

一株花生根际促生菌的筛选鉴定及其特性研究

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Isolation, Identification and Characteristics of a Peanut Growth-Promoting Strain of Rhizobacteria

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摘要 从种植于红壤的健康花生根际, 筛选出7株产吲哚乙酸(IAA)菌株, 以菌株L4合成IAA的能力最强, 培养24 h时IAA产生量达 $135.67 \mu\text{g} \cdot \text{mL}^{-1}$, 且菌株L4具有解磷能力。通过菌株形态、生理生化特征测定及16S rRNA的保守序列鉴定, 初步确定菌株L4为氯酚节杆菌(*Arthrobacter chlorophenolicus*), 其GenBank登录号为JQ277449。菌株生长和发酵条件试验结果表明, 菌株L4生长和分泌IAA的最佳培养条件并不完全一致, 既能促进菌株生长又能合成较多IAA的最佳培养条件是初始pH值为5~6, 装液量为 $50 \text{ mL} \cdot (250 \text{ mL})^{-1}$, 30°C 摇床培养24 h; 促进菌株生长的最佳碳、氮源分别是麦芽糖和酵母粉, 而提高IAA产生量的最佳碳源是木糖, 最佳氮源是 KNO_3 。

关键词: 红壤 根际促生菌 吲哚乙酸(IAA) 条件优化

Abstract: Seven IAA(indole-3-acetic)-producing strains were isolated from the rhizosphere of peanuts growing in red soil. Among the 7 strains, Strain L4 was the highest in IAA excreting capability ($135.67 \mu\text{g} \cdot \text{mL}^{-1}$ in 24 h of cultivation), in addition to its phosphate-dissolving capability. Based on its morphological feature, some of its physiological and biochemical characteristics and its 16S rRNA sequence analysis, it was identified as *Arthrobacter chlorophenolicus* (GenBank Accession No. JQ277449). Single factor tests were designed to explore conditions optimal to growth and fermentation of the strain. Results show that the optimum conditions for its growth differed from those for its IAA excretion. The conditions optimal both to its growth and to its IAA secretion as well were 5-6 in initial pH, volume $50 \text{ mL} \cdot 250 \text{ mL}^{-1}$ in liquid volume in flask, 30°C in temperature, and 24 h of shaking culture. The best carbon and nitrogen sources for its growth was maltose and yeast extract, but for its IAA production, xylose and KNO_3 , respectively.

Keywords: red soil PGPR indole-3-acetic acid (IAA) optimization

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