EFFECTS OF SALINITY ON THE α-TOCOPHEROL, ASCORBIC ACID AND CAROTENOID CONCENTRATION IN *Cryptocoryne ciliata* CULTURES

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Lihat sebelah

EFFECTS OF SALINITY ON THE α-TOCOPHEROL, ASCORBIC ACID AND CAROTENOID CONCENTRATION IN *Cryptocoryne ciliata* CULTURES

By

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **EFFECTS OF SALINITY ON THE α-TOCOPHEROL, ASCORBIC ACID AND CAROTENOID CONCENTRATION IN *Cryptocoryne ciliata* CULTURES** oleh **NIK NADIAH RAMIZ BINTI YAAZIZ**, no. matrik:**UK10603** 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, Universiti Malaysia Terengganu.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ABBREVIATIONS

APX	-	ascorbate peroxidase
BAP	-	benzylaminopurine
CAT	-	catalase
fwt	-	fresh weight
GR	-	glutathione reductase
g/L	-	gram per liter
HCl	-	hydrochloric acid
H_2O_2	-	hydrogen peroxide
M	-	molar
mg/l	-	milligram per liter
ml	-	mililiter
mM	-	milimolar
NaCl	-	sodium chloride
NaOH	-	sodium hydroxide
nm	-	nanometer
$OH^{\cdot}$	-	hydroxyl radical
$O_2^{\cdot-}$	-	superoxide radical
O_2	-	oxygen
PSII	-	photosystem II
ROS	-	reactive oxygen species
rpm	-	revolution per minute
SE	-	standard error
SOD	-	superoxide dismutase
v/v	-	volume per volume
$^1O_2$	-	singlet oxygen
°C	-	degree celcius
µl	-	microliter
µg/ml	-	microgram per liter

LIST OF APPENDICES

ABSTRACT

Salinity induces wide range of responses in plants. Since the *Cryptocoryne ciliata* can tolerate salinity by using its defense mechanism, the resistance level of this plant was studied in order to see how far they can survive with salinity. Thus, the resistant type of this plant might be produced. The objective of this experiment was to investigate the effects of different NaCl concentrations on the α-tocopherol, ascorbic acid and carotenoid concentration in *C. ciliata* cultures. *C. ciliata* cultures were treated with 0, 25, 50 and 100 mM of NaCl for 28 days in solid MS medium. All the antioxidant levels were measured every 0, 1, 2, 7, 14 and 28 days of treatment periods. The NaCl initially decreased the α-tocopherol concentration up to 2 days of treatment and longer incubation period tend to increase the α-tocopherol concentration and decreased afterwards. At the earlier stage of treatment, the ascorbic acid and carotenoid concentration decreased up to day 1 of treatment and longer treatment period increased the ascorbic acid concentration until day 2 of treatment period and slowly decreased at the later stages of treatment. Similar result was obtained in carotenoid concentration except that the carotenoid concentration increased at the later stage of treatment period. Results indicated all treatments induced the oxidative stress in *C. ciliata* cultures where α-tocopherol, ascorbic acid and carotenoid concentrations were affected differently in *C. ciliata* cultures.

KESAN SALINITI KE ATAS KEPEKATAN α-TOKOFEROL, ASID ASKORBIK DAN KAROTENOID DALAM KULTUR *Cryptocoryne ciliata*

ABSTRAK

Saliniti dapat mempengaruhi pelbagai tindakbalas di dalam tumbuhan. Memandangkan *Cryptocoryne ciliata* adalah rintang terhadap saliniti, tahap kerintangannya dikaji untuk melihat sejauh mana ia mampu menghadapi keadaan kemasinan. Oleh itu, pokok yang rintang terhadap saliniti mungkin dapat dibiakkan. Objektif eksperimen ini adalah untuk mengkaji kesan kepekatan NaCl yang berlainan terhadap kepekatan α-tokoferol, asid askorbik dan karotenoid di dalam kultur *C. ciliata*. *C. ciliata* dirawat dengan 0, 25, 50 dan 100mM NaCl selama 28 hari. Semua aras antioksidan diukur pada setiap 0, 1, 2, 7, 14, dan 28 hari masa rawatan di dalam media pepejal MS. Rawatan NaCl pada awalnya merendahkan kepekatan α-tokoferol sehingga hari ke-2 rawatan dan tempoh rawatan yang lebih panjang meningkatkan kepekatan α-tokoferol dan merendahkannya kembali selepas itu. Pada peringkat awal eksperimen, kepekatan asid askorbik dan karotenoid menurun sehingga hari pertama rawatan dan masa rawatan yang lebih lama meninggikan kepekatan asid askorbik dan seterusnya merendahkannya secara perlahan-lahan di akhir tempoh rawatan. Keputusan yang sama juga diperoleh bagi kepekatan karotenoid kecuali di akhir masa rawatan, di mana kepekatan karotenoid telah meningkat. Keputusan menunjukkan bahawa rawatan saliniti telah merangsang tegasan oksidatif di dalam kultur *C. ciliata* di mana kepekatan α-tokoferol, asid askorbik dan karotenoid memberi kesan yang berlainan di dalam kultur *C. ciliata*.