

DAFTAR PUSTAKA

- Afriyanti. 2014. Konversi mikrobiologis batang pohon singkong (*Mannihot esculenta*) menjadi etanol oleh *Trichoderma reesei* Pk1J2 dan *Saccharomyces cerevisiae* 3012. Tesis. Fakultas Teknologi Pertanian. Universitas Gadjah Mada : Yogyakarta.
- Ahamed, A., dan Patrick, V. 2008. Culture-based strategies to enhance cellulose enzyme production from *Trichoderma reesei* RUT-C30 in bioreactor culture conditions. *Biochemical Engineering Journal*. 40 : 399-407.
- Anggraeni, N. D., 2008. Analisa SEM (Scanning Electron Microscope) dalam Pemantauan Proses Oksidasi Magnetite Menjadi Hematite. *Seminar Nasional-VII Rekayasa dan Aplikasi Teknik Mesin di Industri*
- Annamalai, N. dan Nallusamy, S. 2016. Production of polyhydroxybutyrate from wheat bran hydrolysate using *Ralstonia eutropha* through microbial fermentation. *Journal of Biotechnology* 237 : 13 – 17.
- Apriliana, D. 2015. Bioconversion of unpretreated dan pretreated rice straw to L (+)-lactic acid using enzymatic hidrolisis dan absorbed carrier solid-state fermentation by *Rhizopus oryzae*. Tesis. Teknologi pertanian. Universitas Gadjah Mada.
- Arora, S.R. dan Sanjoy, R.G. 2018. Bioreactors in solid state fermentation technology: design, applications and engineering aspects. *J. Biotech.* 269 : 16 – 24.
- Awg-Adeni, D.S., Bujang, K.B., Hassan, M.A., dan Abd-Aziz, S. 2013. Recovery of glucose from residual starch of sago hampas for bioethanol production. *Int. BioMed. Res.* <https://doi.org/10.1155/2013/935852>.
- Bu, Y., Alkotaini, B., Salunke, B.K., Deshmukh, A.R., Saha, P., dan Kim, B. S. 2019. Direct ethanol production from cellulose by consortium of *Trichoderma reesei* and *Candida molischiana*. *Green Processing and Synthesis*. 8(1) : 416–420.
- Cecil, J. 2002. The development of technology for the extraction of sago. In: Kainuma, K. Okazaki, M. Toyoda, Y. Cecil, J.E. (Eds.), New frontiers of sago palm studies. Proceedings of the International Symposium on Sago (SAGO 2001). Universal Academy Press, Tokyo : 83–91.

- Chang, S., Wangliang, L., dan Yuming, Z. 2018. Impact of double alkaline peroxide pretreatment on enzymatic hydrolysis of palm fibre. *Carbon Resources Conversion*, 1 : 147 – 152.
- Chiaramonti, D., Matteo, P., Simone, F., Luis, O., Piero, O., Paolo, T., dan Francesco, C. 2012. Review of pretreatment processes for lignocellulosic ethanol production, and development of an innovative method. *Biomass and Bioenergy*. 46 : 25 – 35.
- Datta, R. 1981. Acidogenic fermentation of lignocellulose-acid yield dan conversion of components. *Biotechnology dan Bioengineering* 13: 2167-2170.
- Dewi, P., Indrati, R., Millati, R., dan Sardjono, S. 2018. Effect of physical pretreatment on microstructure of cassava stem fibers and *Aspergillus niger* FNCC 6114 growth through solid state fermentation. *International Journal of Science and Research (IJSR)*. 7(3) : 995–998.
- Dhyani, V. dan Thallada, B. 2018. A comprehensive review on the pyrolysis of lignocellulosic biomass. *Renewable Energy* 129 : 695 – 716.
- Du, L., Lijuan, M., Qing, M., Gaojie, G., Xiaoxia, H., dan Dongguang, X. 2018. Hydrolytic boosting of lignocellulosic biomass by a fungal lytic polysaccharide monooxygenase, AnLPMO15g from *Aspergillus niger*. *Industrial Crops & Products*. 126 : 309 – 315.
- Fang, H. dan Xia, L. 2013. High activity cellulase production by recombinant *Trichoderma reesei* ZU-02 with the enhanced cellobiohydrolase production, *Bioresour. Technol.* 144 : 693 – 697.
- Farkas, C., Rezessy-Szabó, J.M., Gupta, V.K., Truong, D.H., Friedrich, L., Felföldi, J. dan Nguyen, Q. D. 2019. Microbial saccharification of wheat bran for bioethanol fermentation. *Journal of Cleaner Production*, 240 : 1 - 9.
- Gao, K., Boiano, S., Marzocchella, A. dan Rehmann, L. 2014. Cellulosic butanol production from alkali-pretreated switchgrass (*Panicum virgatum*) and phragmites (*Phragmites australis*). *Bioresour. Technol.* 174: 176 –181.
- Garcia, N. F. L., da Silva Santos, F. R., Gonçalves, F. A., da Paz, M. F., Fonseca, G. G., & Leite, R. S. R. (2015). Production of β -glucosidase on solid-state fermentation by *Lichtheimia ramosa* in agroindustrial residues: Characterization and catalytic properties of the enzymatic extract. *Electronic Journal of Biotechnology*, 18(4), 314–319.

