



Microbiome-mediated alleviation of tobacco replant problem via autotoxin degradation after long-term continuous cropping.

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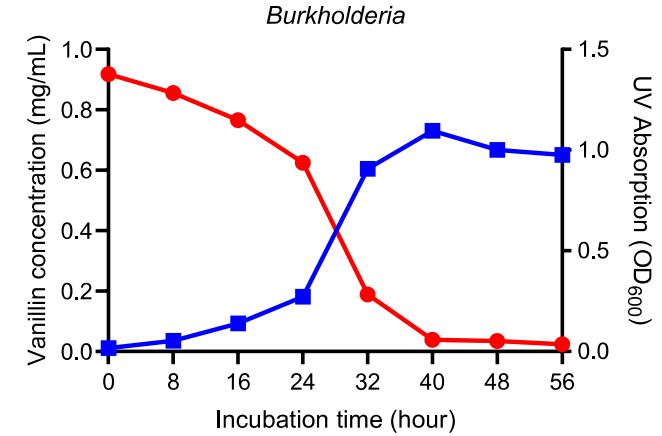
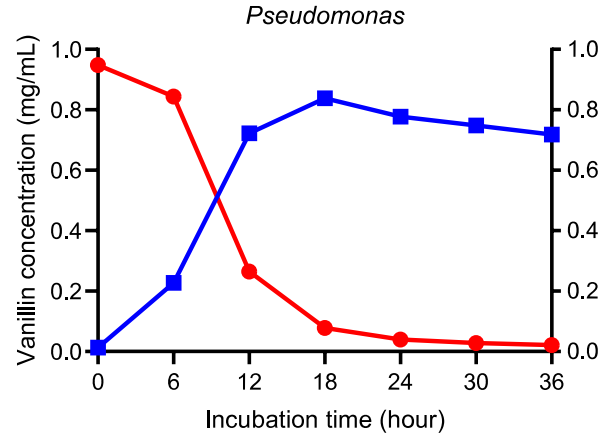
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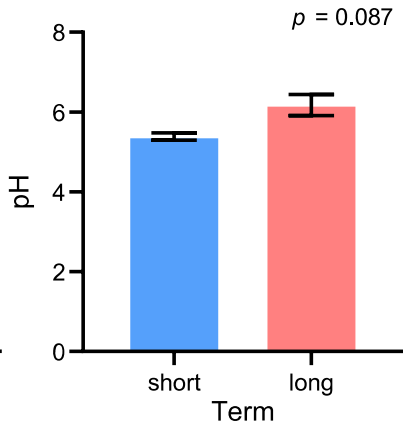
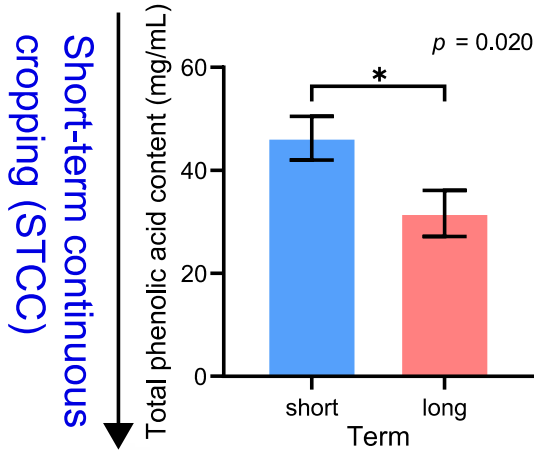
Introduction



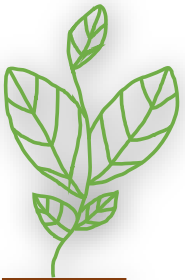
Health tobacco



Autotoxin degradation



Autotoxin accumulation
Soil acidification

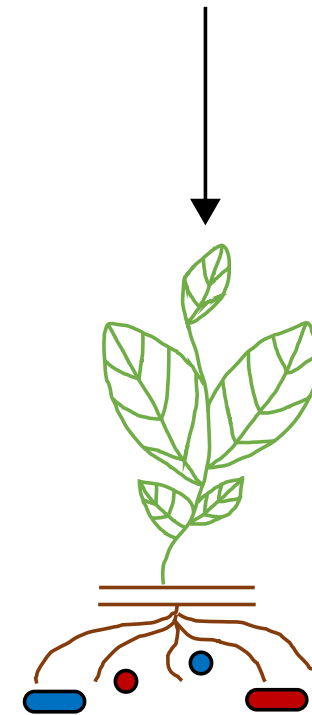


Replant problem

Enrichment of autotoxin-degrading microbes

Long-term continuous cropping (LTCC)

