

Genetic study for earliness in sponge gourd [*Luffa cylindrica* (Roem.) L.]

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ABSTRACT

The component of gene effects for characters related to earliness in sponge gourd were studied using six basic generation means (P_1 , P_2 , F_1 , F_2 , BC_1 and BC_2) derived from eight diverse genotypes. Non-allelic interactions were present in all the characters for majority of the crosses as evident from individual scaling tests and joint scaling test. The results revealed that earliness in flowering and fruiting as well as number of picking was mainly governed by dominance (h) and dominance x dominance (l) gene effects with few exception and hence these characters can be improved through heterosis breeding. The preponderance of duplicate gene action is suggestive, most of the crosses revealed the possibility of improvement of earliness and number of picking through heterosis breeding. However, for exploration of all the types of gene effects (both additive and non-additive gene action), reciprocal recurrent selection may be suggested.

Key words : Gene effect, Generation mean analysis, Sponge gourd, Heterosis breeding.

Sponge gourd [*Luffa cylindrica* (Roem.) L.] is one of the most important cucurbitaceous vegetable crops grown extensively throughout the tropical and sub-tropical region of the world. Tender fruits of sponge gourd are very popular and well known culinary vegetable in India with good nutritive value and high yield potentials. It is good source of carbohydrates, vitamins A and C and minerals. The fibers are used for industrial purpose. Sponge gourd is highly cross-pollinated crop and has a broad spectrum of early maturity, high yielding, large fruit size and shape, colour and other compositions. The generation mean analysis provides valuable information on the nature of gene action and relative magnitude of additive, dominance and epistatic variances. Therefore, present experiment was planned to study generation mean analysis for earliness in sponge gourd.

MATERIALS AND METHODS

Eight promising genotypes/cultivars of diverse nature viz., CHSG-2, JSGL-46, JSGL-71, JSGL-51, JSGL-39 JSGL-23, Pusa Chikni and NSG-28 were used as parental lines in the present investigation conducted at the Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh during *Kharif*, 2004. The experimental material consisted of six basic generations (P_1 , P_2 , F_1 , F_2 , BC_1 and BC_2) of six crosses namely CSHG-2 x JSGL-46 (cross-I), JSGL-71 x JSGL-46 (cross-II), JSGL-71 x JSGL-51 (cross-III), Pusa Chikni x JSGL-51 (cross-IV), NSG-28 x JSGL-39 (cross-V) and NSG-28 x JSGL-23 (cross-VI) involving eight genotypes. The experiment was carried out in RBD with three replications. In each replication, observations were

recorded on five plants for each parental line and their F_1 crosses, 40 plants for each F_2 and 20 plants for each BC_1 and BC_2 generations. The family means values for P_1 , P_2 , F_1 , F_2 , BC_1 and BC_2 were calculated for each cross in each replication.

The observations were recorded on seven characters (Table 1) to study various statistical parameters used in this investigation. The plants were spaced at 2.0 m between rows and 1.0 m within a row. The vines were trained to horizontal trellises. All the recommended cultural practices and plant protection measures were adopted to raise a good crop. The estimate of six genetic parameters viz., m (mean), d (additive), h (dominance), i (additive x additive), j (additive x dominance) and l (dominance x dominance) were calculated based on the formula suggested by Hayman (1958).

RESULTS AND DISCUSSION

The analysis of variance for six basic generations revealed significant differences among the generation means for all the characters for all the crosses except for number of node at which first female flower appeared in cross V; for days to first picking in cross II, III, IV and V; for number of picking in cross IV and VI. The individual scaling tests of Mather (1949) and joint scaling test of Cavalli (1952) revealed the presence of non-allelic interaction in majority of the crosses for the characters studied.

Days to first male flower opening :

The significant additive (d) gene effect was observed in negative direction in all the three interacting crosses,