DAFTAR PUSTAKA

Abdurrachman, O., Mutiara, M., Buchori, L. 2013. Pengikatan Karbon Dioksida dengan Mikroalga (*Chlorella vulgaris*, *Chlamydomonas* sp., *Spirullina* sp.) dalam Upaya untuk Meningkatkan Kemurnian Biogas. *Jurnal Teknologi Kimia dan Industri*,2(4): 212-216.

Abreu, A. P., Martins, R., Nunes, J. 2023. Emerging Applications of *Chlorella* sp. and *Spirulina* (*Arthrospira*) sp. *Bioengineering*, 10(8):955. https://doi.org/10.3390/bioengineering10080955.

Ainurrohmah, S., Sudarti, S. 2022. Analisis Perubahan Iklim dan *Global Warming* yang Terjadi sebagai Fase Kritis. *Jurnal Pendidikan Fisika dan Fisika Terapan*, 3(3): 1-10.

Almomani, F. *et al.* 2019. Intergraded wastewater treatment and carbon bio-fixation from flue gases using *Spirulina platensis* and mixed algal culture. *Process Saf. Environ. Prot.* 124, 240–250.

Anggadhania, L., dan Nugroho, A. P. 2017. Efek Laju Karbondioksida (CO_2) Terhadap Morfologi dan Laju Pertumbuhan Populasi *Spirulina platensis* (Gomont). *Jurnal Faloak*, 1(2): 75-84.

Ari, W.K., Satwiko, S., & Fachrizal, N. 2012. Ekstraksi Minyak Nabati dari Mikroalga *Scenedessmus* sp. Menggunakan Gelombang Ultrasonik. *Seminar Nasional Fisika*. Universitas Negeri Jakarta.

Baker, M., Blackman, S., Cooper, R., Smartt, K., Walser, D., Boland, M., Kolar, P., Beck, A. E., Chinn, M. S. 2021. Exploratory analysis of *Spirulina plantesis* LB 2340 growth in varied concentrations of anaerobically digested pig effluent (ADPE). *Heliyon*, 7(9): e08065.

Bennett A, Bogobad L, Complementary chromatic adaptation in a fi lamentous blue-green alga. *Journal of Cell Biology*. 1973; 58(2): 419–435.

Berger, Paul D., Robert, E., Maurer., Giovana, B., Celli. (2018*). "Two-Level Factorial Designs." In Experimental Design*, 295–342. Cham: Springer International Publishing. doi: 10.1007/978-3-319-64583-4_9

Bold, H. C., & M.J. Wynne. 1985. *Introduction To The Alga Structure And Reproduction*. Englewood, New Jersey: Prentice Hall Inc.

Brock, T. D. and M. T. Madigan. 2018. *Biology of Microorganisms 14th Ed.Inc.* New Jersey: Prentice-Hall International.

Buwono, N. R., & Nurhasanah, R. Q. 2018. Studi Pertumbuhan Populasi *Spirulina* sp. pada Skala Kultur yang Berbeda. *Jurnal Ilmiah Perikanan dan Kelautan*, 10(1): 26-33.

Chen, C. Y., Kao, P. C., Tsai, C. J., Lee, D. J., and Chang, J. S. 2013. Engineering strategies for simultaneous enhancement of C-phycocyanin production and CO_2 fixation with *Spirulina platensis*. *Bioresour. Technol.* 145, 307-312. doi: 10.1016/j.biortech.2013.01.054.

Choudhary, P., Bhattacharya, A., Prajapati, S.K., Kaushik, P., Malik, A. 2015. *Chapter 32-Phycoremediation-coupled biomethanation of microalgal biomass. In: Kim S-K, editor. Handbook of marine microalgae*, 483-499. Boston: Academic Press.

Chrismadha, T., & Waluya, R. A. 2013. Growth and Phycocyanin Productivity of *Spirulina fusiformis* under Various Light Regimes. *Annales Bogorienses*, 17(1):1-6.

Christwardana, M; Nur; Hadiyanto. 2013. *Spirulina platensis*: Potensinya sebagai Bahan Pangan Fungsional. *Jurnal Aplikasi Teknologi Pangan*, 2(1).

