

## BAB V

### KESIMPULAN DAN SARAN

#### A. KESIMPULAN

1. Konsentrasi Carbopol berpengaruh terhadap sifat fisik *patch* terutama pada nilai *swelling index patch*, dengan adanya penambahan Carbopol diikuti dengan peningkatan nilai *swelling index patch*, dari data yang didapatkan nilai *swelling index* terbesar pada formula 3 pada menit ke 180 dengan variasi kadar Carbopol dan HPMC 7:3 yaitu sebesar 306,41%.
2. Konsentrasi Carbopol berpengaruh terhadap pelepasan obat, dengan Penambahan Carbopol diikuti dengan peningkatan jumlah pelepasan obat, pelepasan obat terbesar pada formula 3 dengan variasi kadar 7:3 dilihat dari nilai  $DE_{480}$  (%) yaitu 91,21%. Pelepasan obat pada sediaan *patch* bukal mukoadhesif Salbutamol Sulfat mengikuti kinetika pelepasan Orde Nol dilihat dari harga koefisien korelasi (  $r$  ) untuk *patch* 1 sebesar 0,815 , *patch* 2 sebesar 0,876, *patch* 3 sebesar 0,815, *patch* 4 sebesar 0,819 , *patch* 5 sebesar 0,826, *patch* 6 sebesar 0,807. Mekanisme pelepasan mengikuti mekanisme Difusi Fiks.

## **B. SARAN**

1. Perlu dilakukan uji *in vivo* sehingga dapat diketahui bioavaibilitas sediaan *patch* bukal mukoadhesif salbutamol sulfat dan dapat dibuat korelasi *in vivo* *in vitro*.
2. Perlu dilakukan penelitian lebih lanjut mengenai formula yang optimum dengan menggunakan polimer Carbopol dan HPMC K10M agar mendapatkan pelepasan obat yang lebih baik.

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**Lampiran 1. Data Hasil Uji Keseragaman Bobot**

	Patch 1 (mg)	Patch 2 (mg)	Patch 3 (mg)	Patch 4 (mg)	Patch 5 (mg)	Patch 6 (mg)
1	109,8	99,2	120,8	107,4	107,3	99,8
2	102,5	113,9	125,3	113,9	112,7	100,6
3	102,3	98,4	122,4	111,1	110,0	106,8
4	110,8	115,7	123,3	109,7	124,4	98,5
5	104,5	100,8	117,7	109,4	117,9	100,1
6	104,1	110,3	120,5	110,3	115,9	100,4
7	108,2	105,8	120,0	108,9	110,6	99,8
8	105,8	109,4	118,3	116,5	112,3	104,3
9	107,0	114,1	119,8	122,4	111,0	97,9
10	98,0	100,4	124,4	123,3	117,2	103,9
11	109,9	101,2	117,4	123,0	107,4	107,6
12	101,8	111,5	117,9	112,7	115,2	100,2
13	101,5	109,2	129,8	110,5	117,8	99,2
14	105,9	105,0	127,2	125,0	109,2	98,4
15	106,0	107,8	121,9	109,8	119,8	102,3
16	99,4	101,3	127,1	110,3	114,8	97,5
17	106,3	100,8	123,8	108,1	112,1	100,3
18	104,8	99,7	119,2	112,2	108,2	101,1
19	108,7	102,3	128,7	125,0	117,7	106,2
20	100,2	101,2	129,1	113,8	107,4	102,1
Mean (mg)	104,875	105,4	122,73	114,165	113,445	101,35
SD	3,65	5,62	4,05	6,07	4,75	2,97
CV	3,48%	5,33%	3,29%	5,32%	4,19%	2,93%

**Lampiran 2. Data Hasil Uji *Folding Endurance***

Macam Patch	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6
Replikasi 1	> 300	> 300	> 300	> 300	> 300	> 300
Replikasi 2	> 300	> 300	> 300	> 300	> 300	> 300
Replikasi 3	> 300	> 300	> 300	> 300	> 300	> 300

**Lampiran 3. Data Hasil Uji Surface pH**

Macam Patch	Patch 1	Patch 2	Patch 3	Patch 4	Patch 5	Patch 6
R1	6-7	6-7	6-7	6-7	6-7	6-7
R2	6-7	6-7	6-7	6-7	6-7	6-7
R3	6-7	6-7	6-7	6-7	6-7	6-7
Ideal	6,8	6,8	6,8	6,8	6,8	6,8



**Lampiran 4. Data Hasil Uji Swelling Index**

Waktu (menit)	Patch 1 (%)	Patch 2 (%)	Patch 3 (%)	Patch 4 (%)	Patch 5 (%)	Patch 6 (%)
60	233,26	224,51	263,27	246,36	226,88	221,18
120	251,35	240,23	292,76	267,74	245,93	246,65
180	264,73	248,43	306,41	282,47	259,23	265,54

**Lampiran 5. Data Kurva Baku**

Waktu (menit)	Absorbansi (y)	Slope (b)	Intersep (a)
32	0,213	0,0067875	-0,0022
40	0,272		
48	0,322		
56	0,381		
64	0,43		

