Comparative Assessment of Genotyping Methods for Study Genetic Diversity of Fusarium oxysporum Isolates

KAMEL A. ABD-ELSALAM1,2, JIAN-RONG GUO2, FRANK SCHNIEDER2, ABDEL-MONGY ASRAN-AMAL1 and JOSEPH-ALEXANDER VERREET2

1 Agricultural Research Center, Plant Pathology Research Institute, 9 Gamaa St., Giza, Egypt
2 Christian Albrechts Universitat zu Kiel, Institut fur Phytopathologie Hermann-Rodewald-St. 9, D-24118 Kiel, Germany

Received in revised form 12 April 2004

Abstract

In this study, we evaluated three PCR-based methods for the molecular typing of nonpathogenic Fusarium oxysporum isolates: random amplified polymorphic DNA (RAPD), polymerase chain reaction restriction fragment length polymorphism (PCR-RFLP) and amplified fragment length polymorphism (AFLP). The analyses were performed using 64 isolates of F. oxysporum collected from cotton-producing areas in Egypt. A number of polymorphic RAPD, PCR-RFLP and AFLP bands were scored in all isolates and the genetic similarity among them was assessed. Clustering analysis separated the isolates into two main groups, with similarities ranging from 87 to 100% for RAPD, 80 to 100% for PCR-RFLP and 88 to 97% for AFLP, respectively. The obtained data suggested that all three types of markers are equally informative, but the three assays differed in the amount of detected polymorphic bands. AFLP fingerprinting was also found to be more differentiating than other techniques for the typing of F. oxysporum populations.

Key words: AFLP, RAPD, ITS-PCR-RFLP, polymorphism, Fusarium oxysporum

* Corresponding author: e-mail: kaabdelsalam@msn.com