

BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan penelitian dapat disimpulkan bahwa:

Pertama, ekstrak etanol 70% akar iler dapat menunjukkan efek hipoglikemik pada tikus putih jantan galur wistar yang diinduksi aloksan.

Kedua, dari hasil analisa statistik ekstrak 70% etanol akar iler dengan dosis 38,5 mg/200 g BB, 77 mg/200 g BB, 154 mg/200 g BB tikus memberikan efek hipoglikemik pada tikus putih jantan yang diinduksi aloksan sehingga dosis terkecil yaitu 38,5 mg/200 g BB tikus sudah memberikan efek hipoglikemik pada tikus putih jantan yang diinduksi aloksan.

B. Saran

Perlu dilakukan penelitian lebih lanjut untuk mengetahui aktifitas senyawa aktif yang mempunyai pengaruh dalam menurunkan kadar glukosa darah. Penelitian ini dapat ditambahkan dengan penelitian hispatologi untuk mengetahui keadaan pankreas hewan uji.

DAFTAR PUSTAKA

- Agusta, A., 2000, *Minyak Atsiri Tumbuhan Tropika Indonesia*, 8, ITB Bandung
- Anonim, 1979, *Farmakope Indonesia*, Edisi III, Departemen Kesehatan Republik Indonesia, Jakarta
- Anonim, 1986, *Sediaan Galenik*, Departemen Kesehatan Republik Indonesia, Jakarta, 1-7, 10-12
- Anonim, 1995, *Himpunan Peraturan Perundang-Undangan Bidang Kesehatan 1994-1995*, 2-3, mitra informasi Jakarta
- Anonim. 1993. *Penapisan Farmakologi, Pengujian Fitokimia dan Pengujian Klinik*. Jakarta: Departemen Kesehatan Republik Indonesia. 15-17.
- Anonim. 2000. *Informatorium Obat Nasional Indonesia*. Departemen Kesehatan Republik Indonesia. Jakarta. 263-270.
- Anonim. 2005. *Pelayanan Kefarmasian dan Terapi Pengobatan*. Departemen Kesehatan Republik Indonesia.
- Ansel, H.C, 1989, *Pengantar Bentuk Sediaan Farmasi*, Edisi IV, Universitas Indonesia, Jakarta
- Astuti, N.H., 2000, menyelamatkan tanaman obat asli Indonesia melalui paten, *medika*, 10, XXVI
- Backer, c.a., Van den Brink, R.C.B, 1965, *Flora Of Java*, Volume I, II, N.V.P. Nordhoff Groningen, the Netherlands
- Dalimarta, S., 2005, *Ramuan Tradisional untuk Pengobatan Diabetes Mellitus*, Cetakan IV, PT. Penebar Swadaya, Jakarta
- Ganong, 1983, *Fisiologi Kedokteran* (review of Medical Physiology), edisi 10, Jakarta, 290
- Hargono, D., 1996, *Efek Samping Obat Dari Bahan Alam Lebih Kecil Daripada Efek Samping Obat Kimia Murni*, *Cermin Dunia Farmasi*, 28, 9-10
- Hartini, SK. 2009. *Diabetetes ? Siapa Takut !! Panduan Lengkap Untuk Diabetisi, Keluarganya, dan Profesional Medis*. Bandung : Mizan Pustaka.

- Hermawan, A., 2009, *Rahasia Memyembuhkan Diabetes Secara Tuntas Dan Alami*, 6, Ebook Healindonesia, Healindonesia Group.
- Lanywati, Endang. (2001). *Diabetes Mellitus Penyakit Kencing Manis*. Yogyakarta : Kanisius.
- Mansjoer A, Triyanti K, Savitri R, Wardhani WI, Setiowulan W, (Ed.). 2001. *Kapita Selekta Kedokteran*, Edisi Ketiga, Jilid I, Media Aesculapius, Jakarta, 580-588
- Robinson t. 1995. *Kandungan Organik Tumbuhan Tinggi*. Diterjemahkan oleh Padmawinata K. ITB. Bandung
- Siswandono dan Soekarjo B. 2000. *Kimia Medisinal*. Surabaya : Erlangga University Press. 459-464.
- Smith JB, Mangkoewidjojo S. 1988. *Pemeliharaan, Pembiakan dan Penggunaan Hewan Percobaan di Daerah Tropis*. Jakarta: UI Press. 37-38.
- Soebagio. 1996. *Fisiologi Kelenjar Endokrin*. Cetakan I. Penerbit UI Press. Jakarta
- Sudarmaji S, Haryono B, Suhardi. 1997. *Prosedur Analisis Untuk Bahan Makanan dan Pertanian*. Yogyakarta: Liberty.
- Tandra H. 2008. *Segala Sesuatu Yang Harus Anda Ketahui Tentang Diabetes*. Gramedia Pustaka Utama. Jakarta.
- Thomas, A.S.S, 1992, *Tanaman Obat Tradisoanal*, 39. Penerbit Kanisius, Yogyakarta
- Tranggono. 1987. *Biokimia dan Fisiologi Karbohidrat*. Pusat Antar Universitas Pangan dan Gizi. UGM. Yogyakarta
- Utami P. 2003. *Tanaman Obat Untuk Mengatasi Diabetes Mellitus*. Jakarta : PT Agromedia Pustaka.
- Voight R. 1995. *Buku Pelajaran Teknologi Farmasi*, Diterjemahkan Oleh Soendani Noerono, Edisi ke 5, Gadjah Mada University Prees, Yogyakarta
- Waspadji. 1996. *Buku Ajar Ilmu Penyakit Dalam*. Jilid I, edisi III. Jakarta : Jayabaru. 648-654.

