DAFTAR PUSTAKA

Abdelaziz, D. H. A., & Ali, S. A. (2014). The protective effect of Phoenix dactylifera L. seeds against CCl4-induced hepatotoxicity in rats. *Journal of Ethnopharmacology*, *155*(1), 736–743. https://doi.org/https://doi.org/10.1016/j.jep.2014.06.026

Abdu, S. (2018). Ameliorative influence of ajwa dates on ochratoxin A-induced testis toxicity. *Journal of Microscopy and Ultrastructure*, *6*(3), 134–138. https://doi.org/10.4103/JMAU.JMAU_14_18

Ahmed R. Ragab, Mohamed A. Elkablawy, B. Y. S. and H. N. B. (2013). Antioxidant and Tissue-Protective Studies on Ajwa Extract: Dates from Al Madinah Al-Monwarah, Saudia Arabia. *Journal of Environmental & Analytical Toxicology*. https://doi.org/10.4172/2161-0525.1000163

Al-Alawi, R. A., Al-Mashiqri, J. H., Al-Nadabi, J. S. M., Al-Shihi, B. I., & Baqi, Y. (2017). Date Palm Tree (Phoenix dactylifera L.): Natural Products and Therapeutic Options. *Frontiers in Plant Science*, *8*, 845. https://doi.org/10.3389/fpls.2017.00845

Alghamdi, M. A., Hussein, A. M., AL-Eitan, L. N., Elnashar, E., Elgendy, A., Abdalla, A. M., Ahmed, S., & Khalil, W. A. (2020). Possible mechanisms for the renoprotective effects of date palm fruits and seeds extracts against renal ischemia/reperfusion injury in rats. *Biomedicine & Pharmacotherapy*, *130*, 110540. https://doi.org/https://doi.org/10.1016/j.biopha.2020.110540

Andrade, R. J., Aithal, G. P., Björnsson, E. S., Kaplowitz, N., Kullak-Ublick, G. A., Larrey, D., & Karlsen, T. H. (2019). EASL Clinical Practice Guidelines: Drug-induced liver injury. *Journal of Hepatology*, *70*(6), 1222–1261. https://doi.org/https://doi.org/10.1016/j.jhep.2019.02.014

Anthony L., Mescher, P. . (2012). *Histologi Dasar Junqueira Teks & Atlas Edisi 12* (12th Ed.). The McGraw-Hill Companies Inc. https://www.academia.edu/39766554/Histologi_Dasar_JU_QUEIRA_Teks_and_Atlas_Buku_asli_berstiker_hologram_3_dimensi

Bethesda (MD). (2020). *Meloxicam.* National Centre for Biotechnology Information (NCBI). https://www.ncbi.nlm.nih.gov/books/NBK548278/

Botting, R. M. (2006). Inhibitors of cyclooxygenases: mechanisms, selectivity and uses. *Journal of Physiology and Pharmacology : An Official Journal of the Polish Physiological Society*, *57 Suppl 5*, 113–124.

Brogden, R. N., Heel, R. C., Pakes, G. E., Speight, T. M., & Avery, G. S. (1980). Diclofenac

sodium: a review of its pharmacological properties and therapeutic use in rheumatic diseases and pain of varying origin. *Drugs*, *20*(1), 24–48. https://doi.org/10.2165/00003495-198020010-00002

Contreras-Zentella, M. L., & Hernández-Muñoz, R. (2016). Is Liver Enzyme Release Really Associated with Cell Necrosis Induced by Oxidant Stress? *Oxidative Medicine and Cellular Longevity*, *2016*. https://doi.org/10.1155/2016/3529149

D. R. Laurence, A. L. B. (1964). *Evaluation of Drug Activities: Pharmacometrics, Volume 1*. Elsevier Ltd. https://doi.org/https://doi.org/10.1016/C2013-0-12092-2

Devarbhavi, H., Bonkovsky, H. L., Russo, M., & Chalasani, N. (2018). 56 - Drug-Induced Liver Injury. In A. J. Sanyal, T. D. Boyer, K. D. Lindor, & N. A. B. T.-Z. and B. H. (Seventh E. Terrault (Eds.), *Zakim and Boyer's Hepatology (Seventh Edition)* (Seventh, pp. 844-890.e17). Elsevier. https://doi.org/https://doi.org/10.1016/B978-0-323-37591-7.00056-2

El Arem, A., Saafi, E. B., Ghrairi, F., Thouri, A., Zekri, M., Ayed, A., Zakhama, A., & Achour, L. (2014). Aqueous date fruit extract protects against lipid peroxidation and improves antioxidant status in the liver of rats subchronically exposed to trichloroacetic acid. *Journal of Physiology and Biochemistry*, *70*(2), 451–464. https://doi.org/10.1007/s13105-014-0323-6

Elberry, A. A., Mufti, S. T., Al-Maghrabi, J. A., Abdel-Sattar, E. A., Ashour, O. M., Ghareib, S. A., & Mosli, H. A. (2011). Anti-inflammatory and antiproliferative activities of date palm pollen (Phoenix dactylifera) on experimentally-induced atypical prostatic hyperplasia in rats. *Journal of Inflammation (London, England)*, *8*(1), 40. https://doi.org/10.1186/1476-9255-8-40

