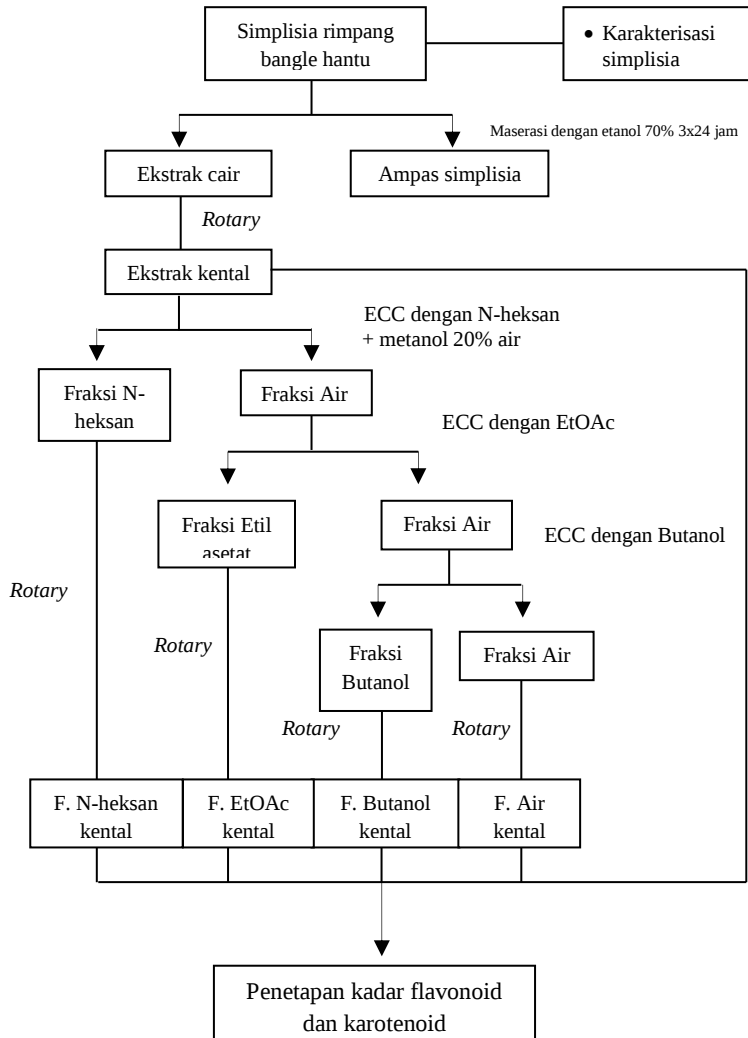


LAMPIRAN

Lampiran 1. Bagan Alir Kerja



Lampiran 2. Hasil Determinasi



INSTITUT TEKNOLOGI BANDUNG

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Nomor : 5600/11.CO2.2/PL/2018.
Hal : Determinasi tumbuhan

12 November 2018

Kepada Yth.
Ketua
Sekolah Tinggi Farmasi Bandung
Jalan Soekarno Hatta no. 754
Bandung

Memperhatikan surat permintaan Saudara dalam surat No. 1361/WKI-SI/XI/2018 tanggal 6 November 2018 mengenai determinasi tumbuhan, dengan ini kami sampaikan bahwa setelah dilakukan determinasi oleh staf kami, tumbuhan yang dibawa oleh Sdr. Raisy Ikrimah (NPM : 13171080), adalah :

- | | |
|----------------------|--|
| Divisi | : Magnoliophyta |
| Kelas | : Liliopsida (Monocots) |
| Anak kelas | : Zingiberidae |
| Bangsa | : Zingiberales |
| Nama suku / familia | : Zingiberaceae |
| Nama jenis / species | : <i>Zingiber ottensii</i> Valetton |
| Sinonim | : - |
| Nama umum | : Banglai hitam (Indonesia) |
| Buku acuan | : 1. Backer, C.A. & Bakhuizen van den Brink, Jr., R.C. 1968. Flora of Java. Volume. III. N.V.P. Noordhoff – Groningen, the Netherland. pp. 46. |
| | 2. Cronquist, A. 1981. An Integrated System of Classification of Flowering Plants. Columbia University Press, New York. pp. Xiii – Xviii. |
| | 3. Newman, M., Lhuillier, A., & Poulsen, A.D. 2004. Checklist of the Zingiberaceae of Malesia. BLUMEA Supplement. 16: 1 – 163. |

Demikian yang kami sampaikan. Atas perhatian dan kerjasama yang diberikan, kami ucapkan terima kasih.

