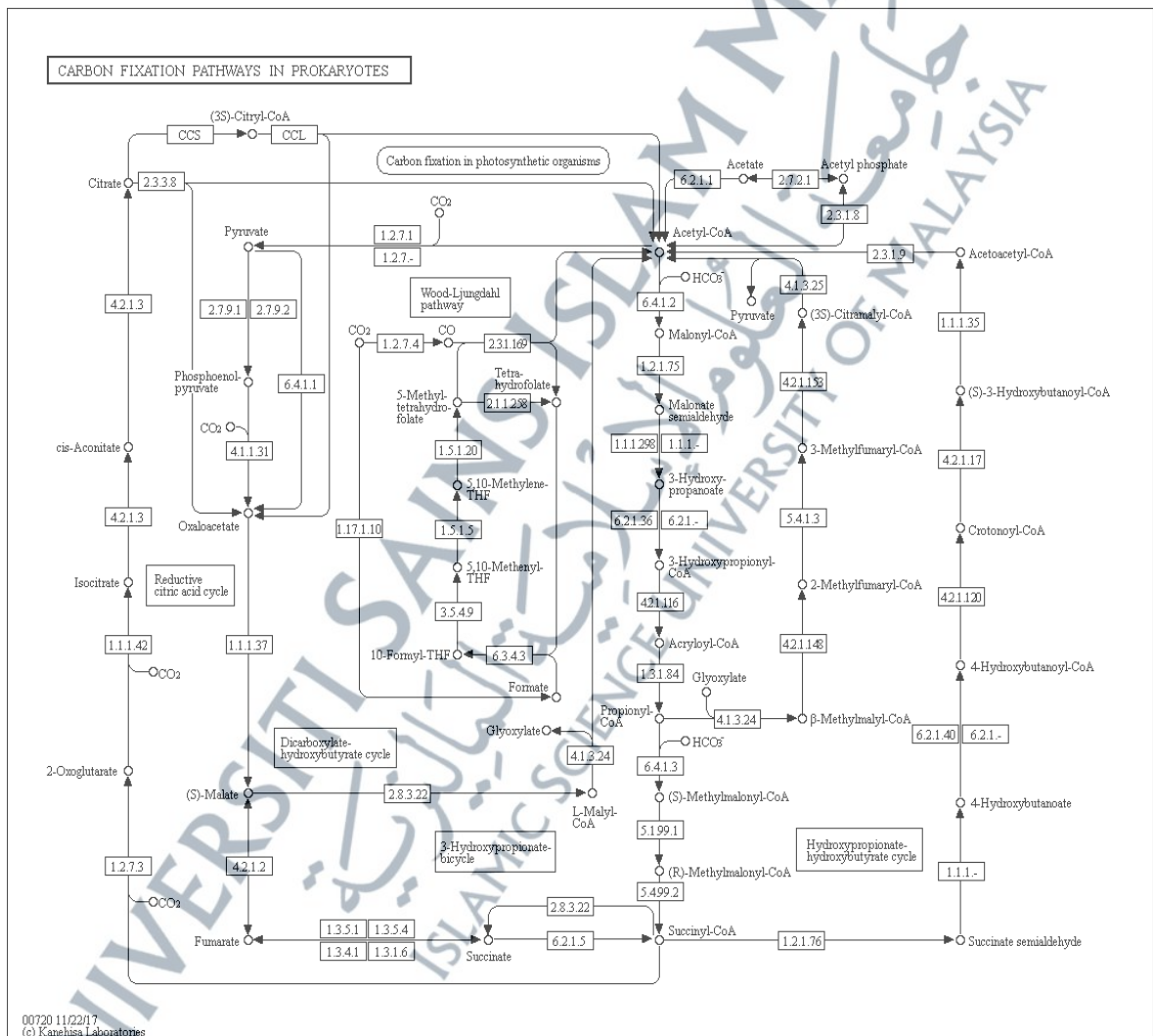
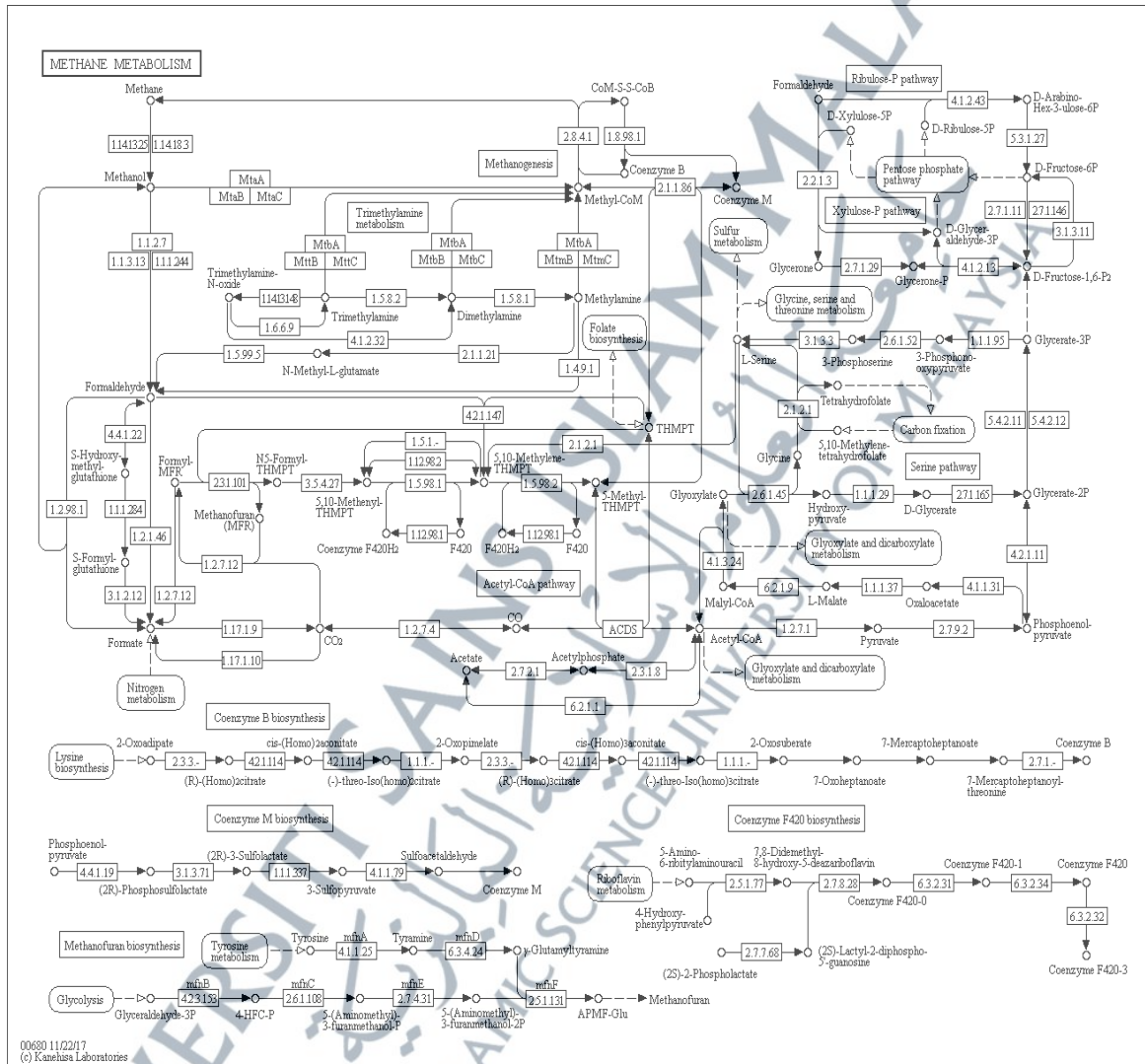


