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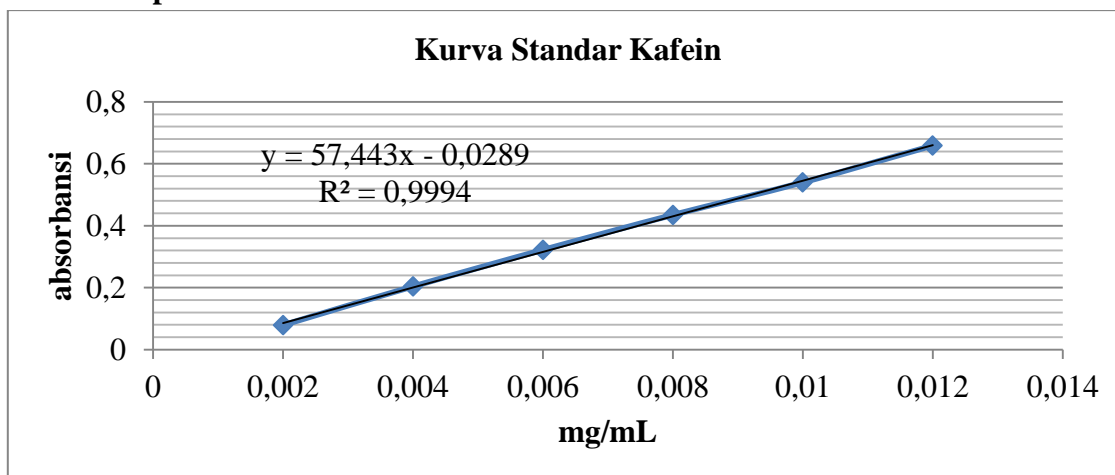
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LAMPIRAN

Lampiran A. Data Hasil Pengujian Kadar Kafein dan Penurunan Kafein pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Gambar Lampiran A. Kurva Standar Kafein



Tabel Lampiran A1. Hasil Pengujian Kadar Kafein Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

TANPA PERLAKUAN (KONTROL)							
Panjang gelombang	Perlakuan	Abs	FP	Kafein (mg/mL)	Berat (g)/100 mL	%kafein	rata-rata
275	U1_A0	0,483	50	0,445572	1,83	2,434820	2,133828
	U2_A0	0,332	50	0,314137	1,54	2,039854	
	U3_A0	0,312	50	0,296729	1,54	1,926811	

Panjang gelombang	Perlakuan	Abs	FP	Kafein (mg/mL)	Berat (g)/100 mL	%kafein	%penurunan kafein	Rata-rata
275	UIYI (18 jam)	0,259	25	0,125298	1,41	0,888639	63,502887	0,830319
	U2YI (18 jam)	0,230	25	0,112677	1,46	0,771760	68,303219	
	U3YI (18 jam)	0,244	25	0,118770	1,43	0,830559	65,888292	
	U1Y2 (24 Jam)	0,212	25	0,104843	1,50	0,698954	71,293417	0,647024
	U2Y2 (24 Jam)	0,160	25	0,082212	1,36	0,604499	75,172727	
	U3Y2 (24 Jam)	0,185	25	0,093092	1,46	0,637618	73,812509	
	U1Y3 (30 Jam)	0,192	25	0,096139	1,42	0,677034	72,193692	0,686598
	U2Y3 (30 Jam)	0,175	25	0,088740	1,27	0,698741	71,302143	
	U3Y3 (30 Jam)	0,232	25	0,113547	1,66	0,684020	71,906752	

Tabel Lampiran A2. Hasil Analisa Sidik Ragam (ANOVA) Kadar Kafein Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA					
Kafein					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	4.581	3	1.527	79.200	.000
Within Groups	.154	8	.019		
Total	4.736	11			

Tabel Lampiran A3. Hasil Uji Lanjut dengan Metode *Duncan* pada Kadar Kafein Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Kafein			
Duncan			
Perlakuan	N	Subset for alpha = 0.05	
		1	2
Dekaf 24 jam	3	.647023	
Dekaf 30 jam	3	.671185	
Dekaf 18 jam	3	.830319	
Kontrol	3		2.133828
Sig.		.160	1.000

Means for groups in homogeneous subsets are displayed.

