

LAMPIRAN

Lampiran 1. Surat Determinasi Tanaman Kelor

	LABORATORIUM PEMBELAJARAN BIOLOGI FAKULTAS SAINS DAN TEKNOLOGI TERAPAN UNIVERSITAS AHMAD DAHLAN Jl. Ringroad Selatan, Tamanan, Banguntapan, Bantul
SURAT KETERANGAN Nomor : 255/Lab.Bio/B/V/2024	
Yang bertanda tangan di bawah ini Kepala Laboratorium Pembelajaran Biologi Universitas Ahmad Dahlan menerangkan bahwa :	
Nama	: Deby Mariska Sune
NIM	: 2022142015
Prodi, PT	: Farmasi, Universitas Sahid Surakarta
Telah melakukan determinasi daun tanaman dengan bimbingan Hery Setiyawan, M.Si di Laboratorium Pembelajaran Biologi Universitas Ahmad Dahlan, pada tanggal 18 Mei 2024.	
Tanaman tersebut adalah : <i>Moringa oleifera</i> Lam.	
Demikian Surat Keterangan ini untuk dapat dipergunakan sepenuhnya.	
Yogyakarta, 21 Mei 2024	
Kepala Lab. Pembelajaran Biologi	
 Ichsan Luqman Lata Putra, S. Si., M.Sc.	

1b – 2b – 3b – 4b – 12b – 13b – 14b – 17b – 18b – 19b – 20b – 21b – 22b – 23b – 24b – 25b –
26b – 27a – 28b – 29b – 30b – 21a – 32a – 33a – 34a – 35a – 36d – 37b – 38b – 39b – 41b –
42b – 44b – 45b – 46a – 47a Moringaceae
1 Moringa
1 *Moringa oleifera* Lam.

Flora of Java (Backer, 1965)

<https://www.worldfloraonline.org>



Lampiran 2. Dokumentasi Preparasi dan Ekstraksi Sampel

2.1 Preparasi Sampel



Pengumpulan Bahan Baku



Sortasi Basah



Pencucian



Pengeringan Oven



Sortasi Kering



Penghalusan



Pengayakan



Serbuk Daun Kelor

2.2 Ekstraksi Sampel



2.3 Tabel Pengamatan Berat Ekstrak dan Rendemen Ekstrak

Sampel	Pelarut	Berat Ekstrak (g)	Rendemen (%)
Daun kelor (<i>Moringa oleifera</i> L)	Kloroform	29	10,62

$$\begin{aligned}
 \% \text{ Rendemen} &= \frac{\text{Berat Ekstrak}}{\text{Berat Simplisia}} \times 100 \% \\
 &= \frac{29 \text{ g}}{273 \text{ g}} \times 100 \% \\
 &= 10,62 \%
 \end{aligned}$$

Lampiran 3. Uji Aktivitas Antioksidan

3.1 Data Penimbangan DPPH

Molaritas DPPH yang dibutuhkan 0,4 Mm (0,0004 M) dalam 100 mL

Mr DPPH adalah 394,32 g/mol

$$\text{Molaritas} = \frac{\text{Berat DPPH}}{\text{Mr}} \times \frac{1000}{\text{Volume Larutan}}$$

$$0,0004 \text{ M} = \frac{\text{Berat DPPH}}{394,32 \text{ g/mol}} \times \frac{1000}{100 \text{ mL}}$$

$$\begin{aligned} \text{Berat DPPH} &= \frac{0,0004 \text{ M} \times 394,32 \text{ g/mol}}{10} \\ &= 0,01577 \text{ gr} = 15,77 \text{ mg} \end{aligned}$$

3.2 Asam Askorbat (Vitamin C)

a. Data Penimbangan Vitamin C

	Replikasi 1 (mg)	Replikasi 2 (mg)	Replikasi 3 (mg)
Berat wadah	125	133	133
Berat wadah + sampel	135	143	143
Berat wadah + sisa	124	134	133
Berat Zat	11	9	10

b. Perhitungan Pengenceran Larutan Uji Vitamin C

Dibuat dari larutan stok 1000 ppm yang diencerkan menjadi 1 ppm, 1,5 ppm, 2 ppm, 2,5 ppm, dan 3 ppm sebanyak 5 mL.

