Original Research Article

*In vitro*plant regeneration of banana cv. Bhimkol (*Musa balbisiana,* BB) through shoot tip culture

ABSTRACT

Bhimkol(*Musa balbisiana*, BB) is a wild diploid seeded Banana cultivar,belonging to the family Musaceae. It is tolerance to pest and diseases, and ~~since~~ itis in ~~has~~ high demand for commercialization because of ~~for~~ its high nutritive values.~~Therefore, t~~The present studywas undertaken to standardize the protocol for *in vitro* plant regeneration *via* shoot tipsfor further breeding programmes (*in vitro* mutagenesis). E~~The e~~fforts weremade to improve the shoot proliferation efficacy through MS medium enhanced with different combinations of cytokinins (BAP and TDZ) and auxins (NAA) to achievehigh~~er~~numbers of multiple shoots with shortergrowth? period. Among the different combinations of BAP, TDZ and NAA, T_5 (MS + TDZ 0.1 mgL^{-1} + NAA 0.2 mgL^{-1}) ~~was~~recordedearly response (6.60 days), percentage of explant response to initiation (93.33%), days taken for multiple shoot induction (46.40 days) and the highest number of shootsper explant(8.93). The days taken for rooting, number of roots per shoot and highest root length were ~~was~~ noted in the treatment half strength MS + 1.0 mgL^{-1} IBA + 1.0 gL^{-1} activated charcoal.

Key words:*Musa balbisiana*, *In vitro* regeneration, Shoot tip, Bhimkol, Multiple shoots

INTRODUCTION

Bananas and plantains are vital foods throughout the tropical and subtropical regions of the world. The *Musa acuminata* (AA) and *Musa balbisiana*(BB)are two species from which edible bananas are derived (Simmonds and Shepherd, 1956).However, b~~B~~anana productionis hampered by ~~many~~ diseases, pests and traditional propagation approaches.India is the largest producer of bananas with production of 31.5 million tonnes from an area of 0.878 million hectares with an average productivity of 35.8 tonnes ha^{-1} (FAOSTAT, 2020).

Bhimkolbanana is an important backyard crop distributed mostly in Assam and to some extent to neighbouring states like West Bengal, Arunachal Pradesh, Nagaland, and

Meghalaya~~, *etc.*~~It has been exploited as a highly nutritive source of energy, vitamins and amino acids. Bhimkol fruits are consumed as a dietary supplement by the people of Assam and parts of North-east India, because fruits are rich in carbohydrates, vitamins and proteins. Fresh ripe fruit pulp has antiperoxidative and antioxidant characteristics that can help to prevent oxidative stress-related illnesses (Bhattacharjya*et al.*, 2015). It is regarded as anessential baby weaning food due to its nutritious sweet pulp. The various portions of the plant are used as food, in religious rites and also as medication to treat diseases such as jaundice and dysentery. Therefore, this plant has farfetched commercial value ~~in this area~~ (Borborah*et al.*, 2016). Bhimkol banana has many advantages but is not ~~gain more~~popular ~~popularity~~ due to long crop duration (740 days) and presence of excessive ~~more~~ number of seeds (100-150) which are compactly arranged in the fruit which makes ~~and~~ it ~~is the most~~ undesirable ~~character not only~~ from a ~~the~~ consumption point of view. The ~~but~~ seeds ~~of Bhimkol~~ hinder~~s~~during~~the~~ processing for product development (Northeast news, 30th April~~,~~ 2014).Toinduct the desirable traits likeseedlessness, dwarfness and early flowering of~~, in~~ this cultivar is ~~very~~ important for commercialization. ~~of this crop.It needs standardized *in vitro* protocol for further breeding studies such as *in vitro* mutagenesis in different explants.~~

The corms and small sword suckersare ~~were~~ used as traditional propagation ~~method~~ (Cronauer and Krikorian, 1984; Arias, 1992). However, the conventional propagation plant material is not an ideal propagule, because propagules harbour ~~since they transmit~~ weevils, fungal pathogens, nematodes and viruses (Arias, 1992; Sagi*et al.*, 1998). Hence, shoot tip culture has become increasingly popular in several countries since 1985 (Israel, the Canary Islands, Taiwan and South Africa) as a substitute to conventional planting material (Robinson, 1996).