Tabel Lampiran A4. Hasil Analisa Sidik Ragam (ANOVA) Penurunan Kadar Kafein Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA					
Penurunan_Kafein					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	94.049	2	47.024	14.305	.005
Within Groups	19.723	6	3.287		
Total	113.772	8			

Tabel Lampiran A5. Hasil Uji Lanjut dengan Metode *Duncan* pada Penurunan Kadar Kafein Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi
Penurunan_Kafein

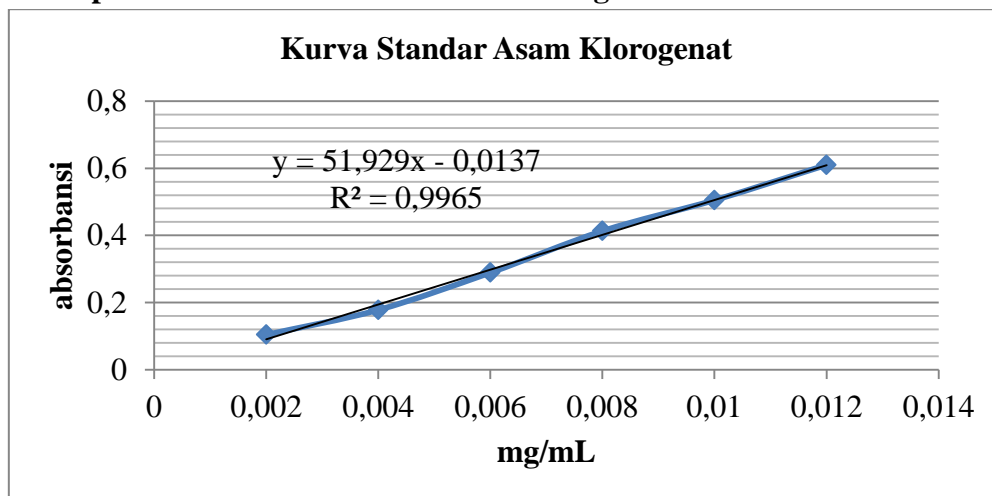
Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
Dekaf 18 jam	3	65.89815	
Dekaf 30 jam	3		71.78828
Dekaf 24 jam	3		73.42624
Sig.		1.000	.311

Means for groups in homogeneous subsets are displayed.

Lampiran B. Data Hasil Pengujian Kadar Asam Klorogenat pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Gambar Lampiran B. Kurva Standar Asam Klorogenat



Tabel Lampiran B1. Hasil Pengujian Kadar Asam Klorogenat Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Panjang gelombang	Perlakuan	Abs	FP	CGA (mg/mL)	Berat (gr)/100 mL	%Asam klorogenat	%Penurunan CGA	Rata-rata
328,9	U1_A0	0,444	25	0,2203489	1,54	1,430837		1,607526
	U2_A0	0,482	30	0,2863718	1,6	1,789824		
	U3_A0	0,532	25	0,2627145	1,64	1,601918		
	UI (18 jam)	0,327	10	0,0656088	1,59	0,412634	71,161358	0,442569
	U2 (18 jam)	0,358	10	0,0715785	1,49	0,480393	66,425768	
	U3 (18 jam)	0,282	10	0,0569431	1,31	0,434680	69,620555	
	UI (24 jam)	0,287	10	0,0579060	1,40	0,413614	71,092856	0,429723
	U2 (24 jam)	0,221	10	0,0451963	1,28	0,353096	75,322400	
	U3 (24 jam)	0,339	10	0,0679197	1,30	0,522459	63,485790	
	UI (30 jam)	0,244	10	0,0496255	1,32	0,375950	73,725147	0,387700
	U2 (30 jam)	0,283	10	0,0571357	1,46	0,391340	72,649549	
	U3 (30 jam)	0,272	10	0,0550174	1,39	0,395809	72,337257	

