

DAFTAR PUSTAKA

- Abdulkhair, M. Waleed, dan A. M. Alghuthaymi. 2016. Plant pathogens. *Plant Growth* 4: 49-59.
- Acosta, K., K.J. Appenroth, L. Borisjuk, M. Edelman, U. Heinig, M.A.K. Jansen, T. Oyama, B. Pasaribu, I. Schubert, S. Sorrels, K.S. Sree, S. Xu, T.P. Michael, dan E. Lam. 2021. Return of the *Lemnaceae*: duckweed as a model plant system in the genomics and post genomics era. *The Plant Cell* 3: 3207–3234.
- Ahemad, M. dan K. Mulugeta. 2014. Mechanisms and applications of plant growth promoting rhizobacteria: Current perspective. *Journal of King Saud University – Science* 26: 1-20.
- Appenroth, K. J., K. S. Sree, V. Böhm, S. Hammann, W. Vetter, M. Leiterer, dan G. Jahreis. 2017. Nutritional value of duckweeds (*Lemnaceae*) as human food. *Food Chemistry* 217:266–273.
- Baek, G. Y., M. Saeed, dan H. L. Choi. 2021. Duckweeds: their utilization, metabolites, and cultivation. *Applied Biological Chemistry* 73(64):1-5.
- Beneduzi, A., F. Moreirab, P. B. Costab, L. K. Vargasa, B. B. Lisboa, dan R. Favreto. 2013. Diversity and plant growth promoting evaluation abilities of bacteria isolated from sugarcane cultivated in the South of Brazil. *Applied of Soil Ecology* 63: 94-104.
- Bergmann, B. A., J. Cheng, J. Classen, dan A. M. Stomp. 2000. In vitro selection of duckweed geographical isolates for potential use in swine lagoon effluent renovation. *Bioresource Technology* 73:13–20.
- Bhattacharyya, P. N. dan D. K. Jha. 2011. Plant growth-promoting rhizobacteria (PGPR): emergence in agriculture. *World Journal Microbiol Biotechnology* (2012) 28:1327–1350.
- Bolotova, Y. V. 2015. Aquatic plants of the Far East of Russia: a review on their use in medicine, pharmacological activity, Bangladesh. *Journal Medical Sciences* 14:9–13.
- Brady, N.C., dan R. R. Weil. 2002. *Organisms and ecology of the Soil*. In *Nature and Properties of Soils*. Prentice Hall: New Jersey 13: 449-497.
- Bulgarelli, D., K. Schlaeppli, S. Spaepen, V. L. E. Themaat, and P. Schulze-Lefert. 2013. Structure and functions of the bacterial microbiota of plants. *Annual Review of Plant Biology*. 64:807-838.

- Chen, G., K. Zhao, W. Li, B. Yan, Y. Yu, J. Li, Y. Zhang, S. Xia, Z. Cheng, F. Lin, L. Li, H. Zhao, and Y. Fang. 2022. A review on bioenergy production from duckweed. *Biomass and Bioenergy* 161: 1-12.
- Chen, Q. Y., T. Z. Lei, Y. Q. Wu, G. C. Si, C. W. Xi, dan G. X. Zhang. 2019. Comparison of soil organic matter transformation processes in different alpine ecosystems in the Qinghai-Tibet Plateau. *Journal of Geophysical Research: Biogeosciences* 124: 8-9.
- Cheng, J. J. dan A. M. Stomp. 2009. Growing duckweed to recover nutrients from wastewaters and for production of fuel ethanol and animal feed. *Clean Soil Air Water* 37:17–26.
- Culley, D. D. dan E. A. Epps. 1973. Use of duckweed for waste treatment and animal feed. *Journal Water Pollutan Control Fed* 45:337–347.
- Dalu, J. M. dan Ndamba J. 2003. Duckweed based wastewater stabilization ponds for wastewater treatment (a low costs technology for small urban areas in Zimbabwe). *Physics and Chemistry of the Earth Parts A/B/C* 28(20–27): 1147–60.
- Das, B. K., Das, D. P., J. Pradhan, B. Priyadarshinee, I. Sahu, P. Roy, dan B. K. Mishra. 2012. Evaluation of antimicrobial activity and phytochemical screen- ing of ethanolic extract of greater duckweed, *Spirodela polyrrhiza*. *International Journal Pharmacy Biology Sciene* 3:822–833 59.
- Davison, J. 1988. Plant beneficial bacteria. *Biotechnology* 6:282–286.
- Dawis, D. M. K. I., A. G. Coronacion, C. B. Hernandez, M. K. S. Onal, dan J. K. T. Lacsina. 2023. Duckweed (*Landoltia punctata*) production using an arduino-based culturing chamber. *CIGR Journal* (325): 146-158.
- Ertekin Ö, T. Kösesakal, V. S. Ünlü, S. Dağlı, V. Pelitli, H. Uzyol, Y. Tuna, O. Külen, B. Yüksel, S. Onarici, B. C. Keskin, dan A. Memon. 2015. Phytoremediation potential of *Landoltia punctata* on petroleum hydrocarbons. *Turkish Journal of Botany* 39(1): 23-29.
- Fang, Y., O. Babourina, dan Z. Rengel. 2007. Ammonium and nitrate uptake by the floating plant *Landoltia punctata*. *Ann Bot* 99(2):365–370.
- Fourounjian, P., T. Fakhoorian, dan X. Hieu Cao. 2020. Importance of duckweeds in basic research and their industrial applications. *Compendium of Plant Genomes* 1: 1-17.
- Gallego, L. M., Chien, Y., dan Angeles, I. G. C. 2021. Effects of light source and photoperiod on growth of duckweed *Landoltia punctata* and its water quality. *Aquaculture Research* 53(2): 398–408.

