

## LAMPIRAN

### Lampiran 1. Hasil identifikasi determinasi daun ketapang



Yogyakarta, 13 Januari 2025

No. : 165/LHD/01/2025  
Hal : Hasil Determinasi

Kepada Yth.  
Rima Yusliana  
Farmasi Universitas Bhakti Kencana Bandung

Dengan hormat,  
Bersama ini disampaikan hasil determinasi tumbuhan sesuai permintaan sebagai berikut:

| No. | Nama jenis                   | Nama Lokal |
|-----|------------------------------|------------|
| 1.  | <i>Terminalia catappa</i> L. | Ketapang   |

Kunci Determinasi:

1b-2b-3b-4b-6b-7b-9b-10b-11b-12b-13b-14a-15a-109b-120b-128b-129b-135b- 136b-139b-140b-142b-143b-146b-154b-155b-156b-158b-159b-160b.

Backer CA, Brink RCB. *Flora of Java*. Vol. I-III. Groningen: N.V.P. Noordhoff; 1963–1968

Klasifikasi :

Kingdom : Plantae  
Divisi : Magnoliophyta  
Classis : Magnoliopsida  
Ordo : Myrtales  
Familia : Combretaceae  
Genus : Terminalia  
Species : *Terminalia catappa* L.

Demikian semoga berguna bagi saudara.

Divisi Teknik Galenika

  
Apriyani Susilowati, S.Si.

**Lampiran 2. Certificate of Analysis ekstrak daun ketapang**

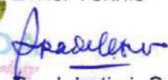


**SERTIFIKAT HASIL UJI**

Nomor : 250133057b  
 Nama Sampel : Ekstrak Daun Ketapang (*Terminalia catappa*)  
 Uji : Kualitatif Tannin  
 Metode : Thin Layer Chromatography  
 Tanggal : 13 Januari 2025  
 Permintaan : Rima Yusliana  
 NIM : -  
 Institusi : Fakultas Farmasi Universitas Bhakti Kencana

**Hasil Uji**

| Parameter Uji Kualitatif | Hasil Uji | Metode                    |
|--------------------------|-----------|---------------------------|
| Tannin                   | Positif   | Thin Layer Chromatography |

Divisi Teknis  
  
 Pradekatiwi, S.Si.

### Lampiran 3. Surat keterangan prosedur ekstraksi dan skrinning fitokimia (tanin)

|                                                                                                        |               |                                                  |                 |
|--------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------|-----------------|
| <br>jasaekstraksi.com |               | LEMBAR KERJA EKSTRAKSI<br>LABORATORIUM PENGUJIAN |                 |
| Nama sampel                                                                                            | Daun Ketapang | Tanggal                                          | 13 Januari 2025 |
| Kode sampel                                                                                            | 250133057     | Metode                                           | Maserasi ; TLC  |

**Prosedur ekstraksi :**

1. Petik daun
2. Cuci pada kran air mengalir.
3. Masukkan kedalam tabung spinner, putar selama 5 menit
4. Potong / iris daun dengan dimensi 2 cm
5. Keringkan dalam oven pada suhu 40°C selama 12 jam
6. Giling simplisia kering menggunakan diskmill dengan ayakan 40 mesh
7. Masukkan ke dalam kontainer ekstraktor
8. Tambahkan solvent ethanol 70%
9. Ekstraksikan dengan ultra turax pada kecepatan 1.000 rpm selama 2 jam
10. Maserasikan selama 24 jam
11. Filtrasi dengan corong buchner, sedot dengan mesin vakum
12. Residu diekstraksi ulang seperti diatas
13. Filtrat pertama dan kedua dievaporasi dengan vakum rotary evaporator pada suhu 45°C tekanan vakum
14. Tuang ekstrak ke dalam cawan porselin
15. Uapkan sisa solvent dengan penangas air waterbatch
16. Timbang ekstrak yang diperoleh.

**Uji Kualitatif Tannin**

1. Timbang sampel dengan seksama
2. Tambahkan solvent dietil eter 10 ml
3. Ekstraksi dengan sonikator ultrasonik selama 30 menit
4. Maserasikan selama 20 jam
5. Sentrifuge selama 5 menit
6. Buang fase eter
7. Residu yang diperoleh dididihkan dengan 5 mL akuades selama 2 jam, kemudian didinginkan dan disaring.
8. Spotting sampel sebanyak 10 µl pada plate silica gel.
9. Masukkan plate ke dalam chamber jenuh fase gerak etil asetat - asam asetat - asam formiat - air (100-11-11-27).
10. Eluasikan hingga batas.
11. Keringkan plate, amati di bawah sinar UV
12. Semprot dengan pereaksi ferri chloride.

Membuat Reagent Iron(III) chloride for phenols and hydroxamic acids:  
 Spray solution: 1-5% solution of iron(III) chloride in hydrochloric acid (c =0.5 mol/L.)  
 Note: Hydroxamic acids turn red, phenols blue or greenish.  
 Literature:  
 K. Fink, R.M. Fink, Proc. Soc. Expl. Bio. Med. 70, 654 (1949).

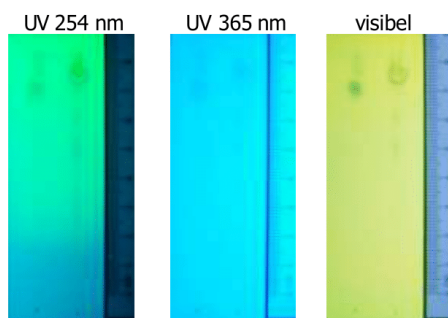
Chemicals:  
 Iron(III) chloride hexahydrate GR, Ord. No. 1.03943  
 Hydrochloric acid 0.5 mol/l Titrisol® Ord. No. 1.09971

**Data Ekstraksi :**

|                            |   |       |    |
|----------------------------|---|-------|----|
| Berat daun segar           | : | 6,22  | Kg |
| Berat serbuk               | : | 1.980 | g  |
| Volume solvent ethanol 70% | : | 18,5  | L  |
| Berat ekstrak              | : | 262,3 | g  |

**TLC PROFILE**

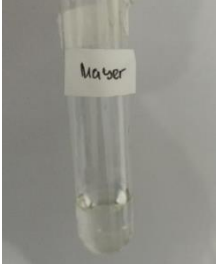
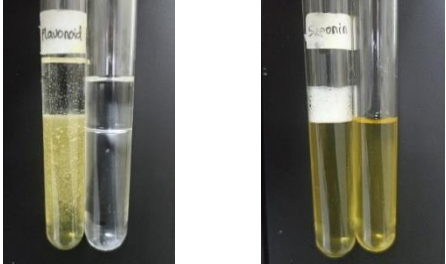
|               |   |                                                        |
|---------------|---|--------------------------------------------------------|
| Sample number | : | 250133057b                                             |
| Sample detail | : | Ekstrak Daun Ketapang                                  |
| Analysis      | : | Tannin                                                 |
| Adsorbent     | : | Silicagel 60 F <sub>254</sub> (Al - Sheet)             |
| Mobile Phase  | : | Etanol – Asam Asetat_Asam Formiat – Air (100:11:11:27) |
| Detection     | : | Ferri Chloride                                         |



