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EFFECT OF DIFFERENT BAP CONCENTRATION ON SHOOT MULTIPLICATION FROM SHOOT TIP EXPLANT OF F1 HYBRID BRINJAL (Solanummelongena)

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CERTIFICATION FORM

This project paper entitled Effect of Different BAP Concentration on Shoot Multiplication from Shoot Tip Explant of F1 Hybrid Brinjal (*Solanummelongena*), prepared by MuhamadNasrulHazli Bin MohamadNabawi (156007) in partial fulfilment of requirement of PRT 4999 (Final Year Project) for the award of the Degree of Bachelor of Agricultural Science.

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LIST OF ABBREVIATIONS AND SYMBOLS

%	Percentage
˚C	Degree Celcius
2.4-D	2.4-dichlorophenoxyacetic acid
2-ip	2-isopentyladenine
ANOVA	Analysis of Variance
BAP	6-benzylaminopurine
FAOSTAT	Food and Agriculture Organization of the United Nation
HCl	Hydrochloric acid
Mg/L	Milligram per liter
MS	Murashige and Skoog
ml	millimetre
cm	centimetre
pH	Hydrogen ion concentration
IAA	indole-3-acetic acid

ABSTRACT

*Solanummelongena is*one of the important vegetables in this world where its estimated world production is reaching 47 million tons in 2011. This vegetable is also indicated for the treatment of several diseases, including diabetes, arthritis, asthma and bronchitis. An F1 hybrid cultivar of this species cannot be propagated using seeds because it cannot maintain the true to typeness at the second filial generation (F2 generation). Therefore an alternative approach to maintain true to typness and uniformity of the propagule is through propagation by asexual means. Since, in vitro culture can mass produce propagules within a shorter period of time this approach is justified as a means to propagate *S.melongena*F1 hybrid plant. Therefore an experiment was carried out to study the effect of different BAP concentration on shoot multiplication from shoot tip explants of F1 hybrid brinjal. Five BAP treatments wereused in this experiment which were 0.0, 0.5, 1.0, 2.5, and 5.0 mg/L. The experiment was conducted using a completely randomized design (CRD) with 12 replications per treatment. One explant was used for each treatment per replication. All the explants were cultured on half strength MS medium with the different BAP treatments. Data collections were taken for 6 weeks based on the percentage of explants regenerating shoot and the number of shoot formed per explant. It was observed thatthe shoot tip explants cultured on medium containing 2.5 mg/L BAP had the highest percentage of explants forming new shoots after 6 weeks of culture compared to other treatments. Analysis of variance also showed there was no significant difference on mean number of shoot per explant between the BAP treatments including the control (0.0 mg/L BAP).

ABSTRAK

*Solanummelongena*merupakansalahsatusayur-sayuran yang penting di duniaini di manahasilpengeluaranduniayaadalahdianggarkanmencapai 47 juta tan padatahun 2011. Sayur-sayuraninijugamempunyaikeupayaanuntukmerawatbeberapapenyakit, termasukkencingmanis, artritis, asmadanbronkitis. Satukultivar F1 hibridspesiesinitidakbolehdibiakkandenganmenggunakanbijibenihkeranaiatidakbolehmengekalkanciriasalindukpadagenerasikeduaibubapa (generasi F2). Olehitu, satupendekatanalternatifuntukmengekalkanciriasaldankeseragamannyaadalahmelaluipembiakandengancaraaseksual. Disebabkankultur*in vitro* bolehmenghasilkanpropagul yang banyakdalamtempoh yang lebihsingkatpendekataniniadalahwajarsebagaisatucarauntukmembanyakkantumbuhanF1 hibrid*S. melongena*. Olehitusatueksperimentelahdijalankanuntukmengkajikesankepekatan BAP yang berbezapadapenggandaanpucukdaripadaeksplanpucuk F1 hibridterung. Lima rawatan BAP telahdigunakandalameksperimeniniiaitu 0.0, 0.5, 1.0, 2.5, dan 5.0 mg / L. Ujikajitelahdijalankanmenggunakanrekabentukrawaksempurna (CRD) dengan 12 replikasisetiaprawatan.

