

CONTENTS

	page
INTRODUCTION	1
REVIEW OF LITERATURE	4
1. First experimental	4
a. Degree of homogeneity.....	4
1. Vegetative characteristics.....	4
2. Fruit characteristics.....	5
2. Second experiment	12
a. Evaluation of horticultural characters for parents and hybrids.....	12
1. Vegetative characteristics.....	12
2. Number of days to first female flower anthesis.....	16
3. Total yield per plant.....	18
4. Fruit characteristics.....	21
b. Evaluation of resistance to fusarium wilt for parents and hybrids.....	32
MATERIALS AND METHODS	37
RESULTS AND DISCUSSION	51
1. First experiment	51
a. Degree of homogeneity.....	51
1. Vegetative characteristics.....	51
2. Fruit characteristics.....	51
b. Evaluation of resistance to fusarium wilt for lines.....	55
2. Second experiment	56
a. Evaluation of horticultural characters for parents and hybrids.....	56
1. Analysis of variance.....	56
a. Vegetative characteristics.....	57
b. Number of days to first female flower anthesis.....	57
c. Total yield per plant.....	58
d. Fruit characteristics.....	58
2. Mean performance.....	60
a. Vegetative characteristics.....	61
b. Number of days to first female flower anthesis.....	62
c. Total yield per plant.....	62
d. Fruit characteristics.....	62
3. Heterosis.....	68
a. Vegetative characteristics.....	68
b. Number of days to first female flower anthesis.....	69

c. Total yield per plant.....	69
d. Fruit characteristics	69
4. Combining ability effects	74
a. Vegetative characteristics	74
b. Number of days to first female flower anthesis.....	75
c. Total yield per plant.....	75
d. Fruit characteristics	76
b. Evaluation of resistance to fusarium wilt for parents and hybrids	80
SUMMARY	84
REFERENCES	96
ARABIC SUMMARY	

ABBREVIATIONS

C.V	Coefficient of Variance
TSS	Total Soluble Solids
MP	Mid Parents
GCA	General Combining Ability
SCA	Specific Combining Ability
KVRF	Kaha Vegetable Research Farm
EP	Experimental Plot
RCBD	Randomized Complete Block Design
ADH	Average Degree of Heterosis
BP	Better Parent
R	Resistant
S	Susceptible
PAL	Phenylalanine Ammonia Lyase
PPO	PolyPhenol Oxidase
PO	PerOxidase

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ABSTRACT

This study was conducted during the period from 2011 to 2016 at Kaha Vegetable Research Farm (KVRF), Qalubia Governorate to evaluate some watermelon landraces collected from nine different local geographic regions of Egypt to increasing their homogeneity through inbreeding and selecting the best individual genotypes during four successive generations to produce 14 inbred lines. Seedling inoculation procedures were used to screen 14 lines of watermelon ecotypes for resistance to fusarium wilt. Of these ecotypes, 4 lines significantly showed resistance to *fusarium oxysporum*. And used these lines as female parent Suhag 1(P1) - Suhag 2(P2)-Sinaa (P3)-Bir El-abd 2(P4); and the cultivars Giza1 (P5), Crimson sweet (P6) and the line (Beni Swif) (P7) were used as male parents in a line x tester mating design to produce twelve hybrids. Parents and hybrids were evaluated to horticultural characters and resistance to fusarium wilt. Biochemical parameter such as phenolic content and some enzymes in three watermelon hybrids shown susceptible, moderately resistance and resistant to fungus *fusarium oxysporum* f.sp. *niveum*.

Estimates of coefficient of variance (C.V %) values showed that, most of the breeding lines were highly homogeneous and could be considered pure lines. All parents and crosses were significant with positive value for all traits studied. With respect to heterosis effects, cross P2 xP6 gave highest values with significant effect for plant fresh weight, total yield /plant and fruit weight for mid-parent and better parent. Crosses P2x P7, P3x P5 and P4 x P6 gave earliest female flower over mid-parent and better parent, cross P4xP6 gave highest values with significant effect for rind thickness for mid-parent and better parent. Cross P1x P7 gave highest values with significant effect for T.S.S for mid-parent. Results showed that the lowest mean performance of seven parents and their twelve crosses of watermelon for disease severity on the foliage growth and on the xylem vesicles were 21.9 % for parents line (Beni Swif) (P7) and the lowest disease severity on the foliage and on the xylem vesicles were 26.2 % for crosses (P2xP7). Data reveal that, in general, the three enzymes, i.e. PAL, PPO and PO and total phenols were greatly increased in the shoot base of the hybrids by increasing the resistance of these hybrids.

Key words: landraces, Evaluation, *Fusarium* resistant, KVRF.