Kiri : Comparator tannic acid  
Kanan : Ekstrak Daun Ketapang

|                              |   |             |
|------------------------------|---|-------------|
| Warna spot tannin di visibel | : | biru kelabu |
| Rf spot tannin terdeteksi    | : | 0,88        |

**Lampiran 4.** Skrinning fitokimia ekstrak daun ketapang (alkaloid, flavonoid, dan saponin)

| Alkaloid                                                                          | Flavonoid                                                                         | Saponin                                                                            |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |  |
| Dragendorff                                                                       | Mayer                                                                             |                                                                                    |

**Lampiran 5.** Certificate of Analysis propilen glikol

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                     |                    |                    |              |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------|--------------------|--------------|---------------|
| <br>DOW CHEMICAL PACIFIC<br>(SINGAPORE) PRIVATE LIMITED                                                                                                                                                                                                                                                                                                          |                                                     |                    |                    |              |               |
| <b>Certificate of Analysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                     |                    |                    |              |               |
| Product Number                                                                                                                                                                                                                                                                                                                                                                                                                                    | 00000114877                                         |                    |                    |              |               |
| Product Name                                                                                                                                                                                                                                                                                                                                                                                                                                      | Propylene Glycol USP/EP                             |                    |                    |              |               |
| Delivery No.                                                                                                                                                                                                                                                                                                                                                                                                                                      | 828602441 / 000010                                  |                    |                    |              |               |
| Order Number                                                                                                                                                                                                                                                                                                                                                                                                                                      | 116837310                                           |                    |                    |              |               |
| Shipping Units                                                                                                                                                                                                                                                                                                                                                                                                                                    | 80.000 DR                                           |                    |                    |              |               |
| Date Shipped                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2024-11-12 (YYYY-MM-DD)                             |                    |                    |              |               |
| Shipment No.                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4542345                                             |                    |                    |              |               |
| Batch Number                                                                                                                                                                                                                                                                                                                                                                                                                                      | C8150AMA21                                          |                    |                    |              |               |
| Seal Number                                                                                                                                                                                                                                                                                                                                                                                                                                       | HAS1363921                                          |                    |                    |              |               |
| Expiration Date                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2026-10-22 (YYYY-MM-DD)                             |                    |                    |              |               |
| Manufacturing Date                                                                                                                                                                                                                                                                                                                                                                                                                                | 2024-10-22 (YYYY-MM-DD)                             |                    |                    |              |               |
| Quantity                                                                                                                                                                                                                                                                                                                                                                                                                                          | 80.000 DR                                           |                    |                    |              |               |
| Net Weight                                                                                                                                                                                                                                                                                                                                                                                                                                        | 17200.000 KG                                        |                    |                    |              |               |
| Manufacturing Plant                                                                                                                                                                                                                                                                                                                                                                                                                               | MTP AIE PG                                          |                    |                    |              |               |
| Manufacturer Address                                                                                                                                                                                                                                                                                                                                                                                                                              | 10/4 Moo 2 ASIA IND EST<br>BANCHANG<br>Rayong 21130 |                    |                    |              |               |
| Manufacturer: Dow Chemical Thailand Ltd                                                                                                                                                                                                                                                                                                                                                                                                           |                                                     |                    |                    |              |               |
| It is hereby certified that the material indicated above has been inspected and tested in accordance with the conditions and requirements of the contract or purchase order and, unless agreed otherwise conforms in all respects to the specification relevant thereto and it meets all requirements of the current United States Pharmacopoeia, current Food Chemical Codex, current European Pharmacopoeia and current Pharmacopoeia of Japan. |                                                     |                    |                    |              |               |
| <b>Test</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Unit</b>                                         | <b>Lower Limit</b> | <b>Upper Limit</b> | <b>Value</b> | <b>Method</b> |
| S Residue on Ignition USP                                                                                                                                                                                                                                                                                                                                                                                                                         | %                                                   | -                  | 0.0070             | 0.0040       | Current JP    |
| Assay                                                                                                                                                                                                                                                                                                                                                                                                                                             | %                                                   | 99.80              | -                  | 99.99        | Current USP   |
| M Acidity                                                                                                                                                                                                                                                                                                                                                                                                                                         | ml                                                  | -                  | 0.20               | 0.02         | Current USP   |
| S Sulfated ash EP                                                                                                                                                                                                                                                                                                                                                                                                                                 | %                                                   | -                  | 0.0100             | 0.0040       | Current JP    |
| M Chlorides                                                                                                                                                                                                                                                                                                                                                                                                                                       | ppm                                                 | -                  | 70                 | < 70         | Current USP   |
| S Residue on Ignition FCC                                                                                                                                                                                                                                                                                                                                                                                                                         | %                                                   | -                  | 0.0070             | 0.0040       | Current JP    |

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|                                                                                                                                          |     |        |        |        |             |
|------------------------------------------------------------------------------------------------------------------------------------------|-----|--------|--------|--------|-------------|
| <br>DOW CHEMICAL PACIFIC<br>(SINGAPORE) PRIVATE LIMITED |     |        |        |        |             |
| S Residue on Ignition JP                                                                                                                 | %   | -      | 0.0050 | 0.0040 | Current JP  |
| M Specific Gravity @ 25/25degC                                                                                                           |     | 1.035  | 1.037  | 1.036  | Current USP |
| M Spec. Grav. @ 20C                                                                                                                      |     | 1.0376 | 1.0389 | 1.0383 | ASTM D4052  |
| M Sulfate                                                                                                                                | ppm | -      | 60     | < 60   | Current USP |
| Water Content                                                                                                                            | %   | -      | 0.200  | 0.004  | Current USP |
| M ID Test A matches IR scan                                                                                                              | -   | -      | -      | Pass   | Current USP |
| ID Test B Limit of Ethylene Glycol                                                                                                       | -   | -      | -      | Pass   | Current USP |
| ID Test B Limit of Diethylene Glycol                                                                                                     | -   | -      | -      | Pass   | Current USP |
| ID Test C Matches GC Scan                                                                                                                | -   | -      | -      | Pass   | Current USP |
| M Acidity                                                                                                                                | ml  | -      | 0.05   | 0.02   | Current EP  |
| M Boiling Point                                                                                                                          | °C  | 184    | 189    | 185    | Current EP  |
| M Clarity                                                                                                                                | -   | -      | -      | Pass   | Current EP  |
| M Color                                                                                                                                  | -   | -      | -      | Pass   | Current EP  |
| O Melting Point                                                                                                                          | °C  | 121    | 128    | 125    | Current EP  |
| M Oxidizing Substances 0.05M sodium thiosulfate                                                                                          | ml  | -      | 0.20   | 0.03   | Current EP  |
| M Reducing Substances                                                                                                                    | -   | -      | -      | Pass   | Current EP  |
| M Refractive Index @ 20degC                                                                                                              |     | 1.431  | 1.433  | 1.433  | Current EP  |
| M Relative Density @ 20/20degC                                                                                                           |     | 1.035  | 1.040  | 1.038  | Current EP  |
| Water Content                                                                                                                            | %   | -      | 0.200  | 0.004  | Current EP  |
| Assay                                                                                                                                    | %   | 99.80  | -      | 99.99  | Current FCC |
| M Acidity                                                                                                                                | -   | -      | -      | Pass   | Current FCC |
| M Appearance clear & colorless                                                                                                           | -   | -      | -      | Pass   | Current FCC |
| M Distillation, IBP                                                                                                                      | °C  | 185.0  | -      | 185.4  | Current FCC |
| M Distillation, DP                                                                                                                       | °C  | -      | 189.0  | 187.2  | Current FCC |

