

MICROPROPAGATION OF WETLAND MONOCOT CATTAIL

(*Typha latifolia*)

By

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A PITA report submitted in partial fulfilment of
the requirement for the award of the degree of
Bachelor of Science (Biological Sciences)

**DEPARTMENT OF BIOLOGICAL SCIENCES
FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITI MALAYSIA TERENGGANU**

2011



**JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
UNIVERSITI MALAYSIA TERENGGANU**

SBB/SBD 4399B
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DECLARATION

I hereby declare that this PITA research report entitled **Micropropagation of Wetland Monocot Cattail (*Typha latifolia*)** is the result of my own research except as cited in the references.

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ACKNOWLEDGEMENTS

Alhamdulillah, with the God's help and His amazing grace, I'm finally completing this dissertation after going through one year of challenging period. Nevertheless, this period is so meaningful because it gives me an opportunity to step foot into true research work. This research has been developed and implemented with assistance of several generous individuals.

I would like to thank all those people who made this thesis possible and an enjoyable experience for me. First and foremost, I wish to express my sincere gratitude to my supervisor, Prof. Madya Dr. Aziz Bin Ahmad and my co-supervisor, Dr. Jamilah Binti Salim @ Mohd Halim for the continuous guidance, support and encouragement from the initial until the final level that enable me to develop understanding to my project. Moreover, they show me different ways to approach a research problem and the need to be persistent to accomplish any goal.

A special thank also goes to laboratory assistance for their help during my works at Biotechnology Laboratory.

I would like to extend my thankfully gratitude to my friends for their encouragement and help especially to Ahmad Ariff Azuan Bin Munshi, Siti Faridah Binti Abdul Rahman, Nur Fatin Binti Ahmad, Sharifah Binti Mukhtar, Nor Shamira Binti Lokman, Nusaibah Binti Md. Disa, Mohd Ridhwan Bin Abdullah Asri, Nur Syazana Binti Md. Saad, Nur Azirah Binti Amzah, Mohd Iqbal Bin Hamzah and Azmi B. Ismun.

Finally, I would like also to express my deepest gratitude for a constant support and emotional understanding that I received from my family especially my parents, Meor Hashim Bin Meor Osman and Waidah Binti Mat Yaakob.

MIKROPROPAGASI TUMBUHAN BERTANAH LEMBAB (*TYPHA LATIFOLIA*)

ABSTRAK

Typha latifolia adalah tumbuhan monokot yang mana ia biasanya tumbuh di kawasan bertanah lembab. Tumbuhan ini mempunyai kelebihan dalam tindak balas alleopathy, pembuatan racun tumbuhan, rawatan air tercemar serta aktiviti imun. Kajian ini dijalankan bertujuan untuk mengenalpasti kesan sitokinin ke atas pembiakan *T. latifolia* selain pemerhatian kepada jumlah flavon, flavonoid serta isipadu phenolik dalam tumbuhan. Hujung apeks atau rizom *T. latifolia* yang diperoleh daripada Simpang Pulai, Ipoh di kultur di antara enam atau sembilan minggu di dalam media MS dengan berbagai jenis sitokinin (1.0-5.0 mg^l-1) iaitu 6-bezyladenine (BAP), 6-furfurylaminopurine (Kinetin/KN), Thidiazuron (TDZ) dan 6-4-hydroxy-3-methyl-but-2-enylaminopurine (Zeatin/ZEA). 1.0 mg^l-1 dan 2.0 mg^l-1 BAP dikenalpasti merangsang pertumbuhan daun secara maksimum. Pemindahan rizom kepada media MS yang mempunyai kombinasi di antara BAP dan Indole-3-acetic acid (IAA), menunjukkan bahawa nisbah 1:1 BAP dan IAA diperlukan dalam pembiakan daun. Namun begitu, pemanjangan daun diperhatikan tinggi di dalam media tidak berhormon. 2.0 mg^l-1 BAP dan 3.0 mg^l-1 TDZ serta kombinasi di antara 5.0 mg^l-1 BAP+3.0 mg^l-1 IAA menghasilkan bilangan anak pokok baru yang lebih banyak. Pertumbuhan akar adalah rendah di dalam sitokinin dan tinggi di dalam auksin. 3.0 mg^l-1 IAA merangsang pertumbuhan akar yang lebih tinggi. Selain itu, jumlah flavon, flavonoid serta phenolik di dalam *T. latifolia* juga diukur. 1.0 mg^l-1 BAP menghasilkan kandungan phenolik yang lebih tinggi. Kandungan flavonoid yang tinggi didapati daripada 3.0 mg^l-1 KN serta kombinasi diantara 1.0 mg^l-1 BAP+3.0 mg^l-1 IAA. Namun, kandungan flavon yang tinggi diperhatikan dalam *T. latifolia* yang tumbuh dalam 1.0 mg^l-1 BAP+3.0 mg^l-1 IAA media. Kesimpulannya, MS media yang dibekalkan dengan kepekatan sitokinin dan auksin yang berbeza akan mempengaruhi pertumbuhan serta bahan metabolic sekunder dalam *T. latifolia*.

MICROPROPAGATION OF WETLAND MONOCOT CATTAIL (*TYPHA LATIFOLIA*)

ABSTRACT

Typha latifolia is monocotyledonous plant which commonly grows in the wetland. It has the ability for alleopathy response, manufacture pesticides, treatment the polluted water and also stronger in immunosuppressive activity. This study was conducted to establish and determine the effect of cytokinin on proliferation of *T. latifolia* besides to observe the total flavone, flavonoid and phenolic content of plant. Apical tips and rhizome of *T. latifolia* were collected from Simpang Pulai, Ipoh was cultured for six to nine weeks in MS basal medium with various cytokinin (1.0-5.0 mg l⁻¹) of 6-bezyladenine (BAP), 6-furfurylamino purine (Kinetin/KN), Thidiazuron (TDZ) and 6-4-hydroxy-3-methyl-but-2-enylamino purine (Zeatin/ZEA). 1.0 mg l⁻¹ and 2.0 mg l⁻¹ BAP was induced maximum in leaves multiplication. Transfer of rhizome to MS medium supplemented with BAP and Indole-3-acetic acid (IAA), individually or combination, indicated that a combination 1:1 ratio of BAP and IAA was required in leaves multiplication. In contrast, the elongation of leaves was found highest in medium free hormone. The presence of a single 2.0 mg l⁻¹ BAP and 3.0 mg l⁻¹ TDZ and also combination of 5.0 mg l⁻¹ BAP+3.0 mg l⁻¹ IAA were produced the greater number of new plantlets. Root induction was lower in the presence of cytokinin but may induce higher with presence of auxin. 1.0 mg l⁻¹ BAP+3.0 mg l⁻¹ IAA was efficient in root development. The total flavone, flavonoid and phenolic content of *T. latifolia* were measured. 3.0 mg l⁻¹ BAP gave the highest content of total phenolic compound. The highest content of flavonoids was obtained from 3.0 mg l⁻¹ KN and combination between 1.0 mg l⁻¹ BAP+3.0 mg l⁻¹ IAA. However, the medium free hormone gave the highest content of total flavone than single treatment in *T. latifolia*. In contrast, combination between 1.0 mg l⁻¹ BAP+3.0 mg l⁻¹ IAA has the highest of total flavone content. On the basis of culture findings, we can conclude that MS media supplemented with different concentration of cytokinins and auxins may influence the growth and secondary metabolites in *T. latifolia*.