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LAMPIRAN

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN FAKULTAS KEDOKTERAN
KOMITE ETIK PENELITIAN UNIVERSITAS HASANUDDIN
RSPTN UNIVERSITAS HASANUDDIN
RSUP Dr. WAHIDIN SUDIROHUSODO MAKASSAR
Sekretariat : Lantai 2 Gedung Laboratorium Terpadu
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Contact Person: dr. Agussalim Bukhari.,MMed.PhD, SpGK TELP. 081241850858, 0411 5780103, Fax : 0411-581431

REKOMENDASI PERSETUJUAN ETIK

Nomor : 124/UN4.6.4.5.31/ PP36/ 2023

Tanggal: 16 Februari 2023

Dengan ini Menyatakan bahwa Protokol dan Dokumen yang Berhubungan Dengan Protokol berikut ini telah mendapatkan Persetujuan Etik :

No Protokol	UH23010060	No Sponsor Protokol	
Peneliti Utama	**Jusniar Patandung, S.Tr.Kes**	Sponsor	
Judul Peneliti	Pengaruh Pemberian Ekstrak Alga Merah (Eucheuma spinosum) Terhadap Kadar Alkali Fosfatase, Foto X-Ray Serta Gambaran Histologi Mencit Osteoporosis.		
No Versi Protokol	**1**	Tanggal Versi	**26 Januari 2023**
No Versi PSP		Tanggal Versi	
Tempat Penelitian	Laboratorium Hewan Fakultas Kedokteran Universitas Hasanuddin, Laboratorium Biokimia, Balai Besar Lab Kesehatan, dan Klinik Hewan Sahabat Satwa Celebes di Makassar		
Jenis Review	[ ] Exempted [x] Expedited [ ] Fullboard Tanggal	Masa Berlaku **16 Februari 2023** sampai **16 Februari 2024**	Frekuensi review lanjutan
Ketua KEP Universitas Hasanuddin	Nama **Prof.Dr.dr. Suryani As'ad, M.Sc.,Sp.GK (K)**	Tanda tangan	
Sekretaris KEP Universitas Hasanuddin	Nama **dr. Agussalim Bukhari, M.Med.,Ph.D.,Sp.GK (K)**	Tanda tangan	

Kewajiban Peneliti Utama:

- Menyerahkan Amandemen Protokol untuk persetujuan sebelum di implementasikan
- Menyerahkan Laporan SAE ke Komisi Etik dalam 24 Jam dan dilengkapi dalam 7 hari dan Lapor SUSAR dalam 72 Jam setelah Peneliti Utama menerima laporan
- Menyerahkan Laporan Kemajuan (progress report) setiap 6 bulan untuk penelitian resiko tinggi dan setiap setahun untuk penelitian resiko rendah
- Menyerahkan laporan akhir setelah Penelitian berakhir
- Melaporkan penyimpangan dari prokol yang disetujui (protocol deviation / violation)
- Mematuhi semua peraturan yang ditentukan

KEMENTERIAN KESEHATAN RI
DIREKTORAT JENDERAL PELAYANAN KESEHATAN
BALAI BESAR LABORATORIUM KESEHATAN MAKASSAR
Jl.Perintis Kemerdekaan KM. 11 Tamalanrea Makassar 90245 Telp.(0411) 585457-586458 Fax.(0411) 586270
Surat Elektronik : bblk_makassar@yahoo.com

SURAT KETERANGAN
TELAH MELAKUKAN PENELITIAN

Nomor : : SR.04.01/D.L/2138/2023

Yang bertanda tangan dibawah ini Kepala Balai Besar Laboratorium Kesehatan Makassar dengan ini menerangkan bahwa Mahasiswa Pascasarjana Prodi Ilmu Biomedik Universitas Hasanuddin Makassar, yaitu:

Nama	:	Jusniar Patandung
NIM	:	P062212002
Judul Penelitian	:	Pengaruh Pemberian Tepung Alga Merah (Eucheuma spinosum) Terhadap Kadar Alkali Fosfatase, Foto X-ray serta Gambaran Histologi Mencit Osteoporosis

Telah Melakukan Penelitian Pada Balai Besar Laboratorium Kesehatan Makassar pada tanggal 16 Maret 2023

Demikian surat keterangan ini diberikan untuk dipergunakan seperlunya.

