DAFTAR PUSTAKA

Ahmad, A., Banat, F., Alsafar, H. and Hasan, S.W., 2022. Algae biotechnology for industrial wastewater treatment, bioenergy production, and high-value bioproducts. *Science of the Total Environment*, *806*, p.150585.

Aiba, S., 2005. Growth kinetics of photosynthetic microorganisms. *Microbial reactions*, pp.85-156.

Alazaiza, M.Y., He, S., Su, D., Abu Amr, S.S., Toh, P.Y. and Bashir, M.J., 2023. Sewage water treatment using Chlorella vulgaris microalgae for simultaneous nutrient separation and biomass production. *Separations*, *10*(4), p.229.

Alfaridho, M. I., Rahayu, D.E. and Sarwono, E., 2023. Analisis Life Cycle Assessment (LCA) Pada Pengolahan Air Limbah di Pahu Makmur Palm Oil Mill: Life Cycle Assessment (LCA) Analysis of Wastewater Treatment at Pahu Makmur Palm Oil Mill. *Jurnal Teknologi Lingkungan*, *24*(2), pp.116-126.

Almomani, F., 2020. Kinetic modeling of microalgae growth and CO_2 bio-fixation using central composite design statistical approach. *Science of the Total Environment*, *720*, p.137594.

Almomani, F. and Bhosale, R.R., 2021. Bio-sorption of toxic metals from industrial wastewater by algae strains *Spirulina platensis* and *Chlorella vulgaris*: Application of isotherm, kinetic models and process optimization. *Science of the Total Environment*, *755*, p.142654.

Amalia, A.V., Soeprobowati, T.R. and Christwardana, M., 2025. Optimization of consortia *Chlorella vulgaris* and *Nannochloropsis oculata* in remediation of palm oil mill effluent. In *E3S Web of Conferences* (Vol. 605, p. 03030). EDP Sciences.

Amalia, A.V., Soeprobowati, T.R. and Christwardana, M., 2026. Performance of Microalgae Consortia in Palm Oil Mill Effluent Remediation: An Eco-Friendly Strategy. *Jurnal Pendidikan IPA Indonesia*, *15*(1).

Amalina, I.F., Haziq, J.M., Syukor, A.A., Ridwan, A.A. and Rashid, A.M., 2021. Study of palm acid oil (PAO) from sludge palm oil mill effluent (POME) as goat's feed. *Materials Today: Proceedings*, *41*, pp.96-101.

Amini, M., Khoei, Z.A. and Erfanifar, E., 2019. Nitrate ($NO3^-$) and phosphate ($PO43^-$) removal from aqueous solutions by microalgae Dunaliella salina. *Biocatalysis and agricultural biotechnology*, *19*, p.101097.

Arifin, N.B., Putra, A.P.R., Widyawati, Y. and Hariati, A.M., 2023. Pengaruh urea terhadap pertumbuhan dan kandungan nutrisi Spirulina platensis. *Jurnal Sumberdaya Akuatik Indopasifik*, *7*(4), pp.493-504.

Azmil, N.M., Yuzir, A., Mohamad, S.E., Abdullah, N. and El Sheekh, M., 2025. Microalgae for Palm Oil Mill Effluent (POME) Remediation: Future Trends. *Tropical Aquatic and Soil Pollution*, *5*(2), pp.125-139.

Apriyanto, M., 2020. Pengolahan Limbah Cair Pabrik Kelapa Sawit (Studi Kasus pada PT. Tri Bakti Sarimas PKS 2 Ibul, Riau). *Jurnal Teknologi Pertanian*, *9*(2), pp.86-93.

Asmar, G.A., 2022. *Pemodelan Kinetika Laju Pertumbuhan Serta Kemampuan Macroalgae CladopHora Glomerata Dalam Mengolah Air Limbah Laundry* (Doctoral dissertation, UPN Veteran Jatim).

Asmawati, A. and Purnomo, Y.S., 2024. Sistem Moving Bed Biofilm Reactor Menggunakan Mikroalga dalam Menyisihkan Amonia (NH_3-N) dan Fosfat (PO_4) Pada Air Limbah Tahu. *Journal Serambi Engineering*, *9*(3).

Azubuike, C.C., Chikere, C.B. and Okpokwasili, G.C., 2016. Bioremediation techniques–classification based on site of application: principles, advantages, limitations and prospects. *World Journal of Microbiology and Biotechnology*, *32*, pp.1-18.

Baihaqi, R.A. and Pratama, W.D., 2023. Feasibility study of utilization of palm oil mill effluent (POME) as a source for microalgae nutrients. *Journal of Emerging Science and Engineering*, *1*(1), pp.1-5.

Basyuni, M., Amri, N., Putri, L.A.P., Syahputra, I. and Arifiyanto, D., 2017. Characteristics of fresh fruit bunch yield and the physicochemical qualities of palm oil during storage in North Sumatra, Indonesia. *Indonesian Journal of Chemistry*, *17*(2), pp.182-190.

Cheah, W.Y., Show, P.L., Juan, J.C., Chang, J.S. and Ling, T.C., 2018. Microalgae cultivation in palm oil mill effluent (POME) for lipid production and pollutants removal. *Energy Conversion and Management*, *174*, pp.430-438.

Cheng, Y.W., Chong, C.C., Lam, M.K., Ayoub, M., Cheng, C.K., Lim, J.W., Yusup, S., Tang, Y. and Bai, J., 2021. Holistic process evaluation of non-conventional palm oil mill effluent (POME) treatment technologies: A conceptual and comparative review. *Journal of Hazardous Materials*, *409*, p.124964.

Cho, D.H., Cho, K., Heo, J., Kim, U., Lee, Y.J., Choi, D.Y., Yoo, C., Kim, H.S. and Bae, S., 2020. High-throughput in vitro screening of changed algal community structure using the PHotoBiobox. *Journal of Microbiology and Biotechnology*, *30*(11), p.1785.

Choong, Y.Y., Chou, K.W. and Norli, I., 2018. Strategies for improving biogas production of palm oil mill effluent (POME) anaerobic digestion: A critical review. *Renewable and Sustainable Energy Reviews*, *82*, pp.2993-3006.

Coulombier, N., Blanchier, P., Le Dean, L., Barthelemy, V., Lebouvier, N. and Jauffrais, T., 2021. The effects of karbon-induced acidification on Tetraselmis biomass production, pHotopHysiology and antioxidant activity: A comparison using batch and continuous culture. *Journal of Biotechnology*, *325*, pp.312-324.

