



土壤pH通过改变微生物组成与代谢途径调控 日本森林土壤中的氮分配

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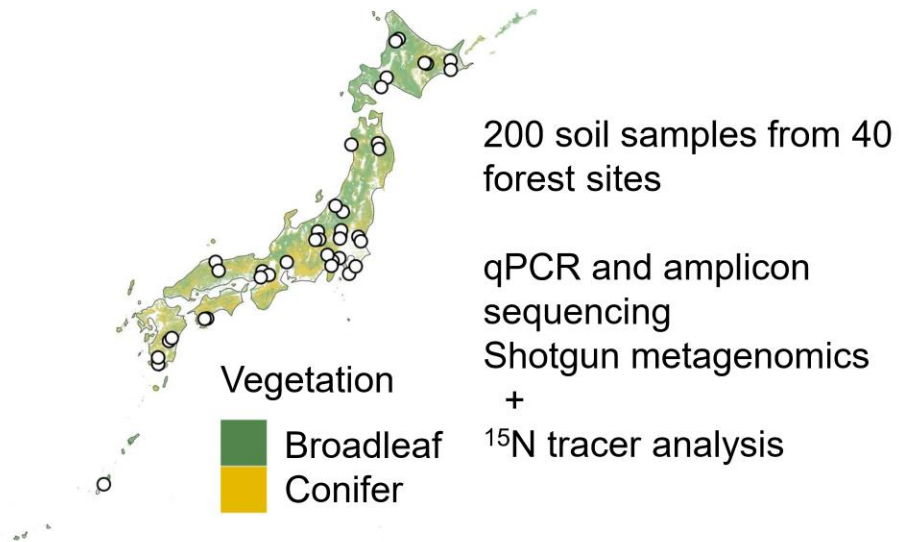


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Soil pH modulates microbial nitrogen allocation in soil via compositional and metabolic shifts across forests in Japan.
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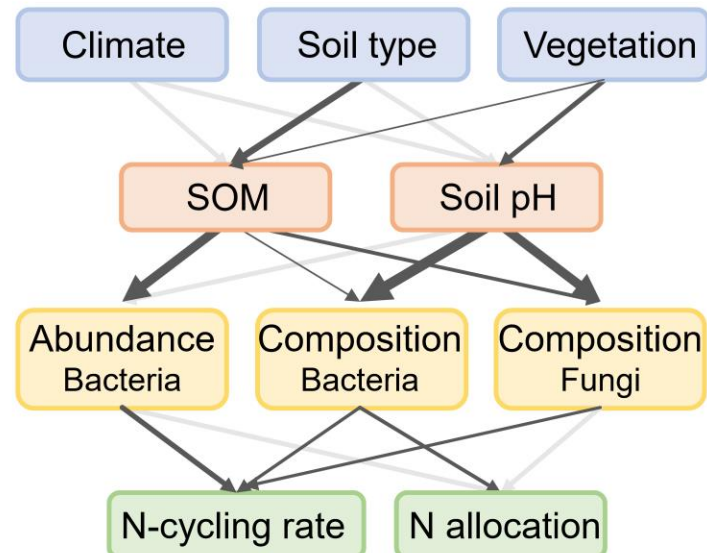


摘要&亮点

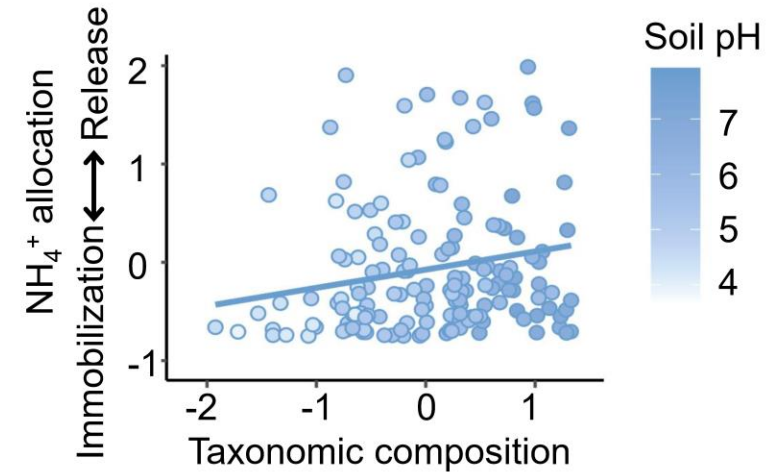
How is N allocation in forest soil—whether NH_4^+ is released or immobilized—regulated by the microbial community?



