L A M P I R A N

Lampiran 1. Surat Determinasi Tannaman Kelor

PEMERINTAH PROVINSI JAWA TIMUR
DINAS KESEHATAN
UPT LABORATORIUM HERBAL
MATERIA MEDICA BATU
Jl. Lahor 87 Kota Batu
Jl. Raya 228 Kejayan Kabupaten Pasuruan
Jl. Kolonel Sugiono 457 – 459 Kota Malang
Email : materiamedicabatu@jatimprov.go.id

Nomor : 074/ 676/ 102.20-A/ 2022
Sifat : Biasa
Perihal : **Determinasi Tanaman Kelor**

Memenuhi permohonan saudara :

Nama : AFIF MEILANA SINDANI PUTRI
NIM : 25195684A
Fakultas : FARMASI, UNIVERSITAS SETIA BUDI

1. Perihal determinasi tanaman kelor
   - Kingdom : Plantae (Tumbuhan)
   - Divisi : Magnoliophyta (Tumbuhan berbunga)
   - Kelas : Dicotyledonae
   - Sub kelas : Dilleniidae
   - Bangsa : Capparales
   - Suku : Moringaceae
   - Marga : Moringa
   - Jenis : *Moringa oleifera* Lamk.
   - Nama Daerah : Kelor (Jawa, Sunda, Bali, Lampung), Maronggih (Madura), Moltong (Flores), Keloro (Bugis), Ongge (Bima), Murong atau Barunggai (Sumatera), Hau Fo (Timur).
   - Kunci determinasi : 1b-2b-3b-4b-6b-7b-9b-10b-11b-12b-13b-14a-15b-197b-208b-209b-210b-211b-214a:Moringaceae-1:*M.oleifera*.
2. Morfologi : Habitus: Pohon, tinggi ±8 m. Batang: Berkayu, bulat, bercabang, berbintik hitam, putih kotor. Daun: Majemuk, panjang 20-60 cm, anak daun bulat telur, tepi rata, ujung berlekuk, menyirip ganjil, hijau. Bunga: Majemuk, bentuk malai, letak di ketiak daun, panjang 10-30 cm, daun kelopak hijau, benang sari dan putik kecil, mahkota putih, putih. Buah: Polong, panjang 20-45 cm, berisi 15-25 biji, coklat kehitaman. Biji: Bulat, bersayap tiga, hitam. Akar: Tunggang, putih kotor.
3. Bagian yang digunakan : Daun.
4. Penggunaan : Penelitian (Skripsi).
5. Daftar Pustaka
   - Van Steenis, CGGJ. 2008. *FLORA: untuk Sekolah di Indonesia*. Pradnya Paramita, Jakarta.

Demikian surat keterangan determinasi ini kami buat untuk dipergunakan sebagaimana mestinya.

Batu, 17 Oktober 2022
KEPALA UPT LABORATORIUM HERBAL
MATERIA MEDICA BATU

ACHMAD MABRUR, SKM, M.Kes.
PEMBINA
NIP. 19680203 199203 1 004

Lampiran 2. Foto Serbuk dan Ekstrak Daun Kelor

Lampiran 3. Alat dan Bahan

ALAT

Botol maserasi

Timbangan analitik

Micropipet 50-500 µl dan micropipet 500-1000 µl

Beaker glass

Botol kaca gelap

Vial

Cawan porselen

Labu ukur 50ml

Gelas ukur 10 ml

Pipet tetes

Pipet volume

Spektrofotmeter UV-Vis

BAHAN

Serbuk daun kelor

Ekstrak daun kelor

Lactobacillus bulgaricus

Lampiran 4. Perhitungan Rendemen Serbuk Daun Kelor

Hasil perhitungan rendemen serbuk daun kelor

Bobot basah (kg)	Bobot kering (kg)	Rendemen (%)
12	1,1	9,17%

% rendemen $= \frac{Berat\ kering}{Berat\ basah}\ x\ 100\%$

$= \frac{1{,}1\ kg}{12\ kg}\ x\ 100\%$

= 9,17%

Lampiran 5. Perhitungan Susut Pengeringan

Hasil perhitungan rendemen susut pengeringan

No	Beart serbuk (g)	Susut pengeringan (%)
1	2	6
2	2	6,2
3	2	5,5
Rata-rata SD		**5,9 0,5**

Rata-rata susut pengeringan $= \frac{\mathbf{6{,}0}\ \%+\mathbf{6{,}2}\ \%+\mathbf{5{,}5}\ \%}{\mathbf{3}}$

= 5,9 %

Lampiran 6. Perhitungan Kadar Air

Hasil perhitungan kadar air serbuk daun kelor

No	Bobot ekstrak (g)	Bobot sesudah pengeringan (g)			% kadar air
		5 jam	6 jam	7 jam	
Replikasi I	10,3712	9,5387	9,4667	9,4645	8,745
Replikasi II	10,4520	9,4753	9,3298	9,3189	10,8410
Replikasi III	10,0051	9,4768	9,3246	9,3241	6,8065
Rata-rata ± SD	10,2761 ± 0,316	9,4969 ± 0,0362	9,3870 ± 0,0806	9,3825 ± 0,0826	8,7967 ± 2,0178

Rumus:

% Kadar air = $\frac{BB\ awal - BB\ akhir}{BB\ awal}$ **x 100%**

Replikasi 1

Bobot krus kosong = 43,5562 gram

Bobot krus + ekstrak = 53,9274 gram

Bobot ekstrak = 10,3712 gram

Bobot ekstrak setelah pengeringan = 5 jam: 9,5387 ; 6 jam: 9,4667 ; 7 jam: 9,4645

% Kadar air $= \frac{10{,}3712 - 9{,}4645}{10{,}3712}$ **x 100%**

= 8,745%

Replikasi 2

Bobot krus kosong = 40,0582 gram

Bobot krus + ekstrak = 50,5102 gram

Bobot ekstrak = 10,4520 gram

Bobot ekstrak setelah pengeringan = 5 jam:9,4753 ; 6 jam: 9,3298 ; 7 jam: 9,3189

% Kadar air $= \frac{10{,}4520 - 9{,}3189}{10{,}4520}$ **x 100%**

= 10,8410%

Replikasi 3

Bobot krus kosong = 42,2318 gram

Bobot krus + ekstrak = 52,2369 gram

Bobot ekstrak = 10,0051 gram

Bobot ekstrak setelah pengeringan = 5 jam: 9,4768 ; 6 jam: 9,3246 ; 7 jam: 9,3241

% Kadar air $= \frac{10{,}0051 - 9{,}3241}{10{,}0051}$ **x 100%**

= 6,8065%

Lampiran 7. Hasil Uji Bebas Etanol

Lampiran 8. Perhitungan Rendemen Ekstrak

Berat serbuk (g)	Volume etanol 96% (ml)	Berat ekstrak (g)	Rendemen (%)
1000	10.000	182	18,20%

