

DIALLEL ANALYSIS TO SOME HYBRIDS OF MELON

By

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B.Sc. Agric. Sci. (Vegetable), Fac. Agric., Cairo Univ., 2004

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تحليل الداي النيل لبعض هجن الشمام

رسالة ماجستير
في العلوم الزراعية
(خضر)

مقدمة من

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ABSTRACT

This study was carried out at El-Kanater Experimental Station, Kaliobia Governorate during the period of 2007-2009. Five parental lines of melon (*Cucumis melo* L.) were used in this study, namely: PI 169374 (P₁), PI 175673 (P₂), Trooper (P₃), Kahera 6 (P₄) and Ananas EL- Dokki (P₅). Crossed between them was done to obtain 10 F₁ hybrids, crosses among these cultivars were made in diallel mating design. All genotypes were evaluated in fall season of 2008 and summer season of 2009 to estimate heterosis, general and specific combining ability for vegetative and flowering traits, yield and its components and fruit characters. In addition to evaluate these genotypes with the commercial hybrid (primal) to powdery mildew disease.

Heterosis based on the mid-parent and high-parent was significant with positive or negative values for all studied traits in the two seasons.

Highly significant differences for general and specific combining ability were obtained for all studied traits. The ratio of GCA/SCA mean squares for total yield (fruit weight), average fruit weight, net density, flesh thickness and T.S.S. indicated The predominance role of additive gene action in the expression of these characters in both seasons. On the other hand, this ratio for the first female flower anthesis revealed that additive and non- additive gene effects were the same magnitude in the inheritance of this character especially in fall season.

Estimates of GCA effect revealed that the inbred lines Trooper and Ananas EL-Dokki had the highest positive values for yield component, net density and flesh thickness in both seasons. The lines PI175673 and Ananas EL-Dokki showed negative GCA effects for the first female flower anthesis and the crosses PI 175673 × Trooper , PI 175673 × Kahera 6 and Trooper ×Ananas EL-Dokki showed significant negative SCA values for date of the first female flower anthesis in both seasons. This indicate that, These parental lines and crosses were earlier than those having positive GCA and SCA of flowering date. Finally, the crosses PI169374 × Trooper and Trooper× Ananas EL-Dokki in fall season, PI175673 × Trooper and Kahera 6×Ananas EL-Dokki in summer season were the promising hybrids for most traits under the study.

Evaluation of the five parents and their 10 F₁hybrids to powdery mildew showed that, the parents P₁, P₂ and hybrids P₁ ×P₂, P₁ ×P₄, P₂ ×P₄showed resistance.

Key words: Melon, heterosis, general and specific combining ability, additive and non – additive gene action, diallel analysis.

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As I began this work in the name of ALLAH. I would like to end it also by thanking ALLAH who gives me the power, sufferance and help to finish it.

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DEDICATION

I dedicate this work to whom my heart felt thanks; to my parents and brothers for all the support they lovely offered along the period of my post graduation as well as to my fiancé Emad for his help and my friends especially Rania.

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	المستخلص العربي أجريت الدراسة بمزرعة محطة البساتين بالقناطر الخيرية – محافظة القليوبية خلال الفترة من عام ٢٠٠٧ حتى ٢٠٠٩ حيث استخدم في هذه الدراسة ٥ أباء وأجرى بينهم تهجين نصف دائري وهم PI169374 , PI175673 , Kahera 6 , Trooper , Ananas El-Dokki , لأنتاج ١٠ هجن وتقييم الأباء والهجن فى عروة خريفى ٢٠٠٨ وعروة صيفى ٢٠٠٩ وذلك بهدف تقدير قوة الهجين و القدرة العامة والخاصة على الانتلاف لمحصول الشام ومكوناته بالإضافة الى تقييم الأباء والهجن لمقاومتها للبياض الدقيقى مع الهجين التجارى بريمال. أخذت القياسات اللازمة على النموات الخضرية وصفات المحصول وبعد تحليل البيانات المتحصل عليها أتضح أن: أظهرت قوة الهجين بالنسبة لمتوسط الأباء والأب الأعلى معنوية موجبة وسالبة لمعظم الصفات المدروسة. أظهرت القدرة العامة والخاصة على الانتلاف وجود اختلافات عالية المعنوية لكل الصفات المدروسة . أظهرت النسبة المحسوبة بين متوسط مربعات الانحرافات للقدرتين العامة والخاصة على الانتلاف أن الفعل المضيف للجينات كان يلعب دورا أكثر أهمية من الفعل غير المضيف في وراثه صفة وزن المحصول الكلى ، متوسط وزن الثمرة ، كثافة الشبكة ، سمك اللحم ،والسكريات الصلبة الذائبة فى الموسمين. أظهرت النسبة المحسوبة بين متوسط مربعات الانحرافات للقدرتين العامة والخاصة على الانتلاف أن الفعل المضيف وغير المضيف للجينات له نفس الأهمية في وراثه صفة ميعاد تفتح أول زهرة مؤنثة فى العروة الخريفى. اختلفت الأباء في تأثيرات القدرة العامة على الانتلاف فمثلا Trooper ، Ananas El-Dokki أعطى قيم عالية لمعظم صفات المحصول ومكوناته وكثافة الشبكة وسمك اللحم فى الموسمين بينما كانت أفضل الأباء في صفة ميعاد تفتح أول زهرة مؤنثة هي PI175673 ، Ananas El-Dokki كذلك أوضحت حسابات تأثيرات القدرة الخاصة على الانتلاف للهجن المختلفة أن أفضل الهجن Trooper × Ananas El-Dokki and Kahera6 × PI175673 , Trooper × PI175673 في ميعاد تفتح أول زهرة حيث أعطت قيم معنوية سالبة وبالتالي هي أفضل الهجن في التبكير فى الموسمين . من هذه الدراسة اتضح ان الهجن Trooper × Ananas El-Dokki , PI169374 × Trooper , Trooper × Ananas El-Dokki فى العروة الخريفى والهجن Trooper × PI175673 , Ananas El-Dokki × Kahera6 فى العروة الصيفى كانت أفضل الهجن في معظم الصفات محل الدراسة ويمكن اجراء تجارب موسعة على هذه الهجن قبل تسجيلها كهجن تجارية توزع على المزارعين. عند تقييم الأباء والهجن للبياض الدقيقى وجد ان الأباء PI169374 , PI175673 والهجن PI175673 × PI169374 , Kahera6 × PI169374 , Kahera6 × PI175673 أظهرت مقاومة. الكلمات الدالة: الشام، قوة الهجين، القدرة العامة والخاصة على التالف، تحليل الداي اليل

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