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Use of Two Pathogen-inhibiting Streptomyces Isolates for Biocontrol of Scab Disease of *Raphanus sativus*

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Use of two pathogen-inhibiting *Streptomyces* isolates for biocontrol of scab disease of *Raphanus sativus*.

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Streptomyces species are ubiquitous soil bacteria that are promising as biological control agents due to their prolific antibiotic production that can inhibit soil-borne plant pathogens. This includes *Streptomyces scabies*, which causes scab disease on underground storage organs. The goal of this research was to test two *Streptomyces* isolates that have known inhibitory and biocontrol abilities against *S. scabies* in a potato (*Solanum tuberosum*) agricultural system for their effectiveness in biocontrol of this pathogen in a radish (*Raphanus sativus*) greenhouse assay. Pathogenic *S. scabies* were mixed into either pasteurized or unpasteurized soil prior to planting. Radish seeds or radish roots were soaked in a spore suspension of the two biocontrol *Streptomyces* isolates. Controls of treatments without the pathogen and the biocontrol *Streptomyces* were included. Radish plants were grown to maturity. Upon harvesting, the radish taproot was rated for scab disease and tuber weight and length were determined. Disease levels were reduced in the presence of the two biocontrol *Streptomyces*. Taproot weight was greater in the treatments that included the biocontrol *Streptomyces*. In addition, evidence was sought to determine the ability of these *Streptomyces* isolates and other pathogen-inhibiting bacteria to enter into an endophytic relationship with the radish plant. For this, several protocols were assessed to try to optimize the isolation of endophytic bacteria from stem and taproot tissue. Surface-sterilized tissue sections (stem and taproot) or macerated stem tissue spread on agar plates have indicated the presence of several bacterial endophytes, including two putative *Streptomyces* isolates from the stem tissue sections. The search for additional endophytic bacteria capable of inhibiting the scab pathogen are currently underway. The results of this study are promising for the use of these *Streptomyces* isolates for biocontrol against scab disease in radish.