



Post-transcriptional silencing of the *SGE1* gene induced by a dsRNA hairpin in *Fusarium oxysporum* f. sp *cupense*, the causal agent of Panama disease

J.S. Fernandes¹, P.C.S. Angelo², J.C. Cruz¹, J.M.M. Santos³, N.R. Sousa⁴ and G.F. Silva¹

¹Laboratório de Biologia Molecular, Embrapa Amazônia Ocidental, Manaus, AM, Brasil

²Embrapa Café - Fundação Procafé, Varginha, MG, Brasil

³Instituto Nacional de Pesquisa da Amazônia & Universidade do Estado do Amazonas, Manaus, AM, Brasil

⁴Embrapa Cocais, São Luiz, MA, Brasil

Corresponding author: G.F. Silva

E-mail: gilvan.silva@embrapa.br

Genet. Mol. Res. 15 (2): gmr.15027941

Received October 28, 2015

Accepted December 9, 2015

Published April 4, 2016

DOI <http://dx.doi.org/10.4238/gmr.15027941>

ABSTRACT. *Fusarium oxysporum* f. sp *cupense* (*Foc*), the causal agent of Panama disease, is responsible for economic losses in banana crops worldwide. The identification of genes that effectively act on pathogenicity and/or virulence may contribute to the development of different strategies for disease control and the production of resistant plants. The objective of the current study was to analyze the importance of *SGE1* gene expression in *Foc* virulence through post-transcriptional silencing using a double-stranded RNA hairpin. Thirteen transformants were selected based on different morphological characteristics, and sporulation in these transformants was significantly reduced by approximately 95% ($P < 0.05$) compared to that of the wild-type strain. The relative *SGE1* expression

levels in the transformant strains were reduced by 27 to 47% compared to those in the wild-type strain. A pathogenicity analysis revealed that the transformants were able to reach the rhizomes and pseudostems of the inoculated banana plants. However, the transformants induced initial disease symptoms in the banana plants approximately 10 days later than that by the wild-type *Foc*, and initial disease symptoms persisted even at 45 days after inoculation. These results indicate that the *SGE1* gene is directly involved in the virulence of *Foc*. Therefore, *SGE1* may be a potential candidate for host-induced gene silencing in banana plants.

Key words: Gene silencing; *F. oxysporum* f. sp. *cubense*; *SGE1*; *Foc*