Cui, X., Yang, J., Cui, M., Zhang, W. and Zhao, J., 2021. Comparative experiments of two novel tubular pHotobioreactors with an inner aerated tube for microalgal cultivation: Enhanced mass transfer and improved biomass yield. *Algal Research*, *58*, p.102364.

Das, A., Adhikari, S. and Kundu, P., 2019. Bioremediation of wastewater using microalgae. *Environmental biotechnology for soil and wastewater implications on ecosystems*, pp.55-60.

de Morais Campos, G., dos Santos Renato, N., Oliveira, V.H.L.D., de Moura Rodrigues, P.H. and Martins, M.A., 2025. Influence of paddlewheel geometry on hydrodynamic performance and energy consumption in microalgae cultivations in open raceway ponds. *Bioprocess and Biosystems Engineering*, *48*(7), pp.1171-1188.

Dewi, R., Djufri, U. and Wijaya, H., 2022. Pemanfaatan Biomassa Padat Kelapa Sawit Sebagai Energi Baru Terbarukan Di Pltu Pabrik Kelapa Sawit Pt. Perkebunan Nusantara Vi Unit Usaha Bunut. *Journal Of Electrical Power Control And Automation (Jepca)*, *5*(1), pp.17-23.

Dirgantoro, M.A. and Adawiyah, R., 2018. Nilai ekonomi pemanfaatan limbah kelapa sawit menuju zero waste production. *Biowallacea*, *5*(2), pp.825-837.

dos Santos, V.Z., Vieira, K.R., Nass, P.P., Zepka, L.Q. and Jacob-Lopes, E., 2021. Application of microalgae consortia/cocultures in wastewater treatment. In *Recent advances in microbial degradation* (pp. 131-154). Singapore: Springer Singapore.

Dubber, D. and Gray, N.F., 2010. Replacement of chemical oxygen demand (COD) with total organic carbon (TOC) for monitoring wastewater treatment performance to minimize disposal of toxic analytical waste. *Journal of Environmental Science and Health Part A*, *45*(12), pp.1595-1600.

Elystia, S., Hasti, F.A. and Muria, S.R., 2022. Penyisihan COD dan nitrogen total pada limbah cair sawit menggunakan *Chlorella sp*. yang diimobilisasi dalam flat-fotobioreaktor. *JST (Jurnal Sains dan Teknologi)*, *11*(1), pp.67-76.

Emparan, Q., Jye, Y.S., Danquah, M.K. and Harun, R., 2020. Cultivation of *Nannochloropsis sp.* microalgae in palm oil mill effluent (POME) media for pHycoremediation and biomass production: Effect of microalgae cells with and without beads. *Journal of Water Process Engineering*, *33*, p.101043.

Fallahi, A., Hajinajaf, N., Tavakoli, O. and Sarrafzadeh, M.H., 2020. Cultivation of mixed microalgae using municipal wastewater: biomass productivity, nutrient removal, and biochemical content. *Iranian Journal of Biotechnology*, *18*(4), p.e2586.

Fan, Y., Wang, Y., Qian, P.Y. and Gu, J.D., 2004. Optimization of phthalic acid batch biodegradation and the use of modified Richards model for modelling degradation. *International Biodeterioration & Biodegradation*, *53*(1), pp.57-63.

Fernando, J.S.R., Premaratne, M., Dinalankara, D.M.S.D., Perera, G.L.N.J. and Ariyadasa, T.U., 2021. Cultivation of microalgae in palm oil mill effluent (POME) for astaxanthin production and simultaneous pHycoremediation. *Journal of Environmental Chemical Engineering*, *9*(4), p.105375.

Foladori, P., Petrini, S. and Andreottola, G., 2018. Evolution of real municipal wastewater treatment in photobioreactors and microalgae-bacteria consortia using real-time parameters. *Chemical engineering journal*, *345*, pp.507-516.

Francisco López, A., Lago Rodríguez, T., Faraji Abdolmaleki, S., Galera Martínez, M. and Bello Bugallo, P.M., 2024. From biogas to biomethane: an in-depth review of upgrading technologies that enhance sustainability and reduce greenhouse gas emissions. *Applied Sciences*, *14*(6), p.2342.

Gatamaneni, B.L., Orsat, V. and Lefsrud, M., 2018. Factors affecting growth of various microalgal species. *Environmental Engineering Science*, *35*(10), pp.1037-1048.

Gururani, P., Bhatnagar, P., Kumar, V., Vlaskin, M.S. and Grigorenko, A.V., 2022. Algal consortiums: a novel and integrated approach for wastewater treatment. *Water*, *14*(22), p.3784.

Gür, T.M., 2022. Carbon dioxide emissions, capture, storage and utilization: Review of materials, processes and technologies. *Progress in Energy and Combustion Science*, *89*, p.100965.

Goswami, R.K., Agrawal, K., Mehariya, S. and Verma, P., 2022. Current perspective on wastewater treatment using pHotobioreactor for *Tetraselmis sp*.: an emerging and foreseeable sustainable approach. *Environmental Science and Pollution Research*, *29*(41), pp.61905-61937.

Gultom, S.O., 2018. Mikroalga: Sumber energi terbarukan masa depan. *Jurnal Kelautan: Indonesian Journal of Marine Science and Technology*, *11*(1), pp.95-103.

Gupta, S., Pandey, R.A. and Pawar, S.B., 2017. Bioremediation of synthetic high–chemical oxygen demand wastewater using microalgal species Chlorella pyrenoidosa. *Bioremediation Journal*, *21*(1), pp.38-51

Hadiyanto, M.A. and Nur, M.A., 2012. Mikroalga Sumber Pangan dan Energi Masa Depan. *Edisi Pertama. UPT Universitas Diponegoro Press, Semarang.[Indonesian]*.

Hadiyanto and Maulana, A. (2012). Mikroalga Sumber Pangan & Energi Masa Depan. Semarang: UPT UNDIP Press.

Halim, A.A., Samsudin, A., Azmi, A.S. and Nawi, M.N.M., 2019. Nutrients and chemical oxygen demand (COD) removals by microalgae-bacteria co-culture system in palm oil mill effluent (POME). *IIUM Engineering Journal*, *20*(2), pp.22-31.

Hariz, H.B., Takriff, M.S., Yasin, N.H.M., Ba-Abbad, M.M. and Hakimi, N.I.N.M., 2019. Potential of the microalgae-based integrated wastewater treatment and CO_2 fixation system to treat Palm Oil Mill Effluent (POME) by indigenous microalgae; Scenedesmus sp. and Chlorella sp. *Journal of Water Process Engineering*, *32*, p.100907.

Hasnain, M., Abideen, Z., Hashmi, S., Naz, S. and Munir, N., 2023. Assessing the potential of nutrient deficiency for enhancement of biodiesel production in algal resources. *Biofuels*, *14*(1), pp.1-34.