Eroschenko, V. P. (2008). *diFiore's Atlas of Histology with Functional Correlations Eleventh Edition* (11th Ed.). Lippincott Williams & Wilkins. https://www.academia.edu/36111379/DiFiores_Atlas_of_Histology_with_Functional_Correlations_11th_Ed._

Ganeva, M. G., Getova, D. P., & Gadjeva, V. G. (2008). Adverse drug reactions and reactive oxygen species. *Folia Medica*, *50*(1), 5–11. https://pubmed.ncbi.nlm.nih.gov/18543782/

Ghnimi, S., Umer, S., Karim, A., & Kamal-Eldin, A. (2017). Date fruit (Phoenix dactylifera L.): An underutilized food seeking industrial valorization. *NFS Journal*, *6*, 1–10. https://doi.org/https://doi.org/10.1016/j.nfs.2016.12.001

Hall, J. E. (2016). *Guyton and Hall: Textbook of Medical Physiology 13th Edition* (Thirteenth). Elsevier. https://www.elsevier.com/books/pocket-companion-to-guyton-

and-hall-textbook-of-medical-physiology/hall/978-1-4557-7006-9

Hasna, F. A. (2015). *Uji Aktivitas Hepatoprotektif Ekstrak Air Sarang Burung Walet Putih (Collocalia fuciphaga Thunberg) Terhadap Aktivitas SGPT dan SGOT pada Tikus Putih Jantan Galur Sprague Dawley* [UIN Syarif Hidayatullah Jakarta]. https://repository.uinjkt.ac.id/dspace/bitstream/123456789/29062/1/AGENG HASNA FAUZIYAH-FKIK.pdf

I M Baskara, A., I N, A., & N.K.A, J. (2019). Gambaran Histopatologi Hati TikusWistar (Rattus norvegicus) Pasca Pemberian Monosodium Glutamat. *Jurnal Widya Biologi*, *10*(01), 68–75. https://doi.org/10.32795/widyabiologi.v10i01.238

Khalid, S., Khalid, N., Khan, R. S., Ahmed, H., & Ahmad, A. (2017). A review on chemistry and pharmacology of Ajwa date fruit and pit. *Trends in Food Science and Technology*, *63*(September), 60–69. https://doi.org/10.1016/j.tifs.2017.02.009

Khan, F., Khan, T. J., Kalamegam, G., Pushparaj, P. N., Chaudhary, A., Abuzenadah, A., Kumosani, T., Barbour, E., & Al-Qahtani, M. (2017). Anti-cancer effects of Ajwa dates (Phoenix dactylifera L.) in diethylnitrosamine induced hepatocellular carcinoma in Wistar rats. *BMC Complementary and Alternative Medicine*, *17*(1), 418. https://doi.org/10.1186/s12906-017-1926-6

Kumar, Abbas, F. (2005). *Robbins and Cotran Pathologic Basis of Disease 7th Edition* (7th Ed.). Elsavier.

Mohamed, D., & Al-Okbi, S. (2004). In vivo evaluation of antioxidant and anti-inflammatory activity of different extracts of date fruits in adjuvant arthritis. *Polish Journal of Food and Nutrition Sciences*, *13*.

Pinandita, T., Ismono, D., Ismiarto, Y. D., & Chaidir, M. R. (2018). Efek Pemberian Meloxicam Yang Diberikan Selama Fase Inflamasi Terhadap Proses Penyembuhan Tulang Tikus Paska Open Reduction Internal Fixation K-Wire Dinilai Secara Radiologis. *Jurnal Sistem Kesehatan*, *3*(3), 135–141. https://doi.org/10.24198/jsk.v3i3.16989

Ricciotti, E., & FitzGerald, G. A. (2011). Prostaglandins and inflammation. *Arteriosclerosis, Thrombosis, and Vascular Biology*, *31*(5), 986–1000. https://doi.org/10.1161/ATVBAHA.110.207449

S Eddine, L., Segni, L., Noureddine, G., M Redha, O., & Sonia, M. (2013). Antioxidant, Anti-Infammatory and Diabetes Related Enzyme Inhibition Properties of Leaves Extract from Selected Varieties of Phoenix Dactylifera L. *Innovare Journal of Life Sciences*, *1*(1 SE-Articles), 14–18. https://innovareacademics.in/journals/index.php/ijls/article/view/26

Saafi-Ben Salah, E. B., El Arem, A., Louedi, M., Saoudi, M., Elfeki, A., Zakhama, A., Najjar, M. F., Hammami, M., & Achour, L. (2012). Antioxidant-rich date palm fruit extract inhibits oxidative stress and nephrotoxicity induced by dimethoate in rat. *Journal of Physiology and Biochemistry*, *68*(1), 47–58. https://doi.org/10.1007/s13105-011-0118-y

