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Lampiran 1. Hasil determinasi tanaman kelor



UPT-LABORATORIUM

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Nomor : 144/DET/UPT-LAB-05.03.2021
Hal : Hasil determinasi tumbuhan
Lamp. : -

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Alamat : Program Studi S-1 Farmasi,
Universitas Setia Budi, Surakarta
Nama sampel : Kelor/ *Moringa oleifera* Lamk.

HASIL DETERMINASI TUMBUHAN

Klasifikasi

Kingdom : Plantae
Super Divisi : Spermatophyta
Divisi : Magnoliophyta
Kelas : Magnoliopsida
Ordo : Brassicales
Famili : Moringaceae
Genus : *Moringa*
Species : *Moringa oleifera* Lamk.

Hasil Determinasi menurut Steenis, C.G.G.J.V, Bloembergen, H, Eyma, P.J. 1992 :
1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 15b. golongan 9. 197b – 208a –
209b – 210b – 211b – 214a. familia 55. Moringaceae. *Moringa oleifera* Lamk.

Deskripsi :

Habitus : Pohon bengkok, menggugurkan daun, tinggi 3 – 10 m.
Akar : Sistem akar tunggang.
Batang : Batang berkayu, percabangan monopodial, ranting dengan tanda bekas daun yang besar.

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- Daun** : Daun tersebar, menyirip ganjil rangkap 2 – 4. Anak daun bertangkai, bulat telur terbalik, tepi rata, sisi bawah hijau pucat, panjang 1,6 – 2,1 cm, tulang daun menyirip.
- Bunga** : Bunga malai, panjang 11,4 – 14,1 cm. Piala kelopak hijau, taju kelopak melengkung membalik, putih, panjang 1 cm. Daun mahkota putih kuning, yang terdepan terbesar, panjang lk 1,5 cm, yang lain membalik. Benang sari dan staminodia dengan ujung yang melengkung kembali.
- Buah** : Buah kotak, menggantung, bersudut 3, panjang 33,2 – 46,5 cm. Katup tebal, di tengah ada bekas cetakan yang dalam berisi 1 baris biji.
- Biji** : Biji bentuk bola, bersayap 3.



Surakarta, 5 Maret 2021
Penanggung jawab
Determinasi Tumbuhan



Dra. Dewi Sulistyawati, M.Sc.

Lampiran 2. Perhitungan rendemen serbuk

Berat daun kelor kering = 1,251 kg

Berat serbuk daun kelor = 1,200 kg

$$\% \text{ Rendemen} = \frac{\text{berat serbuk daun kelor}}{\text{berat daun kelor kering}} \times 100\%$$

$$= \frac{1,200 \text{ kg}}{1,251 \text{ kg}} \times 100\%$$

$$= 95,92\%$$

Lampiran 3. Hasil uji kelembaban serbuk simplisia daun kelor



Replikasi 1



Replikasi 2



Replikasi 3

Lampiran 4. Perhitungan rendemen ekstrak

Botol	Berat botol kosong (gram)	Berat botol + ekstrak (gram)	Berat ekstrak (gram)
1	173,9562	292,100	118,1438
2	173,9640	291,000	117,036
Berat total ekstrak			235,1798

Berat serbuk simplisia = 1000 gram

Berat ekstrak kental = 235,1798 gram

$$\begin{aligned} \% \text{ Rendemen} &= \frac{\text{berat ekstrak kental}}{\text{berat serbuk simplisia}} \times 100\% \\ &= \frac{235,1798 \text{ gram}}{1000 \text{ gram}} \times 100\% \\ &= 23,51798 \% \end{aligned}$$

Lampiran 5. Perhitungan penetapan kadar air ekstrak

Replikasi	Berat kurs kosong (gram)	Berat kurs + ekstrak (gram)	Berat awal ekstrak (gram)	Berat kurs + ekstrak setelah di oven (gram)	Berat akhir ekstrak (gram)	Kadar air (%)
1	40,514	50,601	10,087	49,976	9,462	6,19
2	41,524	51,596	10,072	50,997	9,473	5,95
3	42,112	52,166	10,054	51,434	9,322	7,28
Rata-rata ± SD				6,47 ± 0,71		

$$\text{Kadar air ekstrak} = \frac{\text{berat awal ekstrak (gram)} - \text{berat akhir ekstrak (gram)}}{\text{berat awal ekstrak (gram)}} \times 100\%$$

$$\text{Replikasi 1} = \frac{10,087 \text{ gram} - 9,462 \text{ gram}}{10,087 \text{ gram}} \times 100\% = 6,19\%$$

$$\text{Replikasi 2} = \frac{10,072 \text{ gram} - 9,473 \text{ gram}}{10,072 \text{ gram}} \times 100\% = 5,95\%$$

$$\text{Replikasi 3} = \frac{10,054 \text{ gram} - 9,322 \text{ gram}}{10,054 \text{ gram}} \times 100\% = 7,28\%$$

$$\text{Rata-rata} = \frac{6,19\% + 5,95\% + 7,28\%}{3} = 6,47\%$$

Lampiran 6. Perhitungan rendemen fraksi n-heksana dan fraksi etil asetat

Fraksi	Berat botol kosong (gram)	Berat botol + fraksi (gram)	Berat fraksi (gram)	Rendemen (%)
N-heksana	259	262,39	3,39	6,78
Etil asetat	260	264,75	4,75	9,5

Berat ekstrak kental = 50 gram

Berat fraksi n-heksana = 3,39 gram

Berat fraksi etil asetat = 4,75 gram

$$\% \text{ Rendemen fraksi n-heksana} = \frac{\text{berat fraksi n-heksana}}{\text{berat ekstrak kental}} \times 100\%$$

$$= \frac{3,39 \text{ gram}}{50 \text{ gram}} \times 100\%$$

$$= 6,78 \%$$


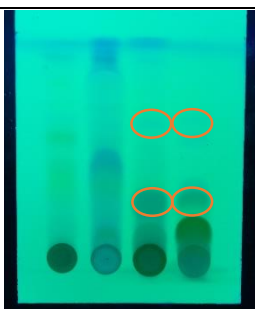
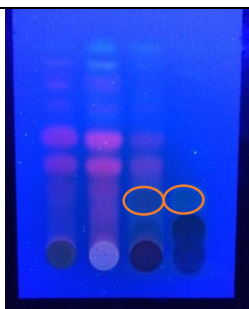
$$\% \text{ Rendemen fraksi etil asetat} = \frac{\text{berat fraksi etil asetat}}{\text{berat ekstrak kental}} \times 100\%$$

$$= \frac{4,75 \text{ gram}}{50 \text{ gram}} \times 100\%$$

$$= 9,5 \%$$

Lampiran 7. Hasil identifikasi senyawa secara KLT

1. Senyawa Flavonoid

Fase gerak	= n-heksana : etil asetat (5 : 5)			
Jarak tempuh fase gerak	= 5 cm			
Rumus nilai Rf	= $\frac{\text{jarak tempuh bercak}}{\text{jarak tempuh fase gerak}}$			
Gambar kromatogram				
				
Visual	UV 254 nm	UV 366 nm		
Kode bercak	Nilai Rf	Warna bercak		
		Visual	UV 254 nm	UV 366 nm
A ₁	$\frac{0,8}{5} = 0,16$	Transparan	Kuning muda	Merah
A ₂	$\frac{1,5}{5} = 0,3$	Transparan	Kuning muda	Merah
A ₃	$\frac{2,2}{5} = 0,44$	Transparan	Kuning muda	Merah
A ₄	$\frac{2,8}{5} = 0,56$	Hijau	Kuning muda	Merah
A ₅	$\frac{3,2}{5} = 0,64$	Transparan	Kuning muda	Merah
A ₆	$\frac{3,9}{5} = 0,78$	Transparan	Kuning muda	Merah
A ₇	$\frac{4,4}{5} = 0,88$	Transparan	Ungu	Merah
A ₈	$\frac{4,6}{5} = 0,92$	Transparan	Ungu	Hijau muda
B ₁	$\frac{1}{5} = 0,2$	Transparan	Kuning muda	Merah
B ₂	$\frac{1,6}{5} = 0,32$	Transparan	Kuning muda	Merah

