

专论与综述

## 植物内生菌及其防治植物病害的研究进展

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**摘要** 综述了植物内生菌及其防治植物病害的研究进展。植物内生菌分布广, 种类多, 几乎存在于所有目前已研究过的陆生及水生植物中, 目前全世界至少已在80个属290多种禾本科植物中发现有内生真菌, 在各种农作物及经济作物中发现的内生细菌已超过120种。感染内生菌的植物宿主往往具有生长快速、抗逆境、抗病害、抗动物危害等优势, 比未感染内生菌的植株更具生存竞争力。植物内生菌的防病机理主要表现在通过产生抗生素类, 水解酶类, 植物生长调节剂和生物碱类物质, 与病原菌竞争营养物质, 增强宿主植物的抵抗力以及诱导植物产生系统抗性途径抑制病原菌生长。另外, 对植物内生真菌和内生细菌的分离、筛选和检测方法; 利用植物内生菌控制植物病害的途径如人工接种内生菌, 利用内生菌代谢产生的抗生素以及将内生菌作为基因工程的载体菌等进行了综述。同时, 对植物内生菌作为生物防治因子未来发展前景及存在的问题进行了讨论。利用植物内生菌作为生物防治因子进行大田防病, 需要考虑它的病理学、生态学和形态学等方面的影响。

**关键词** [内生菌](#); [植物病害](#); [生物防治](#)

**分类号** [S476](#); [S432](#)

## Advances in the study of endophytes and their effects on control of plant diseases

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**Abstract** Recent advances in the study of endophytic bacteria and endophytic fungi in plants and their effects on biological control of plant diseases were reviewed. Endophytes with many varieties are widely distributed and almost exist in all aquatic and terrestrial plants. Now endophytic fungi have been observed in gramineous plants of 80 genera and 290 species and more than 120 species of endophytic bacteria have been found in some agronomic and cash crops in the world. The host plants infected by endophytes usually grow fast, have a strong resistance to adversity and diseases, and are immune to animal attack compared to uninfected plants. Therefore endophytes-infected plants are more competitive than uninfected ones in adverse circumstances. The mechanism whereby endophytes act as biological control agents is that endophytes inhibit pathogen growth by producing antibiotics, hydrolases, plant growth regulators and alkaloids, competing with pathogen for nutrition, enhancing resistance of host plants to diseases and inducing system resistance. The techniques of isolating, screening and detecting endophytes, approaches of controlling plant diseases by endophytes such as artificial inoculation of endophytes to plant, and application of antibiotics produced by endophytes, and utilization of endophytes as vectors in gene engineering were also reviewed. In addition, prospects and problems about endophytes as biological control agents were discussed. Many factors such as ecology, pathology and morphology should be considered in using endophytes as biological agents in the field.

**Key words** [endophyte](#); [plant disease](#); [biological control](#)

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