

Heterosis studies in okra [*Abelmoschus esculentus* (L.) Moench]

M.D. KHANPARA¹, L.L. JIVANI*, J.H. VACHHANI, V.H. KACHHADIA AND R.B. MADARIA²

Main Oilseeds Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT) INDIA

ABSTRACT

Heterosis for pod yield and its components was studied in a set of line x tester crosses of 8 lines and 4 testers. The analysis of variance revealed highly significant differences among genotypes, parents and hybrids for all the characters indicating substantial amount of genetic variability present in the material studied. The magnitude of heterosis varied from cross to cross for all the characters studied. Mean squares due to parents vs hybrids were significant for days to 50 % flowering, days to first picking, internodal length, plant height, fruit girth, number of fruits per plant and fruit yield per plant indicating considerable heterosis for these characters. The pronounced heterotic effects were observed for number of nodes per plant, internodal length, plant height, number of branches per plant, number of fruits per plant and fruit yield per plant. While, moderate heterotic effects were recorded for fruit length and fruit girth. While, days to 50 % flowering and days to first picking depicted low heterotic effects. Out of 32 crosses studied, two and twenty eight crosses manifested significant and positive heterobeltiosis and standard heterosis for fruit yield per plant, respectively. The hybrid BO-13 x GO-2 exhibited highest heterobeltiosis (15.72 %), whereas the hybrid Pant Bhindi x JOL-1 showed the maximum standard heterosis (60.18 %) for fruit yield per plant. Which could be further exploited in okra breeding.

Key words : Heterobeltiosis, Standard heterosis, Line x tester and okra

INTRODUCTION

Okra [*Abelmoschus esculentus* (L.) Moench] is one of the most important vegetable crops grown extensively throughout the country during both summer and rainy seasons for its green tender fruits. It is a good source of vitamin A, B, and C, protein and mineral elements. Its fast growth, short duration and photoinensitive nature, genetical study can be completed in short span of time. Moreover, its large flower and monadelphous nature of the stamens make emasculation and pollination process easier. With the ease in fruit set and good number of seeds per pod, okra can be well exploited for hybrid vigour.

Choice of the parents for a breeding programme is important to improve quantitative characters like fruit yield and its components. Exploitation of hybrid vigour is an important tool for making genetical improvement of yield and its attributing characters in okra. The magnitude of heterosis for fruit yield and its components provides a basis for determining genetic diversity and also serves as a guide for the choice of desirable parents for developing superior F_1 hybrids to exploit hybrid vigour and for building gene pools to be employed in breeding programme. Keeping this in view, the present investigation was carried out to know the extent of heterobeltiosis and standard heterosis for fruit yield and its components in okra crosses obtained from 8 lines x 4 testers mating method.

MATERIALS AND METHODS

The experimental materials comprised of eight lines

of diverse origin namely; Chhodawadi, HRB-108-2, D-1-87-5, KS-404, Pant Bhindi, BO-13, EC-329372 and IC-990049; four testers viz., JOL-1, GO-2, Parbhani Kranti and HRB-55 as well as their 32 F_1 's obtained through line x tester crosses. Thus, 12 parental lines and 32 hybrids along with a standard check (GO-2) were evaluated in a Randomized Block Design with three replications during *kharif* season of 2005 at Instructional Farm, Department of Agronomy, Junagadh Agricultural University, Junagadh. Each entry consisted of a single row plot of ten plants for each parent and F_1 , spaced at 45 cm x 30 cm. All the recommended agronomic practices and plant need based protection measures were followed to raise the good crop of okra. The observations were recorded on five randomly selected competitive plants of each parent and F_1 from each replication for 10 various characters (Table 1). The heterotic effects were computed as the percentage increase (+) or decrease (-) of F_1 mean values over better parent (heterobeltiosis) and standard check variety GO-2 (economic heterosis) for all the characters and crosses, following the standard formula.

RESULTS AND DISCUSSION

The analysis of variance revealed highly significant differences among the genotypes for all the characters studied indicating the presence of sufficient variability in the experimental material (Table 1). Further, partitioning of mean sum of squares for parents and hybrids were also found significant for all the characters studied suggesting considerable amount of variability among the

* Author for correspondence. ¹Regional Cotton Research Station, Junagadh Agricultural University, JUNAGADH (GUJARAT), INDIA

²Department of Agricultural Botany, Junagadh Agricultural University, JUNAGADH (GUJARAT), INDIA