Tabel Lampiran B2. Hasil Analisa Sidik Ragam (ANOVA) Kadar Asam Klorogenat Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA

CGA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.178	3	1.059	103.575	.000
Within Groups	.082	8	.010		
Total	3.260	11			

Tabel Lampiran B3. Hasil Uji Lanjut dengan Metode *Duncan* pada Kadar Asam Klorogenat Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

CGA

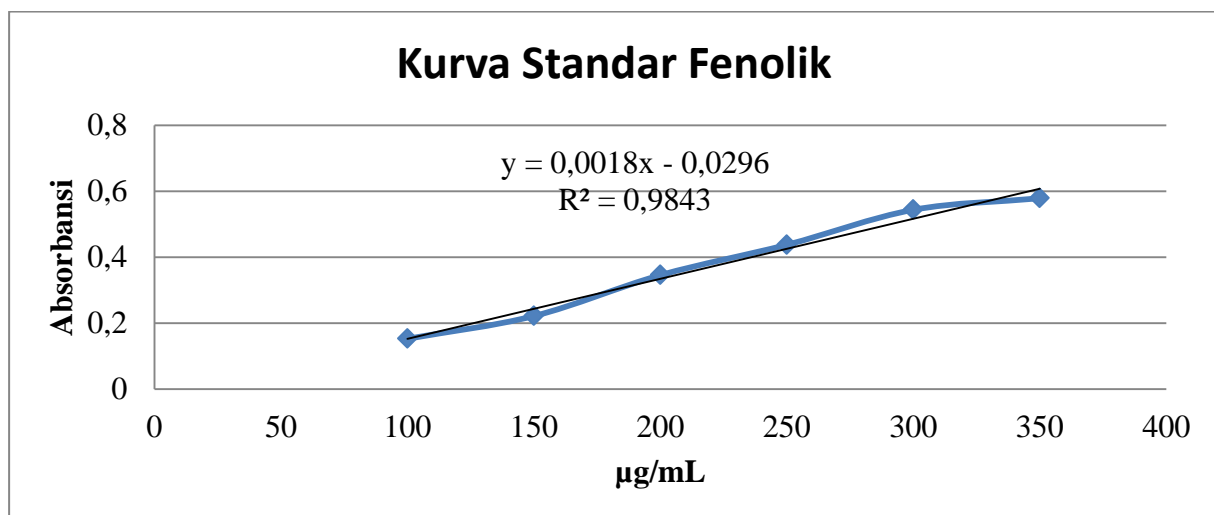
Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
Dekaf 30 jam	3	.387700	
Dekaf 24 jam	3	.429723	
Dekaf 18 jam	3	.442569	
Kontrol	3		1.607526
Sig.		.541	1.000

Means for groups in homogeneous subsets are displayed.

Lampiran C. Data Hasil Pengujian Total Fenolik pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Gambar Lampiran C. Kurva Standar Fenolik