Hassan, M.H.A., Snape, C.E. and Stevens, L., 2019. Validation on carbon dioxide hydrate formation through analysis on the solubility of CO_2 in water using Henry's law and the experimental pressure-time curve. *Malaysian Journal of Analytical Sciences*.

Hayati, A.P., Zhafran, M., Sidiq, M.A., Rinaldi, A., Fitria, B., Tarisma, R. and Bindar, Y., 2020. Analysis of power from palm oil solid waste for biomass power plants: A case study in Aceh Province. *ChemospHere*, *253*, p.126714.

Hermanto, M.B., Boxtel, A.J.B. and Keesman, K.J., 2020. Identifikasi kinetika pertumbuhan alga pada model monod. *JURNAL AGROTEKNOLOGI*, *5*(01), pp.21-31.

Hindarti, F. and Ayuningtyas, E., 2020. Pengembangan teknik kultivasi *Spirulina sp.* sebagai sumber biomassa energi terbarukan dalam fotobioreaktor airlift. *Jurnal Energi dan Lingkungan (Enerlink)*, *16*(1), pp.17-24.

Hotos, G.N. and Avramidou, D., 2021. The effect of various salinities and light intensities on the growth performance of five locally isolated microalgae [*AmpHidinium carterae*, *NepHroselmis sp*., *Tetraselmis sp.*(var. red pappas), *Asteromonas gracilis* and *Dunaliella sp*.] in laboratory batch cultures. *Journal of Marine Science and Engineering*, *9*(11), p.1275.

Hussain, A., Rehman, F., Rafeeq, H., Waqas, M., Asghar, A., Afsheen, N., Rahdar, A., Bilal, M. and Iqbal, H.M., 2022. In-situ, Ex-situ, and nano-

remediation strategies to treat polluted soil, water, and air–A review. *ChemospHere*, *289*, p.133252.

Hussian, M. and Ellatif, A., 2018. The role of microalgae in renewable energy production: challenges and opportunities.

Idris, M., Mayasari, U. and Nasution, R.A., 2022. Exploration And Implementation Of Indigenous Microbabs As Bioremediation Agents Against Mercury Contaminated Land In The Mining Area Of North Sumatera Through The Wahdatul Ulum Transandiciplinary Approach In Improving The Quality Of Research At UINSU.

Ifrim, G.A., Titica, M., Horincar, G., Antache, A., Baicu, L., Barbu, M. and Guzmán, J.L., 2022. Model based optimal control of the pHotosynthetic growth of microalgae in a batch pHotobioreactor. *Energies*, *15*(18), p.6535.

Igou, T.K.S., 2022. *Enabling Large-Scale Microalgal Biomass Production in Open Raceway Ponds* (Doctoral dissertation, Georgia Institute of Technology).

Isiramen, O.E., Bahri, P.A., Moheimani, N.R., Vadiveloo, A., Shayesteh, H. and Parlevliet, D.A., 2022. Improving pH control and carbon dioxide utilisation efficiency in microalgae cultivation systems with the use of a Proportional-integral+ dead-zone control strategy. *Bioresource Technology Reports*, *17*, p.100917.

Isnansetyo, A. and Kurniastuty, E., 1995. Teknik Kultur PHytoplankton dan Zooplankton. *Pakan Alami untuk Pembenihan Organisme Laut. Penerbit Kanisius, Yogyakarta*.

Jana, B.B., 2024. Chlorophyta. In *Aquatic Sciences in the Tropics* (pp. 51-58). CRC Press.

Jia, H. and Yuan, Q., 2016. Removal of nitrogen from wastewater using microalgae and microalgae–bacteria consortia. *Cogent Environmental Science*, *2*(1), p.1275089.

Jijingi, H.E., Yazdia, S.K., Abakr, Y.A. and Satya, A.D.M., 2025. Exploring the potential of Chlorella vulgaris for nutrient removal and biomass accumulation in palm oil mill effluent (POME): A sustainable and green technology approach. *Case Studies in Chemical and Environmental Engineering*, p.101274.

Kacaribu, A.A., Aisyah, Y. and Febriani, F., 2025. Development of wastewater treatment methods for palm oil mill effluent (POME): A comprehensive review. *Resources Chemicals and Materials*, p.100130.

Kamarudin, K.F., Yaakob, Z., Rajkumar, R., Takriff, M.S. and Tasirin, S.M., 2013. Bioremediation of palm oil mill effluents (POME) using Scenedesmus dimorpHus and Chlorella vulgaris. *Advanced Science Letters*, *19*(10), pp.2914-2918.

Kamyab, H., Din, M.F.M., Keyvanfar, A., Abd Majid, M.Z., Talaiekhozani, A., Shafaghat, A., Lee, C.T., Shiun, L.J. and Ismail, H.H., 2015. Efficiency of microalgae *Chlamydomonas* on the removal of pollutants from palm oil mill effluent (POME). *Energy Procedia*, *75*, pp.2400-2408.

Kandimalla, P., Desi, S. and Vurimindi, H., 2016. MixotropHic cultivation of microalgae using industrial flue gases for biodiesel production. *Environmental Science and Pollution Research*, *23*(10), pp.9345-9354.

Kaplan, D., 2013. Absorption and adsorption of heavy metals by microalgae. *Handbook of microalgal culture: applied phycology and biotechnology*, pp.602-611.

Katarzyna, L., Sai, G. and Singh, O.A., 2015. Non-enclosure methods for non-suspended microalgae cultivation: literature review and research needs. *Renewable and sustainable energy reviews*, *42*, pp.1418-1427.

Khambali, I. and ST, M., 2019. Pemanasan Global dan Gangguan Kesehatan Serta Mitigasinya. *Surabaya: HAKLI Provinsi Jawa Timur*.

Khuzaimah, I. and Astuti, D., 2023, January. Studi Literatur Efektivitas Metode Bioremediasi Terhadap Penurunan Kromium Pada Air Limbah Penyamakan Kulit. In *Prosiding University Research Colloquium* (pp. 349-364).

Komala, R. and Aziz, S., 2019. Pengaruh proses aerasi terhadap pengolahan limbah cair pabrik kelapa sawit di PTPN VII secara aerobik. *Jurnal Redoks*, *4*(2), pp.7-16.

Kristanti, R.A., Hadibarata, T., Yuniarto, A. and Muslim, A., 2021. Palm oil industries in Malaysia and possible treatment technologies for palm oil mill effluent: A review. *Environmental Research, Engineering and Management*, *77*(3), pp.50-65.

