Fan Hao et al., J Ecosyst Ecography 2018, Volume 8
DOI: 10.4172/2157-7625-C1-033

World Conference on Ecology

March 19-20, 2018 | Berlin, Germany

Climate sensitive leaf vein traits of Quercus variabilis

Fan Hao and **Xiaofeng Zheng**
Northwest A&F University, China

Statement of the Problem: Quercus variabilis is a widely distributed tree species in China. The climatic status in the habitats of Q. variabilis is changing under global warming in recent years. Plant's veins provide mechanical supports and mainly occur in the mesophyll of leaf lamina. Ecological adaption of a given plant in its occurring areas could be reflected by leaf vein characteristics. The structure, function and development of leaf venation, as well as its ecological traits have been reported for multiple times. However, the evolution of leaf venation networks in different climatic conditions remains unclear. In this study, we focus on the correlation of leaf venation characteristics with the climatic status in the habitats of Q. variabilis all across China.

Methodology & Theoretical Orientation: Leaf samples, a total of 320 samples of Q. variabilis collected from 16 areas in China, were analyzed with the LEAF GUI software after scanning. The corresponding climatic data, 30 years, from 1986 to 2016, were extracted from the weather logs based on local meteorological bureaus.

Findings: Our results show that the vein density, i.e. vein length per area (mm/mm2) and distance between veins (mm) of leaves are strongly correlated with the mean annual temperature (MAT) and mean annual precipitation (MAP). When the temperature goes up, the vein density decreases significantly while the distance between veins tends to increase. As to precipitation, it shares the same trajectory of the temperature.

Conclusion & Significance: For Q. variabilis, the leaf vein traits are sensitive to the climatic indicator referring to the MAT and MAP. Q. variabilis cannot be immune to the global climate change, so much more concerns should be given to conserve Q. variabilis ecological niche.

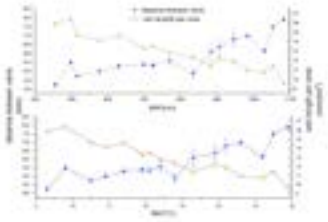

Figure 1: Leaf vein traits in correlation with mean annual temperature (MAT) and mean annual precipitation (MAP)

Recent Publications

1. Caringella M A, Bongers F J and Sack L (2015) Leaf hydraulic conductance varies with vein anatomy across Arabidopsis thaliana wild-type and leaf vein mutants. Plant Cell & Environment 38(12):2735.
2. Zhang J L, Zhang S B and Chen Y J (2015) Nutrient resorption is associated with leaf vein density and growth performance of dipterocarp tree species. Journal of Ecology 103(3):541-549.
3. Qi D D, Lu L and Hu L C (2015) A leaf veins visualization modeling method based on deformation. Communications in Computer & Information Science 525:340-352.
4. Song L, Hu C and Hou X (2015) Relationship between photosynthetic characteristics and leaf vein density in Sorghum bicolor and Perilla frutescens. Chinese Bulletin of Botany 50(1):100.
5. De Boer H J, Drake P L and Wendt E (2016) Over-investment in leaf venation relaxes morphological constraints on photosynthesis in eucalypts. Plant Physiology 172(4).

Biography

Hao Fan, PhD Candidate, majors in ecology, focusing on acclimation; Xiaofeng Zheng, PhD Candidate, majors in ecology, focusing on plant community ecology, forest soil and plant-soil feedback.

haofan@nwafu.edu.cn; xfzheng@nwafu.edu.cn