Saafi, E. B., Louedi, M., Elfeki, A., Zakhama, A., Najjar, M. F., Hammami, M., & Achour, L. (2011). Protective effect of date palm fruit extract (Phoenix dactylifera L.) on dimethoate induced-oxidative stress in rat liver. *Experimental and Toxicologic Pathology*, *63*(5), 433–441. https://doi.org/https://doi.org/10.1016/j.etp.2010.03.002

Sahyon, H. A., & Al-Harbi, S. A. (2020). Chemoprotective role of an extract of the heart of the Phoenix dactylifera tree on adriamycin-induced cardiotoxicity and nephrotoxicity by regulating apoptosis, oxidative stress and PD-1 suppression. *Food and Chemical Toxicology*, *135*, 111045. https://doi.org/https://doi.org/10.1016/j.fct.2019.111045

Salem, G. A., Shaban, A., Diab, H. A., Elsaghayer, W. A., Mjedib, M. D., Hnesh, A. M., & Sahu, R. P. (2018). Phoenix dactylifera protects against oxidative stress and hepatic injury induced by paracetamol intoxication in rats. *Biomedicine & Pharmacotherapy*, *104*, 366–374. https://doi.org/https://doi.org/10.1016/j.biopha.2018.05.049

Sengupta, P. (2013). The laboratory rat: relating its age with human's. *International Journal of Preventive Medicine*, *4*(6), 624. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3733029/

Sherwood, L. (2013). *Human physiology : from cells to systems*. Eighth edition. Belmont, CA : Brooks/Cole, Cengage Learning, [2013] ©2013. https://search.library.wisc.edu/catalog/9910192145402121

Souli, A., Sebai, H., Rtibi, K., Chehimi, L., Sakly, M., Amri, M., & El-Benna, J. (2014). Effects of dates pulp extract and palm sap (Phoenix dactylifera L.) on gastrointestinal transit activity in healthy rats. *Journal of Medicinal Food*, *17*(7), 782–786. https://doi.org/10.1089/jmf.2013.0112

Sriuttha, P., Sirichanchuen, B., & Permsuwan, U. (2018). Hepatotoxicity of Nonsteroidal Anti-Inflammatory Drugs: A Systematic Review of Randomized Controlled Trials. *International Journal of Hepatology*, *2018*, 5253623. https://doi.org/10.1155/2018/5253623

Sulistia, Gan., Rianto S., dan N. (2007). *Farmakologi dan Terapi Edisi 5 (Cetak ulang dengan tambahan, 2012)*.

Talhouk, R. S., Karam, C., Fostok, S., El-Jouni, W., & Barbour, E. K. (2007). Anti-

inflammatory bioactivities in plant extracts. *Journal of Medicinal Food*, *10*(1), 1–10. https://doi.org/10.1089/jmf.2005.055

Tuma, A. K. E. Y. C. J. W. F. (2022). *Physiology, Liver*. StatPearls Publishing LLC. https://www.ncbi.nlm.nih.gov/books/NBK535438/

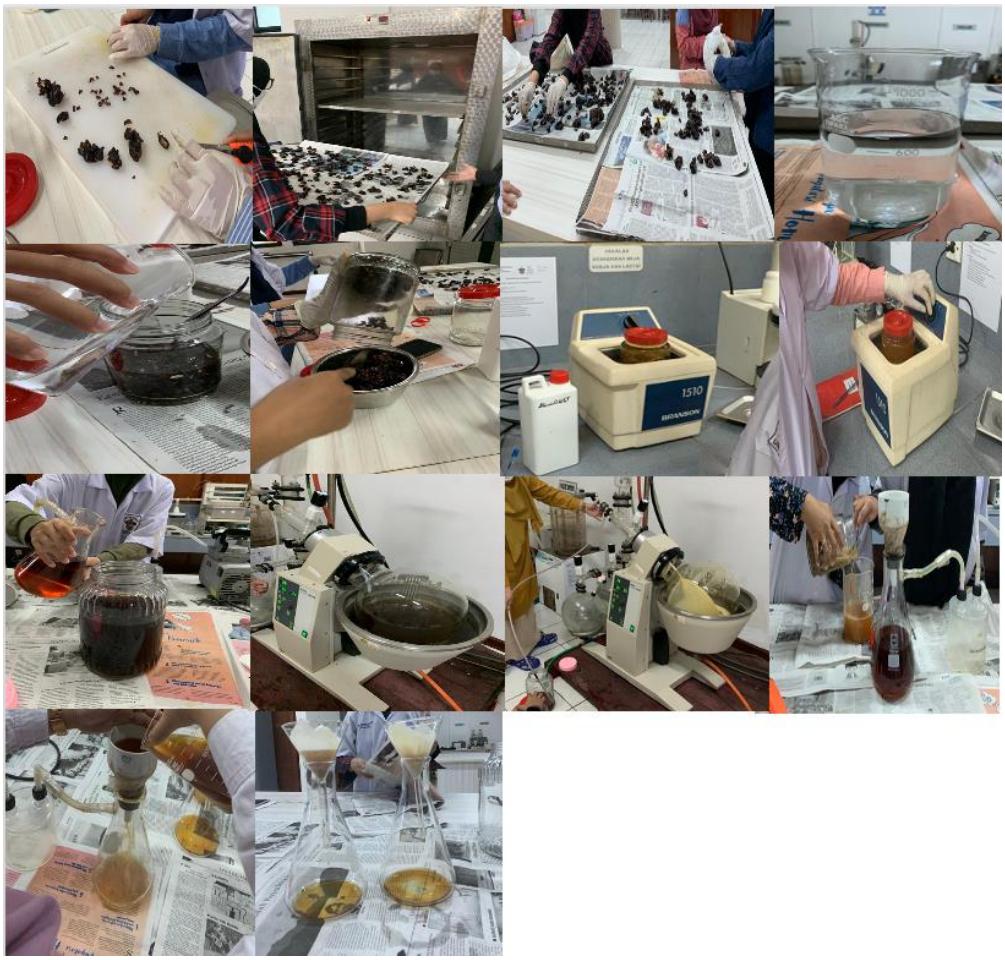
Widiartini, W., Siswati, E., Setiyawati, A., Rohmah, I. M., & Prastyo, E. (2013). Pengembangan usaha produksi tikus putih (Rattus norvegicus) tersertifikas dalam upaya memenuhi kebutuhan hewan laboratorium. *Program Kreativitas Mahasiswa-Kewirausahaan*. https://d1wqtxts1xzle7.cloudfront.net/53980175/149-299-1-SM.pdf?1501067337=&response-content-disposition=inline%3B+filename%3DPENGEMBANGAN_USAHA_PRODUKSI_TIKUS_PUTIH.pdf&Expires=1605629899&Signature=fnCn91mlqtqrk3gt4gmHsRU2eD2xi8JxKpb5XkUGMrygVAV6eFjjvnrX

