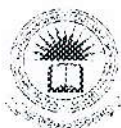


**STRATEGIES FOR THE IMPROVEMENT OF
CONTROL MEASURES AGAINST COCKCHAFER
GRUB (*Melolontha spp.*) INFESTATION IN
RUBBER PLANTATION**



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ABSTRACT

Cockchafer grub attack on the root system of young rubber clearings was reported occasionally since the establishment of the rubber plantation industry in Sri Lanka. However, grub infestation reached epidemic proportions during the year 2002 in Awissawella region and destroying young rubber clearings. Presently, this problem has spreaded to Rathnapura, Kegalle and Kalutara districts threatening the establishment of new clearings in certain locations. With the spread of the attacks, various pesticides were tested as soil drenching chemicals and Chlophyrifos was identified as an effective insecticide. As this chemical was banned in Sri Lanka the Rubber Research Institute introduced Imidacloprid as a substitute. Once Imidacloprid will be banned there is a need to Rubber Research Institute to identify an alternative to control the pest attacks. With this background the present investigation was carried out to develop control methods against cockchafer grub.

Screening of new insecticides against cockchafer grubs were carried out at Raigam estate Ingiriya under field conditions. This experiment was laid out in the Randomized Complete Block Design, with 11 treatments and 30 replicates. Five different insecticides were applied in two concentrations as a soil drench. Among the treatments tested Imidacloprid 2.5 ml in 1.5 L of water/plant was the most effective treatment followed by Imidacloprid 2 ml in 1.5 L of water/plant and Diazinon 2.5 ml in 1.5 L of water/plant in controlling the cockchafer grubs.

As the chemical insecticides have many disadvantages there is an urgent need to develop alternative eco-friendly treatments with the help of natural pesticides and

biological control agents. Because of that efficacy of entomopathogenic fungus *Beauveria bassiana* was investigated in in-vitro conditions as second experiment at Plant Pathology and Microbiology Department of Rubber Research Institute, Sri Lanka. *B. bassiana* fungus solutions were prepared with four concentrations and cockchafer grubs were treated with these different concentrations. The experiment was laid out in the Completely Randomized Design with 10 replications. The results revealed that the fungus solutions with 15×10^9 spores/ml and 20×10^9 spores/ml had the most efficacy with 100% mortality in cockchafer grubs in 14 days.

Compatibility study of *B. bassiana* with different insecticides was investigated as third experiment in in-vitro conditions. The experiment was laid out in Completely Randomized Design with 11 treatments and 3 replicates. The findings evidenced that the lower concentration of Chlorantraniliprole + Thiamethoxam mixture was safer to *B. bassiana* and allowed the development of fungus on PDA media followed by Imidacloprid and Carbosulfan. As the Imidacloprid had less detrimental effect on environment and low inhibition to *B. bassiana* it is possible to develop a control measure with Imidacloprid and *B. bassiana* against cockchafer grubs.

Table of Contents

ABSTRACT.....	I
ACKNOWLEDGEMENTS	III
LIST OF TABLES.....	VIII
LIST OF FIGURES.....	IX
LIST OF PLATES.....	X
ABBREVIATION	XII
CHAPTER 1.....	1
INTRODUCTION.....	1
CHAPTER 2.....	6
LITERATURE REVIEW	6
2.1 The rubber plant (<i>Hevea brasiliensis</i>).....	6
2.1.1 History.....	6
2.1.2 Taxonomy of Rubber	8
2.1.3 Botany.....	8
2.1.3 Economical importance.....	10
2.1.4 Global production.....	11
2.1.5 Production constrains of rubber in Sri Lanka	12
2.1.6 Diseases of rubber plant (<i>Hevea brasiliensis</i>)	12
2.1.7 Pests of rubber.....	18
2.2 Control methods of white grubs	25
2.2.1 Natural enemies of white grubs	25
2.2.2 Chemical management.....	29
2.2.3 Botanicals against root grubs	31
2.2.4 Mechanical and cultural practices.....	31

2.2.5 Light trapping of cockchafers	32
2.2.6 Integrated pest management.....	32
CHAPTER 3.....	34
MATERIALS AND METHODS	34
3.1 Evaluate the efficacy of <i>Beauveria bassiana</i> (Entomopathogenic fungi) in controlling Cockchafer grubs.	34
3.1.1 Experimental site	34
3.1.2 Collection of cockchafer grubs and rearing in laboratory.....	34
3.1.3 Sterilization of materials needed.....	34
3.1.4 Preparation of PDA media	35
3.1.5 Culturing of <i>Beauveria bassiana</i> in PDA media.....	35
3.1.6 Observation of the macroscopic and microscopic characteristics of <i>B. bassiana</i>	36
3.1.7 Preparation of the <i>Beauveria bassiana</i> solution with different concentrations	36
3.1.8 Flooding the grubs with each prepared solutions with different concentrations.....	39
3.1.9 Placing the grubs in the clay pots.....	39
3.1.10 Experimental design.....	40
3.2 Insecticide screening trial against Cockchafer grub attack	41
3.2.1. Experimental site	41
3.2.2. Selecting the insecticides	41
3.2.3. Dividing the plots.....	43
3.2.4 Pre assessment of the grub population.....	43
3.2.5 Application of the insecticides.....	43
3.2.6 Experimental design.....	43
3.3 In vitro compatibility of different insecticides against <i>B. bassiana</i>	46
3.3.1 Experimental site	46
3.3.2 Preparation of the media	46
3.3.3 Mixing insecticides with PDA media	46
3.3.4 Inoculation of <i>B. bassiana</i> in to the media.....	46

3.3.5 Experimental design.....	47
CHAPTER 4.....	49
RESULTS AND DISCUSSION	49
4.1 Efficacy of <i>Beauveria bassiana</i> against cockchafer grubs	49
4.1.2 Macroscopic characteristics of <i>B. bassiana</i>	57
4.1.3 Microscopic characteristics of <i>B. bassiana</i>	57
4.2 Screening of insecticides against cockchafer grubs.....	58
4.2.1 Efficacy of insecticides one month after application	58
4.2.2 Efficacy of insecticides two months after application	60
4.2.3 Efficacy of insecticides three months after application	62
4.3 In vitro compatibility of different insecticides against <i>B. bassiana</i>	66
CHAPTER 5.....	72
CONCLUSIONS	72
SUGGESTIONS FOR FURTHER STUDIES.....	73
REFERENCE.....	74
APPENDICES	