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

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**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*