

Multiple processes shape plant ecological uniqueness in Northeast China's forests

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In a study published in [*Journal of Biogeography*](#), scientists from the Institute of Applied Ecology of the Chinese Academy of Sciences have shed light on understanding the driving mechanisms of the uniqueness of plant species composition in different life forms.

Ecological uniqueness emphasizes the distinctiveness of [species](#) composition in different locations. Higher uniqueness is often accompanied by a higher proportion of rare or endemic species, which is crucial for biodiversity conservation practices.

Four potential drivers of the distribution of ecological uniqueness have been hypothesized: Regional Climate Hypothesis, Local Environment Hypothesis, Biotic Heterogeneity Hypothesis, and Human Disturbance Intensity Hypothesis. However, the relative importance of the four hypotheses is still unclear, and there is a lack of comparison between different plant life forms.

To this end, the researchers investigated approximately 800 temperate forest plant community plots in northeast China. They used multivariate statistical regression and structural equation models to study the local-scale distribution pattern of ecological uniqueness of different life forms (trees, shrubs and herbs) and the differences in the influence effects of the above four processes between different life forms.

They found that the ecological uniqueness of different plant life forms was consistently high in the south of the study area and relatively low in the north. The four hypotheses mentioned above jointly influenced the spatial distribution of the ecological uniqueness of plant life forms, but their relative importance was different among different plant life forms.

Overall, the regional climate hypothesis had a dominant effect on the

ecological uniqueness of tree species, while the biotic heterogeneity hypothesis mainly affected the distribution of ecological uniqueness of shrub and herb plants. The local environment and human disturbance intensity hypotheses had relatively weaker effects than the other two hypotheses. Human disturbance intensity had a significant effect only on the ecological uniqueness of herbs.

In addition, regional climate, [local environment](#) and human disturbance also indirectly shaped the distribution pattern of plant ecological [uniqueness](#) by changing biotic heterogeneity, according to the researchers.

More information: Yue Chen et al, Multiple processes jointly determine ecological uniqueness across forest plant life-forms in Northeast China, *Journal of Biogeography* (2024). [DOI: 10.1111/jbi.14817](#)

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