1) 1 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 1000 \text{ ppm} = 5 \text{ mL} \cdot 1 \text{ ppm}$$

$$V_1 = \frac{5}{1000}$$

$$V_1 = 0,005 \text{ mL} = 5 \mu\text{L}$$

2) 1,5 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 1000 \text{ ppm} = 5 \text{ mL} \cdot 1,5 \text{ ppm}$$

$$V_1 = \frac{7,5}{1000}$$

$$V_1 = 0,0075 \text{ mL} = 7,5 \mu\text{L}$$

3) 2 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 1000 \text{ ppm} = 5 \text{ mL} \cdot 2 \text{ ppm}$$

$$V_1 = \frac{10}{1000}$$

$$V_1 = 0,01 \text{ mL} = 10 \mu\text{L}$$

4) 2,5 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 1000 \text{ ppm} = 5 \text{ mL} \cdot 2,5 \text{ ppm}$$

$$V_1 = \frac{12,5}{1000}$$

$$V_1 = 0,0125 \text{ mL} = 12,5 \mu\text{L}$$

5) 3 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 1000 \text{ ppm} = 5 \text{ mL} \cdot 3 \text{ ppm}$$

$$V_1 = \frac{15}{1000}$$

$$V_1 = 0,015 \text{ mL} = 15 \mu\text{L}$$

c. Absorbansi Larutan Blanko/Kontrol DPPH

Bahan	Replikasi	Absorbansi	Rata-Rata Absorbansi
Blanko	1	0,916	0,932
	2	0,941	
	3	0,940	

d. Absorbansi dan Pengujian Aktivitas Antioksidan Vitamin C

1) Replikasi 1

Konsentrasi	Absorbansi	Absorbansi Kontrol	% Inhibisi	IC ₅₀
1	0,677	0,932	27,361	1,951
1,5	0,568	0,932	39,056	
2	0,472	0,932	49,356	
2,5	0,341	0,932	63,412	
3	0,216	0,932	76,824	

Perhitungan % Penghambatan

$$1 \text{ ppm} = \frac{0,932 - 0,677}{0,932} \times 100 \% = 27,361 \%$$

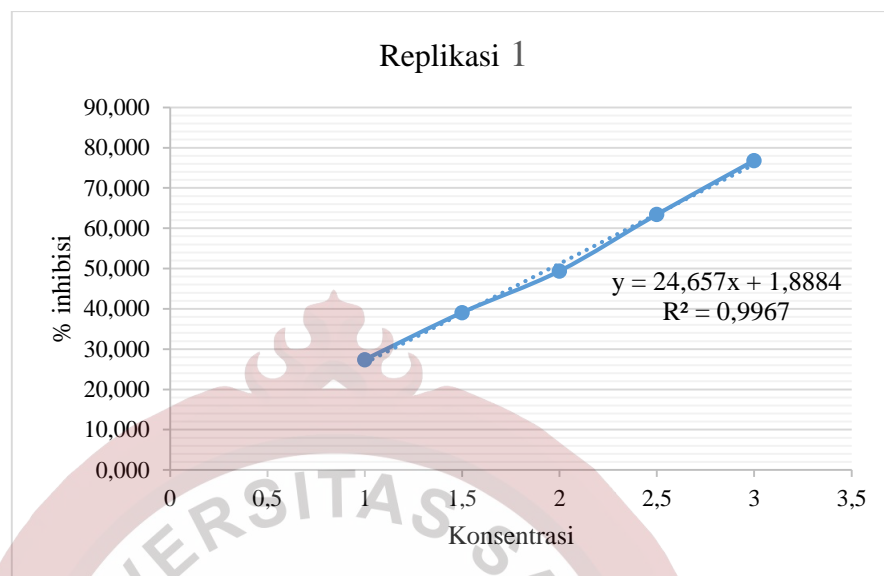
$$1,5 \text{ ppm} = \frac{0,932 - 0,568}{0,932} \times 100 \% = 39,056 \%$$

$$2 \text{ ppm} = \frac{0,932 - 0,472}{0,932} \times 100 \% = 49,356 \%$$

$$2,5 \text{ ppm} = \frac{0,932 - 0,341}{0,932} \times 100 \% = 63,412 \%$$

$$3 \text{ ppm} = \frac{0,932 - 0,216}{0,932} \times 100 \% = 76,824 \%$$

Persamaan Regresi Linear Vitamin C



Perhitungan IC₅₀

$$y = 24,657x + 1,8884$$

$$\begin{aligned} \text{IC}_{50} &= \frac{50 - 1,8884}{24,657} \\ &= \frac{48,1116}{24,657} \\ &= 1,951 \end{aligned}$$