Hasil perhitungan rendemen ekstrak daun kelor

% rendemen $= \frac{Berat\ ekstrak\ (g)}{Berat\ serbuk\ (g)}\ x\ 100\%$

$= \frac{182\ gram}{1000\ gram}\ x\ 100\%$

= 18,2%

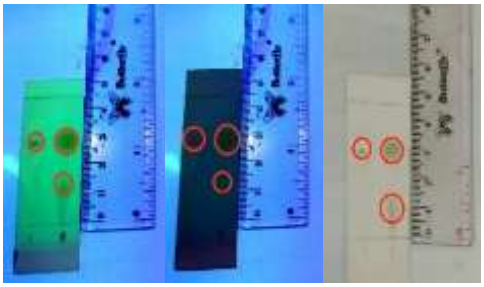
Lampiran 9. Hasil Uji Kualitatif Ekstrak Daun Kelor

Nama Senyawa	Gambar	Hasil	Keterangan
Flavonoid		Terbentuk cincin warna merah kecoklatan	+
Fenolik		Terbentuk warna hitam	+
Alkaloid	 Bouchardat  Mayer  Dragendroff	- Terbentuk endapan coklat - Terbentuk endapan kuning - Terbentuk endapan merah bata	+

Nama Senyawa	Gambar	Hasil	Keterangan
Saponin		Terbentuk buih mantap selama lebih dari 10 detik	+
Tannin		Terbentuk warna hijau kehitaman	+

Lampiran 10. Hasil Penegasan Senyawa Fitokimia KLT

Flavonoid



Rf = $\frac{jarak\ bercak}{jarak\ pelarut}$

Baku standart

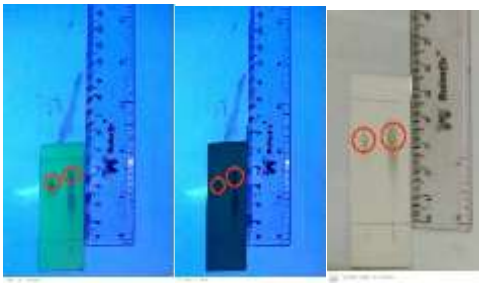
Rf $_1$ = $\frac{2,4}{5,5}$ = 0,44

Rf $_2$ = $\frac{4}{5,5}$ = 0,73

Sampel

Rf = $\frac{3,8}{5,5}$ = 0,69

Saponin



Rf = $\frac{jarak\ bercak}{jarak\ pelarut}$

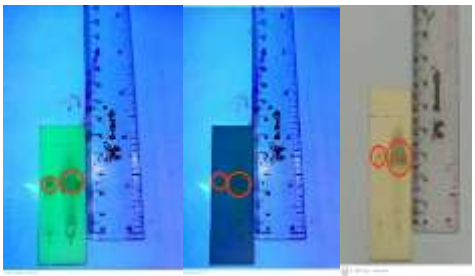
Baku standart

Rf = $\frac{4,5}{5,5}$ = 0,82

Sampel

Rf = $\frac{4,8}{5,5}$ = 0,87

Fenolik



Rf = $\frac{jarak\ bercak}{jarak\ pelarut}$

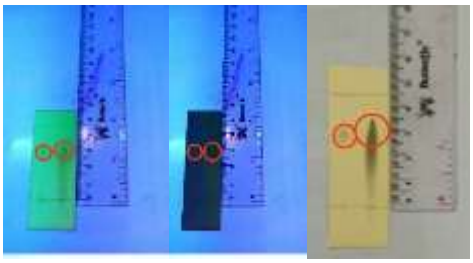
Baku standart

Rf = $\frac{4}{5,5}$ = 0,73

Sampel

Rf = $\frac{3,8}{5,5}$ = 0,69

Tannin



Rf = $\frac{jarak\ bercak}{jarak\ pelarut}$

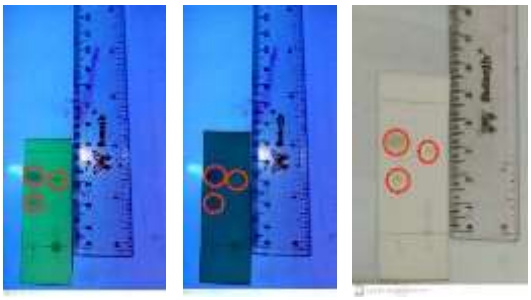
Baku standart

Rf = $\frac{4,3}{5,5}$ = 0,78

Sampel

Rf = $\frac{4}{5,5}$ = 0,73

Alkaloid



Rf = $\frac{jarak\ bercak}{jarak\ pelarut}$

Baku standart

Rf = $\frac{3,1}{5,5}$ = 0,56

Rf = $\frac{4,5}{5,5}$ = 0,82

Sampel

Rf = $\frac{4,3}{5,5}$ = 0,78

Lampiran 11. Hasil Peremajaan Bakteri

Jenis Bakteri	Gambar	Hasil
Lactobacillus bulgaricus		Terbentuk goresan zig-zag

Lampiran 12. Hasil Perhitungan Bakteri Metode ALT

Volume pengenceran	Jumlah koloni	Total BAL (CFU/ml)
10^{-1}	0	0
10^{-2}	0	0
10^{-3}	132	1,32 x 10^5
10^{-4}	121	1,21 x 10^6
10^{-5}	50	5 x 10^6
10^{-6}	33	3,3 x 10^7

Perhitungan bakteri

$10^{-1} = 0$

$10^{-2} = 0$

$10^{-3} = 132 = \frac{132}{1 \text{ x } 10\text{^}-3} = \frac{132}{0{,}001} = 132.000 \rightarrow 1{,}32 \text{ x } 10^5$

$10^{-4} = 121 = \frac{121}{1 \text{ x } 10\text{^}-4} = \frac{121}{0{,}0001} = 1.210.000 \rightarrow 1{,}21 \text{ x } 10^6$

$10^{-5} = 50 = \frac{50}{1 \text{ x } 10\text{^}-5} = \frac{50}{0{,}00001} = 5.000.000 \rightarrow 5 \text{ x } 10^6$

$10^{-6} = 33 = \frac{33}{1 \text{ x } 10\text{^}-6} = \frac{33}{0{,}000001} = 33.000.000 \rightarrow 3{,}3 \text{ x } 10^7$

