

**PERFORMANCE OF PARENTS, F<sub>1</sub> AND F<sub>2</sub> FOR  
TOLERANCE TO *OROBANCHE* AND *BOTRYTIS*  
IN FABA BEAN AND MOLECULAR  
CHARACTERIZATION OF HOST AND PARASITE**

**By**

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# CONTENTS

|  | Page |
|--|------|
| <b>INTRODUCTION</b> .....  | 1    |
| <b>REVIEW OF LITERATURE</b> .....  | 5    |
| 1. Variability of genetic behavior of faba bean.....   | 5    |
| 2. Variability of tolerance to <i>Orobanche</i> in faba bean.....  | 18   |
| 3. Variability of resistance to <i>Botrytis</i> in faba bean.....  | 28   |
| a) Symptoms of the disease .....   | 29   |
| b) Environmental factors effects on growth of lesions  | 30   |
| 4. Molecular Genetic Markers   | 36   |
| <b>MATERIALS AND METHODS</b> .....   | 40   |
| A. Plant material.....   | 40   |
| B. Methods.....  | 40   |
| 1. Tolerance to <i>Orobanche</i> experiment.....   | 40   |
| Studied characters .....   | 41   |
| 2. Resistance to <i>Botrytis</i> experiment.....   |      |
| 1) <i>Inoculation</i> .....  | 43   |
| Studied characters .....   | 43   |
| 3. Molecular assay using ISSR markers  | 46   |
| a) DNA isolation .....   | 46   |
| b) ISSR amplification.....   | 46   |
| C. Statistical Analysis.....   | 48   |
| 1) Heterosis and inbreeding depression .....   | 48   |
| 2) Combining ability.....  | 49   |
| <b>RESULTS AND DISCUSSION</b> .....  | 50   |
| 1. Evaluation faba bean for tolerance to <i>Orobanche</i><br>under free and <i>Orobanche</i> infested field conditions | 50   |
| a. Hybridization.....  | 50   |
| 1) Significance of mean squares.....   | 50   |
| 2) Mean performance of parents, F <sub>1</sub> s and F <sub>2</sub> s .....  | 54   |
| 3) General combining ability.....  | 59   |
| 4) Specific combining ability.....   | 60   |

|   |            |
|---|------------|
| 5) Estimates of heterosis and heterobeltiosis .....                                     | 65         |
| 6) Inbreeding effects .....   | 69         |
| 7) Correlation coefficients.....  | 72         |
| <b>2. Evaluation faba bean for <i>Botrytis fabae</i> Resistance....</b>                 | <b>75</b>  |
| <b>a. Hybridization studies.....</b>  | <b>75</b>  |
| 1) Significance of mean squares.....  | 75         |
| 2) Mean performance of parents, F <sub>1</sub> s and F <sub>2</sub> s .....             | 78         |
| 3) Estimates of heterosis and heterobeltiosis.....                                      | 80         |
| 4) General combining ability.....   | 86         |
| 5) Specific combining ability.....  | 89         |
| 6) Inbreeding effects .....   | 93         |
| 7) Correlation coefficients.....  | 96         |
| <b>3. Molecular DNA assay.....</b>  | <b>98</b>  |
| <b>a. Genetic polymorphism .....</b>  | <b>98</b>  |
| <b>b. Genetic Similarity.....</b>   | <b>105</b> |
| <b>c. Genetic polymorphism.....</b>   | <b>111</b> |
| <b>d. Genetic Similarity.....</b>   | <b>116</b> |
| <b>e. Genetic polymorphism and similarity between<br/>        <i>Orobanche</i>.....</b> | <b>127</b> |
| <b>SUMMARY.....</b>   | <b>133</b> |
| <b>REFERENCES.....</b>  | <b>138</b> |
| <b>ARABIC SUMMARY .....</b>   |            |

