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## 红树内生细菌AiL3在大豆体内的定殖与促生作用研究

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摘要: 为明确红树内生解淀粉芽孢杆菌AiL3在大豆体内的定殖及促生效果,通过逐步提高抗生素浓度驯化和平板对峙生长法,筛选对利福平标记稳定且对大豆疫霉菌具有较好抑菌作用的AiL3Rif突变菌株,分别采用灌根和涂叶法研究了AiL3Rif在大豆体内的定殖动态,并在灌根处理中考察了菌株发酵液对大豆的促生作用。结果表明:培养10代后的AiL3Rif标记保持稳定,原始AiL3菌株和AiL3Rif菌株对大豆疫霉抑制率分别为57.58%和56.92%;灌根与涂叶法均可使利福平标记菌株AiL3在大豆体内定殖,且能上下传导,有效定殖期持续达30d以上,其中灌根处理第11天后大豆根部定殖数量最高可达 $6.2 \times 10^3$  cfug<sup>-1</sup>,同期定殖量根部>茎部>叶片,涂叶处理第1天大豆叶片出现最大值 $3.34 \times 10^3$  cfug<sup>-1</sup>,同期定殖量叶片>茎部>根部,总体看来定殖量灌根要高于涂叶同期处理,且相对稳定;促生方面,以浓度为 $1.0 \times 10^7$  cfumL<sup>-1</sup> AiL3菌株悬浮液灌根盆栽大豆,20d后处理组鲜重、干重、株高、根长、叶绿素、根系活力等指标均显著高于其他组,说明红树内生细菌AiL3对大豆具有明显促生作用。

Abstract:

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Mangrove endophytic *Bacillus amyloliquefaciens* AiL3 were used as materials to study the colonization and promotion growth in soybean. Mutant strains AiL3Rif owned stable marker of antibiotic rifampicin and inhibitory effect against *Phytophthora sojae* were screened by gradually increasing the concentration of antibiotics and dual culture method. Colonizing dynamics of the AiL3Rif strain in root, stem and leaf of soybean were investigated by treating with root pouring and leaf coating and promotion growth of plant were determined after root pouring inoculation. The results indicated that the strain AiL3Rif was remain stable resistance marker after 10 generations of cultivation. The inhibition rates of the original AiL3 and mutated AiL3Rif strains against *P. sojae* were 57.58% and 56.92%, respectively. The strain AiL3Rif could not only colonize in soybean but also conduct from top to bottom and effective colonization period could sustain 30 days or more. The most amount of the marked strain were  $6.2 \times 10^3$  cfug<sup>-1</sup> after 11 days inoculation of pouring inoculation and the colonizing ability in the root was stronger than stems and leaves. Treated with leaf coating, the most amount appeared in the leaves was  $3.34 \times 10^3$  cfug<sup>-1</sup>, and followed by stems and least in the roots. The amount of bacteria colone of root pouring was higher than that of leaf coating and relatively stable. In soybean growth promoting aspects, the content of  $1.0 \times 10^7$  cfumL<sup>-1</sup> AiL3 fermentation broth were significantly higher than the other test groups based on determination results of the fresh and dry weight, height, root length, chlorophyll and root activity. It illustrated that mangrove endophytic bacteria AiL3 owned a obvious promoting effect for soybean.

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