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Lampiran 1 Surat Determinasi



UPT-LABORATORIUM

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Nomor : 306/DET/UPT-LAB/25.11/2021
Hal : Hasil determinasi tumbuhan
Lamp. : -

Nama Pemesan : Marcherriva Iqlima Kurnia Putri
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Alamat : Program Studi S-I Farmasi, Universitas Setia Budi, Surakarta.
Nama sampel : Kembang Telang / *Clitoria ternatea*, L

HASIL DETERMINASI TUMBUHAN

Klasifikasi

Kingdom : Plantae
Super Divisi : Spermatophyta
Divisi : Magnoliophyta
Kelas : Magnoliopsida
Ordo : Fabales
Famili : Fabaceae/Papilionaceae
Genus : *Clitoria*
Species : *Clitoria ternatea*, L

Hasil Determinasi menurut Steenis, C.G.G.J.V, Bloembergen, H, Eyma, P.J. 1992 :

1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 15b. golongan 9. 197b – 208b – 219b – 220b – 224b – 225b – 227b – 229b – 230a – 231b – 233a. familia 60. Papilionaceae.
1b - 5b - 16b - 19b - 20a -21a. *Clitoria ternatea*, L.

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Homepage : www.setiabudi.ac.id, e-mail : info@setiabudi.ac.id

Deskripsi:

- Habitus : Perdu, tinggi 5-10 m.
- Akar : Akar tunggang.
- Batang : Batang bulat, permukaanya berambut, arah tumbuhnya membelit ke kiri.
- Daun : Daun menyirip berdaun 3-9, anak daun bertangkai sangat pendek, ellips atau bulat telur, tumpul, kebanyakan agak melekuk ke dalam, ukuran 2-7 kali 1-4,5 cm. Daun penumpu bentuk garis.
- Bunga : Bunga dengan bendera mengarah ke bawah, jarang berjumlah dua, tangkai karangan bunga sampai 1,5 cm; anak tangkai bunga lk 0,5 cm. Daun pelindung pada pangkal kelopak oval lebar sampai bentuk lingkaran, bergaris, Panjang 0,5-1 cm. Kelopak tinggi 1,5-2,5 cm, gundul, taju 5, runcing. Bidang bendera oval yang lebar atau bulat telur terbalik, warna biru tua, biru muda, violet atau putih, di tengah dengan noda kuning pucat dilingkupi tepi warna putih, Panjang 4-5 cm; lunas bergandengan dengan sayap yang lebih pendek.
- Buah : Buah polong bertangkai sangat pendek dengan sisa kelopak, bentuk garis, membengkok lemah, pipih sekali, berparuh, dengan sekat antara, Panjang 5-12,5 cm, berkatup 2,
- Biji : Biji 6-10, pipih sekali, bentuk ginjal.

Kepala UPT-LAB
Universitas Setia Budi



Asik Gunawan, Amdk.

Surakarta, 25 November 2021

Penanggung jawab
Determinasi Tumbuhan



Dra. Dewi Sulistyawati. M.Sc.

Lampiran 2 Surat bakteri *Propionibacterium acnes*

PRO - Technology

Laboratorium Uji Mikrobiologi
Jalan Cempaka Putih No.69 - Jakarta Pusat
Indonesia

SERTIFIKAT HASIL UJI

1. Bakteri : Stock Strain *Propionibacterium acnes* ATCC 11827
2. Nomor Uji Bakteri : V. 1. 7
3. Tanggal Uji bakteri : 9 - 14 November 2020

Uraian Hasil Uji

Strain V. 1. 7. Biakan Murni dari *Propionibacterium acnes* ATCC 11827

- I. Ciri-ciri koloni :
 1. Pewarnaan Gram : Bentuk sel batang anaerobik, kecil-kecil, menyebar, berwarna merah violet, Gram positif.
 2. Di tanam pada media Blood Agar Plate (BAP) : koloni berwarna putih, permukaan koloni cembung
- II. Uji Fermentasi Karbohidrat dan Biokimia Penegasan










Uji Fisiologi bakteri	Hasil Uji
1. MOTILITAS	+
2. KATALASE	+
3. KOAGULASE	+
4. GLUKOSA	ASAM : + GAS : 0
5. LAKTOSA	ASAM : + GAS : 0
6. MALTOSA	ASAM : + GAS : 0
7. SUKROSA	ASAM : + GAS : 0
8. DEKTROSA	ASAM : + GAS : +

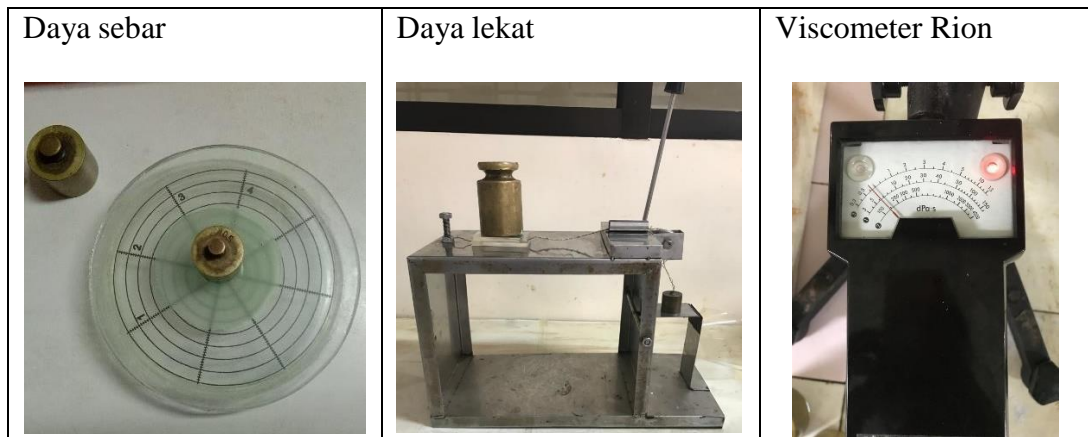
Catatan:

1. Hasil Uji ini hanya berlaku untuk contoh yang diuji.
2. Alat Uji BD BACTEC 9050.



Lampiran 3 Gambar alat dan bahan penelitian

<p>Bunga telang</p> 	<p>Ekstrak bunga telang</p> 	<p>Evaporator</p> 
<p>Timbangan digital</p> 	<p>Botol maserasi</p> 	<p>Desikator</p> 
<p>Moisture balance</p> 	<p>Oven</p> 	<p>pH meter</p> 



Lampiran 4 Perhitungan rendemen, kadar air dan susut pengeringan

Perhitungan rendemen bunga telang kering

Berat Basah (g)	Berat Kering (g)	Rendemen (%)
3.300	1.650	50%

Rendemen serbuk terhadap berat kering = berat kering/ berat basah X 100%
= 1.650/ 3.300 X 100%
= 50%

Perhitungan rendemen serbuk bunga telang

Berat Kering (g)	Berat Serbuk (g)	Rendemen (%)
1.650	763	46,24%

Rendemen serbuk terhadap berat serbuk = berat kering/ berat serbuk X 100%
= 763/ 1.650 X 100%
= 46,24%

Perhitungan rendemen ekstrak bunga telang

Serbuk (g)	Ekstrak kental (g)	Rendemen (%)
600	178	29,66%

Rendemen serbuk terhadap berat ekstrak = berat kering/ berat serbuk X 100%
= 178/ 600 X 100%
= 29,66%

Perhitungan kadar air ekstrak

No	Berat awal ekstrak (g)	Berat akhir ekstrak (g)	Kadar air (%)
1.	10,065	9,788	2,75
2.	10,063	9,796	2,65
3.	10,062	9,771	2,89
	Rata-rata	9,785	2,66

Bobot sampel – (bobot awal – bobot akhir)/ bobot sampel x 100%

$$10,065 - (49,362 - 39,544) / 10,065 \times 100\% = 2,45\%$$

Bobot sampel – (bobot awal – bobot akhir)/ bobot sampel x 100%

$$10,063 - (49,204 - 39,574) / 10,063 \times 100\% = 2,65\%$$

Bobot sampel – (bobot awal – bobot akhir)/ bobot sampel x 100%

$$10,062 - (50,523 - 40,752) / 10,062 \times 100\% = 2,89\%$$

Susut pengeringan serbuk menggunakan *moisture balance*

Descriptive Statistics

	N	Mean	Std. Deviation
Kadarlembab	3	9.5000	.50000
Valid N (listwise)	3		

Uji kadar air serbuk

Descriptive Statistics





	N	Mean	Std. Deviation
kadarairserbuk	3	8.3333	.28868
Valid N (listwise)	3		

$$\text{Uji kadar air} = \text{volume} / \text{penimbangan} \times 100\% = 1,7/20 \times 100\% = 8,5\%$$

$$\text{Uji kadar air} = \text{volume} / \text{penimbangan} \times 100\% = 1,6/20 \times 100\% = 8\%$$

$$\text{Uji kadar air} = \text{volume} / \text{penimbangan} \times 100\% = 1,7/20 \times 100\% = 8,5\%$$






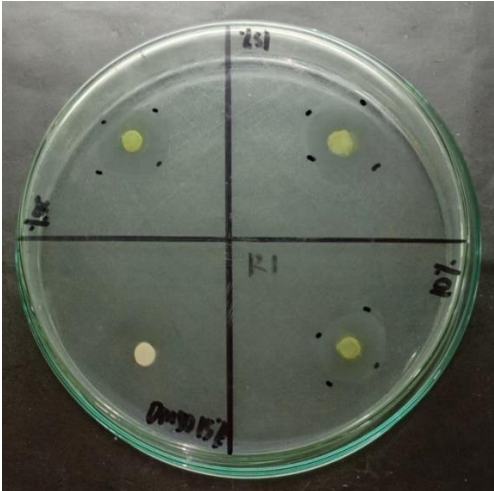
Lampiran 5 Gambar uji kandungan senyawa dan KLT

<p>Uji alkaloida</p> 	<p>Uji flavanoid</p> 
<p>Uji fenol</p> 	<p>Uji antosianin</p> 

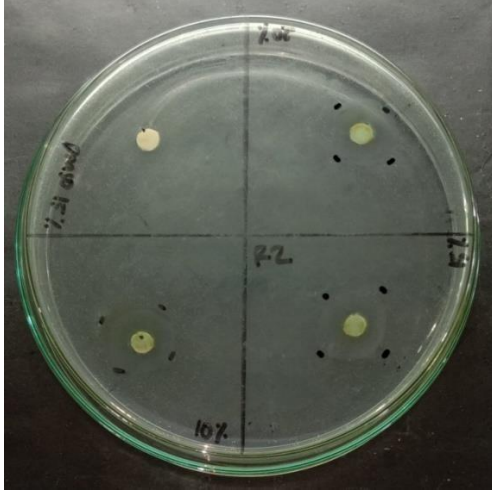
Kromatografi Lapis Tipis (KLT) senyawa antosianin

1. $R_f = \text{jarak yang ditempuh komponen} / \text{jarak yang ditempuh pelarut}$
 $= 3,9 / 4 = 0,9$
2. $R_f = \text{jarak yang ditempuh komponen} / \text{jarak yang ditempuh pelarut}$
 $= 3,5 / 4 = 0,8$
3. $R_f = \text{jarak yang ditempuh komponen} / \text{jarak yang ditempuh pelarut}$
 $= 2,9 / 4 = 0,7$
4. $R_f = \text{jarak yang ditempuh komponen} / \text{jarak yang ditempuh pelarut}$
 $= 2,5 / 4 = 0,6$
5. $R_f = \text{jarak yang ditempuh komponen} / \text{jarak yang ditempuh pelarut}$
 $= 2,2 / 4 = 0,5$
6. $R_f = \text{jarak yang ditempuh komponen} / \text{jarak yang ditempuh pelarut}$
 $= 1,9 / 4 = 0,4$