Xiao, J., Liong, E. C., Huang, H., On Tse, W., Lau, K. S., Pan, J., Nanji, A. A., Fung, M. L., Xing, F., & Tipoe, G. L. (2015). Cyclooxygenase-1 Serves a Vital Hepato-Protective Function in Chemically Induced Acute Liver Injury. *Toxicological Sciences*, *143*(2), 430–440. https://doi.org/10.1093/toxsci/kfu244

Yasin, B. R., El-Fawal, H. A. N., & Mousa, S. A. (2015). Date (Phoenix dactylifera) Polyphenolics and Other Bioactive Compounds: A Traditional Islamic Remedy's Potential in Prevention of Cell Damage, Cancer Therapeutics and Beyond. *International Journal of Molecular Sciences*, *16*(12), 30075–30090. https://doi.org/10.3390/ijms161226210

Zakaria Al-Shoaibi, Mohamed A. Al-Mamary, Molham A. AL-Habori, A. S. A.-Z. and S. I. A. (2012). In vivo Antioxidative and Hepatoprotective Effects of Palm Date Fruits (Phoenix dactylifera). *International Journal of Pharmacology*, *8*(3), 185–191. https://doi.org/10.3923/ijp.2012.185.191

LAMPIRAN 1



Gambar. Proses Pembuatan Ekstrak Buah Kurma Ajwa

Proses pembuatan ekstrak buah kurma Ajwa dengan dimulai dengan mengumpulkan kurma Ajwa sebanyak 1 kg. Selanjutnya buah kurma dikeringkan menggunakan oven suhu 50^0C. Penyerbukan buah kurma kemudian pembuatan ekstrak kurma menggunakan pelarut etanol 96% dengan metode maserasi. Penghilangan pelarut menggunakan rotary evaporator untuk menghasilkan ekstrak kental buah kurma.

LAMPIRAN 2

Gambar. Proses Pemeliharaan Tikus dan Pemberian Perlakuan

Sampel yang digunakan yaitu tikus Wistar jantan. Jumlah sampel yang memenuhi kriteria yakni 25 sampel. Pengamatan harian dilakukan selama 14 hari untuk melihat adanya gejala klinis yang muncul pada tikus selama proses pemberian Meloxicam dan ekstrak buah kurma Ajwa.

- Pertama: dilakukan pengamatan perilaku tikus, apakah bergerak aktif atau tidak, hingga menjadi sensitif serta gelisah
- Kedua: dilakukan penilaian kondisi bulu, apakah terjadi perubahan warna, kebotakan
- Ketiga: mengamati perubahan warna dan konsistensi feses tikus
- Keempat: mengamati apakah ada tikus yang mati selama diberikan perlakuan dengan Meloxicam maupun kurma Ajwa

Tabel. Hasil Pengamatan Gejala Klinis selama 14 Hari Pemberian Meloxicam dan ekstrak buah kurma Ajwa

Jenis Pengamatan	Kelompok				
	K1 (Kontrol Sehat, larutan Na CMC 1%)	K2 (Kontrol Negatif, larutan Na CMC 1% dan Meloxicam dosis 30mg/kgBB)	K3 (Kel. Perlakuan 1, ekstrak buah kurma Ajwa sebanyak 75mg/kgBB dan 1 jam kemudian diberikan Meloxicam dosis 30mg/KgBB	K4 (Kel. Perlakuan 2, ekstrak buah kurma Ajwa sebanyak 150mg/kgBB dan 1 jam kemudian diberikan Meloxicam dosis 30mg/KgBB	K5 Kel. Perlakuan 3, ekstrak buah kurma Ajwa sebanyak 300mg/kgBB dan 1 jam kemudian diberikan Meloxicam dosis 30mg/KgBB
Perilaku	Normal, aktif	Normal, aktif	Normal, aktif	Normal, aktif	Normal, aktif
Warna bulu	Putih	Putih	Putih	Putih	Putih
Defekasi	Normal	Normal	Normal	Normal	Normal
Mati	-	-	-	-	-

