

DAFTAR PUSTAKA

- Ajala, S.O. and Alexander, M.L. 2020. Assessment of *Chlorella vulgaris*, *Scenedesmus obliquus*, and *Oocystis minuta* for removal of sulfate, nitrate, and phosphate in wastewater. *International of Journal Energy and Environmental Engineering*, 11: 311-326.
- Anwar, A., Dong, R., Bai, L., Yu, X., and Li, Y. 2018. The physiological and molecular mechanism of brassinosteroid in response to stress: a review. *Biological Research*, 51(46): 1-15.
- Arora, N. and Philippidis, G. P. 2021. Insights into the physiology of *Chlorella vulgaris* cultivated in sweet sorghum bagasse hydrolysate for sustainable algal biomass and lipid production. *Scientific reports*, 11: 1-14.
- Asghari, T., Ahmadifard, N., and Nikoo, M. 2023. Effect of phytohormone kinetin on cell density, photosynthetic pigments, antioxidant enzymes, and fatty acid composition of the microalgae *Tetraselmis suecica*. *Aquaculture research*, 1-8.
- Asiandu A. P., Nugroho A. P., Naser A. S., Sadewo B. R., Koereniawan M. D., Buidman A., Siregar U. J., Suwanti L. T., and Suyono A. E. 2022. The effect of tofu wastewater and pH on the growth kinetics and biomass composition of *Euglena* sp. *Current Applied Science and Technology*, 23(23): 1-16.
- Assuncao, J., Batista, A.P., Manoel, J., da Silva, T.L., Marques, P., Reis, A., and Gouveia, L. 2017. CO₂ utilization in the production of biomass and biocompounds by three different microalgae. *Engineering in Life Sciences*, 17: 1126-1135.
- Atteya, A.K.G., El-Serafy, R., El-Zaabalawy, K.M., Elhakem, A., Genaidy, E.A.E. 2022. Brassinolide maximized the fruit and oil yield, induced the

secondary metabolites, and stimulated linoleic acid synthesis of *Opuntia ficus-indica* oil. *Horticulturae*, 8(5): 1-15.

Bajguz A and Czerpak R. 1998. Physiological and Biochemical Role of Brassinosteroids and Their Stucture-Activity Relationship in the Green Alga *Chlorella vulgaris* Beijerinck (Chlorophyceae). *Journal of Plant and Growth Regulation*, 17: 131-139

Bajguz A. 2000. Effect of brassinosteroids on nucleic acid and protein content in cultured cells of *Chlorella vulgaris*. *Plant Physiology and Biochemistry*. 38(3): 209-215.

Bajguz, A. and Piotrowska-Niczyporuk, A. 2014. Interactive effect of brassinosteroids and cytokinins on growth, chlorophyll, monosaccharide and protein content in the green alga *Chlorella vulgaris* (Trebouxiophyceae). *Plant Physiology and Biochemistry*, 80: 176-183.

Bajguz, A. and Piotrowska-Niczyporuk, A. 2014. Interactive effect of brassinosteroids and cytokinins on growth, chlorophyll, monosaccharide and protein content in the green alga *Chlorella vulgaris* (Trebouxiophyceae). *Plant Physiology and Biochemistry*, 80: 176-183.

Barsanti, L., Birindelli, L., and Gualtieri. 2022. Paramylon and Other Biocative Molecules in Micro and Macroalgae. *International Journal of Molecular Science*, 23: 1-15.

Begum, H., Yusoff, F.M.D., Banerjee, S., Khatoon, H., and Shariff, M. 2016. Availability and utilization of pigments from microalgae. *Critical Reviews in Food Science and Nutrition*, 56(13): 1-13.

Bligh, E. G. and Dyer, W. J., 1959. A rapid method of total lipid extraction and purification. *Canadian journal of biochemistry and physiology*, 37(8): 911-917.

