

LAMPIRAN

Lampiran I. Komposisi media *Murashige and skoog* (MS)

Larutan stok	Bahan kimia	Konsentrasi dalam larutan stok	Volume larutan dalam media (ml/L)	Konsentrasi dalam media (mg/L)
A	NH ₄ NO ₃	33.0000	50	1650.0000
B	KNO ₃	38.0000	50	1900.0000
C	CaCl ₂ .2H ₂ O	8.8000	50	440.0000
D	MgSO ₄ .7H ₂ O	7.4000	50	370.0000
	KH ₂ PO ₄	3.4000	50	170.0000
E	FeSO ₄ .7H ₂ O	2.7800	10	27.8000
	Na ₂ EDTA	3.7300	10	37.3000
F	H ₃ BO ₃	0.6200	10	6.2000
	MnSO ₄ .4H ₂ O	2.2300	10	22.3000
	ZnSO ₄ .4H ₂ O	0.8600	10	8.6000
	KI	0.0830	10	0.8300
	Na ₂ MoO ₄ .2H ₂ O	0.0250	10	0.2500
	CuSO ₄ .5H ₂ O	0.0025	10	0.0250
	CoCl ₂ .6H ₂ O	0.0025	10	0.0250
Vitamin	C-phantotenat	0.8000	10	8.0000
	Myo-inositol	10.0000	20	200.0000
	Thiamin	0,0100	10	0.1000
	Nicotin acid	0.0500	10	0.5000
	pyridoxine	0.0500	10	0.5000
Gula				30.0000

Gunawan, 1987

Lampiran 2. Perhitungan Kandungan Klorofil a Daun Planlet Tomat

Tabel 7. Rata-rata, standar deviasi, ragam, standar eror, koefisien keragaman, rasio kandungan klorofil a pada daun planlet tomat

Ulangan	kontrol	15 ppm	30 ppm	45 ppm	60 ppm
1	0.58162	0.35819	0.35465	0.30254	0.68719
2	0.58579	0.36348	0.35352	0.30254	0.68302
3	0.58579	0.36348	0.36635	0.30254	0.68719
4	0.55328	0.33577	0.34518	0.27527	0.61629
5	0.55920	0.41111	0.41353	0.29195	0.55951
6	0.68745	0.41241	0.36877	0.25249	0.57844
	0.59219	0.37407	0.36700	0.28789	0.63527
s	0.04872	0.03093	0.02440	0.02036	0.05831
s ²	0.00237	0.00095	0.00059	0.00041	0.00340
s	0.01989	0.01262	0.00996	0.00831	0.02380
CV	8.2%	8.2%	6.6%	7%	9.1%

Kurva standar $y = 0.003 x^2 - 0.201x + 6.024$ ($R^2 = 0.855$)

Tabel 8. \bar{y} , y^2 , $(\sum y)^2$. Rasio Planlet daun tomat

ulangan	kontrol	15 ppm	30 ppm	45 ppm	60 ppm	Total
1	0.58162	0.35819	0.35465	0.30254	0.68719	
2	0.58579	0.36348	0.35352	0.30254	0.68302	
3	0.58579	0.36348	0.36635	0.30254	0.68719	
4	0.55328	0.33577	0.34518	0.27527	0.61629	
5	0.55920	0.41111	0.41353	0.29195	0.55951	
6	0.68745	0.41241	0.36877	0.25249	0.57844	
\bar{y}	3.55315	2.24447	2.20203	1.72735	3.81166	13.53
$(\sum y^2)$	2.11601	0.84439	0.81114	0.49936	2.43846	6.70
$(\sum y)^2$	12.62487	5.03768	4.84896	2.98373	14.52880	40.02

Perhitungan Faktor Koreksi, Jumlah Kuadrat Total, Jumlah Kuadrat Perlakuan, dan Jumlah Kuadrat Error.

$$FK = [(\sum Y)^2] / rt = 13.53^2 / 30 = 6.102$$

$$JK \text{ total} = \sum y^2 - FK = 6.70 - 6.102 = 0.598$$

$$JK \text{ perlakuan} = [(\sum y)^2 / r] - FK = (40.02 / 6) - 6.102 = 6.67 - 6.102 = 0.568$$

$$JK \text{ error} = JK \text{ total} - JK \text{ perlakuan} = 0.598 - 0.568 = 0,038$$

