

DAFTAR PUSTAKA

- Abas, F., Lajis, N. H., Shaari, K., Israfi, D. A., Stanslas, J., Yusuf, U. K., Raof, S. M., 2005, *A Labdane Diterpene Glucoside from the Rhizomes of Curcuma mangga*, J. Nat. Prod, 68, 1090-1093.
- Abbas, A. K., Lichtman, A. H. & Pillai, S., 2020, *Cellular and Molecular Immunology*, 9th Edition, Saunders Elsevier, 51-84, Philadelphia.
- Adewole, S.O. & Ezekiel A.C.M. 2006. Morphological Changes and Hypoglycemic Effects of *Annona Muricata* Linn. (Annonaceae) Leaf Aqueous Extract on Pancreatic B-Cells of Streptozotocin-Treated Diabetic Rats. *African Journal of Biomed Research* 9: 173 – 187.
- Ahlmann, M. and Hempel, G., 2016, *The effect of cyclophosphamide on the immune system: implications for clinical cancer therapy*, *Cancer chemotherapy and pharmacology*, 78(4), pp.661-671.
- Ahmada, F. N., 2019, *Uji Aktivitas Imunomodulator Kombinasi Ekstrak Etanolik Herba Meniran (Phyllanthus Niruri L.) Dan Rimpang Temu Mangga (Curcuma Mangga Val.) terhadap Fagositosis Makrofag Tikus Jantan Galur Sprague-Dawley*, Skripsi, Program Sarjana Fakultas Farmasi Universitas Gadjah Mada, Yogyakarta.
- Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., dan Walter, P. 2002. *Helper T Cells and Lymphocyte Activation*. Mol. Biol. Cell 4th Ed.
- Aldi, Y., Ogiana, N., & Handayani, D., 2013, *Uji Imunomodulator Beberapa Subfraksi Ekstrak Etil Asetat Meniran (Phyllanthus niruri L) pada Mencit Putih Jantan dengan Metoda Carbon Clearance*, Prosiding Seminar Nasional Perkembangan Terkini Sains Farmasi dan Klinik III, Fakultas Farmasi, Universitas Andalas.
- Aldi, Y., Rasyadi, Y., & Handayani, D., 2014, *Aktivitas Imunomodulator dari Ekstrak Etanol Meniran (Phyllanthus niruri Linn.) terhadap Ayam Boiler*, *Jurnal Sains Farmasi & Klinis*, 01, No. 01.
- Al-Shura AN (2020). "Lymphocytes". *Advanced Hematology in Integrated Cardiovascular Chinese Medicine*. Elsevier. pp. 41–46. doi:10.1016/b978-0-12-817572-9.00007-0. ISBN 978-0-12-817572-9. S2CID 241913878.
- Al-shura, Anika Niambi, 2020, *Lymphocyte*, in *Advanced Hematology in Integrated Cardiovascular Chinese Medicine* pp. 41-46, Academic Press, Cambridge.

