LAMPIRAN

Lampiran 1. Determinasi Tanaman

HERBARIUM UNIVERSITAS ANDALAS (ANDA)
Departemen Biologi FMIPA Universitas Andalas Kampus Limau Manih Padang
Sumbar Indonesia 25163 Telp. +62-751-777427 e-mail: herbariumanda@yahoo.com

HASIL IDENTIFKASI

Nama : Ghalib Syukrillah Syahputra., M. Farm
Instansi : Institut Kesehatan Mitra Bunda

No	Family	Spesies	Nama Koleksi
1.	Moraceae	*Artocarpus altilis* (Parkinson) Fosberg	IKMB. 22.5. Tanaman Sukun
2.	Asteraceae	*Pluchea indica* (L.) Less.	IKMB. 22.6. Tanaman Beluntas
3.	Amaryllidaceae	*Crinum asiaticum* L.	IKMB. 22.15. Tanaman Bakung
4.	Pandanaceae	*Pandanus odorifer* (Forssk.) Kuntze	IKMB. 22.24. Tanaman Pandan Laut
5.	Bonnetiaceae	*Ploiarium elegans* Korth.	IKMB. 22.27. Tanaman Beriang
6.	Acanthaceae	*Ruellia simplex* C.Wright	IKMB. 22.42. Tanaman Kencana Ungu
7.	Asteraceae	*Gynura procumbens* (Lour.) Merr.	IKMB. 22.51. Tanaman Sambung Nyawa

Padang, 30 Januari 2026
Kepala,

Dr. Nurainas
NIP. 196908141995122001

HERBARIUM UNIVERSITAS ANDALAS (ANDA)
Departemen Biologi FMIPA Universitas Andalas Kampus Limau Manih Padang
Sumbar Indonesia 25163 Telp. +62-751-777427 e-mail: herbariumanda@yahoo.com

Nomor : 069/K-ID/ANDA/I/2026
Lampiran : -
Perihal : Hasil Identifikasi

Kepada yth,
Ghalib Syukrillah Syahputra., M. Farm
Di
Tempat

Dengan hormat,
Sehubungan dengan surat permohonan determinasi sampel dari Institut Kesehatan Mitra Bunda No. 020/K/S1-Farm/IKMB/I/2026 tanggal 20 Januari 2026 di Herbarium Universitas Andalas Departemen Biologi FMIPA Universitas Andalas, kami telah membantu mengidentifikasi tumbuhan yang dibawa, dari:

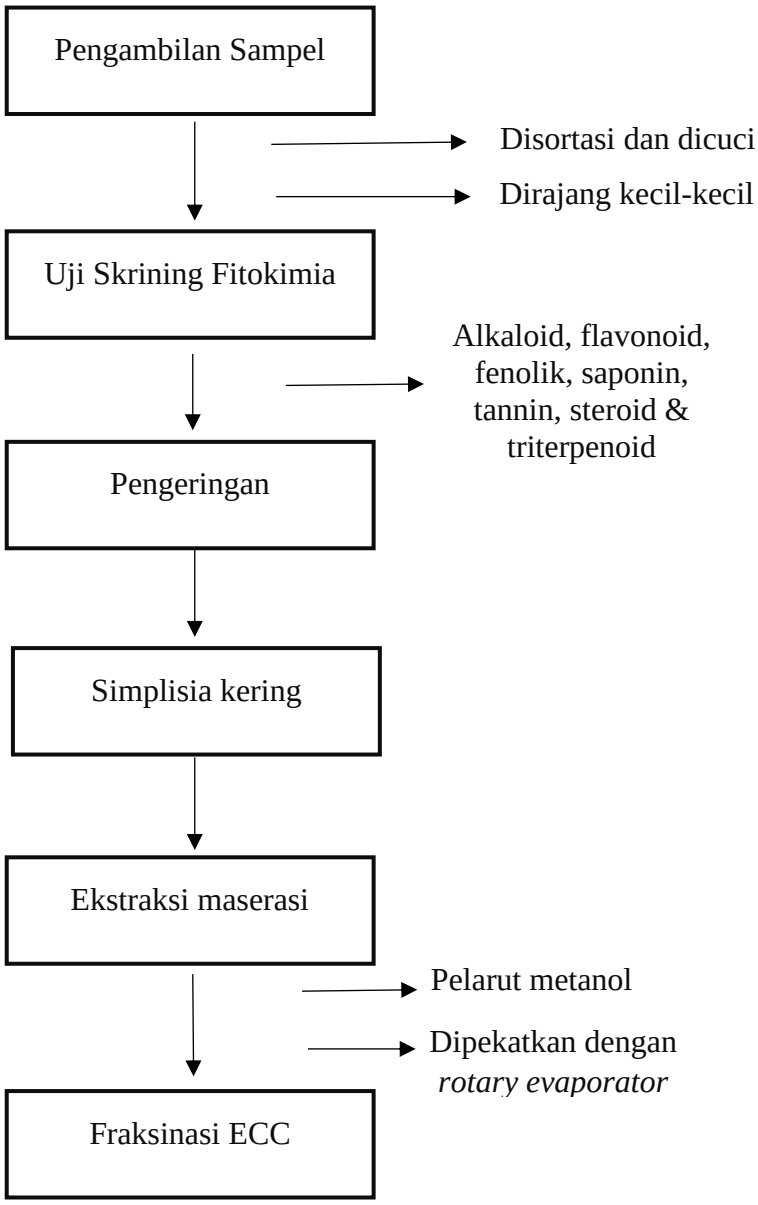
Nama : Ghalib Syukrillah Syahputra., M. Farm
Instansi : Institut Kesehatan Mitra Bunda

Berikut ini diberikan hasil identifikasi yang dikeluarkan dari Herbarium Universitas Andalas.
Demikian surat ini dibuat untuk dapat digunakan seperlunya.

