

DAFTAR PUSTAKA

- Amanatin, DR. dan Nurhidayati, T. 2013. Pengaruh kombinasi konsentrasi media ekstrak taugé (MET) dengan pupuk urea terhadap kandungan protein spirulina sp. *Jurnal Sains dan Seni POMITS*. 2(2) : 2337-3520.
- Andersen, A. R. 2005. *Alga Culturing Techniques*. Elsevier Academic Press. USA. Pp.67-69.
- Andreozzi R., Caprio V., Insola A., Marotta R . 1999. Advanced oxidation process (AOP) for water purification and recovery. *Today*. 53 : 51-59.
- Barber, T.A. 2000. *Control of particulate matter contamination in health care manufacturing*. Interham Press. Englewood USA. Pp. 1 – 2.
- Barrocal, V.M., Garcia-Cuberi, M.T., Gonzalez-Benito, G., dan Coca, M. Production of biomass by *Spirulina maxima* using sugar beet vinasse in growth media. *New Biotechnology*. 27(6) : 851-856.
- Becker E.W., Baddiley S.J., Carey N.H., Higgins I.J., Potter W.G. 1994. *Microalgae : Biotechnology and Microbiology*. New York : Cambridge University Press. Pp. 336-337.
- Belotti, G., Bravi, M., de Caprariis, B., de Filippis, P., Scarsella, M. 2013. Effect of Nitrogen and Phosphorus Starvations on *Chlorella vulgaris* Lipids Productivity and Quality under Different Trophic Regimens for Biodiesel Production *American Journal of Plant Sciences*, 4:44-51.
- Bhatnagar A., Chinnasamy S., Das K.C. 2011. *Chlorella minutissima*-a promising fuel alga for cultivation in municipal wastewaters. *Applied Biochemistry and Biotechnology*. 161 : 523-536.
- Bligh, E. G., and Dyer, W. J. 1959. A rapid method of total lipid extraction and purification. *Canadian Journal Biochemistry and Physiology*. 37: 911–917.
- Budiyono, Syaichurrozi, I., Sumardiono, S., dan Sasongko, S.B. 2014. Production of *Spirulina platensis* biomass using digested vinasse as cultivation medium. *Trends in Applied Sciences Research* 9(2):93-102.
- Chalid, S. Y., Amini, S., Lestari, S. D. 2010. Kultivasi *Chlorella* sp. pada media tumbuh yang diperkaya dengan pupuk anorganik dan soil extract. *Jurnal Kimia Valensi* 4(1):298-304.
- Chen, F., dan Yue Jiang. 2001. *Algae and their biotechnological potential*. Kluwer Academic Publisher. USA. p.20.
- Chrismadha, T., Lily, P., dan Yayah, M. 2006. Pengaruh konsentrasi nitrogen dan fosfor terhadap pertumbuhan, kandungan protein, karbohidrat dan fikosianin pada kultur spirulina fusiformis. *Berita Biologi*. 8(3).
- Chisti, Y. 2007. Biodiesel from Microalgae. *Biotechnology Advances*. 25: 294-306.
- Cortez, L.A.B., B. Pérez, L.E. 1997. Experiences on vinasse disposal. *Brazilian Journal of Chemical Engineering*. 14(1) : 1-14.
- Courchesne, N.M.D., Parisien, A., Wang, B., Lan, C.Q. 2009. Enhancement of lipid production using biochemical, genetic and transcription factor engineering approaches. *Journal of Biotechnology*. 141 : 31-41.
- De Carvalho, L.F., Oliveira, M.S.D., and Costa, J.A.V. 2014. Evaluation of the influence of nitrogen and phosphorus nutrients in the culture and

