ABSTRACT

Marwa Abdalla Mahmoud Atwa: Studies on the interaction among some leaf spot diseases of faba bean in Egypt. Un-published Doctor of Philosophy thesis. Department of Plant Pathology, Faculty of Agriculture, Ain Shams University (2005).

Faba bean (*Vicia faba* L.) is considered the most important food legume crops in Egypt. Foliar diseases are the major diseases affecting the crop causing serious damage to the plants and consequent decrease in the yield production. Therefore the principle objectives of this work aimed to study the variation among some leaf spot pathogenic fungi as well as isolating and screening biocontrol agents against the most pathogenic fungus under green house and field conditions. Disease survey of leaf spot diseases during 2000/2001 and 2001/2002 seasons indicated that Nubaria district has showed the highest percentage of disease severity vice versa of El-Sharkia governorate , also chocolate spot disease (*Botrytis fabae*) , *B. cinerea*, Alternaria leaf spot (*Alternaria alternata*) and Stemphylium leaf spot (*Stemphylium botryosum*) were the predominant isolated fungi, and the most virulent fungus was *B. fabae* which isolated from Nubaria district .

Isolated fungi differ in their virulence on seven faba bean cultivars. There was a clear variation between isolates concerning morphological characters. The *fabae* type has produced less number of spores and small size of sclerotia, large in number, while *cinerea* type has produced high number of spores and producing sclerotia large in size but less in number or absent. Also, extensive genetic diversity among isolates were observed with the cluster analysis of RAPD-markers, and there was a distinct separation between the isolates (eight isolates of each *B. fabae, B. cinerea* , *A.*

alternata and 5 isolates of *S. botryosum*), which showed apparent clustering of isolates according to the geographic origin as well as aggressiveness of the isolates. The interaction among different pathogens of leaf spot diseases concluded that, there was an increase in disease severity when pathogens inoculated sequential, while there was no reaction when pathogens inoculating in simultaneous.

More than 90 isolate of bacteria, fungi and yeast were isolated and screening as a biocontrol agent against the most important pathogenic fungi namely *B. fabae in vitro* and *in vivo* using detached leaves and whole plants techniques. The most effective isolates were applied under field conditions at Kafer El- Shiekh (Sakha Research Station). The most effective isolates identified as *Bacillus mycoides*, *Pichia guilermondii* and *Trichoderam harzianum*. All bioagents decreased disease severity of chocolate spot disease, and increased the yield component ; growth characters (plant height, number of branches), and number of pods, number of seeds , as well as seed yield weight. The ultrastructural of the interaction of biocontrol agent with *B. fabae* showed clearly suppression of conidia germination. Combining between the effective biocontrol agents indicated a significant reduction on the disease severity of chocolate spot disease by more than 97%.

Key words:
Faba bean, *Vicia faba* L., leaf spot diseases, chocolate spot disease, *Botrytis fabae*, *B. cinerea* , Alternaria leaf spot (*A. alternata*) , Stemphylium leaf spot (*S. botryosum*), virulence, morphological characters, genetic diversity, RAPD-PCR, DNA electrophoresis, biological control, mode of action , combination between biocontrol agents.

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