

研究论文

烟草根际微生物研究

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摘要 利用选择性培养基, 对土壤肥力肥沃、中等、贫瘠的烟区根际细菌、真菌和放线菌进行了分离和测数。根据菌体形态及培养特征、生理生化指标及16S rDNA部分序列分析等, 对根际自生固氮菌、磷细菌、钾细菌进行了鉴定和分类。主要结果为: 土壤肥沃的烟区根际细菌的数量最多, 土壤贫瘠的烟区数量最少; 土壤贫瘠烟区根际真菌的数量较多, 中等和肥沃烟区的较少; 根际放线菌的数量随土壤肥力的降低而依次减小。从不同肥力烟区分离的根际自生固氮菌、磷细菌、钾细菌以革兰氏阴性杆菌为主, 分别属于10个属。土壤的肥沃程度对根际3类细菌的种类和数量都有影响, 总体上看, 土壤肥沃和中等的条件下, 细菌类群的多样性和丰富度较大, 而贫瘠土壤细菌类群的优势度较大。

关键词 [烟草; 根际微生物; 多样性](#)

分类号 [Q143, Q398](#)

Studies on tobacco rhizosphere microbes

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Abstract The rhizosphere soils were obtained by five point sampling method from brown tobacco soils with different fertilities in Yishui County of Shandong Province. The tobacco variety was k 368. Rhizosphere bacteria, fungi and actinomyces in samples from fertile, medial fertile, and infertile soils were isolated and cultivated by the plate cultivation method with selective media. Specifically, azotobacter, phosphobacteria and potassium-bacteria were isolated and identified by their morphology, growth, and physiochemical characteristics, and by sequence analysis of their 16S rDNAs. The main results were as follows: the quantities of total rhizosphere bacteria, azotobacter, phosphobacteria and potassium-bacteria were the largest in fertile soils and were the lowest in infertile soils. In soils of the same fertility, the quantity of potassium-bacteria was the largest, that of phosphobacteria the second, and that of azotobacter the least. The quantities of rhizosphere fungi in fertile soils were significantly more than those in medial fertile or infertile soils, and the quantity of actinomyces showed a declining trend along with the decrease in soil fertility.

Azotobacter, phosphobacteria and potassium-bacteria isolated from all three types of soils consisted of mainly Gram-negative bacilli, belonging to ten genera. The azotobacter fell into four genera: Bacillus, Azotobacter, Beijerinckia and Azomonas. The phosphobacteria were from genera Bacillus, Azotobacter, Mycobacterium, Micrococcus and Pseudomonas. The potassium-bacteria were from genera Bacillus, Erwinia, Sinorhizobium, Pseudomonas, Proteus Hauser and Micrococcus.

The diversity index and evenness index of potassium-bacteria in fertile soils and in medial fertile soils were the largest; the diversity index of azotobacter in all three types of soils was the lowest. These results were consistent with tobacco plants' high demand for potassium. The diversity index and richness index of azotobacter decreased along with the decrease in soil fertility, accompanied by an increase in the domination index. The diversity index and evenness index of phosphobacteria decreased as soil fertility decreased. The diversity index and the evenness index of potassium-bacteria were greater in medial fertile soils than in the other types.

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Key words [tobacco](#) [rhizosphere](#) [microbes](#) [species](#) [diversity](#)

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