Berdasarkan data diatas, dengan regresi linier diperoleh persamaan :

$$y = bx + a$$

$$y = 0,0067875x - 0,0022$$

$$y = 0,99952$$

**Lampiran 6. Data Hasil Uji Keseragaman Kadar**

	Patch 1 (mg)	Patch 2 (mg)	Patch 3 (mg)	Patch 4 (mg)	Patch 5 (mg)	Patch 6 (mg)
Replikasi 1	7,75	7,29	7,71	7,69	7,71	0
Replikasi 2	7,59	7,53	7,99	7,71	7,77	0
Replikasi 3	7,93	7,83	7,99	7,99	7,61	0
Rata-rata	7,75	7,69	7,89	7,79	7,69	0
SD	0,169	0,265	0,162	0,166	0,159	0
CV	2,18%	3,52%	2,05%	2,13%	2,07%	0%

### Lampiran 7. Contoh Cara Perhitungan

Jumlah salbutamol per patch = 8mg

Volume medium = 250ml

Volume pengambilan sampling = 5ml

Disolusi formula 1 replikasi 1

waktu (menit)	absorbansi	X (mg/250ml)	kadar koreksi	% kadar terdisolusi
5	0,050	1,922651934	1,922651934	24,78475563
10	0,059	2,254143646	2,292596685	29,55368448
15	0,072	2,732965009	2,778047882	35,81159787
30	0,089	3,359116022	3,413775322	44,00671056
45	0,117	4,390423573	4,457605893	57,46264877
60	0,141	5,274401473	5,362209945	69,12382882
120	0,159	5,937384899	6,042872928	77,89820208
180	0,175	6,526703499	6,645451197	85,66599139
240	0,18	6,710865562	6,841399632	88,19194733
300	0,185	6,895027624	7,029244936	90,61344644
360	0,183	6,821362799	6,959263352	89,71131932
420	0,176	6,563535912	6,699963168	86,36870094
480	0,170	6,342541436	6,473812155	83,45340593

Kadar dihitung berdasarkan kurva baku salbutamol sulfat

$$y = 0,0067875x - 0,0022$$

$$x = \frac{y + 0,0022}{0,0067875} \times fp$$

keterangan : x = kadar salbutamol sulfat (mg/ml)

y = absorbansi

fp = factor pengenceran

Misal

$$x = \frac{0,050 + 0,0022}{0,0067875} \times 1 = 7,691 \text{ mg/ml}$$

$$X = 7,691 \times 100\text{ml} = 70,691 \text{ mg}$$

### Lampiran 7. (lanjutan)

- Kadar koreksi

$$\text{kadar koreksi} = (\text{kadar} \times \text{fp}) + \left( \frac{\text{v.yang diambil}}{\text{volume medium}} \right) \times \{ \text{kadar} \times \text{fp} (t - 1) \}$$

$$\text{kadar koreksi 5} = (1,92265) + \left( \frac{5}{250} \right) \times 0 = 1,92265$$

$$\text{kadar koreksi 10} = (2,254143) + \left( \frac{5}{250} \right) \times 1,92265 = 2,292596$$

- Jumlah salbutamol sulfat terdisolusi (%)

$$\text{jumlah SS terdisolusi 5} = \left( \frac{\text{kadar koreksi 5}}{\text{kadar rata-rata SS per formula 1}} \right) \times 100\%$$

$$\text{jumlah SS terdisolusi 5} = \left( \frac{1,922651}{7,757397} \right) \times 100\% = 24,784755 \%$$

### Lampiran 8. Data Jumlah Salbutamol Sulfat Terdisolusi

Dengan perhitungan seperti pada lampiran 2, diperoleh data sebagai berikut :

Jumlah salbutamol sulfat terdisolusi (%) formula 1

Waktu (menit)	R1	R2	R3	RATA2
5	24,78475563	23,83514814	26,68397063	25,10129147
10	29,55368448	28,11028108	30,06647253	29,24347936
15	35,81159787	34,35869841	37,24550519	35,80526716
30	44,00671056	44,92782983	45,45961003	44,79805014
45	57,46264877	58,43124842	56,06672575	57,32020765
60	69,12382882	68,19321347	67,67092935	68,32932388
120	77,89820208	78,35401368	75,97049886	77,40757154
180	85,66599139	84,72587997	85,62800709	85,33995949
240	88,19194733	89,12256268	88,66675108	88,66042036
300	90,61344644	90,15763485	90,62294252	90,4646746
360	89,71131932	90,176627	88,28690808	89,39161813
420	86,36870094	87,80260826	87,76462396	87,31197772
480	83,45340593	88,22993163	84,43150165	85,37161307

**Lampiran 8. (lanjutan)**

Jumlah salbutamol sulfat terdissolusi (%) formula II

Waktu (menit)	R1	R2	R3	RATA2
5	12,77965661	12,77965661	11,8041103	12,45447451
10	15,96188866	15,4741155	14,47905827	15,30502081
15	18,94706035	20,40062435	17,45447451	18,93405307
30	23,39555151	27,32700312	23,85405827	24,85887097
45	31,77549428	35,75572321	31,78524974	33,10548907
60	45,59898543	57,87135796	42,67234651	48,71422997
120	54,164282	64,16363163	57,03238814	58,45343392
180	65,06113424	69,15842872	66,58298647	66,93418314
240	74,05567118	75,59703434	75,06048387	74,90439646
300	76,18236212	77,67494797	75,7140999	76,52380333
360	75,24583767	76,25065036	75,72385536	75,74011446
420	75,22632674	75,24583767	74,2605359	74,9109001
480	75,7140999	75,22632674	74,23126951	75,05723205

