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Development of salt tolerant lines in Mung bean (*Vigna radiata* L. Wilczek Var. - K – 851)

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ABSTRACT

Different ex plants such as hypocotyls, excised roots, steam segments, cotyledons, first leaf, secondary leaf, shoot apices of mung bean [*Vigna radiata* (L.) Wilczek] variety K 851 were inoculated on MS (Murashige and Skoog, 1962) medium supplemented with different concentrations of various hormones, viz. indoleacetic acid (IAA), -2, 4-dichlorophenoxyacetic acid (2, 4-D), naphthaleneacetic acid (NAA), 6-benzyladenine (BA) and kinetin (KN) fortified with NaCl (0.25, 0.50, 0.75 and 1.00% concentration). Salt stress showed decreased germination with increasing salt concentrations. MS media supplemented with 2, 4-D) and B.A. showed morphogenesis at various salt concentrations, some salt tolerant explants were isolated and regeneration of shoots have been achieved at 5 µM BA + 1 µM NAA, but an alteration in leaf morphology was noted. Rooting have been induced in such regenerants at 20 µM NAA without intervening callus phase. These plantlets were transferred to Knop's solution for hardening. Later they were transferred to pots with autoclaved soil.

Keywords: *Vigna radiata,* phytohormones, Callus, Salt tolerance.

I. INTRODUCTION

In vitro culture techniques have been used to supplement the conventional genetic improvement methods in pulses. Apical meristem culture has been found to be useful in checking the spread of seed-borne viral diseases (Kartha et al., 1981, Kartha, 1982). Multiple shoot production has been found successful in mass propagation and in germplasm conservation (Kartha, 1982; Rubluo and Kartha, 1985). Production of soma clonal variants has been observed by Evans et al. (1984) and Larkin (1987). This paper embodies the results on the effect of growth hormones on callus indication, morphogenesis and plant regeneration from various explants in *Vigna radiata* (L.) Wilczek.

II. Materials and Methods:

Seeds of Vigna radiata var. K 851 were washed in running tap water for an hour, treated with 1%

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Tween-20 for 10 min and washed again in running water for 30 min. These were then treated with 1% $HgCl_2$ for one min followed by 5 to 6 rinses in double-distilled sterilized water. Thereafter, 5 to 6 seeds were inoculated in culture tubes containing 20 ml of 0.7% agarified basal MS medium under aseptic conditions. In vitro-germinated seedlings were utilized as a source of different explants. Segments of hypocotyl, root, stem (about 5 mm in length), cotyledon, first leaf, secondary leaf (10 mm in length) and shoot apices were cultured in 20 ml of 0.7% agarified MS medium supplemented with different concentrations of IAA, 2, 4-D, NAA, BA and KN and 0.25, 0.50, 0.75 and 1.00% concentration of NaCl and the culture tubes were incubated under 15 h light (white cool, 1200 lux) and 9 h dark at 22 $\pm$ 2ºC in culture room. Sub-culturing was done after 30 days of inoculation. The regenerated shoots were transferred to MS medium supplemented with 20 µM NAA without intervening callus phase. The plantlets were transferred to Knop's solution for hardening. Later they were transferred to pots with autoclaved soil.

III.Result and Discussion

Exposure to salt stress (0.25, 0.50, 0.75 and 1.00% concentration of NaCl).

- Best responding variety K851 of mung bean to various phytohormonal concentrations/combination showed retardation/suppression of morphogenic response at various salt concentrations. Salt stress showed decreased germination with increasing salt concentration. When basal media supplemented with salt was fortified with 2,4-D – 15 µM and BA – 5 µM then morphogenesis was noted at 0.25, 0.50, 0.75% salt concentration but germinated shoots showed necrosis and death at 1.0% concentration (Plate 11D, E, F, G).
- Calli induced from leaf explants were also cultured on salt fortified media in combination with varying phytohormonal combinations.
- Different explants also showed suppressed morphogenesis at various salt concentrations, i.e., percentage response declined but at 0.5, 0.75 concentrations/combinations some calli / explants showed recovery in callusing and morphogenesis (Plate 11A).

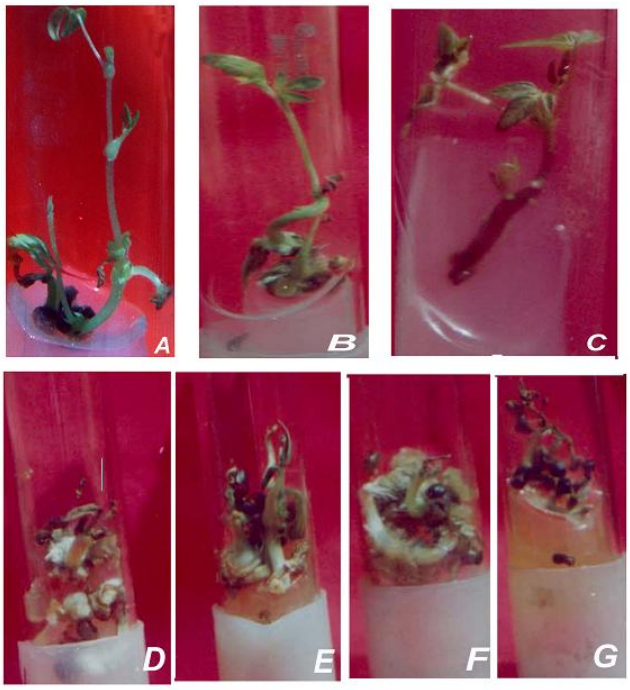


Plate No 1.

- Some salt tolerant explants were isolated and regeneration of shoots have been achieved at 5 µM BA + 1 µM NAA, but an alteration in leaf morphology was noted (Plate 11B). Leaves became reduced and instead of trifoliate, single leaflet was also observed (Plate 12E). Leaf surface showed nodules in some cases along with yellowing of vein (Plate 11C).
- Rooting have been induced in such regenerants at 20 µM NAA without intervening callus phase (Plate 12 A.C). These plantlets were transferred to Knop's solution for hardening. Later they were transferred to pots with autoclaved soil (Plate 12D.E).

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