

## 栝楼雌雄植株的光合作用和蒸腾作用特性

刘芸1\*\*, 钟章成2, 王小雪1, 谢君1, 杨文英1

1西南大学资源环境学院三峡库区生态环境教育部重点实验室, 重庆 400716; 2西南大学生命科学学院| 重庆 400715

Photosynthesis and transpiration characteristics of female and male *Trichosanthes kirilowii* Maxim individuals.

LIU Yun1, ZHONG Zhang-cheng2, WANG Xiao-xue1, XIE Jun1, YANG Wen-ying1

1Ministry of Education Key Laboratory of Eco-Environment of Three Gorges Reservoir Region, College of Resources and Environment, Southwest University, Chongqing 400716, China|2College of Life Science, Southwest University, Chongqing 400715, China

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## 摘要

对栝楼雌雄植株生长发育关键时期的光合作用和蒸腾作用进行研究.结果表明:在营养生长阶段,栝楼雄株的光合速率、蒸腾速率、气孔导度和水分利用效率均大于雌株;雄株比雌株提前22 d进入生殖生长阶段,当雄株进入生殖生长阶段后,其光合速率、蒸腾速率和气孔导度均大于雌株,但水分利用效率略小于雌株;当雌株进入生殖生长阶段后,其蒸腾速率和气孔导度大于雄株,而光合速率和水分利用效率显著小于雄株.气候因子对栝楼生长发育的影响主要是在营养生长和生殖生长初期,栝楼生长发育后期对气候因子的响应程度减弱.较高的温度和较低的湿度有利于栝楼的生长发育,光照可提高栝楼尤其是雄株的光合速率.进入生殖生长后,雄株的光合速率随光照的增强显著增加,而雌株的光合速率增加不显著;随气温的升高,雄株的蒸腾速率显著提高,雌株的光合速率极显著提高.

关键词: 栝楼 雌雄异株 光合速率 蒸腾速率 气候因子

## Abstract:

A field research was conducted on the photosynthesis and transpiration characteristics of dioecious *Trichosanthes kirilowii* individuals at four key development stages. At vegetative growth stage, the photosynthesis rate, transpiration rate, stomatal conductance, and water use efficiency of male individuals were higher than those of female individuals, and hence, male individuals entered into reproductive growth stage 22 days earlier than female individuals. After entering into reproductive growth stage, male individuals had higher photosynthesis rate, transpiration rate, and stomatal conductance, but slightly lower water use efficiency than female individuals. As the female individuals started to reproductive growth, their photosynthesis rate and water use efficiency were significantly lower, while the transpiration rate and stomatal conductance were higher than those of the male individuals. The effects of climate factors on the growth and development of *T. kirilowii* mainly occurred at its vegetative growth and early reproductive growth stages, and weakened at later reproductive growth stages. Higher temperature and lower relative humidity benefited the growth and development of *T. kirilowii*, and illumination could enhance the photosynthesis rate of *T. kirilowii*, especially its male individuals. After entering into reproductive growth stage, the photosynthesis rate of male individuals increased significantly with increasing illumination, but that of female individuals only had a slight increase, and the transpiration rate of male individuals as well as the photosynthesis rate of female individuals all increased significantly with increasing temperature.

Key words: *Trichosanthes kirilowii* dioecious plant photosynthesis rate transpiration rate climate factor

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