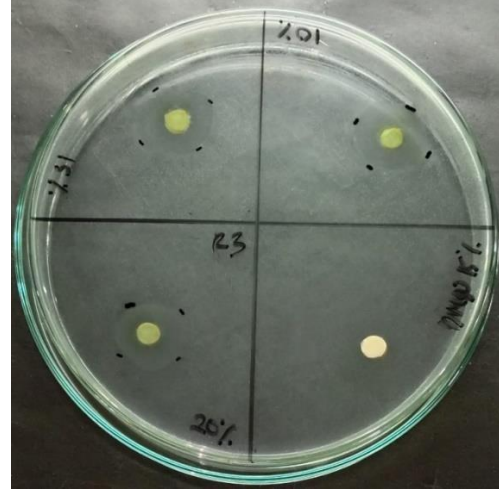
Lampiran 6 Gambar uji identifikasi, aktivitas bakteri *Propionibacterium acnes* dan hasil output SPSS uji aktivitas ekstrak etanol bunga telang

<p>Pewarnaan bakteri</p> 	<p>Uji katalase</p> 
<p>Uji indol</p> 	<p>Inokulasi bakteri</p> 
<p>Pembuatan suspensi bakteri</p> 	<p>Uji aktivitas antibakteri ekstrak etanol bunga telang (R1)</p> 

Uji aktivitas antibakteri ekstrak etanol bunga telang (R2)



Uji aktivitas antibakteri ekstrak etanol bunga telang (R3)



Hasil perhitungan pembuatan larutan uji ekstrak etanol bunga telang

- Pengenceran larutan DMSO pekat 100%

$$\begin{aligned} 100\% \times V &= 15\% \times 20\text{ml} \\ &= (15\% \times 20\text{ml}) / 100\% \\ &= 3\text{ml} \end{aligned}$$

Larutan DMSO 15% = 3ml ad 20ml

- Pembuatan larutan ekstrak konsentrasi 10%

$$\begin{aligned} 10\% &= 10\text{gram} / 100\text{ml} \\ &= 1\text{gram} / 10\text{ml} \\ &= 0,1\text{gram} / 1\text{ml} \rightarrow 0,5\text{gram} / 5\text{ml} \end{aligned}$$

$$\begin{aligned} 15\% &= 15\text{gram} / 100\text{ml} \\ &= 1,5\text{gram} / 10\text{ml} \\ &= 0,15\text{gram} / 1\text{ml} \rightarrow 0,75\text{gram} / 5\text{ml} \end{aligned}$$

$$\begin{aligned} 20\% &= 20\text{gram} / 100\text{ml} \\ &= 2\text{gram} / 10\text{ml} \\ &= 0,2\text{gram} / 1\text{ml} \rightarrow 1\text{gram} / 5\text{ml} \end{aligned}$$

Hasil output SPSS uji aktivitas antibakteri ekstrak etanol bunga telang

Tests of Normality

	replikasi	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
zonahambat	ekstrak10%	.292	3	.	.923	3	.463
	ekstrak15%	.219	3	.	.987	3	.780
	ekatrak20%	.335	3	.	.858	3	.262

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
zonahambat	Based on Mean	.092	2	6	.913
	Based on Median	.079	2	6	.925
	Based on Median and with adjusted df	.079	2	5.987	.925
	Based on trimmed mean	.092	2	6	.914

ANOVA

zonahambat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.100	2	3.050	10.255	.012
Within Groups	1.785	6	.297		
Total	7.885	8			

zonahambat

Tukey HSD^a

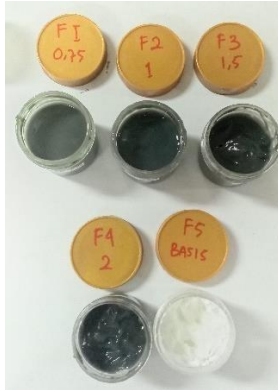
replikasi	N	Subset for alpha = 0.05	
		1	2
ekstrak10%	3	25.0833	
ekstrak15%	3		26.6667
ekatrak20%	3		26.9567
Sig.		1.000	.799

Means for groups in homogeneous subsets are displayed.

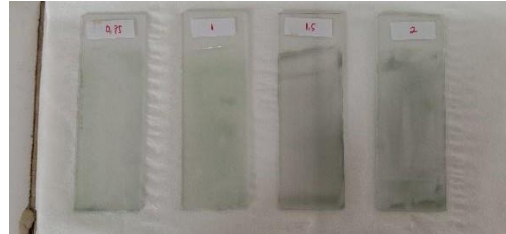
a. Uses Harmonic Mean Sample Size = 3.000.

Lampiran 7 Gambar uji mutu fisik emulgel ekstrak etanol bunga telang

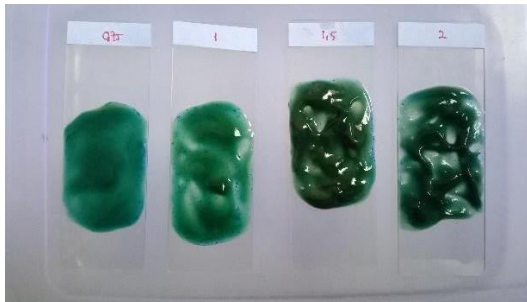
Uji organoleptic



Uji homogenitas



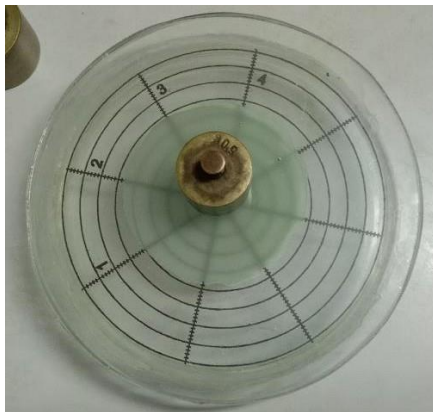
Uji tipe emulsi (pengenceran)



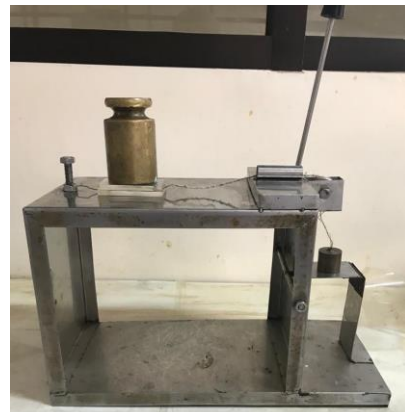
Uji tipe emulsi (pewarnaan)



