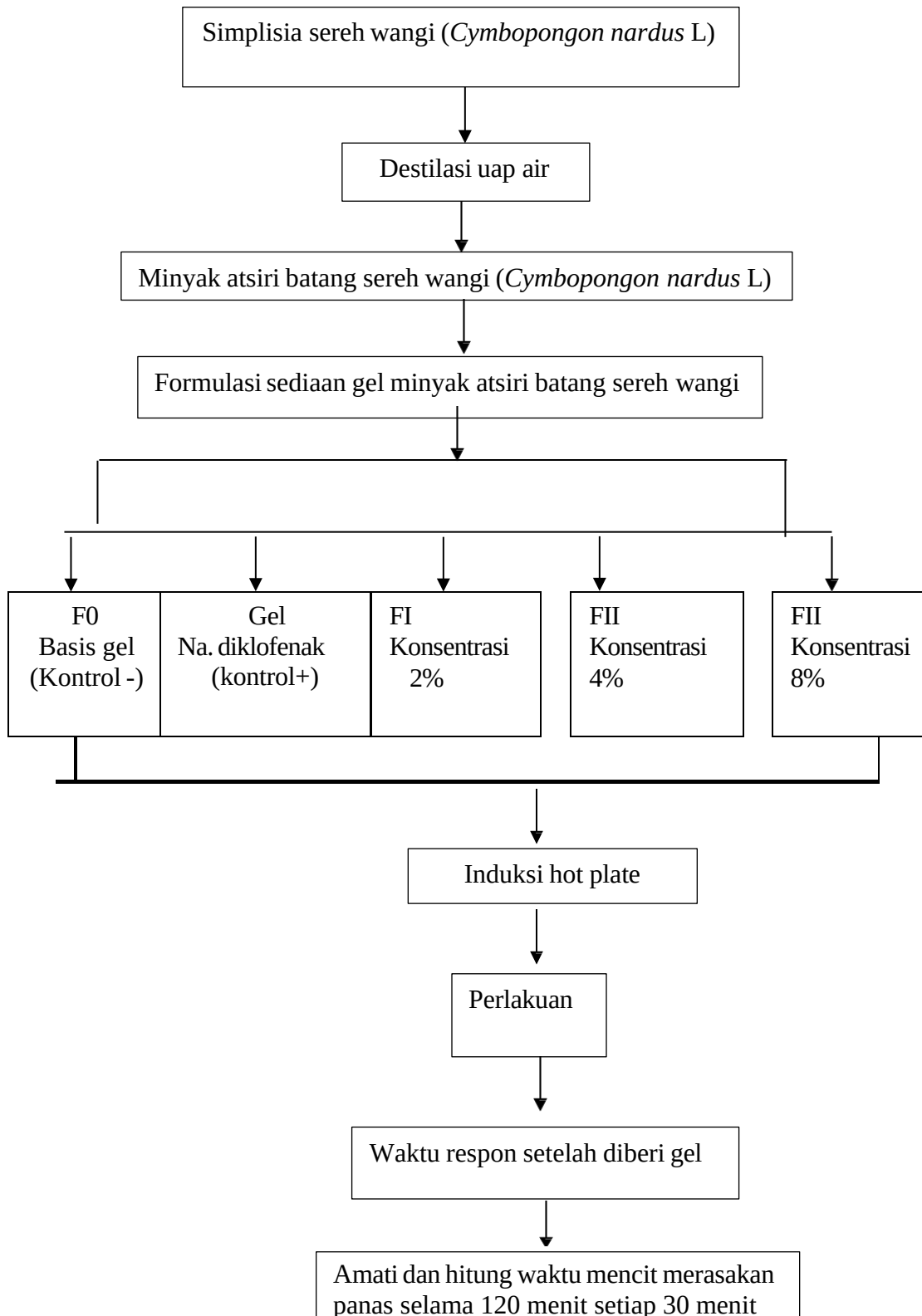


Lampiran 1. Kerangka konseptual



Lampiran 2. Formulasi dan Perhitungan Bahan Sediaan Gel

1. Formula Gel Minyak Atsiri Sereh Wangi (*Cymbopogon nardus* L.)

Bahan	Konsentrasi				Fungsi
	F0	F1	F2	F3	
Minyak atsiri Sereh wangi	-	2%	4%	6%	Zat aktif
Carbomer 940	0,5%	0,5%	0,5%	0,5%	Gelling agen
Propilen glikol	5%	5%	5%	5%	Humektan
TEA	2%	2%	2%	2%	Penetral pH
Metil paraben	0,3%	0,3%	0,3%	0,3%	Pengawet
Propil paraben	0,01%	0,01%	0,01%	0,01%	Pengawet
Aqua Destillata	Ad 100	Ad 100	Ad 100	Ad 100	Pelarut