Tabel Lampiran C1. Hasil Pengujian Total Fenolik Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Panjang gelombang	Perlakuan	Abs	preparasi awal	Berat hasil evaporasi (gr)	Berat sampel ditimbang (gr)/10 mL EtOH 70%	FP	Konsentrasi ($\mu\text{g/mL}$)	Total Fenol dalam 0,1 gr (μg)	Total Fenol dalam 1 gr (mg)	Total Fenol dalam berat hasil eva (mg)	Total Fenol mg GAE/gr	Rata-rata
782	kontrol (u1)	0,358	25 g/100 mL Et Oh 70%	1,95	0,1	5x	1076,667	10766,667	107,667	209,950	107,667	110,444
	kontrol (u2)	0,376					1126,667	11266,667	112,667	219,700	112,667	
	Kontrol (u3)	0,370					1110,000	11100,000	111,000	216,450	111,000	
	18 jam (u1)	0,519		1,46	0,1		1523,889	15238,889	152,389	222,488	152,389	149,889
	18 jam (u2)	0,493		0,8	0,1		1451,667	14516,667	145,167	116,133	145,167	
	18 jam (u3)	0,518		1,10	0,1		1521,111	15211,111	152,111	167,322	152,111	
	24 jam (u1)	0,554		0,39	0,1		1621,111	16211,111	162,111	63,223	162,111	159,426
	24 jam (u2)	0,557		0,9	0,1		1629,444	16294,444	162,944	146,650	162,944	
	24 jam (u3)	0,522		0,79	0,1		1532,222	15322,222	153,222	121,046	153,222	
	30 jam (u1)	0,490		0,99	0,1		1443,333	14433,333	144,333	142,890	144,333	141,000
	30 jam (u2)	0,468		0,52	0,1		1382,222	13822,222	138,222	71,876	138,222	
	30 jam (u3)	0,476		1,14	0,1		1404,444	14044,444	140,444	160,107	140,444	

Tabel Lampiran C2. Hasil Analisa Sidik Ragam (ANOVA) Total Fenolik Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA

Fenol					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4048.566	3	1349.522	87.307	.000
Within Groups	123.658	8	15.457		
Total	4172.223	11			

Tabel Lampiran C3. Hasil Uji Lanjut dengan Metode *Duncan* pada Total Fenolik Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Fenol

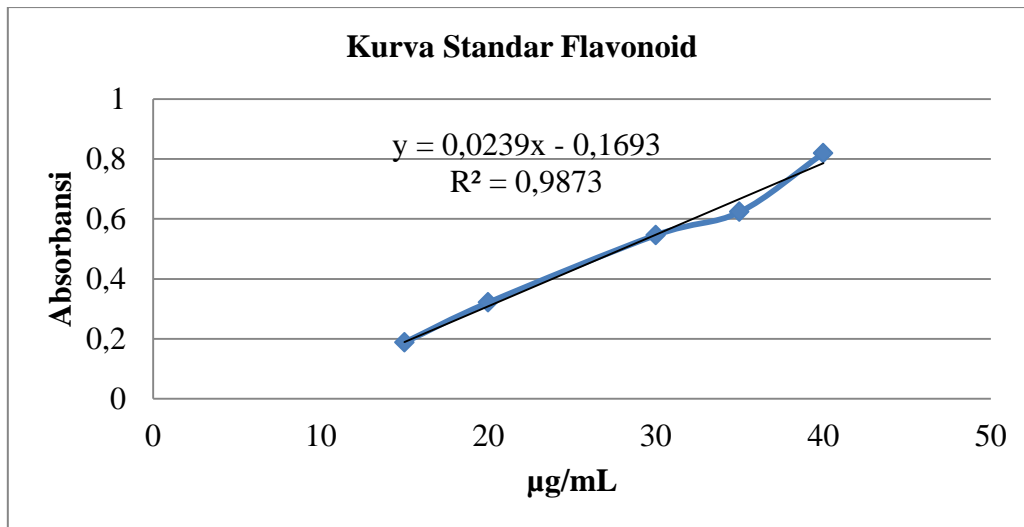
Duncan

Perlakuan	N	Subset for alpha = 0.05			
		1	2	3	4
Kontrol	3	1.10445E2			
Dekaf 30 jam	3		1.41000E2		
Dekaf 18 jam	3			1.49889E2	
Dekaf 24 jam	3				1.59426E2
Sig.		1.000	1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

Lampiran D. Data Hasil Pengujian Total Flavonoid pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Gambar Lampiran D. Kurva Standar Fenolik



