

## DAFTAR PUSTAKA

1. Johnson SA. Evidence Based Essential Oil Therapy: The Ultimate Guide to The Therapeutic and Clinical Application of Essential Oils. Orem: Scott A. Johnson Professional Writing Services, LLC; 2015.
2. Rialita T, Rahayu WP, Nuraida L, & Nurtama B. Aktivitas Antimikroba Minyak Esensial Jahe Merah (*Zingiber officinale* var. *rubrum*) dan Lengkuas Merah (*Alpinia purpurata* K. Schum) terhadap Bakteri Patogen dan Perusak Pangan. *J Agritech*. 2015;35(01):43.
3. López EIC., Balcázar MFH., Mendoza JMR, Ortiz ADR., Melo MTO., Parrales RS, et al. Antimicrobial Activity of Essential Oil of *Zingiber officinale* Roscoe (Zingiberaceae). *Am J Plant Sci*. 2017;08(07):1511–24.
4. Lely N, Firdiawan A, & Martha S. Efektivitas Antibakteri Minyak Atsiri Rimpang Jahe Merah (*Zingiber officinale* var. *rubrum*) terhadap Bakteri Jerawat. *Sci J Farm dan Kesehatan*. 2016;6(1):44.
5. Phat DT, Quyen NTC, Minh PTH, & Huyen LV. Modeling the Kinetics of Essential Oil Hydrodistillation from Vietnamese Ginger (*Zingiber officinale*). *IOP Conf Ser Mater Sci Eng*. 2020;991(1).
6. Abdullahi A, Khairulmazmi A, Yasmeen S, Ismail IS, Norhayu A., Sulaiman M.R., et al. Phytochemical Profiling and Antimicrobial Activity of Ginger (*Zingiber officinale*) Essential Oils Against Important Phytopathogens. *Arab J Chem*. 2020;13(11):8012–25.
7. Kementerian Kesehatan Republik Indonesia. Farmakope Herbal Indonesia. Jakarta: Kemenkes RI; 2017.
8. Rinanda T, Isnanda RP, & Zulfitri. Chemical Analysis of Red Ginger (*Zingiber officinale* Roscoe var *rubrum*) Essential Oil and Its Anti-Biofilm Activity Against *Candida albicans*. *Nat Prod Commun*. 2018;13(12):1587–90.
9. Lukita S, Khosasi W, Susanto C, & Florenly. The Antibacterial Effectiveness of Red Ginger (*Zingiber officinale* Roscoe) Essential Oil in Inhibiting the Growth of *Staphylococcus aureus* and *Staphylococcus mutans*. *Biomed J Indones*. 2021;7(2):357–63.
10. Situmorang N. Efek Ekstrak dan Fraksi Herbal *Peperomia pellucida* (L.) Kunth terhadap Beberapa Bakteri Patogen Kulit. *Biolink (Jurnal Biol Lingkungan, Ind Kesehatan)*. 2018;4(2):90.
11. Al-Amara SS. Comparison Between Phenotype and Molecular Resistance Characteristic in *Staphylococcus epidermidis* Isolates from Wound Infections in Al-Basrah Province, Iraq. *Period Eng Nat Sci*. 2021.
12. Zafar U, Taj MK, Nawaz I, Zafar A, & Taj I. Characterization of *Proteus mirabilis* Isolated from Patient Wounds at Bolan Medical Complex Hospital, Quetta. *Jundishapur J Microbiol*. 2019;12(7).
13. Setiadhi R, Sufiawati I, Zakiawati D, & Firman DR. Time-Kill Assay of Pomegranate (*Punica granatum* L.) Seed Ethanolic Extract Against *Streptococcus sanguis*. *The Cause of Recurrent Aphthous Stomatitis*. 2018;3(3):152–5.
14. Raveesha KA. Antibacterial Activity and Time-kill Assay of *Terminalia catappa* L. and *Nigella sativa* L. Against Selected Human Pathogenic

- Bacteria. 2021;15:285–99.
