

# Ecological strategies of lianas differ in habitats with contrasting water availability

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In a study published in *Tree Physiology*, researchers from the

Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences tried to evaluate how lianas differ in their ecological adaptation strategies when facing habitats with contrasting precipitation.

The researchers conducted a comparison of 25 leaf and stem traits concerning leaf anatomy, morphology, physiology, and stem hydraulics for 36 liana species from two contrasting habitats, 17 from a tropical seasonal [rainforest](#) in Xishuangbanna and 19 from a valley [savanna](#) ecosystem in Yuanjiang, Yunnan Province, Southwest China.

They found that savanna lianas exhibited a relatively conservative (slow) resource (water and nutrient) use strategy (e.g., higher leaf dry matter content, wood density, vessel density, carbon isotope composition ( $\delta^{13}\text{C}$ ), photosynthetic water use efficiency, ratio of nitrogen to phosphorus).

In contrast, rainforest lianas showed a relatively acquisitive (fast) [strategy](#) (higher phosphorus, hydraulically weighted vessel diameter, theoretical hydraulic conductivity, leaf size, nitrogen and potassium).

Moreover, the associations among water-related traits were found to be tighter in savanna than in rainforest lianas, suggesting a stronger limitation of water supply to trait. Savanna lianas are able to regulate [water transport](#) and use water more efficiently than tropical seasonal rainforest lianas.

Surprisingly, savanna and rainforest lianas did not differ in either area-based or mass-based light-saturated photosynthetic rate. Conservative water and nutrient use of savanna lianas did not result in lower photosynthetic carbon assimilation.

The results revealed that the ecological strategies of lianas differed in

habitats with contrasting water availability.

"Enhanced [water](#) and nutrient use efficiencies might have contributed to the ecological success of lianas in dry and hot habitats like savanna ecosystems," said Zhang Jiaolin, principal investigator of the study.

**More information:** Yun-Bing Zhang et al, Higher water and nutrient use efficiencies in savanna than in rainforest lianas result in no difference in photosynthesis, *Tree Physiology* (2021). [DOI: 10.1093/treephys/tpab099](#)

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