

TABLE I

*Effect of temperature on seed germination and natural infection of Poi seedlings*

Trial	No. of seeds sown	Treatment at temperature (°C)	Period of treatment (in min.)	No. of seeds germinated	Seedling* infection
1	10	54	20	10	Moderate
2	10	55	30	6	Light
3	10	58	20	4	Light
4	10	60	15	4	Light
5	10	65	15	2	Traces
6	5	70	10	3	Traces
7	5	75	5	0	—

\* Traces = Upto 5% infection; Light = 6-25%; Moderate = 26-50%.

branched, long bearing chains of conidia, light brown septate, geniculate, 3.06-6.12  $\mu$ m in breadth. Conidia obclavate or muriform, geniculate, short, sub-hyaline beaked, double walled, walls smooth, transverse septa 3-8, longitudinal septa 1-2, moderately constricted at transverse septa, light-brown in colour measuring 13.77-61.20  $\mu$ m (19.89-45.90  $\mu$ m)  $\times$  7.65-16.83  $\mu$ m (9.18-12.2  $\mu$ m).

An experiment was conducted for reducing the natural seed infection by physical methods. Hot water treatment was given to *Basella* seeds at different temperatures and treated seeds were sown in sterilized soil (sterilization on three successive days at 15 lb psi for 30 min). The results are summarized in Table I.

The experiment on temperature treatment demonstrated little success in curbing natural infection at the cost of damage to seeds by way of failure of germination. Hot-water treatment of seed, therefore, can hardly be recommended for control.

There is so far no record in India of *Alternaria alternata* pathogenic on *Basella rubra* L. Mundkur<sup>1</sup> however, reported *Alternaria* spot but the species was not identified.

Thanks are due to Dr. L. M. Joshi, Head, Mycology Division of this Institute for his encouragement.

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1. Mundkur, B. B., "Report of the Imperial Mycologist," *Sci. Rep. Agric. Res. Inst.* 1936-37, 1938, p. 146.

## HETEROSIS IN BLACKGRAM

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DEVELOPMENT of commercial hybrids in self-pollinated crops like sorghum and cotton during the past few years, has drawn the attention of breeders to explore the possibilities of evolving such hybrids in other self-fertilized crops also. But for the commercial exploitation of heterosis, sufficient information on the desired parental combinations showing high manifestation of heterosis is essential. Hence the present investigation was undertaken to study the magnitude of heterosis on the yield and its component characters in blackgram [*Vigna mungo* (L.) Wilczek].

### Materials and Methods

Ninety crosses made between 30 genetically diverse lines and 3 testers in 1973 were raised during 1974 and 1975 along with presents in randomized blocks replicated thrice. Each plot had single row of 10 plants with 50  $\times$  20 cm spacing. Five plants were randomly selected in each plot and observations recorded on clusters per plant, pods per cluster, harvest index, test weight (g) and grain yield per plant (g). Heterosis over the better parent was calculated from the mean values over a period of two years.

### Results and Discussion

Out of ninety, the results of ten best crosses exhibiting heterosis for yield are discussed here. The range of heterosis was comparatively high for grain yield per plant (20.2-98.9%), clusters per plant (2.2-93.7%), and harvest index (11.6-39.2%), and low for pods per cluster (3.2-13.8%) and test weight (1.5-5.9%). The highest heterosis of 98.9% for yield was recorded by the cross 6,426  $\times$  59. The other nine crosses in descending order were 109  $\times$  32 (55.8%), 6,426  $\times$  32 (50.6%), 109  $\times$  K21 (50.0%), 109  $\times$  T77 (46.4%), 109  $\times$  55 (40.7%), 109  $\times$  14 (31.4%), 109  $\times$  59 (26.3%), 109  $\times$  128 (24.4%) and 6426  $\times$  T65 (20.2%).

Out of these ten crosses, two involved low  $\times$  low yielding parents (6,426  $\times$  T65 and 6,426  $\times$  32), four high  $\times$  low combinations (6,426  $\times$  59, 109  $\times$  14, 109  $\times$  32 and 109  $\times$  128) and four high  $\times$  high (109  $\times$  K21, 109  $\times$  T77, 109  $\times$  55 and 109  $\times$  59). Thus six crosses involved at least one of the parents as low yielder for heterosis in yield. This suggests that the phenotypic superiority of the parent is not always an indication of a good genotype.

It was observed that heterosis in yield resulted mainly due to heterosis in clusters per plant and harvest index as also reported by earlier workers<sup>1-5</sup>. It is, therefore, suggested that heterosis in these two characters will be helpful in improving the productivity of blackgram.

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1. Singh, K. B., *Proc. V All India Pulse Conf. (Mineograph)*, 1971, p. 18.
2. — and Jain, R. P., *Indian J. Genet.*, 1970, 30, 251.
3. — and Singh, J. K., *Ibid.*, 1971, 31, 491.

