LAMPIRAN

Lampiran 1
Hasil Determinasi Tanaman

UNIVERSITAS GADJAH MADA
FAKULTAS BIOLOGI
LABORATORIUM SISTEMATIKA TUMBUHAN
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SURAT KETERANGAN
Nomer : 0839/ S.Tb. / V / 2016

Yang bertanda tangan dibawah ini, Kepala Laboratorium Sistematika Tumbuhan Fakultas Biologi UGM, menerangkan dengan sesungguhnya bahwa,

Nama : Aditya Dwi Pamungkas
NIM. : 20120350011
Asal instansi : Fakultas Kedokteran dan Ilmu Kesehatan UMY

telah melakukan identifikasi tumbuhan dengan hasil sebagai berikut,

NO	FAMILIA	GENUS	SPESIES	NAMA DAERAH
1	Cactaceae	*Hylocereus*	*Hylocereus polyrhizus* (F. A. C. Weber) Britton & Rose	Buah naga daging merah

identifikasi tersebut dibantu oleh Dr. Purnomo, M.S.
Demikian surat keterangan ini diberikan untuk dapat dipergunakan seperlunya.

Yogyakarta, 17 Juni 2016
Kepala Laboratorium
Sistematika Tumbuhan
Fakultas Biologi UGM

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Lampiran 2
Perhitungan nilai rendemen

Hasil fraksinasi dari 5,022 gram ekstrak adalah 1,987 gram atau 39,565 % dari berat ekstrak.

Oleh karena itu, apabila ekstrak yang digunakan adalah 19,273 gram, maka perkiraan hasil fraksinasi adalah:

$$19{,}273 \text{ gram } x \text{ } 39{,}565\ \% \ = 7{,}625 \text{ gram}$$

Oleh karena itu, nilai rendemen fraksi kental kloroform KBNM terhadap kulit buah naga merah kering (nilai X) adalah:

$$\mathrm{X} \ = \frac{\text{Berat perkiraan hasil fraksinasi}}{\text{Berat kulit buah naga kering}} \ x \ 100\%$$

$$\mathrm{X} = \frac{7{,}625 \text{ g}}{470 \text{ g}} x \ 100\%$$

$$\mathrm{X} \ = 1{,}622\ \%$$

Lampiran 3
Perhitungan Rf

Nilai Rf dihitung dengan menggunakan perbandingan sebagai berikut:

$$\text{Rf} = \frac{\text{Jarak yang ditempuh solut (cm)}}{\text{Jarak yang ditempuh fase gerak (cm)}}$$

1. Sinar tampak

   Kuersetin (A) $= \frac{7,1}{8} = 0,87$

   Kloroform KBNM (B) $= \frac{7,5}{8} = 0.93$

2. Sinar UV 254 nm

   Kuersetin (A) $= \frac{7.1}{8} = 0,87$

   Kloroform KBNM (B) $= \frac{7,5}{8} = 0.93$

3. Sinar UV 366 nm setelah disemprot

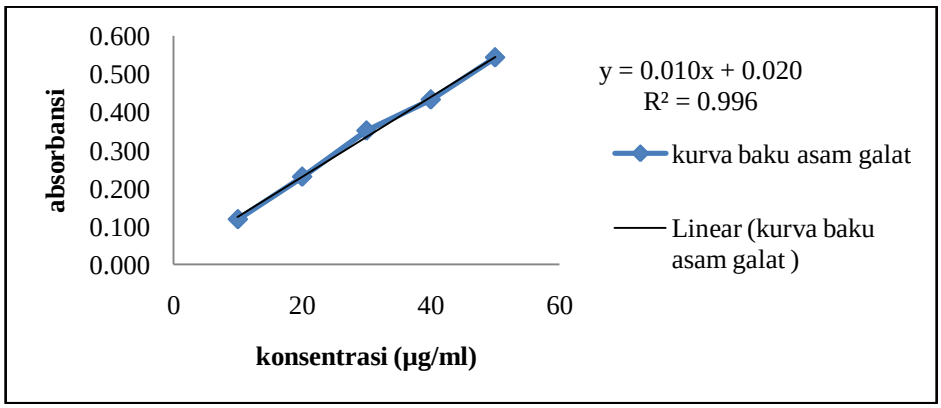
   Kuersetin (A) $= \frac{7.1}{8} = 0.87$

