

## DAFTAR PUSTAKA

- Abdullah, Angelina, Yumna, M., Arbianti, R., Utami, T. S., Hermansyah, H., & Ningsih, S. 2018. Flavonoid isolation and identification of mother-in-law's tongue leaves (*Sansevieria trifasciata*) and the inhibitory activities to xanthine oxidase enzyme. *E3S Web of Conferences*. 67(1):03011.  
<https://doi.org/10.1051/e3sconf/20186703011>
- Abubakar, M. N., & Majinda, R. R. T. 2016. GC-MS analysis and preliminary antimicrobial activity of *Albizia adianthifolia* (Schumach) and *Pterocarpus angolensis* (DC). *Medicines*. 3(1): 3.
- Adeola, S. A., Folorunso, O. S., Raimi, G. O., & Akinsiku, A. B. 2015. Antimicrobial assay for the volatile oils of *Chromolaena odorata* and its inhibition against the partially purified and characterized extracellular protease of *Pseudomonas aeruginosa*. *Asian Journal of Biochemistry*. 10(3): 93–105.  
<https://doi.org/10.3923/ajb.2015.93.105>
- Adnan, M., Nazim Uddin Chy, M., Mostafa Kamal, A. T. M., Azad, M. O. K., Paul, A., Uddin, S. B., Barlow, J. W., Faruque, M. O., Park, C. H., & Cho, D. H. 2019. Investigation of the Biological Activities and Characterization of Bioactive Constituents of *Ophiorrhiza rugosa* var. prostrata (D.Don) & Mondal Leaves through In Vivo, In Vitro, and In Silico Approaches. *Molecules (Basel, Switzerland)*. 24(7).  
<https://doi.org/10.3390/molecules24071367>
- Aendekerk, S., Diggle, S. P., Song, Z., Høiby, N., Cornelis, P., Williams, P., & Camara, M. 2005. The MexGHI-OpmD multidrug efflux pump controls growth, antibiotic susceptibility and virulence in *Pseudomonas aeruginosa* via 4-quinolone-dependent cell-to-cell communication. *Microbiology*. 151(4): 1113–1125.
- Ahemad, M., & Kibret, M. (2014). Mechanisms and applications of plant growth promoting rhizobacteria: Current perspective. *Journal of King Saud University - Science*, 26(1): 1–20.  
<https://doi.org/https://doi.org/10.1016/j.jksus.2013.05.001>
- Aisyah, S. I., Rusmiyati, H., Sukma, D., Damanik, R., & Nurcholis, W. 2020. Analisis komparatif kandungan metabolit pada daun mutan tanaman Torbangun (*Plectranthus amboinicus* (Lour.) Spreng.). *Agrosainstek: Jurnal Ilmu Dan Teknologi Pertanian*. 4(1): 10–16.
- Ajizah, A. 2018. Sensitivitas Salmonella Typhimurium Terhadap Ekstrak Daun Psidium Guajava L. *Bioscientiae*. 1(1).
- Akindele, A. J., Wani, Z. A., Sharma, S., Mahajan, G., Satti, N. K., Adeyemi, O. O., Mondhe, D. M., & Saxena, A. K. 2015. In vitro and in vivo anticancer activity of root extracts of *Sansevieria liberica* Gerome and Labroy (Agavaceae). *Evidence-Based Complementary and Alternative Medicine*. 2015 :1-11
- Akiyama, H., Fujii, K., Yamasaki, O., Oono, T., & Iwatsuki, K. 2001. Antibacterial action of several tannins against *Staphylococcus aureus*. *The Journal of Antimicrobial Chemotherapy*. 48(4): 487–491.  
<https://doi.org/10.1093/jac/48.4.487>

- Aliero, A. A., Jimoh, F., & Afolayan, A. J. 2008. Antioxidant and antibacterial properties of *Sansevieria hyacinthoides*. *Int J Pure Appl Sci.* 2 :103–110.
- Amini, A., & Namvar, A. E. 2019. Antimicrobial resistance pattern and presence of beta-lactamase genes in *Pseudomonas aeruginosa* strains isolated from hospitalized patients, Babol-Iran. *Journal of Medical Bacteriology.* 8(1–2): 45–50.
- Andersen, O. M., & Markham, K. R. 2005. *Flavonoids: chemistry, biochemistry and applications*. Taylor & Francis CRC press., London, 1256 p.
- Andhare, R. N., Raut, M. K., & Naik, S. R. 2012. Evaluation of antiallergic and anti-anaphylactic activity of ethanolic extract of *Sanseveiria trifasciata* leaves (EEST) in rodents. *Journal of Ethnopharmacology.* 142(3): 627–633. <https://doi.org/https://doi.org/10.1016/j.jep.2012.05.007>
- Armstrong, S. M., Sankey, B. M., & Voordouw, G. 1995. Conversion of dibenzothiophene to biphenyl by sulfate-reducing bacteria isolated from oil field production facilities. *Biotechnology Letters.* 17(10): 1133–1136.
- Arung, E. T., Pasedan, W. F., Kusuma, I. W., Hendra, M., & Supriadi, M. B. 2017. Selected medicinal plants in East and North Kalimantan (Indonesia) against *Propionibacterium acnes*. *Biodiversitas Journal of Biological Diversity.* 18(1).
- Aseptianova, A. 2019. Pemanfaatan Tanaman Obat Keluarga Untuk Pengobatan Keluarga Di Kelurahan Kebun Bunga Kecamatan Sukarami-Kota Palembang. *Batoboh.* 3(1): 1. <https://doi.org/10.26887/bt.v3i1.680>
- Babii, C., Mihalache, G., Bahrin, L. G., Neagu, A.-N., Gostin, I., Mihai, C. T., Sârbu, L.-G., Birsa, L. M., & Stefan, M. 2018. A novel synthetic flavonoid with potent antibacterial properties: In vitro activity and proposed mode of action. *PLOS ONE.* 13(4): 1–15. <https://doi.org/10.1371/journal.pone.0194898>
- Balouiri, M., Sadiki, M., & Ibensouda, S. K. 2016. Methods for in vitro evaluating antimicrobial activity: A review. *Journal of Pharmaceutical Analysis.* 6(2): 71–79. <https://doi.org/https://doi.org/10.1016/j.jpha.2015.11.005>
- Baloyi, I. T., Adeosun, I. J., Yusuf, A. A., & Cosa, S. 2021. In Silico and In Vitro Screening of Antipathogenic Properties of *Melianthus comosus* (Vahl) against *Pseudomonas aeruginosa*. *Antibiotics* 10:6. <https://doi.org/10.3390/antibiotics10060679>
- Banerjee, M., Moulick, S., Bhattacharya, K. K., Parai, D., Chattopadhyay, S., & Mukherjee, S. K. 2017. Attenuation of *Pseudomonas aeruginosa* quorum sensing, virulence and biofilm formation by extracts of *Andrographis paniculata*. *Microbial Pathogenesis.* 113: 85–93. <https://doi.org/10.1016/j.micpath.2017.10.023>
- Barathikannan, K., Khusro, A., & Paul, A. 2016. Simultaneous production of xylitol and ethanol from different hemicellulose waste substrates by *Candida tropicalis* strain LY15. *J Bioprocess Biotech.* 6(289): 2.
- Batubara, R., Wirjosentono, B., Siregar, A. H., Harahap, U., & Tamrin. 2021. Bioactive compounds of ethanol extract from agarwood leaves (*Aquilaria malaccensis*) and antimicrobial activity against bacteria and fungi growing on the skin. *Biodiversitas.* 22(5): 2884–2890.

