

DAFTAR PUSTAKA

- Aasen, I. M., Ertesvåg, H., Heggeset, T. M. B., Liu, B., Brautaset, T., Vadstein, O., & Ellingsen, T. E. (2016). Thraustochytrids as production organisms for docosahexaenoic acid (DHA), squalene, and carotenoids. *Applied Microbiology and Biotechnology*, 100(10), 4309–4321. <https://doi.org/10.1007/s00253-016-7498-4>
- Alatas, Zubaidah. (2004). Efek Radiasi Pengion dan Non Pengion Pada Manusia. *Buletin Alara*, 5(2), 99-112.
- Amaro-Ortiz, A., Yan, B., & D’Orazio, J. A. (2014). Ultraviolet radiation, aging and the skin: Prevention of damage by topical cAMP manipulation. *Molecules*, 19(5), 6202–6219. <https://doi.org/10.3390/molecules19056202>
- Aminullah, Mardiah, Muhammad Reza Riandi, Arum Puspito Argani, Gustini, Syahbirin, T. K. (2018). Kandungan Total Lipid Lemak Ayam dan Babi Berdasarkan Perbedaan Jenis Metode Ekstraksi Lemak. *Jurnal Agroindustri Halal*, 4(1), 94–100. <https://core.ac.uk/download/pdf/228440701.pdf>
- Andini, Rahma, N. M., & Anneke. (2023). Penentuan Nilai Sun Protection Factor (SPF) Ekstrak Bonggol Pisang Kepok (*Musa Paradisiaca* L.) dengan Metode Spektrofotometri UV-Vis. *HEXAGON: Jurnal Teknik Dan Sains*, 4(1), 40–45.
- Becker, E. W. (2006). Handbook of Microalgal Culture. *Handbook of Microalgal Culture*, 253–448.
- BPOM. (2014). Peraturan Badan pengawas Obat dan Makanan Republik Indonesia Nomor 2 Tahun 2014 Tentang Perubahan Kedua Atas Peraturan Kepala Badan Pengawas Obat dan Makanan Nomor Hk.03.1.23.08.11.07517 Tahun 2011 Tentang Persyaratan Teknis Bahan Kosmetika. *Badan Pengawas Obat Dan Makanan*, 53, 52.
- Calabrese, M. N., Anne, C., Tianco, D., Michael, A., Garate, C., Carmen, M., Tan, S., Ting, J., Anthony, R., Galian, F., Bonto, A. P., Caye, A., & Chang, G. (2024). *Evaluation of Spirulina spp. Crude Extract Revealed*
- Candraningrat, I. D. A. A., Santika, A. A. G. J., Dharmayanti, I. A. M. S., & Prayascita, P. W. (2021). Review Kemampuan Metode Gc-MS Dalam Identifikasi Flunitrazepam Terkait Dengan Aspek Forensik Dan Klinik. *Jurnal Kimia*, 15(1), 12. <https://doi.org/10.24843/jchem.2021.v15.i01.p03>
- Ciriminna, R., Pandarus, V., Beland, F., & Pagliaro, M. (2014). ChemInform Abstract: Catalytic Hydrogenation of Squalene to Squalane. *ChemInform*, 45(50), no-no. <https://doi.org/10.1002/chin.201450257>
- da Silva, A. C. P., Santos, B. A. M. C., Castro, H. C., & Rodrigues, C. R. (2022). Ethylhexyl methoxycinnamate and butyl methoxydibenzoylmethane: Toxicological effects on marine biota and human concerns. *Journal of Applied Toxicology*, 42(1), 73–86. <https://doi.org/https://doi.org/10.1002/jat.4210>
- Damogalad, V., Jaya Edy, H., & Sri Supriati, H. (2013). Formulasi Krim Tabir Surya Ekstrak Kulit Nanas (*Ananas Comosus* L Merr) Dan Uji in Vitro Nilai Sun Protecting Factor (SPF). *PHARMACON Jurnal Ilmiah Farmasi – UNSRAT*, 2(02), 2302–2493.
