POSTER SUMMARY

DEVELOPMENT OF REAL-TIME QUANTITATIVE POLYMERASE CHAIN REACTION TO DETECT AND QUANTIFY SMUT INFECTION IN SUGARCANE VARIETIES

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Abstract

Sugarcane smut caused by the fungus *Sporisorium scitamineum* can reduce sugarcane yield significantly in susceptible varieties. The ability of TaqMan real time quantitative polymerase chain reaction assays (RT-qPCR) to detect and quantify smut in sugarcane varieties with different levels of susceptibility and resistance to smut was evaluated in a pot trial at SASRI. Nine local sugarcane varieties were inoculated with a smut spore suspension at a concentration of $5X10^8$ spores/mL by injecting spores into swollen sugarcane buds. Genomic DNA was extracted after 14 days from germinated buds and the quantity of smut DNA present was determined by TaqMan qPCR assay. The target smut gene was detected in all inoculated varieties. However, the quantity of the gene (measured as gene copy number) varied between the varieties. All susceptible varieties had a significantly higher smut gene copy number ($P<0.001$) compared to resistant varieties. The TaqMan RT-qPCR assay is potentially a suitable diagnostic tool for the determination of resistance or susceptibility to smut in sugarcane.

Keywords: sugarcane smut, *Sporisorium scitamineum*, real-time quantitative polymerase chain reaction.