Lampiran 1. Surat Keterangan Determinasi



No : 053/DET/UPT-LAB/26/III/2013
Hal : Surat Keterangan Determinasi Tumbuhan

Menerangkan bahwa :

Nama : Mensie Martha Levianie
NIM : 15092723 A
Fakultas : Farmasi Universitas Setia Budi

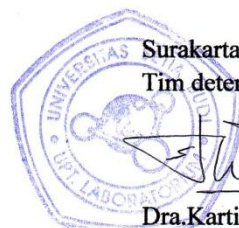
Telah mendeterminasikan tumbuhan : **Iler (*Coleus scutellarioides* Bth.)**

Hasil determinasi berdasarkan : Steenis : FLORA

1b – 2b – 3b – 4b – 6b – 7b – 9b – 10b – 11b – 12b – 13b – 14b – 16a – 239b – 243b – 244b – 248b – 249b – 250b – 266b – 267a – 268b – 271b. familia 110. Labiatae. 1a – 2b – 4b – 6b – 7a. Coleus. ***Coleus scutellarioides* Bth.**

Deskripsi:

- Habitus : Semak, tinggi dapat mencapai 2 meter.
Batang : Tegak, bentuk segi empat, lunak, berwarna hijau.
Daun : Tunggal, berhadapan bersilang, bangun lonjong, ujung runcing, pangkal membulat, tepi bergerigi, panjang 6 – 8 cm, lebar 3 – 4 cm, tulang daun menyirip, permukaan berwarna merah kecoklatan dan hijau.
Bunga : Majemuk, berkarang, terdapat di ujung batang, tangkai silindris, kelopak bentuk bintang, daun kelopak 5, mahkota bunga bentuk bibir, berwarna ungu, benangsari dan putik kecil.
Akar : **Tunggang, berwarna kuning.**
Pustaka : Steenis C.G.G.J., Bloembergen S. Eyma P.J. (1978): *FLORA*, PT Pradnya Paramita. Jl. Kebon Sirih 46. Jakarta Pusat, 1978.



Surakarta, 26 Maret 2013
Tim determinasi

Dra.Kartinah Wiryosoendjojo, SU.

Lampiran 2. Surat Keterangan Pembelian Hewan Uji

"ABIMANYU FARM"

√ Mencit putih jantan √ Tikus Wistar √ Swis Webster √ Cacing √ Mencit Jepang √ Kelinci New Zealand
Ngampon RT 04 / RW 04. Mojosongo Kec. Jebres Surakarta. Phone 085 629 994 33 / Lab USB Ska

Menerangkan dengan sebenarnya bahwa Tikus Wistar yang dibeli oleh:

Nama : Mensie Martha Lovianie
Alamat : Universitas Setia Budi Surakarta
Fakultas : Farmasi
Nim : 15092723 A
Keperluan : Praktikum Penelitian
Tanggal : 6 Mei 2013
Jenis : Tikus Wistar
Kelamin : Tikus Wistar Jantan
Umur : ± 3 - 4 bulan
Jumlah : 40 ekor jantan

Atas kerja samanya, kami mengucapkan terima kasih dan mohon maaf jika dalam pelayanannya banyak kekurangan.

Demikian surat keterangan ini dibuat, semoga dapat digunakan sebagaimana mestinya.

Surakarta, 27 Mei 2013

Hormat kami



ABIMANYU FARM

Sigit Pramono

Lampiran 3. Glibenklamid



3263, G.I.D.C. Estate,
Ankleshwar - 393002
Gujarat, India

Phone : +91-2646-250174/220178
Fax : +91-2646-26519
Website : www.cadilapharma.com