- Astana, P. R. W., Ardiyanto, D., and Mana, T. A. (2018). Change in quality of life and CD4+ value on HIV/AIDS patients with immuostimulant Jamu Formula in Sragen regency. *Indonesian J. Clin. Pharm.* 7, 227-235. doi:10.15416/ijcp.2018.7.4.227
- Baratawidjaja, K. G., & Rengganis, I. 2014. *Imunologi Dasar* edisi ke-11. Jakarta: Fakultas Kedokteran Universitas Indonesia.
- Baratawidjaja, K.G. 2000. *Imunologi Dasar*. Balai Penerbit FK UI. Jakarta.
- Behl Tapan dkk., 2021, *Exploring The Multifocal Role of Phytochemical as Immunomodulators*, Elsevier, Philadelphia.
- Bellanti, J.A. 1993. *Immunologi III*. Georgetown University School of Medicine: Washington. D.C.
- Bakshi RK, Cox MA, Zajac AJ (2014). "Cytotoxic T Lymphocytes". *Encyclopedia of Medical Immunology*. pp. 332–342. doi:10.1007/978-0-387-84828-0_36. ISBN 978-0-387-84827-3.
- BPOM RI, 2009, *Taksonomi Koleksi Tanaman Obat Kebun Tanaman Obat Citeureup*, Volume 2, 29, Badan Pengawas Obat dan Makanan RI, Direktorat Obat Asli Indonesia, Jakarta.
- Bronte, V., dan Pittet, M.J., 2013. The Spleen in Local and Systemic Regulation of Immunity. *Immunity*. 39: 806. <https://doi.org/10.1016/j.immuni.2013.10.010>
- Burren OS, Rubio García A, Javierre BM, Rainbow DB, Cairns J, Cooper NJ, et al., 2017, "Chromosome contacts in activated T cells identify autoimmune disease candidate genes". *Genome Biology*. 18 (1): 165. doi:10.1186/s13059-017-1285-0. PMC 5584004. PMID 28870212.
- Carmagnani, J.H., Mansano, B.G., dan Sobreira, F., 2020. Optimization of the extraction process of *Phyllanthus niruri* L. *O Mundo da Saúde*, 44: 134–143.
- Catanzaro M., Emanuela C., Michela R., Marco R., & Christina L., 2018, *Immunomodulator Inspired by Nature : A Review on Curcumin and Echinacea*, *Molecules*, 23 (11), 1-40.
- Chairul & Praptiwi, 2008, *Uji Efektivitas Immunomodulator Tiga Jenis Zingiberaceae secara In Vitro melalui Pengukuran Aktivitas Sel Makrofage dan Kapasitas Fagositosis*, *Majalah Obat Tradisional*, 13 (44), 67- 72.
- Chang HF, Bzeih H, Chitirala P, Ravichandran K, Sleiman M, Krause E, et al. (February 2017). "Preparing the lethal hit: interplay between exo- and endocytic pathways in cytotoxic T lymphocytes". *Cellular and Molecular*

Life Sciences. 74 (3): 399–408. doi:10.1007/s00018-016-2350-7. PMC 5241346. PMID 27585956.

Chaudhry, S.R., Luskin, V., dan Panuganti, K.K. 2022. *Anatomy, Abdomen and Pelvis, Spleen*. StatPearls Publishing, Treasure Island (FL).

Cota, AM., Midwinter, MJ., 2015, The immune system, Anaesthesia and IntensiveCare, <https://doi.org/10.1016/j.mpaic.2015.04.006>.

Dexa medica, 2008, *Tumbuh Liar ke Tingkat Dunia*, www.dexa-medica.com. diunduh tanggal 9 September 2022.

Dwiyati, P. dan Wazyka, A. (2005). *Potensi Kunir Putih (Curcuma manggaVal) sebagai sumber Antioksidan untuk Pengembangan Produk MakananFungsional*. Laporan Hasil Penelitian HIBAH PEKERTI Tahun II.

Ediati Sasmito, 2018, Pendahuluan, *Bahan Ajar Immunologi Farmasi, Fakultas Farmasi UGM*, Yogyakarta.

Eze, C.O., Nworu, C.S., Esimone, C.O., dan Okore, V.C., 2014. Immunomodulatory activities of methanol extract of the whole aerial part of *Phyllanthus niruri* L. *Journal of Pharmacognosy and Phytotherapy*, 6: 41–46.

Fathir, M., Muhaimin, R., Widodo, 2014, Aktivitas Ekstrak Daun Kelor Terhadap Sel-T Helper dan Sel-T Sitotoksik pada Mencit yang Diinfeksi *Salmonella thypi*. *Jurnal Veteriner* 15 (1) : 114-122.

Ganeshpurkar, A. dan Saluja, A.K., 2017. Protective effect of rutin on humoral and cell mediated immunity in rat model. *Chemico-Biological Interactions*, 273: 154–159.

Harborne, J.B., 1987, *Metode Fitokimia Penuntun cara Modern MenganalisisTumbuhan*, Edisi kedua, Penerbit ITB, Bandung

Hendrikos, R., Marusin, N., & Tjong, H. D., 2014, Efek Ekstrak Etanol Rimpang Temu Mangga (*Curcuma mangga* Val.) terhadap Sel β Pankreas Mencit Putih yang Diinduksi Aloksan secara Histologis, *Jurnal Biologi Universitas Andalas*, 3 (4).

Hidayat T., Kusumawaty D, Kusdianti K, Yati DD, Muchtar AA, MarianaD. 2008. Analisis Filogenetik Molekuler pada *Phyllanthus niruri* L. (Euphorbiaceae) Menggunakan Urutan Basa DNA Daerah Internal Transcribed Spacer (ITS). *Jurnal Matematika & Sains* 13 (1): 16-21.

- Hutapea, J. R., 2001, *Inventaris Tanaman Obat Indonesia (I), Jilid II*, 267-268, Departemen Kesehatan, Badan Penelitian dan Pengembangan Kesehatan, Jakarta.
- Jantan, I., Haque, Md.A., Ilangkovan, M., dan Arshad, L., 2019. An Insight Into the Modulatory Effects and Mechanisms of Action of *Phyllanthus* Species and Their Bioactive Metabolites on the Immune System. *Frontiers in Pharmacology*, 10: 878.
- Janeway CA Jr, Travers P, Walport M, et al. Immunobiology: The Immune System in Health and Disease. 10th edition. New York: Garland Science; 2022. T cell-mediated cytotoxicity. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK27101/>
- Kamruzzaman, H. dan Hoq, O., 2016. A review on ethnomedicinal, phytochemical and pharmacological properties of *Phyllanthus niruri*. *Journal of Medicinal Plants Studies*, 4: 173–180.
- Kapila, V., Wehrle, C.J., dan Tuma, F. 2022. Physiology, Spleen. StatPearls Publishing, Treasure Island (FL).
- Kardian A dan Kusuma FR, 2004, *Meniran Penambah Daya Tahan Tubuh Alami*, Agromedia Pustaka, Jakarta, 5-14.
- Kemenkes RI, 2017, *Farmakope Herbal Indonesia Edisi II*, Kementrian Kesehatan RI, Jakarta.
- Khasanah, N., 2002, *Analisis GC-MS dan Uji Sitotoksitas Ekstrak Minyak Atsiri Rimpang Curcuma mangga Val. Pada HeLa-S3 dan Raji Cell Line*, Tesis, Universitas Gadjah Mada, Yogyakarta.
- Kusumawati, A. P., 2018, Evaluasi Aktivitas Imunomodulator Kombinasi Ekstrak Etanolik Herba Meniran (*Phyllanthus Niruri* L.) Dan Rimpang Temu Mangga (*Curcuma Mangga* Val.) Pada Respon Imun Spesifik Secara In Vivo, Skripsi, Universitas Gadjah Mada, Yogyakarta.
- Lee, Y.K., Bae, K., Yoo, H.S. and Cho, S.H., 2018, Benefit of adjuvant traditional herbal medicine with chemotherapy for resectable gastric cancer, *Integrative cancer therapies*, 17(3), pp.619-627.
- Liao, G.S., Apaya, M.K. and Shyur, L.F., 2013, *Herbal medicine and acupuncture for breast cancer palliative care and adjuvant therapy*, Evidence-Based Complementary and Alternative Medicine.
- Lim, T.K., 2016. Curcuma mangga, dalam: Edible Medicinal and Non-Medicinal Plants. Springer International Publishing, Cham, hal. 363–370.

