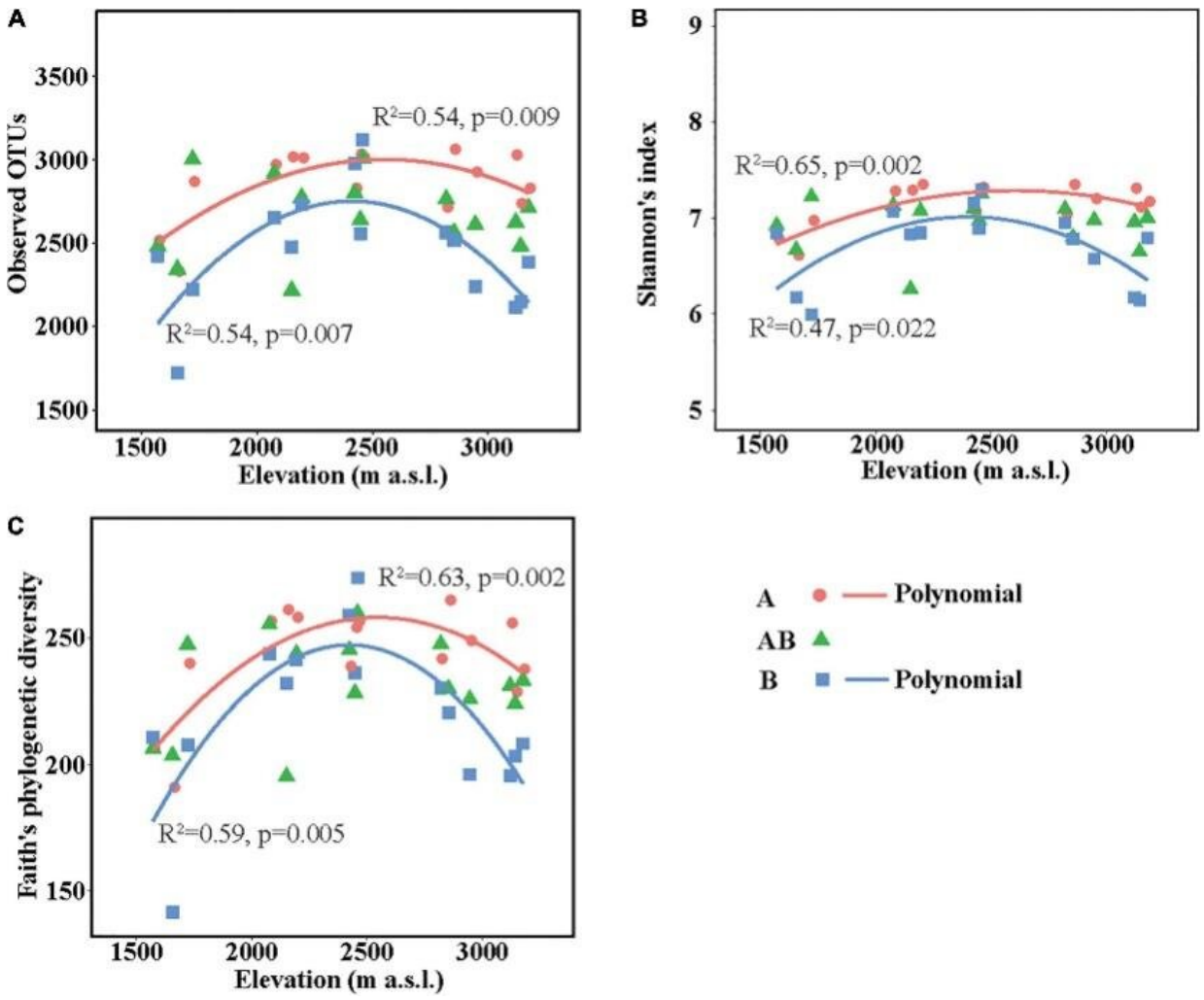
Distribution of soil bacterial community in surface and deep layers reported along elevational gradient

