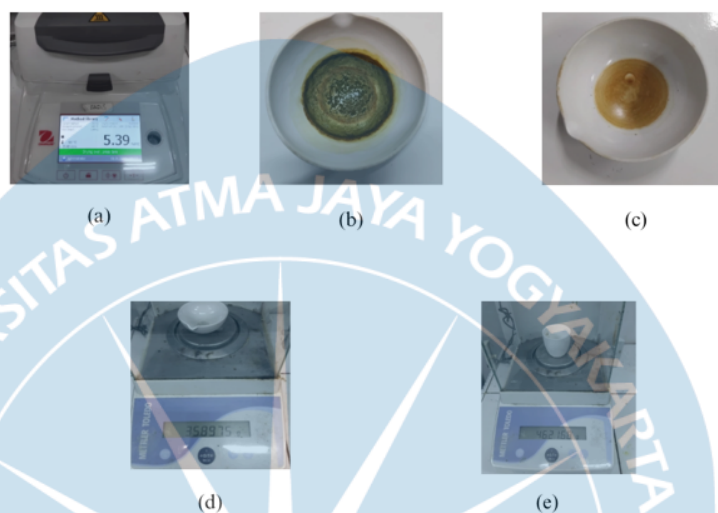


Lampiran 2. Hasil Standardisasi Simplisia. (a) Kadar Air, (b) Kadar Sari Larut Air, (c) Kadar Sari Larut Etanol, (d) Kadar Abu Total, (e) Kadar Abu Tidak Larut Asam.



Lampiran 3. Hasil Uji Kuantitatif Flavonoid.

Pengulangan	A.pengukuran	a	b	x (ug/mL)	x (mg/mL)	KTF (mgQE/g)
1	0,472	0,0035	-0,0074	136,971429	0,13697143	54,78857143
2	0,473	0,0035	-0,0074	137,257143	0,13725714	54,90285714
3	0,470	0,0035	-0,0074	136,4	0,1364	54,56
Rata-rata	0,472			136,87619	0,13687619	54,75047619

Lampiran 4. Hasil Uji Kuantitatif Fenolik.

Pengulangan	A.pengukuran	a	b	x (ug/mL)	x (mg/mL)	KTFe (mgGAE/g)
1	0,145	0,0043	0,0127	30,767442	0,0307674	30,76744186
2	0,143	0,0043	0,0127	30,302326	0,0303023	30,30232558
3	0,142	0,0043	0,0127	30,069767	0,0300698	30,06976744
Rata-rata	0,143333333	0,0043	0,0127	30,379845	0,0303798	30,37984496

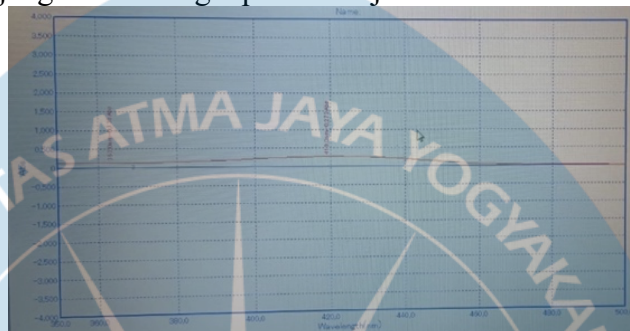
Lampiran 5. Hasil Uji Aktivitas Antioksidan Kontrol Positif.

Konsentrasi kontrol	logaritma natural (ln) kontrol	Absorbansi			Rata-rata	% Inhibisi
		u1	u2	u3		
5	1,60943791	0,353	0,350	0,352	0,352	31,1806915
10	2,30258509	0,305	0,301	0,302	0,303	40,7697326
15	2,7080502	0,251	0,250	0,251	0,251	50,9458578
20	2,99573227	0,184	0,182	0,182	0,183	64,2530985
25	3,21887582	0,128	0,125	0,127	0,127	75,2120026

Lampiran 6. Hasil Uji Aktivitas Antioksidan Sampel.

