GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Quantitative detection of the rice false smut pathogen *Ustilaginoidea virens* by real-time PCR

H. Li[1,2,3]*, D.H. Ni[1,2]*, Y.B. Duan[2,4], Y. Chen[5], J. Li[1,2], F.S. Song[2,4], L. Li[2], P.C. Wei[2,3] and J.B. Yang[2]

[1]Key Laboratory of Ion Beam Bioengineering,
Institute of Technical Biology and Agriculture Engineering,
Chinese Academy of Sciences, Hefei, Anhui, China
[2]Key Laboratory of Rice Genetics Breeding of Anhui Province,
Rice Research Institute, Anhui Academy of Agricultural Sciences,
Hefei, Anhui, China
[3]Institute of Agricultural Engineering, Anhui Academy of Agricultural Sciences,
Hefei, Anhui, China
[4]College of Life Sciences, Anhui Agricultural University, Hefei, Anhui, China
[5]Institute of Plant Protection, Anhui Academy of Agricultural Sciences,
Hefei, Anhui, China

*These authors contributed equally to this study.
Corresponding author: J.B. Yang
E-mail: yjianbo@263.net

Genet. Mol. Res. 12 (4): 6433-6441 (2013)
Received April 25, 2013
Accepted September 15, 2013
Published December 10, 2013
DOI http://dx.doi.org/10.4238/2013.December.10.4

ABSTRACT. Rice false smut (RFS) is an important rice disease that is caused by the pathogen *Ustilaginoidea virens*. In this study, we developed a real-time polymerase chain reaction (PCR) assay to detect *U. virens* and to estimate the level of disease. The genomic DNAs of *U. virens* and rice were extracted together from the rice samples. Real-time PCR assays were performed and compared to conventional nested-PCR assays. The real-time PCR assay presented a consistent linearity of the standard curve (R^2 = 0.9999). The detection limit could be as low as 40 fg *U. virens* DNA with a rice genomic DNA background on using the real-time PCR assay, which

showed significantly higher sensitivity than the conventional nested-PCR assay. We conclude that the real-time PCR quantitative assay is a useful tool for detecting *U. virens* and for early defense and control of RFS.

Key words: Rice false smut; Real-time PCR; Detection; Quantification; *Ustilaginoidea virens*

