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## LAMPIRAN

### Lampiran 1. Hasil Kadar Biokimia, Parameter Pertumbuhan dan Tempat Tumbuh

Tabel 5. Rata-rata Kadar Biokimia, Parameter Pertumbuhan dan Tempat Tumbuh pada Empat Jenis Sampel

Species	Biokimia			Parameter Pertumbuhan			Parameter Lingkungan		
	Tannins	Flavonoid	Polifenol	Diameter (m)	Tinggi (m)	Umur	Kelembaban (%)	Suhu (°c)	Elevasi (mdpl)
<i>P. merkusii</i>	2.6156	3.4892	0.0562	0.53	6.67	90	62.17	22.84	1,386
<i>Pinus sp.</i>	2.0436	4.1806	0.0094	0.46	10.48	90	67.33	20.33	1,349
<i>C. equisetifolia</i>	0.9116	4.7713	0.0059	0.35	13.3	50	68	26	2.5
<i>G. rumphianum</i>	0.4011	3.8884	0.0049	0.41	20.13	80	68.17	38	1,030

Tabel 6. Total Kadar Biokimia *P. merkusii*

Species	Biokimia			Parameter Pertumbuhan			Parameter Lingkungan		
	Tanin	Flavonoid	Polifenol	Tinggi (m)	Diameter (m)	Umur	Kelembaban (°c)	Elevasi (mdpl)	Suhu (°c)
<i>P. merkusii_1</i>	4.6846	2.9440	0.2797	7.65	0.44	90	62	1,359	22
<i>P. merkusii_2</i>	2.9741	5.7451	0.0142	6.64	0.19	90	62	1,359	22
<i>P. merkusii_3</i>	0.5877	4.1459	0.0143	19.74	0.30	90	69	1,364	20
<i>P. merkusii_4</i>	0.4846	4.3339	0.0089	7.41	0.47	90	69	1,364	20
<i>P. merkusii_5</i>	5.7344	2.4777	0.0123	9.66	0.63	90	62	1,332	22
<i>P. merkusii_6</i>	1.2280	1.2887	0.0078	11.79	0.72	90	80	1,315	16
<b>Rata-rata</b>	<b>2.6156</b>	<b>3.4892</b>	<b>0.0562</b>	<b>10.48</b>	<b>0.46</b>	<b>90</b>	<b>67.33</b>	<b>1,349</b>	<b>20.33</b>

Tabel 7. Total Kadar Biokimia *Pinus* sp.

Species	Biokimia			Parameter Pertumbuhan			Parameter Lingkungan		
	Tanin	Flavonoid	Polifenol	Tinggi (m)	Diameter (m)	Umur	Kelembaban (°c)	Elevasi (mdpl)	Suhu (°c)
<i>Pinus</i> sp._1	4.7303	2.0706	0.0223	9.97	0.61	90	75	1,381	18
<i>Pinus</i> sp._2	2.1943	5.6991	0.0145	11.2	0.72	90	62	1,380	21
<i>Pinus</i> sp._3	0.9421	8.8905	0.0057	12.1	0.72	90	62	1,378	21
<i>Pinus</i> sp._4	1.7213	1.9474	0.0031	6.9	0.43	90	36	1,393	21
<i>Pinus</i> sp._5	1.3569	2.2955	0.0073	6.7	0.35	90	69	1,391	21
<i>Pinus</i> sp._6	1.3165	4.4473	0.0032	6.4	0.33	90	69	1,395	21
<b>Rata-rata</b>	<b>2.0436</b>	<b>4.1806</b>	<b>0.0094</b>	<b>6.67</b>	<b>0.53</b>	<b>90</b>	<b>62.17</b>	<b>1,386</b>	<b>20.50</b>

Tabel 8. Total Kadar Biokimia *C. equisetifolia*.

Species	Biokimia			Parameter Pertumbuhan			Parameter Lingkungan		
	Tanin	Flavonoid	Polifenol	Tinggi (m)	Diameter (m)	Umur	Kelembaban (°c)	Elevasi (mdpl)	Suhu (°c)
<i>C. equisetifolia</i> _1	0.3948	2.1037	0.0195	14.47	0.39	50	68	4	26
<i>C. equisetifolia</i> _2	2.7245	1.0598	0.0057	11.66	0.29	50	68	3	26
<i>C. equisetifolia</i> _3	1.0643	4.5485	0.0025	14.92	0.29	50	68	2	26
<i>C. equisetifolia</i> _4	0.0517	7.7492	0.0032	14.21	0.35	50	68	2	26
<i>C. equisetifolia</i> _5	1.0883	9.7107	0.0026	10.71	0.4	50	68	2	26
<i>C. equisetifolia</i> _6	0.6257	3.4557	0.0021	13.8	0.39	50	68	2	26
<b>Rata-rata</b>	<b>0.9916</b>	<b>4.7713</b>	<b>0.0059</b>	<b>13.30</b>	<b>0.35</b>	<b>50</b>	<b>68</b>	<b>2.5</b>	<b>26.00</b>



