

DAFTAR PUSTAKA

- Achyani, & Wicandra, D. 2019. *Kiat Praktis Budidaya Lebah Trigona (Heterotrigona itama)*. Laduny, Lampung.
- Aziz, N. A. A., Hasham, R., Sarmidi, M. R., Suhaimi, S. H., & Idris, M. K. H. (2021). A review on extraction techniques and therapeutic value of polar bioactives from Asian medicinal herbs: Case study on *Orthosiphon aristatus*, *Eurycoma longifolia* and *Andrographis paniculata*. *Pharmacognosy Reviews*, 15(29), 22–36. https://doi.org/10.4103/phrev.phrev_65_20
- Azwanida, N. N. 2015. A review on the extraction methods use in medicinal plants, principle, strength and limitation. *Medicinal & Aromatic Plants*, 4(3), 196. <https://doi.org/10.4172/2167-0412.1000196>
- Balouiri, M., Sadiki, M., & Ibnsouda, S. K. 2016. Methods for *in vitro* evaluating antimicrobial activity: A review. *Journal of Pharmaceutical Analysis*, 6(2), 71-79.
- Bankova, VS., Milena, P., Stefan, B., & Anna, GS. 2002. Chemical composition of European propolis. Expected and Unexpected Result. *Z Naturforsch* 57:530-533.
- Blair, J. M., Webber, M. A., Baylay, A. J., Ogbolu, D. O., & Piddock, L. J. 2015. Molecular mechanisms of antibiotic resistance. *Nature Reviews Microbiology*, 13(1), 42–51.
- Borges, A., Ferreira, C., Saavedra, M. J., & Simões, M. 2013. Antibacterial activity and mode of action of ferulic acid against pathogenic bacteria. *Microbial Drug Resistance*, 19(4), 256–265.
- Budak, N. H., Aykin, E., Seydim, A. C., Greene, A. K., & Guzel-Seydim, Z. B. 2014. Functional properties of vinegar. *Journal of Food Science*, 79(5), R757–R764.
- Bueschelger, H. G. 2004. Lecithin. New Dehli, India: *Blackwell Publishing Ltd*.
- Chen, H., Xiao, H., & Pang, J. 2020. Parameter Optimization and Potential Bioactivity Evaluation of a Betulin Extract from White Birch Bark. *Plants*, 9(3), 392.
- Daglia, M. 2012. Polyphenols as antimicrobial agents. *Current Opinion in Biotechnology*, 23(2), 174–181.
- Dai, J., & Mumper, R. J. 2010. Plant phenolics: Extraction, analysis and their antioxidant and anticancer properties. *Molecules*, 15(10), 7313–7352.

- Dalynn. 2014. *McFarland Standard*. Dalynn Biological Catalogue No. TM50-TM60: Canada.
- Davies, J., & Davies, D. 2010. Origins and evolution of antibiotic resistance. *Microbiology and Molecular Biology Reviews*, 74(3), 417–433.
- Desrosier, N.W. 1988. *Teknologi Pengawetan Pangan dan Gizi*, Penerbitan Universitas Indonesia, Jakarta.
- Dhianawaty, D., & Ruslin. 2015. Kandungan Total Polifenol dan Aktivitas Antioksidan dari Ekstrak Metanol Akar *Imperata cylindrica* (L) Beauv. (Alangalang). *Majalah Kedokteran Bandung*, 47(1), 60–64
- Diantari, I. G. A. M. W., Bkti, H. S., & Sundari, C. D. W. H. 2022. Uji Aktivitas Antibakteri Cuka Apel Terhadap Bakteri *Salmonella Paratyphi A*. *Jurnal Skala Husada: The Journal of Health*, 19(1), 5–10.
- Djajasaputra, M. 2010. Potensi Budidaya Lebah Trigona dan Pemanfaatan Propolis sebagai Antibiotik Alami untuk Sapi PO. Bogor: *IPB Repository*
- Do Nascimento, T. G., Dos Santos Arruda, R. E., da Cruz Almeida, E. T., et al. 2019. Comprehensive multivariate correlations between climatic effect, metabolite-profile, antioxidant capacity and antibacterial activity of Brazilian red propolis metabolites. *Scientific Reports*, 9, 18293.