Chunzuk, E.A., Grigorenko, A.V., Kiseleva, S.V., Chernova, N.I., Vlaskin, M.S., Ryndin, K.G., Butyrin, A.V., Ambaryan, G.N. 2023. Effects of Light Intensity on the Growth and Biochemical Composition in Various Microalgae Grown at High CO_2 Concentrations. *Plants*, 12:3876. https://doi.org/10.3390/plants12223876.

CSIRO. 1991. Commonwealth Scientific and Industrial Research Organization. Australia.

Damyanti, A., Megawati. 2020. *Kinetika Hidrolisis Mikroalga dengan Enzim*. Yogyakarta: Deepublish Publisher.

Engelen, A., Sugiyono, Budijanto, S. 2015. Optimasi Proses dan Formula Pada Pengolahan Mi Sagu Kering (*Metroxylon sagu*). *AGRITECH*, 35(4):359-367.

García J L, de Vicente M., and Galán B. 2017. Microalgae, old sustainable food and fashion nutraceuticals. *Microb Biotechnol*, 2783.

Gao, K., Xue, C., Yang , M., Li, L., Qian, P., Gao, Z., Gao, Z., Deng, X. 2022. Optimization of light intensity and photoperiod for growing *Chlorella sorokiniana* on cooking cocoon wastewater in a bubble-column bioreactor. Algal Research, 62. https://doi.org/10.1016/j.algal.2021.102612.

Gim, G.H.; Ryu, J.; Kim, M.J.; Kim, P.I.; Kim, S.W. 2016. Effects of carbon source and light intensity on the growth and total lipid production of three

microalgae under different culture conditions. *J. Ind. Microbiol. Biotechnol*, 43:605–616.

Giossi C., Cartaxana P., Cruz S. Photoprotective role of neoxanthin in plants and algae. *Molecules*. 2020;25:4617. doi: 10.3390/molecules25204617.

GLOSOLAN. 2019. *Standard operating procedure for soil organic carbon (Walkley-Black method: Tritaion and colorimetric method)*. Food and Agriculture Organization of the United Nations, Philippines: Global Soil Partnership.

Haryati, R., 2008. Pertumbuhan dan biomassa *Spirulina* sp. dalam skala laboratoris. *Jurnal BIOMA*, 10(1): 19-22.

Hendrawan, Y., Susilo, B., Putranto, A. W., Riza, D. F. A., Maharani, D. M., Amri, M. N. 2016. Optimasi dengan Algoritma RSM-CCD Pada Evaporator Vakum Waterjet dengan Pengendali Suhu *Fuzzy* Pada Pembuatan Permen Susu. *AGRITECH*, 36(2): 226-232.

Hikmawan, B. D., Praharyawan, S., Kintoko. 2022. Optimalisasi Produksi Fikosianin pada Sianobakteria Laut BTM 11 dan Uji Aktivitas Antioksidannya. *Jurnal Ilmu Kefarmasian Indonesia*, 20(2):217-224.

Ilhamdy, A. F., Jumsurizal., Darwin., Tambunan, Y. F. S. 2020. Kultivasi *Spirulina platensis* Menggunakan Media Walne dalam Skala Laboratorium. *MARINADE*, 3(2): 114-120.

Jacek, P., Mariuz, S., Jaroslaw, D., Aneta, G. M., Malgorzata, S. 2015. The Parametric RSM Model with Higher Order Terms for the Meat Tumbler Machine Process. *Solid State Phenomena*, 235:37-44.

Jaiswal, K. K., Dutta, S., Banerjee, I., Pohrmen, C. B., Kumar, V. 2021. Photosynthetic microalgae–based carbon sequestration and generation of biomass in biorefinery approach for renewable biofuels for a cleaner environment. *Biomass Conversion and Biorefinery*, 13, 7403–7421. https://doi.org/10.1007/s13399-021-01504-y.

Jeong, Y., Choi, WY., Park, A. 2021. Marine cyanobacterium *Spirulina maxima* as an alternate to the animal cell culture medium supplement. *Sci Rep* 11, 4906. https://doi.org/10.1038/s41598-021-84558-2.