Konsentrasi (ppm)	logaritma natural (ln)	Absorbansi pengukuran			Rata-Rata	% Inhibisi
		U1	U2	U3		
50	3,91202301	0,487	0,488	0,490	0,488	4,4357469
100	4,60517019	0,420	0,422	0,425	0,422	17,3515982
150	5,01063529	0,383	0,380	0,384	0,382	25,1793868
200	5,29831737	0,282	0,281	0,282	0,282	44,8793216
250	5,52146092	0,234	0,231	0,235	0,233	54,3378995
Rata-rata						

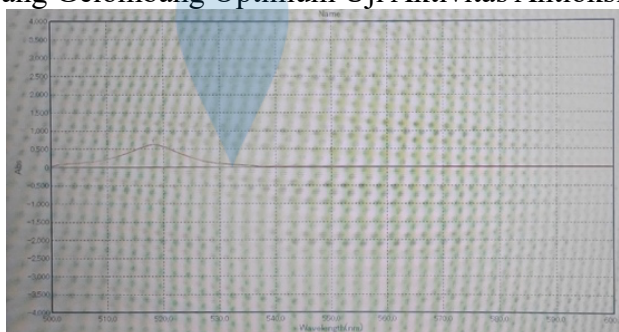
Lampiran 7. Panjang Gelombang Optimum Uji Kuantitatif Flavonoid



Lampiran 8. Panjang Gelombang Optimum Uji Kuantitatif Fenolik



Lampiran 9. Panjang Gelombang Optimum Uji Aktivitas Antioksidan



Tabel 8. Pembuatan Larutan Seri Kontrol Positif.

Konsentrasi (ppm)	Larutan Vitamin C (μL)	Etanol (μL)	Larutan DPPH (μL)
5 ppm	75 μL	925 μL	500 μL
10 ppm	150 μL	850 μL	500 μL

15 ppm	225 µL	775 µL	500 µL
20 ppm	300 µL	700 µL	500 µL
25 ppm	375 µL	625 µL	500 µL

Tabel 9. Pembuatan Larutan Seri Sampel.

Konsentrasi (ppm)	Larutan Vitamin C (µL)	Etanol (µL)	Larutan DPPH (µL)
50 ppm	75 µL	925 µL	500 µL
100 ppm	150 µL	850 µL	500 µL
150 ppm	225 µL	775 µL	500 µL
200 ppm	300 µL	700 µL	500 µL
250 ppm	375 µL	625 µL	500 µL

2. Perhitungan

A. Standardisasi Simplisia

a. Kadar air

$$\text{Persentase total kadar air simplisia} = \frac{5,60\% + 5,39\% + 6,19\%}{3}$$

$$\text{Persentase total kadar air simplisia} = 5,73\%$$

b. Kadar sari larut air

$$\text{Persentase total kadar sari larut air} = \frac{(74,2834 - 74,1725) \times 10}{5} \times 100\%$$

$$\text{Persentase total kadar sari larut air} = 22,18\% \Rightarrow \text{Pengulangan 1}$$

$$\text{Persentase total kadar sari larut air} = \frac{(72,0290 - 71,8637) \times 10}{5} \times 100\%$$

$$\text{Persentase total kadar sari larut air} = 33,06\% \Rightarrow \text{Pengulangan 2}$$

$$\text{Persentase total kadar sari larut air} = \frac{(74,2882 - 74,1789) \times 10}{5} \times 100\%$$

$$\text{Persentase total kadar sari larut air} = 21,86\% \Rightarrow \text{Pengulangan 3}$$

$$\text{Rata - rata} = \frac{22,18\% + 33,06\% + 21,86\%}{3}$$

$$\text{Total persentase kadar sari larut air} = 25,7\%$$

c. Kadar sari larut etanol

$$\text{Persentase total kadar sari larut etanol} = \frac{(72,0083 - 71,8653) \times 10}{5} \times 100\%$$

$$\text{Persentase total kadar sari larut etanol} = 28,6\% \Rightarrow \text{Pengulangan 1}$$

$$\text{Persentase total kadar sari larut etanol} = \frac{(74,3523 - 74,2070) \times 10}{5} \times 100\%$$