Name of Finished Product		Glibenclamide BP/ Ph.Eur.	
Manufactured By		Cadila Pharmaceuticals Limited, Ankleshwar	
Lot No.	2011010	A.R. NO	FP20021
Manufacturing Date	JANUARY 2012	Qty Mfgd.	253.10 kg
Expiry Date	DECEMBER 2016		
Certificate of Analysis			
Test	Requirements	Results	
Characteristics			
Appearance	A white or almost white crystalline powder	White crystalline powder.	
Solubility	Practically insoluble in water, sparingly soluble in methylene chloride, slightly soluble in alcohol and in methanol.	Practically insoluble in water, sparingly soluble in methylene chloride, slightly soluble in alcohol and in methanol.	
Identification			
A) Melting point	Melting Point 169°C to 174°C	172.4°C	
C) By IR	Examine by infrared absorption spectrophotometry, comparing with the spectrum obtained with Glibenclamide working standard. Examine the substance as disc prepared using potassium bromide. If the spectra obtained shows differences, moisten separately the substance with methanol, titrate, dry at 100°C to 105°C and record the spectrum again.	Matches with working standard	
Related substances (By HPLC)			
1 Impurity A	Not more than 0.5 %	0.02 %	
2 Impurity B	Not more than 0.5 %	0.07 %	
3 Unknown Impurity 1	Not more than 0.2 %	0.17 %	
4 Unknown Impurity 2	Not more than 0.1 %	0.04 %	
5 Unknown Impurity 3	Not more than 0.1 %	0.03 %	
6 Total of other Impurity	Not more than 0.5 %	0.24 %	
Heavy metals	Not more than 20 ppm (Determined on 1.0 g)	Less than 20 ppm	
Loss on drying	Not more than 1.0 % (Determined on 1.0 g by drying in an oven at 100 to 105°C.)	0.40 % w/w	
Sulphited ash	Not more than 0.1 % (Determined on 1.0 g)	0.06 % w/w	
Away	Not less than 99.0 % and not more than the equivalent of 101.0 % of $C_{12}H_{12}ClN_2O_5S$, calculated with reference to the dried substance.	99.6 % w/w	
Additional tests:			
Particle size			
(By Malvern master size)	90 % particle should be less than 20 μ	90 % particles are less than 11.19 μ .	
Remarks: The material complies with respect to the BP/ Ph.Eur. Specification.			
Prepared By		Checked By	
Date	09.11.12	Date	09.11.12
Approved By		Date	09.11.12

P/QC029/01/01.01.11

Corporate Office :
"Cadila Corporate Campus,"
Sankhji-Dholka Road, Bhat,
Ahmedabad - 382 210, Gujarat, India.

Phone : +91-2718-25001-15
Fax : +91-2718-25039
Website : www.cadilapharma.com

The Care Continues...

Lampiran 4. KIT Reagen glukosa



Glucose GOD FS*

Diagnostic reagent for quantitative in vitro determination of glucose in serum or plasma on photometric systems

Order Information

Cat. No.	Kit size
1 2500 99 83 021 R	5 x 25 mL + 1 x 3 mL Standard
1 2500 99 83 026 R	6 x 100 mL
1 2500 99 83 023 R	1 x 1000 mL
1 2500 99 83 704 R	8 x 50 mL
1 2500 99 83 717 R	6 x 100 mL
1 2500 99 83 917 R	10 x 60 mL
1 2500 99 83 192 R	4 x 60 mL
1 2500 99 83 030	6 x 3 mL Standard

Summary [1,2]

Measurement of glucose concentration in serum or plasma is mainly used in diagnosis and monitoring of treatment in diabetes mellitus. Other applications are the detection of neonatal hypoglycemia, the exclusion of pancreatic islet cell carcinoma as well as the evaluation of carbohydrate metabolism in various diseases.

Method

*GOD-PAP: enzymatic photometric test

Principle

Determination of glucose after enzymatic oxidation by glucose oxidase. The colorimetric indicator is quinoneimine, which is generated from 4-aminoantipyrene and phenol by hydrogen peroxide under the catalytic action of peroxidase (Trinder's reaction) [3].



Reagents

Components and Concentrations

Reagent:		
Phosphate buffer	pH 7.5	250 mmol/L
Phenol		5 mmol/L
4-Aminoantipyrene		0.5 mmol/L
Glucose oxidase (GOD)		≥ 10 KU/L
Peroxidase (POD)		≥ 1 KU/L
Standard:		100 mg/dL (5.55 mmol/L)

Storage Instructions and Reagent Stability

The reagent is stable up to the end of the indicated month of expiry, if stored at 2-8 °C, protected from light and contamination is avoided. Do not freeze the reagents!

The standard is stable up to the end of the indicated month of expiry, if stored at 2-25 °C.

Note! It has to be mentioned, that the measurement is not influenced by occasionally occurring color changes, as long as the absorbance of the reagent is < 0.3 at 546 nm.

Warnings and Precautions

- The reagent contains sodium azide (0.95 g/L) as preservative. Do not swallow! Avoid contact with skin and mucous membranes.
- Please refer to the safety data sheets and take the necessary precautions for the use of laboratory reagents.

Waste Management

Please refer to local legal requirements.

Reagent Preparation

Reagent and standard are ready-to-use.

Materials required but not provided

NaCl solution 9 g/L
General laboratory equipment

Specimen

Serum, heparin, plasma or EDTA plasma. Separate at the latest 1h after blood collection from cellular contents.

