Charaterisation of Magnaporthe oryzae isolates from rice in peninsular Malaysia

ABSTRACT

The genus Pyricularia (anamorph)/Magnaporthe (teleomorph) includes important destructive pathogens causing blast disease on various species from the family Poaceae. Thirty-five Magnaporthe isolates were collected from diseased rice plants (variety MR219) in different rice-growing regions of Malaysia, including the five states of Selangor, Penang, Kedah, Kelantan, and Perak between 2010 and 2014. DNA sequence analyses of the internal transcribed spacer (ITS), actin, β-tubulin and calmodulin gene regions, random amplified polymorphic DNA (RAPD) and intersimple sequence repeat (ISSR) analyses were conducted to analyse 35 Magnaporthe isolates. Phylogenetic analysis of the combined dataset confirmed the identification of all isolates as M. oryzae with a high distance from other Magnaporthe (Pyricularia) species. RAPD and ISSR analyses indicated the existence of a relatively low similarity index value among M. oryzae isolates through identification of four main clades. The clustering of RAPD and ISSR analyses demonstrated that there was a correlation between the isolates and their geographical origins.

Keyword: Genetic diversity; ISSR; Oryza sativa; RAPD; rDNA-ITS; Rice blast