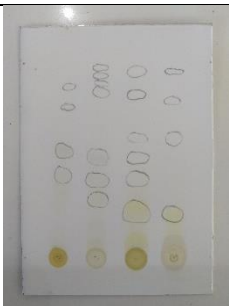
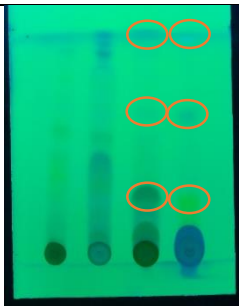
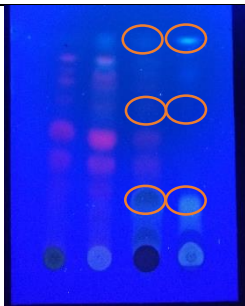
B ₃	$\frac{2,2}{5} = 0,44$	Transparan	Ungu	Merah
B ₄	$\frac{2,8}{5} = 0,56$	Transparan	Ungu	Merah
B ₅	$\frac{3,1}{5} = 0,62$	Transparan	Ungu	Merah
B ₆	$\frac{4,3}{5} = 0,86$	Transparan	Ungu	Merah
B ₇	$\frac{4,5}{5} = 0,9$	Transparan	Ungu	Merah
B ₈	$\frac{4,7}{5} = 0,94$	Transparan	Ungu	Hijau muda
B ₉	$\frac{4,9}{5} = 0,8$	Transparan	Ungu	Hijau muda
C ₁	$\frac{0,6}{5} = 0,12$	Coklat muda	Ungu	Kuning
C ₂	$\frac{0,9}{5} = 0,18$	Coklat muda	Ungu	Kuning
C ₃	$\frac{2,2}{5} = 0,44$	Transparan	Ungu	Merah
C ₄	$\frac{2,6}{5} = 0,52$	Transparan	Ungu	Merah
C ₅	$\frac{3,2}{5} = 0,64$	Transparan	Ungu	Merah
C ₆	$\frac{4,5}{5} = 0,9$	Transparan	Ungu	Merah
C ₇	$\frac{4,8}{5} = 0,96$	Transparan	Ungu	Hijau muda
C ₈	$\frac{4,9}{5} = 0,98$	Transparan	Ungu	Hijau muda
D ₁	$\frac{0,7}{5} = 0,14$	Kuning	Coklat	Coklat
D ₂	$\frac{0,9}{5} = 0,18$	Kuning muda	Ungu	Kuning
D ₃	$\frac{1,8}{5} = 0,36$	Transparan	Ungu	Transparan
D ₄	$\frac{2,8}{5} = 0,56$	Transparan	Ungu	Transparan
D ₅	$\frac{3,2}{5} = 0,64$	Transparan	Ungu	Transparan
D ₆	$\frac{4,3}{5} = 0,86$	Transparan	Ungu	Hijau muda

Keterangan :

A = Ekstrak Etanol Daun Kelor
B = Fraksi N-Heksana

C = Fraksi Etil Asetat
D = Baku Kuersetin

2. Senyawa Tanin

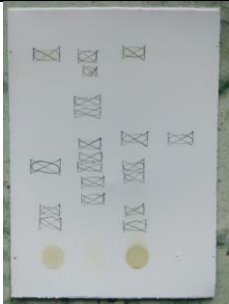
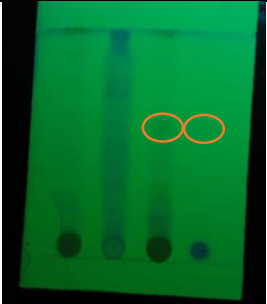
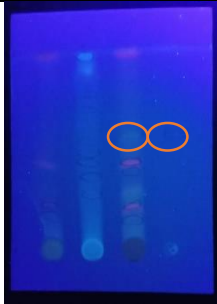
Fase gerak	= n-heksana : etil asetat (6 : 4)			
Jarak tempuh fase gerak	= 5 cm			
Rumus nilai Rf	= $\frac{\text{jarak tempuh bercak}}{\text{jarak tempuh fase gerak}}$			
Gambar kromatogram				
				
Visual	UV 254 nm			
				
	UV 366 nm			
Kode bercak	Nilai Rf	Warna bercak		
		Visual	UV 254 nm	UV 366 nm
A ₁	$\frac{2}{5} = 0,4$	Hijau muda	Kuning muda	Merah
A ₂	$\frac{2,7}{5} = 0,54$	Hijau muda	Kuning muda	Merah
A ₃	$\frac{3,8}{5} = 0,76$	Transparan	Kuning muda	Merah
A ₄	$\frac{4,4}{5} = 0,88$	Transparan	Ungu	Merah
B ₁	$\frac{1,4}{5} = 0,28$	Hijau muda	Kuning muda	Merah
B ₂	$\frac{2}{5} = 0,4$	Hijau muda	Ungu	Merah
B ₃	$\frac{2,5}{5} = 0,5$	Hijau muda	Ungu	Merah
B ₄	$\frac{4,2}{5} = 0,84$	Transparan	Ungu	Merah
B ₅	$\frac{4,4}{5} = 0,88$	Transparan	Ungu	Hijau
B ₆	$\frac{4,6}{5} = 0,92$	Transparan	Ungu	Merah
B ₇	$\frac{4,8}{5} = 0,96$	Transparan	Ungu	Hijau
C ₁	$\frac{1,2}{5} = 0,24$	Kuning muda	Coklat muda	Coklat

C ₂	$\frac{2,1}{5} = 0,42$	Transparan	Ungu	Ungu
C ₃	$\frac{2,6}{5} = 0,52$	Transparan	Ungu	Ungu
C ₄	$\frac{3,1}{5} = 0,62$	Transparan	Ungu	Ungu
C ₅	$\frac{4,2}{5} = 0,84$	Transparan	Ungu	Ungu
C ₆	$\frac{4,8}{5} = 0,96$	Transparan	Ungu	Ungu
D ₁	$\frac{1,2}{5} = 0,24$	Kuning muda	Kuning muda	Hijau muda
D ₂	$\frac{3,1}{5} = 0,62$	Transparan	Ungu	Transparan
D ₃	$\frac{4}{5} = 0,8$	Transparan	Ungu	Ungu
D ₄	$\frac{4,8}{5} = 0,96$	Transparan	Ungu	Hijau muda

Keterangan :

A = Ekstrak Daun Kelor C = Fraksi Etil Asetat
 B = Fraksi N-Heksana D = Baku Asam Galat

3. Senyawa Saponin

Fase gerak	= kloroform : aseton (4 : 1)			
Jarak tempuh fase gerak	= 5 cm			
Rumus nilai Rf	= $\frac{\text{jarak tempuh bercak}}{\text{jarak tempuh fase gerak}}$			
Gambar kromatogram				
				
Visual	UV 254 nm			
				
	UV 366 nm			
Kode bercak	Nilai Rf	Warna bercak		
		Visual	UV 254 nm	UV 366 nm

A ₁	$\frac{0,8}{5} = 0,16$	Transparan	Ungu	Kuning muda
A ₂	$\frac{1,1}{5} = 0,22$	Transparan	Ungu	Kuning muda
A ₃	$\frac{2,2}{5} = 0,44$	Transparan	Ungu	Merah
A ₄	$\frac{4,8}{5} = 0,96$	Transparan	Ungu	Merah
B ₁	$\frac{1,4}{5} = 0,28$	Transparan	Ungu	Kuning muda
B ₂	$\frac{1,8}{5} = 0,36$	Transparan	Ungu	Kuning muda
B ₃	$\frac{2,2}{5} = 0,44$	Transparan	Ungu	Kuning muda
B ₄	$\frac{2,5}{5} = 0,56$	Transparan	Ungu	Kuning muda
B ₅	$\frac{2,8}{5} = 0,56$	Transparan	Ungu	Kuning muda
B ₆	$\frac{3,5}{5} = 0,7$	Transparan	Ungu	Kuning muda
B ₇	$\frac{3,8}{5} = 0,76$	Transparan	Ungu	Kuning muda
B ₈	$\frac{4,5}{5} = 0,9$	Transparan	Ungu	Hijau
B ₉	$\frac{4,8}{5} = 0,96$	Transparan	Ungu	Hijau
C ₁	$\frac{0,7}{5} = 0,14$	Transparan	Ungu	Kuning muda
C ₂	$\frac{1,1}{5} = 0,22$	Transparan	Ungu	Merah
C ₃	$\frac{1,9}{5} = 0,38$	Transparan	Ungu	Kuning muda
C ₄	$\frac{2,2}{5} = 0,44$	Transparan	Ungu	Merah
C ₅	$\frac{2,9}{5} = 0,58$	Transparan	Ungu	Kuning muda
C ₆	$\frac{4,9}{5} = 0,98$	Transparan	Ungu	Merah
D ₁	$\frac{2,9}{5} = 0,58$	Transparan	Ungu	Transparan

Keterangan :

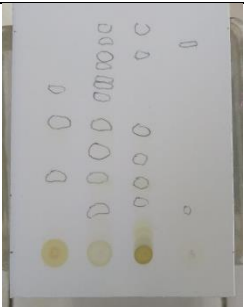
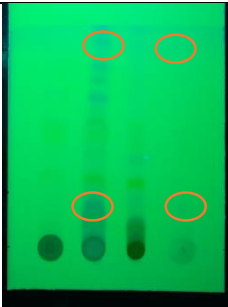
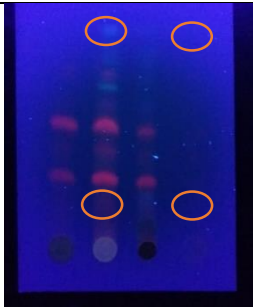
A = Ekstrak Etanol Daun Kelor

C = Fraksi Etil Asetat

B = Fraksi N-Heksana

D = Baku Sapogenin

4. Senyawa Steroid

Fase gerak	= toluen : etil asetat : kloroform (5 : 1 : 4)			
Jarak tempuh fase gerak	= 5 cm			
Rumus nilai Rf	= $\frac{\text{jarak tempuh bercak}}{\text{jarak tempuh fase gerak}}$			
Gambar kromatogram				
				
Visual	UV 254 nm	UV 366 nm		
Kode bercak	Nilai Rf	Warna bercak		
		Visual	UV 254 nm	UV 366 nm
A ₁	$\frac{1,7}{5} = 0,34$	Transparan	Kuning muda	Merah
A ₂	$\frac{2,9}{5} = 0,58$	Transparan	Kuning muda	Merah
A ₃	$\frac{3,6}{5} = 0,72$	Transparan	Kuning muda	Merah
B ₁	$\frac{0,9}{5} = 0,18$	Transparan	Ungu	Merah
B ₂	$\frac{1,6}{5} = 0,32$	Transparan	Kuning muda	Merah
B ₃	$\frac{2,2}{5} = 0,44$	Transparan	Kuning muda	Merah
B ₄	$\frac{2,8}{5} = 0,56$	Transparan	Kuning muda	Merah
B ₅	$\frac{3,5}{5} = 0,7$	Transparan	Ungu	Merah
B ₆	$\frac{3,7}{5} = 0,74$	Transparan	Ungu	Hijau muda
B ₇	$\frac{3,9}{5} = 0,78$	Transparan	Ungu	Merah
B ₈	$\frac{4,2}{5} = 0,84$	Transparan	Ungu	Hijau muda
B ₉	$\frac{4,4}{5} = 0,88$	Transparan	Ungu	Hijau muda

B ₁₀	$\frac{4,7}{5} = 0,94$	Transparan	Ungu	Hijau muda
B ₁₁	$\frac{5}{5} = 1$	Transparan	Ungu	Hijau muda
C ₁	$\frac{1,1}{5} = 0,22$	Transparan	Ungu	Merah
C ₂	$\frac{1,6}{5} = 0,32$	Transparan	Kuning muda	Merah
C ₃	$\frac{2,1}{5} = 0,42$	Transparan	Ungu	Merah
C ₄	$\frac{2,7}{5} = 0,54$	Transparan	Kuning muda	Hijau muda
C ₅	$\frac{4,4}{5} = 0,88$	Transparan	Ungu	Hijau muda
C ₆	$\frac{5}{5} = 1$	Transparan	Ungu	Hijau muda
D ₁	$\frac{0,9}{5} = 0,18$	Transparan	Ungu	Merah
D ₂	$\frac{4,7}{5} = 0,94$	Transparan	Ungu	Hijau muda

Keterangan :

A = Ekstrak Etanol Daun Kelor

B = Fraksi N-Heksana

C = Fraksi Etil Asetat

D = Baku Stigmasterol

Lampiran 8. Pengukuran λ_{\max} DPPH dan OT sampel

Perhitungan larutan DPPH 0,4 mM

Mr DPPH = 394,32 gram/mol

DPPH 0,4 mM = 0,0004 M dalam 100 ml

Berat serbuk DPPH yang dibutuhkan :

$$M = \frac{g}{Mr} \times \frac{1000}{\text{volume (ml)}}$$

$$0,0004 = \frac{g}{394,32} \times \frac{1000}{100}$$

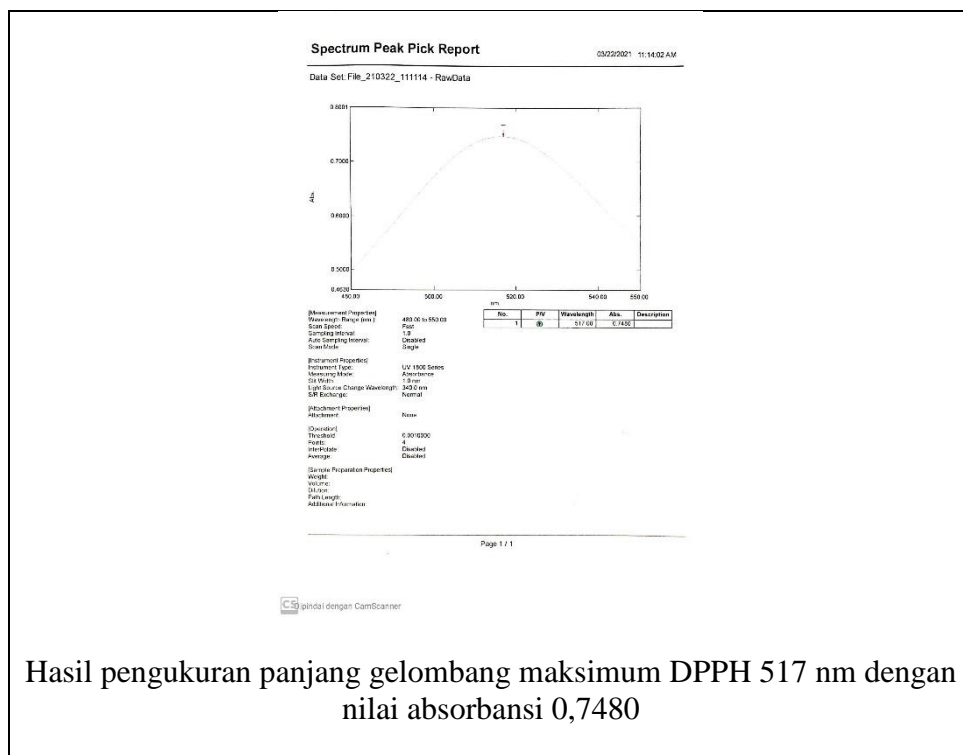
$$0,0005 = \frac{g}{394,32} \times 10$$

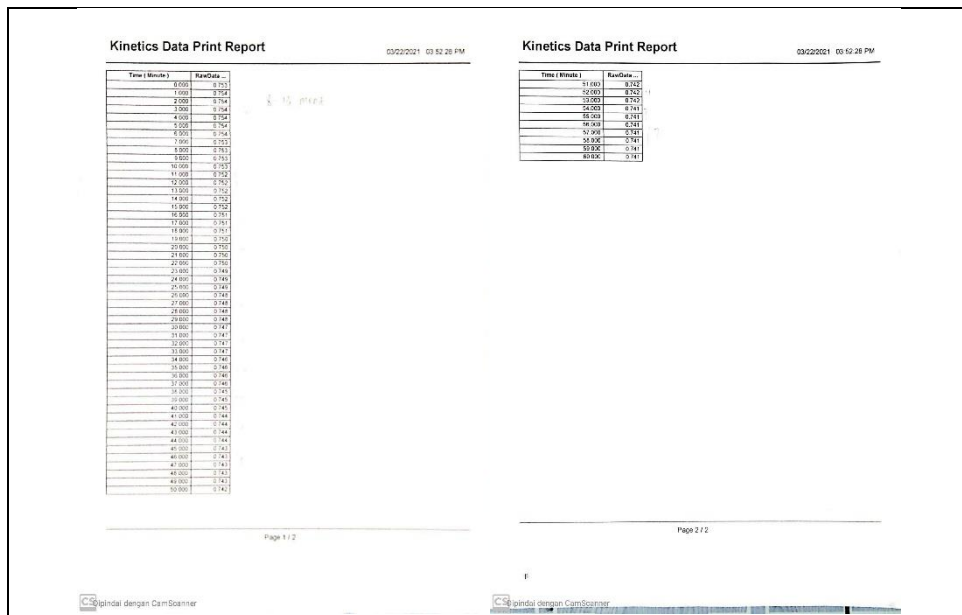
$$10 \times g = 0,0004 \times 394,32$$

$$10 \times g = 0,157728$$

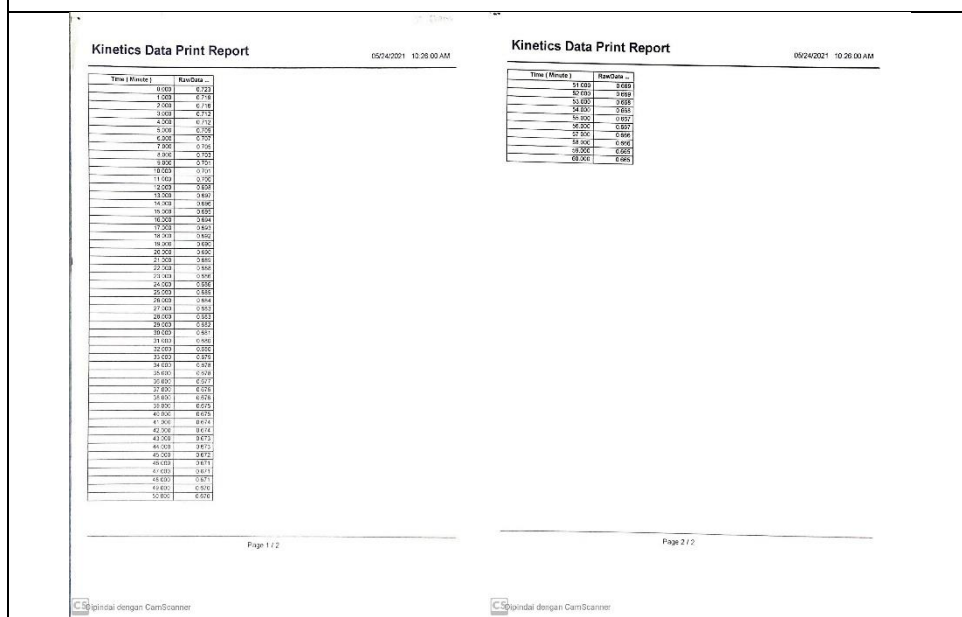
$$g = \frac{0,157728}{10}$$

$$g = 0,0157728 \text{ g} \approx 15,7728 \text{ mg} \approx 15,8 \text{ mg}$$





Hasil pengukuran OT Hemaviton C1000 = 8-13 menit dengan nilai absorbansi 0,754



Hasil pengukuran OT ekstrak etanol daun kelor = 47-49 menit dengan nilai absorbansi 0,671

Kinetics Data Print Report
05/19/2021 01:45:29 PM

Time (Minutes)	RawData
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8.000	0.54
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10.000	0.54
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15.000	0.54
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34.000	0.54
35.000	0.54
36.000	0.54
37.000	0.54
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40.000	0.54
41.000	0.54
42.000	0.54
43.000	0.54
44.000	0.54
45.000	0.54
46.000	0.54
47.000	0.54
48.000	0.54
49.000	0.54
50.000	0.54

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55.000	0.54
56.000	0.54
57.000	0.54
58.000	0.54
59.000	0.54
60.000	0.54

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Hasil pengukuran OT fraksi n-heksana = 15-16 menit dengan nilai absorbansi 0,736.