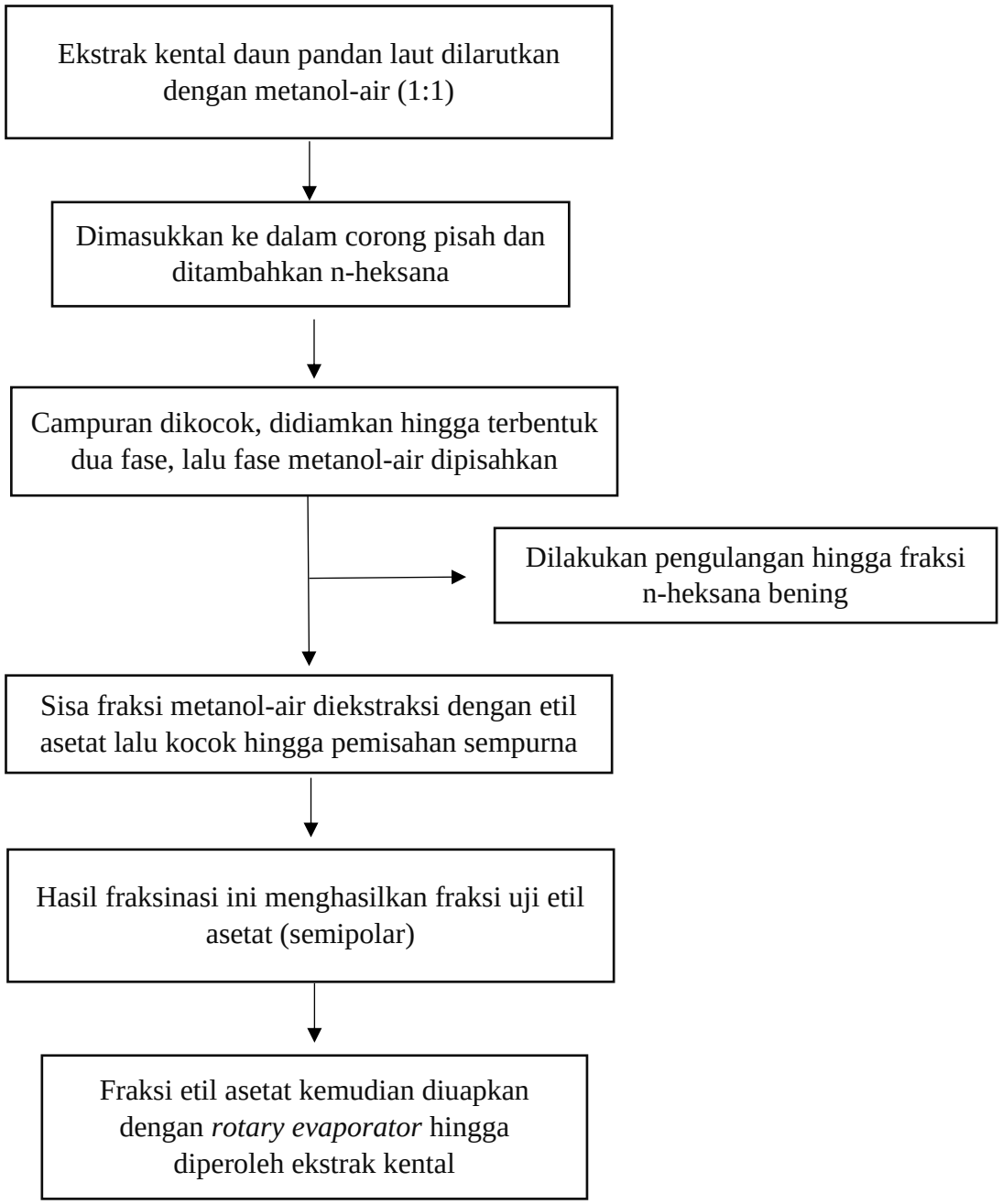
Padang, 30 Januari 2026
Kepala,

Dr. Nurainas
NIP. 196908141995122001

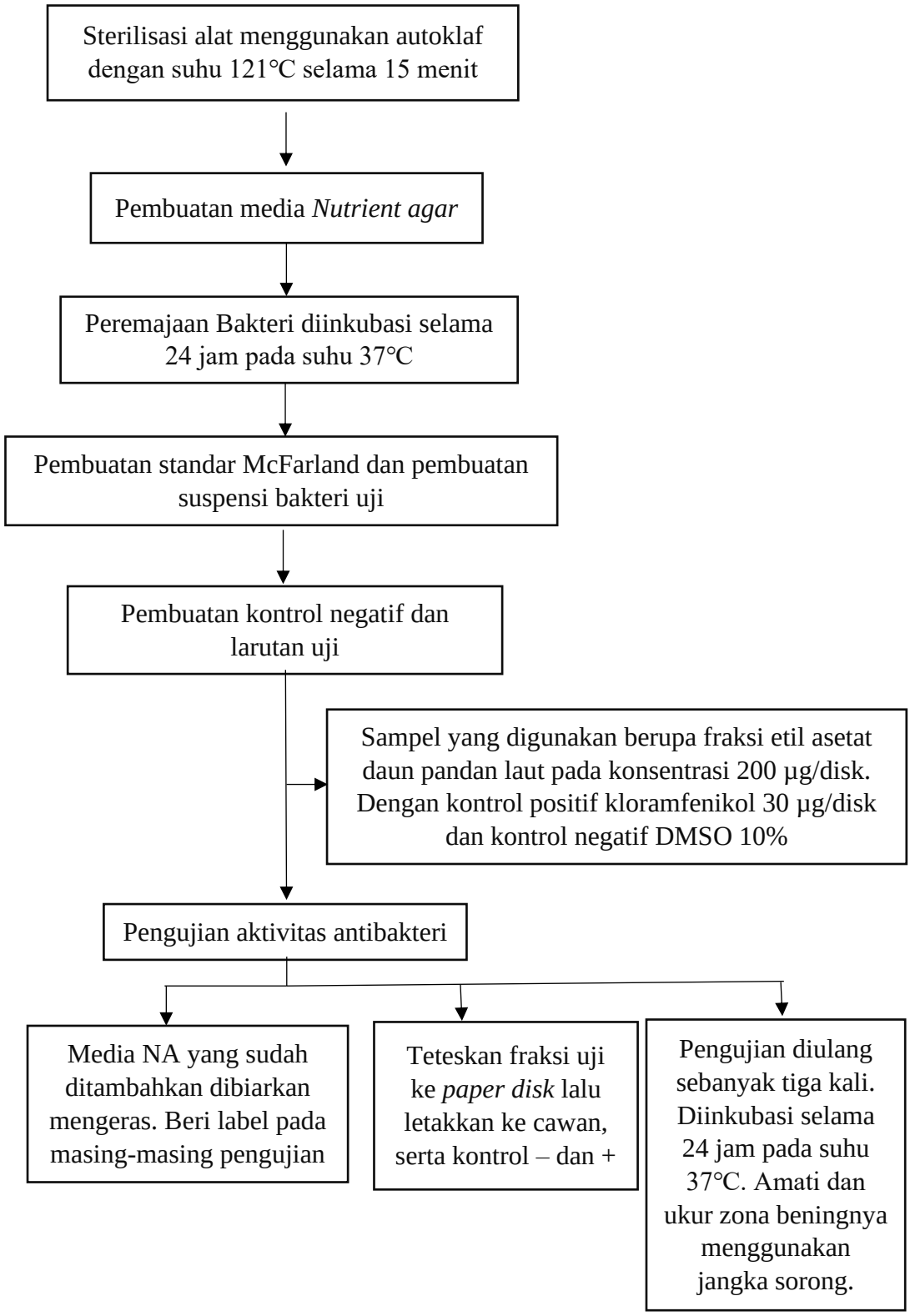
Lampiran 2. Proses Pembuatan Ekstrak Daun Pandan Laut



