



Laporan Hasil Penelitian

Optimasi Ekstraksi Minyak Atsiri Daun Serai Wangi (*Cymbopogon nardus* L.) Berbantuan Gelombang Ultrasonik dan Mikro dengan *Response Surface Methodology*

LAMPIRAN I

1. Data Hasil Penelitian

Tabel 1. Analisis *Yield* Minyak Atsiri Daun Serai Wangi yang Dihasilkan

| Waktu Ekstraksi (Menit) | Konsentrasi Larutan Garam (%b/v) | Berat Minyak I (gram) | Berat Minyak II (gram) | Yield Minyak I (%) | Yield Minyak II (%) | Yield Minyak Rata-Rata (%) |
|-------------------------|----------------------------------|-----------------------|------------------------|--------------------|---------------------|----------------------------|
| 30 | 2 | 0.37 | 0.43 | 0.925 | 1.075 | 1 |
| | 4 | 0.52 | 0.53 | 1.3 | 1.325 | 1.3125 |
| | 6 | 0.55 | 0.59 | 1.375 | 1.475 | 1.425 |
| | 8 | 0.51 | 0.62 | 1.275 | 1.55 | 1.4125 |
| | 10 | 0.28 | 0.57 | 0.7 | 1.425 | 1.0625 |
| 45 | 2 | 0.44 | 0.68 | 1.1 | 1.7 | 1.4 |
| | 4 | 0.63 | 0.62 | 1.575 | 1.55 | 1.5625 |
| | 6 | 0.66 | 0.7 | 1.65 | 1.75 | 1.7 |
| | 8 | 0.58 | 0.66 | 1.45 | 1.65 | 1.55 |
| | 10 | 0.36 | 0.6 | 0.9 | 1.5 | 1.2 |
| 60 | 2 | 0.64 | 0.54 | 1.6 | 1.35 | 1.475 |
| | 4 | 0.75 | 0.68 | 1.875 | 1.7 | 1.7875 |
| | 6 | 0.82 | 0.76 | 2.05 | 1.9 | 1.975 |
| | 8 | 0.76 | 0.63 | 1.9 | 1.575 | 1.7375 |
| | 10 | 0.69 | 0.65 | 1.725 | 1.625 | 1.675 |
| 75 | 2 | 0.46 | 0.53 | 1.15 | 1.325 | 1.2375 |
| | 4 | 0.73 | 0.54 | 1.825 | 1.35 | 1.5875 |
| | 6 | 0.76 | 0.69 | 1.9 | 1.725 | 1.8125 |
| | 8 | 0.57 | 0.68 | 1.425 | 1.7 | 1.5625 |
| | 10 | 0.45 | 0.53 | 1.125 | 1.325 | 1.225 |
| | 2 | 0.59 | 0.6 | 1.475 | 1.5 | 1.4875 |



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| Waktu Ekstraksi (Menit) | Konsentrasi Larutan Garam (%b/v) | Berat Minyak I (gram) | Berat Minyak II (gram) | Yield Minyak I (%) | Yield Minyak II (%) | Yield Minyak Rata-Rata (%) |
|-------------------------|----------------------------------|-----------------------|------------------------|--------------------|---------------------|----------------------------|
| 90 | 4 | 0.66 | 0.64 | 1.65 | 1.6 | 1.625 |
| | 6 | 0.68 | 0.68 | 1.7 | 1.7 | 1.7 |
| | 8 | 0.64 | 0.59 | 1.6 | 1.475 | 1.5375 |
| | 10 | 0.58 | 0.61 | 1.45 | 1.525 | 1.4875 |

Tabel 2. Analisis Densitas Minyak Atsiri Daun Serai Wangi yang Dihilangkan

| Waktu Ekstraksi (Menit) | Konsentrasi Larutan Garam (%b/v) | Berat Piknometer Isi (gram) | Berat Piknometer Kosong (gram) | Densitas Minyak (gr/ml) |
|-------------------------|----------------------------------|-----------------------------|--------------------------------|-------------------------|
| 30 | 2 | 8.0375 | 7.1816 | 0.8559 |
| | 4 | 8.0406 | 7.1816 | 0.859 |
| | 6 | 8.0436 | 7.1816 | 0.862 |
| | 8 | 8.0451 | 7.1816 | 0.8635 |
| | 10 | 8.0474 | 7.1816 | 0.8658 |
| 45 | 2 | 8.0424 | 7.1816 | 0.8608 |
| | 4 | 8.0433 | 7.1816 | 0.8617 |
| | 6 | 8.0453 | 7.1816 | 0.8637 |
| | 8 | 8.047 | 7.1816 | 0.8654 |
| | 10 | 8.0525 | 7.1816 | 0.8709 |
| 60 | 2 | 8.0445 | 7.1816 | 0.8629 |
| | 4 | 8.0465 | 7.1816 | 0.8649 |
| | 6 | 8.049 | 7.1816 | 0.8674 |
| | 8 | 8.0519 | 7.1816 | 0.8703 |
| | 10 | 8.0611 | 7.1816 | 0.8795 |