Uji daya sebar



Uji daya lekat



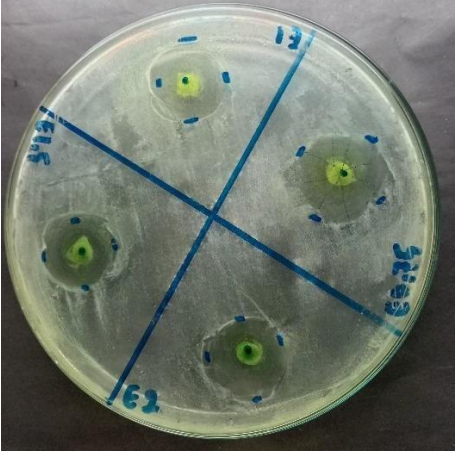
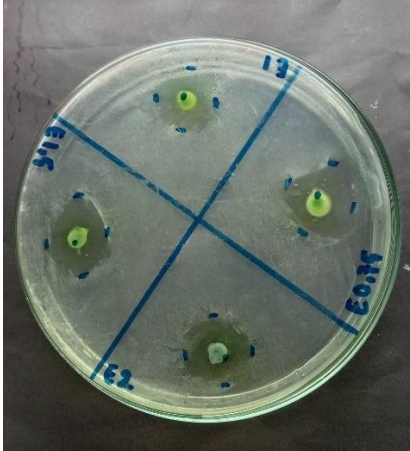
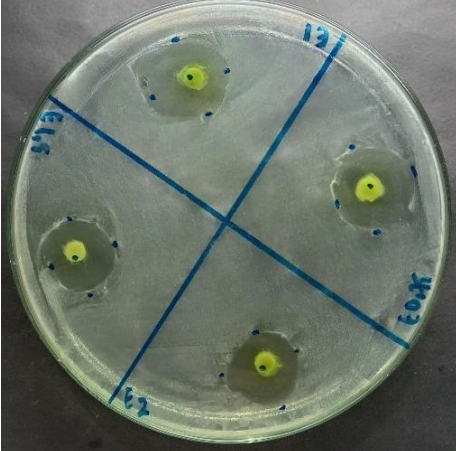

Uji pH



Uji viskositas



Lampiran 8 Gambar dan hasil output SPSS uji identifikasi sediaan emulgel ekstrak etanol bunga telang

<p>Uji identifikasi bakteri F1 hingga F4 (R1)</p> 	<p>Uji identifikasi bakteri F1 hingga F4 (R2)</p> 
<p>Uji identifikasi bakteri F1 hingga F4 (R3)</p> 	<p>Uji Uji identifikasi bakteri F5, DMSO 15%, ekstrak 10% dan clindamycin gel (R1)</p> 

Uji Uji identifikasi bakteri F5, DMSO 15%, ekstrak 10% dan clindamycin gel (R2)



Uji Uji identifikasi bakteri F5, DMSO 15%, ekstrak 10% dan clindamycin gel (R3)



Hasil output uji identifikasi sediaan emulgel ekstrak etanol bunga telang

Tests of Normality

	replikasi	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
zonahambat	F1	.175	3	.	1.000	3	1.000
	F2	.253	3	.	.964	3	.637
	F3	.204	3	.	.993	3	.843
	F4	.175	3	.	1.000	3	1.000
	ekstrak	.175	3	.	1.000	3	1.000
	klindamisin	.175	3	.	1.000	3	1.000

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
zonahambat	Based on Mean	.812	5	12	.563
	Based on Median	.489	5	12	.778
	Based on Median and with adjusted df	.489	5	7.978	.776
	Based on trimmed mean	.791	5	12	.576

ANOVA

zonahambat

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	63.198	5	12.640	35.002	.000
Within Groups	4.333	12	.361		
Total	67.531	17			

zonahambat

Tukey HSD^a

replikasi	N	Subset for alpha = 0.05			
		1	2	3	4
F4	3	22.7500			
F3	3	23.9167	23.9167		
F2	3		24.8333	24.8333	
F1	3		25.0000	25.0000	
ekstrak	3			26.0000	
klindamisin	3				28.7500
Sig.		.238	.302	.238	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Lampiran 9 Hasil output analisis statistik pada uji mutu fisik

A. Uji pH

Formula	pH			Rata-rata	SD
	R1	R2	R3		
1	6,59	6,53	6,55	6,55	0,03
2	6,45	6,47	6,48	6,46	0,01
3	6,34	6,35	6,30	6,33	0,02
4	6,04	6,07	6,06	6,05	0,01
5	7,76	7,77	7,79	7,77	0,01

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Formula1	.253	3	.	.964	3	.637
Formula2	.253	3	.	.964	3	.637
Formula3	.314	3	.	.893	3	.363
Formula4	.253	3	.	.964	3	.637
Formula5	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
pHformula	Based on Mean	1.051	4	10	.429
	Based on Median	.294	4	10	.875
	Based on Median and with adjusted df	.294	4	6.800	.873
	Based on trimmed mean	.975	4	10	.463

ANOVA

pHformula

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.273	4	1.318	2824.964	.000
Within Groups	.005	10	.000		
Total	5.278	14			

pHformula

Tukey HSD^a

formula	N	Subset for alpha = 0.05				
		1	2	3	4	5
formula4	3	6.0567				
formula3	3		6.3300			
formula2	3			6.4667		
formula1	3				6.5567	
formula5	3					7.7733
Sig.		1.000	1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

B. Uji viskositas

Formula	viskositas			Rata-rata	SD
	R1	R2	R3		
1	120	130	120	123,33	5,77
2	280	270	275	275,00	5,00
3	350	350	340	246,66	5,77
4	400	440	450	430,00	26,45
5	415	410	400	408,33	7,63