Tabel Lampiran D1. Hasil Pengujian Total Flavonoid Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Panjang gelombang	Perlakuan	Abs	Berat ditimbang g (gr)/10 mL	Berat hasil evaporasi (gr)	FP	Konsentrasi ($\mu\text{g/mL}$)	Total Flavo dalam 0,01 gr (μg)	Total Flavo dalam 1 gr (mg)	Total Flavo dalam berat hasil eva (mg)	Total Flavonod mg QE/gr	Rata-rata
424	kontrol (u1)	0,190	0,01	1,95	2x	30,067	300,669	30,067	58,631	30,067	30,123
	kontrol (u2)	0,207				31,490	314,895	31,490	61,405	31,490	
	kontrol (u3)	0,175				28,812	288,117	28,812	56,183	28,812	
	18 jam (u1)	0,302	0,01	1,46		39,439	394,393	39,439	57,581	39,439	37,459
	18 jam (u2)	0,277	0,01	0,8		37,347	373,473	37,347	29,878	37,347	
	18 jam (u3)	0,256	0,01	1,10		35,590	355,900	35,590	39,149	35,590	
	24 jam (u1)	0,340	0,01	0,39		42,619	426,192	42,619	16,622	42,619	42,480
	24 jam (u2)	0,333	0,01	0,9		42,033	420,335	42,033	37,830	42,033	
	24 jam (u3)	0,342	0,01	0,79		42,787	427,866	42,787	33,801	42,787	
	30 jam (u1)	0,333	0,01	0,99		42,033	420,335	42,033	41,613	42,033	40,750
	30 jam (u2)	0,293	0,01	0,52		38,686	386,862	38,686	20,117	38,686	
	30 jam (u3)	0,327	0,01	1,14		41,531	415,314	41,531	47,346	41,531	

Tabel Lampiran D2. Hasil Analisa Sidik Ragam (ANOVA) Total Flavonoid pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA					
Flavonoid					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	268.851	3	89.617	40.173	.000
Within Groups	17.846	8	2.231		
Total	286.697	11			

Tabel Lampiran D3. Hasil Uji Lanjut dengan Metode *Duncan* pada Total Flavonoid Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Flavonoid				
Duncan				
Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
Kontrol	3	3.01230E 1		
Dekaf 18 jam	3		3.74587E 1	
Dekaf 30 jam	3			4.07500E 1
Dekaf 24 jam	3			4.24797E 1
Sig.		1.000	1.000	.194

Means for groups in homogeneous subsets are displayed.

Lampiran E. Data Hasil Pengujian Total Padatan Terlarut pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Tabel Lampiran E1. Hasil Pengujian Total Padatan Terlarut pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Perlakuan	Total Padatan Terlarut (ppm)	Rata-rata
Kontrol	1119	1043,667
kontrol (u2)	1027	
kontrol (u3)	985	
U1Y1 (18 jam)	414	424,333
U2Y1 (18 jam)	441	
U3Y1 (18 jam)	418	
U1Y2 (24 jam)	375	368
U2Y2 (24 jam)	353	
U3Y2 (24 jam)	376	
U1Y3 (30 jam)	327	339,333
U2Y3 (30 jam)	336	
U3Y3 (30 jam)	355	

Tabel Lampiran E2. Hasil Analisa Sidik Ragam (ANOVA) Total Padatan Terlarut pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA					
TDS					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1010553.667	3	336851.222	255.045	.000
Within Groups	10566.000	8	1320.750		
Total	1021119.667	11			

Tabel Lampiran E3. Hasil Uji Lanjut dengan Metode *Duncan* pada Total Padatan Terlarut pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

TDS

Duncan

Perlakuan	N	Subset for alpha = 0.05		
		1	2	3
Dekaf 30 jam	3	339.33		
Dekaf 24 jam	3	368.00	368.00	
Dekaf 18 jam	3		424.33	
Kontrol	3			1043.67
Sig.		.362	.094	1.000

Means for groups in homogeneous subsets are displayed.

