

DAFTAR PUSTAKA

- Ahmad, I., M. Ahmad, A. Hussain, dan M. Jamil. 2021. Integrated use of phosphate-solubilizing *Bacillus subtilis* IA6 and zinc-solubilizing *Bacillus* sp. strain IA16: a promising approach for improving cotton growth. *Folia Microbiologica* 66: 115 – 125.
- Alen'kina, S.A. dan V.E. Nikitina. 2017. Change in the ratio between the activities of different types of protease and their inhibitors in plant roots exposed to *Azospirillum* lectins. *Journal of Plant Growth Regulation* 36: 522 – 527.
- Ali, Z., H. Waheed, A.G. Kazi, A. Hayat, dan M. Ahmad. 2016. *Plant Metal Interaction*. Elsevier Inc., Amsterdam.
- Appenroth, K. J., K. S. Sree, M. Bog, J. Ecker, C. Seeliger, V. Bohm, S. Lorkowski, K. Sommer, W. Vetter, K. T. Banasch, R. Kirmse, M. Leiterer, C. Dawczynski, G. Liebisch, dan G. Jahreis. 2018. Nutritional value of the *Duckweed* species of the genus *Wolffia* (Lemnaceae) as human food. *Frontiers in Chemistry* 6: 1 – 13.
- Baldani, J. I., V. M. Reis, S. S. Videira, L. H. Boddey, dan V. L. D. Baldani. 2014. The art of isolating nitrogen-fixing bacteria from non-leguminous plant using N-free semi solid media: a practical guide for microbiologist. *Plant and Soil* 384: 413 – 431.
- Broeckling, C. D., M. W. Paschke, J. M. Vivanco, dan D. Manter. 2019. Rhizosphere ecology. *Encyclopedia of Ecology (Second Edition)* 3: 574 – 578.
- Cao, X. H., dan G.T.H. Vu. 2020. Cytogenetics, Epigenetics, and Karyotype Evolution of Duckweed. *The Duckweed Genomes*: 47 – 57.
- Chen, G., Y. Fang, J. Huang, Y. Zhao, O. Li, F. Lai, Y. Xu, X. Tian, K. He, Y. Jin, L. Tan, dan H. Zhao. 2018. Duckweed systems for eutrophic water purification through converting wastewater nutrients to high-starch biomass: comparative evaluation of three different genera (*Spirodela polyrrhiza*, *Lemna minor*, and *Landoltia punctata*) in monoculture or polyculture. *RSC Advances* 8: 17927 – 17937.
- Coico, R. 2005. *Gam Staining*. *Current Protocols in Microbiology*. John Wiley & Sons, Inc., New York.
- Davidson D., dan J. Simon. 1981. Thermal adaptation and acclimation of ecotypic populations of *Spirodela polyrrhiza* (L.) Schleid. (Lemnaceae): morphology and growth rates. *Journal of Thermal Biology* 6: 121 – 128.
- Defez, R., A. Andreozzi, dan C. Bianco. 2017. The overproduction of indole-3-acetic acid (IAA) in endophytes upregulates nitrogen fixation in both bacterial cultures and inoculated rice plants. *Microbial Ecology* 74: 441 – 452.
- Dworkin, M., S. Falkow, E. Rosenberg, K. Schleifer, dan E. Stackebrandt. 2006. The genus *Azospirillum*. *Prokaryotes* 5: 115 – 140.