Lampiran 3. Proses Fraksinasi Daun Pandan Laut



Lampiran 4. Uji Antibakteri Fraksi Ekstrak Daun Pandan Laut



Lampiran 5. Perhitungan Konsentrasi Fraksi



Pembuatan konsentrasi 200 µg/disk:

1 mg = 1.000 µg

1 mL = 1.000 µL

1 disk = 10 µL

200 µg/disk = 20 mg/mL (dikonversikan)

20 mg/mL = $\frac{20.000\ \mu g}{1.000\ \mu L}$

Maka, $\frac{20.000\ \mu g}{1.000\ \mu L}$: 100 = $\frac{200\ \mu g}{10\ \mu L}$

Maka, timbang 20 mg ekstrak fraksi daun pandan laut dan larutkan dalam 1 mL DMSO 10%.

Ekstrak diambil sebanyak 10 µL (perdisk = 200 µg/disk).

Lampiran 6. Perhitungan Rendemen Ekstraksi Daun Pandan Laut

Berat sampel awal daun Pandan Laut: 5 kg (5.000g)

Berat simplisia kering: 500g

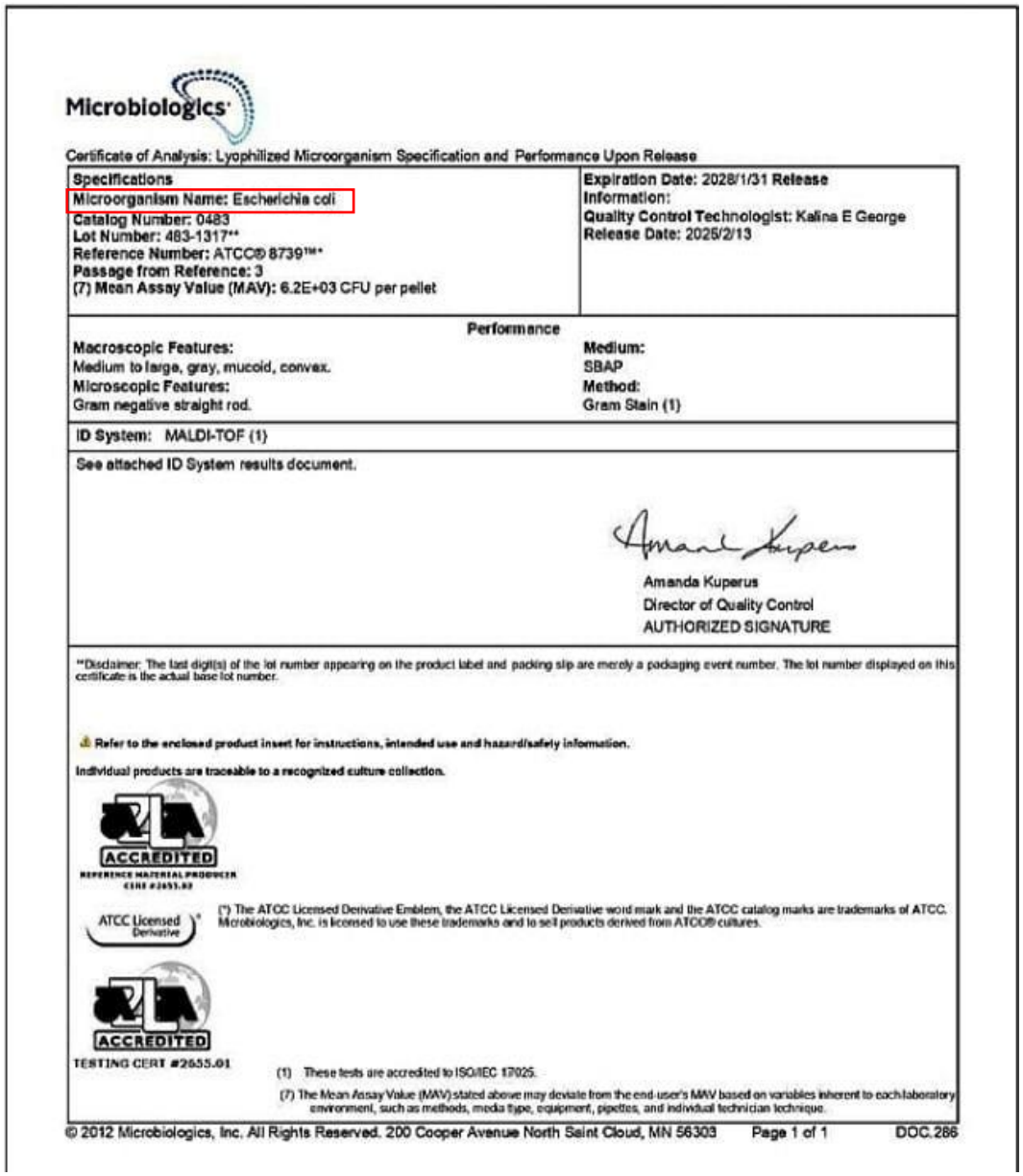
Berat ekstrak kental: 54g

$$\%\text{Rendemen} = \frac{\text{Bobot ekstrak yang diperoleh}}{\text{Bobot simplisia}} \times 100\%$$

$$= \frac{54g}{500g} \times 100\%$$

$$= 10{,}8\%$$

Lampiran 7. Sertifikat Bakteri *Escherichia coli*



Microbiologics

Certificate of Analysis: Lyophilized Microorganism Specification and Performance Upon Release

