BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan hasil penelitian yang telah dilakukan, dapat ditarik kesimpulan sebagai berikut:

1. Variasi basis asam stearat dan triethanolamin dalam pembuatan krim ekstrak buah belimbing wuluh (*Averrhoa bilimbi* L.) berpengaruh terhadap mutu fisik krim (organoleptis, viskositas, daya sebar, daya lekat dan pH).
2. Formula I dengan konsentrasi asam stearat dan triethanolamin (12% : 2%) memenuhi uji mutu fisik krim terbaik (viskositas yang tinggi, daya lekat yang tinggi dan daya sebar yang rendah).

B. Saran

1. Perlu dilakukan penelitian lebih lanjut mengenai uji *antiacne* dari krim ekstrak buah belimbing wuluh (*Averrhoa bilimbi* L.)
2. Perlu dilakukan penelitian lebih lanjut mengenai pembuatan krim ekstrak buah belimbing wuluh (*Averrhoa bilimbi*. L) dengan basis lain, untuk mendapatkan krim yang lebih baik dalam hal mutu fisik dan stabilitas agar bermanfaat dikalangan masyarakat.

LAMPIRAN

Lampiran 1. Hasil determinasi tanaman belimbing wuluh (*averrhoa bilimbi* L.)

UNIVERSITAS SETIA BUDI

UPT- LABORATORIUM

No : 185/DET/UPT-LAB/02/XII/2014
Hal : Surat Keterangan Determinasi Tumbuhan

Menerangkan bahwa :
Nama : Ajeng Novita W
NIM : 15120907 B
Fakultas : Farmasi Universitas Setia Budi

Telah mendeterminasikan tumbuhan : **Belimbing wuluh (*Averhoa bilimbi* L.)**

Hasil determinasi berdasarkan : Steenis : FLORA

1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 15b. golongan 9. 197b – 208b – 219b – 220b – 224b – 225b – 227b – 229b – 230b – 234b – 235b – 236b – 237b – 238a. familia 61. Oxalidaceae. 1a. Averrhoa. ***Averhoa bilimbi* L.**

Deskripsi :

Habitus : Pohon, tinggi dapat mencapai 10 meter.
Batang : Bulat, berkayu, monopodial, tegak.
Daun : Majemuk, beranak daun ganjil, ke arah ujung poros lebih besar, tidak ada daun penumpu. Anak daun memanjang, ujung meruncing, pangkal membulat, tepi rata, panjang 3 – 7 cm, lebar 1,5 – 3 cm, tulang daun menyirip, permukaan atas hijau tua, permukaan bawah hijau muda.
Bunga : Majemuk, malai, keluar dari batang atau cabang yang besar. Bunga semuanya dengan panjang tangkai putik yang sama. Kelopak panjang lk 6 mm. Daun mahkota tidak atau hampir bergandengan, bentuk spatel atau lanset, dengan pangkal yang pucat. 5 benang sari di depan daun mahkota mereduksi menjadi staminodia.
Buah : Buni bulat persegi membulat tumpul, kuning hijau, panjang 4-6,5 cm, mengandung banyak air, terasa sangat masam.
Akar : Tunggang.

Pustaka : Steenis C.G.G.J., Bloembergen S. Eyma P.J. (1978): *FLORA*, PT Pradnya Paramita. Jl. Kebon Sirih 46. Jakarta Pusat, 1978.

Surakarta, 02 Desember 2014
Tim determinasi

Dra. Kartinah Wirjosoendjojo, SU.

Jl. Let.jen Sutoyo, Mojosongo-Solo 57127 Telp.0271-852518, Fax.0271-853275
Homepage : www.setiabudi.ac.id, e-mail : info@setiabudi.ac.id