Kumaran, M., Palanisamy, K.M., Bhuyar, P., Maniam, G.P., Rahim, M.H.A. and Govindan, N., 2023. Agriculture of microalgae *Chlorella vulgaris* for polyunsaturated fatty acids (PUFAs) production employing palm oil mill effluents (POME) for future food, wastewater, and energy nexus. *Energy Nexus*, *9*, p.100169.

Kurniawan, A., & Effendi, A. J. (2014). Biodegradasi Residu Total Petroleum Hidrokarbon Di Bawah Konsentrasi 1%(W/w) Hasil Proses Bioremediasi (Biodegradation of Total Petroleum Hydrocarbons Residues Below 1% Concentration (W/w) Using Bioremediation Process). *Jurnal Manusia dan Lingkungan*, *21*(3), 286-294.

La Bella, E., Occhipinti, P.S., Puglisi, I., Fragalà, F., Saccone, R., Russo, N., Randazzo, C.L., Caggia, C. and Baglieri, A., 2023. Comparative pHycoremediation performance of three microalgae species in two

different magnitude of pollutants in wastewater from farmhouse. *Sustainability*, *15*(15), p.11644.

Lee, E., Jalalizadeh, M. and Zhang, Q., 2015. Growth kinetic models for microalgae cultivation: A review. *Algal research*, *12*, pp.497-512.

Lee, E. and Zhang, Q., 2016. Integrated co-limitation kinetic model for microalgae growth in anaerobically digested municipal sludge centrate. *Algal research*, *18*, pp.15-24.

Li, P., Luo, Y., Ming, F., Zheng, J., Pan, Z., Wang, R., He, Y., Zhou, M., Xiong, X., Zhang, C. and Lei, Y., 2025. Aeration strategies for microalgae in wastewater treatment: Enhancing pollutant removal and community dynamics. *Journal of Environmental Management*, *377*, p.124629.

Li, X., Feng, C., Lei, M., Luo, K., Wang, L., Liu, R., Li, Y. and Hu, Y., 2022. Bioremediation of organic/heavy metal contaminants by mixed cultures of microorganisms: A review. *Open Chemistry*, *20*(1), pp.793-807.

Li, Y., Zhang, Q., Wang, Z., Wu, X. and Cong, W., 2014. Evaluation of power consumption of paddle wheel in an open raceway pond. *Bioprocess and biosystems engineering*, *37*(7), pp.1325-1336.

Lim, S.L., Chu, W.L. and PHang, S.M., 2010. Use of *Chlorella vulgaris* for bioremediation of textile wastewater. *Bioresource technology*, *101*(19), pp.7314-7322.

Low, S.S., Bong, K.X., Mubashir, M., Cheng, C.K., Lam, M.K., Lim, J.W., Ho, Y.C., Lee, K.T., Munawaroh, H.S.H. and Show, P.L., 2021. Microalgae cultivation in palm oil mill effluent (POME) treatment and biofuel production. *Sustainability*, *13*(6), p.3247.

Maharani, P.L., Pamoengkas, P. and Mansur, I., 2017. Pemanfaatan pome sebagai pupuk organik pada lahan pascatambang batubara the application of pome (palm oil mill effluent) as organic fertilizer for ex-coal mine soil. *Journal of tropical silviculture*, *8*(3), pp.177-182.

Mahdi, M.Z., Titisari, Y.N. and Hadiyanto, H., 2012. Evaluasi pertumbuhan mikroalga dalam medium POME: variasi jenis mikroalga, medium dan waktu penambahan nutrient. *Jurnal Teknologi Kimia dan Industri*, *1*(1), pp.312-319.

Malek, A., Zullo, L.C. and Daoutidis, P., 2016. Modeling and dynamic optimization of microalgae cultivation in outdoor open ponds. *Industrial & Engineering Chemistry Research*, *55*(12), pp.3327-3337.

Maltsev, Y., Kulikovskiy, M. and Maltseva, S., 2023. Nitrogen and pHospHorus stress as a tool to induce lipid production in microalgae. *Microbial cell factories*, *22*(1), p.239.

Martínez-Macias, M.D.R., Correa-Murrieta, M.A., Villegas-Peralta, Y., Dévora-Isiordia, G.E., Álvarez-Sánchez, J., Saldivar-Cabrales, J. and Sánchez-Duarte, R.G., 2019. Uptake of copper from acid mine drainage by the

microalgae *Nannochloropsis oculata*. *Environmental Science and Pollution Research*, *26*, pp.6311-6318.

Mathew, M.M., Khatana, K., Vats, V., Dhanker, R., Kumar, R., Dahms, H.U. and Hwang, J.S., 2022. Biological approaches integrating algae and bacteria for the degradation of wastewater contaminants—A review. *Frontiers in Microbiology*, *12*, p.801051.

Maulinda, L., 2017. Pengolahan awal limbah cair pabrik minyak kelapa sawit secara fisika. *Jurnal Teknologi Kimia Unimal*, *2*(2), pp.31-41.

Meijaard, E., Brooks, T.M., Carlson, K.M., Slade, E.M., Garcia-Ulloa, J., Gaveau, D.L., Lee, J.S.H., Santika, T., Juffe-Bignoli, D., Struebig, M.J. and Wich, S.A., 2020. The environmental impacts of palm oil in context. *Nature plants*, *6*(12), pp.1418-1426.

Meisyara, M.A.R., 2019. *Potensi Mikroalga Tetraselmis chuii Butcher dalam Bioremediasi Logam Berat Timbal (Pb) Dari Limbah Batik* (Doctoral dissertation, UAJY).

Mendes, A.R., Spínola, M.P., Lordelo, M. and Prates, J.A., 2024. Chemical compounds, bioactivities, and applications of Chlorella vulgaris in food, feed and medicine. *Applied Sciences*, *14*(23), p.10810.

Minturo, G.J., Noorain, R., Hitam, S.M.S., Shoiful, A., Azni, M.E., Ernawati, L., Abdullah, R. and Mohamad, R., 2022, April. Immobilized *Nannochloropsis oculata* in a down-flow hanging sponge (DHS) reactor for the treatment of palm oil mill effluent (POME). In *IOP Conference Series: Earth and Environmental Science* (Vol. 1017, No. 1, p. 012024). IOP Publishing.

Mirzaei, M., Jazini, M., Aminiershad, G. and Refardt, D., 2024. Biodesalination of saline aquaculture wastewater with simultaneous nutrient removal and biomass production using the microalgae Arthrospira and Dunaliella in a circular economy approach. *Desalination*, *581*, p.117564.

