

Lampiran 1. Perhitungan Zona hambat minyak atsiri kemangi

1. Bakteri *Pseudomonas aeruginosa*

A. Konsetrasi 5%

$$\begin{aligned} A1. &= \frac{1,6+1,5}{2} \\ &= 1,55 \times 10 \\ &= 15,5 \text{ mm} \end{aligned}$$

$$\begin{aligned} A2. &= \frac{1,6+1,6}{2} \\ &= 1,6 \times 10 \\ &= 16 \text{ mm} \end{aligned}$$

$$\begin{aligned} A3. &= \frac{1,3+1,3}{2} \\ &= 1,3 \times 10 \\ &= 13 \text{ mm} \end{aligned}$$

Rata-rata diameter zona hambat :

$$\begin{aligned} &= A1 + A2 + A3 \\ &= \frac{15,5+16+13}{3} \\ &= 14,8 \text{ mm} \end{aligned}$$

B. Konsetrasi 10%

$$\begin{aligned} B1. &= \frac{1,6+1,6}{2} \\ &= 1,6 \times 10 \\ &= 16 \text{ mm} \end{aligned}$$

$$\begin{aligned} B2. &= \frac{1,6+1,6}{2} \\ &= 1,6 \times 10 \\ &= 16 \text{ mm} \end{aligned}$$

$$\begin{aligned} B3. &= \frac{1,6+1,5}{2} \\ &= 1,55 \times 10 \\ &= 15,5 \text{ mm} \end{aligned}$$

Rata-rata diameter zona hambat :

