

LAMPIRAN

Lampiran 1. Hasil Analisis Data SPSS

A. Populasi Bakteri Lama Waktu Simpan 2 Jam

One-Way

Descriptives

TPC

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	75.00	5.568	3.215	61.17	88.83	69	80
25%	3	75.67	7.767	4.485	56.37	94.96	67	82
50%	3	44.67	12.342	7.126	14.01	75.33	31	55
75%	3	27.33	4.041	2.333	17.29	37.37	23	31
100%	3	13.33	5.859	3.383	-1.22	27.89	9	20
Total	15	47.20	26.703	6.895	32.41	61.99	9	82

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
TPC	Based on Mean	1.607	4	10	.247
	Based on Median	.445	4	10	.774
	Based on Median and with adjusted df	.445	4	6.023	.774
	Based on trimmed mean	1.488	4	10	.278

ANOVA

TPC

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9393.733	4	2348.433	39.894	.000
Within Groups	588.667	10	58.867		
Total	9982.400	14			

**Post Hoc Tests
Homogeneous Subsets****TPC**Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
100%	3	13.33		
75%	3	27.33	27.33	
50%	3		44.67	
0%	3			75.00
25%	3			75.67
Sig.		.243	.112	1.000

Means for groups in homogeneous subsets are displayed.

B. Populasi Bakteri Lama Waktu Simpan 4 Jam

One-Way

Descriptives

TPC

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	78.67	3.512	2.028	69.94	87.39	75	82
25%	3	79.33	3.215	1.856	71.35	87.32	77	83
50%	3	78.00	2.646	1.528	71.43	84.57	75	80
75%	3	52.67	2.517	1.453	46.42	58.92	50	55
100%	3	36.33	5.508	3.180	22.65	50.01	31	42
Total	15	65.00	18.396	4.750	54.81	75.19	31	83

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
TPC	Based on Mean	.556	4	10	.700
	Based on Median	.365	4	10	.828
	Based on Median and with adjusted df	.365	4	8.077	.827
	Based on trimmed mean	.544	4	10	.708

ANOVA

TPC

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	4605.333	4	1151.333	86.784	.000
Within Groups	132.667	10	13.267		
Total	4738.000	14			

**Post Hoc Tests
Homogeneous Subsets****TPC**Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
100%	3	36.33		
75%	3		52.67	
50%	3			78.00
0%	3			78.67
25%	3			79.33
Sig.		1.000	1.000	.990

Means for groups in homogeneous subsets are displayed.

Two-Way Populasi Total Bakteri

Levene's Test of Equality of Error Variances^{a,b}

		Levene Statistic	df1	df2	Sig.
Hasil_TPC	Based on Mean	2.117	9	20	.078
	Based on Median	.646	9	20	.746
	Based on Median and with adjusted df	.646	9	8.36 9	.737
	Based on trimmed mean	1.976	9	20	.098

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Hasil_TPC

b. Design: Intercept + Konsentrasi + Waktu_Simpan + Konsentrasi *
Waktu_Simpan

Tests of Between-Subjects Effects

Dependent Variable: Hasil_TPC

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16375.367 ^a	9	1819.485	50.448	.000
Intercept	94416.300	1	94416.300	2617.827	.000
Konsentrasi	12912.200	4	3228.050	89.502	.000
Waktu_Simpan	2376.300	1	2376.300	65.886	.000
Konsentrasi * Waktu_Simpan	1086.867	4	271.717	7.534	.001

Error	721.333	20	36.067		
Total	111513.000	30			
Corrected Total	17096.700	29			

a. R Squared = ,958 (Adjusted R Squared = ,939)

C. Kadar TMA Lama Waktu Simpan 2 Jam One-Way

Descriptives

Kadar

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	2.4300	.26665	.15395	1.7676	3.0924	2.13	2.64
25%	3	2.4333	.33005	.19055	1.6134	3.2532	2.16	2.80
50%	3	1.6667	.23861	.13776	1.0739	2.2594	1.40	1.86
75%	3	.8200	.31749	.18330	.0313	1.6087	.46	1.06
100%	3	.5800	.17436	.10066	.1469	1.0131	.46	.78
Total	15	1.5860	.83850	.21650	1.1217	2.0503	.46	2.80

