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# LAMPIRAN

## Lampiran 1Hasil Analisis Data

Lampiran 1.1 Uji Normalitas

**Tests of Normality**

| | | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | Larvasida | Statistic | df | Sig. | Statistic | df | Sig. |
| Total_Larva_Mati | Granula | .258 | 12 | .027 | .887 | 12 | .109 |
| | Maserat | .364 | 12 | .000 | .753 | 12 | .003 |

a. Lilliefors Significance Correction

Lampiran 1.2 Uji Homogenitas

**Test of Homogeneity of Variances**

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| Kematian Larva | Based on Mean | 11.000 | 3 | 12 | .001 |
| | Based on Median | 11.000 | 3 | 12 | .001 |
| | Based on Median and with adjusted df | 11.000 | 3 | 3.000 | .040 |
| | Based on trimmed mean | 11.000 | 3 | 12 | .001 |

Lampiran 1.3 Uji One-Way ANOVA Pada Kelompok Granular

**ANOVA**

Kematian Larva

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 93.000 | 3 | 31.000 | 37.200 | .000 |
| Within Groups | 10.000 | 12 | .833 | | |
| Total | 103.000 | 15 | | | |

Lampiran 1.4 Uji Lanjutan Post-Hoc (Least Significant Difference / LSD)

**Post Hoc Tests**

**Multiple Comparisons**

Dependent Variable: Kematian Larva

LSD

| (I) Konsentrasi Larvasida | (J) Konsentrasi Larvasida | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Kontrol - | 10 gr | -3.500* | .645 | .000 | -4.91 | -2.09 |
| | 15 gr | -5.000* | .645 | .000 | -6.41 | -3.59 |
| | 20 gr | -6.500* | .645 | .000 | -7.91 | -5.09 |
| 10 gr | Kontrol - | 3.500* | .645 | .000 | 2.09 | 4.91 |
| | 15 gr | -1.500* | .645 | .039 | -2.91 | -.09 |
| | 20 gr | -3.000* | .645 | .001 | -4.41 | -1.59 |
| 15 gr | Kontrol - | 5.000* | .645 | .000 | 3.59 | 6.41 |
| | 10 gr | 1.500* | .645 | .039 | .09 | 2.91 |
| | 20 gr | -1.500* | .645 | .039 | -2.91 | -.09 |
| 20 gr | Kontrol - | 6.500* | .645 | .000 | 5.09 | 7.91 |
| | 10 gr | 3.000* | .645 | .001 | 1.59 | 4.41 |
| | 15 gr | 1.500* | .645 | .039 | .09 | 2.91 |

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

Lampiran 1.5 Kruskal-Wallis Kelompok Maserat

**Kruskal-Wallis Test**

**Ranks**

| | Dosis | N | Mean Rank |
|---|---|---|---|
| Total Larva Yang Mati | Kontrol | 1 | 1.00 |
| | 10 ml | 4 | 5.75 |
| | 15 ml | 4 | 7.13 |
| | 20 ml | 4 | 9.63 |
| | Total | 13 | |

**Test Statistics[a,b]**

| | Total Larva Yang Mati |
|---|---|
| Kruskal-Wallis H | 6.076 |
| df | 3 |
| Asymp. Sig. | .108 |