- Darmapatni, K. A. G., Basori, A., & Suaniti, N. made. (2016). Pengembangan Metode GC-MS Untuk Penetapan Kadar Acetaminophen Pada Spesimen

- Rambut Manusia. *Jurnal Biosains Pascasarjana*, 18(3), 255–270.
- Dillon, G. P., Yiannikouris, A., Brandl, W., Cardinall, C., Yuan, W., & Moran, C. A. (2019). Analytical Method Assessment for the Determination of DHA and Fatty Acids Present in Unextracted *Aurantiochytrium limacinum* Biomass. *Food and Nutrition Sciences*, 10(04), 469–483. <https://doi.org/10.4236/fns.2019.104035>
- Djamaludin, H., & Chamidah, A. (2021). Analisis Komposisi Asam Lemak Ekstrak Minyak Mikroalga *Spirulina* sp. dengan Metode Ekstraksi yang Berbeda. *JFMR-Journal of Fisheries and Marine Research*, 5(2). <https://doi.org/10.21776/ub.jfmr.2021.005.02.10>
- Dutra, E. A., Da Costa E Oliveira, D. A. G., Kedor-Hackmann, E. R. M., & Miritello Santoro, M. I. R. (2004). Determination of sun protection factor (SPF) of sunscreens by ultraviolet spectrophotometry. *Revista Brasileira de Ciencias Farmaceuticas/Brazilian Journal of Pharmaceutical Sciences*, 40(3), 381–385. <https://doi.org/10.1590/S1516-93322004000300014>
- Fessenden, R. J. dan Fessenden, J. S. 1997. Dasar-Dasar Kimia Organik. Jakarta: Binarupa Aksara
- Food and Drug Administration, United States Government, 2009, Sunburn Protection Factor (SPF), Diakses tanggal 27 November 2023 <http://www.fda.gov/aboutfda/centersoffices/officeofmedicalproduct>
- Fossier Marchan, L., Lee Chang, K. J., Nichols, P. D., Mitchell, W. J., Polglase, J. L., & Gutierrez, T. (2018). Taxonomy, ecology and biotechnological applications of thraustochytrids: A review. *Biotechnology advances*, 36(1), 26–46. <https://doi.org/10.1016/j.biotechadv.2017.09.003>
- Gandjar, I. G., dan Rohman A. 2012. Analisis Obat Secara Spektrofotometri dan Kromatografi. Pustaka Pelajar. Yogyakarta.
- Gandjar, I. G., dan Rohman A. 2007. Kimia Farmasi Analisis. Pustaka Pelajar. Yogyakarta.
- Guntarti, A., Rohman, A., Martono, S., & Yuswanto, A. (2016). Autentikasi Lemak Celeng dengan Kromatografi Gas- Spektroskopi Massa yang Dikombinasikan Kemometrika PCA (*Principle Component Analysis*). 57–63.
- Gupta, A., Singh, A. P., Singh, V. K., Singh, P. R., Jaiswal, J., Kumari, N., Upadhye, V., Singh, S. C., & Sinha, R. P. (2023). Natural Sun-Screening Compounds and DNA-Repair Enzymes: Photoprotection and Photoaging. *Catalysts*, 13(4), 1–23. <https://doi.org/10.3390/catal13040745>
- Hapsah Isfardiyana, S., & Ririn Safitri, S. (2014). Pentingnya Melindungi Kulit Dari Sinar Ultraviolet dan Cara Melindungi Kulit dengan Sunblock Buatan Sendiri. *Jurnal Inovasi dan Kewirausahaan*, 3(2), 126–133.