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Kadar	Based on Mean	.550	4	10	.704
	Based on Median	.127	4	10	.969
	Based on Median and with adjusted df	.127	4	8.90 4	.969
	Based on trimmed mean	.498	4	10	.738

ANOVA

Kadar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.107	4	2.277	30.920	.000
Within Groups	.736	10	.074		
Total	9.843	14			

**Post Hoc Tests
Homogeneous Subsets****Kadar**Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
100%	3	.5800		
75%	3	.8200		
50%	3		1.6667	
0%	3			2.4300
25%	3			2.4333
Sig.		.811	1.000	1.000

Means for groups in homogeneous subsets are displayed.

D. Kadar TMA Lama Waktu Simpan 4 Jam

One-Way

Descriptives

Kadar

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	3.0267	.23007	.13283	2.4551	3.5982	2.80	3.26
25%	3	2.9867	.32884	.18985	2.1698	3.8035	2.74	3.36
50%	3	2.9367	.28113	.16231	2.2383	3.6350	2.75	3.26
75%	3	1.3400	.37363	.21572	.4118	2.2682	.94	1.68
100%	3	.6267	.27154	.15677	-.0479	1.3012	.46	.94
Total	15	2.1833	1.07179	.27674	1.5898	2.7769	.46	3.36

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Kadar	Based on Mean	.332	4	10	.850
	Based on Median	.084	4	10	.985
	Based on Median and with adjusted df	.084	4	8.911	.985
	Based on trimmed mean	.302	4	10	.870

ANOVA

Kadar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.175	4	3.794	41.835	.000
Within Groups	.907	10	.091		
Total	16.082	14			

Post Hoc Tests

Homogeneous Subsets

Kadar

Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05	
		1	2
100%	3	.6267	
75%	3	1.3400	
50%	3		2.9367
25%	3		2.9867
0%	3		3.0267
Sig.		.091	.996

Means for groups in homogeneous subsets are displayed.

Two-Way Kandungan Kadar TMA

Levene's Test of Equality of Error Variances^{a,b}

		Levene Statistic	df1	df2	Sig.
Kadar_TMA	Based on Mean	.399	9	20	.921
	Based on Median	.097	9	20	.999

Based on Median and with adjusted df	.097	9	17.522	.999
Based on trimmed mean	.363	9	20	.940

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Kadar_TMA

b. Design: Intercept + Konsentrasi + Waktu_Simpan + Konsentrasi *
Waktu_Simpan

Tests of Between-Subjects Effects

Dependent Variable: Kadar_TMA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	26.958 ^a	9	2.995	36.458	.000
Intercept	106.559	1	106.559	1296.970	.000
Konsentrasi	23.137	4	5.784	70.402	.000
Waktu_Simpan	2.676	1	2.676	32.571	.000
Konsentrasi * Waktu_Simpan	1.145	4	.286	3.485	.026
Error	1.643	20	.082		
Total	135.161	30			
Corrected Total	28.602	29			

a. R Squared = ,943 (Adjusted R Squared = ,917)

E. Tingkat Keasaman (pH) Lama Waktu Simpan 2 Jam One-Way

Descriptives

Nilai

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	7.2733	.01155	.00667	7.2446	7.3020	7.26	7.28
25%	3	7.0633	.03512	.02028	6.9761	7.1506	7.03	7.10
50%	3	6.9933	.03786	.02186	6.8993	7.0874	6.95	7.02
75%	3	6.9733	.03512	.02028	6.8861	7.0606	6.94	7.01
100 %	3	6.9533	.02517	.01453	6.8908	7.0158	6.93	6.98
Total	15	7.0513	.12386	.03198	6.9827	7.1199	6.93	7.28

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Nilai	Based on Mean	.885	4	10	.507
	Based on Median	.353	4	10	.836
	Based on Median and with adjusted df	.353	4	6.780	.834
	Based on trimmed mean	.840	4	10	.530

ANOVA

Nilai

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.205	4	.051	55.029	.000
Within Groups	.009	10	.001		
Total	.215	14			

**Post Hoc Tests
Homogeneous Subsets**

Nilai

Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
100%	3	6.9533		
75%	3	6.9733		
50%	3	6.9933	6.9933	
25%	3		7.0633	
0%	3			7.2733
Sig.		.527	.105	1.000

Means for groups in homogeneous subsets are displayed.

