


LAMPIRAN

Lampiran 1. Hasil Determinasi Tanaman



BAGIAN BIOLOGI FARMASI
FAKULTAS FARMASI
UNIVERSITAS GADJAH MADA YOGYAKARTA
 Alamat: Sekip Utara Jl. Kaliurang Km 4, Yogyakarta 55281
 Telp. , 0274.542738, 0274.649.2568 Fax. +274-543120

SURAT KETERANGAN
 No.: BF/48/Ident/Det/III/2015

Kepada Yth. :
Sdri/Sdr.Waralita Mayudanti
NIM. 20120350061
Fakultas Farmasi UMY
Di Yogyakarta


Dengan hormat,

Bersama ini kami sampaikan hasil identifikasi/determinasi sampel yang Saudara kirimkan ke Bagian Biologi Farmasi, Fakultas Farmasi UGM, adalah :

No.Pendaftaran	Jenis	Suku
48	<i>Piper nigrum L.</i>	Piperaceae

Demikian, semoga dapat digunakan sebagaimana mestinya.

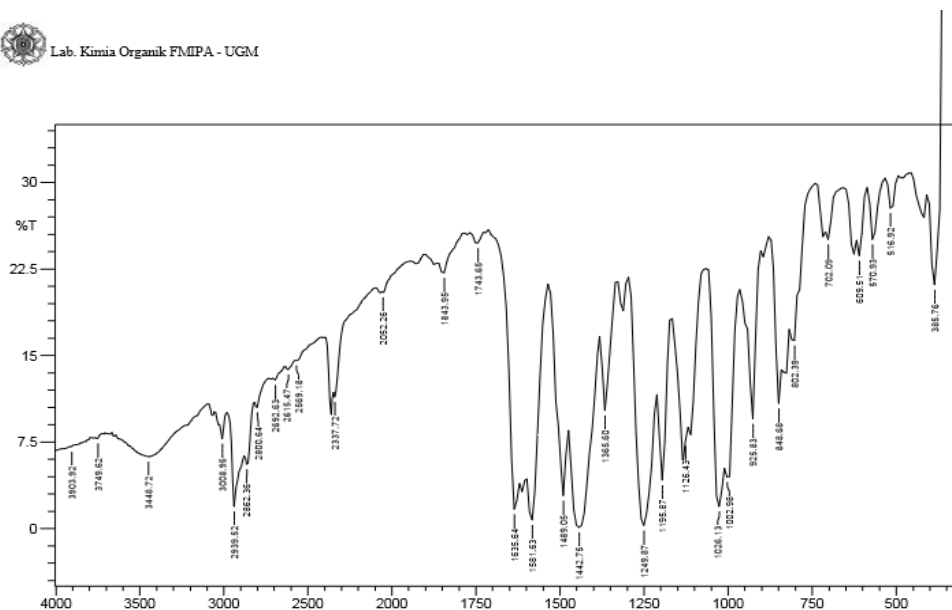
Yogyakarta, 26 Januari 2015
 Ketua


 Prof. Dr. Wahyono, SU., Apt.
 NIP. 495007011977021001

Lampiran 2. Hasil FTIR Kristal Alkaloid Lada *Piper nigrum* Linn.



Lab. Kimia Organik FMIPA - UGM



Ilham Perdana, pelet, 4 Mei 2016

1/cm

No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	385.76	21.09	17.26	401.19	362.62	21.32	6.57
2	516.92	27.75	2.68	532.35	493.78	20.64	0.73
3	570.93	25.03	4.68	586.36	540.07	25.88	1.56
4	609.51	23.63	5.28	648.08	594.08	31.99	2.96
5	702.09	25.03	4.63	732.95	655.8	43.17	2.4
6	802.39	16.29	3.48	817.82	740.67	48.15	1.08
7	848.68	10.83	10.82	871.82	817.82	44.68	7.17
8	925.83	9.47	12.45	964.41	910.4	43.03	7.15
9	1002.98	4.45	3.75	1010.7	972.12	39.53	4.01
10	1026.13	1.9	9.05	1056.99	1010.7	60.1	13.09
11	1126.43	7.58	12.27	1165	1064.71	89.52	20.36
12	1195.87	4.16	10	1211.3	1172.72	40.15	8.48
13	1249.87	0.24	14.38	1296.16	1219.01	111.07	45.38
14	1365.6	10.22	7.96	1381.03	1334.74	38.26	5.09
15	1442.75	0.07	10.78	1473.62	1388.75	144.03	64.55
16	1489.05	2.83	5.85	1527.62	1481.33	52.57	6.91
17	1581.63	0.74	7.77	1597.06	1535.34	74.01	15.27
18	1635.64	1.66	5.9	1712.79	1620.21	87.25	6.18
19	1743.65	24.73	0.8	1759.08	1728.22	18.54	0.26
20	1843.95	22.12	1.41	1859.38	1789.94	43.2	0.61
21	2052.26	20.44	0.24	2059.98	1944.25	76.22	0.11
22	2337.72	11.39	0.7	2345.44	2098.55	183.21	0.27
23	2569.18	14.55	0.12	2576.9	2422.59	124.4	0.17
24	2615.47	13.77	0.4	2630.91	2576.9	45.93	0.36
25	2692.63	12.86	0.38	2708.06	2638.62	60.61	0.36
26	2800.64	10.48	0.84	2816.07	2738.92	71.44	0.59
27	2862.36	5.55	1.32	2870.08	2823.79	51.67	2.2
28	2939.52	1.9	6.66	2978.09	2877.79	131.13	19.87
29	3008.95	7.77	2.25	3047.53	2985.81	64.63	2.98
30	3448.72	6.2	2.84	3641.6	3093.82	607.34	43.84

Lampiran 3. Hasil Uji Titik Lebur Kristal Alkaloid Lada *Piper nigrum* Linn.

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TITIK LELEH
"Electrothermal"

Nama : Ratih Dwi Amaliah
Instansi : F. farmasi UMY

No.	Nama Sampel	Hasil pengukuran (°C)	Keterangan
1.	Sampel Piperin	122-132	Meleleh

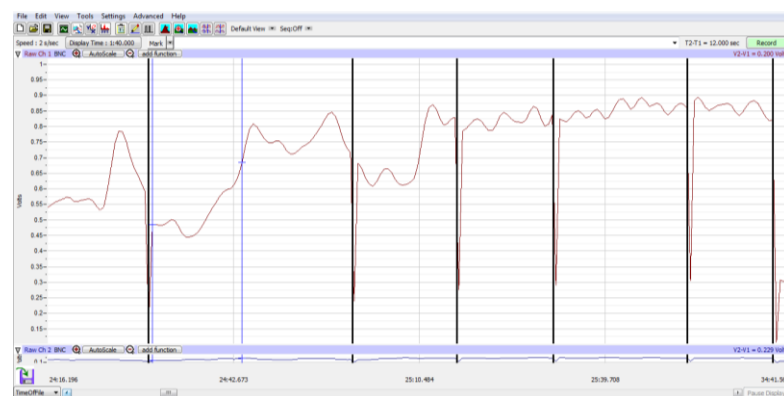
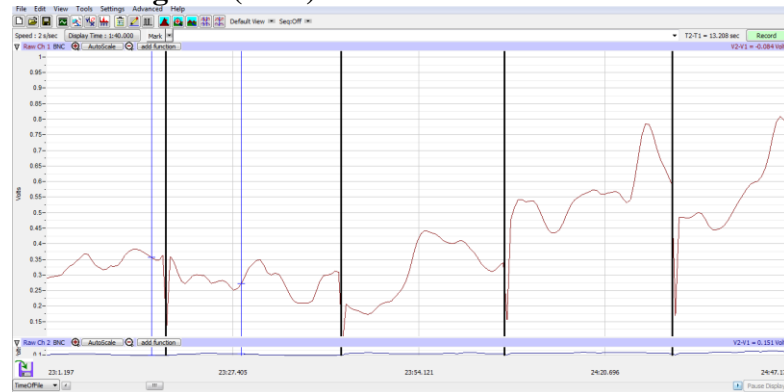


