DAFTAR PUSTAKA

Abd-Elkhalek, A. M., Seoudi, D. M., Ibrahim, O. A., Abd-Rabou, N. S., & Abd Elazeem, E. M. (2020). Extraction, Partial Purification, Characteristics, and Antimicrobial Activity of Plant Protease From *Moringa Oleifera* Leaves. *Journal of Applied Biotechnology Reports*, *7*(4), 243–250. https://doi.org/10.30491/jabr.2020.230789.1225

Abshire, N., Hauck, A. L., Walia, H., & Obata, T. (2024). Tissue- and Time-Dependent Metabolite Profiles During Early Grain Development Under Normal and High Night-Time Temperature Conditions. *BMC Plant Biology*, *24*(1), 568–583. https://doi.org/10.1186/s12870-024-05190-6

Abubakar, H., & Garba Pan, O. (2025). Evaluation of An Effective Hair-Care Product: Extracting, Accessing and Formulating Onions, Lemon and Honey-Based Anti-Hair Loss and Anti-Premature Gray-Hair. *Chemistry Research Journal*, *10*(1), 78–82.

Abulencia, A. B., Vidallon, M. L. P., Almeda, R. A., Salamanez, K. C., & Rodriguez, E. B. (2020). Rice Bran Phospholipid-Based Nanovesicles for Enhanced Oral and Topical Delivery of Capsaicinoids. *Journal of Drug Delivery Science and Technology*, *60*(102005), 1–9. https://doi.org/10.1016/j.jddst.2020.102005

Adu, S. A., Naughton, P. J., Marchant, R., & Banat, I. M. (2020). Microbial Biosurfactants in Cosmetic and Personal Skincare Pharmaceutical Formulations. *Pharmaceutics; Multidisciplinary Digital Publishing Institute*, *12*(1099), 1–21. https://doi.org/10.3390/pharmaceutics12111099

Ajayakumar, A., Sini, K. R., & C, S. M. (2016). Chemical and Medico Biological Applications of the Genus *Costus* (Gingers). *Journal of Chemical and Pharmaceutical Research*, *8*(8), 453–458.

Akbari, S., Abdurahman, N. H., Yunus, R. M., Fayaz, F., & Alara, O. R. (2018). Biosurfactants—A New Frontier for Social and Environmental Safety: A Mini Review. *Biotechnology Research and Innovation*, *2*(1), 81–90. https://doi.org/10.1016/j.biori.2018.09.001

Alam, S., Algahtani, M. S., Ahmad, M. Z., & Ahmad, J. (2020). Investigation Utilizing the HLB Concept for the Development of Moisturizing Cream and Lotion: In-Vitro Characterization and Stability Evaluation. *Cosmetics;Multidisciplinary Digital Publishing Institute*, *7*(2), 43–55. https://doi.org/10.3390/COSMETICS7020043

Al-Attas, A. A. M., El-Shaer, N. S., Mohamed, G. A., Ibrahim, S. R. M., & Esmat, A. (2015). Anti-Inflammatory Sesquiterpenes from *Costus speciosus* Rhizomes. *Journal of Ethnopharmacology*, *176*, 365–374. https://doi.org/10.1016/j.jep.2015.11.026

Ali, A., Aziz, A. R. A., A. Ismael, M., & Alqaed, S. (2024). Biosurfactants as an Alternative Eco-Friendly Solution for Water-in-Diesel Emulsions: A Review Paper. *Heliyon*, *10*(e37485), 1–17. https://doi.org/10.1016/j.heliyon.2024.e37485

Aliffia, A., & Fauzi, R. (2024). Analisis Pengaruh Kasus Covid-19 Terhadap Perjalanan Instansi XYZ Lampung. *Jurnal Ilmiah Matematika*, *3*(2), 15–30. https://doi.org/10.30872/basis.v3i2.1289

Aljehany, B. M., & Bahshwan, S. M. (2020). A Review on the Therapeutic and Medicinal Activities of *Costus speciosus*. *Pharmacophore*, *11*(3), 124–129.

Allen, L. (2018). Quality Control: Water Activity Considerations for Beyond-use Dates. *International Journal of Pharmaceutical Compounding*, *22*, 288–293.

Al-Marshadi, A. H., Aslam, M., & Abdullah, A. (2021). Uncertainty-Based Trimmed Coefficient of Variation with Application. *Hindawi: Journal of Mathematics*, *2021*(1), 1–6. https://doi.org/10.1155/2021/5511904

AlQuadeib, B. T., Eltahir, E. K. D., Banafa, R. A., & Al-Hadhairi, L. A. (2018). Pharmaceutical Evaluation of Different Shampoo Brands in the Local Saudi Market. *Saudi Pharmaceutical Journal*, *26*, 98–106. https://doi.org/10.1016/j.jsps.2017.10.006

Amelia, S. (2020). Potensi Antibakteri Ekstrak Daun Kluwih (*Artocarpus camansi* Blanco) terhadap Shigella dysenteriae dan Bacillus subtilis. *Jurnal Ilmu Dasar*, *21*(2), 105–114. https://doi.org/10.19184/jid.v21i2.11568

Amirav, A., Neumark, B., Elkabets, O., & Alon, T. (2025). NIST Library Identification Probabilities Are the Highest with Cold EI Mass Spectra. *Journal of the American Society for Mass Spectrometry*, *36*(1), 221–228. https://doi.org/10.1021/jasms.4c00441

Anggista, G., Pangestu, I. T., Handayani, D., Yulianto, M. E., Kusuma, S., Soedarto, J., Semarang, K., & Tengah, J. (2019). Penentuan Faktor Berpengaruh pada Ekstraksi Rimpang Jahe Menggunakan Extraktor Berpengaduk. *Jurnal Gema Teknologi*, *20*(3), 80–84. https://doi.org/10.14710/gt.v20i3.24532

Anggraini, S. I., Sholih, M. G., & Zahra, A. A. (2024). Formulasi dan Evaluasi Sediaan *Cleansing Stick* dengan Kombinasi *Sodium Cocoyl Isethionate* dan *Cocamidopropyl Betaine* sebagai Surfaktan. *Jurnal Integrasi Kesehatan Dan Sains*, *6*(2), 112–118. https://doi.org/10.29313/jiks.v6i2.13713

Anggreni, D. (2022). *Buku Ajar Metodologi Penelitian Kesehatan* (E. D. Kartiningrum, Ed.). STIKes Majapahit Mojokerto.

Annisanur, A., & Musfiroh, I. (2022). Evaluation of Shampoo by Quality Control: Review. *Indonesian Journal of Pharmaceutics*, *4*(2), 2022–2267. https://doi.org/10.24198/idjp.v4i2.40492

Antonioli Júnior, R., Poloni, J. de F., Pinto, É. S. M., & Dorn, M. (2023). Interdisciplinary Overview of Lipopeptide and Protein-Containing Biosurfactants. *Journal Genes*, *14*(76), 1–0. https://doi.org/10.3390/genes14010076

Aprilyanie, I., Handayani, V., & Syarif, R. A. (2023). Uji Toksisitas Ekstrak Kulit Buah Tanaman Jeruk Purut (*Citrus hystrix* DC.) Dengan Menggunakan Metode *Brine Shrimp Lethality Test* (BSLT). *Makassar Natural Product Journal*, *1*(1), 1–9.

Ara, T., Nabi Laway, G., Samieh Deva, A., Deva, B., Bhatia, N., & Arifa Khan, R. (2018). Hazardous Effects of Sodium Lauryl Sulfate and Sodium Laureth Sulfate, An Overview. *World Journal of Pharmacy and Pharmaceutical Sciences*, *7*(5), 282–292. https://doi.org/10.20959/wjpps20185-11456

Ariningsih, A., Loebis, E. H., & Siregar, N. C. (2016). Pembuatan Dietanolamida dari Asam Lemak Sawit Destilat dan Minyak Kelapa untuk Sabun Transparan. *Warta Industri Hasil Pertanian*, *33*(2), 82–89.

Arsyad, R., Amin, A., & Waris, R. (2023). Teknik Pembuatan dan Nilai Rendemen Simplisia dan Ekstrak Etanol Biji Bagore (*Caesalpinia crista* L.) Asal Polewali Mandar. *Makassar Natural Product Journal*, *3*(14), 138–147.

Arzola-Rodríguez, S. I., Muñoz-Castellanos, L. N., López-Camarillo, C., & Salas, E. (2022). Phenolipids, Amphipilic Phenolic Antioxidants with Modified Properties and Their Spectrum of Applications in Development: A Review. *Biomolecules: Multidisciplinary Digital Publishing Institute*, *12*(12). https://doi.org/10.3390/biom12121897

Aslam, R., Mobin, M., Aslam, J., & Zehra, S. (2023). Advancements in Biosurfactants Research. In *Advancements in Biosurfactants Research*. Springer International Publishing. https://doi.org/10.1007/978-3-031-21682-4

Atmanto, D., & Ambarwati, N. S. S. (2023). Development of An Eco-Shampoo Formulation Using Local Environmental Plant Extracts for Healthy Hair as an Effort to Increase the Potential of Environmental Resources. *Journal Biology, Medicine, & Natural Product Chemistry*, *12*(1), 399–405. https://doi.org/10.14421/biomedich.2023.121.399-405

Auliya, D. G., Setiadji, S., Fitrilawati, F., & Risdiana, R. (2022). Physical Characterization and In Vitro Toxicity Test of PDMS Synthesized from Low-Grade D4 Monomer as a Vitreous Substitute in the Human Eyes. *Journal of Functional Biomaterials*, *13*(3), 1–0. https://doi.org/10.3390/jfb13010003

Azhari, Mutia, N., & Ishak. (2020). Proses Ekstraksi Minyak dari Biji Pepaya (*Carica papaya*) dengan Menggunakan Pelarut n-Heksana. *Jurnal Teknologi Kimia Unimal*, *9*, 58–67.