2. Perhitungan Bahan

a. F0 konsentrasi 0%

$$\text{Carbomer} = \frac{0,5}{100} \times 20 \text{ gr} = 0,1 \text{ gr}$$

$$\text{Propilenglikol} = \frac{5}{100} \times 20 \text{ gr} = 1 \text{ gr}$$

$$\text{TEA} = \frac{2}{100} \times 20 \text{ gr} = 0,4 \text{ gr}$$

$$\text{Metil paraben} = \frac{0,3}{100} \times 20 \text{ gr} = 0,06 \text{ gr}$$

$$\text{Propil paraben} = \frac{0,01}{100} \times 20 \text{ gr} = 0,002 \text{ gr}$$

$$\begin{aligned} \text{Aquadest} &= 20 - (0,1+1+0,4+0,06+0,002) \\ &= 20 - 1,562 \\ &= 18,43 \text{ gr} \end{aligned}$$

b. F1 Konsentrasi 2%

$$\text{Minyak Atsiri Sereh Wangi} = \frac{2}{100} \times 20 \text{ gr} = 0,4 \text{ gr}$$

$$\text{Carbomer} = \frac{0,5}{100} \times 20 \text{ gr} = 0,1 \text{ gr}$$

$$\begin{aligned}
 \text{Propilenglikol} &= \frac{5}{100} \times 20 \text{ gr} = 1 \text{ gr} \\
 \text{TEA} &= \frac{2}{100} \times 20 \text{ gr} = 0,4 \text{ gr} \\
 \\
 \text{Metil paraben} &= \frac{0,3}{100} \times 20 \text{ gr} = 0,06 \text{ gr} \\
 \text{Propil paraben} &= \frac{0,01}{100} \times 20 \text{ gr} = 0,002 \text{ gr} \\
 \\
 \text{Aquadest} &= 20 - (0,4 + 0,1 + 1 + 0,4 + 0,06 + 0,002) \\
 &= 20 - 1,962 \\
 &= 18,038 \text{ gr}
 \end{aligned}$$

c. F2 Konsentrasi 4%

$$\begin{aligned}
 \text{Minyak Atsiri Sereh Wangi} &= \frac{4}{100} \times 20 \text{ gr} = 0,8 \text{ gr} \\
 \\
 \text{Carbomer} &= \frac{0,5}{100} \times 20 \text{ gr} = 0,1 \text{ gr} \\
 \text{Propilenglikol} &= \frac{5}{100} \times 20 \text{ gr} = 1 \text{ gr} \\
 \text{TEA} &= \frac{2}{100} \times 20 \text{ gr} = 0,4 \text{ gr} \\
 \\
 \text{Metil paraben} &= \frac{0,3}{100} \times 20 \text{ gr} = 0,06 \text{ gr} \\
 \text{Propil paraben} &= \frac{0,01}{100} \times 20 \text{ gr} = 0,002 \text{ gr} \\
 \\
 \text{Aquadest} &= 20 - (0,8 + 0,1 + 1 + 0,4 + 0,06 + 0,002) \\
 &= 20 - 2,362 \\
 &= 17,638 \text{ gr}
 \end{aligned}$$

d. F3 Konsentrasi 6%

$$\begin{aligned}
 \text{Minyak Atsiri Sereh Wangi} &= \frac{6}{100} \times 20 \text{ gr} = 1,2 \text{ gr} \\
 \\
 \text{Carbomer} &= \frac{0,5}{100} \times 20 \text{ gr} = 0,1 \text{ gr} \\
 \text{Propilenglikol} &= \frac{5}{100} \times 20 \text{ gr} = 1 \text{ gr}
 \end{aligned}$$

TEA	$= \frac{2}{100} \times 20 \text{ gr} = 0,4 \text{ gr}$
Metil paraben	$= \frac{0,3}{100} \times 20 \text{ gr} = 0,06 \text{ gr}$
Propil paraben	$= \frac{0,01}{100} \times 20 \text{ gr} = 0,002 \text{ gr}$
Aquadest	$= 20 - (1,2+0,1+1+0,4+0,06+0,002)$ $= 20 - 2762$ $= 17,238 \text{ gr}$

Lampiran 3. Perhitungan Banyaknya Sampel (Mencit)

Rumus Frederer meliputi:

$$(t-1) (n-1) \geq 15$$

Keterangan:

t = jumlah kelompok percobaan

n = jumlah pengulangan atau jumlah sampel setiap kelompok

penyelesaian:

$$(5-1) (n-1) \geq 15$$

$$4 (n-1) \geq 15$$

$$4n - 4 \geq 15$$

$$4n \geq 15 + 4$$

$$n \geq \frac{19}{4}$$

$$\geq 4,75$$

$$\geq 5$$

Jadi jumlah sampel yang digunakan 5 ekor perkelompok.

