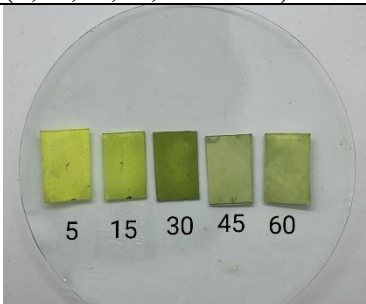
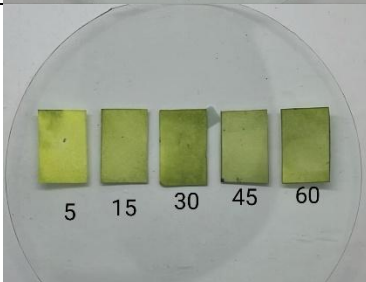
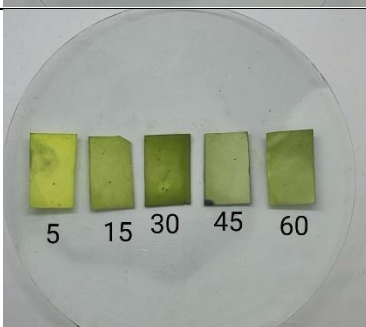


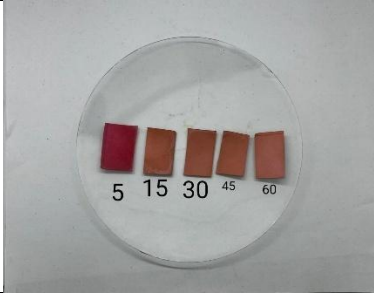
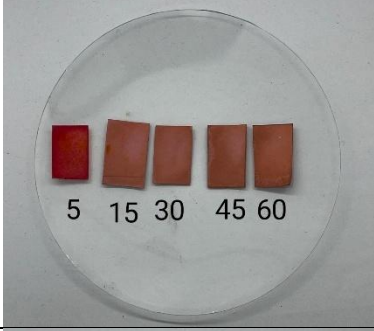
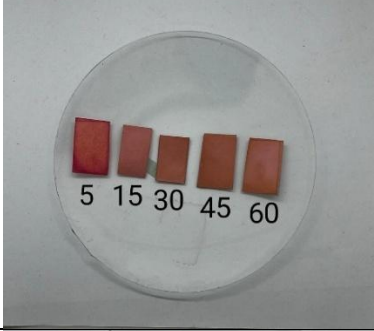
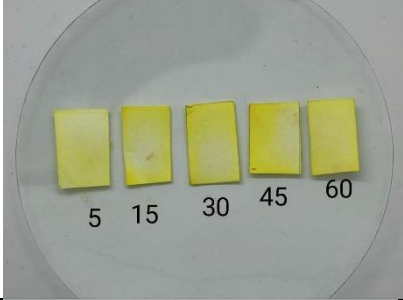
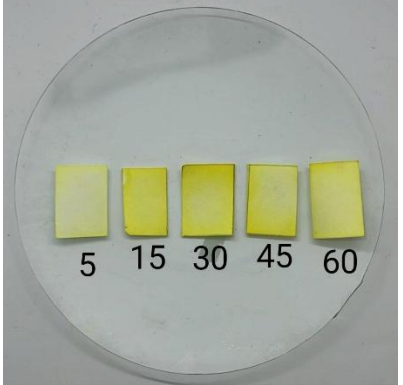
LAMPIRAN

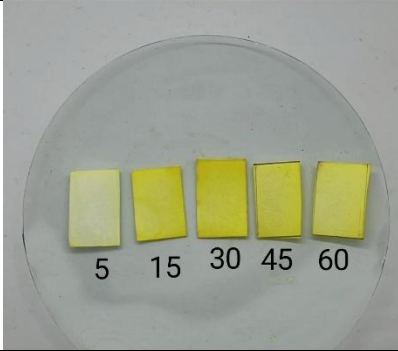
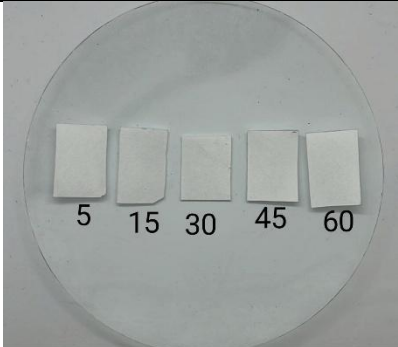
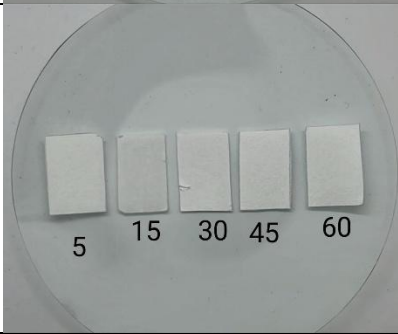
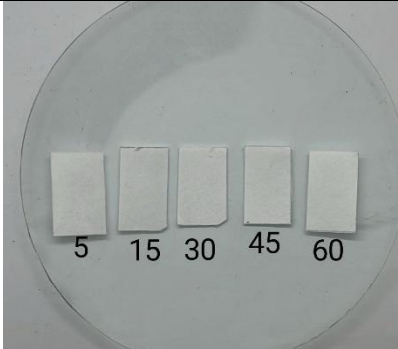
Lampiran 1 Perhitungan Preparasi