Kabinawa, K. 1994. *Spirulina Ganggang Penggempur Aneka Penyakit*. Jakarta: Agromedia Pustaka.

Kao, C. Y. *et al.* 2014. Utilization of carbon dioxide in industrial flue gases for the cultivation of microalga *Chlorella* sp. *Bioresour. Technol.* 166: 485–493.

Kawaroe, M., Tri P., Adriani S., Dahlia Wulan S., & Dina A. 2010. *Mikroalga: Potensi dan Pemanfaatannya Untuk Produksi Bio Bahan Bakar*. Bogor: IPB Press.

Kim, S.-G., Choi, A., Ahn, C.-Y., Park, C.-S., Park, Y.-H., & Oh, H.-M. 2005. Harvesting of *Spirulina platensis* by cellular flotation and growth stage determination. *Letters in Applied Microbiology*, 40(3):190–194. doi:10.1111/j.1472-765x.2005.01654.x

Kumar, A.; Ergas, S.; Yuan, X.; Sahu, A.; Zhang, Q.; Dewulf, J.; Malcata, F.X.; van Langenhove, H. 2010. Enhanced CO_2 Fixation and Biofuel Production via Microalgae: Recent Developments and Future Directions. *Trends Biotechnol*, 28: 371–380.

Kumar, K., Nag, C., Nayak, B., Lindblad, P. & Das, D. 2011. Development of suitable photobioreactors for CO_2 sequestration addressing global warming using green algae and cyanobacteria. *Bioresour. Technol.* 102, 4945–4953.

Kumar, M., Sundaram, S., Gnansounou, E., Larrouche, C., Thakur, I. S. 2018. Carbon dioxide capture, storage and production of biofuel and biomaterials by bacteria: A review. *Bioresource Technology*. 247, 1059-1068.

Kurniawati, R., Praharyawan, S., Panji, T. 2020. Optimasi nisbah natrium nitrat: urea dan konsentrasi nitrogen pada kultivasi Spirulina platensis untuk produksi protein dan pigmen fikosianin. *Menara Perkebunan*, 88(2):130-140.

Ladygin V.G. 2014. Ways of biosynthesis, localization, metabolism and functions of carotenoids in chloroplasts of different types of algae. *Issues Mod. Algol.* http://www.algology.ru/52.

Laluce, C., Tognolli, J.O., Oliveira, K.F.D., Souza, C.S. dan Morais, M.R. 2009. Optimization of temperature, sugar concentraion and inoculum size to maximize ethanol production without significant decrease in yeast cell viability. *Applied Microbiology and Biotechnology*, 83: 627-637.

Le B., Williams P.J., Laurens L.M.L. 2010. Microalgae as biodiesel & biomass feedstocks: Review & analysis of the biochemistry, energetics & economics. *Energy Environ. Sci.* 3:554–590. doi: 10.1039/B924978H.

Li, G.; Xiao, W.; Yang, T.; Lyu, T. 2023. Optimization and Process Effect for Microalgae Carbon Dioxide Fixation Technology Applications Based on Carbon Capture: A Comprehensive Review. *Journal of Carbon Reseacrh*, 9(1):35. https://doi.org/10.3390/c9010035.

Lima, Gustavo M.; Teixeira, Pedro C.N.; Teixeira, Cláudia M.L.L.; Filócomo, Diego; Lage, Celso L.S. 2018. Influence of spectral light quality on the

pigment concentrations and biomass productivity of *Arthrospira platensis*. *Algal Research*, 31, 157–166. https://doi:10.1016/j.algal.2018.02.012.

Liu, J., Yuan C., Hu, G., Li, F. 2012. Effects of light intensity on the growth and lipid accumulation of microalga *Scendesmus* sp. 11-1 under nitrogen limitation. *Appl. Biochem. Biotechnol*, 166: 2127-2137.

Lowry, O.H., Rosebrough, N.J., Farr, A.L., Randall, R.J., 1951. Protein measurement with the Folin phenol reagent. *J. Biol. Chem.* 193, 265–275.