Operator

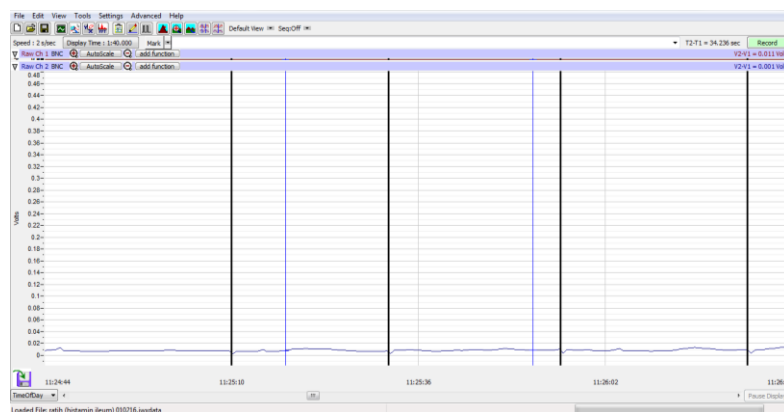
Rochfitni

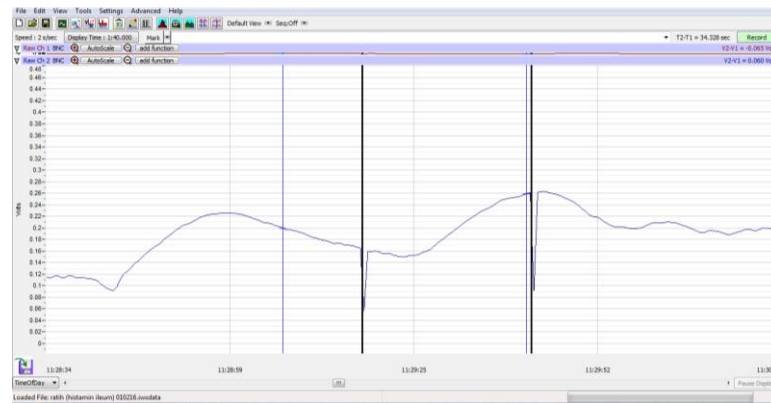
Lampiran 4. Data Recorder Pada Uji *In Vitro*

A. Seri Kadar Agonis (ACh)

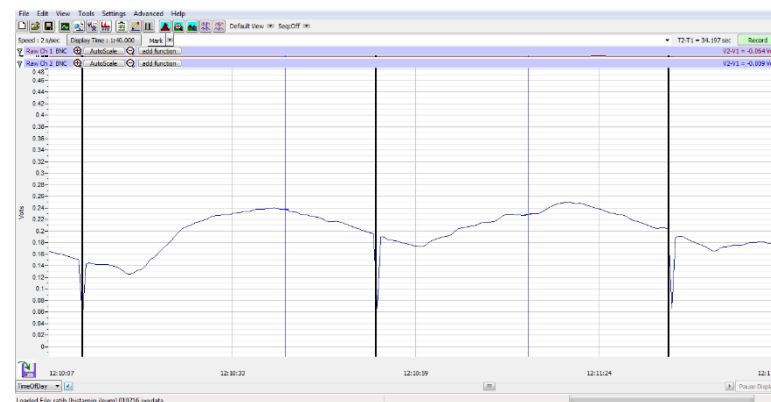
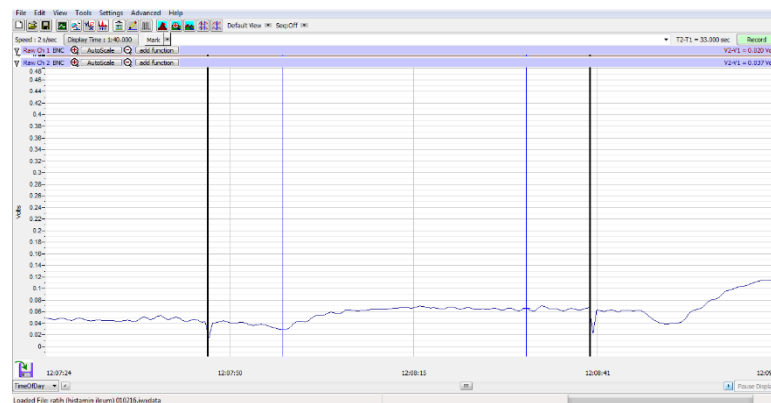


B. Alkaloid Lada *Piper nigrum* Linn. + Agonis (ACh)

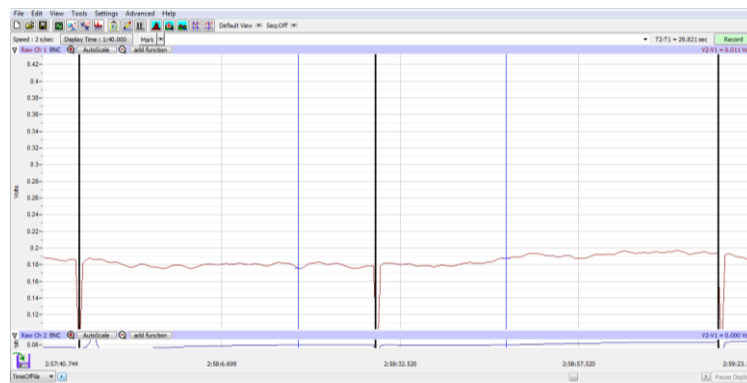
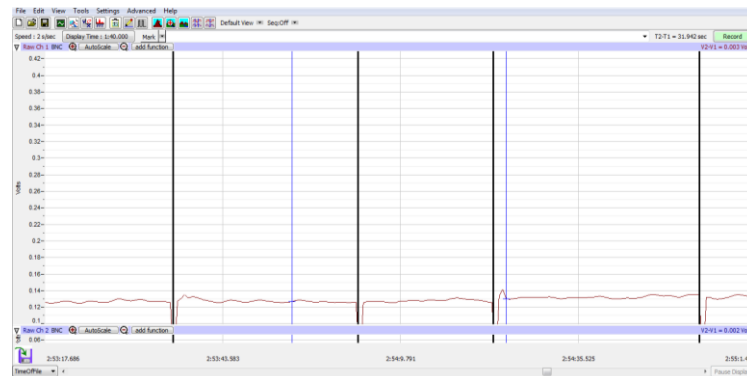