2) Replikasi 2

Konsentrasi	Absorbansi	Absorbansi Kontrol	% Inhibisi	IC ₅₀
1	0,679	0,932	27,146	
1,5	0,579	0,932	37,876	
2	0,483	0,932	48,176	1,987
2,5	0,336	0,932	63,948	
3	0,238	0,932	74,464	

Perhitungan % Penghambatan

$$1 \text{ ppm} = \frac{0,932 - 0,679}{0,932} \times 100 \% = 27,146 \%$$

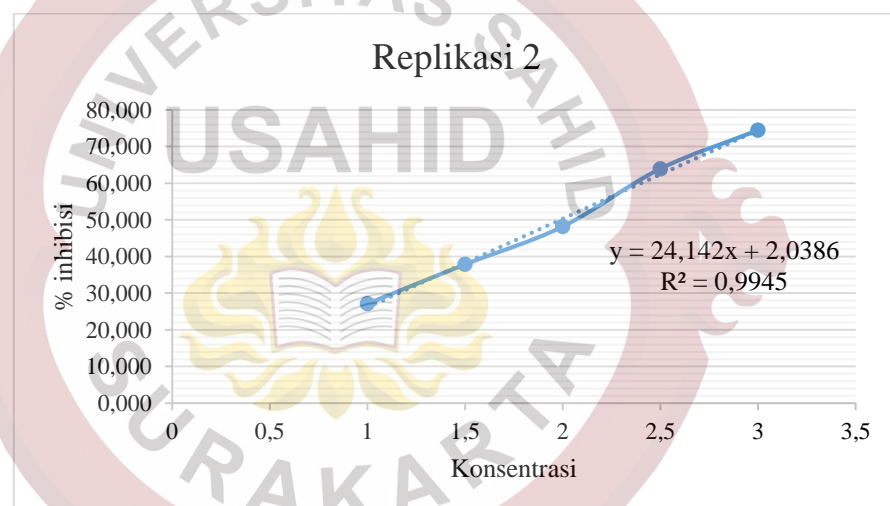
$$1,5 \text{ ppm} = \frac{0,932 - 0,579}{0,932} \times 100 \% = 37,876 \%$$

$$2 \text{ ppm} = \frac{0,932 - 0,483}{0,932} \times 100 \% = 48,176 \%$$

$$2,5 \text{ ppm} = \frac{0,932 - 0,336}{0,932} \times 100 \% = 63,948 \%$$

$$3 \text{ ppm} = \frac{0,932 - 0,238}{0,932} \times 100 \% = 74,464 \%$$

Persamaan Regresi Linear Vitamin C



Perhitungan IC₅₀

$$y = 24,142x + 2,0386$$

$$IC_{50} = \frac{50 - 2,0386}{24,142}$$

$$= \frac{47,9614}{24,142}$$

$$= 1,987$$

3) Replikasi 3

Konsentrasi	Absorbansi	Absorbansi Kontrol	% Inhibisi	IC ₅₀
1	0,670	0,932	28,112	
1,5	0,575	0,932	38,305	
2	0,482	0,932	48,283	1,962
2,5	0,340	0,932	63,519	
3	0,220	0,932	76,395	

Perhitungan % Penghambatan

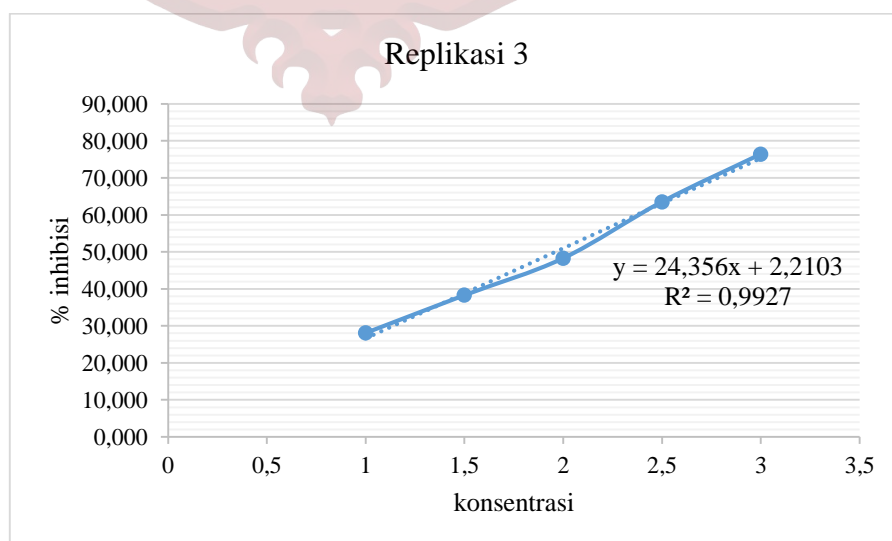
$$1 \text{ ppm} = \frac{0,932 - 0,670}{0,932} \times 100 \% = 28,112 \%$$