$$= B1 + B2 + B3$$

$$= \frac{16+16+15,5}{3}$$

$$= 15,8 \text{ mm}$$

C. Konsetrasi 15%

$$C1. = \frac{1,8+1,7}{2}$$

$$= 1,75 \times 10$$

$$= 17,5 \text{ mm}$$

$$C2. = \frac{1,7+1,7}{2}$$

$$= 1,7 \times 10$$

$$= 17 \text{ mm}$$

$$C3. = \frac{1,6+1,6}{2}$$

$$= 1,6 \times 10$$

$$= 16 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= C1 + C2 + C3$$

$$= \frac{17,5+17+16}{3}$$

$$= 16,6 \text{ mm}$$

2. Bakteri *Streptococcus pyogenes*

A. Konsetrasi 5%

$$A1. = \frac{1,4+1,4}{2}$$

$$= 1,4 \times 10$$

$$= 14 \text{ mm}$$

$$A2. = \frac{1,4+1,4}{2}$$

$$= 1,4 \times 10$$

$$= 14 \text{ mm}$$

$$A3. = \frac{1,3+1,3}{2}$$

$$= 1,3 \times 10$$

$$= 13 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= A1 + A2 + A3$$

$$= \frac{14+14+13}{3}$$

$$= 13,6 \text{ mm}$$

B. Konsentrasi 10%

$$B1. = \frac{1,6+1,6}{2}$$

$$= 1,6 \times 10$$

$$= 16 \text{ mm}$$

$$B2. = \frac{1,5+1,5}{2}$$

$$= 1,5 \times 10$$

$$= 15 \text{ mm}$$

$$B3. = \frac{1,4+1,5}{2}$$

$$= 1,45 \times 10$$

$$= 14,5 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= B1 + B2 + B3$$

$$= \frac{16+15+14,5}{3}$$

$$= 15,1 \text{ mm}$$

C. Konsentrasi 15%

$$C1. = \frac{1,8+1,8}{2}$$

$$= 1,8 \times 10$$

$$= 18 \text{ mm}$$

$$C2. = \frac{1,5+1,5}{2}$$

$$= 1,5 \times 10$$

$$= 15 \text{ mm}$$

$$C3. = \frac{1,6+1,5}{2}$$

$$= 1,55 \times 10$$

$$= 15,5 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= C1 + C2 + C3$$

$$= \frac{18+15+16}{3}$$

$$= 16,3 \text{ mm}$$

3. Bakteri *Streptococcus intermedius*

A. Konsentrasi 5%

$$A1. = \frac{1,1+1,2}{2}$$

$$= 1,15 \times 10$$

$$= 11,5 \text{ mm}$$

$$A2. = \frac{1,2+1,2}{2}$$

$$= 1,2 \times 10$$

$$= 12 \text{ mm}$$

$$A3. = \frac{1,1+1,1}{2}$$

$$= 1,1 \times 10$$

$$= 11 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= A1 + A2 + A3$$

$$= \frac{11,5+12+11}{3}$$

$$= 11,5 \text{ mm}$$

B. Konsentrasi 10%

$$B1. = \frac{1,5+1,5}{2}$$

$$= 1,5 \times 10$$

$$= 15 \text{ mm}$$

$$B2. = \frac{1,4+1,5}{2}$$

$$= 1,45 \times 10$$

$$= 14,5 \text{ mm}$$

$$B3. = \frac{1,2+1,2}{2}$$

$$= 1,2 \times 10$$

$$= 12 \text{ mm}$$

$$B3. = \frac{1,2+1,2}{2}$$

$$= 1,2 \times 10$$

$$= 12 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= B1 + B2 + B3$$

$$= \frac{15+14,5+12}{3}$$

$$= 13,8 \text{ mm}$$

C. Konsentrasi 15%

$$C1. = \frac{1,3+1,3}{2}$$

$$= 1,3 \times 10$$

$$= 13 \text{ mm}$$

$$C2. = \frac{1,2+1,2}{2}$$

$$= 1,2 \times 10$$

$$= 12 \text{ mm}$$

$$C3. = \frac{1,4+1,4}{2}$$

$$= 1,4 \times 10$$

$$= 14 \text{ mm}$$

Rata-rata diameter zona hambat :

$$= C1 + C2 + C3$$

$$= \frac{13+12+14}{3}$$

$$= 15,5 \text{ mm.}$$

Lampiran 2. Perhitungan

Pembuatan Konsentrasi Minyak atsiri

Diketahui : Konsentrasi (Vial 1) = 5%

 Konsentrasi (Vial 2) = 10%

 Konsentrasi (Vial 3) = 15%

 Minyak Atsiri = 20 ml

 Tween 80 = 100 ml

Penyelesaian :

$$1. \quad \text{Konsentrasi } 5\% \quad = \frac{5\%}{100} \times 5 \quad = 0,25 \text{ ml}$$

$$\text{Pelarut} \quad = 5 - 0,25 \text{ ml} \quad = 4,75 \text{ ml}$$

$$2. \quad \text{Konsentrasi } 10\% \quad = \frac{10\%}{100} \times 5 \quad = 0,5 \text{ ml}$$

$$\text{Pelarut} \quad = 5 - 0,5 \text{ ml} \quad = 4,5 \text{ ml}$$

$$3. \quad \text{Konsentrasi } 15\% \quad = \frac{15\%}{100} \times 5 \quad = 0,75 \text{ ml}$$

$$\text{Pelarut} \quad = 5 - 0,75 \text{ ml} \quad = 4,25 \text{ ml}$$

Lampiran 3. Hasil Pengukuran Zona Hambat

1. Tabel hasil pengukuran zona hambat pada pengujian minyak atsiri daun kemangi terhadap bakteri *Pseudomonas aeruginosa*

Minyak Atsiri Daun Kemangi (<i>Ocimum Basilicum L.</i>)	Diameter Zona Hambat			Kekuatan Hambatan
	I	II	III	
Konsentrasi 5%	15,5	16	13	Kuat
Konsentrasi 10%	16	16	15,5	Kuat
Konsentrasi 15%	17,5	17	16	Kuat
K+	28	29	33	Sangat kuat
K-	0	0	0	Lemah

2. Tabel hasil pengukuran zona hambat pada pengujian minyak atsiri daun kemangi terhadap bakteri *Streptococcus pyogenes*

Minyak Atsiri Daun Kemangi (<i>Ocimum Basilicum L.</i>)	Diameter Zona Hambat			Kekuatan Hambatan
	I	II	III	
Konsentrasi 5%	14	14	13	Kuat
Konsentrasi 10%	16	15	14,5	Kuat
Konsentrasi 15%	18	15	15,5	Kuat
K +	23	23	25	Sangat Kuat
K-	0	0	0	Lemah

3. Tabel hasil pengukuran zona hambat pada pengujian minyak atsiri daun kemangi *Streptococcus intermedius*

Minyak Atsiri Daun Kemangi (<i>Ocimum Basilicum L.</i>)	Diameter Zona Hambat			Kekuatan Hambatan
	I	II	III	
Konsentrasi 5%	11,5	12	11	Kuat
Konsentrasi 10%	15	14,5	12	Kuat
Konsentrasi 15%	13	12,5	14	Kuat
K+	18	19	18	Kuat
K-	0	0	0	Lemah

Lampiran 4. Hasil Uji Statistika Aktivitas Antibakteri terhadap bakteri
Pseudomonas aeruginosa