Tabel 9. Total Kadar Biokimia *G. rumphianum*

Species	Biokimia			Parameter Pertumbuhan			Parameter Lingkungan		
	Tanin	Flavonoid	Polifenol	Tinggi (meter)	Diameter (m)	Umur	Kelembaban (°c)	Elevasi (mdpl)	Suhu (°c)
<i>G. rumphianum_1</i>	0.6096	2.8927	0.0009	27.53	0.58	80	79	1,302	23
<i>G. rumphianum_2</i>	0.6405	7.0532	0.0071	28.95	0.54	80	72	1,352	23
<i>G. rumphianum_3</i>	0.7669	1.1240	0.0054	12.59	0.25	80	72	1,342	23
<i>G. rumphianum_4</i>	0.2364	5.5929	0.0054	13.4	0.22	80	62	700	53
<i>G. rumphianum_5</i>	0.1162	4.9292	0.0053	19.52	0.56	80	62	732	53
<i>G. rumphianum_6</i>	0.0369	1.7383	0.0055	18.8	0.33	80	62	750	53
<b>Rata-rata</b>	<b>0.4011</b>	<b>3.8884</b>	<b>0.0049</b>	<b>20.13</b>	<b>0.41</b>	<b>80</b>	<b>68.17</b>	<b>1,030</b>	<b>38</b>

## Lampiran 2. Nilai Analisis *Matrix Corelation* dan *Eigenvectors*

Tabel 10. *Eigenanalysis* of the Correlation Matrix

<i>Eigenvalue</i>	2.8592	1.6051	1.2591	1.0263	0.8845	0.6453	0.3928	0.3206	0.0069
<i>Proportion</i>	0.318	0.178	0.140	0.114	0.098	0.072	0.044	0.036	0.001
<i>Cumulative</i>	0.318	0.496	0.636	0.750	0.848	0.920	0.964	0.999	1.000

Tabel 11. *Eigenvectors*

Variable	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
tanin	0.428	-0.264	0.275	0.048	0.183	0.281	0.314	-0.676	0
flavonoid	-0.174	0.158	-0.163	0.824	0.194	-0.359	0.192	-0.187	0.002
polifenol	0.270	-0.301	0.140	-0.062	0.751	-0.333	-0.199	0.314	-0.004
Tinggi (meter)	-0.273	0.518	-0.039	-0.251	0.397	0.039	-0.432	-0.485	-0.106
Diameter (m)	0.259	0.467	0.084	0.284	0.237	0.644	0.048	0.39	0.049
Umur	0.476	0.233	-0.406	-0.128	-0.065	-0.195	0.164	0.014	-0.685
Kelembaban (°c)	-0.089	0.426	0.589	-0.240	0.015	-0.350	0.523	0.101	0.004
Elevasi (mdpl)	0.490	0.292	-0.277	-0.111	-0.110	-0.274	-0.060	-0.096	0.697
Suhu (°c)	-0.312	-0.086	-0.530	-0.292	0.366	0.172	0.576	0.038	0.178