**Lampiran 8. (lanjutan)**

Jumlah salbutamol sulfat terdissolusi (%) formula III

Waktu (menit)	R1	R2	R3	RATA2
5	19,68773327	22,02040308	21,55386912	21,08733516
10	23,81375964	24,79348096	24,78415028	24,46379696
15	30,88641453	32,30467778	32,77121174	31,98743468
30	43,15625777	45,05038567	45,05971635	44,42211993
45	65,32595173	63,03060462	62,56407066	63,640209
60	79,76051256	76,44812142	81,10413038	79,10425479
120	88,43804429	88,37272953	87,5329684	88,11458074
180	95,137472	94,67093804	92,31960686	94,0426723
240	96,20116944	97,12490669	98,47785518	97,2679771
300	99,01903458	99,5042299	99,53222194	99,35182881
360	99,07501866	98,61781537	99,08434934	98,92572779
420	98,60848469	99,06568798	99,07501866	98,91639711
480	98,13262005	99,07501866	98,60848469	98,60537447



**Lampiran 8. (lanjutan)**

Jumlah salbutamol sulfat terdisolusi (%) formula IV

Waktu (menit)	R1	R2	R3	RATA2
5	17,57369614	15,6840514	15,21164021	16,15646258
10	21,70445956	23,08390023	21,18480726	21,99105568
15	29,33862434	30,78420257	30,27399849	30,13227513
30	40,8276644	40,38359788	38,9569161	40,05605946
45	56,64399093	57,10695389	56,13378685	56,62824389
60	70,65570673	68,7755102	73,00831444	70,81317712
120	80,85034013	81,75736961	83,25963719	81,95578231
180	87,19009826	86,26417233	89,12698413	87,52708491
240	91,09221466	92,01814059	91,13000756	91,41345427
300	93,52985639	94,49357521	93,52985639	93,85109599
360	93,5770975	94,06840514	92,15986394	93,26845553
420	92,15986394	91,22448979	91,65910809	91,68115394
480	92,60393046	92,11262283	92,59448224	92,43701184

**Lampiran 8. (lanjutan)**

Jumlah salbutamol sulfat terdissolusi (%) formula V

Waktu (menit)	R1	R2	R3	RATA2
5	18,76675603	17,3305247	19,72424358	18,60717477
10	21,05706626	19,5921103	20,59747223	20,4155496
15	26,84029108	25,8540789	24,91574109	25,87003702
30	38,44504021	36,03217158	36,01302183	36,83007787
45	49,68594408	53,94676369	52,03178859	51,88816545
60	63,78973573	62,43967828	60,0076599	62,07902464
120	73,64228265	70,74109536	73,56568364	72,64968722
180	81,0149368	81,9149751	80,53619303	81,15536831
240	86,42474148	85,0076599	84,02144772	85,15128303
300	88,92378399	88,41631559	88,87590961	88,73866973
360	88,01417081	87,04710839	86,57793948	87,21307289
420	84,64381463	85,58215243	83,65760245	84,6278565
480	81,22558407	84,11719647	81,68517809	82,34265288

**Lampiran 8. (lanjutan)**

Jumlah salbutamol sulfat terdissolusi (%) formula VI

Waktu (menit)	R1	R2	R3	RATA2
5	1,012891344	1,012891344	1,012891344	1,012891344
10	1,033149171	1,033149171	1,033149171	1,033149171
15	1,033149171	1,033149171	1,033149171	1,033149171
30	1,033149171	1,033149171	1,033149171	1,033149171
45	1,033149171	1,033149171	1,033149171	1,033149171
60	1,033149171	1,033149171	1,033149171	1,033149171
120	1,033149171	1,033149171	1,033149171	1,033149171
180	1,033149171	1,033149171	1,033149171	1,033149171
240	1,033149171	1,033149171	1,033149171	1,033149171
300	1,033149171	1,033149171	1,033149171	1,033149171
360	1,033149171	1,033149171	1,033149171	1,033149171
420	1,033149171	1,033149171	1,033149171	1,033149171
480	1,033149171	1,033149171	1,033149171	1,033149171