Makassar, 11 Mei 2023

An Kepala,
Sub Koordinator Bimbingan Teknis

KEMENTERIAN KESEHATAN REPUBLIK INDONESIA
DIREKTORAT JENDERAL PELAYANAN KESEHATAN

Hasni Latif, SKM, M.Kes
NIP. 196912051991032009

KLINIK HEWAN
SAHABAT SATWA CELEBES
Pelayanan Emergency & Laboratorium 24 Jam
Jl. Nuri No. 43A , Makassar – 90121
Telepon : 0411 – 876825, E-mail : sahabatsatwacelebes@gmail.com

SURAT KETERANGAN
TELAH MELAKUKAN PENELITIAN

Nomor : 002/SSC/VI/2023

Yang bertanda tangan dibawah ini Kepala/Dokter Klinik Hewan Sahabat Satwa Celebes Makassar. Dengan ini menerangkan bahwa :

Nama	: Jusniar Patandung
NIM	: P062212002
Prodi	: S2 Ilmu Biomedik
Instansi	: Universitas Hasanuddin
Judul Penelitian	: Pengaruh Pemberian Tepung Alga Merah (*Eucheuma spinosum*) Terhadap Kadar Alkali Fosfatase, Foto X-ray Serta Gambaran Histologi Mencit Osteoporosis.

Telah melakukan penelitian di Klinik Hewan Sahabat Satwa Celebes pada tanggal 03 Juni 2023.

Demikian surat keterangan ini diberikan untuk dipergunakan seperlunya.

Makassar, 04 Juni 2023

KLINIK HEWAN SAHABAT SATWA CELEBES

Drh. Suci Ramadani
SIPV [illegible]
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LABORATORIUM TERPADU
PROGRAM STUDI KEDOKTERAN HEWAN
FAKULTAS KEDOKTERAN HEWAN
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SURAT KETERANGAN BEBAS LABORATORIUM

Yang bertanda tangan dibawah ini, Kepala Laboratorium Terpadu Program Studi Kedokteran Hewan menerangkan bahwa :

Nama	: Jusniar Patandung
Nim	: P062212002
Asal Instransi / Jurusan	: Ilmu Biomedik
Judul	: Pengaruh Pemberian Tepung Alga Merah (Eucheuma Spinosum) Terhadap Kadar Alkali Fosfatase, Foto X-Ray Serta Gambaran Histologi Tulang Mencit Osteoporosis.

Benar mahasiswa tersebut telah menyelesaikan penelitiaan di Lab Terpadu Kedokteran Hewan Universitas Hasanuddin dan tidak mempunyai tanggungan berupa alat/bahan Laboratorium, Program Studi Kedokteran Hewan Fakultas Kedokteran Universitas Hasanuddin.

Demikian surat keterangan ini dibuat untuk dipergunakan seperlunya.

Makassar, 06 Oktober 2023

Pengelola Laboratorium Terpadu
Program Studi Kedokteran Hewan

LABORATORIUM TERPADU

Drh. Nurul Sulfi Andini, M.Sc
NIDK.8929300020

Surat Keterangan Jurnal

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET, DAN TEKNOLOGI
UNIVERSITAS HASANUDDIN
SEKOLAH PASCASARJANA
Sekretariat lantai 3 Jl. Perintis Kemerdekaan KM. 10 Makassar, 90245

SURAT KETERANGAN JURNAL
Nomor: 257/UN4.20/PJ.00.01/2024

Yang bertanda tangan di bawah ini menerangkan bahwa:

Nama	: Jusniar Patandung
NIM	: P062212002
Program Studi	: Ilmu Biomedik
Judul Jurnal	: The Powdered Red Macroalgae (Eucheuma spinosum) Supplementation Potentially Enhanced Bone Structure in Osteoporotic Mice

Naskah tersebut telah disubmit pada **The Indonesian Biomedical Journal (ISSN: 2355-9179)** dengan status **Under Review** yang telah terindeks **Scopus Q3** dan mempunyai **Impact Factor (IF) 0.22**

Makassar, 09 January 2024

a.n Dekan,
Wakil Dekan Bidang Kemitraan,
Riset dan Inovasi

Prof. Dr. Amir Ilyas, SH., MH
NIP. 19800710 200604 1 001

Bebas Plagiasi

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SURAT KETERANGAN BEBAS PLAGIASI

Nomor: 19772 /UN4.20.1/PJ.01.02/2023

Yang bertandatangan di bawah ini, menerangkan bahwa :

Nama	:	Jusniar Patandung
NIM	:	P062212002
Program Pendidikan	:	Magister
Program Studi	:	Ilmu Biomedik
Judul Tesis/Disertasi	:	Pengaruh Pemberian Tepung Alga Merah (*Eucheuma Spinosum*) Terhadap Kadar Alkali Fosfatase, Foto X-Ray Serta Gambaran Histologi Tulang Mencit Osteoporosis

benar naskah Tesis/Disertasi yang bersangkutan telah melalui proses deteksi plagiasi menggunakan aplikasi Turnitin (maksimal 30%) dengan persentase tingkat kemiripan naskah tersebut sebesar 16 %

Demikian surat keterangan ini dibuat untuk dipergunakan sebagaimana mestinya.

Makassar, 19 Desember 2023

Menyetujui
Ketua Program Studi S2
Ilmu Biomedik

dr. Rahmawati, Ph.D.., Sp.PD-KHOM., FINASIM

Pemeriksa,

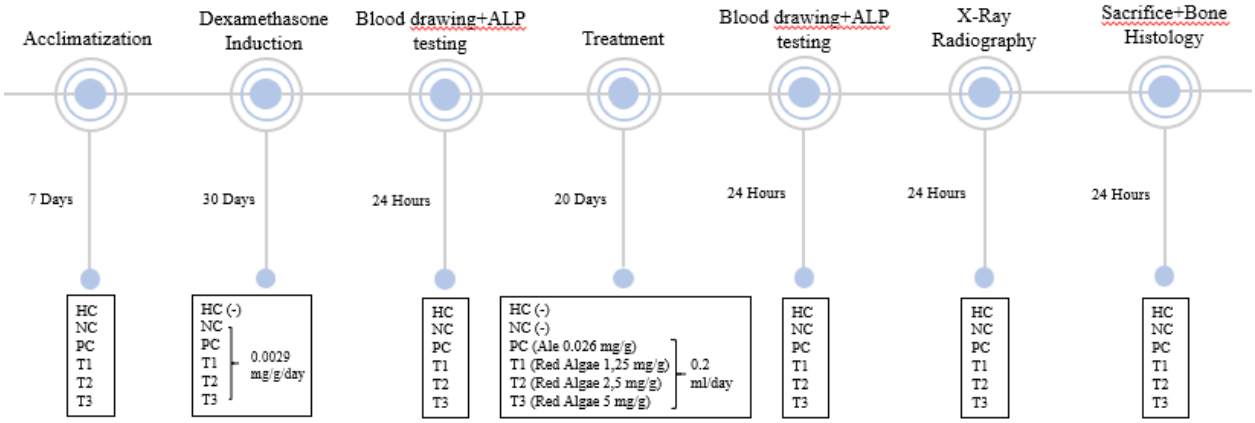
Arman Jaya, S.Kom.

