

EFFECTS OF SALINITY ON GROWTH AND CHLOROPHYLL  
CONTENT OF *Ulvaenema simplex* CULTURES

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EFFECTS OF SALINITY ON GROWTH AND CHLOROPHYLL CONTENT OF  
*Aglaonema simplex* CULTURES

By

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **EFFECTS OF SALINITY ON GROWTH AND CHLOROPHYLL CONTENT OF *Aglaonema simplex* CULTURES** oleh **NURHUDA BINTI YAZID**, no. matrik: **UK 9505** telah diperiksa dan semua pembedaan 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, Universiti Malaysia Terengganu.

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## ABBREVIATIONS

%	-	Percentage
$^1\text{O}_2$	-	Singlet oxygen
$A_{663}$	-	Absorbance reading at 663 nm
$A_{645}$	-	Absorbance reading at 645 nm
ANOVA	-	Analysis of Variance
APX	-	Ascorbate peroxidase
BAP	-	6-Benzylaminopurine
CaCl	-	Calcium chloride
CAT	-	Catalase
Chl-a	-	Chlorophyll a
Chl-a+b	-	Total chlorophyll
$\text{Cl}^-$	-	Chlorin ion
cm	-	Centimeter
$\text{CO}_2$	-	Carbon dioxide
g	-	Gram
g/L	-	Gram per litre
GR	-	Glutathione reductase
$\text{H}_2\text{O}_2$	-	Hydrogen peroxide
$\text{H}_2\text{O}$	-	Water
HCl	-	Hydrochloric acid
$\text{K}^+$	-	Potassium ion
mg/g	-	Milligram per gram
ml	-	Milliliter
mM	-	Milimolar
MS	-	Murashige and Skoog culture media
$\text{Na}^+$	-	Sodium ion
NaCl	-	Natrium chloride / Sodium chloride
NaOH	-	Sodium hydroxide
nm	-	Nanometer
n	-	Number of data
$\text{O}_2$	-	Oxygen

$O_2^{\cdot -}$	-	Superoxide radical
$O_3$	-	Ozone
$^{\circ}C$	-	Degree celcius
$OH^{\cdot}$	-	Hydroxyl radical
P	-	Significance level
PSII	-	Photosystem II
ROS	-	Reactive oxygen species
RUBPCase	-	Ribulose biphosphate carboxylase
$SO^{\cdot -}$	-	Sulphuroxide radical
SOD	-	Superoxide dismutase
SPSS	-	Statistical Package for Social Sciences
UV	-	Ultraviolet
V	-	Volume
w	-	Watts
W	-	Weight

## ABSTRACT

The study of salinity effect on plant cultures were expected to offer understanding of plant response to salinity. These will then helps solving problem of supply and quality of cultured plant. The effects of different concentrations of sodium chloride, NaCl (0 mM, 25 mM, 50 mM and 100 mM), on growth and chlorophyll content in *Aglaonema simplex* cultures were studied. Growth of stems, roots, leaves and biomass as well as chlorophyll content were measured every 0, 1, 2, 7, 14 and 28 days of treatment periods. Generally, treatment with NaCl resulted in increased of *A. simplex* cultures fresh weight, dry weight and stem height while root length reduced significantly ( $P < 0.05$ ) when treated with 50 mM NaCl especially at later stages of treatment periods. NaCl treatment did not significantly ( $P > 0.05$ ) affected leaves length and leaves width of *A. simplex* cultures. Chlorophyll content were significantly ( $P < 0.05$ ) higher in control plant compared to the treated cultures especially after 7 days of experiment. Above results indicated that oxidative stress caused by NaCl would not affected the growth of *A. simplex* cultures while significantly lowered the chlorophyll content of treated cultures.

# KESAN SALINITI TERHADAP PERTUMBUHAN DAN KANDUNGAN KLOROFIL KULTUR *Aglaonema simplex*

## ABSTRAK

Kajian kesan saliniti ke atas kultur pokok dapat menambahkan kefahaman tentang tindak balas pokok terhadap saliniti serta membantu menyelesaikan masalah bekalan dan kualiti pokok yang dikultur. Kesan kepekatan natrium klorida (NaCl) yang berbeza (0 mM, 25 mM, 50 mM and 100 mM) kepada pertumbuhan dan kandungan klorofil telah dikaji pada kultur pokok *Aglaonema simplex*. Pertumbuhan batang, akar, daun, biojisim dan kandungan klorofil diukur setiap 0, 1, 2, 7, 14 dan 28 hari rawatan. Umumnya, rawatan dengan NaCl menyebabkan peningkatan berat basah, berat kering, dan ketinggian batang kultur pokok *A. simplex* manakala panjang akar berkurang dengan ketara berbanding kultur yang dirawat dengan 50 mM NaCl terutamanya pada peringkat akhir tempoh rawatan. Rawatan NaCl tidak memberi kesan yang bererti kepada panjang dan lebar daun kultur *A. simplex*. Kandungan klorofil adalah lebih tinggi pada kawalan berbanding kultur rawatan terutamanya selepas hari ketujuh kajian. Keputusan tersebut menunjukkan bahawa tegasan oksidatif yang disebabkan oleh NaCl tidak memberi kesan ketara ke atas pertumbuhan kultur *A. simplex* manakala kandungan klorofil kultur rawatan berkurangan.