Azzahrah, R., Rosita, N., Purwanto, D. A., & Soeratri, W. (2022). The Effect of Decyl Glucoside on Stability and Irritability of Nanostructured Lipid Carriers-Green Tea Extract as Topical Preparations. *Jurnal Farmasi Dan*

Ilmu Kefarmasian Indonesia, *9*(3), 220–228. https://doi.org/10.20473/jfiki.v9i32022.220-228

Badan Standardisasi Nasional. (1992). *SNI 06-2692-1992 : Sampo* (Patent 019/IV.2.06/HK.01.04/05/1992). 71.100.70 Kosmetika . Bahan kecantikan.

Badmus, S. O., Amusa, H. K., Oyehan, T. A., & Saleh, T. A. (2021). Environmental Risks and Toxicity of Surfactants: Overview of Analysis, Assessment, and Remediation Techniques. *Journal Environmental Science and Pollution Research*, *28*, 62085–62104. https://doi.org/10.1007/s11356-021-16483-w

Bae, S., Jeong, N. H., Choi, Y. A., Lee, B., Jang, Y. H., Lee, S., & Kim, S. H. (2023). Lupeol Alleviates Atopic Dermatitis-Like Skin Inflammation in *2,4-Dinitrochlorobenzene/Dermatophagoides farinae* Extract-Induced Mice. *BMC Pharmacology and Toxicology*, *24*(1). https://doi.org/10.1186/s40360-023-00668-9

Bagchi, A., Raha, A., Mukherjee, P., & Paul, M. (2016). Study of the Effect of Co-Solvent on the Critical Micelle Concentration (CMC) of Sodium Lauryl Sulphate. *International Journal of Recent Advances in Pharmaceutical Research*, *6*(3), 122–127.

Bajcura, M., Lukáč, M., Pisárčik, M., & Horváth, B. (2024). Study of Micelles and Surface Properties of Triterpene Saponins with Improved Isolation Method from Hedera helix. *Chemical Papers*, *78*(3), 1875–1885. https://doi.org/10.1007/s11696-023-03212-5

Bakan, B. (2025). Ocular Toxicity Assessment of Bisphenol A and Its Derivatives by the Hen's Egg Test–Chorioallantoic Membrane (HET-CAM) Assay. *Türk Doğa ve Fen Dergisi*, *14*, 254–259. https://doi.org/10.46810/tdfd.1773113

Bakr, R. O., Amer, R. I., Fayed, M. A. A., & Ragab, T. I. M. (2019). A Completely Polyherbal Conditioning and Antioxidant Shampoo: A Phytochemical Study and Pharmaceutical Evaluation. *Journal of Pharmacy and Bioallied Sciences*, *11*(2).

Bansal, M., & Jamil, S. (2018). Micellar Microparticles: A Novel Approach to Topical Drug Delivery System. *International Journal of Applied Pharmaceutics*, *10*(5), 1–5. https://doi.org/10.22159/ijap.2018v10i5.27506

Barbosa, F. G., Ribeaux, D. R., Rocha, T., Costa, R. A. M., Guzmán, R. R., Marcelino, P. R. F., Lacerda, T. M., & da Silva, S. S. (2022). Biosurfactants: Sustainable and Versatile Molecules. *Journal of the Brazilian Chemical Society*, *33*(8), 870–893. https://doi.org/10.21577/0103-5053.20220074

Basuki, K. H. (2021). Aplikasi Logaritma dalam Penentuan Derajat Keasaman (pH). *Prosiding Diskusi Panel Nasional Pendidikan Matematika*, 29–38.

Bezerra, K. G. O., Silva, I. G. S., Almeida, F. C. G., Rufino, R. D., & Sarubbo, L. A. (2021). Plant-Derived Biosurfactants: Extraction, Characteristics, and Properties for Application in Cosmetics. *Journal Biocatalysis and Agricultural Biotechnology*, *34*(102036), 1–10. https://doi.org/10.1016/j.bcab.2021.102036

Bois, R., Pezron, I., & Nesterenko, A. (2020). Dynamic Interfacial Properties of Sugar-Based Surfactants: Experimental Study and Modeling. *Colloid and Interface Science Communications*, *37*, 100293. https://doi.org/10.1016/j.colcom.2020.100293

Bombeli, K., & Bombeli, T. (2018). *Recipes for Hair Care Products* (3rd ed., Vol. 6). Making Cosmetics Incorporated.

Budai, P., Kormos, É., Buda, I., Somody, G., & Lehel, J. (2021). Comparative Evaluation of HET-CAM and ICE Methods for Objective Assessment of Ocular Irritation Caused by Selected Pesticide Products. *Toxicology in Vitro Journal*, *74*(105150), 1–9. https://doi.org/10.1016/j.tiv.2021.105150

Bustos, K. A. G., Muñoz, S. S., da Silva, S. S., Alarcon, M. A. D. F., dos Santos, J. C., Andrade, G. J. C., & Hilares, R. T. (2024). Saponin Molecules from Quinoa Residues: Exploring Their Surfactant, Emulsifying, and Detergent Properties. *Molecules*, *29*(20). https://doi.org/10.3390/molecules29204928

Cavalcanti, A. P. B., de Araújo, G. P., Bezerra, K. G. de O., de Almeida, F. C. G., da Silva, M. da G. C., Sarubbo, A., da Silva Júnior, C. J. G., Soares da Silva, R. de C. F., & Sarubbo, L. A. (2025). Production of a Biosurfactant for Application in the Cosmetics Industry. *Fermentation*, *11*(8). https://doi.org/10.3390/fermentation11080451

Celikoglu, M., Raab, C., Vollert, H., Harder, J., Liu, X., Baines, J. F., Fluhr, J. W., Keck, C. M., Infante, V. H. P., & Meinke, M. C. (2025). A Pilot Study on the Cutaneous Effects of Ethanol in a Moisturizing Cream on Non-Lesional Skin of Patients with Atopic Dermatitis. *Scientific Reports*, *15*(32536), 1–15. https://doi.org/10.1038/s41598-025-18487-9

Chae, C., Hong, J., Kim, H., Kim, D. H., Lee, S. O., & Kim, I. (2025). Extraction of Saponins from Soapnut and Their Application in Controlling Ammonia and Particulate Matter. *Royal Society of Chemistry*, *15*(36), 29190–29200. https://doi.org/10.1039/d5ra03653d

Chakkinga T., R., & Dan, M. (2018). Comparative Macroscopic and Microscopic Foliar Characterization of Twelve Species Belonging to Four Genera in the Family Costaceae. *International Journal of Research and Analytical Reviews*, *5*(4), 753–758.

Chavan, C., Bala, P., Pal, K., & Kale, S. N. (2017). Cross-Linked Chitosan–Dextran Sulphate Vehicle System for Controlled Release of Ciprofloxaxin Drug: An Ophthalmic Application. *OpenNano: Science Direct*, *2*, 28–36. https://doi.org/10.1016/j.onano.2017.04.002

Choi, E. H., & Kang, H. (2024). Importance of Stratum Corneum Acidification to Restore Skin Barrier Function in Eczematous Diseases. *Annals of Dermatology*, *36*(1), 1–8. https://doi.org/10.5021/ad.23.078

Christiandari, H., Suprasetya, E., & Nurainy, Y. (2024). Formulasi Dan Evaluasi Sediaan Sampo Ekstrak Daun Seledri (*Apium Graveolens* L) Sebagai Penumbuh Rambut. *An-Najat: Jurnal Ilmu Farmasi Dan Kesehatan*, *2*(2), 151–158. https://doi.org/10.59841/an-najat.v2i2.1176

Costa, J. A. V, Treichel, H., Santos, L. O., & Martins, V. G. (2018). Solid-State Fermentation for the Production of Biosurfactants and Their Applications. In Ashok Pandey, Christian Larroche, & Carlos Ricardo Soccol (Eds.), *Current Developments in Biotechnology and Bioengineering* (1st ed., pp. 357–372). Elsevier. https://doi.org/10.1016/B978-0-444-63990-5.00016-5

Davies, J. T. (1957). A Quantitative Kinetic Theory of Emulsion Type. I. Physical Chemistry of the Emulsifying Agent. *Gas/Liquid and Liquid/Liquid*

Interfaces. Proceedings of 2nd International Congress Surface Activity, 426–438.

de Araujo Lowndes Viera, L. M., Silva, R. S., da Silva, C. C., Presgrave, O. A. F., & Boas, M. H. S. V. (2022). Comparison of the Different Protocols of the Hen's Egg Test–Chorioallantoic Membrane (HET-CAM) by Evaluating the Eye Irritation Potential of Surfactants. *Toxicology in Vitro*, *78*, 105255. https://doi.org/https://doi.org/10.1016/j.tiv.2021.105255

DepKes RI. (2015). *Farmakope Indonesia* (V).

DepKes RI. (2022). *Farmakope Herbal Indonesia* (II).

D'Errico, G., Ciccarelli, D., & Ortona, O. (2005). Effect of Glycerol on Micelle Formation by Ionic and Nonionic Surfactants at 25°C. *Journal of Colloid and Interface Science*, *286*(2), 747–754. https://doi.org/10.1016/j.jcis.2005.01.030

Dhruv, D. (2023). The Study of Sodium Lauryl Sulfate (SLS) Toxicity. *Journal of Clinical Toxicology*, *13*(4), 1–5. https://doi.org/10.35248/2161-0495.23.13.542

Dini, S., Bekhit, A. E. D. A., Roohinejad, S., Vale, J. M., & Agyei, D. (2024). The Physicochemical and Functional Properties of Biosurfactants: A Review. *Molecules*, *29*(11), 1–31. https://doi.org/10.3390/molecules29112544

Dinurrohmah, S., Hadiatul Fauki, U., Jiana Bahi, M., Subagiyo, L., Nuryadin, A., Kunci, K., Cair, D., Lingkungan, P., & Kelor, D. (2022). Efektivitas Pemanfaatan Daun Kelor sebagai Alternatif Biosurfaktan Detergen dengan Metode PRES (Prinsip Rotary Evaporator Sederhana). *Envirotek : Jurnal Ilmiah Teknik Lingkungan*, *14*(2), 192–196.

