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TISSUE CULTURE STUDIES OF DIFFERENTIATION IN A GRAIN LEGUME *CYAMOPSIS TETRAGONOLOBA* (L.) TAUB

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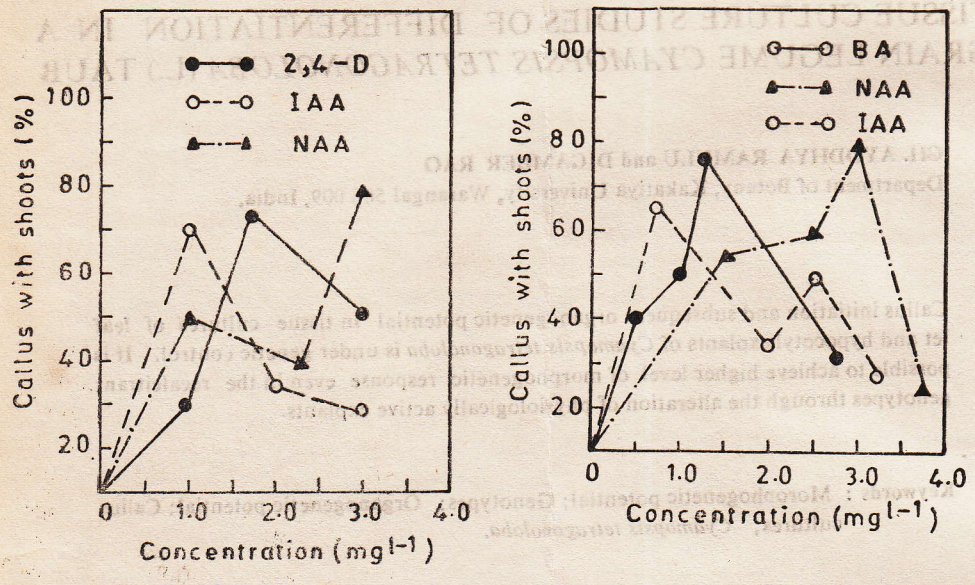
Callus initiation and subsequent organogenetic potential in tissue cultures of leaf let and hypocotyl explants of *Cyamopsis tetragonoloba* is under genetic control. It is possible to achieve higher level of morphogenetic response even in the recalcitrant genotypes through the alteration of physiologically active explants.

Keywords : Morophogenetic potential; Genotypes; Organogenetic potential; Callus cultures; *Cyamopsis tetragonoloba*.

The ***in vitro*** techniques that have been developed and promise to play increasingly important role in crop plants. The importance of plant cell and tissue culture in applied and fundamental research has been outlined by many workers (Thorpe, 1978, Hicks 19?0) Legumes have been extensively used in plant cell and tissue culture system, regeneration of whole plants from non-embryonic, embryonic and from callus derived has been achieved in only limited species like *Psophocarpus tetragonoloba* (Gregory *et al.*, 1980), *Trifolium patense* (Horvath Beach and Smith, 1979). In the majority of the species the primary explants were from hypoctyl explants of the seedlings.

Two genotypes of *Cyamopsis tetragonoloba* (L.) Taub. namelv Pusa Navabhar and Pusa Sadhabar obtained from Andhra Pradesh Agriculture University,Hyderabad were employed inthe present investigation. The growth conditions for this two genotypes were maintained similarly. The seeds were aspectically germinated in the agar medium without nutrients. The leaf and hypocotyl explants were taken from the 5–6 days old grown seedlings. A minimum of 30 cultures were raised for each treatment. For the leaf explants, the B_5 medium containing NAA (2mg/l)+BAP 0 75 mg/l, though satisfactory effect for initiationof callus, was not suitable for long term maintenance of cultures and for routine subcultures a medium supplemented with IAA (0 5 mg/l+BAP (1.5 mg/l) was employed.

The various shoot meristems showed callusination with in three



Figs. 1 and 2. Callusination frequency of pusa sadabhar and pusa navabhar cultivars.

weeks of cultures in the both genotypes tested (Figs. 1 and 2). Quantitatively, considerable variation was observed in the response of the apical meristems. But activated apical meristem-axillary meristems showed high percentage of callusination that the genotypic influence was not apparent. In the activated axillary meristems the differentiating shoot buds was also much higher Interestingly the cultures contained numerous embryoid like structures. The small plantlets could be obtained from these cultures on BM + NAA (3. 0mg/1) +BAP (0.75 mg/1).

Attempts were made to initiate, maintain and differentiate leaf cultures. Small leaflets were cultured on B5+ NAA (2.5 mg/1) +BAP (1.25 mg/1) and most significant genotypic influence was observed in these cultures. High percentage of 70-80% showed callus initiation and nodulation with in the three weeks of both the genotypes. During the initial stages of sub-cultures (2-3)formation of shoots was frequently observed,

Cyamopsis seed legume of the semi-arid regions is cultivated in India. For guar improvement programmes two genotypes were tested for the tissue culturability and genotypic difference was noticed. The physiological status of the donor plant was altered the inherent inhibitory effect of the both genotypes. The genotypic differences

in *in vitro* manuplation of tissue was reported by (Kao and Michakyluk, 1981) in *Medicago satisva*. In the *Trifolium patense* differentiation, somatic embryogensis from leaf explants has been reported (Phillips and Collins, 1980).

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