- Borowitzka MA (2018) Biology of microalgae. In: Levine IA (eds) Microalgae in health and disease prevention. Academic Press, pp 23-72
- Borowitzka, M. A. 2018. Microalgae in Health and Disease Prevention: Chapter 3 – Biology of Microalgae. Academic Press.
- Bradford, M. M. 1976. A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Analytical Biochemistry*, 72(1-2): 248–254.
- Buetow, D. E. 2011. *Euglena*. In: *Encyclopedia of Life Sciences (ELS)*. John Wiley & Sons, Ltd: Chichester.
- Chandel, N. S. 2021. Carbohydrate Metabolism. *Cold Spring Harbor Perspectives in Biology*, 13(1): 1-16.
- Chizzola, R., Hochsteiner, W., and Hajek, S. 2004. GC analysis of essential oils in the rumen fluid after incubation of *Thuja orientalis* twigs in the Rusitec system. *Research in Veterinary Science*, 76: 77-82.
- Chmur, M. and Bajguz, A. 2021. Brasinolid Enhances the Level of Brassinosteroids, Protein, Pigments, and Monosaccharides in *Wolffia arrhiza* Treated with Brassinazole. *Plants*, 10(7): 1-17.
- Chowdury, K. H., Nahar, N., and Deb, U. K. 2020. The Growth Factors Involved in Microalgae Cultivation for Biofuel Production: A Review. *Computational Water, Energi, and Environmental Engineering*, 9:185-215.
- Croteau, R.B., Davis, E.M., Ringer, K.L., and Wildung, M.R. 2005. (–)-Menthol biosynthesis and molecular genetics. *Naturwissenschaften*, 92: 562–577.
- Divi, U.K. and Krishna, P. 2009. Brassinosteroid: A biotechnological target for enhancing crop yield and stress tolerance. *New Biotechnology*, 26(3-4): 131-136.

- Dods M. N., Kim, E. J, Long, J. R., and Weston, S. C. 2021. Deep CCS: Moving Beyond 90% Carbon Dioxide Capture. *Environmental Science and Technology*, 55: 1-10.
- Doyle, J., Cooper, J. S. 2022. Physiology, Carbon Dioxide Transport. (<https://www.ncbi.nlm.nih.gov/books/NBK532988/>) Diakses tanggal 11 Desember 2022.
- Dubois, M., Gilles, K. A., Hamilton, J. K., Rebers, P. A., and Smith, F. 1956. Colorimetric method for determination of sugars and related substances. *Analytical Chemistry*, 28(3): 350-356.
- 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.
- Friedlingstein, P., Jones, M. W., O'Sullivan, M., Andrew, R. M., Bakker, D. C. E., Hauck, J., Le Quere, C., Peters, G. P., Peters, W., Pongratz, J., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Anthoni, P., Bates, N. R., Becker, M., Bellouin, N., Bopp, L., Chau, T. T. T., Chevallier, F., Chini, L. P., Crinin, M., Currie, K. I., Decharme, B., Djeutchouang, L. M., Dou, X., Evans, W., Feely, R. A., Feng, L., Gasser, T., Gilfilan, D., Gkritzalis, T., Grassi, G., Gregor, L., Gruber, N., Gurses, O., Harris, I., Houghton, R. A., Hurtt, G. C., Ilyina, T., Luijkx, I. T., Jain, A., Jones, S. D., Kato, E., Kennedy, D., Goldewijk, K. K., Knauer, J., Korsbakken, J. I., Kortzinger, A., Landschutzer, P., Lauvest, S. K., Lefevre, N., Lienert, S., Liu, J., Marland, G., McGuire, P. C., Melton, J. R., Munro, D. R., Nabel, J. E. M. S., Nakaoka, Shin-Ichiro, Niwa, Y., Ono, T., Pierrot, D., Poulter, B., Rehder, G., Resplandy, L., Robertson, E., Rodenbeck, C., Rosan, T. M., Schwinger, J., Schwingshackl, C., Seferian, R., Sutton, A. J., Sweeney, C., Tanhua, T., Tans, P. P., Tian, H., Tilbrook, B., Tubiello, F., van der Werf, G. R., Vuichard, N., Wada, C., Wanninkhof, R., Watson, A. J., Willis, D.,

