DAFTAR PUSTAKA

Abdel-Latif, H. M., Dawood, M. A., Menanteau-Ledouble, S., & El-Matbouli, M. (2020). The nature and consequences of co-infections in tilapia: A review. Journal of Fish Diseases, 43(6), 651-664.

Abdel-Tawwab, M., Hagras, A. E., Elbaghdady, H. A. M., & Monier, M. N. (2019). Effects of dietary nanozeolite on growth, physiological responses, and resistance of Nile tilapia, *Oreochromis niloticus (L.)* to *Aeromonas hydrophila infection.* Aquaculture, 501, 50-57.

Abdel-Tawwab, M., Razek, N. A., & Abdel-Rahman, A. M. (2022). Immunostimulants for aquaculture purposes: A critical appraisal of current knowledge. Reviews in *Aquaculture*, 14(1), 531-553.

Aisyah, S., Manoppo, H., & Tumbol, R. A. (2016). Uji resistensi benih ikan nila (*Oreochromis niloticus*) yang diberi larutan daun kayu manis (*Cinnamomum verum*) melalui pakan terhadap infeksi bakteri Aeromonas hydrophila. e-Journal Budidaya Perairan, 4(3).

Asikin, A. N. (2016). Toksisitas ekstrak daun kirinyuh *(Chromolaena odorata L.)* terhadap ikan nila (*Oreochromis niloticus*). Jurnal Akuakultur Indonesia, 15(2), 158-170.

Chen, M., Li, L. P., Wang, R., Liang, W. W., Huang, Y., Li, J., Lei, A. Y., Huang, W. Y., & Gan, X. (2019). PCR detection and PFGE genotype analyses of streptococcal clinical isolates from tilapia in China. Veterinary Microbiology, 233, 47-56.

Darmawati, S., Haribi, R., & Artama, T. M. (2015). Daya antibakteri ekstrak daun kirinyuh (*Eupatorium odoratum L.*) terhadap bakteri Pseudomonas aeruginosa dan Staphylococcus aureus. Prosiding Seminar Nasional & Internasional, 2(2).

Dawood, M. A., Koshio, S., & Esteban, M. Á. (2020). Beneficial roles of feed additives as immunostimulants in *aquaculture*: a review. Reviews in *Aquaculture*, 12(4), 2019-2041.

Dwiono, S. A. P., Oktaviani, T., & Supono. (2018). Histologi insang ikan nila (*Oreochromis niloticus*) yang terpapar merkuri klorida (HgCl2) pada konsentrasi sublethal. Jurnal Sains Teknologi Akuakultur, 2(2), 32-40.

Ernawati. (2015). Aktivitas antibakteri ekstrak daun kirinyuh (*Eupatorium odoratum L.*) terhadap bakteri *Pseudomonas aeruginosa*. Jurnal Kesehatan, 6(1).

FAO. (2022). The State of World Fisheries and Aquaculture 2022. Rome, FAO.

Ghosh,A.,&Bhoumik,s.(2017).Histological Techniques for Fish:A Comprehensive Guide .journal of Aquatic Animal Health,29(2),123-130.

Hartati, S. (2015). Pengaruh ekstrak daun kirinyuh (*Chromolaena odorata L.*) terhadap histopatologi insang dan hati ikan nila (*Oreochromis niloticus*). Jurnal Biologi Tropis, 15(2), 132-143.

Hastuti, S., & Subandiyono. (2011). Performa hematologis ikan lele dumbo (*Clarias gariepinus*) dan kualitas air media pada sistem budidaya dengan penerapan kolam biofiltrasi. Jurnal Saintek Perikanan, 6(2), 1-5.

Hoseinifar, S. H., Sun, Y. Z., Wang, A., & Zhou, Z. (2020). Probiotics as means of diseases control *in aquaculture*, a review of current knowledge and future perspectives. Frontiers in Microbiology, 11, 2092.

Irma, Jaya, B., & Loppies, C. R. M. (2016). Uji aktivitas antibakteri ekstrak daun kirinyuh (*Chromolaena odorata*) terhadap pertumbuhan bakteri *Staphylococcus aureus* dan *Escherichia coli*. Jurnal Kimia Mulawarman, 14(1), 29-34.