Specifications	Expiration Date: 2028/1/31 Release Information:
Microorganism Name: Escherichia coli Catalog Number: 0483 Lot Number: 483-1317** Reference Number: ATCC® 8739™* Passage from Reference: 3 (7) Mean Assay Value (MAV): 6.2E+03 CFU per pellet	Quality Control Technologist: Kalina E George Release Date: 2025/2/13

Performance

Macroscopic Features:	Medium:
Medium to large, gray, mucoid, convex.	SBAP
Microscopic Features:	**Method:**
Gram negative straight rod.	Gram Stain (1)

ID System: MALDI-TOF (1)

See attached ID System results document.

Amanda Kuperus
Director of Quality Control
AUTHORIZED SIGNATURE

**Disclaimer: The last digit(s) of the lot number appearing on the product label and packing slip are merely a packaging event number. The lot number displayed on this certificate is the actual base lot number.

⚠ Refer to the enclosed product insert for instructions, intended use and hazard/safety information.

Individual products are traceable to a recognized culture collection.

ACCREDITED
REFERENCE MATERIAL PRODUCER
CERT #2655.02

ATCC Licensed Derivative

(*) The ATCC Licensed Derivative Emblem, the ATCC Licensed Derivative word mark and the ATCC catalog marks are trademarks of ATCC. Microbiologics, Inc. is licensed to use these trademarks and to sell products derived from ATCC® cultures.

ACCREDITED
TESTING CERT #2655.01

(1) These tests are accredited to ISO/IEC 17025.

(7) The Mean Assay Value (MAV) stated above may deviate from the end-user's MAV based on variables inherent to each laboratory environment, such as methods, media type, equipment, pipettes, and individual technician technique.

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Lampiran 8. Sertifikat Bakteri *Staphylococcus aureus*

ThermoFisher SCIENTIFIC
The world leader in serving science

Thermo Fisher Scientific
Microbiology
12076 Santa Fe Trail Drive
Lenexa, KS 66215
800.255.6730
800.447.5761 fax
www.thermofisher.com

thermoscientific

Certificate of Analysis - Certified Reference Material

Thermo Scientific™ Trademark™	
Product Number	**R4607010**
Product Name	**S. aureus ATCC 25923 PK/5**
Lot Number	**162589**
Usage Decision	**Accepted (OK)**
Expiration Date	**2026-02-25**

This product has been manufactured, processed and packaged in accordance with Quality Systems Regulation, 21 CFR Part 820.
The results were derived from a representative sample of the batch and were obtained at the time of release.
Refer to the enclosed product insert for instructions, intended use, hazard/safety requirements, and storage conditions.

Product Char	Results
Purity	Demonstrates pure growth on applicable media
Viability	Recovered at acceptable level within test period
Passage	3 (Current preserved state)

Microbiological testing	Results	Specification
>85% Identification on Vitek 2C GP	99	85 - 100
>95% Identification on MicroSEQ		95 - 100
Microscopic Features	Pass	

These tests are performed in accordance with ISO 17025 guidelines.
Thermo Fisher Scientific has determined each loop of this reference material to be sufficiently homogeneous for its intended use.
Individual products are traceable to a recognized culture collection.
Although the Vitek(TM) panel uses many conventional tests, the unique environment of the card, combined with the short incubation period, may produce results that differ from published results obtained by other methods

Lampiran 9. Sertifikat *Chloramphenicol*

ThermoFisher SCIENTIFIC

OXOID

Page 1 of 1

CERTIFICATE OF ANALYSIS

PRODUCT **CT0013B**
C30 CHLORAMPHENICOL

LOT NUMBER 6248346

EXPIRY DATE 2028.04.02

DATE OF MANUFACTURE 2025.04.03

Delivery/Customer information
Date Printed
2025.04.17
Delivery No.

Customer
Customer Order Number

Microbiological Performance

Assay (mcg/disc) 32.5

Tested in accordance with current CLSI methodology

	Zone Size (mm)	Limits (mm)
Staphylococcus aureus ATCC®25923	21	19 - 26
Escherichia coli ATCC®25922	23	21 - 27
Haemophilus influenzae ATCC®49247	33	31 - 40
Streptococcus pneumoniae ATCC®49619	27	23 - 27

Tested in accordance with current EUCAST methodology

Escherichia coli ATCC®25922	23	21 - 27
Staphylococcus aureus ATCC®29213	22	20 - 28
Streptococcus pneumoniae ATCC®49619	29	24 - 30

The above have been tested in our Product Performance Laboratory using conventional procedures and control ATCC and NCTC cultures, where appropriate, and have met the specified test parameters. Additional challenging strains may also be employed.

The accuracy of the information provided in this certificate of analysis / conformity is considered reliable. However, it is important to note that (i) the information is only applicable, and (ii) the product is only approved, for the product's intended use as specified on the label, specification, and website. No warranty is hereby implied. This certificate may only be reproduced in its entirety and cannot be replicated partially or in any altered form.

Lot Accepted. 2025.04.17

This certificate is produced electronically and valid without a signature.

ATCC is a registered trade mark of the American Type Culture Collection.
NCTC and National Collection of Type Cultures are registered trade marks of the Health Protection Agency.