Lampiran 4. Hasil data jumlah geliat mencit metode hot plate

Perlakuan		Menit 0	Menit 30	Menit 60	Menit 90	Menit 120
K-	1	1,2	2,24	2,04	2,29	3,15
	2	1,45	1,50	2,06	2,56	2,41
	3	1,76	1,75	1,86	3,09	2,45
	4	2,75	1,83	1,71	1,57	2,21
	5	2,65	1,32	1,91	1,85	1,86
Rata- rata		1,96	1,72	1,91	2,27	2,41
K+	1	4,74	5,26	10,85	14,38	15,00
	2	3,98	4,72	11,16	14,93	14,07
	3	4,19	5,25	11,25	14,74	14,17
	4	3,92	4,22	10,21	14,97	14,47
	5	3,82	4,09	10,58	14,47	14,37
Rata- rata		4,13	4,70	10,81	14,69	14,41
F1	1	2,28	2,68	5,42	5,10	3,41
	2	2,13	3,97	5,34	5,16	3,62
	3	1,96	1,81	4,84	4,14	3,77
	4	1,91	2,18	4,64	4,20	3,08
	5	2,25	2,40	4,65	4,20	4,41
Rata-rata		2,10	2,60	4,97	4,56	3,65
F2	1	2,76	4,31	6,39	8,61	4,24
	2	2,47	3,46	7,12	8,21	4,56
	3	2,49	3,64	7,62	8,35	4,85
	4	2,30	3,81	7,80	8,07	4,28
	5	2,52	4,27	6,49	8,58	5,24
Rata-rata		2,50	3,89	7,08	8,36	4,63
F3	1	3,35	4,49	6,74	9,44	6,20
	2	3,31	4,21	8,05	11,11	9,75
	3	3,57	4,85	7,73	12,16	10,00
	4	3,21	4,19	7,95	12,51	11,43
	5	3,05	4,09	8,09	12,22	10,98
Rata- rata		3,29	4,36	7,71	11,48	9,67

Lampiran 5. Hasil perhitungan geliat mencit dan aktivitas analgetik

$$\% \text{ Aktivitas} = \frac{T-K}{K} \times 100$$

Keterangan:

T= waktu respon setelah diberi gel

K= waktu respon kontrol negatif

Kontrol positif (+)

$$1. \quad \% T_1 = 4,13 \quad = \frac{4,13-1,96}{1,96} \times 100$$

$$K = 1,9 \quad = 110,71$$

$$2. \quad \% T_2 = 4,70 \quad = \frac{4,70-1,72}{1,72} \times 100$$

$$K = 1,72 \quad = 173,25$$

$$3. \quad \% T_3 = 10,81 \quad = \frac{10,81-1,91}{1,91} \times 100$$

$$K = 1,91 \quad = 465,96$$

$$4. \quad \% T_4 = 14,69 \quad = \frac{14,69-2,27}{2,27} \times 100$$

$$K = 2,27 \quad = 547,13$$

$$5. \quad \% T_5 = 14,41 \quad = \frac{14,41-2,41}{1,96} \times 100$$

$$K = 2,41 \quad = 497,92$$

F1 (2%)

$$1. \quad \% T_1 = 2,10 \quad = \frac{2,10-1,96}{1,96} \times 100$$

$$K = 1,96 \quad = 7,14$$

$$2. \quad \% T_2 = 2,60 \quad = \frac{2,60-1,72}{1,72} \times 100$$

$$K = 1,72 \quad = 51,16$$

$$3. \quad \% T_3 = 4,97 \quad = \frac{4,97-1,91}{1,91} \times 100$$

$$K = 1,91 \quad = 160,20$$

$$4. \quad \% T_4 = 4,56 \quad = \frac{4,56-2,27}{1,96} \times 100$$

$$K = 2,27 \quad = 100,88$$

$$5. \quad \% T_5 = 3,65 \quad = \frac{3,65-2,41}{2,41} X 100$$

$$K = 2,41 \quad = 51,45$$

F2 (4%)

$$1. \quad \% T_1 = 2,50 \quad = \frac{2,50-1,96}{1,96} X 100$$

$$K = 1,96 \quad = 27,55$$

$$2. \quad \% T_2 = 3,89 \quad = \frac{3,89-1,72}{1,72} X 100$$

$$K = 1,72 \quad = 126,16$$

$$3. \quad \% T_3 = 7,08 \quad = \frac{7,08-1,91}{1,91} X 100$$

$$K = 1,91 \quad = 270,68$$

$$4. \quad \% T_4 = 6,49 \quad = \frac{6,49-2,27}{1,96} X 100$$

$$K = 2,27 \quad = 268,28$$

$$5. \quad \% T_5 = 4,63 \quad = \frac{4,63-2,41}{2,41} X 100$$

$$K = 2,41 \quad = 92,11$$

F3 (6%)

