

***In vitro* propagational study of a genetic male sterile line of *Capsicum annuum*. L**

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ABSTRACT

In Vitro propagational studies were conducted for a genetic male sterile mutant of *Capsicum annuum*, which possess marker traits and exhibits very good combining ability with several *C. annuum* varieties. This genetic male sterile line yielded promising hybrids with high heterotic values. In Vitro propagation attempts were made by taking apical and axillary buds as an explant. The explants were cultured on modified MS medium supplemented with varying concentrations of auxins and cytokinins. Maximum percentage of shooting for both kind of explants was observed in MS medium supplemented with 3 mg BAP + 1mg IAA/ lit. Maximum percentage of rooting was observed in MS medium having 2 mg NAA +0.5 mg KN/ lit.

Keywords: In Vitro propagation, male sterile line, apical buds, axillary buds, MS Medium, Phytohormones, IAA, KN, BAP, Shooting, Rooting, Paper bridge.

INTRODUCTION

Male Sterile line has immense importance in plant breeding program because of their convenience in avoiding labor intensive activity called emasculation by providing a genetic means. In commercial crop like Chilli, they proved very useful in the production of hybrid seeds in a large scale. A robust, vigorous genetic male sterile mutant with marker traits and good combining ability was isolated from G2 variety of *C. annuum* by Murthy and Lakshmi (1979). The mutant was propagated in to a line. This mutant proved to be of immense use in exploitation of heterosis with both indigenous and exotic pollinator parents. Being a genetic male sterile line the maintenance of male sterility through back crossing is a tedious and time-consuming process. In order to overcome this difficulty and in vitro propagational studies were conducted by taking apical and axillary buds as explants.

MATERIALS AND METHODS

The back crossed seeds were germinated in pots, the three-week-old seedlings were Identified and collected with the help of marker traits. The identified seedlings were transferred to laminar air flow and surface sterilized with 0.1% HgCl₂. The shoot tips and axillary buds were excised and transferred on to paper bridges made up of with Wattmans filter papers mounted in liquid medium. After four weeks the grown-up young shoots were transferred to semisolid MS medium of same composition. For culture MS medium was employed throughout the study. Phytohormones BAP, KN, IAA and NAA were supplemented at different concentrations. 3% Sucrose was added as a carbon source and Bacto Agar of 1 % is used as a gelling agent. A photoperiod of 16 hrs light and 8

hrs dark was maintained. Temperature of 25° C with a variation of 2° C was maintained during the incubation.

RESULTS AND DISCUSSION

In Vitro morphological response of shoot tip and axillary buds to different phytohormonal concentrations and combinations was variable. Because of the initial culture on paper bridges there is no or little callus formation from the explants. When these regenerated shoots were transferred to semisolid medium little callus formation and multiple shoot formation was noticed. Both the explants i.e apical buds as well as axillary buds exhibited the similar morphological response in this aspect. But while culturing on paper bridges the apical buds showed good morphological response compared with the axillary bud (Table 1).

TABLE -1 SHOOTING RESPONSE OF MERISTEMS.

PHTOHARMONE	Kn mg/ lit						BAP mg/lit					
	1		2		3		1		2		3	
	T	A	T	A	T	A	T	A	T	A	T	A
IAA 0.25 mg /lit	NR	NR	S (18%)	NR	S (31%)	S (18%)	NR	NR	S (31%)	NR	S (73%)	S (42%)
IAA 0.5 mg /lit	NR	NR	S (23%)	NR	S (38%)	S (21%)	NR	NR	S (42%)	S (28%)	S (82%)	S (48%)
IAA 1mg /lit	NR	NR	S (26%)	NR	S (36%)	S (28%)	NR	NR	S (48%)	S (31%)	S (85%)	S (49%)

NR= NO RESPONSE, S = SHOOTING, T = TERMINAL BUD AND A = AXILLARY BUD.

TABLE -2. ROOTING RESPONSE OF REGENERATED SHOOTS.

PHYTOHARMONE	IAA mg/lit			NAA mg/lit		
	1	2	3	1	2	3
KN 0.25 mg/ lit	C	R (42%)	R (58%)	R (62%)	R (78%)	R (89%)
KN 0.5 mg/ lit	C	R (38%)	R (63%)	R (72%)	R (87%)	R (48%)
KN 1 mg /lit	C	R (45%)	R (54%)	R (78%)	R (94%)	R (92%)

C= CALLUS, R = ROOT

Maximum percentage of shooting was observed on medium supplemented with 3 mg BAP + 1 mg IAA /lit. The earlier workers Sadhana Agarwal (1988) Jin and Mingwang (1990) proposed 5mg BAP+ 1mg IAA/ lit and 2.5 mg BAP +1 mg IAA / lit respectively as best shooting supplement. Bahatee et al (1994) worked with four varieties of *C. annuum* and suggested four different media supplements 4mg BAP+0.5 mg IAA/ lit for variety Agni, 6mg KN+ 0.5 mg IAA/ lit for variety Jwala, 5mg BAP + 0.5 mgIAA/ lit for variety Tej and 6 mg BA +0.5mg IAA / lit for variety G4.

CONCLUSION

The regenerated shoots, both from apical buds as well as axillary buds shown similar response in rooting medium. The rooting response of shoots cultured on paper bridges in liquid medium and shoots obtained from subcultured on semisolid medium are also not shown any variation in rooting response. Profused rooting was observed in medium supplemented with 1mg NAA /lit. Bahatee et al (1994) proposed 0.5 mg IAA/ lit or 0.5 mg IBA / lit as best supplement for root induction.

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Conflict of Interest: The authors declare no conflict of interest in relation to this research.

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