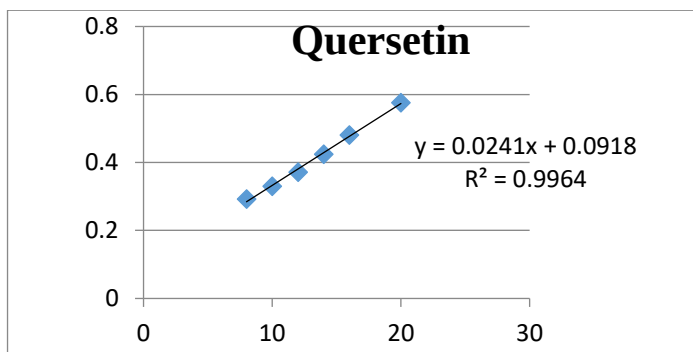


Tembusan :
Dekan SITH ITB, sebagai laporan

Lampiran 3. Penentuan Kurva Kalibrasi Quersetin

- Tabel absorbansi quersetin

Konsentrasi (ppm)	Absorbansi
8	0.293
10	0.330
12	0.372
14	0.425
16	0.481
20	0.576



Lampiran 4. Hasil Perhitungan Flavonoid

Sampel	Konsentrasi (ppm)	Absorbansi	X (µg/mL)	Volume baku (mL)	Bobot Ekstrak (mg)	Kadar flavonoid (mg QE/100 mg ekstrak)	Rata-rata (mg QE/100 mg ekstrak)
Ekstrak	3000	0,474	15,680	10	30	0,528	0.524
		0,476	15,760			0,525	
		0,472	15,600			0,520	
Fraksi n-heksan	1500	0,202	4,800	10	15	0,320	0.328
		0,209	5,080			0,339	
		0,204	4,880			0,325	
Fraksi etil asetat	1000	0,557	19,000	10	10	1,900	1.896
		0,557	19,000			1,900	
		0,554	18,880			1,888	
Fraksi Butanol	5000	0,388	12,240	10	50	0,245	0.245
		0,383	12,040			0,241	
		0,393	12,440			0,249	
Fraksi air	5000	0,224	5,680	10	50	0,114	0.114
		0,219	5,480			0,110	
		0,228	5,840			0,117	

Lampiran 5. Perhitungan Kadar Flavonoid

$$\text{Kadar flavonoid} : \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100$$

1. Ekstrak *Zingiber ottensi*

a. $y = 0,0241x + 0,0918$
 $x = \frac{0,474 - 0,082}{0,025} = 15,68 \text{ } \mu\text{g/mL}$

$$\text{kadar} = \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100$$

$$= \frac{\frac{15,68}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x 10}{30 \text{ (mg)}} \times 100$$

$$= 0,528 \text{ mgQE/100mg}$$

b. $y = 0,025x + 0,082$
 $x = \frac{0,476 - 0,082}{0,025} = 15,76 \text{ } \mu\text{g/mL}$

$$\text{kadar} = \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100$$

$$= \frac{\frac{15,76}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x 10}{30 \text{ (mg)}} \times 100$$

$$= 0,525 \text{ mgQE/100mg}$$

c. $y = 0,025x + 0,082$
 $x = \frac{0,472 - 0,082}{0,025} = 15,60 \text{ } \mu\text{g/mL}$

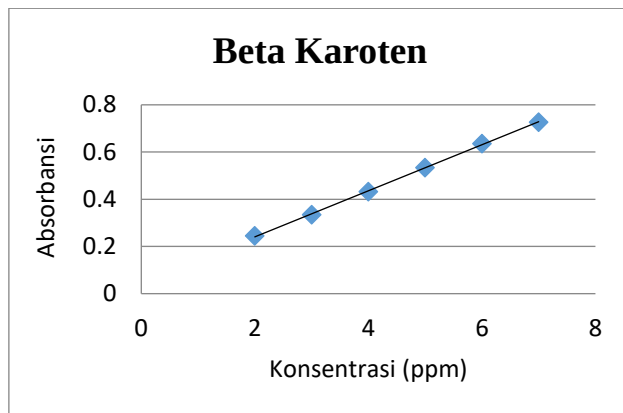
$$\text{kadar} = \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100$$

