LAMPIRAN

Lampiran 1
Hasil Determinasi Tanaman

UNIVERSITAS GADJAH MADA
FAKULTAS BIOLOGI
LABORATORIUM SISTEMATIKA TUMBUHAN
Jalan Teknika Selatan Sekip Utara Yogyakarta 55281 Telpon (0274) 6492262/6492272, Fax: (0274)580839

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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Mengetahui,
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Lampiran 2
Perhitungan nilai rendemen

Hasil fraksinasi dari 5,046 gram ekstrak adalah 2,886 gram atau 57,1938 % dari berat ekstrak.

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

$$19{,}273 \text{ gram } x\ 57{,}1938\% = 11{,}02296 \text{ gram}$$

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

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

$$\text{X} = \frac{11{,}02296 \text{ g}}{470 \text{ g}}\ x\ 100\%$$

$$\text{X} = 2{,}3453\ \%$$

Lampiran 3
Perhitungan Rf

Nilai Rf dihitung dengan menggunakan perbandingan sebagai berikut:

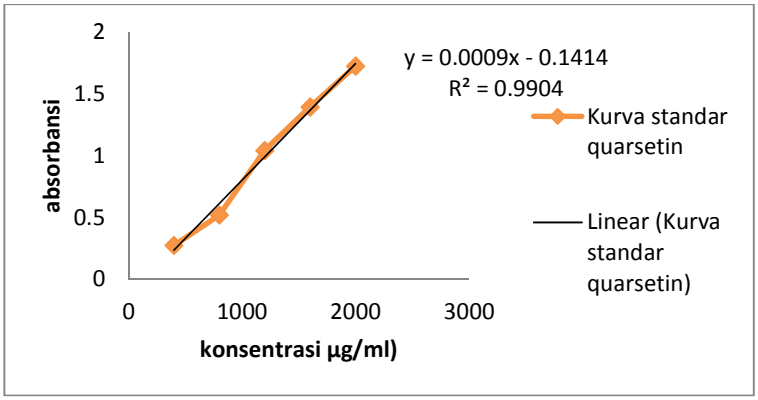
$$\text{Rf} = \frac{\text{Jarak yang ditempuh solut (cm)}}{\text{Jarak yang ditempuh fase gerak (cm)}}$$

1. Sinar tampak
   $\text{A} = \frac{7.85}{8} = 0{,}9812$
   $\text{B} = \frac{6.8}{8} = 0.85$
2. Sinar UV 254 nm
   $\text{A} = \frac{7.85}{8} = 0{,}9812$
   $\text{B} = \frac{6.8}{8} = 0.85$
3. Sinar UV 366 nm setelah disemprot
   $\text{A} = \frac{7.8}{8} = 0.975$
   $\text{B} = \frac{7}{8} = 0.875$

Lampiran 4
Analisis Total Flavonoid sampel uji

Tabel 13. 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



Gambar 1. Kurva standar kuersetin pada uji total flavonoid

Persamaan regresi kuersetin:

$$y = 0.0009x - 0.1414$$

Tabel 14. Uji Flavonoid total Fraksi KBNM-*AcOEt*

Sampel	Replikasi ke-	Absorbansi (510 nm)
Fraksi KBNM-*AcOEt*	1	0.0154
	2	0.0151
	3	0.0094
Rata- rata		0.0133
SD		0.003380828

Hasil pembacaan Fraksi KBNM- *AcOEt*

Replikasi 1

y = 0.0009x - 0.1414
0.0154 = 0.0009x - 0.1414
x = 174.2222 µg/mL

Replikasi 2

y = 0.0009x - 0.1414
0.0151 = 0.0009x - 0.1414
x = 173.8889 µg/mL

Replikasi 3

y = 0.0009x - 0.1414
0.0094 = 0.0009x - 0.1414
x = 167.5556 µg/mL

Perhitungan kadar flavonoid

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

$$= \frac{10.4 \text{ mg}}{0.01 \text{ L}} = 1040 \text{ ppm}$$

Total flavonoid Fraksi KBNM-*AcOEt* (% b/b EQ)