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|                                                                                                                                            |       |       |        |          |             |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|--------|----------|-------------|
| <br>DOW CHEMICAL PACIFIC<br>(SINGAPORE) PRIVATE LIMITED |       |       |        |          |             |
| O Lead (Pb)                                                                                                                                | ppm   | -     | 1.0    | < 1.0    | Current FCC |
| M Identification matches IR scan                                                                                                           | -     | -     | -      | Pass     | Current FCC |
| M Specific Gravity @ 25/25degC                                                                                                             |       | 1.035 | 1.037  | 1.036    | Current FCC |
| Water Content                                                                                                                              | %     | -     | 0.200  | 0.004    | Current FCC |
| M Acidity                                                                                                                                  | -     | -     | -      | Pass     | Current JP  |
| M Arsenic                                                                                                                                  | ppm   | -     | 2.0    | < 2.0    | Current JP  |
| M Chlorides                                                                                                                                | %     | -     | 0.007  | < 0.007  | Current JP  |
| M Distilling Range 184 - 189 degC                                                                                                          | % vol | 95    | -      | 98       | Current JP  |
| M Glyoxaline (Odor)                                                                                                                        | -     | -     | -      | Pass     | Current JP  |
| M Heavy Metals                                                                                                                             | ppm   | -     | 5.0    | < 5.0    | Current JP  |
| O Melting Point                                                                                                                            | °C    | 174   | 178    | 174      | Current JP  |
| M Odor                                                                                                                                     | -     | -     | -      | Pass     | Current JP  |
| M Specific Gravity @ 20/20degC                                                                                                             |       | 1.035 | 1.040  | 1.038    | Current JP  |
| M Sulfate                                                                                                                                  | %     | -     | 0.002  | < 0.002  | Current JP  |
| Water Content                                                                                                                              | %     | -     | 0.500  | 0.004    | Current JP  |
| Acidity as acetic acid                                                                                                                     | %     | -     | 0.0020 | 0.0001   | DOWM 101370 |
| Appearance clear, free of suspended matter                                                                                                 | -     | -     | -      | Pass     | Visual      |
| Chlorides                                                                                                                                  | ppm   | -     | 1.0    | < 1.0    | DOWM 101867 |
| Color, Pt-Co                                                                                                                               | -     | -     | 10     | 2        | ASTM D5386  |
| Dimer, Trimer & Higher Polymers                                                                                                            | %     | -     | 0.100  | 0.008    | DOWM 100687 |
| Ethylene Glycol                                                                                                                            | %     | -     | 0.0080 | < 0.0080 | DOWM 100687 |
| Diethylene Glycol                                                                                                                          | %     | -     | 0.0080 | < 0.0080 | DOWM 100687 |
| Odor practically odorless                                                                                                                  | -     | -     | -      | Pass     | Olfactory   |
| Iron                                                                                                                                       | ppm   | -     | 0.30   | 0.01     | ASTM E394   |

Note 1:  
 Values reported for Assay, Ethylene Glycol and Diethylene Glycol under USP and for Assay under FCC are obtained using the validated equivalent Dow GC

Lampiran 6. *Certificate of Analysis* gliserin



**PT. WILMAR NABATI INDONESIA**  
Quality Control Department

F/WINA-QC-10-011A  
Rev : 20.01.2024  
Page : 1 of 1

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Date : 21/January/2025

**CERTIFICATE OF ANALYSIS**

Ref No. : RG/QC/GSK/25/I-0119

Product : WILFARIN USP-997 : REFINED GLYCERINE USP GRADE

Manufactured Date : JANUARY 11, 2025

Best Before : JANUARY 11, 2027

Date of Sample Received : JANUARY 11, 2025

Date of Analysis : JANUARY 11, 2025

Lot No. : G250111-22W

| Parameter                                         | Unit | Result                             | Specification                      | Test Method                   |
|---------------------------------------------------|------|------------------------------------|------------------------------------|-------------------------------|
| Appearance                                        |      | Clear, Transparent, Viscous Liquid | Clear, Transparent, Viscous Liquid | Visual                        |
| Identification test A                             |      | Conform                            | Conform                            | USP-NF : 2024 (Page 1)        |
| Identification test B :                           |      |                                    |                                    |                               |
| - Diethylene Glycol                               | %    | <0.10                              | 0.1 max                            | USP-NF : 2024 (Page 1)        |
| - Ethylene Glycol                                 | %    | <0.10                              | 0.1 max                            | USP-NF : 2024 (Page 1)        |
| Identification test C                             |      | Conform                            | Conform                            | USP-NF : 2024 (Page 1)        |
| Assay                                             | %    | 99.8                               | 99 - 101                           | USP-NF : 2024 (Page 1)        |
| Chloride                                          | ppm  | <10                                | 10 max                             | USP-NF : 2024 (221) Page 1    |
| Sulfate                                           | ppm  | <20                                | 20 max                             | USP-NF : 2024 (221) Page 1    |
| Residue on Ignition                               | %    | 0.003                              | 0.01 max                           | USP-NF : 2024 (261) Page 1    |
| Related Compounds :                               |      |                                    |                                    |                               |
| - Individual Impurities                           | %    | <0.1                               | 0.1 max                            | USP-NF : 2024 (Page 2)        |
| - Total Impurities                                | %    | <1.0                               | 1.0 max                            | USP-NF : 2024 (Page 2)        |
| Chlorinated Compounds                             | ppm  | <30                                | 30 max                             | USP-NF : 2024 (Page 2)        |
| Fatty Acids & Esters<br>(as mL of 0.5N NaOH/50 g) |      | 0.20                               | 1 max                              | USP-NF : 2024 (Page 2)        |
| Color (mL FeCl3)                                  | -    | <0.4                               | 0.4 max                            | USP-NF : 2024 (Page 2)        |
| Specific Gravity @ 25                             | -    | 1.2614                             | 1.2612 min                         | USP-NF : 2024 (841) Page 2    |
| Water Determination                               | %    | 0.06                               | 0.3 max                            | USP-NF : 2024 (921) Page 2    |
| Color (APHA)                                      | -    | 3                                  | 10 max                             | AOCS Ea 9-65                  |
| Heavy Metal as Pb                                 | ppm  | < 5                                | 5 max                              | USP 41 : 2018 (231) Page 1968 |

Certified Control



**Riko Julianti**  
QC Head



The result of these test relate only to the sample (s) submitted. The publication and duplicating of our test reports and expert opinions for advertising purpose as well as their use for any other purposes in extracts requires our written approval.

