tropical montane rainforest](#)

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