Selama pengamatan 14 hari pemberian Meloxicam dan ekstrak buah kurma Ajwa, tidak terlihat perubahan perilaku pada tikus dan semua tikus terpantau sehat. Warna bulu dari semua tikus tidak mengalami perubahan dan tidak terjadi diare maupun kematian, berat badan tikus juga cenderung naik.

Selama 14 hari tiap kelompok diberikan;

- K1 merupakan kontrol sehat dan hanya diberikan larutan Na CMC 1 %
- K2 merupakan kontrol negatif dengan pemberian larutan Na CMC 1% dan Meloxicam dosis 30mg/KgBB
- K3 atau perlakuan 1 diberikan ekstrak buah kurma Ajwa sebanyak 75mg/kgBB dan 1 jam kemudian diberikan Meloxicam dosis 30mg/KgBB
- K4 atau perlakuan 2 diberikan ekstrak buah kurma Ajwa sebanyak 150mg/kgBB dan 1 jam kemudian diberikan Meloxicam dosis 30mg/KgBB
- Kelompok K5 atau perlakuan 3 diberikan ekstrak buah kurma Ajwa sebanyak 300mg/kgBB dan 1 jam kemudian diberikan Meloxicam dosis 30mg/KgBB

Gambar. Proses pengambilan darah dan persiapan pengambilan organ hati

Kemudian hari ke 15 dilakukan anastesi pada seluruh tikus dengan menggunakan anestesi, kemudian diambil darahnya dari pembuluh darah mata sebanyak 2-3 ml menggunakan tabung mikrokapiler kemudian dimasukkan di tabung EDTA. Pengambilan darah ini bertujuan untuk memeriksa kadar ALT dan AST. Tikus kemudian di euthanasia dan diambil organ hatinya untuk dilakukan pemeriksaan histopatologi hati.

LAMPIRAN 3

ANALISIS STATISTIK

ALANIN TRANSAMINASE (ALT)

Tabel Hasil Pengukuran ALT:

Kelompok	K1	K2	K3	K4	K5
Sampel 1	21.5	56.1	44.6	36.7	32.5
Sampel 2	20.7	60.3	45.8	34.3	33.0
Sampel 3	23.3	62.5	39.3	35.5	34.1
Sampel 4	19.1	58.7	46.0	32.8	34.4
Sampel 5	23.5	63.8	38.3	35.2	35.3

Tabel Rata – Rata Hasil ALT pada tiap Kelompok:

Kelompok	Rata-Rata Nilai ALT (IU/dL)
K1	21.62
K2	60.28
K3	42.80
K4	34.90
K5	33.86

Descriptives

Kelompok			Statistic	Std. Error
Kontrol Sehat (K1)	Mean		21.6200	.82365
	95% Confidence Interval for Mean	Lower Bound	19.3332	
		Upper Bound	23.9068	
	5% Trimmed Mean		21.6556	
	Median		21.5000	
	Variance		3.392	
	Std. Deviation		1.84174	
	Minimum		19.10	
	Maximum		23.50	
	Range		4.40	
	Interquartile Range		3.50	
	Skewness		-.360	.913
	Kurtosis		-1.318	2.000
Kontrol Negatif (K2)	Mean		60.2800	1.36543
	95% Confidence Interval for Mean	Lower Bound	56.4890	
		Upper Bound	64.0710	
	5% Trimmed Mean		60.3167	
	Median		60.3000	
	Variance		9.322	
	Std. Deviation		3.05320	
	Minimum		56.10	
	Maximum		63.80	
	Range		7.70	
	Interquartile Range		5.75	
	Skewness		-.328	.913
	Kurtosis		-.961	2.000
Perlakuan 1 (K3)	Mean		42.8000	1.65801
	95% Confidence Interval for Mean	Lower Bound	38.1966	
		Upper Bound	47.4034	

	5% Trimmed Mean		42.8722	
	Median		44.6000	
	Variance		13.745	
	Std. Deviation		3.70742	
	Minimum		38.30	
	Maximum		46.00	
	Range		7.70	
	Interquartile Range		7.10	
	Skewness		-.559	.913
	Kurtosis		-2.995	2.000
Perlakuan 2 (K4)	Mean		34.9000	.65038
	95% Confidence Interval for Mean	Lower Bound	33.0942	
		Upper Bound	36.7058	
	5% Trimmed Mean		34.9167	
	Median		35.2000	
	Variance		2.115	
	Std. Deviation		1.45430	
	Minimum		32.80	
	Maximum		36.70	
	Range		3.90	
	Interquartile Range		2.55	
	Skewness		-.461	.913
	Kurtosis		.443	2.000
Perlakuan 3 (K5)	Mean		33.8600	.50060
	95% Confidence Interval for Mean	Lower Bound	32.4701	
		Upper Bound	35.2499	
	5% Trimmed Mean		33.8556	
	Median		34.1000	
	Variance		1.253	
	Std. Deviation		1.11937	
	Minimum		32.50	