Mengetahui,

Wakil Dekan Bidang Akademik
Dan Publikasi Ilmiah

Prof. Baharuddin Hamzah, S.T., M.Arch., Ph.D
NIP. 196903081995121001

Timeline Penelitian



Data Statistik Berat Badan Mencit

```
ONEWAY berat_badan BY perlakuan
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /PLOT MEANS
  /MISSING ANALYSIS
  /POSTHOC=LSD ALPHA(0.05).
```

Oneway

Descriptives

perubahan berat badan

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
KN	3	3.000	.0000	.0000	3.000	3.000	3.0	3.0
KS	3	4.000	2.0000	1.1547	-.968	8.968	2.0	6.0
KP	3	4.333	.5774	.3333	2.899	5.768	4.0	5.0
P1	3	3.000	1.0000	.5774	.516	5.484	2.0	4.0
P2	3	3.667	.5774	.3333	2.232	5.101	3.0	4.0
P3	3	4.333	1.1547	.6667	1.465	7.202	3.0	5.0
Total	18	3.722	1.0741	.2532	3.188	4.256	2.0	6.0

Test of Homogeneity of Variances

perubahan berat badan

Levene Statistic	df1	df2	Sig.
1.961	5	12	.157

ANOVA

perubahan berat badan

	Sum of Squares	df	Mean Square	F	Sig.

Between Groups	5.611	5	1.122	.962	.478
Within Groups	14.000	12	1.167		
Total	19.611	17			