- Dziaugyte, L., Zilius, M., & Ivanauskas, L. 2022. Antibacterial properties of propolis extracts prepared using different solvents against *Escherichia coli* and *Staphylococcus aureus*. *Antibiotics*, 11(2), 205.
- Elpawati, A. T. N., Nugraha, A. T., & Maulana, H. 2019. Faktor-Faktor yang Mempengaruhi Produksi Propolis Lebah *Heterotrigona itama* di Rumah Kompos. *Jurnal Agribisnis*, 13(2), 108-115.
- Fan, S., Yang, G., Zhang, J., Li, J., & Bai, B. 2020. Optimization of Ultrasound-Assisted Extraction Using Response Surface Methodology for Simultaneous Quantitation of Six Flavonoids in Flos *Sophorae Immaturus* and Antioxidant Activity. *Molecules*, 25(8), 1767.
- Ferrazzano, G. F., Amato, I., Ingenito, A., De Natale, A., & Pollio, A. 2011. Plant polyphenols and their anti-cariogenic properties: A review. *Molecules*, 16(2), 1486-1507.
- Gibbons, S. 2004. Anti-staphylococcal plant natural products. *Natural Product Reports*, 21(2), 263–277.
- Guerreiro, C. I. P. D., Machado, D., Rocha, I., & Nielsen, J. 2022. Diffusion-based models of antimicrobial zone inhibition: Mechanistic insights and applications. *Biophysics Reports*, 8(1), 99–111.

- Gunawan, Sulistia Gan. 2009. *Farmakologi dan terapi*. Edisi V. Jakarta: Departemen Farmakologi dan Terapeutik Fakultas Kedokteran Indonesia, 2009.
- Hamad, A., Septhea, A., & Ma'ruf, A. 2016. Kemampuan Daya Emulsifier Corn Lecithin yang Dihasilkan dari Water Degumming Process Minyak Jagung. Purwokerto: *Universitas Muhammadiyah Repository*.
- Handayani, F., H. Warnida, S.J. Nur. 2016. Formulasi dan Uji Aktivitas Antibakteri *Streptococcus mutans* Dari Sediaan Mouthwash Ekstrak Daun Salam (*Syzygium polyanthum* (Wight) Walp.). *Media Sains*. 9(1).
- Haryati, N. A., Chairul S., & Erwin. 2015. Uji toksisitas dan aktivitas antibakteri ekstrak daun merah tanaman pucuk merah (*Syzygium myrtifolium* Walp.) terhadap bakteri *Staphylococcus aureus* dan *Escherichia coli*. *Jurnal Kimia Mulawarman*, 13(1).
- Hemaiswarya, S., Kruthiventi, A. K., & Doble, M. 2008. Synergism between natural products and antibiotics against infectious diseases. *Phytomedicine*, 15(8), 639–652.
- Herwina, H., Janra, M. N., Salmah, S., Mairawita, & Jasmi. 2022. Analisis cepat terhadap budidaya galo-galo (*Apidae: Meliponini*) di Desa Suntur, Kecamatan Barangin, Kota Sawahlunto. *Aksiologi: Jurnal Pengabdian Kepada Masyarakat*, 6(3), 388–399.
- Huang, S., Zhang, C. P., Wang, K., Li, G. Q., & Hu, F. L. 2014. Recent advances in the chemical composition of propolis. *Molecules*, 19(12), 19610–19632.
- Hudzicki J. Kirby-Bauer disk diffusion susceptibility test protocol. *American society for microbiology*, 2016;15, 1-23.
- Jawetz, E., Melnick, J. L., & Adelberg, E. A. 2007. *Mikrobiologi kedokteran* (Edisi ke-24; N. Edi & R. F. Maulany, Penerj.). ECG.
- Jiménez-Moreno, N., Volpe, F., Moler, J. A., Esparza, I., & Ancín-Azpilicueta, C. 2019. Impact of Extraction Conditions on the Phenolic Composition and Antioxidant Capacity of Grape Stem Extracts. *Antioxidants*, 8(12), 597.