## APPENDICES

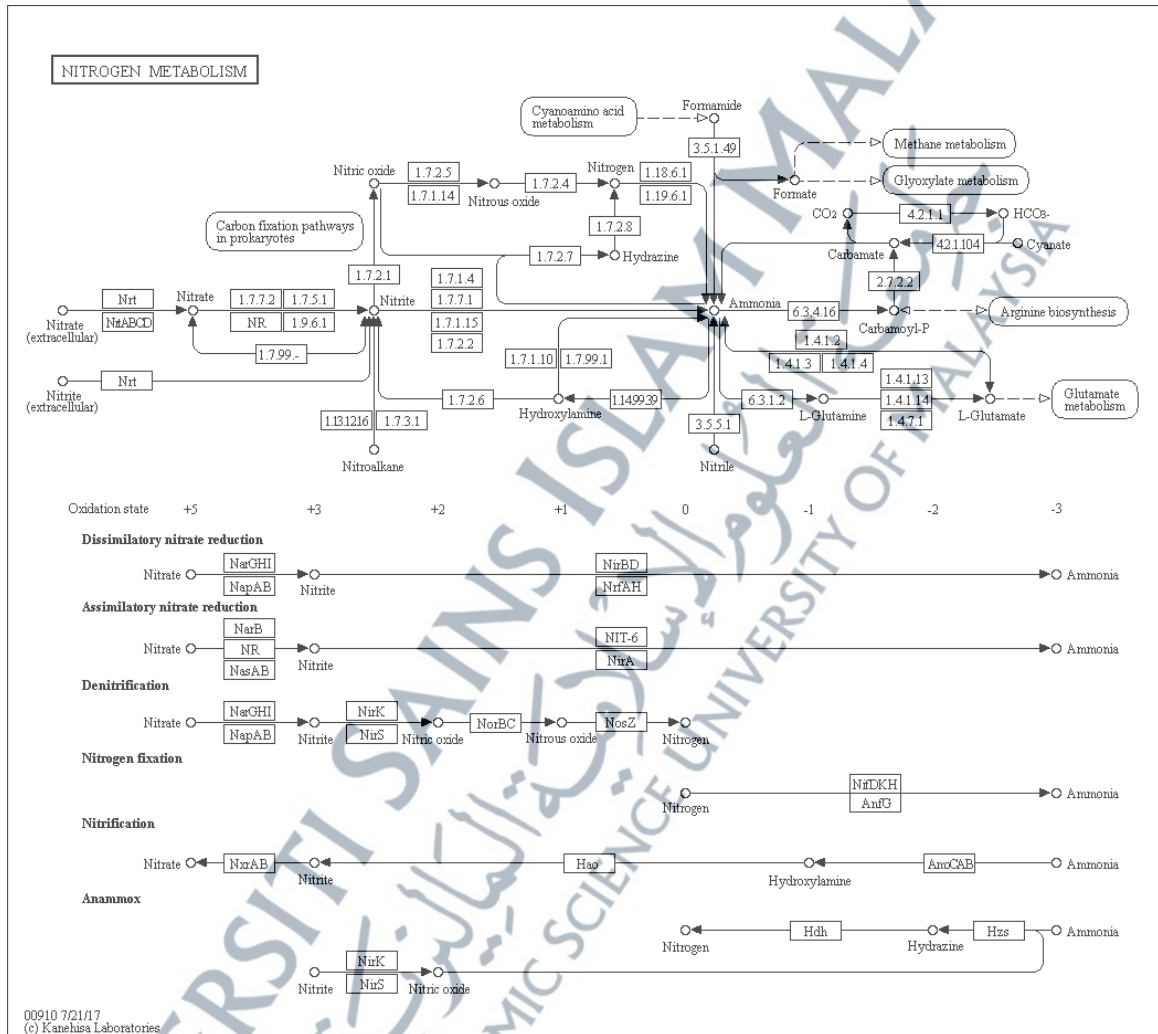
### Appendix A : Carbon Fixation Metabolism Pathway of Microbiome 1, 2 and 3 from Mangrove Soil in Sungai Lukut



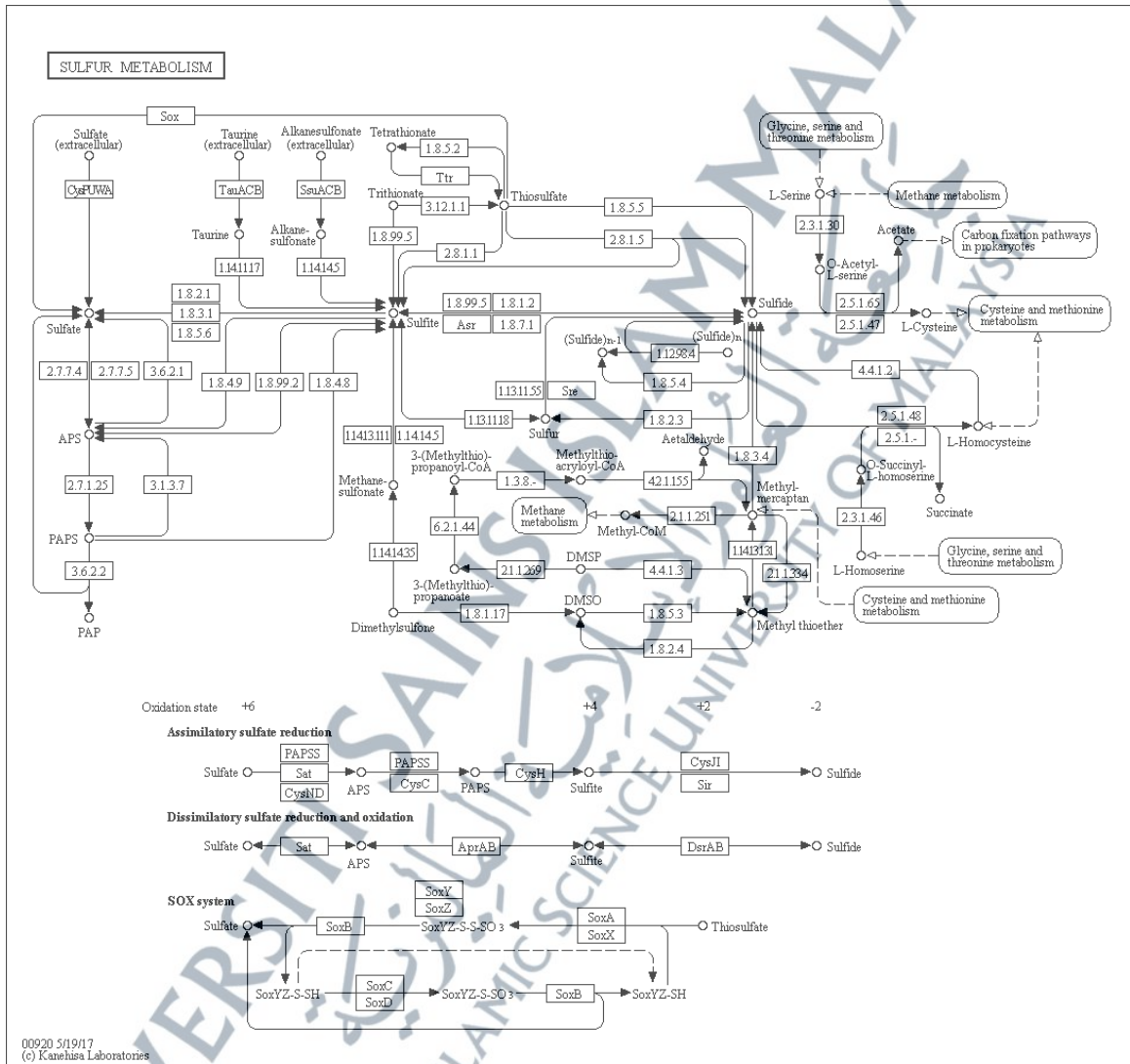
## Appendix B : Methane Metabolism Pathway of Microbiome 1, 2 and 3 from Mangrove Soil in Sungai Lukut



