**IMPROVING YIELD AND FRUITQUALITY OF THE LOCAL MELON VARIETY ANANAS EL DOKKI**

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**ABSTRACT**

These experiments were carried out at Barage Station, Qaluobia Governorate and Dokki greenhouses, Horticulture Research Institute, Giza Governorate, Egypt during the six successive seasons from 2014 to 2017. Four inbred lines of melon (*Cucumismelo* L.) were used in making half diallel set of crosses to determine some of the genetic parameters which are necessary in breeding programs to improve local melon (Ananas type) fruit characters and yields. The results showed significant general and specific combining ability effects for fruit characters and yield. However, the calculated ratio general combining ability (GCA) / specific combining ability (SCA) was more than unity, which indicates that the additive genetic variance component is the larger component than other types of genetic variance components. Both line 2 (P3) and 52 (P4) parents were found to be a good general combiner for all studied charactersThe potentiality of crossing between specific parents were detected by estimating (SCA) effects of each F1 cross combination for all studied traits. three out of six crosses exhibitedsignificant positive SCA effects for early and total yield/plant. Four out of these six crosses namely: (P1 x P2), (P1 x P3), (P2 x P3) and (P3 x P4) exhibited significant desirable positive of SCA average fruit weight and flesh thickness. Two out of the six crosses namely: (P1 x P4) and (P2 x P3) exhibited significant desirable positive of SCA effects for average fruit length and fruit diameter. Regarding to total soluble solids two of the six crosses namely: (P2 x P4) and (P2 x P3) exhibited significant desirable positive of SCA effectsindicating the possibility of combine both high yield and good quality characters. The three crosses combinations, which exhibited significant positive of SCA for yield/plant, were also combined significant, highly significant , desirable SCA effects forflesh thickness and average fruit weight. Two out of the four best crosses in early and total yield were derived from 2 (P3) and 52 (P4) parents that were above classified as a good general combiner for early , total yield, flesh thickness and TSS.Therefore, these parents 2(P3) and 52 (P4) could be used as promising progenitors for abovementioned traits either for heterosis breeding or in genetic improvements by means of selection in segregating generations. The first cross P3 (2) x P4 (52) was derived from good × good general combiner parents for total yield/plant and exhibited the highest mean yield, highest desirable heterosis for yield, highest desirable SCA effects (for yield and all other traits) over the mid parent and high parent in this cross (P3×P4). Regarding to heritability was high in early yield, total yield, average fruit weight , average fruit length, flesh thickness and total soluble solids was( 99 %- 99 %- 99 %-99 %-98 %-99 % respectively ) while the narrow sense heritability was intermediate or low (43 %- 7 %- 4 %- 47 %- 40 %- 4 % respectively), which indicate the potentiality of these characters to be genetically improved. Except average fruit width character. The broad sense and narrow sense heritability was intermediate (49.98 %) and (54 %) respectively. These results indicate that influence of the environmental factors on the expression on this character

**INTRODUCTION**

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Melon (*cucumismelo*L.) is an important vegetable crops in Egypt. Significant variability regarding yielding ability is found among the local Ananas cultivars evaluation of quality and size of the genetic effects in quantitative traits were mostly important in designing the assess breeding program.

Yieldingability is the most important target to melon breeder , F1 hybrids is well advantaged for high yield and quality (**Mohamed 2011)**The hybrids production becomes the necessary way to increase the yield crops and constricting the gap between production and real needs from the food for people. Breeding for yield and quality is an important aim in many breeding programs of melon.