OXOID LIMITED
Wade Road, Basingstoke, Hampshire RG24 8PW. England
www.ThermoFisher.com

Lampiran 10. COA n-heksana

AIK MOH
A BRENNTAG GROUP COMPANY

PT. AIK MOH CHEMICALS INDONESIA
Komplex Bintang Makmur Industri Block FG No. 8-9
Batam Centre, Indonesia
Tel: (+62) 778 7431208 / 7431209
Fax: (+62) 778 7431211
Email: contact_us@aikmoh.com.sg

Certificate Of Analysis

CAS :110-54-3
Batch No. :2601T022
Date Of Manufacture :13-Jan-2026
Date Of Expiry :13-Jul-2027
Ref No. :AMCOA/093287/0126

Hexane

Properties	Specification	Result
APPEARANCE	Clear Colourless Liquid	Clear Colourless Liquid
AROMATICS CONTENT	Max. 20 WT PPM	<10 WT PPM
COLOUR (SAYBOLT)	Min. +30	+30
DISTILLATION RANGE @ 760MMHG - DP	Max. 75 °C	68 °C
DISTILLATION RANGE @ 760MMHG - IBP	Min. 60 °C	64.9 °C
N-HEXANE	Min. 40 WT%	52 WT%
SPECIFIC GRAVITY @ 15 °C	0.660 - 0.686	0.6717



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COA Created Date: 14-Jan-2026

File Generated By: Martines Emili
File Generated On: 05-May-2026

Lampiran 11. COA Etil Asetat

AIK MOH
A BRENNTAG GROUP COMPANY

PT. AIK MOH CHEMICALS INDONESIA
Komplex Bintang Makmur Industri Block FG No. 8-9
Batam Centre, Indonesia
Tel: (+62) 778 7431208 / 7431209
Fax: (+62) 778 7431211
Email: contact_us@aikmoh.com.sg

Certificate Of Analysis

CAS :141-78-6
Batch No. :26022702
Date Of Manufacture :27-Feb-2026
Date Of Expiry :26-Feb-2028
Ref No. :AMCOA/094166/0326

Ethyl Acetate

Properties	Specification	Result
ACIDITY (AS ACETIC ACID)	Max. 0.005 % WT	0.002 % WT
APPEARANCE	CLEAN, CLEAR & COLOURLESS	CLEAN, CLEAR & COLOURLESS
COLOUR	Max. 10 Hazen	5 Hazen
ODOUR	Characteristic	Characteristic
PURITY	Min. 99.5 %	99.95 %
SPECIFIC GRAVITY @ 20 °C	0.897 - 0.903	0.9022
WATER CONTENT	Max. 0.15 % WT	<0.01 % WT

REMARK: * Whenever Purity is given, Distillation Range may not be available & vice versa.



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COA Created Date: 03-Mar-2026

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File Generated On: 18-Jun-2026

Lampiran 12. COA metanol

AIK MOH
A BRENNTAG GROUP COMPANY

PT. AIK MOH CHEMICALS INDONESIA
Komplex Bintang Makmur Industri Block FG No. 8-9
Batam Centre, Indonesia
Tel: (+62) 778 7431208 / 7431209
Fax: (+62) 778 7431211
Email: contact_us@aikmoh.com.sg

Certificate Of Analysis

CAS :67-56-1
Batch No. :2511T033
Date Of Manufacture :14-Nov-2025
Date Of Expiry :14-May-2027
Ref No. :AMCOA/092242/1125

Methanol

Properties	Specification	Result
ACIDITY (AS ACETIC ACID)	Max. 0.003 WT%	0.002 WT%
APPEARANCE	Clear Free From Suspended Matter	Clear Free From Suspended Matter
COLOUR, PT-CO SCALE	Max. 5	5
DISTILLATION RANGE @ 760MMHG - DP	63.5 - 65.7 °C	64.8 °C
DISTILLATION RANGE @ 760MMHG - IBP	63.5 - 65.7 °C	64.5 °C
NON-VOLATILE MATTER	Max. 10 ppm	4 ppm
PERMANGANATE TIME	Min. 50 mins	>50 mins
PURITY	Min. 99.85 WT%	99.99 WT%
SPECIFIC GRAVITY @ 20 °C	0.7910 – 0.7930	0.7925
WATER	Max. 0.10 WT%	0.004 WT%

REMARK: Distillation range IBP & DP will be within 1.0degC
range to include 64.6 +/- 0.1
Whenever Purity is given, Distillation Range will not be given & vice versa



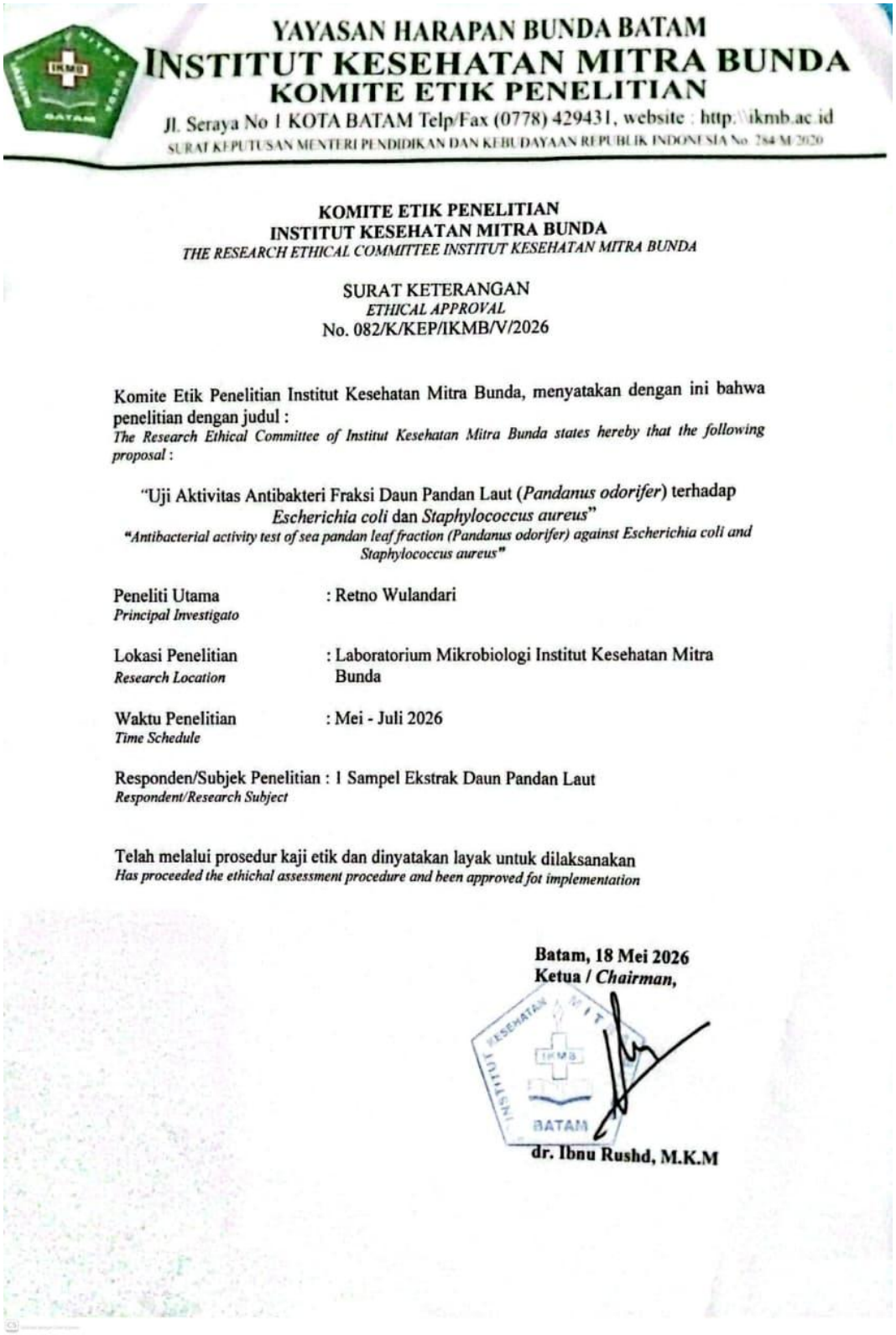
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COA Created Date: 17-Nov-2025