Mohd, N., Mohd Yasin, N. H., Osman, W. H. W. and Takriff, M. S. (2024) 'Unlocking the potential of *Chlamydomonas sp.* for sustainable nutrient removal from POME: A biokinetic investigation', *Journal of Water Process Engineering*, Elsevier Ltd, vol. 57 [Online]. DOI: 10.1016/j.jwpe.2023.104590.

Mohd, N., Yasin, N.H.M. and Takriff, M.S., 2021, February. Predictive growth model of indigenous green microalgae (Scenedesmus sp. UKM9) in palm oil mill effluent (POME). In *IOP Conference Series: Materials Science and Engineering* (Vol. 1051, No. 1, p. 012070). IOP Publishing.

Moghazy, R.M. and Abdalla, S.B., 2024. Boosting wastewater treatment and carbon bioremediation with Nile River microalgae: Resilience to simulated smoke and enhanced biomass production. *Bioresource Technology Reports*, *25*, p.101809.

Muchammad, A., Kardena, E. and Rinanti, A., 2013. Pengaruh intensitas cahaya terhadap penyerapan gas karbondioksida oleh mikroalga tropis *Ankistrodesmus sp.* Dalam fotobioreaktor. *Jurnal Teknik Lingkungan*, *19*(2), pp.103-111.

Muntaha, S. and Hamka, M., 2025. Diplomasi Indonesia Menghadapi Kebijakan Renewable Energy Directive II (Pengembangan Energi Terbarukan) Uni Eropa Terhadap Ekspor Kelapa Sawit. *Jurnal Riset Multidisiplin Edukasi*, *2*(12), pp.876-894.

Muria, S.R., Chairul, C. and Naomi, D.C., 2020. Pemanfaatan mikroalga *Chlorella sp*. untuk pengolahan limbah cair kelapa sawit (pome) secara fed batch. *Jurnal Sains Dan Teknologi*, *19*(1), pp.7-12.

Muthukumaran, M., Rawindran, H., Noorjahan, A., Parveen, M., Barasarathi, J., Blessie, J. P. J., Ali, S. S., Sayyed, R. Z., Awasthi, M. K., Hassan, S., Ravindran, B., Vatanpour, V. and Balakumar, B. S. (2024) 'Microalgae-based solutions for palm oil mill effluent management: Integrating pHycoremediation, biomass and biodiesel production for a greener future', *Biomass and Bioenergy*, Elsevier Ltd, vol. 191 [Online]. DOI: 10.1016/j.biombioe.2024.107445

Nasrin, A.B., Raman, A.A.A., Bukhari, N.A., Sukiran, M.A., Buthiyappan, A., Subramaniam, V., Aziz, A.A. and Loh, S.K., 2022. A critical analysis on biogas production and utilisation potential from palm oil mill effluent. *Journal of Cleaner Production*, *361*, p.132040.

Nath, A., Tiwari, P.K., Rai, A.K. and Sundaram, S., 2019. Evaluation of carbon capture in competent microalgal consortium for enhanced biomass, lipid, and carbohydrate production. *3 Biotech*, *9*, pp.1-15.

Nedaei, L. and Shokrkar, H., 2025. Influence of process factors and photobioreactor design on microalgae cultivation. *Biofuels, Bioproducts and Biorefining*, *19*(6), pp.2433-2456.

Nedbal, J., 2020. Counting microalgae culture density V. 2. *Protocols. io*, *2*, pp.1-10

Novianti, T., Zainuri, M. and 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), pp.72-87.

Nugroho, A., 2019. Teknologi Agroindustri Kelapa Sawit. *Lambung Mengkurat Universitas Press (Issue November)*.

Nur, M.A., Garcia, G.M., Boelen, P. and Buma, A.G.J., 2019. Enhancement of C-pHycocyanin productivity by Arthrospira platensis when growing on palm oil mill effluent in a two-stage semi-continuous cultivation mode. *Journal of Applied PHycology*, *31*(5), pp.2855-2867.

Nur, M.M.A., Djarot, I.N., Boelen, P., Hadiyanto and Heeres, H.J., 2022. Co-cultivation of microalgae growing on palm oil mill effluent under

outdoor condition for lipid production. *Environmental Pollutants and Bioavailability*, *34*(1), pp.537-548.

Ojaniemi, U., Syrjänen, J. and Barth, D., 2025. Modeling the effect of internal lighting and mixing through bubbles in a cylindrical vessel on CO2 fixation by microalgae cultivation. *Algal Research*, p.104209.

Oktari Setiyorini, O.S., 2019. *Manajemen Pengelolaan Limbah Cair di PT. Golden Dilindo Nusantara Desa Sei Rambutan Kecamatan Indralaya Utara Kabupaten Ogan Ilir Tahun 2019* (Doctoral dissertation, STIK Bina Husada Palembang).

Pachiappan, P., Santhanam, P., Begum, A. and Balaji Prasath, B., 2018. An introduction to plankton. In *Basic and applied phytoplankton biology* (pp. 1-24). Singapore: Springer Singapore.

Padmaperuma, G., Kapoore, R.V., Gilmour, D.J. and Vaidyanathan, S., 2018. Microbial consortia: a critical look at microalgae co-cultures for enhanced biomanufacturing. *Critical reviews in biotechnology*, *38*(5), pp.690-703.

Palikrousis, T. L., Manolis, C., Kalamaras, S. D. and Samaras, P. (2024) 'Effect of Light Intensity on the Growth and Nutrient Uptake of the Microalga *Chlorella sorokiniana* Cultivated in Biogas Plant Digestate', *Water (Switzerland)*, Multidisciplinary Digital Publishing Institute (MDPI), vol. 16, no. 19 [Online]. DOI: 10.3390/w16192782.

Paliwal, C., Mitra, M., Bhayani, K., Bharadwaj, S.V., Ghosh, T., Dubey, S. and Mishra, S., 2017. Abiotic stresses as tools for metabolites in microalgae. *Bioresource technology*, *244*, pp.1216-1226.

Patrinou, V., Daskalaki, A., Kampantais, D., Kanakis, D.C., Economou, C.N., Bokas, D., Kotzamanis, Y., Aggelis, G., Vayenas, D.V. and Tekerlekopoulou, A.G., 2022. Optimization of cultivation conditions for *Tetraselmis striata* and biomass quality evaluation for fish feed production. *Water*, *14*(19), p.3162.

Pawar, S., 2016. Effectiveness mapping of open raceway pond and tubular photobioreactors for sustainable production of microalgae biofuel. *Renewable and Sustainable Energy Reviews*, *62*, pp.640-653.