Among the analysis used to chose the parents and the segregating population . The diallel analysis is being. It uses information about the performance of parents and their hybrids. From the diallel crosses the general and specific combining ability can be estimated **(Glala 2007)**studied the inheritance of melon fruit, using a half diallel cross in 6 inbred lines to evaluate early yield, total yield, marketable yield average fruit weight, flesh thickness and TSS comparing with two commercial cultivars(Ideal and Primal). Noteworthy, combining ability analysis is an important tool for the selection of desirable parents while, it also provides useful information regarding the nature and magnitude of gene effects controlling traits of economic importance**.Moon *et.al.* (2004)** used a half diallel crosses mating design to obtain 28 F1 hybrids from 8 parental varieties of melon. Their parental and F1hybrids were evaluated for fruit weight, fruit diameter, flesh thickness, average yield per plant and vine length. The results indicated that, the presence of high significance differences among genotypes and non-additive gene action for inheritance of these characters**.Hatem(1992)** studied 6 inbred line to estimate the combining ability for some economic characters early yield, total yield, average fruit weight, fruit shape index, fruit flesh thickness and total soluble solids. He reported that, highly significant differences for general and specific combining ability for all studies traits, the ratio between GCA and SCA mean squares suggested that the additive gene effects are more important than the non- additive effects in the inheritance of all studies traits. In general, the parental lines EzustAnanaz and Magyar Kincs were the best of all since they showed significant GCA effects for 12 traits**.** Heterosis breeding plays a critical role in genetic improvement of any crop relative to yield and quality traits. **Choudhary*et.al.* (2003)**used 8 different varieties of melon in diallel fashion. The results showed, significant heterosis for yield was observes in the crosses MS1 X Hara Mmadhu (44.44%) ,Jobner Local x DurgapuraMadhu (38.65%) and Hara Mmadhu x DurgapuraMadhu(35.90%) over better parent. For estimating the values of heritability in broad sense and narrow sense **(Mohamed 2011)** found that, the broad and narrow sense heritability estimated for fruit diameter, fruit length, total yield, early yield and fruit flesh thickness were ( 25.22- 21.13%), 43.82-11.74%), 63..59-49.09%),(68.13- 31.01%) and (83.24- 43.88%) respectively. Which indicated that, progresses in improving these characters can be achieved.

**MATERIAL AND METHODS**

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This study came out as results of some preceding studies from 2014 to 2017years , at the farm of the Vegetable Research Department, Horticulture Research Institute in Dokki., Barage Station. which led to select promising four Ananas type inbred lines(*Cucumismelo* L.). A half diallel cross program was conducted among the selected inbred lines in Dokki greenhouse to produce six Ananas type F1 hybrids as follows :

1. 77x26 (p1xp2) 2- 77x2 (p1xp3) 3 – 77x52 (p1xp4)
2. 26x2 (p2xp3) 5- 26x52 (p2xp4) 6 – 2x52 (p3xp4)

The four inbred lines and their six F1hybrids were evaluated in comparison with one commercial F1 hybrid (Palmera) in the summer season 2017in open field (Barage Station). Seeds of the four parental lines, their F1 hybrids and the one commercial F1 hybrid were sown on March 2017. On March 21th 2017, seedling were transplanted in a complete randomize blocks design with three replicates. Each plot area was 12 m2 which was 10m long and 1.2 m wide. Plants were spaced at 50 cm and given common agricultural practices. Recommended quantities of fertilizer were applied according to the recommendations of ministry of agriculture.

**Data were recorded as follows :**

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**Early yield (ton/ fed)**: it was measured as the yield of the three first pickings.

**Total yield (ton/ fed):**It was calculated from the total weight of harvested fruits.

**Average fruit weight (gm)** : It was recorded as an average of weight of 10 randomly fruit for each plot, for all the three replicates.

**Average fruit length (cm)** : It was measured from 5 fruits for each plot.

**Average fruit width (cm)** : It was measured from 5 fruits for each plot.

**Flesh thickness (cm)** : It was measured from the outer skin to the side of seed cavity.

**Total soluble solids (T.S.S) %**: It was measured by using hand refractometer according to **Welles and Buitelaar (1988)**.

**Statistical analysis:**

Data were statistically analyzed, using analyses of variance (ANOVA) with the Stat soft statistical package (MSTATC) software program (Michigan State University, East Lansing, MI, USA). Probabilities of significance among genotypes compared with the least significant difference L.S.D. (P≤0.05) were used to according to **Gomez and Gomez (1984)**. The form of the analysis of variance and the expectations of mean squares are presented in Table (1)