Satueksplantelahdigunakanuntuksetiaprawatanbagisetiapreplikasi.Semuaeksplantdikulturpada ½ MS medium denganrawatan BAP yang berbeza.Koleksi Data diambilselama 6 mingguberdasarkanperatusaneksplanyang menghasilkanpucukdanbilangan minpucukterbentukbagisatueksplan.Pemerhatian yang telahdilakukanmendapatibahawaeksplan yang dikultur di dalam medium yang mengandungi 2.5 mg / L BAP mempunyaiperatusantertinggibilanganeksplan yangmembentukpucukbaruselepas 6 minggudikulturberbandingdenganrawatan lain. Analisisvariansjugamenunjukkantidakterdapatperbezaan yang signifikanantaramin

bilanganpucukbagisetiapeksplanantararawatan BAPtermasukrawatankawalan (0.0 mg / L BAP).

1.0 INTRODUCTION

Brinjal (*Solanum melongena*) is an important vegetable crop in the world. It is widely planted in the tropics, subtropics and warm temperate regions of the world (Naujeer, 2009). TheFood and Agriculture Organization of the United Nation [FAOSTAT] (2011) reported that the world production of brinjal was estimated 47 million tons in 2011. Weese and Bohs (2010) stated that brinjals arose in Africa from *Solanum incanum* and were dispersed throughout the Middle East to Asia. It is also considered that this crop originated from India where the major domestication of large fruited cultivars occurred (Ministry of Environment and Forest of India and Ministry of Science and Technology of India, 2010).

Brinjal which is a perennial crop in warmer regions but cultivated as an annual in temperate regionsbelongs to the*Solanaceae* family (Nonnecke, 1989). Nonnecke (1989) has fully described the morphological characteristics of this crop where the plant is bushy andcan have a height of 0.6-1.2 m with a tough herbaceous or woody spiny stem. The leaves are large, simple, ovate, lobed and hairy on the underside and alternate on the stems. The flowers are possibly to be single or multiple with five calyx-lobes and purple-violet corollas. The fruit is a pendant fleshy berry with various shapes from long cylindrical to round, oblong or oval shape. The length of the fruit may vary from 4-45 cm with the colour ranges from shiny purple to white, green, yellow and black often with stripes and patches.

Lawande and Chavan (1998) explained that brinjal has its own nutritional value. It is a good source of iron, calcium, phosphorus, potassium and vitamin B. Its fruit is composed of 92.7% moisture, 1.4% protein, 1.3% fibre, 0.3% fat, 0.3% minerals and the remaining 4% made up of various carbohydrates and vitamins (A and C). In Indian traditional medicine, brinjal is said to begood for diabetic patients and it also has been recommended as an excellent remedy for those suffering from liver complaints.In popular medicine, brinjal is indicated for thetreatment of several diseases, including diabetes,arthritis, asthma and bronchitis. Furthermore, severalgroups have provided evidence that eggplant extractshave a significant effect in reducing blood and livercholesterol rates in humans (Magioli and Mansur, 2005).

There are a lot of F1 hybrid brinjals that have been produced by many breeding company in order to develop and improve varieties of brinjal. Quality of hybrid brinjal is improved in term of its specific characteristics such as size, yield and resistance to disease such as wilt disease caused by *Ralstonia solanacearum*. The cultivation of brinjal is mostly by seeds. The price of the hybrid seeds that are produced is expensive. Furthermore, the seeds produced from the hybrid plant will germinate and grow to produce plants which may differ from the parent (non true-to-type). In addition, the production of hybrid seeds through conventional methods needs high labour cost and time consuming. Therefore, *in vitro* propagation can be an option to produce-true-to type planting material in great number within a shorter period of time.

As part of the solution to this problem, this experiment was conducted with the objectives:

1. To observe the effect of different concentration of BAP on shoot regeneration from shoot tip explants of F1 hybrid brinjal.
2. To determine the best BAP concentration in initiating shoot regeneration in F1 hybrid brinjal.

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