Tabel 9. Analisis ragam kandungan klorofil a daun planlet tomat

Sumber Keragaman	db	JKT	KT	Fhit	Ftab
Perlakuan	4	0.56081	0.14020	90.55138	2.76
Error	25	0.03870	0.00154		
Total	29	0.59952			

Uji BNT

$$\text{BNT (0,05)} = t_{1/2} \sqrt{(2s^2)/r} = 2,086 \times \sqrt{\frac{2(0,00154)}{6}} = 2,086 \times 0,0226 = 0,473$$

Tabel 10. Perbedaan nilai tengah kandungan klorofil a daun planlet tomat

Konsentrasi Asam Salisilat	60 ppm	45 ppm	30 ppm	15 pmm
kontrol	0.043	0.304*	0.225*	0.218*
15 ppm	0.261*	0.086*	0.007	
30 ppm	0.268*	0.079*		
45 ppm	0.347*			

Keterangan ; * berbeda nyata pada taraf 5%

Lampiran 3. Kandungan Klorofil b Daun Planlet Tomat

Tabel 11. Rata-rata, standar deviasi, ragam, standar eror, koefisien keragaman, rasio kandungan klorofil b pada daun planlet tomat

Ulangan	kontrol	15 ppm	30 ppm	45 ppm	60 ppm
1	0.77289	0.54360	0.46400	0.52751	1.03797
2	0.78243	0.54360	0.47354	0.52751	1.03038
3	0.78048	0.54165	0.45640	0.52751	1.03797
4	1.05914	0.73444	0.45445	0.41720	0.97131
5	0.96372	0.54360	0.62300	0.50801	0.90626
6	0.77289	0.65205	0.55920	0.46371	0.95460
	0.85526	0.59316	0.50510	0.49524	0.98975
s	0.12473	0.08178	0.06992	0.04554	0.05449
s ²	0.01555	0.00668	0.00489	0.00207	0.00296
s	0.05092	0.03339	0.02854	0.01859	0.02224
CV	14.5%	13.7%	13.8%	9.1%	5.5%

Keterangan : Kurva standar $y = 0.005x^2 - 0.291x + 8.805$ ($R^2 = 0.925$)

Tabel 12. y , y^2 , (y)². Rasio Planlet daun tomat

Ulangan	kontrol	15 ppm	30 ppm	45 ppm	60 ppm	Total
1	0.77289	0.54360	0.46400	0.52751	1.03797	
2	0.78243	0.54360	0.47354	0.52751	1.03038	
3	0.78048	0.54165	0.45640	0.52751	1.03797	
4	1.05914	0.73444	0.45445	0.41720	0.97131	
5	0.96372	0.54360	0.62300	0.50800	0.90626	
6	0.77289	0.65205	0.55920	0.46371	0.95460	
y	5.13156	3.55897	3.03062	2.97148	5.93851	20.631
(y ²)	4.46662	2.14449	1.55523	1.48199	5.89251	15.540
(y) ²	26.33297	12.66630	9.18468	8.82971	35.26598	92.279

Perhitungan Faktor Koreksi, Jumlah Kuadrat Total, Jumlah Kuadrat Perlakuan, dan Jumlah Kuadrat Error.

$$FK = [(\sum Y)^2] / rt = 20.631^2 / 30 = 14.187$$

$$JK \text{ total} = \sum y^2 - FK = 15.540 - 14.187 = 1.353$$

$$JK \text{ perlakuan} = [(\sum (y)^2) / r] - FK = (92.279 / 6) - 14.187 = 15.379 - 14.187 = 1.191$$

$$JK \text{ error} = JK \text{ total} - JK \text{ perlakuan} = 1.353 - 1.192 = 0.160$$

Tabel 13. Analisis ragam kandungan klorofil b daun planlet tomat

Sumber Keragaman	db	JKT	KT	Fhit	Ftab
Perlakuan	4	1.19177	0.29794	46.28920	2.76
Error	25	0.16091	0.00643		
Total	29	1.35268			