**Lampiran 9. Contoh cara perhitungan AUC dan DE<sub>480</sub> (%)**

Formula 1 Replikasi 1

Waktu (menit)	Jumlah salbutamol sulfat terdisolusi (%)	AUC (mg/menit)
5	24,784755	$(24,784755 + 0) \times \left(\frac{5-0}{2}\right) = 61,961889$
10	29,553684	$(29,553684 + 24,784755) \times \left(\frac{10-5}{2}\right) = 135,8461$
15	35,811597	$(35,811597 + 29,553684) \times \left(\frac{15-10}{2}\right) = 163,413205$
30	44,006711	$(44,006711 + 35,811597) \times \left(\frac{30-15}{2}\right) = 598,637313$
45	57,462648	$(57,462648 + 44,006711) \times \left(\frac{45-30}{2}\right) = 761,020195$
60	69,123828	$(69,123828 + 57,462648) \times \left(\frac{60-45}{2}\right) = 949,398581$
120	77,898202	$(77,898202 + 69,123828) \times \left(\frac{120-60}{2}\right) = 4410,660927$
180	85,665991	$(85,665991 + 77,898202) \times \left(\frac{180-120}{2}\right) = 4906,925804$
240	88,191947	$(88,191947 + 85,665991) \times \left(\frac{240-180}{2}\right) = 5215,738162$
300	90,613446	$(90,613446 + 88,191947) \times \left(\frac{300-240}{2}\right) = 5364,161813$
360	89,711319	$(89,711319 + 90,613446) \times \left(\frac{360-300}{2}\right) = 5409,742973$
420	86,368701	$(86,368701 + 89,711319) \times \left(\frac{420-360}{2}\right) = 5282,400608$
480	83,453405	$(83,453405 + 86,368701) \times \left(\frac{480-420}{2}\right) = 5094,663206$

Bobot patch : 109,9

Kadar rata-rata : 7,757392

Bobot rata-rata patch : 104,875

$$\text{Kadar} = \left( \frac{109,9}{104,875} \right) \times 7,757392 = 8,129086$$

$$\text{Kadar (\%)} = \left( \frac{8,129086}{7,757392} \right) \times 100\% = 104,791418\%$$

$$Y_{100.t} = 104,791418 \times 480 = 50299,88081$$

$$DE_{480} = \int_0^t \frac{Y.dt}{Y_{100.t}} \times 100\%$$

$$DE_{480} (\%) = \frac{\text{AUC}}{Y_{100.t}} \times 100\%$$

$$DE_{480} (\%) = \frac{38354,57078}{50299,88081} \times 100\% = 76,251812\%$$

### Lampiran 10. Data harga AUC dan DE<sub>480</sub> (%)

Dengan perhitungan seperti pada lampiran 9 diperoleh data sebagai berikut :

Jumlah harga AUC dan DE<sub>480</sub> (%) pada formula I

Waktu (menit)	AUC		
	R1	R2	R3
5	61,96188909	59,58787035	66,70992657
10	135,8461003	129,8635731	141,8761079
15	163,4132059	156,1724487	168,2799443
30	598,6373133	594,6489618	620,2883642
45	761,020195	775,1930869	761,4475184
60	949,3985819	949,6834642	928,0324133
120	4410,660927	4396,416814	4309,242846
180	4906,925804	4892,396809	4847,955179
240	5215,738162	5215,453279	5228,842745
300	5364,161813	5378,405926	5378,690808
360	5409,742973	5410,027855	5367,295518
420	5282,400608	5339,377058	5281,545961
480	5094,663206	5280,976197	5165,883768
AUC Total	38354,57078	38578,20334	38266,0911
DE <sub>480</sub> (%)	76,25181245	77,54310556	84,11209557
DE <sub>480</sub> (%) rata-rata	79,30233786		

### Lampiran 10. (lanjutan)

Dengan perhitungan seperti pada lampiran 9 diperoleh data sebagai berikut :

Jumlah harga AUC dan DE<sub>480</sub> (%) pada formula II

Waktu (menit)	AUC		
	R1	R2	R3
5	31,94914152	31,94914152	29,51027575
10	71,85386316	70,63443028	65,70792144
15	87,27237253	89,68684964	79,83383195
30	317,569589	357,957206	309,8139958
45	413,7828434	473,1204475	417,2948101
60	580,3085978	702,2031087	558,4319719
120	2992,898023	3661,049688	2991,14204
180	3576,762487	3999,661811	3708,461238
240	4173,504162	4342,663892	4249,30411
300	4507,140999	4598,159469	4523,237513
360	4542,845994	4617,76795	4543,138658
420	4514,164932	4544,894641	4499,531738
480	4528,212799	4514,164932	4454,754162
AUC Total	30338,2658	32003,91357	30430,16227
DE <sub>480</sub> (%)	62,08553153	64,35463389	60,30646628
DE <sub>480</sub> (%) rata-rata	62,24887723		

**Lampiran 10. (lanjutan)**

Dengan perhitungan seperti pada lampiran 9 diperoleh data sebagai berikut :

Jumlah harga AUC dan DE<sub>480</sub> (%) pada formula III

Waktu (menit)	AUC		
	R1	R2	R3
5	49,21933316	55,05100771	53,8846728
10	108,7537323	117,0347101	115,8450485
15	136,7504354	142,7453969	143,8884051
30	555,3200423	580,1629758	583,7319607
45	813,6165712	810,6074272	807,1784025
60	1088,148482	1046,090445	1077,511508
120	5045,956705	4944,625528	5059,112963
180	5507,265489	5491,310027	5395,577258
240	5740,159243	5753,875342	5723,923861
300	5856,606121	5898,874098	5940,302314
360	5942,821597	5943,661358	5958,497138
420	5930,5051	5930,5051	5944,78104
480	5902,233142	5944,221199	5930,5051
AUC Total	42677,35599	42658.76462	42734,73967
DE <sub>480</sub> (%)	89,51654193	92,90726472	88,26121769
DE <sub>480</sub> (%) rata-rata	90,22834145		