ANOVA

Zona hambat P.aeruginosa

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1358.500	4	339.625	165.671	.000
Within Groups	20.500	10	2.050		
Total	1379.000	14			

Zona hambat P.aeruginosa

Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
K-	3	.0000		
5%	3		14.8333	
10%	3		15.8333	
15%	3		16.8333	
K+	3			30.0000
Sig.		1.000	.469	1.000

Multiple Comparisons

Dependent Variable: Zona hambat P.aeruginosa

Tukey HSD

(I) Konsentrasi	(J) Konsentrasi	Mean Differen (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
K-	K+	-30.00000*	1.16905	.000	-33.8474	-26.1526
	5%	-14.83333*	1.16905	.000	-18.6808	-10.9859
	10%	-15.83333*	1.16905	.000	-19.6808	-11.9859
	15%	-16.83333*	1.16905	.000	-20.6808	-12.9859
K+	K-	30.00000*	1.16905	.000	26.1526	33.8474
	5%	15.16667*	1.16905	.000	11.3192	19.0141
	10%	14.16667*	1.16905	.000	10.3192	18.0141
	15%	13.16667*	1.16905	.000	9.3192	17.0141
5%	K-	14.83333*	1.16905	.000	10.9859	18.6808
	K+	-15.16667*	1.16905	.000	-19.0141	-11.3192
	10%	-1.00000	1.16905	.907	-4.8474	2.8474
	15%	-2.00000	1.16905	.469	-5.8474	1.8474
10%	K-	15.83333*	1.16905	.000	11.9859	19.6808
	K+	-14.16667*	1.16905	.000	-18.0141	-10.3192
	5%	1.00000	1.16905	.907	-2.8474	4.8474
	15%	-1.00000	1.16905	.907	-4.8474	2.8474
15%	K-	16.83333*	1.16905	.000	12.9859	20.6808
	K+	-13.16667*	1.16905	.000	-17.0141	-9.3192
	5%	2.00000	1.16905	.469	-1.8474	5.8474
	10%	1.00000	1.16905	.907	-2.8474	4.8474

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

Lanjutan. Hasil Uji Statistika Aktivitas Antibakteri terhadap bakteri *Streptococcus pyogenes*

ANOVA

Zona hambat S.pyogenes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	885.767	4	221.442	229.078	.000
Within Groups	9.667	10	.967		
Total	895.433	14			

Zona hambat S.pyogenes

Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
K-	3	.0000		
5%	3		13.6667	
10%	3		15.1667	
15%	3		16.1667	
K+	3			23.6667
Sig.		1.000	.066	1.000

Multiple Comparisons

Dependent Variable: Zona hambat *S.pyogenes*

Tukey HSD

(I) Konsentrasi	(J) Konsentrasi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
K-	K+	-23.66667*	.80277	.000	-26.3087	-21.0247
	5%	-13.66667*	.80277	.000	-16.3087	-11.0247
	10%	-15.16667*	.80277	.000	-17.8087	-12.5247
	15%	-16.16667*	.80277	.000	-18.8087	-13.5247
K+	K-	23.66667*	.80277	.000	21.0247	26.3087
	5%	10.00000*	.80277	.000	7.3580	12.6420
	10%	8.50000*	.80277	.000	5.8580	11.1420
	15%	7.50000*	.80277	.000	4.8580	10.1420
5%	K-	13.66667*	.80277	.000	11.0247	16.3087
	K+	-10.00000*	.80277	.000	-12.6420	-7.3580
	10%	-1.50000	.80277	.391	-4.1420	1.1420
	15%	-2.50000	.80277	.066	-5.1420	.1420
10%	K-	15.16667*	.80277	.000	12.5247	17.8087
	K+	-8.50000*	.80277	.000	-11.1420	-5.8580
	5%	1.50000	.80277	.391	-1.1420	4.1420
	15%	-1.00000	.80277	.727	-3.6420	1.6420
15%	K-	16.16667*	.80277	.000	13.5247	18.8087
	K+	-7.50000*	.80277	.000	-10.1420	-4.8580
	5%	2.50000	.80277	.066	-.1420	5.1420
	10%	1.00000	.80277	.727	-1.6420	3.6420

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

Lanjutan. Hasil Uji Statistika Aktivitas Antibakteri terhadap bakteri *Streptococcus intermedius*

ANOVA

Zona Hambat S.intermedius

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	599.500	4	149.875	48.608	.000
Within Groups	30.833	10	3.083		
Total	630.333	14			