Micropropagation techniques offer~~s~~a high rate of multiplication, genetically uniform, pest and disease-free planting materials, year around availability of plant material, and short harvest intervals, compared to conventional planting material and faster growth in the early growing stages (Vuylsteke, 1989; Daniells and Smith, 1991; Arias, 1992). In banana micropropagation, different explants sources and approacheswere ~~are~~ used by several authors (Madhulatha*et al.*, 2004; Strosse*et al.*, 2006; Wang *et al.*, 2006; Venkatachalam *et al.*, 2006; Venkatachalam *et al.*, 2007; Resmi and Nair, 2007; Shirani*et al.*, 2009).*In vitro* multiple shoot formation is regulated by cytokininsbut ~~and~~ the optimal dosage depends on the genotype (Vuylsteke, 1985; Vuylstekee*t al.*, 1998). Plant growth hormones are vital medium components in tissue culture for defining plant cell development. 6-benzylaminopurine

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(BAP) and kinetin are well documentedcytokinins used in banana tissue culture to reduce apical dominance and encourage both axillary and adventitious bud formation from meristematic tissues (Madhulatha*et al.*, 2004).

Apart from the effect ~~influence~~ of genotypes, shoot proliferation rate and elongation are affected by cytokinin types and their concentration. Adenine-based cytokinins are used in several *Musa* spp. for *in-vitro*multiplication of shoots. 6-benzylaminopurine (BAP) is the most frequently preferred cytokinin (Cronauer and Krikorian, 1984; Vuylsteke, 1989). The concentration of exogenous cytokinin appears to be the main factor affecting multiplication. However, the use of diphenyl urea derivatives (thidiazuron) in *Musa* shoot-tip culture is ~~very~~ occasional.The cultivars responded ~~significantly~~ better in their shoot proliferation ~~responses~~ to TDZ than BAP but ~~and that~~ TDZ was more economical than adenine-based cytokinins.

In the presentstudy, the potential of rapid clonal propagation of *Musa balbisiana* (BB) cv. Bhimkolwasstudied. The impact of BAP and TDZ combinations on shoot proliferation and the effect ~~influence~~ of MS medium, charcoal, IBA and NAA on rooting were also investigated.

MATERIALS AND METHODS

Explant Source

Musa balbisiana(BB)cv. Bhimkolplants were grown atCollege Orchard, Horticultural College and Research Institute, TNAU, Coimbatore, India. Two to three months old healthy and vigorously grown sword suckers were collected from a well-maintained mother block and ~~were~~ used as explant ~~and the explants were collected from well maintained mother block~~for the current study.

Preparation of explants ~~(Pre-treatment for explants)~~

The suckers were properlycleanedin running tap water and thenwashed in soap water solution for 30 minutes, to remove the adhering of soilparticles. Theouter leaf sheaths, leaf bases, roots and rhizome tissueswere trimmedusing stainless steel knife, until the dimension of the shoot was 4 to 6 cm. The shootswere immersed in 1% Carbendazim (Fungicide) solution for 60 minutes and ~~were~~ then washed in running tap water. The ~~Again,~~shoots were trimmed~~the shoots~~ again and~~were~~later immersed in Carbendazim 0.5%andStreptomycin 0.05% for 2 hoursto avoid ~~the~~ surface fungal and bacterial growth~~contaminants~~. ~~Then t~~The explants were rinsed well withdistilled water, whereafter ~~, afterwards~~it was ~~explants were~~ cut and kept in solution containingcetrimide (0.5%) for 30 minutes and rinse with distilled water

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again. The washed explants were kept in solution containing ascorbic acid(100 mgL^{-1}) and citric acid (150 mgL^{-1})for 30 minutes and rinse with double distilledwater.