F. Tingkat Keasaman (pH) Lama Waktu Simpan 4 Jam One-Way

Descriptives

Nilai

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0%	3	7.2900	.02646	.01528	7.2243	7.3557	7.27	7.32
25%	3	7.1767	.01528	.00882	7.1387	7.2146	7.16	7.19
50%	3	7.1700	.01000	.00577	7.1452	7.1948	7.16	7.18
75%	3	7.1467	.01155	.00667	7.1180	7.1754	7.14	7.16
100%	3	7.1367	.02082	.01202	7.0850	7.1884	7.12	7.16
Total	15	7.1840	.05889	.01521	7.1514	7.2166	7.12	7.32

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Nilai	Based on Mean	1.611	4	10	.246
	Based on Median	.304	4	10	.869
	Based on Median and with adjusted df	.304	4	6.426	.866
	Based on trimmed mean	1.451	4	10	.288

ANOVA

Nilai

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.045	4	.011	35.438	.000
Within Groups	.003	10	.000		
Total	.049	14			

Post Hoc Tests Homogeneous Subsets

Nilai

Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05	
		1	2
100%	3	7.1367	
75%	3	7.1467	
50%	3	7.1700	
25%	3	7.1767	
0%	3		7.2900
Sig.		.117	1.000

Means for groups in homogeneous subsets are displayed.

Two-Way Tingkat Keasaman (pH)

Levene's Test of Equality of Error Variances^{a,b}

		Levene Statistic	df1	df2	Sig.
Nilai_pH	Based on Mean	1.378	9	20	.262
	Based on Median	.468	9	20	.879

Based on Median and with adjusted df	.468	9	11.4 63	.869
Based on trimmed mean	1.296	9	20	.299

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Nilai_pH

b. Design: Intercept + Konsentrasi + Waktu_Simpan + Konsentrasi *
Waktu_Simpan

Tests of Between-Subjects Effects

Dependent Variable: Nilai_pH

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.383 ^a	9	.043	67.873	.000
Intercept	1519.835	1	1519.835	2425269.197	.000
Konsentrasi	.221	4	.055	88.093	.000
Waktu_Simpan	.132	1	.132	210.644	.000
Konsentrasi * Waktu_Simpan	.030	4	.007	11.960	.000
Error	.013	20	.001		
Total	1520.231	30			
Corrected Total	.395	29			

a. R Squared = ,968 (Adjusted R Squared = ,954)

Lampiran 2. Hasil Data berbagai Parameter Uji

A. Tabel Populasi Total Bakteri (cfu/g) pada Setiap Perlakuan

		Ulangan (N)	Lama Waktu Simpan (L)	
			2 Jam (L1)	4 Jam (L2)
Ekstrak <i>Avicennia lanata</i> (K)	Konsentrasi 0% (K0)	1	80 x 10 ⁵	82 x 10 ⁵
		2	69 x 10 ⁵	75 x 10 ⁵
		3	76 x 10 ⁵	79 x 10 ⁵
	Konsentrasi 25% (K1)	1	78 x 10 ⁵	78 x 10 ⁵
		2	82 x 10 ⁵	83 x 10 ⁵
		3	67 x 10 ⁵	77 x 10 ⁵
	Konsentrasi 50% (K2)	1	31 x 10 ⁵	79 x 10 ⁵
		2	48 x 10 ⁵	80 x 10 ⁵
		3	55 x 10 ⁵	75 x 10 ⁵
	Konsentrasi 75% (K3)	1	31 x 10 ⁵	50 x 10 ⁵
		2	28 x 10 ⁵	53 x 10 ⁵
		3	23 x 10 ⁵	55 x 10 ⁵
	Konsentrasi 100% (K4)	1	9 x 10 ⁵	31 x 10 ⁵
		2	20 x 10 ⁵	42 x 10 ⁵
		3	11 x 10 ⁵	36 x 10 ⁵