Tests of Normality

	formulavis	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
viskositas	formula1	.385	3	.	.750	3	.000
	formula2	.175	3	.	1.000	3	1.000
	formula3	.385	3	.	.750	3	.000
	formula4	.314	3	.	.893	3	.363
	formula5	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
viskositas	Based on Mean	5.754	4	10	.011
	Based on Median	.953	4	10	.473
	Based on Median and with adjusted df	.953	4	2.983	.538
	Based on trimmed mean	5.095	4	10	.017

Ranks

	formulavis	N	Mean Rank
viskositas	formula1	3	2.00
	formula2	3	5.00
	formula3	3	8.00
	formula4	3	13.17
	formula5	3	11.83
	Total	15	

Test Statistics^{a,b}

viskositas	
Kruskal-Wallis H	13.028
df	4
Asymp. Sig.	.011

a. Kruskal Wallis Test

b. Grouping Variable: formulavis

C. Uji daya sebar

Formula	Berat beban	Daya lekat			Rata-rata	SD
		R1	R2	R3		
1	tanpa beban	4,70	4,72	4,65	4,69	0,03
	50	5,95	5,92	5,80	5,89	0,07
	100	6,75	6,77	6,78	6,76	0,01
2	tanpa beban	4,20	4,22	4,17	4,19	0,02
	50	5,47	5,50	5,52	5,49	0,02
	100	6,27	6,25	6,32	6,28	0,03
3	tanpa beban	3,52	3,47	3,50	3,49	0,02
	50	4,10	4,12	4,17	4,13	0,03
	100	4,50	4,40	4,45	4,45	0,05
4	tanpa beban	3,37	3,40	3,35	3,37	0,02
	50	3,72	3,67	3,70	3,69	0,02
	100	4,05	4,10	4,12	4,09	0,03
5	tanpa beban	3,05	3,12	3,10	3,09	0,03
	50	3,35	3,37	3,40	3,37	0,02
	100	3,65	3,57	3,55	3,59	0,05

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
tanpabeban	.276	3	.	.942	3	.537
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.276	3	.	.942	3	.537
beban50	.314	3	.	.893	3	.363
beban50	.219	3	.	.987	3	.780
beban50	.276	3	.	.942	3	.537
beban50	.219	3	.	.987	3	.780
beban50	.219	3	.	.987	3	.780
beban100	.253	3	.	.964	3	.637
beban100	.276	3	.	.942	3	.537
beban100	.175	3	.	1.000	3	1.000
beban100	.276	3	.	.942	3	.537
beban100	.314	3	.	.893	3	.363

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
beban0	Based on Mean	.376	4	10	.820
	Based on Median	.102	4	10	.979
	Based on Median and with adjusted df	.102	4	8.012	.979
	Based on trimmed mean	.351	4	10	.838
beban50	Based on Mean	3.070	4	10	.068
	Based on Median	.537	4	10	.712
	Based on Median and with adjusted df	.537	4	4.146	.719
	Based on trimmed mean	2.743	4	10	.089
beban100	Based on Mean	.987	4	10	.457
	Based on Median	.352	4	10	.837
	Based on Median and with adjusted df	.352	4	6.859	.835
	Based on trimmed mean	.932	4	10	.484

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
beban0	Between Groups	5.169	4	1.292	1435.748	.000
	Within Groups	.009	10	.001		
	Total	5.178	14			
beban50	Between Groups	14.894	4	3.723	1919.326	.000
	Within Groups	.019	10	.002		
	Total	14.913	14			
beban100	Between Groups	23.616	4	5.904	3629.494	.000
	Within Groups	.016	10	.002		
	Total	23.632	14			

beban0

Tukey HSD^a

formulads	N	Subset for alpha = 0.05				
		1	2	3	4	5
formula5	3	3.0900				
formula4	3		3.3733			
formula3	3			3.4967		
formula2	3				4.1967	
formula1	3					4.6900
Sig.		1.000	1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

beban50

Tukey HSD^a

formulads	N	Subset for alpha = 0.05				
		1	2	3	4	5
formula5	3	3.3733				
formula4	3		3.7033			
formula3	3			4.1300		
formula2	3				5.4967	
formula1	3					5.8900
Sig.		1.000	1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

beban100

Tukey HSD^a

formulads	N	Subset for alpha = 0.05				
		1	2	3	4	5
formula5	3	3.5900				
formula4	3		4.0900			
formula3	3			4.4500		
formula2	3				6.2800	
formula1	3					6.7667
Sig.		1.000	1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

D. Uji daya lekat

Formula	Daya lekat			Rata-rata	SD
	R1	R2	R3		
1	1,28	1,64	1,48	1,46	0,18
2	1,52	1,64	1,48	1,54	0,08
3	1,38	1,37	1,32	1,35	0,03
4	2,09	2,80	2,56	2,48	0,36
5	1,48	1,40	1,64	1,50	0,12

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
f1dayalekat	.196	3	.	.996	3	.878

f2dayalekat	.292	3	.	.923	3	.463
f3dayalekat	.328	3	.	.871	3	.298
f4dayalekat	.251	3	.	.966	3	.647
f5dayalekat	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
dayalekat	Based on Mean	3.059	4	10	.069
	Based on Median	1.361	4	10	.315
	Based on Median and with adjusted df	1.361	4	3.695	.394
	Based on trimmed mean	2.925	4	10	.077

ANOVA

dayalekat					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.529	4	.632	17.006	.000
Within Groups	.372	10	.037		
Total	2.900	14			

dayalekat

Tukey HSD^a

formula	N	Subset for alpha = 0.05	
		1	2
formula3	3	1.3567	
formula1	3	1.4667	
formula5	3	1.5067	
formula2	3	1.5467	
formula4	3		2.4833
Sig.		.748	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

Lampiran 10 Hasil output analisis statistik pada uji mutu fisik stabilitas cycling test

A. Uji pH

Formula	pH	sebelum	<i>Cycling test</i>	Rata-rata	SD
	R1	R2	R3		
1	6,59	6,53	6,55	6,55	0,03
2	6,45	6,47	6,48	6,46	0,01
3	6,34	6,35	6,30	6,33	0,02
4	6,04	6,07	6,06	6,05	0,01
5	7,76	7,77	7,79	7,77	0,01
Formula	pH	sesudah	<i>Cycling test</i>	Rata-rata	SD
	R1	R2	R3		
1	6,63	6,66	6,65	6,64	0,01
2	6,61	6,60	6,58	6,69	0,01
3	6,32	6,40	6,22	6,31	0,09
4	6,21	6,26	6,30	6,25	0,04
5	7,90	7,93	7,95	7,92	0,02