Surface sterilization and inoculation of explants

Explants (pale white tissues) were taken to the laminar air flow hood and disinfect with ethanol for 30 seconds,afterwards rinsed 3-4 times with sterile distilled water. Again, the explants were surface sterilized with 0.1% mercuric chloride ($HgCl_2$, SRL,Pvt. Ltd., India) for 10 minutes then finally washed with sterile distilled water for 4-5 times. The ~~Then the~~ explants were transferred to ~~the~~ sterilized glass petriplates (150 mm × 15 mm, Borosil®, India) and the shoot tips (1 cm) were inoculated on 15 ml of MS liquid medium held in autoclaved test tubes (50 mm × 25 mm Borosil®, India).

Nutrient media

The multiplication medium containeds~~s~~MS basal salts (Murashige and Skoog, 1962), adenine sulphate 75 mgL^{-1} (Hi-media, India), ascorbic acid 100 mgL~~l~~$^{-1}$ (Hi-media, India),sucrose 30 gL^{-1} (Hi-media, India), clarigel 2.5 gL^{-1}(Hi-media, India), ~~BAP~~ 3, 5 and 7mgL^{-1}BAP (Hi-media, India), ~~TDZ~~ 0.1, 0.2and 0.3 mgL^{-1}TDZ (Sigma-Aldrich, USA)and ~~with~~ 0.2 mgL^{-1} NAA (Hi-media, India). The medium of the pH was adjusted to 5.8 with 0.1 N sodium hydroxide (NaOH) or hydrochloric acid (HCl) prior to the addition of the gelling agent and autoclaving. The medium was autoclaved for 20 minutes at 121ºC at 15 psi. All growth regulators were filter sterilised and added after the media had been sterilised.

Culture conditions

The aseptic cultures were incubated at 27±2 ~~0~~°C under 16/8 h (light/dark) photoperiod for further observations. Cultures were observed daily for the first 15 days and then at weekly intervals to record contamination (if any).

Rooting and acclimatization of *in vitro* regenerated plantlets

For rooting of *in vitro* regenerated shoots, the proliferated shoots were subculturedin ~~the~~½ MS medium containing ~~added with~~ 0.5 mgL^{-1} NAA and 1 gL^{-1}activated charcoal. ~~were used.~~The well *in vitro*regenerated shoots with healthy roots were transferred to ~~the~~cocopeat medium in portrayspot trays? asprimary hardening and the plants were kept ina 50% shade net house for 30 days. After the ~~those~~ plants were transferred to the polyethylene bags containings potting mixture (1:1:1, soil:sand:FYM) as secondary hardening and the plants were again kept in 50% shade net house.

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Observationsand data analysis

The days taken for response (greening), percentage of explant response to initiation of shoot tips were recorded at initial phase. The days taken for multiple shoot induction, total number of shoots, shoot length and number of leaves were recorded during third sub culture of shoot multiplication stage.The experiment was laid in a completely randomized design (CRD), with three replications of 5explants per treatment. The data were subjected to ANOVA as suggested by Panse and Sukhatme (1967). The data were analysed using One-way Analysis of Variance (ANOVA) rusing statistical package SPSS (Statistical Package for Social Studies) ~~statistics~~ version 22.0. Mean values were separated by Duncan's multiple range test (DMRT) at 5% probability level.

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RESULTS

The aseptic shoot tip cultures were used for multiple shoot initiation in banana cv. Bhimkol.The aseptic cultures were inoculated on MS medium enhanced with various combinations of cytokinins and auxins*viz.*, 6-benzyl aminopurine (BAP),thidiazuron (TDZ) and α-naphthalene acetic acid (NAA) for initiating growth and to induce higher number of multiple shoots.

