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ORIGINAL ARTICLE

Evaluation of Different Growth Regulators on Proliferation of *Polianthes tuberosa*

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ABSTRACT
Tuberos (*polianthes tuberosa*) is one of the important ornamental cut flower in floriculture industry which originated in Mexico . In this study effect of different plant growth regulators on shoot proliferation of Polianthes was studied. The experiment was conducted in factorial on the basis of completely randomized design with three replications. Basal segments (1*1 cm2) of the scales with lateral buds were placed in MS media supplemented with BAP (0,2,4,6mg/l) alone, KIN (0,1.5,3 mg/l) alone or in combination with NAA in different concentrations .Maximum shoot proliferation and the number of shoot and leaf have been achieved in high concentration of BAP. The highest rate of shoot proliferation was observed in medium containing high concentration of NAA and low concentration of KIN . Using different concentrations of KIN was insignificant for the number of shoot, although the number of leaf increased with with increasing of Kin concentration.
Key words: proliferation, *Polianthes tuberosa*, NAA, KIN, BAP

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INRODUCTION

Polianthes tuberose belongs to the Agavaceae family which is one of the ornamental plants in international market. Tissue culture technology, a branch of plant science in recent decades has been developing an important tool for basic and applied research and commercial applications. Conventional breeding methods are extremely time consuming because they depend on cross pollination, seed germination and selection as well as vegetative regeneration. Modern plant biotechnology and genetic engineering has the potential to reduce the time needed for traditional breeding [1]. It was reproduced through bulb and bulblet, however, requires cost material is high because only one plant of each bulb was produced [2]. Hence the rapid proliferation is desired to produce large number of flowers in a short time. Callus induction and proliferation is important to extract active ingredients from callus and produce seedlings for ornamental use and pharmaceutical application [3]. The formation of bulblets and bulblets size in chip is more than twin scale which is an indication of the size [4]. Twin scale method been successful in a large number of species of Liliaceae and Amarylliadaceae [5,6]. Proliferation excised in chip explant at medium consisting 16 mg/l BAP and 4 mg/l NAA. Twin scale explants produced bulblets in media containing 2mg/l NAA [4]. It is conventionally propagated through seed but due to strile variety sexual reproduction is not possible [7].

METHOD AND MATHERIAL

Explants included the base of the bulb scales, leaf, petals and stems in 5 replicates,. Basal plate bulb was used for bud growth in *Polianthes tuberosa* in proliferation stage. Medias consisting MS [14] 2% sucrose were provided .Different hormones added to media. A volume of 20 ml of nutrient medium was dispensed into 3 glass jar that was capped with a polystyrene screw cap. The pH of media was adjusted to 5.7 with 0.1N NaoH or 0.1N HCl prior to autoclaving at 1.05 kg/cm^2, 121°c for 20 min. Explants were transferred to a MS medium containing different concentration NAA(0, 1 mg/l), KIN(0,1.5 , 3 mg/l)and BAP (0,2,4,6 mg/l). The culture was incubated at 25±1°C under an illumination of 1200 Lux during 16/8 h photoperiod obtained from Gro-Lux fluorescent lamps.

The experiments were done in factorial based on completely randomized design (CRD). Data were analyzed by using SAS. In order to determine significances, Duncan Multiple Test will be done (5%, 1% level).

RESULT AND DISCUTION

Tissue culture of the monocot is a far more difficult than dicotyledonous, but it depends on the regeneration of organs and hormone levels. [5] which were also observed in this study. BA concentration have significant effect on the number and length of shoots. According to comparison of mean, media contains 6 mg/l BAP induced maximum percentage of shoots, number of leaves and length shoot. Hasegawa reported that 10mg/lBAP is necessary to break dormancy in *R. hybrida*. Hence, exogenous auxin was needed for multiple shoot formation, the role of BAP seems essential for regeneration. These observations is similar to other researches where the highest number of shoots (2.2 ± 1.2) was obtained by using 1.5 mg/l BAP respectively. Medium supplemented with different concentration of NAA which applied individually or in combination with BA, KIN . NAA concentrations had significant effect of the number and length of shoots, the highest number and length shoot were obtained at higher hormone concentrations. With increasing concentrations of NAA to 1mg/l, number of shoots and leaves increased. Proliferation wasn't occurred in all treatments containing different concentrations of KIN significantly but the number of leaves increased by rising hormone. As results were shown (table comparison of mean), 0.5 mg/L NAA and 4, 6 mg/l BAP was found to produce significantly higher shoot as compare to other treatments. However BAP reaction depends on NAA, since high concentrations of BAP showed significantly lower effect. . Comparison other characteristics did not show significant difference. Azadi and Khosh-khui [8] reported that NAA and BA is necessary to increase the weight of lilium corms in spring and winter. Highest proliferation was reveled at maximum concentration of NAA and minimum level of KIN. There was no significant differences in other traits .In proliferation phase, the base of tuberose bulbs have the meristem cells therefore they were necessary to grow bud. These results was agree with [9, 10] on the other genius in Amarylidacea. Research conducted that NAA was greater than other growth regulators in Narcissus [11]. Lilium proliferating were induced with NAA [12]. Results were consistent with Sangavai and Chellapandi [13] on tuberose where the BAP 1.5 mg was used. These results are in agreement with the previous reports on Alestromeria by Khalighi [14]. These results were similar to Rout whose reported same conclusion on multiplication in Rose [15]. Skoog and Miller [16] demonstrated contrast between auxines and cytokinines. Kinetin is more effective than adenine, because more shooting were observed in 10^{-6} gr/L kinetin in comparison to $3*10^{-8}$ gr/L auxin, so there is a weight relation about 1: 35 between 2 complexes, however about adenine this ratio must be about 1:1500 [16]. Accumulation of cytokinin like substances due to repeated culture in media containing cytokinin may have been one of the factors that contributed to balance out the high endogenous levels of auxins, and subsequently to improve proliferation [17].

Table. Effect of different concentrations of BAP +NAA +KINon some traits of. *polianthes tuberosa*

proliferation	NAA mgl^{-1}	KIN mgl^{-1}	Shoot number	NAA mgl^{-1}	BAP mgl^{-1}
25 b	0		2 d	0	
33 b	0.5	0	2 d	0.5	0
75 a	1		2 d	1	
			2 d	0	
25 b	0		3 b	0.5	2
25 b	0.5	1.5	2.3 c	1	
33 b	1		3 b	0	
			4 a	0.5	4
25 b	0		3 b	1	
41 b	0.5	3	3 b	0	
41 b	1		4 a	0.5	6
			3b	1	

Means with the similar letters are not significantly different at 5% level of probability using Duncan test

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