

研究论文

小麦/蚕豆，玉米/蚕豆和小麦/玉米间作对根际细菌群落结构的影响

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摘要 利用PCR-DGGE技术研究了小麦/蚕豆、玉米/蚕豆和小麦/玉米间作对作物根际细菌群落结构的影响。结果表明: 间作能够提高作物根际细菌群落多样性、改变根际细菌群落结构组成。其中, 小麦/蚕豆间作对根际细菌群落结构的影响最为突出, 作物花期时小麦/蚕豆间作显著提高和改变两种作物根际细菌多样性和群落结构组成。玉米/蚕豆间作主要表现出对苗期玉米根际细菌多样性的显著提高和群落结构组成的改变。小麦/玉米间作对作物根际细菌群落结构的影响程度较弱。同时, 3种间作体系都具有不同程度的产量优势。结果证明了间作体系中地上部植物多样性与地下部微生物多样性存在紧密联系。

关键词 间作; 细菌群落结构; 根际; PCR-DGGE

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Effect of intercropping on bacterial community composition in rhizosphere of wheat (*Triticum aestivum* L.), maize (*Zea mays* L.) and faba bean (*Vicia faba* L.)

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Abstract Cereal/cereal and cereal/legume intercropping systems are popular in the northwest of China and often result in yield increases compared to sole cropping. The aim of this study was to investigate crop yield and the effects of intercropping on bacterial community composition in rhizosphere of wheat, maize and faba bean at different growth stages. Rhizosphere bacterial community composition was studied by denaturing gradient gel electrophoresis (DGGE) of 16S rDNA. The results showed that intercropping increased crop yield, enhanced bacterial diversity and changed bacterial community composition in rhizosphere compared to sole cropping, and the effect was most pronounced in the wheat/faba bean intercropping system when the two species at anthesis. In maize/faba bean intercropping system, the effect was only on maize in seedling. The effect was less pronounced in wheat/maize intercropping. The effects of intercropping on diversity of microbial community in the rhizosphere that may, in part, explain the yield increase compared to sole cropping. Furthermore the results provide evidence that aboveground plant diversity and belowground biodiversity are linked.

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