$$1. \quad \% T_1 = 3,29 \quad = \frac{3,29-1,96}{1,96} X 100$$

$$K = 1,96 \quad = 67,85$$

$$2. \quad \% T_2 = 4,36 \quad = \frac{4,36-1,72}{1,72} X 100$$

$$K = 1,72 \quad = 153,48$$

$$3. \quad \% T_3 = 7,71 \quad = \frac{7,71-1,91}{1,91} X 100$$

$$K = 1,91 \quad = 303,66$$

$$4. \quad \% T_4 = 11,48 \quad = \frac{11,48-2,27}{1,96} X 100$$

$$K = 2,27 \quad = 405,72$$

$$5. \quad \% T_5 = 9,67 \quad = \frac{9,67-2,41}{2,41} X 100$$

$$K = 2,41 \quad = 301,24$$

Perhitungan persen aktivitas analgetik

$$\begin{aligned}
 \text{a. } (k+) &= \frac{110,71+173,25+465,96+547,13+497,92}{5} = 358,99 \\
 \text{b. } (F1) &= \frac{7,14+51,16+160,20+100,88+51,45}{5} = 74,16 \\
 \text{c. } (F2) &= \frac{27,55+126,16+270,68+268,28+92,11}{5} = 156,95 \\
 \text{d. } (F2) &= \frac{27,55+126,16+270,68+268,28+92,11}{5} = 156,95
 \end{aligned}$$

Perhitungan persen efektivitas analgetik

$$\% \text{ Efektivitas} = \frac{\text{Aktivitas Bahan uji}}{\text{Aktivitas Kontrol Positif}} \times 100\%$$

$$\text{Kontrol positif} = \frac{358,99}{358,99} \times 100\%$$

$$= \frac{100\%}{74,16}$$

$$\begin{aligned}
 \text{F1 (Gel minyak atsiri 2\%)} &= \frac{74,16}{358,99} \times 100\% \\
 &= 20,65\%
 \end{aligned}$$

$$\begin{aligned}
 \text{F2 (Gel minyak atsiri 4\%)} &= \frac{156,95}{358,99} \times 100\% \\
 &= 43,71\%
 \end{aligned}$$

$$\begin{aligned}
 \text{F3 (Gel minyak atsiri 6\%)} &= \frac{246,39}{358,99} \times 100\% \\
 &= 68,63\%
 \end{aligned}$$