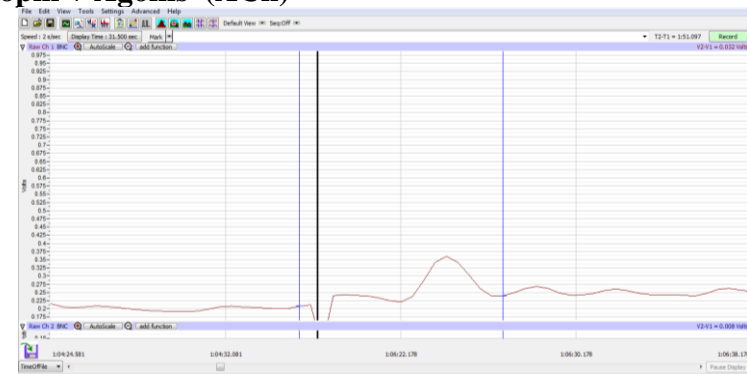
C. Reversibilitas (Agonis ACh)



D. DMSO + Agonis (ACh)



E. Atropin + Agonis (ACh)



Lampiran 5. Data Pengaruh Pelarut DMSO Terhadap Kontraksi Otot Polos Ileum

a. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon Kontraksi*						Mean	SEM
	1	2	3	4	5	6		
-10.0	22.22	11.11	28.57	5.56	5.56	5.56	13.10	2.88
-9.5	22.22	11.11	28.57	5.56	5.56	5.56	13.10	2.88
-9.0	33.33	11.11	42.86	5.56	5.56	5.56	17.33	4.77
-8.5	44.44	22.22	42.86	5.56	5.56	11.11	21.96	5.16
-8.0	55.56	22.22	42.86	5.56	5.56	11.11	23.81	6.06
-7.5	55.56	33.33	42.86	5.56	5.56	11.11	25.66	6.15
-7.0	88.89	33.33	42.86	5.56	16.67	22.22	34.92	8.50
-6.5	88.89	33.33	57.14	22.22	22.22	33.33	42.86	7.48
-6.0	88.89	33.33	57.14	27.78	44.44	55.56	51.19	6.31
-5.5	100.00	44.44	71.43	33.33	72.22	66.67	64.68	6.77
-5.0	100.00	66.67	71.43	66.67	94.44	77.78	79.50	4.17
-4.5	100.00	66.67	85.71	100	100	88.89	90.21	3.79
-4	100.00	88.89	100	100	100	100	98.15	1.31
-3.5	100.00	100	100	100	100	100	100	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan buffer tyrode

b. Data Pengaruh Pelarut DMSO terhadap Kontraksi Otot Polos ileum akibat pemberian DMSO + seri kadar Asetilkolin

Log Konsentrasi (M)	Respon Kontraksi						Mean	SEM
	1	2	3	4	5	6		
-10.0	11.11	11.11	14.29	5.56	16.67	5.56	10.71	1.30
-9.5	22.22	11.11	14.29	5.56	16.67	5.56	12.57	1.89
-9.0	22.22	22.22	14.29	11.11	16.67	5.56	15.34	1.88
-8.5	33.33	22.22	28.57	11.11	16.67	5.56	19.58	3.04
-8.0	55.56	33.33	28.57	16.67	16.67	11.11	26.98	4.70
-7.5	66.67	33.33	28.57	16.67	16.67	11.11	28.84	5.86
-7.0	77.78	33.33	28.57	22.22	22.22	22.22	34.39	6.27
-6.5	88.89	33.33	42.86	22.22	33.33	27.78	41.40	7.00
-6.0	88.89	44.44	57.14	22.22	50.00	50.00	52.12	6.24
-5.5	100.00	55.56	57.14	27.78	66.67	55.56	60.45	6.74
-5.0	100.00	66.67	71.43	61.11	72.22	66.67	73.02	3.99
-4.5	100.00	77.78	71.43	83.33	77.78	72.22	80.42	3.04
-4	100.00	88.89	100.00	100.00	100.00	100.00	98.15	1.31
-3.5	100.00	88.89	100.00	100.00	100.00	100.00	98.15	1.31

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol)
Media : Larutan buffer tyrode

Lampiran 6. Data Pengaruh Alkaloid Lada *Piper nigrum* Linn. Terhadap Reseptor ACh Otot Polos Ileum

a. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon Kontraksi*												M E A N	S E M
	1	2	3	4	5	6	7	8	9	10	11	12		
-10.0	25.00	14.29	8.33	7.69	10.53	6.67	15.38	11.11	0.00	25.00	4.00	9.09	11.42	2.19
-9.5	25.00	14.29	8.33	7.69	10.53	6.67	15.38	11.11	0.00	25.00	4.00	9.09	11.42	2.19
-9.0	31.25	14.29	8.33	7.69	10.53	6.67	15.38	11.11	12.50	25.00	8.00	9.09	13.32	2.17
-8.5	31.25	14.29	8.33	7.69	10.53	6.67	15.38	11.11	37.50	25.00	16.00	9.09	16.07	2.88
-8.0	43.75	14.29	8.33	7.69	10.53	6.67	15.38	11.11	37.50	25.00	16.00	9.09	17.11	3.50
-7.5	43.75	21.43	8.33	7.69	15.79	13.33	15.38	22.22	50.00	25.00	16.00	9.09	20.67	3.89
-7.0	56.25	28.57	25.00	15.38	26.32	20.00	23.08	33.33	50.00	25.00	28.00	9.09	28.34	3.83
-6.5	62.50	42.86	33.33	15.38	42.11	33.33	30.77	44.44	50.00	37.50	28.00	18.18	36.53	3.79
-6.0	75.00	64.29	66.67	46.15	52.63	53.33	46.15	66.67	50.00	50.00	32.00	22.73	52.13	4.30
-5.5	75.00	85.71	83.33	61.54	73.68	73.33	69.23	88.89	62.50	75.00	48.00	54.55	70.90	3.59
-5.0	81.25	92.86	100	69.23	89.47	86.67	76.92	100	75.00	75.00	60.00	63.64	80.84	3.83
-4.5	87.50	92.86	100	84.62	94.74	93.33	92.31	100	87.50	100	80.00	86.36	91.60	1.89
-4.0	100	100	100	92.31	100	100	100	100	87.50	100	80.00	100	96.65	1.91
-3.5	100	100	100	100	100	100	100	100	100	100	100	100	100	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol)
Media : Larutan *buffer tyrode*

b. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Alkaloid Lada *Piper nigrum* Linn. 1000 μ M + Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon Kontraksi*						Mean	SEM
	1	2	3	4	5	6		
-10.0	7.69	8.33	7.14	6.67	8.33	7.69	7.64	0.27
-9.5	7.69	8.33	7.14	6.67	8.33	7.69	7.64	0.27
-9.0	7.69	8.33	7.14	6.67	8.33	7.69	7.64	0.27
-8.5	7.69	8.33	7.14	6.67	8.33	15.38	8.93	1.32
-8.0	7.69	8.33	14.29	20.00	16.67	15.38	13.73	1.97
-7.5	15.38	8.33	14.29	20.00	16.67	15.38	15.01	1.56
-7.0	15.38	16.67	28.57	40.00	33.33	38.46	28.74	4.35
-6.5	15.38	33.33	42.86	53.33	50.00	38.46	38.89	5.57
-6.0	23.08	50.00	42.86	66.67	50.00	46.15	46.46	5.75
-5.5	38.46	66.67	71.43	80.00	66.67	61.54	64.13	5.73
-5.0	38.46	91.67	85.71	80.00	83.33	61.54	73.45	8.14
-4.5	69.23	91.67	92.86	100.00	91.67	76.92	87.06	4.71
-4	92.31	100.00	100.00	100.00	100.00	100.00	98.72	1.28
-3.5	100.00	100.00	100.00	100.00	100.00	100.00	100	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

c. Data Persentase Kontraksi Otot Polos Ileum Akbat Pemberian Alkaloid Lada *Piper nigrum* Linn. 5000 μ M + Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon Kontraksi*						Mean	SEM
	1	2	3	4	5	6		
-10.0	7.14	7.14	7.69	7.14	7.69	8.33	7.52	0.20
-9.5	7.14	7.14	7.69	7.14	7.69	8.33	7.52	0.20
-9.0	7.14	7.14	7.69	7.14	7.69	8.33	7.52	0.20
-8.5	7.14	7.14	7.69	7.14	15.38	8.33	8.81	1.33
-8.0	7.14	7.14	7.69	7.14	23.08	8.33	10.09	2.60
-7.5	7.14	14.29	7.69	7.14	30.77	33.33	16.73	4.98
-7.0	14.29	14.29	15.38	7.14	38.46	33.33	20.48	5.06
-6.5	28.57	28.57	23.08	35.71	46.15	41.67	33.96	3.59
-6.0	28.57	42.86	46.15	50.00	61.54	58.33	47.91	4.84
-5.5	42.86	57.14	61.54	71.43	61.54	66.67	60.20	4.01
-5.0	64.29	71.43	76.92	85.71	61.54	83.33	73.87	4.04
-4.5	71.43	78.57	92.31	85.71	61.54	91.67	80.20	4.95
-4	85.71	100.00	100.00	100.00	100.00	100.00	97.62	2.38
-3.5	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

Lampiran 7. Data Uji Reversibilitas Alkaloid Lada *Piper nigrum* Linn. 1000 μ M dan 5000 μ M Terhadap Reseptor ACh Otot Polos ileum

a. Polos Ileum Akibat Pemberian Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon kontraksi*												Mean	SEM
	1	2	3	4	5	6	7	8	9	10	11	12		
-10.0	7.69	8.33	7.14	7.14	7.14	6.67	7.69	14.29	8.33	15.38	7.69	8.33	8.82	0.83
-9.5	7.69	8.33	7.14	7.14	7.14	6.67	7.69	14.29	16.67	23.08	15.38	16.66	11.49	1.58
-9.0	7.69	8.33	14.29	7.14	21.43	13.33	15.38	14.29	16.67	23.08	15.38	16.66	14.47	1.44
-8.5	7.69	16.67	14.29	14.29	28.57	13.33	15.38	14.29	25.00	23.08	30.77	33.33	19.72	2.35
-8.0	15.38	16.67	14.29	28.57	42.86	26.67	23.08	14.29	41.67	30.77	30.77	41.67	27.22	3.13
-7.5	15.38	16.67	21.43	35.71	50.00	40.00	30.77	14.29	41.67	30.77	46.15	41.67	32.04	3.62
-7.0	15.38	33.33	21.43	50.00	71.43	46.67	38.46	21.43	58.33	38.46	61.54	58.33	42.90	5.16
-6.5	30.77	50.00	28.57	50.00	78.57	60.00	53.85	35.71	75.00	46.15	69.23	66.67	53.71	4.84
-6.0	76.92	66.67	35.71	71.43	78.57	73.33	69.23	64.29	91.67	53.85	76.92	83.33	70.16	4.18
-5.5	84.62	83.33	50.00	78.57	92.86	86.67	92.31	85.71	100	69.23	92.31	83.33	83.24	3.77
-5.0	100	100	71.43	78.57	100	93.33	100	100	100	76.92	92.31	100	92.71	3.11
-4.5	100	100	78.57	100	100	100	100	100	100	84.62	100	100	96.93	2.10
-4	100	100	100	100	100	100	100	100	100	100	100	100	100	0.00
-3.52	100	100	100	100	100	100	100	100	100	100	100	100	100	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

b. Data Persentase Kontraksi Otot Polos Ileum Pada Uji Reversibilitas Alkaloid Lada *Piper nigrum* Linn. 1000 μ M

Log Konsentrasi (M)	Respon Kontraksi*						Mean	SEM
	1	2	3	4	5	6		
-10.0	1.00	8.33	7.14	6.67	16.67	23.08	10.48	3.25
-9.5	1.00	8.33	7.14	13.33	16.67	23.08	11.59	3.18
-9.0	7.69	8.33	14.29	13.33	33.33	23.08	16.68	4.02
-8.5	7.69	8.33	21.43	26.67	33.33	30.77	21.37	4.53
-8.0	15.38	16.67	21.43	26.67	41.67	30.77	25.43	4.03
-7.5	15.38	16.67	35.71	40.00	50.00	46.15	33.99	6.03
-7.0	23.08	25.00	64.29	53.33	66.67	46.15	46.42	7.70
-6.5	38.46	41.67	71.43	73.33	83.33	61.54	61.63	7.39
-6.0	61.54	58.33	78.57	86.67	83.33	61.54	71.66	5.14
-5.5	84.62	75.00	92.86	86.67	91.67	69.23	83.34	3.84
-5.0	100.00	83.33	92.86	93.33	100.00	76.92	91.07	3.78
-4.5	100.00	83.33	100.00	100.00	100.00	76.92	93.38	4.27
-4	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00
-3.52	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

b. Data Persentase Kontraksi Otot Polos Ileum Pada Uji Reversibilitas Alkaloid Lada *Piper nigrum* Linn. 5000 μ M

Log Konsentrasi (M)	Respon Kontraksi*						Mean	SEM
	1	2	3	4	5	6		
-8.0	7.14	7.14	15.38	7.14	15.38	8.33	10.09	1.69
-7.5	7.14	7.14	15.38	7.14	15.38	16.67	11.48	1.95
-7.0	21.43	7.14	15.38	14.29	15.38	16.67	15.05	1.89
-6.5	21.43	14.29	23.08	14.29	30.77	16.67	20.09	2.61
-6.0	28.57	14.29	23.08	14.29	30.77	33.33	24.05	3.38
-5.5	35.71	28.57	23.08	21.43	53.85	33.33	32.66	4.81
-5.0	35.71	35.71	30.77	28.57	53.85	50.00	39.10	4.24
-4.5	42.86	42.86	46.15	42.86	61.54	58.33	49.10	3.49
-4.0	42.86	50.00	61.54	57.14	61.54	75.00	58.01	4.50
-3.5	50.00	71.43	76.92	78.57	76.92	91.67	74.25	5.57
-3.0	64.29	78.57	92.31	92.86	84.62	100.00	85.44	5.19
-2.5	78.57	78.57	100.00	100.00	100.00	100.00	92.86	4.52
-2	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00
-1.52	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

