

DAFTAR PUSTAKA

- Antarti, A., & Lisnasari, R. 2018. Uji Aktivitas Antioksidan Ekstrak Ethanol Daun Family Solanum Menggunakan Metode Reduksi Radikal Bebas DPPH. *Journal of Pharmaceutical Science and Clinical Research*, 3(2), 62-69.
- Amelia, R., Budiman, A., Nugroho, A. P., & Suyono, E. A. (2023). Influence of salinity on the growth and fatty acids production of *E. gracilis* sp. local strain from Dieng Plateau, Indonesia. *Squalen Bulletin of Marine and Fisheries Postharvest and Biotechnology*, 18(2), 45–56.
- Aparna, V., Dileep, K.V., Mandal, P.K., Karthe, P., Sadasivan, C., & Haridas, M. 2012. Anti-inflammatory property of n-hexadecanoic acid: Structural evidence and kinetic assessment. *Chemical Biology & Drug Design*, 80(3), 434–439.
- Asli-Ardeh, E.A., & Mohsenimanesh, A. 2012. Determination of Effective Factorson Power Requirement and Conveying Capacity of a Screw Conveyor Under Three Paddy Grain Varieties. *The Scientific World Journal*, 14(5), 23 – 28.
- Assuncao, J., Batista, A.P., Manoel, J., da Silva, T.L., Marques, P., Reis, A., & Gouveia, L. 2017. CO₂ Utilization In the Production of Biomass and Biocompounds by Three Different Microalgae. *Engineering in Life Sciences*, 17(1), 1126-1135.
- Badan Pusat Statistik Indonesia. 2023. Analisis Isu Terkini 2023 [Online]. <https://www.bps.go.id/id/publication/2023/12/06/3abd56940bdcd5f8868f6473/analisis-isu-terkini-2023-.html>. Diakses pada 14 Maret 2024, jam 09.21 WIB.
- Barras, D.R. & B.A Stone. 1965. Chemical composition of pellicle of *E. gracilis gracilis* var. bacillaris. *Biochemical Journal*, 97(3), 14–15.
- Barros, M. P., Pinto, E., Colepicolo, P., & Pedersen, M. 2001. Astaxanthin and peridinin inhibit oxidative damage in Fe(II)-loaded liposomes: Scavenging oxyradicals or changing membrane permeability?. *Biochemical and Biophysical Research Communications*, 288(1), 225–232.

- Barsanti, L., Birindelli, L., & Gualtieri. 2022. Paramylon and Other Biocative Molecules in Micro and Macroalgae. *International Journal of Molecular Science*, 23(1), 1-15.
- Begum, H., Yusoff, F.M.D., Banerjee, S., Khatoon, H., & Shariff, M. 2016. Availability and Utilization of Pigments from Microalgae. *Critical Reviews in Food Science and Nutrition*, 56(13), 1-13.
- Borowitzka, M. A. 2018. Microalgae in Health and Disease Prevention: Chapter 3– Biology of Microalgae. *Academic Press*. 22 – 43.
- Buetow, D. E. 2011. *E. gracilis*. *Encyclopedia of Life Sciences*, 1–5.
- Chisti, Y. 2007. Biodiesel from Microalgae. *Biotechnology Advances*. 25(1), 294-306.
- Chen, Z., Chen, Y., Zhang, H., Qin, H., He, J., Zheng, Z., Zhao, L., Lei, A., & Wang, J. 2022. Evaluation of *Euglena gracilis* 815 as a New Candidate for Biodiesel Production. *Frontiers in Bioengineering and Biotechnology*, 10 (3).
- Chock, T. (2016). Phenol-Sulfuric Acid Assay to Quantify Carbohydrates (EPSs). Aridlands Ecology Lab Protocol.
- Chowdury, K. H., Nahar, N., & Deb, U. K. 2020. The Growth Factors Involved in Microalgae Cultivation for Biofuel Production: A Review. *Computational Water, Energi, and Environmental Engineering*, 9(1), 185–215.
- Choochote, W., Suklampoo, L., & Ochaikul, D. 2014. Evaluation of antioxidant capacities of green microalgae. *Journal of Applied Phycology*, 26(1), 43–48.
- Coulombier, N., Nicolau, E., Le Déan, L., Barthelemy, V., Schreiber, N., Brun, P., Lebouvier, N., & Jauffrais, T. 2020. Effects of Nitrogen Availability on the Antioxidant Activity and Carotenoid Content of the Microalgae *Nephroselmis* sp. *Marine Drugs*, 18(9), 453.
- Danilov, R., & Ekelund, N. 2000. Applicability of Growth Rate, Cell Shape, and Motility of *E. gracilis gracilis* as Physiological Parameters for Bioassessment at Lower Concentrations of Toxic Substances: An Experimental Approach. *Environmental Toxicology*. 16(7), 50–67.