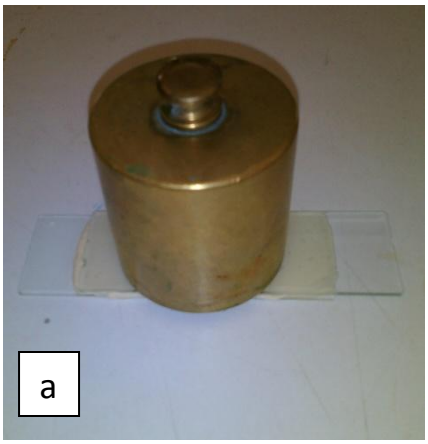
Lampiran 2. Gambar buah belimbing wuluh

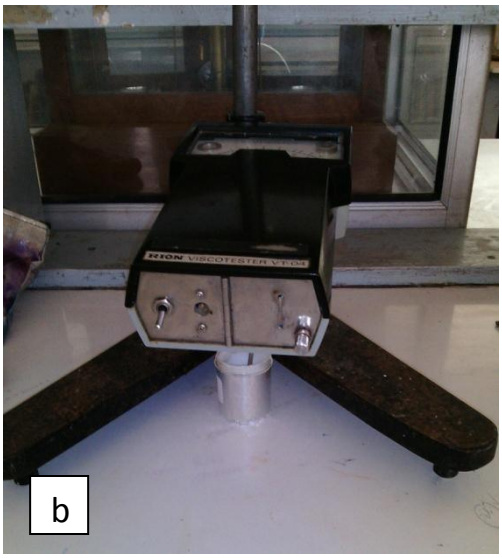
Lampiran 3. Gambar krim ekstrak buah belimbing wuluh

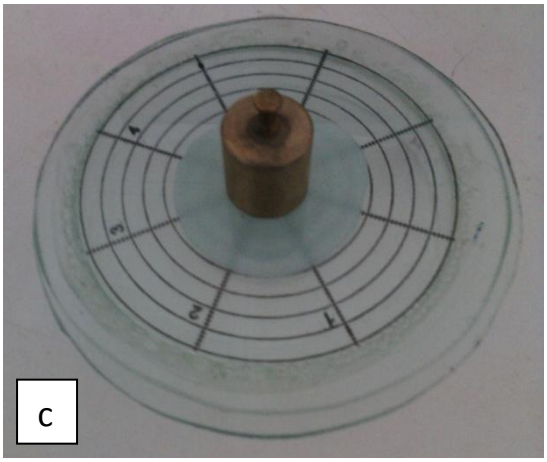
Keterangan :

a. Krim setelah pembuatan
b. Penyimpanan krim dengan ditutup alumunium foil

Lampiran 4. Gambar pengujian krim







Keterangan :

a. Pengujian daya lekat
b. Pengujian viskositas
c. Pengujian daya sebar

Lampiran 5. Hasil statistik uji daya lekat

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Lekat	12	26.2625	6.31451	19.50	38.21

One-Sample Kolmogorov-Smirnov Test

		Daya Lekat
N		12
Normal Parameters[a,,b]	Mean	26.2625
	Std. Deviation	6.31451
Most Extreme Differences	Absolute	.178
	Positive	.178
	Negative	-.142
Kolmogorov-Smirnov Z		.616
Asymp. Sig. (2-tailed)		.843

a. Test distribution is Normal.

b. Calculated from data.

Descriptives

Daya Lekat

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula I	4	33.5275	4.52276	2.26138	26.3308	40.7242	27.50	38.21
Formula II	4	24.0100	3.45859	1.72930	18.5066	29.5134	20.15	28.11
Formula III	4	21.2500	1.77341	.88671	18.4281	24.0719	19.50	23.35
Total	12	26.2625	6.31451	1.82284	22.2505	30.2745	19.50	38.21

Test of Homogeneity of Variances

Daya Lekat

Levene Statistic	df1	df2	Sig.
1.055	2	9	.388

ANOVA

Daya Lekat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	331.917	2	165.958	14.000	.002
Within Groups	106.687	9	11.854		
Total	438.603	11			

Multiple Comparisons

Daya Lekat
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula I	Formula II	9.51750*	2.43455	.009	2.7202	16.3148
	Formula III	12.27750*	2.43455	.002	5.4802	19.0748
Formula II	Formula I	-9.51750*	2.43455	.009	-16.3148	-2.7202
	Formula III	2.76000	2.43455	.519	-4.0373	9.5573
Formula III	Formula I	-12.27750*	2.43455	.002	-19.0748	-5.4802
	Formula II	-2.76000	2.43455	.519	-9.5573	4.0373

*. The mean difference is significant at the 0.05 level.

Daya Lekat

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05	
		1	2
Formula III	4	21.2500	
Formula II	4	24.0100	
Formula I	4		33.5275
Sig.		.519	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4,000.

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Lekat	6	26.1367	6.91620	19.50	38.21

One-Sample Kolmogorov-Smirnov Test

		Daya Lekat
N		6
Normal Parameters[a,,b]	Mean	26.1367
	Std. Deviation	6.91620
Most Extreme Differences	Absolute	.221
	Positive	.221
	Negative	-.169
Kolmogorov-Smirnov Z		.541
Asymp. Sig. (2-tailed)		.931

a. Test distribution is Normal.

b. Calculated from data.