- Kadarsah, A., Putra, A. P., Nurliani, A., Suhartono, E., & Ibrahim, F. S. 2024. Morphological Characteristics and Nest Structure of Stingless Bee (*Heterotrigona itama*) from Different Meliponiculture Practices. *Biosaintifika: Journal of Biology & Biology Education*, 16(1), 49-62.
- Kamoda, D. R., Tutu, D. S., & Lolong, D. B. 2021. Antioksidan dan pengaruhnya terhadap kesehatan manusia. *Jurnal Biomedik*, 13(1), 45–52.

- Khairunnisa, K., Mardawati, E., & Putri, S. H. 2020. Karakteristik fitokimia dan aktivitas antioksidan ekstrak propolis lebah *Trigona* sp. *Jurnal Industri Pertanian*, 2(1), 124–129.
- Khairunnisa, N., Yuniati, K., Arsal, A. S. F., Hermiaty, & Syamsu, R. F. 2023. Efektifitas Ekstrak Daun Kemangi & Ekstrak Daun Sirih Merah sebagai Anti Mikroba *Staphylococcus aureus* Penyebab Furunkle. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, 3(2).
- Khotimah, H., Anggraeni, E. W., & Setianingsih, A. 2017. Karakterisasi hasil pengolahan air menggunakan alat distilasi/Characterization of water processing using distillation equipment. *Jurnal Chemurgy*, 1(2), 34–38.
- Król W, Bankova V, Sforcin JM, Szliszka E, Czuba Z, Kuropatnicki AK. 2013. Propolis: properties, application, and its potential. *Evid Based Complement Alternat Med*.
- Kumazawa, S., Hamasaka, T., & Nakayama, T. 2004. Antioxidant activity of propolis of various geographic origins. *Food Chemistry*, 84(3), 329–339.
- Kuncahyo, I., & Sunardi. 2007. Uji Aktivitas Antioksidan Ekstrak Belimbing Wuluh (*Averrhoa blimbi* L) Terhadap 1,1-diphenyl-2-picrylhydrazil (DPPH). *Prosiding Seminar Nasional Teknologi*. Yogyakarta. 19(78): 97-99.
- Kurek-Górecka, A., Górecki, M., Rzepecka-Stojko, A., Balwierz, R., & Stojko, J. (2020). Bee products in dermatology and skin care. *Molecules*, 25(3), 556. <https://doi.org/10.3390/molecules25030556>
- Kusumaningtyas, E. 2011. Mekanisme Infeksi *Candida albicans* pada Permukaan Sel. Balai Penelitian Veteriner. *Lokalkarya Nasional Penyakit Zoonosis* 304-313.
- Laxminarayan, R., Duse, A., Wattal, C., et al. 2013. Antibiotic resistance—the need for global solutions. *The Lancet Infectious Diseases*, 13(12), 1057–1098.
- Lehninger. 1982. *Dasar-Dasar Biokimia*. Jilid 1. Jakarta: Erlangga.
- Lotfy, M., El-Malak, A., Abd El Hady, F., & Nasr, N. F. 2019. Combined use of propolis and bee venom in the prevention of microbial growth. *Pakistan Journal of Pharmaceutical Sciences*, 32(1), 223–230.
- Lutpiatina, L. 2015 Efektivitas ekstrak propolis lebah kelulut (*Trigona spp*) dalam menghambat pertumbuhan *Salmonella typhi*, *Staphylococcus aureus* dan *Candida albicans*. *J Skala Kesehat* 6: 1–8.
- Magvirah, T., Marwati, & Ardhani, F. 2019. Uji daya hambat *Staphylococcus aureus* menggunakan ekstrak daun Tahongai (*Kleinhovia hospita* L.). *Jurnal Peternakan dan Lingkungan Tropis*, 2(2), 41–50.

- Martin, M.V.1999. The use of fluconazole and itraconazole in the treatment candida albicans infections: a review, *Journal of Antimicrobial Chemotherapy*, (44) : 429-437.