Zona Hambat S.intermedius

Tukey HSD^a

Konsentrasi	N	Subset for alpha = 0.05		
		1	2	3
K-	3	.0000		
5%	3		11.5000	
10%	3		13.8333	13.8333
15%	3		15.5000	15.5000
K+	3			18.3333
Sig.		1.000	.108	.063

Multiple Comparisons

Dependent Variable: Zona Hambat S.intermedius

Tukey HSD

(I) Konsentrasi	(J) Konsentrasi	Mean Differen (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
K-	K+	-18.33333*	1.43372	.000	-23.0518	-13.6148
	5%	-11.50000*	1.43372	.000	-16.2185	-6.7815
	10%	-13.83333*	1.43372	.000	-18.5518	-9.1148
	15%	-15.50000*	1.43372	.000	-20.2185	-10.7815
K+	K-	18.33333*	1.43372	.000	13.6148	23.0518
	5%	6.83333*	1.43372	.005	2.1148	11.5518
	10%	4.50000	1.43372	.063	-.2185	9.2185
	15%	2.83333	1.43372	.342	-1.8852	7.5518
5%	K-	11.50000*	1.43372	.000	6.7815	16.2185
	K+	-6.83333*	1.43372	.005	-11.5518	-2.1148
	10%	-2.33333	1.43372	.514	-7.0518	2.3852
	15%	-4.00000	1.43372	.108	-8.7185	.7185
10%	K-	13.83333*	1.43372	.000	9.1148	18.5518
	K+	-4.50000	1.43372	.063	-9.2185	.2185
	5%	2.33333	1.43372	.514	-2.3852	7.0518
	15%	-1.66667	1.43372	.771	-6.3852	3.0518
15%	K-	15.50000*	1.43372	.000	10.7815	20.2185
	K+	-2.83333	1.43372	.342	-7.5518	1.8852
	5%	4.00000	1.43372	.108	-.7185	8.7185
	10%	1.66667	1.43372	.771	-3.0518	6.3852

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

Lampiran 5. Dokumentasi penelitian

Gambar	Keterangan
	Menimbang media Na
	Proses melarutkan media NA hingga menjadi bening
	Mensterilisasikan media NA ke dalam alat autoklaf
	Proses pembuatan media NA miring
	Peremajaan bakteri

			Proses penanaman kultur bakteri ke dalam media NB
			Memfortex media NB yang telah diinkubasi
			Proses mensterilisasi cawan petri, kertas cakram serta pinset
			Proses penuangan media NA
			Proses peletakkan kertas cakram

	Media uji diinkubasi dengan posisi terbalik
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Lampiran 6. (Lanjutan)

 Kultur Bakteri Murni	 Macam-macam konsentrasi
 Magnetik stirer	 Autoklaf
 Laminar Air Flow	 Oven