Lampiran 13. Hasil Penimbangan DPPH

Rumus : mM = $\frac{mg}{MR} \; x \; \frac{1000}{V}$

0,3 mM = $\frac{mg}{394{,}32} \; x \; \frac{1000}{100}$

mg = $\frac{0{,}3 \; x \; 394{,}32}{10}$

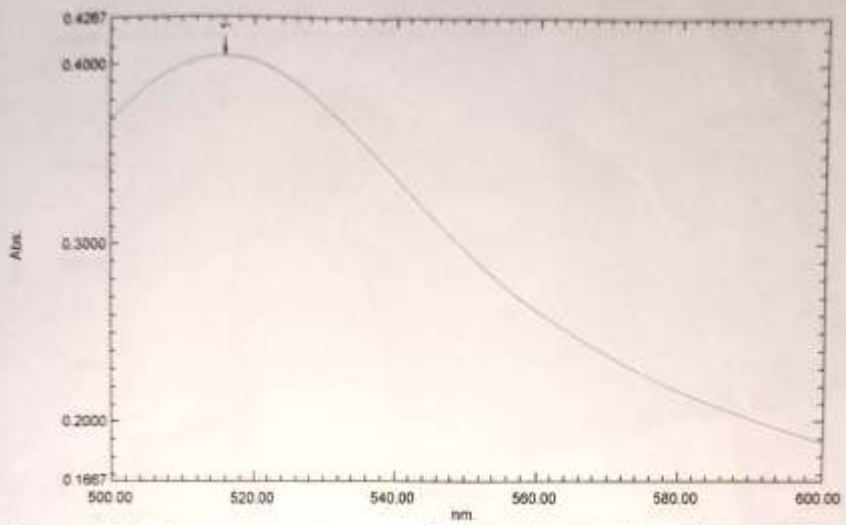
mg = 11,8296

Lampiran 14. Hasil Penetapan Panjang gelombang DPPH

Spectrum Peak Pick Report

12/09/2022 12:28:22 PM

Data Set: File_220915_170626_122729 - RawData



No.	P/V	Wavelength	Abs.	Description
1	V	516.00	0.4050	

[Measurement Properties]
Wavelength Range (nm.): 500.00 to 600.00
Scan Speed: Fast
Sampling Interval: 1.0
Auto Sampling Interval: Disabled
Scan Mode: Auto

[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1.0 nm
Light Source Change Wavelength: 340.0 nm
S/R Exchange: Normal

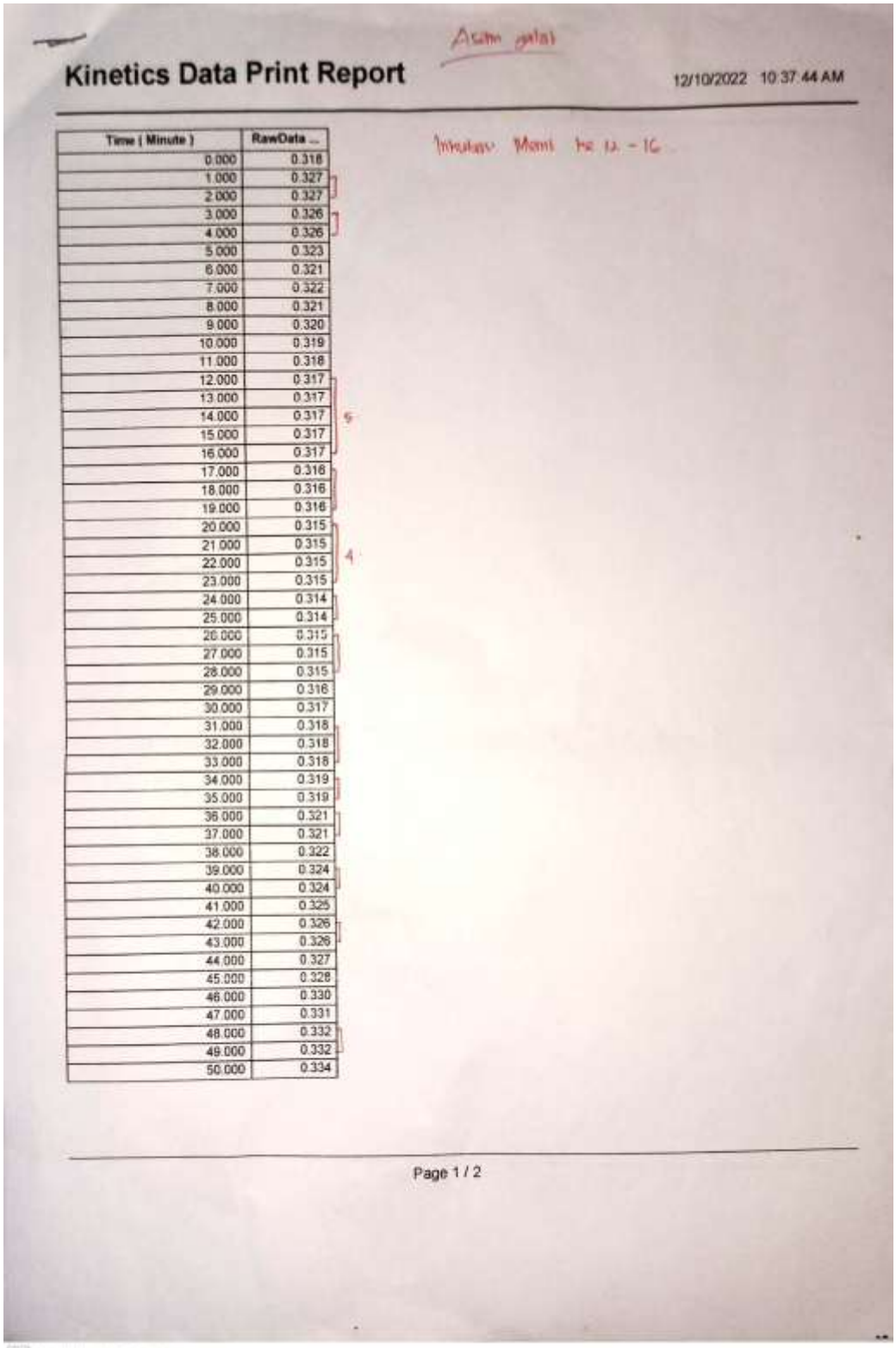
[Attachment Properties]
Attachment: None

[Operation]
Threshold: 0.0010000
Points: 4
InterPolate: Disabled
Average: Disabled

[Sample Preparation Properties]
Weight:
Volume:
Dilution:
Path Length:
Additional Information:

Page 1 / 1

Lampiran 15. Hasil Operating Time DPPH + Asam Galat



Asam galat

Kinetics Data Print Report

12/10/2022 10:37:44 AM

Time (Minute)	RawData ...
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1.000	0.327
2.000	0.327
3.000	0.326
4.000	0.326
5.000	0.323
6.000	0.321
7.000	0.322
8.000	0.321
9.000	0.320
10.000	0.319
11.000	0.318
12.000	0.317
13.000	0.317
14.000	0.317
15.000	0.317
16.000	0.317
17.000	0.316
18.000	0.316
19.000	0.316
20.000	0.315
21.000	0.315
22.000	0.315
23.000	0.315
24.000	0.314
25.000	0.314
26.000	0.315
27.000	0.315
28.000	0.315
29.000	0.316
30.000	0.317
31.000	0.318
32.000	0.318
33.000	0.318
34.000	0.319
35.000	0.319
36.000	0.321
37.000	0.321
38.000	0.322
39.000	0.324
40.000	0.324
41.000	0.325
42.000	0.326
43.000	0.326
44.000	0.327
45.000	0.328
46.000	0.330
47.000	0.331
48.000	0.332
49.000	0.332
50.000	0.334