a. Kruskal Wallis Test

b. Grouping Variable: Dosis

**Lampiran 2 Dokumentasi Penelitian**

**Dokumentasi Pembuatan Larvasida Granular :**



Lampiran 2.1 Alat



Lampiran 2.2 Bahan



Lampiran 2.3 Daun Kemangi Segar



Lampiran 12.4 Daun Sirsak Segar



Lampiran 2.5 Daun Kemangi Kering



Lampiran 2.6 Daun Sirsak Kering



Lampiran 2.7 Penghalusan Daun Sirsak dan Daun Kemangi



Lampiran 2.8 Simplisa Daun Sirsak dan Daun Kemangi



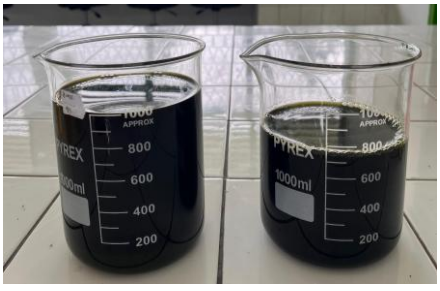
Lampiran 2.9 Simplisa dan Alkohol 70 %



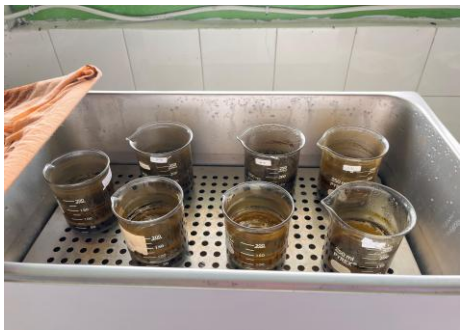
Lampiran 2.10 Proses Pencampuran Simplisa dan Alkohol 70%



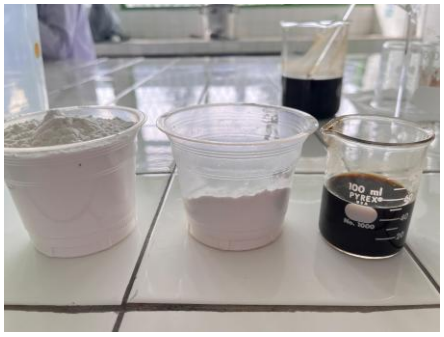
Lampiran 2.11 Penyimpanan




Lampiran 2.12 Hasil Maserasi



Lampiran 2. 13 Penguapan Dengan *Waterbath*



Lampiran 2.14 Filtrat dan Tepung Tapioka



Lampiran 2.15 Larvasida Granula



Lampiran 2.16 Jentik *Aedes Aegypti*



Lampiran 2.17 Uji Larvasida Granula Kombinasi Daun Sirsak dan Daun Kemangi

**Dokumentasi Larvasida Maserat :**



Lampiran 2.18 Alat



Lampiran 2.19 Bahan



Lampiran 2.20 Campuran Daun Kemangi dan Daun Sirsak dan Aquades



Lampiran 2.21 Proses Perendaman



Lampiran 2.22 Proses Penyaringan




Lampiran 2.23 Hasil Maserat



Lampiran 2.24 Uji Larvasida Maserat Daun Sirsak Dan Daun Kemangi

## Lampiran 3 Lembar Bimbingan

**KEMENTERIAN KESEHATAN POLITEKNIK KESEHATAN MEDAN**

**JURUSAN KESEHATAN LINGKUNGAN PRODI SARJANA TERAPAN SANITASI LINGKUNGAN**
**TA 2025/2026**

**LEMBAR BIMBINGAN SKRIPSI**

Nama Mahasiswa : SINDI FATIKAWA SEMBIRING
NIM : P00933222065
Dosen Pembimbing : DESY ARI APSARI, SKM. MPH
Judul Skripsi : EFEKTIVITAS KOMBINASI EKSTRAK DAUN SIRSAK (Annona Muricata L.) DAN DAUN KEMANGI (Ocimum Basilicum) SEBAGAI LARVASIDA AEDES AEGYPTI

| Pertemuan Ke | Hari/ Tanggal | Materi Bimbingan | Tanda Tangan Dosen |
|---|---|---|---|
| 1 | JUMAT, 24/10/2025 | Konsultasi Judul | |
| 2 | RABU, 05/11/2025 | Konsultasi Bab I | |
| 3 | JUMAT, 21/11/2025 | KONSULTASI Bab II | |
| 4 | SENIN, 15/12/2025 | KONSULTASI Bab III | |
| 5 | RABU, 07/01/2026 | Acc Proposal | |
| 6 | SENIN, 16/03/2026 | Bimbingan Revisi | |
| 7 | SELASA, 26/05/2026 | Konsultasi Penelitian | |
| 8 | JUMAT, 12/06/2026 | Bimbingan Analisis Data | |
| 9 | KAMIS, 25/06/2026 | Konsultasi BAB IV | |
| 10 | SENIN, 29/06/2026 | Perbaikan Hasil Analisis Data | |
| 11 | JUMAT, 03/07/2026 | Acc Maju Sidang | |
| 12 | SENIN, 10/08/2026 | Acc Perbaikan Skripsi | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Ketua Jurusan Kesehatan Lingkungan
Kemenkes Poltekkes Medan,