- production of biosurfactants by microalga *Spirulina*. *International Journal of Engineering Research and Applications* 6(6) : 90-98.
- De la Noüe J., Lalibereté G., Proulx D. 1992. Algae and wastewater. *Journal of Applied Physiology*. 4 : 247–254.
- Delforno, T.P., Moura, A.G.L., Okada, D.Y., Varesche, M.B.A. 2014. Effect of biomass adaption to the degradation of anionic using EGSB reactors. *Bioresource Technology*. 154 (8) : 114-121.
- Demirbas, M.F. 2011. Biofuels from algae for sustainable development. *Applied Energy*. 88(10) : 3473-3480.
- Dubois M., Gilles K.A., Hamilton J.K., Rebers P.A., Smith F. 1956. Colorimetric method for determination of sugars and related substances. *Analytical Chemistry*. 28 : 350-356.
- Dwidevi S. 2012. Bioremediation of heavy metal by algae : current and future perspective. *Journal of Advanced Laboratory Research in Biology*. 3(3): 195-199.
- El-Sheek, M. M., and Rady, A. A. 1994. Effect of phosphorusstarvation on growth, photosynthesis, and some metabolic process in the unicellular Green alga. *Chlorellakessleri*. 35 (1):139-151.
- FAPRI. 2008. *FAPRI 2008*. U.S. and World Agricultural Outlook. <http://www.fapri.iastate.edu/outlook/2008/text/OutlookPub2008.pdf>.
- Feng, P., Deng, Z., Fan, L., and Hu, Z. 2012. Lipid accumulation and growth characteristics of *Chlorella zofingiensis* under different nitrate and phosphate concentrations. *Journal of Bioscience and Bioengineering*. 114 (4): 405–410.
- Gardner F.P., Pierce R.B., Mitchell R.L. 1991. *Fisiologi Tanaman Budidaya*. UI Press. Jakarta. Pp.27-29.
- Goldberg, I.K., Cohen, Z. 2006. The effect of phosphate starvation on the lipid and fatty acid composition of the fresh water eustigmatophyte *Monodus subterraneus*. *Phytochemistry*. 67 : 696-701.
- Habib, M.A.B and Parvin,M. 2008. A review on culture, production and use of spirulina as food for humans and feeds for domestic animals and fish. *FAO Fisheries and Aquaculture Circular* no.1034.
- Hakalin, N.L.S., Paz, A.P., Aranda, D.A.G. and Moraes, L.M.P. 2014. Enhancement of Cell Growth and Lipid Content of a Freshwater Microalga *Scenedesmus* sp. by Optimizing Nitrogen, Phosphorus and Vitamin Concentrations for Biodiesel Production. *Natural Science*, 6 : 1044-1054.
- Hu, H., K. Gao. 2006. Response of Growth and Fatty Acid Compositions of *Nannochloropsis* sp. to Environmental Factor Under Elevated CO₂ Concentration. *Biotechnology Letters*. 28 : 987-992.
- Kadioğlu A. and Algur Ö.A. 1992. Tests of media with vinasse for *Chlamydomonas reinhardtii* for possible reduction in vinasse pollution. *Bioresource Technology*. 42 (1) : 1–5.
- Kawaroe *et al.* 2010. *Mikroalga : Potensi dan Pemanfaatannya untuk Produksi Bio Bahan Bakar*. Bogor: IPB Press.
- Kazamia, E., Aldridge, D.C., dan Smith , A.G. 2012. Synthetic ecology : a way forward for sustainable algal biofuel production. *Journal of Biotechnology*. (162) : 163-169.

- Blanken, W., Postma, P.R., Lenneke, D.W., Rene, H.W., and Marcel, J. 2016. Predicting microalgae growth. *Algal Research*, 14 : 28-38.
- Margarites, A.C.F., dan Costa J.A.V. 2014. Increment of carbohydrate concentration of *Chlorella minutissima* microalgae for bioethanol production. *International Journal of Engineering Research and Application*. 4 (11) : 80-86.
- Markou, G., Angelidaki, I., Georgakakis. 2012. D. Microalgal carbohydrates: An overview of the factors influencing carbohydrates production, and of main bioconversion technologies for production of biofuels. *Applied Microbiology and Biotechnology*. 96 : 631–645.
- Markou, G. and Georgakakis, D. 2011. Cultivation of filamentous cyanobacteria (blue-green algae) in agro-industrial wastes and wastewaters : A review. *Applied Energy*. 88 : 3389-3401.
- Mata, T. M., Martins, A. A., Caetano, N. S. 2010. Microalgae for biodiesel production and other applications : a review. *Renewable and Sustainable Energy Reviews*. 14:217-232.
- Mulyanto, A. 2010. Mikroalgae (*Chlorella* sp.) Sebagai Agensi Penambat Gas Karbondioksia. *Journal Hidrosfer Indonesia*. 5 (2) : 13 – 23.
- Minnesota Pollution Control Agency. 2008. Nutrients : Phosphorus, Nitrogen Sources, Impact on Water Quality- A General Overview. *Water Quality Impaired Water* 3 (22) : 1-2.
- Nuhamunada, M., Zusron, M., Kusuma, A. B. Haiti, E. P., Amalia, R. & Suyono, E.A. 2013. *Eksplorasi Mikroalga di Pesisir Selatan Yogyakarta untuk Mendapatkan Strain Lokal yang Unggul dalam Produksi Biodiesel*. Program Kreativitas Mahasiswa. Universitas Gadjah Mada. Yogyakarta.
- Parnaudeau V., Condom N., Oliver R., Cazeville P., Recous S. 2007. Vinnase Organic Matter Quality and Mineralization Potential, as Influenced by Raw Material, Fermentation and Concentration Processes. *Journal of Bioresource and Technology*. 99 : 1553-1562.
- Radzun, K. A. Wolf, J., Jakob, G., Zhang, E., Stephens, E., Ross, I., Hankamer, B. 2015. Automated nutrient screening system enables high-throughput optimization of microalgae production conditions. *Biotechnology for Biofuels*. 8:65.
- Richmond, A. 2004. *Handbook of microalgal culture : biotechnology and applied phycology*. Blackwell Science. USA. Pp. 43-46 ; 85-87
- Richmond, A. Emeritus., and Qiang, Hu. 2013. *Handbook of Microalgal Culture : Biotechnology and Applied Phycology Second Edition*. Willey Blackwell. UK. Pp. 45-46.
- Rodolfi, L., Zittelli, G.C., Bassi, N., Padovani, G., Biondi, N., G., Tredici, M.R. 2009. Microalgae for oil : strain selection, induction of lipid synthesis and outdoor mass cultivation in a low-cost photobioreactor. *Biotechnology and Bioengineering*. 102 (1) : 100-112.
- Santos, G.M., R.V. Macedo, R.M. Alegre. 2003. Influência do teor de nitrogênio no cultivo de *Spirulina* máxima em duas temperaturas Parte I: alteração da composição da biomassa. *Ciência e Tecnologia de Alimentos*. 23: 17-21.