	Maximum	35.30	
	Range	2.80	
	Interquartile Range	2.10	
	Skewness	.002	.913
	Kurtosis	-1.347	2.000

Tests of Normality

Kelompok	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Kontrol Sehat (K1)	.219	5	.200*	.930	5	.595
Kontrol Negatif (K2)	.166	5	.200*	.977	5	.916
Perlakuan 1 (K3)	.286	5	.200*	.813	5	.103
Perlakuan 2 (K4)	.182	5	.200*	.982	5	.943
Perlakuan 3 (K5)	.185	5	.200*	.965	5	.840

a. Lilliefors Significance Correction

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

→ Data berdistribusi Normal dengan semua nilai sig > 0.05 sehingga bisa dilanjutkan dengan uji *Independent T-Test.*

Test of Homogeneity of Variances

Hasil

Levene Statistic	df1	df2	Sig.
4.276	4	20	.012

→ Signifikansi 0.012 >0.05 yang berarti data homogen

Uji *Independent T-Test* K1 dan K2

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	1.093	.326	-24.244	8	.000	-38.66000	1.59462	-42.33719	-34.98281
	Equal variances not assumed			-24.244	6.571	.000	-38.66000	1.59462	-42.48120	-34.83880

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K1 dan K3

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	8.751	.018	-11.440	8	.000	-21.18000	1.85132	-25.44916	-16.91084
	Equal variances not assumed			-11.440	5.861	.000	-21.18000	1.85132	-25.73621	-16.62379

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K1 dan K4

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	.391	.549	-12.654	8	.000	-13.28000	1.04948	-15.70010	-10.85990
	Equal variances not assumed			-12.654	7.592	.000	-13.28000	1.04948	-15.72294	-10.83706

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K1 dan K5

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	1.277	.291	-12.699	8	.000	-12.24000	.96385	-14.46263	-10.01737
	Equal variances not assumed			-12.699	6.600	.000	-12.24000	.96385	-14.54741	-9.93259

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K2 dan K3

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	1.105	.324	8.138	8	.000	17.48000	2.14788	12.52697	22.43303
	Equal variances not assumed			8.138	7.716	.000	17.48000	2.14788	12.49510	22.46490

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K2 dan K4

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	2.240	.173	16.781	8	.000	25.38000	1.51242	21.89236	28.86764
	Equal variances not assumed			16.781	5.726	.000	25.38000	1.51242	21.63593	29.12407

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K2 dan K5

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	3.394	.103	18.167	8	.000	26.42000	1.45430	23.06637	29.77363
	Equal variances not assumed			18.167	5.056	.000	26.42000	1.45430	22.69406	30.14594

Hasil uji *Independent T-Test* 0.000<0.05 signifikan atau berbeda nyata.

ASPARTAT AMINOTRANSFERASE (AST)

Hasil Pengukuran AST:

Kelompok	K1	K2	K3	K4	K5
Sampel 1	67.7	123.0	102.3	97.4	89.5
Sampel 2	58.9	115.6	98.1	89.5	85.0
Sampel 3	70.1	109.3	101.7	88.5	91.1
Sampel 4	55.2	125.2	107.9	100.8	99.4
Sampel 5	64.5	131.4	110.6	90.1	85.3

Tabel Rata – Rata Hasil AST pada tiap Kelompok:

Kelompok	Rata-Rata Nilai AST (IU/dL)
K1	63.28
K2	120.90
K3	104.12
K4	93.26
K5	90.06

Descriptives

Kelompok			Statistic	Std. Error
Konrol Sehat (K1)	Mean		63.2800	2.75688
	95% Confidence Interval for Mean	Lower Bound	55.6257	
		Upper Bound	70.9343	
	5% Trimmed Mean		63.3500	
	Median		64.5000	
	Variance		38.002	
	Std. Deviation		6.16458	
	Minimum		55.20	
	Maximum		70.10	
	Range		14.90	
	Interquartile Range		11.85	
	Skewness		-.367	.913
	Kurtosis		-1.787	2.000
Kontrol Negatif (K2)	Mean		120.90E2	3.84578
	95% Confidence Interval for Mean	Lower Bound	110.22E2	
		Upper Bound	131.58E2	
	5% Trimmed Mean		1.2096E2	
	Median		1.2300E2	
	Variance		73.950	
	Std. Deviation		8.59942	
	Minimum		109.30	
	Maximum		131.40	
	Range		22.10	
	Interquartile Range		15.85	
	Skewness		-.304	.913
	Kurtosis		-.820	2.000
Perlakuan 1 (K3)	Mean		104.12E2	2.25486
	95% Confidence Interval for Mean	Lower Bound	97.8595	
		Upper Bound	110.38E2	

