RESEARCH ARTICLE

Evaluation of *in Vitro* Salt Tolerance in Medicinally Important Legume

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Manuscript details:

Date of publication 18.10.2014

Available online on http://www.ijlsci.in

ISSN: 2320-964X (Online)
ISSN: 2320-7817 (Print)

Editor: Dr. Arvind Chavhan

Cite this article as:
Tiwari Punita (2014) Evaluation of *in Vitro* Salt Tolerance in Medicinally Important Legume, *Int. J. of Life Sciences,* Special Issue, A2: 185-187.

Acknowledgement
Author is grateful to D.K. Burghate, Principal, Shivaji Science College, Nagpur, for facilitation and Prof. Y.K. Bansal, Dept of Biological Sciences, R.D. University, Jabalpur, for guidance.

ABSTRACT

The use of saline water for irrigation has been reported. Much research has been done on the effect of irrigation with low quality matter on saline tolerant species, little is known about the salinity tolerance of legume plant. Despite the wide range of medicinal use of *Psorelea. corylifolia*, the plant has not received much attention. The present work has been taken up to evaluate *in vitro* salt tolerance capability of callus and its response to organogenesis with different cones of salt. The results revealed highest, 93% per cent of shooting in 25 mM salt conc. with 10 mg/l BAP alone; 5 mg/l BAP in combination with 2.5 mg/l. NAA induced 90% shooting with 50 mM salt conc. In 25 & 50 mM salt conc. the callus was appeared white & light green in color and soft & friable in texture with shoot buds and good viability. Tolerance for salt in explants of *P. corylifolia* was reported highest at low salt conc. i.e. 25 mM & moderate at 50 mM . Salt tolerance level declined with increased in salts conc.

Key words: Salt tolerance, organogenesis response, friable, callus, *Psorelea corylifolia*

INTRODUCTION

Plants of the family Leguminosae are not only a source of proteinaceous human food to the predominantly vegetarian population (Kochar, 1981) but they are also having potent medicinal value and used in indigenous medicines by tribal people. Plant growth is greatly influenced by various environmental factors such as temperature, light, water and nutrient availability (Rajam, 1997).The limited mater resources in arid & semiarid areas form a major constraints for socio economic development. (Hamdy *et al*., 2002).The use of saline water for irrigation has been reported by (Katerji et.al 2001). Much research has been done on the effect of irrigation with low quality mater on saline tolerant species, a little is known about the salinity tolerance of legume plant. *Psorelea corylifolia* L commonly known as '*Babchi*', an erect annual important medicinal plant of Leguminosae widely distributed in the tropical and subtropical regions (Jain, 1994). It is used as anthelmintic, laxative, diuretic and diaphoretic in febrile conditions.

Despite the wide range of medicinal uses of *P. corylifolia*, the plant has not been fully studied. There is pressing need to make plants more tolerant to such conditions and improvement of salt tolerance in *vitro*. Therefore, the present work has been taken up to evaluate in vitro salt tolerance capability of callus and its response to organogenesis with different conc. of salt.

MATERIAL AND METHOD

Seeds of *Psorelea corylifolia*, obtained from local medicinal plant agency, were surface sterilized with aqueous solution of 0.1% mercuric chloride for 1 min and then rinsed with sterile distilled water for 4-5 times. The seeds were allowed to germinate on sterile moist blotter paper in Petri plates as well as in sterile moist cotton in flasks at 22-25°C temperature in dark. Hypocotyls and leaf explants were excised from 3 to 4 days old seedlings and placed aseptically on sterile solidified MS medium containing 2% sucrose; 0.8% agar and different conc. of salt solution (25 mM, 50 mM, 75 mM and 100 mM) to test salt tolerance and also effect of growth regulators to check the growth along with salt. Cultures were maintained under white fluorescent light with light /dark cycle of 16 hrs/8 hrs at 25± 2°C. MS Media containing various conc. of salt (25 mM- 100 mM) and different combinations of growth regulators (NAA, 2,4-D, BAP, 0.5 – 10 mg/l) was tested to report the effect of salt conc. on growth and callus in response of *P. corylifolia*.

RESULT AND DISCUSSION

MS medium containing various conc. of salt (25 mM – 100 mM) and diff. concs .and combinations of growth regulators (NAA, 2, 4-D, BAP, 0.5 – 10 mg/l) were taken to observe the effect of salt concs. on organogenesis and caullogenesis in *P. corylifolia*. Highest, 93 per cent shooting was observed in 25 mM salt conc. with 10 mg/l BAP alone.5 mg/l BAP in combination with 2.5 mg/l. The seeds receiving treatment of NAA had 90% shoot response with 50 mM salt conc. Rhizogenesis was observed in callus when media was supplemented with 5 mg/l IBA and 25 mM salt conc. (77%) while lower conc. of IBA alone i.e. (0.5 – 2.5 mg/l, no rooting was observed in callus (Table 1). When callus with shoot buds & regenerated shoots were sub-cultured on media augmented with 5 & 10 mg/l IBA 78- 84% of shoots exhibited rooting. Callus also showed variation in its texture & friability. The results indicated that, in 25 & 50 mM salt conc. the callus was appeared white & light green, soft and friable with shoot buds and good viability. With 75 to 100 mM conc. of salt, the callus appeared light to dark brown, hard and exhibited no viability (Table-1).

The primary growth rate of the callus was slightly affected at a low salt conc.i.e.50mM. However, this effect increased with increasing salt conc i.e. 75 – 100 mM where no shooting was observed and callus produced were also not viable. These results confirmed with earlier findings (Katerji *et al*., 2001; Gandour, 2002; Leskeys *et al*., 1999).

Table 1: *In vitro* response of hypocotyl explants of *P. corylifolia* after 25 days in different salt conc.

Salt conc. (mM)	GR (mg/L)	% Conc	texture	%S
25mM	5BAP/2.5NAA	98	W,F	82
	1 2,4-D/10 BAP	92	W,S,F	58
	1NAA	86	W,S	85
	10BAP	67	G , S	93
50mM	5BAP/2.5NAA	95	W,S,F	90
	12,4-D/10BAP	90	W,F	28
	1NAA	80	W,F	45
	10 BAP	47	G,F	82
75mM	5BAP/2.5NAA	77	Lb, F	-
	12,4-D/10BAP	80	Lb,H	-
	1NAA	45	Lb,,H	-
	10 BAP	36	Lb,,H	-
100mM	5BAP/2.5NAA	22	DB, H	-
	12,4-D/10BAP	25	DB, H	-
	1NAA	20	DB, H	-
	10 BAP	13	DB, H	-

Growth of shoot response and rhizogenesis at higher salinity level was almost negligible. This result is in confirmation with the finding of Hoffman *et al*., (1997) and Mac Adam *et al* (1997). Tolerance for salt in explants of *P. corylifolia* was reported highest at low salt conc. i.e. 25 mM & moderate at 50 mM and as the salt conc. increased it exhibited almost negligible tolerance level. It may be due to cellular dehydration caused by higher conc. of salt as reported in past by several workers (Bartels and Nelson, 1994). Interaction between growth regulators and salt conc. can have synergistic and antagonistic effect on cell growth (Thomshow, 2001).

CONCLUSION

Tolerance for salt in explants of *P. corylifolia* was highest at low salt conc. i.e. 25 mM; moderate at 50 mM and as the salt conc. increased it exhibited almost negligible tolerance level. It is concluded that the use of *in vitro* technique to estimate salt tolerance in legumes is an efficient system but still more investigations is in urgent need in this regard.

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