Stability in plasma after addition of a glycolytic inhibitor (Fluoride, monoiodacetate, mannose) [4]:

2 days at 20-25 °C

7 days at 4-8 °C

1 day at -20 °C

Stability in serum (separated from cellular contents, hemolysis free) without adding a glycolytic inhibitor [2,5]:

8 h at 25 °C

72 h at 4 °C

Discard contaminated specimens!

Assay Procedure

Application sheets for automated systems are available on request.

Wavelength	500 nm, Hg 546 nm
Optical path	1 cm
Temperature	20-25 °C / 37 °C
Measurement	Against reagent blank

Sample or standard	Blank	Sample or standard
Dist. water	10 µL	10 µL
Reagent	1000 µL	1000 µL
Mix, incubate 20 min. at 20-25 °C or 10 min. at 37 °C.		
Read absorbance against the blank within 60 min.		

Calculation

With standard or calibrator

$$\text{Glucose [mg/dL]} = \frac{\Delta A \text{ Sample}}{\Delta A \text{ Std / Cal}} \times \text{Conc. Std / Cal [mg/dL]}$$

Conversion factor

$$\text{Glucose [mg/dL]} \times 0.05551 = \text{Glucose [mmol/L]}$$

Calibrators and Controls

For the calibration of automated photometric systems the TruCal U calibrator is recommended. For internal quality control TruLab N and P controls should be assayed with each batch of samples.

	Cat. No.	Kit size
TruCal U	5 9100 99 83 063	20 x 3 mL
	5 9100 99 83 064	6 x 3 mL
TruLab N	5 9000 99 83 062	20 x 5 mL
	5 9000 99 83 061	6 x 5 mL
TruLab P	5 9050 99 83 062	20 x 5 mL
	5 9050 99 83 061	6 x 5 mL

Performance Characteristics

Measuring range

The test has been developed to determine glucose concentrations within a measuring range from 1 - 400 mg/dL. When values exceed this range samples should be diluted 1 + 4 with NaCl solution (9 g/L) and the result multiplied by 5.

Specificity / Interferences

No interference was observed by ascorbic acid up to 15 mg/dL, bilirubin up to 40 mg/dL, hemoglobin up to 200 mg/dL and lipemia up to 2,000 mg/dL triglycerides.

Sensitivity / Limit of Detection

The lower limit of detection is 1 mg/dL.

Precision (at 37°C)

Intra-assay precision n = 20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	43.9	0.30	0.67
Sample 2	89.5	0.72	0.81
Sample 3	297	2.45	0.82

Inter-assay precision n = 20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	45.7	0.40	0.87
Sample 2	92.3	0.79	0.85
Sample 3	301	2.09	0.70

Method Comparison

A comparison between Glucose FS (y) and a commercially available test (x) using 78 samples gave following results: $y = 1.00 \cdot x + 1.00 \text{ mg/dL}$; $r = 0.996$.

Reference Range [1]

	[mg/dL]	[mmol/L]
Newborns:		
Cord blood	63 - 158	3.5 - 8.8
1 h	36 - 99	2.0 - 5.5
2 h	36 - 89	2.2 - 4.9
5 - 14 h	34 - 77	1.9 - 4.3
10 - 28 h	46 - 81	2.6 - 4.5
44 - 52 h	48 - 79	2.7 - 4.4
Children (fasting):		
1 - 6 years	74 - 127	4.1 - 7.0
7 - 19 years	70 - 106	3.9 - 5.9
Adults (fasting):		
Serum / plasma	70 - 115	3.9 - 6.4

Each laboratory should check if reference ranges are transferable to its own patient population and determine own reference ranges if necessary.

Literature

- Thomas L. Clinical Laboratory Diagnostics, 1st ed. Frankfurt: TH-Books Verlagsgesellschaft; 1998. p. 131-7.
- Sacks DB. Carbohydrates. In: Burtis CA, Ashwood ER, editors. Tietz Textbook of Clinical Chemistry, 3rd ed. Philadelphia: W.B Saunders Company; 1999. p. 750-808.
- Barnham D, Trinder P. An improved color reagent for the determination of blood glucose by the oxidase system. Analyst 1972; 97: 142-5.
- Guder WG, Zawita B et al. The Quality of Diagnostic Samples. 1st ed. Darmstadt: GIT Verlag; 2001; p. 30-1.
- Sacks DB, Bruns DE, Goldstein DE, MacLaren NK, Mc Donald JM, Parrott M. Guidelines and recommendations for laboratory analysis in the diagnosis and management of diabetes mellitus. Clin Chem 2002; 48: 436-72.