Lopez, C. V. G., Garcia, M. D. C. C., Fernandez, F. G. A., Bustos, C. S., Chisti, Y., Sevilla, J. M. F. 2010. Protein measurements of microalgal and cyanobacterial biomass. *Bioresource Technology*, 101:7587-7591.

Lupatini, A. L., Bispo, L. de O., Colla, L. M., Costa, J. A. V., Canan, C., & Colla, E. 2017. Protein and carbohydrate extraction from *S. platensis* biomass by ultrasound and mechanical agitation. *Food Reasearch International*, 99, 1028-1035.

Maltsev Y, Maltseva K, Kulikovskiy M, Maltseva S. 2021. Influence of Light Conditions on Microalgae Growth and Content of Lipids, Carotenoids, and Fatty Acid Composition. Biology (Basel). 10(10):1060. doi: 10.3390/biology10101060. PMID: 34681157; PMCID: PMC8533579.

Manzolini, G. *et al.* 2020. Techno-economic assessment of SEWGS technology when applied to integrated steel-plant for CO_2 emission mitigation. *Int. J. Greenh. Gas Control* 94, 102935.

Maria, Paula, da, Costa, Monteiro., Rosa, Helena, Luchese., Theresinha, Monteiro, Absher. 2010. Effect of three different types of culture conditions on *Spirulina maxima* growth. *Brazilian Archives of Biology and Technology*, 53(2):369-373. doi: 10.1590/S1516-89132010000200016.

Marrez, D.A., Mohamed, M.N., Yousef, Y.S., Zakaria, Y.D. & Aziz, M.H. 2014. Evaluation of Chemical Composition for *Spirulina platensis* in Different Culture Media. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, 5(4): 1161 – 1171.

Masojidek, J., Torzillo, G., Koblížek, M. 2013. *Photosynthesis in microalgae, in: Handbook of Microalgal Culture, John Wiley & Sons*. UK: Ltd. Oxford.

Montone, C. M., Capriotti, A. L., Cavaliere, C., Barbera, G. La, Piovesana, S., Chiozzi, R. Z., & Lagana, A. (2018). Peptidomic strategy for purification and identification of potential ACE- inhibitory and antioxidant peptides in Tetradesmus obliquus microalgae. *Analytical and Bioanalytical Chemistry*, 410, 3573–3586.

Morales, M., Sanchez, L., & Revah, S. 2018. The impact of environmental factors on carbon dioxide fixation by microalgae. *FEMS Microbiology Letters*, 365(3), https://doi.org/10.1093/femsle/fnx262.

Muchammad, A., Kardena, E., & Rinanti, A. 2013. Pengaruh Intensitas Cahaya Terhadap Penyerapan Gas Karbondioksida Oleh Mikroalga Tropis *Ankistrodesmus* sp. dalam Fotobioreaktor. *Jurnal Teknik Lingkungan*, 19(2):103-116.

Nancucheo, I., & Johnson, D.B. 2012. Acidophilic algae isolated from mineimpacted environments and their roles in sustaining heterotrophic acidophiles. *Front Microbiol*, 3:325.

Niangoran NUF, Buso D, Zissis G, Prudhomme T. 2021. Influence of light intensity and photoperiod on energy efficiency of biomass and pigment production of *Spirulina (Arthrospira platensis)*. *Oilseeds & fats Crops and Lipids*, 28(37): 1-8.

Nicoletti, M. 2016. Review Microalgae Nutraceuticals. *Foods*, 5(54); doi:10.3390/foods5030054.

Norbawa, P., Ervia Y., & Widianingsih. 2013. Pengaruh Perbedaan Periode Aerasi Karbon dioksida terhadap Laju Pertumbuhan dan Kadar Total Lipid pada Kultur *Nannochloropsis oculate*. *Journal of Marine Research*, 2(3): 6-14.