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
f1sebelumcycling	.253	3	.	.964	3	.637
f2sebelumcycling	.253	3	.	.964	3	.637
f3sebelumcycling	.314	3	.	.893	3	.363
f4sebelumcycling	.253	3	.	.964	3	.637
f5sebelumcycling	.253	3	.	.964	3	.637
f1sesudahcycling	.253	3	.	.964	3	.637
f2sesudahcycling	.253	3	.	.964	3	.637
f3sesudahcycling	.196	3	.	.996	3	.878
f4sesudahcycling	.196	3	.	.996	3	.878
f5sesudahcycling	.219	3	.	.987	3	.780

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene	df1	df2	Sig.
		Statistic			
pHsebelum	Based on Mean	1.051	4	10	.429
	Based on Median	.294	4	10	.875

	Based on Median and with adjusted df	.294	4	6.800	.873
	Based on trimmed mean	.975	4	10	.463
pHsesudah	Based on Mean	2.190	4	10	.144
	Based on Median	1.686	4	10	.229
	Based on Median and with adjusted df	1.686	4	3.682	.322
	Based on trimmed mean	2.160	4	10	.147

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
pHsebelum	Between Groups	5.273	4	1.318	2824.964	.000
	Within Groups	.005	10	.000		
	Total	5.278	14			
pHsesudah	Between Groups	5.558	4	1.390	616.676	.000
	Within Groups	.023	10	.002		
	Total	5.581	14			

Paired Samples Test

		Paired Differences				t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower Upper			
Pair 1	f1sebelumcycli ng - f1sesudahcycli ng	-.0900	.04583	.02646	-.20384 .02384	-3.40	2	.077
Pair 2	f2sebelumcycli ng - f2sesudahcycli ng	-.1300	.03000	.01732	-.20452 -.05548	-7.50	2	.017

Pair 3	f3sebelumcycli ng - f3sesudahcycli ng	.0166 7	.06506	.03756	-.14496	.17829	.444	2	.701
Pair 4	f4sebelumcycli ng - f4sesudahcycli ng	- .2000 0	.03606	.02082	-.28957	-.11043	- 9.60 8	2	.011
Pair 5	f5sebelumcycli ng - f5sesudahcycli ng	- .1533 3	.01155	.00667	-.18202	-.12465	- 23.0 00	2	.002

B. Uji viskositas

Formula	viskositas	sebelum	<i>Cycling test</i>	Rata-rata	SD
	R1	R2	R3		
1	120	130	120	123,33	5,77
2	280	270	275	275,00	5,00
3	350	350	340	246,66	5,77
4	400	440	450	430,00	26,45
5	415	410	400	408,33	7,63
Formula	viskositas	sesudah	<i>Cycling test</i>	Rata-rata	SD
	R1	R2	R3		
1	40	60	50	50,00	10,00
2	180	170	180	176,66	5,77
3	260	220	230	243,33	20,81
4	370	380	385	378,33	7,63
5	390	380	360	376,66	15,27

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sebelumf1vis	.385	3	.	.750	3	.000
sebelumf2vis	.175	3	.	1.000	3	1.000
sebelumf3vis	.385	3	.	.750	3	.000
sebelumf4vis	.314	3	.	.893	3	.363
sebelumf5vis	.253	3	.	.964	3	.637
sesudahf1vis	.175	3	.	1.000	3	1.000
sesudahf2vis	.385	3	.	.750	3	.000
sesudahf3vis	.292	3	.	.923	3	.463
sesudahf4vis	.253	3	.	.964	3	.637
sesudahf5vis	.253	3	.	.964	3	.637

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
forsebelum	Based on Mean	5.754	4	10	.011
	Based on Median	.953	4	10	.473
	Based on Median and with adjusted df	.953	4	2.983	.538
	Based on trimmed mean	5.095	4	10	.017
forsesudah	Based on Mean	1.901	4	10	.187
	Based on Median	.569	4	10	.691
	Based on Median and with adjusted df	.569	4	5.368	.697
	Based on trimmed mean	1.772	4	10	.211

Ranks

	formulavis	N	Mean Rank
forsebelum	formula1	3	2.00
	formula2	3	5.00
	formula3	3	8.00
	formula4	3	13.17
	formula5	3	11.83
	Total	15	
forsesudah	formula1	3	2.00
	formula2	3	5.00
	formula3	3	8.00
	formula4	3	12.50
	formula5	3	12.50
	Total	15	

Test Statistics^{a,b}

	forsebelum	forsesudah
Kruskal-Wallis H	13.028	12.871
df	4	4
Asymp. Sig.	.011	.012

a. Kruskal Wallis Test

b. Grouping Variable: formulavis

Ranks

		N	Mean Rank	Sum of Ranks
sesudahf1vis - sebelumf1vis	Negative Ranks	3 ^a	2.00	6.00
	Positive Ranks	0 ^b	.00	.00
	Ties	0 ^c		
	Total	3		
sesudahf2vis - sebelumf2vis	Negative Ranks	3 ^d	2.00	6.00
	Positive Ranks	0 ^e	.00	.00
	Ties	0 ^f		
	Total	3		
sesudahf3vis - sebelumf3vis	Negative Ranks	3 ^g	2.00	6.00
	Positive Ranks	0 ^h	.00	.00
	Ties	0 ⁱ		
	Total	3		
sesudahf4vis - sebelumf4vis	Negative Ranks	3 ^j	2.00	6.00
	Positive Ranks	0 ^k	.00	.00
	Ties	0 ^l		
	Total	3		
sesudahf5vis - sebelumf5vis	Negative Ranks	3 ^m	2.00	6.00
	Positive Ranks	0 ⁿ	.00	.00
	Ties	0 ^o		
	Total	3		