   Kloroform KBNM (B) $= \frac{7,2}{8} = 0.90$

Lampiran 4
Data kandungan fenolik total

Tabel 10. Absorbansi Standar asam galat

Konsentrasi (µg/ml)	Absorbansi (760 nm)		Rerata
	Duplo 1	Duplo 2	
10	0,119	0,119	0,119
20	0,230	0,231	0,231
30	0,351	0,352	0,352
40	0,432	0,434	0,433
50	0,543	0,544	0,544



Gambar 12. Kurva standar asam galat

Hasil kurva standar asam galat diperoleh persamaan:

$Y = 0{,}010x + 0{,}020$

$R^2 = 0{,}996$

Tabel 11. Perhitungan Konsentrasi fenol Fraksi kloroform KBNM

Sampel	Replikasi ke-	Absorbansi (760 nm)	Konsentrasi fenol total larutan (µg GAE/ml sampel)	Kadar Fenol Total (mg GAE/100g sampel)
Fraksi kloroform KBNM	1	0.121	10,1	2430
	2	0.124	10,4	2490
	3	0.124	10,4	2450
Rata- rata			10.3	2470
SD			0.173	34.641

Konsentrasi fenol total larutan Fraksi kloroform KBNM

Replikasi 1
y = 0,010x + 0,020
0.121 = 0,010x + 0,020
x = 10,1 µg GAE/ml sampel
Replikasi 2
y = 0,010x + 0,020
0.124 = 0,010x + 0,020
x = 10,4 µg GAE/ml sampel
Replikasi 3
y = 0,010x + 0,020
0.124 = 0,010x + 0,020
x = 10,4 µg GAE/ml sampel

Kadar fenol total per berat sampel Fraksi kloroform KBNM dapat dihitung dengan Rumus:

$$TPC = \frac{C.V.fp}{g}$$

Keterangan :
C = konsentrasi fenol total (nilai x)
V = volume ekstrak yang digunakan (ml)
Fp = factor pengenceran
G = berat sampel yang digunakan (g)

Replikasi 1
$TPC = \frac{10,1 \text{ x } 10 \text{ x } 1}{0,10 \text{ g}}$ = 1010 µg GAE/g sampel
1010 µg GAE/g sampel = x mg GAE/100g sampel
1,010 mg GAE/g sampel = x mg GAE/100g sampel
1,010 x 100 = x
x = 1010

Replikasi 2
$TPC = \frac{10,4 \text{ x } 10 \text{ x } 1}{0,10 \text{ g}}$ = 1040 µg GAE/g sampel
1040 µg GAE/g sampel = x mg GAE/100g sampel
1,040 mg GAE/g sampel = x mg GAE/100g sampel
1,040 x 100 = x
x = 1040

Replikasi 3
$TPC = \frac{10,4 \; x \; 10 \; x \; 1}{0,10 \text{ g}}$ = 1040 µg GAE/g sampel

1040 µg GAE/g sampel = x mg GAE/100g sampel
1,040 mg GAE/g sampel = x mg GAE/100g sampel
1,040 x 100 = x
x = 1040

Lampiran 5

Analisis Total Flavonoid sampel uji

Tabel 12. Uji Flavonoid total standar kuersetin

konsentrasi (µg/ml)	Abs 1	Abs 2	Abs 3	Rerata Absorbansi
400	0.2904	0.2666	0.2633	0.2734
800	0.5042	0.5426	0.5122	0.5196
1200	1.1251	0.9203	1.0753	1.0402
1600	1.3572	1.3900	1.4305	1.3925
2000	1.6538	1.8073	1.7048	1.7219

Sehingga didapatkan persamaan regresi kuersetin:

y = 0.0009 x - 0.1414

Tabel 13. Uji Flavonoid total Fraksi kloroform KBNM

Sampel	Replikasi ke-	Absorbansi (510 nm)
Fraksi kloroform KBNM	1	0.0780
	2	0.0756
	3	0.0776
Rata- rata		0.0770
SD		0.001286

Tabel 14. Kandungan total flavonoid Fraksi kloroform KBNM

Sampel	Replikasi ke-	Kadar flavonoid dalam sampel (ppm)	Konsentrasi sampel (ppm)	Total flavonoid (% b/b EQ)
Fraksi kloroform KBNM	1	243,770	1050	23,216
	2	241,111	1050	22,962
	3	243,333	1050	23,174
Rata- rata		242,738	1050	23,117
SD		1,425	0	0,135