$$1,5 \text{ ppm} = \frac{0,932 - 0,575}{0,932} \times 100 \% = 38,305 \%$$

$$2 \text{ ppm} = \frac{0,932 - 0,482}{0,932} \times 100 \% = 48,283 \%$$

$$2,5 \text{ ppm} = \frac{0,932 - 0,340}{0,932} \times 100 \% = 63,519 \%$$

$$3 \text{ ppm} = \frac{0,932 - 0,220}{0,932} \times 100 \% = 76,395 \%$$

Persamaan Regresi Linear Vitamin C

Perhitungan IC₅₀

$$y = 24,356x + 2,2103$$

$$IC_{50} = \frac{50 - 2,2103}{24,356}$$

$$= \frac{47,7897}{24,356}$$

$$= 1,962$$

3.3 Ekstrak Kloroform Daun Kelor**a. Data Penimbangan Sampel**

	Replikasi 1 (mg)	Replikasi 2 (mg)	Replikasi 3 (mg)
Berat wadah	19778	22881	21914
Berat wadah + sampel	19878	22981	22014
Berat wadah + sisa	19799	22883	21915
Berat Zat	99	98	99

b. Perhitungan Pengenceran Larutan Uji Sampel

Dibuat dari larutan stok 4000 ppm yang diencerkan menjadi 100 ppm, 200 ppm, 300 ppm, 400 ppm, dan 500 ppm sebanyak 5 mL.

1) 100 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 4000 \text{ ppm} = 5 \text{ mL} \cdot 100 \text{ ppm}$$

$$V_1 = \frac{500}{4000}$$

$$V_1 = 0,125 \text{ mL} = 125 \mu\text{L}$$

2) 200 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 4000 \text{ ppm} = 5 \text{ mL} \cdot 200 \text{ ppm}$$

$$V_1 = \frac{1000}{4000}$$

$$V_1 = 0,25 \text{ mL} = 250 \text{ } \mu\text{L}$$

3) 300 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 4000 \text{ ppm} = 5 \text{ mL} \cdot 300 \text{ ppm}$$

$$V_1 = \frac{1500}{4000}$$

$$V_1 = 0,375 \text{ mL} = 375 \text{ } \mu\text{L}$$

4) 400 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 4000 \text{ ppm} = 5 \text{ mL} \cdot 400 \text{ ppm}$$

$$V_1 = \frac{2000}{4000}$$

$$V_1 = 0,5 \text{ mL} = 500 \text{ } \mu\text{L}$$

5) 500 ppm

$$V_1 \cdot C_1 = V_2 \cdot C_2$$

$$V_1 \cdot 4000 \text{ ppm} = 5 \text{ mL} \cdot 500 \text{ ppm}$$

$$V_1 = \frac{2500}{4000}$$

$$V_1 = 0,625 \text{ mL} = 625 \text{ } \mu\text{L}$$

c. Absorbansi Larutan Blanko/Kontrol DPPH

Bahan	Replikasi	Absorbansi	Rata-Rata Absorbansi
Blanko	1	1,707	1,673
	2	1,688	
	3	1,624	

a. Absorbansi dan Pengujian Aktivitas Antioksidan Sampel

1) Replikasi 1

Konsentrasi	Absorbansi	KW	Absorbansi Sampel	Absorbansi Blanko	% Inhibisi	IC ₅₀
100	1,463	0,055	1,408	1,673	15,840	316,180
200	1,255	0,089	1,166	1,673	30,305	
300	1,012	0,195	0,817	1,673	51,166	
400	0,855	0,254	0,601	1,673	64,077	
500	0,690	0,290	0,400	1,673	76,091	