File Generated By: Martines Emili
File Generated On: 05-May-2026

Lampiran 13. *Ethical Clearance*



YAYASAN HARAPAN BUNDA BATAM
INSTITUT KESEHATAN MITRA BUNDA
KOMITE ETIK PENELITIAN
Jl. Seraya No 1 KOTA BATAM Telp/Fax (0778) 429431, website : http.\\ikmb.ac.id
SURAT KEPUTUSAN MENTERI PENDIDIKAN DAN KEBUDAYAAN REPUBLIK INDONESIA No. 284/M/2020

KOMITE ETIK PENELITIAN
INSTITUT KESEHATAN MITRA BUNDA
THE RESEARCH ETHICAL COMMITTEE INSTITUT KESEHATAN MITRA BUNDA

SURAT KETERANGAN
ETHICAL APPROVAL
No. 082/K/KEP/IKMB/V/2026

Komite Etik Penelitian Institut Kesehatan Mitra Bunda, menyatakan dengan ini bahwa penelitian dengan judul :
The Research Ethical Committee of Institut Kesehatan Mitra Bunda states hereby that the following proposal :

"Uji Aktivitas Antibakteri Fraksi Daun Pandan Laut (*Pandanus odorifer*) terhadap *Escherichia coli* dan *Staphylococcus aureus*"
"Antibacterial activity test of sea pandan leaf fraction (Pandanus odorifer) against Escherichia coli and Staphylococcus aureus"

Peneliti Utama : Retno Wulandari
Principal Investigato

Lokasi Penelitian : Laboratorium Mikrobiologi Institut Kesehatan Mitra Bunda
Research Location

Waktu Penelitian : Mei - Juli 2026
Time Schedule

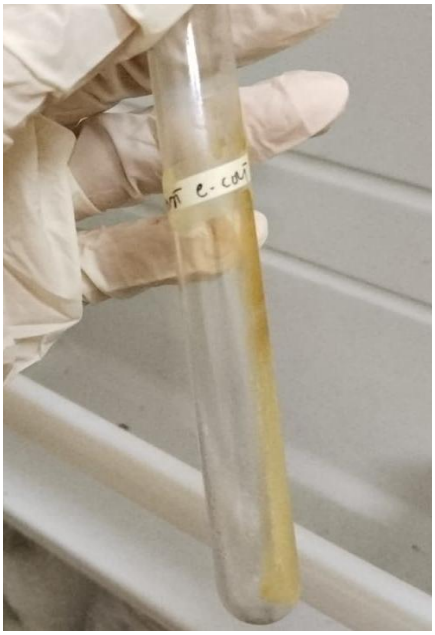
Responden/Subjek Penelitian : 1 Sampel Ekstrak Daun Pandan Laut
Respondent/Research Subject

Telah melalui prosedur kaji etik dan dinyatakan layak untuk dilaksanakan
Has proceeded the ethichal assessment procedure and been approved fot implementation

Batam, 18 Mei 2026
Ketua / *Chairman*,

dr. Ibnu Rushd, M.K.M

Lampiran 14. Proses Peremajaan Bakteri

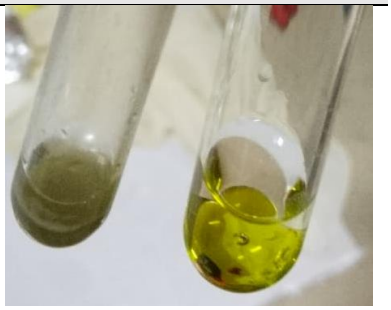
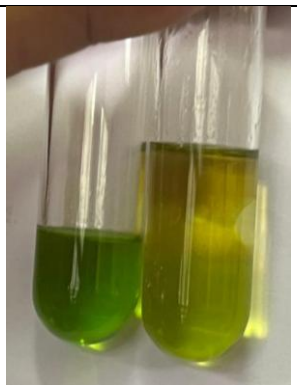
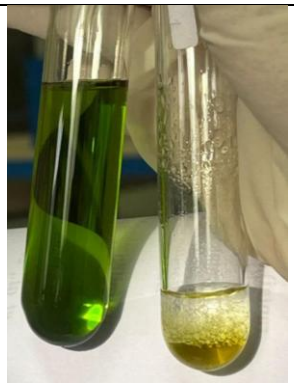