Menit ke 12 - 16

5

4

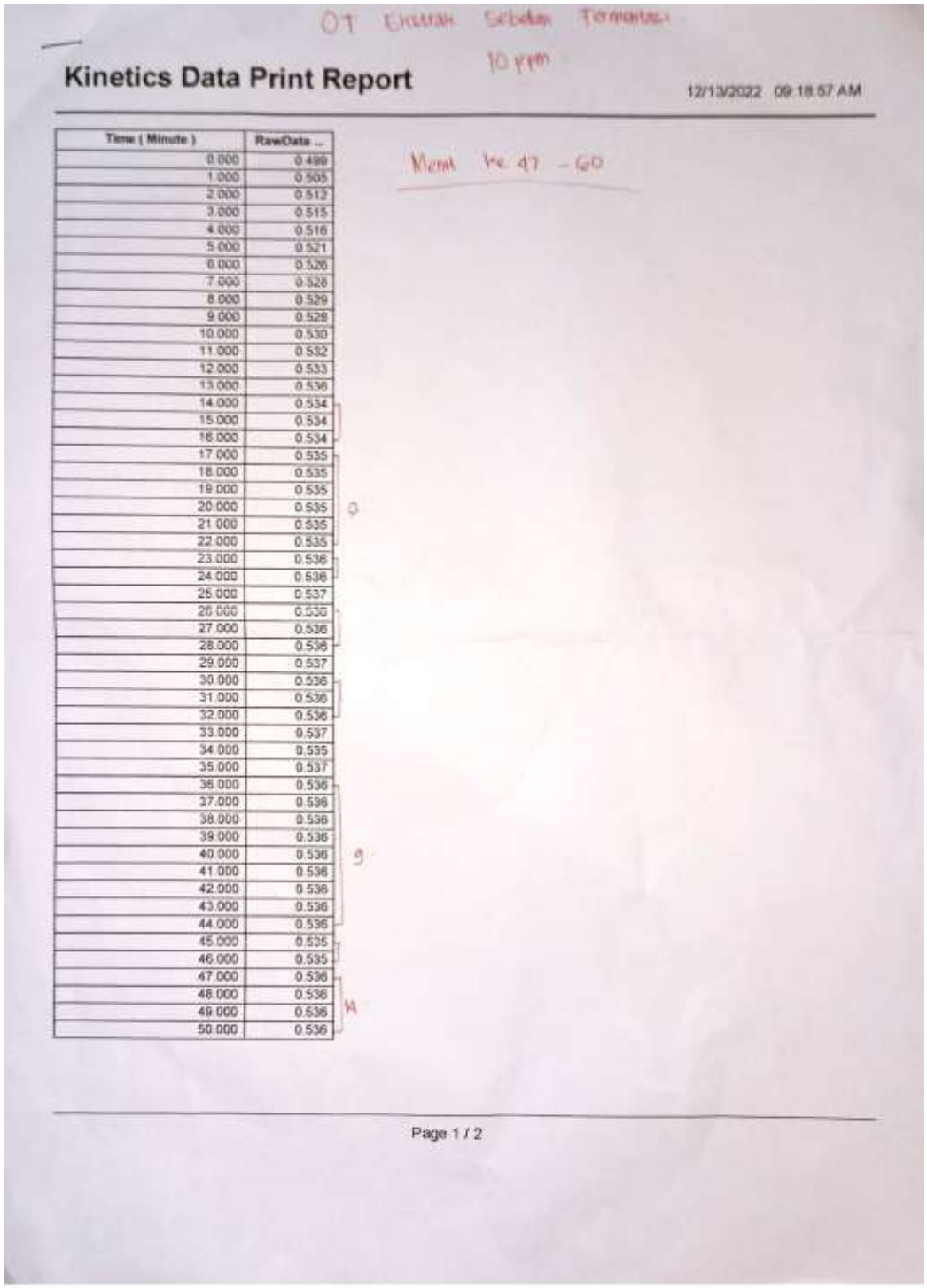
Page 1 / 2

Kinetics Data Print Report

12/10/2022 10:37:44 AM

Time (Minute)	RawData ...
51.000	0.335
52.000	0.335
53.000	0.337
54.000	0.337
55.000	0.338
56.000	0.339
57.000	0.339
58.000	0.340
59.000	0.340
60.000	0.341

Lampiran 16. Hasil Operating Time DPPH + Ekstrak Etanol 96% Daun Kelor



01 Ekstrak Sebelum Fermentasi
10 ppm

Kinetics Data Print Report

12/13/2022 09:18:57 AM

Time (Minute)	RawData ...
0.000	0.499
1.000	0.505
2.000	0.512
3.000	0.515
4.000	0.516
5.000	0.521
6.000	0.526
7.000	0.528
8.000	0.529
9.000	0.528
10.000	0.530
11.000	0.532
12.000	0.533
13.000	0.536
14.000	0.534
15.000	0.534
16.000	0.534
17.000	0.535
18.000	0.535
19.000	0.535
20.000	0.535
21.000	0.535
22.000	0.535
23.000	0.536
24.000	0.536
25.000	0.537
26.000	0.536
27.000	0.536
28.000	0.536
29.000	0.537
30.000	0.536
31.000	0.536
32.000	0.536
33.000	0.537
34.000	0.535
35.000	0.537
36.000	0.536
37.000	0.536
38.000	0.536
39.000	0.536
40.000	0.536
41.000	0.536
42.000	0.536
43.000	0.536
44.000	0.536
45.000	0.535
46.000	0.535
47.000	0.536
48.000	0.536
49.000	0.536
50.000	0.536

Menit ke 47 - 60

Page 1 / 2

Kinetics Data Print Report

12/13/2022 09:18:57 AM

Time (Minute)	RawData ...
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54.000	0.536
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56.000	0.536
57.000	0.536
58.000	0.536
59.000	0.536
60.000	0.536

Lampiran 17. Hasil Operating Time DPPH + Fermentasi Ekstrak 24 Jam

OT FERMENTASI 24 JAM

Kinetics Data Print Report

12/17/2022 08:55:11 AM

Menit ke 45 - 53

Time (Minute)	RawData ...
0.000	0.498
1.000	0.498
2.000	0.497
3.000	0.496
4.000	0.497
5.000	0.498
6.000	0.497
7.000	0.497
8.000	0.497
9.000	0.497
10.000	0.496
11.000	0.496
12.000	0.496
13.000	0.496
14.000	0.496
15.000	0.496
16.000	0.495
17.000	0.495
18.000	0.495
19.000	0.495
20.000	0.495
21.000	0.494
22.000	0.494
23.000	0.493
24.000	0.493
25.000	0.493
26.000	0.492
27.000	0.492
28.000	0.492
29.000	0.491
30.000	0.491
31.000	0.491
32.000	0.491
33.000	0.490
34.000	0.490
35.000	0.490
36.000	0.490
37.000	0.489
38.000	0.489
39.000	0.489
40.000	0.489
41.000	0.488
42.000	0.488
43.000	0.488
44.000	0.488
45.000	0.487
46.000	0.487
47.000	0.487
48.000	0.487
49.000	0.487
50.000	0.487

Page 1 / 2

Kinetics Data Print Report

12/17/2022 08:55:11 AM

Time (Minute)	RawData ...
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52.000	0.487
53.000	0.487
54.000	0.486
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57.000	0.486
58.000	0.485
59.000	0.486
60.000	0.485

Lampiran 18. Hasil Operating Time DPPH + Fermentasi Ekstrak 48 Jam

OT FERMENTASI 48.