Nowicka-Krawczyk, P., Mühlsteinová, R. & Hauer, T. 2019. Detailed characterization of the *Arthrospira* type species separating commercially grown taxa into the new genus *Limnospira* (Cyanobacteria). *Sci Rep* 9, 694. https://doi.org/10.1038/s41598-018-36831-0

Park, J., and Dinh, T. B. 2019. Contrasting effects of monochromatic LED lighting on growth, pigments and photosynthesis in the commercially important cyanobacterium Arthrospira maxima. Bioresource Technology, 291.

Park, Y. I. (David)., Labrecque, M., Lavoie, J. M. 2013. Influence of Elevated CO2 and Municipal Wastewater Feed on the Productivity, Morphology, and Chemical Composition of *Arthrospira (Spirulina) platensis*. *ACS Sustainable Chemistry & Engineering*, 1(11): 1348-1356. doi:10.1021/SC400230Q.

Prayitno, Joko. 2016. Pola Pertumbuhan dan Pemanenan Biomassa dalam Fotobioreaktor Mikroalga untuk Penangkapan Karbon. *Jurnal Teknologi Lingkungan*, 17(1): 45-52.

Putra, D. J., N. Hasnunidah, dan T. Jalmo. 2019. Pengaruh *argument driven inquiry* terhadap keterampilan berpikir kritis pada materi sistem pencernaan. *Jurnal Bioterdidik*, 7(1):1–7.

Razzak, S.A., Ilyas, M., Ali, S.A.M., Hossain, M.M. 2015. Effects of CO2 Concentration and pH on Mixotrhophic Growth of *Nannochloropsis oculata*. *Appl. Bichem. Biotechnol*, 176: 1290-1302.

Ridlo, A., Sedjati, S., & Supriyantini, E. 2015. Aktivitas Anti Oksidan Fikosianin Dari Spirulina Sp. Menggunakan Metode Transfer Elektron Dengan DPPH (*1,1-difenil-2-pikrilhidrazil*). *Jurnal Kelautan Tropis*, 18(2):58-63.

Samiun, W. S., Ashari, S. E., Salim, N., Ahmad, S. 2020. Optimization of Processing Parameters of Nanoemulsion Containing Aripiprazole Using Response Surface Methodology. *International Journal Nanomedicine*, 9(15): 1585-1594.

Satya, A., Chrismadha, T., Satya, I. A. 2021. Irradiance Optimation for Growing *Spirulina fusiformis*: Biomass, Phycocyanin and Protein Production. *Indonesian Journal of Limnology*, 2(1): 76-85.

Scandalios J.G. 2005. Oxidative stress: Molecular perception and transduction of signals triggering antioxidant gene defenses. *Braz. J. Med. Biol. Res.* 38:995–1014. doi: 10.1590/S0100-879X2005000700003.

Septaria, K., B. A. Dewanti, dan M. Habibbulloh. 2019. Implementasi metode pembelajaran *spot capturing* pada materi pemanasan global untuk meningkatkan keterampilan proses sains. *Prisma Sains : Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, 7(1):27–37.

Setyaningsih, I., Saputra, A. T., dan Uju. 2011. Komposisi Kimia dan Kandungan Pigmen *Spirulina fusiformis* Pada Umur Panen yang Berbeda Dalam Media Pupuk. *Jurnal Pengolahan Hasil Perikanan Indonesia*, 14(1): 63-69.

Shively, J. M., Cannon, G. C., Heinhorst, S., Fuerst, J. A., Bryant, D. A., Gantt, E., Federici, B. A. 2009. Intracellular Structures of Prokaryotes: Inclusions, Compartments and Assemblages. *Encyclopedia of Microbiology*, 404-424.

Silva, S.C., Almeida, T., Colucci, G., Echart, A.S., Manrique, Y.A., Dias, M.M., Barros, L., Fernandes, A., Colla, E., Barreiro, M.F. 2022. *Spirulina* (*Arthrospira platensis*) protein-rich extract as a natural emulsifier for oil-in-water emulsions: Optimization through a sequential experimental design strategy. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 648:129264.

Solovchenko, A.E., Khozin, G.I., Didi, C.S., Cohen, Z., Merzlyak, M.N. 2008. Effects of light intensity and nitrogen starvation on growth, total fatty acids and arachidonic acid in the green microalga *Parietochloris incisa*. *J. Phycol*, 20:245-251.

