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IN VITRO PROPAGATION OF AGLAONEMA (*AGLAONEMA COMMUTATUM*)

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ABSTRACT: The present investigation "*In vitro* propagation of Aglaonema (*Aglaonema commutatum),* was undertaken to identify suitable media combinations for in vitro propagation of Aglaonema. The mother plant of Aglaonema was collected from Mauli Hitech Nursery, Solu, Tal.Khed, Dist.Pune. The nodal explants were initiated on MS media with 3% sucrose, 8gm Agar fortified with different concentration of BA and NAA (3.0, 0.5+2.5, 1.0+2.0, 1.5+1.5, 2.0+1.0 mg/l) respectively. After four weeks of inoculations it was observed that MS media supplemented with 1.0 mg/l BA + 2.0 mg/l NAA gives best result with 80% initiation. MS media supplemented with 4.0 mg/l BA + 1.0 mg/l NAA was found to be most suitable for shoot multiplication i.e. average 3 shoots per bottle. MS media supplemented with 0.5 mg/l IBA + 0.25 mg/l NAA was found to be most suitable for rooting i.e. average 5 roots per explants. Thus, the nodal explant of Aglaonema can be effectively used for the *in vitro* propagation.

Keywords: Aglaonema, MS media, BA, NAA, IBA.

1. INTRODUCTION

Aglaonema commutatum, belongs to the family Araceae, which commonly known as aroids, it has more than three thousand species that are mostly herbaceous either as terrestrial, aquatic, or epiphytic (Mayo *et al.*, 1997; Brown, 2000). The genus *Aglaonema* is comprised of 21 species which inhabit humid and heavily shaded forests of many territories of Asia (Chen *et al.*, 2003). Aglaonema is an ornamental plant important in interior landscaping due to its attractive brightly colored leaves. Aglaonema has been produced as a foliage ornamental plant due to its attractive foliage, easiness to grow and tolerance to low light conditions and low relative humidity (Henny, 2000; Chen *et al*., 2002). The rooting of its cuttings and division of basal shoots are the basic methods of propagation since non-simultaneous flowering and short life span of the pollen make sexual reproduction difficult.

Adoption of *in vitro* propagation has reduced the time-spanned for plant introduction and new cultivar release. Using micropropagation techniques, a new cultivar can be improved quickly enough to reach commercial production levels (Henny and Chen, 2003). It has been principally effective mainly due to

difficulty of establishing sterile culture (Chen and Yeh, 2007), low rate of shoot multiplication (Zhang *et al*., 2004), and lack of detailed methodological information on *invitro* propagation technique (Mariani*et al*., 2011).

Need of propagation of Aglaonema : The non-simultaneous flowering and short life cycle of the pollen make the sexual reproduction difficult, so most of Aglaonema sp. has been propagated by cutting the rooting part, from nodes, or shoot basal division as the basic method (Barakat and Gaber, 2018).

Micropropagation technique are advanced vegetative propagation technique for producing a large amount of uniform and pathogen-free transplants in a short period of time and limited space, decreases greenhouse space needed for stock plant production and provides growers with lines of tissue-cultured plantlets grown in cell plug trays on a year-round basis (Chen and Henny, 2008).

MATERIALS AND METHODS

Source of explant and sterilization : The Axillary shoots explants were collected from Maulihitech nursery, Solu and bought to the tissue culture laboratory. These explants were thoroughly washed under running tap water for 5-6 times. Thenthe explants were washed with few drops of Tween 20 for 15 min. Then they were treated with 0.5% Bavistin for 4 minutes followed by washing with 70% ethanol for 15 sec in laminar air flow. Finally it was treated with 0.1% mercuric chloride for 1 min. Then it was thoroughly washed with sterile distilled water for 4-5 times before inoculation. Finally the explants were dried using the sterilized tissue paper.

Initiation stage and culture conditions: The surface sterilized nodal explants were inoculated on the MS media supplemented with different combinations of BA and NAA.All the inoculated cultured bottles were incubated at 25 ± 2 ºC temperature for 16 hours light (2000-3000 lux) and 8 hours dark period.