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Daya Lekat	6	26.1367	6.91620	2.82353

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Daya Lekat	9.257	5	.000	26.13667	18.8786	33.3948

Lampiran 6. Hasil statistik uji viskositas

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Viskositas	12	167.08	57.819	80	265

One-Sample Kolmogorov-Smirnov Test

		Viskositas
N		12
Normal Parameters[a,,b]	Mean	167.08
	Std. Deviation	57.819
Most Extreme Differences	Absolute	.149
	Positive	.149
	Negative	-.132
Kolmogorov-Smirnov Z		.515
Asymp. Sig. (2-tailed)		.953

a. Test distribution is Normal.

b. Calculated from data.

Descriptives

Viskositas

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula I	4	228.75	29.545	14.773	181.74	275.76	200	265
Formula II	4	160.00	39.158	19.579	97.69	222.31	120	210
Formula III	4	112.50	27.234	13.617	69.17	155.83	80	145
Total	12	167.08	57.819	16.691	130.35	203.82	80	265

Test of Homogeneity of Variances

Viskositas

Levene Statistic	df1	df2	Sig.
.462	2	9	.644

ANOVA

Viskositas

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	27329.167	2	13664.583	13.023	.002
Within Groups	9443.750	9	1049.306		
Total	36772.917	11			

Multiple Comparisons

Viskositas
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula I	Formula II	68.750*	22.905	.036	4.80	132.70
	Formula III	116.250*	22.905	.002	52.30	180.20
Formula II	Formula I	-68.750*	22.905	.036	-132.70	-4.80
	Formula III	47.500	22.905	.151	-16.45	111.45
Formula III	Formula I	-116.250*	22.905	.002	-180.20	-52.30
	Formula II	-47.500	22.905	.151	-111.45	16.45

*. The mean difference is significant at the 0.05 level.

Viskositas

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05	
		1	2
Formula III	4	112.50	
Formula II	4	160.00	
Formula I	4		228.75
Sig.		.151	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4,000.

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Viskositas	6	170.00	67.454	80	265

One-Sample Kolmogorov-Smirnov Test

		Viskositas
N		6
Normal Parameters[a,,b]	Mean	170.00
	Std. Deviation	67.454
Most Extreme Differences	Absolute	.172
	Positive	.145
	Negative	-.172
Kolmogorov-Smirnov Z		.421
Asymp. Sig. (2-tailed)		.994

a. Test distribution is Normal.

One-Sample Kolmogorov-Smirnov Test

		Viskositas
N		6
Normal Parameters[a,,b]	Mean	170.00
	Std. Deviation	67.454
Most Extreme Differences	Absolute	.172
	Positive	.145
	Negative	-.172
Kolmogorov-Smirnov Z		.421
Asymp. Sig. (2-tailed)		.994

a. Test distribution is Normal.

b. Calculated from data.

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Viskositas	6	170.00	67.454	27.538

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Viskositas	6.173	5	.002	170.000	99.21	240.79

Lampiran 7. Hasil statistik uji daya sebar

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Sebar	12	3.2258	.40684	2.50	3.87

One-Sample Kolmogorov-Smirnov Test

		Daya Sebar
N		12
Normal Parameters[a,,b]	Mean	3.2258
	Std. Deviation	.40684
Most Extreme Differences	Absolute	.138
	Positive	.138
	Negative	-.082
Kolmogorov-Smirnov Z		.478
Asymp. Sig. (2-tailed)		.976

a. Test distribution is Normal.

b. Calculated from data.

Descriptives

Daya Sebar

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Formula I	4	2.9900	.40075	.20037	2.3523	3.6277	2.50	3.47
Formula II	4	3.0900	.26445	.13222	2.6692	3.5108	2.77	3.40
Formula III	4	3.5975	.30566	.15283	3.1111	4.0839	3.17	3.87
Total	12	3.2258	.40684	.11744	2.9673	3.4843	2.50	3.87

Test of Homogeneity of Variances

Daya Sebar

Levene Statistic	df1	df2	Sig.
.222	2	9	.805

ANOVA

Daya Sebar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.849	2	.424	3.930	.059
Within Groups	.972	9	.108		
Total	1.821	11			

Multiple Comparisons

Daya Sebar
Tukey HSD

(I) Formula	(J) Formula	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Formula I	Formula II	-.10000	.23236	.904	-.7488	.5488
	Formula III	-.60750	.23236	.066	-1.2563	.0413
Formula II	Formula I	.10000	.23236	.904	-.5488	.7488
	Formula III	-.50750	.23236	.128	-1.1563	.1413
Formula III	Formula I	.60750	.23236	.066	-.0413	1.2563
	Formula II	.50750	.23236	.128	-.1413	1.1563

Daya Sebar

Tukey HSD[a]

Formula	N	Subset for alpha = 0.05
		1
Formula I	4	2.9900
Formula II	4	3.0900
Formula III	4	3.5975
Sig.		.066

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 4,000.