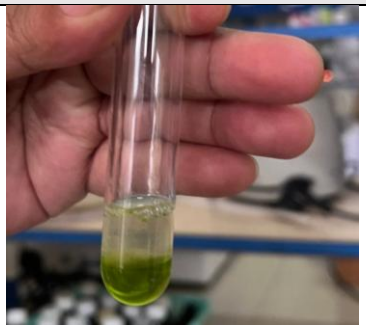
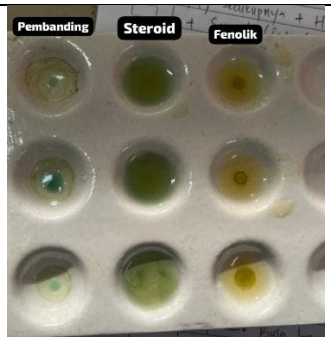
Bakteri *Escherichia coli*



Bakteri *Staphylococcus aureus*

Lampiran 15. Uji Skrining Fitokimia

No	Golongan Senyawa	Hasil	Ket	Gambar
1.	Alkaloid	Tidak ada reaksi endapan jingga/putih	-	
2.	Flavonoid	Terbentuk lapisan warna kuning, oren atau merah	+	
3.	Fenolik	Perubahan warna biru tua/hijau kehitaman	+	
4.	Saponin	Busa Stabil	+	

No	Golongan Senyawa	Hasil	Ket	Gambar
5.	Tanin	Tidak terjadi denaturasi protein	-	
6.	Steroid & Triterpenoid	Perubahan warna ungu-biru	+	

Lampiran 16. Proses Kegiatan



Pengambilan sampel



Penimbangan serbuk daun segar untuk uji skrining fitokimia



Pengeringan daun pandan laut



Proses maserasi sampel



Rotary evaporator maserat yang diperoleh



Fraksinasi



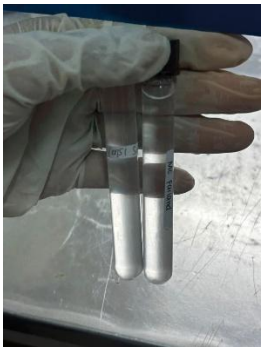
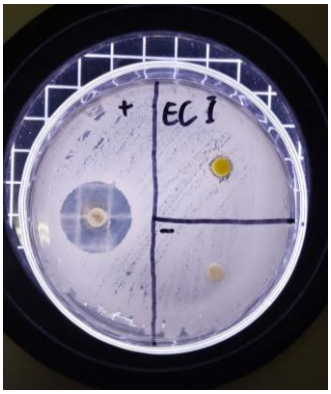
Autoklaf



Hasil sterilisasi alat



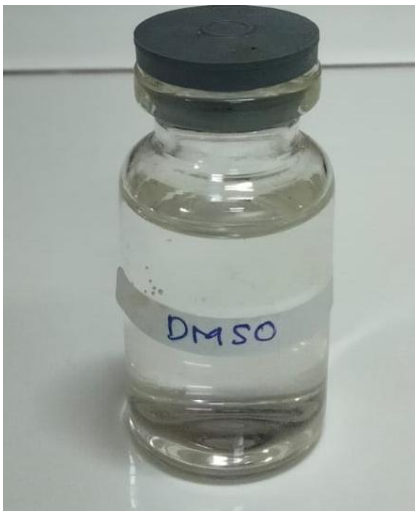
Sterilisasi media NA

		
Pembandingan Mc farland dengan suspensi bakteri	Proses pengambilan larutan uji	Hasil uji antibakteri

Lampiran 17. Kontrol positif dan Kontrol negatif



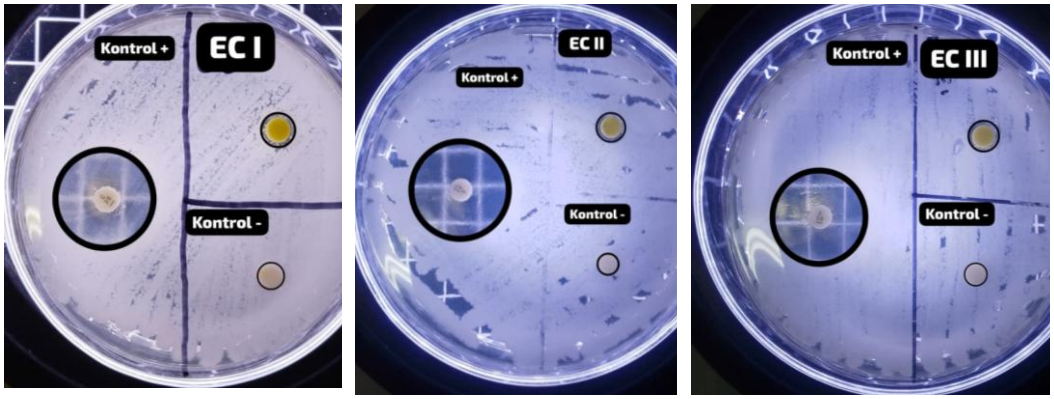
Kontrol positif (Kloramfenikol 30 µg/disk)



Kontrol negatif (DMSO 10%)

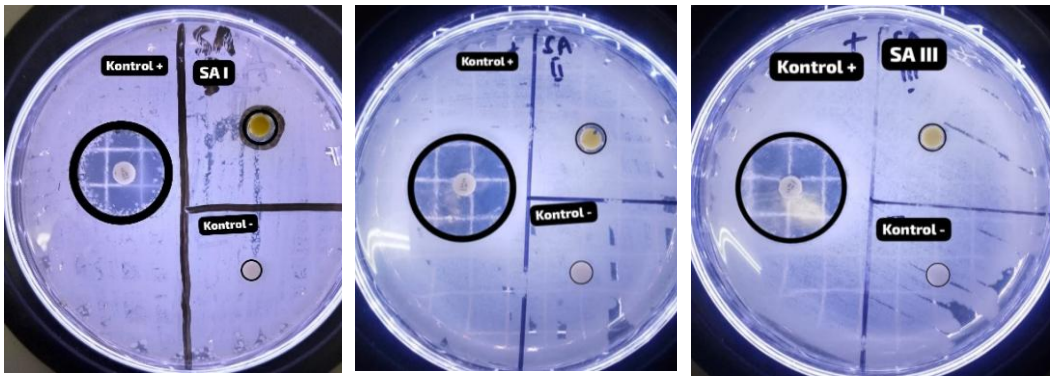
Lampiran 18. Hasil Pengujian Aktivitas Antibakteri

