





ENZYMATIC AND NON-ENZYMATIC ACTIVITY OF *Aglaonema simplex*  
CULTURES UNDER DROUGHT STRESS

By

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **Enzymatic and non-enzymatic activity of *Aglaonema simplex* cultures under drought stress** oleh Nurul Hadijah binti Idris, no. matrik: **UK 15505** 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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## DECLARATION

I hereby declare that this research report entitled **Enzymatic and Non-enzymatic Activity of *Aglaonema simplex* Cultures under Drought Stress** is the result of my own research except as cited in the references.

Signature : .....  
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## ENZYMATIC AND NON-ENZYMATIC ACTIVITY OF *Aglaonema simplex* CULTURES UNDER DROUGHT STRESS

### ABSTRACT

Drought is one of the major environmental factors that promote the reactive oxygen species (ROS) in plant. ROS can cause oxidative damage and contribute to negative effect on plant physiology. The aim of this study is to determine the physiological changes of *Aglaonema simplex* cultures under drought stress. Induction of drought stress of *A. simplex* plantlets were induced using MS media supplied with 20% (w/v) of Polyethylene glycol (PEG) 4000. The growth, enzymatic and non-enzymatic parameter were measured every 7 days interval for 7 week. Total specific activity of antioxidative enzyme Peroxidase (POD), Ascorbate Peroxidase (APx) and Catalase (CAT) were measured. The fresh weight and dry weight of both control plants and plants subjected to drought increased significantly throughout all the treatment periods. The number of leaf growth was also investigated but there was no significant different observed between control and treatment plants. Drought stress resulted in higher enzyme activity in POD, APx and CAT at the early treatment duration. Fluctuated pattern was observed on the non-enzymatic antioxidant's  $\alpha$ -Tocopherol, chlorophyll and anthocyanin. Drought stress gives physiological changes on the *A. simplex* plantlets.

## **AKTIVITI ENZIM DAN BUKAN ENZIM KULTUR *Aglaonema simplex* DI BAWAH TEKANAN KEMARAU**

### **ABSTRAK**

Kemarau adalah salah satu faktor alam semulajadi yang major dapat mempromosikan spesies oksigen reaktif (ROS) di dalam tumbuhan. ROS boleh mengakibatkan kerosakan oksidatif dan menyumbang kepada kesan negatif kepada tumbuhan. Objektif di dalam kajian ini adalah untuk menentukan perubahan fisiologi kultur *Aglaonema simplex* di bawah tekanan kemarau. Pengaruh tekanan kemarau pokok *A. simplex* telah diaruhkan dengan menggunakan media MS yang dibekalkan dengan 20 % kepekatan berat per isipadu Polyethylene glycol (PEG) 4000. Parameter pertumbuhan, aktiviti enzim dan bukan enzim telah diukur setiap selang 7 hari selama 7 minggu. Keseluruhan aktiviti spesifik antioksidatif enzim Peroksidase (POD), Askorbat Peroksidase (APx) dan Katalase (CAT) telah diukur. Berat basah dan berat kering kedua-dua pokok kawalan dan pokok yang didedahkan kepada kemarau meningkat secara beerti sepanjang tempoh rawatan. Pertumbuhan bilangan daun juga turut dikaji tetapi tiada perbezaan beerti yang diperhatikan di antara pokok kawalan dan pokok rawatan. Tekanan kemarau menyebabkan aktiviti enzim POD, APx dan CAT tinggi di awal masa rawatan. Paten turun naik telah diperhatikan pada antioksidan bukan enzim  $\alpha$ -Tocopherol, klorofil dan anthocyanin. Tekanan kemarau memberikan perubahan fisiologi terhadap anak pokok *A. simplex*.