Perhitungan kadar flavonoid

$$\text{Konsentrasi sampel (ppm)} = \frac{berat\ sampel\ (mg)}{(volume\ (L)}$$

$$= \frac{10.5\ mg}{0.01\ L} = 1050\ ppm$$

Hasil pembacaan Fraksi kloroform KBNM

Replikasi 1

y = 0.0009 x - 0.1414

0.0780 = 0.0009 x - 0.1414

x = 243,770

Replikasi 2

y = 0.0009 x - 0.1414

0.0756 = 0.0009 x - 0.1414

x = 241,111

Replikasi 3

y = 0.0009 x - 0.1414

0.0776 = 0.0009 x - 0.1414

x = 243,333

Total flavonoid Fraksi Kloroform KBNM (% b/b EQ)

Replikasi 1

$$\text{Total Flavonoid 1} = \frac{\text{kadar flavonoid dalam sampel (ppm)}}{konsentrasi\ sampel\ (ppm)}\ x\ 100\ \%$$
$$= \frac{243{,}770}{1050}\ x\ 100\ \%$$
$$= 23{,}216\ \%\ \text{b/b EQ}$$

Replikasi 2

$$\text{Total Flavonoid 2} = \frac{\text{kadar flavonoid dalam sampel (ppm)}}{konsentrasi\ sampel\ (ppm)}\ x\ 100\ \%$$
$$= \frac{241{,}111}{1050}\ x\ 100\ \%$$
$$= 22{,}962\ \%\ \text{b/b EQ}$$

Replikasi 3

$$\text{Total Flavonoid 3} = \frac{\text{kadar flavonoid dalam sampel (ppm)}}{konsentrasi\ sampel\ (ppm)}\ x\ 100\ \%$$
$$= \frac{243{,}333}{1050}\ x\ 100\ \%$$
$$= 23{,}174\ \%\ \text{b/b EQ}$$

Lampiran 6

Uji aktivitas antioksidan kloroform KBNM

Tabel 15. Uji penangkapan radikal bebas DPPH quarsetin replikasi 1

Konsentrasi (µg/ml)	Duplo 1 (nm)	Duplo 2 (nm)	Rata-Rata	% Inhibisi
1	0,473	0,472	0,473	31,422
2	0,375	0,371	0,373	45,864
3	0,264	0,262	0,263	61,829
4	0,168	0,169	0,169	75,544
5	0,094	0,093	0,094	86,430
Absorbansi Kontrol				0,689

Tabel 16. Uji penangkapan radikal bebas DPPH quarsetin replikasi 2

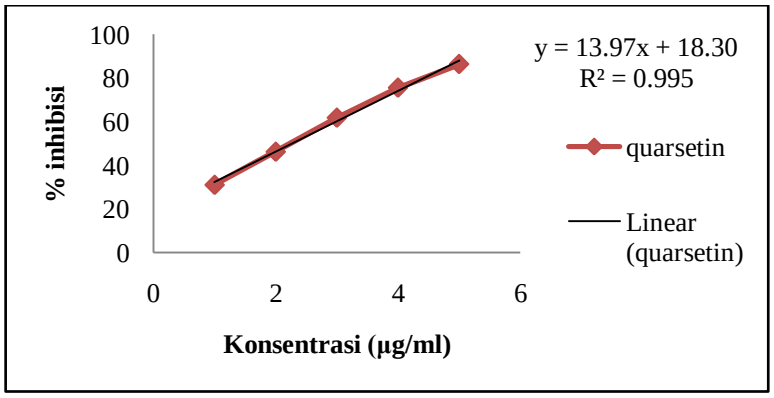
Konsentrasi (µg/ml)	Duplo 1 (nm)	Duplo 2 (nm)	Rata-Rata	% Inhibisi
1	0,476	0,480	0,478	30,624
2	0,369	0,363	0,366	46,880
3	0,261	0,262	0,262	62,046
4	0,167	0,168	0,168	75,689
5	0,094	0,097	0,096	86,139
Absorbansi Kontrol				0,689

Tabel 17. Uji penangkapan radikal bebas DPPH quarsetin replikasi 3

Konsentrasi (µg/ml)	Duplo 1 (nm)	Duplo 2 (nm)	Rata-Rata	% Inhibisi
1	0,473	0,473	0,473	31,350
2	0,371	0,372	0,372	46,081
3	0,264	0,265	0,265	61,611
4	0,169	0,169	0,169	75,472
5	0,091	0,095	0,093	86,502
Absorbansi Kontrol				0,689