- Hien, H. T. M., Thom, L. T., Ha, N. C., Tam, L. T., Thu, N. T. H., Nguyen, T. Van, Loan, V. T., Dan, N. T., & Hong, D. D. (2022). Characterization and Optimization of Culture Conditions for *Aurantiochytrium* sp. SC145 Isolated from Sand Cay (Son Ca) Island, Vietnam, and Antioxidative and Neuroprotective Activities of Its Polyunsaturated Fatty Acid Mixture. *Marine Drugs*, 20(12). <https://doi.org/10.3390/md20120780>
- Indarto, I., Isnanto, T., Muyassaroh, F., & Putri, I. (2022). Efektivitas Kombinasi Ekstrak Kayu Manis (*Cinnamomum burmannii*) dan Mikroalga

- (*Haematococcus pluvialis*) sebagai Krim Tabir Surya: Formulasi, Uji In Vitro, dan In Vivo. *Jurnal Kefarmasian Indonesia*, 12(1), 11–24. <https://doi.org/10.22435/jki.v0i0.5085>
- Jarikhuan, S., & Suanjit, S. (2018). Species diversity and polyunsaturated fatty acid content of thraustochytrids from fallen mangrove leaves in Chon Buri province, Thailand. *Agriculture and Natural Resources*, 52(1), 24–32. <https://doi.org/10.1016/j.anres.2018.05.002>
- Kalangi, S. J. R. (2014). Histofisiologi Kulit. *Jurnal Biomedik (Jbm)*, 5(3), 12–20. <https://doi.org/10.35790/jbm.5.3.2013.4344>
- Kesehatan RI, K. (2017). Farmakope Herbal Indonesia Edisi II. *Pills and the Public Purse*, 97–103. <https://doi.org/10.2307/jj.2430657.12>
- Kintoko, K., Witasari, H. A., & Pratama, Y. F. (2023). Aktivitas Anti-Wrinkle Gel Ekstrak Binahong (*Anredera cordifolia*) Secara In Vivo. *Jurnal Farmasi Udayana*, 12(1), 1. <https://doi.org/10.24843/jfu.2023.v12.i01.p01>
- Klau, M. H. C., & Hesturini, R. J. (2021). Pengaruh Pemberian Ekstrak Etanol Daun Dandang Gendis (*Clinacanthus nutans* (Burm F) Lindau) Terhadap Daya Analgetik dan Gambaran Makroskopis Lambung Mencit. *Jurnal Farmasi & Sains Indonesia*, 4(1), 6–12. <https://doi.org/10.52216/jfsi.v4i1.59>
- Komala, W. O. R. N., Mita, N., & Sastyarina, Y. (2020). Karakteristik Rumpun Banto (*Leersia hexandra* Sw.) Berdasarkan Makroskopik dan Mikroskopik. *Proceeding of Mulawarman Pharmaceuticals Conferences*, 11, 33–37. <https://doi.org/10.25026/mpc.v11i1.390>
- Koyande, A. K., Chew, K. W., Rambabu, K., Tao, Y., Chu, D. T., & Show, P. L. (2019). Microalgae: A potential alternative to health supplementation for humans. *Food Science and Human Wellness*, 8(1), 16–24. <https://doi.org/10.1016/j.fshw.2019.03.001>
- Kusantati, H., Prihatin, P. T., & Wiana, W. (2008). Tata Kecantikan Kulit Untuk Sekolah Menengah Kejuruan Jilid 1. In *Journal of Chemical Information and Modeling* (Vol. 53, Issue 9).
- Lavi, N. (2012). Tabir Surya Bagi Pelaku Wisata. *E-Jurnal Medika Udayana*, 2(6), 1–10. <https://ojs.unud.ac.id/index.php/eum/article/view/5624/4268>
- Leba, Maria Aloisia Uron. (2017). Buku Ajar Ekstraksi dan Real Kromatografi. Yogyakarta : Deepublish
- Lourenço-Lopes, C., Fraga-Corral, M., Jimenez-Lopez, C., Pereira, A. G., Garcia-Oliveira, P., Carpena, M., Prieto, M. A., & Simal-Gandara, J. (2020). Metabolites from macroalgae and its applications in the cosmetic industry: A circular economy approach. *Resources*, 9(9). <https://doi.org/10.3390/RESOURCES9090101>
- Lozano-Grande, M. A., Gorinstein, S., Espitia-Rangel, E., Dávila-Ortiz, G., & Martínez-Ayala, A. L. (2018). Plant Sources, Extraction Methods, and Uses of Squalene. *International Journal of Agronomy*, 2018. <https://doi.org/10.1155/2018/1829160>
- Mansur, J.S., Breder, M.N., Azulay, R.D. 1986. Determinação do fator de proteção solar por espectrofotometria, *An. Bras. Dermatol.* 61. 121-24.