Du, X. N., He, Y., Chen, Y. W., Liu, Q., Sun, L., Sun, H. M., Wu, X. F., & Lu, Y. (2024). Decoding Cosmetic Complexities: A Comprehensive Guide to Matrix Composition and Pretreatment Technology. *Molecules*, *29*(2). https://doi.org/10.3390/molecules29020411

El Haber, M., Ferronato, C., Giroir-Fendler, A., Fine, L., & Nozière, B. (2023). Salting Out, Non-Ideality and Synergism Enhance Surfactant Efficiency in

Atmospheric Aerosols. *Scientific Reports*, *13*(1). https://doi.org/10.1038/s41598-023-48040-5

El-Far, A. H., Shaheen, H. M., Alsenosy, A. W., El-Sayed, Y., Al Jaouni, S. K., & Mousa, S. A. (2018). *Costus speciosus*: Traditional Uses, Phytochemistry, and Therapeutic Potentials. *Pharmacognosy Reviews 12*(23), pp. 120–127). Medknow Publications. https://doi.org/10.4103/phrev.phrev_29_17

Fakhruzy, Kasim, A., Asben, A., & Anwar, A. (2020). Review: Optimalisasi Metode Maserasi Untuk Ekstraksi Tanin Rendemen Tinggi. *Jurnal Menara Ilmu*, *XIV*(2), 38–41.

Fauziah, D. W., & Yamaesa, G. K. (2019). Formulasi Sampo Ekstrak Daun Manggga (*Mangifera indica* L.). *Jurnal Ilmiah Pharmacy*, *6*(1), 158–174.

Febriana, V. G., & Wulandari. (2023). Aktivitas Antibakteri Sediaan Serum Wajah Ekstrak Etanol Daun Jati (*Tectona grandis*) Terhadap Bakteri Methicillin Resistant *Staphylococcus aureus* (MRSA). *Repository STIFAR*.

Ferraro, R., Michela Salvatore, M., Esposito, R., Murgia, S., Caserta, S., D'Errico, G., & Guido, S. (2024). Impact of Surfactant Polydispersity on the Phase and Flow Behavior in water: The Case of Sodium Lauryl Ether Sulfate. *Journal of Molecular Liquids*, *405*, 124990. https://doi.org/10.1016/j.molliq.2024.124990

Ferreira, I. N. S., Rodríguez, D. M., Campos-Takaki, G. M., & Andrade, R. F. da S. (2020). Biosurfactant and Bioemulsifier as Promising Molecules Produced by *Mucor hiemalis* Isolated from *Caatinga soil*. *Electronic Journal of Biotechnology*, *47*, 51–58. https://doi.org/10.1016/j.ejbt.2020.06.006

Firdaus, H. A., Shoviantari, F., & Lestari, T. P. (2019). Formulasi dan Uji Mutu Fisik Sabun Padat Ekstrak Ubi Ungu (*Ipomea batatas* L.). *Prosiding Seminar Nasional Farmasi Institut Ilmu Kesehatan Bhakti Wiyata Kediri*, 51–56.

Fitriana, N., & Asri, M. T. (2022). Aktivitas Proteolitik pada Enzim Protease dari Bakteri Rhizosphere Tanaman Kedelai (*Glycine max* L.) di Trenggalek. *Jurnal LenteraBio*, *11*(1), 144–152. https://doi.org/10.26740/lenterabio.v14n1

Fiyani, A., Nanda Saridewi, & Siti Suryaningsih. (2021). Analisis Konsep Kimia Terkait dengan Pembuatan Surfaktan dari Ampas Tebu. *JRPK: Jurnal Riset Pendidikan Kimia*, *10*(2), 94–101. https://doi.org/10.21009/jrpk.102.05

Flora, G., Mittal, M., & Flora, S. J. S. (2015). Medical Countermeasures—Chelation Therapy. In S. J. S. Flora (Ed.), *Handbook of Arsenic Toxicology* (pp. 589–626). Academic Press. https://doi.org/10.1016/B978-0-12-418688-0.00026-5

Fontes, G. C., Amaral, P. F. F., Nele, M., & Coelho, M. A. Z. (2010). Factorial Design to Optimize Biosurfactant Production by *Yarrowia lipolytica*. *Journal of Biomedicine and Biotechnology*, *2010*, 1–8. https://doi.org/10.1155/2010/821306

Fracchia, L., Cavallo, M., Martinotti, M. G., & Banat, I. M. (2012). Biosurfactants and Bioemulsifiers Biomedical and Related Applications – Present Status and Future Potentials. *Biomedical Science, Engineering and Technology*, 325–370.

Frolova, N., Orlova, A., Popova, V., Bilova, T., & Frolov, A. (2025). GC-MS Based Metabolomics – Part 1 Gas Chromatography-Mass Spectrometry (GC-MS) and its Place in the Plant Metabolomics Toolbox. *Multidisciplinary Digital Publishing Institute (MDPI): Biomolecules*, *16*(1), 1–33. https://doi.org/10.26434/chemrxiv-2025-5kgvt

Garcia, M. T., Campos, E., Marsal, A., & Ribosa, I. (2008). Fate and Effects of Amphoteric Surfactants in the Aquatic Environment. *Environment International Journal*, *34*(7), 1001–1005. https://doi.org/10.1016/j.envint.2008.03.010

Gould, O., Nguyen, N., & Honeychurch, K. C. (2023). New Applications of Gas Chromatography and Gas Chromatography-Mass Spectrometry for Novel Sample Matrices in the Forensic Sciences: A Literature Review. *Multidisciplinary Digital Publishing Institute (MDPI): Chemosensors*, *11*(527), 1–34. https://doi.org/10.3390/chemosensors11100527

Griffin, W. C. (1954). *Calculation of HLB values of non-ionic surfactants*.

Hengkengbala, S. I., Lintang, R. A. J., Sumilat, D. A., Mangindaan, R. E. P., Ginting, E. L., & Tumembouw, S. (2021). Karakteristik Morfologi Dan Aktivitas Enzim Protease Bakteri *Simbion nudibranch*. *Jurnal Pesisir Dan Laut Tropis*, *9*(3), 83–94.

Hidayat, F., Hardiyati, I., & Noviati, K. I. (2021). Formulasi dan Uji Efektivitas Sediaan Sampo dari Lendir Bekicot (*Achatina fulica*). *IONTech: ISTA Online Technologi Journal*, *02*(01), 51–56.

Himawan, O., Revina, R., Rifkia, V., & Rahmi, E. P. (2024). *Pengembangan Ekstrak Air Bract Pacing Pentul (Costus woodsonii Maas.) Sebagai Sampo Antioksidan*. Universitas Pembangunan Nasional Veteran Jakarta.

Hizmadin, A.K., Sumual, M.F., Djarkasi, G.S.S., Program, S.T., Pangan, J., Teknologi, P., Fakultas, P., 2024. Penambahan *Carboxymethyl Celullose* (CMC) pada Susu Kacang Kenari (*Canarium indicum*, L.) Untuk Meningkatkan Stabilitas Emulsi dan Tingkat Kesukaan Panelis. *Jurnal Teknologi Pertanian*, 14(2).

Hofer, F., Kraml, J., Kahler, U., Kamenik, A. S., & Liedl, K. R. (2020). Catalytic Site pKa Values of Aspartic, Cysteine, and Serine Proteases: Constant pH MD Simulations. *Journal of Chemical Information and Modeling*, *60*(6), 3030–3042. https://doi.org/10.1021/acs.jcim.0c00190

Huang, H., Ji, H., Ju, S., Lin, W., Li, J., Lv, X., Lin, L., Guo, L., Qiu, D., Yan, J., & Ma, X. (2022). Pantranscriptome Combined with Phenotypic Quantification Reveals Germplasm Kinship and Regulation Network of Bract Color Variation in Bougainvillea. *Frontiers in Plant Science*, *13*. https://doi.org/10.3389/fpls.2022.1018846

Hutauruk, H. P., Yamlean, P. V. Y., & Wiyono, W. (2020). Formulasi Dan Uji Aktivitas Sabun Cair Ekstrak Etanol Herba Seledri (*Apium graveolens* L) Terhadap Bakteri *Staphylococcus aureus*. *PHARMACON Jurnal Ilmiah Farmasi-UNSRAT*, *9*(1), 73–81. https://doi.org/10.35799/pha.9.2020.27412

Ilmiah, S. N., Mubarik, N. R., & Wahyuntari, B. (2018). Characterization of Protease from *Bacillus licheniformis* F11.1 as a Bio-Detergent Agent. *Makara Journal of Science*, *22*(3). https://doi.org/10.7454/mss.v22i3.8809

Incocciati, A., Di Fabio, E., Boffi, A., Bonamore, A., & Macone, A. (2022). Rapid and Simultaneous Determination of Free Aromatic Carboxylic Acids and Phenols in Commercial Juices by GC-MS after Ethyl Chloroformate Derivatization. *Separations*, *9*(1). https://doi.org/10.3390/separations9010009

Islam, M. S., Pramanik, M. H., HAFEEZ, A. S. M. G., Chowdhury, Md. K., Abdul BARI, A., Aurib, K., Çiğ, F., & Soysal, S. (2024). Effect of Storage Containers and Storage Periods on the Moisture Content, Germination and Biotic Status of Durum Wheat (*Triticum turgidum* L.) Seed. *ISPEC Journal of Agricultural Sciences*, *8*(2), 338–345. https://doi.org/10.5281/zenodo.11154397

Jarzębski, M., Siejak, P., Smułek, W., Fathordoobady, F., Guo, Y., Pawlicz, J., Trzeciak, T., Kowalczewski, P. Ł., Kitts, D. D., Singh, A., & Singh, A. P. (2020). Plant Extracts Containing Saponins Affects the Stability and Biological Activity of Hempseed Oil Emulsion System. *Molecules*, *25*(11). https://doi.org/10.3390/molecules25112696

Jaya, J. M., Yulistia, A., Hunga, M., Nikmah, S. S., & Susanti, M. M. (2019). Sintesis Senyawa Etil Laurat menggunakan Variasi Volume Katalis Asam Sulfat Pekat. *Jurnal Labora Medika*, *3*(1), 1–9.

