

# Environmental filtering structures functional strategies of bryophytes in cloud forest

June 1 2020, by Zhang Nannan

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Bryophyte at Ailao Mountain subtropical forest. Credit: FAN Xiaoyang

The distribution and performance of bryophyte species vary with vertical gradients, as a result of changes in environmental factors, especially light. However, the role of functional traits in bryophyte species

distribution, especially vertical distribution in forests, is fairly unknown, especially in subtropical forests. Furthermore, for bryophytes, very few studies have fully analyzed ecological strategies to cope with excess light.

In a study published in *American Journal of Botany*, researchers from Xishuangbanna Tropical Botanical Garden (XTBG) found morphological and photosynthetic functional trait differences in bryophytes distributed along a vertical microhabitat gradient in the subtropical montane [cloud forest](#).

The researchers quantified a range of functional traits in 18 bryophyte species that vary in life-forms and from three microhabitats in Ailao Mountain subtropical montane cloud [forest](#) to determine variations in morphological and photosynthetic traits and the distribution of bryophyte species along a vertical gradient with different light conditions.

They found trade-offs among traits of photosynthetic capacity, shade or sun adaptation, and allocation to tissue structure in bryophytes. Bryophytes from more shaded subtropical forests devoted greater proportions of chlorophyll to light capture rather than light-energy conversion. The spatial distribution of functional trait combinations is a trade-off between light acquisition and utilization strategies in the environment.



Bryophyte at Ailao Mountain subtropical forest. Credit: FAN Xiaoyang



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"Our research demonstrated that environmental filtering structured the functional strategies of bryophytes in the cloud forest," said Prof. LIU Wen Yao, principal investigator of the study.

Furthermore, their findings also provide evidence for the role of photoprotective strategies in shaping photosynthetic capacity and distribution of bryophyte species across vertical environment gradients in subtropical montane cloud forests.

**More information:** Xiao-Yang Fan et al. A combination of morphological and photosynthetic functional traits maintains the vertical

distribution of bryophytes in a subtropical cloud forest, *American Journal of Botany* (2020). [DOI: 10.1002/ajb2.1474](https://doi.org/10.1002/ajb2.1474)

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