How Does Endophytic Bacteria Affect the Growth of Plant Pathogenic Fungi?

Adkins, Madison (School: Lincoln Park Academy)

Endophytic bacteria are bacteria that live inside plant tissue and benefit themselves as well as the plant host. Endophytic bacteria have been reported that can promote plant growth and suppress plant disease. The objective of this research is to test the effect of endophytic bacteria on growth of fungi causing anthracnose disease. Branches from mango were cut into 5-6 centimeter pieces, surface sterilized and ground in saline solution using sterile mortars and pestles. One hundred microliters of plant suspension were plated on Tryptic Soy Agar medium. Colonies were observed and recorded after 24 and 48 hours of incubation. At 24 hours of incubation, only a few bacterial colonies were observed. The colonies were uniformly round in shape and creamy white in color. At 48 hours of incubation, there were large numbers of colonies observed. The colonies of the second type of bacteria observed were round and small in shape and bright yellow in color. Eight bacterial isolates were grown in TS broth for 24 hours, then inoculated on TSA plates. Colletotrichum gloeosporioides agar discs were placed in the middle of the plates containing bacteria and on blank TSA as control. At three and five days after incubation, the diameter of fungal colonies were measured. For control, the fungal diameters were 48 and 73 mm for three days and five days, respectively. All eight isolates of bacteria inhibit the growth of fungi indicated by the smaller size of fungal colonies. Bacterial isolate MA4 was the most effective endophytic bacteria in inhibiting growth of the fungi. Gram stain results showed that isolate MA4 was gram negative and rod-shaped. Ongoing sequence analysis of polymerase chain reaction amplicons will help to further identify the bacteria.

Awards Won: