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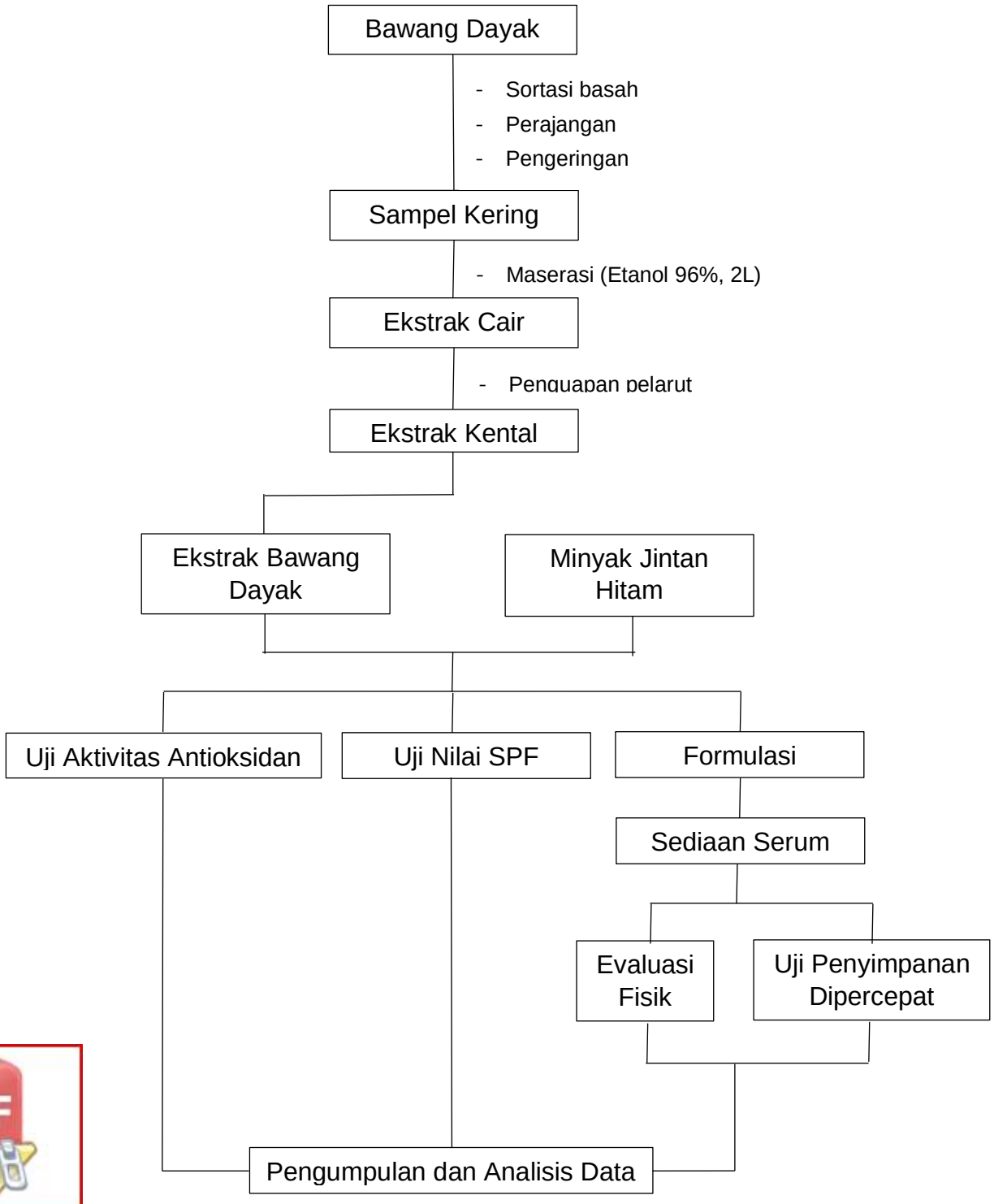
LAMPIRAN

