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**STUDIES ON HETEROSIS AND COMBINING ABILITY IN
FABA BEAN (*Vicia faba* L.)**

I- EARLINESS AND YIELD COMPONENTS

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ABSTRACT

A half diallel set of six genetically diverse lines of faba beans, was evaluated for heterosis, general and specific combining ability (GCA and SCA). Results showed significant negative mid-parent heterosis for flowering date (FD), maturity date (MD) and maturity period (MP). Ten hybrids expressed significant positive mid-parent heterosis and nine hybrids expressed significant better-parent heterosis for seed yield/plant.

GCA and SCA were significant for all traits with the exception of the number of branches/plant.

Values largely exceeding unity for GCA/SCA ratio were obtained indicating the importance of additive and additive x additive gene action in the expression of the traits. Significant additive component (D), dominance component (h_1) and overall heterozygous dominance were detected for all traits. High heritability values were obtained for (MD), (MP), number of seeds/pod and 100-seed weight. Moderate heritability values were obtained for seed yield/plant and number of branches/plant, while low heritability values were obtained for (FD), plant height and number of pods/plant.

Correlations of parental means and their order of dominance show that small number of seeds/pod was dominant over large number. Increaser genes were dominant over decreasers for (MD), (MP) and 100-seed weight. And low seed yield/plant was dominant over high yield. Breeding methods to handle the resulting material were postulated.

INTRODUCTION

The use of heterosis in the form of F_1 hybrids has long been an objective of faba bean breeders. That sufficient magnitudes of heterosis are present in faba bean to result in significant earliness and increased yields has been established (El-Hosary 1984, El-Hosary and Nawar 1984 and El-Hosary 1985). In review of several studies, percentage heterosis for seed yield/plant

reached 38,6% (El-Hosary 1988). Useful heterosis reached 85.23% and 71.76% for seed yield/plant (Hendawy et al 1988). High heritability estimates for various traits have been given by many investigators and have been encouraging toward breeding for early maturity (Shahin et al 1973, El-Hosary, 1989), high productivity, Abu-El-Nasr et al (1989). However, breeding