Media NA dan Media NB



Minyak Atsiri kemangi



Tween 80



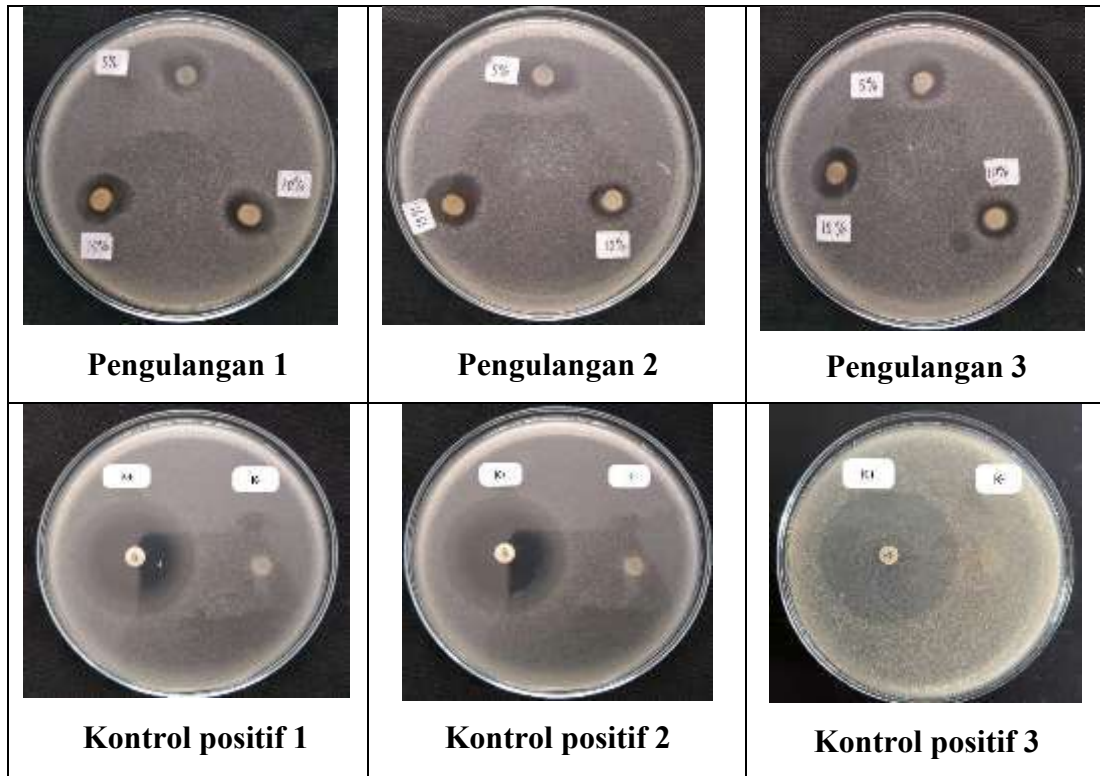
Aquadest



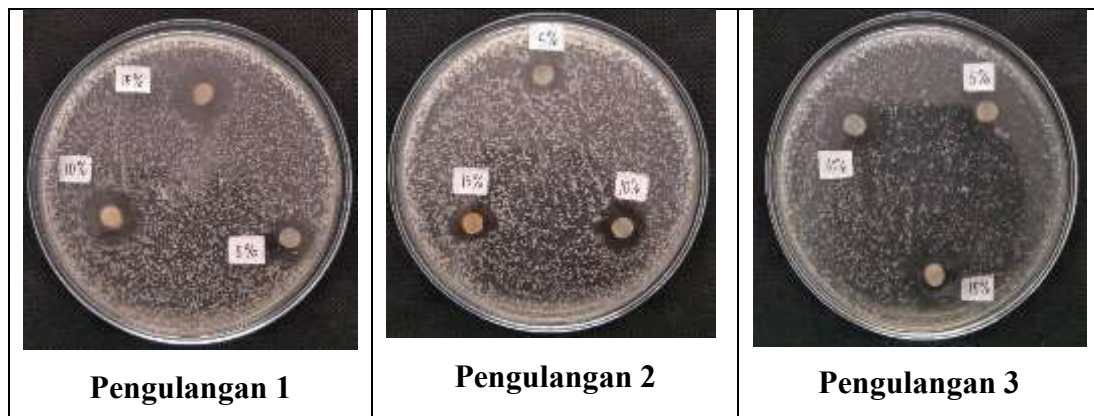
Klorphenicol

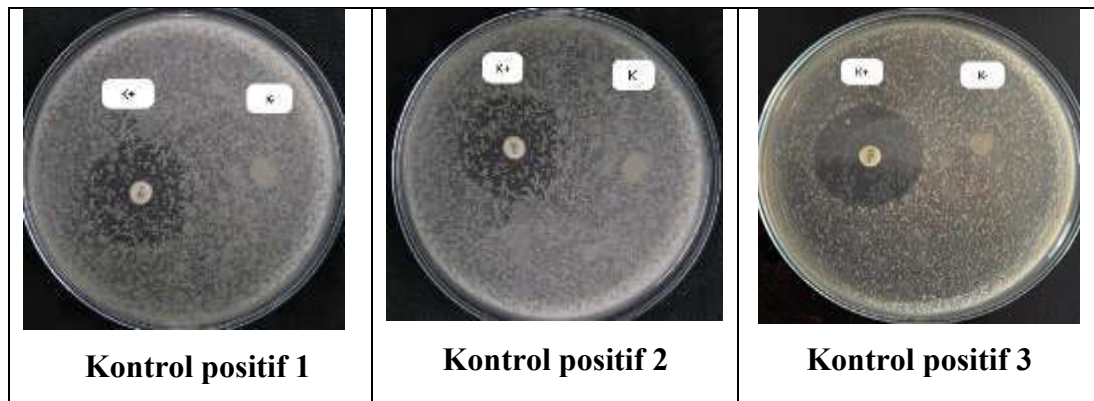
Lampiran 7. Gambar hasil pengamatan aktivitas daya hambat minyak atsiri terhadap 3 jenis bakteri uji

1. Bakteri *Pseudomonas aeruginosa*



2. Bakteri *Streptococcus pyogenes*





3. Bakteri *Streptococcus intermedius*