Kinetics Data Print Report

12/17/2022 11:30:15 AM

Menit ke 37 – 47

Time (Minute)	RawData ...
0.000	0.457
1.000	0.457
2.000	0.456
3.000	0.456
4.000	0.456
5.000	0.456
6.000	0.454
7.000	0.455
8.000	0.455
9.000	0.454
10.000	0.454
11.000	0.454
12.000	0.454
13.000	0.456
14.000	0.454
15.000	0.454
16.000	0.454
17.000	0.454
18.000	0.453
19.000	0.454
20.000	0.454
21.000	0.454
22.000	0.454
23.000	0.453
24.000	0.454
25.000	0.453
26.000	0.453
27.000	0.454
28.000	0.454
29.000	0.454
30.000	0.453
31.000	0.454
32.000	0.454
33.000	0.454
34.000	0.454
35.000	0.454
36.000	0.455
37.000	0.454
38.000	0.454
39.000	0.454
40.000	0.454
41.000	0.454
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43.000	0.454
44.000	0.454
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47.000	0.454
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49.000	0.454
50.000	0.454

Kinetics Data Print Report

12/17/2022 11:30:15 AM

Time (Minute)	RawData ...
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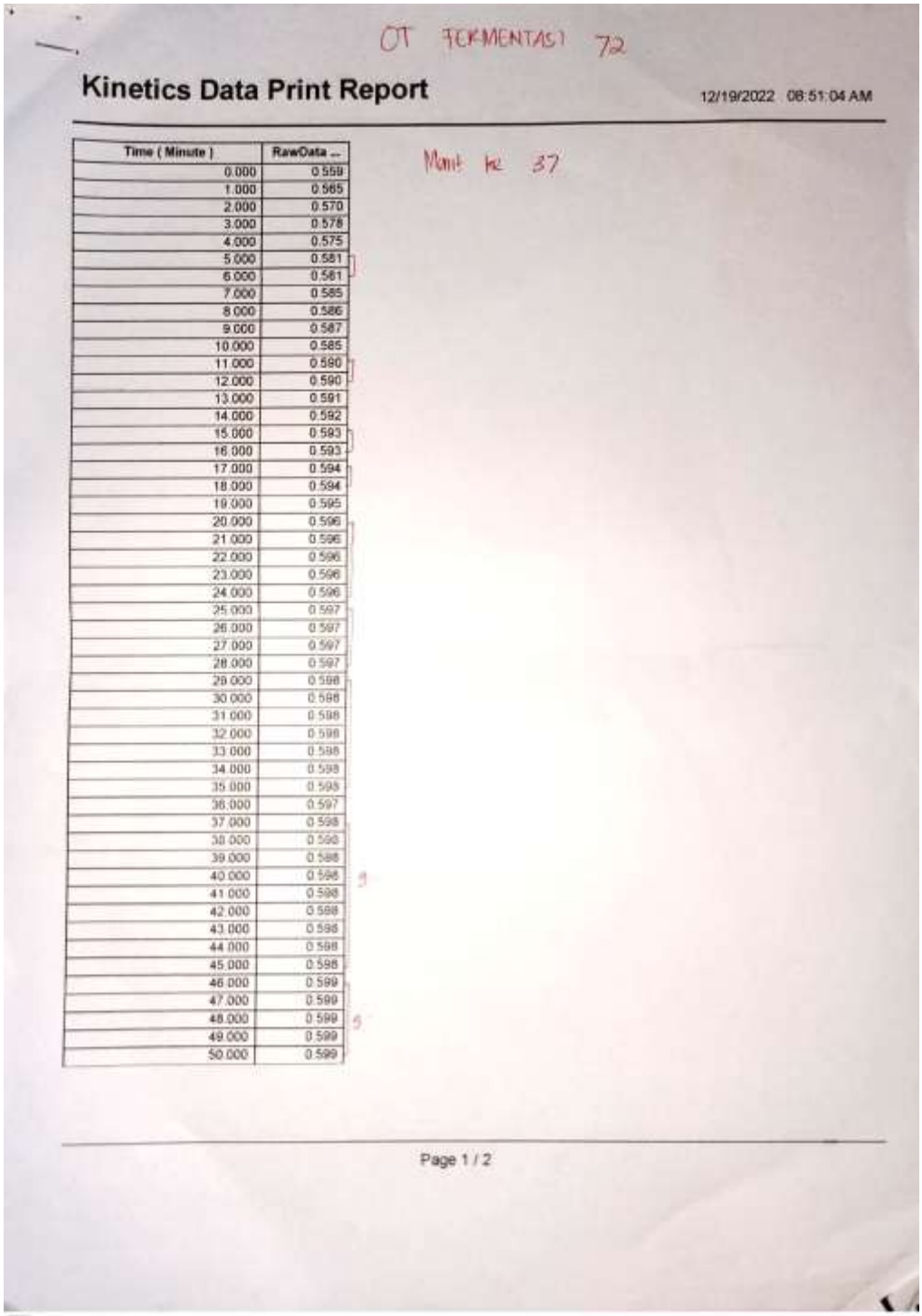
60.000	0.455

Lampiran 19. Hasil Operating Time DPPH + Fermentasi Ekstrak 72 Jam



OT FERMENTASI 72

Kinetics Data Print Report

12/19/2022 08:51:04 AM

Menit ke 37

Time (Minute)	RawData ...
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5.000	0.581
6.000	0.581
7.000	0.585
8.000	0.586
9.000	0.587
10.000	0.585
11.000	0.590
12.000	0.590
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18.000	0.594
19.000	0.595
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31.000	0.598
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39.000	0.598
40.000	0.598
41.000	0.598
42.000	0.598
43.000	0.598
44.000	0.598
45.000	0.598
46.000	0.599
47.000	0.599
48.000	0.599
49.000	0.599
50.000	0.599

Page 1 / 2

Kinetics Data Print Report

12/19/2022 08:51:04 AM

Time (Minute)	RawData ...
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53.000	0.599
54.000	0.599
55.000	0.598
56.000	0.599
57.000	0.599
58.000	0.599
59.000	0.599
60.000	0.599