Lampiran 6. Gambar yang digunakan dalam formulasi sediaan gel

Carbomer



TEA



Propil paraben



Propilen glikol



Aquadest



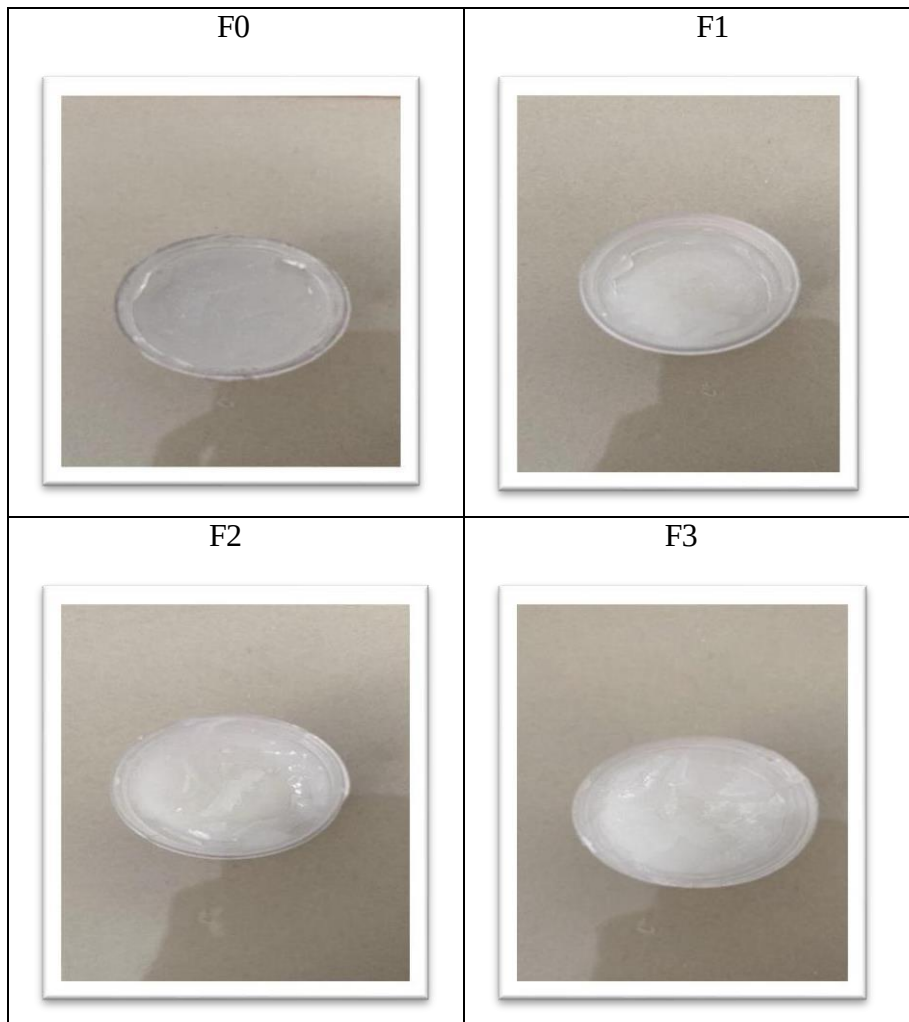
Metil paraben



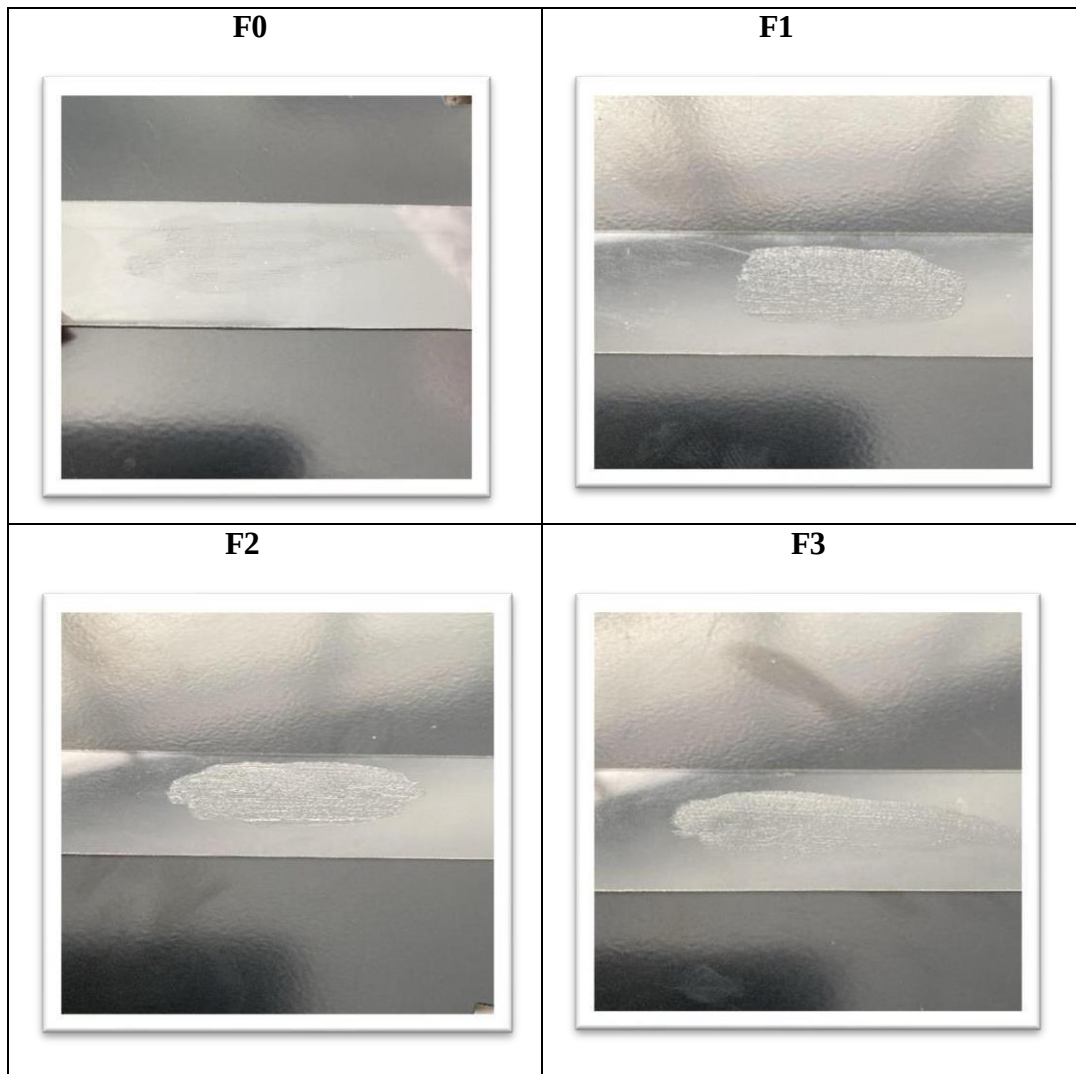
Gambar Zat aktif (minyak atsiri sereh wangi) dan sediaan gel

