

ANALYSIS OF THE EFFECTS OF FERMENTING  
AND DRYING ON THE COMPOSITION OF  
ANANAS COMPOSUS (PINEAPPLE) USING  
THE GRAMM-SCHMIDT (G-S) ANALYSIS

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SOMACLONAL VARIATION OF LONG TERM CULTURING AND HIGH  
CYTOKININ CONCENTRATION ON *ANANAS COMOSUS* N36  
CULTURES USING RAPD (RANDOM AMPLIFIED  
POLYMERASE DNA) ANALYSIS

By

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**JABATAN SAINS BIOLOGI  
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**PENGAKUAN DAN PENGESAHAN LAPORAN  
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: SOMACLONAL VARIATION OF LONG TERM CULTURING AND HIGH CYTOKININ CONCENTRATION ON *Ananas comosus* N36 CULTURES USING RAPD (Random Amplified Polymerase DNA) ANALYSIS oleh Zairul Fazwan Bin Md Zainordin No. Matrik UK 8654 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, Kolej Universiti Sains dan Teknologi Malaysia.

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## LIST OF ABBREVIATION

BAP	-	benzylaminopurine
Bp	-	base pair
HCl	-	hydrochloric acid
mg l <sup>-1</sup>	-	milligram per liter
M	-	molar
MS	-	Murashige and Skoog
NaOH	-	sodium hydrochloride
v/v	-	volume per volume
v/w	-	volume per weight
CAM	-	crassulacean acid metabolism
%	-	percent
DNA	-	deoxyribonucleic acid
CTAB	-	cetyltrimethylammonium bromide
µg ml <sup>-1</sup>	-	microgram per milliliter
PCR	-	polymerase chain reaction
RAPD	-	random amplified polymerase DNA

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## ABSTRACT

Twenty primers were screened for *Ananas comosus* Var. N36 cultures. Three primers OPA1, OPA4 and OPA13 which showed clearest band and polymorphism was chosen to detect the somaclonal variation in three generations i.e. (six, seven and eight) of *A. comosus* N36 cultures. The sixth generation was cultured on MS added with  $1.0 \text{ mg l}^{-1}$  BAP while the seventh and eighth generations were cultured on MS added with  $5.0 \text{ mg l}^{-1}$  BAP. The genomic polymorphism was analyzed by RAPD-PCR method. The percentage of polymorphism among sixth generation (twenty individuals) was 21.05%, 13.16% in seventh generation (twenty four individuals) while for eighth generation (twenty four individuals) was 15.79%. For the percentage of variation among sixth generation analyzed by NTSYS-pc version 2.1 program was 45.00%, 45.83% in seventh generation and for eighth generation was 29.17%. Data obtained from RAPD-PCR analysis showed that the somaclonal variation in the plantlet was not due to higher concentration of BAP, but influenced by the number of subculture.

**VARIASI SOMAKLONAL TERHADAP PENGKULTURAN JANGKA MASA PANJANG DAN KESAN KEPEKATAN HORMON SITOKININ YANG TINGGI TERHADAP KULTUR *ANANAS COMOSUS* N36 DENGAN MENGGUNAKAN ANALISIS RAPD (RANDOM AMPLIFIED POLYMERASE DNA)**

**ABSTRAK**

Dua puluh primer telah diskriminasi untuk kultur *Ananas comosus* var. N36. Tiga primer iaitu OPA 01, OPA 04 dan OPA 13 menunjukkan jalur dan polimorfisme yang jelas telah dipilih untuk mengesan variasi somaklonal di dalam tiga generasi (enam, tujuh dan lapan) kultur *A. comosus* N36. Generasi ke-enam dikultur di dalam medium MS yang dicampur  $1.0 \text{ mg l}^{-1}$  BAP manakala bagi generasi ke-tujuh dan ke-lapan dikultur di dalam medium MS dicampur  $5.0 \text{ mg l}^{-1}$  BAP. Polimorfisme genomik dianalisa menggunakan kaedah RAPD-PCR. Peratusan polimorfisme yang dikesan pada generasi ke-enam (dua puluh individu) adalah 21.05%, 13.16% pada generasi ke-tujuh (dua puluh empat individu) manakala untuk generasi ke-lapan (dua puluh empat individu) pula sebanyak 15.79%. Bagi peratusan variasi bagi generasi ke-enam dianalisa menggunakan program NTSYS-pc versi 2.1 adalah 45.00%, 45.83% di dalam generasi ke-tujuh dan untuk generasi ke-lapan adalah sebanyak 29.17%. Data analisis RAPD-PCR menunjukkan variasi somaklonal di dalam kultur tidak disebabkan oleh kepekatan BAP yang tinggi tetapi dipengaruhi oleh bilangan kali subkultur.