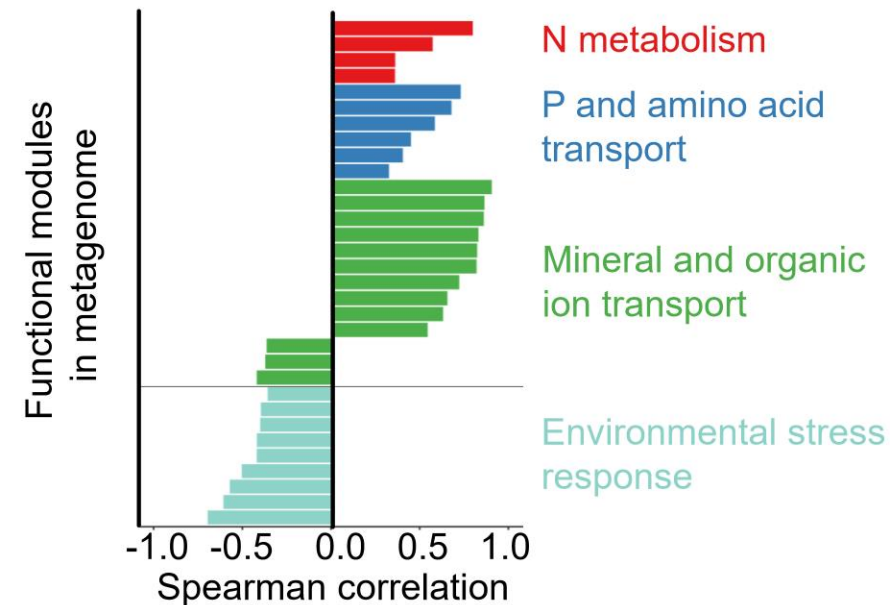
Hierarchical effects on N-cycling



Soil pH regulates N allocation via taxonomic composition constraints

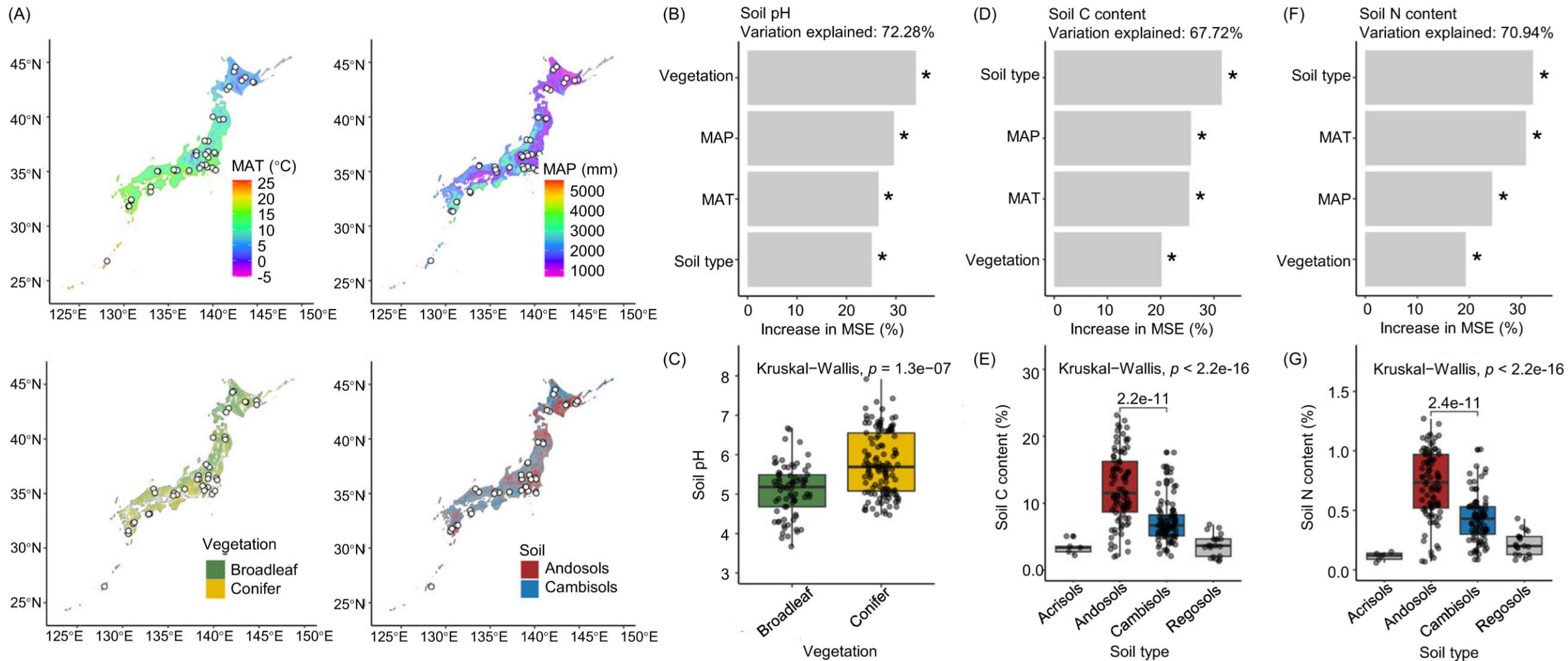