Hasil Uji Aktivitas Antibakteri terhadap *Escherichia coli*



Replikasi 1 Replikasi 2 Replikasi 3

Hasil Uji Aktivitas Antibakteri terhadap *Staphylococcus aureus*



Replikasi 1 Replikasi 2 Replikasi 3

Lampiran 19. Analisis Data *E. coli* dan *S. aureus*

1. Uji Normalitas (*Shapiro-Wilk*)

Tests of Normality

Bakteri		Perlakuan	Kolmogorov-Smirnov[a] Statistic	df	Sig.	Shapiro-Wilk Statistic	df	Sig.
Escherichia coli	Daya_Hambat_mm	Fraksi e	.328	3	.	.871	3	.298
		Negatif	.	3	.	.	3	.
		Positif	.323	3	.	.879	3	.321
Staphylococcus aureus	Daya_Hambat_mm	Fraksi e	.227	3	.	.983	3	.747
		Negatif	.	3	.	.	3	.
		Positif	.334	3	.	.860	3	.266

a. Lilliefors Significance Correction

- Hipotesis nol (H_0) = Data terdistribusi normal (*p* atau *sig.* >0,05)
- Hipotesis alternatif (H_a) = Data tidak terdistribusi normal (*p* atau *sig.* < 0,05)
- Data yang diperoleh pada kedua bakteri uji memiliki nilai signifikan >0,05, sehingga H_a ditolak, artinya data yang didapatkan terdistribusi normal

2. Uji Homogenitas (*Levene's Test*)

Tests of Homogeneity of Variances

Bakteri			Levene Statistic	df1	df2	Sig.
Escherichia coli	Daya_Hambat_mm	Based on Mean	11.353	2	6	.009
		Based on Median	1.596	2	6	.278
		Based on Median and with adjusted df	1.596	2	2.048	.382
		Based on trimmed mean	9.855	2	6	.013
Staphylococcus aureus	Daya_Hambat_mm	Based on Mean	6.059	2	6	.036
		Based on Median	1.044	2	6	.408
		Based on Median and with adjusted df	1.044	2	2.763	.460
		Based on trimmed mean	5.404	2	6	.045

- Hipotesis nol (H_0) = Data varians antar kelompok perlakuan homogen (*sig.* >0,05).
- Hipotesis alternatif (H_a) = Data varians antar kelompok perlakuan heterogen (*p* atau *sig.* < 0,05).
- Data yang diperoleh pada based on mean terhadap bakteri uji *E. coli* menunjukkan nilai sig (.009) dan terhadap bakteri uji *S. aureus* (.036), sehingga H_0 ditolak, artinya varians antar kelompok perlakuan heterogen (<0,05).

3. Uji Robust *Analysis of Variance* (ANOVA)

Robust Tests of Equality of Means

Daya_Hambat_mm

Bakteri		Statistic[a]	df1	df2	Sig.
E. coli	Welch	371.632	1	2.046	.002
S. aureus	Welch	832.973	1	3.301	<,001

a. Asymptotically F distributed.

- H_0 = Tidak terdapat perbedaan yang signifikan antar kelompok perlakuan terhadap bakteri *E. coli* dan *S. aureus*
- H_a= Terdapat perbedaan yang signifikan antar kelompok perlakuan terhadap bakteri *E. coli* dan *S. aureus*
- Data yang dihasilkan terhadap kedua bakteri uji menunjukkan terdapat perbedaan signifikan antar kelompok perlakuan, sehingga H_0 ditolak.

4. Uji lanjut *Games-Howell* Post Hoc Test

Multiple Comparisons

Dependent Variable: Daya_Hambat_mm

Games-Howell

Bakteri	(I) Kode_Perlakuan	(J) Kode_Perlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Escherichia coli	Fraksi Etil asetat 200ug/disk	Kontrol positif Kloramfenikol 30 ug/disk	-16.71667*	.86715	.004	-21.7023	-11.7311
		kontrol negatif DMSO 10%	7.18333*	.09280	<,001	6.6367	7.7300
	Kontrol positif Kloramfenikol 30 ug/disk	Fraksi Etil asetat 200ug/disk	16.71667*	.86715	.004	11.7311	21.7023
		kontrol negatif DMSO 10%	23.90000*	.86217	.002	18.8212	28.9788
	kontrol negatif DMSO 10%	Fraksi Etil asetat 200ug/disk	-7.18333*	.09280	<,001	-7.7300	-6.6367
		Kontrol positif Kloramfenikol 30 ug/disk	-23.90000*	.86217	.002	-28.9788	-18.8212
Staphylococcus aureus	Fraksi Etil asetat 200ug/disk	Kontrol positif Kloramfenikol 30 ug/disk	-21.03333*	.72877	<,001	-23.9041	-18.1626
		kontrol negatif DMSO 10%	7.40000*	.37859	.005	5.1698	9.6302
	Kontrol positif Kloramfenikol 30 ug/disk	Fraksi Etil asetat 200ug/disk	21.03333*	.72877	<,001	18.1626	23.9041
		kontrol negatif DMSO 10%	28.43333*	.62272	<,001	24.7651	32.1016
	kontrol negatif DMSO 10%	Fraksi Etil asetat 200ug/disk	-7.40000*	.37859	.005	-9.6302	-5.1698
		Kontrol positif Kloramfenikol 30 ug/disk	-28.43333*	.62272	<,001	-32.1016	-24.7651

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

- H_0 = Tidak terdapat perbedaan yang signifikan pada diameter zona hambat antara dua kelompok perlakuan yang dibandingkan secara berpasangan.
- H_a= Terdapat perbedaan yang signifikan pada diameter zona hambat antara dua kelompok perlakuan yang dibandingkan secara berpasangan.
- Berdasarkan hasil uji lanjut pada data di atas, seluruh nilai signifikan (Sig.) antar kelompok perlakuan menunjukkan nilai <0,05, sehingga H_0 ditolak dan H_a diterima untuk semua pasangan.