**Lampiran 10. (lanjutan)**

Dengan perhitungan seperti pada lampiran 9 diperoleh data sebagai berikut :

Jumlah harga AUC dan DE<sub>480</sub> (%) pada formula IV

Waktu (menit)	AUC		
	R1	R2	R3
5	43,93424036	39,2101285	38,02910053
10	98,19538927	96,91987906	90,99111867
15	127,6077097	134,670257	128,6470144
30	526,2471655	533,7585034	519,2318594
45	731,037415	731,1791383	713,1802721
60	954,7477324	944,1184807	968,5657596
120	4545,181406	4515,986394	4688,038549
180	5041,213152	5040,646258	5171,598639
240	5348,469388	5348,469388	5407,70975
300	5538,662131	5595,351474	5539,795918
360	5613,208617	5656,85941	5570,69161
420	5572,108843	5558,786848	5514,569161
480	5542,913832	5500,113379	5527,60771
AUC Total	39683,52702	39696,06954	39878,65646
DE <sub>480</sub> (%)	81,0169861	85,44309538	84,16050752
DE <sub>480</sub> (%) rata-rata	83,54019633		

**Lampiran 10. (lanjutan)**

Dengan perhitungan seperti pada lampiran 9 diperoleh data sebagai berikut :

Jumlah harga AUC dan DE<sub>480</sub> (%) pada formula V

Waktu (menit)	AUC		
	R1	R2	R3
5	46,91689008	43,32631176	49,31060896
10	99,55955572	92,30658751	100,8042895
15	119,7433933	113,615473	113,7830333
30	489,6399847	464,1468786	456,9657219
45	660,9823822	674,8420145	660,3360781
60	851,0675986	872,8983148	840,2958636
120	4122,960551	3995,423209	4007,200306
180	4639,716584	4579,682114	4623,0563
240	5023,190348	5007,67905	4936,729222
300	5260,455764	5202,719265	5186,92072
360	5308,138644	5263,902719	5263,615473
420	5179,739563	5178,877824	5107,066258
480	4976,081961	5090,980467	4960,283416
AUC Total	36778,19322	36580,40023	36306,36729
DE <sub>480</sub> (%)	78,94468042	79,24581044	72,61231858
DE <sub>480</sub> (%) rata-rata	76,93426981		

**Lampiran 10. (lanjutan)**

Dengan perhitungan seperti pada lampiran 9 diperoleh data sebagai berikut :

Jumlah harga AUC dan DE<sub>480</sub> (%) pada formula VI

Waktu (menit)	AUC		
	R1	R2	R3
5	2,532228361	2,532228361	2,532228361
10	5,115101289	5,115101289	5,115101289
15	5,165745856	5,165745856	5,165745856
30	15,49723757	15,49723757	15,49723757
45	15,49723757	15,49723757	15,49723757
60	15,49723757	15,49723757	15,49723757
120	61,98895028	61,98895028	61,98895028
180	61,98895028	61,98895028	61,98895028
240	61,98895028	61,98895028	61,98895028
300	61,98895028	61,98895028	61,98895028
360	61,98895028	61,98895028	61,98895028
420	61,98895028	61,98895028	61,98895028
480	61,98895028	61,98895028	61,98895028
AUC Total	493,2274401	493,2274401	493,2274401
DE <sub>480</sub> (%)	0	0	0
DE <sub>480</sub> (%) rata-rata	0		

## Lampiran 11. Data SPSS Rata-Rata Disolusi

### NPar Tests

**Descriptive Statistics**

	N	Mean	Std. Deviation	Minimum	Maximum
patch	78	3.50	1.719	1	6
kadar	78	52.980403	32.3020929	2.8545	99.6335

**One-Sample Kolmogorov-Smirnov Test**

		patch	kadar
N		78	78
Normal Parameters <sup>a,b</sup>	Mean	3.50	52.980403
	Std. Deviation	1.719	32.3020929
Most Extreme Differences	Absolute	.142	.137
	Positive	.142	.120
	Negative	-.142	-.137
Kolmogorov-Smirnov Z		1.253	1.212
Asymp. Sig. (2-tailed)		.086	.106

a. Test distribution is Normal.

b. Calculated from data.