- Ertuck, Y., S. Ercisli, A. Haznedar, dan R. Cakmakci. 2010. Effect of plant growth promoting rhizobacteria (PGPR) on rooting and root growth of kiwifruit (*Actinidia deliciosa*) stem cuttings. *Biological Research* 43: 91 – 98.
- Fan, B., X. H. Chen, A. Budiharjo, W. Bleiss, J. Vater, R. Borris, 2011. Efficient coloization of plant roots by plant growth promoting bacterium *Bacillus amyloliquefaciens* FZB42, engineered to express green plourescent protein. *Journal of Biotechnology* 151: 303 – 311.
- Fouda, A., A. M. Eid, A. Elsaid, E.F. El-Belely, M.G. Barghoth, E. Azab, A.A. Gobouri, dan S.E. Hassan. 2021. Plant growth-promoting endophytic bacterial community inhabiting the leaves of *Pulicaria incisa* (Lam.) DC inherent to arid regions. *Plants* 10: 1 – 11.
- Garcia-Fraile, P., L.Carro, M. Robledo, M. Ramirez-Bahena, J. Flores-Felix, M.T. Fernandez, P.F. Mateos, R. Rivas, J.M. Igual, E. Martinez-Molina, A. Peix, dan E. Velazquez. 2012. *Rhizobium* promotes non-legumes growth and quality in several productions steps: towards a biofertilization of edible raw vegetable healthy for human. *PLoS ONE* 7: 1 – 7.
- Griffin, M. E., M. K. Mullenix, D. W. Held, R. B. Muntifering, dan S. L. Dillard. 2019. 146 evaluation of plant growth promoting rhizobacteria on stockpiled bermudagrass. *Journal of Animal Science* 97: 36 – 37.
- Hasuty, A., A. Choliq, dan I. hidayat. 2019. Production of Indole Acetic Acid (IAA) by *Serratia marcescens* subsp. *Marcescens* and *Rhodococcus* aff. *qingshengii*. *International Journal of Agricultural Technology* 14: 299 – 312.
- Huang, M., L. Fu, X. Sun, R. Di, dan J. Zhang. 2016. Rapid and highly efficient callus induction and plant regeneration in the starch-rich duckweed strains of *Landoltia punctata*. *Acta Physiologie Plantarum* 288: 1 -13.
- Huelsenbeck, J. P., dan D. M. Hillis. 1993. Success of phylogenetic methods in the four-taxon case. *Systematic Biology* 42: 247 – 264.
- 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: 1 – 10.
- Iwano, H., S. Hatohara, T. Tagawa, H. Tamaki, Y. Li, dan K. Kubota. 2020. Effect of treated sewage characteristics on duckweed biomass production and microbial communities. *Water Science and Technology* 82: 292 – 302.

- Janczarek, M., K. Rachwal, J. Ciesla, G. Ginalska, dan A. Bieganowski. 2014. Production of exopolysaccharide by *Rhizobium leguminosarum* bv. *Trifolii* and its role in bacterial attachment and surface properties. *Plant and Soil* 388: 211 – 227.
- Kang, S. M., A. L. Khan, M. Waqas, K. E. Lee, Y. G. Park, A. Y. Kim, M. A. Khan, Y. H. You, dan I. J. Lee. 2019. Integrated phytohormone production by the plant growth-promoting rhizobacterium *Bacillus tequilensis* SSB07 induced thermotolerant in soybean. *Journal of Plant Interactions* 14: 416 – 423.
- Khairina, Y., R. Jog, C. boonmak, T. Toyama, T. Oyama, dan M. Morikawa. 2020. Indigenous bacteria, an excellent reservoir of functional plant growth promoters for enhancing *Duckweed* biomass yield on site. *Chemosphere* 268: 1 – 8.
- Kittiwongwattana, C. 2019. Differential effects of synthetic media on long-term growth, starch accumulation, and transcription of ADP-glucosepyrophosphorylase subunit genes in *Landoltia punctata*. *Scientific Report* 9: 1 – 11.
- Kittiwongwattana, C. dan C. Thawai. 2014. *Rhizobium lemnae* sp. nov., a bacterial endophyte of *Lemna aequinoctialis*. *International Journal of Systematic and Evolutionary Microbiology* 64: 2455 – 2460.
- 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.
- Kuan, K. B., R. Othman, K. A. Rahim, dan Z. H. Shamsuddin. 2016. Plant growth-promoting rhizobacteria inoculation to enhance vegetative growth, nitrogen fixation, and nitrogen remobilisation of maize under greenhouse conditions. *PLoS ONE* 11: 1 – 19.
- Landolt, E. dan P. Wolff. 1994. Spread of *Lemna turionifera* (Lemnaceae), the red *Duckweed* in Poland. *Fragmenta Floristica et Geobotanica* 39.
- Lebrazi, S., K. Niehaus, H. Bednarz, M. Fadil, M. Chraibi, dan K. Fikri-Benbrahim. 2020. Screening and optimization of indole-3-acetic acid production and phosphate solubilization by rhizobacterial strains isolated from *Acacia cyanophylla* root nodules and their effects on its plant growth. *Journal of Genetic Engineering and Biotechnology* 18: 1 – 12.
- Leng, R. A., J. H. Stambolie, dan R. Bell. 1995. *Duckweed* – a potential high-protein feed resource for domestic animals and fish. *Livestock Research for Rural Development* 7.
- Les, D.H. dan D.J. Crawford. 1999. *Landoltia* (Lemnaceae), a new genus of *Duckweeds*. *Novon* 9: 530 – 533.
- Les, D.H., E. Landolt, dan D.J. Crawford. 1997. Systematics of the *Lemnaceae* (*Duckweeds*): inferences from micromolecular and morphological data. *Plant Systematics and Evolution* 304: 161 – 177.