<https://doi.org/10.13057/biodiv/d220553>

- Bazargani, M. M., & Rohloff, J. 2016. Antibiofilm activity of essential oils and plant extracts against *Staphylococcus aureus* and *Escherichia coli* biofilms. *Food Control*. 61: 156–164.
- Berame, J., Cuenca, S., Cabilin, D., & Manaban, M. 2017. Preliminary Phytochemical Screening and Toxicity Test of Leaf and Root Parts of the Snake Plant (*Sansevieria trifasciata*). *Journal of Phylogenetics & Evolutionary Biology*, 05. <https://doi.org/10.4172/2329-9002.1000187>
- Bernasconi, G., Gerster, H., Hauser, H., Stauble, H., & Schneiter, E. 1995. *Teknologi kimia bagian 2. Terjemahan Lienda Handojo*. Pradnya Paramita., Jakarta, 215 p
- Bhakuni, D. S., & Rawat, D. S. 2005. Bioactive metabolites of marine algae, fungi and bacteria. *Bioactive Marine Natural Products*. 1–25.
- Bidlingmeyer, B. A. 1987. *Preparative liquid chromatography*. Elsevier.
- Bjarnsholt, T. 2013. The role of bacterial biofilms in chronic infections. *Apmis*. 121: 1–58.
- Bjarnsholt, T., Jensen, P. Ø., Rasmussen, T. B., Christophersen, L., Calum, H., Hentzer, M., Hougen, H.-P., Rygaard, J., Moser, C., Eberl, L., Høiby, N., & Givskov, M. 2005. Garlic blocks quorum sensing and promotes rapid clearing of pulmonary *Pseudomonas aeruginosa* infections. *Microbiology (Reading, England)*. 151(Pt 12): 3873–3880. <https://doi.org/10.1099/mic.0.27955-0>
- Bodoprost, J., & Rosemeyer, H. 2007. Analysis of phenacyl ester derivatives of fatty acids from human skin surface sebum by reversed-phase HPLC: chromatographic mobility as a function of physico-chemical properties. *International Journal of Molecular Sciences*. 8(11): 1111–1124.
- Borges, A., Saavedra, M. J., & Simões, M. 2012. The activity of ferulic and gallic acids in biofilm prevention and control of pathogenic bacteria. *Biofouling*. 28(7):755–767.
- Brannen, L. A., & Davidson, P. M. 1993. *Antimicrobial in foods*. Marcel., New York, 369p.
- Bratu, S., Gupta, J., & Quale, J. 2006. Expression of the las and rhl quorum-sensing systems in clinical isolates of *Pseudomonas aeruginosa* does not correlate with efflux pump expression or antimicrobial resistance. *Journal of Antimicrobial Chemotherapy*. 58(6): 1250–1253.
- Brindhadevi, K., LewisOscar, F., Mylonakis, E., Shanmugam, S., Verma, T. N., & Pugazhendhi, A. 2020. Biofilm and Quorum sensing mediated pathogenicity in *Pseudomonas aeruginosa*. *Process Biochemistry*. 96(May): 49–57. <https://doi.org/10.1016/j.procbio.2020.06.001>
- Brintha S, Renuka R, Rajesh S, Vp, S., & Gnanam R. 2017. Phytochemical analysis and bioactivity prediction of compounds in methanolic extracts of *Curculigo orchioides* Gaertn. ~ 192 ~ *Journal of Pharmacognosy and Phytochemistry*. 6(4): 192–197. <https://www.nist.gov/srd/nist-standard-reference-database->
- Burger, I., Burger, B. V., Albrecht, C. F., Spies, H. S., & Sándor, P. 1998. Triterpenoid saponins from *Becium grandiflorum* var. *obovatum*. *Phytochemistry*. 49(7): 2087–2095. [https://doi.org/10.1016/s0031-9422\(98\)00413-0](https://doi.org/10.1016/s0031-9422(98)00413-0)

- Butler, A. 1998. *Sansevierias* — a guide part two. *British Cactus & Succulent Journal*. 16(2): 99–102. <http://www.jstor.org/stable/42792405>
- Buyun, L. 2018. A Promising Alternative for Treatment of Bacterial Infections by *Sansevieria Cylindrica* Bojer ex Hook Leaf Extract. *Agrobiodiversity for Improving Nutrition, Health and Life Quality*. 2018(2) : 82–93. <https://doi.org/10.15414/agrobiodiversity.2018.2585-8246.082-93>
- Caballero, A. R., Moreau, J. M., Engel, L. S., Marquart, M. E., Hill, J. M., & O’Callaghan, R. J. 2001. *Pseudomonas aeruginosa* protease IV enzyme assays and comparison to other *Pseudomonas* proteases. *Analytical Biochemistry*. 290(2): 330–337.
- Caesar, L. K., & Cech, N. B. 2019. Synergy and antagonism in natural product extracts: When 1 + 1 does not equal 2. *Natural Product Reports*. 36(6): 869–888. <https://doi.org/10.1039/c9np00011a>
- Călina, D., Docea, A. O., Rosu, L., Zlatian, O., Rosu, A. F., Anghelina, F., Rogoveanu, O., Arsene, A. L., Nicolae, A. C., Drăgoi, C. M., Tsiaoussis, J., Tsatsakis, A. M., Spandidos, D. A., Drakoulis, N., & Gofita, E. 2017. Antimicrobial resistance development following surgical site infections. *Molecular Medicine Reports*. 15(2): 681–688. <https://doi.org/10.3892/mmr.2016.6034>
- Casillas-Vargas, G., Ocasio-Malavé, C., Medina, S., Morales-Guzmán, C., Del Valle, R. G., Carballeira, N. M., & Sanabria-Ríos, D. J. 2021. Antibacterial fatty acids: An update of possible mechanisms of action and implications in the development of the next-generation of antibacterial agents. *Progress in Lipid Research*. 82:(November 2020). <https://doi.org/10.1016/j.plipres.2021.101093>
- Causapé, C. L. 2018. Clonal epidemiology and antimicrobial resistance in *Pseudomonas aeruginosa* chronic respiratory infections: interpatient transmission and resistome evolution of an international cystic fibrosis clone. [Dissertation]. Universitat de les Illes Balears, Palma. [Spain]
- Chakraborti, S., & Dhalla, N. S. 2017. *Pathophysiological Aspects of Proteases*. Springer., Singapore. 671p. <https://doi.org/10.1007/978-981-10-6141-7>
- Chanda, W., Joseph, T. P., Padhiar, A. A., Guo, X., Min, L., Wang, W., Lolokote, S., Ning, A., Cao, J., Huang, M., & Zhong, M. 2017. Combined effect of linolenic acid and tobramycin on *Pseudomonas aeruginosa* biofilm formation and quorum sensing. *Experimental and Therapeutic Medicine*. 14(5): 4328–4338. <https://doi.org/10.3892/etm.2017.5110>
- Chávez Guerrero, L., Garza-Cervantes, J., Caballero-Hernández, D., González-López, R., Sepúlveda-Guzmán, S., & Cantú-Cárdenas, E. 2017. Synthesis and characterization of calcium hydroxide obtained from agave bagasse and investigation of its antibacterial activity. *Revista Internacional de Contaminación Ambiental*. 33(2): 347–353.
- Choi, S.-J., Park, D.-K., Jang, D., Yun, Y.-M., & Kang, S. 2021. Changes of functional microbial genes by quorum sensing inhibition during the operation of forward osmosis. *Environmental Engineering Research*. 26(3): 190509.
- Cholley, P., Thouverez, M., Hocquet, D., van der Mee-Marquet, N., Talon, D., & Bertrand, X. 2011. Most multidrug-resistant *Pseudomonas aeruginosa* isolates



- from hospitals in eastern France belong to a few clonal types. *Journal of Clinical Microbiology*. 49(7):2578–2583.
- Clement, R. E., & Taguchi, V. Y. 1991. *Techniques for the gas chromatography-mass spectrometry identification of organic compounds in effluents*. Queen's Printer for Ontario., Ontario. 49 p.
- Cobrado, L., Azevedo, M. M., Silva-Dias, A., Ramos, J. P., Pina-Vaz, C., & Rodrigues, A. G. 2012. Cerium, chitosan and hamamelitannin as novel biofilm inhibitors? *Journal of Antimicrobial Chemotherapy*. 67(5): 1159–1162.
- Coli, J. C., & Bowden, B. F. 1986. The application of vacuum liquid chromatography to the separation of terpene mixtures. *Journal of Natural Products*. 49(5): 934–936. <https://doi.org/10.1021/np50047a033>
- Cowan, M. M. 1999. Plant products as antimicrobial agents. *Clinical Microbiology Reviews*. 12(4): 564–582. <https://doi.org/10.1128/CMR.12.4.564>
- Cushnie, T. P. T., Cushnie, B., & Lamb, A. J. 2014. Alkaloids: an overview of their antibacterial, antibiotic-enhancing and antivirulence activities. *International Journal of Antimicrobial Agents*. 44(5): 377–386. <https://doi.org/10.1016/j.ijantimicag.2014.06.001>
- Da Silva Antunes, A., Da Silva, B. P., Parente, J. P., & Valente, A. P. 2003. A new bioactive steroidal saponin from *Sansevieria cylindrica*. *Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives*. 17(2): 179–182.
- Dafale, N. A., Semwal, U. P., Rajput, R. K., & Singh, G. N. 2016. Selection of appropriate analytical tools to determine the potency and bioactivity of antibiotics and antibiotic resistance. *Journal of Pharmaceutical Analysis*. 6(4): 207–213. <https://doi.org/10.1016/j.jpha.2016.05.006>
- Daniels, A. O., Temikotan, T., & Ibiyemi, D. A. 2021. Identification and Characterization of Fatty Acids, Phytochemical Properties and Antibacterial Effect of the Ethyl Acetate Extract of *Piliostigma Reticulatum*. *Journal of Biotechnology and Bioengineering*. 5(1) 2021:30-40.
- Das, M. C., Sandhu, P., Gupta, P., Rudrapaul, P., De, U. C., Tribedi, P., Akhter, Y., & Bhattacharjee, S. 2016. Attenuation of *Pseudomonas aeruginosa* biofilm formation by Vitexin: A combinatorial study with azithromycin and gentamicin. *Scientific Reports*. 6(1): 1–13.
- Das, S., Das, D., Nayak, A., Dash, S., & Bhattacharyay, D. 2020. Myristica fragrans Derived Phytochemicals against Shikimate Dehydrogenase of *E. coli* Causing Diarrhea. *Journal of Pharmaceutical Research International*. 110–112.
- Davenport, P. W. 2018. A Metabolomics-Based Analysis of Acyl-Homoserine Lactone Quorum Sensing in *Pseudomonas aeruginosa*. [Doctoral Thesis]. University of Cambridge, Cambridge.[UK]
- De Kievit, T. R., & Iglewski, B. H. 2000. Bacterial quorum sensing in pathogenic relationships. *Infection and Immunity*. 68(9): 4839–4849. <https://doi.org/10.1128/IAI.68.9.4839-4849.2000>
- Denyer, S. P., & Stewart, G. 1998. Mechanisms of action of disinfectants. *International Biodeterioration & Biodegradation*. 41(3–4): 261–268.
- Dewanjee, S., Gangopadhyay, M., Bhattacharya, N., Khanra, R., & Dua, T. K. 2015. Bioautography and its scope in the field of natural product chemistry.