B. Tabel Kandungan Kadar Trimetilamina (mg/100 g) pada Setiap Perlakuan

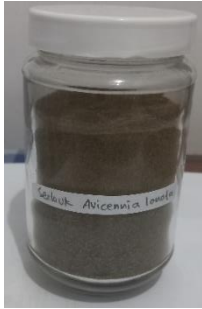
		Ulangan (N)	Lama Waktu Simpan (L)	
			2 Jam (L1)	4 Jam (L2)
Ekstrak <i>Avicennia lanata</i> (K)	Konsentrasi 0% (K0)	1	2,64	2,80
		2	2,13	3,02
		3	2,52	3,26
	Konsentrasi 25% (K1)	1	2,34	3,36
		2	2,34	2,86
		3	2,80	2,74
	Konsentrasi 50% (K2)	1	1,40	2,80
		2	1,86	2,75
		3	1,74	3,26
	Konsentrasi 75% (K3)	1	1,06	1,40
		2	0,94	1,68
		3	0,46	0,94
	Konsentrasi 100% (K4)	1	0,78	0,46
		2	0,46	0,94
		3	0,50	0,48

C. Tabel Tingkat Keasaman (pH) pada Setiap Perlakuan

		Ulangan (N)	Lama Waktu Simpan (L)	
			2 Jam (L1)	4 Jam (L2)
Ekstrak <i>Avicennia lanata</i> (K)	Konsentrasi 0% (K0)	1	7,26	7,27
		2	7,28	7,28
		3	7,28	7,32
	Konsentrasi 25% (K1)	1	7,03	7,16
		2	7,06	7,19
		3	7,10	7,18
	Konsentrasi 50% (K2)	1	7,01	7,16
		2	6,95	7,18
		3	7,02	7,17
	Konsentrasi 75% (K3)	1	6,97	7,14
		2	6,94	7,14
		3	7,01	7,16
	Konsentrasi 100% (K4)	1	6,98	7,13
		2	6,95	7,12
		3	6,93	7,16

Lampiran 3. Dokumentasi Penelitian

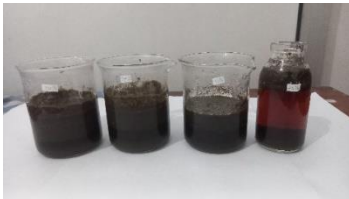
 <p>Udang <i>Vannamei</i> (<i>Litopenaeus vannamei</i>)</p>	 <p>Tempat Penyimpanan Udang Beraerasi</p>
  <p>Proses Pengambilan Udang <i>L. vannamei</i></p>	 <p>Proses Menghaluskan & Menimbang Udang</p>
   <p>Proses Memetik dan Mencuci Daun <i>Avicennia lanata</i></p>	  <p>Menserbukkan Daun <i>A. lanata</i></p>



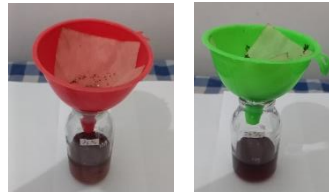
Serbuk Daun Kateng Mangrove
(*Avicennia lanata*)



Menimbang Serbuk *A. lanata*



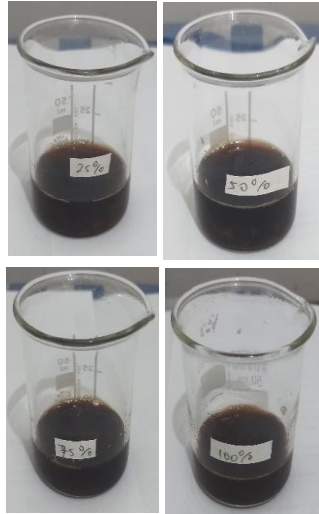
Setelah Perebusan Serbuk *A. lanata*



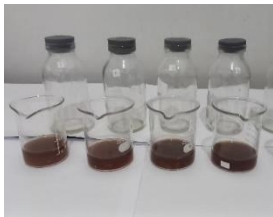
Penyaringan Ekstrak Air *A. lanata*



Serbuk Hasil Penyaringan



Ekstrak Air *A. lanata* Setelah Maserasi dan Pemekatan

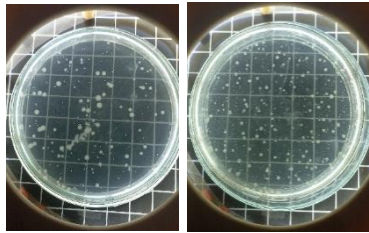


Perendaman Daging Segar Udang *L. Vannamei* dengan Berbagai Konsentrasi Ekstrak Air *A. lanata*