15. Faradina EM. Uji Aktivitas Antibakteri Ekstrak Buah Kemukus (*Piper cubeba* L.) terhadap Bakteri Methicillin Resistant *Staphylococcus aureus* (MRSA). Bandung: Universitas Pendidikan Indonesia; 2020.
  16. Tim Penerbit KBM Indonesia. Ensiklopedi Jahe: Deskripsi, Filosofi, Manfaat, Budidaya, dan Peluang Bisnisnya. Yogyakarta: Karya Bakti Makmur Indonesia; 2020.
  17. Putri M. Khasiat dan Manfaat Jahe Merah. Semarang: ALPRIN; 2019.
  18. Amin A, Waris R. Eksplorasi Ilmiah Jahe Sebagai Obat Tradisional dari Sisi Agama, Kesehatan, dan Ekonomi. Solok: Insan Cendekia Mandiri; 2021.
  19. Juwitaningtyas T. Analisis Kelayakan Finansial Usaha Perkebunan Tanaman Jahe Merah (*Zingiber officinale* var. *rubrum*). Agriindustrial Technol J. 2018;02(01):65–9.
  20. Tritanti A & Pranita I. The Making of Red Ginger (*Zingiber officinale* var. *rubra*) Natural Essential Oil. J Phys Conf Ser. 2019;1273(1).
  21. Liu Y, Liu J, & Zhang Y. Review Article: Research Progress on Chemical Constituents of *Zingiber officinale* Roscoe. Biomed Res Int. 2019;1-21.
  22. Dhanik J, Verma A, Arya N, & Nand V. Chemical Profiling and Antioxidant Activity of Essential Oil of *Zingiber officinale* Roscoe from Two Different Altitudes of Uttarakhand. J Essent Oil-Bearing Plants. 2017;20(6):1547–56.
  23. Aryanta IWR. Manfaat Jahe untuk Kesehatan. Widya Kesehatan. 2019;1(2):39–43.
  24. Lestari DF, Fatimatuzzahra, & Dominica D. Jurnal Sains dan Kesehatan. J Sains dan Kesehat. 2020;3(2):242–7.
  25. Tirta IG & Wibawa IPAH. Eksplorasi Tumbuhan yang Berpotensi Sebagai Penghasil Minyak Atsiri di Lombok Timur-NTB. J Biol Udayana. 2017;21(1):12–6.
  26. Nazzaro F. Essential Oils and Antifungal Activity. Pharmaceuticals. 2017;10(86):1-20.
  27. Buchbauer G & Baser KHC. Handbook of Essential Oils: Science, Technology, and Applications Third Edition. Boca Raton: Taylor & Francis; 2016. 1–23 p.
  28. Saad NY, Muller CD, & Lobstein A. Major Bioactivities and Mechanism of Action of Essential Oils and Their Components. Flavour and Fragrance Journal. 2013;28:269–79.
  29. Adelifar N & Rezanejad FA. Comparative Study of Essential Oil Constituents, Total Phenolics and Antioxidant Capacity of the Different Organs of Four Species of the Genus *Bunium*. Flavour Fragr J. 2021;36(3):384–94.
  30. Mogosan C, Vostinaru O, Oprean R, Heghes C, Filip L, Balica G, et al. A Comparative Analysis of The Chemical Composition, Anti-Inflammatory, and Antinociceptive Effects of The Essential Oils From Three Species of *Mentha* Cultivated in Romania. Molecules. 2017;22(2):1-11.
  31. Ferrentino G, Morozova K, Horn C, & Scampicchio M. Extraction of Essential Oils from Medicinal Plants and Their Utilization as Food Antioxidants. Curr Pharm Des. 2020;26(5):519–41.