Peng, H., Huang, Y., Xia, A., Zhu, X., Zhu, X. and Liao, Q., 2025. Predicting synergistic effects of light, nitrogen, and dissolved inorganic carbon on microalgae growth for CO_2 bio-fixation: A kinetic modeling approach. *Biochemical Engineering Journal*, *215*, p.109614.

PHang, S.M., Chu, W.L. and Rabiei, R., 2015. PHycoremediation. *The algae world*, pp.357-389.

Pirasaci, T., Manisali, A.Y., Dogaris, I., Philippidis, G. and Sunol, A.K., 2017. Hydrodynamic design of an enclosed Horizontal BioReactor (HBR) for algae cultivation. *Algal research*, *28*, pp.57-65.

Plöhn, M., Spain, O., Sirin, S., Silva, M., Escudero-Oñate, C., Ferrando-Climent, L., Allahverdiyeva, Y. and Funk, C., 2021. Wastewater treatment by microalgae. *Physiologia Plantarum*, *173*(2), pp.568-578.

Pradhan, H., Poudel, A., Shrestha, D., Rogers, A., Stewart, M., Jereb, A., Harper, J., Li, M., Zhang, W., Chen, J. and Wang, Y., 2025. Concentration-dependent responses of C. reinhardtii to silver ions: hormetic response in growth and reduction of motility. *The European PHysical Journal E*, *48*(8), p.56.

Prartono, T.R.I., Kawaroe, M., Sari, D.W. and Augustine, D.I.N.A., 2010. Fatty acid content of Indonesian aquatic microalgae. *HAYATI Journal of Biosciences*, *17*(4), pp.196-200.

Priya, A.K., Jalil, A.A., Vadivel, S., Dutta, K., Rajendran, S., Fujii, M. and Soto-Moscoso, M., 2022. Heavy metal remediation from wastewater using microalgae: Recent advances and future trends. *Chemosphere*, *305*, p.135375.

Purba, E., Khairunisa, A.C., No, J.S.B. and Lampung, B., 2012. Kajian awal laju reaksi fotosintesis untuk penyerapan gas karbon menggunakan mikroalga Tetraselmis chuii. *J. Rekayasa Proses*, *6*(1), pp.7-13.

Putra, S.E., Marten, T.W., Yuniarti, E. and Handayani, L., 2023. Potential of *Chlorella sp* As A Bioremediation Agent in Tofu Liquid Waste: Literature Review. *Jurnal Biologi Tropis*, *23*(1), pp.140-146.

Račys, V., Kliučininkas, L., Jankūnaitė, D. and Albrektienė, R., 2010. Application of ORP for the evaluation of water contamination. *Linnaeus Eco-Tech*, pp.1082-1089.

Rafay, R., Uratani, J.M., Hernandez, H.H. and Rodríguez, J., 2020. Growth and nitrate uptake in *Nannochloropsis gaditana* and *Tetraselmis chuii* cultures grown in sequential batch reactors. *Frontiers in Marine Science*, *7*, p.77.

Rajkumar, R. and Yaakob, Z., 2013. The biology of microalgae. *Biotechnological Applications of Microalgae: Biodiesel and Value-Added Products*, pp.7-16.

Rashid, N., Ryu, A.J., Jeong, K.J., Lee, B. and Chang, Y.K., 2019. Co-cultivation of two freshwater microalgae species to improve biomass productivity and biodiesel production. *Energy Conversion and Management*, *196*, pp.640-648.

Rawat, S., Gangwar, A. and Kumar, S., 2024. Semi-continuous cultivation of microalgae to treat coal mine effluent in pilot scale: Nutrient removal, biodesalination and fatty acid composition analysis. *Journal of Water Process Engineering*, *67*, p.106271.

Ren, S., Shao, C., Zhu, F., Schagerl, M., Hu, X., Sobhi, M., Xu, L., Qian, J. and Huo, S., 2025. Optimization and synergistic enhancement of microalgae productivity in laboratory raceway ponds via co-regulation of

automated light-supplemented mixers and electric field system. *Biotechnology for biofuels and bioproducts*, *18*(1), p.63.

Rizal, A., Permana, R. and Apriliani, I.M., 2020. The effect of pHospHate addition with different concentration on the capability of *Nannochloropsis oculata* as a bioremediation agent of medium heavy metal (Cd^{2+}). *World Scientific News*, (145), pp.286-297.

Roni, K.A., 2019. Liquid Waste of Palm Oil Plantations as Liquid Fertilizer. *Journal of Computational and Theoretical Nanoscience*, *16*(12), pp.5166-5170.

Ruano, M.V., Ribes, J., Seco, A. and Ferrer, J., 2012. An advanced control strategy for biological nutrient removal in continuous systems based on pH and ORP sensors. *Chemical Engineering Journal*, *183*, pp.212-221.

Ruiz-Ruiz, P., Gómez-Borraz, T.L., Saldivar, A., Hernández, S., Morales-Ibarría, M. and Revah, S., 2024. Diluted methane mitigation by a co-culture of alkalipHilic methanotropHs and the microalgae *Scenedesmus obtusiusculus* towards carbon neutrality. *Biochemical Engineering Journal*, *203*, p.109211.

Rusdiani, R.R., Boedisantoso, R. and Hanif, M., 2016. Optimalisasi teknologi fotobioreaktor mikroalga sebagai dasar perencanaan strategi mitigasi gas karbon. *Jurnal Teknik ITS*, *5*(2), pp.F188-F192.

Rusli, M.Z, Azianabiha A, Gong Tao Ding and M. S. Takriff. 2023. An Effective Two-Steps Polyacrylamide-Microalgae System for Flocculation and Bioremediation of Palm Oil Mill Effluent. *International Journal of Environmental Science and Development, 14, p.2.*

Ruswanto, A., 2019. *Mengenal teknologi pengolahan tandan buah sawit (TBS) menjadi minyak kelapa sawit*. Instiper Press

Sacristán de Alva, M. and Luna Pabello, V. M. (2021) 'PHycoremediation by simulating marine aquaculture effluent using *Tetraselmis sp.* and the potential use of the resulting biomass', *Journal of Water Process Engineering*, Elsevier Ltd, vol. 41 [Online]. DOI: 10.1016/j.jwpe.2021.102071.

Salema, A.A., Ani, F.N., Mouris, J. and Hutcheon, R., 2017. Microwave dielectric properties of Malaysian palm oil and agricultural industrial biomass and biochar during pyrolysis process. *Fuel Processing Technology*, *166*, pp.164-173.

Sardjono, M. 2024. "Produksi CPO Indonesia Naik 5,91 Persen Pada Januari 2024, Konsumsi Justru Menurun." Available at https://www.infosawit.com/2024/03/29/produksi-cpo-indonesia-naik-591-persen-pada-januari-2024-konsumsi-justru-menurun/.