- Wiltshire, A. J., Yuan, W., Yue, C., Yue, X., Zaehle, S., and Zeng, J. 2022. Global Carbon Budget 2021. *Earth System Science Data*, 14: 1917-2005.
- Gao, Y., Jiang, T., Xiang, Y., He, X., Zhang, Z., Wen, S., Zhang, J. 2021. Epi-brassinolide positively affects chlorophyll content and dark-reaction enzymes of maize seedlings. *Phyton-International Journal of Experimental Botany*, 90(5): 1465-1476.
- Gatamaneni, B. L., Orsat, V., and Lefsrud, M. 2018. Factors Affecting Growth of Various Microalgal Species. *Environmental Engineering Science*, 35(10): 1037-1048.
- Gissibl, A., Sun, A., Care, A., Nevalainen, H., Sunna, A. 2019. Bioproducts from *Euglena gracilis*: Synthesis and applications. *Frontiers in Bioengineering and Biotechnology*, 7(108): 1-16.
- González-Camejo, J., Aparicio, S., Ruano, M. V., Borrás, L., Barat, R., and Ferrer, J. 2019. Effect of ambient temperature variations on an indigenous microalgaenitrifying bacteria culture dominated by *Chlorella*. *Biosource Technology*, 290: 1-10.
- Guo, C., Shen, Y., Li, M., Chen, Y., Xu, X., Chu, J., Yao, X. 2022. Principal Component Analysis to Assess the Changes of Yield and Quality of Two *Pinellia ternata* Cultivars After Brassinolide Treatments. *Journal of Plant Growth Regulation*, 41: 2185-2197.
- Gyamfi, D., Awuah, E. O., and Owsu, S. 2019. *The Molecular Nutrition of Fats: Chapter 2 – Lipid Metabolism: An Overview*. Academic Press.
- Harrewijn P, van Oosten AM, Piron PGM (2000) Production of terpenes and terpenoids. In Harrewijn P, van Oosten AM, Piron PGM (eds) Natural terpenoids as messengers. Springer, Dordrecht, pp 11-57

- Herrero, O., Ramon, D., and Orejas, M. 2008. Engineering the *Saccharomyces cerevisiae* isoprenoid pathway for de novo production of aromatic monoterpenes in wine. *Metabolic Engineering*, 10: 78-86.
- Hu, Y., Bao, F., and Li, J. 2000. Promotive effect of brassinosteroids on cell division involves a distinct CycD3-induction pathway in *Arabidopsis*. *The Plant Journal*, 24(5): 693-701.
- Hu, Z., Lin, L., Li, H., Li, P., Weng, Y., Zhang, C., Yu, A., and Xiao, D. 2020. Engineering *Saccharomyces cerevisiae* for production of the valuable monoterpene d-limonene during Chinese Baijiu fermentation. *Metabolic Engineering And Synthetic Biology*, 45: 511-523.
- Huang, Y., Wan, X., Zhao, Z., Liu, H., Wen, Y., Wu, W., Ge, X., and Zhao, C. 2023. Metabolomic analysis and pathway profiling of paramylon production in *Euglena gracilis* grown on different carbon sources. *International Journal of biological macromolecules*, 246: 1-10.
- Iftikhar, A., Ali, S., Yasmeen, T., Arif, M.S., Zubair, M., Rizwan, M., Alhaithloul, H.A.S., Alayafi, A.A.M., and Soliman, M.H. 2019. Effect of giberellic acid on growth, photosynthesis and antioxidant defense system of wheat under zinc oxide nonparticle stress. *Environmentall pollution*, 254: 1-9.
- Inui, H., Ishikawa, T., and Tamoi, M. 2017. *Euglena: Biochemistry, Cell and Molecular Biology: Chapter 13 - Wax Ester Fermentation and Its Application for Biofuel Production*. Springer International Publishing.
- Inwongwan, S., Kruger, Nj. , Ratcliffe, G., and Nell, ECO. 2019. Euglena Central Metabolic Pathways and Their Subcellular Locations. *Metabolites*, 9(6): 115-139.
- Jacob-Lopes, E., Queiroz, M.I., and Zepka, L.Q. 2020. *Pigments from Microalgae Handbook*. Switzerland: Springer Nature.
- Johnson, M. P. 2016. Photosynthesis. *Essays in Biochemistry*, 60: 255-273.