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| Waktu Ekstraksi (Menit) | Konsentrasi Larutan Garam (%b/v) | Berat Piknometer Isi (gram) | Berat Piknometer Kosong (gram) | Densitas Minyak (gr/ml) |
|-------------------------|----------------------------------|-----------------------------|--------------------------------|-------------------------|
| 75 | 2 | 8.0456 | 7.1816 | 0.864 |
| | 4 | 8.0475 | 7.1816 | 0.8659 |
| | 6 | 8.0525 | 7.1816 | 0.8709 |
| | 8 | 8.0538 | 7.1816 | 0.8722 |
| | 10 | 8.055 | 7.1816 | 0.8734 |
| 90 | 2 | 8.046 | 7.1816 | 0.8644 |
| | 4 | 8.05 | 7.1816 | 0.8684 |
| | 6 | 8.0542 | 7.1816 | 0.8726 |
| | 8 | 8.057 | 7.1816 | 0.8754 |
| | 10 | 8.059 | 7.1816 | 0.8774 |

Berat Piknometer = 7,1816 gram

Volume Piknometer = 1 ml

2. Perhitungan

a. Perhitungan Konsentrasi Larutan Garam 2%

1. Volume Larutan Labu

$$\% \frac{B}{V} = \frac{\text{Berat Garam}}{\text{Volume Larutan}}$$

$$2\% = \frac{\text{Berat Garam}}{400 \text{ ml}}$$

$$\text{Berat Garam} = 8 \text{ gram}$$

2. Volume Larutan Clavenger

$$\% \frac{B}{V} = \frac{\text{Berat Garam}}{\text{Volume Larutan}}$$



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$$2\% = \frac{\text{Berat Garam}}{45 \text{ ml}}$$

$$\text{Berat Garam} = 0,9 \text{ gram}$$

$$\text{Volume Larutan Labu} = 400 \text{ ml}$$

$$\text{Volume Larutan Clavenger} = 45 \text{ ml}$$

b. Perhitungan Densitas

$$\rho = \frac{\text{Berat Piknometer Isi} - \text{Berat Piknometer Kosong}}{\text{Volume Piknometer}}$$

$$\rho = \frac{8,0525 \text{ gram} - 7,1816 \text{ gram}}{1 \text{ ml}}$$

$$\rho = 0,8709 \frac{\text{gram}}{\text{ml}}$$

$$\text{Piknometer Kosong} = 7,1816 \text{ gram}$$

$$\text{Volume Piknometer} = 1 \text{ ml}$$

c. Perhitungan Yield

1. Perhitungan Yield

$$\text{Yield (\%)} = \frac{\text{Berat Minyak Atsiri Daun Serai Wangi}}{\text{Berat Daun Serai Kering}} \times 100\%$$

$$\text{Yield (\%)} = \frac{0,52 \text{ gram}}{40 \text{ gram}} \times 100\%$$

$$\text{Yield (\%)} = 1,3\%$$

2. Perhitungan Yield Rata-Rata

$$\text{Yield (\%)} = \frac{\text{Yield I} + \text{Yield II}}{2}$$

$$\text{Yield (\%)} = \frac{0,925 \% + 1,075 \%}{2}$$

$$\text{Yield (\%)} = 1\%$$

d. Perhitungan Kadar Air yang Hilang Daun Serai Wangi

$$\text{Kadar Air Hilang (\%)} = \frac{\text{Berat Segar} - \text{Berat Kering}}{\text{Berat Segar}}$$

$$\text{Kadar Air Hilang (\%)} = \frac{10 \text{ gram} - 3,5 \text{ gram}}{10 \text{ gram}} \times 100\%$$



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Kadar Air Hilang (%) = 65%

Kadar air yang hilang diukur setelah dilakukan pengovenan selama 90 menit dengan suhu 100°C. Pada kondisi tersebut berat kering daun serai wangi sudah berada pada keadaan konstan