$$\text{Persentase total kadar sari larut etanol} = 29,06\% \Rightarrow \text{Pengulangan 2}$$

$$\text{Persentase total kadar sari larut etanol} = \frac{(74,3337 - 74,1743) \times 10}{5} \times 100\%$$

$$\text{Persentase total kadar sari larut etanol} = 31,88\% \Rightarrow \text{Pengulangan 3}$$

$$\text{Rata - rata} = \frac{28,6\% + 29,06\% + 31,88\%}{3}$$

$$\text{Total persentase kadar sari larut etanol} = 29,85\%$$

d. Kadar abu total

$$\% \text{ kadar abu total} = \frac{(45,4313 - 45,4181)}{1} \times 100\%$$

$$\% \text{ kadar abu total} = 1,32\% \Rightarrow \text{Pengulangan 1}$$

$$\% \text{ kadar abu total} = \frac{(45,4313 - 45,4181)}{1} \times 100\%$$

$$\% \text{ kadar abu total} = 4,35\% \Rightarrow \text{Pengulangan 2}$$

$$\% \text{ kadar abu total} = \frac{(45,4313 - 45,4181)}{1} \times 100\%$$

$$\% \text{ kadar abu total} = 4,73\% \Rightarrow \text{Pengulangan 3}$$

$$\text{Rata - rata} = \frac{1,32\% + 4,35\% + 4,73\%}{3}$$

$$\% \text{ kadar abu total} = 3,53\%$$

e. Kadar abu tidak larut asam

$$\% \text{ kadar abu tidak larut asam} = \frac{(45,4020 - 45,4018)}{1} \times 100\%$$

$$\% \text{ kadar abu tidak larut asam} = 0,02\% \Rightarrow \text{Pengulangan 1}$$

$$\% \text{ kadar abu tidak larut asam} = \frac{(46,2168 - 46,2038)}{1} \times 100\%$$

$$\% \text{ kadar abu tidak larut asam} = 1,3\% \Rightarrow \text{Pengulangan 2}$$

$$\% \text{ kadar abu tidak larut asam} = \frac{(46,6409 - 46,6398)}{1} \times 100\%$$

$$\% \text{ kadar abu tidak larut asam} = 0,11\% \Rightarrow \text{Pengulangan 3}$$

$$\text{Rata - rata} = \frac{0,02\% + 1,3\% + 0,11\%}{3}$$

$$\% \text{ kadar abu tidak larut asam} = 0,48\%$$

B. Uji Fitokimia Kualitatif

a. Larutan induk 1000 ppm

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 100 \text{ mL}$$

$$\text{massa (g)} = 100 \text{ mg} \Rightarrow \text{untuk 1000 ppm}$$

C. Uji Kadar Total Flavonoid

a. Pembuatan larutan baku kuersetin

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 10 \text{ mL}$$

$$\text{massa (g)} = 10 \text{ mg} \Rightarrow \text{untuk 1000 ppm}$$

$$M1.V1 = M2.V2$$

$$1000 \text{ ppm}.V1 = 100 \text{ ppm}.10 \text{ mL}$$

$$1000 \text{ ppm}.V1 = 1000 \text{ ppm}/\text{mL}$$

$$V1 = 1 \text{ mL} \Rightarrow \text{untuk 100 ppm}$$

b. Pembuatan kurva standar kuersetin

$$1000 \text{ ppm} \cdot V_1 = 40 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 200 \text{ ppm} / \text{mL}$$

$$V_1 = 0,2 \text{ mL} \Rightarrow \text{untuk } 40 \text{ ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 60 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 300 \text{ ppm} / \text{mL}$$

$$V_1 = 0,3 \text{ mL} \Rightarrow \text{untuk } 60 \text{ ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 80 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 400 \text{ ppm} / \text{mL}$$

$$V_1 = 0,4 \text{ mL} \Rightarrow \text{untuk } 80 \text{ ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 100 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 500 \text{ ppm} / \text{mL}$$