Soil pH regulates N allocation via metabolic constraints



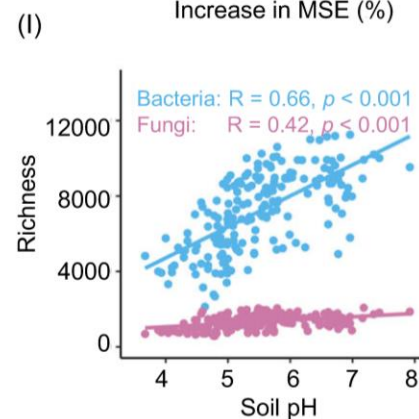
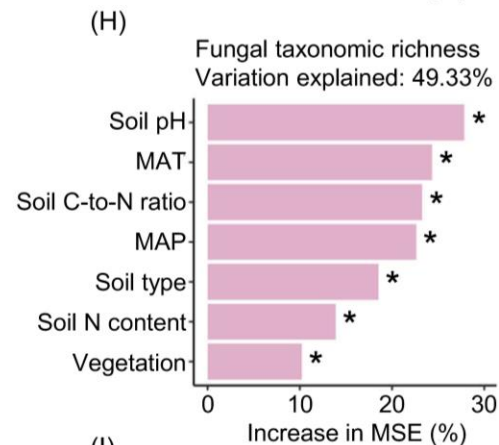
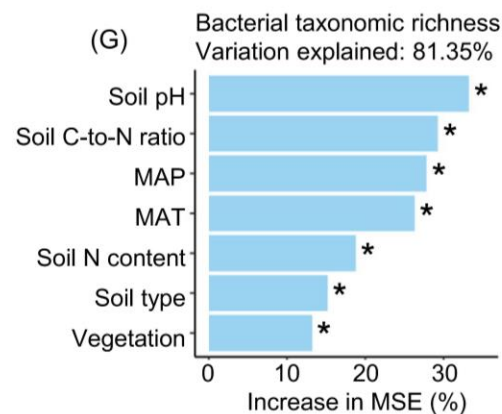
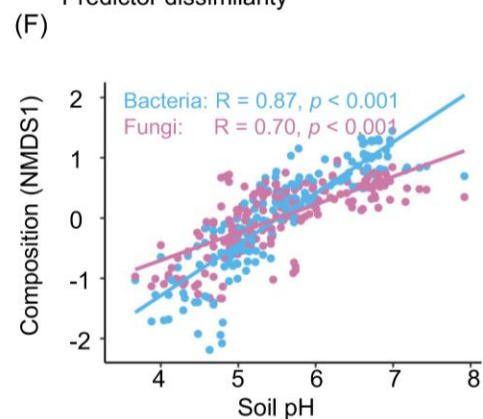