minyak atsiri sereh wangi	Basis Gel	Minyak atsiri 2%
		
Minyak atsiri 4%	Minyak atsiri 6%	
		

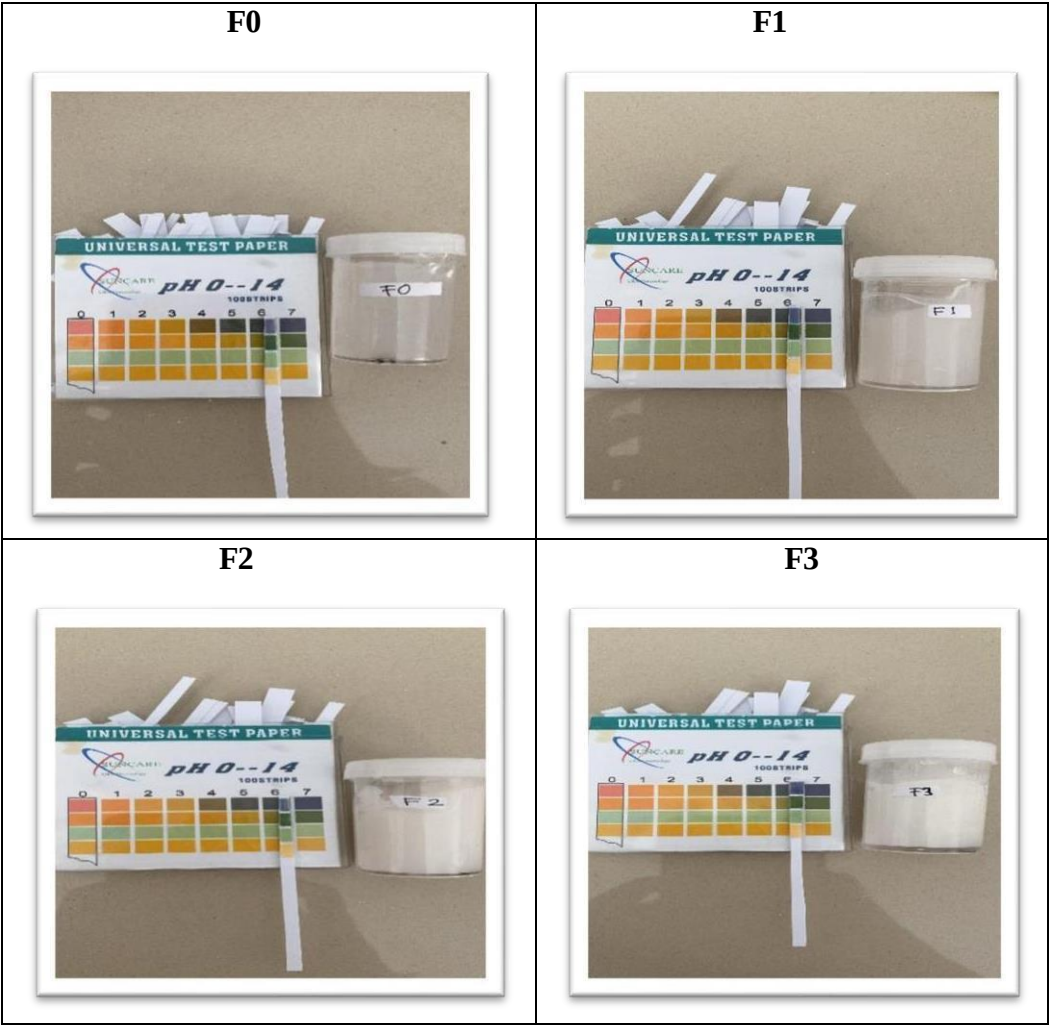
Gambar sediaan gel dan pengujian organoleptis