**Table (1): The form of the analysis of variance and expectations of mean squares.**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.V.** | **d.f** | **MS** | **E.M.S** |
| **Entries** | **G-1** | **M.Sg** | **σ 2 e + r σ2 en** |
| **Parents** | **P-1** | **M.Sp** | **σ 2ep + r σ2 p** |
| **Crosses** | **C-1** | **M.Sc** | **σ 2ec + r σ2 c** |
| **Error** | **(r-1)(G-1)** | **M.Se** | **σ 2 e** |
| **G.C.A** | **P-1** | **MSg** | **σ 2 e + σ2 s + (p+2) σ2 g** |
| **S.C.A.** | **P(P-1)/2** | **MSs** | **σ 2 e + σ2 s** |
| **Error** | **(r-1) (g-1)** | **MSe** | **σ 2 e** |

Where: r: Number of replications G: Number of genotypes

 P: Number of parents C: Number of crosses

M.Sg, M.Sp, M.Sc, M.Se, MSs and MSg are the mean squares of genotypes, parents, crosses, error, SCA and GCA, respectively. e, ep and ec are the error of genotypes, parents and crosses, respectively.

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**Genetic analysis**

**Combining abilities:**

 The data of the parental lines and their F1 hybrids were used to study the general and specific combining abilities and to illustrate their relations to the type of gene action involved. The genetic analyses were based on the method proposed by **Griffing (1956)**and **Singh and Chaudhary (1979).**

**Heterosis**

Mid parent heterosis was estimated and expressed as percentage **(Mather and Jinkes, 1982 )** as the deviation of F1 mean over the mid parents (M.P)

Mid-parent heterosis (M.P) = [(F1-M.P)/M.P] x100 (relative heterosis)

**Heritability**

The broad and narrow sense heritability values were calculated according to the method described by **Pandey and Gritton (1975)** using the general and specific combining ability component.

a) Broad sense heritability (h2 bs)= 2δ2 gca + δ2sca x 100

 2δ2gca+ δ2sca+ δ2e

 b) Narrow sense heritability(h2ns) = 2δ2 gca x 100

 2δ2gca+ δ2sca+ δ2e

Where : δ2gca = (Mg - Ms)

δ2sca = MS - Me

δ2e = Me

Where : Mg and MS are mean squares for general and specific combining abilities, respectively.

**RESULTS AND DISCUSSION**

**Analysis of variance**

Data presented in Table (2) showed that, highly significant values were observed for the studied genotypes. Mean square values for parents and hybrids were highly significant for total yield, also highly significant values were found for general and specific combining ability variances. These results indicated that, both additive and nonadditive genetic variances are involved in the inheritance of total yield. Meanwhile, the ratio between GCA and SCA mean square was greater than higher than unity (1.128), indicating that, the additive component of genetic variances was higher than the non- additive ones. This results was found to be in harmony with **Mohamed (2011) and Hatem*et al* (2009).**

For early yield, data presented in Table (2) showed that, analysis of variances for early yield were highly significant differences for genotypes, parents, hybrids and both general and specific combining ability, this result indicated that, both additive and non- additive genetic variances are involved in the inheritance of early yield ratio.Moreover GCA/SCA mean squares was greater than unity (2.18) showing that, the additive components of genetic variances was higher than the non-additive one, indicating that, additive gene effects are important in inheritance of this trait. The estimated ratio was (2.18).This result was agreed with **Feyzian*et al* (2009a&b), Mohamed (2011).**

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**Table (2) Analysis of variance for yield and fruit characters of 4×4 half diallel melon crosses.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **T.S.S** | **Flesh thickness** | **Average fruit width** | **Average fruit length** | **Average fruit weight** | **Total yield** | **Early yield** | **df** | **Sov** |
| **0.028** | **0.002** | **0.025** | **0.067** | **0.002** | **0.088** | **0.079** | **2** | **Rep** |
| **2.507** | **0.429** | **7.240** | **7.550** | **0.390** | **36.308** | **8.58** | **9** | **Genotype** |
| **1.680** | **0.179** | **3.980** | **3.920** | **0.068** | **18.880** | **3.54** | **3** | **Parents** |
| **1.310** | **0.145** | **18.205** | **3.840** | **0.189** | **11.980** | **4.42** | **5** | **hybrids** |
| **11.000** | **2.600** | **0.490** | **36.940** | **2.360** | **59.900** | **44.50** | **1** | **Parents vs Hybrids** |
| **0.857** | **0.087** | **2.409** | **2.560** | **0.132** | **11.900** | **3.00** | **18** | **Error** |
| **2.633** | **0.644** | **12.610** | **12.215** | **0.380** | **39.270** | **13.42** | **3** | **GCA** |
| **2.443** | **0.321** | **4.560** | **5.218** | **0.390** | **34.830** | **6.16** | **6** | **SCA** |
| **0.018** | **0.008** | **0.076** | **0.076** | **0.0008** | **0.037** | **0.02** | **18** | **Error** |
| **1.080** | **2.010** | **2.770** | **2.340** | **0.960** | **1.128** | **2.18** |  | **GCA/SCA** |