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Initial culture establishment

~~Shoot tip is used as an explant for the current study and the cultures were initially established in the MS liquid medium containing BAP (2.0 mgL^{-1})and NAA (0.2mgL^{-1}).~~ The ~~explants free from contaminants resulting in the establishment of aseptic cultures and~~

T~~t~~he explants respond~~s~~ within week, the colour changes from creamy white to greenishcolour (greening of shoot tip),were indicative of a ~~indicating~~ successful establishment of the culture. These cultures were used for the*in vitro* shoot proliferation.~~and medium is supplemented with various levels of BAP, TDZ and NAA.~~

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In the present study, different levels of cytokinins were used for *in vitro* shoot multiplication in banana cv. Bhimkol. The effect of different combinations of BAP and TDZ on shoot proliferation with NAA were investigated. The treatment showed significant results in early response (greening) which was observed within a week in T_5 (6.60 days), followed by T_4 (7.80 days) and T_6 (7.93 days) (Table 1). A~~The~~ delayed greening was observed in T_1 MS bas~~e~~al medium (11.07 days). The percentage of explant response to initiation was recorded highest in T_5 (93.33 %), followed by T_4 (90.67 %) and lowest percentage observed in T_1 (66.67 %). ~~(Table 1).~~

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Combinations of growth hormones on shoot proliferation

The days taken for multiple shoot initiationwas documented at the end of the third sub culture (Table 1). The MS medium enhanced withTDZ 0.1 mgL^{-1} + NAA 0.2 mgL^{-1} showed earlier multiple shoot induction (46.40 days),followed byBAP 7.0 mgL^{-1} + NAA 0.2 mgL^{-1} (46.87 days) which both were similar to ~~on par and~~ the maximum days taken for multiple shoot induction in T_1 (62.87 days). The highest number ofshoots per explant were produced in T_5 (8.93),followed by T_4 (7.07) and the least number shoots per explant were observed in control (2.60) (Table 2).

The highest shoot length was observed in BAP 7.0 mgL^{-1} + NAA 0.2 mgL^{-1} (5.60 cm), followed by T_2 and T_3 (5.27 and 5.26 cm, respectively) and the lowest shoot length was observed in T_7 (4.13 cm). The number of leaves were recorded at the end of third sub culture (Table 2). The maximum number of leaves were produced in T_3(4.27), followed by T_2, T_5, T_4 and T_6 (4.0, 4.00, 3.93 and 3.87, respectively) these treatments were not statistically different~~are on par~~. Fewer ~~Lesser~~ number of leaves were produced in control (3.00), compared to the treatments.

Rooting and acclimatization of *in vitro* shoots

~~The well-developed shoots were transferred to the half strength MS medium supplemented with different levels of NAA (0.5 and 1.0 mgL^{-1}), IBA(0.5 and 1.0 mgL^{-1}) and activated charcoal (1.0 gL^{-1}) to produce healthy roots and successful plantlets development.~~ H~~The h~~alf strength MS medium supplemented ~~fortified~~ with 1.0 mgL^{-1} IBA produced earlier roots (10.35 days), high~~er~~ number of roots (6.50) and highest root length (10.34 cm), followed by 0.5 mgL^{-1} IBA. The delayed rooting (14.80 days), smaller ~~less~~ number of roots(3.20) and lowest root length (4.30) was observed in the control (Table 3).The ~~well~~ developed rooted shoots were planted in portrayspot trays? containing sterilized cocopeat. The plants were maintained under ~~at~~ poly tunnel condition with high humidity for primary hardeningprimary settling? and within 10 - 15 days, the new leaf emerged from the plantlets that resumed new growth. After 30 days the primary hardened plantlets were transferred to ~~planted in~~ polyethylene bags containing sand, soil and FYM (1:2:1) and maintained in 50% shade net house.

DISCUSSION

Banana trees/plants are ~~is~~ threatened by several ~~devastating~~ diseases and pests transmitted by planting material and in the present circumstances Fusarium wilt is the most

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common ~~important~~problem in banana cultivation across the world. Cultivated bananas are diploid, triploid and some are tetraploids with genome *Musa acuminata* (AA) and *Musabalbisiana* (BB) (Bose and Sharma, 1990). All genomic groups do not respond equally to ~~for~~ plant tissue culture. The cultivars specifically those with genome *balbisiana*~~are~~ show~~s~~ poor response (Silayoi and Kaewsompong, 1992).However, there are no reports on Bhimkol commercial scale micropropagation, which are commonly found in North-East regions of India. Only few reports are available on micropropagation of *M. balbisiana* (BB). Therefore, the attempts were undertaken in this study to mass multiply the banana cv. Bhimkol.

