Morphological, phylogenetic and pathogenicity characterisation of Fusarium species associated with wilt disease of pumpkin (Cucurbita pepo Linnaeus)

ABSTRACT

Fusarium is a well-known soil-borne fungus where most species belonged in this genus is prominently phytopathogenic. Nevertheless, this pathogenic species has affected the production of pumpkin worldwide. This study underlines the morphological, phylogeny and pathogenicity characteristics of Fusarium for a better disease-control strategy. Twenty-six Fusarium isolates were collected from wilt infected pumpkin in various locations of Peninsular Malaysia. From the combinations of morphological and molecular identifications, four species were identified as F. oxysporum (2 isolates), F. solani (4 isolates), F. proliferatum (7 isolates) and F. incarnatum (13 isolates). Microscopic and macroscopic observation visualized distinct characteristics of the identified Fusarium species. Sequence analyses of tef1α and β-tub genes inferred by maximum likelihood tree resulted in distinct section-specific characteristics. Meanwhile, pathogenicity test of Fusarium isolates presented by the seed inoculation produced various degrees of severities. Fusarium solani C2526P recorded the highest severity of 93.8% after 30 days of post inoculation (dpi). Symptoms have been identified as early as 10 dpi producing stunted growth of the plants. On the other hand, Fusarium oxysporum D2532P recorded 85.3% disease severity. Pathogenic Fusarium caused stunted growth, chlorosis, wilting and necrosis especially at the root of pumpkin plants. This study provides valuable information and methods to manage wilt infected pumpkin in the future.

Keyword: Fusarium wilt; Cucurbita pepo; Phylogeny; Pathogenicity