Uji BNT

$$\text{BNT (0,05)} = t_{1/2} \sqrt{(2s^2)/r} = 2,086 \times \sqrt{\frac{2(0,00643)}{6}} = 2,086 \times 0,0462 = 0,0965$$

Tabel 14. Perbedaan nilai tengah kandungan klorofil b daun planlet tomat

Konsentrasi Asam Salisilat	60 ppm	45 ppm	30 ppm	15 pmm
kontrol	0.134*	0.360*	0.350*	0.262*
15 ppm	0.397*	0.098*	0.088	
30 ppm	0.485*	0.010		
45 ppm	0.495*			

Keterangan ; * berbeda nyata pada taraf 5%

Lampiran 4. Kandungan Klorofil Total Daun Planlet Tomat

Tabel 15. Rata-rata, standar deviasi, ragam, standar error, koefisien keragaman, rasio kandungan klorofil total pada daun planlet tomat

Ulangan	kontrol	15 ppm	30 ppm	45 ppm	60 ppm
1	1.37522	0.97556	0.83954	0.82976	1.86214
2	1.38364	0.97556	0.84795	0.82976	1.85038
3	1.38698	0.97890	0.82778	0.82976	1.86214
4	1.62772	1.14390	0.83112	0.91974	1.55531
5	1.54355	0.97556	1.13671	0.86318	1.51818
6	1.37525	1.11171	0.94883	0.64188	1.48489
	1.44872	1.02687	0.90532	0.81901	1.68884
s	0.10944	0.07885	0.12212	0.09361	0.18692
s ²	0.01197	0.00621	0.01491	0.00876	0.03494
s	0.04467	0.03219	0.04985	0.03821	0.07631
CV	7.5%	7.6%	13.4%	11.4%	11%

Keterangan : Kurva standar $y = 0.008x^2 + 0.480x + 14.96$ ($R^2 = 0.887$)

Tabel 16. \bar{y} , \bar{y}^2 , $(\bar{y})^2$. Rasio Planlet daun tomat

ulangan	kontrol	15 ppm	30 ppm	45 ppm	60 ppm	Total
1	1.37522	0.97556	0.83954	0.82976	1.86214	
2	1.38364	0.97556	0.84795	0.82976	1.85038	
3	1.38698	0.97890	0.82778	0.82976	1.86214	
4	1.62772	1.1439	0.83112	0.91974	1.55531	
5	1.54355	0.97556	1.13671	0.86318	1.51818	
6	1.37522	1.11171	0.94883	0.64188	1.48489	
\bar{y}	8.69235	6.16122	5.43195	4.91410	10.13305	35.33
(\bar{y}^2)	12.65273	6.35787	4.99226	4.06856	17.28785	45.35
$(\bar{y})^2$	75.55709	37.96069	29.50617	24.14846	102.67887	269.85

Perhitungan Faktor Koreksi, Jumlah Kuadrat Total, Jumlah Kuadrat Perlakuan, dan Jumlah Kuadrat Error

$$FK = [(\bar{Y})^2] / rt = 35.33^2 / 30 = 41.60$$

$$JK \text{ total} = \bar{y}^2 - FK = 45.35 - 41.60 = 3.75$$

$$JK \text{ perlakuan} = [(\bar{y})^2 / r] - FK = (269.85 / 6) - 41.60 = 44.975 - 41.60 = 3.375$$

$$JK \text{ error} = JK \text{ total} - JK \text{ perlakuan} = 3.75 - 3.375 = 0,38$$

Tabel 7. Analisis ragam kandungan klorofil total daun planlet tomat

Sumber Keragaman	db	JKT	KT	Fhit	Ftab
Perlakuan	4	3.36187	0.84046	54.70667	2.76
Error	25	0.38407	0.01536		
Total	29	3.74595			

Uji BNT

$$\text{BNT (0,05)} = t_{/2} \sqrt{(2s^2)/r} = 2,060 \times \sqrt{\frac{2(0,01536)}{6}} = 0,14742$$

Tabel 18. Perbedaan nilai tengah kandungan klorofil total daun planlet tomat antar konsentrasi asam salisilat

Konsentrasi Asam Salisilat	60 ppm	45 ppm	30 ppm	15 ppm
kontrol	0.240*	0.630*	0.543*	0.422*
15 ppm	0.662*	0.208*	0.122	
30 ppm	0.784*	0.086		
45 ppm	0.870*			

