

# Fog maintains water balance of epiphytes during dry season

February 23 2022, by Zhang Nannan

---



Montane cloud forest in SW Yunnan. Credit: Song Liang

Montane cloud forest is generally characterized by persistent, frequent incidences of fog and low cloud cover at the canopy level, which usually harbors an abundant epiphyte community. To adapt to the water deficits,

epiphytes was suggested to exhibit higher intrinsic water use efficiency ( $WUE_i$ ) than the ground-rooted plants. However, far too little attention has been paid to the quantitative relationship between the potential water sources and the  $WUE_i$  among different groups of epiphytes.

In a study published in *Water*, researchers from the Xishuangbanna Tropical Botanical Garden (XTBG) of the Chinese Academy of Sciences tried to quantify the [water](#) sources of different epiphyte groups in the dry season based on stable isotope techniques, and explore the intrinsic water use efficiency of various epiphyte groups in Ailaoshan montane cloud [forest](#) in southwest China.

The researchers selected 12 [dominant species](#) belonging to four epiphyte groups (i.e., epiphytic lichens, epiphytic bryophytes, epiphytic ferns, and epiphytic seed plants) from Ailaoshan montane cloud forest to study their water use at the peak of the dry season.

They found that epiphytic lichens and epiphytic seed plants depended mainly on fog water, whereas the epiphytic bryophytes and epiphytic ferns relied on both fog water and humus. The contribution of fog water to the water sources could be as high as 83.2% in epiphytic lichens.

They also found significant differences in  $WUE_i$  among epiphytic groups and species. The variation in  $WUE_i$  was probably related to the differentiation of water resources and water use strategies. The clear differentiation of water utilization among epiphytes provides a possible explanation for their coexistence.

High fog dependence of epiphytes indicates that predicted declines in fog persistence due to climate change may negatively impact their performance and survival. The potential deterioration of epiphytes due to decreasing fog persistence may have cascading effects on the whole forest ecosystem.

"Therefore, more conservation attention should be paid to epiphytes in montane forest ecosystems under [climate change](#)," said Dr. Song Liang of XTBG.

**More information:** Lu-Lu Liu et al, Dry-Season Fog Water Utilization by Epiphytes in a Subtropical Montane Cloud Forest of Southwest China, *Water* (2021). [DOI: 10.3390/w13223237](https://doi.org/10.3390/w13223237)

Provided by Chinese Academy of Sciences

Citation: Fog maintains water balance of epiphytes during dry season (2022, February 23)  
retrieved 23 June 2024 from <https://phys.org/news/2022-02-fog-epiphytes-season.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.