$$V_1 = 0,5 \text{ mL} \Rightarrow \text{untuk } 100 \text{ ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 120 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 600 \text{ ppm} / \text{mL}$$

$$V_1 = 0,6 \text{ mL} \Rightarrow \text{untuk } 120 \text{ ppm}$$

c. Ekstrak sampel

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 10 \text{ mL}$$

$$\text{massa (g)} = 10 \text{ mg} \Rightarrow \text{untuk } 1000 \text{ ppm}$$

d. Perhitungan KTF

$$KTF = \frac{V \text{ (mL)} \times X \text{ (mg/mL)} \times fp}{g \text{ ekstrak}}$$

$$KTF = \frac{4 \times 0,13697143}{0,01} = 54,78857143 \text{ mgQe/g ekstrak} \Rightarrow \text{pengulangan 1}$$

$$KTF = \frac{4 \times 0,13725714}{0,01} = 54,90285714 \text{ mgQe/g ekstrak} \Rightarrow \text{pengulangan 2}$$

$$KTF = \frac{4 \times 0,1364}{0,01} = 54,56 \text{ mgQe/g ekstrak} \Rightarrow \text{pengulangan 3}$$

$$\text{Rata-rata} = \frac{54,78857143 + 54,90285714 + 54,56}{3} = 54,75047619$$

D. Uji Kadar Fenolik Total

a. Pembuatan Larutan Baku Asam Galat

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 10 \text{ mL}$$

$$\text{massa (g)} = 100 \text{ mg} \Rightarrow \text{untuk } 1000 \text{ ppm}$$

$$M_1 \cdot V_1 = M_2 \cdot V_2$$

$$1000 \text{ ppm} \cdot V_1 = 100 \text{ ppm} \cdot 10 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 1000 \text{ ppm} / \text{mL}$$

$$V_1 = 1 \text{ mL} \Rightarrow \text{untuk } 100 \text{ ppm}$$

b. Pembuatan kurva standar asam galat

$$1000 \text{ ppm} \cdot V_1 = 10 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 50 \text{ ppm} / \text{mL}$$

$$V_1 = 0,05 \text{ mL} \Rightarrow \text{untuk } 10 \text{ ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 20 \text{ ppm} \cdot 5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 100 \text{ ppm} / \text{mL}$$

$$\begin{aligned}
 V1 &= 0,1 \text{ mL} \Rightarrow \text{untuk 20 ppm} \\
 1000 \text{ ppm} \cdot V1 &= 30 \text{ ppm} \cdot 5 \text{ mL} \\
 1000 \text{ ppm} \cdot V1 &= 150 \text{ ppm} \cdot \text{mL} \\
 V1 &= 0,15 \text{ mL} \Rightarrow \text{untuk 30 ppm} \\
 1000 \text{ ppm} \cdot V1 &= 40 \text{ ppm} \cdot 5 \text{ mL} \\
 1000 \text{ ppm} \cdot V1 &= 200 \text{ ppm} \cdot \text{mL} \\
 V1 &= 0,2 \text{ mL} \Rightarrow \text{untuk 40 ppm} \\
 1000 \text{ ppm} \cdot V1 &= 50 \text{ ppm} \cdot 5 \text{ mL} \\
 1000 \text{ ppm} \cdot V1 &= 250 \text{ ppm} \cdot \text{mL} \\
 V1 &= 0,25 \text{ mL} \Rightarrow \text{untuk 50 ppm}
 \end{aligned}$$

c. Ekstrak sampel

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 10 \text{ mL}$$

$$\text{massa (g)} = 10 \text{ mg} \Rightarrow \text{untuk 1000 ppm}$$

d. Perhitungan KTF_e

$$KTF = \frac{V \text{ (mL)} \times X \text{ (mg/mL)} \times fp}{g \text{ ekstrak}}$$

$$KTF = \frac{4 \times 0,13697143}{0,01} = 54,78857143 \text{ mgQe/g ekstrak} \Rightarrow \text{pengulangan 1}$$

$$KTF = \frac{4 \times 0,13725714}{0,01} = 54,90285714 \text{ mgQe/g ekstrak} \Rightarrow \text{pengulangan 2}$$

$$KTF = \frac{4 \times 0,1364}{0,01} = 54,56 \text{ mgQe/g ekstrak} \Rightarrow \text{pengulangan 3}$$

$$\text{Rata - rata} = \frac{54,78857143 + 54,90285714 + 54,56}{3} = 54,75047619$$