- De Jesús-Campos, D., López-Elías, J.A., Medina-Juarez, L.Á., Carvallo-Ruiz, G., Fimbres-Olivarria, D., & Hayano-Kanashiro, C. 2020. Chemical composition, fatty acid profile and molecular changes derived from nitrogen stress in the diatom *Chaetoceros muelleri*. *Aquaculture Reports*, 16, 100281.
- Erfianti, T., Maghfiroh, K. Q., Amelia, R., Kurnianto, D., Sadewo, B. R., Marno, S., Devi, I., Dewayanto, N., Budiman, A., & Suyono, E. A. 2023. Nitrogen sources affect the growth of local strain *E. gracilis* sp. isolated from Dieng Peatland, Central Java, Indonesia, and their potential as bio-avtur. *In IOP Conference Series: Earth and Environmental Science* 1151(1): 012059).
- Erfianti, T., Daryono, B. S., Budiman, A., & Suyono, E. A. 2024. Growth and Metabolite Enhancement of Acidophile *E. gracilis* sp. Isolated from Indonesia under Different Photoperiod Cycles. *Scientific Journal of Fisheries & 50 Marine/Jurnal Ilmiah Perikanan dan Kelautan*, 16(1):15-30.
- Ehrenberg, C. G. 1830. Neue Beobachtungen über blutartige Erscheinungen in Aegypten, Arabien und Sibirien, nebst einer Uebersicht und Kritik der früher bekannten. *Annalen der Physik und Chemie*, Ser. 2(8), 477 – 514.
- Elloumi, W., Jebali, A., Maalej, A., Chamkha, M., & Sayadi, S. 2020. Effect of mild salinity stress on the growth, fatty acid and carotenoid compositions, and biological activities of the thermal freshwater microalgae *Scenedesmus* sp. *Biomolecules*, 10(11), 1576.
- Fakhri, M., Antika, W., Wilujeng Ekawati, A., Nasrullah, D., & Arifin, B. 2020. Pertumbuhan, Kandungan Pigmen, dan Protein *Spirulina platensis* yang Dikultur Pada $\text{Ca}(\text{NO}_3)_2$ Dengan Dosis yang Berbeda. *Journal of Aquaculture and Fish Health*, 9(1), 38–47.
- Filatov, V. A., Ilin, E. A., Kulyak, O. Y., & Kalenikova, E. I. 2023. Development and Validation of a Gas Chromatography-Mass Spectrometry Method for the Analysis of the Novel Plant Based Substance with Antimicrobial Activity. *Antibiotics (Basel)*. 12(10), 1558.
- Gıdıık B. 2021. Antioxidant, Antimicrobial Activities and Fatty Acid Compositions of Wild *Berberis* spp. by Different Techniques Combined with