- Meliana, N., Putri, S. H., & Mardawati, E. 2019. Optimasi Kondisi Acid Degumming pada Proses Produksi Lesitin dari CPO. *Jurnal Industri Pertanian*, 1(3), 70–76.
- Michener, CD. 2007. *The Bees of The World*. The John Hopkins Univ Pr, Baltimore.
- Moeljaningsih. 2013. Pengaruh penambahan lesitin terhadap kualitas permen coklat selama penyimpanan pada suhu kamar (The influence of lecithine addition to the quality of soft candy chocolate during room temperature storage). *Jurnal Teknologi Pangan*, 4(1), 1–10. <https://doi.org/10.33005/jtp.v4i1.430>
- Mohammad Azmin, S.N.H., Abdul Manan, Z., Wan Alwi, S.R., Chua, L.S., Mustaffa, A.A. and Yunus, N.A., 2016. Herbal processing and extraction technologies. *Separation & Purification Reviews*, 45(4), pp.305-320.
- Molyneux, P. 2004. The use of the stable free radical diphenylpicrylhydrazyl (DPPH) for estimating antioxidant activity. *Songklanakarin Journal of Science and Technology*. 26: 211 – 219.
- Morello, J.A., P.A. Granato. & H.E. Mizer. 2003. Laboratory Manual and Workbook in Microbiology. 7 th Edition. *The McGraw-Hill Companie*. New York.
- Mubarak, Z., Chismirina, S., & Daulay, HH. 2016. Aktivitas antibakteri ekstrak propolis alami dari sarang lebah terhadap pertumbuhan *Enterococcus faecalis*. *J Syiah Kuala Dent Soc* 1: 175–186.
- Musradinur. 2016. Radikal bebas dan implikasinya terhadap kesehatan. *Jurnal Kesehatan Masyarakat*, 8(2), 111–117.
- Nazarian, A., & Shahidi, F. 2019. *Antimicrobial activity of apple cider vinegar and its synergism with natural products*. *Journal of Food Protection*, 82(5), 896–902.
- Nurhasanah, Putriani, E., N., Utami, H., & Ginting, S., B. 2019. Pengaruh Jenis Soluility Promotor dan Waktu Reaksi pada Sintesis a-Terpineol dari Minyak Terpentin Menggunakan Katalis Zeolit Alam Lampung Teraktivasi. *Indonesian Journal of Chemical Science*, 8(2), 76-80.
- Nurhayati, S., Suhartono, E., Mulyono, N., & Muspiah, M. 2021. Aktivitas antioksidan dan kandungan total fenolik ekstrak propolis dari lebah *Tetragonula laeviceps* dengan pelarut berbeda. *Jurnal Kimia VALENSI*, 7(1), 45–52.

- Nurmiati, N., Herwina, H., Periadnadi, P., Janra, M. N., Hidayat, R., & Edelwis, T. W. 2024. Exploration of natural microflora from stingless bee honey harvested from Limau Manis area, Padang, West Sumatra, Indonesia. *Biodiversitas*, 25(9), 2908–291.
- Nurmiati, N., Periadnadi, P., Syahril, S. F., & Edelwis, T. W. 2024. The antimicrobial and antioxidant potentials of *Annona* species (*A. muricata*, *A. squamosa*, and *A. reticulata*) through leaf infusions. *Biodiversitas*, 25(8), 3422–3430. <https://doi.org/10.13057/biodiv/d250813>
- Ogbolu, D. O., et al. 2007. In vitro antimicrobial properties of coconut oil on *Candida* species in Ibadan, Nigeria. *Journal of Medicinal Food*, 10(2), 384–387. <https://doi.org/10.1089/jmf.2006.1209>
- Parrilla, A.E., L.A. de-la Rosa., N.R. Martinez and G.A.G. Aguilar. 2007. Total Phenols and Antioxidant Activity Of Commercial and Wild Mushrooms From Chihuahua, Mexico : *journal of somenta*.
- Parwata, M. O. A. 2016. *Antioksidan*. Kimia Terapan Program Pascasarjana Universitas Udayana, 1–54.