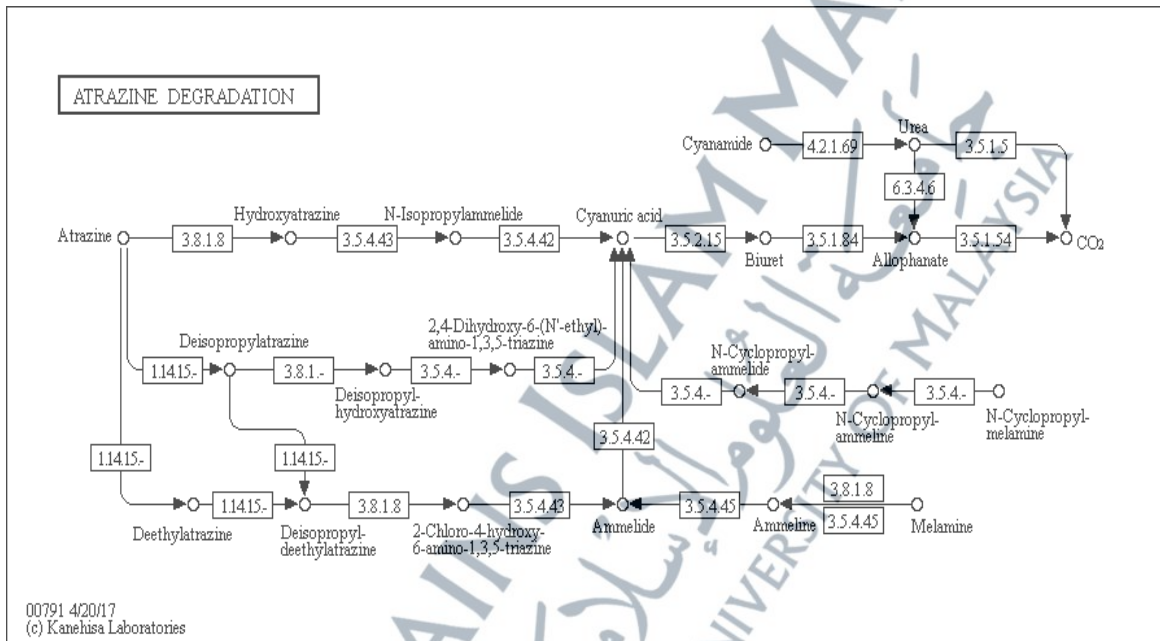
## Appendix C : Nitrogen Metabolism Pathway of Microbiome 1, 2 and 3 from Mangrove Soil in Sungai Lukut



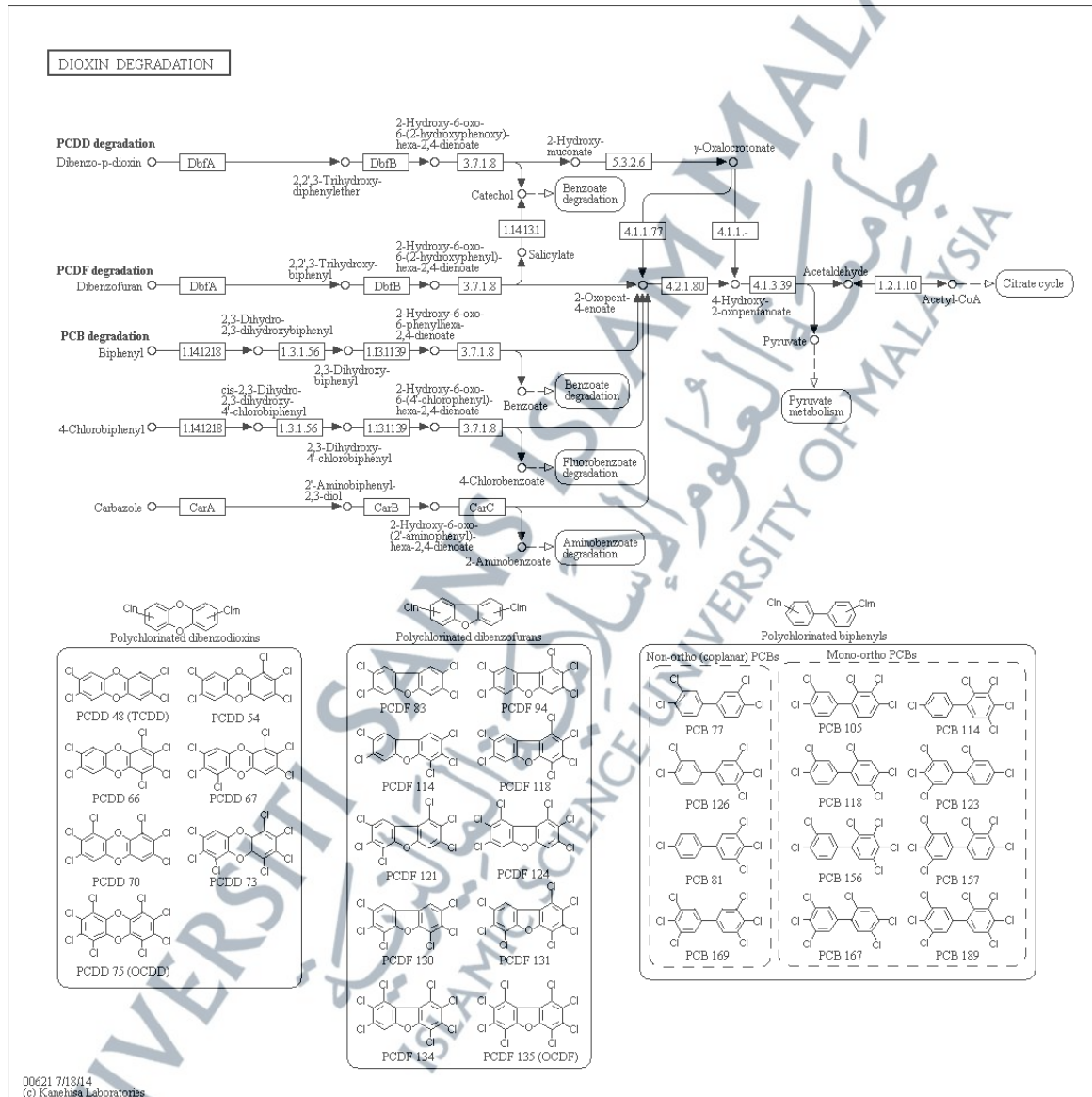
## Appendix D : Sulfur Metabolism Pathway of Microbiome 1, 2 and 3 from Mangrove Soil in Sungai Lukut



**Appendix E : Atrazine Degradation Pathway of Microbiome 1, 2 and 3 from Mangrove Soil in Sungai Lukut**



## Appendix F : Dioxin Degradation Pathway of Microbiome 1, 2 and 3 from Mangrove Soil in Sungai Lukut



**Appendix G : One-Way ANOVA of Microbial Survivability in Biofertilizer of  
Control, Set A, B and C**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	3	1141.6	380.53	12.72	0.002
Error	8	239.3	29.92		
Total	11	1380.9			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

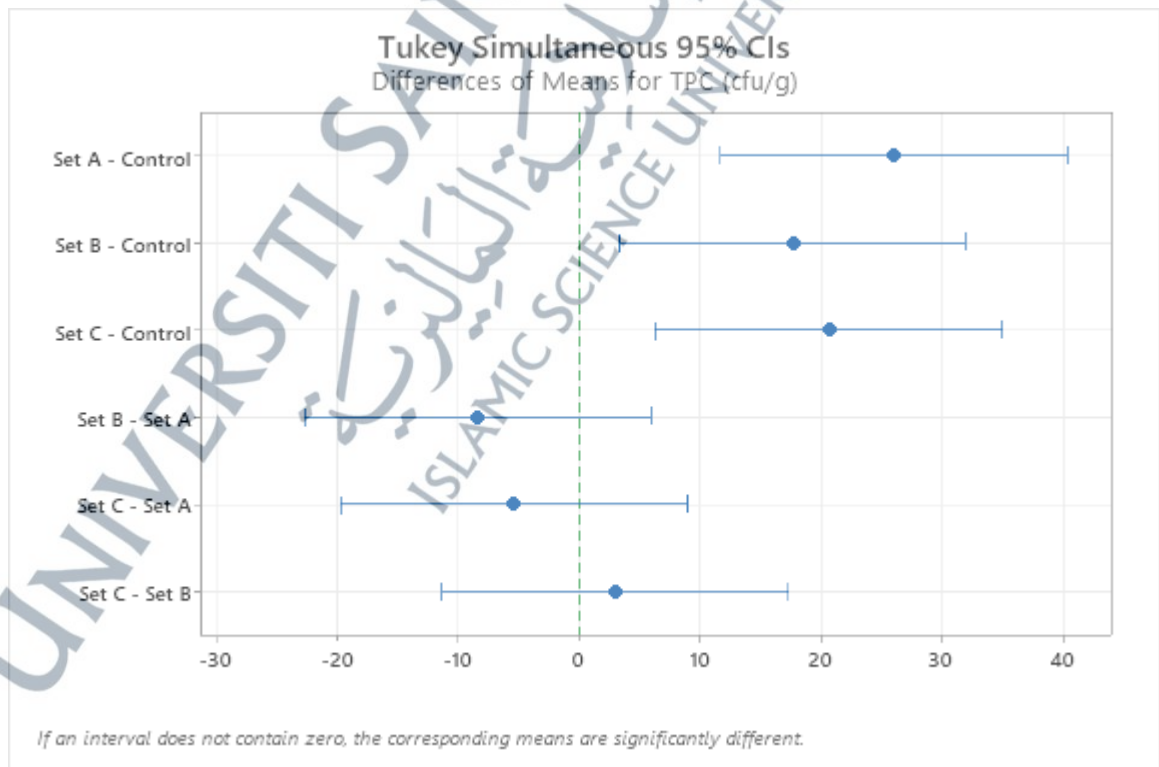
Sample	N	Mean	Grouping
Set A	3	88.00	A
Set C	3	82.667	A
Set B	3	79.667	A
Control	3	62.00	B