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Daya Sebar	6	3.1967	.49750	2.50	3.87

One-Sample Kolmogorov-Smirnov Test

		Daya Sebar
N		6
Normal Parameters[a,,b]	Mean	3.1967
	Std. Deviation	.49750
Most Extreme Differences	Absolute	.159
	Positive	.138
	Negative	-.159
Kolmogorov-Smirnov Z		.389
Asymp. Sig. (2-tailed)		.998

a. Test distribution is Normal.

One-Sample Kolmogorov-Smirnov Test

		Daya Sebar
N		6
Normal Parameters[a,,b]	Mean	3.1967
	Std. Deviation	.49750
Most Extreme Differences	Absolute	.159
	Positive	.138
	Negative	-.159
Kolmogorov-Smirnov Z		.389
Asymp. Sig. (2-tailed)		.998

a. Test distribution is Normal.

b. Calculated from data.

T-Test

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Daya Sebar	6	3.1967	.49750	.20310

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Daya Sebar	15.739	5	.000	3.19667	2.6746	3.7188

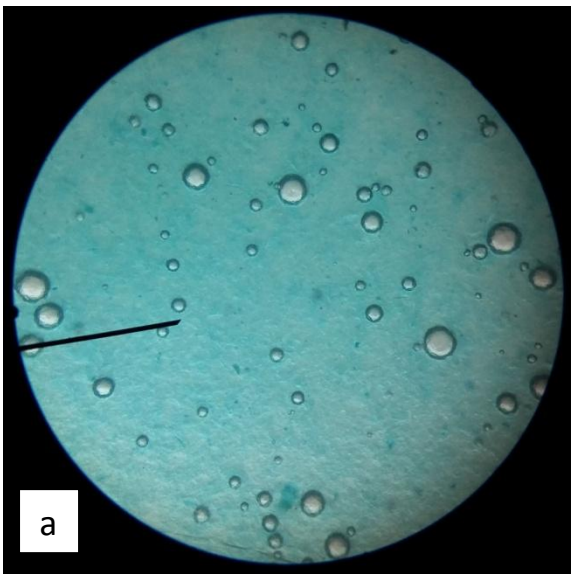
Lampiran 8. Data replikasi pengujian daya sebar krim

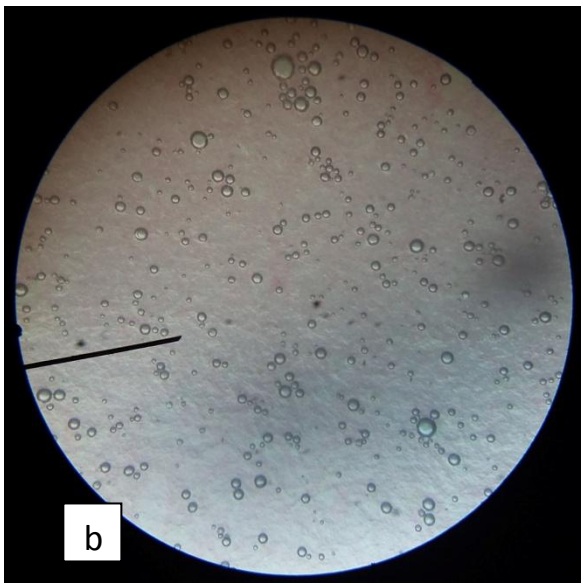
Pengujian daya sebar krim (cm)										
Berat beban (gram)	Formula	F 1			F 2			F 3		
	Replikasi pengujian	1	2	3	1	2	3	1	2	3
Minggu 1										
50		3,47	3,46	3,47	3,40	3,41	3,40	3.87	3,88	3,88
100		3,57	3,56	3,56	3,50	3,49	3,50	3,97	3,96	3.97
150		3,67	3,67	3,66	3,57	3,56	3,57	4,10	4.11	4,11
200		3,75	3,74	3,75	3,67	3,67	3,66	4,17	4,18	4,17
250		3,80	3,79	3,79	3,87	3,86	3,87	4,27	4,28	4,28
Minggu 2										
50		3,07	3,07	3,06	3,17	3,17	3,16	3,75	3,74	3,75
100		3,15	3,15	3,15	3,25	3,24	3,24	3,85	3,86	3,86
150		3,22	3,23	3,22	3,30	3,29	3,29	3,92	3,91	3,91
200		3,27	3,27	3,26	3,37	3,36	3,37	4,00	4,01	4,01
250		3,37	3,36	3,36	3,45	3,45	3,44	4,05	4,04	4,04
Minggu 3										
50		2,92	2,91	2,91	3,02	3,02	3,01	3,60	3,59	3,60
100		3,00	3,01	3,01	3,07	3,07	3,06	3,72	3,72	3,71
150		3,07	3,06	3,06	3,17	3,16	3,16	3,80	3,79	3,79
200		3,15	3,15	3,14	3,25	3,24	3,24	3,87	3,88	3,88
250		3,22	3,23	3,23	3,35	3,34	3,34	3,95	3,94	3,95
Minggu 4										
50		2,50	2.50	2,49	2,77	2,77	2,76	3,17	3,16	3,16
100		2,55	2,54	2,54	2,82	2,82	2,81	3,25	3,24	3,24
150		2,62	2.62	2,61	2,92	2,91	2,91	3,30	3,30	3,29
200		2,67	2,67	2,66	3,00	3,00	2,99	3,37	3,36	3,36
250		2,75	2,74	2,74	3,10	3,10	3,09	3,45	3,45	3,44