Jusadi, D., Hutama, A. A., Nuryati, S., Wasjan, & Mokoginta, I. (2018). Growth performance and health status of red tilapia (*Oreochromis sp.*) supplemented with nucleotide and β-glucan. Jurnal Akuakultur Indonesia, 17(1), 1-8.

Khan, M. I., Ahhmed, A., Shin, J. H., Baek, J. S., Kim, M. Y., & Kim, J. D. (2018). Green tea seed isolated saponins exerts antibacterial effects against various strains of gram positive and gram negative bacteria, a comprehensive study in vitro and in vivo. Evidence-Based Complementary and Alternative Medicine, 2018, 1-12.

Kusuma, M. S., Wahyuningsih, H., & Sarjito. (2021). Pengaruh pemberian probiotik dengan dosis berbeda terhadap pertumbuhan dan kelulushidupan ikan nila (*Oreochromis niloticus*). Sains Akuakultur Tropis, 5(1), 56-65.

Liu, X., Xu, H., Wang, X., Wu, Z., & Bao, X. (2022). An integrated analysis on histopathological alterations in gills of Nile tilapia (*Oreochromis niloticus*) exposed to waterborne copper. Aquatic Toxicology, 242, 105980.

Mangunwardoyo, W., Ismayasari, R., & Riani, E. (2016). Pathogenicity and virulence of *Aeromonas hydrophila* isolated from Nile tilapia (*Oreochromis niloticus L.*) on different water salinity. Asian Journal of Microbiology, Biotechnology and Environmental Sciences, 18(1), 123-129.

Mitaningrum, E. (2019). Uji aktivitas antibakteri ekstrak daun kirinyuh (*Chromolaena odorata L.*) terhadap bakteri *Aeromonas hydrophila*. Skripsi. Universitas Jenderal Soedirman.

Muchlisin, Z. A., Nazir, M., & Musman, M. (2016). Pematangan gonad, fekunditas, dan derajat pembuahan ikan peres (*Osteochilus kappeni*) di Perairan Aceh. Jurnal Ilmu-Ilmu Perairan dan Perikanan Indonesia, 23(1), 9-16.

Mujalifah, U., Susilowati, T., & Yuniarti, T. (2018). Pengaruh salinitas terhadap pertumbuhan dan kelangsungan hidup benih ikan nila (*Oreochromis niloticus)*. Journal of Aquaculture Management and Technology, 7(1), 90-98.

Ngajow, M., Abidjulu, J., & Kamu, V. S. (2013). Pengaruh antibakteri ekstrak kulit batang matoa (*Pometia pinnata*) terhadap bakteri *Staphylococcus aureus secara* in vitro. Jurnal MIPA, 2(2), 128-132.

Noer, S. F. (2006). Aktivitas antibakteri ekstrak etanol daun kirinyuh (*Eupatorium odoratum L.*) terhadap *Escherichia coli* dan *Staphylococcus aureus* multiresisten antibiotik. Pharmacon, 7(1), 7-11.

Omokhua, A. G., Abdalla, M. A., Staden, J. V., & McGaw, L. J. (2020). *Chromolaena odorata (L.)* R.M. King & H. Rob. (*Asteraceae)* in sub-Saharan Africa: A synthesis and review of its medicinal potential. Journal of Ethnopharmacology, 247, 112176.

Phan, T. T., Wang, L., See, P., Grayer, R. J., Chan, S. Y., & Lee, S. T. (2020). Phenolic compounds of *Chromolaena odorata* protect cultured skin cells from oxidative damage: implication for cutaneous wound healing. Biological and Pharmaceutical Bulletin, 43(1), 67-74.

Phan, T. T., Wang, L., See, P., Grayer, R. J., Chan, S. Y., & Lee, S. T. (2021). Phenolic compounds of *Chromolaena odorata* protect cultured skin cells from oxidative damage: implication for cutaneous wound healing. Biological and Pharmaceutical Bulletin, 24(12), 1373-1379.

Pramono, T. B., Triyanto, & Kusuma, M. S. W. (2016). Struktur histologis insang ikan nila (*Oreochromis niloticus*) yang dipelihara pada salinitas berbeda. Jurnal Perikanan dan Kelautan, 7(2), 193-202.