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Cytokinins are the most~~significant~~important growth hormones in the plant tissue cultureand are frequently used in several *Musa* spp. for *in vitro* proliferation. Growth and multiplication rate is ~~enormously~~ dependent on the function of cytokinin concentrations (Gubbuk and Pekmezci, 2004). 6-benzyl aminopurine (BAP) is the ideal cytokininsused in a banana micropropagation, whereas~~,~~ TDZ is used in rare cases (Venkatachalam *et al.*, 2006; Bairu*et al.*, 2008; Jafari *et al.*, 2011). Therefore, the present investigation~~was~~ examined to standardize a ~~the~~ protocol for micropropagation in banana cv. Bhimkol with ~~various~~various concentrations of cytokinins (BAP and TDZ).

Thidiazuron (TDZ) is a synthetic diphenyl urea derivative of cytokinin group and superior to the BAP (Waman *et al.*, 2016) in overcoming apical dominance and stimulates the lateral bud break and multiple shoot induction. In the present study, cytokinins*viz.*, BAP and TDZ along with NAA were tested at different levels for shoot proliferation.

This may be due to suppression of an apical dominance, which might have led to improved axillary bud formation and restricted growth of explants as opined by Huetteman and Preece (1993).In ~~As~~ previous research, the synergistic impact of cytokinins and auxins may have stimulated the shoot bud production in recalcitrant bananas (Gubbuk and Pekmezci 2004; Shirani*et al.*, 2009; Ngomuo*et al.*, 2014). The ability of TDZ might be associatedwith ~~to~~ the increase in biosynthesis of endogenous adenine based cytokinins and its leastsusceptible to the degrading enzymes present in the plant system (Huetteman and Preece 1993; Thomas and Katterman, 1986).The rate of multiple shoots in banana is a function of cytokinin in the culture media (Damasco and Barba, 1985). Furthermore, TDZ has a higher *in vitro* efficiency because of its~~is~~ resistant to degradation by ~~all~~ cytokinin oxidase enzymes (Kaminck, 1992).

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The number of shoots gradually decreases with an increase in TDZ concentration and also and it retarded the shoot elongation (Farahani *et al.*, 2008; Arinaitwe *et al.*, 2000; and Youmbi *et al.*, 2006). The highest shoot length was observed in medium supplemented fortified with BAP at 5.0 mgL^{-1} in banana. Similar and the same findings were reported by Meitei *et al.* (, 2007) and ; Rahaman *et al.* (2004). The present study revealed that, due to the compaction of the shoots in medium supplemented with TDZ regenerated plantlets had produced fewer lesser number of leaves. Similar findings were reported by Rabbani *et al.* (1996) and Rahaman *et al.* (2004) in banana (*Musa* spp.).

For sustained growth and development, shoots regenerated from *in vitro* cultures had sufficient number of roots and root length prior to transfer to the *in vivo* environmental conditions. Most commonly used Most used rooting hormones are *viz.*, IBA, IAA and NAA to induce rooting in *in vitro* regenerated shoots of banana (Molla *et al.*, 2004; Saraswathi *et al.*, 2014; Kahia *et al.*, 2015). The half strength MS medium supplemented with different levels of auxins like NAA and IBA were tested for root initiation and root growth. There was a corresponding increase in the number of roots and root length, as the increase in the concentrations of IBA and NAA increased (Karule *et al.*, 2016).

When the IBA levels was res above higher over 1.5 mg^{L-1}, there was an inhibitory effect impact. This is consistent with the results of Lohidas and Sujin (2015), who demonstrated that IBA has an inhibitory impact at doses over 2 mgL^{-1}. A The 0.1% activated charcoal was added to in the rooting medium and it promoted the rooting of in banana explants? reported earlier. rThis might be because it results in the permanent adsorption of inhibitory substances and a reduction in the build-up of noxious metabolites such as phenolics, thus encouraging plant growth in addition to rooting (Thomas, 2008).

