STUDIES ON SOME MICROORGANISMS AS BIOLOGICAL CONTROL AGENTS FOR POTATO BROWN ROT

By

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ABSTRACT

Laboratory and greenhouse experiments (using sterile and non- sterile soil) were conducted at the Potato Brown Rot Project (PBRP), Giza, Egypt to evaluate the ability of some strains of plant growth promoting rhizobacteria (PGPR) to control the pathogen microorganism causing potato brown rot disease. Two bacterial strains (*Ralstonia solanacearum*) were isolated from naturally infected potato tubers and identified by PCR and Real-time PCR technique as *Ralstonia solanacearum* race 3 biovar 2. Results of the antagonistic activity of the tested bio -agents against *Ralstonia solanacearum* showed that all of the tested PGPR strains exhibited variable antibacterial effects against *Ralstonia solanacearum.* Under greenhouse conditions, PGPR stimulated the growth of potato varieties (Draga CV and Spunta CVS). Shoot and root dry weights as well as root length and shoot height were significantly increased when potato was inoculated with the biocontrol agents either as a single inoculum or in combination. The treatment received the mixture of all tested bioagents (*Bacillus circulans, Paenibacillus polymyxa, Bacillus pasteurii, Bacillus megaterium* and *Pseudomonas fluorescence*) was the superior among the other treatments. A positive response was recorded for the NPK-contents of the plants as a result of inoculation with the PGPR strains. The percentage of disease severity either in sterilized or non- sterilized soil tended to be reduced due to the inoculation of potato tubers with the tested bioagents (PGPR). Counts of pathogenic bacteria in rhizosphere soil were also reduced.

Key words: PGPR, Bio control agents, *Ralstonia solanacearum*, Potato Brown Rot, Draga *CV*, Spunta *CVS*.

CONTENTS

INTRODUCTION 1

REVIEW OF LITERATURE

1. Economical importance of potato crop……..... 5
2. Plant-growth promoting rhizobacteria (PGPR)..... 6
3. Potato brown rot disease..... 8
4. Disease distribution..... 9
5. Characteristics of *R. solanacearum* 10
6. Host range..... 11
   a. Races..... 11
   b. Biovars..... 11
   c. Occurrence and host range..... 12
7. Survival..... 13
8. Biological control..... 18

MATERIALS AND METHODS

1. Materials..... 27
   a. Soil used..... 27
   b. Potato seed tubers..... 27
   c. The used strains as biocontrol agents..... 27
1. Isolation of *Ralstonia solanacearum* from different sources and their pathgenicity test …… 38
2. Pathogenicity of the isolates pathogens……
3. Identification of the pathogen 41
   1. Morphological characteristics..... 41
   2. Plating on the SMSA medium..... 41
   3. Immunofluorescence Antibody Stain (IFAS)..... 41
4. Polymerase Chain Reaction (PCR)..... 43
   a. Extraction of DNA..... 43
   b. DNA amplification..... 43
   c. Analysis of the PCR product..... 44
5. Multiplex, Real-time, Fluoro genic PCR (Taq-Man) Assay..... 45
   a. Bacterial strains and growth conditions..... 46
   b. DNA amplification..... 46
   c. PCR analysis..... 47

6. Assay the potency of the tested bacterial strains as biocontrol agents……..…47
7. Pot experiment ……48
8. Methods of Determination ……..……...49
9. Statistical analysis …….. ……...……**50**

RESULTS

1. Isolation of *Ralstonia solanacearum* and its pathogenicity..51
2. Detection of *Ralstonia solanacearum*..... 52
a. Colony characteristics of *Ralstonia solanacearum*…….. .52
b. Immuno-fluorescence staining (IFAS) **52**
c. Polymerase Chain Reaction (PCR) **55**
d. Real-time, Fluorogenic PCR (Taq-Man) assay..... .**56**
3. Antagonistic effect of some PGPR strains against *R. solanacearum* .....**..... 58**
4. Effect of bio-agents on growth of potato plants infected with *Ralstonia solanacearum*..... 58
a. Root parameters.....**58**
b. Shoot parameters..... 64
5. NPK –contents of potato plants (Draga & Spunta) **65**
6. Wilt disease severity (%) infested of potato plant *Ralstonia solanacearum* **73**
7. Densities of *R. solanacearum* in the rhizosphere soil of potato plants. **74**
DISCUSSION. **79**
SUMMARY..... **83**
REFERENCES.....**... 87**
ARABIC SUMMARY.....

LIST OF TABLES

No. **Title** **Page**

1. Chemical properties of the studied soil. ……...27

2. Antagonistic activity of the tested bioagents against *Ralstonia solanacearum (R.S.).*……58

3. Influence of different strains of PGPR on root dry weight (g plant-1) of potato varieties (Draga CV & Spunta CVS) infested with *Ralstonia solanacearum* in sterilized soil.……60

4. Influence of different strains of PGPR on root length (cm plant-1) of potato varieties (Draga CV & Spunta CVS) infested with *Ralstonia solanacearum* in sterilized soil.…….....61

5. Influence of different strains of PGPR on shoot dry weight (g plant-1) of potato varieties (Draga CV & Spunta CVS) grown in sterilized soil and infested with *Ralstonia solanacearum.*……65

6. Influence of different strains of PGPR on shoot height (cm plant-1) of potato varaieties (Draga CV & Spunta CVS) grown in sterilized soil and infested with *Ralstonia solanacearum.*……66

7. Effect of different bioagents on root NPK-contents (ppm) of potato varieties (Draga CV & Spunta CVS) plants infested with *Ralstonia solanacearum* in sterilized soil.……69

8. Effect of different bioagents on shoot NPK-contents (ppm) of potato varieties (Draga CV & Spunta CVS) plants infested with *Ralstonia solanacearum* in sterilized soil……70

9. Wilt severity% infested with *Ralstonia solanacearum* of potato plants (Draga CV & Spunta CVS) under sterile soil condition in

presence of different bioagents.……74

10. Densities of *Ralstonia solanacearum* (10^2cfu/g) in sterilized soil inoculated with different bioagents in presence of two potato varieties....……75