- Jung, Jong-Min, Kim, J. Y., Jung, S., Choi, Yoon-E., and Kwon, E. E. 2021. Quantitative study on lipid productivity of *Euglena gracilis* and its biodiesel production according to the cultivation conditions. *Journal of Cleaner Production*, 291: 1-10.
- Kang A, Lee TS (2016) Secondary metabolism for isoprenoid-based biofuels. In Eckert CA, Trinh CT (eds) *Biotechnology for biofuel production and optimization*. Elsevier, pp 35-71.
- Kearns, D., Liu. H., and Consoli, C. 2021. *Technology readiness and costs of CCS*. Global CCS Institute.
- Khandaker, M.M., Majrashi, A., and Boyee, A.N. 2015. The influence of giberelic acid on the chlorophyll fluorescence, protein content and PAL activity of wax apple (*Syzygium samarangense* var. jambu madu) fruits. *Australian journal of crop science*, 9(12): 1221-1227.
- Kim, S., Lee, D., Lim, D., Lim, S., Park, S. Kangm, C., Yu, J., and Lee, T. 2020. Paramylon production from heterotrophic cultivation of *Euglena gracilis* in two different industrial byproducts: Corn steep liquor and brewer's spent grain. *Algal Research*, 40: 1-7.
- Kim, S., Lim, D., Lee, D., Yu, J., and Lee, T. 2022. Valorization of corn steep liquor for efficient paramylon production using *Euglena gracilis*: The impact of precultivation and light-dark cycle. *Algal Research*, 61: 1-9.
- Kim, S., Wirasnita, R., Lee, D., Yu, J., and Lee, T. 2021. Enhancement of growth and paramylon production of *Euglena gracilis* by upcycling of spent tomato byproduct as an alternative medium. *Applied Science*, 11: 1-11.
- Kirk, J. T. O. and Juniper, B. E. 1964. The fine structure of the pellicle of *Euglena gracilis*. *Journal oof the Royal Microscopial Society*, 82(3): 205-210.
- Kothari R, Azam R, Singh HM, Kumar P, Kumar V, Singh RP, Tyagi VV (2023) Nutrients sequestration from slaughterhouse wastewater with kinetic model studies using *C. vulgaris* for lipid production and reduction in

freshwater footprint: A synergistic approach. *Waste Biomass Valor.*
doi: 10.1007/s12649-023-02226-0

Kottuparambil, S., Thankamony, R. L., and Agusti, S. 2019. Euglena as a potential natural source of value-added metabolites. A review. *Algal Research*, 37: 154-159.

Kour, J., Kohli, S.K., Khanna, K., Bakshi, P., Sharma, P., Singh, A.D., Ibrahim, M., Devi, K., Sharma, N., Ohri, P., Skalicky, M., Brestic, M., Bhardwaj, R., Landi, M., and Sharma, A. 2021. Brassinosteroid signaling, crosstalk and, physiological functions in plants under heavy metal stress. *Fontiers in plant science*, 12: 1-19.

Kozlova, T., Hardy, B. P., Krishna, P., and Levin, D. B. 2017. Effect of phytohormones on growth and accumulation of pigments and fatty acids in the microalgae *Scenedesmus quadricauda*. *Algal Research*, 27: 325-334.

Kume, K., Akitsu, T., and Nasahara, K.N. 2018. Why is chlorophyll b only used in light-harvesting systems. *Journal of plant research*, 131: 961-972.

Lacroux, J., Jounannais, P., Atteia, A., Bonnafous, A., Trably, E., Steyer, J. P., and van Lis R. 2022. Microalgae screening for heterotrophic and mixotrophic growth on butyrate. *Algal Research*, 67: 1-12.

Lan, X., Li, J., Chen, J., Liu, J., Cao, F., Liao, C., Zhang, Z., Gu, M., Wei, Y., Shen, F., Wei, X., Luo, X., and Zhang, X. 2022. Effects of foliar applications of Brassinolide and Selenium on the accumulation of Arsenic and Cadmium in rice grains and an assessment of their health risk. *International Journal of Phytoremediation*, 25(2): 161-171.

LaPelusa, A., Kaushik, R. 2021. Physiology, Proteins. (<https://www.ncbi.nlm.nih.gov/books/NBK555990/>) Diakses tanggal 11 Desember 2022.

- Leander, B.S., Lax, G., Karnkowska, A., and Simpson, A.G.B. 2017. *Hanbook of the protists: Euglenida*. Springer: Champ.
- Lee, E., Jalalizadeh, M., and Zhang, Q. 2015. Growth kinetic models for microalgae cultivation: A review. *Algal Research*, 12: 497-512.
- Lei, D., Qiu, Z., Wu, J., Qiao, B., Qiao, J., and Zhao, Guang-Rong. 2021. Combining Metabolic and Monoterpene Synthase Engineering for de Novo Production of Monoterpene Alcohols in *Escherichia coli*. *ACS Synthetic Biology*, 10: 1531-1544.
- Lida, M., Desamero, M.J., Yasudam K., Nakashima, A., Suzuki, K., Chambers, J.K., Uchida, K., Ogawa, R., Hachimura, S., Nakayama, J., Kyuwa, S., Miura, K., Kakuta, S., and Hirayama, K. 2021. Effects of orally administered *Euglena gracilis* and its reserve polysaccharide, paramylon, on gastric dysplasia in A4gnt knockout mice. *Scientific Report*, 11(1): 1-13.
- Lim, Y. A., Khong, N. M. H., Priyawardana, S. D., Ooi, K. R., Ilankoon, I.M.S.K., Chong, N. M., and Foo, S. C. 2022. Distinctive correlations between cell concentration and cell size to microalgae biomass under increasing carbon dioxide. *Biosurce technology*, 347: 1-6.
- Lima, J.V. and Lobato, A.K.S. 2017. Brassinosteroids improve photosystem II efficiency, gas exchange, antioxidant enzymes and growth of cowpea plants exposed to water deficit. *Physiology and molecular of biology plants*, 23(1): 59-72.
- Liu, C., Feng, B., Zhou, Y., Liu, C., and Gong, X. 2022. Exogenous brassinosterpids increases tolerance to shading by altering stress responses in mung bean (*Vigna radiate* L.). *Photosynthesis Research*, 151: 279-294.
- Liu, F., Yang, J., Mu, H., Li, X., Zhang, X., Wen, Y., and Zhnag, X. 2023. Effects of brassinolide on growth, photosynthesis rate and antioxidant enzyme