## Oneway

### Descriptives

kadar

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5:5	13	64.345091	24.0982741	6.6836587	49.782650	78.907533
3:7	13	50.270860	23.4612340	6.5069755	36.093378	64.448342
7:3	13	71.868820	31.7657096	8.8102227	52.672994	91.064646
6:4	13	65.053407	28.9607698	8.0322723	47.552589	82.554225
4:6	13	59.364216	26.1432788	7.2508409	43.565991	75.162441
kontrol	13	6.980025	2.0243606	.5614566	5.756717	8.203334
Total	78	52.980403	32.3020929	3.6574918	45.697407	60.263400

### Descriptives

kadar

	Minimum	Maximum
5:5	24.0331	87.8656
3:7	12.0626	71.9079
7:3	19.4291	99.6335
6:4	17.1271	91.1989
4:6	18.0479	85.5175
kontrol	2.8545	9.4770
Total	2.8545	99.6335

### Test of Homogeneity of Variances

kadar

Levene Statistic	df1	df2	Sig.
1.034	5	72	.429

### ANOVA

kadar

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36345.599	5	7269.120	11.895	.000
Within Groups	43998.142	72	611.085		
Total	80343.741	77			

## Post Hoc Tests

### Multiple Comparisons

kadar  
Scheffe

(I) patch	(J) patch	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
5:5	3:7	17.053461	9.6960365	.324	-19.104265	47.252728
	7:3	-11.910163	9.6960365	.756	-40.702225	25.654768
	6:4	-.7083156	9.6960365	1.000	-33.886812	32.470181
	4:6	4.9808755	9.6960365	.998	-28.197621	38.159372
	kpntrol	57.0945155 <sup>*</sup>	9.6960365	.000	24.186570	90.543562
3:7	5:5	-14.0742315	9.6960365	.257	-47.252728	19.104265
	7:3	-21.59796 <sup>*</sup>	9.6960365	.043	-54.776456	11.580536
	6:4	-14.7825471	9.6960365	.509	-47.961043	18.395949
	4:6	-9.0933560	9.6960365	.875	-42.271852	24.085140
	kpntrol	43.2908344 <sup>*</sup>	9.6960365	.000	10.112338	76.469331
7:3	5:5	7.5237286	9.6960365	.987	-25.654768	40.702225
	3:7	-14.63925 <sup>*</sup>	9.6960365	.050	-11.580536	54.776456
	6:4	6.8154129	9.6960365	.992	-26.363083	39.993909
	4:6	12.5046040	9.6960365	.892	-20.673892	45.683100
	kpntrol	64.8887944 <sup>*</sup>	9.6960365	.000	31.710298	98.067291
6:4	5:5	.7083156	9.6960365	.648	-32.470181	33.886812
	3:7	14.7825471	9.6960365	.114	-18.395949	47.961043
	7:3	-6.8154129	9.6960365	.203	-39.993909	26.363083
	4:6	5.6891911	9.6960365	.277	-27.489305	38.867687
	kpntrol	58.0733815 <sup>*</sup>	9.6960365	.000	24.894885	91.251878
4:6	5:5	-4.9808755	9.6960365	.982	-38.159372	28.197621
	3:7	9.0933560	9.6960365	.311	-24.085140	42.271852
	7:3	-12.5046040	9.6960365	.631	-45.683100	20.673892
	6:4	-5.6891911	9.6960365	.828	-38.867687	27.489305
	kpntrol	52.3841904 <sup>*</sup>	9.6960365	.000	19.205694	85.562687
kpntrol	5:5	-57.3650659 <sup>*</sup>	9.6960365	.000	-90.543562	-24.186570
	3:7	-43.2908344 <sup>*</sup>	9.6960365	.000	-76.469331	-10.112338
	7:3	-64.8887944 <sup>*</sup>	9.6960365	.000	-98.067291	-31.710298
	6:4	-58.0733815 <sup>*</sup>	9.6960365	.000	-91.251878	-24.894885
	4:6	-52.3841904 <sup>*</sup>	9.6960365	.000	-85.562687	-19.205694

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

## Homogeneous Subsets

kadar

Scheffe<sup>a</sup>

patch	N	Subset for alpha = 0.05	
		1	2
kpntrol	13	6.980025	
3:7	13		50.270860
4:6	13		59.364216
5:5	13		64.345091
6:4	13		65.053407
7:3	13		71.868820
Sig.		1.000	.429

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.000.

## Lampiran 12. Data *Swelling Index* (%)

### NPar Tests

#### Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
patch	18	3.50	1.757	1	6
swelling	18	254.830795	23.1548102	221.1833	306.4089

#### One-Sample Kolmogorov-Smirnov Test

	patch	swelling
N	18	18
Normal Parameters <sup>a,b</sup>	Mean	3.50
	Std. Deviation	254.830795
Most Extreme Differences	Absolute	.137
	Positive	.137
	Negative	-.137
Kolmogorov-Smirnov Z	.580	.517
Asymp. Sig. (2-tailed)	.890	.952

a. Test distribution is Normal.

b. Calculated from data.