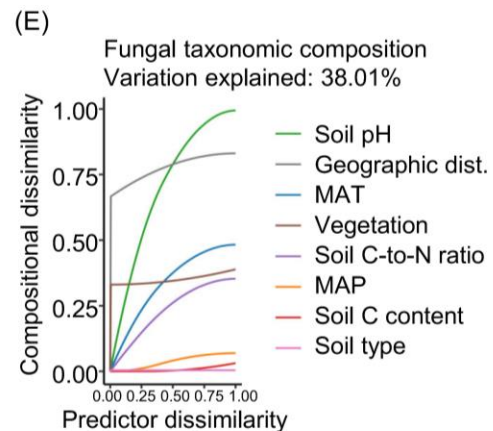
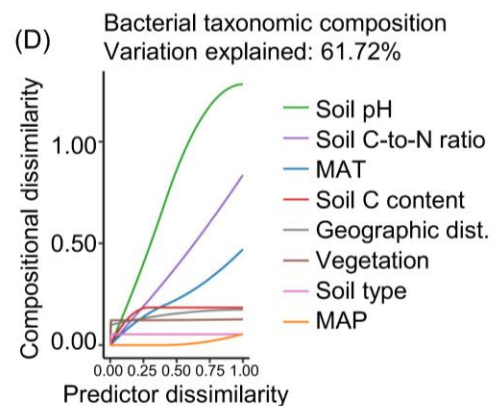
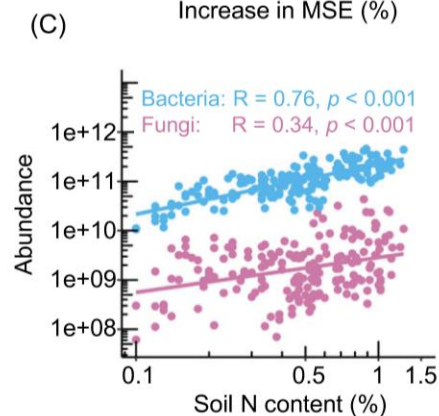
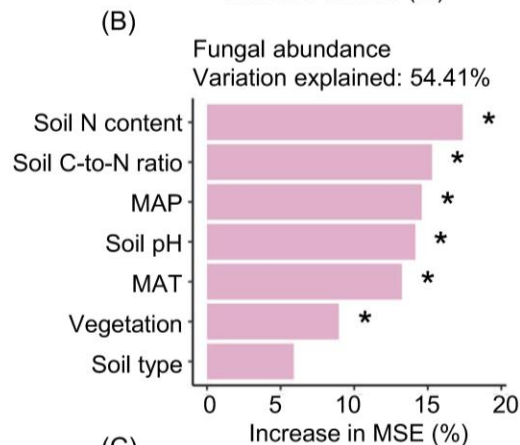
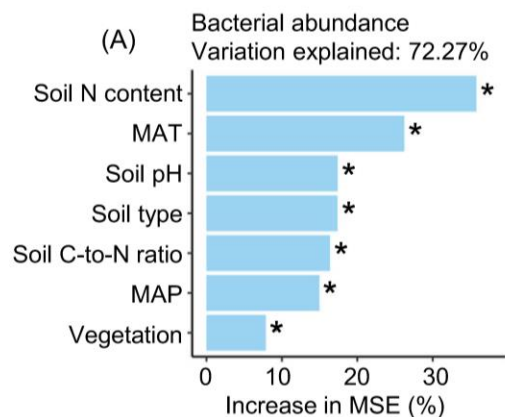