- Journal of Pharmaceutical Analysis*. 5(2):75–84.
- Dewick, P. M. 2002. *Medicinal natural products: a biosynthetic approach*. John Wiley & Sons.
- Dewick, P. M. 2009. The shikimate pathway: aromatic amino acids and phenylpropanoids. *Medicinal Natural Products*. 137: 86.
- Dias, V., Uqueio, M., Nhaca, A., & Salência, H. 2020. Qualitative Analysis of Phytocompounds of *Liagora divaricata* and *Trematocarpus flabellatus*. *Journal of Drug Delivery and Therapeutics*. 10(5): 75–81.
- Dolatabadi, S., Moghadam, H. N., & Mahdavi-Ourtakand, M. 2018. Evaluating the anti-biofilm and antibacterial effects of *Juglans regia* L. extracts against clinical isolates of *Pseudomonas aeruginosa*. *Microbial Pathogenesis*. 118(November 2017): 285–289.  
<https://doi.org/10.1016/j.micpath.2018.03.055>
- Donlan, R. M. 2002. Biofilms: survival mechanisms of clinically relevant microorganisms. *Clinical Microbiology Reviews*. 15(2): 167–193.
- Donlan, R. M., & Costerton, J. W. 2002. Biofilms: survival mechanisms of clinically relevant microorganisms. *Clinical Microbiology Reviews*. 15(2): 167–193.
- Dwidjoseputro, D. 2019. *Dasar-dasar mikrobiologi*. Djambatan., Jakarta, 214 p.
- Dzen, S. M., Roekistiningsih, S. S., Winarsih, S., & Sumarno, I. S. 2003. *Bakteriologi medik*. Bayumedia Publishing., Malang, 31,32–120pp.
- Eliyanor, B. B. 2019. *Fitokimia: Bahan Ajar Farmasi*. Kemkes.BPPSDM., Jakarta, 246 p
- Fardiaz, S. 1993. *Analisa mikrobiologi pangan*. Raja Grafindo Persada., Jakarta, 199 p
- Fatisa, Y. 2013. Daya antibakteri ekstrak kulit dan biji buah pulasan (*nephelium mutabile*) terhadap *staphylococcus aureus* dan *escherichia coli* secara in vitro. *Jurnal Peternakan*. 10(1).
- Febriani, Y., Mierza, V., Handayani, N. P., Surismayanti, S., & Ginting, I. 2019. Antibacterial Activity of Lidah Mertua (*Sansevieria trifasciata* Prain.) Leaves Extract on *Escherichia coli* and *Staphylococcus aureus*. *Open Access Macedonian Journal of Medical Sciences*. 7(22): 3882–3886.  
<https://doi.org/10.3889/oamjms.2019.525>
- Febriyani, E., Falah, S., Andrianto, D., & Lastini, T. 2018. Identification of active compounds and anti-acne activity from extracts and fractions of surian (*Toona sinensis*) leaves planted in Sumedang, West Java, Indonesia. *Biodiversitas Journal of Biological Diversity*. 19(4): 1406–1412.
- Fitri, L., & Bustam, B. M. 2010. Screening of antimicrobial producing strains isolated from the soil of grassland rhizosphere in Pocut Meurah Intan Forest Park, Seulawah, Aceh Besar. *Biodiversitas Journal of Biological Diversity*. 11(3).
- Fleming, D., & Rumbaugh, K. P. 2017. Approaches to Dispersing Medical Biofilms. *Microorganisms*. 5(2):15  
<https://doi.org/10.3390/microorganisms5020015>
- Florence, A. R., & Jeeva, S. 2015. FTIR and GC-MS spectral analysis of *Gmelina asiatica* L. Leaves. *Science Research Reporter*. 5(2):125–136.

- Frazier, R. A., Deaville, E. R., Green, R. J., Stringano, E., Willoughby, I., Plant, J., & Mueller-Harvey, I. 2010. Interactions of tea tannins and condensed tannins with proteins. *Journal of Pharmaceutical and Biomedical Analysis*. 51(2): 490–495.
- Frazier, W. C., & Westhoff, D. C. 1983. *Food microbiology 3rd Ed*. TATA McGraw-Hill publishing company limited., New Delhi, India.
- Fuller, R. 1991. Probiotics in human medicine. *Gut*.32(4): 439.
- Fuqua, C., Parsek, M. R., & Greenberg, E. P. 2001. Regulation of gene expression by cell-to-cell communication: acyl-homoserine lactone quorum sensing. *Annual Review of Genetics*. 35(1): 439–468.
- Gala, V., & Desai, K. 2014. Plant based quorum sensing inhibitors of *Pseudomonas aeruginosa*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 6(8): 20–25.
- Galán-Vásquez, E., Luna, B., & Martínez-Antonio, A. 2011. The regulatory network of *Pseudomonas aeruginosa*. *Microbial Informatics and Experimentation*. 1(1): 1–11.
- Galdino, A. C. M., Viganor, L., De Castro, A. A., Da Cunha, E. F. F., Mello, T. P., Mattos, L. M., Pereira, M. D., Hunt, M. C., O’Shaughnessy, M., Howe, O., Devereux, M., McCann, M., Ramalho, T. C., Branquinha, M. H., & Santos, A. L. S. 2019. Disarming *Pseudomonas aeruginosa* virulence by the inhibitory action of 1,10-phenanthroline-5,6-dione-based compounds: Elastase B (*lasB*) as a chemotherapeutic target. *Frontiers in Microbiology*. 10(July): 1–16. <https://doi.org/10.3389/fmicb.2019.01701>
- Gambello, M. J., & Iglewski, B. H. 1991. Cloning and characterization of the *Pseudomonas aeruginosa lasR* gene, a transcriptional activator of elastase expression. *Journal of Bacteriology*. 173(9): 3000–3009.
- Gandjar, I. G., & Rohman, A. 2018. *Spektroskopi molekuler untuk analisis farmasi*. UGM PRESS., Yogyakarta, 191 p
- Gertenbach, D. D. 2002. Solid-liquid extraction technologies for manufacturing nutraceuticals. *Functional Foods: Biochemical and Processing Aspects*. 2: 331–366.
- Ghosh, G., Panda, P., Rath, M., Pal, A., Sharma, T., & Das, D. 2015. GC-MS analysis of bioactive compounds in the methanol extract of *Clerodendrum viscosum* leaves. *Pharmacognosy Research*. 7(1): 110.
- Gilbert, P. 1984. The revival of micro-organisms sublethally injured by chemical inhibitors. *Society for Applied Bacteriology Symposium Series*, 12, 175–197.
- Gilman, A. G., Hardman, J. G., & Limbird, L. E. 2012. *Goodman & Gilman Dasar Farmakologi Terapi*. Ed.10 vol 1. 628 p
- Gita, R. S. D., & Danuji, S. 2021. Studi Keanekaragaman Tumbuhan Obat Yang Digunakan Dalam Pengobatan Tradisional Masyarakat Kabupaten Pamekasan. *Bioma : Jurnal Biologi Dan Pembelajaran Biologi*. 6(1): 11–23. <https://doi.org/10.32528/bioma.v6i1.4817>
- Goldoni, M., & Johansson, C. 2007. A mathematical approach to study combined effects of toxicants in vitro: evaluation of the Bliss independence criterion and the Loewe additivity model. *Toxicology in Vitro*. 21(5): 759–769.
- Górniak, I., Bartoszewski, R., & Króliczewski, J. 2019. Comprehensive review of

- antimicrobial activities of plant flavonoids. *Phytochemistry Reviews*. 18(1): 241–272.
- Govaerts, R. 2019. *World Checklist of Selected Plant Families in the Catalogue of Life*.
- Gritter, R. J., Bobbit, J. M., & Schwarting, A. E. 1991. Pengantar kromatografi. *Edisi Kedua, Penerbit ITB.*, Bandung, 1, 118 p.
- Gunardi, W. D. 2016. Mekanisme Biomolekuler *Pseudomonas aeruginosa* dalam Pembentukan Biofilm dan Sifat Resistensi terhadap Antibiotika. *Jurnal Kedokteran Meditek*. 22(15): 1-7
- Gurib-Fakim, A. 2006. Medicinal plants: traditions of yesterday and drugs of tomorrow. *Molecular Aspects of Medicine*. 27(1): 1–93.  
<https://doi.org/10.1016/j.mam.2005.07.008>
- Hahn-Deinstrop, E. 2007. *Applied thin-layer chromatography: best practice and avoidance of mistakes*. John Wiley & Sons., New York, 330 p
- Halyna, T., Buyun, L., Osadowski, Z., & Maryniuk, M. 2017. *The Antibacterial Activity Of Certain Sansevieria Thunb. Species Against Escherichia coli. Agrobiodiversity for Improving Nutrition, Health and Life Quality*. 446-453.  
<https://doi.org/10.15414/agrobiodiversity.2017.2585-8246.446-453>
- Hamidu, H. 2009. *Kajian Etnobotani Suku Buton (Kasus Masyarakat Sekitar Hutan Lambusango, Kabupaten Buton, Provinsi Sulawesi Tenggara)*. IPB (Bogor Agricultural University).
- Handayani, L., Faridah, D. N., & Kusumaningrum, H. D. 2014. Staphylococcal Enterotoxin A Gene–Carrying *Staphylococcus aureus* Isolated from Foods and Its Control by Crude Alkaloid from Papaya Leaves. *Journal of Food Protection*. 77(11): 1992–1997.
- Hanlon, G. W., & Hodges, N. A. 1981. Bacitracin and protease production in relation to sporulation during exponential growth of *Bacillus licheniformis* on poorly utilized carbon and nitrogen sources. *Journal of Bacteriology*. 147(2): 427–431. <https://doi.org/10.1128/jb.147.2.427-431.1981>
- Harborne, J B. 1987. Metode fitokimia: Penuntun cara modern menganalisis tumbuhan. ITB Bandung., Bandung, 354 p
- Harborne, Jeffrey Barry, & Baxter, H. 1996. *Dictionary of plant toxins*. John Wiley and Sons., New York, 540 p
- Hariana, H. A. 2013. *Tumbuhan obat dan khasiatnya*. Penebar Swadaya Grup., Jakarta, 262 p
- Hartanti, D., & Budipramana, K. 2020. Traditional antidiabetic plants from indonesia. *Ethnobotany Research and Applications*. 19. <https://doi.org/10.32859/era.19.34.1-24>
- Hartono, R. H. 2021. Potensi Ekstrak Air Dan Ekstrak Etanol Daun *Avicennia Marina* Sebagai Nutraceutical Farmasi. *Wahana*. 73(1):52-61
- Hema, R., Kumaravel, S., & Alagusundaram, K. 2011. GC-MS study on the bioactive components and anti-cancer activities of *Solanum surattense*. *Cancer Biol*. 1(1):13–17.
- Hentzer, M., & Givskov, M. 2003. Pharmacological inhibition of quorum sensing for the treatment of chronic bacterial infections. *The Journal of Clinical Investigation*. 112(9): 1300–1307.



