

Interactions between human-modified habitat change and climate change shape tropical butterfly biodiversity in Yunnan

June 15 2020, by Zhang Nannan



Butterfly in Xishuangbanna tropical rainforest. Credit: Miao Baige

Butterflies are considered bioindicators of environmental change. In a study published in *Insect Science*, researchers from Xishuangbanna

Tropical Botanical Garden (XTBG) found that butterfly diversity in tropical rainforests and savannas is threatened by human-modified habitat loss and global climate change.

The researchers investigated taxonomic alpha and beta diversity patterns by surveying butterflies along a gradient of land-use intensity in both humid tropical rainforest and semi-arid savanna biomes in SW China over three years. They also established a multi-model inference framework to analyze the relative importance of climate and land-use change on the alpha and beta diversity of butterflies.

Their long-term butterfly monitoring data highlighted changes in butterfly biodiversity along a land-use intensity gradient, with alpha diversity strongly declining with land-use intensity and beta diversity significantly lower than random expectation in non-natural habitats in both the tropical rainforest and savanna ecosystems.

Moreover, they found that the interaction between local climate conditions and land-use changes affected butterfly diversity only in the savanna ecosystem, suggesting that the effects of climate may vary across different ecosystems.



Butterfly in Yuanjiang savanna. Credit: Miao Baige

They also found a substantial decline in butterfly species richness with increasing land-use intensity in both tropical rainforest and savanna ecosystems. Their results also revealed that butterfly species of different biomes varied in their response to the combined effects of climate and land-use intensity.

"Our findings also have important implications for [biodiversity conservation](#) under the current era of rapid human-induced [habitat loss](#) and [climate change](#)," said Prof. Peng Yanqiong, principal investigator of the study.

More information: Bai-Ge Miao et al. Climate and land use interactively shape butterfly diversity in tropical rainforest and savanna ecosystems of southwestern China, *Insect Science* (2020). [DOI: 10.1111/1744-7917.12824](https://doi.org/10.1111/1744-7917.12824)

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