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Short Communication

GERMPLASM EXPLORATIONS WITHIN INDIA AND CONTRIBUTION TO GENETIC DIVERSITY IN COTTON

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India is the ancient home of the cultivated Asiatic species of *Gossypium* L. particularly representing the origin, and domestication of three geographical races of *G. arboreum* L. namely *bengalense, cernuum* and *indicum* and also the race *wightianum* of *G. herbaceum* (Hutchinson *et al.*, 1947). India grows the diploid desi cottons from earlier than 3000 BC and both perennial and annual forms are found widely distributed. In addition, several *G. hirsutum* and *G. barbadense* genotypes were introduced by the British East India Company and other agencies from the latter half of the 18th century and during the last two centuries, introduced and acclimatised materials have been spread in localised pockets all over the Indian sub-continent. Some of these have also undergone isolation, introgresion and continuous localised selection in various regions and are often grown by the tribals etc., in smaller pockets besides the large scale commercial cultivation of improved cultivars evolved during the recent decades. In the germplasm bank of cotton maintained at Central Institute for Cotton Research, Nagpur, though some such forms are available from the earlier acquisitions, there is scope and need for recollecting additional and fresh diversity for enriching the national cotton gene pool. In this paper, the utility of material collected under CICR-NBPGR joint explorations during 1979-1992 is presented and discussed.

The NBPGR in collaboration with CICR, Nagpur has a joint mandate to collect genetic diversity in cotton from India and exotic sources by explorations and exchange. During 1979-1992, seven explorations were conducted in various regions of Indian sub- continent as indicated in Fig. 1 and Table 1. The material collected from these explorations were systematically evaluated at CICR, Nagpur (Singh *et al.*, 1992) and the new gene sources available for crop

improvement programmes were recorded and documented. These accessions were added to the National Cotton Gene Bank at CICR, Nagpur.

The regions explored, type of material and number of accessions collected and useful characters identified are presented in Table 1. From the table, it may be seen that during 7 explorations, the total quantitative addition to the gene pool was to the extent of 315 *G. arboreum* race collections, 72 *G. herbaceum* and 40 *G. hirsutum* types. This included about 50 perennial forms also.