---

**Factory :**  
 Jl. Kapten Damo Sugondo No. 56  
 Gresik - 61124, East Java - Indonesia  
 Tel : +6231-28932555 / +6231-28932222

### Lampiran 7. Certificate of Analysis Muller Hinton Agar





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## CERTIFICATE OF ANALYSIS

**PRODUCT** CM0337B  
MUELLER HINTON AGAR 500g

**LOT NUMBER** 6126394

**EXPIRY DATE** 2029.05.23

**DATE OF MANUFACTURE** 2024.05.28

**Delivery/ Customer information**

Date Printed  
2025.02.15

Delivery No.

Customer  
Customer Order Number

| Physical Characteristics | Results      | Specification |
|--------------------------|--------------|---------------|
| Appearance               | Straw powder | Straw powder  |
| Color on reconstitution  | Straw 2-3    | Straw 2-3     |
| pH (25°C)                | 7.2          | 7.2 - 7.4     |
| Clarity                  | Clear        | Clear         |

### Microbiological Performance

Antibiotic susceptibility tests are performed in accordance with, and meet the acceptance limits of, the current ISO/TS 16781. Performance is assessed using EUCAST methodology.

| Zone Size (mm)                                        | Limits (mm) |
|-------------------------------------------------------|-------------|
| <b>Staphylococcus aureus ATCC®25923 WDCM00034</b>     |             |
| Incubation at 35 ± 1°C for 16-20 hours in ambient air |             |
| Erythromycin E15                                      | 22 - 30     |
| Tetracycline TE30                                     | 24 - 30     |
| Ciprofloxacin CIP5                                    | 22 - 30     |
| Amoxicillin-clavulanate AMC30                         | 28 - 36     |
| Ampicillin-sulbactam SAM20                            | 29 - 37     |
| Linezolid LZD30                                       | 25 - 32     |
| Cefoxitin FOX30                                       | 23 - 29     |
| Gentamicin CN10                                       | 19 - 27     |
| Penicillin P10                                        | 26 - 37     |
| <b>Staphylococcus aureus ATCC®29213 WDCM00131</b>     |             |
| Incubation at 35 ± 1°C for 16-20 hours in ambient air |             |
| Penicillin P1                                         | 12 - 18     |
| Cefoxitin FOX30                                       | 24 - 30     |
| Ciprofloxacin CIP5                                    | 21 - 27     |
| Erythromycin E15                                      | 23 - 29     |
| Gentamicin CN10                                       | 19 - 25     |
| Linezolid LZD10                                       | 21 - 27     |
| Tetracycline TE30                                     | 23 - 31     |

**OXOID LIMITED**

Wade Road, Basingstoke, Hampshire RG24 8PW, England

[www.thermofisher.com](http://www.thermofisher.com)

## Lampiran 8. Certificate of Analysis *Staphylococcus aureus*

**ThermoFisher Scientific**  
The world leader in serving science

Thermo Fisher Scientific  
Microbiology  
12076 Santa Fe Trail Drive  
Lansing, MI 48215  
800.225.6738  
www.thermoFisher.com

**Certificate of Analysis - Certified Reference Material**

Thermo Scientific™ Trademark™  
Product Number 84609002  
Product Name *S. aureus* sup. aureus ATCC 6538P PK/S  
Lot Number 15718  
Usage Declaration Accepted (OK)  
Expiration Date 2024-02-01

This product has been manufactured, processed and packaged in accordance with Quality System 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 condition.

**Product Char Results**

|           |                                                  |
|-----------|--------------------------------------------------|
| Purity    | Demonstrates pure growth on applicable media     |
| Viability | Recovered at acceptable level within test period |
| Passage   | 3 (Current preserved time)                       |

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

These tests are performed in accordance with ISO 17025 guidelines.  
Thermo Fisher Scientific has determined each lot 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.

Signed  
Dawn Baker  
QA Manager  
The identity, purity, and authenticity of the Licensed Products are exclusively the responsibility of Remel Inc. and not ATCC.  
The ATCC Licensed Derivative Emblem, the ATCC Licensed Derivative Word mark, and the ATCC Catalog Marks are trademarks of ATCC.  
Remel Inc. is licensed to use these trademarks and to sell products derived from ATCC's culture.

ATCC Licensed Derivative

ACCREDITED  
CERT. PASS (1)

Thermo Fisher Scientific is accredited by A2LA as a registered reference material producer certificate number 6559.01 in accordance with ISO 17034[1].

[1] ISO 17034 First Edition 2016-11-01 General requirements for the competence of reference material producers

Version 1.0

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## Lampiran 9. Optimasi basis