Jiang, Q., Sun, N., Kumar, P., Li, Q., Liu, B., Li, A., Wang, W., & Gao, Z. (2020). Real-Time Analysis of the Stability of Oil-In-Water Pickering Emulsion by Electrochemical Impedance Spectroscopy. *Molecules*, *25*(12). https://doi.org/10.3390/molecules25122904

Johnson, P., Trybala, A., Starov, V., & Pinfield, V. J. (2020). Effect of Synthetic Surfactants on the Environment and the Potential for Substitution by Biosurfactants. *Advances in Colloid and Interface Science*, *288*(102340). https://doi.org/10.1016/j.cis.2020.102340

Kaczerewska, O., Martins, R., Figueiredo, J., Loureiro, S., & Tedim, J. (2020). Environmental Behaviour and Ecotoxicity of Cationic Surfactants Towards Marine Organisms. *Journal of Hazardous Materials*, *392*(122299), 1. https://doi.org/10.1016/j.jhazmat.2020.122299

Kanlayavattanakul, M., Mersni, D., & Lourith, N. (2024). Plant-Derived Saponins and Their Prospective for Cosmetic and Personal Care Products. In *Botanical Studies* (Vol. 65, Issue 1). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1186/s40529-024-00438-8

Kariyawasam, T., Prenzler, P. D., Howitt, J. A., & Doran, G. S. (2023). Eucalyptus Saponin- and Sophorolipid-Mediated Desorption of Polycyclic Aromatic Hydrocarbons from Contaminated Soil and Sediment. *Environmental Science and Pollution Research*, *30*(8), 21638–21653. https://doi.org/10.1007/s11356-022-23562-z

Karnwal, A., Shrivastava, S., Al-Tawaha, A. R. M. S., Kumar, G., Singh, R., Kumar, A., Mohan, A., Yogita, & Malik, T. (2023). Microbial Biosurfactant as an Alternate to Chemical Surfactants for Application in Cosmetics Industries in Personal and Skin Care Products: A Critical Review. *BioMed Research International*, *2023*. https://doi.org/10.1155/2023/2375223

Khafidhoh, Z., Sinto Dewi, S., & Iswara, A. (2015). Efektivitas Infusa Kulit Jeruk Purut (*Citrus hystrix* DC.) Terhadap Pertumbuhan *Candida albicans* Penyebab Sariawan Secara in vitro. *The 2nd University Research Coloquium*, 31–37.

Kharazi, M., Saien, J., & Miller, R. (2025). The Surface Activity of Surfactants at Liquid Interfaces: The Role of CMC, Decrease in Surface Tension, HLB , Thermodynamic Adsorption Models. *Journal of Surfactants and Detergents*, *29*. https://doi.org/10.1002/jsde.12902

Khaw, K. Y., Parat, M. O., Shaw, P. N., & Falconer, J. R. (2017). Solvent Supercritical Fluid Technologies to Extract Bioactive Compounds from Natural Sources: A Review. *Molecules Journal*, *22*(1186), 1–22. https://doi.org/10.3390/molecules22071186

Kim, Y. J., Lee, E. S., Choi, J., Park, S. H., Chae, B., & Kim, E. (2023). Zein-Induced Polyelectrolyte Complexes for Encapsulating Triterpenoid Phytochemicals. *ACS Omega*, *8*(47), 44637–44646. https://doi.org/10.1021/acsomega.3c05157

Kolo, S. M. D., Obenu, N. M., & Rohy, N. T. (2022). Pengaruh Perlakuan Awal Ampas Biji Jewawut (*Setaria italica* L.) dengan Microwave Irradiation Untuk Produksi Bioetanol. *ALCHEMY Jurnal Penelitian Kimia*, *18*(2), 183. https://doi.org/10.20961/alchemy.18.2.59819.183-192

Kubitzki, K., Berlin, S.-V., & Gmbh, H. (1998). *THE FAMILIES AND GENERA OF VASCULAR PLANTS*. Springer

Kulkarni, V. S., & Shaw, C. (2016). Chapter 2 - Surfactants, Lipids, and Surface Chemistry. In V. S. Kulkarni & C. Shaw (Eds.), *Essential Chemistry for Formulators of Semisolid and Liquid Dosages* (pp. 5–19). Academic Press. https://doi.org/10.1016/B978-0-12-801024-2.00002-9

Kumar, P., & Das, A. (2023). Acid Mantle: What We Need To Know. *Indian Journal of Dermatology, Venereology and Leprology*, *89*(5), 729–732. https://doi.org/10.25259/IJDVL_153_2022

Kurniawati, T., Rahayu, T. P., & Kiromah, N. Z. W. (2022). Formulasi dan Uji Sifat Fisik Facial Wash Ekstrak Methanol Daun Salam (*Eugenia polyntha*) sebagai Antioksidan dengan Metode DPPH (1,1-difenil-2-pikrihidrazil). *Jurnal Sains Dan Kesehatan*, *4*(3), 243–250. https://doi.org/10.25026/jsk.v4i3.983

Larasati, I., & Mahbub, K. (2024). Pengaruh Pelarut Terhadap Kadar Saponin Ekstrak Daun Teratai (*Nymphaea nouchali* Burm. F.). *BENZENA Pharmaceutical Scientific Journal*, *03*(02). https://doi.org/10.31941/benzena.v3i02.5480

Lee, S. Y., Kim, D. Y., Jang, H. J., Oh, S. M., Kim, H. G., Ahn, J., Heo, I. S., Yuk, H. J., Seo, E. K., Oh, S. R., & Ryu, H. W. (2025). Characterization and Comparative Analysis of Saponins in Various Spinach (*Spinacia oleracea* L.) Cultivars According to Growing Seasons. *Food Chemistry*, *493*. https://doi.org/10.1016/j.foodchem.2025.145741

Lee, S.-M. (2018). *Characterization of Lactose Fatty Acid Esters for their Microbial Growth Inhibitory Activity and Emulsification Properties*. Utah State University.

Leoty-Okombi, S., Gillaizeau, F., Leuillet, S., Douillard, B., Fresne-Languille, S. Le, Carton, T., Martino, A. De, Moussou, P., Bonnaud-Rosaye, C., & André,

V. (2021). Effect of Sodium Lauryl Sulfate (SLS) Applied as a Patch on Human Skin Physiology and Its Microbiota. *Journal Cosmetics*, *8*(1), 1–12. https://doi.org/10.3390/COSMETICS8010006

Lestari, T. P. (2024). Formulasi dan Stabilitas Mutu Fisik Sediaan Gel Ekstrak Daun Binahong (*Anredera cordifolia* (Ten.) Steenis) Dengan Variasi Konsentrasi Carbopol Sebagai Gelling Agent. *Journal of Herbal, Clinical and Pharmaceutical Science (HERCLIPS)*, *5*(02), 130. https://doi.org/10.30587/herclips.v5i02.7373

Li, B., Li, H., Su, S., Shi, M., Qin, S., & Zeng, C. (2024). Enhanced Bioaccessibility of Interfacial Delivered Oleanolic Acid Through Self-Constructed Pickering Emulsion: Effects of oil types. *Food Research International*, *191*, 114708. https://doi.org/10.1016/j.foodres.2024.114708

Li, W., Zhu, L., Zhang, W., Han, C., Li, P., & Jiang, J. (2024). Foam and fluid Properties of Purified Saponins and Non-Purified Water Extracts from *Camellia oleifera* Cake (by-product). *Food Chemistry*, *440*, 138313. https://doi.org/10.1016/j.foodchem.2023.138313

Ling, J. W. A., Chang, L. S., Mohd Khalid, R., Wan Mustapha, W. A., Sofian-Seng, N. S., Mohd Razali, N. S., Rahman, H. A., Mohd Zaini, N. A., & Lim, S. J. (2020). Sequential Extraction of Red Button Ginger (*Costus woodsonii*): Phytochemical Screening and Antioxidative Activities. *Journal of Food Processing and Preservation*, *44*(14776), 1–11. https://doi.org/10.1111/jfpp.14776

Liris Nareswari, T., Nurjannah, O., Meliyana Nur Indah Sari, L., & Syafitri, E. (2022). Pengaruh Variasi Surfaktan Terhadap Sifat Fisik Sampo Berbasis Minyak Serai Wangi (*Cymbopogon nardus* (L.) Rendle) dan Ekstrak Lidah Buaya (*Aloe vera*). *Jurnal Farmasi Malahayati,* 5(2).