Manufacturer

DiaSys Diagnostic Systems GmbH
Alte Strasse 9 65558 Holzheim Germany
Distributed by Diagnostika Sistem Indonesia

Lampiran 5. Foto – foto alat penelitian



Alat spektrofotometer Stardust



Alat sentrifuge



Alat sterling-Bidwell



Botol maserasi

Lampiran 6. Foto serbuk dan akar iler



Serbuk akar iler



Akar iler

Lampiran 7. Hewan uji



Tikus wistar jantan



Pengambilan darah



Pemberian perlakuan



Penyuntikan aloksan melalui intraperitoneal



Pemberian Glibenklamid

Lampiran 8. Foto identifikasi senyawa dan sediaan uji

Tannin , Flavonoid, Saponin



Sediaan uji



Sediaan uji



Ekstrak kental akar iler

Lampiran 9. Reagen glukosa



Reagen glukosa



Serum darah yang telah dicampur reagen yang akan diukur kadar glukosanya

Lampiran 10. Hasil prosentase berat kering terhadap berat basah akar iler

No.	Bobot basah (g)	Bobot kering (g)	Rendemen (%)
1	3500 g	1900 g	54,28%

Perhitungan:

$$\begin{aligned}\% \text{ Rendemen} &= \frac{\text{Bobot akar iler kering}}{\text{Bobot akar iler basah}} \times 100\% \\ &= \frac{1900 \text{ gram}}{3500 \text{ gram}} \times 100\% \\ &= 54,28 \%\end{aligned}$$

Prosentase akar iler kering terhadap akar iler basah adalah 54,28%.

Lampiran 11. Hasil penetapan kadar air serbuk akar iler dengan menggunakan Sterling-Bidwell

No	Berat serbuk (g)	Volume terbaca (ml)	Kadar air (%)
1	10,01	0,6	5,99
2	10,01	0,6	5,99
3	10,02	0,7	6,98
Rata-rata			6,32

Hasil penetapan kadar air serbuk akar iler dengan menggunakan Sterling-Bidwell.

Ditimbang \pm 10 gram serbuk akar iler kemudian dilarutkan dengan xylene 100 ml.

Prosentase rata-rata kadar air serbuk akar iler yang didapat adalah 6,32 %

Perhitungan :

$$\text{Kadar air 1} = \frac{\text{volume terbaca (ml)}}{\text{Berat serbuk (g)}} \times 100\%$$

$$= \frac{0,6 \text{ ml}}{10,01 \text{ g}} \times 100\%$$

$$= 5,9\%$$

$$\text{Kadar air 2} = \frac{\text{volume terbaca (ml)}}{\text{Berat serbuk (g)}} \times 100\%$$

$$= \frac{0,6 \text{ ml}}{10,01 \text{ g}} \times 100\%$$

$$= 5,9\%$$

$$\text{Kadar air 3} = \frac{\text{volume terbaca (ml)}}{\text{Berat serbuk (g)}} \times 100\%$$

$$= \frac{0,7 \text{ ml}}{10,02 \text{ g}} \times 100\%$$

$$= 6,9\%$$

Lampiran 12. Hasil rendemen ekstrak maserasi akar iler menggunakan pelarut etanol 70%



Ekstrak kental akar iler

Lampiran 13. Hasil perhitungan dosis dan pembuatan larutan stok uji ekstrak etanol

Perhitungan dosis

1. Suspensi CMC 0,5 %

$$\begin{aligned} \text{Konsentrasi CMC Na 0,5\%} &= 0,5 \text{ g /100 ml aquadest} \\ &= 500 \text{ mg/100 ml aquadest} \\ &= 5 \text{ mg/ml} \end{aligned}$$

Dibuat larutan stok 500 ml

$$\begin{aligned} \text{Stok CMC 0,5\%} &= \frac{500 \text{ ml}}{100 \text{ ml}} \times 500 \text{ mg} \\ &= 2500 \text{ mg/500 ml aquadest} \\ &= 2,5 \text{ g/500 ml aquadest.} \end{aligned}$$

Ditimbang serbuk CMC 2,5 g kemudian disuspensikan dengan aquadest panas ad 500 ml sampai homogen. Suspensi ini digunakan sebagai kontrol negatif dan *suspending agent*.

Volume pemberian suspensi CMC 0,5 % untuk tikus 200 g adalah 2,5 ml.

2. Glibenklamid (kontrol positif)

Dosis yang digunakan adalah dosis yang digunakan masyarakat pada umumnya. Dosis terapi glibenklamid sekali pemakaian untuk manusia 70 kg adalah 5 mg.

Faktor konversi dari manusia 70 kg ke tikus 200 g adalah 0,018.

$$5 \text{ mg} \times 0,018 = 0,09 \text{ mg/200 g BB tikus.}$$

Suspensi Glibenklamid dibuat dalam konsentrasi 0,05 %. Ditimbang 5 mg serbuk glibenklamid kemudian disuspensikan dengan CMC 0,5 % pada volume ad 100 ml sampai homogen.

$$\begin{aligned}\text{Suspensi Glibenklamid 0,05\%} &= 5 \text{ mg}/100 \text{ ml} \\ &= 0,05 \text{ mg/ml}\end{aligned}$$

$$\begin{aligned}\text{Volume Pemberian} &= \frac{0,09 \text{ mg}}{5 \text{ mg}} \times 100 \text{ ml} \\ &= 1,8 \text{ ml}\end{aligned}$$