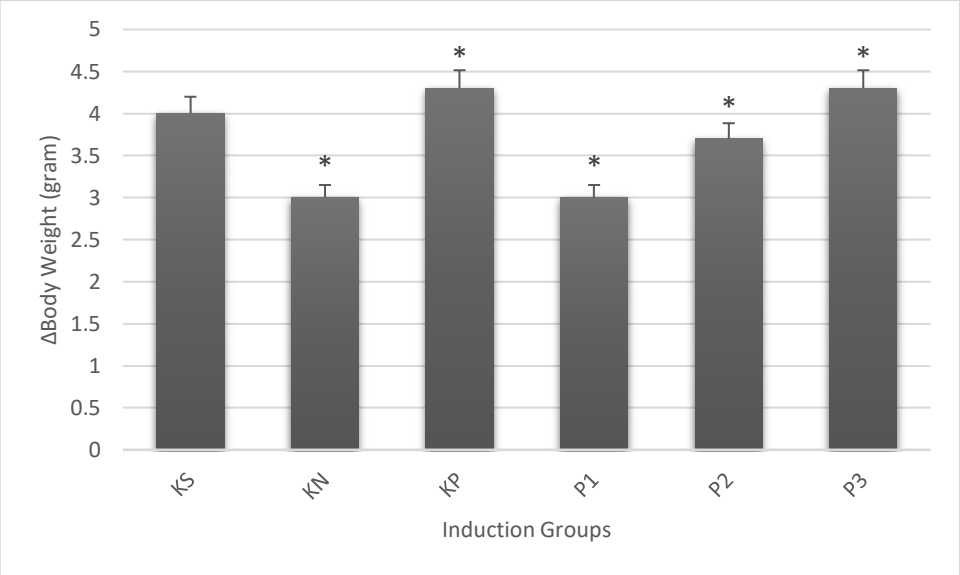
Post Hoc Tests

Multiple Comparisons

Dependent Variable: perubahan berat badan

LSD

(I) perlakuan	(J) perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
	KS	-1.0000	.8819	.279	-2.922	.922
	KP	-1.3333	.8819	.156	-3.255	.588
KN	P1	.0000	.8819	1.000	-1.922	1.922
	P2	-.6667	.8819	.464	-2.588	1.255
	P3	-1.3333	.8819	.156	-3.255	.588
	KN	1.0000	.8819	.279	-.922	2.922
	KP	-.3333	.8819	.712	-2.255	1.588
KS	P1	1.0000	.8819	.279	-.922	2.922
	P2	.3333	.8819	.712	-1.588	2.255
	P3	-.3333	.8819	.712	-2.255	1.588
	KN	1.3333	.8819	.156	-.588	3.255
	KS	.3333	.8819	.712	-1.588	2.255
KP	P1	1.3333	.8819	.156	-.588	3.255
	P2	.6667	.8819	.464	-1.255	2.588
	P3	.0000	.8819	1.000	-1.922	1.922
	KN	.0000	.8819	1.000	-1.922	1.922
	KS	-1.0000	.8819	.279	-2.922	.922
P1	KP	-1.3333	.8819	.156	-3.255	.588
	P2	-.6667	.8819	.464	-2.588	1.255
	P3	-1.3333	.8819	.156	-3.255	.588
	KN	.6667	.8819	.464	-1.255	2.588
	KS	-.3333	.8819	.712	-2.255	1.588
P2	KP	-.6667	.8819	.464	-2.588	1.255
	P1	.6667	.8819	.464	-1.255	2.588
	P3	-.6667	.8819	.464	-2.588	1.255
	KN	1.3333	.8819	.156	-.588	3.255
	KS	.3333	.8819	.712	-1.588	2.255
P3	KP	.0000	.8819	1.000	-1.922	1.922
	P1	1.3333	.8819	.156	-.588	3.255
	P2	.6667	.8819	.464	-1.255	2.588



Data Statistik ALP

UJI ANOVA

```
ONEWAY ALP Levels BY Treatment
  /STATISTICS DESCRIPTIVES HOMOGENEITY
  /PLOT MEANS
  /MISSING ANALYSIS
  /POSTHOC=TUKEY ALPHA(0.05).
```

Oneway

[DataSet0]

Descriptives

ALP Levels (U/L)

	N	Mean	Std. Deviation	Std. Error	Minimum	Maximum
KS	3	35.1950	26.77122	15.45637	6.60	59.67
KN	3	-3.3920	34.06803	19.66919	-39.76	27.77
KP	3	-21.4060	14.75012	8.51598	-32.65	-4.71
P1	3	-12.5607	18.47404	10.66599	-30.77	6.17
P2	3	-66.9190	7.38647	4.26458	-74.70	-60.01
P3	3	-35.2783	16.02720	9.25331	-48.04	-17.29
Total	18	-17.3935	36.63517	8.63499	-74.70	59.67

Test of Homogeneity of Variances

ALP Levels (U/L)

Levene Statistic	df1	df2	Sig.
1.244	5	12	.348

ANOVA

ALP Levels (U/L)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17321.074	5	3464.215	7.565	.002
Within Groups	5495.232	12	457.936		
Total	22816.305	17			

Post Hoc Tests

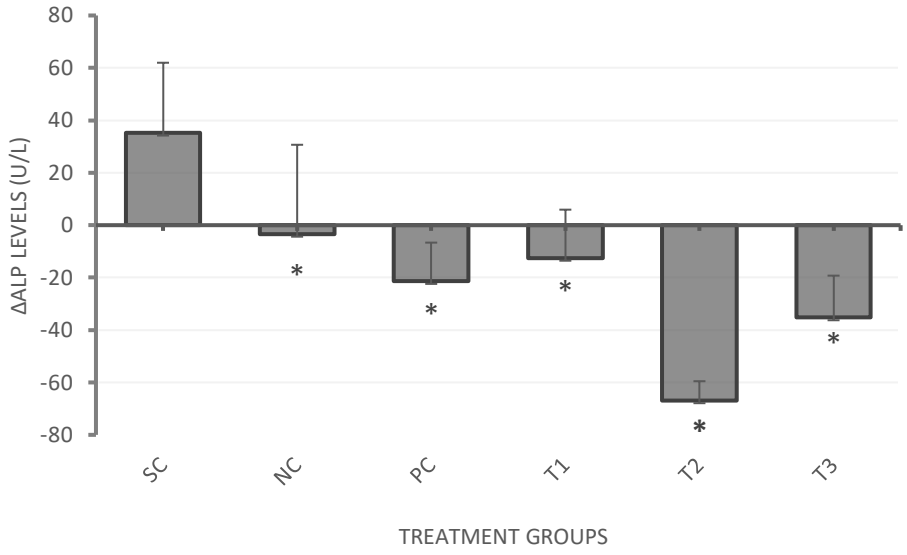
Multiple Comparisons

Dependent Variable: ALP Levels (U/L)