Tabel 18. Uji penangkapan radikal bebas DPPH quarsetin

Konsentrasi (µg/ml)	Rerata % inhibisi
1	31.132
2	46.275
3	61.829
4	75.568
5	86.357

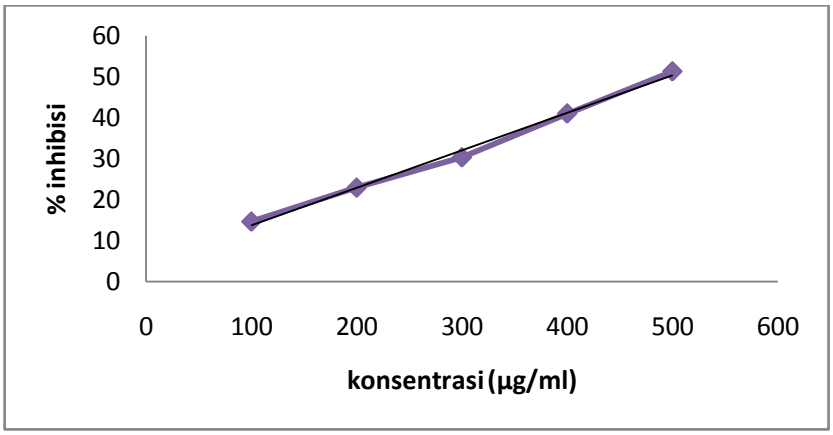


Gambar 13. Grafik uji aktivitas antioksidan kuersetin pada uji DPPH

Fraksi Kloroform KBNM

Tabel 19. Uji penangkapan radikal bebas DPPH fraksi Kloroform KBNM

Kons. (µg/ml)	Replikasi 1		Replikasi 2		Rata-rata	Abs kontrol negatif	% inhibisi
	Abs 1	Abs 2	Abs 1	Abs 2			
100	0.572	0.577	0.644	0.643	0.609	0.714	14.70588
200	0.527	0.527	0.574	0.572	0.55	0.714	22.96919
300	0.449	0.445	0.547	0.548	0.49725	0.714	30.35714
400	0.394	0.388	0.453	0.449	0.421	0.714	41.03641
500	0.32	0.318	0.38	0.373	0.34775	0.714	51.29552



Gambar 14. Grafik uji aktivitas antioksidan fraksi kloroform KBNM

Didapatkan regresi linier **y = 0.091x + 4.698**

R^2 = 0.994

Perhitungan IC_{50}

Kuersetin

Persamaan regresi :

y = 13.974x + 18.309

Keterangan: y = 50

$y = 13.974x + 18.309$

$50 = 13.974x + 18.309$

$$x = \frac{50 - 18.309}{13.974}$$

$x = \mathbf{2.269080636\ \mu g/ml}$

Fraksi Kloroform KBNM

Persamaan regresi :

y = 0.091x + 4.698

Keterangan: y = 50

$y = 0.091x + 4.698$

$50 = 0.091x + 4.698$

$$x = \frac{50 - 4.698}{0.091}$$

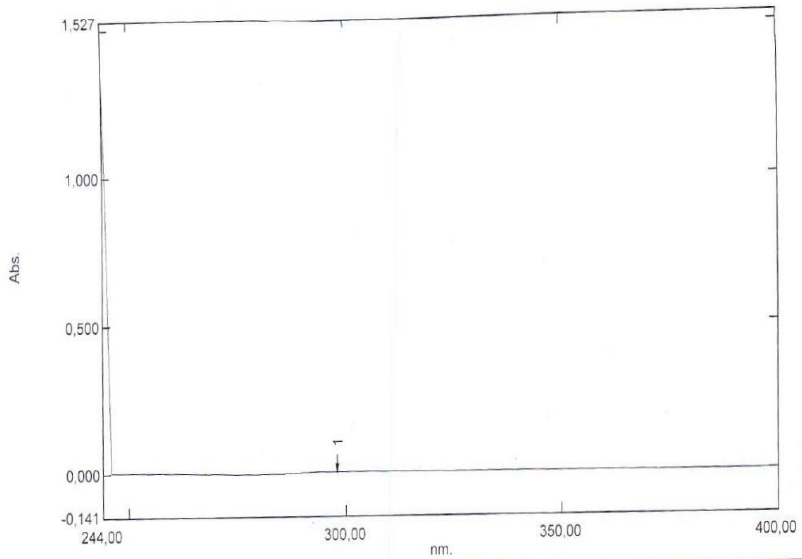
$x = \mathbf{497.824176\ \mu g/ml}$

Lampiran 7. Hasil penetapan panjang gelombang maksimal Fraksi kloroform KBNM

Spectrum Peak Pick Report

28/04/2015 13:38:39

Data Set: ekstrak kloroform atas 0,5mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	↑	298,00	0,004	