## LIST OF TABLES

| No | Title  | Page  |
|----|--|-------|
| 1  | Types, pedigree and characteristics of faba bean parental genotypes used in the present study.....   | 42    |
| 2  | ISSR primer sequences used for DNA fingerprinting of faba bean segrigants and <i>Orobanche</i> .....   | 47    |
| 3  | Analysis of variance of combining ability.....   | 49    |
| 4  | Significance of mean squares of different traits of six faba bean genotypes and their crosses in F <sub>1</sub> and F <sub>2</sub> generations...                  | 52-53 |
| 5  | Mean performance of parents and their crosses in F <sub>1</sub> and F <sub>2</sub> generations of faba bean for various traits.....                                | 57-58 |
| 6  | Estimates of the general combining ability effects (g <sub>i</sub> ) of parental lines in the F <sub>1</sub> and F <sub>2</sub> crosses for studied traits.....    | 62    |
| 7  | Estimates of the specific combining ability effects (S <sub>ij</sub> ) of diallel crosses for studied traits of F <sub>1</sub> and F <sub>2</sub> generations..... | 63-64 |
| 8  | Heterosis (%) in F <sub>1</sub> over mid (MP) and better parent (BP) for studied traits.....   | 67-68 |
| 9  | Inbreeding effects (%) in F <sub>2</sub> for studied traits.....   | 70    |
| 10 | Correlation coefficients among studied traits of faba bean genotypes (combined data).....  | 74    |
| 11 | Significance of mean squares of different traits of six faba bean genotypes and their crosses in F <sub>1</sub> and F <sub>2</sub> generations.....                | 76-77 |
| 12 | Mean performance of parents and their crosses in F <sub>1</sub> and F <sub>2</sub> generations of faba bean for various traits.....                                | 82-83 |
| 13 | Heterosis (%) in F <sub>1</sub> over mid (MP) and better parent (BP) for studied traits.....   | 84-85 |
| 14 | Estimates of the general combining ability effects (g <sub>i</sub> ) of parental lines in the F <sub>1</sub> and F <sub>2</sub> crosses for studied traits.....    | 88    |
| 15 | Estimates of the specific combining ability effects (S <sub>ij</sub> ) of diallel crosses for studied traits of F <sub>1</sub> and F <sub>2</sub> generations..... | 91-92 |

|           |   |            |
|-----------|---|------------|
| <b>16</b> | Inbreeding effects (%) in F <sub>2</sub> for studied traits.....  | <b>94</b>  |
| <b>17</b> | Correlation coefficients among studied traits of faba bean genotypes (combined data).....   | <b>97</b>  |
| <b>18</b> | ISSR -markers for selected segregants of faba bean plants and <i>Orobanche</i> generated by five primers.....   | <b>99</b>  |
| <b>19</b> | Similarity matrix among the cross Cairo 33 × Nubaria 1 (parents, five segregants faba bean plants (F1–F5) and <i>Orobanche crenata</i> (OR1–OR5) using ISSR molecular marker analysis.....    | <b>108</b> |
| <b>20</b> | Similarity matrix among the cross Cairo 33 × Giza 843 (parents, five segregants faba bean plants (F1–F5) and <i>Orobanche</i> (OR1–OR5) using ISSR molecular marker analysis.....             | <b>108</b> |
| <b>21</b> | Similarity matrix among the cross Cairo 33 × Camilina (parents, five segregants faba bean plants (F1–F5) and <i>Orobanche</i> (OR1–OR5) using ISSR molecular marker analysis.....             | <b>109</b> |
| <b>22</b> | ISSR -markers for selected segregants of faba bean plants and <i>Orobanche</i> generated by five primers.....   | <b>113</b> |
| <b>23</b> | Similarity matrix (%) among the cross Camilina × Giza 843 (parents, five segregants faba bean plants (F1–F5) and <i>Orobanche crenata</i> (OR1–OR5) using ISSR molecular marker analysis..... | <b>118</b> |
| <b>24</b> | Similarity matrix (%) among the cross Camilina × Sakha 4 (parents, five segregants faba bean plants (F1–F5) and <i>Orobanche</i> (OR1–OR5) using ISSR molecular marker analysis.....          | <b>121</b> |
| <b>25</b> | Similarity matrix (%) among the cross Cairo 33 × Camilina (parents, five segregants faba bean plants (F1–F5) and <i>Orobanche</i> (OR1–OR5) using ISSR molecular marker analysis.....         | <b>123</b> |
| <b>26</b> | Similarity matrix (%) among collected <i>Orobanche crenata</i> samples using ISSR molecular marker analysis.....  | <b>131</b> |

