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研究报告

西双版纳地区附生与非附生植物叶片对雾水的吸收

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摘要 采用蒸馏水喷雾(模拟雾)法,测定了西双版纳地区干季中10种附生植物和非附生植物叶片水势(Φ)、相对含水量(RWC)和吸水量的变化，探讨了不同类型植物叶片的吸收雾水的能力.结果表明，随喷雾时间的延长，植物叶片Φ、RWC和吸水量均升高，说明附生植物和非附生植物叶片都能吸收雾水，但附生植物叶片吸水后Φ升高明显快于非附生植物.附生植物附着实蕨和爬树龙叶片吸水快、RWC变化大，表明其叶片吸收雾水的能力强；贝母兰和掌唇兰叶片吸水能力低于非附生植物中的穿鞘花和野靛棵，但高于其它4种非附生植物.傍晚雾生之前附生植物叶片Φ显著低于清晨，表明夜间附生植物叶片吸收了雾水；而非附生植物傍晚叶片Φ与清晨水势差异不显著，夜间几乎不吸收雾水.除贝母兰外，附生植物叶生物量分数高于非附生植物，利于其吸收雾水.由于西双版纳地区干季多雾，该区植物叶片最低水势均在-0.8 MPa以上，水分胁迫不严重.

关键词 附生植物 非附生植物 雾 叶片吸水 水势 相对含水量

分类号

Fog water absorption by the leaves of epiphytes and non-epiphytes in Xishuangbanna

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Abstract

Xishuangbanna is located at the northern margin of tropics. Its climate is different from that of typical tropics, but the rainforest there is not very different from that of the typical tropics in Southeast Asia. The main problems in Xishuangbanna are seasonal drought and low temperature. Fog may contribute to the development of rainforest here, but related studies are few. This study is aimed to know whether the leaves of epiphytes and non-epiphytes in Xishuangbanna can directly absorb fog water and contribute to their water status recovery, and whether epiphytes are more competent than non-epiphytes in their leaf fog water absorption. The study was conducted in dry season, and four species of epiphytes and six species of non-epiphytes were investigated. The effect of fog was imitated by spraying leaves with distilled water. For epiphytes and non-epiphytes, their leaf water potential (Φ), relative water content (RWC), and amount of absorbed water increased gradually with the time of spraying, but the Φ of epiphytes increased more quickly than that of non-epiphytes. The leaves of epiphytes Bolbitis scandens and Rhaphidophora decursiva could absorb fog water more quickly, and increase their RWC more greatly than those of non-epiphytes, indicating that these epiphytes were more competent than non-epiphytes in their leaf fog water absorption. The fog water absorption capacity of the leaves in epiphytic orchid *Coelogyne occultata* and *Staurochilus dawsonianus* was lower than that in *Amischotolype hispida* and *Mananthus patentiflora* , but higher than that in other four non-epiphytes. The Φ of epiphytes at early evening when no fog was formed was significantly lower than that at early morning, suggesting that fog water was absorbed by epiphytes at night to improve their leaf water status. Non-epiphytes did not need to absorb fog water directly through leaves, and they could recover their leaf water status through absorbing soil water by root system. Epiphytes except *C. occultata* had a much more leaf biomass than non-epiphytes, which was also beneficial to their leaf fog water absorption. Because there was abundant fog in dry season in Xishuangbanna, the Φ of test ten species was higher than -0.8 MPa, indicating that water stress was not serious in dry season.

Key words Epiphytes Non-epiphytes Fog Leaf water absorption Water

potential Relative water content

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