ANTIOXIDATIVE COMPOUNDS OF *Stenochlaena palustris* (PAKU MIDIN) AT DIFFERENT LEAF STAGES

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2008

Antioxcidative compounds of Stenochlaena palustris (paku mindin) at different leaf stages. / Azlinda Ghazali.

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By
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A research report submitted in partial fulfilment of
the requirements 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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2008

This project should be cited as:

Azlinda, G. 2008. Antioxidative Compounds of *Stenochlaena palustris* (Paku Midin) at Different Leaf Stages. Undergraduate Thesis, Bachelor of Biological Sciences. Faculty of Science and Technology, Universiti Malaysia Terengganu. Terengganu. 49pp.

JABATAN SAINS BIOLOGI
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PENGAKUAN DAN PENGESAHAN LAPORAN PITA 1 DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: ANTIOXIDATIVE COMPOUNDS OF *Stenochlaena palustris* (PAKU MIDIN) AT DIFFERENT LEAF STAGES oleh Azlinda bt. Ghazali, No. Matrik: UK12049 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains (Sains Biologi), Fakulti Sains dan Teknologi, UMT.

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DECLARATION

I hereby declare that this thesis entitled ANTIOXIDATIVE COMPOUNDS OF *Stenochlaena palustris* (PAKU MIDIN) AT DIFFERENT LEAF STAGES is the result of my own research except as cited in the references.

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ACKNOWLEDGEMENTS

Praised and thanks to the Almighty Allah s.w.t for giving me tstrength, patience and capability to complete this project and thesis writing and salawat and salam to his righteous messenger, prophet Muhammad s.a.w.

First of all, I would like to express my deepest thanks and appreciation to Puan Norhayati bt. Yusuf as my supervisor for her guidance, tolerance, advice, constructive criticisms and encouragement throughout this study. Her continuous commitment and motivation to help towards the success of my study will always be remembered deep in my heart.

Sincere thanks also extended to all the highly dedicated, helpful and friendly staffs of Biotechnology and Biochemistry Laboratory especially En. Mazrul, Pn. Ku Naiza, Pn. Fatimah and Pn. Normaizianti. Not forgetting, Miss Rokiah, the post-graduate student for her help and idea.

My deep sense of gratitude and respect is quoted to my friends Sitih, Syu, Kak Zira, Su, Bibi, Abid, Ejam, Wan, Yana, Zue and Faraidayu who give the advice and help in the lab.Thanks for the smile and joke.

Paramount gratitude is also owed to my parents, Sadariah bt. Dollah and Ghazali b. Mohd Noor who give me the inspiration during completing this project and thanks a lot for their love, prayer, moral and financial support.

ABSTRACT

Plants possess a self-defense mechanism to counteract the oxidative stress that caused by the accumulation of reactive oxygen species (ROS). In plant, antioxidant composed of enzymatic and non-enzymatic antioxidants. Enzymatic antioxidant includes ascorbate peroxidase (APx), catalase (CAT), guaiacol peroxidase (G-POD) and superoxide dismutase (SOD) while the non-enzymatic antioxidant comprise of ascorbic acid, α-tocopherol, carotenoid and flavonoid. *Stenochlaena palustris* (paku midin) is a type of ferns that widely distributed in Malaysia. Objectives of this study are to determine and compare the level of antioxidative compounds in *S. palustris* at different leaf stages, i.e. stage 1 (frond), stage 2 (juvenile leaf), stage 3 (matured leaf). The antioxidant assayed includes APx, CAT and G-POD specific activity as well as ascorbic acid, α-tocopherol and carotenoid content. Among the three stages, juvenile leaf contained the highest specific activities of APx and CAT as well as α-tocopherol and carotenoid content. On the other hand, matured leaf exhibited highest specific activity of POD and ascorbic acid concentration. The results suggest that juvenile leaf is a good source of dietary antioxidants due to high concentrations of antioxidants compared to other stages.

ABSTRAK

Tumbuhan mempunyai mekanisma pertahanan untuk mengatasi tegasan oksidatif yang disebabkan oleh pengumpulan spesis oksigen reaktif (ROS). Di dalam tumbuhan, antioksidan terdiri daripada berenzim dan bukan enzim. Antioksidan berenzim termasuk askorbat peroksida (APx), katalas (CAT) dan guaiakol peroksida. Manakala antioksidan bukan enzim terdiri daripada asid askorbik, α-tokoferol, karotenoid dan flavonoid. *Stenochlaena palustris* (paku midin) adalah sejenis paku-pakis yang tumbuh meliar di Malaysia. Objektif projek ini adalah untuk menentu dan membandingkan kandungan antioksidan di dalam *S. palustris* pada fasa pembentukan daun yang berlainan iaitu fasa 1(frond), fasa 2 (daun muda), fasa 3 (daun tua). Asai antioksidan termasuk aktiviti spesifik enzim APx, CAT dan POD dan asid askorbik, α-tokoferol dan karotenoid. Antara ketiga-tiga fasa tersebut, daun muda mengandungi aktiviti spesifik enzim APx, CAT dan kandungan α-tokoferol and karotenoid yang lebih tinggi. Walaubagaimanapun, daun tua mengandungi aktiviti spesifik enzim POD dan kepekatan asid askorbik yang lebih tinggi. Berdasarkan keputusan yang diperolehi, daun muda sesuai dijadikan sumber antioksidan berdasarkan kandungan antioksidan yang lebih tinggi berbanding dengan fasa yang lain.