$$= \frac{\frac{15,6}{1000} \left(\frac{\text{mgQE}}{\text{mL}} \right) x 10}{30 \text{ (mg)}} \times 100$$

$$= 0,520 \text{ mgQE/100mg}$$

Lampiran 6. Baku Beta Karoten

Konsentrasi	Absorbansi
2	0.245
3	0.334
4	0.432
5	0.534
6	0.635
7	0.727



Lampiran 7. Hasil Perhitungan Karotenoid dengan Standar

Sampel	Konsentrasi (ppm)	Absorbansi	X (µg/mL)	Volume baku (mL)	Bobot Ekstrak (mg)	Kadar flavonoid (mg BE/100 mg ekstrak)	Rata-rata (mg BE/100 mg ekstrak)
Ekstrak	8000	0.839	8.131	10	80	0.102	0.103
		0.843	8.172			0.102	
		0.856	8.305			0.104	
Fraksi n-heksan	2000	0.352	3.141	10	20	0.157	0.157
		0.354	3.162			0.158	
		0.348	3.100			0.155	
Fraksi etil asetat	5000	0.838	8.121	10	50	0.162	0.162
		0.839	8.131			0.163	
		0.838	8.121			0.162	
Fraksi Butanol	2000	0.261	2.209	10	20	0.110	0.110
		0.263	2.230			0.111	
		0.261	2.209			0.110	
Fraksi air	8000	0.378	3.408	10	80	0.043	0.043
		0.381	3.439			0.043	
		0.376	3.387			0.042	

Lampiran 8. Hasil Perhitungan Karotenoid Tanpa Standar

Sampel	Konsentrasi (ppm)	Abs _{661.6}			Abs _{644.8}			Abs ₄₇₀		
		1	2	3	1	2	3	1	2	3
Ekstrak	8000	0.310	0.311	0.320	0.321	0.325	0.318	0.839	0.843	0.856
Fraksi N- Heksan	2000	0.292	0.295	0.291	0.274	0.274	0.269	0.352	0.354	0.348
Fraksi Etil Asetat	5000	0.201	0.201	0.203	0.204	0.205	0.203	0.838	0.839	0.838
Fraksi Butanol	2000	0.325	0.328	0.323	0.227	0.225	0.229	0.261	0.263	0.261
Fraksi Air	8000	0.270	0.276	0.273	0.271	0.273	0.272	0.378	0.381	0.376

Ca (µg/mL)			Cb (µg/mL)			Ck (µg/mL)			%			Rata- rata
1	2	3	1	2	3	1	2	3	1	2	3	
2.830	2.833	2.948	5.163	5.239	5.061	2.372	2.368	2.481	0.030	0.030	0.031	0.030
2.723	2.757	2.722	4.292	4.280	4.196	0.354	0.367	0.364	0.018	0.018	0.018	0.018
1.843	1.841	1.868	3.264	3.284	3.236	2.936	2.935	2.945	0.059	0.059	0.059	0.059
3.190	3.228	3.163	3.208	3.155	3.256	0.245	0.269	0.231	0.012	0.013	0.012	0.012
2.482	2.545	2.514	4.324	4.339	4.331	0.469	0.478	0.457	0.006	0.006	0.006	0.006

Lampiran 9. Perhitungan Karotenoid Tanpa Standar

Perhitungan karotenoid

$$\begin{aligned}
 C_a (\mu\text{g/mL}) &= 11.24 A_{661.6} - 2.04 A_{644.8} \\
 C_b (\mu\text{g/mL}) &= 20.13 A_{644.8} - 4.19 A_{661.6} \\
 C_k (\mu\text{g/mL}) &= (1000 A_{470} - 1.90 C_a - 63.14 C_b) / 214 \\
 \% C_k &= \frac{C_k \mu\text{g/mL} \times \text{vol baku}}{\text{bobot sampel}} \times 100 \%
 \end{aligned}$$

$$C_a (\mu\text{g/mL}) = 11.24 A_{661.6} - 2.04 A_{644.8}$$

$$C_b (\mu\text{g/mL}) = 20.13 A_{644.8} - 4.19 A_{661.6}$$

$$C_k (\mu\text{g/mL}) = (1000 A_{470} - 1.90 C_a - 63.14 C_b) / 214$$

Ekstrak

$$\text{a. } C_a (\mu\text{g/mL}) = (11.24 \times 0.310) - (2.04 \times 0.321) = 2.830$$