Lampiran 1. Skema Kerja Penelitian



Lampiran 2. Tabel Hasil Uji Aktivitas Antioksidan dan Nilai SPF

Lampiran 2.1 Tabel Hasil Uji Aktivitas Antioksidan

Tabel 12. Hasil pengujian aktivitas antioksidan

Sampel	Replikasi	Konsentrasi	Absorbansi	% Inhibisi	IC_{50}	Rata-rata IC_{50}	SD
Ekstrak Bawang Dayak	1	100 µg/mL	0,408	55,56	37,91	36,08	4,87
		150 µg/mL	0,336	63,40			
		200 µg/mL	0,285	68,95			
		250 µg/mL	0,232	74,73			
		300 µg/mL	0,204	77,78			
	2	100 µg/mL	0,41	55,34	40,92		
		150 µg/mL	0,339	63,07			
		200 µg/mL	0,286	68,85			
		250 µg/mL	0,242	73,64			
		300 µg/mL	0,202	78,00			
	3	100 µg/mL	0,403	56,10	29,41		
		150 µg/mL	0,326	64,49			
		200 µg/mL	0,283	69,17			
		250 µg/mL	0,245	73,31			
		300 µg/mL	0,197	78,54			
Minyak Jintan Hitam	1	100 µg/mL	1,145	2,97	1182,49	1326,09	248,38
		150 µg/mL	1,110	5,93			
		200 µg/mL	1,080	8,47			
		250 µg/mL	1,057	10,42			
		300 µg/mL	1,045	11,44			
	2	100 µg/mL	1,086	7,97	1120,26		
		150 µg/mL	1,071	9,24			
		200 µg/mL	1,066	9,66			
		250 µg/mL	1,019	13,64			
		300 µg/mL	0,988	16.27			
	3	100 µg/mL	1,132	4,07	1675,51		
		150 µg/mL	1,129	4,32			
		200 µg/mL	1,120	5,08			
		250 µg/mL	1,092	7,46			
		300 µg/mL	1,063	9,92			
Ekstrak Bawang Dayak : Minyak Jintan Hitam (3:1)	1	100 µg/mL	0,444	51,63	78,88	62,32	12,02
		150 µg/mL	0,381	58,50			
		200 µg/mL	0,311	66,12			
		250 µg/mL	0,268	70,81			
		300 µg/mL	0,226	75,38			
	2	100 µg/mL	0,426	53,59	57,37		
		150 µg/mL	0,355	61,33			
		200 µg/mL	0,311	66,12			
		250 µg/mL	0,260	71,68			
		300 µg/mL	0,220	76,03			
	3	100 µg/mL	0,408	55,56	50,71		
		150 µg/mL	0,367	60,02			
		200 µg/mL	0,308	66,45			
		250 µg/mL	0,250	72,77			
		300 µg/mL	0,217	76,36			
		100 µg/mL	0,325	68,01	84,07	93,86	9,91

