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Studies on regeneration potential of callus in chickpea cv. ICCV - 2

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For callus induction studies explants i.e., shoot tips hypocotyls and roots were excised from six days aseptically grown seedlings. NAA 2mg/l +BAP 2mg/l was found best among various combinations used for induction of callus. For differentiation of callus BAP 1mg/l + NAA 0.5mg/l treatment combination was found to be the best that resulted in maximum number of shoot lets, for differentiation followed by profuse rooting to the regenerated shoots. For the completely developed plantlets, the maximum survival was observed with the hardening treatment where in the plants were directly transferred into polybags were kept in mist chamber.

Key words : Callus, Chickpea, BAP, NAA.

INTRODUCTION

Chickpea (*Cicer arielinum* L.) is one of the most important pulse crops of India by virtue of its average and production. It accounts for 33 per cent of area and 40 per cent of production. Interspecific hybridization has tremendous potential for breaking yield barriers and broadening genetic base of Chickpea (Sharma *et al.*, 1979). The problem of sexual incompatibility coning in the way of development of interspecific hybrids could be resolved by using tissue culture techniques and that is to go for synthesis of Somatic hybrids which is not difficult when there are well developed conditions for induction of callus and its differentiation to develop whole plants. So unless regeneration protocol in Chickpea becomes available, the fruit of innovative plant biotechnological approaches cannot be reaped.

Thus for media standardization for callus induction from a suitable explants the present investigation Callus induction in Chickpea (*Cicer arietinum* L.) was undertaken.

Conventional breeding methods seem inadequate in genetic improvement of chickpea due to narrow genetic base and sexual incompatibility existing between the relatives of Cicer species. Plant tissue culture techniques such as embryo rescue, protoplast fusion, etc could assist the convention breeding approaches made in the improvement of Chickpea. Also through tissue culture, useful variability could be created and exploited which would enrich the general and could open the mew avenues for improvement in Chickpea .

For efficient utilization of improvement in Chickpea techniques like embryo rescue, protoplast fusion, in vitro pollination & test tube fertilization in any crop, in vitro regeneration of that Species is a prerequisite.

MATERIALS AND METHODS

The experimental material comprised of one Chickpea cultivars ICCV-2 which is main commercial cultivars of Maharashtra state. The study was conducted in Tissue culture Laboratory, Department of Botany, Dr.PDKV, Akola.

Glasswares were first washed in sterile distilled water with soda water solution for two hours then they were rinsed with tap water and dipped in dilute nitric acid overnight. After drying they were sterilized. MS medial was prepared and various composition of MS & B5 medium were prepared alone with supplements of NAA, BAP, KIN. Inoculation was done *in vitro* conditions by growing the seedlings aseptically for induction of Callus. The effect of different treatment combinations on induction of fresh & dry weights of calli produced 25 days after culturing or explants. The calli obtained from shoot tip, hypocotyls & root explant were transferred on differentation media for regeneration. It was followed by rooting on and the plantlets were hardened ultimately.

RESULTS AND DISCUSSION

The calli obtained from shoot tip explant were transferred on differentiation media. B_5 and MS basal media supplemented with different levels of auxins and cytokinins in combination were used for regeneration of callus. After 12-15 days of culturing of calli in

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