Gambar pengujian homogenitas

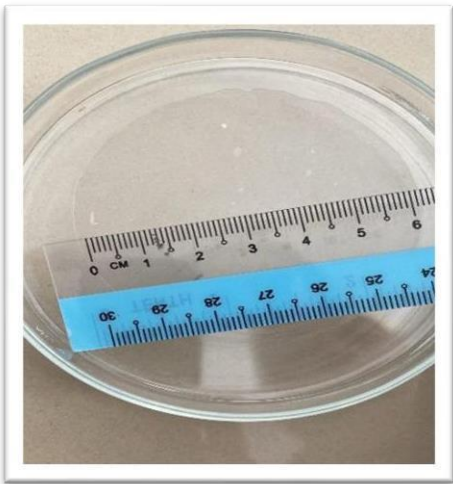


Gambar pengujian Ph



Gambar daya sebar

F0



F1



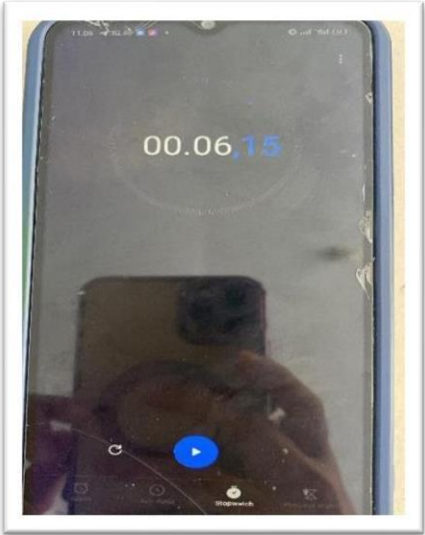
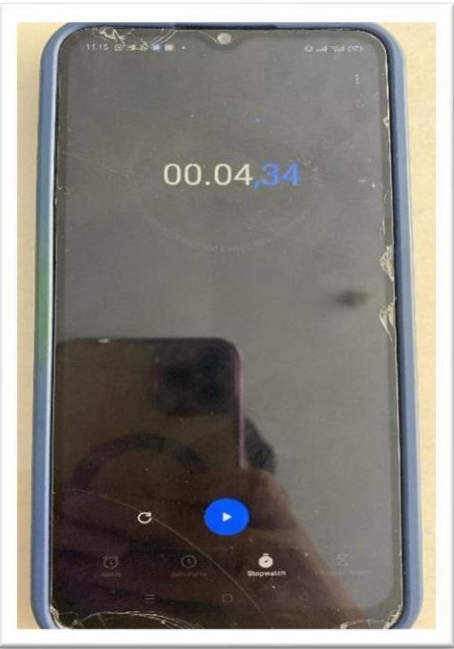
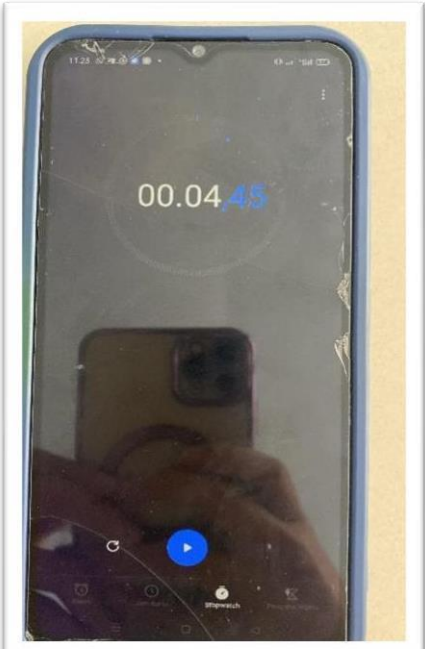
F2



F3



Gambar pengujian daya lekat

F0  A photograph of a smartphone screen displaying a timer application. The timer shows 00.05.66 in blue digits. The screen is slightly dark and has some reflections.	F1  A photograph of a smartphone screen displaying a timer application. The timer shows 00.06.15 in blue digits. The screen is slightly dark and has some reflections.
F2  A photograph of a smartphone screen displaying a timer application. The timer shows 00.04.34 in blue digits. The screen is slightly dark and has some reflections.	F3  A photograph of a smartphone screen displaying a timer application. The timer shows 00.04.45 in blue digits. The screen is slightly dark and has some reflections.

Gambar pengujian uji viskositas

F0



F1



F2



F3



Gambar Pengujian Uji Iritasi

	Proses Sebelum dilakukan uji iritasi
	Proses uji iritasi selama 40 menit
	Proses setelah uji iritasi selama 40 menit

KUESIONER UJI IRITASI

Nama :

Umur :

Hari/ tanggal :

Nama produk : Uji Efektivitas Analgetik Gel Minyak Atsiri Sereh wangi (Cymbopogon nardus L.)

Terhadap Mencit (Mus musculus)

Instruksi:

Dihadapkan saudara/i terdapat 3 sediaan Analgetik Gel Minyak Atsiri Sereh Wangi (Cymbopogon nardus L.) berkode F1, F2 dan F3 saudara/i diminta untuk menilai sediaan alpaca mengiritasi dengan cara mengoleskan sediaan pada pergelangan tangan saudara/i seluas 2cm. kemudian biarkan selama 40 menit. Adapun kriteria untuk penilaian sebagai berikut:

Tabel 1. Kriteria penelitian Uji Iritasi

kriteria	Penilaian	Skor	Keterangan
Mengiritasi	-	0	Kemerahan, gatal-gatal dan bengkak
Sedikit mengiritasi	+	1	Kemerahan, gatal-gatal dan tidak bengkak
Tidak mengiritasi	++	2	Tidak menimbulkan kemerahan, tidak gatal dan tidak bengkak

Petunjuk pengisian : setelah selesai melakukan penelitian, silahkan mengisi pada kolom penilaian saudara/i dengan tanda (-/+/+).