$$C_b (\mu\text{g/mL}) = (20.13 \times 0.321) - (4.19 \times 0.310) = 5.163$$

$$C_k (\mu\text{g/mL}) = \frac{(1000 \times 0.839) - (1.90 \times 2.830) - (63.14 \times 5.163)}{214} = 2.372$$

$$\% C_k = \frac{C_k \mu\text{g/mL} \times \text{vol baku}}{\text{bobot sampel}} \times 100 \%$$

$$= \frac{2.372 \mu\text{g/mL} \times 5 \text{ mL}}{40000 \mu\text{g}} \times 100\% = 0.030 \%$$

$$\text{b. } C_a (\mu\text{g/mL}) = (11.24 \times 0.311) - (2.04 \times 0.325) = 2.833$$

$$C_b (\mu\text{g/mL}) = (20.13 \times 0.325) - (4.19 \times 0.311) = 5.239$$

$$C_k (\mu\text{g/mL}) = \frac{(1000 \times 0.843) - (1.90 \times 2.833) - (63.14 \times 5.239)}{214} = 2.368$$

$$\% C_k = \frac{C_k \mu\text{g/mL} \times \text{vol baku}}{\text{bobot sampel}} \times 100 \%$$

$$= \frac{2.368 \mu\text{g/mL} \times 5 \text{ mL}}{40000 \mu\text{g}} \times 100\% = 0.030 \%$$

$$\text{c. } C_a (\mu\text{g/mL}) = (11.24 \times 0.320) - (2.04 \times 0.318) = 2.948$$

$$C_b (\mu\text{g/mL}) = (20.13 \times 0.318) - (4.19 \times 0.320) = 5.061$$

$$C_k (\mu\text{g/mL}) = \frac{(1000 \times 0.856) - (1.90 \times 2.948) - (63.14 \times 5.061)}{214} = 2.481$$

$$\begin{aligned} \% C_k &= \frac{C_k \mu\text{g/mL} \times \text{vol baku}}{\text{bobot sampel}} \times 100 \% \\ &= \frac{2.481 \mu\text{g/mL} \times 5 \text{ mL}}{40000 \mu\text{g}} \times 100\% = 0.031 \% \end{aligned}$$

Lampiran 10. Perhitungan Kadar Karotenoid dengan Standar Beta Karoten

$$\text{Kadar karotenoid : } \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100$$

Ekstrak

$$\begin{aligned} \text{a. } y &= 0.0976x + 0.0454 \\ x &= \frac{0.839 - 0.045}{0.0976} = 8.131 \mu\text{g/mL} \end{aligned}$$

$$\begin{aligned} \text{kadar} &= \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100 \\ &= \frac{\frac{8.131}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times 10}{80 \text{ (mg)}} \times 100 \\ &= 0.102 \text{ mgBE/100mg} \end{aligned}$$

$$\begin{aligned} \text{b. } y &= 0.0976x + 0.0454 \\ x &= \frac{0.843 - 0.0454}{0.0976} = 8.172 \mu\text{g/mL} \end{aligned}$$

$$\begin{aligned} \text{kadar} &= \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100 \\ &= \frac{\frac{8.172}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times 10}{80 \text{ (mg)}} \times 100 \\ &= 0.102 \text{ mgBE/100mg} \end{aligned}$$

$$\text{c. } y = 0.0976x + 0.0454$$

$$x = \frac{0,856 - 0,0454}{0,0976} = 8,305 \text{ } \mu\text{g/mL}$$

$$\text{kadar} = \frac{\frac{\text{Sampel ekuivalen}}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times V_{\text{total}}}{\text{Bobot sampel (mg)}} \times 100$$

$$= \frac{\frac{8,305}{1000} \left(\frac{\text{mgBE}}{\text{mL}} \right) \times 10}{80 \text{ (mg)}} \times 100$$

$$= 0,104 \text{ mgBE/100mg}$$

Lampiran 11. Korelasi antara senyawa flavonoid dan karotenoid dengan aktivitas antioksidan

		Correlations		
		flavonoid	karotenoid	antioksidan
flavonoid	Pearson Correlation	1	.973**	-.834*
	Sig. (2-tailed)		.005	.039
	N	5	5	5
karotenoid	Pearson Correlation	.973**	1	-.829*
	Sig. (2-tailed)	.005		.043
	N	5	5	5
antioksidan	Pearson Correlation	-.834*	-.829*	1
	Sig. (2-tailed)	.039	.043	
	N	5	5	5