a. sesudahf1vis < sebelumf1vis

b. sesudahf1vis > sebelumf1vis

c. sesudahf1vis = sebelumf1vis

d. sesudahf2vis < sebelumf2vis

e. sesudahf2vis > sebelumf2vis

f. sesudahf2vis = sebelumf2vis

g. sesudahf3vis < sebelumf3vis

h. sesudahf3vis > sebelumf3vis

i. sesudahf3vis = sebelumf3vis

j. sesudahf4vis < sebelumf4vis

k. sesudahf4vis > sebelumf4vis

l. sesudahf4vis = sebelumf4vis

m. sesudahf5vis < sebelumf5vis

n. sesudahf5vis > sebelumf5vis

o. sesudahf5vis = sebelumf5vis

Test Statistics^a

	sesudahf1vis	sesudahf2vis	sesudahf3vis	sesudahf4vis	sesudahf5vis
	-	-	-	-	-
	sebelumf1vis	sebelumf2vis	sebelumf3vis	sebelumf4vis	sebelumf5vis
Z	-1.633 ^b	-1.633 ^b	-1.633 ^b	-1.604 ^b	-1.604 ^b
Asymp. Sig. (2-tailed)	.102	.102	.102	.109	.109

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

C. Uji daya lekat

Formula	Daya lekat	sebelum	<i>Cycling test</i>	Rata-rata	SD
	R1	R2	R3		
1	1,28	1,64	1,48	1,46	0,18
2	1,52	1,64	1,48	1,54	0,08
3	1,38	1,37	1,32	1,35	0,03
4	2,09	2,80	2,56	2,48	0,36
5	1,48	1,40	1,64	1,50	0,12
Formula	Daya lekat	sesudah	<i>Cycling test</i>	Rata-rata	SD
	R1	R2	R3		
1	1,21	1,57	1,42	1,40	0,18
2	1,35	1,42	1,40	1,42	0,02
3	1,35	1,30	1,29	1,31	0,03
4	2,05	2,78	2,48	2,43	0,36
5	1,40	1,35	1,62	1,45	0,14

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
sebelumf1dayalekat	.196	3	.	.996	3	.878
sebelumf2dayalekat	.292	3	.	.923	3	.463
sebelumf3dayalekat	.328	3	.	.871	3	.298
sebelumf4dayalekat	.251	3	.	.966	3	.647
sebelumf5dayalekat	.253	3	.	.964	3	.637
sesudahf1dayalekat	.211	3	.	.991	3	.817
sesudahf2dayalekat	.219	3	.	.987	3	.780
sesudahf3dayalekat	.328	3	.	.871	3	.298
sesudahf4dayalekat	.214	3	.	.990	3	.804
sesudahf5dayalekat	.320	3	.	.883	3	.334

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
sebelumcycling	Based on Mean	3.059	4	10	.069
	Based on Median	1.361	4	10	.315
	Based on Median and with adjusted df	1.361	4	3.695	.394
	Based on trimmed mean	2.925	4	10	.077
sesudahcycling	Based on Mean	3.041	4	10	.070
	Based on Median	1.728	4	10	.220
	Based on Median and with adjusted df	1.728	4	4.150	.300
	Based on trimmed mean	2.952	4	10	.075

ANOVA

		Sum of		Mean		
		Squares	df	Square	F	Sig.
sebelumcycling	Between Groups	2.529	4	.632	17.006	.000
	Within Groups	.372	10	.037		
	Total	2.900	14			
sesudahcycling	Between Groups	2.621	4	.655	17.279	.000
	Within Groups	.379	10	.038		
	Total	3.001	14			

Paired Samples Test

		Paired Differences					
Mea n	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2- tailed)
			Lower	Upper			

Pai r 1	sebelumf1daya lekat - sesudahf1daya lekat	.066 67	.00577	.00333	.05232	.08101	20.0 00	2	.002
Pai r 2	sebelumf2daya lekat - sesudahf2daya lekat	.123 33	.08386	.04842	-.08500	.33167	2.54 7	2	.126
Pai r 3	sebelumf3daya lekat - sesudahf3daya lekat	.043 33	.02309	.01333	-.01404	.10070	3.25 0	2	.083
Pai r 4	sebelumf4daya lekat - sesudahf4daya lekat	.046 67	.03055	.01764	-.02922	.12256	2.64 6	2	.118
Pai r 5	sebelumf5daya lekat - sesudahf5daya lekat	.050 00	.03000	.01732	-.02452	.12452	2.88 7	2	.102

D. Uji daya sebar

Formula	Berat beban	Daya lekat	sebelum	<i>Cycling test</i>	Rata-rata	SD
		R1	R2	R3		
1	tanpa beban	4,70	4,72	4,65	4,69	0,03
	50	5,95	5,92	5,80	5,89	0,07
	100	6,75	6,77	6,78	6,76	0,01
2	tanpa beban	4,20	4,22	4,17	4,19	0,02
	50	5,47	5,50	5,52	5,49	0,02
	100	6,27	6,25	6,32	6,28	0,03
3	tanpa beban	3,52	3,47	3,50	3,49	0,02
	50	4,10	4,12	4,17	4,13	0,03
	100	4,50	4,40	4,45	4,45	0,05
4	tanpa beban	3,37	3,40	3,35	3,37	0,02
	50	3,72	3,67	3,70	3,69	0,02
	100	4,05	4,10	4,12	4,09	0,03
5	tanpa beban	3,05	3,12	3,10	3,09	0,03
	50	3,35	3,37	3,40	3,37	0,02
	100	3,65	3,57	3,55	3,59	0,05
Formula	Berat beban	Daya lekat	sesudah	<i>Cycling test</i>	Rata-rata	SD