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Set A - Control	26.00	4.47	(11.69, 40.31)	5.82	0.002
Set B - Control	17.67	4.47	(3.36, 31.97)	3.96	0.018
Set C - Control	20.67	4.47	(6.36, 34.97)	4.63	0.007
Set B - Set A	-8.33	4.47	(-22.64, 5.97)	-1.87	0.313
Set C - Set A	-5.33	4.47	(-19.64, 8.97)	-1.19	0.647
Set C - Set B	3.00	4.47	(-11.31, 17.31)	0.67	0.905

Individual confidence level = 98.74%



**Appendix H : One-Way ANOVA of Nitrogen (%) in Soil 1, 2 and 3 of Mangrove**

**Soil**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	2	0.113090	0.056545	40.58	0.000
Error	6	0.008361	0.001394		
Total	8	0.121451			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

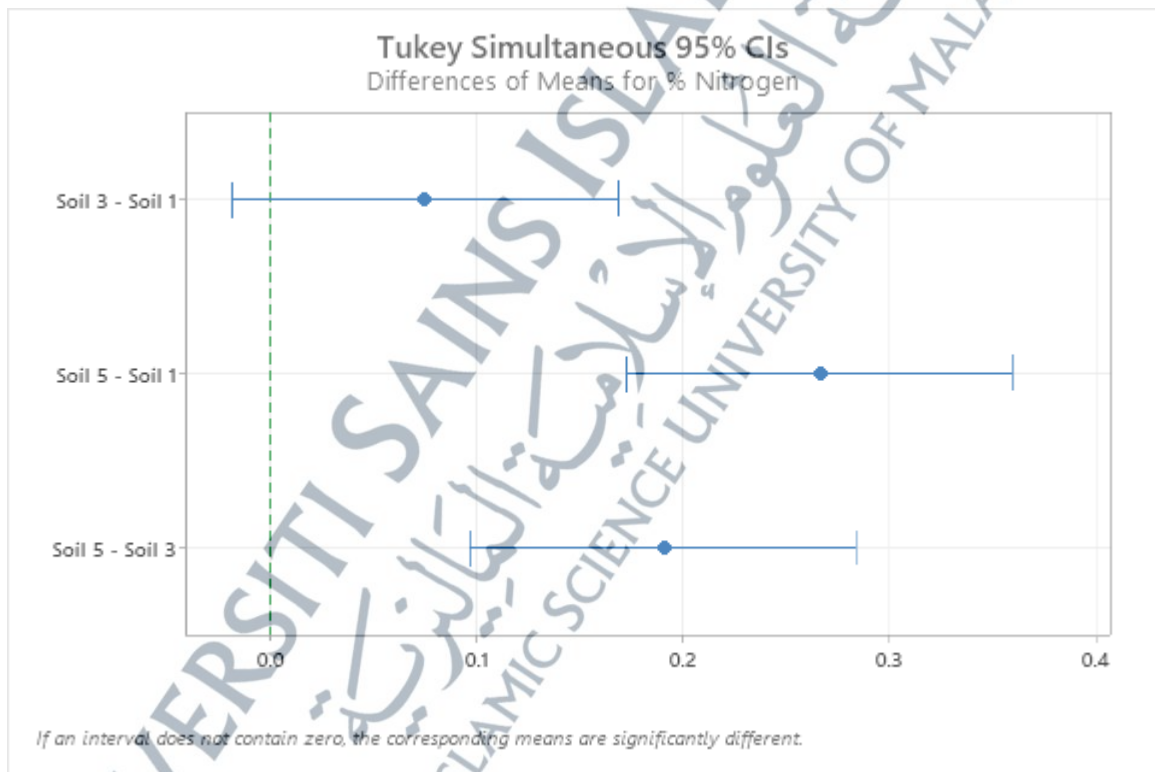
Sample	N	Mean	Grouping
Soil 5	3	0.4143	A
Soil 3	3	0.2233	B
Soil 1	3	0.14800	B

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Soil 3 - Soil 1	0.0753	0.0305	(-0.0182, 0.1689)	2.47	0.106
Soil 5 - Soil 1	0.2663	0.0305	(0.1728, 0.3599)	8.74	0.000
Soil 5 - Soil 3	0.1910	0.0305	(0.0975, 0.2845)	6.27	0.002

Individual confidence level = 97.80%



**Appendix I : One-Way ANOVA of Phosphorus (%) in Soil 1, 2 and 3 of Mangrove**

**Soil**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	2	0.000000	0.000000	1787.19	0.000
Error	6	0.000000	0.000000		
Total	8	0.000000			

**Tukey Pairwise Comparisons**

**Grouping Information Using the Tukey Method and 95% Confidence**

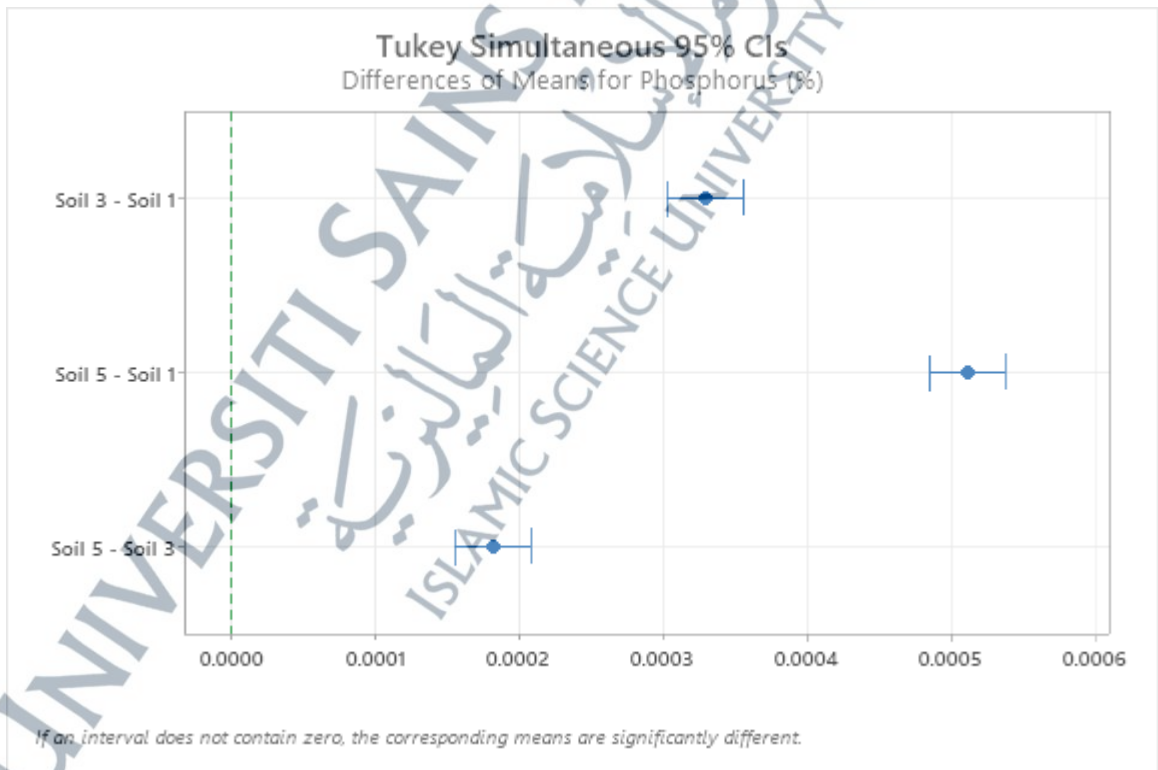
Sample	N	Mean	Grouping
Soil 5	3	0.000853	A
Soil 3	3	0.000671	B
Soil 1	3	0.000341	C

