

EFFECT OF SALICYLIC AND ASCORBIC ACID
TREATMENT ON THE GROWTH, BIOCHEMICAL
AND ANTIOXIDANT CONTENTS OF
Cryptococcus albidus CULTURES

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EFFECT OF SALINITY ON THE α -TOCOPHEROL, ASCORBATE AND
CAROTENOID CONTENT OF *Cryptocoryne elliptica* CULTURES

By

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LIST OF ABBREVIATIONS

ATP	-	adenine triphosphate
APX	-	ascorbate peroxidase
BAP	-	benzylaminopurine
CO ₂	-	carbon dioxide
°C	-	degree of celcius
DNA	-	deoxyribonucleic acid
fwt	-	fresh weight
g/L	-	gram per liter
HCl	-	hydrochloric acid
H ₂ O ₂	-	hydrogen peroxide
OH·	-	hydroxyl radical
µg/ml	-	microgram per liter
µl	-	microliter
mg/L	-	milligram per liter
mM	-	millimolar
NaOH	-	natrium hydroxide
O ₂	-	oxygen
%	-	percentage
PSII	-	photosystem II
ROS	-	reactive oxygen species
rpm	-	revolution per minute
¹ O ₂	-	singlet oxygen
NaCl	-	sodium chloride
SE	-	standard error
SOD	-	superoxide dismutase
O ₂ ⁻	-	superoxide radical

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ABSTRACT

Tolerability of *Cryptocoryne elliptica* to salt stress was observed through the non-enzymatic antioxidants concentration produce so that it can be propagate to maintain its species. The objective of this experiment was to investigate the effect of different concentrations of NaCl on non-enzymatic antioxidant (α -tocopherol, ascorbic acid and carotenoid) content in *C.elliptica* cultures, an aquatic plant (freshwater plant). *C.elliptica* cultures were treated with 0, 25, 50 and 100mM NaCl for 28 days in B5 solid medium. α -Tocopherol, ascorbic acid and carotenoid concentrations were measured at 0, 1, 2, 7, 14 and 28 days of treatment periods. No significant differences ($p>0.05$) were observed in α -tocopherol concentration in treated and controls up to 2 days of treatment. After 2 days treatment, α -tocopherol concentration increased significantly ($p<0.05$) especially in cultures treated with 25 and 50mM NaCl. However, no significant differences ($p>0.05$) were observed in plant treated with 25 and 50mM of NaCl. Longer treatment periods significantly ($p<0.05$) lowered the α -tocopherol concentrations. Ascorbic acid concentrations were increased significantly ($p<0.05$) after 1 to 7 days of treatment with NaCl. Higher concentration of NaCl led to greater increase of ascorbic acid concentration. Longer treatment period significantly ($p<0.05$) decreased the ascorbic acid concentrations except for plant treated with 50mM NaCl where the ascorbic acid concentrations remained constant. NaCl treatments reduced the carotenoid concentrations. Higher NaCl concentration significantly ($p<0.05$) lowered the carotenoid concentration. Results indicated that α -tocopherol, ascorbic acid and carotenoid contents were affected differently in *C.elliptica* cultures when treated with NaCl.

KESAN SALINITI TERHADAP KANDUNGAN α -TOKOFEROL, ASID ASKORBİK DAN KAROTENOID DALAM KULTUR *Cryptocoryne elliptica*

ABSTRAK

Rentan *Cryptocoryne elliptica* terhadap kemasinan dikesan melalui kepekatan antioksidan bukan enzim yang dihasilkan supaya ia boleh dibiakkan untuk mengekalkan spesies ini. Objektif eksperimen ini ialah untuk mengkaji kesan kepekatan NaCl yang berlainan terhadap kandungan antioksidan bukan enzim (α -tokoferol, asid askorbik dan karotenoid) di dalam kultur *C.elliptica* sejenis tumbuhan akuatik (tumbuhan air tawar). Kultur *C.elliptica* dirawat dengan 0, 25, 50 dan 100mM NaCl selama 28 hari dalam media pepejal B5. Kandungan α -tokoferol, asid askorbik dan karotenoid diukur pada setiap 0, 1, 2, 7, 14 dan 28 hari masa rawatan. Tiada perbezaan bererti ($p>0.05$) diperhatikan dalam kepekatan α -tokoferol pada rawatan dan kawalan sehingga 2 hari rawatan. Selepas 2 hari rawatan, kepekatan α -tokoferol meningkat dengan signifikan ($p<0.05$) terutamanya dalam kultur yang dirawat dengan 25 dan 50mM NaCl. Walau bagaimanapun, tiada perbezaan bererti ($p>0.05$) diperhatikan dalam tumbuhan yang dirawat dengan 25 dan 50mM NaCl. Peningkatan masa rawatan, menyebabkan pengurangan kepekatan α -tokoferol secara signifikan. Kepekatan asid askorbik meningkat dengan signifikan ($p<0.05$) selepas 1 hingga 7 hari rawatan dengan NaCl. Kepekatan NaCl yang tinggi meningkatkan kepekatan asid askorbik. Peningkatan masa rawatan menyebabkan penurunan secara signifikan ($p<0.05$) kepekatan asid askorbik kecuali pada tumbuhan yang dirawat dengan 50mM NaCl di mana kepekatan asid askorbik adalah tetap. Rawatan NaCl mengurangkan kepekatan karotenoid. Kepekatan NaCl yang tinggi menyebabkan penurunan secara signifikan ($p<0.05$) kepekatan karotenoid. Keputusan menunjukkan kandungan α -tokoferol, asid askorbik dan karotenoid memberi kesan yang berlainan di dalam kultur *C.elliptica* apabila diberi rawatan dengan NaCl.