- Satyawali, Y., Balakrishnan M. 2008. Wastewater treatment in molasses-based alcohol distilleries for COD and color removal : A review. *Journal Environment and Management*. 86 :481-497.
- Schumann R., N. Häubner, S. Klausch, and U. Karsten. 2005. Chlorophyll extraction methods for the quantification of green microalgae colonizing building facades. *International Biodeterioration and Biodegradation* 55 (3) : 213–222.
- Sheehan J., Dunahay, T. Benneman, J., Roessler, P. 1998. A look back at the department of energy's aquatic species program-biodiesel from algae. *National Renewable Energy Laboratory*. (23) : 167-172.
- Sujatha, K., Nagajaran, P. 2013. Optimization of growth conditions for carotenoid production from *Spirulina plantensis* (Geitler). *International Journal of Current Microbiology and Applied Sciences*. 2 (10) : 325-328.
- Suplee, M.W., Watson, V., Dodds, W.K., and Shirley, C. 2012. Response of alga biomass to large-scale nutrient control in the Clark Fork River, Montana. *United States Journal of American Water Resources Association*. 48 (5): 12-20.
- Syaichurrozi I., Budiyo, Sumardiono S. 2013. Predicting Kinetic Model of Biogas Production from Vinasse at Variation of COD/N. *Bioresource Technology*. 149 : 390-397.
- Syaichurrozi I., Budiyo, Sumardiono S., Sansongko S. B. 2015. Triple Batch Digesters in Series Method to Analyze Biogas Potential from Bioetanol Vinasse. *World Chemical Engineering Journal*. 1 (1) : 1-5.
- Tabatabaei, M., Tohidfar, M., Jouzani, G.S., Safarnejad, M., Pazouki, M. 2011. Biodiesel production from genetically engineered microalgae. *Renewable and Sustainable Energy Reviews*. (15):1918-1924.
- Uslu, L., Isik, O., Koc, K., Goksan, T. 2011. The effects of nitrogen deficiencies on the lipid and protein contents of *Spirulina platensis*. *African Journal of Biotechnology*. 10(3) : 385-389.
- Utama, I. V., S. Nopitasari, Stevanus, Fahrudin, dan R. D. Pahlevi. 2015. Isolasi kultur murni mikroalga dari konsorsium superstrain Glagah sebagai stok *culture collection* di Indonesia. *Program Kreativitas Mahasiswa*. Universitas Gadjah Mada. Yogyakarta.
- Valderrama, L.T., Del Campo, C.M., Rodriguez, C.M., de- Bashana, L.E., Bashan, Y. 2002. Treatment of recalcitrant wastewater from ethanol and citric acid production using the microalga *Chlorella vulgaris* and the macrophyte *Lemna minuscula*. *Water Research*. 36 : 4185-4192.
- Vonshak, A. 2002. *Spirulina platensis (Arthrospira): physiology, cellbiology and Biotechnology*. Taylor & Francis. London.
- Wang J., dan Chen C. 2009, Biosorbents for heavy metals removal and their future. *Biotechnology Advanced*. 27:195-226.
- Wilkie. A. C., Owens J. M., and Riedesel K. J. 2000. Stillage characterization and anaerobic treatment of ethanol stillage from conventional and cellulosic feedstocks. *Biomass and Bioenergy*. 19 (2) : 63-102.
- Xin, L., Hong-ying, H., Ke, G., dan Ying-xue, S. 2010. Effect of different nitrogen and phosphorus concentrations on the growth, nutrient uptake, and lipid accumulation of a freshwater microalga *Scenedesmus sp.* *Bioresource Technology*. 101: 5494-5500.



UNIVERSITAS
GADJAH MADA

**PENGARUH PENAMBAHAN NITROGEN DAN FOSFOR DALAM MEDIUM LIMBAH CAIR BIOETANOL
TERHADAP PERTUMBUHAN,
KANDUNGAN KLOOROFIL, KARBOHIDRAT, DAN LIPID PADA KULTUR CAMPURAN MIKROALGA
STRAIN GLAGAH**

DIGDO SUDIGYO, Dr. Eko Agus Suyono, M. App. Sc

Universitas Gadjah Mada, 2016 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Zhu, C.J. and Lee, Y.K. 1997. Determination of biomass by weight of marine microalgae. *Journal of Applied Phycology*. 9 : 189–94.