结果1：成土因子影响对土壤特性





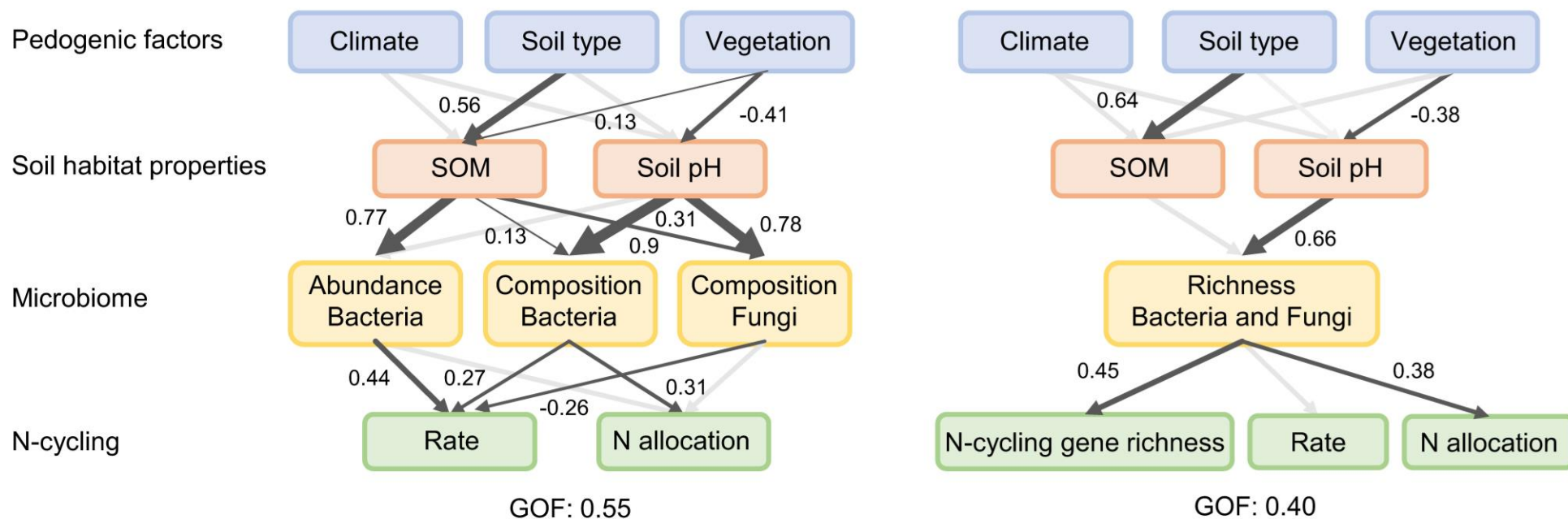
结果2：成土因子与土壤特性影响土壤微生物群落



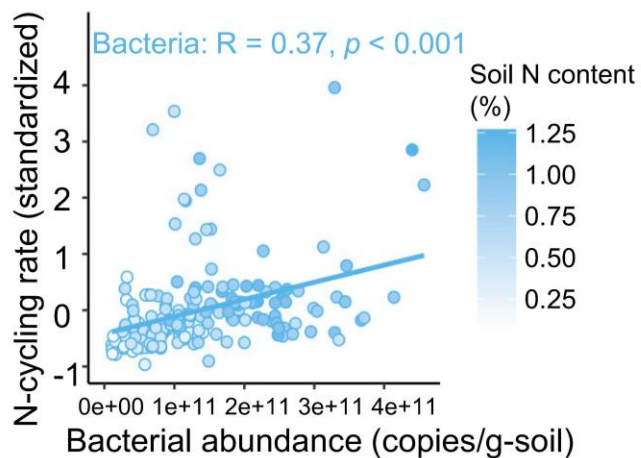
结果3：成土因子、土壤特性与微生物群落对氮循环的层级效应



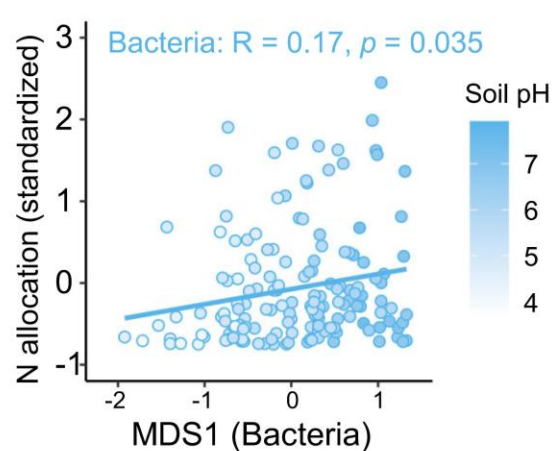
(A)