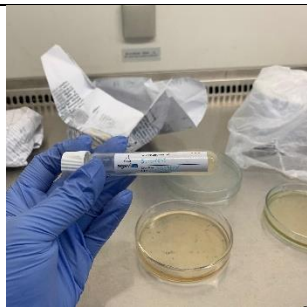
Batch 1



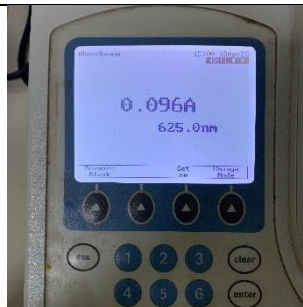
Batch 2



Batch 3

**Lampiran 10. Peremajaan Bakteri *Staphylococcus aureus***

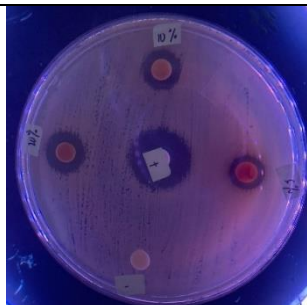
Kultur bakteri murni



Absorbansi suspensi bakteri



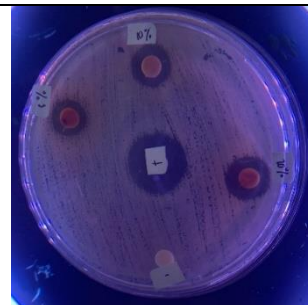
Hasil peremajaan

**Lampiran 11. Uji aktivitas antibakteri ekstrak daun ketapang**

Replikasi 1



Replikasi 2



Replikasi 3

**Lampiran 12. Sediaan deodoran *spray* ekstrak daun ketapang**

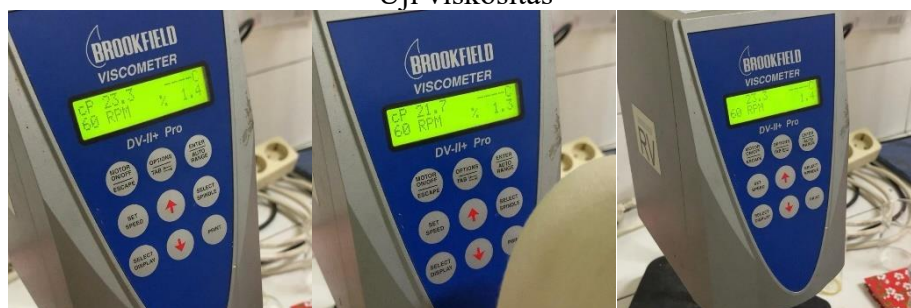
Batch 1



Batch 2



Batch 3

**Lampiran 13. Evaluasi sediaan deodoran *spray* ekstrak daun ketapang****Uji organoleptik****Uji pH****Uji kejernihan****Uji viskositas**

---

### Uji waktu kering



### Uji iritasi



sebelum perlakuan

jam ke-24

jam ke-48



Jam ke-72

---

Jumlah pengamatan = jumlah kelinci x waktu pengamatan  
 = 1 x 3 = 3

a. F0

$$A = \frac{0}{3} = 0$$

$$B = \frac{0}{3} = 0$$

$$C = 1$$

$$\text{Indeks iritasi primer} = \frac{0-0}{1} = 0$$

b. F1

$$A = \frac{0}{3} = 0$$

$$B = \frac{0}{3} = 0$$

$$C = 1$$

$$\text{Indeks iritasi primer} = \frac{0-0}{1} = 0$$

c. F2

$$A = \frac{0}{3} = 0$$

$$B = \frac{0}{3} = 0$$

$$C = 1$$

$$\text{Indeks iritasi primer} = \frac{0-0}{1} = 0$$

d. F3

$$A = \frac{1}{3} = 0,33$$

$$B = \frac{0}{3} = 0$$

$$C = 1$$

e. Indeks iritasi primer =  $\frac{0,33-0}{1} = 0,33$

Keterangan:

A: jumlah skor eritema dan edema seluruh titik pengamatan sampel pada jam ke 24, 48, dan 72 dibagi jumlah pengamatan

B: jumlah skor eritema dan edema seluruh titik pengamatan kontrol pada jam ke 24, 48, dan 72 dibagi jumlah pengamatan

C: jumlah hewan

#### Lampiran 14. Data hasil evaluasi pH terhadap basis

| Basis | pH      |         |         | Rata-rata±SD |
|-------|---------|---------|---------|--------------|
|       | batch 1 | batch 2 | batch 3 |              |
| B1    | 6,01    | 6,13    | 6,05    | 6,06±0,06    |
| B2    | 6,02    | 6,08    | 6,11    | 6,07±0,05    |
| B3    | 6,00    | 6,19    | 6,25    | 6,15±0,13    |

#### Lampiran 15. Data hasil evaluasi viskositas terhadap basis

| Basis | Kejernihan |         |         |
|-------|------------|---------|---------|
|       | batch 1    | batch 2 | batch 3 |
| B1    | Jernih     | Jernih  | Jernih  |
| B2    | Jernih     | Jernih  | Jernih  |
| B3    | Jernih     | Jernih  | Jernih  |

#### Lampiran 16. Data hasil evaluasi waktu kering terhadap basis

| Basis | Waktu Kering (menit) |         |         | Rata-rata±SD |
|-------|----------------------|---------|---------|--------------|
|       | batch 1              | batch 2 | batch 3 |              |
| B1    | 1,49                 | 2,02    | 1,19    | 1,57±0,42    |
| B2    | 1,52                 | 1,58    | 2,01    | 1,70±0,27    |

|    |      |      |      |           |
|----|------|------|------|-----------|
| B3 | 1,58 | 2,01 | 2,42 | 2,00±0,42 |
|----|------|------|------|-----------|

**Lampiran 17.** Data hasil evaluasi pH sediaan

| Formula | pH      |         |         | Rata-rata±SD |
|---------|---------|---------|---------|--------------|
|         | batch 1 | batch 2 | batch 3 |              |
| F0      | 6,02    | 6,08    | 6,11    | 6,07±0,05    |
| F1      | 5,87    | 5,77    | 5,78    | 5,81±0,06    |
| F2      | 5,74    | 5,79    | 5,76    | 5,76±0,03    |
| F3      | 5,62    | 5,71    | 5,66    | 5,66±0,05    |

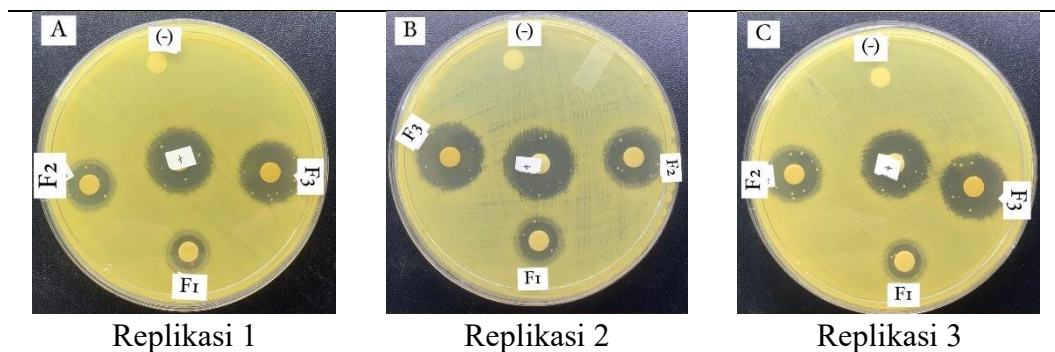
**Lampiran 18.** Data hasil evaluasi viskositas sediaan

| Formula | Viskositas (cP) |         |         | Rata-rata±SD |
|---------|-----------------|---------|---------|--------------|
|         | batch 1         | batch 2 | batch 3 |              |
| F0      | 18,4            | 17,9    | 18,0    | 18,1±0,26    |
| F1      | 21,7            | 21,9    | 22,1    | 21,9±0,20    |
| F2      | 22,3            | 21,8    | 22,2    | 22,1±0,26    |
| F3      | 24,7            | 24,4    | 23,2    | 24,1±0,79    |