activity of ornamental ground under salt stress. *Russian journal of plant physiology*, 70(137): 1-11.

Liu, J., Qiu, W., and Xia, D. 2018. Brassinosteroid improves lipid productivity and stress tolerance of *Chlorella* cells induced by high temperature. *Journal of Applied Phycology*, 30: 253-260.

MA, Y.H. and GUO, S.R. 2014. 24-epibrassinolide improves cucumber photosynthesis under hypoxia by increasing CO₂ assimilation and photosystem II efficiency. *Photosynthetica*, 52(1): 96-104.

Malumbres, M. 2014. Cyclin-dependent Kinases. *Genome Biology*, 15:122-132.

Morais, K. C. C., Conceição, D., Vargas, J. V. C., Mitchell, D. A., Mariano, A. B., Ondonez, J. C., Galli-Terasawa, L. V., and Kava, V. M. 2021. Enhanced microalgae biomass and lipid output for increased biodiesel productivity. *Renewable Energy*, 16(3): 138-145.

Muller, M. and Munne-Bosch, S. 2021. Hormonal impact on photosynthesis and photoprotection in plants. *Plant Physiology*, 185: 1500-1522.

Mumtaz, M.A., Li, F., Zhang, X., Tao, J., Ge, P., Wang, Y., Wang, Y., Gai, W., Dong, H., and Zhang, Y. 2022. Altered brassinolide sensitivity1 regulates fruit size in association with phytohormones modulation in tomato. *Horticulturae*, 8(11): 1-11.

Mumtaz, M.A., Munir, S., Liu, G., Chen, W., Wang, Y., Yu, H., Mahmood, S., Ahiakpa, J.K., Tamim, S.A., and Zhang, Y. 2020. Altered brassinolid sensitivity 1 ytrancriptionally inhibits chlorophyll synthesis and photosynthetic capacity in tomato. *Plant Growth Regulation*, 1-10.

Nagao, R., Yokono, M., Kato, Ka-Ho., ueno, Y., Shen, Jian-Ren., and Akimoto, S. 2021. High-light modification of excitation-energy-relaxation processes in the green fagellate *Euglena gracilis*. *Photosynthesis Research*, 149: 303-311.

- Nakamura, A., Higuchi, K., Goda, H., Fujiwara, M. T., Sawa, S., Koshiba, T., Shimada, Y., and Yoshida, S. 2003. Brassinolide Induces IAA5, IAA19, and DR5, a Synthetic Auxin Response Element in Arabidopsis, Implying a Cross Talk Point of Brassinosteroid and Auxin Signaling. *Plant Physiology*, 133: 1843-1853.
- Nakano, Y., Miyatake, K., Okuno, H., Hamazaki, K., Takenaka, S., Honami, N., Kiyota, M., Aiga, I., Kondo, J. 1996. Growth Of Photosynthetic Algae *Euglena* In High CO₂ Conditions And Its Photosynthetic Characteristics. *Acta Horticulturae*, (440): 49–54.
- Nakrani, M. N., Wineland, R. H., Anjum, F. 2022. Physiology, Glucose Metabolism. (<https://www.ncbi.nlm.nih.gov/books/NBK560599/>)
Diakses tanggal 10 Desember 2022.
- Nasser, S.E.D.M. and Sarhan, I.A. 2023. Effect of spraying with brassinolide on yield and its components of sesame cultivars. *IOP Conference Series: Earth Environment and Science*, 1213: 1-8.
- Natesan, V. and Kim, Sung-Jin. 2021. Lipid Metabolism, Disorders and Therapeutic Drugs – Review. *Biomolecules and Therapeutics*, 29(6): 596-604.
- Nzayisenga, J. C., Fargel, X., Groll, S. L., and Sellstedt. 2020. Effects of light intensity on growth and lipid production in microalgae grown in wastewater. *Biotechnology for biofuels*, 13(4): 1-8.
- Ogawa, T., Nakamoto, M., Tanaka, Y., Sato, K., Okazawa, A., Kanaya, S., and Ohta, D. 2022. Exploration and characterization of chemical stimulators to maximize the wax ester production by *Euglena gracilis*. *Journal of Bioscience and Bioengineering*, 133: 243-249.
- Padermshoke, A., Ogawa, T., Nishino, K., Nakazawa, M., Nakamoto, M., Okazawa, A., Kanaya, S., Arita, M., and Ohta, D. 2016. Critical

