

## **Title: Mechanism of action of effective microbes against fusarium oxysporum f. Sp. Melonis**

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The use of effective microbes obtained from the rhizosphere to suppress soil borne plant pathogens has received greater attention in recent decades as an alternative to chemical fungicides. The present study was conducted to explore the effects of effective microbes (EMs) and to understand the mechanisms of action and their ability to produce inhibitory metabolites and hydrolytic enzymes that enhance their antagonistic capability and activity against Fusarium wilt caused by *Fusarium oxysporum* f. sp. melonis (Fom), as well as plant growth promotion activity on the rock melon plant. Two EMs namely *Bacillus amyloliquefaciens* MKB04 (KM220772) and *Alcaligenes faecalis* MKB10 (KM220771) were selected, The in vitro evaluation of antifungal compound production was found to be a common characteristic among the two selected potential bacterial isolates.

Moreover, the isolates showed strong antagonistic activity and different mechanisms of action in the diffusible metabolites assay compared to the volatile one, This characteristic significantly add to its role in controlling Fom, where the bacterial isolates exhibited significantly different combinations of antimicrobial metabolites, such as cellulase, pectinase, proteases and chitinases. The activities of the various effective bacteria isolates were shown by the clear zones that formed surrounding the colonies of bacteria. In biocontrol assay they produced antibiotic substances which prevent the fungal growth up to 92.05 and 93.18% for *B. amyloliquefaciens* and *A. faecalis* respectively compared with control and spores germination by 100%. Furthermore, the two isolates responded positively in vitro for siderophore and HCN, indole acetic acid (IAA) production, and phosphate solubilisation. As effective microbes are environmental friendly and in vitro antagonistic and hydrolytic activities it showed against *F.oxysporum* f. s. melonis in this study suggest that they can be used as an effective biological control agent as well as plant growth promoters.

### **Biography**

Salha Elmahdi was born in Omdurman the national capital of Sudan, she conferred her Bachelor's degree in Agricultural Science major in crop protection and Master degree in Department of Crop Protection at Faculty of Agriculture- University of Khartoum. She obtained her PhD from Department of Plant Protection, Faculty of Agriculture, Universiti Putra Malaysia She has keen interest in Plant Pathology majoring in Biocontrol of phytopathogens using effective microbes. her expertise in crop Protection, general and applied microbiology, biotechnology (biodegradation and bioremediation), Statistics and experimental designs . She has experience in research, teaching of different courses (theory and practical) in education institutions. She also actively involved in administrative assignments and memberships in her University, as well as curricular activities.