Key autotoxin-degrading bacteria



Replant problem alleviation



Highlights

- ❑ Long-term continuous cropping alleviates the tobacco replant problem and this alleviation can be transferred to soil of short-term continuous cropping systems.
- ❑ Tobacco recruits autotoxin-degrading bacteria that mitigate the replant problem.
- ❑ Inoculation with autotoxin-degrading bacteria helps to alleviate the tobacco replant problem.



Microbial alleviation of replant problem

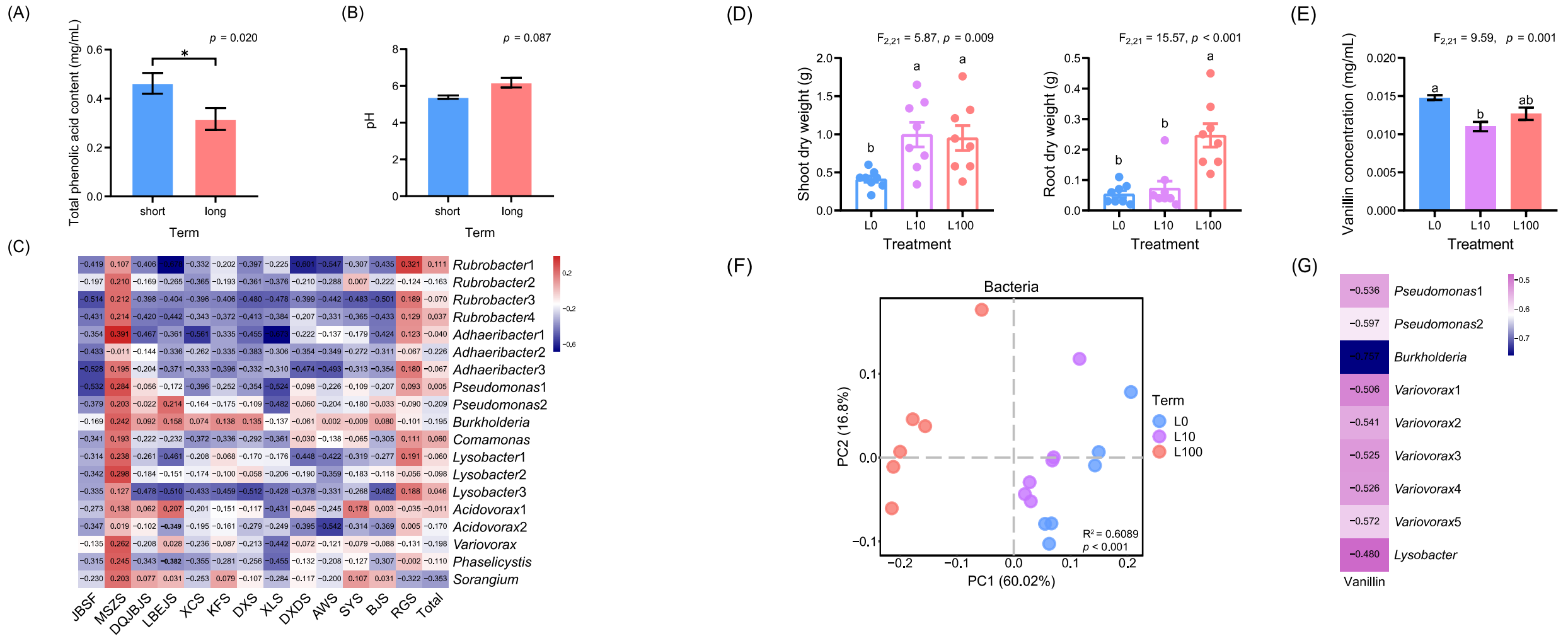


Figure 1 Long-term continuous cropping of tobacco modulates soil acidification, autotoxin accumulation, and root-associated microbiota.



