

## Evaluation of endophytic actinobacteria as antagonists of *Pythium aphanidermatum* in corn

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**Abstract:** Endophytic bacteria reside within plant hosts without causing disease symptoms. Suppression of plant disease due to the action of endophytic microorganisms has been demonstrated in several pathosystems. Endophytic actinobacteria isolated from healthy corn plants were assessed for their ability to control damping-off. Forty one selected isolates were screened for *in vitro* antagonism towards *Pythium aphanidermatum* and for production of endo-glucanase, pectinase and chitinase. The taxonomy characterization of the isolates was fermented by using a combination of phenotypic, genotypic and phylogenetic methods and by FAME. All isolates were assigned to the genus *Streptomyces*. Some strains were putatively identified as *S. halstedii*, *S. lavendulae*, *S. californicus*, *S. rochei rochei*, *S. anulatus*, *S. exfoliatus*, *S. glaucescens*, *S. albidoflavus* and *S. violaceusniger violaceusniger*. Six strains were highly related and could not be identified to any *Streptomyces* species. These strains could represent novel streptomycete species. All *Streptomyces* isolates completely inhibited the mycelial growth of the pathogen. The active compounds, extracted with ethyl acetate, produced by all isolates, also strongly inhibited the mycelial growth. A *Streptomyces lavendulae* strain 16R3B, tested for its effects on biocontrol of *Pythium* in greenhouse, significantly reduced the root rot index of cucumber and corn. Some isolates produced high amount of chitinase, pectin lyase and endo-glucanase. The results of this study indicate that endophytic actinobacteria isolated from corn plants provide an advantage as biocontrol agents for use in the field, where other have failed, due to their ability to colonize internal tissues of the host plant.

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