MODES OF MICROBIAL RESISTANCE MECHANISMS TO THE ANTIBIOTIC AND PHYTOTOXIC FUSARIC ACID

F. K. Crutcher
J. Liu
R. D. Stipanovic
L. S. Puckhaber
A. A. Bell
USDA, ARS, SPARC
College Station, TX
R. L. Nichols
Cotton Incorporated
Cary, NC

Abstract

Fusaric acid (FA), a highly phytotoxic compound produced by *Fusarium oxysporum* f. sp. *vasinfectum*, has been suggested to be associated with the severe symptoms of root rot, damping-off, and vascular wilting of cotton. In response to a potential threat to cotton production by the introduction of high FA producing strains from Australia, new sources for resistance within commercially available cotton cultivars are being pursued. Many soil microbes show resistance to a number of toxic compounds through the use of two mechanisms, active transport and metabolite degradation. To address this as a possible source for FA resistance, several microorganisms, including those identified by selection from *Fusarium*-infested soils, were screened using an antibiotic disk assay. A number of resistant isolates of bacteria and fungi identified using this screening method were evaluated by high pressure liquid chromatography (HPLC) for their ability to alter FA to produce less toxic derivatives. Five derivatives were detected in this analysis and one has been identified as a compound previously shown to have less phytotoxicity than FA.