Shoot initiation and multiplication and rooting: After four weeks of the growth cycle, established cultures were subjected to different media concentrations of BA and NAA for multiplication. The shoot initials obtained from the *in vitro* established cultures were subjected for multiplication. The shoot number per explants varied under various cytokinin and auxin concentration. After successful shoot multiplication, the explants were transferred to rooting media supplemented with varying concentrations of IBA and NAA.

RESULT AND DISCUSSION

The shoot initiations were obtained after 4 weeks of culture inoculation. The best result was obtained on MS medium supplemented with 1.0 mg/l BA + 2.0 mg/l NAA.

Table 1:Effect of different concentration of BA & NAA on culture initiation of Aglaonema after four weeks

Sr. No	MS Media + BA + NAA (mg/l)		Total no. of explants inoculated	Total no. of explants shown growth	Rate of Survival in %
	BA	NAA			
1.	0.0	3.0	20	10	50
2.	0.5	2.5	20	14	70
3.	**1.0**	**2.0**	**20**	**16**	**80**
4.	1.5	1.5	20	12	60
5.	2.0	1.0	20	10	50

The explants which successfully grown on the initiation medium were then subjected to multiplication medium supplemented with combinations of BA and NAA. The best results were obtained on MS medium supplemented with BA 4.0 mg/l and NAA 1.0mg/l. The mean no. of shoots observed 4 on the said combination.

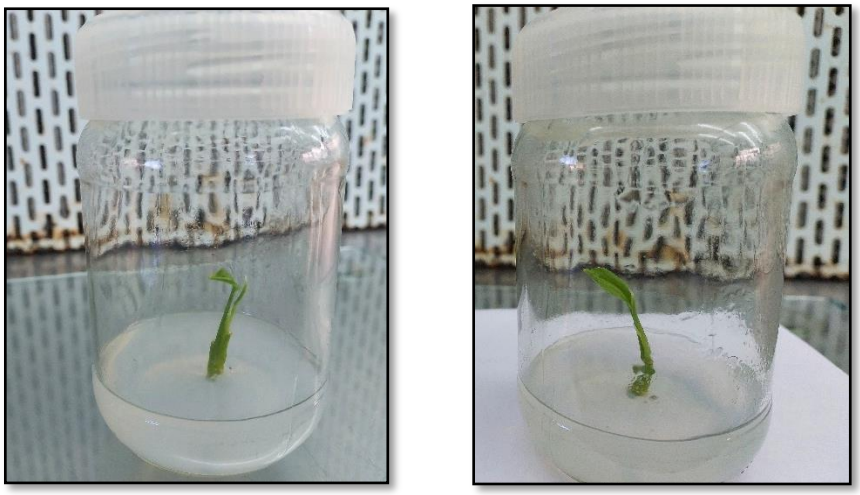
Table 2: Effect of different concentration of BA & NAA on culture multiplication

Sr.no	MS media + BA + NAA (mg/l)		Mean no. of Shoots
	BA	NAA	
1.	2.0	2.0	1
2.	3.0	1.5	3
3.	**4.0**	**1.0**	**4**
4.	5.0	0.5	2

After the growth cycle of initiation and multiplication the culture were transferred to rooting media for four weeks. The combination of MS media supplemented with IBA 1.0 mg/l + NAA 0.25 mg/l shown best result for the rooting.

Table 3: Effect of different concentration of IBA & NAA on rooting

Sr.no	MS media + IBA + NAA (mg/l)		Average Number of roots
	IBA	NAA	
1.	1.0	0.5	3
2.	**0.5**	**0.25**	**6**



A. Initation

B. Multiplication

C. Rooting

CONCLUSION

From the present study it can be concluded that the nodal segment of Aglaonema can be effectively used for *in vitro* propagation of the plant. The hormones like BA, NAA and IBA are useful for the initiation, multiplication and root formation along with full strength MS medium. Thus the productions of large numbers of Aglaonema plants are possible through *in vitro* propagation technique.

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