Pratama, R. A., Rosidah, & Silvi, M. A. (2017). Efektivitas ekstrak daun kirinyuh (*Chromolaena odorata*) terhadap kelulushidupan ikan mas (*Cyprinus carpio*) yang diinfeksi bakteri *Aeromonas hydrophila*. Jurnal Perikanan dan Kelautan, 8(1), 139-149.

Priono A, Yanti N, Lili D, 2016. Perbandingan Efektivitas Antibakteri Ekstrak Etanol Daun Kelor (Moringaoleifera lamck.) dan Ekstrak Daun Chromolaena odorata L.. Jurnal Ampibi 1 (2) :

Raharjo, E. I., Rachimi, & Muhamad, A. (2016). Pengaruh kualitas air terhadap pertumbuhan ikan nila (*Oreochromis niloticus*) di kolam terpal. Jurnal Ruaya, 4(1), 1-6.

Rahma, F. W., Sarjito, S., & Prayitno, S. B. (2023). Histopathological changes in the gills and liver of tilapia (*Oreochromis niloticus*) infected with Aeromonas hydrophila. IOP Conference Series: Earth and Environmental Science, 1064(1), 012059.

Reed, L.J. and Muench, H. (1938). A simple method of estimating fifty per cent endpoints. American Journal of Hygiene, 27, 493-497.

Rahmadani, F., Kamaruddin, & Rusaini. (2017). Profil histopatologi insang dan hati ikan nila (*Oreochromis niloticus* Linnaeus, 1758) yang terinfeksi *Aeromonas hydrophila* dan diobati dengan ekstrak daun sirih (Piper betle L.). Jurnal Sains dan Teknologi Tadulako, 6(1), 21-30.

Ramadhani, E. (2017). Analisis parameter fisika kimia air sungai Siak Provinsi Riau. Jurnal Dinamika Lingkungan Indonesia, 4(2), 138-144.

Restina, D., Roza, R. M., & Fitmawati. (2016). Aktivitas antibakteri ekstrak daun Pelawan (*Tristaniopsis merguensis Griff.*) terhadap Escherichia coli dan Salmonella typhi. JOM FMIPA, 3(1), 107-114.

Reverter, M., Sarter, S., Caruso, D., Avarre, J. C., Combe, M., Pepey, E., Pouyaud, L., Vega-Heredía, S., de Verdal, H., & Gozlan, R. E. (2021). Aquaculture at the crossroads of global warming and antimicrobial resistance. Nature Communications, 11(1), 1870.

Sari, N. I., Setyawati, T. R., & Khotimah, S. (2015). Uji antibakteri ekstrak kasar biji buah langsat (*Lansium domesticum Corr.*) terhadap bakteri Staphylococcus aureus. Jurnal Protobiont, 4(1), 134-137.

SNI. (2017). Standar Nasional Indonesia: Ikan nila (*Oreochromis niloticus, Bleeker*). Badan Standardisasi Nasional.

Subekti, K. (2017). Pengaruh ekstrak daun kirinyuh (*Chromolaena odorata L.*) terhadap aktivitas enzim antioksidan pada ikan nila (*Oreochromis niloticus)*. Jurnal Perikanan dan Kelautan, 8(1), 66-72.

Sukamto, B., Cahyono, B., & Widodo, F. M. (2021). Toxicity test of *Chromolaena odorata leaf extract on tilapia* (*Oreochromis niloticus*). IOP Conference Series: Earth and Environmental Science, 750(1), 012020.

Suryati, N., Priyoutomo, N. B., & Santanumurti, M. B. (2023). Efektivitas ekstrak daun kirinyuh (*Chromolaena odorata*) sebagai alternatif pengobatan infeksi *Aeromonas hydrophila* pada ikan nila (*Oreochromis niloticus*). Jurnal Perikanan dan Kelautan Tropis, 14(1), 56-65.

Vita, L. S. (2017). Kimia air. Pustaka Pelajar.