Lokole, P. B., Ngombe, N. K., Motomba, D. I., Safari, J. B., Mpuza, M. K., Krause, R. W. M., Mutwale, P. K., & Nkanga, C. I. (2024). Preparation and Characterization of Micellar Nanoparticles Using Crude Saponins from Five Congolese Plant Species. *Pharmaceutical Science Advances*, *2*. https://doi.org/10.1016/j.pscia.2024.100055

Lorençone, B. R., Guarnier, L. P., Palozi, R. A. C., Romão, P. V. M., Marques, A. A. M., Klider, L. M., Souza, R. I. C., Santos, A. C. Dos, Tirloni, C. A. S., Cassemiro, N. S., Silva, D. B., Budel, J. M., & Junior, A. G. (2021). Atheroprotective Properties of *Costus spicatus* (Jacq.) sw. in Female Rats. *Life*, *11*(3). https://doi.org/10.3390/life11030212

Lozsan, A., Rivas, I., Rodriguez, G., Martinez, S., Pérez, M.Á., 2017. Determination of Surface-Active Characteristics of a Natural Surfactant Extracted from Sapindus Saponaria. *Tenside Surfactants Detergents*, 54(2), 109–117. https://doi.org/doi:10.3139/113.110491

Mahreni, Lucitasari, D. R., & Puspitasari, M. (2021). *Biosurfaktan*. Lembaga Penelitian dan Pengabdian Kepada Masyarakat UPN Veteran Yogyakarta.

Mamo, J., & Assefa, F. (2018). The Role of Microbial Aspartic Protease Enzyme in Food and Beverage Industries. *Journal of Food Quality*, *2018*. https://doi.org/10.1155/2018/7957269

Manayi, A., & Saeidnia, S. (2015). A concern on phthalate pollution of herbal extracts/medicines and detection methods. *Research Journal of Pharmacognosy (RJP)*, *2*(3), 49–54.

Markande, A. R., Patel, D., & Varjani, S. (2021). A review on biosurfactants: properties, applications and current developments. *Bioresource Technology*, *330*(124963). https://doi.org/10.1016/j.biortech.2021.124963

Marnolia, A., Haryani, Y., & Puspita, F. (2016). Uji Aktivitas Enzim Protease dari Isolat *Bacillus sp.* Endofit Tanaman Kelapa Sawit (*Elaeis quinensis*). *Jurnal Photon, 6* (2).

Martin, J. (2023). A Comprehensive Study on the Botanical Characteristics of Spiral Flag Plant. *Journal of Biology and Today's World*, *12*(6), 6. https://doi.org/10.35248/2322-3308-12.6.006

Mawani, J. S., Mali, S. N., & Pratap, A. P. (2023). *Formulation and evaluation of antidandruff shampoo using mannosylerythritol lipid (MEL) as a bio-surfactant*. *60*(1), 44–53. https://doi.org/doi:10.1515/tsd-2022-2449

Mboseh, K. S., Ngwasiri, P. N., Makebe, C. W., Akah, A. V., Ngwa, N. M., & Ngassoum, M. B. (2024). Production and Process Optimization of an

Emulsifier as a Tradition Food Salt (Nikki) from *Musa paradisiaca* (Plantain) Waste Peels Enriched with Ficus Waste Peels Ash and Evaluation of Its Effect on the Emulsification, Stabilisation and Sensory Properties of Yellow Achu-Soup. *Open Accesses Library*, *11*(02), 1–25. https://doi.org/10.4236/oalib.1111217

Meena, P., & Kishore, N. (2021). Ionic Strength Modulated Interactions of Sorbitol With Lysozyme and Amino Acids: Quantitative Understanding in Protein Stabilizing Effects. *Journal of Molecular Liquids*, *340*, 117166. https://doi.org/https://doi.org/10.1016/j.molliq.2021.117166

Meshram, P. D., Shingade, S., & Madankar, C. S. (2021). Comparative study of Saponin for Surfactant Properties and Potential Application in Personal Care Products. *Materials Today: Proceedings*, *45*, 5010–5013. https://doi.org/https://doi.org/10.1016/j.matpr.2021.01.448

Miranza, N., Yuniarti, R., Lubis, M. S., & Daulay, A. S. (2020). Journal of Pharmaceutical and Sciences Formulation of Transparent Soap with Carrot Juice (*Daucus carota L.*) as a Skin Moisturizer. *JPS*, *2025*(2), 664–678. https://doi.org/10.36490/journal-jps.com

Moito, R. A., Husain, R., & Silvana Naiu, A. (2023). Analisis Kadar Saponin dan Aktivitas Antioksidan Ekstrak Daun Mangrove *Sonneratia alba* dari Perairan Desa Monano Kabupaten Gorontalo Utara. *Jurnal Ilmiah Perikanan Dan Kelautan*, *11*(2), 92–96.

Molina-Zamudio, K.Y., Dervishi, M., Wang, C., Rami, M., Browne, P.D., Hansen, H.C.B., Bak, S., Nicolaisen, M.H., 2025. Degradation of Biopesticidal Triterpenoid Saponins by the Soil Bacterium *Arthrobacter* sp. α-11c. *BioRxiv*. https://doi.org/10.1101/2025.08.18.670823

Mugford, S. T., & Osbourn, A. (2013). Saponin synthesis and function. In *Isoprenoid Synthesis in Plants and Microorganisms: New Concepts and Experimental Approaches* (pp. 405–424). Springer New York. https://doi.org/10.1007/978-1-4614-4063-5_28

Myers, D. (2020). *Surfactant Science and Technology* (4th ed.). Wiley.

Nabilaputri, L., Indihadi, D., & Suryana, Y. (2024). Pengaruh Penggunaan Media Gambar Terhadap Keterampilan Menulis Deskripsi Tema Lingkungan pada Kelas II Sekolah Dasar. *Collase: Creative of Learning Students Elementary Education Journal*, *7*(5), 906–915. https://doi.org/10.22460/collase.v7i5.19742

Nagtode, V. S., Cardoza, C., Yasin, H. K. A., Mali, S. N., Tambe, S. M., Roy, P., Singh, K., Goel, A., Amin, P. D., Thorat, B. R., Cruz, J. N., & Pratap, A. P. (2023). Green Surfactants (Biosurfactants): A Petroleum-Free Substitute for Sustainability Comparison, Applications, Market, and Future Prospects. *ACS Omega*, *8*(13), 11674–11699. https://doi.org/10.1021/acsomega.3c00591

Najihah, M. Z., & Winie, T. (2021). Dye extracted from *Costus woodsonii* Leave as a Natural Sensitizer For Dye-Sensitized Solar Cell. *Science Letters Journal*, *15*(1), 58–68. https://doi.org/10.24191/sl.v15i1.11794

Nareswari, T. L., Nurjannah, O., Sari, L. M. N. I., & Syafitri, E. (2022). Pengaruh Variasi Surfaktan Terhadap Sifat Fisik Sampo Berbasis Minyak Serai Wangi (*Cymbopogon nardus* (L.) Rendle) dan Ekstrak Lidah Buaya (*Aloe vera*). *Jurnal Farmasi Malahayati*, *5*(2), 155–164. https://doi.org/10.33024/jfm.v5i2.8106

Ningrum, Y. D. A., Roffada, R.-, & Lara, S. P. (2023). Formulasi dan Uji Karakteristik Fisik Sediaan Sampo Ekstrak Air Kelapa Menggunakan Metode Freeze Drying. *INPHARNMED Journal (Indonesian Pharmacy and Natural Medicine Journal)*, *7*(1), 27–41. https://doi.org/10.21927/inpharnmed.v7i1.3188

Noviyanty, Y., Hepiyansori, & Dewi, B. R. (2020). Identifikasi dan Penetapan Kadar Senyawa Saponin Ekstrak Etanol Bunga Senggani (*Melastoma malabathricum* L) Metode Gravimetri. *Oceana Biomedicina Journal*, *3*(1), 45–53. https://doi.org/10.30649/obj.v3i1.46

Nurfazri Istiqomah, A., Kholisatun Nisa, S., & Septi Lestari, K. (2025). Pengaruh Toksisitas Subkronik Ekstrak Etanol Rimpang Pacing (*Costus speciosus*) terhadap Fungsi Hati pada Tikus. *Indonesian Journal of Herbal Science and Innovation*, *1*(1), 24–35. https://doi.org/doi.org/10.64673/ijherbsi.v1i1.1

Nurzaman, F., Djajadisastra, J., & Elya, B. (2018). Identifikasi Kandungan Saponin dalam Ekstrak Kamboja Merah (*Plumeria rubra* L.) dan Daya Surfaktan dalam Sediaan Kosmetik. *Jurnal Kefarmasian Indonesia*, *8*(2), 85–93. https://doi.org/10.22435/jki.v8i2.325

Obara, K., Obara, C., Naito, M., Asano, A., & Tajima, A. (2024). Real-Time Visualisation of Developing Chick Embryos Cultured in transparent Plastic Films from the Blastoderm Stage Until Hatching. *Scientific Reports*, *14*(22790). https://doi.org/10.1038/s41598-024-72004-y

Octavia, Amin, A., Waris, R., & Yuliana, D. (2023). Identifikasi Organoleptik, dan Kelarutan Ekstrak Etanol Daun Pecut Kuda (*Stachitarpeta jamaiensis* (L.) Vahl) Pada Pelarut Dengan Kepolaran Berbeda. *Makassar Natural Product Journal*, *1*(4), 203–211.