- Pasupuleti, V. R., Sammugam, L., Ramesh, N., & Gan, S. H. 2017. Honey, Propolis, and Royal Jelly: A Comprehensive Review of Their Biological Actions and Health Benefits. *Oxidative Medicine and Cellular Longevity*.
- Pelezar, M. J., & E.C.S. Chan. 1988. *Dasar-Dasar Mikrobiologi*. Universitas Indonesia. Jakarta
- Popov, D., Petkova, N., Vasileva, I., & Denev, P. 2019. Natural lecithin – Properties and application. *Food Science and Applied Biotechnology*, 2(1), 67–74.
- Pratiwi, ST. 2008. *Mikrobiologi Farmasi*. Erlangga. Jakarta
- Purwanto, Budhi, N.S. 2016. *Obat Herbal Andalan Keluarga*. Yogyakarta: Flashbook.12.
- Puspitasari, D. A., Rahmawati, N., Putri, N. K., & Pradipta, M. F. 2022. Nanoemulsi ekstrak wortel dan virgin coconut oil sebagai suplemen provitamin A untuk mencegah kekurangan vitamin A. *agriTECH*, 42(1), 65-74.
- Putra, DP., & Jasmi. 2021. Teknik perbanyakan koloni *Trigona* spp. ke sarang buatan (Stup). *UNES Journal of Scientech Research* 1: 11-19.
- Rahmawati, E. 2018. Pembuatan *VCO* (*Virgin Coconut Oil*) dengan Proses Fermentasi dan Enzimatis. *Journal of Food and Culinary*. Yogyakarta.
- Ramayani, S. L., Rohmawati, F., & Rahmadani, Y. S. 2022. Pengaruh rasio bahan dan pelarut terhadap kadar flavonoid dan aktivitas penangkapan radikal bebas ekstrak daun mengkudu (*Morinda citrifolia*). *Jurnal Jamu Indonesia*, 7(2), 56–61.

- Rice-Evans CA., Miller NJ., Paganga G. 1996. Structure-antioxidant activity relationships of flavonoids and phenolic acids. *Free Radical Biology & Medicine*. Vol. 20, No. 7, pp. 933-956.
- Rosa, N. N., Oliveira, L. D., Jorge, A. O. C., & Dos Santos, S. S. F. 2020. Antimicrobial activity of virgin coconut oil on *Streptococcus mutans* and *Candida albicans*: A systematic review. *Journal of Oral Research*, 9(5), 424–429. <https://doi.org/10.17126/joralres.2020.081>
- Satiova, I.R., Periadnadi dan Nurmiati. 2017. Aktivitas Antimikroba Ekstrak Segar Belimbing Wuluh (*Averrhoa blimbi* L.) Terhadap *Candida albicans* (R.) Berkhout, *Staphylococcus aureus* Rosenbach dan *Escherichia coli* Castellani and Chalmers (Migula). *Prosiding Semirata 2017 Bidang MIPA BKS-PTN Wilayah Barat*. Universitas Jambi.
- Sanches, N. M., Almeida, J. A. C., & Moura, R. R. 2017. Influence of extraction method on antioxidant activity and chemical composition of Brazilian green propolis. *Brazilian Journal of Pharmaceutical Sciences*, 53(3), 202.
- Seydim, A. C., Akin, E., & Greene, A. K. 2021. The antimicrobial effects of vinegar and its combination with herbal extracts against food spoilage microorganisms. *Food Bioscience*, 42, 101203.
- Sinaga, Y. M. R., Rahayu, T. I., Perdhana, F. F., Ariyana, M. D., & Amaro, M. 2024. Efektivitas antimikroba ekstrak air propolis *Trigona* spp asal Lombok. *Jurnal Kolaboratif Sains*, 7(6), 1954–1962.
- Soltan, S. S. A., Abdel Motaal, A. A., & Saleh, D. O. 2020. Phytochemical, antioxidant and antimicrobial activities of different vinegar samples from Egyptian markets. *Biocatalysis and Agricultural Biotechnology*, 24, 101562.
- Suárez, A. I., Martínez, J. R., & Rojas, M. 2021. Effect of extraction solvents on the antioxidant activity and phenolic content of propolis from various regions. *Industrial Crops and Products*, 162, 113242.