Regarding average fruit weight(kg), data presented in Table(2) showed that, significant mean square values were found for all genotypes, parents and hybrids, but the inheritance between parents VS. hybrids was not significant. The GCA mean square value was significant, also SCA mean square value was significant. Ratio of GCA/SCA was less than unity (0.96) indicating that, non – additive gene action is more important in the inheritance of this trait. This result agreed with those clarified by **Feyzian et al (2009 a).**

Concerning fruit length, data in Table (2) revealed that, highly significant mean squares values were found for genotypes, parents and hybrids. Also the inheritance between parents versus hybrids was highly significant, also GCA and SCA mean square values were highly significant indicating the presence of additive and non-additive genetic component in the inheritance of this trait. The GCA/SCA ratio was found to be larger than unity (2.34) as shown in Table (2) indicating the importance of additive gene effects in heredity of this character. This finding was found in line with those obtained by**El-Shimi and Mohamedein(2008).**

The analysis of variance for fruit diameter genotypes and hybrids mean squares values exhibited highly significant variance (Table2) and the interaction between parents versus hybrids was no significant. The estimates general and specific combining ability variances were highly significant, GCA/SCA ratio was larger than unity (2.77) indicating the presence of additive and non- additive genetic variances and the importance of additive gene effects than non-additive ones in heredity of this trait **El-Shimi and Mohamedein (2008).**

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With regard to fruit flesh thickness, data in Table (2 ) showed that mean square values for parents and hybrids were highly significant , also the interaction mean square value was highly significant for this trait. The mean square values for general and specific combining ability were also highly significant, indicating the presence of both additive and non- additive genetic effects for this trait. The GCA/SCA ratio was more than unity (2.01) indicating the importance of additive gene effects in controlling this trait. This result was in harmony with those obtained by**El-Shimi and Mohamedein (2008) andMohamed (2011) .**

Analysis of variance for total soluble solids content, data presented in Table (2), showed highly significant mean square values for genotypes, parents, hybrids also interaction value between parental genotypes and their hybrids.

The variance of general and specific combining ability effects was highly significant this indicates that both additive and non- additive genetic variances are involved in the inheritance of total soluble solids. The ratio of GCA/SCA estimates was more than unity (1.08) indicating the importance of additive gene effects in heredity of this character. This results agreed with those reported by **Mohamed (2011)**.Data In Table (3) showed that the mean performance for the parental and their F1 crosses for early yield, the evaluated genotypes were significant differences. The highest inbred lines were 2 and 52 get no significant differences but the cross 2x52 was obtained the highest value for all genotypes (8.68 ton/fed) this results confirmed by **Mohamed (2011) and Glala*et al* (2002).**According to total yield, the differences among the evaluated entries were highly significant, total yield almost took the same trend of early yield the data showed the hybrid (2x52)was the highest total yield(16.184 ton/fed), the inbreed lines 2 and 52was the best parents lines. This was true in the results of **Glala et al (2002),Mohamed (2011) and Feyzian*et al* (2009 b)**

