Endophytic Fungi in Cucurbitaceous Plants and Their Inhibitive Effects on Common Soilborne Pathogens of Cucurbits

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Abstract:

Endophytic fungi are common in plants. In order to understand the endophytic mycobiota, and their functions, endophytic fungi were isolated from asymptomatic cucumber plants, including different cultivars growing in greenhouse and open field at different stages, collected from Yanqing of Beijing, and some more cucumber and other cucurbitaceous plants collected from several other locations of Beijing and Langfang of Hebei. Based on morphological characteristics, 18S rDNA and ITS sequence alignments, 21 genera were identified out of 1268 fungal isolates. The endophytic fungi from cucumber included 20 genera: *Alternaria, Apiospora, Arthrinium, Aspergillus, Bipolaris, Chaetomium, Cladosporium, Colletotrichum, Corynespora, Didymella, Exserohilum, Fusarium, Mortierella, Myrothecium, Neocosmospora, Nigrospora, Penicillium, Pleospora, Rhizoctonia*, and *Trichoderma*. Most of them also appeared in other cucurbitaceous plants. *Curvularia* was isolated from pumpkin and luffa. Plate confrontation tests were carried out with 341 strains of endophytic fungi, representing all of the 1268 isolates, against common cucumber pathogenic fungi *Fusarium oxysporum* f. sp. *cucumerinum*, *Sclerotinia sclerotiorum*, *Rhizoctonia solani*, and *Phytophthora drechsleri*. Quite a few strains showed inhibitive effects on the pathogenic fungi in varying degrees. There were 31, 57, 36 and 19 strains showed notable inhibitive effects on *F. oxysporum* f. sp. *cucumerinum*, *S. sclerotiorum*, *R. solani*, and *P. drechsleri*, respectively. Most of the strains had distinct inhibition zone. Some strains were selected and tested for the stability of inhibition of their fermentation liquid. Results showed that the filtrate of the fermentation liquid could maintain steady antagonism ability after disposing at 80 „aC for 30 min. Preliminary results of artificial inoculation tests with some endophytic fungal strains showed that they took some control effects on the diseases caused by the above pathogens.

Key words: cucumber, cucurbit, endophytic fungi, inhibition, pathogen