Abstract

Unique Secreted in Xylem Genes in Banana-Infecting Endophytic *Fusarium Oxysporum* [†]

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Abstract: Members of the *Fusarium oxysporum* species complex include pathogenic and non-pathogenic isolates and infect a broad range of plant species. *F. oxysporum* f. sp. *cubense* (*Foc*) causes the destructive Fusarium wilt of banana, and the recently emerged *Foc* tropical race 4 strain threatens the global banana industry. *Secreted in xylem* (*SIX*) genes encode for *F. oxysporum* effector proteins that are associated with virulence in pathogenic *F. oxysporum*, however they have rarely been reported from non-pathogenic *F. oxysporum* isolates. Our recent survey of asymptomatic banana plants grown in *Foc*-infested fields in Queensland and northern NSW revealed that diverse *Fusarium* spp, including *F. oxysporum*, reside in the plant roots and pseudostem without causing obvious damage to the plant. Intriguingly, we amplified *SIX* genes from several of the putative endophytic *F. oxysporum* isolates identified in the survey and found that they differ in their profile to known *Foc SIX* genes. To study the role of the endophytic *F. oxysporum* isolates *in planta* and the biological function of their *SIX* genes in more detail, we will re-inoculate cultivated and wild diploid banana lines with the endophytic *F. oxysporum* strains under glasshouse conditions to assess if they are non-pathogenic on banana. Secondly, we will determine whether the endophytic *F. oxysporum SIX* genes are expressed *in planta* and/or *in vitro* and look at the transcriptome changes occurring in the host following infection. Finally, endophytic *F. oxysporum* strains transformed with GFP will be used to investigate the extent of fungal colonisation in the plant.

Keywords: plant immunity; endophytes; fungal disease; banana; *Fusarium oxysporum*

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