Wijaya, H., Novitasari, & Jubaidah, S. (2018). Perbandingan metode ekstraksi terhadap rendemen ekstrak daun rambai laut (*Sonneratia caseolaris L. Engl*). Jurnal Ilmiah Manuntung, 4(1), 79-83.

Yusuf, M. S., Zhao, S., Shi, X., Chen, J., Duan, Y., & Zhang, M. (2021). *Aeromonas hydrophila*: An emerging pathogen for freshwater fish. Reviews in Aquaculture, 13(3), 1348-1377.

Zainuddin, E. N. (2006). Chemical and biological investigations of selected cyanobacteria (*blue-green algae*). PhD Thesis. University of Greifswald, Germany.

Zainuddin, E. N., Syahril, M., Himawan, H. R., Malina, A. C., & Alimuddin, A. (2019). Antibacterial activities of eucheuma denticulatum-associated bacteria against fish pathogenic bacteria. IOP Conference Series: Earth and Environmental Science, 370(1), 012038.

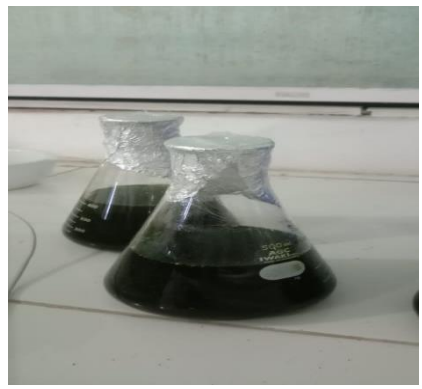
Zainuddin, E. N., Syahril, M., Malina, A. C., Ilham, H., Jabbar, A., & Nelvia, N. (2020). Screening of antibacterial activities of marine-derived fungi extracts isolated from South Sulawesi coastline. IOP Conference Series: Earth and Environmental Science, 564(1), 012067.

Zhang, Q. W., Lin, L. G., & Ye, W. C. (2018). Techniques for extraction and isolation of natural products: a comprehensive review. Chinese Medicine, 13, 20.