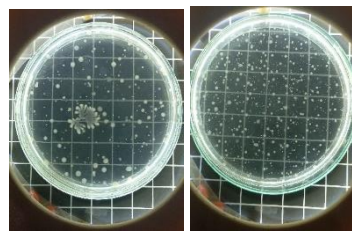


Bahan dan Alat yang Digunakan Pada Penelitian

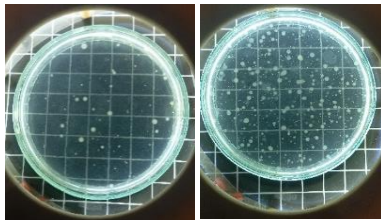
Hasil Dokumentasi Populasi Total Bakteri



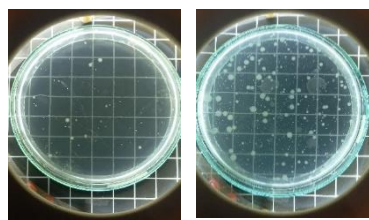
Konsentrasi 0% (kontrol)
Kiri (2 Jam) Kanan (4 Jam)



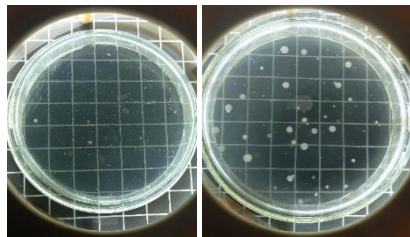
Konsentrasi 25%
Kiri (2 Jam) Kanan (4 Jam)



Konsentrasi 50%
Kiri (2 Jam) Kanan (4 Jam)








Konsentrasi 75%
Kiri (2 Jam) Kanan (4 Jam)

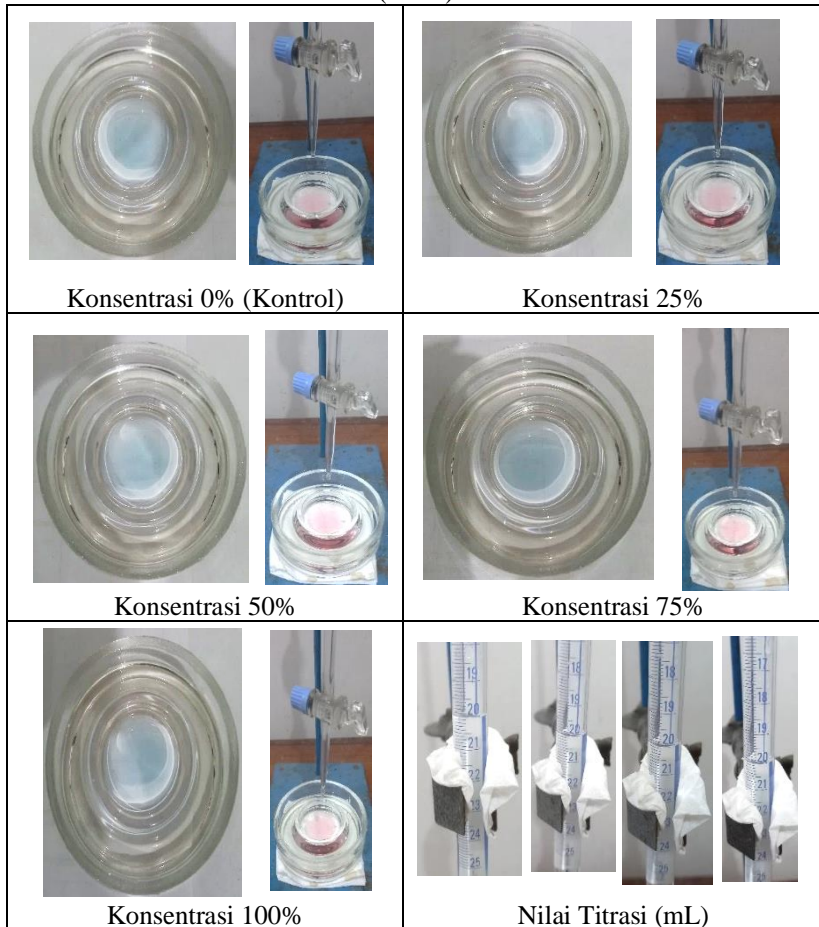


Konsentrasi 100%
Kiri (2 Jam) Kanan (4 Jam)