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Soil 3 - Soil 1	0.000329	0.000009	(0.000303, 0.000356)	37.96	0.000
Soil 5 - Soil 1	0.000512	0.000009	(0.000485, 0.000538)	58.98	0.000
Soil 5 - Soil 3	0.000182	0.000009	(0.000156, 0.000209)	21.02	0.000

Individual confidence level = 97.80%



**Appendix J : One-Way ANOVA of Potassium (%) in Soil 1, 2 and 3 of Mangrove**

**Soil**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	2	0.23109	0.115544	43.51	0.000
Error	6	0.01593	0.002656		
Total	8	0.24702			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

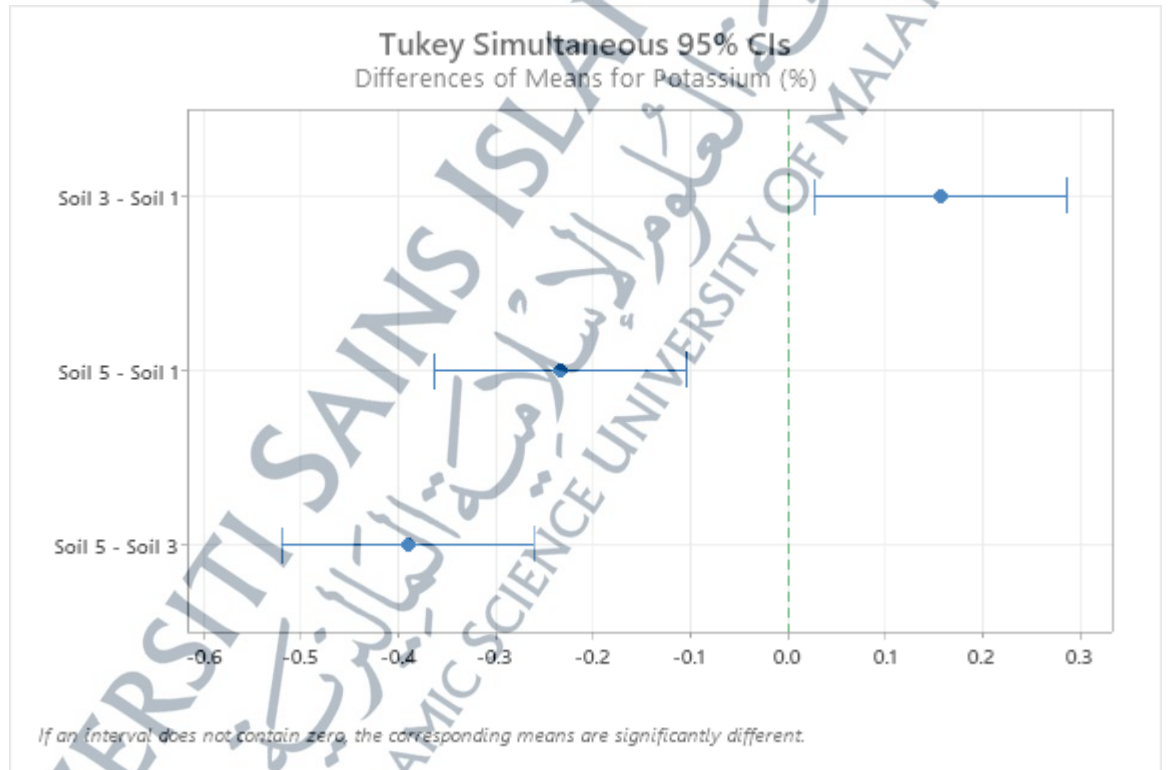
Sample	N	Mean	Grouping
Soil 3	3	1.7167	A
Soil 1	3	1.5600	B
Soil 5	3	1.3267	C

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Soil 3 - Soil 1	0.1567	0.0421	(0.0275, 0.2858)	3.72	0.023
Soil 5 - Soil 1	-0.2333	0.0421	(-0.3625, -0.1042)	-5.55	0.004
Soil 5 - Soil 3	-0.3900	0.0421	(-0.5191, -0.2609)	-9.27	0.000

Individual confidence level = 97.80%



**Appendix K : One-Way ANOVA of Nitrogen Content in Biofertilizer of Control, Set  
A, B and C**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	3	2.14367	0.714556	92.74	0.000
Error	8	0.06164	0.007705		
Total	11	2.20531			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

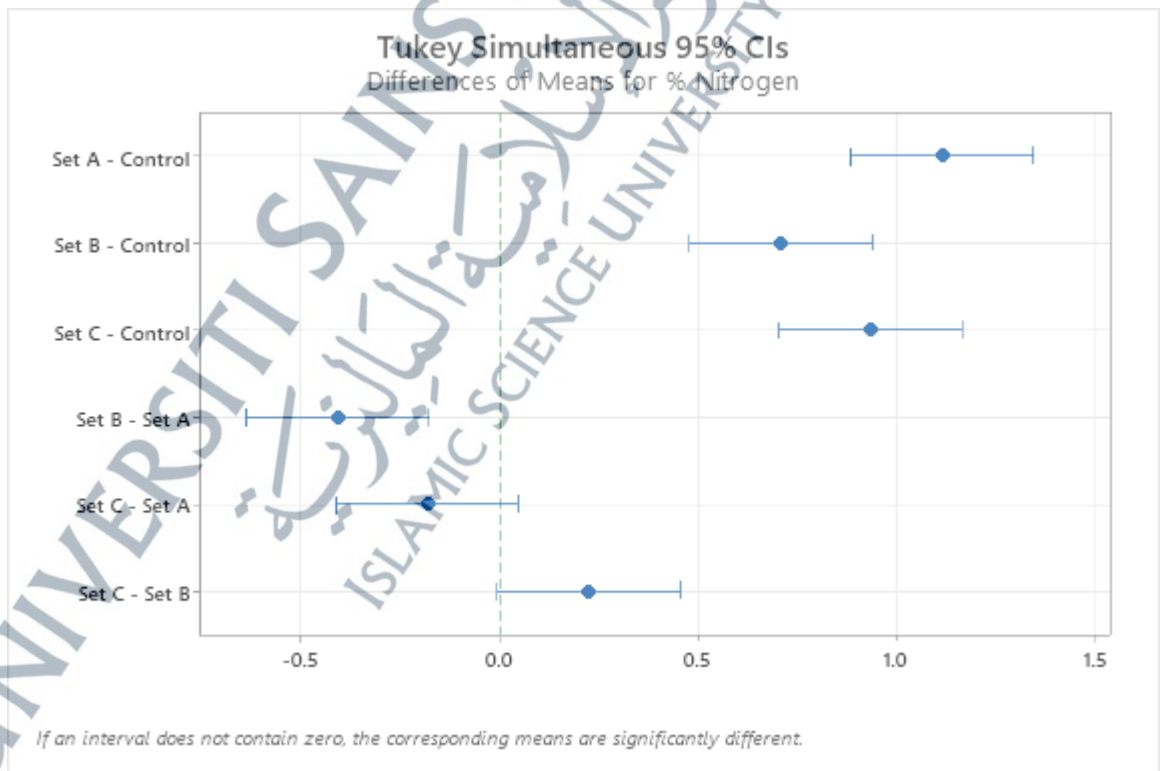
Sample	N	Mean	Grouping
Set A	3	1.4983	A
Set C	3	1.3187	A B
Set B	3	1.0933	B
Control	3	0.3853	C