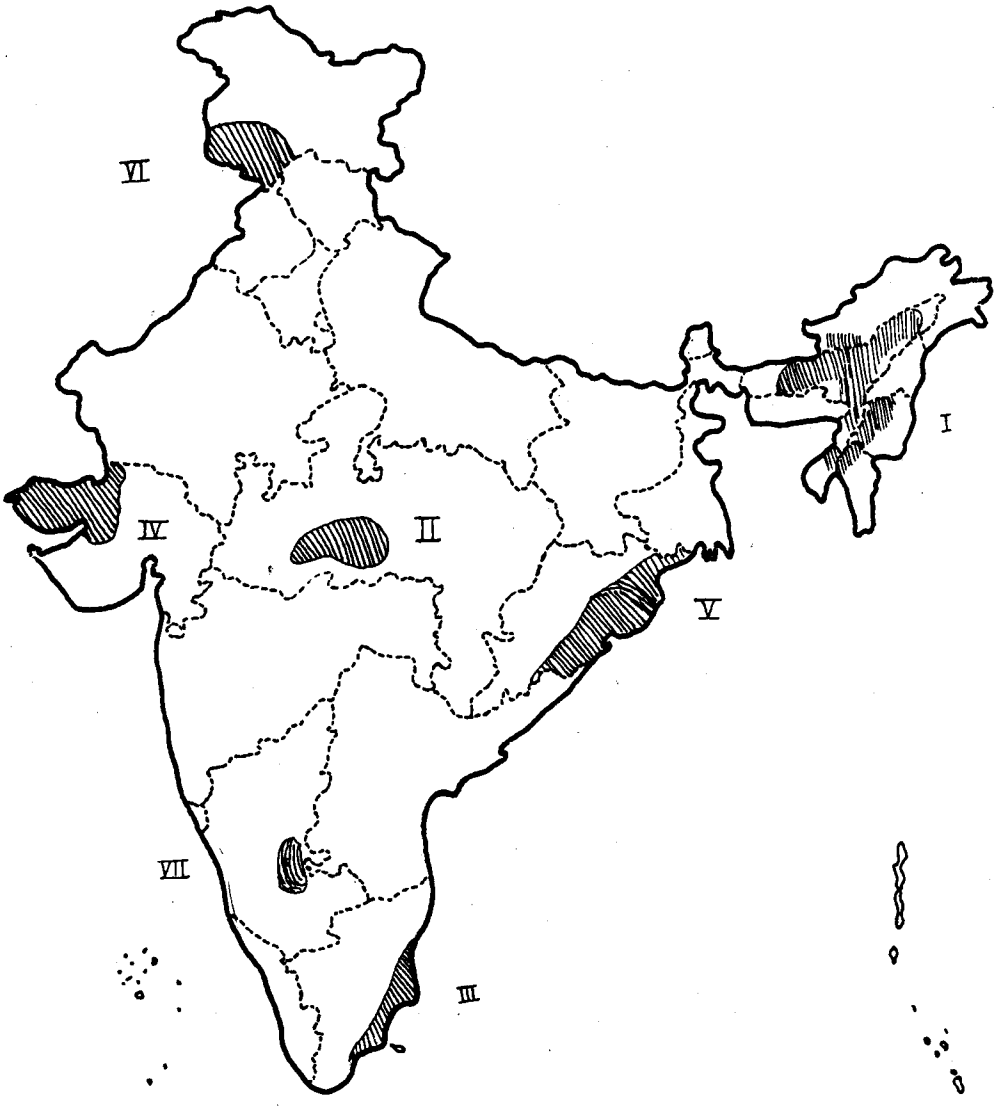

Fig. 1. Cotton Germplasm exploration regions explored I-VII

Table 1. Regions explored, material collected, characters identified (CICR-NBPGR)

No.	Region explored	Year	Species	No. of Accs.	Characters
1.	Neh region- mainly Assam, Meghalaya, Nagaland, Manipur, Tripura	1979 1984 1990	*arboreum* race-*cernuum* & perennials	190	Big long bolls, high boll weight, high got, high seed number, coarse fibre, short staple and high locule retentivity
II	Malwa plateau region	1980-81	*hirsutum* (upland types)	34	Hairy types, big boll, high boll weight and salt tolerant types.
III.	South coastal region	1979 1981	*arboreum* introgressed *indicum* and *hirsutum* types	32	Small bolls, medium staple, salt and drought resistant/tolerant types, bourbon types (*G.hirsutum*) drought tolerant
IV.	Gujarat Kutch Saurashtra region	1979	*herbaceum*	50	Round and closed bolls, high got and drought tolerant.
V.	East coast tract (Orissa)	1989	Mostly *arboreum*, some *hirsutum*, perennials and introgressed types	54	Small bolls, high got.
VI.	Jammu region (J&K)	1991-92	*arboreum*	45	High elevation and cold tolerant types.
VII.	Karnataka (raichur)	1979	*aerbaceum*	22	High boll number and high got

The major achievements of these efforts are represented by the acquisition of new/additional variability such as for increased boll size, boll shape differences, drought resistance, cold tolerance, high boll number, high ginning outturn, high locule retentive capacity after boll bursting and high seed number per boll in the *G. arboreum* collections. These have added considerably to the diversity in national gene pool of the diploid **desi** cottons. The additional variability collected in the tetraploid species from such remote locations falling

mostly outside the predominantly cultivated pockets was comparatively of a lower magnitude. The desi cottons are again regaining special importance compared to the trtraploid cottons because of the higher level of resistance of the desi cottons to abiotic and biotic stresses and the future scope for their yield and quality improvement (Singh and Narayanan, 1990; Narayanan *et al.*, 1990). Already CICR has used some of these new germplasm accessions especially the *cernuum* and *indicum* types for improving the productivity potential and developed advanced cultures which have been tested under All India Co-ordinated Cotton trials (Singh and Narayanan, 1987). These efforts thus have brought out the importance of collecting within the country from selected areas of origin, diversification and distribution of old cotton forms for enlarging and enriching the national gene pool of cotton.

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