- a) Preparasi Reagen Lieberman 1M:
 Pengenceran H_2SO_4 18 M menjadi 1M sebanyak 10 ml
 $M_1 \cdot V_1 = M_2 \cdot V_2$
 $18 \cdot V_1 = 1 \cdot 10 \text{ ml}$
 $V_1 = \frac{10}{18}$
 $= 0,5 \text{ ml } \text{H}_2\text{SO}_4 / 10 \text{ ml akuades.}$
- b) Preparasi pembanding standar parasetamol 500 ppm
 Dibuat konsentrasi 500 ppm sebanyak 25 ml
 $\text{Massa zat terlarut} = \frac{500 \text{ mg}}{1000 \text{ ml}} \times 25 \text{ ml}$
 $= 12,5 \text{ mg} / 25 \text{ ml pelarut etanol}$
- c) Preparasi larutan sampel jamu pegal linu 500 ppm
 $\text{Massa zat terlarut} = \frac{500 \text{ mg}}{1000 \text{ ml}} \times 25 \text{ ml}$
 $= 12,5 \text{ mg} / 25 \text{ ml pelarut etanol}$

Lampiran 2 Uji Waktu Respon

No	Reagen yang digunakan	Replikasi	Strip tes setelah direaksikan (5,15,30,45, 60 menit)
1.	Folin Ciocalteu	1	
		2	
		3	

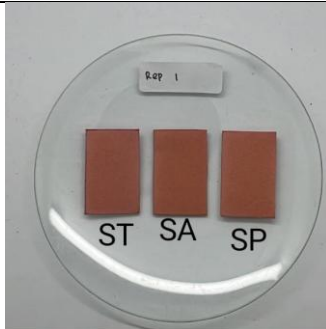
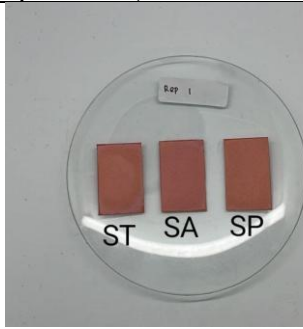
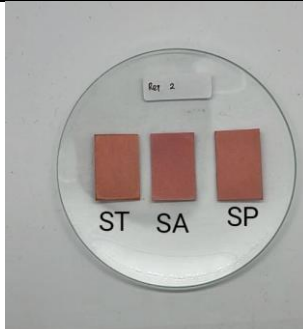
2.	Metil Merah	1		
		2		
		3		
3.	FeCl_3	1		
		2		

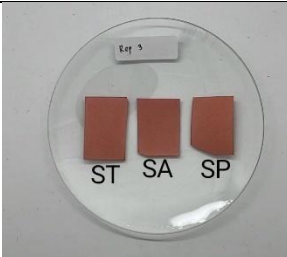
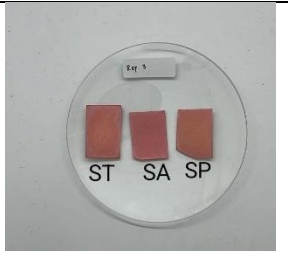
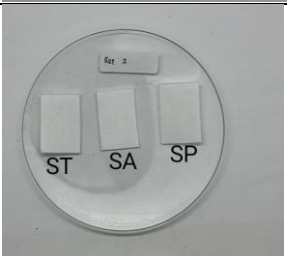
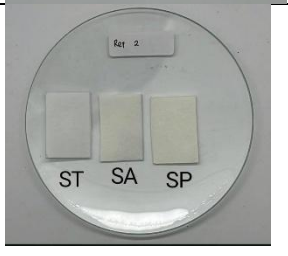
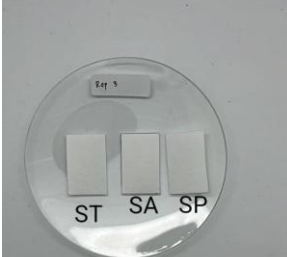
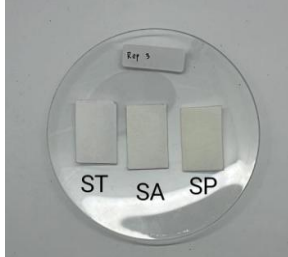
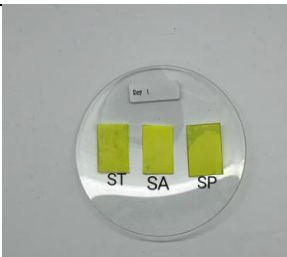
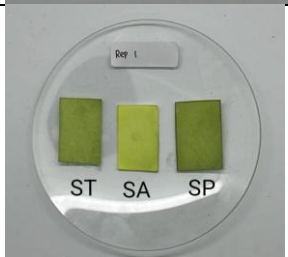
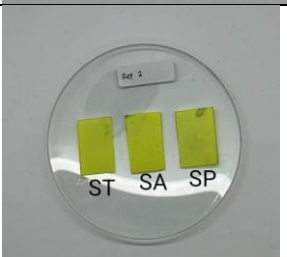
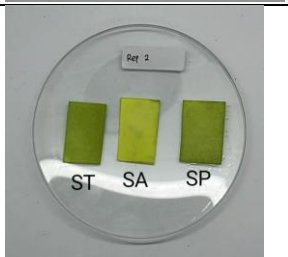
		3		
4.	Lieberman 1M	1		
		2		
		3		