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Set A - Control	1.1130	0.0717	(0.8834, 1.3426)	15.53	0.000
Set B - Control	0.7080	0.0717	(0.4784, 0.9376)	9.88	0.000
Set C - Control	0.9333	0.0717	(0.7038, 1.1629)	13.02	0.000
Set B - Set A	-0.4050	0.0717	(-0.6346, -0.1754)	-5.65	0.002
Set C - Set A	-0.1797	0.0717	(-0.4092, 0.0499)	-2.51	0.133
Set C - Set B	0.2253	0.0717	(-0.0042, 0.4549)	3.14	0.054

Individual confidence level = 98.74%



**Appendix L : One-Way ANOVA of Phosphorus Level in Biofertilizer of Control,  
Set A, B and C**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	3	10.3854	3.46181	225.14	0.000
Error	8	0.1230	0.01538		
Total	11	10.5084			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

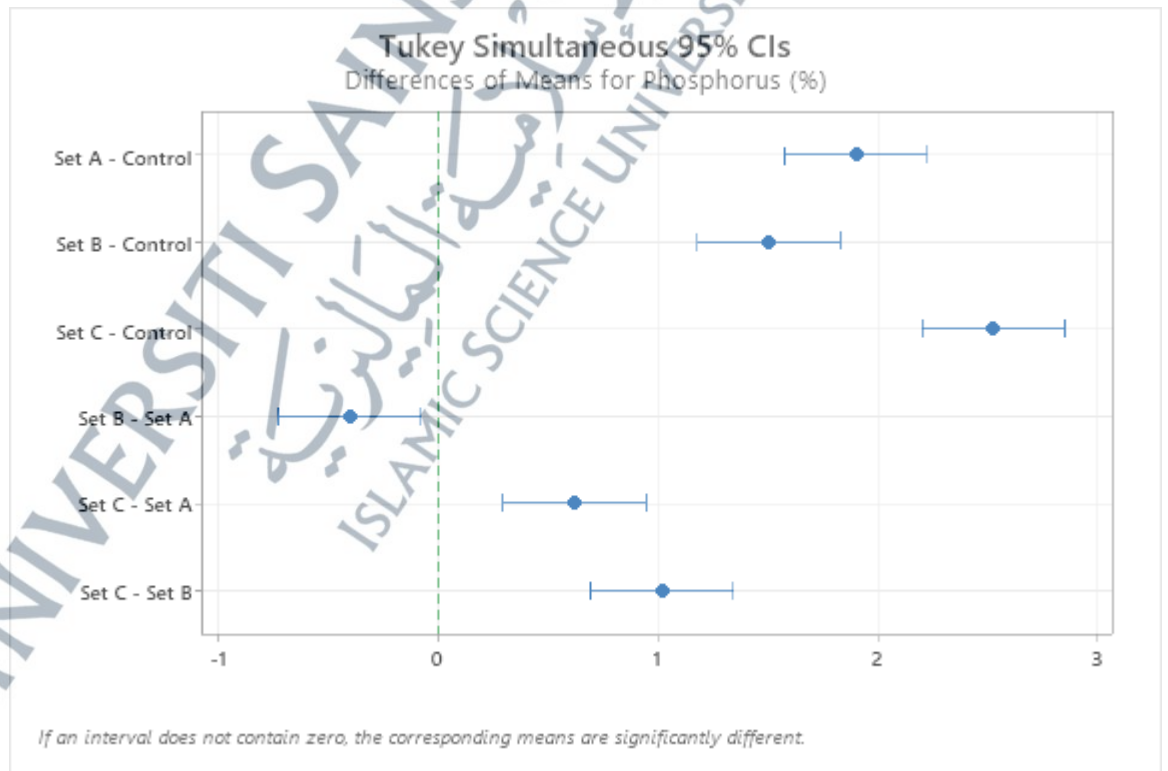
Sample	N	Mean	Grouping
Set C	3	3.2333	A
Set A	3	2.6100	B
Set B	3	2.2133	C
Control	3	0.7080	D

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Set A - Control	1.902	0.101	(1.578, 2.226)	18.79	0.000
Set B - Control	1.505	0.101	(1.181, 1.830)	14.87	0.000
Set C - Control	2.525	0.101	(2.201, 2.850)	24.94	0.000
Set B - Set A	-0.397	0.101	(-0.721, -0.072)	-3.92	0.019
Set C - Set A	0.623	0.101	(0.299, 0.948)	6.16	0.001
Set C - Set B	1.020	0.101	(0.696, 1.344)	10.07	0.000

Individual confidence level = 98.74%



**Appendix M : One-Way ANOVA of Potassium Level in Biofertilizer of Control, Set  
A, B and C**

**Analysis of Variance**

<b>Source</b>	<b>DF</b>	<b>Adj SS</b>	<b>Adj MS</b>	<b>F-Value</b>	<b>P-Value</b>
Sample	3	53.134	17.7112	115.09	0.000
Error	8	1.231	0.1539		
Total	11	54.365			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

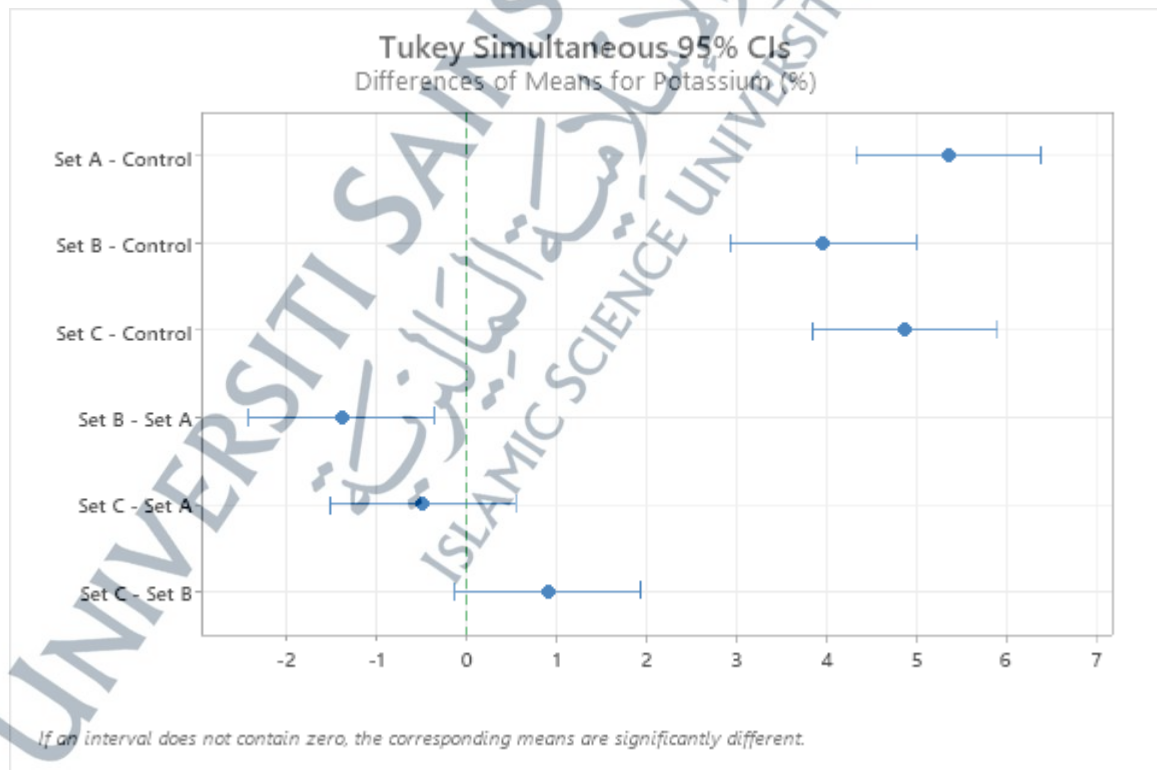
<b>Sample</b>	<b>N</b>	<b>Mean</b>	<b>Grouping</b>
Set A	3	7.803	A
Set C	3	7.323	A B
Set B	3	6.420	B
Control	3	2.460	C

*Means that do not share a letter are significantly different.*

### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Set A - Control	5.343	0.320	(4.317, 6.369)	16.68	0.000
Set B - Control	3.960	0.320	(2.934, 4.986)	12.36	0.000
Set C - Control	4.863	0.320	(3.837, 5.889)	15.18	0.000
Set B - Set A	-1.383	0.320	(-2.409, -0.357)	-4.32	0.011
Set C - Set A	-0.480	0.320	(-1.506, 0.546)	-1.50	0.481
Set C - Set B	0.903	0.320	(-0.123, 1.929)	2.82	0.086