- Gusakov, A. V. 2011. Alternatives to *Trichoderma reesei* in biofuel production. *Trends in Biotechnology* 29 (9) : 419 – 425.
- Harmsen, P.F.H., Huijgen, W., Lopez, L.M.B., dan Bakker, R.R.C., 2010. Literature Review of Physical and Chemical Pretreatment Processes for Lignocellulosic Biomass, *Wageningen UR Food & Biobased Research*.
- Hassan, D.B., Maikano, S.A., Hoomsuk, R.H., Issac, A.J, dan Bugaje, I. M. 2015. Comparative evaluation of reducing sugar yields produced from corn cob and corn stalk hydrolysis using *Aspergillus niger*. *Journal of Biofuels*. 6(2) : 650 -653.
- Jha, V., Kumari, N., Prasad, B., dan Ranjan, T. 2019. Ethanol production by *Aspergillus niger* US4MTCC9931 and *Saccharomyces cerevisiae* MTCC174 using different lignocellulosic biomass feed stocks. *BioResources*. 14(4) : 8753–8764.
- Johnravindar, D., Kumarasamy, M., Jonathan, W.C., Wong, dan Namasivayam, E. 2017. Waste-to-biofuel : production of biobutanol from sago waste residues. *Environmental Technology* 38 : 1725 – 1734.
- Juturu, V. dan Jin, C. W. 2014. Microbial cellulases: engineering, production and applications. *Renewable and Sustainable Energy Reviews* 33 : 188 – 203.
- Kiat, L.J. 2006. Preparation and characterization of carboxymethyl sago waste and it's hydrogel. Tesis S2. University Putra Malaysia. Selangor.
- Klich M.A. 2009. Health effects of *Aspergillus* in food and air. *Toxicol. Ind. Health* 25 : 657 – 667.
- Kogo, T., Yuki, Y., Keisuke, K., Hitoshi, M., Taisuke, W., Jun, O., dan Takafumi, K. 2017. Production of rice straw hydrolysis enzymes by the fungi *Trichoderma reesei* and *Humicola insolens* using rice straw as a carbon source. *Bioresource Technology*. 233 : 67 – 73.
- Kolasa, M., Ahring, B.K., Lübeck, P.S., dan Lübeck, M. 2014. Co-cultivation of *Trichoderma reesei* RutC30 with three black *Aspergillus* strains facilitates efficient hydrolysis of pretreated wheat straw and shows promises for on-site enzyme production. *Bioresource Technology*, 169, 143–148.

- Krijgsheld, P., Bleichrodt, R., van Veluw, G.J., Wang, F., Muller, W.H., Dijksterhuis, J., dan Wosten, H.A.B. 2013. Development in Aspergillus. *Stud. Mycol.* 74: 1 – 29.
- Kumari, D. dan Radhika, S. 2018. Pretreatment of lignocellulosic wastes for biofuel production: A critical review. *Renewable and Sustainable Energy Reviews* 90 : 877 – 891.
- Lai, J.C., Wan, A.W.A.R., dan Wen, Y.T. 2013. Characterisation of sago pith waste and its composites. *Industrial Crops and Products*. 45 : 319 - 326.
- Lay, A.F., Tondak, dan Patrik, M. 2010. Optimalisasi pengolahan sagu (*metroxilon*) menjadi biofuel. *Warta Penelitian dan Pengembangan Tanaman*. 16: 1 -5.
- Madigan, M.T. dan Martinko, J.M. 2006. “Brock Biology of Microorganisms”, 11 th ed., New Jersey: Pearson Edu. : 178 – 185.
- Maitan-Alfenas, G.P., Evan, M.V., dan Valéria, M. G. 2015. Enzymatic hydrolysis of lignocellulosic biomass: converting food waste in valuable products. *Current Opinion in Food Science* 1 : 44 – 49.
- Mardawati, E., Putri, A.V., Yuliana, T., Rahimah, S., Nurjanah, S., dan Hanidah, I. 2019. Effects of substrate concentration on bioethanol production from oil palm empty fruit bunches with simultaneous saccharification and fermentation (SSF). *International Conference on Green Agro-Industry and Bioeconomy*. 230 : 1 – 8.
- Martins, S., Solange, I.M., Guillermo, M.A., Julio, M.S., Cristóbal, N.A., dan Jose, A. T. 2011. Bioactive phenolic compounds: production and extraction by solid-state fermentation. A review. *Biotechnology Advances*. 29 : 365 – 373.
- McClatchey, W.H.I., Manner, dan Elevitch, C.R. 2006. *Metroxylon amicarum, M. paulcoxi, M. sagu, M. salomonense, M. vitiense, and M. warburgii* (sago palm) Arecaceae (palm family). Species profiles for Pacific Island agroforestry. www.traditionaltree.org. (Diakses tanggal 1 September 2018).
- Miller, G. 1959. Use of dinitrosalicylic acid reagent for determination of reducing sugar. *Analytical Chemistry*. 31 (3): 426 – 428.
- Modenbach, A. 2013. Sodium hydroxide pretreatment of corn stover and subsequent enzymatic hydrolysis : An investigation of yields , kinetic modeling and glucose recovery. *Theses and Dissertations--Biosystems and Agricultural Engineering*. 17. https://uknowledge.uky.edu/bae_etds/17



Muhsafaat, L.O., Sukira, H.A., dan Suryahadi. 2015. Kualitas protein dan komposisi asam amino ampas sagu hasil fermentasi *Aspergillus niger* dengan penambahan urea dan zeolit. *Jurnal Ilmu Pertanian Indonesia*. 20 : 124 – 130.

Mussatto, S.I. dan Teixeira, J.A. 2010. Lignocellulosic as raw material in fermentation process. *Current Research, Technology and Education Topics in Applied Microbiology and Microbial Biotechnology* A. Mendez-Vilas (Ed.).

Orinda, E. