Antagonism of Aspergillus terreus Yua-6 to Botrytis cinerea and Colletotrichum gloeosporioides

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ABSTRACT

There exist many kinds of soil microorganisms in a plant rhizosphere. Some help plants against pathogens and fight diseases. In the present study, microorganisms were isolated from rhizosphere soils and tested for antagonistic effect against plant pathogenic fungi Botrytis cinerea and Colletotrichum gloeosporioides by dual culture assays and cellophane paper tests. An isolated fungus Yua-6 showed the best antagonistic abilities to B. cinerea and C. gloeosporioides. Appropriate primers were designed for Yua-6 to perform PCR reaction and a 1.6 kb DNA fragment was amplified, cloning, and sequencing. The sequence of Yua-6 was compared to the NCBI GenBank database and found that Yua-6 share 100% nucleotide sequence identity to Aspergillus terreus. The Yua-6 dry-frozen power from 6-day-cultured potato dextrose broth was added into PDA medium to test for fungal growth inhibition. The result showed that the concentration of 1 mg / ml and 5 mg / ml in PDA medium of Yua-6 dry-frozen power results in 19.29% and 70.63% , respectively, of inhibition rate on C. gloeosporioides and 4.93% and 51.73%, respectively, inhibition rate on B. cinerea. Additionally, spraying of 10-fold-diluted Yua-6 culture filtrate on C. gloeosporioides inoculated mature papaya fruits was able to protect them from the development of disease. The ethyl acetate layer of Yua-6 dry-frozen culture filtrate showed 81.92% of inhibition rate to C. gloeosporioides and 54.11% of inhibition rate to B. cinerea at the concentration of 2 mg / ml. The eluent by using n-hexane: ethyl acetate (55: 45) solvent through silica gel was collected and it showed the inhibit effect on C. gloeosporioides at the concentration of 0.3 mg/ml in PDA. This eluent was further analyzed by high-pressure liquid chromatography (HPLC) and the compound collected from retention time of 5 minutes had the best antagonism activity.

Keywords : Antagonism microorganisms、Botrytis cinerea、Colletotrichum gloeosporioides、Aspergillus terreus、Biological control

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