- Logan, N. A., dan P. de Vos. 2009. *Bacillus* dalam Bergey's Manual of Systematics of Archaea and Bacteria. John Wiley & Sons Inc., United States.
- Mangmang, J. S., R. Deaker, dan G. Rogers. 2015. *Azospirillum brasilense* enhances recycling of fish effluent to support growth of tomato seedlings. *Horticulture* 1: 14 – 26.
- Miljakovic, D., J. Marinkovic, dan S.B. Tubic. 2020. The significance of *Bacillus* spp. in disease suppression and growth promotion of field and vegetable crops. *Microorganisms* 8: 1037.
- Narayan, R., N. C. Gupta, dan D. K. Shahi. 2018. Isolation, morphological, and cultural characterization of *Azospirillum* isolated from rhizospheric soils of various non-leguminous crops of ranchi having acidic pH. *International Journal of Current Microbiology and Applied Sciences* 7: 329 – 338.
- Ondieki, K.D., E.N. Nyaboga, J.M. Wagacha, dan F.B. Mwaura. 2017. Morphological and genetic diversity of Rhizobia nodulating cowpea (*Vigna unguiculata* L.) from agricultural soils of Lower Eastern Kenya. *International Journal of Microbiology*: 1 – 9.
- Park, K.M., H.J. Kim, M. Jeong, M. Koo. 2020. Enterotoxin genes, antibiotic susceptibility, and biofilm formation of low-temperature-tolerant *Bacillus cereus* isolated from green leaf lettuce in the cold chain. *Foods* 9: 249.
- Pellegrini, M., D.M. Spera, C. Ercole, dan M. Del Gallo. 2021. *Allium cepa* L. inoculation with a consortium of plant growth-promoting bacteria: effects on plants, soil, and the autochthonous microbial community. *Microorganisms* 9: 639 – 650.
- Puente, M. L., J. L. Gualpa, G. A. Lopez, R. M. Molina, S. M. Maletti, dan F. D. Cassan. 2018. The benefits of foliar inoculation with *Azospirillum brasilense* in soybean are explain by an auxin signaling model. *Symbiosis* 76: 41 – 49.
- Purwaningsih, S., D. Agustiyani, dan S. Antonius. 2021. Diversity, activity, and effectiveness of *Rhizobium* bacteria as plant growth promoting rhizobacteria (PGPR) isolated from Dieng, Central Java. *Iranian Journal of Microbiology* 13: 130 – 136.
- Randovanovic, N., M. Milutinovic, K. Mihajlovski, J. Jovic, B. Nastasijevic, M. Rajilic-Stojanovic, dan S. Dimitrijevic-Brankovic. 2018. Biocontrol and plant stimulating potential of novel strain *Bacillus* sp. PPM3 isolated from marine sediment. *Microbial Pathogenesis* 120: 71 – 78.
- Sa, G. C. R., C. L. M. Carvalho, A. Moreira, M. hungria, M. A. Nogueira, R. Heinrichs, dan C. V. Soares Filho. 2019. Biomass yield, nitrogen accumulation and nutritive values of mavuno grass inoculated with plant growth-promoting bacteria. *Communications In Soil Science and Plant Analysis* 50: 1911 – 1942.
- Saghafi, D., M. Ghorbanpour, dan B. A. Lajayer. 2018. Efficiency of *Rhizobium* strains as plant growth-promoting rhizobacteria on morpho-physiological properties of