[Measurement Properties]
Wavelength Range (nm.): 244,00 to 400,00
Scan Speed: Fast
Sampling Interval: 2.0
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

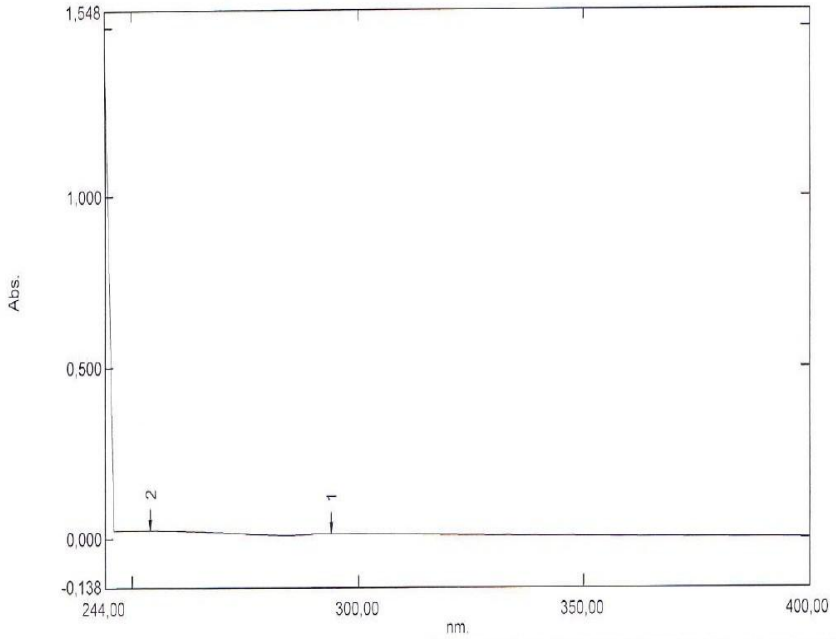
[Operation]
Threshold: 0,0010000
Points: 1
InterPolate: Disabled
Average: Disabled

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

Spectrum Peak Pick Report

28/04/2015 13:38:42

Data Set: ekstrak kloroform atas 2,5mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	↑	294,00	0,014	
2	↑	254,00	0,024	

[Measurement Properties]
Wavelength Range (nm.): 244,00 to 400,00
Scan Speed: Fast
Sampling Interval: 2,0
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

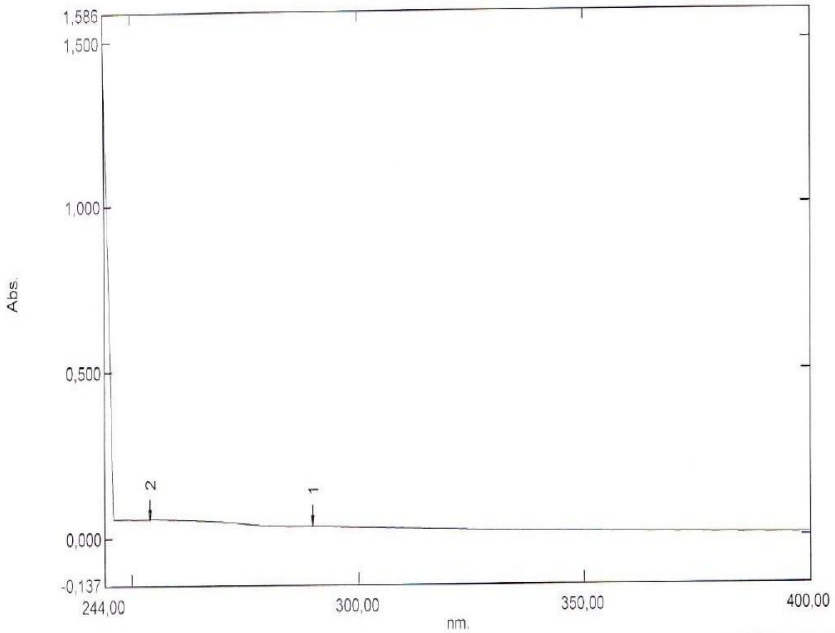
[Operation]
Threshold: 0,0010000
Points: 1
InterPolate: Disabled
Average: Disabled