Lampiran 8. Data Pengaruh Atropin Terhadap Reseptor ACh Otot Polos Ileum

- a. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Atropin 100 + Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon Kontraksi*						MEAN	SEM
	1	2	3	4	5	6		
-10.0	25.00	14.29	5.26	6.67	12.50	0.00	10.62	3.56
-9.5	25.00	14.29	5.26	6.67	12.50	0.00	10.62	3.56
-9.0	25.00	14.29	5.26	6.67	12.50	0.00	10.62	3.56
-8.5	25.00	14.29	5.26	6.67	12.50	0.00	10.62	3.56
-8.0	31.25	14.29	5.26	6.67	12.50	12.50	13.74	3.79
-7.5	31.25	14.29	5.26	6.67	12.50	12.50	13.74	3.79
-7.0	31.25	14.29	10.53	6.67	12.50	25.00	16.70	3.84
-6.5	37.50	35.71	10.53	6.67	25.00	25.00	23.40	5.17
-6.0	37.50	35.71	26.32	13.33	25.00	25.00	27.14	3.57
-5.5	56.25	92.86	42.11	26.67	50.00	62.50	55.06	9.10
-5.0	75.00	92.86	57.89	46.67	62.50	87.50	70.40	7.30
-4.5	100.00	100.00	84.21	80.00	75.00	87.50	87.79	4.22
-4.0	100.00	100.00	100.00	100.00	75.00	100.00	95.83	4.17
-3.5	100.00	100.00	100.00	100.00	100.00	100.00	100.00	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

b. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Atropin 500 +
Seri Konsentrasi Asetilkolin (Kontrol)

Log Konsentrasi (M)	Respon Kontraksi*						MEAN	SEM
	1	2	3	4	5	6		
-10.0	8.33	7.69	0.00	11.11	8.00	9.09	7.37	1.56
-9.5	8.33	7.69	7.69	11.11	8.00	9.09	8.65	0.54
-9.0	8.33	7.69	7.69	11.11	8.00	9.09	8.65	0.54
-8.5	8.33	7.69	7.69	11.11	8.00	9.09	8.65	0.54
-8.0	8.33	7.69	7.69	11.11	8.00	18.18	10.17	1.69
-7.5	8.33	7.69	7.69	11.11	8.00	18.18	10.17	1.69
-7.0	8.33	7.69	7.69	11.11	8.00	18.18	10.17	1.69
-6.5	16.67	7.69	7.69	11.11	16.00	22.73	13.65	2.41
-6.0	25.00	7.69	7.69	11.11	16.00	22.73	15.04	3.07
-5.5	41.67	7.69	7.69	22.22	20.00	27.27	21.09	5.24
-5.0	50.00	23.08	15.38	33.33	28.00	59.09	34.81	6.79
-4.5	66.67	30.77	30.77	55.56	44.00	68.18	49.32	6.86
-4.0	100.00	69.23	61.54	88.89	60.00	100.00	79.94	7.61
-3.5	100.00	100.00	76.92	100.00	100.00	100.00	96.15	3.85

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan buffer tyrode

c. Data Persentase Kontraksi Otot Polos Ileum Akbat Pemberian Kontrol Atropin +
Seri Konsentrasi Asetilkolin (Kontrol)

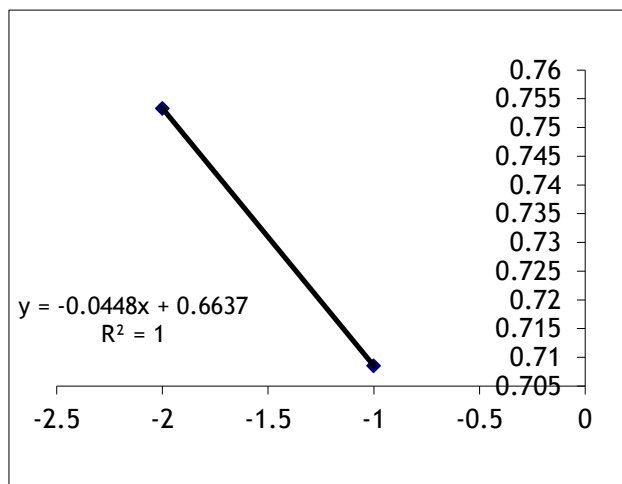
Log Konsentrasi (M)	Respon Kontraksi*												M E A N	S E M
	1	2	3	4	5	6	7	8	9	10	11	12		
-10.0	25.00	14.29	8.33	7.69	10.53	6.67	15.38	11.11	0.00	25.00	4.00	9.09	11.42	2.19
-9.5	25.00	14.29	8.33	7.69	10.53	6.67	15.38	11.11	0.00	25.00	4.00	9.09	11.42	2.19
-9.0	31.25	14.29	8.33	7.69	10.53	6.67	15.38	11.11	12.50	25.00	8.00	9.09	13.32	2.17
-8.5	31.25	14.29	8.33	7.69	10.53	6.67	15.38	11.11	37.50	25.00	16.00	9.09	16.07	2.88
-8.0	43.75	14.29	8.33	7.69	10.53	6.67	15.38	11.11	37.50	25.00	16.00	9.09	17.11	3.50
-7.5	43.75	21.43	8.33	7.69	15.79	13.33	15.38	22.22	50.00	25.00	16.00	9.09	20.67	3.89
-7.0	56.25	28.57	25.00	15.38	26.32	20.00	23.08	33.33	50.00	25.00	28.00	9.09	28.34	3.83
-6.5	62.50	42.86	33.33	15.38	42.11	33.33	30.77	44.44	50.00	37.50	28.00	18.18	36.53	3.79
-6.0	75.00	64.29	66.67	46.15	52.63	53.33	46.15	66.67	50.00	50.00	32.00	22.73	52.13	4.30
-5.5	75.00	85.71	83.33	61.54	73.68	73.33	69.23	88.89	62.50	75.00	48.00	54.55	70.90	3.59
-5.0	81.25	92.86	100	69.23	89.47	86.67	76.92	100	75.00	75.00	60.00	63.64	80.84	3.83
-4.5	87.50	92.86	100	84.62	94.74	93.33	92.31	100	87.50	100	80.00	86.36	91.60	1.89
-4.0	100	100	100	92.31	100	100	100	100	87.50	100	80.00	100	96.65	1.91
-3.5	100	100	100	100	100	100	100	100	100	100	100	100	100	0.00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi asetilkolin (kontrol) Media : Larutan *buffer tyrode*

Lampiran 9. Perhitungan Parameter Antagonis (pA2) Alkaloid lada Terhadap Reseptor ACh