Ekstrak Bawang Dayak : Minyak Jintan Hitam (2:1)		150 µg/mL	0,367	63,88			
		200 µg/mL	0,405	60,14			
		250 µg/mL	0,449	55,81			
		300 µg/mL	0,498	50,98			
	2	100 µg/mL	0,327	67,81			
		150 µg/mL	0,370	63,58			
		200 µg/mL	0,415	59,15	90,07		
		250 µg/mL	0,453	55,41			
		300 µg/mL	0,501	50,69			
	3	100 µg/mL	0,334	67,13			
		150 µg/mL	0,378	62,80			
		200 µg/mL	0,423	58,37	107,43		
		250 µg/mL	0,467	54,04			
		300 µg/mL	0,517	49,11			
Ekstrak Bawang Dayak : Minyak Jintan Hitam (1:1)	1	100 µg/mL	0,371	68,56			
		150 µg/mL	0,453	61,61			
		200 µg/mL	0,465	60,59	141,29		
		250 µg/mL	0,571	51,61			
		300 µg/mL	0,670	43,22			
	2	100 µg/mL	0,359	69,58			
		150 µg/mL	0,395	66,53			
		200 µg/mL	0,455	61,44	125,32	136.12	7,64
		250 µg/mL	0,533	54,83			
		300 µg/mL	0,658	44,24			
	3	100 µg/mL	0,342	71,02			
		150 µg/mL	0,402	65,93			
		200 µg/mL	0,446	62,20	141,75		
		250 µg/mL	0,561	52,46			
		300 µg/mL	0,695	41,10			
Ekstrak Bawang Dayak : Minyak Jintan Hitam (1:2)	1	100 µg/mL	0,298	63,61			
		150 µg/mL	0,362	55,80			
		200 µg/mL	0,420	48,72	216,58		
		250 µg/mL	0,499	39,07			
		300 µg/mL	0,587	28,33			
	2	100 µg/mL	0,296	63,86			
		150 µg/mL	0,351	57,14			
		200 µg/mL	0,412	49,69	215,35	217,28	1.93
		250 µg/mL	0,511	37,61			
		300 µg/mL	0,593	27,59			
	3	100 µg/mL	0,291	64,47			
		150 µg/mL	0,365	55,43			
		200 µg/mL	0,434	47,01	219,91		
		250 µg/mL	0,501	38,83			
		300 µg/mL	0,611	25,40			
Ekstrak Bawang Dayak : Minyak Jintan H	1	100 µg/mL	0,343	58,12			
		150 µg/mL	0,365	55,43			
		200 µg/mL	0,425	48,11	232,65		
		250 µg/mL	0,521	36,39			
		300 µg/mL	0,635	22,47		233.31	2.24
		100 µg/mL	0,338	58,73			
		150 µg/mL	0,382	53,36	230,95		
		200 µg/mL	0,422	48,47			
		250 µg/mL	0,498	39,19			

		300 µg/mL	0,614	25,03			
	3	100 µg/mL	0,350	57,26	236,32		
		150 µg/mL	0,381	53,48			
		200 µg/mL	0,437	46,64			
		250 µg/mL	0,507	38,10			
		300 µg/mL	0,601	26,62			
Asam Askorbat	1	10 µg/mL	0,615	31,51	32,12	32,76	0,49
		20 µg/mL	0,557	37,97			
		30 µg/mL	0,494	44,99			
		40 µg/mL	0,377	58,02			
		50 µg/mL	0,290	67,71			
	2	10 µg/mL	0,618	31,18	32,86		
		20 µg/mL	0,580	35,41			
		30 µg/mL	0,498	44,54			
		40 µg/mL	0,379	57,80			
		50 µg/mL	0,292	67,48			
	3	10 µg/mL	0,621	30,85	33,30		
		20 µg/mL	0,585	34,86			
		30 µg/mL	0,502	44,10			
		40 µg/mL	0,383	57,35			
		50 µg/mL	0,295	67,15			

Lampiran 2.2 Tabel Hasil Uji Nilai SPF

Tabel 13. Hasil pengujian Nilai SPF

Sampel	Konsentrasi	Replikasi	Nilai SPF	Rata-rata	SD
Ekstrak Bawang Dayak	100 µg/mL	1	1,567	1,573	0,005237
		2	1,571		
		3	1,580		
	200 µg/mL	1	6,833	6,814	0,015401
		2	6,795		
		3	6,814		
	400 µg/mL	1	22,924	23,194	1,331776
		2	24,943		
		3	21,715		
	600 µg/mL	1	38,808	38,808	0
		2	38,808		
		3	38,808		
Minyak Jintan Hitam	100 µg/mL	1	-2,685	-2,687	0,00355
		2	-2,684		
		3	-2,692		
	200 µg/mL	1	-2,016	-1,998	0,014331
		2	-1,999		
		3	-1,980		
	400 µg/mL	1	-1,348	-1,310	0,027388
		2	-1,298		
		3	-1,284		
	600 µg/mL	1	-0,337	-0,348	0,011897
		2	-0,364		
		3	-0,342		
Ekstrak Bawang Dayak : Minyak Jintan Hitam (3:1)	100 µg/mL	1	0,684	0,557	0,19919
		2	0,711		
		3	0,275		
	200 µg/mL	1	3,249	3,223	0,019173
		2	3,215		
		3	3,203		
	400 µg/mL	1	9,775	9,814	0,03128
		2	9,851		
		3	9,816		
	600 µg/mL	1	21,387	21,411	0,194731
		2	21,660		
		3	21,185		