- Hermanowicz, S. W. 1999. Two-dimensional simulations of biofilm development: effects of external environmental conditions. *Water Science and Technology*. 39(7), 107–114.
- Hijrah, Arsa Wahyu Nugrahani, dan R. 2019. Studi Etnobotani Tumbuhan Berkhasiat Obat Pada Suku Tau Taa Wana Di Desa Bulan Jaya Kecamatan Ampana Tete, Kabupaten Tojo Una Una, Provinsi Sulawesi Tengah. *Biocelebes*. 13(1): 76–86.
- Hossain, M. A., Al-Hdhrami, S. S., Weli, A. M., Al-Riyami, Q., & Al-Sabahi, J. N. 2014. Isolation, fractionation and identification of chemical constituents from the leaves crude extracts of *Mentha piperita* L grown in Sultanate of Oman. *Asian Pacific Journal of Tropical Biomedicine*. 4; S368–S372.
- Hostettmann, K., Hostettmann, H., & Marson, A. 1995. *Cara Kromatografi Preparatif Penggunaan Pada Isolasi Senyawa Alam* (Terjemahan). Penerbit ITB., Bandung, 9–11 pp.
- Huigens, R. W. 3rd, Ma, L., Gambino, C., Moeller, P. D. R., Basso, A., Cavanagh, J., Wozniak, D. J., & Melander, C. 2008. Control of bacterial biofilms with marine alkaloid derivatives. *Molecular BioSystems*. 4(6): 614–621. <https://doi.org/10.1039/b719989a>
- Hussain, A. I., Anwar, F., Chatha, S. A. S., Latif, S., Sherazi, S. T. H., Ahmad, A., Worthington, J., & Sarker, S. D. 2013. Chemical composition and bioactivity studies of the essential oils from two *Thymus* species from the Pakistani flora. *LWT-Food Science and Technology*. 50(1): 185–192.
- Hussain, F., Malik, A., Ayyaz, U., Shafique, H., Rana, Z., & Hussain, Z. 2017. Efficient hepatoprotective activity of cranberry extract against CCl<sub>4</sub>-induced hepatotoxicity in Wistar albino rat model: Down-regulation of liver enzymes and strong antioxidant activity. *Asian Pacific Journal of Tropical Medicine*, 10(11): 1054–1058.
- Ikonne, E. U., & Odozor, O. 2009. Comparative Efficacy Of Topical Ciprofloxacin On *Staphylococcus aureus* and *Pseudomonas aureginosa* in vitro. *Journal of the Nigerian Optometric Association*. 15: 8–11.
- Ivanišov, E., & Vukovic, N. L. 2020. Antioxidant, Antimicrobial and Antibiofilm Activity of Coriander ( *Coriandrum sativum* L .) Essential Oil for Its Application in Foods. *Foods*. 9(3): 1-19
- Jaffar-Bandjee, M. C., Lazdunski, A., Bally, M., Carrère, J., Chazalette, J. P., & Galabert, C. 1995. Production of elastase, exotoxin A, and alkaline protease in sputa during pulmonary exacerbation of cystic fibrosis in patients chronically infected by *Pseudomonas aeruginosa*. *Journal of Clinical Microbiology*. 33(4): 924–929.
- Jagger, K. S., Bahner, D. R., & Warren, R. L. 1983. Protease phenotypes of *Pseudomonas aeruginosa* isolated from patients with cystic fibrosis. *Journal of Clinical Microbiology*. 17(1): 55–59.
- Jawetz, E. 1996. *Medical Microbiology*. McGraw-Hill Education., New York, 854 p
- \_\_\_\_\_. 2001. *Medical microbiology 28 edition*. McGraw-Hill Education., New York, 275 p
- Jones, D. S., Gorman, S. P., McCafferty, D. F., & Woolfson, A. D. 1991. The effects

- of three non-antibiotic, antimicrobial agents on the surface hydrophobicity of certain micro-organisms evaluated by different methods. *Journal of Applied Bacteriology*. 71(3), 218–227.
- Jones, K. E., Patel, N. G., Levy, M. A., Storeygard, A., Balk, D., Gittleman, J. L., & Daszak, P. 2008. Global trends in emerging infectious diseases. *Nature*, 451(7181): 990–993. <https://doi.org/10.1038/nature06536>
- Jork, H., Funk, W., Fishcer, W., & Wimmer, H. 1994. *Tlc reagents & detection methods—physical & chemical detection methods: Activation reactions, reagent sequences, reagents, ii, vol 1b*. Wiley., New York
- Jose, B & Reddy, J. L. 2013. Evaluation of antibacterial and DPPH radical scavenging activities of the leaf extracts of *Cassia fistula* Linn from South India. *Open Access Scientific Reports*. 2(8): 2–4.
- Kalia, M., Yadav, V. K., Singh, P. K., Sharma, D., Pandey, H., Narvi, S. S., & Agarwal, V. 2015. Effect of cinnamon oil on quorum sensing-controlled virulence factors and biofilm formation in *Pseudomonas aeruginosa*. *PLoS One*. 10(8): e0135495.
- Kanazawa, A., Ikeda, T., & Endo, T. 1995. A novel approach to mode of action of cationic biocides: morphological effect on antibacterial activity. *The Journal of Applied Bacteriology*. 78(1): 55–60. <https://doi.org/10.1111/j.1365-2672.1995.tb01673.x>
- Karthick Raja Namasivayam, Selvaraj, & Roy, E. A. 2013. Anti biofilm effect of medicinal plant extracts against clinical isolate of biofilm of *Escherichia coli*. *International Journal of Pharmacy and Pharmaceutical Sciences*. 5: 486–489.
- Katzung, B. G. 1989. *Farmakologi dasar dan klinik*. buku kedokteran EGC., Yogyakarta, 652 p
- Kaur, R., Kaushal, S., & Sharma, P. 2018. Antimicrobial and antioxidant potential of pomegranate (*Punica granatum* L.) peel. *Int. J. Chem. Stud*. 6: 3441–3449.
- Kerton, F. M., & Marriott, R. 2013. *Alternative solvents for green chemistry* (Issue 20). Royal Society of chemistry.
- Kim, J.-Y., Park, S.-C., Hwang, I., Cheong, H., Nah, J.-W., Hahm, K.-S., & Park, Y. 2009. Protease inhibitors from plants with antimicrobial activity. *International Journal of Molecular Sciences*. 10(6):2860–2872.
- Kim, N. H., & Hwang, B. K. 2015. Pepper pathogenesis-related protein 4c is a plasma membrane-localized cysteine protease inhibitor that is required for plant cell death and defense signaling. *The Plant Journal*. 81(1): 81–94.
- Kingsley, J., Chauhan, R., Sinha, P., & Abraham, J. 2013. Screening and Characterization of Antimicrobial Agents from *Sanseveria roxburghiana* and *Sansveria trifasiata*. *Asian Journal of Plant Sciences*. 12: 224–227. <https://doi.org/10.3923/ajps.2013.224.227>
- Kiratisin, P., Tucker, K. D., & Passador, L. 2002. LasR, a transcriptional activator of *Pseudomonas aeruginosa* virulence genes, functions as a multimer. *Journal of Bacteriology*. 184(17): 4912–4919.
- Kiswandono, A. A. 2017. Perbandingan dua ekstraksi yang berbeda pada daun kelor (*Moringa oleifera*, Lamk) terhadap rendemen ekstrak dan senyawa bioaktif yang dihasilkan. *Jurnal Sains Natural*. 1(1): 53–60.
- Kline, J. M., Wietholter, J. P., Kline, V. T., & Confer, J. 2012. Pediatric antibiotic