Lampiran F. Data Hasil Pengujian Total Asam Tertitrasi pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Tabel Lampiran F1. Hasil Pengujian Total Asam Tertitrasi pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Perlakuan	Jumlah titrasi (mL)	FP	Berat (gr)	Total Asam (%)	Rata-rata	
Kontrol	1,6	2x	5	0,4096	0,4267	
kontrol (u2)	1,5			0,384		
kontrol (u3)	1,9			0,4864		
U1Y1 (18 jam)	1,1			0,2816	0,2645	
U2Y1 (18 jam)	1			0,256		
U3Y1 (18 jam)	1			0,256		
U1Y2 (24 jam)	0,9			0,2304		0,2219
U2Y2 (24 jam)	0,9			0,2304		
U3Y2 (24 jam)	0,8			0,2048		
U1Y3 (30 jam)	0,9			0,2304	0,2219	
U2Y3 (30 jam)	0,8			0,2048		
U3Y3 (30 jam)	0,9			0,2304		

Tabel Lampiran F2. Hasil Analisa Sidik Ragam (ANOVA) Total Asam Tertitrasi pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA					
TAT					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.085	3	.028	32.563	.000
Within Groups	.007	8	.001		
Total	.092	11			

Tabel Lampiran F3. Hasil Uji Lanjut dengan Metode *Duncan* pada Total Asam Tertitrasi pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

TAT			
Duncan			
Perlakuan	N	Subset for alpha = 0.05	
		1	2
Dekaf 24 jam	3	.221867	
Dekaf 30 jam	3	.221867	
Dekaf 18 jam	3	.264533	
Kontrol	3		.426667
Sig.		.128	1.000

Means for groups in homogeneous subsets are displayed.

Lampiran G. Data Hasil Pengujian pH pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Tabel Lampiran G1. Hasil Pengujian pH pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

Perlakuan	Ph	Rata-rata
kontrol (u1)	5,7	5,81
kontrol (u2)	5,93	
kontrol (u3)	5,79	
U1Y1 (18 jam)	5,14	5,03
U2Y1 (18 jam)	5,09	
U3Y1 (18 jam)	4,86	
U1Y2 (24 jam)	4,87	4,92
U2Y2 (24 jam)	4,93	
U3Y2 (24 jam)	4,96	
U1Y3 (30 jam)	4,96	4,92
U2Y3 (30 jam)	4,93	
U3Y3 (30 jam)	4,88	

Tabel Lampiran G2. Hasil Analisa Sidik Ragam (ANOVA) pH pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

ANOVA

PH	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.645	3	.548	55.570	.000
Within Groups	.079	8	.010		
Total	1.724	11			

Tabel Lampiran G3. Hasil Uji Lanjut dengan Metode *Duncan* pada pH pada Kopi Tanpa Dekafeinasi dan Kopi Dekaf dengan Berbagai Lama Waktu Dekafeinasi

PH

Duncan

Perlakuan	N	Subset for alpha = 0.05	
		1	2
Dekaf 24 jam	3	4.9200	
Dekaf 30 jam	3	4.9233	
Dekaf 18 jam	3	5.0300	
Kontrol	3		5.8067
Sig.		.229	1.000

Means for groups in homogeneous subsets are displayed.

Lampiran H. Perhitungan Pembuatan Larutan Uji

- 1) Pembuatan Larutan Aluminium Nitrat $\text{Al}(\text{NO}_3)_3$ 10%

$$\text{Al}(\text{NO}_3)_3 \text{ 10\%} = \frac{W \text{ (massa dalam gram)}}{\text{Volume pelarut (mL)}} \times 100\%$$

$$\text{Al}(\text{NO}_3)_3 \text{ 10\%} = \frac{W}{100 \text{ mL}} \times 100\%$$

$$W = 10 \text{ gram}$$

Maka, untuk membuat larutan Aluminium Nitrat $\text{Al}(\text{NO}_3)_3$ 10% sebanyak 100 mL yaitu dengan cara menimbang 10 gram bubuk $\text{Al}(\text{NO}_3)_3$ lalu dilarutkan dalam aquades 100 mL sehingga diperoleh larutan $\text{Al}(\text{NO}_3)_3$ 10%.