Hasil Dokumentasi Hidrogen Sulfida (H_2S)

 <p>Konsentrasi 0% (Kontrol) Kiri (2 Jam) Kanan (4 Jam)</p>	 <p>Konsentrasi 25% Kiri (2 Jam) Kanan (4 Jam)</p>
 <p>Konsentrasi 50% Kiri (2 Jam) Kanan (4 Jam)</p>	 <p>Konsentrasi 75% Kiri (2 Jam) Kanan (4 Jam)</p>
 <p>Konsentrasi 100% Kiri (2 Jam) Kanan (4 Jam)</p>	

Hasil Dokumentasi Trimetilamina (TMA)



Hasil Dokumentasi pH



Konsentrasi 0%
Kiri (2 Jam) Kanan (4 Jam)



Konsentrasi 25%
Kiri (2 Jam) Kanan (4 Jam)



Konsentrasi 50%
Kiri (2 Jam) Kanan (4 Jam)



Konsentrasi 75%
Kiri (2 Jam) Kanan (4 Jam)



Konsentrasi 100%
Kiri (2 Jam) Kanan (4 Jam)



PROGRAM STUDI BIOLOGI
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BUKTI BIMBINGAN SKRIPSI

Nama : Arkan Setia Pramudya
 NIM : 192500009
 Judul Skripsi : Efektivitas Ekstrak Daun Kateng Mangrove (*Avicennia lanata* Ridl.) Sebagai Pengawet Alami Daging Segar Udang Vannamei (*Litopenaeus vannamei*)
 Dosen Pembimbing : Dr. Arif Yachya, S.Si., M.Si

No	Tanggal	Materi Bimbingan	Pembimbing
1.	05-06-2023	Bimbingan BAB 5-6	
2.	12-06-2023	Bimbingan BAB 5-6	
3.	19-06-2023	Revisi BAB 5-6	
4.	26-06-2023	Bimbingan BAB 1-7	
5.	04-07-2023	Bimbingan BAB 1-7	
6.	10-07-2023	Revisi BAB 7	
7.	14-07-2023	Bimbingan BAB 1-7	
8.	18-07-2023	ACC BAB 1-7	
9.	04-08-2023	Revisi Hasil Sidang Skripsi	

Mengetahui
 Dikan FST,

Dra. Puji Karunia Binawati, M.Si
 NIP. 196204081992022001

Dosen Pembimbing,

Dr. Arif Yachya, S.Si., M.Si
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PROGRAM STUDI BIOLOGI
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PERSETUJUAN PERBAIKAN SKRIPSI


Dosen Pembimbing dan Penguji dibawah ini telah menyetujui atas perbaikan naskah skripsi yang dilakukan oleh:

Nama : Arkan Setia Pramudya
 NIM : 192500009
 Prodi : Biologi
 Judul : Efektivitas Ekstrak Daun Kateng Mangrove (*Avicennia lanata* Ridl.) Sebagai Pengawet Alami Daging Segar Udang Vannamei (*Litopenaeus vannamei*)

DOSEN PEMBIMBING

No.	Nama	Tanda Tangan	Tanggal Persetujuan
1.	Dr. Arif Yachya, S.Si., M.Si		9/8 2023

DOSEN PENGUJI

No.	Nama	Tanda Tangan	Tanggal Persetujuan
1.	Prof. Dr. Ir. Tatang Sopandi, M.P		9/8 2023

***Catatan:**

Naskah skripsi dapat digandakan dan dijilid, apabila mahasiswa yang bersangkutan telah mendapat persetujuan dari dosen pembimbing dan dosen penguji.