**Lampiran 19.** Data hasil evaluasi waktu kering sediaan

| Formula | Waktu Kering (menit) |         |         | Rata-rata±SD |
|---------|----------------------|---------|---------|--------------|
|         | batch 1              | batch 2 | batch 3 |              |
| F0      | 1,52                 | 1,58    | 2,01    | 1,70±0,27    |
| F1      | 2,43                 | 3,08    | 2,55    | 2,69±0,35    |
| F2      | 2,59                 | 2,54    | 3,09    | 2,74±0,30    |
| F3      | 3,15                 | 3,05    | 2,47    | 2,89±0,37    |

**Lampiran 20.** Uji aktivitas antibakteri sediaan



## Lampiran 21. Uji statistik pH

### Uji Normalitas

| Tests of Normality |           |                                 |    |      |              |    |       |
|--------------------|-----------|---------------------------------|----|------|--------------|----|-------|
|                    | Formula   | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |       |
|                    |           | Statistic                       | df | Sig. | Statistic    | df | Sig.  |
| pH                 | Formula 0 | .353                            | 3  | .    | .824         | 3  | .174  |
|                    | Formula 1 | .175                            | 3  | .    | 1.000        | 3  | 1.000 |
|                    | Formula 2 | .196                            | 3  | .    | .996         | 3  | .878  |
|                    | Formula 3 | .253                            | 3  | .    | .964         | 3  | .637  |

a. Lilliefors Significance Correction

### Uji Homogenitas

| Test of Homogeneity of Variances |                                      |                  |     |       |      |
|----------------------------------|--------------------------------------|------------------|-----|-------|------|
|                                  |                                      | Levene Statistic | df1 | df2   | Sig. |
| pH                               | Based on Mean                        | 1.166            | 3   | 8     | .381 |
|                                  | Based on Median                      | .235             | 3   | 8     | .870 |
|                                  | Based on Median and with adjusted df | .235             | 3   | 4.797 | .869 |
|                                  | Based on trimmed mean                | 1.067            | 3   | 8     | .416 |

### Uji ANOVA

| ANOVA          |                |    |             |        |      |
|----------------|----------------|----|-------------|--------|------|
| pH             | Sum of Squares | df | Mean Square | F      | Sig. |
| Between Groups | .256           | 3  | .085        | 45.091 | .000 |
| Within Groups  | .015           | 8  | .002        |        |      |
| Total          | .271           | 11 |             |        |      |

### Uji Post-Hoc

| Multiple Comparisons   |             |                       |            |       |                         |             |
|------------------------|-------------|-----------------------|------------|-------|-------------------------|-------------|
| Dependent Variable: pH |             |                       |            |       |                         |             |
| Bonferroni             |             |                       |            |       |                         |             |
| (I) Formula            | (J) Formula | Mean Difference (I-J) | Std. Error | Sig.  | 95% Confidence Interval |             |
|                        |             |                       |            |       | Lower Bound             | Upper Bound |
| Formula 0              | Formula 1   | -.02333               | .03551     | 1.000 | -.1469                  | .1002       |
|                        | Formula 2   | .14333*               | .03551     | .023  | .0198                   | .2669       |

|           |           |          |        |       |        |        |
|-----------|-----------|----------|--------|-------|--------|--------|
|           | Formula 3 | -.26333* | .03551 | .000  | -.3869 | -.1398 |
| Formula 1 | Formula 0 | .02333   | .03551 | 1.000 | -.1002 | .1469  |
|           | Formula 2 | .16667*  | .03551 | .009  | .0431  | .2902  |
|           | Formula 3 | -.24000* | .03551 | .001  | -.3635 | -.1165 |
| Formula 2 | Formula 0 | -.14333* | .03551 | .023  | -.2669 | -.0198 |
|           | Formula 1 | -.16667* | .03551 | .009  | -.2902 | -.0431 |
|           | Formula 3 | -.40667* | .03551 | .000  | -.5302 | -.2831 |
| Formula 3 | Formula 0 | .26333*  | .03551 | .000  | .1398  | .3869  |
|           | Formula 1 | .24000*  | .03551 | .001  | .1165  | .3635  |
|           | Formula 2 | .40667*  | .03551 | .000  | .2831  | .5302  |

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

## Lampiran 22. Uji statistik viskositas

### Uji Normalitas

| Tests of Normality |           |                                 |    |      |              |    |       |
|--------------------|-----------|---------------------------------|----|------|--------------|----|-------|
|                    | Formula   | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |       |
|                    |           | Statistic                       | df | Sig. | Statistic    | df | Sig.  |
| Viskositas         | Formula 0 | .175                            | 3  | .    | 1.000        | 3  | 1.000 |
|                    | Formula 1 | .314                            | 3  | .    | .893         | 3  | .363  |
|                    | Formula 2 | .314                            | 3  | .    | .893         | 3  | .363  |
|                    | Formula 3 | .314                            | 3  | .    | .893         | 3  | .363  |

a. Lilliefors Significance Correction

### Uji Homogenitas

| Test of Homogeneity of Variances |                                      |                  |     |       |      |
|----------------------------------|--------------------------------------|------------------|-----|-------|------|
|                                  |                                      | Levene Statistic | df1 | df2   | Sig. |
| Viskositas                       | Based on Mean                        | 4.432            | 3   | 8     | .041 |
|                                  | Based on Median                      | .732             | 3   | 8     | .561 |
|                                  | Based on Median and with adjusted df | .732             | 3   | 3.078 | .597 |
|                                  | Based on trimmed mean                | 3.935            | 3   | 8     | .054 |

### Uji ANOVA

#### ANOVA

Viskositas

|                | Sum of Squares | df | Mean Square | F      | Sig. |
|----------------|----------------|----|-------------|--------|------|
| Between Groups | 56.490         | 3  | 18.830      | 92.988 | .000 |
| Within Groups  | 1.620          | 8  | .202        |        |      |
| Total          | 58.110         | 11 |             |        |      |

### Uji Post-Hoc

#### Multiple Comparisons

Dependent Variable: Viskositas

Games-Howell

| (I) Formula | (J) Formula | Mean Difference |            | Sig. | 95% Confidence Interval |             |
|-------------|-------------|-----------------|------------|------|-------------------------|-------------|
|             |             | (I-J)           | Std. Error |      | Lower Bound             | Upper Bound |
| Formula 0   | Formula 1   | -.20000         | .19149     | .737 | -1.0091                 | .6091       |
|             | Formula 2   | -2.20000        | .47258     | .088 | -5.0901                 | .6901       |
|             | Formula 3   | 3.80000*        | .19149     | .000 | 2.9909                  | 4.6091      |
| Formula 1   | Formula 0   | .20000          | .19149     | .737 | -.6091                  | 1.0091      |
|             | Formula 2   | -2.00000        | .48305     | .100 | -4.7438                 | .7438       |
|             | Formula 3   | 4.00000*        | .21602     | .000 | 3.1206                  | 4.8794      |
| Formula 2   | Formula 0   | 2.20000         | .47258     | .088 | -.6901                  | 5.0901      |
|             | Formula 1   | 2.00000         | .48305     | .100 | -.7438                  | 4.7438      |
|             | Formula 3   | 6.00000*        | .48305     | .008 | 3.2562                  | 8.7438      |
| Formula 3   | Formula 0   | -3.80000*       | .19149     | .000 | -4.6091                 | -2.9909     |
|             | Formula 1   | -4.00000*       | .21602     | .000 | -4.8794                 | -3.1206     |
|             | Formula 2   | -6.00000*       | .48305     | .008 | -8.7438                 | -3.2562     |