Perhitungan % Penghambatan

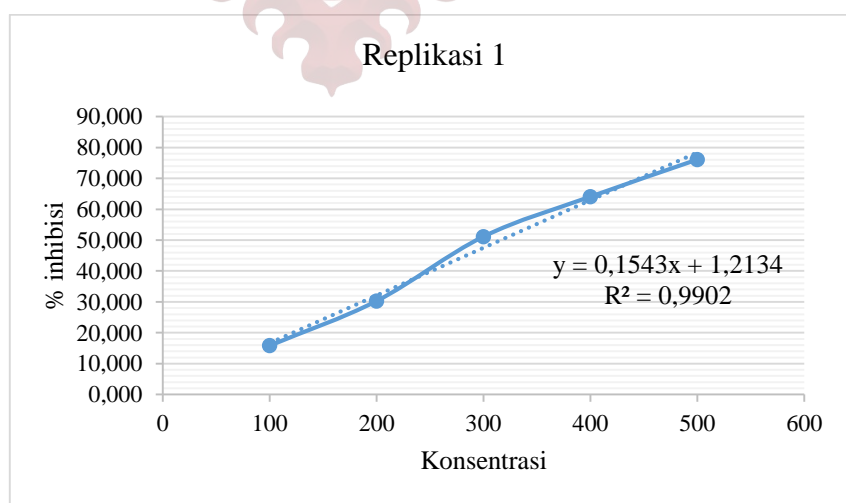
$$100 \text{ ppm} = \frac{1,673 - 1,408}{1,673} \times 100 \% = 15,840 \%$$

$$200 \text{ ppm} = \frac{1,673 - 1,166}{1,673} \times 100 \% = 30,305 \%$$

$$300 \text{ ppm} = \frac{1,673 - 0,817}{1,673} \times 100 \% = 51,166 \%$$

$$400 \text{ ppm} = \frac{1,673 - 0,601}{1,673} \times 100 \% = 64,077 \%$$

$$500 \text{ ppm} = \frac{1,673 - 0,400}{1,673} \times 100 \% = 76,091 \%$$

Persamaan Regresi Linear Ekstrak Kloroform Daun Kelor

Perhitungan IC₅₀

$$y = 0,1543x + 1,2134$$

$$IC_{50} = \frac{50 - 1,2134}{0,1543}$$

$$= \frac{48,7866}{0,1543}$$

$$= 316,180$$

2) Replikasi 2

Konsentrasi	Absorbansi	KW	Absorbansi Sampel	Absorbansi Blanko	% Inhibisi	IC ₅₀
100	1,458	0,052	1,406	1,673	15,959	
200	1,229	0,085	1,144	1,673	31,620	
300	1,011	0,192	0,819	1,673	51,046	315,897
400	0,866	0,257	0,609	1,673	63,598	
500	0,693	0,288	0,405	1,673	75,792	

Perhitungan % Penghambatan

$$100 \text{ ppm} = \frac{1,673 - 1,406}{1,673} \times 100 \% = 15,959 \%$$

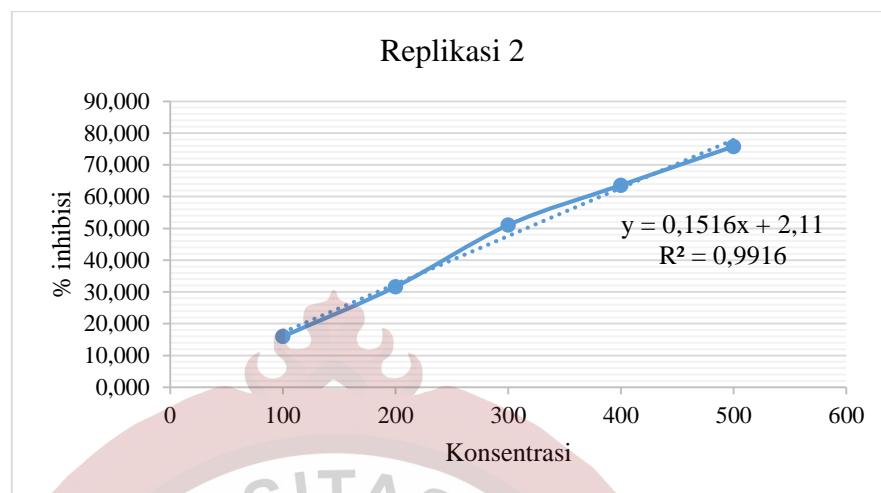
$$200 \text{ ppm} = \frac{1,673 - 1,144}{1,673} \times 100 \% = 31,620 \%$$