CONCLUSION

Based on the current findings of this investigation resulting from in the development of an effective *in vitro* micropropagation or regeneration of banana cv. Bhimkol (*Musabalbisiana*, BB), allowed for to the production of homogenous planting material.

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Table 1: Influence of growth regulators on days taken for greening and days taken for multiple shoot induction in banana cv. Bhimkol

Treatment		Days taken for greening	% of explant response to initiation	Days taken for shoot induction
T_1	MS basal medium (Control)	11.07[a*]	66.67[e]	62.87[a]
T_2	MS + BAP 3.0 mgL^{-1} + NAA 0.2 mgL^{-1}	8.80[b]	72.00[d]	56.47[b]
T_3	MS + BAP 5.0 mgL^{-1} + NAA 0.2 mgL^{-1}	8.07[c]	86.67[b]	51.53[c]
T_4	MS + BAP 7.0 mgL^{-1} NAA 0.2 mgL^{-1}	7.80[c]	90.67[a]	46.87[d]
T_5	MS + TDZ 0.1 mgL^{-1} + NAA 0.2 mgL^{-1}	6.60[d]	93.33[a]	46.40[d]
T_6	MS + TDZ 0.2 mgL^{-1} + NAA 0.2 mgL^{-1}	7.93[c]	84.00[b]	48.20[d]
T_7	MS + TDZ 0.3 mgL^{-1} + NAA 0.2 mgL^{-1}	8.27b[c]	78.67[c]	48.13[d]
	SEm±	**0.19**	**1.21**	**0.71**
	CD = 0.05	**0.58**	**3.66**	**2.17**
	CV (%)	**3.97**	**2.56**	**2.40**

*Mean of four replications. Values followed by the same ~~a common~~ letter are not significantly different at the 5% - level by DMRT.

Table 2: Influence of growth regulators on number of multiple shoots/explants, shoot length (cm) and number of leaves in banana cv. Bhimkol

Treatment		No. of multiple shoots	Shoot length (cm)	No. of leaves
T_1	MS basal medium (Control)	2.60^{e*}	4.62^{b}	3.00^{c}
T_2	MS + BAP 3.0 mgL^{-1} + NAA 0.2 mgL^{-1}	4.13^{d}	5.27^{a}	4.00^{ab}
T_3	MS + BAP 5.0 mgL^{-1} + NAA 0.2 mgL^{-1}	5.53^{c}	5.59^{a}	4.27^{a}
T_4	MS + BAP 7.0 mgL^{-1} NAA 0.2 mgL^{-1}	7.07^{b}	5.60^{a}	3.93^{ab}
T_5	MS + TDZ 0.1 mgL^{-1} + NAA 0.2 mgL^{-1}	8.93^{a}	4.31^{bc}	4.00^{ab}
T_6	MS + TDZ 0.2 mgL^{-1} + NAA 0.2 mgL^{-1}	5.00^{cd}	4.23^{c}	3.87^{ab}
T_7	MS + TDZ 0.3 mgL^{-1} + NAA 0.2 mgL^{-1}	4.20^{d}	4.13^{c}	3.47^{c}
	SEm±	**0.29**	**0.12**	**0.22**
	CD = 0.05	**0.89**	**0.36**	**0.66**
	CV (%)	**9.46**	**4.30**	**10.04**

*Mean of four replications. Values followed by the same ~~a common~~ letter are not significantly different at the 5% - level by DMRT.