Replikasi 1

$$\text{Total Flavonoid 1} = \frac{\text{kadar flavonoid dalam sampel (ppm)}}{\text{konsentrasi sampel (ppm)}} \text{ x 100 \%}$$

$$= \frac{174.2222}{1040} \text{ x 100 \%}$$

$$= 16.7521 \text{ \% b/b EQ}$$

Replikasi 2

$$\text{Total Flavonoid 2} = \frac{\text{kadar flavonoid dalam sampel (ppm)}}{\text{konsentrasi sampel (ppm)}} \text{ x 100 \%}$$

$$= \frac{173.8889}{1040} \text{ x 100 \%}$$

$$= 16.7201 \text{ \% b/b EQ}$$

Replikasi 3

$$\text{Total Flavonoid 3} = \frac{\text{kadar flavonoid dalam sampel (ppm)}}{\text{konsentrasi sampel (ppm)}} \text{ x 100 \%}$$

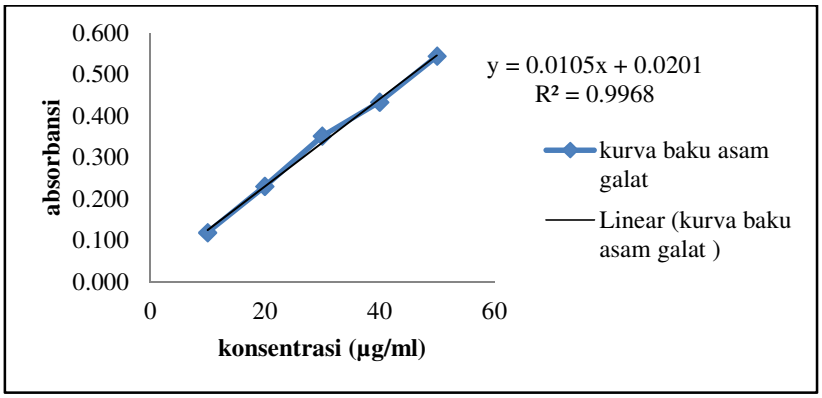
$$= \frac{167.5556}{1040} \text{ x 100 \%}$$

$$= 16.1111 \text{ \% b/b EQ}$$

Lampiran 5
Analisis kandungan fenolik total

Tabel 15. 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 2. Kurva standar asam galat

Kurva standar asam galat diperoleh persamaan:

Y = 0,010x + 0,020
R^2 = 0,996

Konsentrasi fenol total larutan Fraksi KBNM-*AcOEt*

Replikasi 1

y = 0,010x + 0,020
0.174 = 0,010x + 0,020
x = 15.4 µg GAE/mL sampel

Replikasi 2

y = 0,010x + 0,020
0.171 = 0,010x + 0,020
x = 15.1 µg GAE/mL sampel

Replikasi 3

y = 0,010x + 0,020
0.172 = 0,010x + 0,020

x = 15.2 µg GAE/mL sampel

Kadar fenol total per berat sampel Fraksi KBNM-*AcOEt*

Rumus:

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

Keterangan:

C = Kadar fenol larutan (nilai x)

V = Volume ekstrak yang digunakan (mL)

fp = Faktor pengenceran

G = Berat sampel yang digunakan (g)