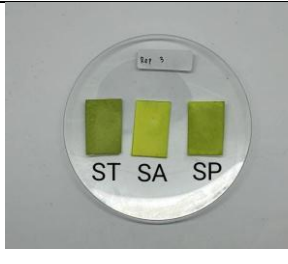
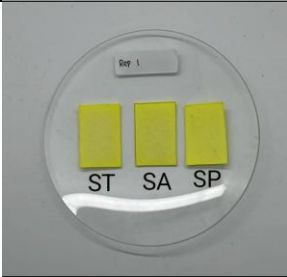
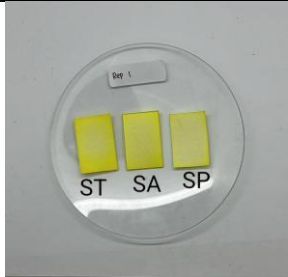
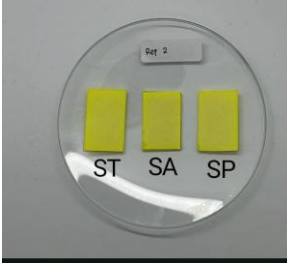
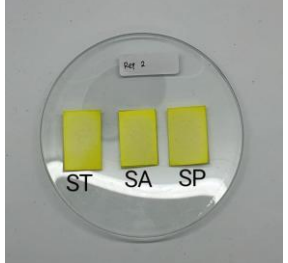
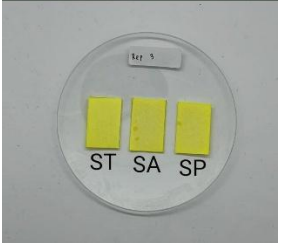
Reagen	Replikasi	Waktu Respon	Nilai RGB		
			R	G	B
FeCl ₃	1	60	179	184	100
		45	173	176	129
		30	180	182	75
		15	185	185	52
		5	177	179	80
	2	60	191	197	123
		45	190	192	59
		30	171	171	29
		15	184	184	50
		5	189	192	50
	3	60	194	197	129
		45	184	174	24
		30	179	172	22
		15	186	186	72
		5	195	195	81
Lieberman	1	60	178	183	177
		45	170	172	169
		30	172	177	171
		15	172	177	171
		5	182	187	181
	2	60	178	183	177
		45	172	174	171
		30	176	178	175
		15	185	190	184
		5	181	186	180
	3	60	180	185	179
		45	169	174	168
		30	169	174	168
		15	174	179	173
		5	185	190	184
Folin Ciocalteu	1	60	170	179	74
		45	139	150	71
		30	118	133	52
		15	143	154	98
		5	99	113	54
	2	60	165	177	80
		45	146	158	84
		30	116	132	61
		15	142	153	93
		5	121	136	71
	3	60	171	181	68

		45	146	163	54
		30	98	116	40
		15	86	94	54
		5	137	149	74
Metil merah	1	60	130	56	47
		45	118	65	59
		30	117	63	51
		15	120	67	53
		5	134	81	75
	2	60	123	28	22
		45	134	79	74
		30	129	74	67
		15	122	65	48
		5	131	75	58
	3	60	118	24	42
		45	132	71	53
		30	121	65	48
		15	121	65	48
		5	138	80	69