October 19 2021, by Zhang Nannan



Soil bacterial community richness and α-diversity along the elevational gradient. (A) Observed operational taxonomic units (OTUs), (B) Shannon's diversity, and

(C) Faith's phylogenetic diversity. Credit: WBG

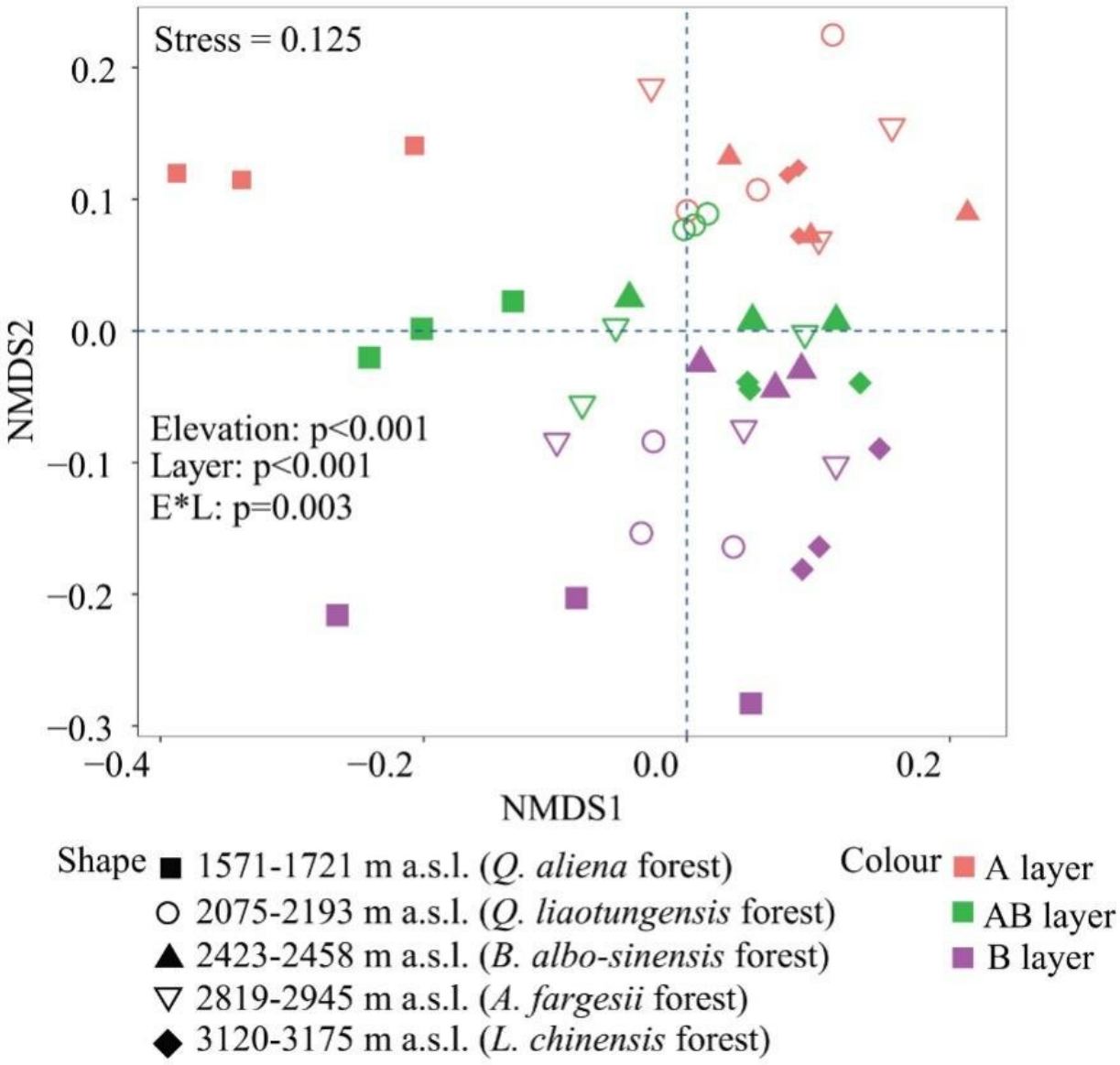
Soil microorganisms are important components of the soil ecosystem, they play critical roles in biogeochemical and nutrient cycling processes. The distribution pattern of bacterial community along the elevational gradient is critical for predicting future ecosystem functions and climate feedbacks. Patterns of soil bacterial community distribution in surface soil layer along elevational gradients have been well documented, but little is known in deep soil layer.