Individual confidence level = 98.74%



**Appendix N : One-Way ANOVA: Amount of Protein in Duckweed Inoculated With  
and Without Biofertilizer**

**Analysis of Variance**

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Sample	3	0.58088	0.193628	93.52	0.000
Error	8	0.01656	0.002071		
Total	11	0.59745			

**Tukey Pairwise Comparisons**

**Grouping Information Using The Tukey Method and 95% Confidence**

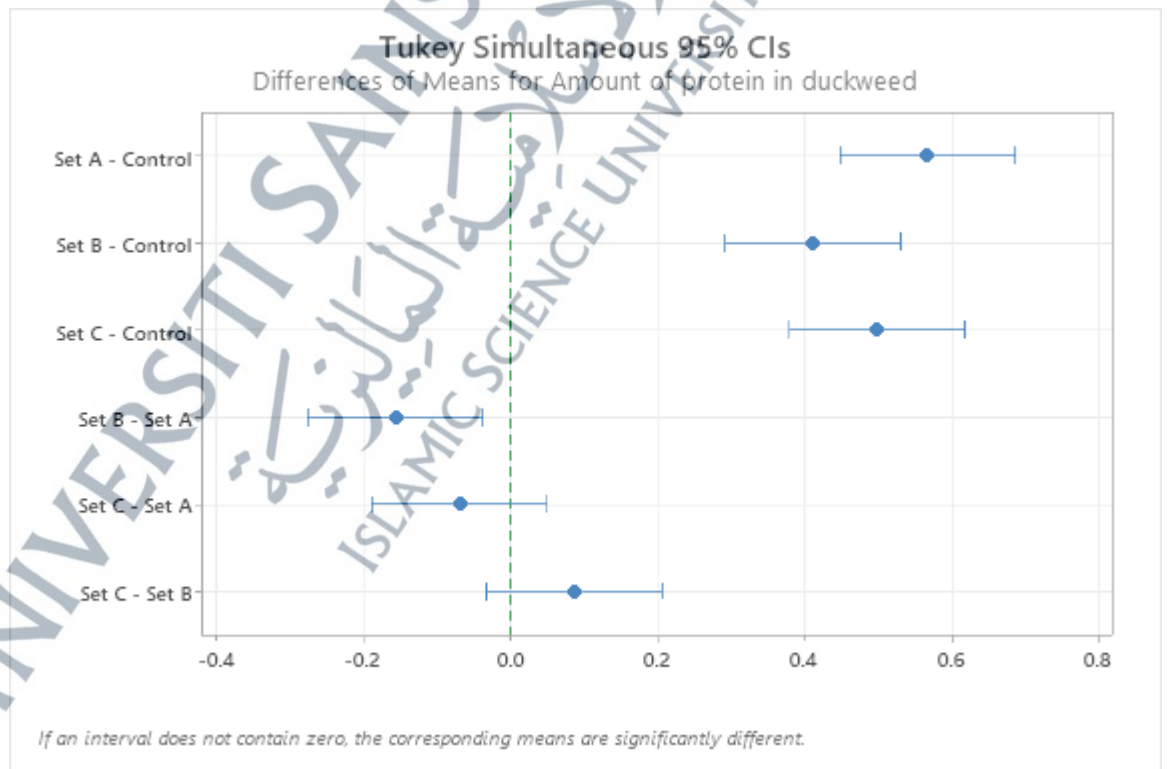
Sample	N	Mean	Grouping
Set A	3	2.0942	A
Set C	3	2.02568	A B
Set B	3	1.9386	B
Control	3	1.52763	C

*Means that do not share a letter are significantly different.*

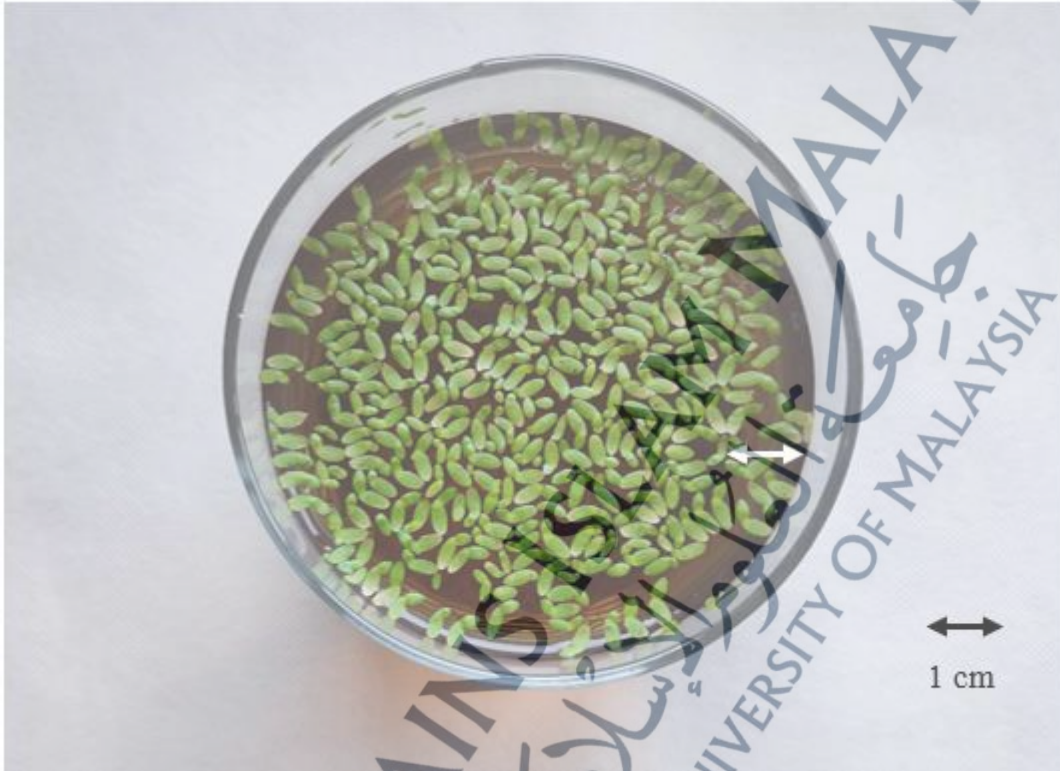
### Tukey Simultaneous Tests For Differences of Means

Difference of Levels	Difference of Means	SE of Difference	95% CI	T-Value	Adjusted P-Value
Set A - Control	0.5666	0.0372	(0.4476, 0.6856)	15.25	0.000
Set B - Control	0.4110	0.0372	(0.2919, 0.5300)	11.06	0.000
Set C - Control	0.4980	0.0372	(0.3790, 0.6171)	13.41	0.000
Set B - Set A	-0.1557	0.0372	(-0.2747, -0.0367)	-4.19	0.013
Set C - Set A	-0.0686	0.0372	(-0.1876, 0.0504)	-1.85	0.321
Set C - Set B	0.0871	0.0372	(-0.0319, 0.2061)	2.34	0.167