### Lampiran 3. Perhitungan Nilai He

Tabel 12. Penentuan Nilai Heterozigositas He Masing-masing Sampel

<i>P. merkusii</i>	Karakter	qi	pi	qi <sup>2</sup>	Pi <sup>2</sup>	He
	Tanin < 2	0.71	0.29	0.50	0.09	0.41
	Tanin 2 - 4	0.41	0.59	0.17	0.35	0.48
	Tanin > 4	0.58	0.42	0.33	0.18	0.49
	Flavonoid < 4	0.41	0.59	0.17	0.35	0.48
	Flavonoid 4 - 8	0.91	0.09	0.83	0.01	0.16
	Flavonoid > 8	0.00	0.00	0.00	0.00	0.00
	Polifenol < 0.050	0.00	0.00	0.00	0.00	0.00
	Polifenol 0.050 - 0.100	0.58	0.42	0.33	0.18	0.49
	Polifenol > 0.100	0.82	0.18	0.67	0.03	0.30
	Tinggi < 10	0.82	0.18	0.67	0.03	0.30
	Tinggi 10 -20	0.58	0.42	0.33	0.18	0.49
	Tinggi > 20	0.00	0.00	0.00	0.00	0.00
	Diameter < 20	0.41	0.59	0.17	0.35	0.48
	Diameter 20 - 40	0.41	0.59	0.17	0.35	0.48
	Diameter > 40	0.82	0.18	0.67	0.03	0.30
<b>Total He</b>						<b>0.32</b>
<i>Pinus sp.</i>	Karakter	qi	pi	qi <sup>2</sup>	Pi <sup>2</sup>	He
	Tanin 2 - 4	0.41	0.59	0.17	0.35	0.48
	Tanin > 4	0.41	0.59	0.17	0.35	0.48
	Flavonoid < 4	0.71	0.29	0.50	0.09	0.41
	Flavonoid 4 - 8	0.58	0.42	0.33	0.18	0.49
	Flavonoid > 8	0.41	0.59	0.17	0.35	0.48
	Polifenol < 0.050	0.58	0.42	0.33	0.18	0.49
	Polifenol 0.050 - 0.100	0.58	0.42	0.33	0.18	0.49
	Polifenol > 0.100	0.58	0.42	0.33	0.18	0.49
	Tinggi < 10	0.82	0.18	0.67	0.03	0.30
	Tinggi 10 -20	0.58	0.42	0.33	0.18	0.49
	Tinggi > 20	0.00	0.00	0.00	0.00	0.00
	Diameter < 20	0.00	0.00	0.00	0.00	0.00
	Diameter 20 - 40	0.58	0.42	0.33	0.18	0.49
	Diameter > 40	0.82	0.18	0.67	0.03	0.30
<b>Total He</b>						<b>0.39</b>

<i>C. equisetifolia</i>	Karakter	qi	pi	qi <sup>2</sup>	Pi <sup>2</sup>	He
	Tanin 2 - 4	0.41	0.59	0.17	0.35	0.48
	Tanin > 4	0.00	0.00	0.00	0.00	0.00
	Flavonoid < 4	0.71	0.29	0.50	0.09	0.41
	Flavonoid 4 - 8	0.58	0.42	0.33	0.18	0.49
	Flavonoid > 8	0.41	0.59	0.17	0.35	0.48
	Polifenol < 0.050	0.82	0.18	0.67	0.03	0.30
	Polifenol 0.050 - 0.100	0.41	0.59	0.17	0.35	0.48
	Polifenol > 0.100	0.41	0.59	0.17	0.35	0.48
	Tinggi < 10	0.00	0.00	0.00	0.00	0.00
	Tinggi 10 -20	1.00	0.00	1.00	0.00	0.00
	Tinggi > 20	0.00	0.00	0.00	0.00	0.00
	Diameter < 20	0.00	0.00	0.00	0.00	0.00
	Diameter 20 - 40	1.00	0.00	1.00	0.00	0.00
	Diameter > 40	0.00	0.00	0.00	0.00	0.00
<b>Total He</b>						<b>0.45</b>
<i>G. rumphianum</i>	Karakter	qi	pi	qi <sup>2</sup>	Pi <sup>2</sup>	He
	Tanin 2 - 4	0.00	0.00	0.00	0.00	0.00
	Tanin > 4	0.00	0.00	0.00	0.00	0.00
	Flavonoid < 4	0.71	0.29	0.50	0.09	0.41
	Flavonoid 4 - 8	0.71	0.29	0.50	0.09	0.41
	Flavonoid > 8	0.00	0.00	0.00	0.00	0.00
	Polifenol < 0.050	0.41	0.59	0.17	0.35	0.48
	Polifenol 0.050 - 0.100	0.91	0.09	0.83	0.01	0.16
	Polifenol > 0.100	0.00	0.00	0.00	0.00	0.00
	Tinggi < 10	0.00	0.00	0.00	0.00	0.00
	Tinggi 10 -20	0.82	0.18	0.67	0.03	0.30
	Tinggi > 20	0.58	0.42	0.33	0.18	0.49
	Diameter < 20	0.41	0.59	0.17	0.35	0.48
	Diameter 20 - 40	0.58	0.42	0.33	0.18	0.49
	Diameter > 40	0.71	0.29	0.50	0.09	0.41
<b>Total He</b>						<b>0.39</b>

#### Lampiran 4. Perhitungan Jarak Genetik

Tabel 13. *P. merkusii* vs *Pinus* sp.