- use: a focused review of fluoroquinolones and tetracyclines. *US Pharm.* 37(8): 56–59.
- Kondo, M., Kita, K., & Yokota, H. 2004. Effects of tea leaf waste of green tea, oolong tea, and black tea addition on sudangrass silage quality and in vitro gas production. *Journal of the Science of Food and Agriculture.* 84(7): 721–727.
- Krishnan, K. R., James, F., & Mohan, A. 2016. Isolation and characterization of n-hexadecanoic acid from *Canthium parviflorum* leaves. *J. Chem. Pharm. Res.* 8:614–617.
- Kristanti, A. N. 2019. *Fitokimia*. Airlangga University Press., Surabaya, 174 p
- Kristanti, H., & Tunjung, W. A. S. 2015. Detection of alkaloid, flavonoid, and terpenoid compounds in bread (*Artocarpus communis* Forst.) leaves and pulps. *KnE Life Sciences.* 129–133.
- Lambert & Pearson. 2016. Susceptibility testing: Accurate and reproducible minimum inhibitory concentration ( MIC ) and non-inhibitory ... Susceptibility testing : accurate and reproducible minimum inhibitory concentration ( MIC ) and non-inhibitory concentration. *Microbiology, Applied.* September: 784–790. <https://doi.org/10.1046/j.1365-2672.2000.01017.x>
- Lay, B. W., & Hastowo, S. 1992. Mikrobiologi. *IPB.* Jakarta Rajawali Pers., Bogor, 376 p
- Lee, J., Wu, J., Deng, Y., Wang, J., Wang, C., Wang, J., Chang, C., Dong, Y., Williams, P., & Zhang, L.-H. 2013. A cell-cell communication signal integrates quorum sensing and stress response. *Nature Chemical Biology.* 9(5): 339–343.
- Lee, J., & Zhang, L. 2015. The hierarchy quorum sensing network in *Pseudomonas aeruginosa*. *Protein & Cell.* 6(1):26–41.
- Li, J., Attila, C., Wang, L., Wood, T. K., Valdes, J. J., & Bentley, W. E. 2007. Quorum sensing in *Escherichia coli* is signaled by AI-2/LsrR: effects on small RNA and biofilm architecture. *Journal of Bacteriology.* 189(16): 6011–6020.
- Lingga, L. 2008. *Sansevieria*. Gramedia Pustaka Utama.
- Lister, J. L., & Horswill, A. R. 2014. *Staphylococcus aureus* biofilms: recent developments in biofilm dispersal. *Frontiers in Cellular and Infection Microbiology.* 4: 178.
- Liu, Y., Rakotondraibe, L. H., Brodie, P. J., Wiley, J. D., Cassera, M. B., Miller, J. S., Ratovoson, F., Rakotobe, E., Rasamison, V. E., & Kingston, D. G. I. 2015. Antimalarial 5,6-Dihydro- $\alpha$ -pyrones from *Cryptocarya rigidifolia*: Related Bicyclic Tetrahydro- $\alpha$ -Pyrones Are Artifacts. *Journal of Natural Products.* 78(6): 1330–1338. <https://doi.org/10.1021/acs.jnatprod.5b00187>
- Livak, K. J., & Schmittgen, T. D. 2001. Analysis of relative gene expression data using real-time quantitative PCR and the  $2^{-\Delta\Delta C(T)}$  Method. *Methods (San Diego, Calif.).* 25(4): 402–408. <https://doi.org/10.1006/meth.2001.1262>
- Lombogia, B., Budiarmo, F., & Bodhi, W. 2016. Uji daya hambat ekstrak daun lidah mertua (*Sansevieriae trifasciata* folium) terhadap pertumbuhan bakteri *Escherichia coli* dan *Streptococcus* sp. *Jurnal E-Biomedik.* 4(1). <https://doi.org/10.35790/ebm.4.1.2016.12230>
- Lorian, V., & Gemmel, G. C. 1996. Effects of low antibiotic concentrations on

- bacterial ultrastructure, virulence, and susceptibility to immunodefenses. In “Antibiotics in laboratory medicine”. *Journal of Antimicrobial Chemotherapy*. 40 (3):319-27
- Ma’arif, B., Agil, M., & Laswati P, H. 2016. Phytochemical assessment on n-hexane extract and fractions of *Marsilea crenata* Presl. leaves through GC-MS. *Majalah Obat Tradisional*. 21(2): 77–85.
- Mabrurroh, E. Q., Mursiti, S., & Kusumo, E. 2019. Isolasi dan Identifikasi Senyawa Flavonoid dari Daun Murbei (*Morus alba* Linn). *Indonesian Journal of Chemical Science*. 8(1): 16–22.
- Majumdar, M., Dubey, A., Goswami, R., Misra, T. K., & Roy, D. N. 2020. In vitro and in silico studies on the structural and biochemical insight of anti-biofilm activity of andrograpanin from *Andrographis paniculata* against *Pseudomonas aeruginosa*. *World Journal of Microbiology and Biotechnology*: 36(10): 1–18. <https://doi.org/10.1007/s11274-020-02919-x>
- Manitto, P. 1992. *Biosintesis produk alami*. Penerjemah Koensoenardiyah, IKIP Semarang Press, Semarang, 597 p
- Mardiana, A. D. W. I. 2015. Potensi Filtrat Daun *Sansevieria trifasciata* terhadap Penghambatan Pertumbuhan Bakteri *Staphylococcus aureus* dan *Escherichia coli*. *LenteraBio: Berkala Ilmiah Biologi*. 4(1).
- Mashburn-Warren, L., Howe, J., Garidel, P., Richter, W., Steiniger, F., Roessle, M., Brandenburg, K., & Whiteley, M. 2008. Interaction of quorum signals with outer membrane lipids: insights into prokaryotic membrane vesicle formation. *Molecular Microbiology*. 69(2): 491–502.
- Maurizi, M. R. 1992. Proteases and protein degradation in *Escherichia coli*. *Experientia*. 48(2): 178–201. <https://doi.org/10.1007/BF01923511>
- Mayasari, E. 2006. *Pseudomonas aeruginosa*; Karakteristik, infeksi dan penanganan. Thesis. Universitas Sumatera Utara Medan, Medan. [Indonesia]
- McGaw, L. J., Jäger, A. K., & Van Staden, J. 2002. Antibacterial effects of fatty acids and related compounds from plants. *South African Journal of Botany*. 68(4), 417–423.
- McKane, L., & Kandel, J. 1996. *Microbiology: essentials and applications*. McGraw-Hill, New York, 843 p
- Mellbye, B. L. 2013. Quorum-sensing-controlled public goods in *Pseudomonas aeruginosa*: regulation and application.[Dissertation]. Oregon State University, Oregon, [USA]
- Mimaki, Y., Inoue, T., Kuroda, M., & Sashida, Y. 1997. Pregnane glycosides from *Sansevieria trifasciata*. *Phytochemistry*. 44(1):107–111.
- Mirzaee, M., Najar-Peerayeh, S., Behmanesh, M., Moghadam, M. F., & Ghasemian, A.-M. 2014. Detection of Intracellular Adhesion (ica) Gene and Biofilm Formation *Staphylococcus aureus* Isolates from Clinical Blood Cultures. *Journal of Medical Bacteriology*. 3(1, 2): 1–7.
- Moldoveanu, S. C. 2019. *Derivatization Methods in GC and GC/MS* (V. D. E.-P. Kusch (ed.); p. Ch. 2). IntechOpen. <https://doi.org/10.5772/intechopen.81954>
- Moore, J. E., Barton, M. D., Blair, I. S., Corcoran, D., Dooley, J. S. G., Fanning, S., Kempf, I., Lastovica, A. J., Lowery, C. J., Matsuda, M., McDowell, D. A., McMahon, A., Millar, B. C., Rao, J. R., Rooney, P. J., Seal, B. S., Snelling,



- W. J., & Tolba, O. 2006. The epidemiology of antibiotic resistance in *Campylobacter*. *Microbes and Infection*. 8(7): 1955–1966.  
<https://doi.org/10.1016/j.micinf.2005.12.030>
- Mulcahy, L. R., Isabella, V. M., & Lewis, K. 2014. *Pseudomonas aeruginosa* biofilms in disease. *Microbial Ecology*. 68(1): 1–12.
- Murugesan, S. D., Thangam, R., Sakthidhasan, P., Arun, S., Sivasubramanian, S., & Thirumurugan, R. 2018. Combined effect of a natural flavonoid rutin from *Citrus sinensis* and conventional antibiotic gentamicin on *Pseudomonas aeruginosa* biofilm formation. *Food control*. (90): 282–294
- Mycek, M. J., Harvey, R. A., Champe, P. C., & Fisher, B. D. 2001. *Farmakologi Ulasan Bergambar: Obat-obat Antijamur Edisi 2*. Widya Medika., Jakarta, 347 p.
- Nafea, E. A., Moselhy, W. A., & Fawzy, A. 2011. Does the HMF value affect the Antibacterial activity of the Bee Honey? *Egyptian Academic Journal of Biological Sciences. A, Entomology*. 4(1): 13–19.
- Nahdi, M. S., & Kurniawan, A. P. 2019. The diversity and ethnobotanical study of medicinal plants in the southern slope of Mount Merapi, Yogyakarta, Indonesia. *Biodiversitas*. 20(8): 2279–2287.  
<https://doi.org/10.13057/biodiv/d200824>
- Naidu, A. S. 2000. Natural Food Antimicrobial Systems. *Catechins*. CRC Press., Florida, 818 p. <https://doi.org/10.1201/9781420039368>
- Namasivayam, K.R.S., Angel, J., Bharani, R. S. A., & Nachiyar, C. V. 2020. Terminalia chebula and *Ficus racemosa* principles mediated repression of novel drug target Las R - the transcriptional regulator and its controlled virulence factors produced by multiple drug resistant *Pseudomonas aeruginosa* - Biocompatible formulation ag. *Microbial Pathogenesis*. 148: 104–412. <https://doi.org/10.1016/j.micpath.2020.104412>
- Narendhiran, S., Mohanasundaram, S., Arun, J., Rannjith, R. V., Saravanan, L., Catherine, L., & Subathra, M. 2014. Phytochemical screening and antimicrobial activity of Thespesiapopulnealinn. *International Journal of Pharmacognosy and Phytochemical Research*. 6(1): 7–10.
- Ngazizah, F. N., Ekowati, N., & Septiana, A. T. 2017. Potensi daun trembilungan (*Begonia hirtella* Link) sebagai antibakteri dan antifungi. *Majalah Ilmiah Biologi BIOSFERA: A Scientific Journal*. 33(3): 126–133.
- Ningsih, D. R., & Zufahair, D. K. 2016. Identifikasi Senyawa Metabolit Sekunder Serta Uji Aktivitas Ekstrak Daun Sirsak Sebagai Antibakteri. *Jurnal Kesehatan*. 4(3): 231–237
- Ntombeziningi, S. M. 2009. *Antimicrobial activity testing of traditionally used plants for treating wounds and sores at Ongoye area KwaZulu-Natal, South Africa*. M. Sc. [Thesis]. University of Zululand. KwaZulu-Natal. [South Africa]
- Nur, R. M., & Nugroho, L. H. 2018. Cytotoxic activities of fractions from *Dioscorea bulbifera* L. chloroform and methanol extracts on T47D breast cancer cells. *Pharmacognosy Journal*. 10(1).
- Nurwaini, S., & Saputri, I. D. 2018. Pengujian Sifat Fisik dan Aktivitas Antibakteri Sediaan Gel Hand Sanitizer Ekstrak Daun Lidah Mertua (*Sansevieria*

- trifasciata* Prain). *Talanta Conference Series: Tropical Medicine (TM)*. 1(3): 078–085. <https://doi.org/10.32734/tm.v1i3.266>
- Nwokocha, C. R., Owu, D. U., McLaren, M., Murray, J., Delgoda, R., Thaxter, K., McCalla, G., & Young, L. 2012. Possible mechanisms of action of the aqueous extract of *Artocarpus altilis* (breadfruit) leaves in producing hypotension in normotensive Sprague–Dawley rats. *Pharmaceutical Biology*. 50(9): 1096–1102.
- O'May, C., & Tufenkji, N. 2011. The swarming motility of *Pseudomonas aeruginosa* is blocked by cranberry proanthocyanidins and other tannin-containing materials. *Applied and Environmental Microbiology*. 77(9): 3061–3067. <https://doi.org/10.1128/AEM.02677-10>
- O'Toole, G., Kaplan, H. B., & Kolter, R. 2000. Biofilm formation as microbial development. *Annual Reviews in Microbiology*. 54(1): 49–79.
- Okechukwu, V. U., Eze, S. O., Omokpariola, D. O., & Okereke, J. C. 2021. Evaluation of phytochemical constituents of Methanol extract of *Moringa oleifera* Lam. whole leaf by Gas Chromatography-Mass Spectrometry and Fourier transform infrared spectroscopy analysis. *World News of Natural Sciences*. 37: 18–30.
- Olsen, I. 2015. Biofilm-specific antibiotic tolerance and resistance. *European Journal of Clinical Microbiology & Infectious Diseases*. 34(5):877–886.
- Pambayun, R., Gardjito, M., Sudarmadji, S., & Kuswanto, K. R. 2007. Phenolic content and antibacterial properties of various extracts of gambir (*Uncaria gambir* Roxb). *Indonesian Journal of Pharmacy*. 18(3):141–146.
- Passador, L., Cook, J. M., Gambello, M. J., Rust, L., & Iglewski, B. H. 1993. Expression of *Pseudomonas aeruginosa* virulence genes requires cell-to-cell communication. *Science*. 260(5111): 1127–1130.
- Patil A, M. R. 2014. Role of Extracellular Proteases in Biofilm Disruption of Gram Positive Bacteria with Special Emphasis on *Staphylococcus aureus* Biofilms. *Enzyme Engineering*. 04(01): 1–7. <https://doi.org/10.4172/2329-6674.1000126>
- Pearson, J. P., Gray, K. M., Passador, L., Tucker, K. D., Eberhard, A., Iglewski, B. H., & Greenberg, E. P. 1994. Structure of the autoinducer required for expression of *Pseudomonas aeruginosa* virulence genes. *Proceedings of the National Academy of Sciences*. 91(1): 197–201.
- Pearson, J. P., Pesci, E. C., & Iglewski, B. H. 1997. Roles of *Pseudomonas aeruginosa* las and rhl quorum-sensing systems in control of elastase and rhamnolipid biosynthesis genes. *Journal of Bacteriology*. 179(18): 5756–5767.
- Pelczar, M. J., & Chan, E. C. S. 1988. Dasar-dasar mikrobiologi Jilid 2. Universitas Indonesia., Jakarta, 997 p
- Pesci, E. C., Pearson, J. P., Seed, P. C., & Iglewski, B. H. 1997. Regulation of las and rhl quorum sensing in *Pseudomonas aeruginosa*. *Journal of Bacteriology*. 179(10): 3127–3132.
- Peyton, B. M. 1996. Effects of shear stress and substrate loading rate on *Pseudomonas aeruginosa* biofilm thickness and density. *Water Research*. 30(1): 29–36.

- Philip, D. C. 2011. Antimicrobial, antioxidant and anticancer activity of a hemp plant, *Sansevieria roxburghiana* Schult and Schult f.[Doctoral Thesis]. St. Peter's University. Chennai. [India]
- Pinky, S., & Hossain, A. 2020. Antioxidant, Anti-inflammatory, Cytotoxic and Analgesic Activities of *Sansevieria trifasciata*. *Bangladesh Pharmaceutical Journal*. 23(2): 195-200. <https://doi.org/10.3329/bpj.v23i1.48341>
- Pratiwi, S. U. T. 2015. *Anti-microbial and anti-biofilm compounds from Indonesian medicinal plants*. [Dissertation]. Leiden University, Leiden. [Netherland]
- Preethi, R., Devanathan, V. V., & Loganathan, M. 2010. Antimicrobial and antioxidant efficacy of some medicinal plants against food borne pathogens. *Advances in Biological Research*. 4(2): 122–125.
- Purwantoro, R. S., Siregar, H.-M., Sudarmono, S., & Agusta, A. 2016. Potensi Antibakteri Ekstrak Daun *Lasianthus* Terhadap Bakteri *Pseudomonas aeruginosa*. *Jurnal Jamu Indonesia*. 1(3): 6–11.
- Qais, F. A., Khan, M. S., & Ahmad, I. 2019. Broad-spectrum quorum sensing and biofilm inhibition by green tea against gram-negative pathogenic bacteria: Deciphering the role of phytochemicals through molecular modelling. *Microbial Pathogenesis*. 126: 379–392.
- Quave, C. L., Plano, L. R. W., Pantuso, T., & Bennett, B. C. 2008. Effects of extracts from Italian medicinal plants on planktonic growth, biofilm formation and adherence of methicillin-resistant *Staphylococcus aureus*. *Journal of Ethnopharmacology*. 118(3):418–428. <https://doi.org/10.1016/j.jep.2008.05.005>
- Rafiee, F., Haghi, F., Bikas, R., Heidari, A., Gholami, M., Kozakiewicz, A., & Zeighami, H. 2020. Synthesis, characterization and assessment of anti-quorum sensing activity of copper (II)-ciprofloxacin complex against *Pseudomonas aeruginosa* PAO1. *AMB Express*. 10(1): 1–11.
- Rajkumari, J., Borkotoky, S., Reddy, D., Mohanty, S. K., Kumavath, R., Murali, A., Suchiang, K., & Busi, S. 2019. Anti-quorum sensing and anti-biofilm activity of 5-hydroxymethylfurfural against *Pseudomonas aeruginosa* PAO1: Insights from in vitro, in vivo and in silico studies. *Microbiological Research*. 226: 19–26.
- Ramos-Villarreal, A. Y., Soliva-Fortuny, R., & Martín-Belloso, O. 2010. Natural antimicrobials for food processing. *Animal Science Reviews* 2010, 211.
- Rasamiravaka, T., Labtani, Q., Duez, P., & El Jaziri, M. 2015. The formation of biofilms by *Pseudomonas aeruginosa*: a review of the natural and synthetic compounds interfering with control mechanisms. *BioMed Research International*. 2015: 1-18
- Rashia, N., Padmini, N., Ajilda, A. A. K., Prabakaran, P., Durgadevi, R., Veera Ravi, A., Ghosh, S., Sivakumar, N., & Selvakumar, G. 2021. Inhibition of biofilm formation and quorum sensing mediated virulence in *Pseudomonas aeruginosa* by marine sponge symbiont *Brevibacterium casei* strain Alu 1. *Microbial Pathogenesis*. 150(104693). <https://doi.org/10.1016/j.micpath.2020.104693>
- Raslan, M. A., Melek, F. R., Said, A. A., Elshamy, A. I., Umeyama, A., & Mounier, M. M. 2017. New cytotoxic dihydrochalcone and steroidal saponins from the

