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Biotechnological Applications In vitro production from Axillary bud explants of Luffa acutangala (L) – A Vegetable crop plant

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ABSTRACT: Recent development in MS media with different levels of BAP, NAA, L Glutamic acid, IAA, Kn. The effect of growth regulators on important parameters of callus initiation and plant regeneration M. Venkateshwarlu (2020) Rao et al (1995) Vasil (1980), Kartha (1981), Skoog F (1944). Addition of BAP at 2.0 mg/l and NAA at 3.0 mg/l to the MS basal medium, induced regeneration from the leaf segments. With an increase in the level of BAP Kn, IAA 2.0 – 3.0 mg/l the percentage of explants producing shoots also increased Punga et al (1990) . The number of shoots developed on the axillary bud explants ranged from 1-4 to 2-3 by the addition of BAP at a concentration of 1.0 mg/l or NAA at 2.0 mg/l. Among the concentrations of 0.5 mg/l BAP proved to be ideal for multiple shoot induction. MS medium fortified with 1.0 mg/l BAP or 2.0 mg/l L-Glutamic acid also induced shoot buds on Axillary bud explants. Gupta et al (1983), M. Venkateshwarlu (2020) Komalavalli et al (2000) In vitro production in crop plants axillary bud multiplication Martin (2002).

Key words: In vitro production, Axillary bud explants, BAP, Kn & IAA

I. INTRODUCTION:

Modern technologists and fast developing industrial sector neither available nor affordable for this large section of the population. Axillary buds from pumpkin were reported by Jelaska (1974) M. Venkateshwarlu (2008). In the present paper, a simple and reproducible procedure was devised to obtain multiple shoots from Luffa axillary bud explants on MS medium fortified with plant growth regulators along with coconut milk and amino acids. The main objective of clonal propagation is to establish plants that are uniform and predictable for selected qualities. In vitro production Solanum SPS M Venkateshwarlu (2012). Most of these are scattered widely throughout tropical and sub tropical regions.

II. MATERIALS AND METHODS

The explants were surface sterilized using mercuric chloride solution containing few drops of Tween-20 for 2-4 min followed by rinses in sterilized double distilled water. Axillary bud explants of 1.0 – 1.5 cm length were cultured and surface sterilized with 0.1% $HgCl_2$ for 4-6 minutes and rinsed with sterile distilled water. They were cultured on MS medium supplemented with various levels of BAP, Kn and IAA was tested development of regenerative system involves use of plant material sterilization obtained from selected Axillary bud explants. These explants were washed under running tap water in common laboratory detergent for 15 minutes then the outer explants axillary buds were removed one by one and when last two nodes remained the surface sterilization containing 2.5% sucrose and 0.8% Agar-Agar. The pH of the medium was adjusted to 5.8 and later was autoclaved at 120^0C for 17 minutes. Cultures were incubated under 16 hrs illumination (250 lux) at 25 ± 2^0C temperature. The processed explants subjected to two hour running tap water washing prior to sterilization.

III. RESULTS AND DISCUSSION

This concentration facilitated development on an average 4-6 new sgoots per culture supplemented MS medium fortified with various cytokinins i.e., BAP, Kn, IAA & NAA also had a role in triggering the formation of multiple shoots. The mean number of shoots developed on the leaf segments ranged from 1-2 to 2-4 by the addition of different concentrations of BAP and IAA (Table 1). Raising the level of BAP (2.0 mg/l to 3.0 mg/l) resulted in an increase in the percentage of shoots developed from leaf segments. There was no significant increase in the number of shoots on NAA at low and high concentrations. MS medium supplemented with 10, 15, 20% of coconut milk also triggered the induction of multiple shoots. Low concentration of L-Glutamic acid (0.5 – 2.0 mg/l, along with BAP (1.0 mg/l, produced significant mean number of multiple shoots that

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ranged from 2-3 to 5-6 in the axillary bud explants. Shoot multiplication was obtained form shoot apices of Niger when cultured on MS medium supplemented with 1.0 to 3.0 mg/l BAP, Kn, IAA and L-Gltamic acid. Raising the level of BAP (1.0 to 2.0 mg/l) resulted in an increase in the number of shoots from axillary bud explants of Niger. A transfer of cultures to auxin-cytokinin supplemented MS medium facilitated elongation of callus with shoots. In brief present efforts on selected axillary bud explants led to the limited success in these Luffa acutangula species. Recent development in molecular biology and genetic transformation however, have made it possible to identify isolate and transfer desirable genes in in vitro crop production plant let regeneration from Biotechnological Applications subjected to varying concentrations of natural and synthetic phytohormones in combinations.