	5% Trimmed Mean		1.0409E2	
	Median		1.0230E2	
	Variance		25.422	
	Std. Deviation		5.04202	
	Minimum		98.10	
	Maximum		110.60	
	Range		12.50	
	Interquartile Range		9.35	
	Skewness		.285	.913
	Kurtosis		-1.567	2.000
Perlakuan 2 (K4)	Mean		93.2600	2.45736
	95% Confidence Interval for Mean	Lower Bound	86.4373	
		Upper Bound	100.08E2	
	5% Trimmed Mean		93.1056	
	Median		90.1000	
	Variance		30.193	
	Std. Deviation		5.49482	
	Minimum		88.50	
	Maximum		100.80	
	Range		12.30	
	Interquartile Range		10.10	
	Skewness		.771	.913
	Kurtosis		-2.051	2.000
Perlakuan 3 (K5)	Mean		90.0600	2.61622
	95% Confidence Interval for Mean	Lower Bound	82.7962	
		Upper Bound	97.3238	
	5% Trimmed Mean		89.8222	
	Median		89.5000	
	Variance		34.223	
	Std. Deviation		5.85004	
	Minimum		85.00	

	Maximum	99.40	
	Range	14.40	
	Interquartile Range	10.10	
	Skewness	1.204	.913
	Kurtosis	1.371	2.000

Tests of Normality

Kelompok	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Kontrol Sehat (K1)	.178	5	.200*	.952	5	.749
Kontrol Negatif (K2)	.196	5	.200*	.978	5	.922
Perlakuan 1 (K3)	.241	5	.200*	.945	5	.704
Perlakuan 2 (K4)	.317	5	.111	.842	5	.169
Perlakuan 3 (K5)	.229	5	.200*	.879	5	.306

a. Lilliefors Significance Correction

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

→ Data berdistribusi Normal dengan semua nilai sig > 0.05 sehingga bisa dilanjutkan dengan uji *Independent T-Test.*

Test of Homogeneity of Variances

Hasil

Levene Statistic	df1	df2	Sig.
.673	4	20	.619

→ Signifikansi 0.619 >0.05 yang berarti data homogen.

Uji *Independent T-Test* K1 dan K2

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	.663	.439	-12.177	8	.000	-57.62000	4.73185	-68.53166	-46.70834
	Equal variances not assumed			-12.177	7.252	.000	-57.62000	4.73185	-68.73063	-46.50937

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K1 dan K3

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	.342	.575	-11.467	8	.000	-40.84000	3.56157	-49.05300	-32.62700
	Equal variances not assumed			-11.467	7.697	.000	-40.84000	3.56157	-49.10959	-32.57041

Uji *Independent T-Test* K1 dan K4

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	.049	.830	-8.118	8	.000	-29.98000	3.69310	-38.49631	-21.46369
	Equal variances not assumed			-8.118	7.896	.000	-29.98000	3.69310	-38.51578	-21.44422

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K1 dan K5

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	.176	.686	-7.046	8	.000	-26.78000	3.80066	-35.54433	-18.01567
	Equal variances not assumed			-7.046	7.978	.000	-26.78000	3.80066	-35.54851	-18.01149

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K2 dan K3

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	1.664	.233	3.764	8	.000	16.78000	4.45807	6.49967	27.06033
	Equal variances not assumed			3.764	6.460	.001	16.78000	4.45807	6.05687	27.50313

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K2 dan K4

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	1.104	.324	6.056	8	.000	27.64000	4.56384	17.11578	38.16422
	Equal variances not assumed			6.056	6.800	.001	27.64000	4.56384	16.78344	38.49656

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

Uji *Independent T-Test* K2 dan K5

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil	Equal variances assumed	1.153	.314	6.630	8	.000	30.84000	4.65130	20.11408	41.56592
	Equal variances not assumed			6.630	7.049	.000	30.84000	4.65130	19.85697	41.82303

Hasil uji *Independent T-Test* 0.00<0.05 signifikan atau berbeda nyata.

HISTOPATOLOGI HATI

Hasil Derajat Kerusakan Hati:

Kelompok	K1	K2	K3	K4	K5
Sampel 1	0	3	2	2	1
Sampel 2	0	2	2	1	1
Sampel 3	0	3	2	1	1
Sampel 4	0	3	3	2	2
Sampel 5	0	3	3	1	1

Tabel Rata – Rata Derajat Kerusakan Hati pada tiap Kelompok:

Kelompok	Rata-Rata Derajat Kerusakan Hati
K1	0
K2	2,8
K3	2,4
K4	1,4
K5	1,2

Descriptives

Kelompok			Statistic	Std. Error
Kontrol Negatif (K2)	Mean		2.8000	.20000
	95% Confidence Interval for Mean	Lower Bound	2.2447	
		Upper Bound	3.3553	
	5% Trimmed Mean		2.8333	
	Median		3.0000	
	Variance		.200	
	Std. Deviation		.44721	
	Minimum		2.00	
	Maximum		3.00	
	Range		1.00	
	Interquartile Range		.50	
	Skewness		-2.236	.913
	Kurtosis		5.000	2.000
Perlakuan 1 (K3)	Mean		2.4000	.24495
	95% Confidence Interval for Mean	Lower Bound	1.7199	
		Upper Bound	3.0801	
	5% Trimmed Mean		2.3889	
	Median		2.0000	
	Variance		.300	
	Std. Deviation		.54772	
	Minimum		2.00	
	Maximum		3.00	
	Range		1.00	
	Interquartile Range		1.00	
	Skewness		.609	.913
	Kurtosis		-3.333	2.000
Perlakuan 2	Mean		1.4000	.24495