  32. Al-Dhahli AS, Al-Hassani FA, Alarjani KM, Yehia HM, Lawati WM Al, Azmi SNH, et al. Essential Oil from the Rhizomes of the Saudi and Chinese

- Zingiber officinale* cultivars: Comparison of Chemical Composition, Antibacterial and Molecular Docking Studies. J King Saud Univ.2020;32(8):3343–50.
33. Julianto TS. Minyak Atsiri Bunga Indonesia. Yogyakarta: Deepublish; 2016.
  34. Rassem H, Nour AH, & Rosli MY. Techniques for Extraction of Essential Oils From Plants: A Review. Aust J Basic Appl Sci. 2016;10(16):117–27.
  35. Sani NS, Racchmawati R, & Mahfud. Pengambilan Minyak Atsiri dari Melati dengan Metode Enfleurasi dan Ekstraksi Pelarut Menguap. J Tek POMITS. 2012;1(1):1–4.
  36. Kurniawan A, Chandra, Indraswati N, & Mudjijati. Ekstraksi Minyak Kulit Jeruk dengan Metode Distilasi, Pengepresan dan Leaching. Widya Tek. 2008;7(1):15–24.
  37. Jayanti HD. Pengendalian Mutu Proses Pembuatan Minyak Atsiri Daun Cengkeh (Clove Leaf Oil ). Universitas Sebelas Maret; 2011.
  38. Yuliani S & Satuhu S. Panduan Lengkap Minyak Atsiri. Advanced Optical Materials. Bogor: Penebar Swadaya; 2012.
  39. Lo CM, Han J, & Wong ESW. Chemistry in Aromatherapy – Extraction and Analysis of Essential Oils from Plants of *Chamomilla recutita*, *Cymbopogon nardus*, *Jasminum officinale*, and *Pelargonium graveolens*. Biomed Pharmacol J. 2020;13(3):1339–50.
  40. Darmapatni KAG, Basori A, & Suaniti NM. Pengembangan Metode GC-MS untuk Penetapan Kadar Acetaminophen pada Rambut Manusia. J Biosains Pascasarjana. 2016;18(3):255–70.
  41. Munarsih E & Rini P. Penggunaan FTIR pada Praktikum Farmasi Fisika untuk Interaksi Fisika Menggunakan Basis Sediaan Semi Solid dengan Bahan Alam Lokal. J Penelit Sains. 2019;21(3):163–7.
  42. Arif M, Li Y, El-Dalatony MM, Zhang C, Li X, & Salama ES. A Complete Characterization of Microalgal Biomass Through FTIR/TGA/CHNS Analysis: An Approach for Biofuel Generation and Nutrients Removal. Renew Energy. 2021;163:1973–82.
  43. Cebi N, Taylan O, Abusurrah M, & Sagdic O. Detection of Orange Essential Oil, Isopropyl Myristate, and Benzyl Alcohol in Lemon Essential Oil by FTIR Spectroscopy Combined with Chemometrics. Foods. 2021;10(1).
  44. Juliani, Yuliana ND, Budijanto S, Wijaya CH, Khatib A. Senyawa Inhibitor Alfa-Glukosidase dan Antioksidan dari Kumis kucing dengan Pendekatan Metabolomik Berbasis FTIR. J Teknol Industri Pangan. 2016;27: 17-30.
  45. Pambudi A, Farid M, & Nurdiansah H. Analisa Morfologi dan Spektroskopi Infra Merah Serat Bambu Betung (*Dendrocalamus asper*) Hasil Proses Alkalisasi Sebagai Penguat Komposit Absorpsi Suara. J Tek ITS. 2017;6(2):441–4.
  46. Aminah, Nugraheni ER, & Yugatama A. Antibacterial Activity Study of Attacus Atlas Cocoon Against *Staphylococcus aureus* And *Escherichia coli* with Diffusion and Dilution Method. IOP Conf Ser Mater Sci Eng. 2018;333(1).