Lampiran 3. Perhitungan

Lampiran 3.1 Persen Rendemen

$$Persen\ rendemen = \frac{Bobot\ ekstrak}{Bobot\ sampel\ awal} \times 100\%$$

Bobot sampel simplisia : 400 gram

Bobot ekstrak cawan porselin A : 5,71 gram

Bobot ekstrak cawan porselin B : 5,68 gram

Bobot ekstrak cawan porselin C : 6,03 gram

Bobot ekstrak cawan porselin D : 5,53 gram

Bobot ekstrak cawan porselin E : 6,71 gram

Bobot ekstrak cawan porselin F : 5,89 gram

Bobot ekstrak cawan porselin g : 4,86 gram

Persen rendemen $= \frac{5,71+5,68+6,03+5,53+6,71+5,89+4,86}{400\ gram} \times 100\%$

$= \frac{40,41}{400} \times 100\%$

$= 10,1025\%$

Lampiran 3.2 Persen Inhibisi

$$\%inhibisi = \frac{Absorbansi\ blanko - absorbansi\ sampel}{Absorbansi\ blanko} \times 100\%$$

- Ekstrak Bawang Dayak

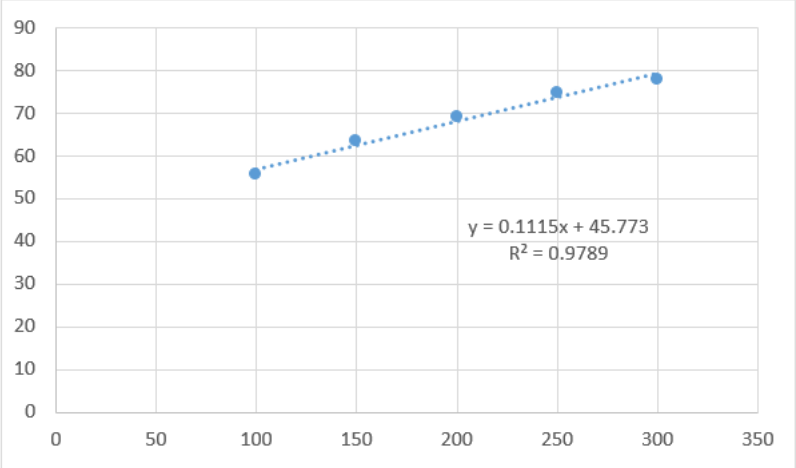
100 µg/mL $\frac{0.918-0,408}{0,918} \times 100\% = 55,56$

- Minyak Jintan Hitam

mL $\frac{1,180-1,145}{1,180} \times 100\% = 2,97$

Lampiran 3.3 IC_{50}

- Ekstrak Bawang Dayak



Gambar 11. Grafik plot ekstrak bawang dayak replikasi 1

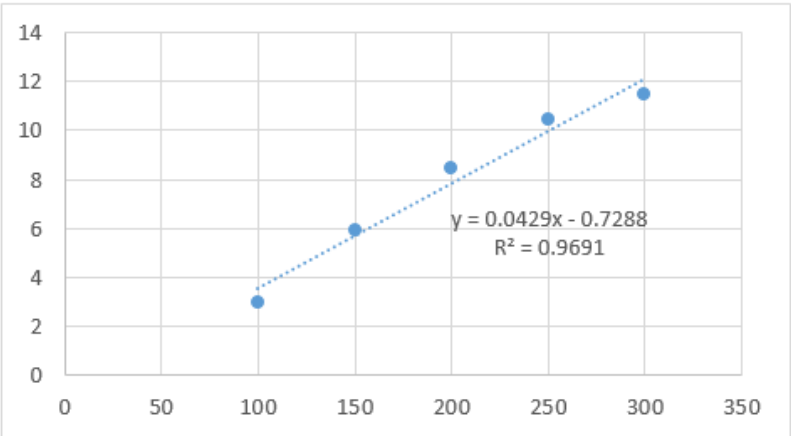
y = ax + b

x = (y-b) / a

x = (50 - 45,773) / 0,1115

x = 37,91 µg/mL

- Minyak Jintan Hitam



Gambar 12. Grafik plot minyak jintan hitam replikasi 1

b

b

x = (y+b) / a

x = (50 + 0.7288) / 0.0429

x = 1182,49 µg/mL

Lampiran 3.4 SPF

$$SPF = CF \times \sum_{290}^{320} EE(\lambda) \times I(\lambda) \times Abs(\lambda)$$

