International Journal of Scientific Engineering and Applied Science (IJSEAS) – Volume-6, Issue-10, October 2020
ISSN: 2395-3470
www.ijseas.com

In Vitro Multiplication from Stem node Explants of *Trichosanthes anguina L*. A Medicinal important Plant.

Mandaloju Venkateshwarlu
Department of Botany, Kakailya University , Warangal - 506 009. Telangana, India.
Email: drvenkat6666@gmail.com.

ABSTRACT

Multiplication of genetically identical copies of a cultivar by asexual reproduction is called clonal propagation and a plant population derived from a single individual by asexual reproduction constitutes a clone. In nature, clonal propogation occurs by apomixis (seed development without meiosis and fertilization) and/or vegetative reproduction (regeneration of new plants from vegetative parts). MS basal medium supplemented with various Auxons/Cytokinins BAP and NAA.Coconut water also had a rolein triggering the formation of mult1ple shoots. Addition of BAP at 3.0 mg/l and NAA at 2.0 mg/l to the MS basal medium, induced regeneration from the Stem node segments. With an increase in the level of BAP 2.0 - 3.0 mg/l the percentage of explants producing shoots also increased. The number of shoots developed on the stem node segments ranged from 1-4 to 2-3 by the addition o BAP at concentration of 2.0 mg/l or NAA at 2.0 mg/l. Among he three concentrations of coconut milk used i.e, 6, 10 and 15% of coconut milk along with 0.5 mg/l BAP proved to be ideal for multiple shoot induction. MS medium fortified with 2.0 mg/l BAP 1.0 mg/l L-3.0mgl/l Kn or 3.0 mg/l L-G Glutamic acid also induced shoot buds on Stem node segments. Regeneration shoots from Stem node explants of callus and *In Vitro* multiple shoots were obtained on MS Medium within BAP, NAA, L-Glumatic acid and Kinetin , Coconut milk (CM). High frequency plant regeneration from leaf explants of *S. Nigrum* by Ugander *et al* (2010) Callus induction and base explants of *Aloe vera* R. Prasad, Venkateshwarlu M *et al* (2018).

Keywords : Stem node Explants, L-Glutamic acid, BAP, *Trichosanthes anguina* L, NAA

INTRODUCTION

Since most fruit trees and ornamental plants are highly heterozygous their seed progeny is not true to type. Asexual reproduction, on the other hand, gives rise to plants which are genetically identical to the parent plant and, thus, permits the perpetuation of the unique characters of the cultivars. In the present paper, a simple and reproducible procedure was devised to obtain multiple shoots from Stem node segments of *Trichosanthes anguina* L 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. Growth or *in vitro* propagated plants is often stronger than in those cloned *in vitro* phyto chemical analysis and biological activities inmomrdica Venkateshwarlu *et al* (2011). The plants of Cucurbitaceae suffer from several diseases including the water melon mosaic virus Wayne *et al* (2011) Cucumber green mottel mosaic virus Wayne *et al* (2011) and *Solanum nigrum* also suffers from downy and powdery mildews which seriously limits the crop production. Axillary buds from pump- kin were reported by Ugender *et al* (2019) & Rathore (2010).

MATERIAlS AND METHODS

The explant material is then surface sterilized, usually in multiple courses of bleach and alcohol washes and finally rinsed in sterilized water. This small portion of plant tissue, sometimes only a single cell, is placed on a growth medium, typically containing sucrose as an energy source and one or more plant growth regulators (plant hormones). They were cultured on MS medium containing 2.5% sucrose and 0.8% Agar- Agar and different concentrations or BAP. NAA and L-Glutamic acid Stem node sgments of Trichosanthes were cultured and surface sterilized with 0.1% HgCl for 5-6 minutes and rinsed with sterile distilled water. Cultures were incu- bated under 16 hrs .illumination (250 lux) at 25± 2°C tempera- ture.Each treatment consisted of 10-15 replicates. The data was recorded at the end of eighth week in vitro propagation of Zyzlus Sudhershan et al (2000) cloning protocol Campstrini (2006). The pH of he medium was adjusted to 5.8 and later was autoclaved at 120 °C for 17minutes. Rajendraprasad, Venkateshwarlu M (2018) experimental mutagenesis on cicer tissue culture studies stem node explants, multiple shoots in cucumis Venkateshwarlu M (2019) and (2020).