involvement of environmental carbon dioxide fixation to drive wax ester fermentation in *Euglena*. *PLoS ONE*, 11(9):1-16.

Peres, A.L.G.L., Soares, J.S., Tavares, R.G., Righetto, G., Zullo, M.A.T., Mandava, B., and Menossi, M. brassinosteroids, the sixth class of phytohormones: A molecular view from the discovery to hormonal interactions in plant development and stress adaptation. *International journal of molecular sciences*, 20(331): 1-33.

Phelan, M.C. and Lawler, G. 1997. Cell Counting. *Current Protocols in Cytometry*, 00: A.3A.1-A.3A.4.

Phukoetphim, N., Salakkam, A., Laopaiboon, P., and Laopaiboon, L. 2017. Kinetic models for batch ethanol production from sweet sorghum juice under normal and high gravity fermentations: Logistic and modified Gompertz models. *Journal of Biotechnology*, 243: 69-75.

Pires, J. C. M. 2017. COP21: The algae opportunity?. *Renewable and Sustainable Energi Reviews*, 79: 867-877.

Pokotylo IV, Kretynin SV, Khripach VA, Ruelland E, Blume YB, Kravets VS (2014) Influence of 24-epibrassinolide on lipid signalling and metabolism in *Brassica napus*. *Plant Growth Regul.* doi: 10.1007/s10725-013-9863-y

Pruvost, J., Vooren, G.V., Le Gouic, B., Cpuzinet-Mossion, A., and Legrand, J. 2011. Systematic investigation of biomass and lipid productivity by microalgae in photobioreactors for biodiesel application. *Bioresource Technology*, 102: 150-158.

Rezaei, H., Saeidi-Sar, S., Ebadi, M., Abbaspour, H. 2018. The effect of spraying of methyl jasmonate and 24-epi-brassinolid on photosynthesis, chlorophyll fluorescence and leaf stomatal traits in black mustard (*Brassica nigra* L.) under salinity stress. *Journal of plant process and function*, 7 (25): 53-62.

- Richmond, A. 2004. *Handbook of Microalgal Culture: Biotechnology and applied phycology*. Blackwell Science.
- Roh J, Moon J, Lee YE, Park CH and Kim S-K (2021) Seed-Specific Expression of *Arabidopsis* AtCYP85A2 Produces Biologically Active Brassinosteroids Such as Castasterone and Brassinolide to Improve Grain Yield and Quality in Seeds of *Brachypodium distachyon*. *Frontiers in Plant Science*, 12:1-14.
- Rubiyatno, Matsui, T., Mori, K., and Toyama, T. 2021. Paramylon production by *Euglena gracilis* via mixotrophic cultivation using sewage effluent and waste organic compoundst. *Biosource Technology Reports*, 15: 1-8.
- Siddiqui, H., Hayat, S., and Bajguz, A. 2018. Regulation of photosynthesis by brassinolide in plants. *Acta physiologiae plantarum*, 40: 1-15.
- Širić, I., Fayssal, S., Adelodun, B., Mioč, B., Andabaka, Ž., Bachheti, A., Goala, M., Kumar, P., AL-Huqail, A.A., Taher, M.A., and Eid, E.M. 2023. Sustainable use of CO₂ and wastewater from mushroom farm for *Chlorella vulgaris* cultivation: Experimental and kinetic studies on algal growth and pollutant removal. *Horticulturae*, 9(3): 308-323.
- Stirbet, A., Lazar, D., Guo, Y., and Govindjee, G. 2020. Photosynthesis: basics, history and modelling. *Annals of Botany*, 126: 511-537.
- Sun S., Yao, X., Liu, X., Qiao, Z., Liu, Y., Li, X., and Jiang, X. 2022. Brassinolide can improve drought tolerance of maize seedlings under drought stress: By inducing the photosynthetic performance, antioxidant capacity and ZmMYB gene expression of maize seedlings. *Journal of soil science and plant nutrition*, 22: 2092-2104.
- Sun, J., Zhang, Xiao-Bing., Liu, Y., and Zheng, X. 2022. Pass-through of diesel taxes and the effect on carbon emissions: Evidence from China. *Journal of Environmental Management*, 321: 1-13.