Sari, F.Y.A., Suryajaya, I.M.A., Christwardana, M. and Hadiyanto, H., 2022. Cultivation of microalgae *Spirulina platensis* in palm oil mill effluent (POME) media with variations of POME concentration and nutrient

composition. *Journal of Bioresources and Environmental Sciences*, *1*(2), pp.57-62.

Schediwy, K., Trautmann, A., Steinweg, C. and Posten, C., 2019. Microalgal kinetics—a guideline for photobioreactor design and process development. *Engineering in life sciences*, *19*(12), pp.830-843.

Senatore, V., Buonerba, A., Zarra, T., Oliva, G., Belgiorno, V., Boguniewicz-Zablocka, J. and Naddeo, V., 2021. Innovative membrane pHotobioreactor for sustainable carbon capture and utilization. *ChemospHere*, *273*, p.129682.

Serra-Maia, R., Bernard, O., Gonçalves, A., Bensalem, S. and Lopes, F., 2016. Influence of temperature on Chlorella vulgaris growth and mortality rates in a photobioreactor. *Algal research*, *18*, pp.352-359.

Setiantoro, A.E., Dewayanto, N. and Budiman, A., 2024. Analisis Kinetika Pertumbuhan Mikroalga *Spirulina Sp.* Menggunakan Pemodelan Richard dan Gompertz pada Fotobioreaktor Algaetree. *Jurnal Ilmiah Universitas Batanghari Jambi*, *24*(2), pp.1424-1428.

Shamanskyi, S., Boichenko, S., Khrutba, V., Barabash, O., Shkilniuk, I., Yakovlieva, A., Topilnyckyi, P. and Pavliukh, L., 2021. Improving the pHotobioreactor operation efficiency in the technological scheme of wastewater treatment. *Eastern-European Journal of Enterprise Technologies*, *6*(10), p.114.

Shah, S. M. U., Ahmad, A., Othman, M. F. and Abdullah, M. A. (2016) 'Effects of palm oil mill effluent media on cell growth and lipid content of *Nannochloropsis oculata* and *Tetraselmis suecica'*, *International Journal of Green Energy*, Taylor and Francis Inc., vol. 13, no. 2, pp. 200–207 [Online]. DOI: 10.1080/15435075.2014.938340.

Shao, C., Zheng, H., Sobhi, M., Zhu, F., Hu, X., Cui, Y., Chen, H., Zou, B., Zan, X., Li, G. and Huo, S., 2024. Enhancing microalgal biomass production in lab-scale raceway ponds through innovative computational fluid dynamics-based electrode deflectors. *Bioresource Technology*, *394*, p.130282.

Singh, N., Chetty, M. and Rathilal, S., 2025. Optimization of Hydrodynamics for Enhanced Co-Cultivation in Bubble Column Reactors: Investigating Flow Dynamics and Biomass Productivity. *Results in Engineering*, p.107841.

Sibisi, S., Mogany, T., Bux, F. and Rawat, I., 2024. Development and performance of microalgae-based symbiotic systems for high-strength chemical oxygen demand wastewater treatment from the sugar mills. *Algal Research*, *84*, p.103773.

Sidabutar, R., Trisakti, B., Bani, O., Nasution, J.A., Khodijah, P., Alexander, V., Daimon, H. and Takriff, M.S., 2024. Treatment of Effluent from the

Upflow Anaerobic Sludge Blanket-Hollow Centered Packed Bed Fermentor by Utilizing *Chlorella vulgaris* in a Fed-Batch System. *Case Studies in Chemical and Environmental Engineering*, p.100756.

Sirakov, I.N. and Velichkova, K.N., 2014. Bioremediation of wastewater originate from aquaculture and biomass production from microalgae species-*Nannochloropsis oculata* and *Tetraselmis chuii*.

Skifa, I., Chauchat, N., Cocquet, P.H. and Le Guer, Y., 2025. Microalgae cultivation in raceway ponds: Advances, challenges, and hydrodynamic considerations. *EFB Bioeconomy Journal*, *5*, p.100073.

Steven, S., Friatnasary, D.L., Wardani, A.K., Khoiruddin, K., Suantika, G. and Wenten, I.G., 2022. High cell density submerged membrane pHotobioreactor (SMPBR) for microalgae cultivation. In *IOP Conference Series: Earth and Environmental Science* (Vol. 963, No. 1, p. 012034). IOP Publishing.

Sun, Z.L., Xin, M.R., Li, P., Sun, L.Q. and Wang, S.K., 2021. Enhancing CO_2 utilization by a pHysical absorption-based technique in microalgae culture. *Bioprocess and Biosystems Engineering*, *44*, pp.1901-1912.

Susanto, J.P., Santoso, A.D. and Suwedi, N., 2017. Perhitungan Potensi Limbah Padat Kelapa Sawit untuk Sumber Energi Terbaharukan dengan Metode LCA. *Jurnal Teknologi Lingkungan*, *18*(2), pp.165-172.

Talib, S.L.A., Yasin, N.H.M., Takriff, M.S. and Japar, A.S., 2023. Comparative studies on pHycoremediation efficiency of different water samples by microalgae. *Journal of Water Process Engineering*, *52*, p.103584.

Tan, K.A., Lalung, J., Wijaya, D., Ismail, N., Wan Omar, W.M., Wabaidur, S.M., Siddiqui, M.R., Alam, M. and Rafatullah, M., 2022. Removal of nutrients by using green microalgae from lab-scale treated palm oil mill effluent. *Fermentation*, *8*(11), p.658.

Tomić, L., Maričić, V.K., Danilović, D. and Crnogorac, M., 2018. Criteria for carbon storage in geological formations. *Podzemni radovi*, (32), pp.61-74.

Trivedi, J., Singh, J., Atray, N., Ray, S.S. and Agrawal, D., 2019. Development of a non-linear growth model for predicting temporal evolution of *Scenedesmus obliquus* with varying irradiance. *Bioprocess and biosystems engineering*, *42*(12), pp.2047-2054.

Tunay, D., Yildirim, O., Ozkaya, B. and Demir, A., 2022. Determination of photoautotrophic growth and inhibition kinetics by the Monod and the Aiba models and bioenergetics of local microalgae strain. *Chemosphere*, *292*, p.133330.

Udaypal, U., Goswami, R.K., Mehariya, S., Karthikeyan, O.P. and Verma, P., 2026. Open Photobioreactor Design and Operational Strategies for Algae

Cultivation: Challenges and Solutions. In *Algal Photobioreactors* (pp. 289-308). Singapore: Springer Nature Singapore.