Kinetics Data Print Report
05/19/2021 11:48:08 AM

Time (Minutes)	RawData
0.000	0.67
1.000	0.67
2.000	0.67
3.000	0.67
4.000	0.67
5.000	0.67
6.000	0.67
7.000	0.67
8.000	0.67
9.000	0.67
10.000	0.67
11.000	0.67
12.000	0.67
13.000	0.67
14.000	0.67
15.000	0.67
16.000	0.67
17.000	0.67
18.000	0.67
19.000	0.67
20.000	0.67
21.000	0.67
22.000	0.67
23.000	0.67
24.000	0.67
25.000	0.67
26.000	0.67
27.000	0.67
28.000	0.67
29.000	0.67
30.000	0.67
31.000	0.67
32.000	0.67
33.000	0.67
34.000	0.67
35.000	0.67
36.000	0.67
37.000	0.67
38.000	0.67
39.000	0.67
40.000	0.67
41.000	0.67
42.000	0.67
43.000	0.67
44.000	0.67
45.000	0.67
46.000	0.67
47.000	0.67
48.000	0.67
49.000	0.67
50.000	0.67

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Time (Minutes)	RawData
51.000	0.56
52.000	0.56
53.000	0.56
54.000	0.56
55.000	0.56
56.000	0.56
57.000	0.56
58.000	0.56
59.000	0.56
60.000	0.56

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Hasil pengukuran OT fraksi etil asetat = adalah 49-50 menit dengan nilai absorbansi 0,563.

Lampiran 9. Hasil uji aktivitas antioksidan secara *in vitro*

Perhitungan variasi konsentrasi larutan uji Hemaviton C1000

Sebanyak 25 mg sampel dilarutkan ke dalam pelarutnya dan volume akhir dicukupkan dengan etanol p.a hingga 25 mL ($25 \text{ mg}/25 \text{ ml} = 1000 \text{ mg}/1000 \text{ ml} = 1000 \text{ ppm}$). Larutan tersebut dibuat 5 seri konsentrasi (10 ppm, 50 ppm, 90 ppm, 130 ppm, 170 ppm) dalam labu takar 10 ml. Volume yang diambil untuk masing-masing konsentrasi adalah :

➤ 10 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 10 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 10 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 0,1 \text{ ml} \end{aligned}$$

➤ 50 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 50 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 50 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 0,5 \text{ ml} \end{aligned}$$

➤ 90 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 90 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 90 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 0,9 \text{ ml} \end{aligned}$$

➤ 130 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 130 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 130 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 1,3 \text{ ml} \end{aligned}$$

➤ 170 ppm

$$V_1 \times C_1 = V_2 \times C_2$$

$$\begin{aligned}
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 170 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 170 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 1,7 \text{ ml}
 \end{aligned}$$

Perhitungan variasi konsentrasi larutan uji ekstrak daun kelor

Sebanyak 25 mg sampel dilarutkan ke dalam pelarutnya dan volume akhir dicukupkan dengan etanol p.a hingga 25 mL ($25 \text{ mg}/25 \text{ ml} = 1000 \text{ mg}/1000 \text{ ml} = 1000 \text{ ppm}$). Larutan tersebut dibuat 5 seri konsentrasi (50 ppm, 100 ppm, 150 ppm, 200 ppm, 250 ppm) dalam labu takar 10 ml. Volume yang diambil untuk masing-masing konsentrasi adalah :

➤ 50 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 50 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 50 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 0,5 \text{ ml}
 \end{aligned}$$

➤ 100 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 100 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 100 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 1 \text{ ml}
 \end{aligned}$$

➤ 150 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 150 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 150 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 1,5 \text{ ml}
 \end{aligned}$$

➤ 200 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 200 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 200 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 2 \text{ ml}
 \end{aligned}$$

➤ 250 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 250 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 250 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 2,5 \text{ ml} \end{aligned}$$

Perhitungan variasi konsentrasi larutan uji fraksi n-heksana

Sebanyak 25 mg sampel dilarutkan ke dalam pelarutnya dan volume akhir dicukupkan dengan etanol p.a hingga 25 mL (25 mg/25 ml = 1000 mg/1000 ml = 1000 ppm). Larutan tersebut dibuat 5 seri konsentrasi (100 ppm, 150 ppm, 200 ppm, 250 ppm, 300 ppm) dalam labu takar 10 ml. Volume yang diambil untuk masing-masing konsentrasi adalah :

➤ 100 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 100 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 100 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 1 \text{ ml} \end{aligned}$$

➤ 150 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 150 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 150 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 1,5 \text{ ml} \end{aligned}$$

➤ 200 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 200 \text{ ppm} \\ V_1 &= \frac{10 \text{ ml} \times 200 \text{ ppm}}{1000 \text{ ppm}} \\ V_1 &= 2 \text{ ml} \end{aligned}$$

➤ 250 ppm

$$\begin{aligned} V_1 \times C_1 &= V_2 \times C_2 \\ V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 250 \text{ ppm} \end{aligned}$$

$$V1 = \frac{10 \text{ ml} \times 250 \text{ ppm}}{1000 \text{ ppm}}$$

$$V1 = 2,5 \text{ ml}$$

➤ 300 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 1000 \text{ ppm} = 10 \text{ ml} \times 300 \text{ ppm}$$

$$V1 = \frac{10 \text{ ml} \times 300 \text{ ppm}}{1000 \text{ ppm}}$$

$$V1 = 3 \text{ ml}$$

Perhitungan variasi konsentrasi larutan uji fraksi etil asetat

Sebanyak 25 mg sampel dilarutkan ke dalam pelarutnya dan volume akhir dicukupkan dengan etanol p.a hingga 25 mL (25 mg/25 ml = 1000 mg/1000 ml = 1000 ppm). Larutan tersebut dibuat 5 seri konsentrasi (50 ppm, 100 ppm, 150 ppm, 200 ppm, 250 ppm) dalam labu takar 10 ml. Volume yang diambil untuk masing-masing konsentrasi adalah :

➤ 50 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 1000 \text{ ppm} = 10 \text{ ml} \times 50 \text{ ppm}$$

$$V1 = \frac{10 \text{ ml} \times 50 \text{ ppm}}{1000 \text{ ppm}}$$

$$V1 = 0,5 \text{ ml}$$

➤ 100 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 1000 \text{ ppm} = 10 \text{ ml} \times 100 \text{ ppm}$$

$$V1 = \frac{10 \text{ ml} \times 100 \text{ ppm}}{1000 \text{ ppm}}$$

$$V1 = 1 \text{ ml}$$

➤ 150 ppm

$$V1 \times C1 = V2 \times C2$$

$$V1 \times 1000 \text{ ppm} = 10 \text{ ml} \times 150 \text{ ppm}$$

$$V1 = \frac{10 \text{ ml} \times 150 \text{ ppm}}{1000 \text{ ppm}}$$

$$V1 = 1,5 \text{ ml}$$

➤ 200 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 200 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 200 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 2 \text{ ml}
 \end{aligned}$$

➤ 250 ppm

$$\begin{aligned}
 V_1 \times C_1 &= V_2 \times C_2 \\
 V_1 \times 1000 \text{ ppm} &= 10 \text{ ml} \times 250 \text{ ppm} \\
 V_1 &= \frac{10 \text{ ml} \times 250 \text{ ppm}}{1000 \text{ ppm}} \\
 V_1 &= 2,5 \text{ ml}
 \end{aligned}$$

Hasil uji aktivitas antioksidan secara *in vitro*

1. Kontrol positif Hemaviton C1000

Absorbansi DPPH = 0,737

Konsentrasi (ppm)	Absorbansi		
	Replikasi 1	Replikasi 2	Replikasi 3
10	0,725	0,723	0,720
50	0,688	0,687	0,687
90	0,496	0,495	0,494
130	0,343	0,343	0,342
170	0,222	0,221	0,219

% peredaman			Rata-rata %peredaman
Replikasi 1	Replikasi 2	Replikasi 3	
1,628	1,900	2,307	1,945
6,649	6,784	6,784	6,739
32,700	32,836	32,972	32,836
53,460	53,460	53,596	53,505
69,878	70,014	70,285	70,059

$$\text{Nilai \%peredaman} = \frac{(\text{Abs DPPH} - \text{Abs sampel})}{\text{Abs DPPH}} \times 100\%$$

REPLIKASI 1

- Konsentrasi 10 ppm = $\frac{(0,737 - 0,725)}{0,737} \times 100\% = 1,628\%$

- Konsentrasi 50 ppm = $\frac{(0,737-0,688)}{0,737} \times 100\% = 6,649\%$
- Konsentrasi 90 ppm = $\frac{(0,737-0,496)}{0,737} \times 100\% = 32,700\%$
- Konsentrasi 130 ppm = $\frac{(0,737-0,343)}{0,737} \times 100\% = 53,460\%$
- Konsentrasi 170 ppm = $\frac{(0,737-0,222)}{0,737} \times 100\% = 69,878\%$

