Study on the resistance of Wild Banana against the wilt pathogen *Fusarium oxysporum* f.sp *cubense*

ABSTRACT

Banana is one of the most important fruit crops in Malaysia. Its susceptibility to *Fusarium oxysporum f. sp. cubense* causes reduction in yield. Chemical and cultural control methods are not effective in controlling the disease. Therefore, host resistance is the most effective and sustainable management option for disease control. This study is to explore the potential host defense mechanism of the wild banana, *Musa acuminata* subsp. *malaccensis*. Bacteria from rhizosphere, rhizoplane and endogenous (endophytic) from wild banana were isolated and identified based on molecular characterization. Of 45 bacterial isolates, 51% are *Bacillus sp,* followed by *Enterobacter sp* (16%), *Exiguobacterium sp.* (11%) and others (22%). Presence of these bacteria could enhance the host resistance towards the fungal disease. The phytochemical, Fourier Transform Infrared and mineral analysis of banana leaves of these varieties; wild, rastali, mas, cavendish and berangan banana were compared. Wild banana leaves contain higher level of phenolic and exhibited higher antioxidant activity. In general, alkanes, carboxylic acid and aromatic compound were present in all variety of banana leaves. Higher content of Zn and Ca was observed in wild banana leaves which promote the physical defense in diseased plant. Tissue cultured banana plantles of five different varieties (wild, rastali, mas, cavendish and berangan) were subjected to bioassay against *Fusarium oxysporum f.sp. cubense* race 4 (VCG 01216). In the disease

severity percentage, wild banana was rated as moderately resistant as none of the plants completely wilted after inoculation but recovered fully from the disease symptom after 15 days. In contrast, other varieties show rapid disease progression and some eventually died at the end of the observation. Histopathology study revealed the formation of gum in the wild and berangan corm tissue. This study enlightens the possible host defense mechanism of *Musa acuminata* subsp. *malaccensis*. However detailed study on the induced resistance or systematic acquired resistance is needed to understand the full potential of the wild banana.