- Brassica napus* L. under salinity stress. *Journal of Soil Science and Plant Nutrition* 18: 253 – 268.
- Saha, P., A. Banerjee, dan S. Sarkar. 2015. Phytoremediation potential of *Duckweed* (*Lemna minor* L.) in steel wastewater. *International Journal of Phytoremediation* 17: 589 – 596.
- Sanders, E. R. 2012. Aseptic Laboratory Technique: Plating Methods. *J. Vis. Exp.* 63: 1-18.
- She R, 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.
- Torre-Ruiz, N. D., V. M. Ruiz-Valdiviezo, C. I. Rincon-Molina, M. Rodriguez-Mendiola, C. Arias-Castro, F. A. Gutierrez-Miceli, H. Palomeque-Dominguez, dan R. Rincon-Rosales. 2016. Effect of plant growth-promoting bacteria on the growth and fructan production of *Agave americana* L. *Environmental Microbiology* 47: 587 - 596.
- Toyama, T., M Kuroda, Y. Ogata, Y. Hachiya, A. Quach, K. Tokura, Y. Yanaka, K. Mori, M. Morikawa, dan M. Ike. 2017. Enhanced biomass production of *Duckweeds* by inoculation a plant growth-promoting bacterium, *Acinetobacter calcoaceticus* P23, in sterile medium and non-sterile environmental waters. *Water Science & Technology* 76: 1418 – 1429.
- Toyobo life Science. 2017. Real Time PCR Reagent. <http://axilscientific.com/downloads/products/Toyobo/TOYOBO-Catalog2016-2017-AXIL.pdf> >. Diakses pada tanggal 20 Mei 2021.
- UK Standards for Microbiology Investigations. 2015. Identification of *Pseudomonas* species and Other non-glucose fermenters. Public Health England.
- Voytas, D. 2001. Agarose gel electrophoresis. *Current Protocols in Molecular Biology* 51: 2 – 5.
- 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.
- Xu, J. dan M.A. Deshusses. 2015. Fermentation of swine wastewater-derived *Duckweed* for biohydrogen production. *International Journal of Hydrogen Energy* 40: 7028 – 7036.
- Xu, Y. L., L. Tan, L. Guo, G. Yang, Q. Li, F. Lai, K. He, Y. Jin, A. Du, Y. Fang, dan H. Zhao. 2019. Increasing starch productivity of *Spirodela polyrrhiza* by precisely control the spectral composition and nutrients status. *Industrial Crops and Products* 134: 284 – 291.

- 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.
- Yin, Y., C. Yu, L. Yu, J. Zhao, C. Sun, Y. Ma, dan G. Zhou. 2015. The influence of light intensity and photoperiod on duckweed biomass and starch accumulation for bioethanol production. *Bioresource Technology* 187: 84 – 90.
- Yousuf, J., J. Thajudeen, M. Rahiman, S. Krishnankutty, A. P. Alikunj, dan M. H. A. Abdulla. 2017. Nitrogen fixing potential of various heterotrophic *Bacillus* strains from a tropical estuary and adjacent coastal regions. *Journal of Basic Microbiology*: 1 – 11.
- Zaim, S., A. A. Bekkar, dan L. Belabid. 2017. *Rhizobium* as a crop enhancer and biofertilizer for increased non-legume production. *Rhizobium Biology and Biotechnology*: 25 – 37.
- Zhao, Y., Y. Fang, Y. Jin, J. Huang, S. Bao, Z. He, F. Wang, dan H. Zhao. 2014. Effects of operation parameters on nutrient removal from wastewater and high-protein biomass production in a *Duckweed*-based (*Lemna aequinoctialis*) pilot-scale system. *Water Science & Technology* 70: 1195 – 1204.
- Zhao, Z., H. Shi, D. Duan, H. Li, T. Lei, M. Wang, dan Y. Zhao. 2015. The influence of *Duckweed* spesies diversity on ecophysiological tolerance to copper exposure. *Aquatic Toxicology*: 1 – 30.
- Zuluaga, M.Y.A., K.M.L. Milani, B. Miras-Moreno, L. Lucini, F. Valentinuzzi, T. Mimmo, Y. Pii, S. Cesco, E.P. Rodrigues, A.L. Martinez de oliveira. 2021. Inoculation with plant growth-promoting bacteria alters the rhizosphere functioning of tomato plants. *Applied Soil Ecology* 158: 1 – 12.