Lampiran 20. Hasil Uji Antioksidan DPPH + Asam Galat dan DPPH + Ekstrak

DPPH + Asam galat

	Konsentrasi	DPPH	Abs	% Inhibisi	Regresi Linier		IC_{50}	Rata-rata	SD
Replikasi 1	2	0,845	0,623	26,272			5,218	5,169	0,046
	3	0,845	0,543	35,740	a	14,249			
	4	0,845	0,478	43,432	b	6,852			
	5	0,845	0,432	48,876	r	0,991			
	6	0,845	0,389	53,964					
Replikasi 2	2	0,845	0,619	26,746			5,162		
	3	0,845	0,541	35,976	a	14,627			
	4	0,845	0,475	43,787	b	6,852			
	5	0,845	0,428	49,349	r	0,991			
	6	0,845	0,386	54,320					
Replikasi 3	2	0,845	0,617	26,982			5,126		
	3	0,845	0,538	36,331	a	14,935			
	4	0,845	0,473	44,024	b	6,840			
	5	0,845	0,426	49,586	r	0,991			
	6	0,845	0,384	54,556					

Perhitungan % inhibisi

Rumus: $\frac{(Abs.DPPH - Abs\ sampel)}{Abs.DPPH}\ x\ 100\%$

Replikasi 1

2 ppm = $\frac{0,845-0,623}{0,845}\ x\ 100\% = 26,272\%$

3 ppm = $\frac{0,845-0,543}{0,845}\ x\ 100\% = 35,740\%$

4 ppm = $\frac{0,845-0,478}{0,845}\ x\ 100\% = 43,432\%$

5 ppm = $\frac{0,845-0,432}{0,845}\ x\ 100\% = 48,876\%$

6 ppm = $\frac{0,845-0,389}{0,845}\ x\ 100\% = 53,964\%$

Perhitungan IC_{50}

Rumus: $\frac{50-a}{b}$

$IC_{50} = \frac{50-14,249}{6,852} = 5,218\ \mu g/ml$

Replikasi 2

2 ppm = $\frac{0,845-0,619}{0,845}\ x\ 100\% = 26,746\%$

3 ppm = $\frac{0,845-0,541}{0,845}\ x\ 100\% = 35,976\%$

4 ppm = $\frac{0,845-0,475}{0,845}\ x\ 100\% = 43,787\%$

5 ppm = $\frac{0,845-0,428}{0,845}\ x\ 100\% = 49,349\%$

6 ppm = $\frac{0,845-0,386}{0,845}$ x 100% = 54,320%

Perhitungan IC_{50}

Rumus: $\frac{50-a}{b}$

IC_{50} = $\frac{50-14,627}{6,852}$ = 5,162 µg/ml

Replikasi 3

2 ppm = $\frac{0,845-0,617}{0,845}$ x100% = 26,982%

3 ppm = $\frac{0,845-0,538}{0,845}$ x 100% = 36,331%

4 ppm = $\frac{0,845-0,473}{0,845}$ x 100% = 44,024%

5 ppm =$\frac{0,845-0,426}{0,845}$ x 100% = 49,586%

6 ppm = $\frac{0,845-0,384}{0,845}$ x 100% = 54,556%

Perhitungan IC_{50}

Rumus: $\frac{50-a}{b}$

IC_{50} = $\frac{50-14,935}{6,840}$ = 5,126 µg/ml

Rata-rata IC_{50} ± SD

$\frac{5,218+5,162+5,126}{3}$ = 5,169 ± 0,046

DPPH + Ekstrak etanol 96% daun kelor

	Konsentrasi	DPPH	Abs	% Inhibisi	Regresi linier		IC_{50}	Rata-rata	SD
Replikasi 1	30	0,823	0,631	23,329			64,092	63,993	0,129
	40	0,823	0,557	32,321	a	1,094			
	50	0,823	0,497	39,611	b	0,763			
	60	0,823	0,439	46,659	r	0,999			
	70	0,823	0,376	54,313					
Replikasi 2	30	0,823	0,628	23,694			63,847		
	40	0,823	0,553	32,807	a	2,211			
	50	0,823	0,491	40,340	b	0,748			
	60	0,823	0,431	47,631	r	0,997			
	70	0,823	0,381	53,706					
Replikasi 3	30	0,823	0,627	23,815			64,039		
	40	0,823	0,558	32,199	a	1,835			
	50	0,823	0,493	40,097	b	0,752			
	60	0,823	0,435	47,145	r	0,999			
	70	0,823	0,379	53,949					

Perhitungan nilai % inhibisi

Rumus: $\frac{Abs\ DPPH-Abs\ sampel}{Abs\ DPPH}$ x 100%

Replikasi 1

30 ppm = $\frac{0,823-0,631}{0,823}$ x 100% = 23,329%

40 ppm = $\frac{0,823-0,557}{0,823}$ x 100% = 32,321%

50 ppm = $\frac{0,823-0497}{0,823}$ x 100% = 39,611%

60 ppm = $\frac{0,823-0,439}{0,823}$ x 100% =46,659%

70 ppm = $\frac{0,823-0,376}{0823}$ x 100% = 54,313%

Perhitungan IC_{50}

Rumus: $\frac{\boldsymbol{50-a}}{\boldsymbol{b}}$

IC_{50} = $\frac{50-1,094}{0,763}$ = 64,092 µg/ml

Replikasi 2

30 ppm = $\frac{0,823-0,628}{0,823}$ x 100% = 23,694%

40 ppm = $\frac{0,823-0,553}{0,823}$ x 100% = 32,807%

50 ppm = $\frac{0,823-0,491}{0,823}$ x 100% = 40,340%

60 ppm = $\frac{0,823-0,431}{0,823}$ x 100% = 47,631%

70 ppm = $\frac{0,823-0,381}{0,823}$ x 100% = 53,706%

Perhitungan IC_{50}

Rumus: $\frac{\boldsymbol{50-a}}{\boldsymbol{b}}$

IC_{50} = $\frac{50-2,21}{0,748}$ = 63,847 µg/ml

Replikasi 3

30 ppm = $\frac{0,823-0,627}{0,823}$ x 100% = 23,815%

40 ppm = $\frac{0,823-0,558}{0,823}$ x 100% = 32,199%

50 ppm = $\frac{0,823-0,493}{0,823}$ x 100% = 40,097%

60 ppm = $\frac{0,823-0,435}{0,823}$ x 100% = 47,145%

70 ppm = $\frac{0,823-0,379}{0,823}$ x 100% = 53,949%

Perhitungan IC_{50}

Rumus: $\frac{\boldsymbol{50-a}}{\boldsymbol{b}}$

IC_{50} = $\frac{50-1,835}{0,752}$ = 64,039 µg/ml

Rata-rata IC_{50} ± SD

$\frac{64,092+63,847+64,039}{3}$ = 63,993 ± 0,129

Lampiran 21. Hasil Pengukuran pH

Waktu Fermentasi	Hasil pH
24 jam	6
48 jam	6
72 jam	5

Lampiran 22. Hasil Uji Antioksidan DPPH + Fermentasi Ekstrak Etanol 96% Daun Kelor