## Oneway

### Descriptives

swelling

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5:5	3	249.781592	15.7916109	9.1172908	210.553056	289.010128
3:7	3	237.722174	12.1532432	7.0166782	207.531844	267.912504
7:3	3	287.480035	22.0505401	12.7308853	232.703457	342.256614
6:4	3	265.524330	18.1540378	10.4812386	220.427200	310.621459
4:6	3	244.017105	16.2575921	9.3863252	203.631007	284.403202
kontrol	3	244.459532	22.2602579	12.8519659	189.161986	299.757078
Total	18	254.830795	23.1548102	5.4576411	243.316178	266.345411

### Descriptives

swelling

	Minimum	Maximum
5:5	233.2631	264.7289
3:7	224.5120	248.4285
7:3	263.2677	306.4089
6:4	246.3640	282.4686
4:6	226.8859	259.2311
kontrol	221.1833	265.5413
Total	221.1833	306.4089

### Test of Homogeneity of Variances

swelling

Levene Statistic	df1	df2	Sig.
.294	5	12	.907

### ANOVA

swelling

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5169.069	5	1033.814	3.144	.049
Within Groups	3945.400	12	328.783		
Total	9114.469	17			

## Post Hoc Tests

### Multiple Comparisons

swelling  
Scheffe

(I) patch	(J) patch	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
5:5	3:7	12.0594182	14.8050295	.982	-46.283249	70.402086
	7:3	-37.6984433	14.8050295	.328	-96.041111	20.644224
	6:4	-15.7427375	14.8050295	.544	-74.085405	42.599930
	4:6	5.7644873	14.8050295	.999	-52.578180	64.107155
	kontrol	5.3220600	14.8050295	1.000	-53.020608	63.664727
3:7	5:5	-12.0594182	14.8050295	.817	-70.402086	46.283249
	7:3	-49.75786 <sup>*</sup>	14.8050295	.049	-108.100529	8.584806
	6:4	-27.8021557	14.8050295	.230	-86.144823	30.540512
	4:6	-6.2949309	14.8050295	.910	-64.637598	52.047737
	kontrol	-6.7373583	14.8050295	.899	-65.080026	51.605309
7:3	5:5	37.6984433	14.8050295	.328	-20.644224	96.041111
	3:7	49.75786 <sup>*</sup>	14.8050295	.049	-8.584806	108.100529
	6:4	21.9557058	14.8050295	.125	-36.386962	80.298373
	4:6	43.4629306	14.8050295	.204	-14.879737	101.805598
	kontrol	43.0205033	14.8050295	.312	-15.322164	101.363171
6:4	5:5	15.7427375	14.8050295	.844	-42.599930	74.085405
	3:7	27.80215 <sup>*</sup>	14.8050295	.050	-30.540512	86.144823
	7:3	-21.9557058	14.8050295	.966	-80.298373	36.386962
	4:6	21.5072248	14.8050295	.699	-36.835443	79.849892
	kontrol	21.0647974	14.8050295	.841	-37.277870	79.407465
4:6	5:5	-5.7644873	14.8050295	.984	-64.107155	52.578180
	3:7	6.2949309	14.8050295	.899	-52.047737	64.637598
	7:3	-43.4629306	14.8050295	.204	-101.805598	14.879737
	6:4	-21.5072248	14.8050295	.699	-79.849892	36.835443
	kontrol	-.4424274	14.8050295	.983	-58.785095	57.900240
kontrol	5:5	-5.3220600	14.8050295	1.000	-63.664727	53.020608
	3:7	6.7373583	14.8050295	.999	-51.605309	65.080026
	7:3	-43.0205033	14.8050295	.421	-101.363171	15.322164
	6:4	-21.0647974	14.8050295	.636	-79.407465	37.277870
	4:6	.4424274	14.8050295	.983	-57.900240	58.785095

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

## Homogeneous Subsets

### swelling

Scheffe<sup>a</sup>

patch	N	Subset for alpha = 0.05
		1
3:7	3	237.722174
4:6	3	244.017105
kontrol	3	244.459532
5:5	3	249.781592
6:4	3	265.524330
7:3	3	287.480035
Sig.		.115

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 3.000.

### Lampiran 13. Data DE<sub>480</sub> (%)

#### NPar Tests

##### Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
patch	18	3.50	1.757	1	6
DE	18	66.741001	28.9186345	6.7330	93.9321

##### One-Sample Kolmogorov-Smirnov Test

	patch	DE
N	18	18
Normal Parameters <sup>a,b</sup>	Mean	66.741001
	Std. Deviation	28.9186345
Most Extreme Differences	Absolute	.247
	Positive	.174
	Negative	-.247
Kolmogorov-Smirnov Z	.580	1.048
Asymp. Sig. (2-tailed)	.890	.222

a. Test distribution is Normal.

b. Calculated from data.

## Oneway

### Descriptives

DE

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
5:5	3	79.302338	4.2151140	2.4335972	68.831414	89.773262
3:7	3	62.248877	2.0290211	1.1714559	57.208509	67.289245
7:3	3	91.212501	2.4775288	1.4304019	85.057979	97.367024
6:4	3	83.540196	2.2773231	1.3148131	77.883012	89.197380
4:6	3	76.934270	3.7459467	2.1627233	67.628822	86.239717
KONTROL	3	7.207822	.7063110	.4077888	5.453249	8.962396
Total	18	66.741001	28.9186345	6.8161875	52.360102	81.121899

### Descriptives

DE

	Minimum	Maximum
5:5	76.2518	84.1121
3:7	60.3065	64.3546
7:3	89.0839	93.9321
6:4	81.0170	85.4431
4:6	72.6123	79.2458
KONTROL	6.7330	8.0195
Total	6.7330	93.9321

### Test of Homogeneity of Variances

DE

Levene Statistic	df1	df2	Sig.
2.377	5	12	.102

### ANOVA

DE

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14121.407	5	2824.281	354.962	.000
Within Groups	95.479	12	7.957		
Total	14216.886	17			