- Ghevariya, K.K. dan P. B. Desai. 2014. Rhizobacteria of sugarcane: in vitro screening for their plant growth promoting potentials. *Research Journal Recent Sciences* 3: 52-58.
- Glick, B. R. 1995. Be enhancement of plant growth by free-living bacteria. *Canadian Journal of Microbiology* 2(41): 109–117.
- Glick, B. R. 2012. Review article: plant growth-promoting bacteria: mechanisms and applications. *Hindawi Publishing Corporation*: 1-15.
- Guo, L., Y. Fang, Y. Jin, K. He, dan H. Zhao. 2023. High starch duckweed biomass production and its highly-efficient conversion to bioethanol. *Environmental Technology & Innovation* 32: 1-12.
- Gupta, G., S. S. Parihar, N. K. Ahirwar, S. K. Snehi, dan V. Singh. 2015. Plant growth promoting rhizobacteria (pgpr): current and future prospects for development of sustainable agriculture. *Journal of Microbial & Biochemical Technology* 7(2): 096-102.
- Hillman, W. S., dan Culley, D. D. 1978. The use of duckweed. *American Scientist* 4(66): 442-451.
- Iqbal, J., A. Javed, dan M. A. Baig. 2019. Growth and nutrient removal efficiency of duckweed (*Lemna minor*) from synthetic and dumpsite leachate under artificial and natural conditions. *PLOS ONE* 14: 1 – 9.
- Ishizawa, H., M Kuroda, K. Inoue, D. Inoue, M. Morikawa, dan M. Ike. 2019. Colonization and competition dynamics of plant growth-promoting/inhibiting bacteria in the phytosphere of the Duckweed *Lemna minor*. *Microbial Ecology*: 1 – 11.
- Ishizawa, H., M. Kuroda., M. Morikawa., dan M. Ike. 2017. Evaluation of environmental bacterial communities as a factor affecting the growth of duckweed *Lemna minor*. *Biotechnology for Biofuels* 10: 62.
- Jha, S. dan P. Bindu. 2015. Duckweed: the hidden treasure. *Nepalese Journal of Biosciences* 5(1): 1-20.
- Kittiwongwattana, C. dan S. Vuttipongchaikij. 2015. Biodiversity of endophytic bacteria isolated from duckweed (*Landoltia punctata*) and their IAA production. *Science & Technology Asia* 20: 1 – 11.
- Kittiwongwattana, Chokchai, and Chitti Thawai. 2015. *Paenibacillus lemnae* sp. nov., an endophytic bacterium of duckweed (*Lemna aequinoctialis*). *International journal of systematic and evolutionary microbiology* 65(1): 107-112.
- Klement, Z., K. Rudolph, dan D. C. Sand. 1990. *Methods in Phytobacteriology*. Academia Kiado, Budapest.