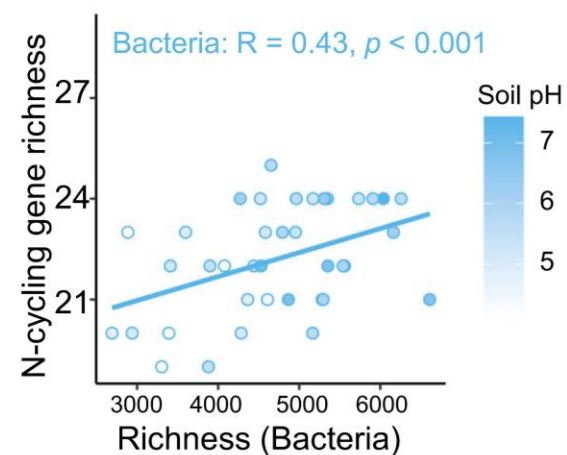
(B)



(C)



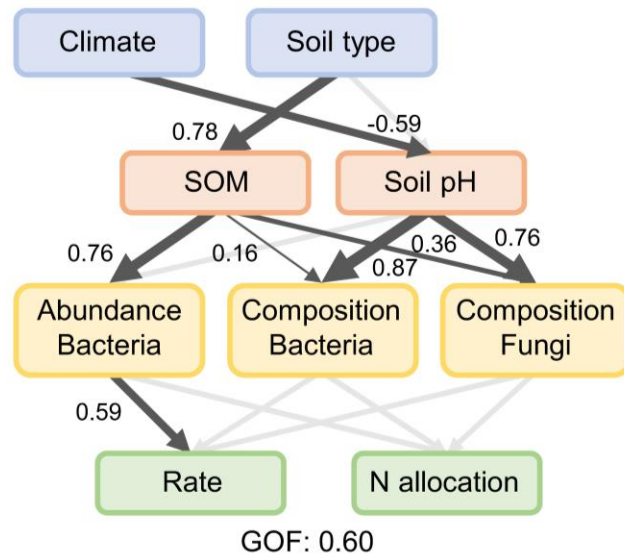
(D)