1. Perhitungan Parameter Antagonis (PA2) Alkaloid Lada *Piper nigrum* Linn. Terhadap Reseptor ACh

No.	PERLAKUAN	pD2	A or A'	A'/A	x-1	log(x-1)	Kons M		Log M
							(uM)		
1	Kontrol	4.735	0.000018						
2	(+)Alkaloid Lada <i>Piper nigrum</i> Linn. 100	3.892	0.00012	6.666667	5.666667	0.753328	1000	0.001	-2
3	(+)Alkaloid Lada <i>Piper nigrum</i> Linn.500	3.940	0.00011	6.111111	5.111111	0.708515	5000	0.005	-1



Lampiran 10. Hasil Uji Statistik Pada Uji Pengaruh Pelarut DMSO Terhadap Kontraksi Otot Polos Ileum

- a. Hasil Uji Statistik Pada Uji Pengaruh Pelarut DMSO terhadap Kontraksi Otot Polos Ileum yang Diinduksi Asetilkolin.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Kontrol	6	100.0%	0	.0%	6	100.0%
DMSO	6	100.0%	0	.0%	6	100.0%

Descriptives

		Statistic	Std. Error	
Kontrol	Mean	4.2833	.45277	
	95% Confidence Interval for Mean	Lower Bound	3.1194	
		Upper Bound	5.4472	
	5% Trimmed Mean	4.2304		
	Median	4.0150		
	Variance	1.230		
	Std. Deviation	1.10907		
	Minimum	3.26		
	Maximum	6.26		
	Range	3.00		
	Interquartile Range	1.78		
	Skewness	1.317	.845	
	Kurtosis	1.649	1.741	
DMSO	Mean	4.2200	.41071	
	95% Confidence Interval for Mean	Lower Bound	3.1642	
		Upper Bound	5.2758	
	5% Trimmed Mean	4.1722		
	Median	4.0000		
	Variance	1.012		
	Std. Deviation	1.00604		
	Minimum	3.17		
	Maximum	6.13		
	Range	2.96		
	Interquartile Range	1.12		
	Skewness	1.677	.845	
	Kurtosis	3.709	1.741	

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Kontrol	.222	6	.200	.886	6	.296
DMSO	.317	6	.059	.825	6	.098

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Kontrol	4.2833	6	1.10907	.45277
	DMSO	4.2200	6	1.00604	.41071

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Kontrol & DMSO	6	.968	.002

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Kontrol	6	100.0%	0	.0%	6	100.0%
DMSO	6	100.0%	0	.0%	6	100.0%

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Kontrol - DMSO	.06333	.28800	.11758	-.23891	.36558	.539	5	.613

Lampiran 11. Hasil Uji Statistik Reversibilitas Kontraksi Otot Polos Ileum

Case Processing Summary

Dosis		Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
pD2	Seri kadar Asetilkolin	12	100.0%	0	.0%	12	100.0%
	Piperin 100 uL	6	100.0%	0	.0%	6	100.0%
	Piperin 500 uL	6	100.0%	0	.0%	6	100.0%

Descriptives

Dosis				Statistic	Std. Error
pD2	Seri kadar Asetilkolin	Mean		6.7350	.17081
		95% Confidence Interval for Mean	Lower Bound	6.3591	
			Upper Bound	7.1109	
		5% Trimmed Mean		6.7589	
		Median		6.7600	
		Variance		.350	
		Std. Deviation		.59169	
		Minimum		5.52	
		Maximum		7.52	
		Range		2.00	
		Interquartile Range		.99	
		Skewness		-.537	.637
		Kurtosis		-.129	1.232
Piperin 100 uL		Mean		6.8400	.20925
		95% Confidence Interval for Mean	Lower Bound	6.3021	
			Upper Bound	7.3779	
		5% Trimmed Mean		6.8344	
		Median		6.8700	
		Variance		.263	
		Std. Deviation		.51256	
		Minimum		6.26	
		Maximum		7.52	
		Range		1.26	
		Interquartile Range		1.06	
		Skewness		-.004	.845
		Kurtosis		-1.471	1.741
Piperin 500 uL		Mean		6.4617	.30173
		95% Confidence Interval for Mean	Lower Bound	5.6860	
			Upper Bound	7.2373	
		5% Trimmed Mean		6.4507	
		Median		6.3250	
		Variance		.546	
		Std. Deviation		.73909	
		Minimum		5.52	
		Maximum		7.60	
		Range		2.08	
		Interquartile Range		1.27	
		Skewness		.512	.845
		Kurtosis		-.159	1.741

Tests of Normality

Dosis	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pD2						
Seri kadar Asetilkolin	.146	12	.200 [*]	.945	12	.567
Piperin 100 uL	.204	6	.200 [*]	.909	6	.429
Piperin 500 uL	.205	6	.200 [*]	.972	6	.907

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

ANOVA

pD2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.472	2	.236	.628	.544
Within Groups	7.896	21	.376		
Total	8.368	23			

Multiple Comparisons

Dependent Variable: pD2

	(i) Dosis	(j) Dosis	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Seri kadar Asetilkolin	Piperin 100 uL	-.10500	.30659	.938	-.8778	.6678
		Piperin 500 uL	.27333	.30659	.651	-.4995	1.0461
	Piperin 100 uL	Seri kadar Asetilkolin	.10500	.30659	.938	-.6678	.8778
		Piperin 500 uL	.37833	.35402	.543	-.5140	1.2707
	Piperin 500 uL	Seri kadar Asetilkolin	-.27333	.30659	.651	-1.0461	.4995
		Piperin 100 uL	-.37833	.35402	.543	-1.2707	.5140
LSD	Seri kadar Asetilkolin	Piperin 100 uL	-.10500	.30659	.735	-.7426	.5326
		Piperin 500 uL	.27333	.30659	.383	-.3643	.9109
	Piperin 100 uL	Seri kadar Asetilkolin	.10500	.30659	.735	-.5326	.7426
		Piperin 500 uL	.37833	.35402	.297	-.3579	1.1146
	Piperin 500 uL	Seri kadar Asetilkolin	-.27333	.30659	.383	-.9109	.3643
		Piperin 100 uL	-.37833	.35402	.297	-1.1146	.3579

pD2

Dosis	N	Subset for alpha = 0.05
		1
Tukey HSD ^a		
Piperin 500 uL	6	6.4617
Seri kadar Asetilkolin	12	6.7350
Piperin 100 uL	6	6.8400
Sig.		.483

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 7.200.

Lampiran 12. Hasil Uji Statistik Pada Uji Pengaruh alkaloid lada *Piper nigrum* Linn. dan asetilkolin terhadap Kontraksi Otot Polos ileum yang diinduksi atropin.