- aerial parts of *Sansevieria cylindrica* Bojer ex Hook. *Phytochemistry Letters*. 22: 39–43.
- Rasmussen, T. B., Bjarnsholt, T., Skindersoe, M. E., Hentzer, M., Kristoffersen, P., Kote, M., Nielsen, J., Eberl, L., & Givskov, M. 2005. Screening for quorum-sensing inhibitors (QSI) by use of a novel genetic system, the QSI selector. *Journal of Bacteriology*. 187(5): 1799–1814.
- Refdanita, R, M., A, N., & P, E. 2004. Pola Kepekaan Kuman Terhadap Antibiotika Di Ruang Rawat Intensif Rumah Sakit Fatmawati Jakarta Tahun 2001 – 2002. *Makara Kesehatan*. 8(2): 41–48.
- Richards, J. J., & Melander, C. 2009. Small molecule approaches toward the non-microbicidal modulation of bacterial biofilm growth and maintenance. *Anti-Infective Agents in Medicinal Chemistry (Formerly Current Medicinal Chemistry-Anti-Infective Agents)*. 8(4): 295–314.
- Robert, F. G. Swinbourne. 2007. *Sansevieria in Cultivation in Australia*. Adelaide Botanic Gardens., Adelaide, 48 p
- Robinson, T. 1991. *Kandungan Organik Tumbuhan Tingkat Tinggi, diterjemahkan oleh Prof. Dr. Kosasih Padmawinata*. Penerbit ITB., Bandung. 367p
- \_\_\_\_\_. 1995. *Kandungan organik tumbuhan tingkat tinggi*. ITB., Bandung. 367 p
- Sabzar Ahmad Dar. 2012. Bioassay guided isolation and identification of anti-inflammatory and anti-microbial compounds from *Urtica dioica* L. (Urticaceae) leaves. *African Journal of Biotechnology*. 11(65): 12910–12920. <https://doi.org/10.5897/ajb11.3753>
- Sagita, D., Aliyah, S. H., & Safitri, M. 2019. Potensi Lidah Mertua Dalam Menghambat Pertumbuhan Bakteri *Salmonella* sp Dan *Staphylococcus aureus*. *Riset Informasi Kesehatan*. 7(2): 129. <https://doi.org/10.30644/rik.v7i2.172>
- Said, A. A., Aboutabl, E. A., El Awdan, S. A., & Raslan, M. A. 2015. Proximate analysis, phytochemical screening, and bioactivities evaluation of *Cissus rotundifolia* (Forssk.) Vahl.(Fam. Vitaceae) and *Sansevieria cylindrica* Bojer ex Hook.(Fam. Dracaenaceae) growing in Egypt. *Egyptian Pharmaceutical Journal*. 14(3): 180.
- Sarabhai, S., Sharma, P., & Capalash, N. 2013. Ellagic acid derivatives from *Terminalia chebula* Retz. downregulate the expression of quorum sensing genes to attenuate *Pseudomonas aeruginosa* PAO1 virulence. *PLoS One*. 8(1): e53441.
- Sarker, S. D., & Nahar, L. 2012. An introduction to natural products isolation. *Natural Products Isolation*. 864: 1–25.
- Sastrohamidjojo, H. 2005. Kimia organik stereokimia, karbohidrat, lemak dan protein. *Penerbit Gadjah Mada University Press.*, Yogyakarta, 172p
- Sathiya Deepika, M., Thangam, R., Sakthidhasan, P., Arun, S., Sivasubramanian, S., & Thirumurugan, R. 2018. Combined effect of a natural flavonoid rutin from *Citrus sinensis* and conventional antibiotic gentamicin on *Pseudomonas aeruginosa* biofilm formation. *Food Control*. 90: 282–294. <https://doi.org/https://doi.org/10.1016/j.foodcont.2018.02.044>
- Scalbert, A. 1991. Antimicrobial properties of tannins. *Phytochemistry*. 30(12):



3875–3883.

- Schuster, M, Urbanowski, M. L., & Greenberg, E. P. 2004. Promoter specificity in *Pseudomonas aeruginosa* quorum sensing revealed by DNA binding of purified LasR. *Proceedings of the National Academy of Sciences*. 101(45): 15833–15839.
- Schuster, Martin, & Greenberg, E. P. 2007. Early activation of quorum sensing in *Pseudomonas aeruginosa* reveals the architecture of a complex regulon. *BMC Genomics*. 8(1): 1–11.
- Seidel, V., & Taylor, P. W. 2004. In vitro activity of extracts and constituents of *Pelagonium* against rapidly growing mycobacteria. *International Journal of Antimicrobial Agents*. 23(6) :613–619.
- Sharma, A., Singh, P., Sarmah, B. K., & Nandi, S. P. 2020. Quorum sensing: its role in microbial social networking. *Research in Microbiology*. 171(5–6): 159–164.
- Sharma, P. C., Jain, A., & Jain, S. 2009. Fluoroquinolone antibacterials: a review on chemistry, microbiology and therapeutic prospects. *Acta Pol Pharm*. 66(6): 587–604.
- Shelef, L. A. 2007. Antimicrobial effects of Spices. *Journal of Food Safety*. 6 :29–44. <https://doi.org/10.1111/j.1745-4565.1984.tb00477.x>
- Shelly, A., Shikha, M., & Narayan, S. R. 2015. Chemical investigation of fatty acid, phenolic content in *arachis hypogaea*, *Anacardium occidentale*, *prunus dulcis*, *Prunus armeniaca* and comparison of their antibacterial activity with amoxicillin. *World J Pharm Res*. 4(11): 1609–1622.
- Silhavy, T. J., Kahne, D., & Walker, S. 2010. The bacterial cell envelope. *Cold Spring Harbor Perspectives in Biology*. 2(5): a000414.
- Simoes, M. 2011. Antimicrobial strategies effective against infectious bacterial biofilms. *Current Medicinal Chemistry*. 18(14): 2129–2145.
- Soheili, V., Tajani, A. S., Ghodsi, R., & Bazzaz, B. S. F. 2019. Anti-PqsR compounds as next-generation antibacterial agents against *Pseudomonas aeruginosa*: A review. *European Journal of Medicinal Chemistry*. 172: 26–35.
- Stahl, E. 1985. Analisis Obat secara Kromatografi dan Mikroskopi (Terjemahan). *Radmawinata Dan I. Soediso*, Penerbit ITB., Bandung, 3–18pp.
- Stefanovic, O. 2018. Synergistic Activity of Antibiotics and Bioactive Plant Extracts: A Study Against Gram-Positive and Gram-Negative Bacteria. *Journal of Applied Pharmaceutical Science*. 2(01): 1–5. <https://doi.org/10.5772/intechopen.72026>
- Stefanović, O., & Comic, L. 2012. Synergistic antibacterial interaction between *Melissa officinalis* extracts and antibiotics. *Journal of Applied Pharmaceutical Science*. 2(01): 1–5.
- Stewart, P. S., Rayner, J., Roe, F., & Rees, W. M. 2001. Biofilm penetration and disinfection efficacy of alkaline hypochlorite and chlorosulfamates. *Journal of Applied Microbiology*. 91(3): 525–532.
- Stoodley, P., Dodds, I., Boyle, J. D., & Lappin-Scott, H. M. 1998. Influence of hydrodynamics and nutrients on biofilm structure. *Journal of Applied Microbiology*. 85(S1): 19S–28S.

- Stover, H. 1983. *The sansevieria book*. Endangered Species Press.
- Sudjaswadi, R. 2006. Increasing of the bacteriostatic effects of HCl tetracycline–polyethylene glycol 6000–tween 80 (PT). *Indonesian Journal of Pharmacy*. 98–103.
- Swamy, M. K., Arumugam, G., Kaur, R., Ghasemzadeh, A., Yusoff, M. M., & Sinniah, U. R. 2017. GC-MS Based Metabolite Profiling, Antioxidant and Antimicrobial Properties of Different Solvent Extracts of Malaysian *Plectranthus amboinicus* Leaves. *Evidence-Based Complementary and Alternative Medicine*. 2017: 1517683. <https://doi.org/10.1155/2017/1517683>
- Swift, Simon, Karlyshev, A. V, Fish, L., Durant, E. L., Winson, M. K., Chhabra, S. R., Williams, P., Macintyre, S., & Stewart, G. 1997. Quorum sensing in *Aeromonas hydrophila* and *Aeromonas salmonicida*: identification of the LuxRI homologs AhyRI and AsaRI and their cognate N-acylhomoserine lactone signal molecules. *Journal of Bacteriology*. 179(17): 5271–5281.
- Swift, Steven, Xu, J., Trivedi, V., Austin, K. M., Tressel, S. L., Zhang, L., Covic, L., & Kuliopulos, A. 2010. A novel protease-activated receptor-1 interactor, bicaudal D1, regulates G protein signaling and internalization. *Journal of Biological Chemistry*. 285(15): 11402–11410. <https://doi.org/10.1074/jbc.M110.105403>
- Syahrurachman, A. 2019. *Buku ajar mikrobiologi kedokteran*. Universitas Indonesia.
- Szczepaniak, S., Polanska, M., Van Assche, A., Moloney, R., & Willems, K. A. 2011. The synergism of natural compounds in the pursuit of safe and healthier food. *Journal of Industrial Microbiology and Biotechnology*. 38(1): 215–220. <https://doi.org/10.1007/s10295-010-0822-6>
- Taga, M. E., & Bassler, B. L. 2003. Chemical communication among bacteria. *Proceedings of the National Academy of Sciences*. 100(suppl 2):14549–14554.
- Tamfu, A. N., Ceylan, O., Fru, G. C., Ozturk, M., Duru, M. E., & Shaheen, F. 2020. Antibiofilm, antiquorum sensing and antioxidant activity of secondary metabolites from seeds of *Annona senegalensis*, Persoon. *Microbial Pathogenesis*. 144: 104191.
- Tanveer, A., Singh, N. D., & Khan, M. F. 2017. Phytochemical analysis, total phenolic content, antioxidant and antidiabetic activity of *Staphylococcus aureus* leaves extract. *Herb Med*. 3(2):6.
- Taylor, T. P., Morris, J. G., Willits, N. H., & Rogers, Q. R. 1996. Optimizing the pattern of essential amino acids as the sole source of dietary nitrogen supports near-maximal growth in kittens. *The Journal of Nutrition*. 126(9): 2243–2252.
- Teanpaisan, R., Kawsud, P., Pahumunto, N., & Puripattanavong, J. 2017. Screening for antibacterial and antibiofilm activity in Thai medicinal plant extracts against oral microorganisms. *Journal of Traditional and Complementary Medicine*. 7(2) :172–177. <https://doi.org/https://doi.org/10.1016/j.jtcme.2016.06.007>
- Teixidó, E., Santos, F., Puignou, L., & Galceran, M. T. 2006. Analysis of 5-hydroxymethylfurfural in foods by gas chromatography–mass spectrometry. *Journal of Chromatography A*. 1135(1): 85–90.
- Teplitski, M., Robinson, J. B., & Bauer, W. D. 2000. Plants secrete substances that