In order to identify the spatial pattern of soil bacterial community along an elevational gradient in deep soil layer, and to reveal their determining factors, researchers led by Prof. Liu Feng from the Wuhan Botanical Garden of the Chinese Academy of Sciences (CAS) presented a study in the Taibai Mountain and explored the diversity and composition of soil bacterial community used 16S rRNA gene sequencing.

According to the researchers, soil bacterial diversity and compositions shifted along the elevational gradient in all soil layers. Soil bacterial diversity showed a hump-shaped trend with elevation. In surface soil layer, pH was the driving factor determining the elevational patterns of bacterial diversity and community composition.

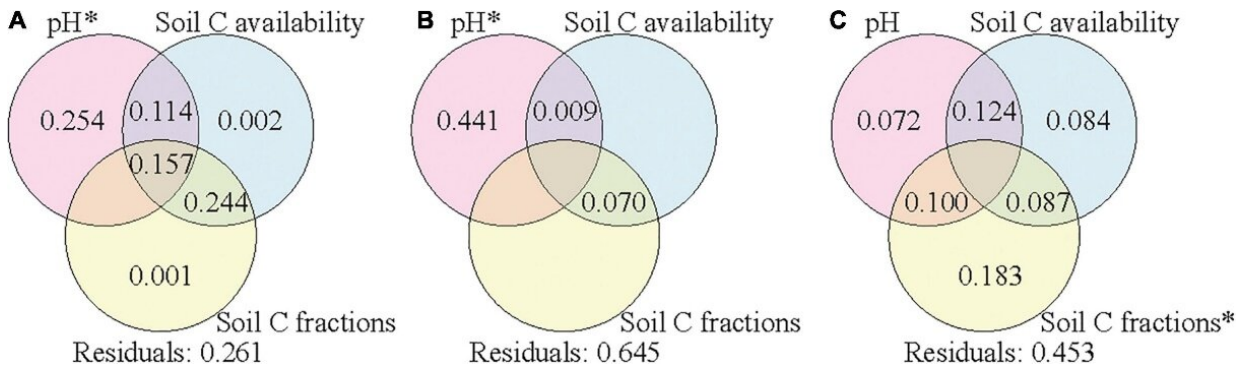
In deep layer, both pH and soil carbon availability could well explain the elevational pattern of bacterial diversity, while the bacterial community composition was more explained by soil carbon fractions.

These results emphasize the strong linkage between soil organic carbon properties and bacterial communities and can potentially help better predict soil carbon cyclings to future environmental changes.



Non-metric multidimensional scaling of soil bacterial community based on weighted UniFrac distances derived from OTU composition. Credit: WBG

The research, titled "Soil pH and organic carbon properties drive soil bacterial community in surface and deep layers along an elevational gradient" was published in *Frontiers in Microbiology*.



Variation partition analysis of the effects of soil pH, soil C availability, and soil C fractions on soil bacterial community composition in the surface soil layer (A), subsurface soil layer (B), and deep soil layer (C). Credit: WBG

More information: Qiuxiang Tian et al, Soil pH and Organic Carbon Properties Drive Soil Bacterial Communities in Surface and Deep Layers Along an Elevational Gradient, *Frontiers in Microbiology* (2021). DOI: 10.3389/fmicb.2021.646124

Provided by Chinese Academy of Sciences