LAMPIRAN

Lampiran 1. Dokmentasi Kegiatan Penelitia

Pengeringan Daun Kirinyuh



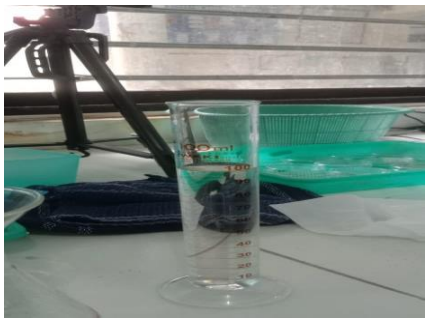
Daun Kirinyuh Dengan Larutan Etanol

Penimbangan Daun kirinyuh

Penyaringan Ekstrak Daun Kirinyuh

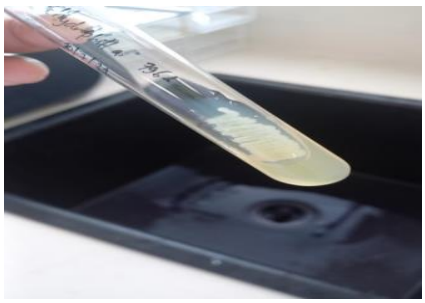
Pemeliharaan Ikan Nila

Penyuntikan Bakteri *Aeromonas*



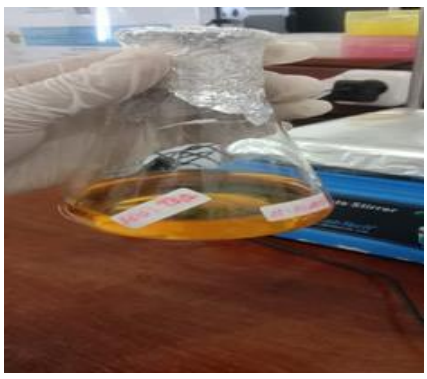
Pengukuran Akuades

Sterilisasi Alat



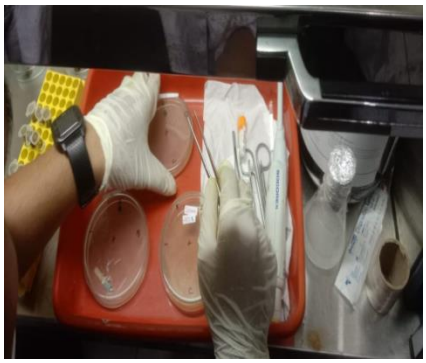
Peremajaan Bakteri Aeromonas

Uji Toksitas

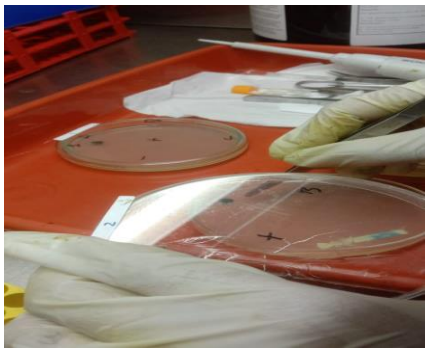


Pembuatan TSA

Pembuatan Media Agar



Peletakan kertas cakram



Uji zona habat anti bakteri

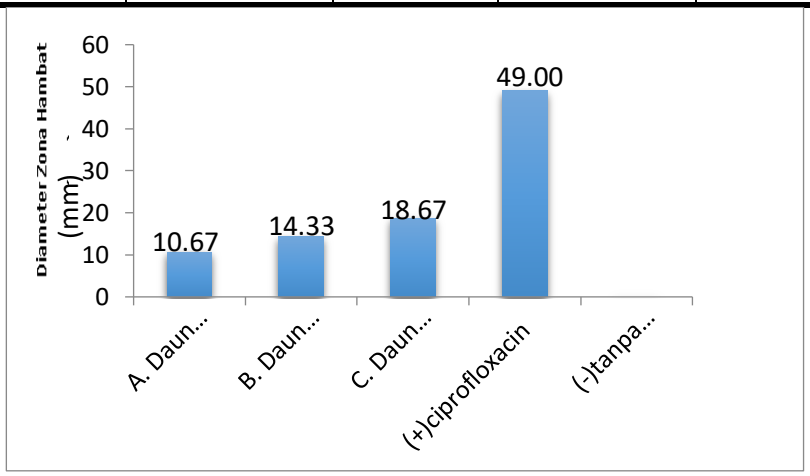
Lampiran 4. Data Pengamatan uji toksitas

Perlakuan	J.ikan awal	j.ikan mati hari ke 1	j.ikan mati hari ke 2	j.ikan mati hari ke 3	Total Ikan Hidup	Total Ikan Mati
A	10	0	0	0	10	0
B	10	0	0	0	10	0
C	10	0	0	1	9	1
D	10	1	1	2	6	4

LAMPIRAN 5. Uji Aktivitas Sona Hambat Ekstrak Daun Kirinyuh

Perlaakuan	Ulangan	Nilai
A	1	10
	2	13
	3	9
Rata-rata		10.67
B	1	13
	2	15
	3	15
Rata-rata		14.33
C	1	15
	2	16
	3	25
Rata-rata		18.67
(-)	1	0
	2	0
	3	0
Rata-rata		0
(+)	1	55
	2	45
	3	47
Rata-rata		49.00

A.EkstrakDaun Kirinyuh 9g/50 µl	B.Ekstral Daun Kirinyuh 10g/50 µl	C.Ekstar Daun Kirinyuh 11g/ 50 µl	(+)ciprofloxacin	(-)tanpa perlakuan
10.67	14.33	18.67	49.00	0



Data SPSS Zona Hambat

Descriptives

ZonaHambat

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
A. 9g	3	10.6667	2.08167	1.20185	5.4955	15.8378	9.00	13.00
B.10g	3	14.3333	1.15470	.66667	11.4649	17.2018	13.00	15.00
C.11g	3	18.6667	5.50757	3.17980	4.9851	32.3482	15.00	25.00
D. (+)	3	49.0000	5.29150	3.05505	35.8552	62.1448	45.00	55.00
E. (-)	3	.0000	.00000	.00000	.0000	.0000	.00	.00
Total	15	18.5333	17.28280	4.46240	8.9624	28.1042	.00	55.00