Lampiran 3 Uji Spesifisitas

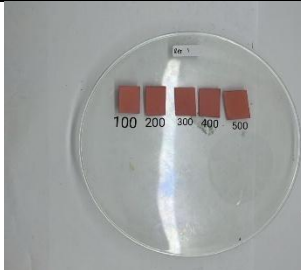
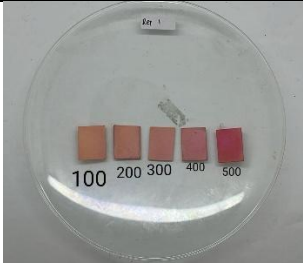
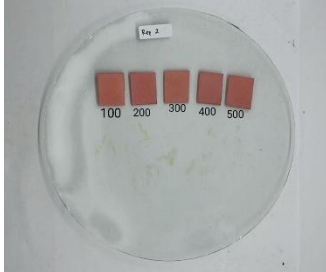
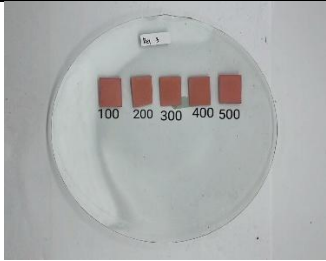
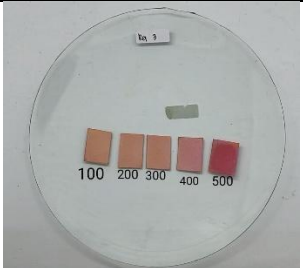
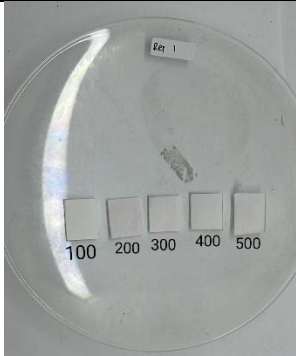
NO	Reagen	replika si	Strip tes sebelum di reaksikan	Strip tes sesudah di reaksikan (Standar/ST, Sampel/SA, <i>Spiked</i> /SP)
1	Metil Merah	1		
		2		

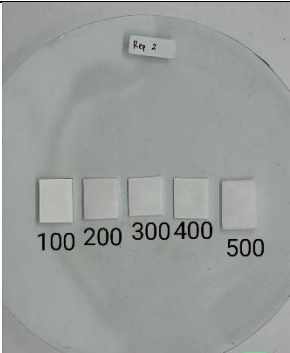
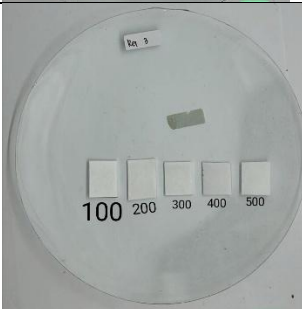
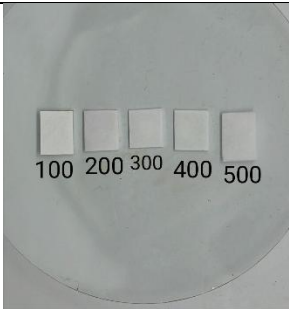
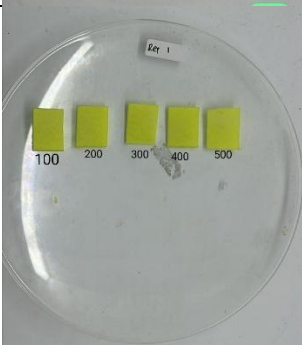
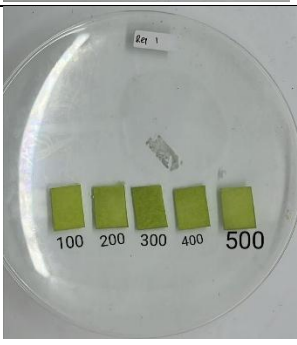
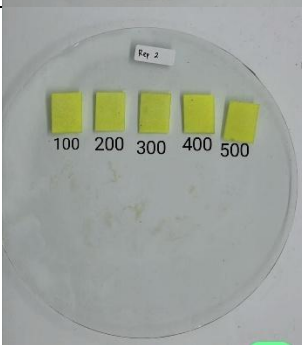
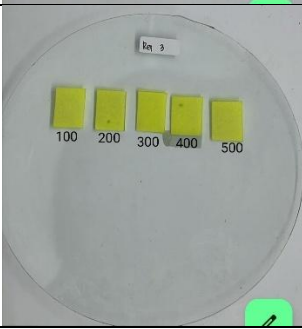
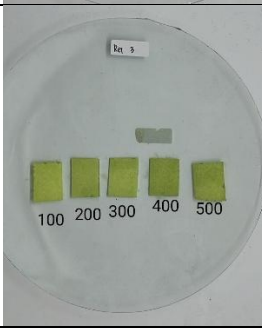
		3		
2	Lieberm an 1M	1		
		2		
		3		
3	Folin- Ciocalte u	1		
		2		