  47. Xia EQ, Deng GF, Guo YJ, & Li H Bin. Biological Activities of Polyphenols from Grapes. Int J Mol Sci. 2010;11(2):622–46.
  48. Nazzaro F. Effect of Essential Oils on Pathogenic Bacteria. Pharmaceuticals. 2013;6(2):1451–74.

49. Sujadmiko WKKY & Wikandari PR. Resistensi Antibiotik Amoksisilin pada Strain *Lactobacillus plantarum* B1765 Sebagai Kandidat Kultur Probiotik. *UNESA J Chem.* 2017;6(1):5–9.
50. Nadeak EF. Uji Efektivitas Antibakteri Ekstrak Daun Ketapang (*Terminalia catappa*) dalam Menghambat Bakteri *Escherichia coli*. Medan: Universitas Medan Area; 2019.
51. Hikmawati. Aktivitas Antibakteri Metabolit Sekunder Isolat Actinomycetes KC 3.1 dari Rizosfer Kumis Kucing (*Orthosiphon stamineus*). Makassar: Universitas Hasanuddin; 2018.
52. Yanling J, Xin L, & Zhiyuan L. The Antibacterial Drug Discovery. InTech; 2013.289-307.
53. Indriani E & Susanti NS. Flu dan Batuk, Perlukah Antibiotik?. *Majalah Farmasetika.* 2017;2(5):5.
54. Eyler RF & Shvets K. Clinical Pharmacology of Antibiotics. *Clin J Am Soc Nephrol.* 2019;14(7):1080–90.
55. Burt SA. Antibacterial Activity of Essential Oils: Potential Applications in Food. Utrecht: Institute for Risk Assessment Sciences; 2007.
56. Balouiri M, Sadiki M, & Ibsouda SK. Methods for In Vitro Evaluating Antimicrobial Activity: A review. *J Pharm Anal.* 2016;6(2):71–9.
57. Veiga A, Toledo M da GT, Rossa LS, Mengarda M, Stofella NCF, Oliveira LJ, et al. Colorimetric Microdilution Assay: Validation of A Standard Method for Determination of MIC, IC50%, and IC90% of Antimicrobial Compounds. *J Microbiol Methods.* 2019;162:50–61.
58. Stanković N, Mihajilov-Krstev T, Zlatković B, Stankov-Jovanović V, Kocić B, & Čomić L. Antibacterial and Antioxidant Activity of Wild-Growing Angelica Species (Apiaceae) from Balkan Peninsula Against Human Pathogenic Bacteria. *J Essent Oil Res.* 2020;464–73.
59. Okukawa M. Antibacterial Activity of 1,2-Alkanediol Against *Staphylococcus aureus* and *Staphylococcus epidermidis*. *Journal of Oleo Science.* 2019;68(8):759–63.
60. Appiah T, Boakye YD, Agyare C. Antimicrobial Activities and Time-Kill Kinetics of Extracts of Selected Ghanaian Mushrooms. *Evidence-based Complement Altern Med.* 2017;1–16.
61. Ibrahim D & Lim SH. In Vitro Antimicrobial Activities of Methanolic Extract from Marine Alga *Enteromorpha intestinalis*. *Asian Pac J Trop Biomed.* 2015;5(9):785–8.
62. Pöntinen AK, Top J, Arredondo-Alonso S, Tonkin-Hill G, Freitas AR, Novais C, et al. Apparent Nosocomial Adaptation of *Enterococcus faecalis* Predates The Modern Hospital Era. *Nat Commun.* 2021;12(1).
63. Esmail MAM, Abdulghany HM, & Khairy RM. Prevalence of Multidrug-Resistant *Enterococcus faecalis* in Hospital-Acquired Surgical Wound Infections and Bacteremia: Concomitant Analysis of Antimicrobial Resistance Genes . *Infect Dis Res Treat.* 2019;12:1-6.