Olatunde, O. Z., Yong, J., Tian, D., & Lu, C. (2025). Comprehensive Review of Plant-Derived Triterpenoid Types, Structures and Cytotoxicity: An Update from 2015 to 2024. In *Organic and Biomolecular Chemistry* (Vol. 23, Issue 25, pp. 5929–6051). Royal Society of Chemistry. https://doi.org/10.1039/d5ob00715a

Önler, E., Çelen, I. H., Gulhan, T., & Boynukara, B. (2017). A Study Regarding the Fertility Discrimination of Eggs By Using Ultrasound. *Indian Journal of Animal Research*, *51*(2), 322–326. https://doi.org/10.18805/ijar.v0iOF.4561

Patil, J. (2017). Surfactant Characterization of Crude Saponin Extracts of *Guaiacum officinale* Leaf and Stem. *World Journal of Pharmaceutical Research*, 974–981. https://doi.org/10.20959/wjpr201711-9631

Perinelli, D. R., Cespi, M., Lorusso, N., Palmieri, G. F., Bonacucina, G., & Blasi, P. (2020). Surfactant Self-Assembling and Critical Micelle Concentration: One Approach Fits All? *Langmuir*, *36*(21), 5745–5753. https://doi.org/10.1021/acs.langmuir.0c00420

Permadi, Y. W., & Mugiyanto, E. (2018). Formulasi dan Evaluasi Sifat Fisik Shampo Anti Ketombe Ekstrak Daun Teh Hijau. *Jurnal Farmasi Sains Dan Praktis*, *IV*(2), 62–66. https://doi.org/10.31603/pharmacy.v4i2.2324

Pravitasari, A. D., Gozali, D., Hendriani, R., & Mustarichie, R. (2021, April 7). Review: Formulasi dan Evaluasi Sampo Berbagai Herbal Penyubur Rambut. *Majalah Farmasetika*, *6*(2), 152–168. https://doi.org/10.24198/mfarmasetika.v6i2.27629

Putri, A., Natalia, D., Fitriangga, A., 2020. Hubungan Personal Hygiene terhadap Kejadian *Pityriasis capitis* pada Siswi di SMK Negeri 1 Mempawah Hilir. *Jurnal Nasional Ilmu Kesehatan (JNIK)*, 2(3), 121–129.

Putri, C. M., Rustama, M. M., & Putranto, W. S. (2024). Skrining Bakteri Asam Laktat dan Khamir Potensial Proteolitik Ekstraseluler dan *Milk Clotting Activity* dari Ekstrak dan *Fresh Cheese* Stroberi (*Fragaria x ananassa* Duch.). *Jurnal Teknologi Hasil Peternakan*, *5*(1), 61–82. https://doi.org/10.24198/jthp.v5i1.49925

Putri, P. A., Chatri, M., Advinda, L., & Violita. (2023). Karakteristik Saponin Senyawa Metabolit Sekunder pada Tumbuhan. *Jurnal Serambi Biologi*, *8*(2), 251–258. https://doi.org/10.24036/srmb.v8i2.207

Rahmasari, D., Nursolich, D. O., Avescina, R. I., Hidayati, M. N., Tahesa, I. Z., & Nugraheni, R. W. (2023). Formulasi dan Evaluasi Sediaan Face Wash Gel Ekstrak Kulit Buah Naga. *Farmasains : Jurnal Ilmiah Ilmu Kefarmasian*, *10*(2), 41–48. https://doi.org/10.22236/farmasains.v10i2.11297

Rai, S., Acharya-Siwakoti, E., Kafle, A., Devkota, H. P., & Bhattarai, A. (2021). Plant-Derived Saponins: A Review of Their Surfactant Properties and Applications. *Journal Sci*, *3*(4). https://doi.org/10.3390/sci3040044

Rai, S., Kafle, A., Devkota, H. P., & Bhattarai, A. (2023). Characterization of saponins from the leaves and stem bark of *Jatropha curcas* L. for surface-active properties. *Heliyon*, *9*(5). https://doi.org/10.1016/j.heliyon.2023.e15807

Razmi, Tuti Alawiyah, & Fitri Yuliana. (2022). Analisis Kadar Surfaktan Anionik Pada Air Sungai Martapura Dengan Metode Spektrofotometri Visible. *Journal of Pharmaceutical Care and Sciences*, *2*(2), 1–6. https://doi.org/https://doi.org/10.33859/jpcs

Razvi, S. Z. A., Kamm, I., Nguyen, T., Pellett, J. D., & Kumar, A. (2021). Loss on Drying Using Halogen Moisture Analyzer: An Orthogonal Technique for Monitoring Volatile Content for In-Process Control Samples during Pharmaceutical Manufacturing. *Organic Process Research and Development*, *25*(2), 300–307. https://doi.org/10.1021/acs.oprd.0c00512

Reningtyas, R., & Mahreni. (2015). *Biosurfaktan*. *XII*(2), 12–22. https://doi.org/10.31315/e.v12i2.1354

Restiana, R., & Cahyana, Y. (2023). Karakterisasi Fisikokimia dan Stabilitas Emulsi Pickering Menggunakan Tepung dan Pati Ganyong Termodifikasi Dry-Heat sebagai Emulsifier. *Jurnal Teknotan*, *17*(3), 173–180. https://doi.org/10.24198/jt.vol17n3.3

Riadi, S., Noval, Rizali, M., & Audina, M. (2024). Evaluasi Fisik Formulasi Sediaan Krim Nanopartikel Ekstrak Daun Taya (*Nauclea subdita*) Sebagai Antioksidan dengan Variasi Konsentrasi Setil Alkohol dan Tween 80. *Jurnal Surya Medika*, *10*(3), 95–104. https://doi.org/10.33084/jsm.v10i3.8971

Riany, H., & Wahyuningtyas, R. K. (2024). Analysis of the Antioxidant Potential of Ethanol Extracts from Pacing Plant (*Costus speciosus*) with DPPH Method. *Organisms*, *4*(2), 89–99.

Riniati, R., Sularasa, A., & Febrianto, A. D. (2019). Ekstraksi Kembang sepatu (*Hibiscus Rosa sinensis* L) Menggunakan Pelarut Metanol dengan Metode Sokletasi untuk Indikator Titrasi Asam Basa. *Indonesian Journal of Chemical Analysis*, *2*(01). https://doi.org/10.20885/ijca.vol2.iss1.art5

Riyanto, R., & Haryanto, Y. (2023). Pengaruh Lama Penyimpanan Ekstrak Terhadap Kadar Pinostrobin Dalam Ekstrak Etanol Temukunci (*Kaemferia pandurata*, Roxb). *Prosiding Seminar Nasional Hasil Penelitian Dan Pengabdian Masyarakat*, *19*, 174–184.

Rosalin, Yasser, M., Kishan, S., & Syuhada, N. A. (2022). Karakterisasi Biosurfaktan dari Ekstrak Daun Bidara dan Kulit Pepaya. *Vol. 7: Prosiding 6th Seminar Nasional Penelitian & Pengabdian Kepada Masyarakat 2022*, 106–111.

Rosen, M. J. ., & Kunjappu, J. T. . (2012). *Surfactants and interfacial phenomena* (4th ed.). Wiley.

Rowe, R. C., Sheskey, P. J., & Owen, S. C. (2006). *Handbook of Pharmaceutical Excipient* (R. C. Rowe & P. J. Sheskey, Eds.; 5th ed.). Pharmaceutical Press.

Salman, S., Yuniar, A., Nanda, D., Irawan, A. H., Wahyudi, N. Y., Olipia, N., & Megrian, E. (2023). Perkembangan Uji Stabilitas Berdasarkan Parameter pada Sediaan Suspensi dengan Berbagai Bahan Aktif yang Berbeda. *Journal of Pharmaceutical and Sciences*, *6*, 633–639.

Samimi, M. S., Mahboobian, M. M., & Mohammadi, M. (2021). Ocular Toxicity Assessment of Nanoemulsion In-Situ Gel Formulation of Fluconazole. *Human and Experimental Toxicology*, *40*(12), 2039–2047. https://doi.org/10.1177/09603271211017314

Sari, D. Y., & Rahman, I. R. (2021). Keamanan Hair Tonic Ekstrak Etanol, Fraksi Etanol, dan Fraksi Kloroform-Metanol dari Kayu Secang (*Caesalpinia sappan* L.) dengan Metode Uji Iritasi Primer dan HET-CAM. *Jurnal Farmasi Udayana*, *10*(2), 156–162. https://doi.org/10.24843/jfu.2021.v10.i02.p08

Sari, G. L., Trihadiningrum, Y., Ni'matuzahroh, Putra, S. A., Kasasiah, A., & Alim, M. S. (2022). Biosurfactant Produced by Indigenous Bacteria During Composting Process of Crude Oil Polluted Soil: Properties and Role. *Journal of Ecological Engineering*, *23*(4), 297–314. https://doi.org/10.12911/22998993/146693

Savarino, P., Demeyer, M., Decroo, C., Colson, E., & Gerbaux, P. (2023). Mass Spectrometry Analysis of Saponins. In *Mass Spectrometry Reviews* (Vol. 42, Issue 3, pp. 954–983). John Wiley and Sons Inc. https://doi.org/10.1002/mas.21728

Seftian, M., Laksitorini, M. D., Nanda, T., & Sulaiman, S. (2023). Penggunaan Surfaktan pada Sistem Dispersi Padat Terner: Manfaat dan Risiko. *Majalah Farmaseutik*, *19*(4), 474–483. https://doi.org/10.22146/farmaseutik.v19i4.86720

Senevirathne, A., Jayathilaka, E. H. T. T., Haluwana, D. K., Chathuranga, K., Senevirathne, M., Jeong, J. S., Kim, T. W., Lee, J. S., & De Zoysa, M. (2023).

The Aqueous Leaf Extract of the Medicinal Herb *Costus speciosus* Suppresses Influenza A H1N1 Viral Activity under In Vitro and In Vivo Conditions. *Viruses*, *15*(6). https://doi.org/10.3390/v15061375

Setyopratiwi, A., Titiek, H., & Hanifah, U. (2022). Formulasi dan Stabilitas Mikroemulsi Minyak dalam Air dengan *Virgin Coconut Oil* (VCO) Sebagai Fase Minyak Menggunakan Metode Emulsifikasi. *Prosiding Seminar Nasional Kimia (SNK) 2022*, *12*, 108–123.

Setyowati, R., Indrayati, A., Nurfiana, G., & Sari, F. (2024). Pengaruh Kombinasi Ekstrak Etanol Daun Beluntas (*Pluchea indica* Less.) dan Daun Sukun (*Artocarpus altilis* (Park.) Fosberg) terhadap Bakteri *Staphylococcus aureus* ATCC 25923. *Jurnal Ilmu Kefarmasian*, *5*(1), 45–52.