**Table (3)Evaluation of parents and F1 hybrids for early yield, total yield, fruit characters.**

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|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T.S.S** | **Flesh thickness (cm)** | **Average fruit diameter (cm)** | **Average fruit length (cm)** | **Average fruit weight (kg)** | **Total yield ton/fed** | **Early yield ton/fed** | **Genotype** |
| **10.133** | **2.633** | **12.167** | **12.100** | **0.663** | **10.453** | **5.284** | **77(p1)** |
| **9.600** | **2.633** | **11.800** | **11.800** | **0.537** | **7.738** | **3.676** | **26(p2)** |
| **11.033** | **3.433** | **11.833** | **11.767** | **0.756** | **12.352** | **5.976** | **2(p3)** |
| **11.133** | **3.033** | **14.200** | **14.133** | **0.881** | **13.456** | **5.932** | **52(p4)** |
| **9.700** | **3.100** | **11.900** | **11.500** | **0.869** | **14.560** | **5.438** | **77x26 (p1xp2)**  |
| **10.233** | **3.400** | **11.167** | **11.333** | **0.642** | **14.225** | **7.263** | **77x2 (p1xp3)** |
| **9.600** | **3.533** | **16.200** | **16.267** | **1.810** | **10.528** | **5.323** | **77x52 (p1xp4)**  |
| **11.233** | **2.667** | **11.267** | **11.333** | **0.678** | **7.555** | **3.365** | **26x2 (p2xp3)**  |
| **12.467** | **2.867** | **11.933** | **11.567** | **0.796** | **5.633** | **3.461** | **26x52 (p2xp4)**  |
| **10.667** | **3.567** | **12.867** | **12.700** | **1.017** | **16.184** | **8.685** | **2x52 (p3xp4)** |
| **10.533** | **2.367** | **11.330** | **10.900** | **0.685** | **8.270** | **4.303** | **Palmera F1(control)** |
| **0.177** | **0.151** | **0.362** | **0.365** | **0.037** | **0.315** | **0.285** | **LSD5%** |

Regarding to average fruit weight, there were highly significant differences among the evaluated entries, the value ranged from 0.537to 1.810 kg. in 26(P2) and 77x52 respectively. Only four of six local hybrids produced heavier fruit than that of Palmera F1. Similar trend was reported **by Glala et al (2002). Mohamed (2011) and Sakata et al (2005).**

Average fruit length and fruit diameter 16.26 cm and 16.2 cm respectively, the highest length and diameter was produced by hybrid 77x52 followed by 52 inbred lines (14.13 and 14.2 cm) respectively. These results are going well with those obtained by **Mohamed (2011), Glala (2003) and Moon *et al* (2003).**

The estimates of mean performance for hybrid combinations showed that, the crosses 2x52 (3.56cm), 77x 52 (3.53 cm) and inbred lines 2 (3.43 cm) exhibited the highest values for flesh thickness without significant differences between them. With respect to T.S.S data showed that, the cross 26 x 52 (12.46) recorded the first rank. Followed by 26x 2 (11.23) compared with Palmera F1. These finding were found to be harmony with those obtained by **Mohamed (2011), Glala (2003) and Glala (2007)**

For early yield and total yield, data presented in Table (3) showed that, there were highly significant differences among the parental genotypes and their F1 crosses indicating the presence of genetic diversity between them. The parents 2 and 52 recorded the first rank for early yield and total yield compared to other parents. The cross 2x52 recorded the first rank compared with the other tested crosses. This result was confirmed by **El-Shimi and Mohamedein (2008) , Glala et al (2002) and Glala (2007)** with regard to average fruit weight, fruit length and fruit diameter, the cross 77x52 recorded the first rank compared to the other crosses and commercial hybrid Palmera F1. This result agreed with those reported by **El-Shimi and Mohamedein (2008) and Glala (2007).**

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**Heterosis percentage**

Heterosis was calculated as percentage increase or decrease above the mid parents are presented in Table (4). With respect to early yield 4 crosses exhibited highly significant positive heterosis effects. These crosses were P3XP4 , P1XP3P1XP2,andP1XP4. The heterotic values ranged from 55.28% to 1.77% while the highest heterotic value was recorded by the cross P3XP4 (2 x 52) which recorded 55.28% followed by the cross P1XP3 (77x 2) which recorded 33.54%, the least heterosis value was recorded by the cross P1XP4(77x 52) 1.77%. With respect to total yield/ fed. Data showed that, there were 4crosses exhibited highly significant positive heterotic values, these crosses were P1XP2,P3XP4 P1XP3 and P1XP4. The highest heterotic value was recorded by the cross P1XP2(77x 26), which recorded 60.18% followed by the cross P3XP4 (2 x 52) which recorded 25.42% .