Microbial alleviation of replant problem

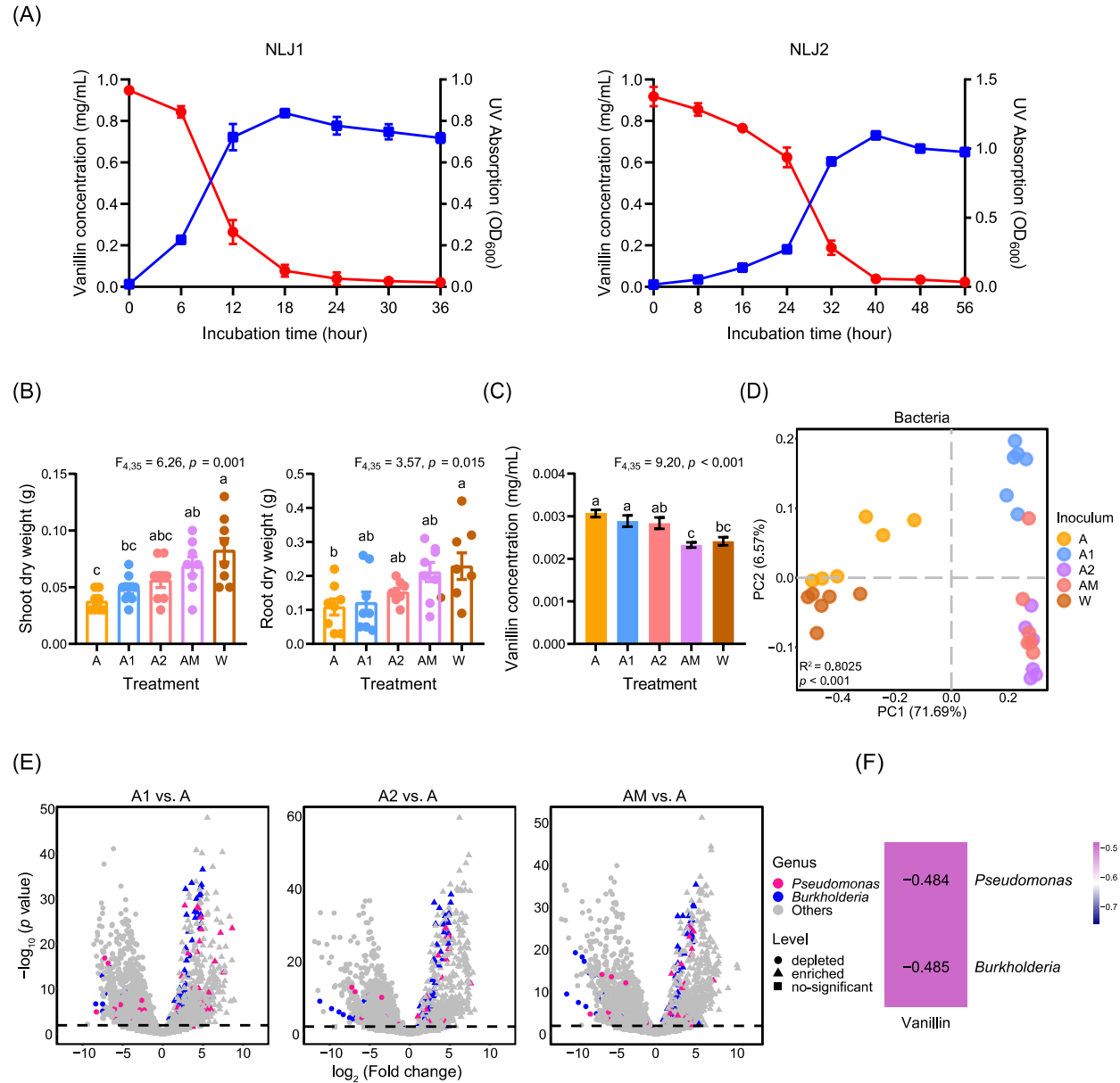


Figure 2 Autotoxin-degrading bacteria alleviate the replant problem via the colonization and autotoxin degradation in soil.



Summary

- ❑ In this study, we found that soil acidification and phenolic acid accumulation have been considered the main causes of replant problems for many crops.
- ❑ Long-term continuous cropping of tobacco alleviates replant problems by increasing soil pH and decreasing phenolic acids in the soil via enrichment of autotoxin-degrading bacteria.
- ❑ Long-term continuous cropping or monocultures of crops under certain stresses can induce soil homeostasis against replant problems, soil-borne diseases, and potentially other stresses to increase crop health.



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