Replikasi 1

$$\text{TPC} = \frac{15.4\ x\ 25x1}{0{,}0255\ \text{g}}$$

= 15098,039 µg GAE/g sampel

15098,039 µg GAE/g sampel = x mg GAE/100g sampel

15,098039 mg GAE/g sampel = x mg GAE/100g sampel

15,098039 x 100 = x

x = 1509,8039

Replikasi 2

$$\text{TPC} = \frac{15.1 \text{ x } 25 \text{ x } 1}{0{,}0255\ \text{g}}$$

= 14803,922 µg GAE/g sampel

14803,922 µg GAE/g sampel = x mg GAE/100g sampel

14,803922 µg mg GAE/g sampel = x mg GAE/100g sampel

14,803922 x 100 = x

x = 1480,3922

Replikasi 3

$$\text{TPC} = \frac{15.2 \text{ x } 25 \text{ x1}}{0{,}0255\ \text{g}}$$

= 14901,961 µg GAE/g sampel

14901,961 µg GAE/g sampel = x mg GAE/100g sampel

14,901961 mg GAE/g sampel = x mg GAE/100g sampel

14,901961 x 100 = x

x = 1490,1961

Lampiran 6
Uji aktivitas antioksidan sampel uji
Sampel kuersetin

Tabel 16. Uji penangkapan radikal bebas DPPH kuersetin replikasi 1

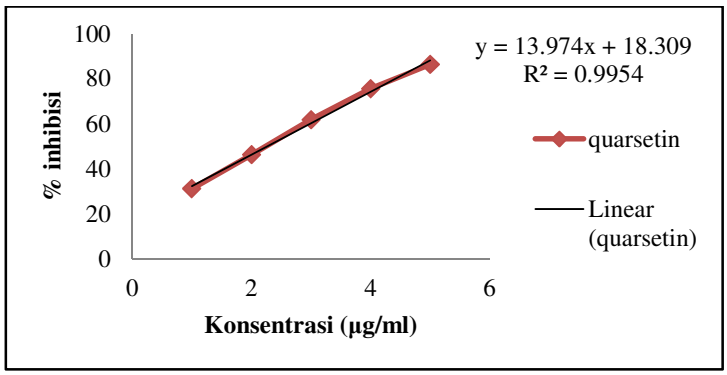
Konsentrasi (µg/mL)	Duplo 1 (nm)	Duplo 2 (nm)	Rata-Rata	% Inhibisi
1	0,473	0,472	0,473	31,422
2	0,375	0,371	0,373	45,864
3	0,264	0,262	0,263	61,829
4	0,168	0,169	0,169	75,544
5	0,094	0,093	0,094	86,430
Absorbansi Kontrol				0,689

Tabel 17. Uji penangkapan radikal bebas DPPH kuersetin 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 18. Uji penangkapan radikal bebas DPPH kuersetin 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

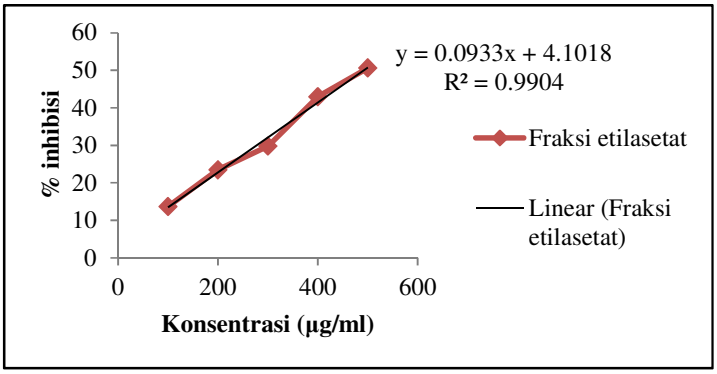


Gambar 3. Grafik uji aktivitas antioksidan kuersetin

Fraksi KBNM-AcOEt

Tabel 19. Uji penangkapan radikal bebas DPPH fraksi KBNM-*AcOEt*

Kons. (µg/mL)	Replikasi 1		Replikasi 2		Rata2	Abs kontrol negatif	% inhibisi
	Abs 1	Abs 2	Abs 1	Abs 2			
100	0.755	0.765	0.746	0.751	0.75425	0.874	13.70137
200	0.671	0.67	0.667	0.668	0.669	0.874	23.45538
300	0.568	0.566	0.661	0.661	0.614	0.874	29.74828
400	0.485	0.484	0.516	0.509	0.4985	0.874	42.96339
500	0.41	0.412	0.459	0.446	0.43175	0.874	50.60069



Gambar 4. Grafik uji aktivitas antioksidan fraksi KBNM- AcOEt

Perhitungan IC_{50}

Kuersetin

Persamaan regresi :

$$y = 13.974x + 18.309$$

Keterangan: y = 50

$y = 13.974x + 18.309$

$50 = 13.974x + 18.309$

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

$x = 2.267854587$ µg/ml

IC_{50} kuersetin adalah 2.26785 µg/mL

Fraksi KBNM-*AcOEt*

Persamaan regresi :