RESULTS AND DISCUSSION

The medium is sterilized during preparation to prevent fungal and bacterial contamination, which can outgrow and smother the growing explant. Autoclaves and filter sterilization are used to remove potential contaminants; under smaller scales of production a pressure cooker is often used.The plant tissue grows and differentiates into new tissues depending on the medium. For example, media containing cytokinins are used to create branched shoots from plant buds.The results of the study have shown the initiation of shoot buds and formation of multiple shoots from Stem node segments. Addition of NAA failedlo produces many shoots, but enlarged theleaf segments. Lower levels of coconut milk (4 & 8%) induced callus formationLeaf explants were inoculated on MS basal medium fortified with various Auxins cytokinins i.e., BAP and NAA. Coconut water also had a role in triggering the format on of multiple shoots Kanna *et al* (2005) *In Vitro* micropropagation *Solanum nigrum* Ram *et al* (2002). The mean number of shoots developed on the stem node segments ranged from 1- 4 to 2 - 3 by the additionof different concentrations of BAPand NAA the level of SAP (3.0 mg/l to 4.0 mg/l) resulted in anincrease in the percentage of shoots developed with 10, 15, 20% of coconut milk also triggered the induction of multiple shoots (Plate I). Low concentration of L- Glulamic acid (0.5 - 3.0 mg/l, along with SAP (1.0 mg/l, produced significant mean number of multiple shoots that ranged from 2-3 to 5-Sin the stem node segments. Shoot multiplicalion was obtained form stem node explants cultured on MS Medium supplemented with 1.0lo 3.0 mg/I BAP.Raising the levelof BAP (0.5 to 2.0 mgn) resulted in an increase in the numberof shoots from stem node segments of *Trichosanthes anguina* L suggestedthat the forma- tion of multiple shoots at the stem node regionof the stem node of soyabean indicated the existence of totipolencyin this regionwhich can be activated with the addition of BAP. (Table-1)

(Plate-I) In the final stage of plant micropropagation, the plantlets are removed from the plant media and transferred to soil or (more commonly) potting compost for continued growth by conventional methods. This stage is often combined with the "pretransplant" stage. Tissue culture has become a popular method for vegetative propagation of plants. The most significant advantage offered by this aspectic method of clonal propogation, popularly called ‘micropropagation’, over the conventional methods is that in a relatively short time and space a large number of plants can be produced starting from a single individual. For orchids, micro propogation is the only commercially viable method of clonal propagation

Table-I Muliple shoots from Stem node explants of *Trichosanthes anguina* L

Growth Regulators	Stem node Explants	
	% Frequency of Shoots	Mean no. of Shoots
MS + 0.5 mg/l BAP + Kn	**45**	**Callus**
MS + 1.0 mg/l BAP + Kn	**40**	**Callus**
MS + 2.0 mg/l BAP + NAA L-Glutamic acid	**35**	**Shoots (2-4)**
MS + 3.0 mg/l BAP + NAA L-Glutamic acid	**30**	**Shoots (2-3)**
MS + 0.5 mg/l NAA + Kn+CM	**22**	**Callus+ Small buds**
MS + 1.0 mg/l NAA + Kn+CM+L-Glutamic acid	**20**	**Callus + Small buds**
MS + 2.0 mg/l NAA + Kn+CM+L-Glutamic acid	**25**	**Shoots (2-4)**
MS + 3.0 mg/l NAA + L-Glutamic acid	**20**	**Shoots (4-6)**
MS + 4.0 mg/l NAA + L-Glutamic acid	**20**	**Shoots (2-4)**

Plate-I M**uliple shoots from stem node explants of** *Trichosanthes anguina* L**.**

Conclusion:

The technique developed by Morel was rapidly adopted by orchid growers because of its tremendous practical applications. Today, tissue culture is the most popular method for clonal propagation of a Medicinal important Plants.