HAESTI SEMBIRING SST,MSc
NIP. 197206181997032003

## Lampiran 4 Lembar Revisi Seminar Proposal

**LEMBAR PERBAIKAN**
**SEMINAR PROPOSAL SKRIPSI MAHASISWA**
**PRODI SARJANA TERAPAN SANITASI LINGKUNGAN**
**KEMENKES POLTEKKES MEDAN**
**TAHUN AJARAN 2025/2026**

Nama : SINDI FATIHAWA SEMBIRING
NIM : P00933222065

| | Hal Yang Disarankan Perbaikan | Disposisi |
|---|---|---|
| Pembimbing | 1. Diagram penelitian dipindahkan di BAB. 3. | |
| Penguji I Pak Nelson | 1. Tambahkan dosis pada tujuan khusus<br>2. Ditambahkan dampak insektisida pada lingkungan. bahan kimia di label.<br>3. Potensi pengembangan. granula.<br>4. Dosis ditambahkan pada kerangka konsep.<br>5. Skema penelitian → Pengulang dikoreksi.<br>6. Ciri. ciri larva instar III hingga IV. | |
| Penguji II Ibu Marina | 1. Tambahkan DO tentang LDCO. ✓<br>2. Justifikasi penelitian metode maserasi ✓<br>3. Pertimbangkan pengulangan. 5x.<br>4. Pertimbangkan kontrol. - ✓ | |

Kabanjahe, Selasa, 13 Januari 2026
Ketua Jurusan Kesehatan Lingkungan

Haesti Sembiring, SST,M.Sc
NIP. 197206181997032003

## Lampiran 5 Lembar Revisi Seminar Hasil

**LEMBAR PERBAIKAN**
**UJIAN SIDANG SKRIPSI MAHASISWA**
**PRODI SARJANA TERAPAN SANITASI LINGKUNGAN**
**KEMENKES POLTEKKES MEDAN**
**TAHUN AJARAN 2025/2026**

Nama : Sindi Fatikawo Sembiring
NIM : P00933222065

| | Hal Yang Disarankan Perbaikan | Disposisi |
|---|---|---|
| Pembimbing<br>Dety | Disesuaikan dengan matriksnya pengaj | |
| Penguji I<br>Pak. Tanjung | 1. Kata pengantar.<br>2. Tujuan khusus. ditambah<br>3. Hipotesis diperbaik.<br>4. Pembahasan. ditambah<br>5. Perbaikan tata tulis<br>6. Keterangan gambar.<br>7. Refrensi | |
| Penguji II<br>Ibu Marina | 1. Pembahasan diperdalam. ditambahkan refrensi<br>2. Narasi pada hal 66 - 67 digabungkan. dalam narasi pembahasan<br>3. Perbaikan judul tabel. dan judul tabel<br>4. Kesimpulan. diperbaiki dan disesuaikan. dengan tujuan. khusus<br>5. Penjelasan tentang efektifitas | |

Kabanjahe, 10 Juli 2026
Ketua Jurusan Kesehatan Lingkungan

Risnawati Tarigan, SKM,MKes
NIP.197505042000122003

## Lampiran 6 Surat Izin Penelitian

Kepada Yth
Ketua Jurusan Kesehatan Lingkungan
Di
Tempat

Dengan hormat,
Sehubungan degan penelitian yang akan saya lakukan guna untuk menyelesaikan Tugas Akhir/Penelitian, maka dengan ini :

Nama : Sindi Fatikawa Sembiring
NIM : P00933222065
Prodi : Sarjana Terapan Sanitasi Lingkungan
Judul : Efektivitas Larvasida Granular Dan Maserat Kombinasi Ekstrak Daun Sirsak *(Annona Muricata)* Dan Daun Kemangi *(Ocimum Sanctum)* Terhadap Larva *Aedes Aegypti*

No.HP : 081378659189

Bermaksud memakai ruangan di Laboratorium Mikrobiologi pada tanggal 15, 17, 18 Juni 2026 (selama 3 hari). Demikian permohonan saya, atas izin dan perhatiannya, saya ucapkan terima kasih.