REPLIKASI 2

- Konsentrasi 10 ppm = $\frac{(0,737-0,723)}{0,737} \times 100\% = 1,900\%$
- Konsentrasi 50 ppm = $\frac{(0,737-0,687)}{0,737} \times 100\% = 6,784\%$
- Konsentrasi 90 ppm = $\frac{(0,737-0,495)}{0,737} \times 100\% = 32,836\%$
- Konsentrasi 130 ppm = $\frac{(0,737-0,343)}{0,737} \times 100\% = 53,460\%$
- Konsentrasi 170 ppm = $\frac{(0,737-0,221)}{0,737} \times 100\% = 70,014\%$

REPLIKASI 3

- Konsentrasi 10 ppm = $\frac{(0,737-0,720)}{0,737} \times 100\% = 2,307\%$
- Konsentrasi 50 ppm = $\frac{(0,737-0,687)}{0,737} \times 100\% = 6,784\%$
- Konsentrasi 90 ppm = $\frac{(0,737-0,494)}{0,737} \times 100\% = 32,972\%$
- Konsentrasi 130 ppm = $\frac{(0,737-0,342)}{0,737} \times 100\% = 53,596\%$
- Konsentrasi 170 ppm = $\frac{(0,737-0,219)}{0,737} \times 100\% = 70,285\%$

Rata-rata %peredaman masing-masing konsentrasi :

- Konsentrasi 10 ppm = $\frac{1,628\%+1,900\%+2,307\%}{3} = 1,945\%$
- Konsentrasi 50 ppm = $\frac{6,649\%+6,784\%+6,784\%}{3} = 6,739\%$
- Konsentrasi 90 pp = $\frac{32,700\%+32,836\%+32,972\%}{3} = 32,836\%$
- Konsentrasi 130 ppm = $\frac{53,460\%+53,460\%+53,596\%}{3} = 53,505\%$
- Konsentrasi 170 ppm = $\frac{69,878\%+70,014\%+70,285\%}{3} = 70,059\%$

Regresi linier (abs vs %peredaman) :

Replikasi	Regresi linier			IC ₅₀ (ppm)	Rata-rata IC ₅₀ ± SD
	a	b	r		
1	-8,382	0,458	0,986	127,395	127,123 ± 0,305
2	-8,155	0,457	0,986	127,181	
3	-7,934	0,457	0,985	126,793	

$$\text{Nilai IC}_{50} \text{ Hemaviton C1000} = \frac{(50-a)}{b}$$

$$\text{REPLIKASI 1} = \frac{(50-(-8,382))}{0,458} = 127,395 \text{ ppm}$$

$$\text{REPLIKASI 2} = \frac{(50-(-8,155))}{0,457} = 127,181 \text{ ppm}$$

$$\text{REPLIKASI 3} = \frac{(50-(-7,934))}{0,457} = 126,793 \text{ ppm}$$

$$\begin{aligned} \text{Rata-rata nilai IC}_{50} \text{ Hemaviton C1000} &= \frac{127,395 \text{ ppm} + 127,181 \text{ ppm} + 126,793 \text{ ppm}}{3} \\ &= 127,123 \text{ ppm} \end{aligned}$$

(kategori sedang 101 – 250 ppm)

2. Ekstrak etanol daun kelor

Absorbansi DPPH = 0,789

Konsentrasi (ppm)	Absorbansi		
	Replikasi 1	Replikasi 2	Replikasi 3
50	0,649	0,649	0,648
100	0,579	0,578	0,577
150	0,501	0,500	0,500
200	0,413	0,412	0,411
250	0,359	0,358	0,358

% peredaman			Rata-rata %peredaman
Replikasi 1	Replikasi 2	Replikasi 3	
17,744	17,744	17,871	17,786
26,616	26,743	26,869	26,743
36,502	36,629	36,629	36,586
47,655	47,782	47,909	47,782
54,499	54,626	54,626	54,584

$$\text{Nilai \%peredaman} = \frac{(\text{Abs DPPH} - \text{Abs sampel})}{\text{Abs DPPH}} \times 100\%$$

REPLIKASI 1

- Konsentrasi 50 ppm = $\frac{(0,789 - 0,649)}{0,789} \times 100\%$ = 17,744%
- Konsentrasi 100 ppm = $\frac{(0,789 - 0,579)}{0,789} \times 100\%$ = 26,616%
- Konsentrasi 150 ppm = $\frac{(0,789 - 0,501)}{0,789} \times 100\%$ = 36,502%
- Konsentrasi 200 ppm = $\frac{(0,789 - 0,413)}{0,789} \times 100\%$ = 47,655%
- Konsentrasi 250 ppm = $\frac{(0,789 - 0,359)}{0,789} \times 100\%$ = 54,499%

REPLIKASI 2

- Konsentrasi 50 ppm = $\frac{(0,789 - 0,649)}{0,789} \times 100\%$ = 17,744%
- Konsentrasi 100 ppm = $\frac{(0,789 - 0,578)}{0,789} \times 100\%$ = 26,743%
- Konsentrasi 150 ppm = $\frac{(0,789 - 0,500)}{0,789} \times 100\%$ = 36,629%
- Konsentrasi 200 ppm = $\frac{(0,789 - 0,412)}{0,789} \times 100\%$ = 47,782%
- Konsentrasi 250 ppm = $\frac{(0,789 - 0,358)}{0,789} \times 100\%$ = 54,626%

REPLIKASI 3

- Konsentrasi 50 ppm = $\frac{(0,789 - 0,648)}{0,789} \times 100\%$ = 17,871%
- Konsentrasi 100 ppm = $\frac{(0,789 - 0,577)}{0,789} \times 100\%$ = 26,869%
- Konsentrasi 150 ppm = $\frac{(0,789 - 0,500)}{0,789} \times 100\%$ = 36,629%
- Konsentrasi 200 ppm = $\frac{(0,789 - 0,411)}{0,789} \times 100\%$ = 47,909%
- Konsentrasi 250 ppm = $\frac{(0,789 - 0,358)}{0,789} \times 100\%$ = 54,626%

Rata-rata %peredaman masing-masing konsentrasi :

- Konsentrasi 50 ppm = $\frac{17,744\% + 17,744\% + 17,871\%}{3}$ = 17,786%
- Konsentrasi 100 ppm = $\frac{26,616\% + 26,743\% + 26,869\%}{3}$ = 26,743%
- Konsentrasi 150 ppm = $\frac{36,502\% + 36,629\% + 36,629\%}{3}$ = 36,586%

- Konsentrasi 200 ppm = $\frac{47,655\%+47,782\%+47,909\%}{3} = 47,782\%$
- Konsentrasi 250 ppm = $\frac{54,499\%+54,626\%+54,626\%}{3} = 54,584\%$

Regresi linier (abs vs %peredaman) :

Replikasi	Regresi linier			IC ₅₀ (ppm)	Rata-rata IC ₅₀ ± SD
	a	b	r		
1	8,238	0,189	0,998	220,845	220,290 ± 0,492
2	8,264	0,190	0,998	220,120	
3	8,416	0,189	0,998	219,906	

Nilai IC₅₀ ekstrak etanol daun kelor = $\frac{(50-a)}{b}$

$$\text{REPLIKASI 1} = \frac{(50-8,238)}{0,189} = 220,845 \text{ ppm}$$

$$\text{REPLIKASI 2} = \frac{(50-8,264)}{0,190} = 220,120 \text{ ppm}$$

$$\text{REPLIKASI 3} = \frac{(50-8,416)}{0,189} = 219,906 \text{ ppm}$$

Rata-rata nilai IC₅₀ ekstrak etanol daun kelor :

$$\frac{220,845 \text{ ppm}+220,120 \text{ ppm}+219,906 \text{ ppm}}{3} = 220,290 \text{ ppm}$$

(kategori sedang 101 – 250 ppm)

3. Fraksi n-heksana daun kelor

Absorbansi DPPH = 0,768

Konsentrasi (ppm)	Absorbansi		
	Replikasi 1	Replikasi 2	Replikasi 3
100	0,668	0,668	0,667
150	0,557	0,556	0,555
200	0,507	0,506	0,506
250	0,407	0,406	0,405
300	0,347	0,346	0,344

% peredaman			Rata-rata %peredaman
Replikasi 1	Replikasi 2	Replikasi 3	
13,021	13,021	13,151	13,064
27,474	27,604	27,734	27,604

33,984	34,115	34,115	34,071
47,005	47,135	47,266	47,135
54,818	54,948	55,208	54,991

$$\text{Nilai \%peredaman} = \frac{(\text{Abs DPPH} - \text{Abs sampel})}{\text{Abs DPPH}} \times 100\%$$

REPLIKASI 1

- Konsentrasi 100 ppm = $\frac{(0,768 - 0,668)}{0,768} \times 100\%$ = 13,021%
- Konsentrasi 150 ppm = $\frac{(0,768 - 0,557)}{0,768} \times 100\%$ = 27,474%
- Konsentrasi 200 ppm = $\frac{(0,768 - 0,507)}{0,768} \times 100\%$ = 33,984%
- Konsentrasi 250 ppm = $\frac{(0,768 - 0,407)}{0,768} \times 100\%$ = 47,005%
- Konsentrasi 300 ppm = $\frac{(0,768 - 0,347)}{0,768} \times 100\%$ = 54,818%

