

Drought-tolerant sugarcane improves rhizosphere bacterial community in response to drought stress

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Abstract

Aims Drought is one of the most important abiotic stresses currently threatening agricultural production. Compared to water-sensitive plant varieties, drought-tolerant varieties have a higher adaptability to drought. Rhizosphere bacteria, which are essential for coordinating host plant health, are also severely affected by drought stress. The response to drought stress of rhizosphere bacterial communities from drought-tolerant plants has become a hot spot of current research. We aim to explore the effect of drought stress on the root microorganisms of sugarcane, and the response of rhizosphere microorganisms of drought-tolerant varieties to drought stress. **Methods** We used pot experiments to test the effects of drought stress on two sugarcane varieties, ZZ9 (drought-tolerant) and GT39 (water-sensitive). Through high-throughput sequencing of bacterial communities in the rhizosphere and analysis of physiological and biochemical characteristics of the rhizosphere soil, changes in the bacterial communities of ZZ9 and GT39 due to drought stress were analyzed, and the relationship between the changes and the soil environment was studied. **Conclusions** Drought stress can reduce the diversity of bacterial communities in the rhizosphere of both plant varieties. Under drought stress, drought-tolerant varieties can better accumulate symbiotic bacteria to cope with the stressful conditions.

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