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Effect of magnesium on phenolics content in cryptococoryne  
minima cultures / by Syazana Md Saad.

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PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

EFFECT OF MAGNESIUM ON PHENOLICS CONTENT IN *CRYPTOCORYNE*  
*MINIMA* CULTURES

By

SYAZANA BT MD SAAD

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  
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2011



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

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PENGAKUAN DAN PENGESAHAN LAPORAN PITA**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **Effect of Magnesium on Phenolic Content in *Cryptocoryne minima* Cultures** oleh **Syazana bt Md Saad**, no. matrik: UK17231 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Sains Biologi) Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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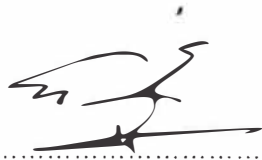
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## DECLARATION

I hereby declare that this PITA entitled **Effect of Magnesium on Phenolics Content in *Cryptocoryne minima* Cultures** is the result of my own research except as cited in the references.

Signature



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## KESAN MAGNESIUM KE ATAS KANDUNGAN PHENOLIK DALAM KULTUR *CRYPTOCORYNE MINIMA*

### ABSTRAK

Adalah diketahui bahawa sebatian phenolik adalah metabolit sekunder bagi tumbuhan yang berperanan untuk pembentukan pigment, pertumbuhan, pertahanan daripada patogen dan pelbagai fungsi lain. Kajian sebelum ini menunjukkan bahawa nutrisi tumbuhan mempengaruhi sintesis metabolit sekunder dalam tumbuhan. Kajian ini telah dijalankan untuk menentukan kesan magnesium ke atas kandungan phenolik dalam tumbuhan kultur *Cryptocoryne minima*, sejenis tumbuhan akuatik yang dijadikan sebagai tumbuhan perhiasan akuarium. *C. minima* telah dibiakkan di dalam media Gamborg's B5 dan dibiarkan selama 2 minggu sebelum menjalankan rawatan magnesium. Ia didedahkan kepada pelbagai kepekatan magnesium untuk 8 minggu, dan jumlah kandungan phenolik, flavonoid, flavone dan anthocyanin telah diukur setiap selang 7 hari. Keputusan menunjukkan kepekatan Mg yang tinggi memberi kesan yang jelas kepada peningkatan pertumbuhan pokok dengan pokok yang dirawat di dalam 36.8 mM Mg, iaitu mempunyai berat basah yang paling tinggi berbanding rawatan lain. Jumlah phenolik, flavonoid, flavone dan anthocyanin menunjukkan pebezaan yang jelas di dalam kepekatan Mg yang berbeza. Oleh itu, dapat disimpulkan bahawa *C. minima* yang hidup dalam kultur tisu dapat tumbuh dalam kepekatan Mg yang luas. Kehadiran Mg juga menyumbang kepada biosintesis sebatian phenolik di dalam pokok ini. Selain itu, nisbah sebatian phenolik yang berbeza tidak dipengaruhi oleh pelbagai kepekatan Mg dengan flavonoid/ total phenolik menunjukkan nisbah paling tinggi diikuti dengan flavone/ total phenolik dan anthocyanin/ total phenolik.

## EFFECT OF MAGNESIUM ON PHENOLICS CONTENT IN *CRYPTOCORYNE MINIMA* CULTURES

### ABSTRACT

It well known that phenolic compounds are plant secondary metabolites that responsible for pigmentation, growth, resistance to pathogens and many other functions. Previous study showed that plant nutrition affected the synthesis of secondary metabolites in plants. This study was determined the effect of Mg on total phenolics content in *Cryptocoryne minima* cultures, an aquatic plant that has been established as aquarium ornamental plant. The *C. minima* was propagated in Gamborg's B5 medium and maintained for 2 weeks before the Mg treatment. It's plantlets were exposed to various concentration of Mg for eight weeks and the total phenolics, flavonoids, flavones and anthocyanins content were measured every seven days interval. The result showed that higher Mg concentration was significantly increased the plant growth, with plants treated in 36.8 mM Mg, containing greater fresh weight than other treatment. Total phenolics, flavonoids, flavones and anthocyanins showed significantly differences with different concentration of Mg. Thus, it was concluded that *C.minima* grown in tissue cultures can growth in broad range of Mg concentration. The present of Mg also contributed to the biosynthesis of phenolics compound in this plant. Besides, the ratio of different phenolics compound does not influence with various concentration of Mg with flavonoids/ total phenolics showed highest ratio followed by flavones/ total phenolics and anthocyanins/ total phenolics.