Vargas, S.R., Macêdo, W.V., Trindade, L.F. and Zaiat, M., 2024. Influence of organic carbon source on hydrogen production and nutrient removal by microbial consortium in anaerobic pHotobioreactors. *International Journal of Hydrogen Energy*, *54*, pp.1160-1168.

Vasumathi, K.K., Premalatha, M. and Subramanian, P., 2012. Parameters influencing the design of photobioreactor for the growth of microalgae. *Renewable and Sustainable Energy Reviews*, *16*(7), pp.5443-5450.

Vega, F., Sanna, A., Navarrete, B., Maroto-Valer, M.M. and Cortés, V.J., 2014. Degradation of amine-based solvents in carbon capture process by chemical absorption. *Greenhouse Gases: Science and Technology*, *4*(6), pp.707-733.

Verma, J.P. and Jaiswal, D.K., 2016. Book review: advances in biodegradation and bioremediation of industrial waste. *Frontiers in Microbiology*, *6*, p.175774.

Wais, M.N., Zulkifly, S., Ibrahim, M.H., Mohamed, A. and Rudin, Z.R.Z., 2024. Evaluation of Microalgae *Chlorella vulgaris* and *Tetradesmus bernardii* for Cultivation and Nutrient Removal in Palm Oil Mill Effluent. *Pertanika Journal of Science & Technology*, *33*(3).

Walters, C., Steyn, M., Ndlela, L., Nocanda, X., Moloi, M. and Oberholster, P., 2025. PHycoremediation of industrial wastewater: review of algae consortia. *International Journal of Environmental Science and Technology*, *22*(7), pp.6209-6224.

Wang, X., Wang, Q., Hong, Y. and Wang, Z., 2024. A whole process study of dual microalgae cultivation coupled to domestic wastewater treatment and wheat growth. *Environmental Research*, p.119168.

Wang, J.H., Zhang, T.Y., Dao, G.H., Xu, X.Q., Wang, X.X. and Hu, H.Y., 2017. Microalgae-based advanced municipal wastewater treatment for reuse in water bodies. *Applied microbiology and biotechnology*, *101*(7), pp.2659-2675.

Wardani, N.K., Supriyantini, E. and Santosa, G.W., 2022. Pengaruh konsentrasi pupuk Walne terhadap laju pertumbuhan dan kandungan klorofil-a Tetraselmis chuii. *Journal of Marine Research*, *11*(1), pp.77-85.

Wei, C., Xu, Y., Xu, L., Liu, J. and Chen, H., 2023. Comparative life-cycle assessment of various harvesting strategies for biogas production from microalgae: Energy conversion characteristics and greenhouse gas emissions. *Energy Conversion and Management*, *289*, p.117188.

Wu, M., Wu, G., Lu, F., Wang, H., Lei, A. and Wang, J. (2022) 'Microalgal pHotoautotropHic growth induces pH decrease in the aquatic environment by acidic metabolites secretion', *Biotechnology for*

Biofuels and Bioproducts, BioMed Central Ltd, vol. 15, no. 1 [Online]. DOI: 10.1186/s13068-022-02212-z.

Wulla, D.R.N.D. and Sarjan, M., 2024. Penerapan Prinsip Deklarasi Rio: Strategi Mengatasi Perubahan Iklim. *LAMBDA: Jurnal Ilmiah Pendidikan MIPA dan Aplikasinya*, *4*(1), pp.9-15.

Xiao, R., Carter, E., Allen, A., Tan, P.L., Zheng, Y.H., Chen, Q., Zhu, S.N., Popat, S.C., Knopf, A., Williams, C.F. and Chou, H.H., 2025. Nutrient recovery from high-salinity dairy wastewater through the cultivation of acclimatized microalgae. *Journal of Water Process Engineering*, *72*, p.107430.

Xiao, X., Li, W., Jin, M., Zhang, L., Qin, L. and Geng, W., 2023. Responses and tolerance mechanisms of microalgae to heavy metal stress: A review. *Marine environmental research*, *183*, p.105805.

Yang, H. and Xin, X., 2023. Carbon capture and lipid production performance of microalgae in the S-shaped pHotobioreactor under different culture modes. *Enzyme and Microbial Technology*, *165*, p.110194.

Yang, Z.Y., Gao, F., Liu, J.Z., Yang, J.S., Liu, M., Ge, Y.M., Chen, D.Z. and Chen, J.M., 2022. Improving sedimentation and lipid production of microalgae in the pHotobioreactor using saline wastewater. *Bioresource technology*, *347*, p.126392.

Yang, C., Hua, Q. and Shimizu, K., 2000. Energetics and carbon metabolism during growth of microalgal cells under photoautotrophic, mixotrophic and cyclic light-autotrophic/dark-heterotrophic conditions. *Biochemical engineering journal*, *6*(2), pp.87-102.

Yanti, R.N. and Hutasuhut, I.L., 2020. Potensi limbah padat perkebunan kelapa sawit di Provinsi Riau. *Wahana Forestra: Jurnal Kehutanan*, *15*(2), pp.1-11.

Yonas, R., Irzandi, U., Satriadi, H., Widayat, W., Christwardana, M. and Hadiyanto, H., 2022. Palm Oil Milling Effluent (POME) Waste Processing by Using Microalgae Chlamydomonas sp. *Journal of Bioresources and Environmental Sciences*, *1*(2), pp.63-69.

Yu, H., Ge, X., Huang, D., Xue, C., Ren, M. and Liang, H., 2023. Dietary supplementation of Chlorella vulgaris effectively enhanced the intestinal antioxidant capacity and immune status of Micropterus salmoides. *Antioxidants*, *12*(8), p.1565.

Zachleder, V., Bišová, K. and Vítová, M., 2016. The cell cycle of microalgae. In *The physiology of microalgae* (pp. 3-46). Cham: Springer International Publishing.

Zhou, G.J., Ying, G.G., Liu, S., Zhou, L.J., Chen, Z.F. and Peng, F.Q., 2014. Simultaneous removal of inorganic and organic compounds in wastewater by freshwater green microalgae. *Environmental Science: Processes & Impacts*, *16*(8), pp.2018-2027.

Znad, H., Al Ketife, A.M., Judd, S., AlMomani, F. and Vuthaluru, H.B., 2018. Bioremediation and nutrient removal from wastewater by Chlorella vulgaris. *Ecological Engineering*, *110*, pp.1-7.

Zuber, M.A., Yahya, W.J., Ithnin, A.M., Sugeng, D.A., Kadir, H.A. and Ahmad, M.A., 2020. A brief review of palm oil liquid waste conversion into biofuel. *Environmental Reviews*, *28*(1), pp.67-76.