

The effect of elevated nitrogen on the microbial decomposition of lignin in Changbai mountain soil

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Motivation

The unprecedented levels of nitrogen emissions from industrialization have drastically increased rates of nitrogen deposition in China. The consequences of excessively high nitrogen are unknown. The degradation of an important component of soil organic matter, lignin, has been found to decrease in response to elevated nitrogen in some situations while increasing in others. Since lignin degradation is largely mediated by microorganisms, the unclear fate of lignin may be better predicted by characterizing the lignin-degrading community. Using 16S rRNA gene amplicon sequencing, this study will determine if elevated nitrogen deposition changes the lignin-degrading microbial community and the overall microbial community structure.

Soil Sampling of Changbai Mountain

Changbai Mountain is a volcano located at the border of China and North Korea. Soil samples were collected from two forest sites that have been managed and extensively studied by the Chinese Academy of Science.



Laboratory Incubations and Future Analysis

Soil was amended with lignin and nitrogen in the lab to enrich for the microbes capable of degrading lignin and to simulate the effect of elevated nitrogen. After incubation, DNA was extracted for *16S rRNA gene amplicon sequencing* to determine the microbial community structure at the University of Tennessee Hazen lab. While at the IAE CAS, soil samples were also analyzed for their *amino sugars*, a biomarker for microbial diversity within bulk soil organic matter, and *cell counts* to estimate biomass. These methods will provide insight into the soil microbial community diversity and the effects that elevated nitrogen may have on lignin degradation.

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