Tabel 2. Penilaian Uji Iritasi

Kode		
F1	F2	F3

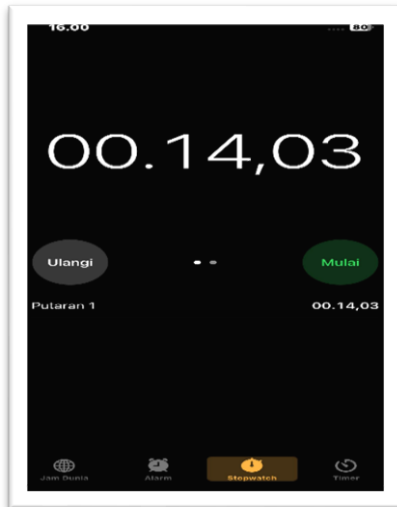
Terimakasih atas ketersediaan saudara/i

Palopo,..... 2024

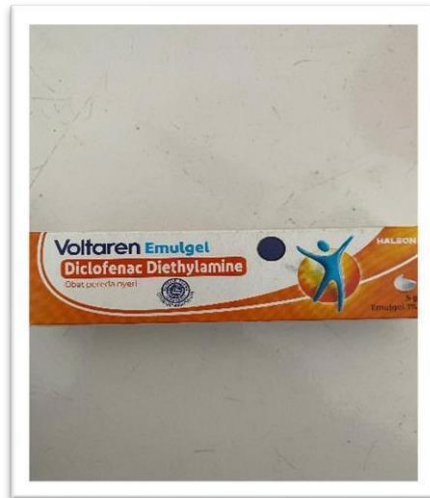
()

Gambar alat dan sediaan kontrol positif

Stopwatch



Gel voltaren



Hot plate



Termometer digital

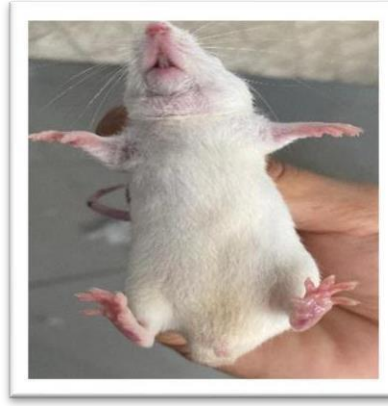


Gambar pengujian analgetik

Penimbangan hewan coba



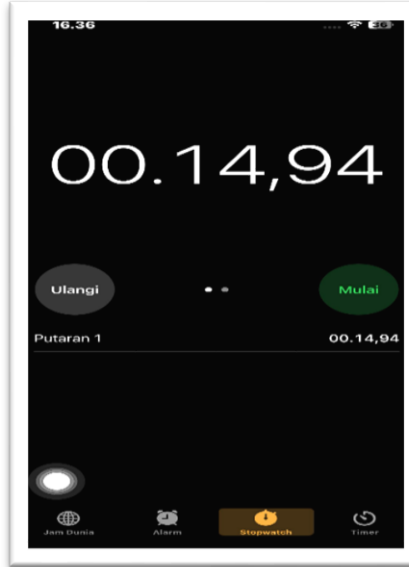
Pemberiaan gel pada kaki mencit



**Perlakuan terhadap mencit,
diletakkan diatas hot plate**



**Pengukuran detik lamanya
mencit diatas hot plate**



Lampiran 7. Analisis data

1. Uji Normalitas

Tests of Normality

Perlakuan		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Geliat	K-	0.231	5	0.200*	0.946	5	0.709
Mencit	K+	0.239	5	0.200*	0.840	5	0.165
	F1	0.188	5	0.200*	0.937	5	0.645
	F2	0.209	5	0.200*	0.954	5	0.766
	F3	0.202	5	0.200*	0.943	5	0.684

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

2. Uji Homogenitas

Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
Geliat	Based on Mean	8.904	4	20	0.080
Mencit	Based on Median	4.473	4	20	0.060
	Based on Median and with adjusted df	4.473	4	20	0.095
	Based on trimmed mean	8.771	4	20	0.700

3. UJI ANOVA

Geliat Mencit

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	184.341	4	46.085	5.079	0.005
Within Groups	181.482	20	9.074		
Total	365.823	24			

4. Uji Duncan

Geliat Mencit

Duncan^a

		Subset for alpha = 0.05		
Perlakuan	N	1	2	3
K-	5	2.0540		
F1	5		3.5760	
F2	5		5.2920	
F3	5			7.3020
K+	5			9.7480
Sig.		0.122	0.078	0.214

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5.000.

Dapat dilanjutkan uji *Duncan*, bertujuan untuk mengetahui perbedaan antara kelompok. Penggunaan uji duncan cenderung lebih mudah, dapat menguji perbedaan dari perlakuan tanpa memperlihatkan jumlah perlakuannya, dan lebih mudah dipahami karena bentuk tabelnya yang simpel (Yuhana, 2023). Dari hasil *Duncan* secara statistik kontrol positif dan konsentrasi 2%,4% dan 6% memberikan efek efektivitas analgetik paling baik, kemudian kontrol negatif yang memberikan efek analgetik paling tidak baik. Hal tersebut menunjukkan bahwa kelompok kontrol positif dan kelompok variasi konsentrasi minyak atsiri sereh wangi dapat menimbulkan efek analgetik pada kaki mencit yang telah diinduksi metode hot plate. Pemberian konsentrasi 6% lebih baik dan paling besar .