64. Da Silva TM, Pinheiro CD, Orlandi PP, & Pontes GS. Zerumbone from *Zingiber zerumbet* (L.) smith: A Potential Prophylactic and Therapeutic Agent Against The Cariogenic Bacterium *Streptococcus mutans*. *BMC Complement Altern Med.* 2017;1–9.
65. Tonguc Altin K, Topcuoglu N, Duman G, Unsal M, Celik A, Selvi Kuvvetli

- S, et al. Antibacterial Effects of Saliva Substitutes Containing Lysozyme Or Lactoferrin Against *Streptococcus mutans*. Arch Oral Biol. 2021;129:1-8.
66. Farghali HA, AbdElKader NA, AbuBakr HO, Aljuaydi SH, Khattab MS, Elhelw R, et al. Antimicrobial Action of Autologous Platelet-Rich Plasma on MRSA-Infected Skin Wounds in Dogs. Nature 2019;9(1):1–15.
67. Ilyas S, Munir T, Sadaf R, & Gilani M. Comparative In Vitro Evaluation of Vancomycin Minimum Inhibitory Concentration by Agar Dilution And E-Strip In Methicillin Resistant *Staphylococcus Aureus*. Pak Armed Forces Med J. 2021;71(1):150–4.
68. Kumari J, Shalini Shenoy M, Chakrapani M, Vidyalakshmi K, & Gopalkrishna BK. Comparison of Etest and Agar Dilution for Determining Minimum Inhibitory Concentration of Vancomycin to Healthcare-Associated Methicillin-Resistant *Staphylococcus aureus*. Asian J Pharm Clin Res. 2016;9(4):189–91.
69. Kwiecińska-Piróg J, Przekwas J, Majkut M, Skowron K, Gospodarek-Komkowska E. Biofilm Formation Reducing Properties of Manuka Honey and Propolis in *Proteus mirabilis* rods Isolated from Chronic Wounds. Microorganisms. 2020;8(11):1–15.
70. Permata S & Wicaksono IA. Review: Uji Aktivitas Antibakteri Ekstrak, Fraksi dan Isolat Rimpang *Curcuma sp.* terhadap Beberapa Bakteri Patogen. Farmaka. 2016;14(1):175–83.
71. Pintatum A, Laphookhieo S, Maneerat W, Logie E, & Berghe WV. Chemical Composition of Essential Oils from Different Parts of *Zingiber kerrii* Craib and Their Antibacterial, Antioxidant, and Tyrosinase Inhibitory Activities. Biomolecules. 2020;10(2):1-13.
72. Salameh N, Shraim N, Jaradat N, El Masri M, Adwan L, K'Aibni S, et al. Screening of Antioxidant and Antimicrobial Activity of *Micromeria fruticosa serpyllifolia* Volatile Oils: A Comparative Study of Plants Collected from Different Regions of West Bank, Palestine. Biomed Res Int.;2020.
73. Bazargani M. Antibiofilm Activity of Essential Oils And Plant Extracts Against *Staphylococcus aureus* and *Escherichia coli* Biofilms. Food Control. 2016;61:156–64.
74. Badan Standardisasi Nasional. Standar Nasional Indonesia 06-1312-1998. Jakarta: BSN; 1998.
75. Guenther E. The Essential Oils. Penerjemah: Ketaren S. Minyak Atsiri. Jilid I. Jakarta: Universitas Indonesia; 1987.
76. Muyassaroh. Proses Microwave Assisted Extraction (MAE) Rimpang Jahe Merah dengan Variasi Perlakuan Bahan dan Daya Operasi. Atmosphere (Basel). 2021;2(2):33–8.
77. Dachriyanus. Analisis Struktur Senyawa Organik Secara Spektroskopi. Padang: LPTIK Universitas Andalas; 2004.
78. Sivasothy Y, Chong WK, Hamid A, Eldeen IM, Sulaiman SF, & Awang K. Essential oils of *Zingiber officinale* var. *rubrum* Theilade and Their Antibacterial Activities. Food Chem. 2011;124(2):514–7.