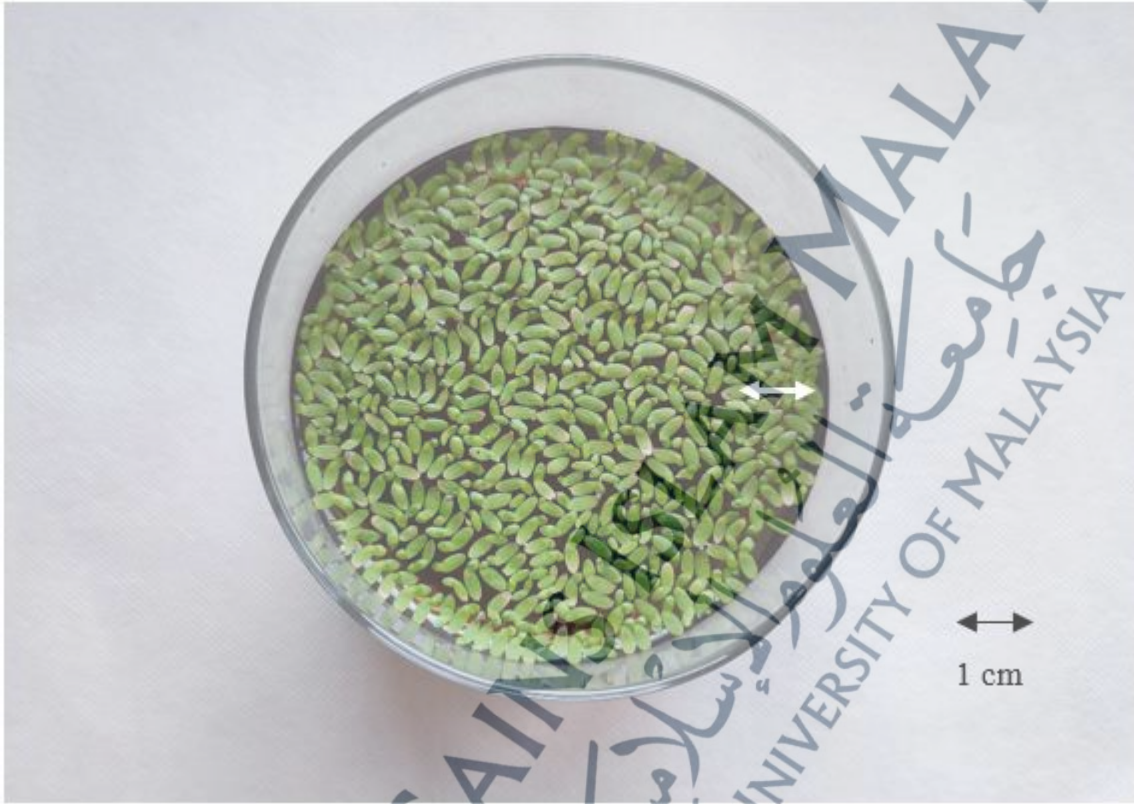
Individual confidence level = 98.74%



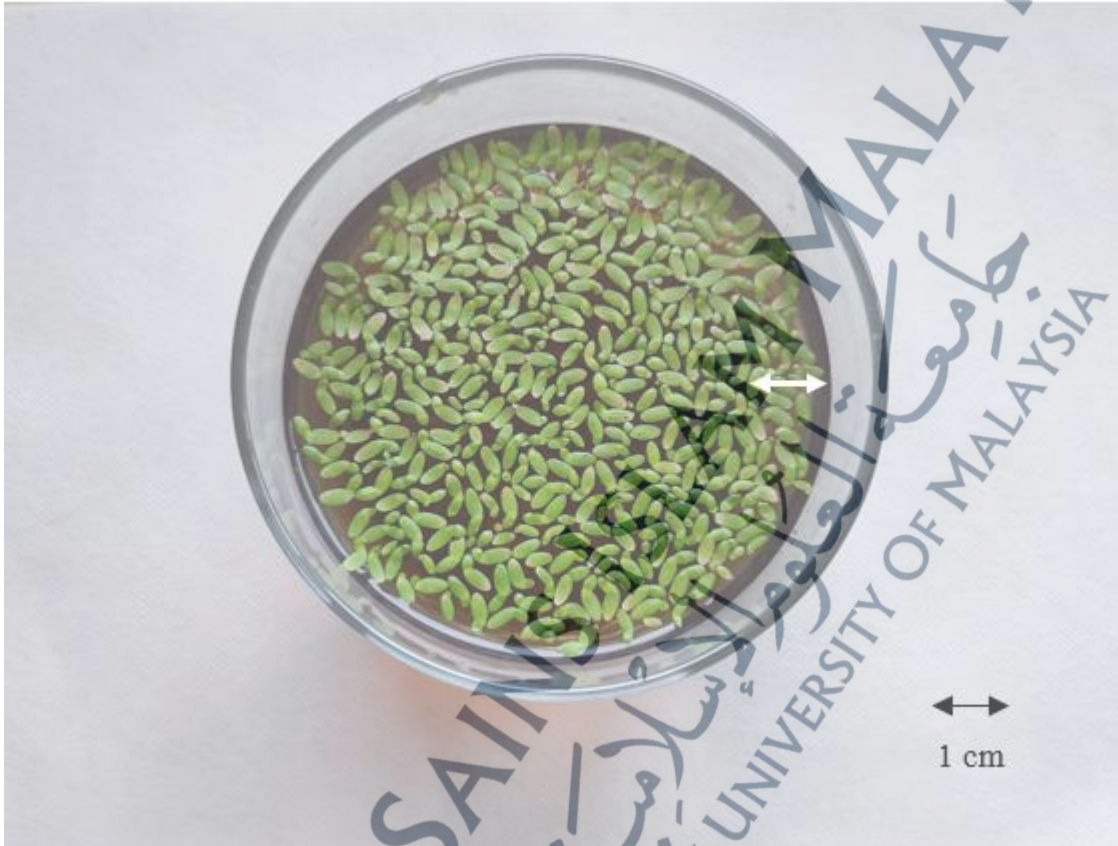
Appendix O : Duckweed Growth With and Without Biofertilizer



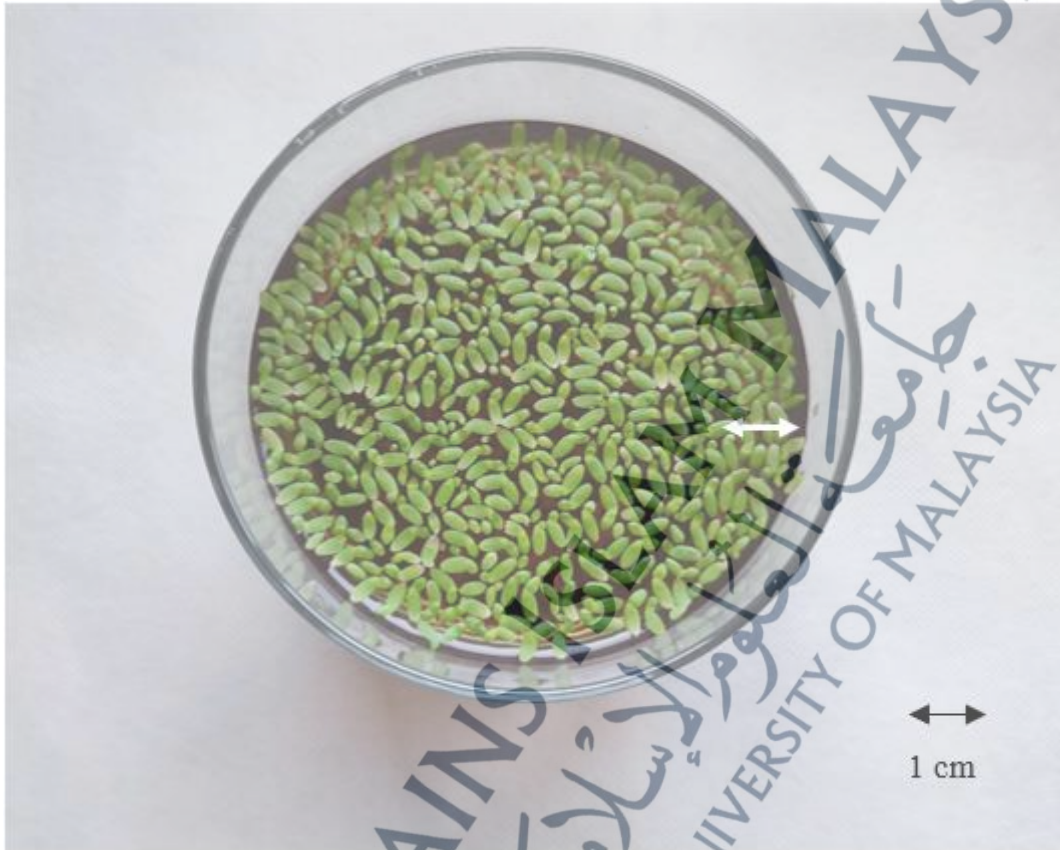
The growth of the duckweed without biofertilizer set (control)



The growth of the duckweed with biofertilizer set (Set A)



The growth of the duckweed with biofertilizer set (Set B)



The growth of the duckweed with biofertilizer set (Set C)