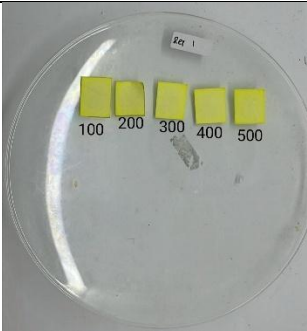
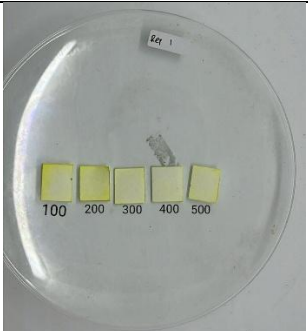
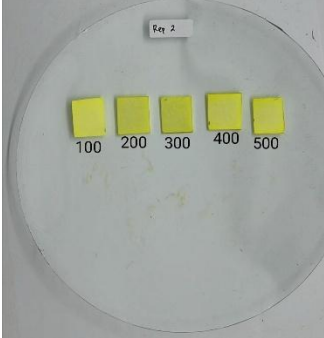
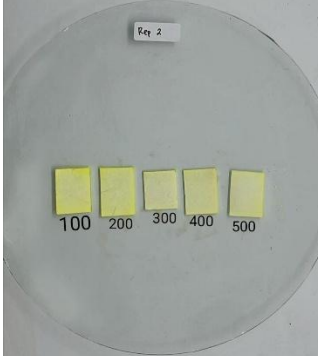
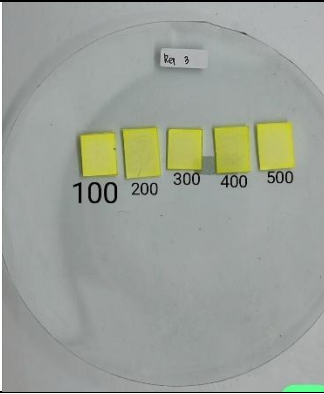
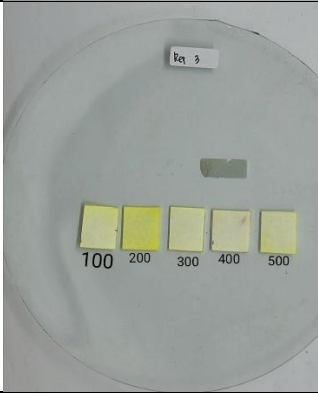
		3		
4	FeCl ₃	1		
		2		
		3		

Reagen	Replikasi	Nilai RGB		
		STANDAR	SAMPEL	SPIKE
Metil merah	1	142,84,73	139,80,74	144,82,69
	2	142,84,70	146,83,78	152,89,80
	3	155,93,82	147,86,83	152,96,79
Folin Ciocalteu	1	121,134,57	149,160,64	107,120,48
	2	99,115,26	150,159,40	110,124,36
	3	112,127,46	151,165,44	113,128,31
Lieberman 1M	1	162,167,161	168,171,162	168,171,162
	2	158,160,155	173,175,161	173,175,161
	3	162,164,159	161,165,151	161,165,151
FeCl ₃	1	184,184,96	180,181,111	180,181,111
	2	169,173,86	174,174,86	174,174,86
	3	178,185,108	175,179,84	175,179,84

Lampiran 4 Uji Limit Deteksi

NO	Reagen	replika si	Strip tes sebelum di reaksikan	Strip tes sesudah di reaksikan std parasetamol (100,200,300,400,500 ppm)
1.	Metil merah	1		
		2		
		3		
2	Lieberm an 1M	1		

		2		
		3		
3	Folin-Ciocalteu	1		
		2		
		3		

4	FeCl_3	1		
		2		
		3		

REAGEN	REPLIKAS I	KONSENTRAS I (PPM)	NILAI RGB		
			R	G	B
Metil Merah	1	100	152	106	83
		200	150	102	88
		300	145	97	87
		400	144	94	97
		500	135	54	70
	2	100	160	116	91
		200	156	113	95
		300	161	113	109
		400	159	103	112
		500	151	58	69
	3	100	160	118	94
		200	162	117	94
		300	162	115	97
		400	159	105	103
		500	143	61	73
lieberman	1	100	177	179	176
		200	171	171	168
		300	170	173	170
		400	169	168	165
		500	166	170	168
	2	100	184	187	180
		200	166	171	165
		300	174	179	173
		400	173	178	172
		500	173	174	169
	3	100	186	191	185
		200	179	184	182
		300	182	187	181
		400	176	178	178
		500	183	188	175
feCl ₃	1	100	173	177	140
		200	171	176	118
		300	170	174	139
		400	173	177	140
		500	174	178	141