- Martínez-Ruiz, M., Martínez-González, C. A., Kim, D. H., Santiesteban-Romero, B., Reyes-Pardo, H., Villaseñor-Zepeda, K. R., Meléndez-Sánchez, E. R.,

- Ramírez-Gamboa, D., Díaz-Zamorano, A. L., Sosa-Hernández, J. E., Coronado-Apodaca, K. G., Gámez-Méndez, A. M., Iqbal, H. M. N., & Parra-Saldivar, R. (2022). Microalgae Bioactive Compounds to Topical Applications Products—A Review. *Molecules*, 27(11), 1–22. <https://doi.org/10.3390/molecules27113512>
- Minerva, P. (2019). Penggunaan Tabir Surya Bagi Kesehatan Kulit. *Jurnal Pendidikan Dan Keluarga*, 11(1), 87. <https://doi.org/10.24036/jpk/vol11-iss1/619>
- Moh, S. H., Suh, S.-S., Cho, M. J., Song, M. Y., Hwang, J., Park, M., & Lee, T.-K. (2014). Evaluation of Sun Protection Factor (SPF) and Protection Factor of UVA (PFA) of the Sunscreen Containing Microalgal Extracts and MAAs. *Journal of the Korea Academia-Industrial Cooperation Society*, 15(5), 3312–3318. <https://doi.org/10.5762/kais.2014.15.5.3312>
- Mopuri, R., Kalyesubula, M., Rosov, A., Edery, N., Moallem, U., & Dvir, H. (2021). Improved Folch Method for Liver-Fat Quantification. *Frontiers in Veterinary Science*, 7(January), 3–7. <https://doi.org/10.3389/fvets.2020.594853>
- Mukhriani. (2014). Ekstraksi, Pemisahan Senyawa, dan Identifikasi Senyawa Aktif, J. Kesehat., vol. VII, no. 2, p. 361, 2014. *J. Kesehat.*, VII(2), 361. <https://doi.org/10.1007/s11293-018-9601-yolan>, A. A., Eddiwan, E., & Windarti, W. (2022). Identifikasi dan Isolasi Mikroalga dari Perairan Rawa Gambut di Kelurahan Air Hitam Kota Pekanbaru Provinsi Riau. *Jurnal Sumberdaya Dan Lingkungan Akuatik*, 3(2).
- Nazudin, Ngatidjo, & Mudasir. (2011). Analisis Kandungan Asam Lemak Omega-3 Epa dan DHA Hewan Laut Telur Bulubabi (*Diadema setosum*) di Daerah Sulawesi Tenggara. 1(1), 30–44.
- Patel, A., Rova, U., Christakopoulos, P., & Matsakas, L. (2019). Simultaneous production of DHA and squalene from *Aurantiochytrium* sp. grown on forest biomass hydrolysates. *Biotechnology for Biofuels*, 12(1), 1–12. <https://doi.org/10.1186/s13068-019-1593-6>
- Patel, A., Rova, U., Christakopoulos, P., & Matsakas, L. (2020). Mining of squalene as a value-added byproduct from DHA producing marine thraustochytrid cultivated on food waste hydrolysate. *Science of the Total Environment*, 736, 139691. <https://doi.org/10.1016/j.scitotenv.2020.139691>
- Pinheiro, J., Paulo, M., Coutinho, J., Baptista, T., Bernardino, S., Tecelão, C., Gil, M., & Lemos, M. (2018). Bioactivity screening of *Aurantiochytrium* sp. for antioxidant activities. *Frontiers in Marine Science*, 5, 2018–2019. <https://doi.org/10.3389/conf.fmars.2018.06.00088>
- Pratama, W. A., & Zulkarnain, A. K. (2015). Uji Spf In Vitro dan Sifat Fisik Beberapa Produk Tabir Surya Yang Beredar Di Pasaran. *Majalah Farmaseutik, Vol. 11 No. 1 Tahun 2015*, 11(1), 275–283.