Volume pemberian untuk tikus dengan berat badan 200 g adalah:

$$\begin{aligned}\text{Volume Pemberian} &= \frac{200 \text{ g}}{200 \text{ g}} \times 1,8 \text{ ml} \\ &= 1,8 \text{ ml}\end{aligned}$$

3. Aloksan

Pembuatan aloksan sebagai penginduksi diabetes dibuat dengan konsentrasi 1% dengan cara:

$$\begin{aligned}\text{Aloksan 1 \%} &= 1 \text{ g}/100 \text{ ml} \\ &= 1000 \text{ mg}/100 \text{ ml} \\ &= 10 \text{ mg/ml}\end{aligned}$$

Dosis aloksan untuk tikus adalah 150 mg/kg BB secara intra peritoneal.

$$\begin{aligned}150 \text{ mg/kg BB tikus} &= \frac{200 \text{ g}}{1000 \text{ g}} \times 150 \text{ mg} \\ &= 30 \text{ mg}/200 \text{ g BB tikus.}\end{aligned}$$

Maka, volume pemberian untuk tikus dengan berat badan 200 g adalah:

$$\begin{aligned} \text{Volume Pemberian} &= \frac{30 \text{ mg}}{10 \text{ mg}} \times 1 \text{ ml} \\ &= 3 \text{ ml.} \end{aligned}$$

4. Ekstrak etanol akar iler

4.1. Dosis orientasi ekstrak etanol akar iler. Dosis akar iler untuk mencit adalah 0,022 gram.

Faktor konversi ke tikus 7

$$\begin{aligned} \text{Dosis ekstrak etanol akar iler untuk tikus} &= 0,022 \text{ g} \times 7 \\ &= 0,154 \text{ g} = 154 \text{ mg} \end{aligned}$$

Dosis ekstrak etanol akar iler untuk tikus adalah 154 mg/200 g BB tikus.

Faktor konversi ke manusia 56

$$\begin{aligned} \text{Dosis ekstrak etanol akar iler untuk manusia} &= 0,154 \text{ g} \times 56 \\ &= 8,6 \text{ g} = 8600 \text{ mg} \end{aligned}$$

Dosis ekstrak etanol akar iler untuk manusia adalah 8600 mg/70 kg BB manusia.

4.2. Pembuatan larutan stok dosis uji ekstrak akar iler

$$\begin{aligned} \text{Konsentrasi dosis } 1/4 \text{ DE} &= 1/4 \times 154 \text{ mg}/200 \text{ g BB} \\ &= 38,5 \text{ mg}/1 \text{ ml} \\ &= 3850 \text{ mg}/100 \text{ ml} \\ &= 3,85 \text{ g}/100 \text{ ml} \\ &= 3,85 \% \end{aligned}$$

$$\begin{aligned} \text{Konsentrasi dosis } 1/2 \text{ DE} &= 1/2 \times 154 \text{ mg} \\ &= 77 \text{ mg}/1 \text{ ml} \\ &= 7700 \text{ mg}/100 \text{ ml} \end{aligned}$$

$$=7,7 \text{ g/100 ml}$$

$$=7,7 \%$$

Konsentrasi dosis 1DE $= 1 \times 154 \text{ mg}$

$$= 154 \text{ mg/1 ml}$$

$$= 15400 \text{ mg/100 ml}$$

$$= 15,4 \text{ g/100 ml}$$

$$= 15,4 \%$$

Konversi tikus ke manusia 56.