- Kloepper, J. W., dan M. N. Schroth. 1978. Plant growth promoting rhizobacteria on radishes. *Proceedings of the Fourth International Conference on Plant Pathogen Bacteria 2*: 879–882.
- Landolt, E. 1981. Distribution pattern of the family *Lemnaceae* in North Carolina. *Veroff. Geobot. Inst. ETH, Stiftung Rubel 77*: 112-148.
- Landolt, E. 1986. The family of *Lemnaceae* - a monographic study. In: *Biosystematic Investigations in the Family of Duckweeds (Lemnaceae)*. *Veroff. Geobot. Inst. ETH Stiftung Rubel 71*(1).
- Lengkong S. C., P. Siahaan, dan A. M. Tangapo. 2022. Analisis karakteristik dan uji bioaktivitas bakteri rizosfer PGPR (Plant Growth Promoting Rhizobacteria) isolat Kalasey. *JURNAL BIOS LOGOS 2*(12): 104-113.
- Leng, R. A., J. H. Stambolie, J.H., dan R. Bell. 1995. Duckweed - a potential high-protein feed resource for domestic animals and fish, livestock. *Research for Rural Development 7*(1).
- Les, D. H. dan D. J. Crawford. 1999. *Landoltia (Lemnaceae)*, a new genus of duckweeds. *Novon 9*: 530–533.
- Les, D. H., D. J. Crawford, E. Landolt, J. D. Gabel, dan R. T. Kimball. 2002. Phylogeny and systematics of *Lemnaceae*, the duckweed family. *Systematic Botany 27*:221–240.
- Makino, A., R. Nakai, Y. Yoneda, T. Toyama, Y. Tanaka, X. Meng, K. Mori, M. Ike, M. Morikawa, Y. Kamagata, dan H. Tamaki. 2022. Isolation of Aquatic Plant Growth-Promoting Bacteria for the Floating Plant Duckweed (*Lemna minor*). *Microorganisms 10*(1546): 1-18.
- Miranda. A. F. N. R. Kumar, G. Spangenberg, S. Subudhi, B. Lal, dan A. Mouradov, A. 2020. Aquatic plants, *Landoltia punctata*, and *Azolla filiculoides* as bio-converters of wastewater to Biofuel. *Plants 9*(4):437- 445.
- Mwale, M. dan F. R. Gwaze. 2013. Characteristics of duckweed and its potential as feed source for chickens reared for meat production: a review. *Science Research Essays 8*: 689–697.
- Nafea, E. M. A. 2016. Characterization of environmental conditions required for production of livestock and fsh fodder from duckweed (*Lemna gibba* L.). *J Mediterr Ecol 14*: 5–11.
- Nie, X., F. Dong, L. Bian, M. Liu, C. Ding, H. He, G. Yang, S. Sun, Y. Qin, R. Huang, Z. Li, R. Wei, dan L. Wang. 2017. Uranium binding on *Landoltia punctata* as a result

- of formation of insoluble nano-U (VI) and U (IV) phosphate minerals. *ACS Sustainable Chemistry and Engineering* 5(2): 1494-1502.
- Pagliuso D, C. E. P. Jara, A. Grandis, E. Lam, M. J. P. Ferreira, dan M. S. Buck- eridge. 2020. Flavonoids from duckweeds: potential applications in the human diet. *RSC Adv* 10:44981–44988.
- Saharan, B.S. dan V. Nehra. 2011. Plant growth promoting rhizobacteria: a critical review. *Life Sciences and Medicine Research* (21): 1-30.
- Samina, M., D. N.Baig, dan G. Lazarovits. 2010. Genetic and phenotypic diversity of plant growth promoting Rhizobacteria isolated from sugarcane plants growing in Pakistan. *Journal Microbiololgy Biotechnology* 20(12): 1614-1623.
- Satheeshkumar, P. K. dan M. Sharma. 2023. Development of an in vitro plant regeneration protocol for the spotted duckweed, *Landoltia punctata*. *Research Square*: 1-17.
- She, R. dan Petti C. 2015. Procedures for the Storage of Microorganisms. In Jorgensen J, Pfaller M, Carroll K, Funke G, Landry M, Richter S, Warnock D (ed), *Manual of Clinical Microbiology*, Eleventh Edition. ASM Press, Washington, DC.
- Shen, N., Q. Wang, J. Zhu, Y. Qin, S. Liao, Y. Li, Q. Zhu, Y. Jin, L. Du, dan R. Huang. 2016. Succinic acid production from duckweed (*Landoltia punctata*) hydrolysate by batch fermentation of *Actinobacillus succinogenes* GXAS137. *Bioresource Technology* 211:307–312.
- Stegemeier, J. P., B. P. Colman, F. Schwab, M. R. Wiesner, dan G. V. Lowry. 2017. Uptake and Distribution of Silver in the Aquatic Plant *Landoltia punctata* (Duckweed) Exposed to Silver and Silver Sulfide Nanoparticles. *Environmental Science and Technology* 51(9): 4936- 4943.
- Stouvenakers, G., P. Dapprich, S. Massart, dan M. H. Jijakli. 2019. Plant pathogens and control strategies in aquaponics. *Aquaponics food production systems* 14: 353-378.
- Su, H., Zhao, Y., Jiang, J., Lu, Q., Li, Q. X., Luo, Y., Zhao, H., dan Wang, M. 2014. Use of duckweed (*Landoltia punctata*) as a fermentation substrate for the production of higher alcohols as biofuels. *Energy & Fuels* 28(5): 3206–3216.
- Suzuki, W. M. Sugawara, K. Miwa, dan M. Morikawa. 2014. Plant growth-promoting bacterium *Acinetobacter calcoaceticus* P23 increases the chlorophyll content of the monocot *Lemna minor* (duckweed) and the dicot *Lactuca sativa* (lettuce). *Journal of Bioscience and Bioengineering* 1(118): 41-44.
- Tao, X., Fang, Y., Xiao, Y., Jin, Y. L., Ma, X. R., Zhao, Y., K. He, H.i Zhao, dan H.Wang. 2013. Comparative transcriptome analysis to investigate the high starch

accumulation of duckweed (*Landoltia punctata*) under nutrient starvation. *Biotechnol. Biofuels* 6(72): 1-15.