**. Correlation is significant at the 0.01 level (2-tailed).

Lampiran 12. Perhitungan IC₅₀ Rimpang *Zingiber Ottensii*

Sa mp el	Kons. (µg/ mL)	Abs. DPP H	Absorbansi			A			T			% Inhibisi			IC ₅₀			Rata- rata IC ₅₀
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Ekstrak	250	0,075	0,240	0,243	0,243	0,165	0,168	0,168	31,60	32,07	32,07	68,4	67,93	67,93	549,88	548,63	546,61	548,37
	400		0,319	0,320	0,323	0,244	0,245	0,248	42,98	43,11	43,50	57,02	56,89	56,5				
	550		0,403	0,400	0,401	0,328	0,325	0,326	53,01	52,68	52,79	46,99	47,36	47,21				
	700		0,447	0,448	0,450	0,372	0,373	0,375	57,53	57,63	57,83	42,47	42,37	42,17				
	850		0,531	0,529	0,529	0,456	0,454	0,454	65,00	64,84	64,84	35	35,16	35,16				
Fraksi n- heksana	300	0,079	0,268	0,271	0,274	0,189	0,192	0,195	35,28	35,73	36,17	64,72	64,27	63,83	447,90	447,28	445,60	446,93
	400		0,354	0,352	0,352	0,275	0,273	0,273	46,91	46,66	46,66	53,09	53,34	53,34				
	500		0,423	0,422	0,422	0,344	0,343	0,343	54,71	54,60	54,60	45,29	45,4	45,4				
	600		0,532	0,532	0,534	0,453	0,453	0,455	64,76	64,76	64,92	35,24	35,24	35,08				
	700		0,635	0,638	0,634	0,556	0,559	0,555	72,20	72,39	72,13	27,8	27,61	27,87				
Fraksi Etil asetat	50	0,079	0,255	0,256	0,257	0,176	0,177	0,178	33,31	33,47	33,62	66,69	66,53	66,38	98,26	97,77	97,67	97,90
	80		0,347	0,347	0,350	0,268	0,268	0,271	46,04	46,04	46,42	53,96	53,96	53,58				
	110		0,429	0,430	0,431	0,350	0,351	0,352	55,33	55,43	55,53	44,67	44,57	44,47				
	140		0,516	0,515	0,517	0,437	0,436	0,438	63,44	63,35	63,52	36,56	36,47	36,48				
	170		0,593	0,592	0,587	0,514	0,513	0,508	69,38	69,30	68,95	30,62	30,07	31,05				

Lampiran 12. Perhitungan IC₅₀ Rimpang *Zingiber Ottensii* (Lanjutan)

Sa mp el	Kons. (µg/ mL)	Abs. DPPH	Absorbansi			A			T			% Inhibisi			IC ₅₀			Rata -rata IC ₅₀
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
Fraksi Butanol	200	0,093	0,243	0,246	0,248	0,150	0,153	0,155	29,20	29,69	30,01	70,8	70,31	69,99	427,06	426,32	425,45	426,28
	300		0,323	0,322	0,322	0,230	0,229	0,229	41,11	40,97	40,97	58,89	59,03	59,03				
	400		0,379	0,381	0,382	0,286	0,288	0,289	48,32	48,47	48,59	51,77	51,53	51,41				
	500		0,463	0,465	0,463	0,370	0,372	0,370	57,34	57,53	57,34	42,66	42,47	42,66				
	600		0,523	0,520	0,521	0,430	0,427	0,428	62,84	62,58	62,67	37,16	37,42	37,33				
Fraksi Air	500	0,075	0,311	0,320	0,321	0,236	0,245	0,246	41,92	43,11	43,24	58,08	56,89	56,76	853,34	826,54	825,92	835,27
	800		0,357	0,360	0,358	0,282	0,285	0,283	47,76	48,11	47,88	52,24	51,89	52,12				
	1100		0,444	0,445	0,448	0,369	0,370	0,373	57,24	57,34	57,63	42,76	42,66	42,37				
	1700		0,577	0,577	0,578	0,502	0,502	0,503	68,52	68,52	68,59	31,48	31,48	31,41				
	2000		0,685	0,683	0,681	0,610	0,608	0,606	75,45	75,33	75,22	24,55	24,67	24,78				