- Ekstrak Bawang Dayak

Nilai SPF 100 µg/mL replikasi 1

SPF = 10 x [(0,0150 x (-4000)) + (0,0817 x 0,143) + (0,2874 x 0,204) + (0,3278 x 0,231) + (0,1864 x 0,243) + (0,0839 x 0,251) + (0,0180 x 0,240)]

= 1,567

- Minyak Jintan Hitam

Nilai SPF

SPF = 10 x [(0,0150 x (-4000)) + (0,0817 x (-0,315)) + (0,2874 x (-0,209)) + (0,3278 x (-0,194)) + (0,1864 x (-0,204)) + (0,0839 x (-0,209)) + (0,0180 x (-0,198))]

= -2,685

Lampiran 4. Data Hasil Analisis Statistika

Lampiran 4.1 Uji Aktivitas Antioksidan

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Perbandingan	Statistic	df	Sig.	Statistic	df	Sig.
IC50	Bawang Dayak	.287	3	.	.930	3	.487
	Jintan Hitam	.348	3	.	.833	3	.196
	1:1	.376	3	.	.771	3	.047
	2:1	.289	3	.	.927	3	.477
	3:1	.298	3	.	.915	3	.436
	1:2	.283	3	.	.934	3	.504
	1:3	.261	3	.	.957	3	.601
	Asam Askorbat	.233	3	.	.979	3	.722

a. Lilliefors Significance Correction

ANOVA

IC50

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3967397.975	7	566771.139	48.733	.000
Within Groups	186082.404	16	11630.150		
Total	4153480.379	23			

Multiple Comparisons (Post Hoc Tests)

Dependent Variable: IC50

Tukey HSD

		Mean Difference			95% Confidence Interval	
(I) Perbandingan	(J) Perbandingan	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Bawang Dayak	Jintan Hitam	-1290.00667*	88.05358	.000	-1594.8614	-985.1519
	1:1	-100.04000	88.05358	.939	-404.8948	204.8148
	2:1	-57.77667	88.05358	.997	-362.6314	247.0781
	3:1	-26.24000	88.05358	1.000	-331.0948	278.6148
	[illegible]	-181.20000	88.05358	.478	-486.0548	123.6548
		-197.22667	88.05358	.380	-502.0814	107.6281
	[illegible]n Askorbat	3.32000	88.05358	1.000	-301.5348	308.1748
	[illegible]ang Dayak	1290.00667*	88.05358	.000	985.1519	1594.8614