- Chemometrics (PCA and HCA). *Molecules (Basel, Switzerland)*, 26(24), 7448.
- Grossman, A. R., Bhaya, D. Apt K. E., & Kehoe, D. M. 1995. Light Harvesting Complexes in Oxygenic Photosynthesis: Diversity, Control, and Evolution. *Annu. Rev. Genet.* 29(1), 231–288.
- Goiris, K., Muylaert, K., Fraeye, I., Foubert, I., De Brabanter, J., & De Cooman, L. 2012. Antioxidant potential of microalgae in relation to their phenolic and carotenoid content. *Journal of Applied Phycology*, 24, 1477–1486.
- Gupta, M. K., Rathod, D. R., & Patel, M. P. 2013. Paramylon: a Potential Candidate as an Antioxidant and Immunostimulant. *Journal of Pharmacy Research*, 6(6), 641-647.
- Häder D.P., & Hemmersbach, R. 2022. *E. gracilis*, a Gravitactic Flagellate of Multiple Usages. *Life*. 12(10), 1522–1555.
- Hemalatha, A., Giridhar, P., & Ravishankar, G. A. 2013. Bioactive compounds from microalgae and its antioxidant properties. *Journal of Applied Phycology*, 25, 963–973.
- Hendra, H. S. Moeljopawiro & Nuringtyas T. R. 2016. Antioxidant and Antibacterial Activities of Agarwood (*Aquilaria malaccensis* Lamk.) Leaves, *AIP Conference Proceedings*. 11(13), 1-9.
- Huang, Y., Wan, X., Zhao, Z., Liu, H., Wen, Y., Wu, W., Ge, X., & Zhao, C. 2023. Metabolomic Analysis and Pathway Profiling of Paramylon Production in *E. gracilis gracilis* Grown on Different Carbon Sources. *International Journal of Biological Macromolecules*, 246(1), 1-10.
- Huang, Z., Shen, L., Wang, W., Zhang, D., Guan, X., Bai, J., Ma, W., & Kuang, T. (2021). Structure of photosystem I-LHCI-LHCII from the green alga *Chlamydomonas reinhardtii* in State 2. *Nature Communications*, 12, 1100.
- Inwongwan, S., Kruger, Nj., Ratcliffe, G., & Nell, ECO. 2019. *E. gracilis* Central Metabolic Pathways and Their Subcellular Locations. *Metabolites*, 9(6), 115-139.
- Inui, H., Miyatake, K., Nakano, Y., Kitaoka, S., & Shozaburo. 1982. Wax ester fermentation in *E. gracilis gracilis*. *FEBS Letters*, 150(1), 89–93.

- Irianti, T., A. Puspitasari, & E. Suryani. 2011. Aktivitas Penangkapan Radikal 2,2-Difenil-1-Pikrilhidrazil oleh Ekstrak Etanolik Batang Brotowali (*Tinospora crispa* (L.) Miers) dan Fraksi – Fraksinya. *Majalah Obat Tradisional*. 16 (3), 138 – 144.
- Irhamni, Elvitriana, & Viena, V. 2014. Kultivasi Mikroalga Hijau Pada Sumber Nitrogen Berbeda Untuk Ekstraksi Lipida. *Jurnal Purifikasi*, 14(2), 99–105.
- Karseno I. Handayani, & Setyawati. 2013. Aktivitas dan Stabilitas Antioksidan Ekstrak Pigmen Alga *Oscillatoria sp.* *Jurnal Agritech Universitas Jenderal Soedirman*. 33 (4), 371-376.
- Kawaroe, M., Prartono, T. A. Sunuddin, S. D., Wulan, & Augustine, D. 2010. *Mikroalga Potensi dan Pemanfaatannya untuk Produksi Bio Bahan Bakar*. Bogor, IPB Press.
- Kim, Y. S., Jung, C. J., & Kang, K. H. 2020. Antioxidant and Anti-Inflammatory Activities of Paramylon Extracted from *E. gracilis gracilis*. *Food Science and Biotechnology*, 29(3), 335-341.
- Kottuparambil, S., Thankamony, R. L., & Agusti, S. 2019. *E. gracilis* as A Potential Natural Source of Value-added Metabolites. A review. *Algal Research*, 37(4), 154-159.
- 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.
- Li, S., Li, X., & Ho, S.-H. 2022. Microalgae as a Solution of Third World Energy Crisis for Biofuels Production from Wastewater toward Carbon Neutrality: An Updated Review. *Chemosphere*, 291(Pt 1), 132863.
- Li, L., Zhu, L., Li, X., Dong, S. and Qin, X. 2025, Structural Insights and Challenges in the Supercomplexes Formed by Photosystem I in Phototrophs. *Plant, Cell & Environment*, 159, 0140-7791.
- Lee, E., Jalalizadeh, M., & Zhang, Q. 2015. Growth Kinetic Models for Microalgae Cultivation: A review. *Algal Research*, 12(4), 497-512.
- Mahapatra, D. M., Chanakya, H. N., & Ramachandra, T. V. 2013. *E. gracilis Sp.* As a Suitable Source of Lipids for Potential Use as Biofuel and Sustainable Wastewater Treatment. *Journal of Applied Phycology*, 25(3), 855–865.