Sun, Y., Casella, S., Fang, Y., Huang, F., Faulkner, M., Barrett, S., and Liu, L. N. 2016. Light Modulates the Biosynthesis and Organization of Cyanobacterial Carbon Fixation Machinery through Photosynthetic Electron Flow. *Plant Physiology*, 171:530-541.

Tan HT, Khong NMH, Khaw YS, Ahmad SA, Yusoff FM. 2020. Optimization of the Freezing-Thawing Method for Extracting Phycobiliproteins from Arthospira sp. Molecules, 25(17):3894. https://doi.org/10.1016/B978-0-12-814667-5.00016-7.

Thajuddin N, Subramanian G. 2005. Cyanobacterial biodiversity and potential applications in biotechnology. *Current Science*, 89:47–57.

Veza, I., Spraggon, M., Fattah, I. M. R., Idris, M. 2023. Response surface methodology (RSM) for optimizing engine performance and emissions fueled with biofuel: Review of RSM for sustainability energy transition. *Results in Engineering*, 18:101213.

Vonshak, Avigad. 1997. *Spirulina platensis* (*Arthrospira*). Physiology, Cell biology and Biotechnology. Taylor & Francis, London, ISBN 0- 2035-8670-0.

Wan, D., Wu, Q., Kuca, K. 2016. *Nutraceuticals (Efficacy, Safety and Toxicity): Chapter 42 – Spirulina*. USA: Academic press.

Wang, L., Yang, T., Pan, Y., Shi, L., Jin, Y., and Huang, X. 2023. The Metabolism of Reactive Oxygen Species and Their Effects on Lipid Biosynthesis of Microalgae. *Int. J.Mol. Sains*, 24(13), 11041.

Widawati, D., Santosa, G. W., Yudiati, E. 2022. Pengaruh *Pertumbuhan Spirulina platensis* terhadap Kandungan Pigmen beda Salinitas. *Journal of Marine Research*, 11(1): 61-70.

Xie, D., Ji, X., Zhou, Y., Dal, J., He. Y., Sun, H., Guo, Z., Yang, Y., Zheng, X., Chen. B. 2022. *Chlorella vulgaris* Cultivation in Pilot-Scale to Treat Real Swine Wastewater and Mitigate Carbon Dioxide for Sustainable Biodiesel Production by Direct Enzymatic Transesterification. *Bioresour. Technol*, 349, 126886.

Yahya, L., Harun, R., & Abdullah, L. C. 2020. Screening of native microalgae species for carbon fixation at the vicinity of Malaysian coal-fired power plant. *Scientific Reports*, 10(1), 1-14. https://doi.org/10.1038/s41598-020-79316-9.

Yu X, Chen L., and Zhang W. 2015. Chemicals to enhance microalgal growth and accumulation of high-value bioproducts. *Front. Microbiol*, 6:56. doi: 10.3389/fmicb.2015.00056.

Zhao, B., & Su, Y. 2014. Process effect of microalgal-carbon dioxide fixation and biomass production: A review. *Renewable and Sustainable Energy Reviews*, 31: 121-132.

Zhou, W. *et al.* 2017. Bio-mitigation of carbon dioxide using microalgal systems: Advances and perspectives. *Renew. Sustain. Energy Rev.* 76, 1163–1175.

Zhu, B., Xiao, T., Shen, H., Li, Y.., Ma, X., Zhao, Y., and Pan, K. 2021. Effects of CO_2 concentration on carbon fixation capability and production of valuable substances by *Spirulina* in a columnar photobioreactor. *Algal Research*, 56.

Zhu, B., Shen, H., Li, Y., Liu, Q., Jin, G., Han, J., Zhao, Y., and Pan K. 2020. Large-Scale Cultivation of *Spirulina* for Biological CO_2 Mitigation in Open Raceway Ponds Using Purified CO_2 From a Coal Chemical Flue Gas. *Front. Bioeng. Biotechnol.* 7:441. https://doi:10.3389/fbioe.2019.00441.