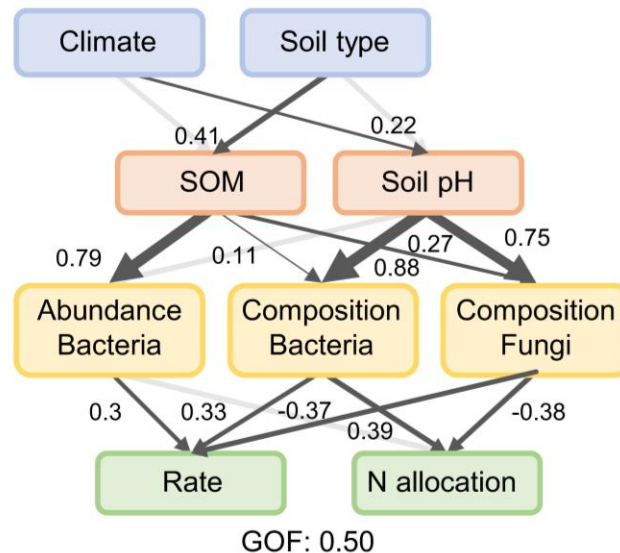


结果4：微生物群落响应及其氮循环影响具有环境依赖性

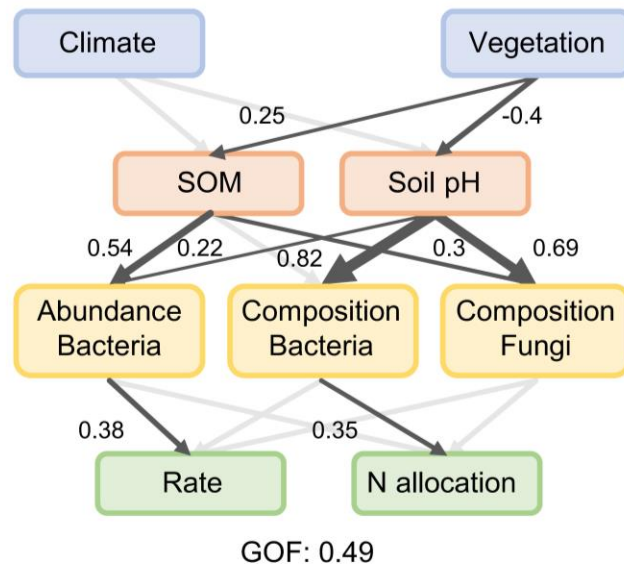
(A) Vegetation: Broadleaved forests



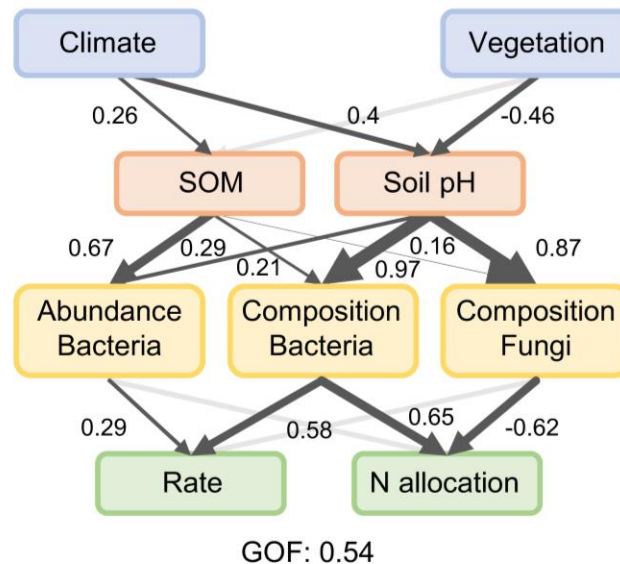
(B) Vegetation: Coniferous forests



(C) Soil type: Andosol forests

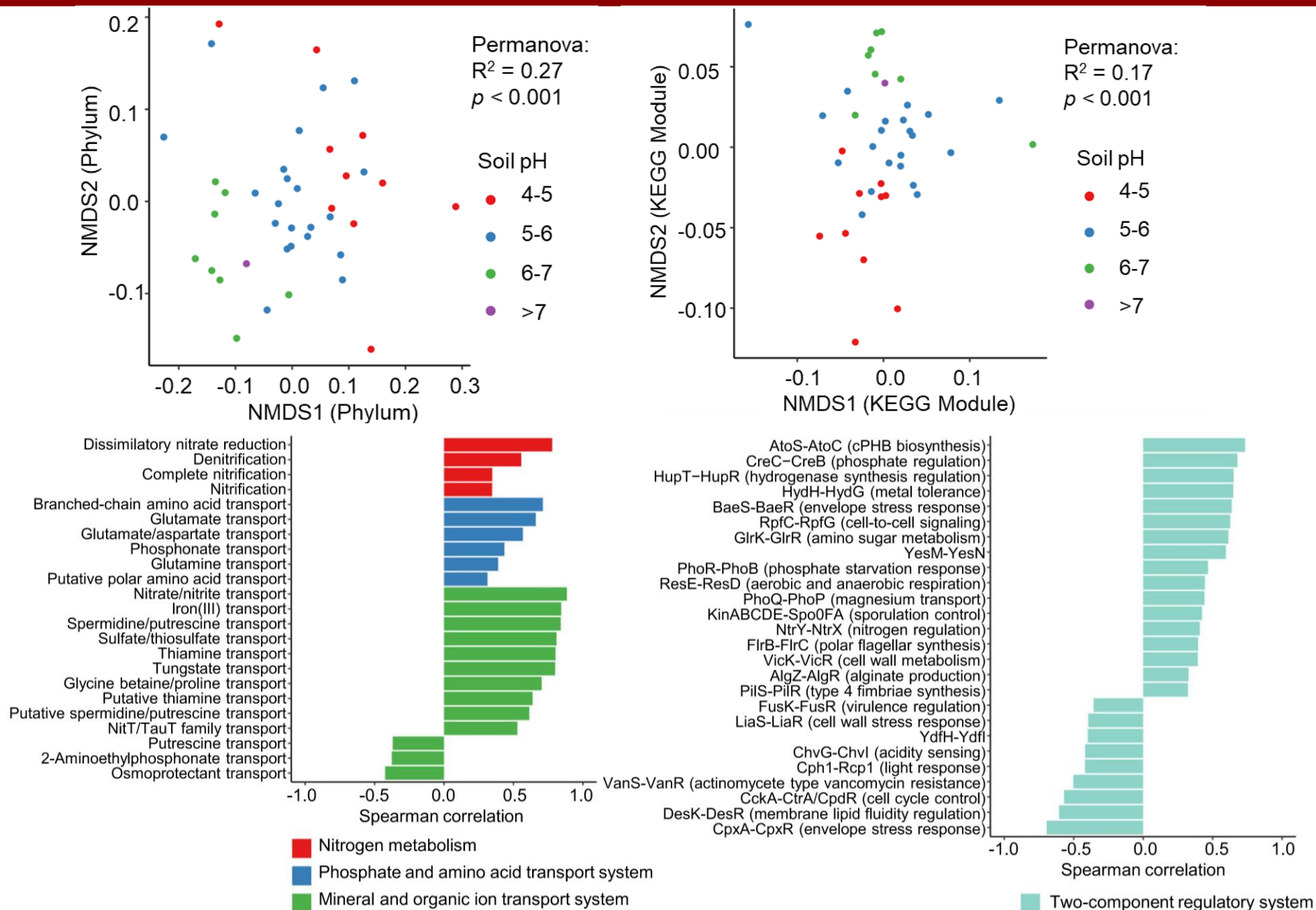


(D) Soil type: Cambisol forests





结果5：微生物群落代谢能力对土壤 pH 变化的响应