- Mardiansyah, D. 2023. Pengaruh Penambahan Brasinolid terhadap Pertumbuhan dan Kandungan Metabolit pada *E. gracilis*(Unpublished Thesis). Universitas Gadjah Mada. Yogyakarta.
- Mata, T. M., Martins, A. A., & Caetano, N. S. 2010. Microalgae for biodiesel production and other applications: A review. *Renewable and Sustainable Energy Reviews*, 14(1), 217–232.
- Matsuda, Y., & Colman, B. 1995. Induction of CO₂ and bicarbonate transport in the green alga *Chlorella ellipsoidea*: Influence of external pH and inorganic carbon status. *Proceedings of the National Academy of Sciences*, 92(10), 4273–4277.
- McGinty, D., Letizia, C.S., & Api, A.M. 2010. Fragrance material review on phytol. *Food and Chemical Toxicology*, 48(3), S59–S63.
- Megarusti, D. 2018. Optimasi Pemanenan Mikroalga dengan Metode Filtrasi : Studi Kasus di IPAL ITDC Bali (Unpublished Thesis). Universitas Gadjah Mada. Yogyakarta.
- Morais, K. C. C., Conceição, D., Vargas, J. V. C., Mitchell, D. A., Mariano, A. B., Ondonez, J. C., Galli-Terasawa, L. V., & Kava, V. M. 2021. Enhanced Microalgae Biomass and Lipid Output for Increased Biodiesel Productivity. *Renewable Energy*, 16(3), 138-145.
- Mousavi, M., Mehrzad, J., Najafi, M. F., Zhaiani, R., & Shamsian, S. A. A. 2022. Nitrate and ammonia: Two key nitrogen sources for biomass and phycocyanin production by *Arthrospira (Spirulina) platensis*. *Journal of Applied Phycology*, 34, 2271–2281.
- Novianti, T., Zainuri, M., & Widowati, I. 2019. Aktivitas Antioksidan dan Identifikasi Golongan Senyawa Aktif Ekstrak Kasar Mikroalga *Chlorella vulgaris* yang Dikultivasi Berdasarkan Sumber Cahaya yang Berbeda. *Barakuda* 45, 1(2), 72–87.
- Nurafifah, I., Hardianto, M. A., Erfianti, T., Amelia, R., Kurnianto, D., & Suyono, E. A. 2023. The effect of acidic pH on chlorophyll, carotenoids, and carotenoid derivatives of *E. gracilis* sp. as antioxidants. *AACL Bioflux*, 16(4), 2391–2401.
- Pratiwi, N.T.M., Krisanti, M., Ayu, I.P., Iswantari, A. dan Apriadi, T., 2015.