TABLE 1: Biotechnological Application in vitro production of Luffa acutangula (L)

Growth Regulators	Axillary bud explants	
	% frequency of shoots	Response of Callus shoots
MS + 0.5 mg/l BAP + Kn	20	Green callus
MS + 1.0 mg/l BAP + Kn	30	Green callus with shoots
MS + 2.0 mg/l BAP + IAA	25	Callus + shoots (1-3)
MS + 3.0 mg/l BAP + IAA	20	shoots (3-4)
MS + 0.5 mg/l NAA + BAP	15	callus
MS + 1.0 mg/l NAA + L-Glutamic acid + BAP	20	Green callus
MS + 2.0 mg/l NAA + L-Glutamic acid + BAP	25	Callus with shoots (2-6)
MS + 3.0 Mg/l NAA + L-Glutamic acid + BAP	22	shoots (2-4)
MS + 4.0 mg/l NAA + L-Glutamic acid + BAP	30	shoots (2-3)

IV. CONCLUSION:

The development of suitable reproducible technology that the improvement programs can be taken up through tools of genetic engineering obtained from mature crop plants are recalcitrant to regenerate and inherent problems like contamination and browning are associated with these explants. In want of basic tissue culture regeneration protocols, work on protoplasts culture the axillary bud explants with an increase in the hormonal concentrations.

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Plate1. Biotechnological Application in vitro production of Luffa acutangula (L)

REFERENCES

[1]. Gupta P.K. G. Timmis, M Carlson and Wetty E (1993) Forestry in 21st century. Biotechnology of Somatic embryogenesis Biotechnology, 11: 454-459.

[2]. Cheng, T. Saka, H & Voqui-Dinh, T. (1980). Plant regeneration from Soybean cotylenodary node segments in culture. Plant. Sci. Lett. **19:** 91-99.

[3]. Jelaska, S. (1974). Embryogenesis and organogenesis in pumpkin explants. Physiol. Plant. **31**: 257-261.

[4]. Komalavalli N and Rao MV (2000) In vitro micro propagation of crop plants and medicinal important plants Gynema sylvestre plant tissue organ culture. 51. (2): 97-105.

[5]. Martin KP (2002) Rapid micro propagation of Holestemma asa-kodien Scgutt. Agri medicinal plant through axillary bud multiplication and indirect organogenesis plant cell RTep. 21(2): 112-117.

[6]. M Venkateshwarlu (2008) Efficient protocol for the in vitro production of Zizyphus martiana L Plant Archives Vol.8 pp: 115-117

[7]. Venkateshwarlu m (2020) Potential and limitations of nodal explants in vitro production of Solanam SPS Vol.15 Iss-05 Spt-Oct 2020 pp: 36-38.

[8]. Mao A Wetty A Iay M (1995) In vitro propagation of Clerodendron SPS plant cell Rep.14: 493-496.

[9]. Skoog F (1944) Growth and organ formation in Tabacco tissue cultures AM .J. Bot. 31: pp-1924, Vasil IK (1980) Isolation and culture of protoplasts Int. Res. Cytol (Suppl) 11B : 1-8.

[10]. Kartha K K (1981) In plant tissue culture methods and Biotechnological applications in agriculture. Thrope T.A. (ed) Acad press. New York pp. 181-211.

[11]. Punja SK, Tang TA and Sarmento G G (1990) Isolation culture and plantlet regeneration from cotyledon and axillary bud explants of cucumber plant cell reports 9: 61-64.

[12]. Venkateshwrlu M, Ugender T, N Raju, BV Kanna (2017) Studies on phytochemical analysis and biological activities in momoridica the plant Inno. J. Vol.06 Iss 12 pp: 437-440.

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