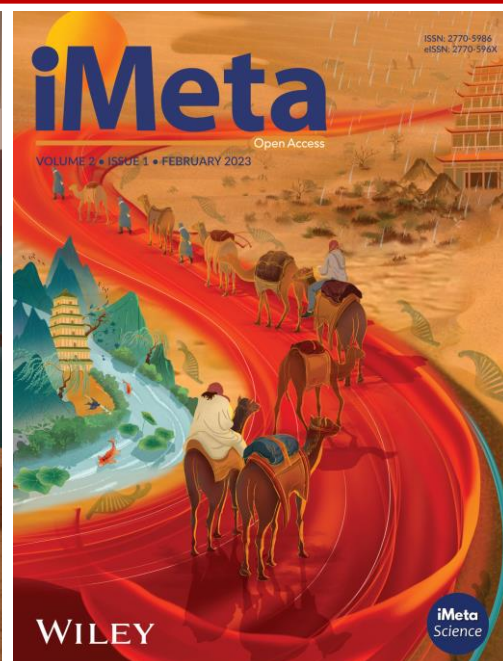




总结

- ❑ 成土因子影响土壤pH和有机质等土壤特性，从而塑造微生物群落结构，并进一步调控氮循环过程及其分配模式。
- ❑ 微生物丰度影响氮循环速率，而群落组成与多样性则通过代谢限制影响铵态氮的释放或保留。
- ❑ 酸性土壤有利于耐胁迫型微生物的生长，这类微生物倾向于保留铵态氮；而近中性土壤则支持能量利用效率更高的微生物类群，从而促进铵态氮的释放与硝化作用。
- ❑ 这些结果强调了微生物分类组成与代谢潜在在铵态氮分配调控中的关键作用，并突出了土壤 pH 作为环境过滤因子在连接土壤性质与生态系统层面氮循环中的核心地位。

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