- Supriyanto, T., & Wahyudi. 2010. *Proses Produksi Etanol Oleh Saccharomyces Cerivisiae Dengan Operasi Kontinyu Pada Kondisi Vakum*. Teknik Kimia. Universitas Diponogoro. Semarang
- Susilo, B., Made, N. M., Budi, E. K., & Agil M., 2009. Komposisi Kimia dan Aktivitas Antimikroba Propolis dari Malang Jawa Timur. *J. Penelit. Med. Eksakta*. 8 (1), 23-30
- Sutiknowati, L. I. 2016. Bioindikator Pencemar, Bakteri *Escherichia coli*. *Oseana*, 44(4) : 63 – 71.

- Syahrurachman, A. 2019 *Buku Ajar Mikrobiologi Kedokteran Edisi Revisi*. Binarupa Aksara publishing.
- Taek, M. M. 2018. Mekanisme kerja antioksidan terhadap radikal bebas. *Jurnal Sains dan Teknologi*, 3(1), 12–19.
- Taek, Y. M. 2018. Uji Aktivitas Antioksidan Infusa Daun Binahong (*Anredera Cordifolia* (Ten.) Steenis) Dengan Metode Dpph (1,1-Diphenyl-2-Picrylhydrazyl). *J Poltekkes Farmasi Kupang*, 24–25.
- Thannhauser, S. J., Bennoti, J., & Boncondo, N. 1946. Isolation and Properties of Hydrolecithin (Dipalmityl Lecithin) from Lung. *J. Biol. Chem.*
- Thomas, G & de Chimie, P. 2000. *Medicinal Chemistry: An Introduction*; John Wiley & Sons: West Sussex, UK.
- Valko, M., Leibfritz, D., Moncol, J., Cronin, M. T., Mazur, M., & Telser, J. 2007. Free radicals and antioxidants in normal physiological functions and human disease. *The International Journal of Biochemistry & Cell Biology*, 39(1), 44–84.
- Ventola, C. L. 2015. The antibiotic resistance crisis: Part 1: causes and threats. *Pharmacy and Therapeutics*, 40(4), 277–283.
- Volk & Wheeler. 2004. *Mikrobiologi Dasar*. Jakarta: Erlangga.
- Waluyo, L. 2004. *Mikrobiologi Umum*. UMM Press, Malang.
- Wang, T., Li, Q., Bi, K., 2018. Bioactive flavonoids in medicinal plants: Structure, activity and biological fate. *Asian J. Pharm. Sci.* 13, 12–23.
- Whitehurst, R. J. (Ed.). 2004. *Lecithin*. New Dehli, India: Blackwell Publishing Ltd.
- Yagnik, D., Serafin, V., & Shah, A. J. 2018. Antimicrobial activity of apple cider vinegar against *Escherichia coli*, *Staphylococcus aureus*, and *Candida albicans*. *Scientific Reports*, 8(1), 1732.
- Yen, L.-T., Weng, C.-H., Than, N. A. T., Tzeng, J.-H., Jacobson, A. R., Iamsaard, K., Dang, V. D., & Lin, Y.-T. (2022). Mode of inactivation of *Staphylococcus aureus* and *Escherichia coli* by heated oyster-shell powder. *Chemical Engineering Journal*, 432, 134386. <https://doi.org/10.1016/j.cej.2021.134386>
- Yusoff, M. S. R., Bahari, S. A., Haliffuddin, R. M. A. A., Zakaria, M. N., Jamaluddin, M. A., & Rashid, N. H. M. N. 2021. Chemical contents and thermal stability of Madu bamboo *Gigantochloa albociliata* for natural-bonded fiber composites. *IOP Conference Series: Earth and Environmental Science*, 644, 012009.

Zhang, H., Wu, Y., Wang, Z., & Wang, Z. 2020. Ethanol extraction of bioactive compounds from propolis and their antioxidant activity. *Food Chemistry*, 331, 127361. <https://doi.org/10.1016/j.foodchem.2020.127361>