Sharma, K., Kaur, R., Kumar, S., Saini, R. K., Sharma, S., Pawde, S. V., & Kumar, V. (2023). Saponins: A Concise Review on Food Related Aspects, Applications and Health Implications. In *Food Chemistry Advances* (Vol. 2). Elsevier Ltd. https://doi.org/10.1016/j.focha.2023.100191

Shimo Yamada, M., Ootsubo, R., Naruse, T., & Watanabe, K. (2000). Effects of Soybean Saponin on Protease Hydrolyses of *β-lactoglobulin* and *α-lactalbumin*. *Bioscience, Biotechnology and Biochemistry*, *64*(4), 891–893. https://doi.org/10.1271/bbb.64.891

Sianturi, R. (2022). Uji Homogenitas Sebagai Syarat Pengujian Analisis. *Jurnal Pendidikan, Sains Sosial, Dan Agama*, *8*(1), 386–397. https://doi.org/10.53565/pssa.v8i1.507

Sikarwar, M. S., Szeek, C. K., & Paliwal, N. (2019). Pharmacognostical, Phytochemical, Antioxidant and Antimicrobial Activity of *Costus woodsonii*. *Edelweiss Applied Science and Technology*, *3*(1), 53–59. https://doi.org/10.33805/2576-8484.168

Silva, M. da G. C., Medeiros, A. O., Converti, A., Almeida, F. C. G., & Sarubbo, L. A. (2024). Biosurfactants: Promising Biomolecules for Agricultural Applications. *Sustainability: Multidisciplinary Digital Publishing Institute (MDPI)* 16, (1). https://doi.org/10.3390/su16010449

Silvia, B. M., & Dewi, M. L. (2022). Studi Literatur Pengaruh Jenis dan Konsentrasi Basis terhadap Karakteristik Masker Gel Peel Off. *Jurnal Riset Farmasi*, *2*(1), 31–40. https://doi.org/10.29313/jrf.v2i1.702

Simões, C. R., da Silva, M. W. P., de Souza, R. F. M., Hacha, R. R., Merma, A. G., Torem, M. L., & Silvas, F. P. C. (2024). Biosurfactants: An Overview of Their Properties, Production, and Application in Mineral Flotation. *Resources Journal*, *13*(81). https://doi.org/10.3390/resources13060081

Sintia, I., Danil Pasarella, M., & Andi Nohe, D. (2022). Perbandingan Tingkat Konsistensi Uji Distribusi Normalitas pada Kasus Tingkat Pengangguran di Jawa. *Prosiding Seminar Nasional Matematika, Statistika, Dan Aplikasinya*, *2*, 322–333.

Siregar, I. A. (2021). Analisis dan Interpretasi Data Kuantitatif. *ALACRITY : Journal Of Education*, *1*(2), 39–48.

Sisilia, Buang, A. , dan, & Adriana Nur Ilmi A. (2021). Pengaruh Variasi Konsentrasi *Hydroxyethyl Cellulose* (HEC) Sebagai Pengental Terhadap Mutu Fisik Sabun Mandi Cair Fraksi *Ethyl Acetate* Daun Kopi Robusta(*Coffea robusta*) yang Berasal dari Tana Toraja. *Fito Medicine : Journal Pharmacy and Sciences*, *12*(2), 62–72.

Smejkal, G., Gross, V., & Lazarev, A. (2024). Theoretical and Experimental Determinations of the Hydrophilic–Lipophilic Balance (HLB) of Representative Oils and Lecithins. *Colloids and Interfaces*, *8*(2). https://doi.org/10.3390/colloids8020021

Sobral, A. F., Ramos, D. G., Lima, B. C. S., Liu, T. P. S. L., Silva, M. R. O. B. da, Lino, L. H. S., Cardoso, K. B. B., Albuquerque, W. W. C., Nascimento, T. P., & Brandão Costa, R. M. P. (2025). Purification and Characterization of a Protease Using Aspergillus oryzae Under Submerged Fermentation Using Dairy By-Products as a Substrate. *Catalysts*, *15*(6). https://doi.org/10.3390/catal15060575

Sohrab, S., Mishra, P., & Mishra, S. K. (2021). Phytochemical Competence And Pharmacological Perspectives of an Endangered Boon—*Costus speciosus*

(Koen.) Sm.: A Comprehensive Review. *Bulletin of the National Research Centre*, *45*(1). https://doi.org/10.1186/s42269-021-00663-2

Song, Aj., Jin, X., Wei, Y., Xiong, C., Shi, T., Ma, Y., & Yang, J. (2025). Dipole Moment Regulation of a Small-Molecule Quinone Mediator Boosts Long-Term Cycling Stability for Decoupled Water Electrolysis. *Green Chemistry*, *27*(21), 6196–6205. https://doi.org/10.1039/d5gc01266j

Song, J., Hu, Y., Yang, S., Liu, D., Tseng, Y., & Li, L. (2025). Predicting the Key Properties of a Modified Product to Pre-Select a Pluronic F127 Modification Scheme for Preparing High-Quality Nano-Micelles. *Polymers*, *17*(3). https://doi.org/10.3390/polym17030349

Song, P., Zhang, X., Wang, S., Xu, W., Wang, F., Fu, R., & Wei, F. (2023). Microbial proteases and their applications. *Frontiers in Microbiology, 14*. https://doi.org/10.3389/fmicb.2023.1236368.

Souza, I. R., Bezerra, K. G. O., Oliveira, C. L., Meira, H. M., Stamford, T. C. M., Converti, A., Sarubbo, L. A., & Rufino, R. D. (2024). Mouthwash Containing Plant-Derived Biosurfactant and Chitosan Hydrochloride: Assessment of Antimicrobial Activity, Antibiofilm Activity, and Genotoxicity. *Applied Sciences (Switzerland)*, *14*(15). https://doi.org/10.3390/app14156711

Subekti, D. R., Tivani, I., & Astuti, D. S. (2017). Uji Persyaratan Mutu Shampo dari Ekstrak Cabe Rawit (*Capsicum frutescens* L.) dengan Penentuan Angka Lempeng Total (Alt). *Jurnal Ilmiah Farmasi*, *17*(2).

Sukmawati. (2017). Pengaruh Temperatur dan Rasio Bahan Baku pada Pembuatan Surfaktan dari Pelepah Sawit. *Journal of Animal Science and Agronomy Panca Budi*, *2*(2), 37–44.

Sumarni, K. N. (2022). REVIEW ARTIKEL : Uji Iritasi Sediaan Topikal dari Tumbuhan Herbal. *Jurnal Jejaring Matematika Dan Sains*, *4*(1), 13–24. https://doi.org/10.36873/jjms.2021.v4.i1.703

Sundaram, T., Govindarajan, R. K., Vinayagam, S., Krishnan, V., Nagarajan, S., Gnanasekaran, G. R., Baek, K. H., & Rajamani Sekar, S. K. (2024). Advancements in Biosurfactant Production Using Agro-Industrial Waste for

Industrial And Environmental Applications. *Frontiers in Microbiology*, *15*(1357302), 1. https://doi.org/10.3389/fmicb.2024.1357302

Sunkara, N., Mounika, D., Lokesh, D., Spandhana, D., & Gayathri, D. (2025). A Review on Gas Chromatography-Mass Spectrometry (GC-MS). *International Journal of Pharmaceutical Sciences*, *3*(7), 1615–1622. https://doi.org/10.5281/zenodo.15864125

Susanti, D., & Safrina, D. (2021). Analisis Faktor Internal Tenaga Kerja yang Mempengaruhi Kecepatan dan Ketelitian Sortasi Basah Tanaman Pegagan. *AGROINTEK: Jurnal Teknologi Industri Pertanian*, *15*(1), 25–34. https://doi.org/10.21107/agrointek.v15i1.6920

Susiloningrum, D., Erliani, D., & Sari, M. (2023). Optimasi Suhu UAE *(Ultrasonik Asssisted Extraction*) Terhadap Nilai *Sun Protection Factor* (SPF) Ekstrak Rimpang Bangle (*Zingiber Purpureum* Roxb) Sebagai Kandidat Bahan Aktif Tabir Surya. *Cendekia Journal of Pharmacy*, *7*(1), 58–66. http://cjp.jurnal.stikescendekiautamakudus.ac.id

Swara, I. M. A. B., Puspawati, G. A. K. D., & Widarta, I. W. R. (2023). Pengaruh Waktu Ekstraksi dengan Metode *Microwave Assisted Extraction* (MAE) terhadap Aktivitas Antioksidan Ekstrak Daun Belimbing Wuluh (*Averrhoa Bilimbi* L.). *Itepa: Jurnal Ilmu Dan Teknologi Pangan*, *12*(4), 939–952. https://doi.org/10.24843/itepa.2023.v12.i04.p14

Tadros, T. F. (2010). *Rheology of Dispersions Principles and Applications*. Wiley-VCH Verlag.