- [Toyama, T.](#), [M. Kuroda](#), [Y. Ogata](#), [Y. Hachiya](#), [A. Quach](#), [K. Tokura](#), [Y. Tanaka](#), [K. Mori](#), [M. Morikawa](#), dan [M. Ike](#). 2017. Enhanced biomass production of duckweeds by inoculating a plant growth-promoting bacterium, *Acinetobacter calcoaceticus* P23, in sterile medium and non-sterile environmental waters. *Water Sci Techno* 76 (6): 1418–1428.
- Wang, W., C. Yang, X. Tang, X. Gu, Q. Zhu, K. Pan, Q. Hu, dan D. Ma. 2014. Effects of high ammonium level on biomass accumulation of common duckweed *Lemna minor* L. *Environment Science and Pollutan Research* 21(24):14202-10.
- Wang, Q., L. Ma, Q. Zhou, B. Chen, X. Zhang, Y. Wu, F. Pan, L. Huang, X. Yang, dan Y. Feng. 2019. Inoculation of plant growth-promoting bacteria from hyperaccumulator facilitated non-host root development and provided promising agents for elevated phytoremediation efficiency. *Chemosphere* 234: 769 – 776.
- Wang, W., R. Li, Q. Zhu, X. Thang, dan Q. Zhao. 2016. Transcriptomic and physiological analysis of common duckweed *Lemna minor* to NH₄⁺ toxicity. *BMC Plant Biology* 16(92): 1-13.
- Whipps, J. M. 2001. Microbial interactions and biocontrol in the rhizosphere. *Journal of Exploration Botany* 52: 487-511.
- Xiao, Y., Y. Fang, Y. Jin, G. Zhang, dan H. Zhao. 2013. Culturing duckweed in the field for starch accumulation. *Industrial Crops and Products* (48): 183–190.
- Xu, J., J. J. Cheng, dan A. M. Stomp. 2012. Growing *Spirodela polyrrhiza* in swine wastewater for the production of animal feed and fuel ethanol: a pilot study. *Clean - Soil, Air, Water* 40: 760–765.
- Yamaga F., K. Washio, dan M. Morikawa. 2010. Sustainable biodegradation of phenol by 550 *Acinetobacter calcoaceticus* P23 isolated from the rhizosphere of duckweed *Lemna aoukikusa*. 551 *Environ Sci Technol* 44: 6470-6474.
- Yamakawa, Y., R. Jog, dan M. Morikawa. 2018. Effects of co-inoculation of two different plant growth-promoting bacteria on duckweed. *Plant Growth Regulation* 86: 287 – 296.
- Yang Fang, Anping Du, Li Tan, Kaize He, Yanling Jin, Yanqiang Ding, Lin Guo dan Hai Zhao. 2007. The transcriptome in *Landoltia punctata*. *The Duckweed Genomes, Compendium of Plant Genomes* 12:125-131.
- Yoneda, Y., K. Yamamoto, A. Makin, Y. Tanaka, X. Y Meng, J. Hashimoto, K. Shin-ya, N. Satoh, M. Fujie, T. Toyama, K. Mori, M. Ike, M. Morikawa, Y. Kamagata, dan H.

- Tamaki. 2021. Novel plant-associated *Acidobacteria* promotes growth of common floating aquatic plants. Duckweeds. *Microorganism* 9(1133): 1-15.
- Zhao, X., A. Elliston, S. R. A. Collins, G. K. Moates, M. J. Coleman, dan K. W. Waldron. 2012. Enzymatic saccharification of duckweed (*Lemna minor*) biomass without thermophysical pretreatment. *Biomass Bioenergy* 47:354–361.
- Zhou, Q., X. Li, Y. Lin, C. Yang, W. Tang, S. Wu, D. Li, dan W. Lou. 2019. Effects of copper ions on removal of nutrients from swine wastewater and on release of dissolved organic matter in duckweed systems. *Water Res* 158:171–181.
- Zuki, N. A. A. M., H. Yahya, N. Ariffin, dan H. N. Yahya. 2022. The classification of duckweed and its bacterial community: a review. *Malaysian Journey of Science, Health, and Technology* 1(8): 14-26.