E. Uji Aktivitas Antioksidan dengan Metode DPPH

a. Pembuatan larutan DPPH 0,2 mM

$$\text{massa (g)} = \text{konsentrasi (M)} \times \text{Mr (g/mol)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = 0,0002 \text{ M} \times 394,32 \text{ g/mol} \times 0,01 \text{ L}$$

$$\text{massa (g)} = 0,00078864 \text{ g} = 0,78864 \text{ mg}$$

$$\text{massa (g)} = 0,79 \text{ mg}$$

b. Pembuatan larutan kontrol positif

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 10 \text{ mL}$$

$$\text{massa (g)} = 10 \text{ mg} \Rightarrow \text{untuk 1000 ppm}$$

c. Pembuatan larutan seri kontrol positif

$$100 \text{ ppm} \cdot V1 = 5 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$100 \text{ ppm} \cdot V1 = 7,5 \text{ ppm} \cdot \text{mL}$$

$$V1 = 0,075 \text{ mL} \Rightarrow \text{untuk 5 ppm}$$

$$100 \text{ ppm} \cdot V1 = 10 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$100 \text{ ppm} \cdot V1 = 15 \text{ ppm} \cdot \text{mL}$$

$$V1 = 0,15 \text{ mL} \Rightarrow \text{untuk 10 ppm}$$

$$100 \text{ ppm} \cdot V1 = 15 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$100 \text{ ppm} \cdot V1 = 22,5 \text{ ppm} \cdot \text{mL}$$

$$V1 = 0,225 \text{ mL} \Rightarrow \text{untuk 15 ppm}$$

$$100 \text{ ppm} \cdot V1 = 20 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$\begin{aligned}
 100 \text{ ppm} \cdot V_1 &= 25 \text{ ppm} / \text{mL} \\
 V_1 &= 0,25 \text{ mL} \Rightarrow \text{untuk 20 ppm} \\
 1100 \text{ ppm} \cdot V_1 &= 25 \text{ ppm} \cdot 1,5 \text{ mL} \\
 100 \text{ ppm} \cdot V_1 &= 37,5 \text{ ppm} / \text{mL} \\
 V_1 &= 0,375 \text{ mL} \Rightarrow \text{untuk 25 ppm}
 \end{aligned}$$

d. Pembuatan larutan sampel

$$\text{massa (g)} = \text{ppm (mg/L)} \times \text{volume larutan (L)}$$

$$\text{massa (g)} = \frac{1000 \text{ mg}}{1000 \text{ L}} \times 10 \text{ mL}$$

$$\text{massa (g)} = 10 \text{ mg} \Rightarrow \text{untuk 1000 ppm}$$

e. Pembuatan larutan seri sampel

$$1000 \text{ ppm} \cdot V_1 = 50 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 75 \text{ ppm} / \text{mL}$$

$$V_1 = 0,075 \text{ mL} \Rightarrow \text{untuk 50 ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 100 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 150 \text{ ppm} / \text{mL}$$

$$V_1 = 0,15 \text{ mL} \Rightarrow \text{untuk 100 ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 150 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 225 \text{ ppm} / \text{mL}$$

$$V_1 = 0,225 \text{ mL} \Rightarrow \text{untuk 150 ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 200 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 250 \text{ ppm} / \text{mL}$$

$$V_1 = 0,25 \text{ mL} \Rightarrow \text{untuk 200 ppm}$$

$$1000 \text{ ppm} \cdot V_1 = 250 \text{ ppm} \cdot 1,5 \text{ mL}$$

$$1000 \text{ ppm} \cdot V_1 = 375 \text{ ppm} / \text{mL}$$

$$V_1 = 0,375 \text{ mL} \Rightarrow \text{untuk 250 ppm}$$