Lampiran 14. Pemeriksaan kadar glukosa darah tikus percobaan

Data kuantitatif penurunan kadar glukosa darah pada uji dosis ekstrak

Kelompok uji	Kadar glukosa darah awal (T0)	Kadar glukosa darah setelah diinduksi aloksan (T1)	Kadar glukosa darah setelah pemberian larutan uji		Penurunan kadar glukosa darah	
			Hari ke-4 (T2)	Hari ke-8 (T3)	▲T1= T1-T2	▲T2= T1-T3
A	86	160	174	163	-14	-3
	75	190	190	190	0	0
	89	170	181	184	-11	-14
	90	176	99	120	77	56
	65	149	147	204	3	-55
Rata-rata (\bar{X})	81±10,28	169±15,58	158,2±36,77	172,2±32,69	11±37,58	-3,2±39,73
$\bar{X} + 2SD$	101,56	200,16	231,74	237,58	86,16	76,26
$\bar{X} - 2SD$	60,44	137,84	84,66	106,82	-64,16	-82,66
B	77	181	73	42	108	139
	78	163	68	51	95	112
	95	170	59	46	111	124
	84	135	66	64	69	71
	79	167	56	52	111	115
Rata-rata (\bar{X})	82,6±7,43	163,2±17,12	64,4±6,87	51±8,21	98,8±17,92	112,2±25,31
$\bar{X} + 2SD$	97,46	197,44	78,14	67,42	134,64	162,82
$\bar{X} - 2SD$	67,74	128,96	50,66	34,58	62,96	61,58
C	94	156	83	63	73	93
	76	180	75	70	105	110
	85	174	50	42	124	132
	87	191	67	63	124	128
	85	147	76	57	71	90
Rata-rata (\bar{X})	85,4±6,42	169,6±17,89	70,2±12,63	59±10,55	99,4±26,19	110,6±19,33
$\bar{X} + 2SD$	98,24	205,38	95,46	80,1	151,78	149,26
$\bar{X} - 2SD$	72,56	133,82	44,94	37,9	47,02	71,94
D	73	182	81	58	101	124
	75	125	71	47	54	78
	86	147	63	54	84	93
	80	184	63	57	121	127
	94	118	64	64	54	54
Rata-rata (\bar{X})	81,6±8,56	151,2±30,94	68,4±7,79	56±6,20	82,8±29,37	95,2±30,97
$\bar{X} + 2SD$	98,72	213,08	83,98	68,4	141,54	157,14
$\bar{X} - 2SD$	64,48	89,32	52,82	43,6	24,06	33,26
E	64	170	74	49	96	121
	79	163	90	60	73	103
	89	142	67	55	75	87
	95	196	52	50	144	146
	100	165	77	74	88	91
Rata-rata (\bar{X})	85,4±14,29	167,2±19,33	72±13,94	57,6±10,16	95,2±28,87	109,6±24,26
$\bar{X} + 2SD$	113,98	205,86	99,88	77,92	152,94	158,12
$\bar{X} - 2SD$	56,82	128,54	44,12	37,28	37,46	61,08

Keterangan :

A = Kontrol Negatif (CMC Na 0,5%)

B = Kontrol Positif (Glibenklamid 0,09 mg)

C = Perlakuan 1/4 DE

D = Perlakuan 1/2 DE

E = Perlakuan 1 DE

Lampiran 15. Anova dua jalan penurunan kadar glukosa darah

$$\blacktriangle T1 = T1 - T2$$

NPar Tests**Descriptive Statistics**

	N	Mean	Std. Deviation	Minimum	Maximum
kadar glukosa darah	25	77.44	43.277	-14	144
Kelompok	25	3.00	1.443	1	5

One-Sample Kolmogorov-Smirnov Test

		kadar glukosa darah	kelompok
N		25	25
Normal Parameters ^{a,b}	Mean	77.44	3.00
	Std. Deviation	43.277	1.443
Most Extreme Differences	Absolute	.183	.156
	Positive	.117	.156
	Negative	-.183	-.156
Kolmogorov-Smirnov Z		.913	.779
Asymp. Sig. (2-tailed)		.374	.579

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

kadar glukosa darah

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
cmc 0.5%	5	11.00	37.583	16.808	-35.67	57.67	-14	77
Glibenklamid	5	98.80	17.922	8.015	76.55	121.05	69	111
0.0385 gram ekstrak akar iler	5	99.40	26.197	11.716	66.87	131.93	71	124
0.077 gram ekstrak akar iler	5	82.80	29.372	13.135	46.33	119.27	54	121
0.154 gram ekstrak akar iler	5	95.20	28.874	12.913	59.35	131.05	73	144
Total	25	77.44	43.277	8.655	59.58	95.30	-14	144

Test of Homogeneity of Variances

kadar glukosa darah

Levene Statistic	df1	df2	Sig.
.458	4	20	.765

ANOVA

kadar glukosa darah

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	28484.560	4	7121.140	8.650	.000
Within Groups	16465.600	20	823.280		
Total	44950.160	24			

Post Hoc Tests

Multiple Comparisons

kadar glukosa darah

Tukey HSD

(I) kelompok	(J) kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
cmc 0.5%	glibenklamid	-87.800*	18.147	.001	-142.10	-33.50
	0.0385 gram ekstrak akar iler	-88.400*	18.147	.001	-142.70	-34.10
	0.077 gram ekstrak akar iler	-71.800*	18.147	.006	-126.10	-17.50
	0.154 gram ekstrak akar iler	-84.200*	18.147	.001	-138.50	-29.90
Glibenklamid	cmc 0.5%	87.800*	18.147	.001	33.50	142.10
	0.0385 gram ekstrak akar iler	-.600	18.147	1.000	-54.90	53.70
	0.077 gram ekstrak akar iler	16.000	18.147	.900	-38.30	70.30
	0.154 gram ekstrak akar iler	3.600	18.147	1.000	-50.70	57.90
0.0385 gram ekstrak akar iler	cmc 0.5%	88.400*	18.147	.001	34.10	142.70
	glibenklamid	.600	18.147	1.000	-53.70	54.90
	0.077 gram ekstrak akar iler	16.600	18.147	.888	-37.70	70.90
	0.154 gram ekstrak akar iler	4.200	18.147	.999	-50.10	58.50
0.077 gram ekstrak akar iler	cmc 0.5%	71.800*	18.147	.006	17.50	126.10
	glibenklamid	-16.000	18.147	.900	-70.30	38.30
	0.0385 gram ekstrak akar iler	-16.600	18.147	.888	-70.90	37.70
	0.154 gram ekstrak akar iler	-12.400	18.147	.958	-66.70	41.90
0.154 gram ekstrak akar iler	cmc 0.5%	84.200*	18.147	.001	29.90	138.50
	glibenklamid	-3.600	18.147	1.000	-57.90	50.70
	0.0385 gram ekstrak akar iler	-4.200	18.147	.999	-58.50	50.10
	0.077 gram ekstrak akar iler	12.400	18.147	.958	-41.90	66.70