	1:1	1189.96667*	88.05358	.000	885.1119	1494.8214
	2:1	1232.23000*	88.05358	.000	927.3752	1537.0848
	3:1	1263.76667*	88.05358	.000	958.9119	1568.6214
	1:2	1108.80667*	88.05358	.000	803.9519	1413.6614
	1:3	1092.78000*	88.05358	.000	787.9252	1397.6348
	Asam Askorbat	1293.32667*	88.05358	.000	988.4719	1598.1814
1:1	Bawang Dayak	100.04000	88.05358	.939	-204.8148	404.8948
	Jintan Hitam	-1189.96667*	88.05358	.000	-1494.8214	-885.1119
	2:1	42.26333	88.05358	1.000	-262.5914	347.1181
	3:1	73.80000	88.05358	.988	-231.0548	378.6548
	1:2	-81.16000	88.05358	.979	-386.0148	223.6948
	1:3	-97.18667	88.05358	.947	-402.0414	207.6681
	Asam Askorbat	103.36000	88.05358	.928	-201.4948	408.2148
2:1	Bawang Dayak	57.77667	88.05358	.997	-247.0781	362.6314
	Jintan Hitam	-1232.23000*	88.05358	.000	-1537.0848	-927.3752
	1:1	-42.26333	88.05358	1.000	-347.1181	262.5914
	3:1	31.53667	88.05358	1.000	-273.3181	336.3914
	1:2	-123.42333	88.05358	.844	-428.2781	181.4314
	1:3	-139.45000	88.05358	.753	-444.3048	165.4048
	Asam Askorbat	61.09667	88.05358	.996	-243.7581	365.9514
3:1	Bawang Dayak	26.24000	88.05358	1.000	-278.6148	331.0948
	Jintan Hitam	-1263.76667*	88.05358	.000	-1568.6214	-958.9119
	1:1	-73.80000	88.05358	.988	-378.6548	231.0548
	2:1	-31.53667	88.05358	1.000	-336.3914	273.3181
	1:2	-154.96000	88.05358	.653	-459.8148	149.8948
	1:3	-170.98667	88.05358	.545	-475.8414	133.8681
	Asam Askorbat	29.56000	88.05358	1.000	-275.2948	334.4148
1:2	Bawang Dayak	181.20000	88.05358	.478	-123.6548	486.0548
	Jintan Hitam	-1108.80667*	88.05358	.000	-1413.6614	-803.9519
	1:1	81.16000	88.05358	.979	-223.6948	386.0148
	2:1	123.42333	88.05358	.844	-181.4314	428.2781
	3:1	154.96000	88.05358	.653	-149.8948	459.8148
	1:3	-16.02667	88.05358	1.000	-320.8814	288.8281
	n Askorbat	184.52000	88.05358	.456	-120.3348	489.3748
	ang Dayak	197.22667	88.05358	.380	-107.6281	502.0814
	n Hitam	-1092.78000*	88.05358	.000	-1397.6348	-787.9252
		97.18667	88.05358	.947	-207.6681	402.0414

	2:1	139.45000	88.05358	.753	-165.4048	444.3048
	3:1	170.98667	88.05358	.545	-133.8681	475.8414
	1:2	16.02667	88.05358	1.000	-288.8281	320.8814
	Asam Askorbat	200.54667	88.05358	.361	-104.3081	505.4014
Asam Askorbat	Bawang Dayak	-3.32000	88.05358	1.000	-308.1748	301.5348
	Jintan Hitam	-1293.32667*	88.05358	.000	-1598.1814	-988.4719
	1:1	-103.36000	88.05358	.928	-408.2148	201.4948
	2:1	-61.09667	88.05358	.996	-365.9514	243.7581
	3:1	-29.56000	88.05358	1.000	-334.4148	275.2948
	1:2	-184.52000	88.05358	.456	-489.3748	120.3348
	1:3	-200.54667	88.05358	.361	-505.4014	104.3081

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

Lampiran 4.2 Uji Nilai SPF

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Perbandingan	Statistic	df	Sig.	Statistic	df	Sig.
SPF	Bawang Dayak 600 ppm	.	3	.	.	3	.
	Jintan Hitam 600 ppm	.320	3	.	.883	3	.334
	3:1 600 ppm	.206	3	.	.993	3	.836

a. Lilliefors Significance Correction

ANOVA

SPF

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2309.259	2	1154.629	60735.153	.000
Within Groups	.114	6	.019		
Total	2309.373	8			

Multiple Comparisons

Dependent Variable: SPF

Tukey HSD

		Mean Difference			95% Confidence Interval	
(I) Perbandingan	(J) Perbandingan	(I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Bawang Dayak 600 ppm	Jintan Hitam 600 ppm	39.155667*	.112579	.000	38.81024	39.50109
	3:1 600 ppm	17.397333*	.112579	.000	17.05191	17.74276
Jintan Hitam 600 ppm	Bawang Dayak 600 ppm	-39.155667*	.112579	.000	-39.50109	-38.81024
	3:1 600 ppm	-21.758333*	.112579	.000	-22.10376	-21.41291
3:1 600 ppm	Bawang Dayak 600 ppm	-17.397333*	.112579	.000	-17.74276	-17.05191
	Jintan Hitam 600	21.758333*	.112579	.000	21.41291	22.10376

* ...nificant at the 0.05 level.

