

Biodiversity of Endophytic Fungi in Cucumber and Other Cucurbitaceous Plants

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Endophytic fungi are common in plants. In order to understand the endophytic mycobiota and its variation in cucumber and other cucurbitaceous plants, endophytic fungi were isolated from forty 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 other locations of Beijing. Based on morphological characteristics, 18S rDNA and ITS sequence alignments, 21 genera were identified out of 1268 fungal strains. 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. Among them, *Exserohilum* and *Neocosmospora* have not been reported as endophytic fungi up to now. In addition, *Curvularia* was isolated from pumpkin and luffa.

The results indicated that *Alternaria*, *Aspergillus*, *Chaetomium*, *Cladosporium*, and *Fusarium* existed universally in different organs of cucumber at all stages. *Alternaria* and *Fusarium* were the dominants in endophytic fungi of cucurbitaceous plants. The colonizing rate of *Alternaria* species reached 47% in leaves, and that of *Fusarium* species reached 32.5% in roots, they were far higher than in other organs of cucumber. Most of the endophytic fungi showed organ favoritism in varying degrees. The number of genus and total colonizing rate of endophytic fungi were higher in leaves and roots than in stems and fruits. Along with plant growth, the number of genera of endophytic fungi and the colonizing rates of some fungi increased, but the colonizing rates of *Neocosmospora* and *Chaetomium* species decreased from all organs. The

number of genera of endophytic fungi isolated from the cucumber growing in open field was more than that isolated from the cucumber growing in greenhouse.

Plate confrontation tests were carried out with 315 strains of endophytic fungi against common cucumber pathogenic fungi. Quite a few strains showed inhibitive effects on the pathogenic fungi in varying degrees. The strains with growth inhibition rate of 50% or above against the four pathogenic fungi *Colletotrichum orbiculare*, *Rhizoctonia solani*, *Fusarium oxysporum* f. sp. *cucumerinum*, and *Phytophthora drechsleri* accounted for 20.3%, 17.1%, 4.8%, and 3.2% of the tested strains, respectively. Artificial inoculation and re-isolation tests indicated that most of strains of endophytic *Fusarium oxysporum* isolated from cucumber were non-pathogenic and could colonize in root and stem of cucumber.