

# CONTENTS

| Subject                                                                                                                                                          | Page      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>I. INTRODUCTION .....</b>                                                                                                                                     | <b>1</b>  |
| <b>II. REVIEW OF LITERATURE .....</b>                                                                                                                            | <b>5</b>  |
| 1- Toxicity of insecticides against stored product insects .....                                                                                                 | 5         |
| 2- Effect of plant extracts and dusts on stored grain insects ...                                                                                                | 11        |
| 3- Residual toxicity of pesticides and plant extracts in stored products .....                                                                                   | 27        |
| 4- Persistence of pesticides in cereal grains and legume seeds .                                                                                                 | 34        |
| 5- Effect of CO <sub>2</sub> and plant extracts alone and under modified atmospheres on insect populations and weight loss caused by stored product insects..... | 38        |
| 6- Effect of plant extracts or insecticides on seed germination and chlorophyll content of the seedlings .....                                                   | 50        |
| 7- Effect of sublethal concentrations of plant extracts and insecticides on some biological aspects of stored grain insects .....                                | 54        |
| <b>III- MATERIALS AND METHODS .....</b>                                                                                                                          | <b>58</b> |
| 1- Insect species used .....                                                                                                                                     | 58        |
| 1.1- Stock culture of insects .....                                                                                                                              | 58        |
| 2- Materials .....                                                                                                                                               | 59        |
| 2.1- Insecticides used .....                                                                                                                                     | 59        |
| 2.2- Plant extracts used .....                                                                                                                                   | 59        |
| 3- Bioassay tests .....                                                                                                                                          | 59        |
| 3.1- Insecticides solution .....                                                                                                                                 | 59        |
| 3.2- Plant extracts .....                                                                                                                                        | 60        |
| 4- persistence of the tested insecticides and plant extracts .....                                                                                               | 61        |
| 4.1- Bioassay test .....                                                                                                                                         | 61        |
| 4.2- Gas chromatography (GLC) test .....                                                                                                                         | 62        |

| Subject                                                                                                                                                    | Page |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 5- Population and weight loss studies .....                                                                                                                | 63   |
| 6- Grain germination tests .....                                                                                                                           | 63   |
| 7- Effect of sublethal concentrations of two plant extracts,<br>malathion and pirimiphos-methyl on some biological<br>aspects of <i>T. castaneum</i> ..... | 66   |
| 7.1- Number of eggs .....                                                                                                                                  | 66   |
| 7.2- The incubation period and the developmental span ....                                                                                                 | 67   |
| <b>IV- RESULTS AND DISCUSSION</b> .....                                                                                                                    | 68   |
| 1- Toxicity of malathion and primiphos-methyl to some stored<br>product insects .....                                                                      | 68   |
| 1.1- Lethal concentrations of malathion and pirimiphos-<br>methyl (Actellic) to the adults of certain stored product<br>insect species .....               | 73   |
| 2- Effect of the plant extracts on some stored product insects ..                                                                                          | 77   |
| 2.1- Effect of Cubeb fruits ( <i>P. cubeba</i> ) acetone extract .....                                                                                     | 77   |
| 2.2- Effect of Cubeb fruits ( <i>P. cubeba</i> ) petroleum ether<br>extract .....                                                                          | 78   |
| 2.3- Effect of Thyme flowering buds ( <i>T. vulgaris</i> ) acetone<br>extract .....                                                                        | 78   |
| 2.4- Effect of Thyme flowering buds ( <i>T. vulgaris</i> )<br>petroleum ether extract .....                                                                | 79   |
| 2.5- Effect of Damsissa leaves ( <i>A. maritima</i> ) acetone<br>extract .....                                                                             | 79   |
| 2.6- Effect of Damsissa leaves ( <i>A. maritima</i> ) petroleum<br>ether extract .....                                                                     | 80   |
| 2.7- Effect of Marjoram ( <i>M. hortensis</i> ) acetone extract ...                                                                                        | 80   |
| 2.8- Effect of Marjoram ( <i>M. hortensis</i> ) petroleum ether<br>extract .....                                                                           | 81   |

| Subject                                                                                                                                              | Page |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 3- Residual toxicity of the two organophosphorus insecticides and plant extracts to the adults of <i>S. oryzae</i> .....                             | 91   |
| 3.1- Malathion .....                                                                                                                                 | 91   |
| 3.2- Pirimiphos-methyl .....                                                                                                                         | 91   |
| 3.3- Plant extracts .....                                                                                                                            | 91   |
| 4- Persistence of malathion and pirimiphos-methyl in cereal grains and legume seeds using the (GLC) method .....                                     | 95   |
| 5- Effect of two plant extracts at 1% (w/w) on the populations of <i>S. oryzae</i> and <i>R. dominica</i> at various storage periods.....            | 102  |
| 6- Effect of two plant extracts at 1% (w/w) alone and under MA of 25% CO <sub>2</sub> on the weight loss of stored wheat grains .                    | 106  |
| 7- Effect of various treatments on germination of wheat grains and chlorophyll content of the seedlings .....                                        | 113  |
| 8- Effect of sublethal concentrations of two plant extracts, malathion and pirimiphos-methyl on some biological aspects of <i>T. castaneum</i> ..... | 115  |
| 8.1- <i>Piper cubeba</i> fruits acetone extract .....                                                                                                | 115  |
| 8.2- <i>Thymus vulgaris</i> flowering buds extract .....                                                                                             | 115  |
| 8.3- Malathion .....                                                                                                                                 | 116  |
| 8.4- Pirimiphos-methyl (Actellic) .....                                                                                                              | 117  |
| V- SUMMARY AND CONCLUSION .....                                                                                                                      | 122  |
| VI- REFERENCES .....                                                                                                                                 | 132  |
| VII- ARABIC SUMMARY .....                                                                                                                            | -    |