- Pratiwi, G. K., Alatas, F., & Putri, D. A. (2021). Efek Ekstrak Air Kulit Buah Naga Merah (*Hylocereus polyrhizus*) Terhadap Aktivitas Tabir Surya Etilheksil Metoksisinamat. *Medika Kartika : Jurnal Kedokteran Dan Kesehatan*, 4(2), 122–131.
- Putri, C. N., & Ningrum, Y. D. A. (2023). Potensi Ekstrak Dan Fraksi Daun Asam

- Jawa Sebagai Antijerawat Dan Tabir Surya. *Medical Sains : Jurnal Ilmiah Kefarmasian*, 8(1), 41–50. <https://doi.org/10.37874/ms.v8i1.524>
- Rahayu, R. I., & Susilo, H. (2021). Keanekaragaman Mikroalga Sebagai Bioindikator Pencemaran di Situ Cibanten Kecamatan Ciomas Kabupaten Serang Banten. *Jurnal Lingkungan dan Sumberdaya Alam (JURNALIS)*, 4(2), 104–116. <https://doi.org/10.47080/jls.v4i2.1459>
- Rasyid, A. (2018). Analisis Metabolit Sekunder, Aktivitas Antibakteri Dan Komposisi Golongan Senyawa Dalam Ekstrak Teripang *Bohadschia sp.* Analysis. 8(2), 53–54.
- Reo, A. R., Berhimpion, S., & Montolalu, R. (2017). Metabolit Sekunder Gorgonia (*Paramuricea clavata*). *Jurnal Ilmiah Platax*, 5(1), 42. <https://doi.org/10.35800/jip.5.1.2017.14971>
- Saengwong, A., Yongmanitchai, W., & Chonudomkul, D. (2018). Screening and optimization of squalene production from microalgae *Aurantiochytrium sp.* *Chiang Mai Journal of Science*, 45(2), 680–691.
- Sahumena, M. H., Ruslin, R., Asriyanti, A., & Nurrohinta Djuwarno, E. (2020). Identifikasi Jamu Yang Beredar di Kota Kendari Menggunakan Metode Spektrofotometri Uv-Vis. *Journal Syifa Sciences and Clinical Research*, 2(2), 65–72. <https://doi.org/10.37311/jsscr.v2i2.6977>
- Saini, R. K., Prasad, P., Shang, X., & Keum, Y. S. (2021). Advances in lipid extraction methods—a review. *International Journal of Molecular Sciences*, 22(24), 1–19. <https://doi.org/10.3390/ijms222413643>
- Sani, R. N., Nisa, F. C., Andriani, R. D., & Maligan, J. M. (2014). Analisis Rendemen Dan Skrining Fitokimia Ekstrak Etanol Mikroalga Laut *Tetraselmis chuii*. *Jurnal Pangan Dan Agroindustri*, 2(2), 121–126.
- Sasaki, K., Geribaldi-Doldán, N., Wu, Q., Davies, J., Szele, F. G., & Isoda, H. (2021). Microalgae *Aurantiochytrium Sp.* Increases Neurogenesis and Improves Spatial Learning and Memory in Senescence-Accelerated Mouse-Prone 8 Mice. *Frontiers in Cell and Developmental Biology*, 8(February), 1–14. <https://doi.org/10.3389/fcell.2020.600575>
- Sembiring Timbangan, Dayana Indri, Rianna Martha. (2019). Alat Penguji Material. Bogor: Guepedia.
- Seran, Y. Y. T., Pasangka, B., & Sutaji, H. I. (2018). Karakteristik Paparan Radiasi Sinar Ultraviolet A (UV-A) dan Cahaya Tampak di Kota Kupang. *Jurnal Biotropikal Sains*, 15(3), 49–56.