	2	100	187	190	123
		200	185	189	130
		300	183	186	142
		400	189	191	142
		500	188	190	151
	3	100	191	194	151
		200	182	188	91
		300	183	187	150
		400	183	186	159
		500	182	185	140
Folin-Ciocalteu	1	100	123	137	42
		200	124	137	57
		300	111	126	45
		400	107	122	42
		500	107	120	48
	2	100	134	148	57
		200	126	139	57
		300	115	129	52
		400	108	119	50
		500	106	118	56
	3	100	139	152	70
		200	123	135	60
		300	133	146	67
		400	118	132	57
		500	134	146	70
BLANKO			167	170	163

- Perhitungan:

• Absorbansi:

1) Metil Merah:

a) Replikasi 1:

- Red

1. Konsentrasi 100 ppm: $\log \left(\frac{167}{152} \right) : 0,041$

2. Konsentrasi 200 ppm: $\log \left(\frac{167}{150} \right) : 0,047$

3. Konsentrasi 300 ppm: $\log \left(\frac{167}{145} \right) : 0,061$

4. Konsentrasi 400 ppm: $\log \left(\frac{167}{144} \right) : 0,064$

5. Konsentrasi 500 ppm: $\log \left(\frac{167}{135} \right) : 0,092$

- Green

1. Konsentrasi 100 ppm: $\log \left(\frac{170}{106} \right) : 0,205$

2. Konsentrasi 200 ppm: $\log \left(\frac{170}{102} \right) : 0,222$

3. Konsentrasi 300 ppm: $\log \left(\frac{170}{97} \right) : 0,244$

4. Konsentrasi 400 ppm: $\log \left(\frac{170}{94} \right) : 0,257$

5. Konsentrasi 500 ppm: $\log \left(\frac{170}{54} \right) : 0,498$

b) Replikasi 2:

- Green

1. Konsentrasi 100 ppm: $\log \left(\frac{170}{116} \right) : 0,166$

2. Konsentrasi 200 ppm: $\log \left(\frac{170}{113} \right) : 0,177$

3. Konsentrasi 300 ppm: $\log \left(\frac{170}{113} \right) : 0,177$

4. Konsentrasi 400 ppm: $\log \left(\frac{170}{103} \right) : 0,218$

5. Konsentrasi 500 ppm: $\log \left(\frac{170}{58} \right) : 0,467$

c) Replikasi 3:

- Green

1. Konsentrasi 100 ppm: $\log \left(\frac{170}{118} \right) : 0,159$

2. Konsentrasi 200 ppm: $\log \left(\frac{170}{117} \right) : 0,162$

3. Konsentrasi 300 ppm: $\log \left(\frac{170}{115} \right) : 0,170$

4. Konsentrasi 400 ppm: $\log \left(\frac{170}{105} \right) : 0,209$

5. Konsentrasi 500 ppm: $\log \left(\frac{170}{61} \right) : 0,445$

2) Lieberman

a) Replikasi 1

- Red

1. Konsentrasi 100 ppm: $\log \left(\frac{167}{177} \right) : -0,025$

2. Konsentrasi 200 ppm: $\log \left(\frac{167}{171} \right) : -0,010$

3. Konsentrasi 300 ppm: $\log \left(\frac{167}{170} \right) : -0,008$
4. Konsentrasi 400 ppm: $\log \left(\frac{167}{169} \right) : -0,005$
5. Konsentrasi 500 ppm: $\log \left(\frac{167}{166} \right) : 0,003$

b) Replikasi 3

- Blue

1. Konsentrasi 100 ppm: $\log \left(\frac{163}{185} \right) : -0,055$
2. Konsentrasi 200 ppm: $\log \left(\frac{163}{182} \right) : -0,048$
3. Konsentrasi 300 ppm: $\log \left(\frac{163}{181} \right) : -0,045$
4. Konsentrasi 400 ppm: $\log \left(\frac{163}{178} \right) : -0,038$
5. Konsentrasi 500 ppm: $\log \left(\frac{163}{175} \right) : -0,031$

3) FeCl_3

- Green

1. Konsentrasi 100 ppm: $\log \left(\frac{170}{194} \right) : -0,057$
2. Konsentrasi 200 ppm: $\log \left(\frac{170}{188} \right) : -0,044$
3. Konsentrasi 300 ppm: $\log \left(\frac{170}{187} \right) : -0,041$
4. Konsentrasi 400 ppm: $\log \left(\frac{170}{186} \right) : -0,039$
5. Konsentrasi 500 ppm: $\log \left(\frac{170}{185} \right) : -0,037$

4) Folin-Ciocalteu

a) Replikasi 1:

- Green

1. Konsentrasi 100 ppm: $\log \left(\frac{170}{137} \right) : 0,094$
2. Konsentrasi 200 ppm: $\log \left(\frac{170}{137} \right) : 0,094$
3. Konsentrasi 300 ppm: $\log \left(\frac{170}{126} \right) : 0,130$
4. Konsentrasi 400 ppm: $\log \left(\frac{170}{122} \right) : 0,144$
5. Konsentrasi 500 ppm: $\log \left(\frac{170}{120} \right) : 0,151$

b) Replikasi 2:

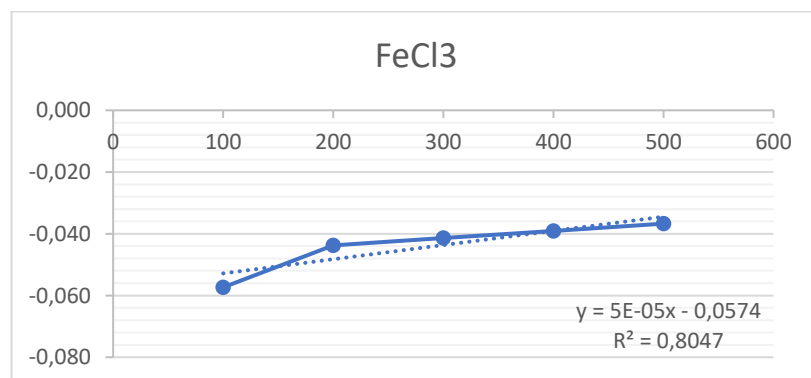
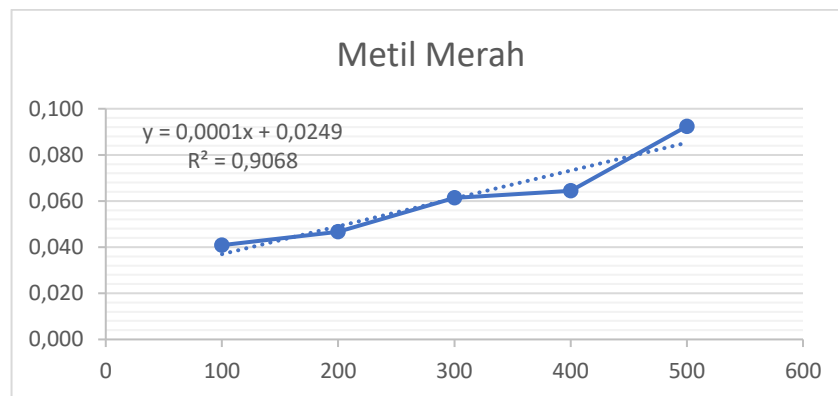
- Red

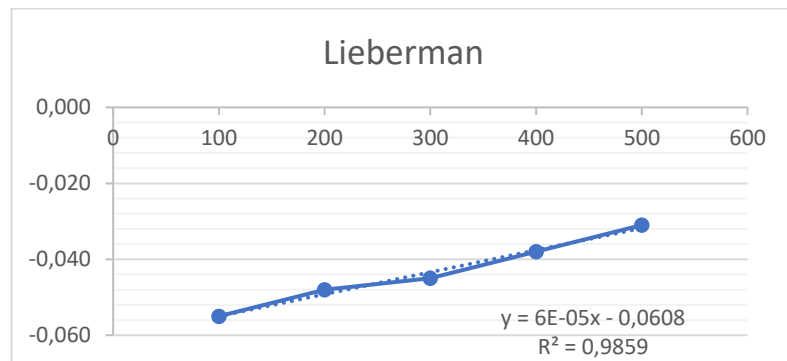
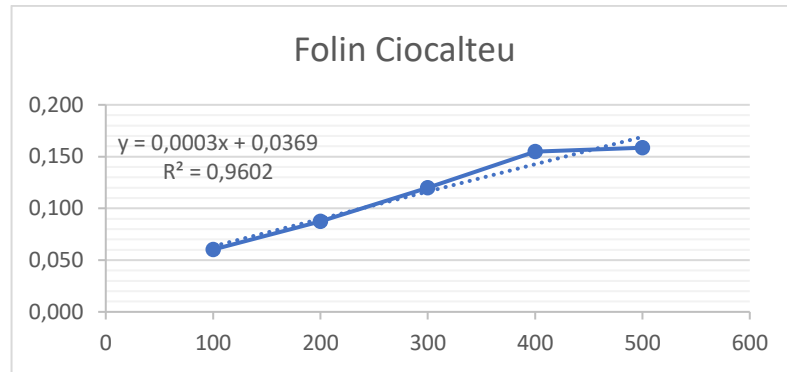
1. Konsentrasi 100 ppm: $\log\left(\frac{167}{134}\right) : 0,096$
2. Konsentrasi 200 ppm: $\log\left(\frac{167}{126}\right) : 0,122$
3. Konsentrasi 300 ppm: $\log\left(\frac{167}{115}\right) : 0,162$
4. Konsentrasi 400 ppm: $\log\left(\frac{167}{108}\right) : 0,189$
5. Konsentrasi 500 ppm: $\log\left(\frac{167}{106}\right) : 0,197$