- Suzuki, K., Mitra, S., Iwata, O., Ishikawa, T., Kato, S., and Yamada, K. 2015. Selection and characterization of *Euglena anabaena* var. minor as a new candidate *Euglena* species for industrial application. *Bioscience, Biotechnology, and Biochemistry*, 79(10): 1730-1736.
- Tachibana, R., Yamagami, A., Miyagi, S., Nakazawa-Miklasevica, M., Matsui, M., Sakuta, M., Tanaka, R., Asami, T., and Nakano, T. 2022. BRZ-INSENSITIVE-PALE GREEN 1 is encoded by chlorophyll biosynthesis enzyme gene that functions in the downstream of brassinosteroid signaling. *Bioscience, Biotechnology, and Biochemistry*, 86(8): 1041-1048.
- Tahri, D., Elhouiti, F., helghoum, M., Nebeg, H., Ouinten, M., and Yousfi, M. 2022. Biosynthesis and Biological Activities of Carvone and Carvotanacetone Derivatives. *Revista Brasileira de Farmacognosia*, 32:708-723.
- Tamaki, S., Nishino, K., Ogawa, T., Maruta, T., Sawa, Y., Arakawa, K., and Ishikawa, T. 2019. Comparative proteomic analysis of mitochondria isolated from *Euglena gracilis* under aerobic and hypoxic conditions. *PLoS ONE*, 14(12): 1-13.
- Tan, X., Zhu, J., and Wakisaka, M. 2020. Effect of Protocatechuic Acid on *Euglena gracilis* Growth and Accumulation of Metabolites. *Sustainability*, 12(21): 1-11.
- Tanaka, R., Koshino, Y., Sawa, S., Ishiguro, S., Okada, K., and Tanaka, A. Overexpression of chlorophyllide a oxygenase (CAO) enlarges the antenna size of photosystem II in *Arabidopsis thaliana*. *The plant journal*, 26(4): 365-373.
- Tollefson J. Carbon emissions hit new high: warning from COP27. ([Carbon emissions hit new high: warning from COP27 \(nature.com\)](https://www.nature.com/articles/d41586-022-03600-2)). Diakses tanggal 16 December 2022.

- Tong H, Xiao Y, Liu D, Gao S, Liu L, Yin Y, Jin Y, Qian Q, Chu C (2014) Brassinosteroid regulates cell elongation by modulating gibberellin metabolism in rice. *Plant Cell*. doi: 10.1105/tpc.114.132092
- Triemer, R. E., and Zakryś, B. 2015. *Photosynthetic euglenoids. In Freshwater Algae of North America*. Academic Press.
- Tripathy, B.C., Pattanayak, G.K. 2012. Chlorophyll Biosynthesis in Higher Plants. In: Eaton-Rye, J., Tripathy, B., Sharkey, T. (eds) *Photosynthesis. Advances in Photosynthesis and Respiration*, vol 34. Springer, Dordrecht.
- Vardhini, B.V. and Anjum, N.A. 2015. Brassinosteroids make plant life easier under abiotic stresses mainly by modulating major components of antioxidant defense system. *Frontiers in Environmental Science*, 2(67): 1-16.
- Villarreal-Soto, S.A., Beaufort, S., Bouajila, J., Souchard, Jean-Pierre, Renard, T., Rollan, S., and Taillander, P. 2019. Impact of fermentation conditions on the production of bioactive compounds with anticancer, anti-inflammatory and antioxidant properties in kombucha tea extracts. *Process Biochemistry*, 83: 44-54.
- Wilberforce, T., Baroutaji, A., Soudan, B., Al-Alami, A.H., and Olabi, A.G. 2021. Outlook of carbon capture technology and challenges. *Science of the Total Environment*, 657: 56-72.
- Xia, Xiao-Jian., Huang, Li-Feng., Zhou, Yan-Hong., Mao, Wei-Hua., Shi, K., Wu, Jian-Xiang., Asami, T., Chen, Z., and Yu, Jing-Quan. 2009. Brassinosteroids promote photosynthesis and growth by enhancing activation of Rubisco and expression of photosynthetic genes in *Cucumis sativus*. *Plants*, 230:1185-1196.
- Xin, K., Guo, R., Zou, X., Rao, M., Huang, Z., Kuang, C., Ye, J., Chen, C., Huang, C., Zhang, M., Yang, W., and Cheng, J. 2023. CO₂ gradient domestication

