SUMMARY AND CONCLUSION

The present investigation "Fractional diallel analysis of some quantitative characters in lady's finger (Abelmoschus esculentus (L.) Moench)" using 20 lines (S=9) was undertaken to investigate the genetic architecture of the parental material by studying combining ability, degree of dominance, heterosis and inbreeding depression, heritability and genetic advance. Inter-relationship among yield and its components was also worked out in parents, F1s and F2s. The 200 progenies (20 parents, 90 F1s and 90 F2s) were raised in randomised blocks with three replications in the Horticultural Gardens of Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, during kharif 1975. The characters studied were: days to flower, first fruiting node, internodal length, number of branches per plant, plant height, fruit thickness, fruit length, number of fruits per plant and yield per plant. The major findings which emerged from the present study are summarized below:

The analysis of variance showed that there were significant differences among genotypes for all the characters under study.

The analysis of variance for combining ability indicated that both gca and sca variances were highly
significant for all the characters. The former were larger than those of latter for most of the characters in both the F₁ and F₂ generations.

A comparison of the variances due to gca and sca revealed that non-additive gene action had a predominant role in the expression of all the characters except fruit thickness in F₁ and fruit length in both F₁ and F₂ generations, where additive gene action was predominant. Accordingly, the average degree of dominance fell in the range of over dominance for most of the traits.

Magnitude of gca effects indicated that the parents 6318, 6315, and 7216 for days to flower; 7307, 7106 and 7121 for first fruiting node; 7312, 7301 and 6320 for internodal length; 7121, 6318 and PS for number of branches per plant; 6318, 7121 and PS for plant height; 6322, 6908 and 7121 for fruit thickness; 6322, 7216 and 6908 for fruit length; 6318, 7215 and 6313 for number of fruits per plant and 7121, 6318 and PS for yield per plant showed consistent performance over two generations. It can be concluded that parents 6318, PS, 7121, 6908, 7301 and 7216 were good general combiners.

Heterosis over superior parent manifested to the extent of 186.32 per cent for yield per plant, 129.56 per cent for number of fruits per plant, 25.73 per cent for
fruit length, 18.18 per cent for fruit thickness, 124.96 per cent for plant height, 179.16 per cent for number of branches per plant, -1.00 per cent for internodal length, -18.60 per cent for first fruiting node and -14.89 per cent for days to flower. Out of 90 hybrids, 79 for yield per plant, 51 for number of fruits per plant, 64 for fruit length, 49 for fruit thickness, 77 for plant height, 85 for number of branches per plant, 16 for first fruiting node and 50 for days to flower manifested significant heterosis over superior parent. None of the cross combination exhibited significant desirable heterosis for internodal length. Cross 7108 x 7312 showed maximum heterosis for yield per plant, number of fruits per plant, plant height and number of branches per plant.

Inbreeding depression in F2 was recorded to the extent of 57.54 per cent for yield per plant, 49.81 per cent for number of fruits per plant, 34.04 per cent for fruit length, 2.39 per cent for fruits thickness, 57.75 per cent for plant height, 50.00 per cent for number of branches per plant, 1.92 per cent for internodal length, 2.85 per cent for first fruiting node and 5.60 per cent for days to flower. Out of 90 F2 populations studied 62 for yield per plant, 25 for number of fruits per plant, 78 for fruit length, 62 for plant height, 73 for number of branches per plant and 11 for days to flower showed inbreeding depression. The crosses 7108 x 7312, 6313 x 7312, 6322 x PS and 7301 x 7106 exhibiting
high heterosis also exhibited high inbreeding depression for yield per plant.

High heritability estimates in narrow sense were recorded in both F₁ and F₂ generations for fruit length, fruit thickness and first fruiting node. Medium and low heritability estimates were recorded for internodal length and days to flower respectively in F₁ and F₂ generations. Remaining characters showed heritability estimates as low in F₁ and medium in F₂.

Genetic advance was highest for fruit thickness in both F₁ and F₂ generations (F₁ 76.98 and F₂ 77.71%) followed by fruit length (F₁ 10.31 and F₂ 11.58%), first fruiting node (F₁ 9.31 and F₂ 9.80%), and internodal length (F₁ 6.9 and F₂ 6.77%). Remaining characters showed very low genetic advance which ranged from 0.02 to 0.95 per cent in F₁ and from 0.01 to 8.04 per cent in F₂.

Correlation coefficient at the genotypic and phenotypic levels among all the characters in parent, F₁ and F₂ generations suggested that a linear relationship existed among yield per plant, number of fruits per plant, plant height, number of branches per plant and internodal length. Yield per plant also showed significant and positive correlation at both genotypic and phenotypic levels with fruit length, fruit thickness in parent and F₂ generations. It showed significant but negative association with days to flower only in parents.
On the basis of above results, it is suggested that six parents viz., 6318, Pusa Sawi, 7121, 6908, 7301 and 7216 should extensively be used in the combination of breeding programmes and diallel selective mating system for achieving worthwhile results. Considering the preponderance of non-additive gene action and high magnitude of economic heterosis, heterosis breeding may be useful for improving yield in bhindi. A hybrid namely 7108 x 7312 may be utilized for commercial exploitation of hybrid vigour as it manifested 186 per cent heterosis over superior parent for yield. The fruits of this hybrid were medium in size and early in fruiting.