## LIST OF FIGURES

| No | Title   | Page    |
|----|---|---------|
| 1  | Banding pattern of tested faba bean parents generated by five ISSR primers.....   | 102     |
| 2  | ISSR profile of sample genotypes of faba bean crosses and <i>Orobanche</i> generated by five ISSR primers.....                  | 103     |
| 3  | Dendrogram of the genetic distances among and within three faba bean crosses and <i>Orobanche</i> based on ISSR analysis.....   | 110     |
| 4  | Banding pattern of tested faba bean parents generated by five ISSR primers.....   | 114     |
| 5  | ISSR profile of sample genotypes of faba bean crosses and <i>Orobanche</i> generated by five ISSR primers.....                  | 114-115 |
| 6  | Dendrogram of the genetic distances among and within Camilina × Giza 843 cross and <i>Orobanche</i> based on ISSR analysis..... | 119     |
| 7  | Dendrogram of the genetic distances among and within Camilina × Sakha 4 cross and <i>Orobanche</i> based on ISSR analysis.....  | 120     |
| 8  | Dendrogram of the genetic distances among and within Cairo 33 × Sakha 4 cross and <i>Orobanche</i> based on ISSR analysis.....  | 122     |
| 9  | ISSR profile of sample genotypes of <i>Orobanche crenata</i> generated by five ISSR primers. M= DNA standard marker.....        | 128     |
| 10 | Dendrogram of <i>Orobanche crenata</i> based on distance obtained from ISSR marker.....   | 129     |
| 11 | Histogram of Similarity (%) between/within collected <i>Orobanche crenata</i> samples.....                                      | 132     |

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### ABSTRACT

This study was conducted during 2015/2016, 2016/2017 and 2017/2018 seasons. The faba bean, *Vicia faba* genotypes: Nubaria 1 (P<sub>1</sub> - *Major*), Giza 843 (P<sub>2</sub> - *Equina*), Sakha 4 (P<sub>3</sub> - *Equina*), Camilina (P<sub>4</sub> - *Minor*), Misr 1 (P<sub>5</sub> - *Equina*) and Cairo 33 (P<sub>6</sub> - *Equina*) were crossed in a diallel system excluding reciprocals, to widen genetic base, to estimate heterosis, GCA, SCA, correlation coefficient and to provide materials for selecting good combinations from segregating generations. The six parents, 15 F<sub>1</sub>'s and 15 F<sub>2</sub>'s were employed in the study and planted in open naturally *Orobanche*-infested field. Also, artificial inoculation with *Botrytis fabae* was done. Characters studied were: flowering date, plant height, branches per plant, pods per plant, seeds per plant, seed yield per plant, 100-seed weight, tolerance criteria for *Orobanche* and disease resistance parameters. Variability was observed among genotypes (parents and crosses). There was significance in tolerance characters of *Orobanche*. The seed yield components showed F<sub>2</sub> to be higher than F<sub>1</sub> due to remaining heterosis and transgressive segregants. This indicates that F<sub>1</sub> and F<sub>2</sub> may be grown commercially to reduce cost of hybrid seed production.

There was positive significance of resistance to chocolate spot disease (**gain**) in all studied resistance characters. Moreover, there were positive significant correlation between yield characters and all plant growth traits, while, all studied plant growth and yield characters were affected negatively by chocolate spot disease.

There were similarity between faba bean host and *Orobanche* parasite and this may indicate some kind of complementary genes system controlling interaction of the host and the parasite. Moreover, there were similarity and high relationship between all tested *Orobanche* plants indicating that every *Orobanche* plant has its unique genotype which was partially similar to other plants in the same plot.

**Key words:** *Vicia faba*, Faba beans, *Orobanche crenata*, *Botrytis fabae*, Hybrids, GCA, SCA, Heterosis, Inbreeding effects, Correlations, ISSR Markers - Genetic Polymorphism - Genetic variability and similarity.