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

Homogeneous Subsets

kadar glukosa darah

Tukey HSD^a

Kelompok	N	Subset for alpha = 0.05	
		1	2
cmc 0.5%	5	11.00	
0.077 gram ekstrak akar iler	5		82.80
0.154 gram ekstrak akar iler	5		95.20
Glibenklamid	5		98.80
0.0385 gram ekstrak akar iler	5		99.40
Sig.		1.000	.888

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5.000.

▲ T2= T1-T3

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
kadar glukosa darah	25	84.88	52.434	-55	146
Kelompok	25	3.00	1.443	1	5

One-Sample Kolmogorov-Smirnov Test

		kadar glukosa darah	kelompok
N		25	25
Normal Parameters ^{a,b}	Mean	84.88	3.00
	Std. Deviation	52.434	1.443
Most Extreme Differences	Absolute	.196	.156
	Positive	.122	.156
	Negative	-.196	-.156
Kolmogorov-Smirnov Z		.981	.779
Asymp. Sig. (2-tailed)		.291	.579

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

kadar glukosa darah

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
cmc 0.5%	5	-3.20	39.733	17.769	-52.53	46.13	-55	56
Glibenklamid	5	112.20	25.312	11.320	80.77	143.63	71	139
0.0385 gram ekstrak akar iler	5	110.60	19.334	8.646	86.59	134.61	90	132
0.077 gram ekstrak akar iler	5	95.20	30.979	13.854	56.73	133.67	54	127
0.154 gram ekstrak akar iler	5	109.60	24.265	10.852	79.47	139.73	87	146
Total	25	84.88	52.434	10.487	63.24	106.52	-55	146

Test of Homogeneity of Variances

kadar glukosa darah

Levene Statistic	df1	df2	Sig.
.312	4	20	.867

ANOVA

kadar glukosa darah

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	49417.840	4	12354.460	14.915	.000
Within Groups	16566.800	20	828.340		
Total	65984.640	24			

Post Hoc Tests

Multiple Comparisons

kadar glukosa darah

Tukey HSD

(I) kelompok	(J) kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
cmc 0.5%	glibenklamid	-115.400 [*]	18.203	.000	-169.87	-60.93
	0.0385 gram ekstrak akar iler	-113.800 [*]	18.203	.000	-168.27	-59.33
	0.077 gram ekstrak akar iler	-98.400 [*]	18.203	.000	-152.87	-43.93
	0.154 gram ekstrak akar iler	-112.800 [*]	18.203	.000	-167.27	-58.33
Glibenklamid	cmc 0.5%	115.400 [*]	18.203	.000	60.93	169.87
	0.0385 gram ekstrak akar iler	1.600	18.203	1.000	-52.87	56.07
	0.077 gram ekstrak akar iler	17.000	18.203	.880	-37.47	71.47
	0.154 gram ekstrak akar iler	2.600	18.203	1.000	-51.87	57.07
0.0385 gram ekstrak akar iler	cmc 0.5%	113.800 [*]	18.203	.000	59.33	168.27
	glibenklamid	-1.600	18.203	1.000	-56.07	52.87
	0.077 gram ekstrak akar iler	15.400	18.203	.913	-39.07	69.87
	0.154 gram ekstrak akar iler	1.000	18.203	1.000	-53.47	55.47
0.077 gram ekstrak akar iler	cmc 0.5%	98.400 [*]	18.203	.000	43.93	152.87
	glibenklamid	-17.000	18.203	.880	-71.47	37.47
	0.0385 gram ekstrak akar iler	-15.400	18.203	.913	-69.87	39.07
	0.154 gram ekstrak akar iler	-14.400	18.203	.930	-68.87	40.07
0.154 gram ekstrak akar iler	cmc 0.5%	112.800 [*]	18.203	.000	58.33	167.27
	glibenklamid	-2.600	18.203	1.000	-57.07	51.87
	0.0385 gram ekstrak akar iler	-1.000	18.203	1.000	-55.47	53.47
	0.077 gram ekstrak akar iler	14.400	18.203	.930	-40.07	68.87

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

Homogeneous Subsets

kadar glukosa darah

Tukey HSD^a

kelompok	N	Subset for alpha = 0.05	
		1	2
cmc 0.5%	5	-3.20	
0.077 gram ekstrak akar iler	5		95.20
0.154 gram ekstrak akar iler	5		109.60
0.0385 gram ekstrak akar iler	5		110.60
glibenklamid	5		112.20
Sig.		1.000	.880

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5.000.