Table 3: Effect rooting h media on root parameters of banana cv. Bhimkol

Treatments		No. of days taken for rooting	No. of roots	Root length (cm)
RM_1	½ MS (Control)	14.80^{a*}	3.20^{e}	4.30^{e}
RM_2	½ MS + 0.5 mg/L NAA + 1g/L AC	13.05^{b}	4.25^{d}	5.14^{d}
RM_3	½ MS + 1.0 mg/L NAA + 1g/L AC	13.10^{b}	4.75^{c}	6.21^{b}
RM_4	½ MS +0.5 mg/L IBA + 1g/L AC	12.60^{b}	5.35^{b}	5.76^{c}
RM_5	½ MS + 1.0 mg/L IBA + 1g/L AC	10.35^{c}	6.50^{a}	10.34^{a}
	SEm±	**0.20**	**0.12**	**0.12**
	CD = 0.05	**0.61**	**0.38**	**0.38**
	CV (%)	**3.14**	**5.18**	**3.93**

*Mean of four replications. Values followed by the same ~~a common~~ letter are not significantly different at the 5% - level by DMRT.

Figure 1. Steps involved in shoot tip culture of banana cv. Bhimkol

A. Sword suckers for preparation of explants

B. Trimming of explants for soap water treatment

C. Explants immersed in fungicide (Bavistin 1%) for 1 hour

D. Trimmed and explants immersed in streptomycin (0.05%) for 2 hours

E. Explants dipped in cetrimide solution (0.05%) for 30 minutes

F. Trimmed and ready for surface sterilization ($HgCl_2$ 0.1% for 10 minutes)

G. Initiation of explant on MS medium with 5 mg/L BAP

H. Response of explant after 7 days of initiation

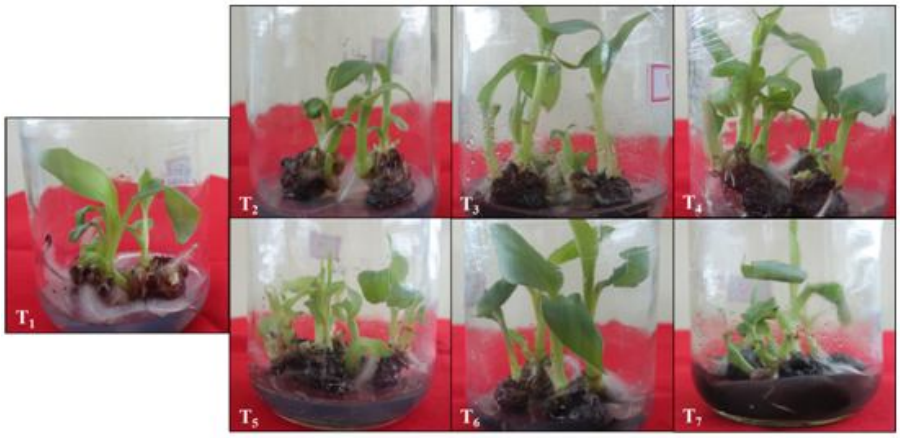

Figure 2. Effect of cytokinins on shoot multiplication in banana cv. Bhimkol

T_1 : MS basal medium (Control) **T_2** : MS + BAP 3.0 mgL^{-1} + NAA 0.2 mgL^{-1}

T_3 : MS + BAP 5.0 mgL^{-1} + NAA 0.2 mgL^{-1} **T_4** : MS + BAP 7.0 mgL^{-1} NAA 0.2 mgL^{-1}

T_5 : MS + TDZ 0.1 mgL^{-1} + NAA 0.2 mgL^{-1} **T_6** : MS + TDZ 0.2 mgL^{-1} + NAA 0.2 mgL^{-1}

T_7 : MS + TDZ 0.3 mgL^{-1} + NAA 0.2 mgL^{-1}

Figure 3. Effect of NAA and IBA on rooting of banana cv. Bhimkol

RM_1 : ½ MS (Control) **RM_2** : ½ MS + 0.5 mg/L NAA + 1g/L AC

RM_3 : ½ MS + 1.0 mg/L NAA + 1g/L sAC **RM_4** : ½ MS +0.5 mg/L IBA + 1g/L AC

RM_5 : ½ MS + 1.0 mg/L IBA + 1g/L AC

The units are written as mgL^{-1} and gL^{-1} in the text and here it is written as mg/L / g/L. Be consistent.