ORIGINAL RESEARCH PAPER

Volume-7 | Issue-4 | April-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

IN VITRO STUDIES IN PROSOPIS JULIFLORA (SW) D.C., A FIREWOOD SPECIES

Botany

R. Somashekhar* Azyme Biosciences Private Limited, Jayanagar, Bengaluru, Karnataka, India. *Corresponding Author

ABSTRACT

Potential plant species Prosopis juliflora has been subjected for tissue culture studies, which include, callus induction and micro propagation. Successful induction of callus was done on MS medium supplemented with IAA (3.0 mg/l), GA (2.5 mg/l) and Kin (3.0 mg/l), for micro propagation on Ms medium with IAA (0.2 mg/l) and Kin (3.0 mg/l). The protocol was established by using various explants with media modification. The results are useful for further application for rapid multiplication of the species.

KEYWORDS

Callus, micro propagation, MS medium, Prosopis juliflora

Introduction

A potential firewood species Prosopis juliflora (SW) D.C., of arid region serves mainly as fuel wood, its leaves and fruits as animal feed and green plants as living fence and shelter [1]. The plant is hard, drought and slat resistant, useful sand binder and established its identity as a fast growing species for reclamation of degraded and wastelands. In the present investigation, in-vitro protocol was established for callus and micro propagation. There are earlier few attempts to undertake tissue culture work in this species [2, 3], but with limited success and utility.

Materials & Methods

Basic medium [4] have been used with different explants for culture studies. The different explants like root and stem tips, hypocotyls, cotyledon, leaf, apical meristem and flower buds were used for root and multiple shoot production. The details of methodology and instrumentation are reported earlier [5].

Results

The hypocotyls explant from aseptically grown 8-12 days old seedlings responded well for early callus induction. In addition to MS medium the modified MS (MS medium +170 mg/l NaH PO)-MMS was found to be better for callus induction using explants as flower bud. The overall results are recorded in table 1.

TABLE 1. EFFECT OF DIFFERENT MEDIUM COMPOSITION OF CALLUS INDUCTION IN PROSOPIS JULIFLORA.

Medium	Growth Harmones (mg/l)					
	Auxin			Cytokinin		Explant
MS	2,4-D	IAA	GA	BAP	Kn	
	2	3	2.5			Hypocotyl
	2	1	-	2		Hypocotyl
MMS	2	-	-	-	2	Flower Bud
	0.5	-	-	-	2	Flower Bud

The multiplication of shoot propogules done on MS medium. The nodal segments from 4-6 years old tree were washed thoroughly with tap water , followed by surface sterilization with 70 % alcohol for 3-5 minutes and 2-3 wash in sterile distil water was done before inoculation. The inoculated explants were incubated at 26° ± 2° C with 16hour light (incandescent and fluorescent 3:1, 2500 lux at culture level) and 8hour dark with 60% relative humidity. MS medium and MMS medium for successful callus by using hypocotyls and flower bud for callus, found more better in MS medium with IAA (3.0 mg/l), GA (2.5 mg/l),whereas for multiple shoot MS medium with IAA (0.2 mg/l) and Kinetin (3.0 mg/l). The callus induction was observed after 15-20 days of inoculation. The browning of callus due to accumulation of polyphenols was avoided by frequent subcultures supplemented with 2 % activated charcoal in the basal medium.

Discussions

There are very scanty reports on tissue culture studies in Prosopis juliflora. The literature survey reveals micro propagation studies [6, 7], regeneration of shoots from nodal explants [3], callus induction have been reported [2, 8]. However the basal medium composition developed during present investigation is better for induction of friable callus and its further subculture.

The present investigation has helped in establishing tissue culture technique for P. juliflora . The work will be extended further for selecting fast growing, stress tolerant, high calorific variants and for multiplication of elite eco types.

References

1. Annonymous. Tropical legumes. Resources for the future (National academy of Sciences, Washington, DC), 1979.
2. Nandwani D, Ramawat KG. Callus culture and plantlets formation from nodal explants of Prosopis juliflora (SW) DC. Indian J of Experimental Biology. 1991;29(6):523-527.
3. Yao D, Batchelor CA, Koechler MJ, Harris PJC. In-vitro regeneration of Prosopis species (P. chilensis, P. cinneraria and P. juliflora) from nodal explants. Chin. J of Bot. 1989;1:89-97.
4. Murashige T, Skoog F. A revised medium for rapid growth and bioassays with tobacco tissue culture. Physiol Plant. 1962;15:473.
5. Naik GR, Harinath babu K, Lingappa. Studies on in-vitro selection of Fe efficient cell lines in sugarcane. Plant and Soil. 1990;129:183-186.
6. Wainright H, England N. The micropropogation of Prosopis juliflora (SW), DC. establishment in-vitro. Acta Horticulturae. 1987;212:49-53.
7. Ramawat KG, Dilip Nandwani. Propogation of Prosopis species, problem: preservence and perspectives. Annals of Arid Zone. 1991;30(3):247-258.
8. Somashekhar R. Physiological studies in firewood crops. PhD thesis. Gulbarga University, Gulbarga, 1994.