UNIVERSITI TEKNOLOGI MARA

IN VITRO PROPAGATION AND COMPARATIVE STUDY ON PHYTOCHEMICAL PROFILES OF *Pogostemon cablin*

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AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Pogostemon cablin is an important aromatic plant producing patchouli oil from its leaves' extraction. The main objective of this study was to develop an effective method for *in vitro* propagation of Malaysian cultivated *P. cablin*. The effect of varying the strength of MS medium was investigated using node explants. Different concentrations of BAP and NAA were added to both full and half strength MS (Murashige and Skoog) medium for regeneration of this plant. The MS media supplemented with 0.25 mg/l BAP gave the highest number of shoots and length followed by the combinations of hormones 1.0 mg/l BAP and 0.25 mg/l NAA. The *in vitro* plantlets were then acclimatized in two different substrates that were soil and the soil mixture with vermiculite which was found with 100% survival rate obtained by *in vitro* grown *P. cablin* plants acclimatized in soil. The leaves part were harvested from both sources of *in vitro* and grown plants and *ex vitro* mother plant of *P. cablin* for further extraction of its essential oil via hydrodistillation and then were analyzed using GC-MS. The gas chromatogram of the extracted oils from both samples showed similar essential oil profiles with relative amount of patchouli alcohol were higher in the *in vitro* grown plants than that in *ex vitro* mother plant. The monomorphic banding pattern analyzed using two universal primers, cytochrome c oxidase (cox1) and maturase K (matK) indicated that the true to type plants of *P. cablin* were established from *in vitro* propagation through direct propagation from node explants. Rapid and high multiplication frequency as well as the essential oil content ensures the efficacy of the protocol developed for the production of this industrially important aromatic plant.

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