GENETIC ENHANCEMENT THROUGH INTROGRESSION OF WILD MULBERRY GENES

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Mulberry crop improvement through breeding programmes are cumbersome, time consuming for the adaptation involving selection of parents, attempting crosses, progeny testing, selection of desirable recombinants and testing their performance and hybrid vigour.

- In recent past the approach of introgression breeding is popular among the germplasm curators of various crops both of annual and perennials.
- Introgression breeding or pre-breeding is the transfer of desired genes and gene combinations from unadapted sources into more useable breeding materials (FAO, 1998).
- To incorporate maximum possible diversity into the breeding pool, it requires introduction of unused, untapped and productive exotic, wild and such genetic materials invariably very few useful traits.
- After introgression of unadapted genes particularly the secondary and tertiary sources, the intermediate populations are termed as genetically enhanced breeding materials.
- In fact breeders prefer to use the genetically enhanced materials with desirable traits in genetic background of widely adapted and elite gene pool.
- The extensive source of germplasm is not being utilized due to its proper characterization, identification and prepared a compact list of core collections.

- A core collection is a subset of entire collections that presents, within a minimum of repetition, the genetic diversity of a species and its wild relatives (Brown, 1989). The core collection should represent 10% of the size of the whole collection, which should represent 70% of the total variation (Hodgkin et al., 1995).
- With the advancement of molecular genetics, cell biology, genetic engineering a new kind of biotechnology assisted genetic enhancement is quite possible.
- Repeated use of similar parental source makes the narrow genetic base of breeding materials. In such case the base broadening is utmost required which can be achieved by incorporation of variability to the gene pool with narrow genetic base by introduction of alleles, new gene and gene combinations is known as base broadening. At macro level collections and addition of various germplasm materials into a gene bank is also referred to as base broadening effort. The collections may include exotic, wild genotypes and wild relatives of the basic germplasm materials avoiding duplicates / similar materials.

Contribution of CSGRC: In a pre-breeding effort, the wild (*M. laevigata* and *M. serrata*) and cultivated species (*M. indica*) were hybridized and F1 population generated. The intermediate enhanced genetic materials showed high biomass, vigorous growth, profuse fruiting and timber value which can be exploited further for crop improvement and different non-sericultural uses. This is the first repot in India for successful development of genetically enhanced materials from wild and cultivated species of mulberry (Tikader and Dandin 2007).

Genetically enhanced material

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