

Combining ability analysis and evaluation of heterosis in *Jatropha curcas* L. F1 hybrids.

ABSTRACT

With the aim of estimating genetic parameters and recognizing superior *Jatropha curcas* L. combinations, ten superior plants were selected based on seed yield and oil content, and were crossed among them in a 10 x 10 half-diallel mating design to produce 45 F1-hybrids. The experiment was conducted in nursery stage using a randomized complete block design (RCBD) with three replications. Analysis of variance for the combining ability indicated that GCA and SCA variance were significant at 1% probability for plant height, collar diameter and number of leaves in nursery stage. The low ratio of GCA/SCA exhibited the non-additive effects. Broad sense heritabilities were high for plant height, collar diameter and number of leaves. Estimates for narrow sense heritability of the traits, plant height collar diameter and number of leaves were low. Percentages of heterosis and heterobeltiosis values for plant height, collar diameter and number of leaves ranged from negative to positive. This showed that the existence of dominance or non-additive gene actions might be present in the hybrids. On the basis GCA and SCA effects, parents, Ph1.2 and In2.1 and hybrids Ph1.2 (3) × In1.2 (8), Ph1.1 (9) × My2.2 (10) and My2.1 (1) × My2.2 (10) could be used for future breeding program.

Keyword: *Jatropha curcas*; Combining ability; Heterosis; Diallel cross.