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TEMPORAL CHANGES IN SOIL BACTERIAL AND ARCHAEAL COMMUNITIES WITH DIFFERENT FERTILIZERS IN TEA ORCHARDS

Key words: Tea orchard, Temporal changes, Fertilizer, Bacterial and archaeal community, Functional genes

RESEARCH SUMMARY

The field experiment was done in tea orchard with 40 years old tea plants.

Sampling every two months, from May 17, 2012 to March 17, 2013

Fertilizer

Soil climate

Chemical fertilizer

Organic fertilizer

Soil temperature

Soil moisture

Soil microbial communities and abundance

Soil properties

T-RFLP qPCR

Bacterial communities
Archaeal communities

The abundance of bacterial and archaeal *amoA* gene

The abundance of bacterial *narG*, *nirK*, *nirS*, and *nosZ*

Soil pH, ammonium, nitrate, total nitrogen, organic carbon

Temporal changes in soil bacterial and archaeal communities with different fertilizers in tea orchards

RESULTS

- **Bacterial and archaeal community structures varied with time and fertilization due to changes in the relative abundance of dominant T-RFs.**
- **Total bacteria, total archaea, and archaeal *amoA* were less abundant in July. The bacterial *amoA* and denitrifying genes were less abundant in September, except for the *nirK* gene.**
- **The OF treatment increased the abundance of the observed genes, while the CF treatment had little influence on them.**
- **Soil temperature significantly affected the bacterial and archaeal community structures.**
- **Soil moisture was significantly correlated with the abundance of denitrifying genes.**
- **Soil organic carbon was the most important factor and was significantly correlated with the abundance of the detected genes, except for the *nirK* gene.**

CONCLUSION

- This study demonstrated the effects of both temporal alteration and organic fertilizer on the microbial community structure and the abundance of genes involved in the nitrogen cycle.