$$y = 0.0933x + 4.1018$$

Keterangan: y = 50

$y = 0.0933x + 4.1018$

$50 = 0.0933x + 4.1018$

$$x = \frac{50 - 4.1018}{0.0933}$$

$x = 491.9421222$ µg/ml

IC_{50} Fraksi KBNM-*AcOEt* adalah 491.9421 µg/mL

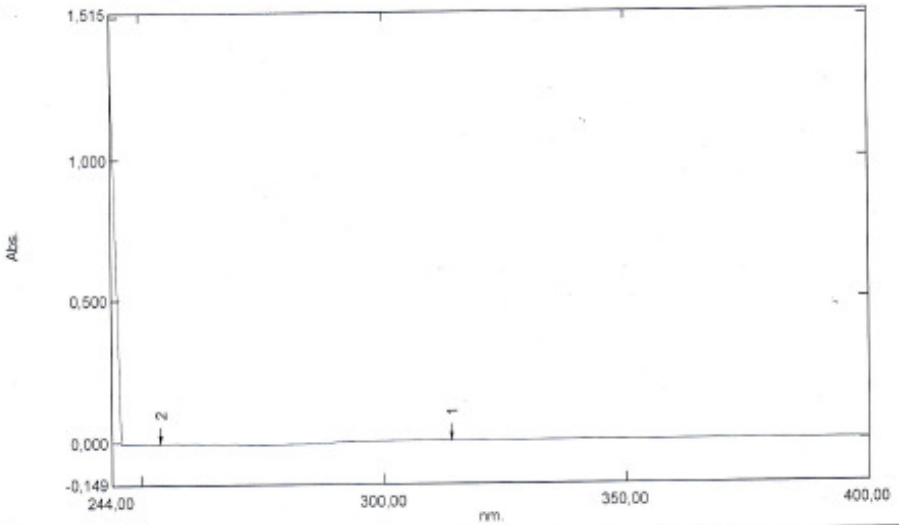
Lampiran 7
Uji SPF

Hasil penetapan panjang gelombang maksimal Fraksi KBNM-*AcOEt*

Spectrum Peak Pick Report

28/04/2015 13:34:09

Data Set: ekstrak etil bawah 0,5mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	⊕	314,00	0,001	
2	⊕	254,00	-0,006	

[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

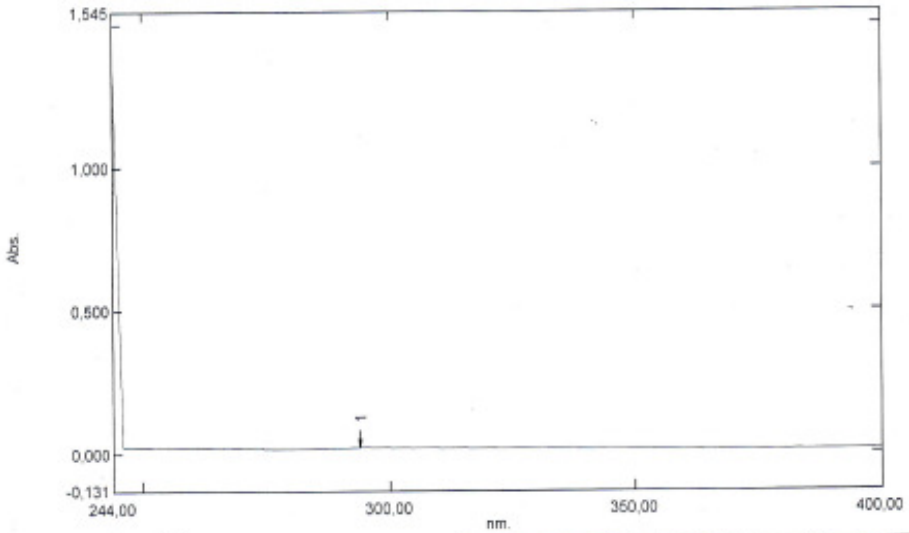
[Operation]
Threshold: 0,0010000
Points: 1
InterPolate: Disabled
Average: Disabled

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

Spectrum Peak Pick Report

28/04/2015 13:34:13

Data Set: ekstrak etil bawah 2,5mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	⊕	294,00	0,018	

[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

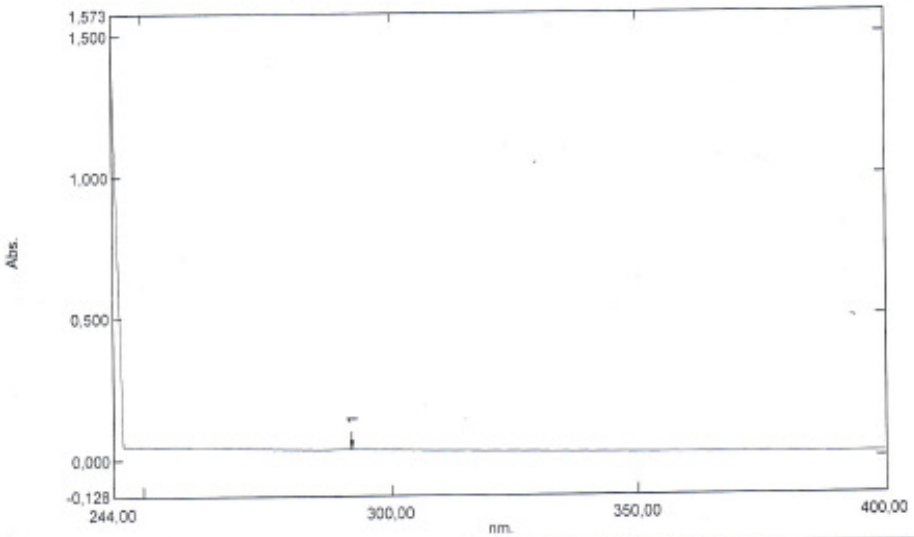
[Operation]
Threshold: 0,0010000
Points: 1
InterPolate: Disabled
Average: Disabled