Lampiran 9. Data replikasi pengujian daya lekat krim

Pengujian daya lekat krim(detik)								
FORMULA								
F 1			F 2			F 3		
Replikasi pengujian								
1	2	3	1	2	3	1	2	3
Minggu 1								
27,50	27,51	27,50	20,15	20,14	20,14	19,50	19,49	19,49
Minggu 2								
33,15	33,15	33,14	22,45	22,44	22,44	20,10	20,11	20,10
Minggu 3								
35,25	32,24	32,24	25,33	25,32	25,32	22,05	22,05	22,04
Minggu 4								
38,21	38,22	38,22	28,11	28,10	28,11	23,35	23,35	23,34

Lampiran 10. Hasil pengujian tipe krim dengan mikroskop





Keterangan :

a. Pengujian tipe krim dengan penambahan metilen blue

b. Pengujian tipe krim dengan penambahan sudan III

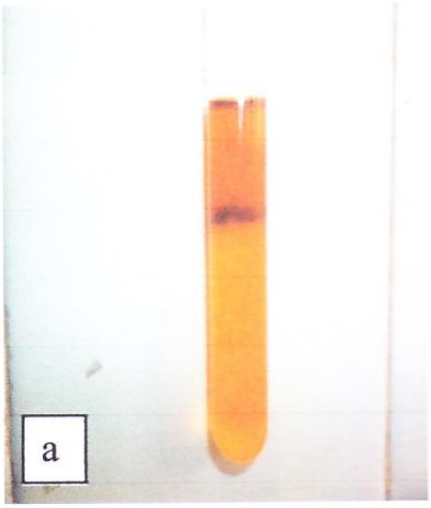
Lampiran 11. Hasil perhitungan rendemen serbuk

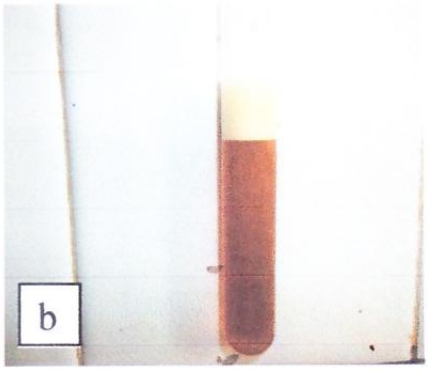
Buah belimbing wuluh 20000 gram bobot basah, setelah dipotong-potong dan dioven didapatkan simplisia 650 gram bobot kering.

Rumus $= \frac{bobotkering\ (gram)}{bobotbasah\ (gram)} \times 100\%$

Prosentase rendemen $= \frac{650\ gram}{20000\ gram}$ x 100% = 3,25 %

Lampiran 12. Hasil pengujian kandungan senyawa ekstrak.





Keterangan :

a. Kandungan flavonoid dengan terbentuk warna pada amyl alcohol.
b. Kandungan saponin dengan terbentuk busa yang stabil.
c. Senyawa tanin dengan terbentuk warna hitam kehijauan.