- Green

1. Konsentrasi 100 ppm: $\log\left(\frac{170}{148}\right) : 0,060$
2. Konsentrasi 200 ppm: $\log\left(\frac{170}{139}\right) : 0,087$
3. Konsentrasi 300 ppm: $\log\left(\frac{170}{129}\right) : 0,120$
4. Konsentrasi 400 ppm: $\log\left(\frac{170}{119}\right) : 0,155$
5. Konsentrasi 500 ppm: $\log\left(\frac{170}{118}\right) : 0,159$

• Kurva





a) Reagen Metil Merah (*Red*)

konsentrasi	absorbansi	Y'	(Y-Y')	(Y-Y') ²
100 ppm	0,041	1,2349	-1,1939	1,4253
200 ppm	0,047	2,4449	-2,3979	5,7499
300 ppm	0,061	3,6549	-3,5939	12,9161
400 ppm	0,064	4,8649	-4,8009	23,0486
500 ppm	0,092	6,0749	-5,9829	35,7950
			Jumlah	77,5097

b) Reagen Lieberman 1M (*Red*)

konsentrasi	absorbansi	Y'	(Y-Y')	(Y-Y') ²
100 ppm	-0,025	-0,6374	-0,6624	0,4387
200 ppm	-0,01	1,2474	-1,2674	1,5810
300 ppm	-0,008	1,8574	-1,8654	3,4797
400 ppm	-0,005	2,4674	-2,4724	6,1127
500 ppm	0,003	3,0774	-3,0744	9,4519
			Jumlah	20,6254

c) Reagen FeCl₃ (*Green*)

konsentrasi	absorbansi	Y'	(Y-Y')	(Y-Y') ²
100 ppm	-0,057	0,5174	-0,5744	0,3299
200 ppm	-0,044	0,9774	-1,0214	1,0432
300 ppm	-0,041	1,4374	-1,4784	2,1856
400 ppm	-0,039	1,8974	-1,9364	3,7496
500 ppm	-0,037	2,3574	-2,3944	5,7331
			Jumlah	12,7117

d) Reagen Folin-Ciocalteu (*Red*)

konsentrasi	absorbansi	Y'	(Y-Y')	(Y-Y') ²
100 ppm	0,096	2,7822	-2,6862	7,21567
200 ppm	0,122	5,4922	-5,3702	28,83905
300 ppm	0,162	8,2022	-8,0402	64,64482
400 ppm	0,189	10,9122	-10,7232	114,987
500 ppm	0,197	12,6222	-13,4252	180,236
			Jumlah	388,7069

• Perhitungan SD

1. Metil Merah :

$$\frac{330,7166}{5} \times 0,5$$

$$= 3,9372$$

2. Folin-Ciocalteu :

$$\frac{388,7069}{5} \times 0,5$$

$$= 8,8171$$

3. FeCl₃ :

$$\frac{12,7117}{5} \times 0,5$$

$$= 1,5944$$

4. Lieberman 1M :

$$\frac{20,6254}{5} \times 0,5$$

$$= 2,0310$$

- Perhitungan LoD

1. Metil Merah:

$$\begin{aligned} & 3,3 \times \frac{SD}{SLOPE} \\ &= 3,3 \times \frac{3,9372}{0,0121} \\ &= 1,07 \text{ mg/ml} \end{aligned}$$

2. Folin-Ciocalteu:

$$\begin{aligned} & 3,3 \times \frac{SD}{SLOPE} \\ &= 3,3 \times \frac{8,8171}{0,0271} \\ &= 1,07 \text{ mg/ml} \end{aligned}$$

3. Lieberman 1M:

$$\begin{aligned} & 3,3 \times \frac{SD}{SLOPE} \\ &= 3,3 \times \frac{2,0310}{0,0061} \\ &= 1,09 \text{ mg/ml} \end{aligned}$$

4. FeCl₃:

$$\begin{aligned} & 3,3 \times \frac{SD}{SLOPE} \\ &= 3,3 \times \frac{1,5944}{0,0046} \\ &= 1,14 \text{ mg/ml} \end{aligned}$$

Lampiran 5 Dokumentasi Penelitian



Penimbangan natrium nitrit untuk reagen Lieberman 1M.



Penimbangan pembanding parasetamol



Penimbangan Sampel Jamu Pegal linu



Hasil Preparasi reagen FeCl_3 10%