Case Processing Summary

dosis	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
pD2 Seri kadar Asetilkolin	12	100.0%	0	.0%	12	100.0%
Piperin 100 uL	6	100.0%	0	.0%	6	100.0%
Piperin 500 uL	6	100.0%	0	.0%	6	100.0%
Seri Kadar Atropin	12	100.0%	0	.0%	12	100.0%
Atropin 100 uL	6	100.0%	0	.0%	6	100.0%
Atropin 500 uL	6	100.0%	0	.0%	6	100.0%

Descriptives

Dosis	Statistic	Std. Error
pD2 Seri Kadar Asetilkolin	Mean	4.7350
	95% Confidence Interval for Mean	4.3591
	Lower Bound	5.1109
	Upper Bound	4.7589
	5% Trimmed Mean	4.7600
	Median	.350
	Variance	.59169
	Std. Deviation	3.52
	Minimum	5.52
	Maximum	2.00
	Range	.99
	Interquartile Range	-.537
	Skewness	1.232
	Kurtosis	
Piperin 100 uL	Mean	3.8917
	95% Confidence Interval for Mean	3.2827
	Lower Bound	4.5006
	Upper Bound	3.9153
	5% Trimmed Mean	3.9400
	Median	.337
	Variance	.58029
	Std. Deviation	2.82
	Minimum	4.52
	Maximum	1.70
	Range	.70
	Interquartile Range	-1.436
	Skewness	.845
	Kurtosis	1.741
Piperin 500 uL	Mean	3.9400
	95% Confidence Interval for Mean	3.5494
	Lower Bound	4.3306
	Upper Bound	3.9476
	5% Trimmed Mean	3.9400
	Median	.139
	Variance	.37218
	Std. Deviation	3.35
	Minimum	4.39
	Maximum	1.04
	Range	.63
	Interquartile Range	-.508
	Skewness	.845
	Kurtosis	1.741
Seri Kadar Atropin	Mean	4.1933
	95% Confidence Interval for Mean	3.7648
	Lower Bound	4.5219
	Upper Bound	4.1787
	5% Trimmed Mean	4.1100
	Median	.455
	Variance	.67453
	Std. Deviation	3.13
	Minimum	5.52
	Maximum	2.39
	Range	.58
	Interquartile Range	-.648
	Skewness	.637
	Kurtosis	1.232
Atropin 100 uL	Mean	3.5617
	95% Confidence Interval for Mean	3.2249
	Lower Bound	3.8984
	Upper Bound	3.5780
	5% Trimmed Mean	3.6700
	Median	.103
	Variance	.32090
	Std. Deviation	2.95
	Minimum	3.88
	Maximum	.93
	Range	.35
	Interquartile Range	-1.747
	Skewness	.845
	Kurtosis	1.741
Atropin 500 uL	Mean	2.7083
	95% Confidence Interval for Mean	2.3240
	Lower Bound	3.0927
	Upper Bound	2.7087
	5% Trimmed Mean	2.7550
	Median	.134
	Variance	.36625
	Std. Deviation	2.26
	Minimum	3.15
	Maximum	.89
	Range	.73
	Interquartile Range	-.166
	Skewness	.845
	Kurtosis	1.741

Tests of Normality

Dosis	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pD2						
Seri Kadar Asetilkolin	.146	12	.200 [*]	.945	12	.567
Piperin 100 uL	.325	6	.046	.866	6	.211
Piperin 500 uL	.148	6	.200 [*]	.970	6	.892
Seri Kadar Atropin	.219	12	.118	.936	12	.454
Atropin 100 uL	.287	6	.134	.807	6	.068
Atropin 500 uL	.200	6	.200 [*]	.921	6	.512

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

ANOVA

pD2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.185	5	3.637	12.301	.000
Within Groups	12.418	42	.296		
Total	30.603	47			

Multiple Comparisons

Dependent Variable: pD2		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval			
(I) Dosis	(J) Dosis				Lower Bound	Upper Bound		
Tukey HSD	Seri Kadar Asetilkolin	Piperin 100 uL	.84333 [*]	.27187	.038	.0317	1.6549	
		Piperin 500 uL	.79500	.27187	.058	-.0166	1.6066	
		Seri Kadar Atropin	.54167	.22198	.166	-.1210	1.2043	
		Atropin 100 uL	1.17333 [*]	.27187	.001	.3617	1.9849	
		Atropin 500 uL	2.02667 [*]	.27187	.000	1.2151	2.8383	
	Piperin 100 uL	Seri Kadar Asetilkolin	-.84333 [*]	.27187	.038	-1.6549	-.0317	
		Piperin 500 uL	-.04833	.31393	1.000	-.9855	.8888	
		Seri Kadar Atropin	-.30167	.27187	.875	-1.1133	.5099	
		Atropin 100 uL	.33000	.31393	.897	-.6072	1.2672	
		Atropin 500 uL	1.18333 [*]	.31393	.006	.2462	2.1205	
	Piperin 500 uL	Seri Kadar Asetilkolin	-.79500	.27187	.058	-1.6066	.0166	
		Piperin 100 uL	.04833	.31393	1.000	-.8888	.9655	
		Seri Kadar Atropin	-.25333	.27187	.936	-1.0649	.5583	
		Atropin 100 uL	.37833	.31393	.832	-.5588	1.3155	
		Atropin 500 uL	1.23167 [*]	.31393	.004	.2945	2.1688	
	Seri Kadar Atropin	Seri Kadar Asetilkolin	-.54167	.22198	.166	-1.2043	.1210	
		Piperin 100 uL	.30167	.27187	.875	-.5099	1.1133	
		Piperin 500 uL	.25333	.27187	.936	-.5583	1.0649	
		Atropin 100 uL	.63167	.27187	.208	-.1799	1.4433	
		Atropin 500 uL	1.48500 [*]	.27187	.000	.6734	2.2966	
	Atropin 100 uL	Seri Kadar Asetilkolin	-1.17333 [*]	.27187	.001	-1.9849	-.3617	
		Piperin 100 uL	-.33000	.31393	.897	-1.2672	.6072	
		Piperin 500 uL	-.37833	.31393	.832	-1.3155	.5588	
		Seri Kadar Atropin	-.63167	.27187	.208	-1.4433	.1799	
		Atropin 500 uL	.85333	.31393	.093	-.0838	1.7905	
	Atropin 500 uL	Seri Kadar Asetilkolin	-2.02667 [*]	.27187	.000	-2.8383	-1.2151	
		Piperin 100 uL	-1.18333 [*]	.31393	.006	-2.1205	-.2462	
		Piperin 500 uL	-1.23167 [*]	.31393	.004	-2.1688	-.2945	
		Seri Kadar Atropin	-1.48500 [*]	.27187	.000	-2.2966	-.6734	
		Atropin 100 uL	-.85333	.31393	.093	-1.7905	.0838	
	LSD	Seri Kadar Asetilkolin	Piperin 100 uL	.84333 [*]	.27187	.003	.2947	1.3920
			Piperin 500 uL	.79500	.27187	.006	.2463	1.3437
			Seri Kadar Atropin	.54167 [*]	.22198	.019	.0937	.9896
			Atropin 100 uL	1.17333 [*]	.27187	.000	.6247	1.7220
			Atropin 500 uL	2.02667 [*]	.27187	.000	1.4780	2.5753
		Piperin 100 uL	Seri Kadar Asetilkolin	-.84333 [*]	.27187	.003	-1.3920	-.2947
			Piperin 500 uL	-.04833	.31393	.878	-.8819	.8552
			Seri Kadar Atropin	-.30167	.27187	.273	-.8503	.2470
			Atropin 100 uL	.33000	.31393	.299	-.3035	.9635
			Atropin 500 uL	1.18333 [*]	.31393	.001	.5498	1.8169
		Piperin 500 uL	Seri Kadar Asetilkolin	-.79500 [*]	.27187	.006	-1.3437	-.2463
			Piperin 100 uL	.04833	.31393	.878	-.8552	.8819
			Seri Kadar Atropin	-.25333	.27187	.357	-.8020	.2953
			Atropin 100 uL	.37833	.31393	.235	-.2552	1.0119
			Atropin 500 uL	1.23167 [*]	.31393	.000	.5981	1.8652
		Seri Kadar Atropin	Seri Kadar Asetilkolin	-.54167 [*]	.22198	.019	-.9896	-.0937
			Piperin 100 uL	.30167	.27187	.273	-.2470	.8503
			Piperin 500 uL	.25333	.27187	.357	-.2953	.8020
Atropin 100 uL			.63167 [*]	.27187	.025	-.0830	1.1803	
Atropin 500 uL			1.48500 [*]	.27187	.000	.9363	2.0337	
Atropin 100 uL		Seri Kadar Asetilkolin	-1.17333 [*]	.27187	.000	-1.7220	-.6247	
		Piperin 100 uL	-.33000	.31393	.299	-.9635	.3035	
		Piperin 500 uL	-.37833	.31393	.235	-1.0119	.2552	
		Seri Kadar Atropin	-.63167 [*]	.27187	.025	-1.1803	-.0830	
		Atropin 500 uL	.85333 [*]	.31393	.009	.2198	1.4869	
Atropin 500 uL		Seri Kadar Asetilkolin	-2.02667 [*]	.27187	.000	-2.5753	-1.4780	
		Piperin 100 uL	-1.18333 [*]	.31393	.001	-1.8169	-.5498	
		Piperin 500 uL	-1.23167 [*]	.31393	.000	-1.8652	-.5981	
		Seri Kadar Atropin	-1.48500 [*]	.27187	.000	-2.0337	-.9363	
		Atropin 100 uL	-.85333 [*]	.31393	.009	-1.4869	-.2198	