Kabanjahe, 2026

Menyetujui
Ketua Jurusan Kesehatan Lingkungan

Haesti Sembiring,S.ST, M.Sc
NIP. 197206181997032003

Peneliti

Sindi Fatikawa Sembiring
NIM : P00933222065

## Lampiran 7 Etical Clearance

Kementerian Kesehatan
Poltekkes Medan
Komisi Etik Penelitian Kesehatan
Jalan Jamin Ginting KM. 13,5
Medan, Sumatera Utara 20137
(061) 8368633
https://poltekkes-medan.ac.id

**KETERANGAN LAYAK ETIK**
*DESCRIPTION OF ETHICAL EXEMPTION*
"ETHICAL EXEMPTION"

No.01.26.3801/KEPK/POLTEKKES KEMENKES MEDAN 2026

Protokol penelitian versi 1 yang diusulkan oleh :
*The research protocol proposed by*

Peneliti utama : Sindi Fatikawa Sembiring
*Principal In Investigator*

Nama Institusi : Poltekkes Kemenkes Medan
*Name of the Institution*

Dengan judul:
*Title*

**"Efektivitas Larvasida Granular Dan Maserat Kombinasi Ekstrak Daun Sirsak (Annona mucirata) Dan Daun Kemangi (Ocimum sanctum) Terhadap Larva Aedes aegypti"**

*"Effectiveness of Granular Larvicide and Macerate of Combined Soursop (Annona muricata) and Holy Basil (Ocimum sanctum) Leaf Extracts Against Aedes aegypti Larvae"*

Dinyatakan layak etik sesuai 7 (tujuh) Standar WHO 2011, yaitu 1) Nilai Sosial, 2) Nilai Ilmiah, 3) Pemerataan Beban dan Manfaat, 4) Risiko, 5) Bujukan/Eksploitasi, 6) Kerahasiaan dan Privacy, dan 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 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Concent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.*

Pernyataan Laik Etik ini berlaku selama kurun waktu tanggal 31 Agustus 2026 sampai dengan tanggal 31 Agustus 2027.

*This declaration of ethics applies during the period August 31, 2026 until August 31, 2027.*

*August 31, 2026*
*Chairperson,*

Dr. Lestari Rahmah, MKT

## Lampiran 8 Abstrak


**ABSTRACT**

**EFFICACY OF GRANULAR AND MACERATE LARVICIDES COMBINING SOURSOP LEAF *(Annona muricata)* AND HOLY BASIL LEAF *(Ocimum sanctum)* EXTRACTS AGAINST *Aedes aegypti* LARVAE**



**SINDI FATIKAWA SEMBIRING, DESY ARI APSARI, SKM, MPH**

**Medan Health Polytechnic Of The Ministry Of Health**

cindysembiring3@gmail.com



Controlling *Aedes aegypti* mosquito vectors at the larval stage represents a crucial strategy to break the transmission chain of Dengue Hemorrhagic Fever (DBD) while avoiding the risk of vector resistance to synthetic larvicides. This study aims to evaluate and compare the efficacy of a natural larvicide combining soursop leaf (*Annona muricata*) and holy basil leaf (*Ocimum sanctum*) extracts in two distinct formulation forms: granular and macerate. This was a laboratory experimental study conducted on *Aedes aegypti* larvae with four replications. The granular formulation group was tested with dosage weight variations of 10 grams, 15 grams, and 20 grams, whereas the macerate formulation used volume variations of 10 ml, 15 ml, and 20 ml over an exposure duration of 1 hour. Data analysis was performed using the One-Way ANOVA test for the granular group and the Kruskal-Wallis test for the macerate group following preliminary normality and homogeneity tests.

The results demonstrated that the granular formulation was significantly effective in inducing larval mortality ($F = 37.200$; $p = 0.000$), where the maximum dose of 20 grams consistently met the Lethal Dose 50% (LD50) criteria precisely at the 60-minute mark with an average mortality of 6.5 larvae. Conversely, the crude macerate formulation did not exhibit significant efficacy within the 1-hour time frame ($p = 0.108$) and failed to reach the LD50 threshold across all treatment units due to the high dilution level of the aqueous macerate formulation. In conclusion, the granular formulation featuring slow-release characteristics is substantially more effective as a delivery system for natural larvicidal phytochemical compounds than the liquid macerate form.



**Keywords:** *Aedes aegypti*, Granular, Natural Larvicide, Macerate, Mortality



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