- Serapan kalsium dan nutrien oleh alga berfilamen *Spirogyra sp.* pada lama penyinaran berbeda. *Limnotek*, 22(1), 96-105.
- Rahayu, Y. C., Setiawatie, E. M., Rahayu, R. P., & Ramadan, D. E. 2023. Analysis of Antioxidant and Antibacterial Activity of Cocoa Pod Husk Extract (*Theobroma cacao* L.). *Dental Journal*, 56(4), 220–225.
- Regista, A., Litaay, M. dan Umar, M.R., 2017. Pengaruh pemberian vermikompos cair *Lumbricus rubellus* Hoffmeister pada pertumbuhan *Chlorella sp.* BIOMA: *Jurnal Biologi Makassar*, 2(1),1-8.
- Reitz, R. C., and Moore, G. S. 1972. Effects of Changes in the Major Carbon Source on the Fatty Acids of *E. gracilis gracilis*. *Lipids* 7 (3), 217–220.
- Sarker, S. D. and L. Nahar. 2012. *Natural Products Isolation: Methods in Molecular Biology*. Vol. 864. Springer Science. Dordrecht, pp: 27 – 34.
- Sarada, R., Tripathi, U., & Ravishankar, G. A. 2002. Influence of stress on astaxanthin production in *Haematococcus pluvialis*. *Journal of Microbiology and Biotechnology*, 12(5), 829–834.
- Schwab, W., Davidovich-Rikanati, R., & Lewinsohn, E. 2008. Biosynthesis of plant-derived flavor compounds. *The Plant Journal*, 54(4), 712–732.
- Singh, S., Kate, B. N., & Banerjee, U. C. 2005. Bioactive compounds from cyanobacteria and microalgae: An overview. *Critical Reviews in Biotechnology*, 25(3), 73–95.
- Sedjati, S., Supriyantini, E., Wulandari, S. Y., & Sulastri, N. I. 2023. Peningkatan Kadar Fenolik Total dari *Chlorella sp.* Menggunakan Cekaman Radiasi Ultraviolet-B. *Jurnal Kelautan Tropis*, 26(1), 49-58.
- Suminto. 2005. *Budidaya Pakan Alami, Microalgae, dan Rotifer*. Universitas Diponegoro. Semarang.
- Sun, X., Cao, Y., Xu, H., Liu, Y., Song, S., & Li, L. 2020. Effect of nitrogen starvation on biochemical composition and antioxidant activity of *Chlorella vulgaris*. *Scientific Reports*, 10, 12546.
- Tanno, Y., Kato, S., Takahashi, S., Tamaki, S., Takaichi, S., Kodama, Y., Sonoike, K., & Shinomura, T. 2020. Light dependent accumulation of β -carotene enhances photo-acclimation of *E. gracilis gracilis*. *Journal of Photochemistry and Photobiology*, 209, 111950.

- Takeyama, H., A. Kanamaru, Y. Yoshino, H. Kakuta, Y. Kawamura, & Matsunaga, T. 1997. Production of Antioxidant Vitamins, β -carotene, Vitamin C, and Vitamin E, by Two-Step Culture of *E. gracilis gracilis* Z. *Biotechnology and Bioengineering*, 53(3), 185–190.
- Toru, M., Tang, H., Ma, H., Holland, T. C., Ng, K. Y. S., & Salley, S. O. (2011). Effect of nutrients on growth and lipid accumulation in the green algae *Dunaliella tertiolecta*. *Bioresource Technology*, 102(2), 1649–1655.
- Viena, V. 2014. Kultivasi Mikroalga Hijau pada Sumber Nitrogen Berbeda Untuk Ekstraksi Lipida. *Jurnal Purifikasi*, 14(2), 99 – 105.
- Wang, H., Zhang, L., Ma, X., & Li, P. 2021. The role of microalgae in oxidative stress defense: Antioxidant capacity, related enzymatic activities, and potential applications. *Algal Research*, 54, 102193.
- Wang, Y., Seppänen-Laakso, T., Rischer, H., & Wiebe, M. G. 2018. *Euglena gracilis* growth and cell composition under different temperature, light and trophic conditions. *PLOS ONE*, 13(4), 195329.
- Widyantoro, H., Wijayanti, M. dan Dwinanti, S.H., 2018. Modifikasi media *Spirulina platensis* sebagai upaya pemanfaatan air limbah budidaya ikan lele. *Jurnal Akuakultur Rawa Indonesia*, 6(2), pp. 153-164.
- Xie, W., Li, X., Xu, H., Chen, F., Cheng, K. W., Liu, H., & Liu, B. 2023. Optimization of Heterotrophic Culture Conditions for the Microalgae *E. gracilis gracilis* to Produce Proteins. *Marine drugs*, 21(10), 519.
- Zhang, Y., Ye, X., Guo, J., & Hu, Z. 2017. Paramylon from *E. gracilis sp. gracilis* Induces Apoptosis in Human Lung Cancer Cells Through Activating p53 Pathway. *Biomedicine & Pharmacotherapy*, 91(8), 775-780.
- Zeng, M., Hao, W., Zou, Y., 2016. Fatty acid and metabolomic profiling approaches differentiate heterotrophic and mixotrophic culture conditions in a microalgal food supplement 'Euglena'. *BMC Biotechnology*, 16, 49.
- Zerveas, S., Mente, M. S., Tsakiri, D., & Kotzabasis, K. 2021. Microalgal photosynthesis induces alkalization of aquatic environment as a result of H^+ uptake independently from CO_2 concentration – New perspectives for environmental applications. *Journal of Environmental Management*, 289, 112546