### IMPARIPINNATE LEAF WITH NORMAL SIZE LEAFLET IN GROUNDNUT

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GROUNDNUT (*Arachis hypogaea*, L.) leaf is paripinnate with two pairs of leaflets (Fig. 1A). Variations in leaflet arrangement are rare in this crop. Short mutants with reduced size of leaflets having imparipinnate<sup>1-3</sup>, and three-paired leaflet<sup>4</sup> arrangements were reported earlier. In the present study a variant similar to the imparipinnate but with normal leaflet size was isolated in one of the F<sub>2</sub> progenies of a cross, TG-16  $\times$  TG-17. Both parents had paripinnate leaves.

Characteristics of the variant and its inheritance are reported.

Trombay Groundnut<sup>5,6</sup> varieties (TG)-16 and 17 having branch habit and leaflet size similar in Spanish Improved (SP) variety (Fig. 1C) were crossed in 1977. F<sub>1</sub> plants and their leaves resembled the TG-16 parent. F<sub>2</sub> progenies of this cross segregated for only the parental types, viz., TG-16 and 17 and all had paripinnate leaves. In F<sub>3</sub>, one of the progenies segregated for plants having imparipinnate leaf (Fig. 1B). There were 22 plants with normal leaves and 7 with imparipinnate leaves. All the plant progenies from the segregating family were grown in F<sub>4</sub> and some in F<sub>5</sub> to study phenotypic and genotypic segregation. The results summarized in Table I showed that the imparipinnate leaf trait was governed by a single recessive gene which was confirmed by the 1:2:1 genotype segregation ( $\chi^2$  in F<sub>4</sub> 0.09,  $P = 70-80$ ; in F<sub>5</sub>  $\chi^2 = 1.46$ ,  $P = 20-30$ ).