## Post Hoc Tests

### Multiple Comparisons

DE  
Scheffe

(I) patch	(J) patch	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
5:5	3:7	17.653445	2.3031248	.678	7.977461	26.129460
	7:3	-11.875443	2.3031248	.188	-20.986163	-2.834164
	6:4	-4.2378585	2.3031248	.649	-13.313858	4.838141
	4:6	2.3680680	2.3031248	.951	-6.707932	11.444068
	KONTROL	72.0945155*	2.3031248	.000	63.018516	81.170515
3:7	5:5	-17.867543	2.3031248	.752	-26.129460	-7.977461
	7:3	-28.644689	2.3031248	.050	-38.039624	-19.887624
	6:4	-21.655433	2.3031248	.274	-30.367319	-12.215319
	4:6	-14.112233	2.3031248	.483	-23.761392	-5.609393
	KONTROL	55.0410549*	2.3031248	.000	45.965055	64.117055
7:3	5:5	-11.875425	2.3031248	.588	2.834164	20.986163
	3:7	28.9636241*	2.3031248	.050	19.887624	38.039624
	6:4	7.6723050	2.3031248	.379	-1.403695	16.748305
	4:6	18.865335	2.3031248	.709	5.202232	23.354231
	KONTROL	84.0046790*	2.3031248	.000	74.928679	93.080679
6:4	5:5	4.2378585	2.3031248	.649	-4.838141	13.313858
	3:7	21.233495	2.3031248	.799	12.215319	30.367319
	7:3	-7.6723050	2.3031248	.120	-16.748305	1.403695
	4:6	6.6059265	2.3031248	.617	-2.470073	15.681926
	KONTROL	76.3323740*	2.3031248	.000	67.256374	85.408374
4:6	5:5	-2.3680680	2.3031248	.951	-11.444068	6.707932
	3:7	14.234568	2.3031248	.987	5.609393	23.761392
	7:3	-14.234568	2.3031248	.067	-23.354231	-5.202232
	6:4	-6.6059265	2.3031248	.173	-15.681926	2.470073
	KONTROL	69.7264475*	2.3031248	.000	60.650448	78.802447
KONTROL	5:5	-72.0945155*	2.3031248	.000	-81.170515	-63.018516
	3:7	-55.0410549*	2.3031248	.000	-64.117055	-45.965055
	7:3	-84.0046790*	2.3031248	.000	-93.080679	-74.928679
	6:4	-76.3323740*	2.3031248	.000	-85.408374	-67.256374
	4:6	-69.7264475*	2.3031248	.000	-78.802447	-60.650448

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

## Homogeneous Subsets

DE

Scheffe<sup>a</sup>

patch	N	Subset for alpha = 0.05			
		1	2	3	4
KONTROL	3	7.207822			
3:7	3		62.248877		
4:6	3			76.934270	
5:5	3			79.302338	
6:4	3			83.540196	83.540196
7:3	3				91.212501
Sig.		1.000	1.000	.222	.120

Means for groups in homogeneous subsets are displayed.

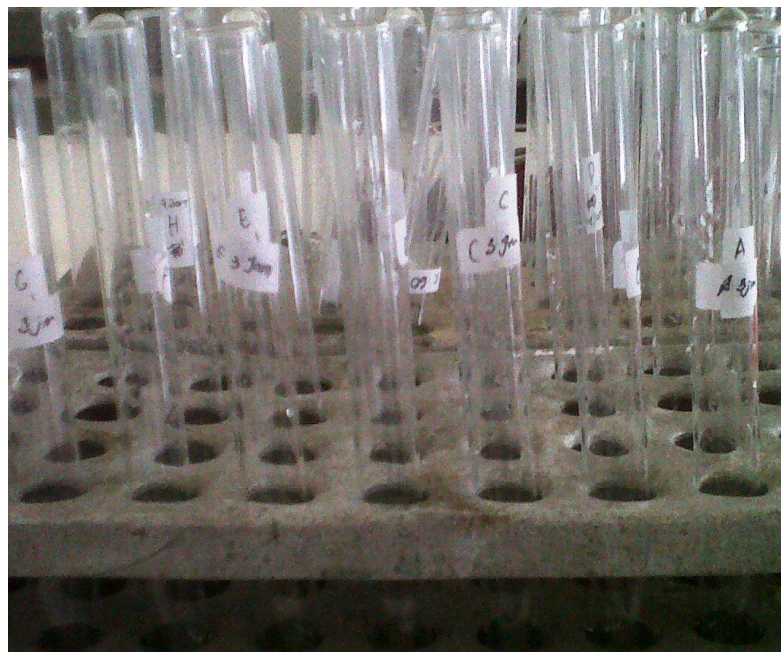
a. Uses Harmonic Mean Sample Size = 3.000.

**Lampiran 14. Pengambilan Gambar-gambar****Gambar 1. Penimbangan Bahan****Gambar 2. Pencampuran Bahan**





**Gambar 3. Alat dissolusi**



**Gambar 4. Tabung Tempas Setelah Pengambilan Media Dissolusi**