(K4)	95% Confidence Interval for Mean	Lower Bound	.7199	
		Upper Bound	2.0801	
	5% Trimmed Mean		1.3889	
	Median		1.0000	
	Variance		.300	
	Std. Deviation		.54772	
	Minimum		1.00	
	Maximum		2.00	
	Range		1.00	
	Interquartile Range		1.00	
	Skewness		.609	.913
	Kurtosis		-3.333	2.000
Perlakuan 3 (K5)	Mean		1.2000	.20000
	95% Confidence Interval for Mean	Lower Bound	.6447	
		Upper Bound	1.7553	
	5% Trimmed Mean		1.1667	
	Median		1.0000	
	Variance		.200	
	Std. Deviation		.44721	
	Minimum		1.00	
	Maximum		2.00	
	Range		1.00	
	Interquartile Range		.50	
	Skewness		2.236	.913
	Kurtosis		5.000	2.000

Tests of Normality

	x	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
y	Kontrol Negatif	.473	5	.001	.552	5	.000
	Perlakuan 1	.367	5	.026	.684	5	.006
	perlakuan 2	.367	5	.026	.684	5	.006
	perlakuan 3	.473	5	.001	.552	5	.000

→ Nilai signifikansi < 0.05 (data tidak berdistribusi Normal) maka dilanjutkan dengan uji *Mann Whitney*

Test of Homogeneity of Variances

Hasil

Levene Statistic	df1	df2	Sig.
5.714	4	20	.003

→ Nilai signifikansi < 0.05 (data tidak homogen) maka dilanjutkan dengan uji *Mann Whitney*

Uji *Mann Whitney* K1 dan K2

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Sehat (K1)	5	3.00	15.00
Kontrol Negatif (K2)	5	8.00	40.00
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	.000
Wilcoxon W	15.000
Z	-2.887
Asymp. Sig. (2-tailed)	.004
Exact Sig. [2*(1-tailed Sig.)]	.008[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.04<0.05 (Berpengaruh signifikan)

Uji *Mann Whitney* K1 dan K3

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Sehat (K1)	5	3.00	15.00
Perlakuan 1 (K3)	5	8.00	40.00
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	.000
Wilcoxon W	15.000
Z	-2.835
Asymp. Sig. (2-tailed)	.005
Exact Sig. [2*(1-tailed Sig.)]	.008[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.05 (Berpengaruh signifikan)

Uji *Mann Whitney* K1 dan K4

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Sehat (K1)	5	3.00	15.00
Perlakuan 2 (K4)	5	8.00	40.00
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	.000
Wilcoxon W	15.000
Z	-2.835
Asymp. Sig. (2-tailed)	.005
Exact Sig. [2*(1-tailed Sig.)]	.008[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.05 (Berpengaruh signifikan)

Uji *Mann Whitney* K1 dan K5

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Sehat (K1)	5	3.00	15.00
Perlakuan 3 (K5)	5	8.00	40.00
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	.000
Wilcoxon W	15.000
Z	-2.887
Asymp. Sig. (2-tailed)	.004
Exact Sig. [2*(1-tailed Sig.)]	.008[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.04<0.05 (Berpengaruh signifikan)

Uji *Mann Whitney* K2 dan K3

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Negatif (K2)	5	6.50	32.50
Perlakuan 1 (K3)	5	4.50	22.50
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	7.500
Wilcoxon W	22.500
Z	-1.225
Asymp. Sig. (2-tailed)	.221
Exact Sig. [2*(1-tailed Sig.)]	.310[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.221>0.05 (Tidak Berpengaruh signifikan)

Uji *Mann Whitney* K2 dan K4

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Negatif (K2)	5	7.80	39.00
Perlakuan 2 (K4)	5	3.20	16.00
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	1.000
Wilcoxon W	16.000
Z	-2.545
Asymp. Sig. (2-tailed)	.011
Exact Sig. [2*(1-tailed Sig.)]	.016[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.011<0.05 (Berpengaruh signifikan)

Uji *Mann Whitney* K2 dan K5

Ranks

Kelompok	N	Mean Rank	Sum of Ranks
Kontrol Negatif (K2)	5	7.90	39.50
Perlakuan 3 (K5)	5	3.10	15.50
Total	10		

Test Statistics[b]

	Hasil
Mann-Whitney U	.500
Wilcoxon W	15.500
Z	-2.683
Asymp. Sig. (2-tailed)	.007
Exact Sig. [2*(1-tailed Sig.)]	.008[a]

a. Not corrected for ties.

b. Grouping Variable: x

→ Signifikansi 0.007<0.05 (Berpengaruh signifikan)