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

### Lampiran 23. Uji statistik waktu kering

#### Uji Normalitas

| Tests of Normality |           |                                 |    |      |              |    |      |
|--------------------|-----------|---------------------------------|----|------|--------------|----|------|
|                    | Formula   | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |      |
|                    |           | Statistic                       | df | Sig. | Statistic    | df | Sig. |
| Waktu_kering       | Formula 0 | .236                            | 3  | .    | .977         | 3  | .712 |
|                    | Formula 1 | .310                            | 3  | .    | .898         | 3  | .380 |
|                    | Formula 2 | .346                            | 3  | .    | .837         | 3  | .206 |
|                    | Formula 3 | .366                            | 3  | .    | .796         | 3  | .104 |

a. Lilliefors Significance Correction

## Uji Homogenitas

## Test of Homogeneity of Variances

|              |                                      | Levene Statistic | df1 | df2   | Sig. |
|--------------|--------------------------------------|------------------|-----|-------|------|
| Waktu_kering | Based on Mean                        | 2.582            | 3   | 8     | .126 |
|              | Based on Median                      | .296             | 3   | 8     | .827 |
|              | Based on Median and with adjusted df | .296             | 3   | 5.954 | .827 |
|              | Based on trimmed mean                | 2.203            | 3   | 8     | .165 |

## Uji ANOVA

## ANOVA

Waktu\_kering

|                | Sum of Squares | df | Mean Square | F     | Sig. |
|----------------|----------------|----|-------------|-------|------|
| Between Groups | 1.998          | 3  | .666        | 7.256 | .011 |
| Within Groups  | .734           | 8  | .092        |       |      |
| Total          | 2.732          | 11 |             |       |      |

## Uji Post-Hoc

## Multiple Comparisons

Dependent Variable: Waktu\_kering

Bonferroni

| (I) Formula | (J) Formula | Mean Difference (I-J) | Std. Error | Sig.  | 95% Confidence Interval |             |
|-------------|-------------|-----------------------|------------|-------|-------------------------|-------------|
|             |             |                       |            |       | Lower Bound             | Upper Bound |
| Formula 0   | Formula 1   | -.22667               | .24735     | 1.000 | -1.0872                 | .6338       |
|             | Formula 2   | -.36333               | .24735     | 1.000 | -1.2238                 | .4972       |
|             | Formula 3   | .69667                | .24735     | .136  | -.1638                  | 1.5572      |
| Formula 1   | Formula 0   | .22667                | .24735     | 1.000 | -.6338                  | 1.0872      |
|             | Formula 2   | -.13667               | .24735     | 1.000 | -.9972                  | .7238       |
|             | Formula 3   | .92333*               | .24735     | .035  | .0628                   | 1.7838      |
| Formula 2   | Formula 0   | .36333                | .24735     | 1.000 | -.4972                  | 1.2238      |
|             | Formula 1   | .13667                | .24735     | 1.000 | -.7238                  | .9972       |
|             | Formula 3   | 1.06000*              | .24735     | .016  | .1995                   | 1.9205      |
| Formula 3   | Formula 0   | -.69667               | .24735     | .136  | -1.5572                 | .1638       |
|             | Formula 1   | -.92333*              | .24735     | .035  | -1.7838                 | -.0628      |
|             | Formula 2   | -1.06000*             | .24735     | .016  | -1.9205                 | -.1995      |

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

## Lampiran 24. Uji statistik aktivitas antibakteri sediaan deodoran *spray*

### Uji Normalitas

| Tests of Normality |             |                                 |    |      |              |    |       |
|--------------------|-------------|---------------------------------|----|------|--------------|----|-------|
|                    | Sampel      | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |       |
|                    |             | Statistic                       | df | Sig. | Statistic    | df | Sig.  |
| Zona_hambat        | Formula 1   | .276                            | 3  | .    | .942         | 3  | .537  |
|                    | Formula 2   | .175                            | 3  | .    | 1.000        | 3  | 1.000 |
|                    | Formula 3   | .219                            | 3  | .    | .987         | 3  | .780  |
|                    | Kontrol (+) | .314                            | 3  | .    | .893         | 3  | .363  |
|                    | Kontrol (-) | .                               | 3  | .    | .            | 3  | .     |

a. Lilliefors Significance Correction

### Uji Homogenitas

| Test of Homogeneity of Variances |                                      |                  |     |       |      |
|----------------------------------|--------------------------------------|------------------|-----|-------|------|
|                                  |                                      | Levene Statistic | df1 | df2   | Sig. |
| Zona_hambat                      | Based on Mean                        | 2.367            | 4   | 10    | .123 |
|                                  | Based on Median                      | .779             | 4   | 10    | .564 |
|                                  | Based on Median and with adjusted df | .779             | 4   | 6.215 | .576 |
|                                  | Based on trimmed mean                | 2.224            | 4   | 10    | .139 |

### Uji ANOVA

| ANOVA          |                |    |             |          |      |
|----------------|----------------|----|-------------|----------|------|
| Zona_hambat    |                |    |             |          |      |
|                | Sum of Squares | df | Mean Square | F        | Sig. |
| Between Groups | 418.407        | 4  | 104.602     | 1724.203 | .000 |
| Within Groups  | .607           | 10 | .061        |          |      |
| Total          | 419.013        | 14 |             |          |      |