Regarding average fruit weight 5 crosses gave positive heterosis. The pronounced hybrid vigor of average fruit weightwas recorded by the cross P1XP4 (77x 52) which it may be considered the average which fruit length and fruit diameter which recorded the first rank 134.8% followed by the cross P1XP2(77x 26) which recorded 45.08%. These results indicated that dominant gene effect was found controlling this character.

The heterotec expression for fruit length and diameter showed, only one cross P1XP4 had significant positive heterosis 23.19% and 23.2% respectively.

Concerning flesh thickness, data presented in Table (4) showed that, five crosses out of six gave positive heterosisvalues. The average degree of positiveheterosis values ranged from 7.41% ( in the crossP2XP4) to 27.27% ( in the cross P1XP4 ). The highest values was recorded by the cross P1XP4.

Regarding total soluble solids % data in Table ( 4 ) showed that, there were three crosses exhibited significant positive heterotic value, these crosses were (P2XP3 – P2XP4- P3XP4) the cross P2XP4exhibited highly significant positive heterotic value indicating the presence of dominance gene effect. Other wise one cross gave zero heterosis because it's value was the same mid parent values. These results were found to be in agreement with those obtained by**Mohamed (2011);Glala et al (2002) ;Glala (2007) ; Moon et al (2003) ;Choudhary et al (2003) and Hatem (1992).**

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**Table ( 4 ) .Average degree of heterosis (ADH) % based on mid parents (M.P) for early yield, total yield, fruit weight, fruit length, fruit diameter, flesh thickness and total soluble solids (TSS) of 6 melon hyprids**.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T.S.S** | **Flesh thickness** | **Average fruit diameter** | **Average fruit length** | **Average fruit weight** | **Total yield** | **Early yield** | **Hybrids** |
| **00.0** | **21.57** | **-0.42** | **-3.76** | **45.08** | **60.18** | **21.41** | **77x26 (p1xp2)** |
| **-3.31** | **15.25** | **-7.36** | **-5.04** | **-9.32** | **24.75** | **33.54** | **77x2 (p1xp3)** |
| **-8.05** | **27.27** | **23.2** | **23.19** | **134.8** | **11.9** | **1.77** | **77x52 (p1xp4)**  |
| **8.21** | **-10** | **-4.49** | **-4.27** | **4.97** | **-24.76** | **-27.37** | **26x2 (p2xp3)** |
| **20.19** | **7.41** | **-7.69** | **-10.77** | **12.42** | **-46.82** | **-25** | **26x52 (p2xp4)** |
| **3.6** | **12.5** | **-0.77** | **-0.77** | **23.62** | **25.42** | **55.28** | **2x52 (p3xp4)** |
| **0.2** | **0.13** | **0.496** | **0.41** | **0.04** | **0.708** | **0.25** | **LSD 5%** |

**Combining ability**

The estimate values of general combining ability effects of the parental lines are presented in Table (5 ) regarding GCA effects for early yield, the parents (2) P3 , (52) P4 and (77) P1 recorded highly significant positive (gi) effect for early yield, while the parent (26) P2  recorded significant negative value for the same trait. for total yield. The parental (2)P3, (77) P1 and (52)P4 had exhibited highly significant positive (gi) effect for total yield, while the parent (26) P2 exhibited highly significant negative value for the same trait and also.

The general combining ability effect values for average fruit weight in Table(5) showed that, tow inbred lines recorded significant positive (52) P4 and (77) P1 (0.177) and (0.054) respectively.

Regarding fruit length and width. Table ( 5 ) showed that, (52) P4 and (77) P1 were the only inbred lines obtained significant positive (gi) effect value 1.092 and 0.175 respectively for fruit length and (1.122 and 0.156 ) respectively for fruit diameter. high significant positive (gi) effect value was given by P4 and P3  (0.35 – 0.217) respectively for the TSS.