		R1	R2	R3		
1	tanpa beban	4,72	4,75	4,69	4,72	0,03
	50	5,97	5,95	5,89	5,93	0,04
	100	6,85	6,82	6,84	6,83	0,01
2	tanpa beban	4,30	4,40	4,20	4,30	0,10
	50	5,51	5,97	5,61	5,69	0,24
	100	6,72	6,82	6,68	6,74	0,07
3	tanpa beban	3,60	3,55	3,57	3,57	0,02
	50	4,14	4,18	4,23	4,18	0,04
	100	4,54	4,42	4,65	4,53	0,11
4	tanpa beban	3,45	3,58	3,40	3,47	0,09
	50	3,85	3,80	3,97	3,87	0,08
	100	4,25	4,22	4,27	4,24	0,02
5	tanpa beban	3,12	3,20	3,17	3,16	0,04
	50	3,45	3,44	3,52	3,47	0,04
	100	3,71	3,85	3,75	3,77	0,07

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
tanpabeban	.276	3	.	.942	3	.537
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.276	3	.	.942	3	.537
beban50	.314	3	.	.893	3	.363
beban50	.219	3	.	.987	3	.780
beban50	.276	3	.	.942	3	.537
beban50	.219	3	.	.987	3	.780
beban50	.219	3	.	.987	3	.780
beban100	.253	3	.	.964	3	.637
beban100	.276	3	.	.942	3	.537
beban100	.175	3	.	1.000	3	1.000
beban100	.276	3	.	.942	3	.537
beban100	.314	3	.	.893	3	.363
tanpabeban	.175	3	.	1.000	3	1.000
tanpabeban	.175	3	.	1.000	3	1.000
tanpabeban	.219	3	.	.987	3	.780
tanpabeban	.280	3	.	.938	3	.520
tanpabeban	.232	3	.	.980	3	.726

beban50	.292	3	.	.923	3	.463
beban50	.307	3	.	.904	3	.398
beban50	.196	3	.	.996	3	.878
beban50	.272	3	.	.947	3	.554
beban50	.343	3	.	.842	3	.220
beban100	.253	3	.	.964	3	.637
beban100	.276	3	.	.942	3	.537
beban100	.178	3	.	.999	3	.952
beban100	.219	3	.	.987	3	.780
beban100	.276	3	.	.942	3	.537

a. Lilliefors Significance Correction

Test of Homogeneity of Variances

		Levene			
		Statistic	df1	df2	Sig.
sebelumformulads0	Based on Mean	.376	4	10	.820
	Based on Median	.102	4	10	.979
	Based on Median and with adjusted df	.102	4	8.012	.979
	Based on trimmed mean	.351	4	10	.838
sesudahformulads0	Based on Mean	1.689	4	10	.228
	Based on Median	.943	4	10	.478
	Based on Median and with adjusted df	.943	4	5.138	.507
	Based on trimmed mean	1.640	4	10	.239
sebelumformulads50	Based on Mean	3.070	4	10	.068
	Based on Median	.537	4	10	.712
	Based on Median and with adjusted df	.537	4	4.146	.719
	Based on trimmed mean	2.743	4	10	.089
sesudahformulads50	Based on Mean	5.673	4	10	.012
	Based on Median	1.076	4	10	.418
	Based on Median and with adjusted df	1.076	4	2.812	.501

	Based on trimmed mean	5.087	4	10	.017
sebelumformulads10 0	Based on Mean	.987	4	10	.457
	Based on Median	.352	4	10	.837
	Based on Median and with adjusted df	.352	4	6.859	.835
	Based on trimmed mean	.932	4	10	.484
sesudahformulads10 0	Based on Mean	1.850	4	10	.196
	Based on Median	1.097	4	10	.410
	Based on Median and with adjusted df	1.097	4	5.940	.438
	Based on trimmed mean	1.801	4	10	.205

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
sebelumformulads0	Between Groups	5.169	4	1.292	1435.748	.000
	Within Groups	.009	10	.001		
	Total	5.178	14			
sesudahformulads0	Between Groups	4.940	4	1.235	283.276	.000
	Within Groups	.044	10	.004		
	Total	4.984	14			
sebelumformulads50	Between Groups	14.894	4	3.723	1919.326	.000
	Within Groups	.019	10	.002		
	Total	14.913	14			
sesudahformulads50	Between Groups	14.888	4	3.722	259.078	.000
	Within Groups	.144	10	.014		
	Total	15.032	14			
sebelumformulads100	Between Groups	23.616	4	5.904	3629.494	.000
	Within Groups	.016	10	.002		
	Total	23.632	14			
sesudahformulads100	Between Groups	25.322	4	6.330	1291.937	.000
	Within Groups	.049	10	.005		
	Total	25.371	14			

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	tanpabeban - tanpabeban	-.03000	.01000	.00577	-.05484	-.00516	-5.196	2	.035
Pair 2	tanpabeban - tanpabeban	-.10333	.07506	.04333	-.28978	.08311	-2.385	2	.140
Pair 3	tanpabeban - tanpabeban	-.07667	.00577	.00333	-.09101	-.06232	-23.000	2	.002
Pair 4	tanpabeban - tanpabeban	-.10333	.06807	.03930	-.27243	.06576	-2.629	2	.119
Pair 5	tanpabeban - tanpabeban	-.07333	.00577	.00333	-.08768	-.05899	-22.000	2	.002
Pair 6	beban50 - beban50	-.04667	.03786	.02186	-.14071	.04738	-2.135	2	.166
Pair 7	beban50 - beban50	-.20000	.23516	.13577	-.78417	.38417	-1.473	2	.279
Pair 8	beban50 - beban50	-.05333	.01155	.00667	-.08202	-.02465	-8.000	2	.015
Pair 9	beban50 - beban50	-.17667	.08083	.04667	-.37746	.02412	-3.786	2	.063
Pair 10	beban50 - beban50	-.09667	.02517	.01453	-.15918	-.03415	-6.653	2	.022
Pair 11	beban100 - beban100	-.07000	.02646	.01528	-.13572	-.00428	-4.583	2	.044
Pair 12	beban100 - beban100	-.46000	.10536	.06083	-.72172	-.19828	-7.562	2	.017
Pair 13	beban100 - beban100	-.08667	.09866	.05696	-.33175	.15841	-1.522	2	.268
Pair 14	beban100 - beban100	-.15667	.04041	.02333	-.25706	-.05627	-6.714	2	.021
Pair 15	beban100 - beban100	-.18000	.11136	.06429	-.45662	.09662	-2.800	2	.107