- 2) Pembuatan larutan Potassium Asetat $\text{CH}_3\text{CO}_2\text{K}$ 1 mol/L (1 M)

$$\text{CH}_3\text{CO}_2\text{K} \text{ 1 mol/L (1 M)} = \frac{\text{massa (gram)}}{\text{Massa Relatif (Mr)}} \times \frac{1000}{\text{Volume pelarut (mL)}}$$

$$\text{CH}_3\text{CO}_2\text{K} \text{ 1 mol/L (1 M)} = \frac{\text{massa (gram)}}{98} \times \frac{1000}{100}$$

$$\text{Massa (gram)} = \frac{9800}{1000}$$

$$\text{Massa (gram)} = 9,8$$

Maka, untuk membuat larutan Potassium Asetat $\text{CH}_3\text{CO}_2\text{K}$ 1 mol/L (1 M) sebanyak 100 mL yaitu dengan cara menimbang 9,8 gram bubuk Potassium Asetat $\text{CH}_3\text{CO}_2\text{K}$ lalu dilarutkan dalam aquades 100 mL sehingga diperoleh larutan Potassium Asetat $\text{CH}_3\text{CO}_2\text{K}$ 1 mol/L.

- 3) Pembuatan Larutan Natrium Karbonat Na_2CO_3 10%

$$\text{Na}_2\text{CO}_3 \text{ 10\%} = \frac{W \text{ (massa dalam gram)}}{\text{Volume pelarut (mL)}} \times 100\%$$

$$\text{Na}_2\text{CO}_3 \text{ 10\%} = \frac{W \text{ (massa dalam gram)}}{100 \text{ mL}} \times 100\%$$

$$W = 10 \text{ gram}$$

Maka, untuk membuat larutan Natrium Karbonat Na_2CO_3 10% sebanyak 100 mL yaitu dengan cara menimbang 10 gram bubuk Na_2CO_3 lalu dilarutkan dalam aquades 100 mL sehingga diperoleh larutan Natrium Karbonat Na_2CO_3 10%.

Lampiran I. Dokumentasi Kegiatan Penelitian

- 1) Penimbangan 500 g biji kopi
- 2) perendaman biji kopi selama 12 jam
- 3) Pencucian karbon aktif



- 4) Pembuatan air jenuh
- 5) Hasil pengukusan biji kopi dekafeinasi
- 6) Penjemuran kopi dekafe



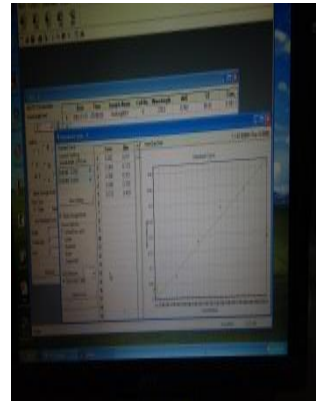
7) Penghalusan biji kopi



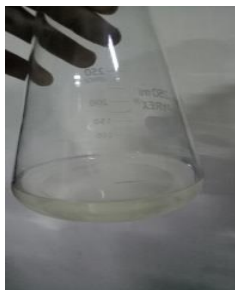
8) Penimbangan biji kopi



9) Penentuan kurva kafein



10) Ekstraksi kafein



11) Pengujian kafein



12) Pengujian kafein



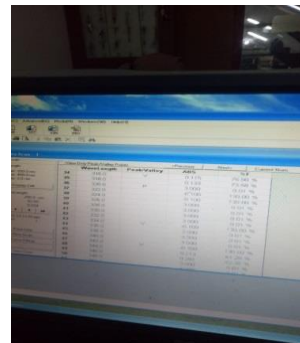
13) Maserasi sampel



14) Pengujian asam klorogenat



15) Pengujian flavonoid



16) Maserasi sampel selama 24 jam



17) Hasil pengeringan dengan evaporator



18) Pengukuran pH dan total asam



19) Pengujian flavonoid



20) Pengujian TPT



21) Pengujian fenolik

