# PATHOLOGICAL AND BIOCHEMICAL STUDIES ON *Rhizoctonia solani* WITH REFERENCE TO COTTON ISOLATES

**By**


## KHALED KASEM KASEM

**B.Sc. (Plant Protection), Fac. Agric., Aleppo Univ., Syria, 2001**
**M.Sc. (Plant Pathology), Fac. Agric., Cairo Univ., Egypt, 2006**


## THESIS

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**Cairo University**
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APPROVAL SHEET

# PATHOLOGICAL AND BIOCHEMICAL STUDIES ON *RHIZOCTONIA SOLANI* WITH REFERENCE TO COTTON ISOLATES

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**In**
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SUPERVISION SHEET

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**Title of Thesis:** Pathological and biochemical studies on *Rhizoctonia solani* with reference to cotton isolates
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**ABSTRACT**

Fifty one isolates of *Rhizoctonia solani* were obtained from cotton seedlings and other hosts. Anastomosis tests revealed that 17 isolates belonged to AG-2-2, 17 isolates belonged to AG-4-HG-I, 7 isolates belonged to AG-4-HG-II, and 10 isolates belonged to AG-5. Pathogenicity test on cotton cultivar Giza 86 showed that the pathogenic isolates of AG-2-2 represented 52.63% of the total pathogenic isolates followed by AG-4-HG-I, which represented 31.58%, these results indicate that both AGs 2-2 and 4-HG-I are important in the etiology of cotton seedling disease. Physiologic specialization exists within *R. solani* isolates pathogenic on cotton. Resistance of cotton cultivars was a mixture of both vertical and horizontal resistance and there were significant differences among cultivars in both types of resistance. Similarly, pathogenicity of the tested isolates is also a mixture of virulence and aggressiveness, and the isolates significantly differed in both types of pathogenicity. *R. solani* isolates responded differently to the application of seed-dressing fungicides, *Trichoderma* isolates, and *Bacillus* isolates. Cluster analysis was used for grouping *R. solani* isolates from cotton based on the similarity level among their protein and isozymes banding patterns. However, grouping the isolates was not related to their virulence, AGs, or geographic origins. The antigenic parity between cotton cultivar Giza 86 and the isolates of *R. solani* was not related to the pathogenicity of the isolates on this cultivar. Isolates of each AG were almost identical in their antigenic composition. Therefore, serological interactions could be used, as a reliable method, for the identification of the *R. solani* AGs.

**Key words:** *Rhizoctonia solani*, anastomosis groups, cotton, electrophoresis, serology.

# *DEDICATION*

*I dedicate this work to whom my heart felt thanks; to my father, my mother, my wife* ***Areej****, my daughter* ***Razan*** *and my son* ***Soliman,*** *for their patience and help, as well as to my brothers and sisters for all the support they lovely offered along the period of my post graduation.*

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# CONTENTS

# LIST OF TABLES