LSD

(I) Perlakuan	(J) Perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
KS	KN	38.58700*	17.47257	.047	.5175	76.6565
	KP	56.60100*	17.47257	.007	18.5315	94.6705
	P1	47.75567*	17.47257	.018	9.6862	85.8251
	P2	102.11400*	17.47257	.000	64.0445	140.1835
	P3	70.47333*	17.47257	.002	32.4039	108.5428
KN	KS	-38.58700*	17.47257	.047	-76.6565	-.5175
	KP	18.01400	17.47257	.323	-20.0555	56.0835
	P1	9.16867	17.47257	.609	-28.9008	47.2381
	P2	63.52700*	17.47257	.003	25.4575	101.5965
	P3	31.88633	17.47257	.093	-6.1831	69.9558
KP	KS	-56.60100*	17.47257	.007	-94.6705	-18.5315
	KN	-18.01400	17.47257	.323	-56.0835	20.0555
	P1	-8.84533	17.47257	.622	-46.9148	29.2241
	P2	45.51300*	17.47257	.023	7.4435	83.5825
	P3	13.87233	17.47257	.443	-24.1971	51.9418
P1	KS	-47.75567*	17.47257	.018	-85.8251	-9.6862
	KN	-9.16867	17.47257	.609	-47.2381	28.9008
	KP	8.84533	17.47257	.622	-29.2241	46.9148
	P2	54.35833*	17.47257	.009	16.2889	92.4278
	P3	22.71767	17.47257	.218	-15.3518	60.7871
P2	KS	-102.11400*	17.47257	.000	-140.1835	-64.0445
	KN	-63.52700*	17.47257	.003	-101.5965	-25.4575
	KP	-45.51300*	17.47257	.023	-83.5825	-7.4435
	P1	-54.35833*	17.47257	.009	-92.4278	-16.2889
	P3	-31.64067	17.47257	.095	-69.7101	6.4288
P3	KS	-70.47333*	17.47257	.002	-108.5428	-32.4039
	KN	-31.88633	17.47257	.093	-69.9558	6.1831
	KP	-13.87233	17.47257	.443	-51.9418	24.1971
	P1	-22.71767	17.47257	.218	-60.7871	15.3518
	P2	31.64067	17.47257	.095	-6.4288	69.7101

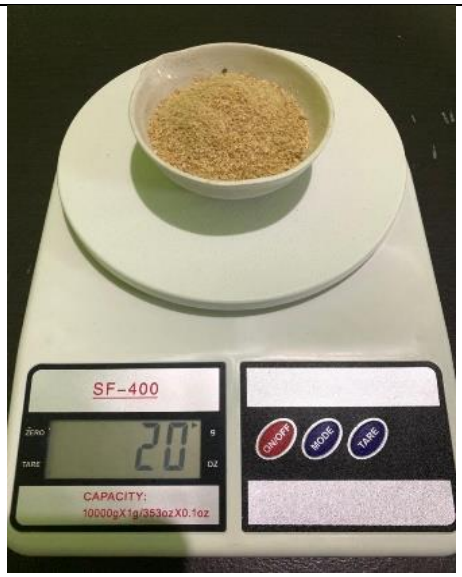
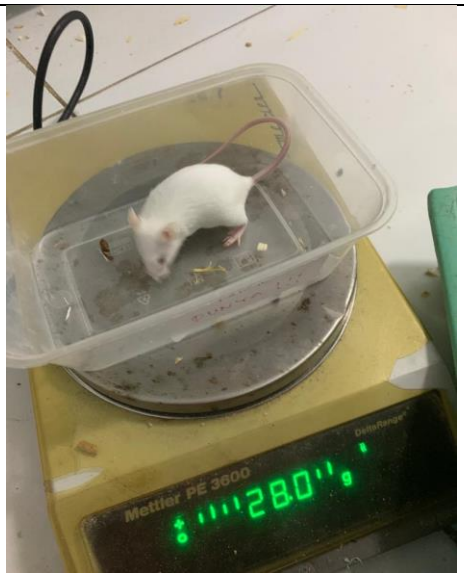
*. The mean difference is significant at the 0.05 level.