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

pD2

dosis	N	Subset for alpha = 0.05		
		1	2	3
Tukey HSD ^a				
Atropin 500 uL	6	2.7083		
Atropin 100 uL	6	3.5617	3.5617	
Piperin 100 uL	6		3.8917	3.8917
Piperin 500 uL	6		3.9400	3.9400
Seri Kadar Atropin	12		4.1933	4.1933
Seri kadar Asetilkolin	12			4.7350
Sig.		.051	.257	.055

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 7.200.

Lampiran 13. Hasil Skor *Docking* Pada Reseptor ACh M3

1. Validasi *Docking* Ligan Asli (Tiotropium) Pada Reseptor ACh M3

```
log - Notepad
File Edit Format View Help
#####
# If you used AutoDock vina in your work, please cite: #
# #
# O. Trott, A. J. Olson, #
# AutoDock vina: improving the speed and accuracy of docking #
# with a new scoring function, efficient optimization and #
# multithreading, Journal of Computational Chemistry 31 (2010) #
# 455-461 #
# DOI 10.1002/jcc.21334 #
# #
# Please see http://vina.scripps.edu for more information. #
#####
Detected 4 CPUs
Reading input ... done.
Setting up the scoring function ... done.
Analyzing the binding site ... done.
Using random seed: 329543304
Performing search ... done.
Refining results ... done.

mode | affinity | dist from best mode
      | (kcal/mol) | rmsd l.b. | rmsd u.b.
-----|-----|-----|-----
1      | -9.2      | 0.000     | 0.000
2      | -9.1      | 0.913     | 1.189
3      | -8.3      | 1.629     | 2.119
4      | -8.3      | 9.279     | 11.946
5      | -8.1      | 8.242     | 9.329
6      | -8.0      | 1.133     | 1.786
7      | -7.9      | 8.918     | 11.222
8      | -7.4      | 8.813     | 11.219
9      | -7.0      | 2.632     | 5.771
writing output ... done.
```

2. Validasi *Docking* Senyawa Uji Alkaloid Lada *Piper nigrum* Linn. Pada Reseptor ACh M3

```
log - Notepad
File Edit Format View Help
#####
# If you used AutoDock vina in your work, please cite: #
# #
# O. Trott, A. J. Olson, #
# AutoDock vina: improving the speed and accuracy of docking #
# with a new scoring function, efficient optimization and #
# multithreading, Journal of Computational Chemistry 31 (2010) #
# 455-461 #
# DOI 10.1002/jcc.21334 #
# #
# Please see http://vina.scripps.edu for more information. #
#####
WARNING: The search space volume > 27000 Angstrom^3 (See FAQ)
Detected 2 CPUs
Reading input ... done.
Setting up the scoring function ... done.
Analyzing the binding site ... done.
Using random seed: -2937264
Performing search ... done.
Refining results ... done.

mode | affinity | dist from best mode
      | (kcal/mol) | rmsd l.b. | rmsd u.b.
-----|-----|-----|-----
1      | -7.4      | 0.000     | 0.000
2      | -7.2      | 37.448    | 40.063
3      | -7.1      | 3.678     | 6.498
4      | -7.0      | 3.060     | 3.966
5      | -7.0      | 26.648    | 27.273
6      | -6.8      | 2.067     | 6.824
7      | -6.8      | 2.766     | 3.464
8      | -6.6      | 26.790    | 28.674
9      | -6.6      | 1.997     | 6.820
writing output ... done.
```

3. Validasi *Docking* Senyawa Pemandang (*Atropine Sulfate*) Pada Reseptor ACh M3

```
log - Notepad
File Edit Format View Help
#####
# If you used Autodock vina in your work, please cite:
#
# O. Trott, A. J. Olson,
# Autodock vina: improving the speed and accuracy of docking
# with a new scoring function, efficient optimization and
# multithreading, Journal of Computational Chemistry 31 (2010)
# 455-461
#
# DOI 10.1002/jcc.21334
#
# Please see http://vina.scripps.edu for more information.
#####
WARNING: The search space volume > 27000 Angstrom^3 (See FAQ)
Detected 2 CPUs
Reading input ... done.
Setting up the scoring function ... done.
Analyzing the binding site ... done.
Using random seed: -1192451224
Performing search ... done.
Refining results ... done.

mode | affinity | dist from best mode
      | (kcal/mol) | rmsd l.b. | rmsd u.b.
-----|-----|-----|-----
1     | -3.8      | 0.000     | 0.000
2     | -3.8      | 8.588     | 9.935
3     | -3.8      | 0.002     | 2.353
4     | -3.7      | 8.637     | 9.844
5     | -3.7      | 1.002     | 2.434
6     | -3.4      | 9.097     | 10.348
7     | -3.3      | 9.959     | 10.828
8     | -3.3      | 9.006     | 10.230
9     | -3.3      | 17.601    | 18.326
writing output ... done.
```