- mimic bacterial N-acyl homoserine lactone signal activities and affect population density-dependent behaviors in associated bacteria. *Molecular Plant-Microbe Interactions*. 13(6): 637–648.
- Thoendel, M., Kavanaugh, J. S., Flack, C. E., & Horswill, A. R. 2011. Peptide signaling in the staphylococci. *Chemical Reviews*. 111(1): 117–151.
- Travis, J., & Potempa, J. 2000. Bacterial proteinases as targets for the development of second-generation antibiotics. *Biochimica et Biophysica Acta (BBA)-Protein Structure and Molecular Enzymology*. 1477(1–2): 35–50.
- Trentin, D. S., Silva, D. B., Amaral, M. W., Zimmer, K. R., Silva, M. V., Lopes, N. P., Giordani, R. B., & Macedo, A. J. 2013 Tannins Possessing Bacteriostatic Effect Impair *Pseudomonas aeruginosa* Adhesion and Biofilm Formation. *PLoS ONE*: 8(6). <https://doi.org/10.1371/journal.pone.0066257>
- Triana, E. 2018. Aktivitas Antibiofilm Bakteri *Escherichia coli* oleh Bakteriofag secara In Vitro. *Berita Biologi*. 17(1): 77–84.
- Tumbarello, M., Repetto, E., Trecarichi, E. M., Bernardini, C., De Pascale, G., Parisini, A., Rossi, M., Molinari, M. P., Spanu, T., & Viscoli, C. 2011. Multidrug-resistant *Pseudomonas aeruginosa* bloodstream infections: risk factors and mortality. *Epidemiology & Infection*. 139(11): 1740–1749.
- Vadakkan, K., Choudhury, A. A., Gunasekaran, R., Hemapriya, J., & Vijayanand, S. 2018. Quorum sensing intervened bacterial signaling: Pursuit of its cognizance and repression. *Journal of Genetic Engineering and Biotechnology*. 16(2): 239–252. <https://doi.org/10.1016/j.jgeb.2018.07.001>
- Vattem, D. A., Mihalik, K., Crixell, S. H., & McLean, R. J. C. 2007. Dietary phytochemicals as quorum sensing inhibitors. *Fitoterapia*. 78(4): 302–310.
- Venkata raman, B., La, S., M, P., B, N., Naga Vamsi Krishna, A., & Tm, R. 2012. Antibacterial, antioxidant activity and GC-MS analysis of *Eupatorium odoratum*. *Asian Journal of Pharmaceutical and Clinical Research*, 5.
- Vikram, A., Jayaprakasha, G. K., Jesudhasan, P. R., Pillai, S. D., & Patil, B. S. 2010. Suppression of bacterial cell-cell signalling, biofilm formation and type III secretion system by citrus flavonoids. *Journal of Applied Microbiology*. 109(2): 515–527. <https://doi.org/10.1111/j.1365-2672.2010.04677.x>
- Virganita, J., Wahyuni, D. S. C., & Nugraheni, E. R. 2009. Antibacterial activity of bioactive compounds from radish (*Raphanus sativus*) leaves against *Escherichia coli* and its chemical compounds. *Asian Journal of Natural Product Biochemistry*. 7(2):94–98.
- Wahyudi, D., & Silviani, Y. 2015. Penghambatan Produksi Eksoprotease Dan Biofilm Pada *Pseudomonas aeruginosa* oleh Ekstrak *Apium graveolens* L. *Jurnal kesehatan Kusuma Husada*. 6(2): 81–88
- Wahyudi, D., Aman, A. T., Handayani, N. S. N., & Soetarto, E. S. 2019. Differences among clinical isolates of *Pseudomonas aeruginosa* in their capability of forming biofilms and their susceptibility to antibiotics. *Biodiversitas*. 20(5): 1450–1456. <https://doi.org/10.13057/biodiv/d200538>
- Wakhidah, Z, A., & A. Sari, I. 2019. Etnobotani Pekarangan di Dusun Kaliurang Barat , Kecamatan Pakem , Sleman-Yogyakarta. *Jurnal EduMatSains*. 4(1): 1–28.
- Walker, T. S., Bais, H. P., Déziel, E., Schweizer, H. P., Rahme, L. G., Fall, R., &

- Vivanco, J. M. 2004. *Pseudomonas aeruginosa*-plant root interactions. Pathogenicity, biofilm formation, and root exudation. *Plant Physiology*. 134(1): 320–331.
- Wang, Y.-L., Xiang, Z.-N., Yuan, Y., Zhou, J.-W., Tian, L.-Y., Chen, J.-C., & Wan, L.-S. (2020). Triterpenoid alkaloids from *Buxus rugulosa* and their cytotoxic activities. *Phytochemistry Letters*. 36: 86–90.
- Watnick, P., & Kolter, R. 2000. Biofilm, city of microbes. *Journal of Bacteriology*. 182(10): 2675–2679.
- Wijeyekoon, S., Mino, T., Satoh, H., & Matsuo, T. 2004. Effects of substrate loading rate on biofilm structure. *Water Research*. 38(10): 2479–2488.
- Williams, R. A. D., Lambert, P. A., & Singleton, P. 1996. *Antimicrobial drug action*. Bios Scientific Publishers Ltd.
- Wink, M., & Schimmer, O. 1999. Modes of action of defensive secondary metabolites. *Annual Plant Reviews*. 3: 17–133.
- Xie, Y., Ge, S., Jiang, S., Liu, Z., Chen, L., Wang, L., Chen, J., Qin, L., & Peng, W. (2018). Study on biomolecules in extractives of *Camellia oleifera* fruit shell by GC–MS. *Saudi Journal of Biological Sciences*. 25(2): 234–236.
- Yaghoobi, M., Khaleghi, M., Rezanejad, H., & Parsia, P. 2018. Antibiofilm Activity of *Dracocephalum polychaetum* Extract on Methicillin-Resistant *Staphylococcus aureus*. *Avicenna Journal of Clinical Microbiology and Infection, In Press*. 5(1): 61772. <https://doi.org/10.5812/ajcmi.61772>
- Yamada, P., Nemoto, M., Shigemori, H., Yokota, S., & Isoda, H. 2011. Isolation of 5-(hydroxymethyl) furfural from *Lycium chinense* and its inhibitory effect on the chemical mediator release by basophilic cells. *Planta Medica*. 77(05): 434–440.
- Yan, S., & Wu, G. 2019. Can Biofilm Be Reversed Through Quorum Sensing in *Pseudomonas aeruginosa*? *Frontiers in Microbiology*. 10(July): 1–9. <https://doi.org/10.3389/fmicb.2019.01582>
- Yumna, M., Angelina, Abdullah, Arbianti, R., Utami, T. S., & Hermansyah, H. 2018. Effect of mother-in-law's tongue leaves (*Sansevieria trifasciata*) extract's solvent polarity on anti-diabetic activity through in vitro  $\alpha$ -glucosidase enzyme inhibition test. *E3S Web of Conferences*. 67: 0–4. <https://doi.org/10.1051/e3sconf/20186703003>
- Zhanel, G. G., DeCorby, M., Laing, N., Weshnoweski, B., Vashisht, R., Tailor, F., Nichol, K. A., Wierzbowski, A., Baudry, P. J., & Karlowsky, J. A. 2008. Antimicrobial-resistant pathogens in intensive care units in Canada: results of the Canadian National Intensive Care Unit (CAN-ICU) study, 2005-2006. *Antimicrobial Agents and Chemotherapy*. 52(4): 1430–1437.
- Zhang, Z. F., & Zhou, X. Y. 2011. GC/MS Analysis on Benzene/Alcohol Extractives of *Manglietia glauca* Leavies for Biomedicine Engineering. *Advanced Materials Research*. 213 :475–478.
- Zuhra, C. F., Tarigan, J. B., & Sihotang, H. 2008. Aktivitas antioksidan senyawa flavonoid dari daun katuk (*Sauropus androgunus* (L) Merr.). *Jurnal Biologi Sumatera*. 3(1): 7–10.