- Malek SN, Lee GS, Hong SL, Yaacob H, Wahab NA, Faizal Weber JF, Shah SA. Phytochemical and cytotoxic investigations of *Curcuma mangga* rhizomes. *Molecules*. 2011 May 31;16(6):4539-48. doi: 10.3390/molecules16064539. PMID: 21629182; PMCID: PMC6264423.
- Maryam, S. dan Martiningsih. 2021. Antioxidant Activity and Total Fenol Content White Saffron (*Curcuma mangga* Val). *IOP Conf. Ser. Mater. Sci. Eng.* 1115: 012081. <https://doi.org/10.1088/1757-899X/1115/1/012081>
- Maulana, R., 2018, *Evaluasi Aktivitas Imunomodulator Kombinasi Ekstrak Etanolik Herba Meniran dan Rimpang Temu Mangga Terhadap Respon Imun Non Spesifik secara in vivo*, Skripsi, Program Sarjana Farmasi Fakultas Farmasi Universitas Gadjah Mada, Yogyakarta.
- Molyneux, G., Andrews, M., Sones, W., York, M., Barnett, A., Quirk, E., Yeung, W., dan Turton, J. 2011. Haemotoxicity of Busulphan, Doxorubicin, Cisplatin and Cyclophosphamide in the Female BALB/C Mouse Using A Brief Regimen Of Drug Administration. *Cell Biol. Toxicol.* 27: 13–40. <https://doi.org/10.1007/s10565-010-9167-1>
- National Center for Biotechnology Information, 2022, PubChem Compound Summary for CID 2907, *Cyclophosphamide*. Retrieved October 18, 2022 from <https://pubchem.ncbi.nlm.nih.gov/compound/Cyclophosphamide>.
- Ogino Mari H., Prasanna Tadi, 2022, *Cyclophosphamide*, StatPearls Publishing LLC., Florida.
- Omman, Reeba A.; Kini, Ameet R., 2020, Leukocyte Development, Kinetics, and Function, *Rodak's Hematology: Clinical Principles and Applications* (6th ed). Elsevier, St. Louis.
- Pangestika, S. S., 2015, *Aktivitas Imunomodulator Kombinasi Ekstrak Etanolik Umbi Keladi Tikus (*Typhonium flagelliforme* (Lodd.) Blume) dan Meniran (*Phyllanthus niruri* L.) terhadap Fagositosis Makrofag, Proliferasi Limfosit dan Titer Antibodi secara In Vivo*, Skripsi, Program Sarjana Fakultas Farmasi, Universitas Gadjah Mada Yogyakarta.
- Parveen A., Sultan Z., Nidhi A., Muhammad A. S., Shahid H. A., Sayeed A., 2021, Modulating effects of the synergistic combination of extracts of herbal drugs on cyclophosphamide-induced immunosuppressed mice, *Saudi Journal of Biological Sciences*, 28 (1), 6178-6190.
- Permadi, A., 2006, *Tanaman Obat Pelancar Air Seni*. Hal. 77, Penebar Swadaya, Jakarta.
- Prakash, Sonam; Attilio Orazi, 2021, Spleen, in *Gattuso's Differential Diagnosis in Surgical Pathology (Fourth Edition)* pp. 815-860, Elsevier, Philadelphia.

- Praptiwi dan Chairul, 2010, Pendayagunaan Dua Jenis Zingiberaceae [*C. mangga* (temu mangga) dan *K. angustifolia* (kunci menir)] sebagai Sumber Bahan Imunomodulator secara in vitro, *Jurnal Tek. Ling*, Vol. 11, No.33, 435-441.
- Pujimulyani, D., Wazyka, A., Anggrahini, S., & Santoso, U., 2012, Antioxidative Properties of White Saffron Extract (*Curcuma mangga* Val.) in the In Vivo Assay, *Agritech*, 43 (4).
- Pujimulyani, D., Yulianto, W.A., Setyowati, A., Arumwardana, S., Rizal, R., 2018, Antidiabetic and antioxidant potential of *Curcuma mangga* Val extract and fractions, *Asian J Agri Biol.*, 6, 162–168.
- Purba, Rimbun A. R., Henny Erina S. O., Joice Sonya G. P., 2014, *Hubungan Jenis Kemoterapi Dengan Mielosupresi Pada Kanker Payudara Di Rumah Sakit Umum Pusat Haji Adam Malik Medan*, Fakultas Kedokteran Universitas HKBP Nommensen, Medan.
- Rafli, Rhandyka; Dessy Abdullah; Billy Y. S., 2021, *Gambaran Efek Samping dan Terapi Supportif Pasien Kanker Payudara Pasca Kemoterapi CAF di RSUP M. Djamil Padang*, Fakultas Kedokteran Universitas Baiturrahman, Padang.
- Rajkumari, S. dan Sanatombi, K. 2017. Nutritional Value, Phytochemical Composition, And Biological Activities Of Edible *Curcuma* Species: A Review. *Int. J. Food Prop.* 20: S2668–S2687. <https://doi.org/10.1080/10942912.2017.1387556>
- Rockville, M. D., & US Food and Drug Administration, 2005, USFDA, *Guidance for Industry: Estimating the maximum safe starting dose in adult healthy volunteer*.
- Riastri, A., 2022, *Efek Imunomodulator Kombinasi Ekstrak Etanolik Herba Meniran (*Phyllanthus niruri* L.) dan Rimpang Temu Mangga (*Curcuma mangga* Val. & Zijp) melalui Jalur NF- κ B/MAPK pada Sel RAW 264.7*, Tesis, Universitas Gadjah Mada, Yogyakarta.
- Satya, A., Narendra, K., Swathi, J., Sowjanya, K. M. 2012. *Phyllanthus niruri*: A Review on its Ethno Botanical, Phytochemical and Pharmacological Profile. *J. Pharm. Res.* 5: 4681.
- Sayuti, K., Yenrina, R., 2015, *Antioksidan, Alami dan Sintetik*, Andalas University Press, Padang.
- Sompayrac L., 2019, *How The Immune System Works*, Wiley-Blackwell, Hoboken. ISBN 978-1-119-54212-4. OCLC 1083261548.
- Sheng, Y., Chen, Y.-J., Qian, Z.-M., Zheng, J., Liu, Y., 2020, Cyclophosphamide induces a significant increase in iron content in the liver and spleen of mice,