- improved high-concentration CO₂ tolerance and photoautotroph growth of *Euglena gracillis*. *Science of The Total Environment*, 868, 1-10.
- Yang, Cang-Jin, Zhang, C., Lu, Yang-Ning, Jin, Jia-Qi, and Wang, Xue-Lu. 2011. The Mechanisms of Brassinosteroids' Action: From Signal Transduction to Plant Development. *Molecular Plant*, 4(4): 588-600.
- Yoshida, E., Kojima, M., Suzuki, M., Matsuda, F., Shimbo, K., Onuki, A., Nishio, Y., Usuda, Y., Kondo, A., and Ishii, J. 2021. Increased carvone production in *Escherichia coli* by balancing limonene conversion enzyme expression via targeted quantification concatamer proteome analysis. *Scientific reports*, 11: 1-13.
- Yoshida, Y., Tomiyama, T., Maruta, T., Tomita, M., Ishikawa, T., and Arakawa, K. 2016. De novo assembly and comparative transcriptome analysis of *Euglena gracilis* in response to anaerobic conditions. *BMC Genomics*, 17(182): 1-10.
- Yuan, L., Shu, S., Sun, J., Guo, S., and Tezuka, T. 2012. Effects on 24-epibrassinolide on the photosynthetic characteristic antioxidant system, and chloroplast ultrastructure in *Cucumis sativus* L. under Ca(NO₃)₂ stress. *Photosynthesis Research*, 112: 205-214.
- Zhang L., Cao X., Wang Z., Zhang Z., Li J., Wang Q., and Xu X. 2022. Brassinolide alleviate chilling injury of bananan fruit by regulating unsaturated fattyacid an dphenolic compounds. *Scientia Horliculturae*, 297: 1-10.
- Zhang, D., Tan, W., Yang, F., Han, Q., Deng, X., Guo, H., Liu, B., Yin, Y., and Lin, H. 2021. A BIN2-GLK1 signaling module integrates brassinosteroid and light signaling to repress chloroplast development in the dark. *Developmental Cell*, 56(3): 310-324.
- Zhang, S., Wei, Y., Lu, Y., and Wang, L. 2009. Mechanisms of brassinosteroids interacting with multiple hormones. *Plant Signaling and Behavior*, 4(12): 1117-1120.

- Zhao, B., and Li, J. 2012. Regulation of Brassinosteroid Biosynthesis and Inactivation. *Journal of Intergrative Plant Biology*, 54(10): 746-759.
- Zhao, M., Yuan, L., Wang, J., Xie, S., Zheng, Y., Nie, L., Hou, S.J., Chen, G., and Wang, C. 2019. Transcriptome analysis reveals a positive effect of brassinosteroids on the photosynthetic capacity of wucai under low temperature. *BMC Genomics*, 20(810): 1-19.
- Zhu, J. and Wakisaka, M. 2021. Application of lignosulfonate as the growth promotor for freshwater microalga *Euglena gracilis* to increase productivity of biomass and lipids. *Fuel*, 283: 1-9.
- Zhu, Z., Jiang, J., and Fa, Y. 2020. Overcoming the Biological Contamination in Microalgae and Cyanobacteria Mass Cultivations for Photosynthetic Biofuel Production. *Molecules*, 25(22): 1-12.
- Zhuang, Lin-Lan., Yu, D., Zhang, J., Liu, Fei-fer., Wu, Yin-Hu., Zhang, Tian-Yuan., Dao, Guo-Hua., and Hu, Hong-Ying. 2018. The characteristics and influencing factors of the attached microalgae cultivation: A review. *Renewable and Sustainable Energi Reviews*, 94: 1-9.
- Zuccaro, G., Yousuf, A., Pollio, A., and Steyer, Jean-Philippe. 2020. Microalgae Cultivation for Biofuels Production: *Chapter 2 – Microalgae Cultivation System*. Academic Press.
- Zullo, M.A.T. and Adam, G. 2002. Brassinosteroid phytohormones - structure, bioactivity and applications. *Brazilian Journal of Plant Physiology*, 14(3): 143-181.