ANOVA

ZonaHambat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4053.733	4	1013.433	79.174	.000
Within Groups	128.000	10	12.800		
Total	4181.733	14			

ZonaHambat

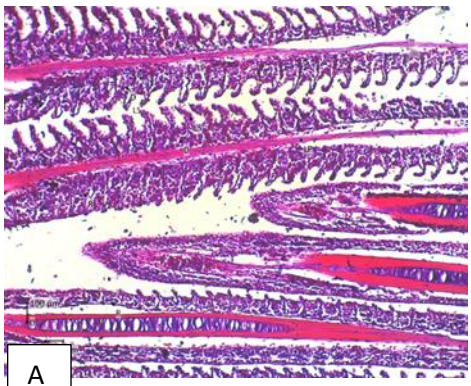
Tukey HSD[a]

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
E. (-)	3	.0000		
A. 9g	3		10.6667	
B. 10g	3		14.3333	
C. 11g	3		18.6667	
D. (+)	3			49.0000
Sig.		1.000	.117	1.000

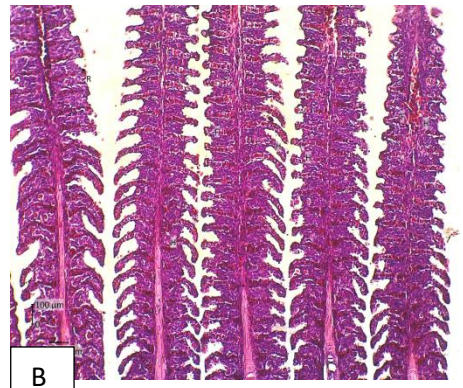
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

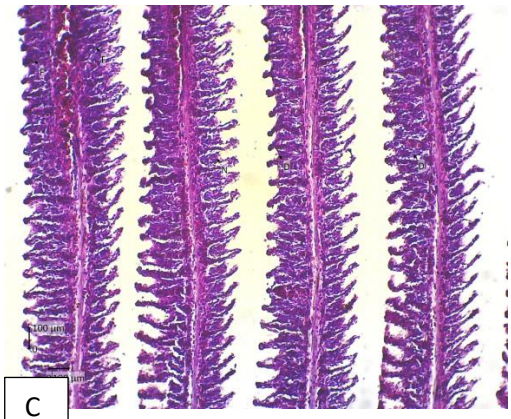
LAMPIAN 6. Hasil Istologi Insang Ikan Nila



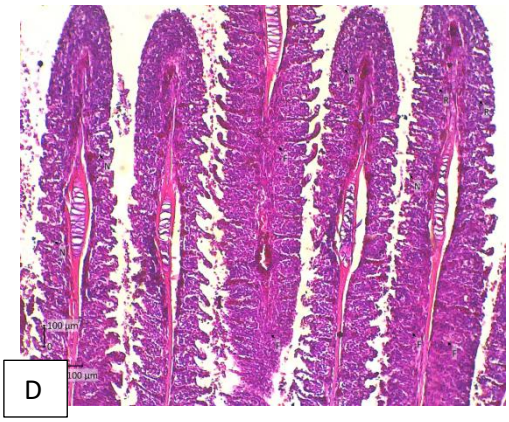
A



B



C

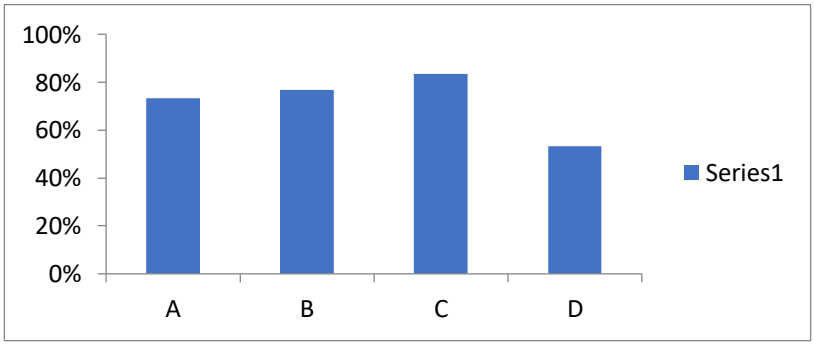


D

Lampiran 8. Analisis Data *Survival Rate* (SR)