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

Spectrum Peak Pick Report

28/04/2015 13:38:44

Data Set: ekstrak kloroform atas 5mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	↑	290,00	0,034	
2	↑	254,00	0,058	

[Measurement Properties]
Wavelength Range (nm.): 244,00 to 400,00
Scan Speed: Fast
Sampling Interval: 2,0
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: 1
InterPolate: Disabled
Average: Disabled

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

Spectrum Peak Pick Report

28/04/2015 13:38:46

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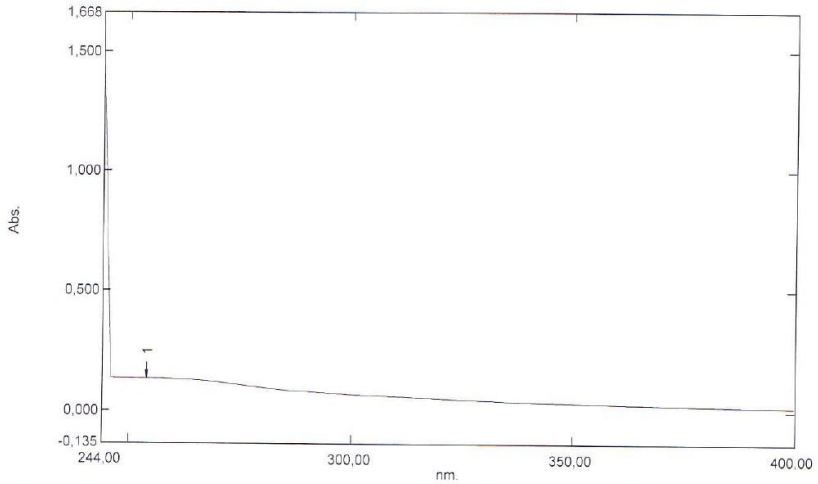


No.	P/V	Wavelength	Abs.	Description
1	ⓟ	254,00	0,131	

[Measurement Properties]
Wavelength Range (nm.): 244,00 to 400,00
Scan Speed: Fast
Sampling Interval: 2,0
Auto Sampling Interval: Disabled
Scan Mode: Auto

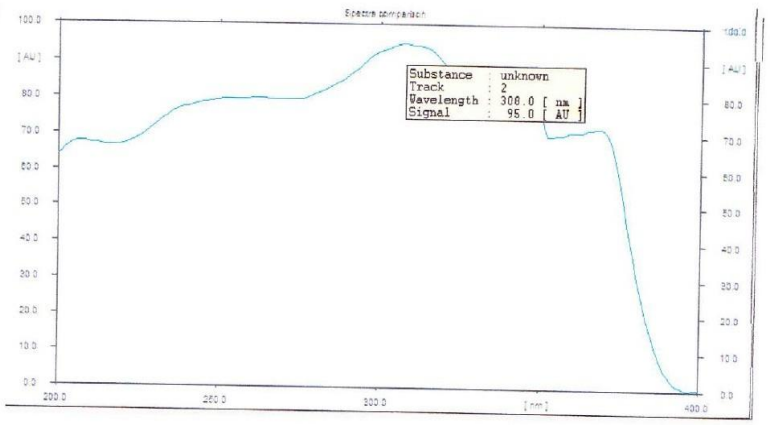
[Instrument Properties]
Instrument Type: UV-1800 Series
Measuring Mode: Absorbance
Slit Width: 1,0 nm
Light Source Change Wavelength: 340,0 nm
S/R Exchange: Normal