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In general, inbred line 2(P3)is a good combiner for early, total yield and flesh thickness, while inbred line 52 (P4) is a good combiner for average fruit length and diameter, average fruit weight and total soluble solids. These lines could be used for improving these characters in melon by breeding programs. These results were found to be in agreement with those obtained by **El-Shimi, et al (2008), Mohamed (2011), Anne Katherine, *et al* (2011), Moushumi and Sirohi (2005) and Feyzian et al (2009a&b).**

**Table (5) .General combining ability values for early yield, total yield, fruit weight, fruit length, fruit diameter, flesh thickness and total soluble solids (TSS) of 4 melon genotypes**.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T.S.S** | **Flesh thickness** | **Average fruit width** | **Average fruit length** | **Average fruit weight** | **Total yield** | **Early yield** | **Genotypes** |
| **-0.517** | **-0.022** | **0.156** | **0.175** | **0.054** | **0.646** | **0.232** | **P1** |
| **-0.050** | **-0.256** | **-0.661** | **-0.708** | **-0.151** | **-2.186** | **-1.264** | **P2** |
| **0.217** | **0.178** | **-0.617** | **-0.558** | **-0.079** | **1.054** | **0.677** | **P3** |
| **0.350** | **0.100** | **1.122** | **1.092** | **0.177** | **0.486** | **0.355** | **P4** |
| **0.100** | **0.067** | **0.204** | **0.204** | **0.021** | **0.144** | **0.127** | **LSD5%** |

**Table (6) .Specific combining ability values for early yield, total yield, fruit weight, fruit length, fruit diameter, flesh thickness and total soluble solids (TSS) of 6 melon hyprids**.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **T.S.S** | **Flesh thickness** | **Average fruit diameter** | **Average fruit length** | **Average fruit weight** | **Total yield** | **Early yield** | **Hybrids** |
| **-0.313** | **0.291** | **-0.128** | **-0.417** | **0.102** | **4.832** | **1.030** | **77x26 (p1xp2)** |
| **-0.047** | **0.158** | **-0.609** | **-0.733** | **-0.197** | **1.255** | **0.914** | **77x2 (p1xp3)** |
| **-0.813** | **0.369** | **2.389** | **2.55** | **0.715** | **1.873** | **0.704** | **77x52 (p1xp4)**  |
| **0.487** | **-0.342** | **0.011** | **0.15** | **0.043** | **-2.581** | **-1.488** | **26x2 (p2xp3)** |
| **1.587** | **-0.064** | **-1.061** | **-1.267** | **-0.094** | **-3.935** | **-1.070** | **26x52 (p2xp4)** |
| **-0.48** | **0.202** | **-0.172** | **-0.283** | **0.055** | **3.376** | **2.213** | **2x52 (p3xp4)** |
| **0.244** | **0.163** | **0.496** | **0.495** | **0.051** | **0.350** | **0.308** | **LSD5%** |

The potentiality of crossing between specific parents were detected by estimating specific combining ability (SCA) effects of each F1 cross combination for all studied traits (Table 6)three out of six crosses exhibited significant positive SCA effects for early yield/plant. The same three crosses exhibited significant desirable positive SCA for total yield. Four out of these six crosses namely: (P1 x P2), (P1 x P4), (P2 x P3) and (P3 x P4) exhibited significant desirable positive SCA for average fruit weight, Two out of the four later crosses namely: (P1 x P4) and (P2 x P3) exhibited significant desirable positive SCA effects for length and diameter, Four out of these six crosses namely ((P1 x P2), (P1 x P3), (P1 x P4) and (P3 x P4) exhibited significant desirable positive SCA for flesh thickness and Two out of the six crosses exhibited significant for TSS. Indicating the possibility of combine both high yield and good quality characters. The

**Heritability:-**

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The results presented in Table ( 7 ) showed that, the broad sense heritability was high in early yield, total yield, average fruit diameter ,average fruit length, flesh thickness and total soluble solids was( 99 %- 99 %- 99 %-99 %-98 %-99 % respectively ) while the narrow sense heritability was intermediate or low (43 %- 7 %- 4 %- 47 %- 40 %- 4 % respectively), which indicate the potentiality of these characters to be genetically improved. Except average fruit width character the Table explained that, the broad sense andnarrow sense heritability was intermediate (49.98 %) and (54 %)respectively. These results indicate that influence of the environmental factors on the expression on this character˖This result agreed with those reported by**El-Shimiand Mohamedein (2008).**