Tan, J. J. Y., Tan, J. B. L., Lee, S. M., & Lim, Y. Y. (2020). Antioxidant and Antimicrobial Potential of *Costus Woodsonii*. *Journal of Herbs, Spices and Medicinal Plants*, *26*(2), 191–202. https://doi.org/10.1080/10496475.2019.1697782

Tan, J. J. Y., Tan, J. B. L., & Lim, Y. Y. (2021). Identification of Bioactive Cytotoxic Compound of Red Button Ginger Extracted by Solvent Fractionation. *Journal of Food Processing and Preservation*, *45*(2). https://doi.org/10.1111/jfpp.15125

Tiara Putri, N., Kurnyawaty, N., Sirajuddin, dan, Studi Petro dan Oleo Kimia, P., Teknik Kimia, J., Negeri Samarinda, P., & Samarinda, K. (2024). Pemanfaatan Saponin dari Ekstrak Daun Belimbing Wuluh yang Diaplikasikan dalam Pembuatan Detergen Cair. *Jurnal Teknik Kimia Vokasional 4*(2), 55–63. https://doi.org/10.46964/jimsi.v4i2.1230

Timilsena, Y. P., Phosanam, A., & Stockmann, R. (2023). Perspectives on Saponins: Food Functionality and Applications. In *International Journal of Molecular Sciences* (Vol. 24, Issue 17). Multidisciplinary Digital Publishing Institute (MDPI). https://doi.org/10.3390/ijms241713538

Tiso, T., Demling, P., Karmainski, T., Oraby, A., Eiken, J., Liu, L., Bongartz, P., Wessling, M., Desmond, P., Schmitz, S., Weiser, S., Emde, F., Czech, H., Merz, J., Zibek, S., Blank, L. M., & Regestein, L. (2024). Foam control in biotechnological processes—challenges and opportunities. *Discover Chemical Engineering 4*(1). https://doi.org/10.1007/s43938-023-00039-0

Tmáková, L., Sekretár, S., & Schmidt, Š. (2015). Plant-Derived Surfactants as an Alternative to Synthetic Surfactants: Surface and Antioxidant Activities. *Chemical Papers*, *70*(2), 188–196. https://doi.org/10.1515/chempap-2015-0200

Tran, T. Van, Nguyen, D. T. C., Kumar, P. S., Din, A. T. M., Qazaq, A. S., & Vo, D.-V. N. (2022). Green synthesis of Mn3O4 Nanoparticles Using *Costus woodsonii* Flowers Extract for Effective Removal of Malachite Green Dye. *Environmental Research Journal*, *214*(113925). https://doi.org/10.1016/j.envres.2022.113925

Tranggono, R. I., & Latifah, F. (2013). *Buku Pegangan Ilmu Pengetahuan Kosmetik*. Gramedia Pustaka Utama.

Tsibranska, S., Tcholakova, S., Golemanov, K., Denkov, N., Pelan, E., & Stoyanov, S. D. (2020). Role of Interfacial Elasticity for the Rheological Properties of Saponin-Stabilized Emulsions. *Journal of Colloid and Interface Science*, *564*, 264–275. https://doi.org/https://doi.org/10.1016/j.jcis.2019.12.108

Utami, Y. P., Sisang, S., & Burhan, A. (2020). Pengukuran Parameter Simplisia Dan Ekstrak Etanol Daun Patikala (*Etlingera elatior* (Jack) R.M. Sm) Asal

Kabupaten Enrekang Sulawesi Selatan. *Majalah Farmasi Dan Farmakologi*, *24*(1), 5–10. https://doi.org/10.20956/mff.v24i1.9831

Wang, J., & Zhang, M. (2020). Adsorption Characteristics and Mechanism of Bisphenol a by Magnetic Biochar. *International Journal of Environmental Research and Public Health*, *17*(3). https://doi.org/10.3390/ijerph17031075

Wardana, D., Ramadhan, A., Prihatini, D., Amne, F., & Eddiyanto. (2019). Utilization of Glycerol from Used Oil as an Ester Glycerol Surfactant. *Indonesian Journal of Chemical Science and Technology*, *2*(2), 111–120.

Wardhono, A., & Lestari, Y. (2022). Tingkat Pemahaman Pengajar Perguruan Tinggi Terhadap Keberadaan Pusat Komisi Etik Penelitian dan Fungsi Etik Penelitian. *An-Nafah Jurnal Pendidikan Dan Keislaman*, *1*, 54–61.

Watanabe, T., Kawai, T., & Nonomura, Y. (2018). Effects of Fatty Acid Addition to Oil-In-Water Emulsions Stabilized with Sucrose Fatty Acid Ester. *Journal of Oleo Science 67*(3), 307–313. Japan Oil Chemists Society. https://doi.org/10.5650/jos.ess17097

Widodo, H., & Subositi, D. (2021). Penanganan Dan Penerapan Teknologi Pascapanen Tanaman Obat. *AGROINTEK: Jurnal Teknologi Industri Pertanian*, *15*(1), 253–271. https://doi.org/10.21107/agrointek.v15i1.7661

Widyapuri, D., Purbowati, I. S. M., & Wibowo, C. (2022). Pengaruh Waktu Ekstraksi Menggunakan *Ultrasonic Assisted Extraction* terhadap Antosianin Jantung Pisang (*Musa spp*). *Agrointek : Jurnal Teknologi Industri Pertanian*, *16*(2), 242–251. https://doi.org/10.21107/agrointek.v16i2.12559

Widyasanti, A., Nurlaily, N., & Wulandari, E. (2018). Karakteristik Fisikokimia Antosianin Ekstrak Kulit Buah Naga Merah Menggunakan Metode UAE. *Jurnal Ilmiah Rekayasa Pertanian Dan Biosistem*, *6*(1), 27–38. https://doi.org/10.29303/jrpb.v6i1.63

Wijaya, D. R., Paramitha, M., & Putri, N. P. (2019). Ekstraksi Oleoresin Jahe Gajah (*Zingiber officinale* var. Officinarum) dengan Metode Sokletasi. *Jurnal Konversi*, *8*(1), 9–16.

Wu, B., Xiu, J., Yu, L., Huang, L., Yi, L., & Ma, Y. (2022). Biosurfactant Production by *Bacillus subtilis* SL and its Potential for Enhanced Oil

Recovery in Low Permeability Reservoirs. *Scientific Reports*, *12*(1). https://doi.org/10.1038/s41598-022-12025-7

Wu, S. M., & Gao, J. Y. (2024). The Conspicuously Large Bracts Influence Reproductive Success in *Thunia alba* (Orchidaceae). *Journal of Plant Ecology*, *17*(1). https://doi.org/10.1093/jpe/rtad036

Wu, Z., Zhu, G., Peng, M., Zhu, Y., Miao, W., Li, D., Qin, D., Ma, P., & Chen, F. (2024). Kinetic Analysis and Calculation Correction Methods for Moisture Evaporation Rate in Pine Lignocellulosic Biomass. *Case Studies in Thermal Engineering*, *61*. https://doi.org/10.1016/j.csite.2024.104985

Wulandari, I. F., Darusman, F., & Dewi, M. L. (2022). Kajian Pustaka Surfaktan dalam Sediaan Pembersih. *Bandung Conference Series: Pharmacy*, *2*(2), 374–378. https://doi.org/10.29313/bcsp.v2i2.4203

Xiang, W., Tardy, B., Bai, L., Stubenrauch, C., & Rojas, O. J. (2019). Measuring the Interfacial Behavior of Sugar-Based Surfactants to Link Molecular Structure and Uses. In Douglas G. Hayes, Daniel K.Y. Solaiman, & Richard D. Ashby (Eds.), *Biobased Surfactants: Synthesis, Properties, and Applications* (2nd ed., pp. 387–412). AOCS Press. https://doi.org/10.1016/B978-0-12-812705-6.00012-5

Xie, J., Huang, W., & Wu, X. (2023). Effects of Tea Saponin on The Foaming Properties of Pea Protein. *Food & Function*, *14*(9), 4339–4353. https://doi.org/10.1039/D3FO00104K

Yıldırım, H. K. (2022). Assessment of Propolis Treated by Different Extraction Methods. *Brazilian Archives of Biology and Technology*, *65*, 1–11. https://doi.org/10.1590/1678-4324-2022210251

Yu, H. L., & Goh, C. F. (2024). Glycols: The Ubiquitous Solvent For Dermal Formulations. *European Journal of Pharmaceutics and Biopharmaceutics*, *196*, 114182. https://doi.org/https://doi.org/10.1016/j.ejpb.2024.114182

Yuliarni, F. F., Ayu Puji Lestari, K., Kun Arisawati, D., Dwi Winda Sari, R., & Ratna K., K. (2022). Ekstraksi Jamur *Auricularia* dengan Menggunakan Pelarut Etanol Dan Metanol. *Jurnal Teknologi Technoscientia*, *14*(2), 129–137. https://doi.org/10.34151/technoscientia.v14i2.3637

Yuniarti, L., Teknologi, H. J., Pertanian, H., Pertanian, F., & Lampung, U. (2022). Pengaruh CMC dan Lama Penyimpanan Terhadap Profil Stabilitas Emulsi (O/W) Menggunakan Santan Kelapa Yang Dicampur Emulsifier Produk Etanolisis Pko Dan Tween 80. *Jurnal Agroindustri BERKELANJUTAN*, *1*(1), 130–141.

Yuwana, N., & Leseni, N. K. (2022). Efisiensi dan Efektivitas Defatting dengan Variasi Metode Ekstraksi dan Kemurnian Pelarut. *Jurnal Teknologi Dan Manajemen Pengelolaan Laboratorium*, *5*(1), 14–20.

Zargar, A. N., Mishra, S., Kumar, M., & Srivastava, P. (2022). Isolation and Chemical Characterization of the Biosurfactant Produced by *Gordonia sp*. IITR100. *PLOS ONE*, *17*(4 April). https://doi.org/10.1371/journal.pone.0264202

Zhang, W., Guo, M., Guo, H., Yang, W., Wang, Z., Cheng, S., & Chen, G. (2024). Cuticle Properties, Wax Composition, And Crystal Morphology of Hami Melon Cultivars (*Cucumis melo* L.) with Differential Resistance to Fruit Softening. *Food Chemistry*, *449*, 139234. https://doi.org/https://doi.org/10.1016/j.foodchem.2024.139234

Zhong, J., Mareque-Rivas, J. C., Lan, X., & Su, Y. X. (2025). Supramolecular Assembly of Triterpenoids: Current State and Biomedical Perspectives. In *Aggregate* (Vol. 6, Issue 8). John Wiley and Sons Inc. https://doi.org/10.1002/agt2.70081