REPLIKASI 2

- Konsentrasi 100 ppm = $\frac{(0,768 - 0,668)}{0,768} \times 100\%$ = 13,021%
- Konsentrasi 150 ppm = $\frac{(0,768 - 0,556)}{0,768} \times 100\%$ = 27,604%
- Konsentrasi 200 ppm = $\frac{(0,768 - 0,506)}{0,768} \times 100\%$ = 34,115%
- Konsentrasi 250 ppm = $\frac{(0,768 - 0,406)}{0,768} \times 100\%$ = 47,135%
- Konsentrasi 300 ppm = $\frac{(0,768 - 0,346)}{0,768} \times 100\%$ = 54,948%

REPLIKASI 3

- Konsentrasi 100 ppm = $\frac{(0,768 - 0,667)}{0,768} \times 100\%$ = 13,151%
- Konsentrasi 150 ppm = $\frac{(0,768 - 0,555)}{0,768} \times 100\%$ = 27,734%
- Konsentrasi 200 ppm = $\frac{(0,768 - 0,506)}{0,768} \times 100\%$ = 34,115%
- Konsentrasi 250 ppm = $\frac{(0,768 - 0,405)}{0,768} \times 100\%$ = 47,266%
- Konsentrasi 300 ppm = $\frac{(0,768 - 0,344)}{0,768} \times 100\%$ = 55,208%

Rata-rata %peredaman masing-masing konsentrasi :

- Konsentrasi 100 ppm = $\frac{13,021\%+13,021\%+13,151\%}{3}$ = 13,064%
- Konsentrasi 150 ppm = $\frac{27,474\%+27,604\%+27,734\%}{3}$ = 27,604%
- Konsentrasi 200 ppm = $\frac{33,984\%+34,115\%+34,115\%}{3}$ = 34,071%
- Konsentrasi 250 ppm = $\frac{47,005\%+47,135\%+47,266\%}{3}$ = 47,135%
- Konsentrasi 300 ppm = $\frac{54,818\%+54,948\%+55,208\%}{3}$ = 54,991%

Regresi linier (abs vs %peredaman) :

Replikasi	Regresi linier			IC ₅₀ (ppm)	Rata-rata IC ₅₀ ± SD
	a	b	r		
1	-5,990	0,206	0,994	271,465	270,740 ± 0,746
2	-5,990	0,207	0,993	270,781	
3	-5,964	0,207	0,993	269,975	

Nilai IC₅₀ fraksi n-heksana daun kelor = $\frac{(50-a)}{b}$

$$\text{REPLIKASI 1} = \frac{(50-(-5,990))}{0,206} = 271,465 \text{ ppm}$$

$$\text{REPLIKASI 2} = \frac{(50-(-5990))}{0,207} = 270,781 \text{ ppm}$$

$$\text{REPLIKASI 3} = \frac{(50-(-5,964))}{0,207} = 269,975 \text{ ppm}$$

Rata-rata nilai IC₅₀ fraksi n-heksana daun kelor :

$$\frac{271,465 \text{ ppm}+270,781 \text{ ppm}+269,975 \text{ ppm}}{3} = 270,740 \text{ ppm}$$

(kategori lemah 250 – 500 ppm)

4. Fraksi etil asetat daun kelor

Absorbansi DPPH = 0,775

Konsentrasi (ppm)	Absorbansi		
	Replikasi 1	Replikasi 2	Replikasi 3
50	0,594	0,594	0,592
100	0,525	0,524	0,523

150	0,467	0,466	0,465
200	0,319	0,318	0,318
250	0,246	0,245	0,244

% peredaman			Rata-rata
Replikasi 1	Replikasi 2	Replikasi 3	%peredaman
23,355	23,355	23,613	23,441
32,258	32,387	32,516	32,387
39,742	39,871	40,000	39,871
58,839	58,968	58,968	58,925
68,258	68,387	68,516	68,387

$$\text{Nilai \%peredaman} = \frac{(\text{Abs DPPH} - \text{Abs sampel})}{\text{Abs DPPH}} \times 100\%$$

REPLIKASI 1

- Konsentrasi 50 ppm = $\frac{(0,775 - 0,594)}{0,775} \times 100\%$ = 23,355%
- Konsentrasi 100 ppm = $\frac{(0,775 - 0,525)}{0,775} \times 100\%$ = 32,258%
- Konsentrasi 150 ppm = $\frac{(0,775 - 0,467)}{0,775} \times 100\%$ = 39,742%
- Konsentrasi 200 ppm = $\frac{(0,775 - 0,319)}{0,775} \times 100\%$ = 58,839%
- Konsentrasi 250 ppm = $\frac{(0,775 - 0,246)}{0,775} \times 100\%$ = 68,258%

REPLIKASI 2

- Konsentrasi 50 ppm = $\frac{(0,775 - 0,594)}{0,775} \times 100\%$ = 23,355%
- Konsentrasi 100 ppm = $\frac{(0,775 - 0,525)}{0,775} \times 100\%$ = 32,387%
- Konsentrasi 150 ppm = $\frac{(0,775 - 0,467)}{0,775} \times 100\%$ = 39,871%
- Konsentrasi 200 ppm = $\frac{(0,775 - 0,319)}{0,775} \times 100\%$ = 58,968%
- Konsentrasi 250 ppm = $\frac{(0,775 - 0,246)}{0,775} \times 100\%$ = 68,387%

REPLIKASI 3

- Konsentrasi 50 ppm = $\frac{(0,775 - 0,592)}{0,775} \times 100\%$ = 23,613%
- Konsentrasi 100 ppm = $\frac{(0,775 - 0,523)}{0,775} \times 100\%$ = 32,516%

- Konsentrasi 150 ppm = $\frac{(0,775-0,465)}{0,775} \times 100\%$ = 40,000%
- Konsentrasi 200 ppm = $\frac{(0,775-0,318)}{0,775} \times 100\%$ = 58,968%
- Konsentrasi 250 ppm = $\frac{(0,775-0,244)}{0,775} \times 100\%$ = 68,516%

Rata-rata %peredaman masing-masing konsentrasi :

- Konsentrasi 50 ppm = $\frac{23,355\%+23,355\%+23,613\%}{3}$ = 23,441%
- Konsentrasi 100 ppm = $\frac{32,258\%+32,387\%+32,516\%}{3}$ = 32,387%
- Konsentrasi 150 ppm = $\frac{39,742\%+39,871\%+40,000\%}{3}$ = 39,871%
- Konsentrasi 200 ppm = $\frac{58,839\%+58,968\%+58,968\%}{3}$ = 58,925%
- Konsentrasi 250 ppm = $\frac{68,258\%+68,387\%+68,516\%}{3}$ = 68,387%

Regresi linier (abs vs %peredaman) :

Replikasi	Regresi linier			IC ₅₀ (ppm)	Rata-rata IC ₅₀ ± SD
	a	b	r		
1	9,574	0,233	0,987	173,670	173,181 ± 0,487
2	9,600	0,233	0,988	173,175	
3	9,845	0,233	0,988	172,697	

$$\text{Nilai IC}_{50} \text{ fraksi etil asetat daun kelor} = \frac{(50-a)}{b}$$

$$\text{REPLIKASI 1} = \frac{(50-9,574)}{0,233} = 173,670 \text{ ppm}$$

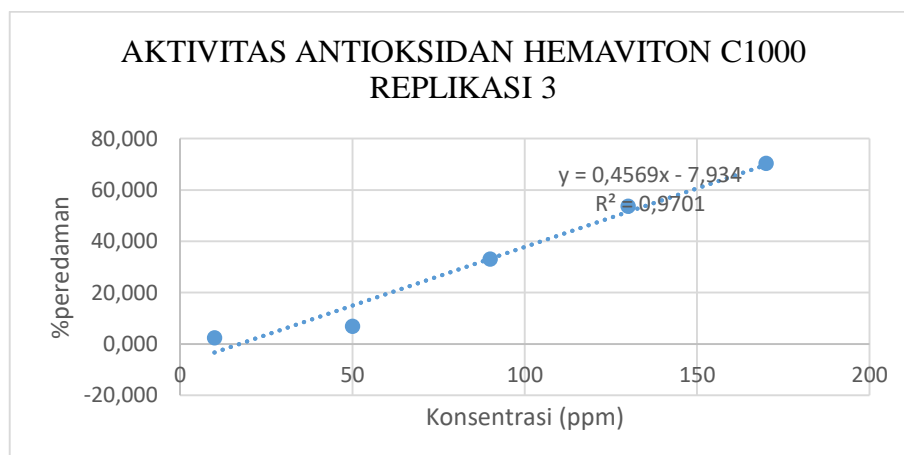
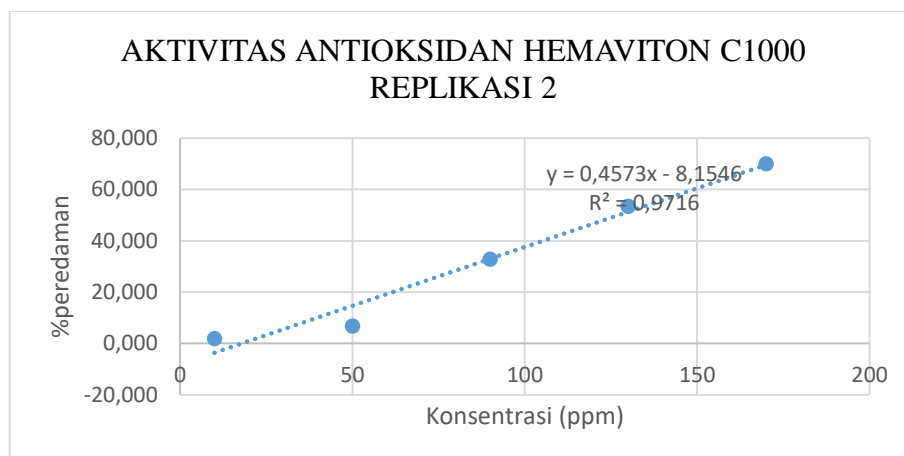
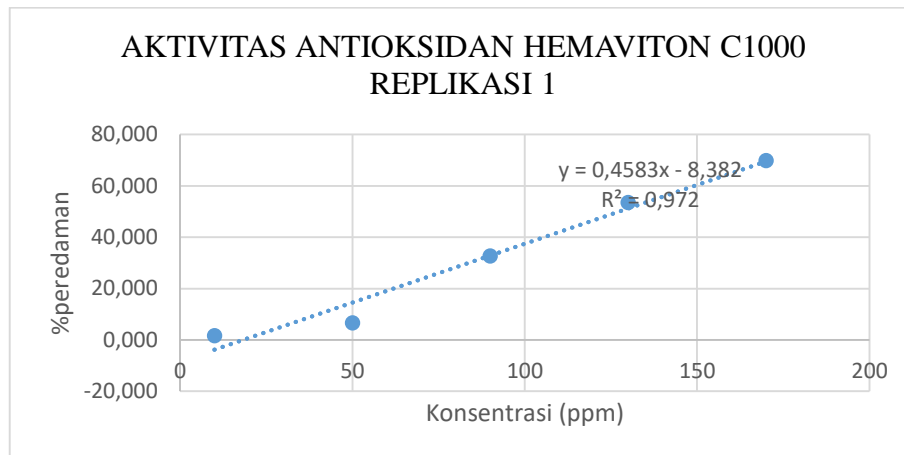
$$\text{REPLIKASI 2} = \frac{(50-9,600)}{0,233} = 173,175 \text{ ppm}$$

