

研究论文

枯草芽孢杆菌B931防治植物病害和促进植物生长的作用

张霞^{1,2}, 唐文华^{1,*}, 张力群¹

1中国农业大学植物病理系, 北京100094 2上海交通大学生命科学技术学院, 上海200240

收稿日期 2006-1-13 修回日期 网络版发布日期 2007-1-17 接受日期 2006-7-6

摘要 枯草芽孢杆菌 (*Bacillus subtilis*) B931是分离自小麦田的植物病害生物防治细菌, 对多种作物土传病害都有很好的防治效果, 并能促进作物生长。本研究通过转座子Tn917的转座诱变, 构建了菌株B931的突变体库。自3 000多个突变体中, 筛选得到了6个对小麦全蚀病菌抑制能力丧失的突变体 (B931-A⁻), 和多个产生长素、赤霉素、细胞分裂素能力增加的突变体B931-I⁺、B931-G⁺、B931-C⁺, 以及产这三类激素能力减少的突变体B931-I⁻、B931-G⁻、B931-C⁻。温室测定这些突变体对小麦全蚀病及棉花立枯病的防治作用, 结果表明抗生素的产生是B931具有病害防治能力的主要原因。产植物激素能力变化的突变体对苗期小麦和棉花没有促生长作用, 但对甘薯苗的生根有显著的促进作用。

关键词 [枯草芽孢杆菌](#) [转座诱变](#) [抗生素](#) [植物激素](#)

分类号

Biological Control of Plant Diseases and Plant Growth Promotion by *Bacillus subtilis* B931

ZHANG Xia^{1,2}, TANG Wen-Hua^{1*}, ZHANG Li-Qun¹

1 Department of Plant Pathology, China Agricultural University, Beijing 100094; 2 Department of Life Science and Technique, Shanghai JiaoTong University, Shanghai 200240, China

Abstract *Bacillus subtilis* B931, a biological control bacterium isolated from wheat field, protects plants against many soil-borne diseases and promotes plant growth. A mutant library of B931 containing over 3 000 Tn917 mutants was constructed by transposon mutagenesis with plasmid pTV1::Tn917. Six mutants defective in antibiotic production (B931-A⁻) were selected by dual culture test with *Gaeumannomyces graminis* var. *tritici* on PDA plates. Another six mutants which over-produced or less-produced phytohormones 3-Indoleacetic acid (IAA), gibberellin (GA3) or cytokinin (CTK), respectively, were selected by ELISA and HPLC methods. Greenhouse experiments showed that, compared with the wild type, the antibiotic-defective mutant was less effective in biological control of wheat take-all caused by *G. graminis* var. *tritici* and cotton damping-off caused by *Rhizoctonia solani*, indicating that the antibiotic production played a major role in the biocontrol activity of B931. The mutants that over-produced or less-produced phytohormones had no significant influence on seedling growth of wheat and cotton. However, the mutants that overproduced IAA or CTK could significantly promote root growth of sweet potato seedlings.

Key words [Bacillus subtilis](#) [Transposon mutagenesis](#) [Antibiotic](#) [Phytohormone](#)

DOI:

通讯作者 唐文华 tangwh@cau.edu.cn

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(460KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“枯草芽孢杆菌” 的相关文章](#)

▶ 本文作者相关文章

· [张霞](#)

· [唐文华](#)

· [张力群](#)