Lampiran 4.3 Uji pH

Formula 1

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pH_sebelum	.175	3	.	1.000	3	1.000
pH_setelah	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	pH_sebelum - pH_setelah	.04667	.00577	.00333	.03232	.06101	14.000	2	.005

Formula 2

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pH_sebelum	.175	3	.	1.000	3	1.000
pH_setelah	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Test Statistics[a]

	pH_sebelum - pH_setelah
Z	-1.633[b]
Asymp. Sig. (2-tailed)	.102

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Formula 3

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pH_sebelum	.385	3	.	.750	3	.000
pH_setelah	.175	3	.	1.000	3	1.000

a. Lilliefors Significance Correction

Test Statistics[a]

	pH_sebelum - pH_setelah
Z	-1.633[b]
Asymp. Sig. (2-tailed)	.102

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Lampiran 4.4 Uji Viskositas

Formula 1

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas_sebelum	.292	3	.	.923	3	.463
Viskositas_setelah	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Test Statistics[a]

	Viskositas_setelah - Viskositas_sebelum
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Formula 2

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas_sebelum	.253	3	.	.964	3	.637
Viskositas_setelah	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Test Statistics[a]

	Viskositas_setelah - Viskositas_sebelum
Z	-1.633[b]
Asymp. Sig. (2-tailed)	.102

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Formula 3

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas_sebelum	.253	3	.	.964	3	.637
Viskositas_setelah	.385	3	.	.750	3	.000

a. Lilliefors Significance Correction

Test Statistics[a]

	Viskositas_setelah - Viskositas_sebelum
Z	-1.604[b]
Asymp. Sig. (2-tailed)	.109

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Lampiran 4.5 Uji Daya Sebar

Formula 1

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Daya Sebar_sebelum	.339	3	.	.850	3	.241
Daya Sebar_setelah	.198	3	.	.995	3	.868

a. Lilliefors Significance Correction

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Daya Sebar_sebelum – Daya Sebar_setelah	.23333	.08622	.04978	.01916	.44751	4.688	2	.043

Formula 2

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas_sebelum	.211	3	.	.991	3	.817
Viskositas_setelah	.240	3	.	.975	3	.694

a. Lilliefors Significance Correction

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Daya Sebar_sebelum – Daya Sebar_setelah	.20333	.16773	.09684	-.21333	.62000	2.100	2	.171

Formula 3

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Viskositas_sebelum	.219	3	.	.987	3	.780
Viskositas_setelah	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Daya Sebar_sebelum – Daya Sebar_setelah	-.10000	.14799	.08544	-.46762	.26762	-1.170	2	.362

Lampiran 5. Sertifikat Analisis dan Lembar Data Keselamatan Bahan

Lampiran 5.1 Sertifikat Analisis

HETAKSH ESSENTIAL OILS
An ISO 9001:2015 and GMP Certified company

CERTIFICATE OF ANALYSIS

Product	**Black Cumin Oil**
Lot No	HEE-05012201
Mfg Date	05.01.22
Best before	04.01.24
Botanical Source	Nigella Sativa
Extraction Process	Cold press

TEST	STANDARD	RESULT
Appearance	Fluid liquid.	Complies
Colour	Brownish yellow to deep brown.	Complies
Odour & Taste	Characteristic taste and odour.	Complies
Solubility	Insoluble in Alcohol & water.	Complies
Specific Gravity	0.918 to 0.925	0.921
Refractive Index	1.465 to 1.480	1.472
Saponification Value	180 to 200	191
Moisture	Less than 1%	Complies
Thymoquinone Content	Min 1%	1.1%
Heavy Metals		
Total heavy metals	Less than 10ppm	Complies
Lead	Less than 1ppm	Complies
Mercury	Less than 1ppm	Complies
Arsenic	Less than 1ppm	Complies
Cadmium	Less than 0.3 ppm	Complies
Microbiology		
Total Bacterial Count	Less than 100 cfu/g	Complies
Yeast & Molds	Less than 10 cfu/g	Complies
Salmonella	Absent	Complies
E-Coli	Absent	Complies
Pseudomonas Aeruginosa	Absent	Complies
Storage	In well fitted container in cool and dark place	