- Shovyana, H. H., & Zulkarnain, A. K. (2013). *Physical Stability and Activity Of Cream W/O Etanolik Fruit Extract Mahkota Dewa (Phaleria macrocarph (scheff.) Boerl.) As A Sunscreen*. 18(May), 109–117.
- Sipahelut, S. G. (2019). Perbandingan Komponen Aktif Minyak Atsiri dari Daging Buah Pala Kering Cabinet Dryer Melalui Metode Distilasi Air dan Air-Uap. *AGRITEKNO, Jurnal Teknologi Pertanian*, 8(1), 8–13. <https://doi.org/10.30598/jagritekno.2019.8.1.8>
- Suhaenah, A., Tahir, M., Farmasi, F., & Indonesia, U. M. (2019). Penentuan Nilai SPF (Sun Protecting Factor) Ekstrak Etanol Jamur Kancing (*Agaricus bisporus*) Secara In Vitro dengan Metode Spektrofotometri Uv-Vis. 11(01), 82–87.

- Suhendra, S., Septianingsih, L., Rizka Ariandi, T., Husna, M., Adi Laksana, Z., Yuniasih, D., & Hutari, A. (2022). Isolasi mikroalga *Aurantiochytrium* dari Raja Ampat dan potensinya pada industri bahan baku adjuvant vaksin. *Jurnal Rekayasa Proses*, 16(2), 34. <https://doi.org/10.22146/jrekpros.72045>
- Suhendra, Hutari, A., Nur Falah, D., & Nura Aini, S. (2023). Karakteristik Asam Lemak Bernilai Ekonomi Dari Kultivasi Mikroalga Hutan Bakau Indonesia. <http://jurnal.umj.ac.id/index.php/semnaslit>.
- Syapitri, H., Amila, N., & Aritonang, J. (2021). *Buku Ajar Metodologi Penelitian Kesehatan*. Ahlimedia Press.
- Tahya, Candra Y., & Karnelasatri. (2021). *Gas Chromatography-Mass Spectrometry Analysis and α -Glucosidase Inhibitory Activity of n-Hexane Extract of Bilajang Bulu (Merremia Vitifolia) Leaves*. 4(2), 162–172.
- Wang, H. M. D., Chen, C. C., Huynh, P., & Chang, J. S. (2015). Exploring the potential of using algae in cosmetics. *Bioresource Technology*, 184, 355–362. <https://doi.org/10.1016/J.BIORTECH.2014.12.001>
- Warono, D., & Syamsudin. (2013). Unjuk Kerja Spektrofotometer Analisa Zat Aktif Ketoprofen. *Konversi*, 2, 60.
- Wiguna, B., Mufti, A., Untoro, M., Nasori, A. S., Wiguna, B., Mufti, A., Laksono, H., Kusumamarawati, A. D., Permana, A. W., & Untoro, M. (2023). Pemanfaatan Palm Fatty Acid Distillate Sebagai Sumber Asam Oleat: Diversifikasi Produk Samping Minyak Kelapa Sawit Sebagai Produk Antara Untuk Industri Hilir. *Jurnal Teknologi Industri Pertanian*, 33(2), 181–187. <https://doi.org/10.24961/j.tek.ind.pert.2023.33.2.181>
- Yanlinastuti, S. fatimah. (2016). Pengaruh Konsentrasi Pelarut Untuk Menentukan Kadar Zirkonium dalam Paduan U-Zr Dengan Menggunakan Metode Spektrofotometri Uv-Vis, 17, 22–33.
- Yanuarti, R., Nurjanah, N., Anwar, E., & Pratama, G. (2017). Kandungan Senyawa Penangkal Sinar Ultra Violet dari Ekstrak Rumput Laut *Eucheuma cottonii* dan *Turbinaria conoides*. *Biosfera*, 34(2), 51. <https://doi.org/10.20884/1.mib.2017.34.2.467>
- Yarkent, Ç., & Oncel, S. S. (2022). Recent Progress in Microalgal Squalene Production and Its Cosmetic Application. *Biotechnology and Bioprocess Engineering*, 27(3), 295–305. <https://doi.org/10.1007/s12257-021-0355-z>