Waktu 24 jam

	Konsentrasi	DPPH	Abs	% Inhibisi	Regresi Liniere		IC_{50}	Rata-rata	SD
Replikasi 1	30	0,823	0,631	23,329			61,238	60,877	0,341
	40	0,823	0,582	29,283	a	-2,904			
	50	0,823	0,466	43,378	b	0,864			
	60	0,823	0,423	48,603	r	0,990			
	70	0,823	0,355	56,865					
Replikasi 2	30	0,823	0,627	23,815			60,831		
	40	0,823	0,579	29,648	a	-2,479			
	50	0,823	0,465	43,499	b	0,863			
	60	0,823	0,419	49,089	r	0,990			
	70	0,823	0,352	57,230					
Replikasi 3	30	0,823	0,625	24,058			60,561		
	40	0,823	0,577	29,891	a	-2,467			
	50	0,823	0,467	43,256	b	0,866			
	60	0,823	0,416	49,453	r	0,992			
	70	0,823	0,349	57,594					

Perhitungan nilai % inhibisi

Rumus: $\frac{Abs\ DPPH - Abs\ sampel}{Abs\ DPPH}\ x\ 100\%$

Replikasi 1

30 ppm = $\frac{0,823-0,631}{0,823}\ x\ 100\% = 23,329\%$

40 ppm = $\frac{0,823-0,582}{0,823}\ x\ 100\% = 29,283\%$

50 ppm = $\frac{0,823-0,466}{0,823}\ x\ 100\% = 43,378\%$

60 ppm = $\frac{0,823-0,423}{0,823}\ x\ 100\% = 48,603\%$

70 ppm = $\frac{0,823-0,355}{0,823}\ x\ 100\% = 56,865\%$

Perhitungan IC_{50}

Rumus: $\frac{\mathbf{50-a}}{\boldsymbol{b}}$

$IC_{50} = \frac{50-(-2,904)}{0,864}$ = 61,238 µg/ml

Replikasi 2

30 ppm = $\frac{0,823-0,627}{0,823}$ x 100% = 23,815%

40 ppm = $\frac{0,823-0,579}{0,823}$ x 100% = 29,648%

50 ppm = $\frac{0,823-0,465}{0,823}$ x 100% = 43,499%

60 ppm = $\frac{0,823-0,419}{0,8223}$ x 100% = 49,089%

70 ppm = $\frac{0,823-0,352}{0,823}$ x 100% = 57,230%

Perhitungan IC_{50}

Rumus: $\frac{\mathbf{50-a}}{\boldsymbol{b}}$

$IC_{50} = \frac{50-(-2,479)}{0,863}$ = 60,831 µg/ml

Replikasi 3

30 ppm = $\frac{0,823-0,625}{0,823}$ x 100% = 24,058%

40 ppm = $\frac{0,823-0,577}{0,823}$ x 100% = 29,891%

50 ppm = $\frac{0,823-0,467}{0,823}$ x 100% = 43,256 %

60 ppm = $\frac{0,823-0,416}{0,823}$ x 100% = 49,453%

70 ppm = $\frac{0,823-0,349}{0,823}$ x 100% = 57,594%

Perhitungan IC_{50}

Rumus: $\frac{50-a}{b}$

$IC_{50} = \frac{50-(-2,467)}{0,866} = 60,561$ µg/ml

Rata-rata IC_{50} ± SD

$\frac{61,238+60,831+60,561}{3} = 60,877 \pm 0,341$

Waktu 48 jam

	Konsentrasi	DPPH	Abs	% Inhibisi	Regresi linier		IC_{50}	Rata-rata	SD
Replikasi 1	30	0,823	0,597	27,461			59,104	58,742	0,315
	40	0,823	0,549	33,293	a	3,536			
	50	0,823	0,452	45,079	b	0,786			
	60	0,823	0,412	49,939	r	0,993			
	70	0,823	0,342	58,445					
Replikasi 2	30	0,823	0,601	26,974			58,595		
	40	0,823	0,545	33,779	a	2,868			
	50	0,823	0,449	45,443	b	0,804			
	60	0,823	0,409	50,304	r	0,994			
	70	0,823	0,338	58,931					
Replikasi 3	30	0,823	0,602	26,853			58,526		
	40	0,823	0,542	34,143	a	2,710			
	50	0,823	0,451	45,200	b	0,808			
	60	0,823	0,411	50,061	r	0,995			
	70	0,823	0,335	59,295					

Perhitungan nilai % inhibisi

Rumus: $\frac{Abs\ DPPH - Abs\ sampel}{Abs\ DPPH}\ x\ 100\%$

30 ppm = $\frac{0,823-0,597}{0,823}\ x\ 100\% = 27,461\%$

40 ppm = $\frac{0,823-0,549}{0,823}\ x\ 100\% = 33,293\%$

50 ppm = $\frac{0,823-0,452}{0,823}\ x\ 100\% = 45,079\%$

60 ppm = $\frac{0,823-0,412}{0,823}\ x\ 100\% = 49,939\%$

70 ppm = $\frac{0,823-0,342}{0,823}\ x\ 100\% = 58,445\%$

Perhitungan IC_{50}

Rumus: $\frac{\mathbf{50-a}}{\boldsymbol{b}}$

$IC_{50} = \frac{50-3,536}{0,786}$ = 59,104 µg/ml

Replikasi 2

30 ppm = $\frac{0,823-0,601}{0,823}$ x 100% = 26,974%

40 ppm = $\frac{0,823-0,545}{0,823}$ x 100% = 33,779%

50 ppm = $\frac{0,823-0,449}{0,823}$ x 100% = 45,443%

60 ppm = $\frac{0,823-0,409}{0,823}$ x 100% = 50,304%

70 ppm = $\frac{0,823-0,338}{0,823}$ x 100% = 58,931%

Perhitungan IC_{50}

Rumus: $\frac{\mathbf{50-a}}{\boldsymbol{b}}$

$IC_{50} = \frac{50-2,868}{0,804}$ = 58,595 µg/ml

Replikasi 3

30 ppm = $\frac{0,823-0,602}{0,823}$ x 100% = 26,853%

40 ppm = $\frac{0,823-0,542}{0,823}$ x 100% = 34,143%

50 ppm = $\frac{0,823-0,451}{0,823}$ x 100% = 45,200%

60 ppm = $\frac{0,823-0,411}{0,823}$ x 100% = 50,061%

70 ppm = $\frac{0,823-0,335}{0,823}$ x 100% = 59,295%

Perhitungan IC_{50}

Rumus: $\frac{50-a}{b}$

$IC_{50} = \frac{50-2,710}{0,808} = 58,526$ µg/ml

Rata-rata IC_{50} ± SD

$\frac{59,104+58,595+58,526}{3} = 58,742 \pm 0,315$

Waktu 72 jam

	Konsentrasi	DPPH	Abs	% Inhibisi	Regresi Linier		IC_{50}	Rata-rata	SD
Replikasi 1	30	0,823	0,569	30,863					
	40	0,823	0,477	42,041	a	7,242			
	50	0,823	0,452	45,079	b	0,807	52,997		
	60	0,823	0,367	55,407	r	0,990			
	70	0,823	0,292	64,520					
Replikasi 2	30	0,823	0,571	30,620					
	40	0,823	0,481	41,555	a	6,416			
	50	0,823	0,454	44,836	b	0,819	53,220	53,169	0,153
	60	0,823	0,371	54,921	r	0,990			
	70	0,823	0,289	64,885					
Replikasi 3	30	0,823	0,572	30,498					
	40	0,823	0,485	41,069	a	5,711			
	50	0,823	0,456	44,593	b	0,831	53,289		
	60	0,823	0,369	55,164	r	0,991			
	70	0,823	0,288	65,006					

