

Short Communication

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IN VITRO STUDIES IN VIGNA RADIATA L. WILCZEK

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The present paper deals with the effect of auxins and cytokinins on differentiation of shoot apex meristem in mung bean.

Key Words : *Vigna radiata*. *in vitro* studies.

Mung bean is one of the most important pulse crop & occupies the first position in the area of about 4.81 lakh hectares with 1.56 lakh tonnes of production. This communication presents organogetic responses of various seedling explants in culture, as a pre-requisite to isolate somaclonal variants and useful genetic variants as a part of the mung bean improvement programme.

Stem, leaves and cotyledonary explants were taken from 3 day old sterile seedlings and cultured on agar slants prepared with MS medium, LS medium and L₆ medium. After 3 weeks of callus initiation, The callus obtained from the various explants was subcultured and maintained at the 24±1°C temperature and 800-1000 lux illumination conditions. Ascorbic acid was added in the medium to prevent browning to tissue during sub-cultures. Data of the callus growth was collected from thirty day old cultures. Regeneration studies were conducted on callus obtained from leaf explants using various hormonal supplementations like 2 mg/l 2-4D + 0.5 mg/l BAP, 1.5 mg/l 2, 4-D + 0.8 mg/l BAP, 1 mg/l 1 mg/l BA, 0.5 mg/l 2-4 D - 2mg/l BAP.

Different explants showed varied callusing efficiencies depending on the basal medium used (Table - 1). Frequency was found to be maximum on MS medium (94%) and minimum on LS medium (37.5%). The data of fresh weights and dry weights of the calli produced from the three explants however proved that MS medium resulted in maximum growth. Minimum growth in terms of fresh and dry weights resulted with LS medium in case of stem and leaf explants and with L₆ medium in case of cotyledonary explants (Table 1).

The regeneration response in terms of production of green compact callus with roots and embry-

Table 1: Efficiency of callus initiation from different explants of *Vigna radiata* var PS - 16 using MS, LS and L₆ culture media.

Medium	Percentage of callus induction	Stem Explant FWT (gms)	Stem Explant DWT (gms)	Cotyle- don FWT (gms)	Explant DWT (gms)	Leaf explant FWT (gms)	Leaf explant DWT (gms)
MS	94	0.219	0.020	0.001	0.025	0.228	0.017
LS	37.5	0.117	0.010	0.200	0.025	0.220	0.012
L ₆	68.3	0.210	0.017	0.198	0.024	0.223	0.016

Table 2: Organogenetic response of *Vigna radiata* var PS - 16 callus with different hormonal supplements to the MS medium.

Hormonal Composition (conc mg/l)	Nature of response
2 2-4D 0.5 BAP	Green compact callus with roots and empyroids
1.5 2-4D 0.8 BAP	Friable callus
1 2 -4D 1 BAP	Stout and short roots
0.5 2-4D 2 BAP	No callus growth

oids, friable callus and stout and short roots (Fig. 1 to 3) varied with different hormonal supplements added to the MS basal medium. The hormonal supplementation of 2mg/l 2, 4-D and 0.5 mg/l BAP resulted in rhizogenesis and embryoids (Table - 2). Hence, this formulation of the medium may be used for high frequency plant rege-neration studies.

Goel *et al* (1983) reported plantlet development of somatic embryos from cotyledonary cultures. The present study further proves that mung bean can be successfully utilised for *in vitro* studies.

In mung bean, addition of auxins and/or cytokinins resulted in dedifferentiation of shoot apex meristems but no regeneration was observed and



Figures 1-3. Organogenesis in *Vigna radiata*.

Figure 1. Green compact callus with roots and embryoids. 2. Friable callus. 3. Stout and short roots.

this recalcitrant nature of grain legumes has always been a subject of discussion in literature (Boultes and Crocomo 1979, Mohan Ram *et al.*, 1981 and Mrogniski and Kartha 1984). The variety PS-16 which was used in the present investigation yielded positive results inspite of being incalcitrant to a certain extent. This has been possible due to intricate hormonal supplementation employed. Attempts are underway to achieve whole plantlet regeneration and efficient transfer to the field.

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