[Attachment Properties]
Attachment: None

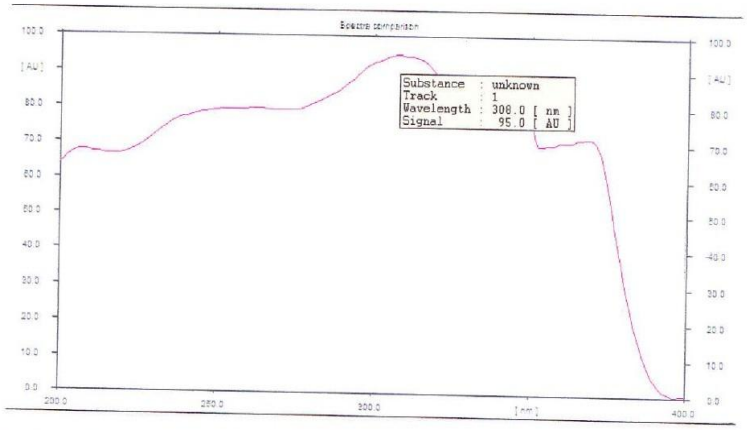
[Operation]
Threshold: 0,0010000
Points: 1
InterPolate: Disabled
Average: Disabled

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

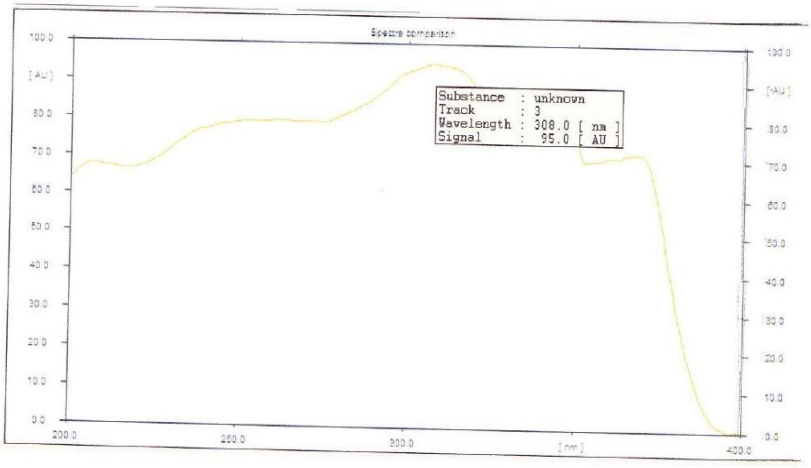
Quarsetin



metanol



Kloro



Lampiran 8. Perhitungan SPF

Tabel 20. Penetapan SPF Secara In Vitro Fraksi Kloroform KBNM

konsentrasi (µg/ml)	Absorbansi	λ max interval 2 nm	λ (nm)	EE x I (λ)	SPF
5	0.004	298	300	0.2874	0.011496
25	0.014	294	295	0.0817	0.011438
50	0.034	290	290	0.0150	0.0051
100	0.131	254	-	-	-
Rata- Rata					0.009344
SD					0.00368

Rumus:

$$\mathbf{SPF_{Spektrofotometrik} = CF \times \Sigma_{290\text{-}320}\ EE\ (\lambda) \times I\ (\lambda) \times Abs\ (\lambda)}$$

Keterangan:
EE (λ) : Spektrum efek erythemal
I (λ) : Spektrum intensitas matahari
Abs (λ) : Absorbansi
CF : Faktor koreksi (= 10)

Fraksi Kloroform KBNM konsentrasi 5 µg/ml

$SPF_{Spektrofotometrik}$ = 10 x 0.2874 x 0.004
= 0.011496

Fraksi Kloroform KBNM konsentrasi 25 µg/ml

$SPF_{Spektrofotometrik}$ = 10 x 0.0817 x 0.014
= 0.011438

Fraksi Kloroform KBNM konsentrasi 50 µg/ml

$SPF_{Spektrofotometrik}$ = 10 x 0.0150 x 0.034
= 0.0051

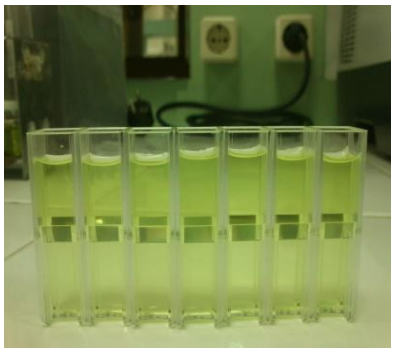
Lampiran 9. Foto dan dokumentasi

Gambar 15. Perajangan kulit buah naga merah

Gambar 16. Proses maserasi

Gambar 17. Proses fraksinasi

Gambar 18. Proses Evaporasi



Gambar 19. Uji Kandungan Fenolik Total

Gambar 20. Penangkapan Radikal Bebas DPPH