Keterangan : * berbeda nyata pada taraf 5%

Lampiran 5. Analisis kandungan lignin

Tabel 19. Rata-rata, standar deviasi, ragam, standar error, keofisien keragaman, rasio ketebalan lignin pada xilem planlet tomat

Ulangan	Kontrol	15 ppm	30 ppm	45 ppm	60 ppm
1	4	4	4	2	4
2	3	4	4	3	4
3	3	4	4	3	6
4	4	4	3	3	5
5	3	5	5	2	4
6	3	4	4	2	5
	3.33333	4.16666	4.0	2.5	4.66666
s	0.51639	0.40824	0.63245	0.54772	0.8164
s ²	0.26666	0.16666	0.40000	0.30000	0.66666
s	0.21081	0.16666	0.25819	0.22360	0.33333
CV	15.4%	9.7%	15.8%	21.9%	17.4%

Tabel 20. \bar{y} , $\sum y^2$, $(\sum y)^2$. Ketebalan lignin pada xilem planlet tomat

Ulangan	Kontrol	15 ppm	30 ppm	45 ppm	60 ppm	Total
1	4	4	4	2	4	
2	3	4	4	3	4	
3	3	4	3	3	6	
4	4	4	5	3	5	
5	3	5	5	2	4	
6	3	4	4	2	5	
\bar{y}	20	25	25	15	28	113
$\sum y^2$	68	105	107	39	134	453
$(\sum y)^2$	400	625	625	225	784	2659

Perhitungan Faktor Koreksi, Jumlah Kuadrat Total, Jumlah Kuadrat Perlakuan, dan Jumlah Kuadrat Error.

$$FK = [(\sum Y)^2] / rt = 113^2 / 30 = 425.633$$

$$JK \text{ total} = \sum y^2 - FK = 453 - 425.633 = 27.367$$

$$JK \text{ perlakuan} = [(\sum y)^2 / r] - FK = (2659 / 6) - 425.633 = 443.16 - 425.63 = 17.533$$

$$JK \text{ error} = JK \text{ total} - JK \text{ perlakuan} = 27.367 - 17.53 = 9.83$$

Tabel 21. Analisis ragam ketebalan Lignin pada xilem planlet tomat

Sumber Keragaman	db	JKT	KT	Fhit	Ftab
Perlakuan	4	17.53	4.3833	11.1444	2.76
Error	25	9.834	0.3933		
Total	29	27.367			

Uji BNT

$$\text{BNT (0,05)} = t_{/2} \sqrt{(2s^2)/r} = 2,060 \times \sqrt{\frac{2(0,3933)}{6}} = 0.7459$$

Tabel 22. Perbedaan nilai tengah ketebalan lignin pada xilem batang planlet tomat antar konsentrasi asam salisilat

Konsentrasi Asam Salisilat	60ppm	45ppm	30ppm	15ppm
kontrol	1.333*	0.833*	0.667	0.833*
15ppm	0.500	1.667*		
30ppm	0.667	1.500*		
45ppm	2.167*			

Keterangan : * berbeda nyata pada taraf 5%

Lampiran 6. Penanaman benih, Analisis klorofil, dan Pengamatan Lignin



Gambar 14. Benih yang disterilisasi dengan Bayclean (NaOCl)



Gambar 15. Penanaman benih tomat yang akan diseleksi selama 8 minggu



Gambar 16. Benih yang sudah ditanam pada medium seleksi



Gambar 17. Benih tomat yang di inkubasi dengan penyinaran ± 1000 lux, 24 jam/hari dan suhu 20°C



Gambar 18. Benih yang dikecambahkan selama 1 minggu



Gambar 19. Kecambah tomat setelah umur 3 minggu



Gambar 20. penimbangan daun untuk analisis klorofil



Gambar 21. Daun planlet tomat yang akan di destruksi dengan alkohol



Gambar 22. Pemanasan dengan alkohol selama 15 menit



Gambar 23. Analisis klorofil dengan Spektrofotometer



Gambar 24. Perendaman anatomi batang dengan alkohol



Gambar 25. Pengamatan anatomi batang dan lignin