REFERENCES:

1. Kanna T.M.S., SM Nagarajan and S. Kulothungan (2005). Micropropagation of *Solanum nigrum* L a medicinal herb plant Archies: 609-305.

2. Rathore, MS and Shekawat N.S. (2010*). Ex Vivo* implication of Phytohormonous on various *in vitro* responses in *Leptadenia reticulata* (Retz) night Am-An endangered plant Envi. Exp. Bilogy 49: 215-220.
3. Sudarshan L, Aboel MN and hussain J (2000). In Vitro propagation of *Ziziplus maritiana* cuctivar umrdu by shoots tip and nodal multiplication. Curr. Sci. 80(2) 290-292.
4. Waynem, Watt JM and MG. Breyer-Brandwijk (2011) *Solanum nigrum* L in the medicinal and poisonous plants of Southern and Eastern Africa. PP-996-1000.
5. Venkateshwarlu M, N Raju Odelu G, Srilatha T, Ugender T (2017). Studies on phytocvhemical analysis and bilogical activities in *Mamordica dioica* Roxb through Fruit. The pharma Innovations and Journal 6(12) 437-440.
6. Ugender T Venkateshwarlu M Anitha Devi U Srilatha T and Prameela K (2019). In Vitro plantlet regeneration from Cotyledonary explants of Solanum torvum (Swartz) a medicinal important plant. International multi disciplinary E – Research Journal PP – 99-106.
7. Rajendra Prasad, Venkateshwarlu m, Rajesham and N Raju (2018). High frequency callus induction from shoot base explants of *Aloe Vera* (L) Burm F An Important plant, medicinal plant European Journal of Bio-Medical & Pharmaceutical Sci. Vol. 5 Issue-01. PP. 363-373.
8. Ugender T Shekar GPV and Manjula P (2010). High frequency plant regeneration from leaf explants of *Solanum nigrum* advances in plant Sci. 23(1) 15-17.
9. Rao C.S. Eganathan P Anand A, BalaKrishna P and Reddy TP (1998) protocol for in vitro propagation of *Excocaria agallocha* a medicinal important plant Mangrove Sps. Plant Cell Rep. 17: 861-865.
10. Ram D, Kalloo G Banerjee M.K. (2002). Popularing Kakrol and Kartolo. The indiegenous nutrition S vegetables Indian Hort. Vol. 9: 6-9.
11. Rajashekaran S, Sivaghanam K and Subramanian S (2006). Modulatory effect of *Aloe vera* leaf get extraction oxidative stress in rats treated with sterptosotocin J Pharma and Phamacol 52(2) 241-246.
12. Campestrini Ach, Kuhnen S Lemos M (2006). Cloving protocol of *Aloe vera* as study case for the Tailormade biotechnology to small farmers J. F. Tech Management and Innovation 1(5) 76-79.
13. Mandaloju Venkateshwarlu (2019). Tissue culture studies callus treatment on stem node explants of *Citrullus valgaris* L perpex Indian Journal Research Vol. (8) ISS-12 No 2280-1991.
14. Rajendra Prasad Venkateshwarlu M Odelu G B Madan Mohan and Bapu Rao M (2018). Studies on experimental Mutagenesis on chick pea (*Cicer aritinum* L Induced by UV rays and EMS Ejbps Vol.5 ISS-08 pp 506-511
15. Mandaloju Venkateshwarlu (2020). Hormonal Differentiation and plantlet regeneration from stem node explanats of *Cucurbita maxima* (L) - Avegetable crop plant. International Journal of Innovative Science, engineering & Technology. Vol. 07, Issue-98, August 2020. PP-187-190.