**Table ( 7 ). Estimates of heritability in broad and narrow sense for early yield, total yield, fruit weight, fruit length, fruit diameter, flesh thickness and total soluble solids (TSS) .**

|  |
| --- |
| **Heritability (%)** |
| **Narrow sense heritability** | **Broad sense heritability** | **variables** |
| **43** | **99** | **Early yield** |
| **7** | **99** | **Total yield** |
| **4** | **99** | **Average fruit weight** |
| **47** | **99** | **Average fruit length** |
| **54** | **49.98** | **Average fruit diameter** |
| **40** | **98** | **Flesh thickness** |
| **4** | **99** | **T.S.S** |

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**تحسين محصول وجودة الصنف المحلي من الشمام (أناناس الدقي )**

**جيهان زينهم محمد 1 و احمد ابراهيم علي 2**

1- باحث بقسم بحوث الخضر خلطية التلقيح 2- باحث بقسم بحوث الخضر ذاتية التلقيح

اجريت هذه التجارب بمحطة بحوث القناطر محافطة القليوبية وصوب الدقي بمحافطة الجيزة مصر خلال ستة مواسم متتالية من 2014 الي 2017 باستخدام اربع اباء مرباة داخليا من الشمام (أناناس الدقي ) **مع ا**ستخدام صنف تجاري( بالميرا **)** كنترول ˖واستخدم برنامج التهجين بين السلالات الاربع بنظام التهجين النصف دائري (4×4) لتقدير المعايير الوراثية الضرورية لتحسين صفات المحصول وجودته .واظهرت النتائج معنوية عالية لصفات المحصول وبخصوص المعايير الوراثية فان النسبة بين القدرة العامة علي التالف والقدرة الخاصة علي التالف كانت من الواحد الصحيح ˖ مما يشير الي ان مكون التباين الوراثي الاضافي هو المكون الاكبر مقارنة بباقي مكونات التباين الوراثي ˖

اظهرت البيانات ان الاباء P1 (77) و P4 (52) كانت افضل الاباء المانحة لجميع الصفات موضوع الدراسة (المحصول المبكر – المحصول الكلي – متوسط وزن الثمرة – طول الثمرة – قطر الثمرة – سمك اللحم – المواد الصلبة الذائبة الكلية ) حيث اعطت اعلي قيم للقدرة علي التالف ˖

 اظهرت البيانات اربعة من الستة هجن اعطت قيم ايجابية SCA عالية للمحصول / النبات (P1×P2- P1×P3 P1×P4 –( P3×P4 - كما اعطت ثلاثة هجن من الاربعة السابقة قيم موجبة لمتوسط وزن الثمرة وسمك اللحم P1×P4-P1×P2) –( P3×P4˖ مما يشير الي امكانية الجمع بين كل من الانتاجية العالية ومكونات المحصول وجودته ˖

ويجدر الاشارة الي ان ثلاثة من الهجن السابقة العالية الانتاجية للمحصول الكلي والمبكر ناتجة من الاب P1(77) واثنين من الهجن ناتجة من الاب P4 (52) ˖

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ولذا نجد ان اكثر الهجن المتفوقة علي الاباء واعطت قيم عالية في قوة الهجين هي P1×P4-P1×P2) –(P3×P4˖في المحصول الكلي والمبكر – متوسط وزن الثمرة – سمك اللحم - وبالنسبة الي TSS كانت احداها مساوية للاباء والاخري اعلي من الاباء ˖

وبالنسبة الي درجة التوريث بمعناه الواسع والضيق بالنسبة للصفات المدروسة (المحصول المبكر – المحصول الكلي – متوسط وزن الثمرة – طول الثمرة – قطر الثمرة – سمك اللحم – المواد الصلبة الذائبة الكلية ) اعطت النتائج الاتية علي الترتيب 99%-43% ، 99%- 7% ، 99% - 4% ، 99% - 47% ، 98˖49% - 54% ،98% - 40% ، 99% - 4% وهذا يشير الي التاثير الغير اضافي للجين وتاثير البيئة وتاثير ذلك علي تعبير الصفة ووراثتها ويجب ان يكون الانتخاب في الاجيال الانعزالية يتم علي اساس انتخاب عائلات لتحقيق اعلي تحسين في تلك الصفات ˖