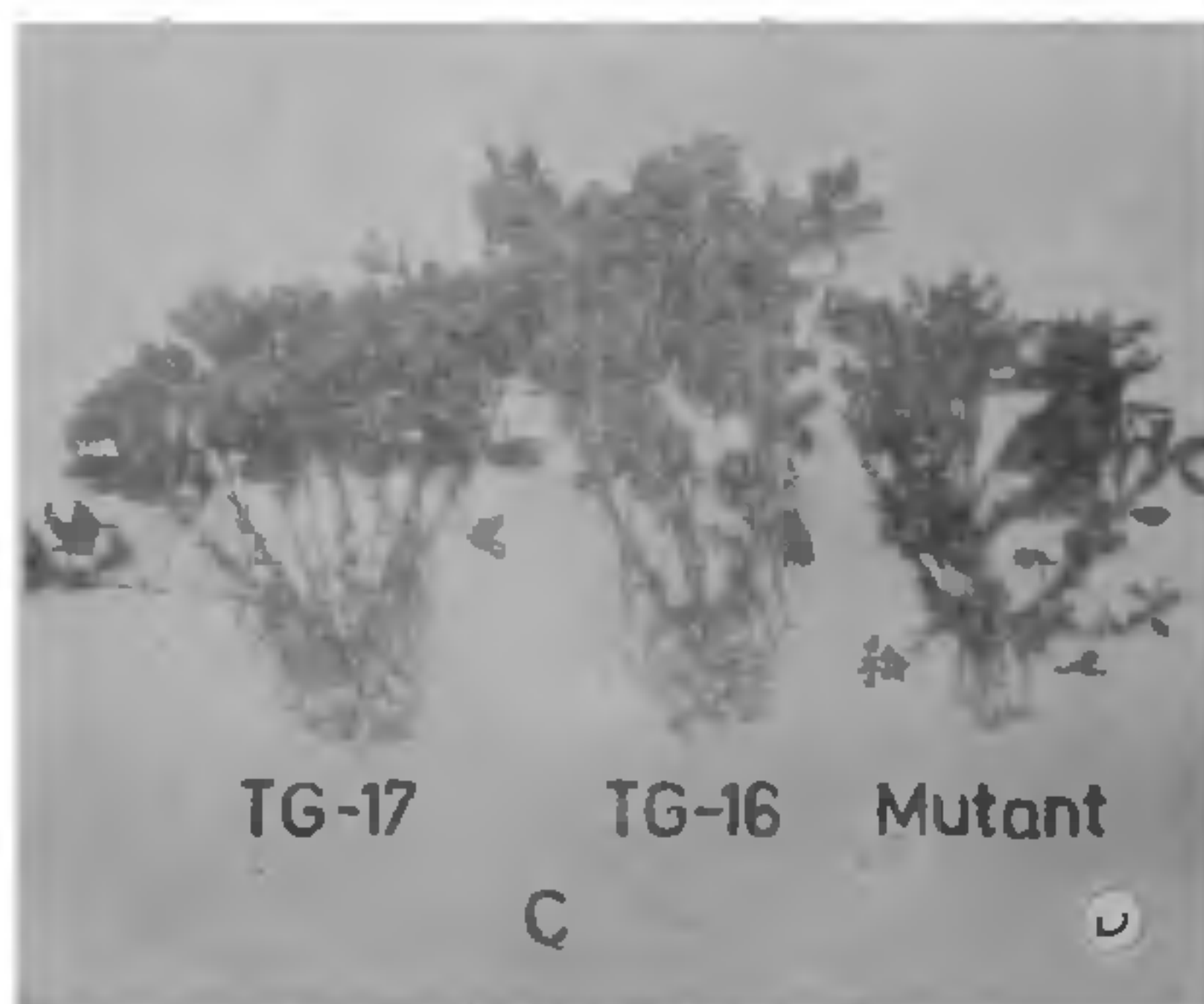
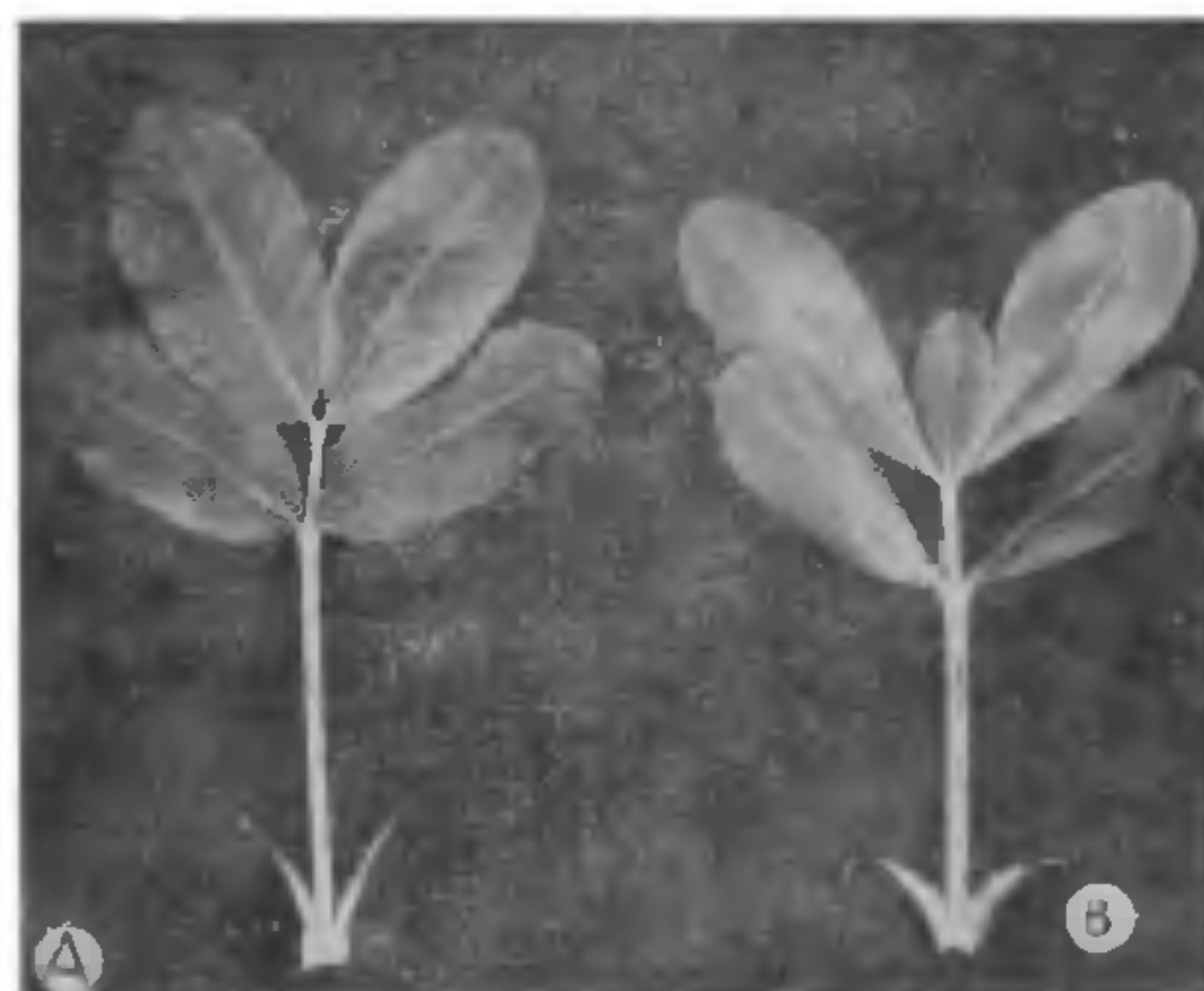


FIG. 1A-C. A. Paripinnate leaf; B. Imparipinnate leaf; C. Parents; D. Mutant, with incurved leaflets.