Karakter	x	y	xy	x <sup>2</sup>	y <sup>2</sup>
Tanin < 2	0.71	0.82	0.58	0.50	0.67
Tanin 2 - 4	0.41	0.41	0.17	0.17	0.17
Tanin > 4	0.58	0.41	0.24	0.33	0.17
Flavonoid < 4	0.41	0.71	0.29	0.17	0.50
Flavonoid 4 - 8	0.91	0.58	0.53	0.83	0.33
Flavonoid > 8	0.00	0.41	0.00	0.00	0.17
Polifenol < 0.050	0.00	0.58	0.00	0.00	0.33
Polifenol 0.050 - 0.100	0.58	0.58	0.33	0.33	0.33
Polifenol > 0.100	0.82	0.58	0.47	0.67	0.33
Tinggi < 10	0.82	0.82	0.67	0.67	0.67
Tinggi 10 -20	0.58	0.58	0.33	0.33	0.33
Tinggi > 20	0.00	0.00	0.00	0.00	0.00
Diameter < 20	0.41	0.00	0.00	0.17	0.00
Diameter 20 - 40	0.41	0.58	0.24	0.17	0.33
Diameter > 40	0.82	0.82	0.67	0.67	0.67
<b>Total</b>			<b>4.50</b>	<b>5.00</b>	<b>5.00</b>

Keterangan:

*P. merkusii* : x

*Pinus* sp. : y

Tabel 14. *C. equisetifolia* vs *G. rumphianum*

Karakter	x	y	xy	x <sup>2</sup>	y <sup>2</sup>
Tanin < 2	0.91	1.00	0.91	0.83	1.00
Tanin 2 - 4	0.41	0.00	0.00	0.17	0.00
Tanin > 4	0.00	0.00	0.00	0.00	0.00
Flavonoid < 4	0.71	0.71	0.50	0.50	0.50
Flavonoid 4 - 8	0.58	0.71	0.41	0.33	0.50
Flavonoid > 8	0.41	0.00	0.00	0.17	0.00
Polifenol < 0.050	0.82	0.41	0.33	0.67	0.17
Polifenol 0.050 - 0.100	0.41	0.91	0.37	0.17	0.83
Polifenol > 0.100	0.41	0.00	0.00	0.17	0.00
Tinggi < 10	0.00	0.00	0.00	0.00	0.00
Tinggi 10 -20	1.00	0.82	0.82	1.00	0.67
Tinggi > 20	0.00	0.58	0.00	0.00	0.33
Diameter < 20	0.00	0.41	0.00	0.00	0.17

Diameter 20 - 40	1.00	0.58	0.58	1.00	0.33
Diameter > 40	0.00	0.71	0.00	0.00	0.50
<b>Total</b>			<b>3.92</b>	<b>5.00</b>	<b>5.00</b>

Keterangan:

*C. equisetifolia* :  $x$

*G. rumphianum* :  $y$

Tabel 15. *P. merkusii* vs *C. equisetifolia*

Karakter	$x$	$y$	$xy$	$x^2$	$y^2$
Tanin < 2	0.71	0.91	0.65	0.50	0.83
Tanin 2 - 4	0.41	0.41	0.17	0.17	0.17
Tanin > 4	0.58	0.00	0.00	0.33	0.00
Flavonoid < 4	0.41	0.71	0.29	0.17	0.50
Flavonoid 4 - 8	0.91	0.58	0.53	0.83	0.33
Flavonoid > 8	0.00	0.41	0.00	0.00	0.17
Polifenol < 0.050	0.00	0.82	0.00	0.00	0.67
Polifenol 0.050 - 0.100	0.58	0.41	0.24	0.33	0.17
Polifenol > 0.100	0.82	0.41	0.33	0.67	0.17
Tinggi < 10	0.82	0.00	0.00	0.67	0.00
Tinggi 10 -20	0.58	1.00	0.58	0.33	1.00
Tinggi > 20	0.00	0.00	0.00	0.00	0.00
Diameter < 20	0.41	0.00	0.00	0.17	0.00
Diameter 20 - 40	0.41	1.00	0.41	0.17	1.00
Diameter > 40	0.82	0.67	0.54	0.67	0.00
<b>Total</b>			<b>3.73</b>	<b>5.00</b>	<b>5.00</b>

Keterangan:

*P. merkusii* :  $x$

*C. equisetifolia* :  $y$

Tabel 16. *P. merkusii* vs *G. rumphianum*

Karakter	$x$	$y$	$xy$	$x^2$	$y^2$
Tanin < 2	0.71	1.00	0.71	0.50	1.00
Tanin 2 - 4	0.41	0.00	0.00	0.17	0.00
Tanin > 4	0.58	0.00	0.00	0.33	0.00
Flavonoid < 4	0.41	0.71	0.29	0.17	0.50
Flavonoid 4 - 8	0.91	0.71	0.65	0.83	0.50
Flavonoid > 8	0.00	0.00	0.00	0.00	0.00

Polifenol < 0.050	0.00	0.41	0.00	0.00	0.17
Polifenol 0.050 - 0.100	0.58	0.91	0.53	0.33	0.83
Polifenol > 0.100	0.82	0.00	0.00	0.67	0.00
Tinggi < 10	0.82	0.00	0.00	0.67	0.00
Tinggi 10 -20	0.58	0.82	0.47	0.33	0.67
Tinggi > 20	0.00	0.58	0.00	0.00	0.33
Diameter < 20	0.41	0.41	0.17	0.17	0.17
Diameter 20 - 40	0.41	0.58	0.24	0.17	0.33
Diameter > 40	0.82	0.71	0.58	0.67	0.50
<b>Total</b>			<b>3.62</b>	<b>5.00</b>	<b>5.00</b>

Keterangan:

*P. merkusii* :  $x$

*G. rumphianum* :  $y$

Tabel 17. *Pinus* sp. vs *C. equisetifolia*

Karakter	x	y	xy	x <sup>2</sup>	y <sup>2</sup>
Tanin < 2	0.82	0.91	0.75	0.67	0.83
Tanin 2 - 4	0.41	0.41	0.17	0.17	0.17
Tanin > 4	0.41	0.00	0.00	0.17	0.00
Flavonoid < 4	0.71	0.71	0.50	0.50	0.50
Flavonoid 4 - 8	0.58	0.58	0.33	0.33	0.33
Flavonoid > 8	0.41	0.41	0.17	0.17	0.17
Polifenol < 0.050	0.58	0.82	0.47	0.33	0.67
Polifenol 0.050 - 0.100	0.58	0.41	0.24	0.33	0.17
Polifenol > 0.100	0.58	0.41	0.24	0.33	0.17
Tinggi < 10	0.82	0.00	0.00	0.67	0.00
Tinggi 10 -20	0.58	1.00	0.58	0.33	1.00
Tinggi > 20	0.00	0.00	0.00	0.00	0.00
Diameter < 20	0.00	0.00	0.00	0.00	0.00
Diameter 20 - 40	0.58	1.00	0.58	0.33	1.00
Diameter > 40	0.82	0.67	0.54	0.67	0.00
<b>Total</b>			<b>4.55</b>	<b>5.00</b>	<b>5.00</b>

Keterangan:

*Pinus* sp. :  $x$

*C. equisetifolia* :  $y$

Tabel 18. *Pinus* sp. vs *G. rumphianum*

Karakter	x	y	xy	x <sup>2</sup>	y <sup>2</sup>
Tanin < 2	0.82	1.00	0.82	0.67	1.00
Tanin 2 - 4	0.41	0.00	0.00	0.17	0.00
Tanin > 4	0.41	0.00	0.00	0.17	0.00
Flavonoid < 4	0.71	0.71	0.50	0.50	0.50
Flavonoid 4 - 8	0.58	0.71	0.41	0.33	0.50
Flavonoid > 8	0.41	0.00	0.00	0.17	0.00
Polifenol < 0.050	0.58	0.41	0.24	0.33	0.17
Polifenol 0.050 - 0.100	0.58	0.91	0.53	0.33	0.83
Polifenol > 0.100	0.58	0.00	0.00	0.33	0.00
Tinggi < 10	0.82	0.00	0.00	0.67	0.00
Tinggi 10 -20	0.58	0.82	0.47	0.33	0.67
Tinggi > 20	0.00	0.58	0.00	0.00	0.33
Diameter < 20	0.00	0.41	0.00	0.00	0.17
Diameter 20 - 40	0.58	0.58	0.33	0.33	0.33
Diameter > 40	0.82	0.71	0.58	0.67	0.50
<b>Total</b>			<b>3.87</b>	<b>5.00</b>	<b>5.00</b>

Keterangan:

*Pinus* sp. : x

*G. rumphianum* : y

**Lampiran 5.** Dokumentasi Penelitian



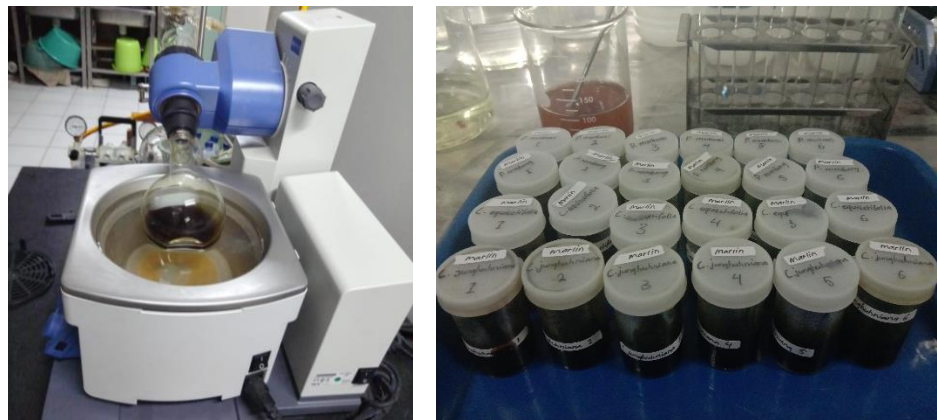
Gambar 11. Pengambilan Sampel; a) *C. equisetifolia*, b) *P. merkusii*



Gambar 12. Sampel Kering Diekstraksi dengan Pelarut Etanol 96%

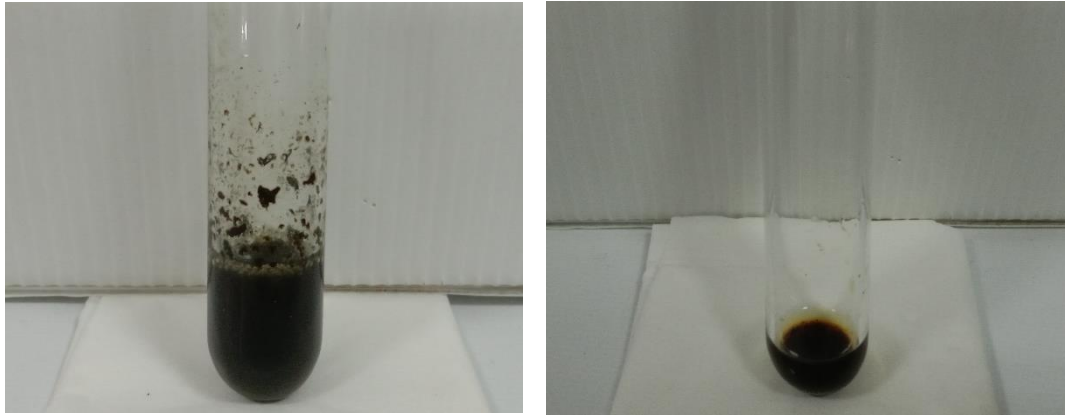


Gambar 13. Sampel Hasil Ekstraksi

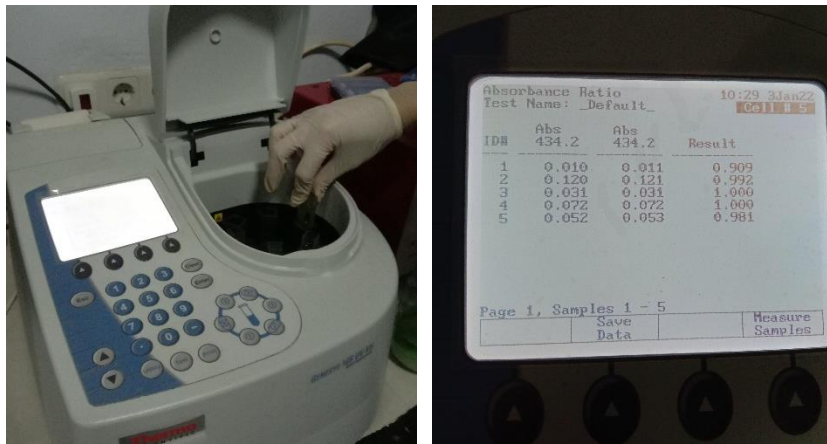


Gambar 14. Hasil Ekstraksi dipekatkan dengan Rotary evaporator





Gambar 15. Screening Metabolit Sekunder



Gambar 16. Penentuan Nilai Adsorban dan Penetapan Kadar Biokimia Menggunakan Spectrofotometer Uv-Vis