Perhitungan nilai % inhibisi

Rumus: $\frac{Abs\ DPPH - Abs\ sampel}{Abs\ DPPH}\ x\ 100\%$

30 ppm = $\frac{0,823-0,569}{0,823}\ x\ 100\% = 30,863\%$

40 ppm = $\frac{0,823-0,477}{0,823}\ x\ 100\% = 42,041\%$

50 ppm = $\frac{0,823-0,452}{0,823}\ x\ 100\% = 45,079\%$

60 ppm = $\frac{0,823-0,367}{0,823}\ x\ 100\% = 55,407\%$

70 ppm = $\frac{0,823-0,292}{0,823}\ x\ 100\% = 64,520\%$

Perhitungan IC_{50}

Rumus: $\frac{\mathbf{50-}\boldsymbol{b}}{\boldsymbol{a}}$

$IC_{50} = \frac{50-7,242}{0,807}$ = 52,997 µg/ml

Replikasi 2

30 ppm = $\frac{0,823-0,571}{0,823}$ x 100% = 30,620%

40 ppm = $\frac{0,823-0,481}{0,823}$ x 100% = 41,555%

50 ppm = $\frac{0,823-0,454}{0,823}$ x 100% = 44,836%

60 ppm = $\frac{0,823-0,371}{0,823}$ x 100% = 54,921%

70 ppm = $\frac{0,823-0,289}{0,823}$ x 100% = 64,885%

Perhitungan IC_{50}

Rumus: $\frac{\mathbf{50-}\boldsymbol{a}}{\boldsymbol{b}}$

$IC_{50} = \frac{50-6,416}{0,819}$ = 53,220 µg/ml

Replikasi 3

30 ppm = $\frac{0,823-0,572}{0,823}$ x 100% = 30,498%

40 ppm = $\frac{0,823-0,485}{0,823}$ x 100% = 41,069%

50 ppm = $\frac{0,823-0,456}{0,823}$ x 100% = 44,593%

60 ppm = $\frac{0,823-0,369}{0,823}$ x 100% = 55,164%

70 ppm = $\frac{0,823-0,288}{0,823}$ x 100% = 65,006%

Perhitungan IC_{50}

Rumus: $\frac{50-a}{b}$

$IC_{50} = \frac{50-5,711}{0,831} = 54,289$ µg/ml

Rata-rata IC_{50} ± SD

$\frac{52,997+53,220+53,289}{3} = 53,169 \pm 0,153$

Lampiran 23. Analisa Uji T dengan SPSS

Uji Normalitas

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Sampel	.166	12	.200*	.876	12	.078
Nilai IC50	.186	12	.200*	.877	12	.081

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

a. Lilliefors Significance Correction

Uji t sampel ekstrak daun kelor dan fermentasi ekstrak 24 jam

Group Statistics

	Sampel	N	Mean	Std. Deviation	Std. Error Mean
Nilai IC50	1.000	3	63.99267	.128904	.074423
	2.000	3	60.87667	.340802	.196762

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
Nilai IC50	Equal variances assumed	1.964	.234	14.812	4	.000	3.116000	.210367	2.531928	3.700072
	Equal variances not assumed			14.812	2.561	.002	3.116000	.210367	2.376628	3.855372

Uji t sampel ekstrak daun kelor dan fermentasi ekstrak 48 jam

Group Statistics

	Sampel	N	Mean	Std. Deviation	Std. Error Mean
NIlai IC50	1.000	3	63.99267	.128904	.074423
	2.000	3	58.74167	.315681	.182258

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
Nilai IC50	Equal variances assumed	4.287	.107	26.673	4	.000	5.251000	.196868	4.704408	5.797592
	Equal variances not assumed			26.673	2.649	.000	5.251000	.196868	4.574780	5.927220

Uji t sampel ekstrak daun kelor dan fermentasi ekstrak 72 jam

Group Statistics

	Sampel	N	Mean	Std. Deviation	Std. Error Mean
Nilai IC50	1.000	3	63.99267	.128904	.074423
	2.000	3	53.16867	.152618	.088114

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
Nilai IC50	Equal variances assumed	.147	.721	93.846	4	.000	10.824000	.115338	10.503770	11.144230
	Equal variances not assumed			93.846	3.891	.000	10.824000	.115338	10.500205	11.147795

Uji t Sampel Fermentasi Ekstrak 24 jam dan Fermentasi Ekstrak 48 jam

Group Statistics

	Sampel	N	Mean	Std. Deviation	Std. Error Mean
NIlai IC50	1.000	3	60.87667	.340802	.196762
	2.000	3	58.74167	.315681	.182258

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
NIlai IC50	Equal variances assumed	.000	.996	7.960	4	.001	2.135000	.268204	1.390345	2.879655
	Equal variances not assumed			7.960	3.977	.001	2.135000	.268204	1.388627	2.881373

Uji t Sampel Fermentasi Ekstrak 24 jam dan Fermentasi 72 jam

Group Statistics

	Sampel	N	Mean	Std. Deviation	Std. Error Mean
Nilai IC50	1.000	3	60.87667	.340802	.196762
	2.000	3	53.16867	.152618	.088114

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
NIlai IC50	Equal variances assumed	.000	.996	7.960	4	.001	2.135000	.268204	1.390345	2.879655
	Equal variances not assumed			7.960	3.977	.001	2.135000	.268204	1.388627	2.881373

Uji t Sampel Fermentasi Ekstrak 48 jam dan Fermentasi Ekstrak 72 jam

Group Statistics

	Sampel	N	Mean	Std. Deviation	Std. Error Mean
Nilai IC50	1.000	3	58.74167	.315681	.182258
	2.000	3	53.16867	.152618	.088114

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
NIlai IC50	Equal variances assumed	.000	.996	7.960	4	.001	2.135000	.268204	1.390345	2.879655
	Equal variances not assumed			7.960	3.977	.001	2.135000	.268204	1.388627	2.881373

Lampiran 24. Perhitungan Nilai AAI

Rumus: AAI = $\frac{\textbf{Konsentrasi DPPH (ppm)}}{\textbf{IC50 sampel (ppm)}}$

Penimbangan DPPH = 11,8 mg/100 ml

= 118 mg/1000 ml → 118 ppm

Ekstrak daun kelor

$\frac{118\ \text{ppm}}{63{,}993}$ = 1,844

Fermentasi Ekstrak Daun Kelor 24 jam

$\frac{118\ \text{ppm}}{60{,}887}$ = 1,938

Fermentasi Ekstrak Daun Kelor 48 jam

$\frac{118\ \text{ppm}}{58{,}742}$ = 2,009

Fermentasi Ekstrak Daun Kelor 72 jam

$\frac{118\ \text{ppm}}{53{,}169}$ = 2,219