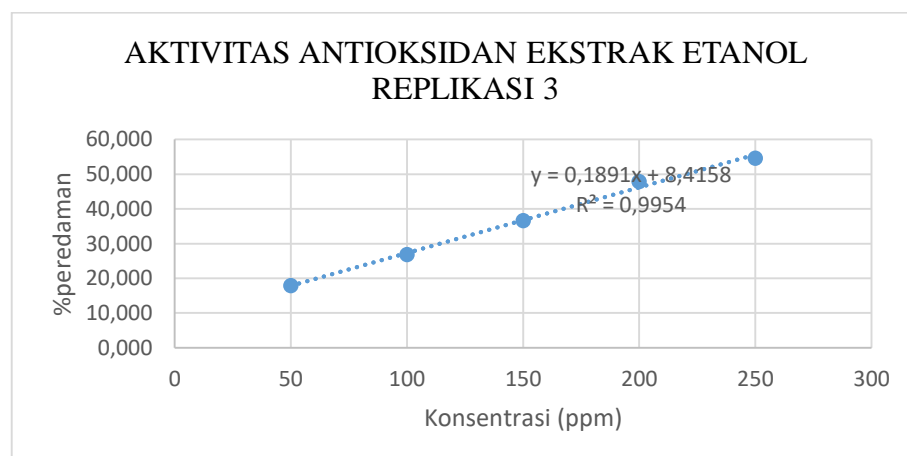
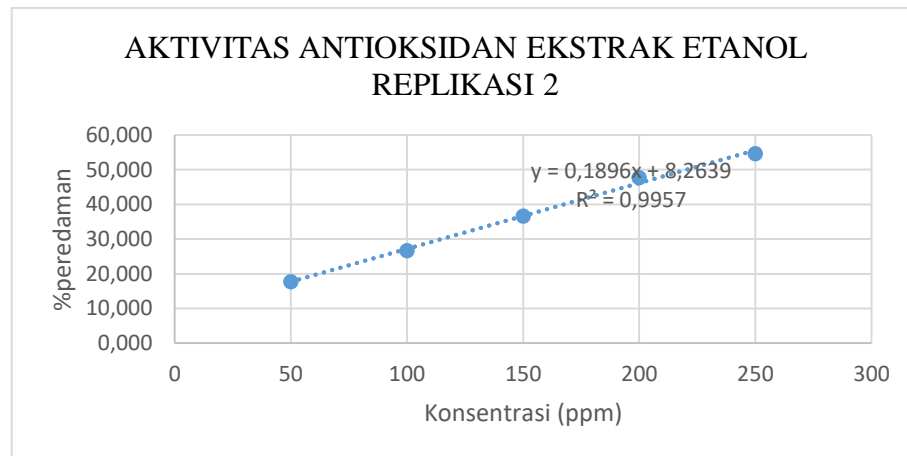
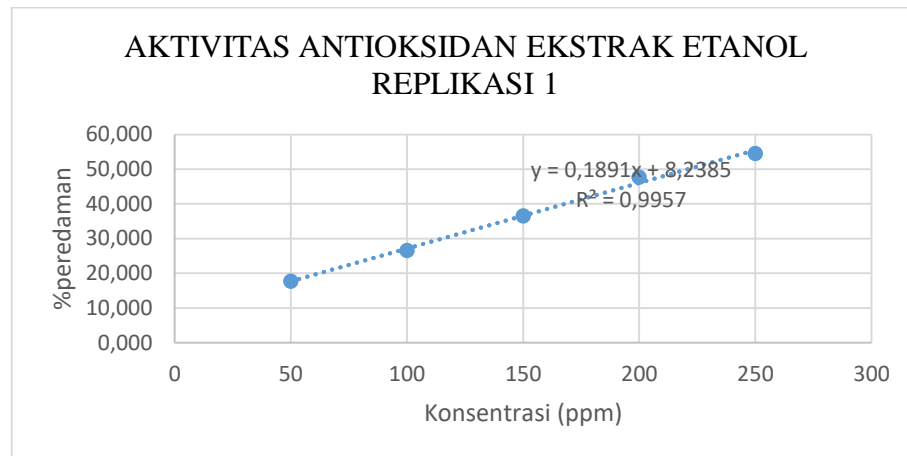
$$\text{REPLIKASI 3} = \frac{(50-9,845)}{0,233} = 172,697 \text{ ppm}$$

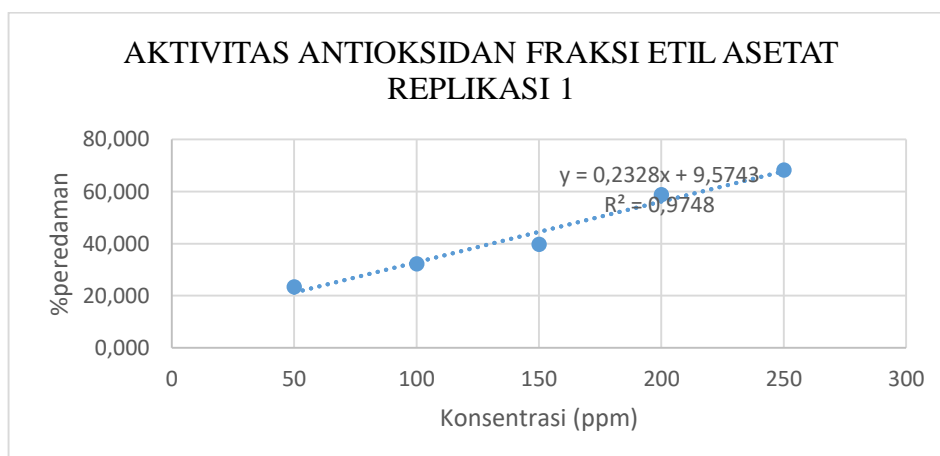
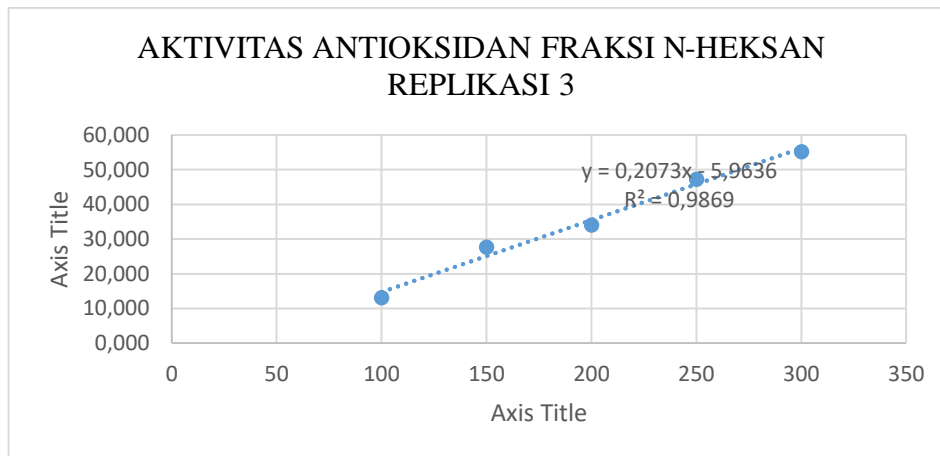
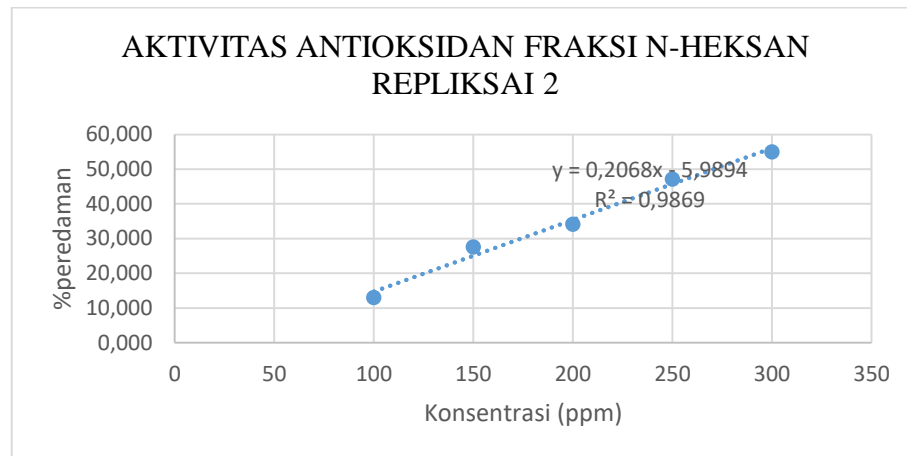
Rata-rata nilai IC₅₀ fraksi etil asetat daun kelor :