$$300 \text{ ppm} = \frac{1,673 - 0,819}{1,673} \times 100 \% = 51,046 \%$$

$$400 \text{ ppm} = \frac{1,673 - 0,609}{1,673} \times 100 \% = 63,598 \%$$

$$500 \text{ ppm} = \frac{1,673 - 0,405}{1,673} \times 100 \% = 75,792 \%$$

Persamaan Regresi Linear Ekstrak Kloroform Daun Kelor



Perhitungan IC₅₀

$$y = 0,1516x + 2,11$$

$$\begin{aligned} \text{IC}_{50} &= \frac{50 - 2,11}{0,1516} \\ &= \frac{47,89}{0,1516} \\ &= 315,897 \end{aligned}$$

3) Replikasi 3

Konsentrasi	Absorbansi	KW	Absorbansi Sampel	Absorbansi Blanko	% Inhibisi	IC ₅₀
100	1,459	0,050	1,409	1,673	15,780	
200	1,247	0,084	1,163	1,673	30,484	
300	1,018	0,193	0,825	1,673	50,687	318,855
400	0,868	0,259	0,609	1,673	63,598	
500	0,69	0,275	0,415	1,673	75,194	

Perhitungan % Penghambatan

$$100 \text{ ppm} = \frac{1,673 - 1,409}{1,673} \times 100 \% = 15,780 \%$$

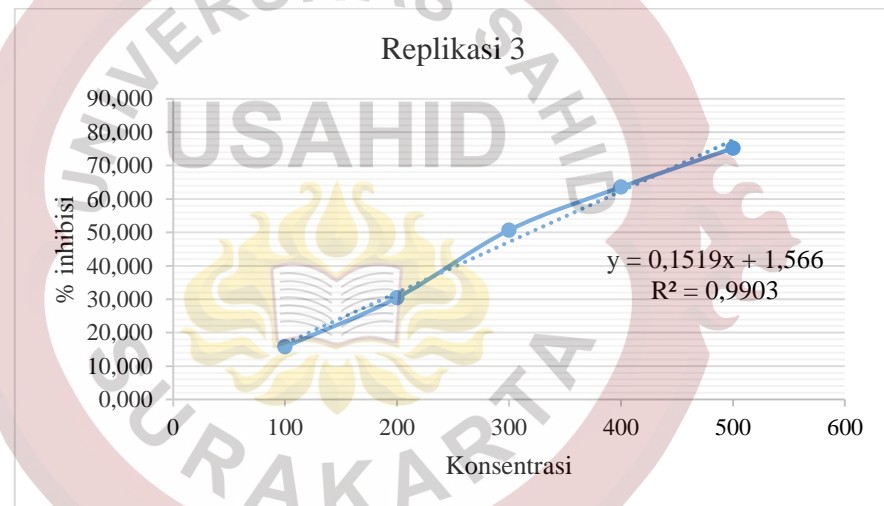
$$200 \text{ ppm} = \frac{1,673 - 1,163}{1,673} \times 100 \% = 30,484 \%$$

$$300 \text{ ppm} = \frac{1,673 - 0,825}{1,673} \times 100 \% = 50,687 \%$$

$$400 \text{ ppm} = \frac{1,673 - 0,609}{1,673} \times 100 \% = 63,598 \%$$

$$500 \text{ ppm} = \frac{1,673 - 0,415}{1,673} \times 100 \% = 75,194 \%$$

Persamaan Regresi Linear Ekstrak Kloroform Daun Kelor



Perhitungan IC₅₀

$$y = 0,1519x + 1,566$$

$$IC_{50} = \frac{50 - 1,566}{0,1519}$$

$$= \frac{48,434}{0,1519}$$

$$= 318,855$$

3.5 Dokumentasi Uji Aktivitas Antioksidan

a. Vitamin C



Larutan Stok
Vitamin C



Pengenceran Replikasi
1,2,3

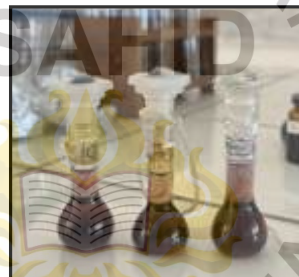


Diinkubasi selama 30
menit

b. Ekstrak Kloroform Daun Kelor



Larutan Stok Sampel



Pengenceran Replikasi
1,2,3



Diinkubasi selama 30
menit