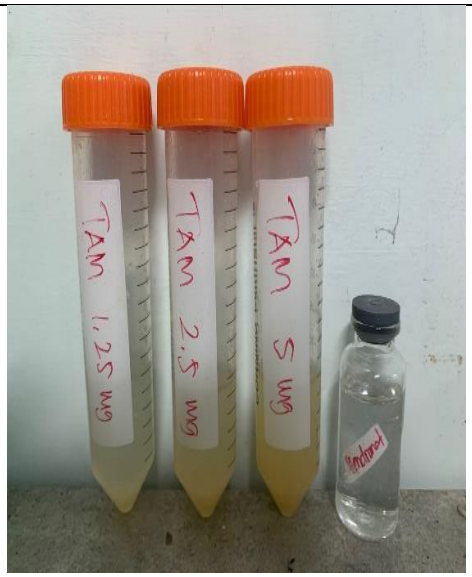


Dokumentasi Penelitian

Alga merah (*E. spinosum*)

Proses ekstraksi alga (lar. ethanol 96%)

 Hasil ekstrak pekat ethanol alga	 Tepung alga merah
 Aklimatisasi hewan coba	 Pemberian oral
 Pengukuran BB mencit	 Sampling darah mencit

 Bisfosfonat (alendronate)	 Sediaan uji intervensi
 Sacrifice mencit	 Sampel tulang mencit

BIODATA PENULIS

Jusniar Patandung. Lahir di Palopo, 16 Maret 1998. Penulis lahir dari pasangan Bapak Samaruddin dan Ibu Intan yang merupakan anak sulung dari tiga bersaudara yakni Lismawati Patandung.,S.Si, dan (alm) Jusman Patandung.

Penulis pertama kali masuk pendidikan formal di SDI Kakullasan, Kec. Tommo, Kab. Mamuju, Prov. Sulbar pada tahun 2004 dan tamat 2010 pada tahun yang sama, penulis melanjutkan pendidikan ke SMPN 1 Lore Timur Kab.Poso, Prov. Sulteng, dan tamat pada tahun 2013.

Setelah tamat SMP, penulis melanjutkan ke SMK Analis Mandala Bakti Kota Palopo, Prov. Sulsel dan tamat 2016 pada tahun yang sama, penulis terdaftar sebagai mahasiswa di Universitas Megarezky Makassar, Fakultas Teknologi Kesehatan tamat pada tahun 2020.

Pada tahun 2022, penulis terdaftar sebagai mahasiswa baru di Universitas Hasanuddin, Program Studi Magister Ilmu Biomedik, Konsentrasi Biokimia dan Biologi Molekuler.

Dengan ketekunan, motivasi tinggi untuk terus belajar, berusaha, dan berdoa. Penulis telah berhasil menyelesaikan pengerjaan tugas akhir tesis ini. Semoga dengan penulisan tugas akhir ini, mampu memberikan kontribusi positif bagi penulis, dan pembaca didunia pendidikan.

Akhir kata, penulis mengucapkan rasa syukur yang sebesar-besarnya atas terselesaikannya tesis yang berjudul ***"Pengaruh pemberian tepung alga merah (Eucheuma spinosum) terhadap kadar alkali fosfatase, foto X-ray serta gambaran histologi tulang mencit osteoporosis".***