UNIVERSITI TEKNOLOGI MARA

IN VITRO REGENERATION OF *Barringtonia racemosa*

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ABSTRACT

Barringtonia racemosa is a type of medicinal plant belongs to Lecythidaceae family. The plants have numerous biological activities such as anti-tumour, anti-bacterial and anti-fungal. However, in Singapore, this species had been acknowledged as endangered species and classified as under-utilized crops in Malaysia. Therefore, the efforts to conserve this threatened species are crucial to ensure its survivability by the implementation of plant tissue culture technique. The objectives of this study were to identify the most effective surface sterilization technique for leaf, stem and shoot tip explants, to identify the most responsive explant for *in vitro* regeneration of *B. racemosa*, to determine the optimum concentration of plant growth hormones for *in vitro* regeneration of *B. racemosa* and to determine stomatal density of *in vitro* and *in vivo* grown *B. racemosa* leaves. Different types and concentrations of plant growth hormones were tested to induce adventitious shoot from various explants (young leaf, stem and shoot tip). Stomatal density (SD) on abaxial and adaxial surfaces between *in vitro* and *in vivo* grown *B. racemosa* was determined using Field Emission Scanning Electronic Microscopy (FESEM).The results indicated that BAP was superior to KIN in promoting adventitious shoot formation. The highest shoot formation (100%) was achieved on MS medium containing 0.4 mg/L NAA + 0.5 mg/L BAP for shoot tip explants, while MS medium supplemented with 0.2 mg/L NAA + 1.0 mg/L BAP was the best for stem explants. However, leaf explants failed to produce any shoot. All explants cultured on MS media supplemented with NAA + KIN became necrotic at all concentrations tested. The results from FESEM micrographs indicated that the stomata of *in vitro* leaf are round in shape and larger size, whereas the stomata of *in vivo* leaf are elliptical shape and smaller size. It was observed that SD of in *vivo* grown *B. racemosa* was higher than *in vitro* for both adaxial and abaxial leaf surfaces. The *in vitro* leaf from stem explant exhibited the lowest mean number of SD. The shape of stomata found on *in vivo* leaf were anomocytic, whereas in *in vitro* leaf were paracytic. Glandular and non-glandular trichomes were also observed on *in vitro* and *in vivo* leaves. Thus, somaclonal variation occurred in *in vitro* plantlets.

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