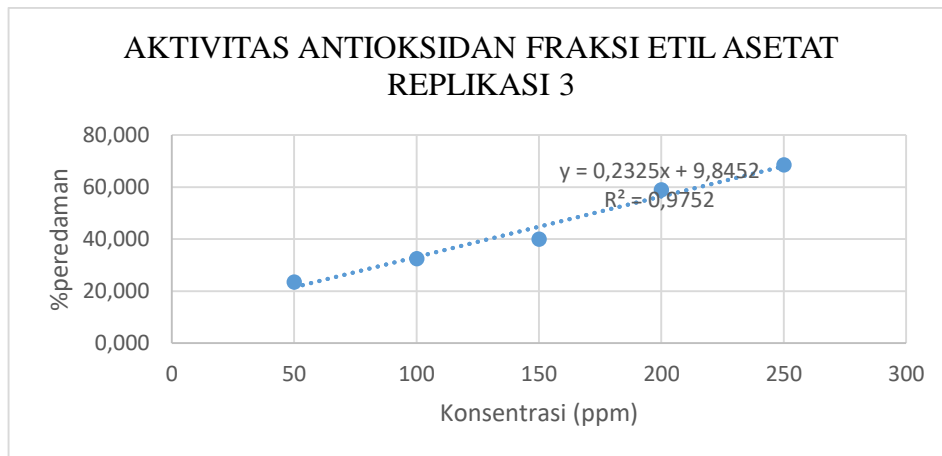
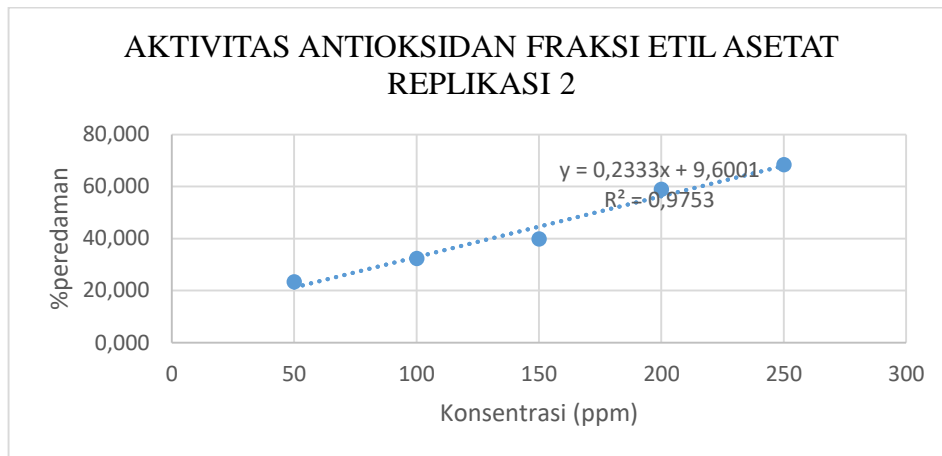
$$\frac{173,670 \text{ ppm}+173,175 \text{ ppm}+172,697 \text{ ppm}}{3} = 173,181 \text{ ppm}$$

(kategori sedang 101 – 250 ppm)

Grafik persamaan garis setiap replikasi larutan uji







Lampiran 10. Hasil uji statistik aktivitas antioksidan fraksi secara *in vitro*

Case Processing Summary

fraksi	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
IC50 Fraksi n-heksan	3	100.0%	0	0.0%	3	100.0%
Fraksi etil asetat	3	100.0%	0	0.0%	3	100.0%

Tests of Normality

fraksi	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
IC50 Fraksi n-heksan	.188	3	.	.998	3	.910
Fraksi etil asetat	.176	3	.	1.000	3	.981

a. Lilliefors Significance Correction

Nilai sig > 0,05 pada hasil uji *Tests of Normality* kolom *Shapiro-Wilk* maka data terdistribusi normal, sehingga dilanjutkan dengan uji *Independent Sample T-test*

Group Statistics

fraksi	N	Mean	Std. Deviation	Std. Error Mean
IC50 Fraksi n-heksan	3	270.74033	.745832	.430606
Fraksi etil asetat	3	173.18067	.486525	.280895

Independent Samples Test

	Levene's Test for Equality of Variances	t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
IC50 Equal variances assumed	.418	.553	189.759	4	.000	97.559667	.514124	96.132229	98.987105	
Equal variances not assumed			189.759	3.441	.000	97.559667	.514124	96.035988	99.083345	

Nilai Sig. (2-tailed) < 0,05 sehingga terdapat perbedaan yang signifikan antara aktivitas antioksidan dari fraksi n-heksana dan fraksi etil asetat.

Lampiran 11. Pembuatan serbuk daun kelor

Pohon kelor



Daun kelor



Simplisia kering daun kelor



Serbuk simplisia daun kelor

Lampiran 12. Hasil uji kandungan kimia

Hasil uji kandungan kimia serbuk simplisia daun kelor



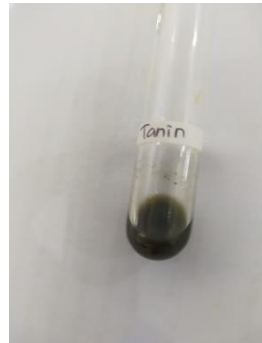
Flavonoid



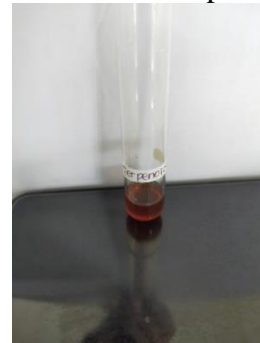
Alkaloid



Saponin



Tanin



Triterpenoid

Hasil uji kandungan ekstrak etanol daun kelor metode uji tabung



Flavonoid



Alkaloid



Saponin



Tanin



Steroid

Hasil uji kandungan kimia fraksi n-heksana metode uji tabung



Flavonoid



Alkaloid



Saponin



Tanin



Steroid

Hasil uji kandungan kimia fraksi etil asetat metode uji tabung

Flavonoid



Alkaloid



Saponin



Tanin



Steroid

Lampiran 13. Dokumentasi penelitian

Pengumpulan daun kelor



Sortasi basah



Pencucian daun kelor



Pengeringan daun kelor



Daun kelor kering



Sortasi kering



Pembuatan serbuk



Pengayakan serbuk



Serbuk daun kelor



Maserasi



Fraksinasi n-heksana



Fraksinasi etil asetat



Ekstrak kental daun kelor



Fraksi n-heksana



Fraksi etil asetat

Vaccum rotary
evaporator

Neraca analitik



Uji kadar air ekstrak



Desikator



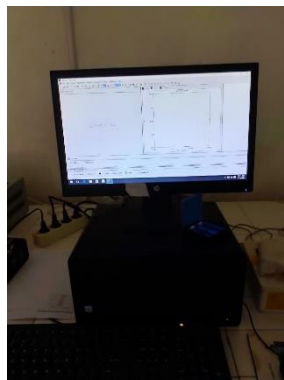
Uji KLT

Spektrofotometer *UV-Vis*

Penimbangan DPPH



Larutan stok DPPH

Larutan stok Hemaviton
C1000Penimbangan untuk
larutan stok sampel ujiPenentuan λ_{max} dan
OTPembacaan absorbansi
sampel

Lampiran 14. Surat keterangan cek plagiasi



SURAT KETERANGAN CEK PLAGIASI

No:562/H5-05/27.09.2021

Yang bertanda tangan ini :
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 Fakultas /Prodi : Farmasi / S1 Farmasi
 Judul Tugas Akhir : Uji Aktivitas Antioksidan Fraksi N-Heksana Dan Fraksi Etil Asetat Ekstrak Daun Kelor (Moringa Oleifera Lamk.) Secara In Vitro

Telah dilakukan cek plagiasi di UPT Perpustakaan Universitas Setia Budi Surakarta menggunakan aplikasi turnitin dengan prosentase *similarity* **30%**.

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Demikian surat keterangan ini kami buat agar dapat digunakan sebagaimana mestinya.

Surakarta, 27 September 2021

Ka UPT Perpustakaan



Rina Handayani, S.IP., MIP