## Uji Post-Hoc

**Multiple Comparisons**

Dependent Variable: Zona\_hambat

Bonferroni

| (I) Sampel  | (J) Sampel  | Mean Difference |            | Sig. | 95% Confidence Interval |             |
|-------------|-------------|-----------------|------------|------|-------------------------|-------------|
|             |             | (I-J)           | Std. Error |      | Lower Bound             | Upper Bound |
| Formula 1   | Formula 2   | -2.30000*       | .20111     | .000 | -3.0202                 | -1.5798     |
|             | Formula 3   | -5.43333*       | .20111     | .000 | -6.1536                 | -4.7131     |
|             | Kontrol (+) | -5.80000*       | .20111     | .000 | -6.5202                 | -5.0798     |
|             | Kontrol (-) | 8.70000*        | .20111     | .000 | 7.9798                  | 9.4202      |
| Formula 2   | Formula 1   | 2.30000*        | .20111     | .000 | 1.5798                  | 3.0202      |
|             | Formula 3   | -3.13333*       | .20111     | .000 | -3.8536                 | -2.4131     |
|             | Kontrol (+) | -3.50000*       | .20111     | .000 | -4.2202                 | -2.7798     |
|             | Kontrol (-) | 11.00000*       | .20111     | .000 | 10.2798                 | 11.7202     |
| Formula 3   | Formula 1   | 5.43333*        | .20111     | .000 | 4.7131                  | 6.1536      |
|             | Formula 2   | 3.13333*        | .20111     | .000 | 2.4131                  | 3.8536      |
|             | Kontrol (+) | -.36667         | .20111     | .983 | -1.0869                 | .3536       |
|             | Kontrol (-) | 14.13333*       | .20111     | .000 | 13.4131                 | 14.8536     |
| Kontrol (+) | Formula 1   | 5.80000*        | .20111     | .000 | 5.0798                  | 6.5202      |
|             | Formula 2   | 3.50000*        | .20111     | .000 | 2.7798                  | 4.2202      |
|             | Formula 3   | .36667          | .20111     | .983 | -.3536                  | 1.0869      |
|             | Kontrol (-) | 14.50000*       | .20111     | .000 | 13.7798                 | 15.2202     |
| Kontrol (-) | Formula 1   | -8.70000*       | .20111     | .000 | -9.4202                 | -7.9798     |
|             | Formula 2   | -11.00000*      | .20111     | .000 | -11.7202                | -10.2798    |
|             | Formula 3   | -14.13333*      | .20111     | .000 | -14.8536                | -13.4131    |
|             | Kontrol (+) | -14.50000*      | .20111     | .000 | -15.2202                | -13.7798    |

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

## Lampiran 25. Surat keterangan kode etik



### KOMISI ETIK PENELITIAN KESEHATAN UNIVERSITAS BHAKTI KENCANA

Jl. Soekarno - Hatta 754, Bandung  
Telp : 022-7830 760 / 022-7830-768  
Email : komisi.etik@bku.ac.id



KOMISI ETIK PENELITIAN KESEHATAN  
HEALTH RESEARCH ETHICS COMMITTEE  
UNIVERSITAS BHAKTI KENCANA  
BHAKTI KENCANA UNIVERSITY

KETERANGAN LAYAK ETIK  
DESCRIPTION OF ETHICAL APPROVAL  
"ETHICAL APPROVAL"  
154/09.KEPK/UBK/VI/2025

Protokol penelitian yang diusulkan oleh :  
*The research protocol proposed by :*

Peneliti Utama : Rima Yusliana  
*Principal in investigator*

Nama institusi : Universitas Bhakti Kencana  
*Name of institution*

Dengan judul :  
*Title*

**Pengembangan Formula Deodoran Spray Ekstrak Daun Ketapang (*Terminalia catappa* L.) Sebagai Antibakteri**

*Development of Deodorant Spray Formula from Ketapang Leaf Extract (*Terminalia catappa* L.) as Antibacterial*

Dinyatakan layak etik sesuai (tujuh) standar WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, dan 4) Risiko, 5) Bujukan atau eksploitasi, 6) Kerahasiaan atau Privacy, 7) Persetujuan Setelah Penjelasan, yang merujuk pada Pedoman CIOMS 2016. Hal ini seperti yang ditunjukkan oleh terpenuhinya indikator setiap standar.

*Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011standards, 1) Social Value, 2) Scientific Value, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Eksploitation, 6) Confidentiality and Privacy, and Informed Consent, referring to the 2016 CIOMS guidelines. This is as indicated by the fulfillment of the indicators of each standards.*

Pernyataan Laik Etik ini berlaku selama kurun waktu 18 Juni 2025 sampai dengan tanggal 18 Juni 2026.

*This declaration of ethics applies during the period 18 th June 2025 until 18 th June 2026.*

18 Juni 2025  
Professor and Chairperson  
  
R. Nety Kustikayanti, S.Kp., M.Kep  
NIK. 02019010336

## Lampiran 26. Lembar Bimbingan

| No | Tanggal       | Dosen Pembimbing                    | Topik                 | Disetujui | Aksi                                                                                                                                                                        |
|----|---------------|-------------------------------------|-----------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 10 Maret 2025 | MOHAMAD ISRONIJAYA                  | formulasi sediaan     | ✓         |       |
| 1  | 11 Mei 2025   | apt. Yanni Dhiani Mardhiani, M.BSc. | evaluasi sediaan      | ✓         |       |
| 2  | 29 April 2025 | MOHAMAD ISRONIJAYA                  | evaluasi sediaan      | ✓         |       |
| 2  | 2 Mei 2025    | apt. Yanni Dhiani Mardhiani, M.BSc. | data hasil pengamatan | ✓         |       |
| 3  | 5 Mei 2025    | apt. Yanni Dhiani Mardhiani, M.BSc. | Laporan Kemajuan I    | ✓         |       |
| 3  | 2 Mei 2025    | MOHAMAD ISRONIJAYA                  | data hasil pengamatan | ✓         |       |
| 4  | 31 Mei 2025   | apt. Yanni Dhiani Mardhiani, M.BSc. | Bimbingan bab 4       | ✓         |       |
| 4  | 5 Mei 2025    | MOHAMAD ISRONIJAYA                  | Kemajuan I            | ✓         |       |
| 5  | 15 Juni 2025  | MOHAMAD ISRONIJAYA                  | Bimbingan bab 4       | ✓         |       |
| 5  | 15 Juni 2025  | apt. Yanni Dhiani Mardhiani, M.BSc. | Bimbingan bab 4       | ✓         |       |
| 6  | 15 Juni 2025  | apt. Yanni Dhiani Mardhiani, M.BSc. | Bimbingan bab 4       | ✓         |       |
| 6  | 15 Juni 2025  | MOHAMAD ISRONIJAYA                  | Bimbingan bab 4       | ✓         |     |
| 7  | 15 Juni 2025  | apt. Yanni Dhiani Mardhiani, M.BSc. | Bimbingan bab 4       | ✓         |   |
| 7  | 15 Juni 2025  | MOHAMAD ISRONIJAYA                  | Bimbingan bab 4       | ✓         |   |
| 8  | 30 Juni 2025  | apt. Yanni Dhiani Mardhiani, M.BSc. | Bimbingan bab 4       | ✓         |   |
| 8  | 10 Juli 2025  | MOHAMAD ISRONIJAYA                  | Bimbingan bab 4       | ✓         |   |
| 9  | 11 Juli 2025  | apt. Yanni Dhiani Mardhiani, M.BSc. | Abstrak               | ✓         |   |

## Lampiran 27. Hasil Turnitin

|                                           |                                                      |              |                |
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**Lampiran 28.** Daftar Riwayat Hidup

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5. Universitas Bhakti Kencana (2021-2025)