Parameter				
SR :	A	B	C	D
	73±0,058[a]	77±0,058[a]	83±0,058[a]	53±0,058[B]

Perlakuan	Ulangan	Jumlah Awal	Jumlah Ahir	SR(%)
A	1	10	8	80%
	2	10	7	70%
	3	10	7	70%
Rata-Rata				73%
Stdev				0.058
B	1	10	7	70%
	2	10	8	80%
	3	10	8	80%
Rata-Rata				77%
		Stdev		0.058
C	1	10	8	80%
	2	10	8	80%
	3	10	9	90%
Rata-Rata				83%
		Stdev		0.0577
D	1	10	5	50%
	2	10	6	60%
	3	10	5	50%
Rata-Rata				53%
Stdev				0.058



Data SPSS Survival Rate (SR)

Descriptives

SurvivalRate

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
A. 9g	3	53.3333	5.77350	3.33333	38.9912	67.6755	50.00	60.00
B. 10g	3	66.6667	15.27525	8.81917	28.7208	104.6125	50.00	80.00
C. 11g	3	70.0000	17.32051	10.00000	26.9735	113.0265	50.00	80.00
D. (Kontrol)	3	23.3333	5.77350	3.33333	8.9912	37.6755	20.00	30.00
Total	12	53.3333	21.88122	6.31656	39.4307	67.2360	20.00	80.00

ANOVA

SurvivalRate

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4066.667	3	1355.556	9.037	.006
Within Groups	1200.000	8	150.000		
Total	5266.667	11			

SurvivalRate

Tukey HSD[a]

Perlakuan	N	Subset for alpha = 0.05	
		1	2
D. (Kontrol)	3	23.3333	
A. 9g	3	53.3333	53.3333
B. 10g	3		66.6667
C. 11g	3		70.0000
Sig.		.067	.398

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

LAMPIRAN 8. Kualitas Air

A

HARI KE	A1	A2	A3
1	27.93	27.75	27.67
2	27.75	27.72	27.67
3	27.71	27.71	27.68
4	27.71	27.72	27.65
5	27.73	27.73	27.67
6	27.72	27.74	27.68
7	27.72	27.73	27.68
RATA-RATA	27.75	27.73	27.67

27.72

B

B1	B2	B3
27.45	27.37	27.24
27.2	27.11	27.25
27.98	27.37	27.37
26.85	27.75	27.32
26.77	27.97	27.47
26.55	28.23	27.42
26.85	28.48	27.75
27.09	27.75	27.40

27.42

C

C1	C2	C3
27.75	27.32	27.24
27.85	28.23	27.24
27.37	28.22	27.24
27.75	27.26	27.24
27.97	27.22	27.24
26.55	27.82	27.24
26.85	27.82	27.24
27.44	27.70	27.24

27.46

D

D1	D2	D3
27.84	28.23	27.82
27.26	28.48	27.48
27.29	28.65	27.62
27.62	29.22	27.22
27.27	28.96	27.21
27.28	27.22	27.32
27.94	28.72	27.36
27.5	28.50	27.43

27.81

DAFTAR RIWAYAT HIDUP

A. Data Pribadi

1. Nama :Ade Pratama
2. Tempat, Tanggal Lahir :Malelara ,03 juni 1999
3. Alamat :malelara RT.001
4. Kewarganegaraan :Indonesia

B. Riwayat Pendidikan

1. Sekolah SMK Negri 3 Palopo Tahun Lulus 2016
2. Sarjana (S1), Tahun lulus 2022, Universitas andi jemma palopo
3. Magister (S2), Tahun lulus 20.., Universitas Hasanuddin

C. Pekerjaan dan Riwayat Pekerjaan

- Jenis Pekerjaan :Mahasiswa
- NIP atau Identitas lain (NIK) :L012222006
- Pangkat atau Jabatan :-

D. Karya Ilmiah yang telah dipublikasikan (missal pada jurnal)

-

E. **Makalah pada Seminar/Konferensi Ilmiah Nasional dan Internasional**

1. –

2. –

3. -