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In Vitro Propagation of *Globba brachyanthera* K.Schum.

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Abstract. An in vitro propagation system was developed for *Globba brachyanthera* K.Schum., a potential ornamental plant by surface sterilized adventitious bulbils in 20% Clorox for 20 minutes and cultured on Gamborg B5 medium supplemented with a biocide Plant Preservative Mixture (PPM) and antibiotic tetracycline. Shoot tips (2-5mm) obtained from in vitro cultured plantlets were induced to form shoots on Gamborg B5 medium containing 20% sucrose and 2.8 g/L Gelrite supplemented with various concentrations of 6-benzylaminopurine (BAP) ranging from 1.0 to 3.0mg/L, either individually or in combination with alpha-naphthalene acetic acid (NAA) at 0.1 mg/L or 0.5 mg/L. All treatments induced formation of multiple shoots as well as rooting after 8 weeks of culture. The highest multiplication rate of 6.6 shoots per explants was obtained in Gamborg B5 medium supplemented with 3.0 mg/L BAP. The generated shoots elongated on Gamborg B5 medium and the multiplication rate did not change further in all of the successive subcultures.

Keywords: Globba micropropagation; Direct organogenesis; Ornamental ginger.

INTRODUCTION

Globba brachyanthera K. Schum. belongs to the family Zingiberaceae. This miniature ginger is known as 'Dancing Girl' and found widespread in Sarawak (Smith, 1988 and Boyce, 2006). This species produced fantastic pendulous bracts with delicate white, yellow and orange inflorescences on the top of the leafy shoot. *G. brachyanthera* K. Schum. grow in a wide range of temperature, have an extended flowering period, produce long-lasting, colorful bracts, a 90 to 120 day production cycle and require little care. Hence, these selling points had increased the popularity of this species as an outstanding ornamental pot plant in patio or indoor gardens, landscapes and floral arrangements (Kuehny, 2001).

G. brachyanthera K. Schum. which is vegetatively propagated by underground rhizome does not produce as rapidly compared with most other gingers. Nevertheless, irregular seed set, long period of dormancy and polyploidy level of this species has been hindering breeding effort by conventional techniques. Furthermore, this species are thought to be declining at an alarming rate as consequences of unplanned exploitation by the ever-growing human population, environmental hazards and habitat depletion. Consequently, a rapid *in vitro* multiplication method is crucial in order to conserve and provide adequate planting material for large-scale cultivation of these species. Thus, this study was carried out with the objective to develop an effective in vitro micropropagation protocol of *G. brachyanthera* K. Schum.

MATERIALS AND METHODS

Establishment of axenic culture. *G. brachyanthera* were collected from Ulu Sungai Adis, Segong, Bau, Kuching, Sarawak and maintained at the green house of Universiti Malaysia Sarawak. Rhizome buds 0.5 – 1.0cm long and vegetative bulbils were served as explants. They were washed with laboratory detergent and kept under running tap water for 1-2 hours. After removal of some outer scales, explants were immersed in 75% ethanol under aseptic conditions for 30 seconds, then in 20% Clorox containing few drops of 'Tween-20' for 20 minutes with gentle agitation. The explants were rinsed for 4-5 times using sterile distilled water. Explants were sectioned to 0.5cm long and inoculated on Gamborg B5 (Gamborg et al., 1968) medium containing 20% sucrose, 2.8 g/L Gelrite supplemented with 2ml/L PPM and 10mg/mL tetracycline and cultured for 10 days. The pH of medium was adjusted to 5.8 with 1 N KOH or 1 N HCl prior to autoclaving at 121°C and 1.05 kg/cm^2 for 20 minutes. Axenic explants were inoculated onto

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