79. Rai Y, Pathak R, Kumari N, Sah DK, Pandey S, Kalra N, et al. Mitochondrial Biogenesis and Metabolic Hyperactivation Limits the Application of MTT Assay in The Estimation of Radiation Induced Growth Inhibition. Sci Rep.

- 2018;8(1):1–15.
80. Evans-Roberts KM, Mitchenall LA, Wall MK, Leroux J, Mylne JS, Maxwell A. DNA Gyrase Is The Target for The Quinolone Drug Ciprofloxacin in *Arabidopsis Thaliana*. *J Biol Chem*. 2016;291(7):3136–44.
  81. Grella E, Kozłowska J, Grabowiecka A. Current methodology of MTT Assay in Bacteria – A review. *Acta Histochem*. 2018;120(4):303–11.
  82. Andrade BFMT, Barbosa LN, Probst I da S, Júnior AF. Antimicrobial Activity of Essential Oils. *J Essent Oil Res*. 2014;26(1):34–40.
  83. Heleili N, Souhila B, Manel M, Yasmine O, Lamraoui A. Screening For Antibacterial Activity of Some Essential Oils and Evaluation of Their Synergistic Effect. *Int J Biosci*. 2018;12(4):292–301
  84. National Institute of Standards and Technology. NIST Chemistry Webbook. [Internet]. 2022 [diakses pada 8 Maret 2022]. Laman: <http://webbook.nist.gov/chemistry>.
  85. Zengin H, Baysal AH. Antibacterial and Antioxidant Activity of Essential Oil Terpenes Against Pathogenic and Spoilage-Forming Bacteria and Cell Structure-Activity Relationships Evaluated by SEM Microscopy. *Molecules*. 2014;19(11):17773–98.
  86. Amaya DR & Farfan JM. *Chemical Changes During Processing and Storage of Foods* 1<sup>st</sup> Ed. Academic Press: Brazil; 2020.
  87. Asghari G, Jalali M, Sadoughi E. Pharmaceutical products. *Pharm Prod*. 2015;17(1):11–5.
  88. Chacón MG, Marriott A, Kendrick EG, Styles MQ, & Leak DJ. Esterification of Geraniol As A Strategy For Increasing Product Titre and Specificity in Engineered *Escherichia coli*. *Microb Cell Fact*. 2019;18(1):1–11.
  89. Pelczar MJ & Chan ECS. *Dasar-Dasar Mikrobiologi*. Jilid I. Jakarta: UI-Press;1986.
  90. Ningtyas, R. Uji Antioksidan, Antibakteri. Ekstrak Air Daun Kecombrang (*Etlingera elatior* (Jack) R. M. Smith) Sebagai Pengawet Alami terhadap *Escherichia coli* dan *Staphylococcus aureus*. Jakarta: Fakultas Sains Dan Teknologi Universitas Islam Negeri Syarif Hidayatullah; 2010.
  91. Silhavy TJ, Kahne D, Walker S. The Bacterial Cell Envelope. *Cold Spring Harb Perspect Biol*. 2010;2:1–16.
  92. Atanasova KR. Interactions Between Porcine Respiratory Coronavirus and Bacterial Cell Wall Toxins in The Lungs of Pigs. 2010.
  93. Drago L, De Vecchi E, Mombelli B, Nicola L, Valli M, Gismondo MR. Activity of Levofloxacin and Ciprofloxacin Against Urinary Pathogens. *J Antimicrob Chemother*. 2001;48(1):37–45.
  94. Zabinski RA, Walker KJ, Larsson AJ, Moody JA, Kaatz GW, Rotschafer JC. Effect of Aerobic and Anaerobic Environments on Antistaphylococcal Activities of Five Fluoroquinolones. *Antimicrob Agents Chemother*. 1994;39(2):507–12.