Hum. Exp. Toxicol., 39, 973–983.
<https://doi.org/10.1177/0960327120909880>

Subarnas, A. 2005. *Khasiat Meniran sebagai Antihepatitis*. www.pikiran-rakyat.com. diunduh tanggal 9 September 2022.

Suebsaard, P. dan Chareerntantanakul, W., 2021. Rutin, α -tocopherol, and l-ascorbic acid up-regulate type I interferon-regulated gene and type I and II interferon expressions and reduce inflammatory cytokine expressions in monocyte-derived macrophages infected with highly pathogenic porcine reproductive and respiratory syndrome virus. *Veterinary Immunology and Immunopathology*, 235: 110231.

Tinago W, Coghlan E, Macken A, McAndrews J, Doak B, Prior-Fuller C, et al. Clinical, immunological and treatment-related factors associated with normalised CD4+/CD8+ T-cell ratio: effect of naive and memory T-cell subsets. *PLoS ONE*. 2014;9(5):e97011.

Tjandrawinata, R.R., Susanto, L.W., dan Nofiarny, D., 2017. The use of *Phyllanthus niruri* L. as an immunomodulator for the treatment of infectious diseases in clinical settings. *Asian Pacific Journal of Tropical Disease*, 7: 132–140.

Van Steenis, CGGJ., 2008, *FLORA*, Pradnya Paramita, Jakarta.

Winarti, S., 2010, *Makanan Fungsional*, 70-71, Graha Ilmu, Yogyakarta.

World Health Organization, 2020, *Indonesia Cancer Country Profile 2020*, World Health Organization, Jenewa.

Yang, H., Du, Z., Wang, W., Song, M., Sanidad, K.Z., Zheng, J., dkk., 2017. Structure and Activity Relationship of Curcumin: Role of Methoxy Group in Anti-inflammatory and Anti-colitis Effects of Curcumin. *Journal of Agricultural and Food Chemistry*, 35.

Yuandani, . Yuliasmi, S., . Satria, D., F. Dongoran, R., S. Sinaga, M., dan H. A. Marpaung, N., 2018. Correlation Between the Phytochemical Constituents of *Curcuma mangga* and its Immunomodulatory Effect. *Rasayan Journal of Chemistry*, 12: 01–06.

Yuandani, S. E., Laila, L., Silaban, S. D., and Ramadhani, F. (2020). Stimulatory Effect of *Curcuma mangga* on Immune Response against *Staphylococcus aureus*. *Nusantara Biosci.* 12, 109–113. doi:10.13057/nusbiosci/n120204

Yulinery, T., Nurhidayat, N., 2012, Penggunaan Ekstrak Fermentasi Beras Dari Beberapa Jenis *Monascus Purpureus* Untuk Aktivitas Invitro Fagositosis Sel Makrofag Dan Polimorfonuklear Peritoneum Mencit Sebagai Immunomodulator, *Berita Biologi* 11(2).



UNIVERSITAS
GADJAH MADA

Pengaruh Pemberian Kombinasi Ekstrak Etanolik Herba Meniran (*Phyllanthus niruri* L.) dan Rimpang Temu

Mangga (*Curcuma mangga* Val.) terhadap Profil Limfosit Darah, Jumlah Sel T CD4+, CD8+, dan Indeks

Limpa pada Mencit ddY yang Diinduksi dengan Siklofosfamid

Ahmad Ridho Abi Daffa, drh. Retno Murwanti, M.P., Ph.D. ; Dr. apt. Andayana Puspitasari Gani

Universitas Gadjah Mada, 2023 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Zhou, X., Dong, Q., Kan, X., Peng, L., Xu, X., Fang, Y., dan Yang, J., 2018, Immunomodulatory Activity Of A Novel Polysaccharide From *Lonicera Japonica* In Immunosuppressed Mice Induced By Cyclophosphamide. *PLoS ONE*, 13(10), pp.1-15.