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

Spectrum Peak Pick Report

28/04/2015 13:34:34

Data Set: ekstrak etil bawah 5mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	⑦	292,00	0,034	

[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

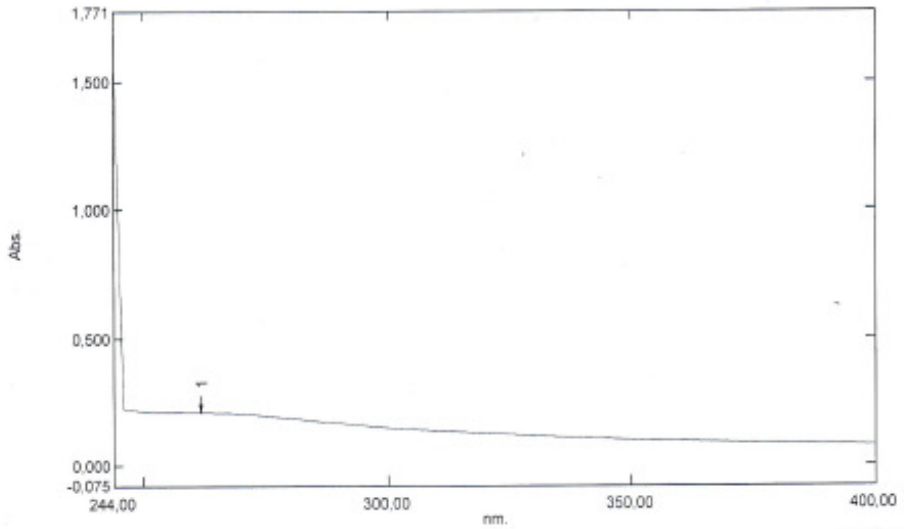
[Operation]
Threshold: 0,0010000
Points: 1
InterPolate: Disabled
Average: Disabled

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

Spectrum Peak Pick Report

28/04/2015 13:34:36

Data Set: ekstrak etil bawah 10mg-100mL - RawData



No.	P/V	Wavelength	Abs.	Description
1	P	262,00	0,211	

[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:

Tabel 20. Penetapan SPF Secara In Vitro Fraksi KBNM-*AcOEt*

konsentrasi (µg/mL)	Absorbansi	λ max interval 2 nm	λ (nm)	EE x I (λ)	SPF
5	0.001	314	315	0.0839	0.0008
25	0.018	294	295	0.0817	0.0147
50	0.034	292	290	0.015	0.0051
100	0.211	262	-	-	-
Rata- Rata					0.0069
SD					0.0071

Perhitungan SPF

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 KBNM-*AcOEt* konsentrasi 5 µg/mL

$SPF_{Spektrofotometrik}$ = 10 x 0.0839 x 0.001
= 0.0008

Fraksi KBNM-*AcOEt* konsentrasi 25 µg/mL

$SPF_{Spektrofotometrik}$ = 10 x 0.0817x 0.018
= 0.0147

Fraksi KBNM-*AcOEt* konsentrasi 50 µg/mL

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

Lampiran 8

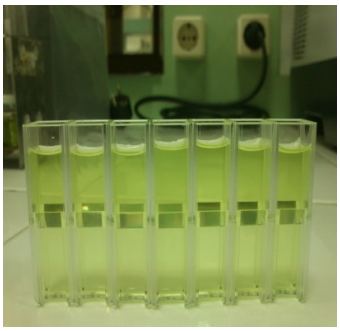
Foto dan dokumentasi

Gambar 5. Perajangan kulit buah naga merah

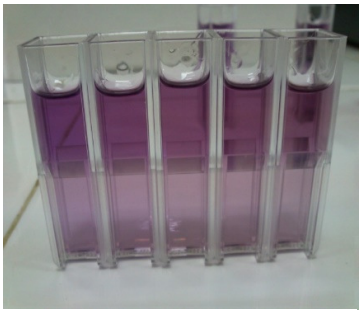
Gambar 6. Proses maserasi

Gambar 8. Proses fraksinasi

Gambar 7. Proses Evaporasi



Gambar 10. Uji Kandungan Fenolik Total



Gambar 9. Penangkapan Radikal Bebas DPPH