Gambar 13. Sertifikat analisis

Lampiran 5.2 Lembar Data Keselamatan Bahan

HETAKSH ESSENTIAL OILS
An ISO 9001:2015 and GMP Certified company

Material Safety Data Sheet

Section 1: Chemical Product and Company Identification
Product Name: Black Cumin Seed Oil
CAS#: 90064-32-7
CI#: Not available.
Synonym:
Chemical Name: Not available.
Chemical Formula: Not available.
Contact Information:
Hetaksh Essential Oils, Delhi, India.
Section 2: Composition and Information on Ingredients
Composition:
Name CAS # % by Weight
Black Cumin Seed Oil 90064-32-7, 100%
Toxicological Data on Ingredients: Not Available.
Section 3: Hazards Identification
Potential Acute Health Effects:
Slightly Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Non-hazardous in case of skin contact (permeator).
Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.
Section 4: First Aid Measures
Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.
Skin Contact: After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap.
Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream.
Inhalation: Allow the victim to rest in a well-ventilated area. Seek immediate medical attention.
Serious Inhalation: Not available.
Ingestion: Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband.
Serious Ingestion: Not available.
Section 5: Fire and Explosion Data
Flammability of the Product: Not available.
Auto-Ignition Temperature: Not available.
Flash Points: Not available.
Flammable Limits: Not available.
Products of Combustion: Not available.
Fire Hazards in Presence of Various Substances: Not available.
Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards: Not available.

Gambar 14. Lembar data keselamatan bahan

Lampiran 6. Dokumentasi Penelitian

Gambar 15. Ekstrak kental bawang dayak

Gambar 16. Uji susut pengeringan

Gambar 17. Minyak jintan hitam

Gambar 18. Uji aktivitas antioksidan

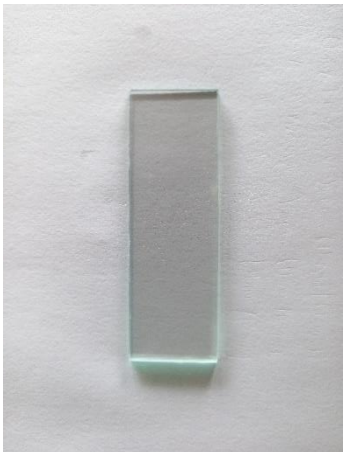
Gambar 19. Uji nilai SPF

Gambar 20. Proses hidrasi *gelling agent*

Gambar 21. Proses pencampuran bahan

Gambar 22. Uji viskositas serum

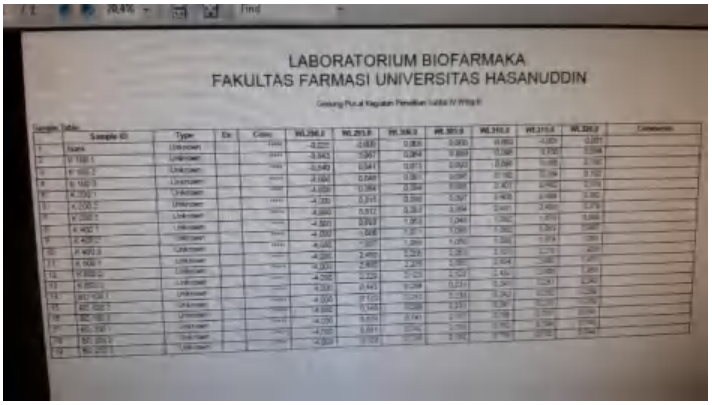
Gambar 23. Uji pH Serum



Gambar 24. Uji homogenitas serum

r 25. Uji daya sebar serum

Gambar 26. Uji penyimpanan dipercepat serum



Gambar 27. Hasil Uji SPF

Gambar 28. Hasil Uji Antioksidan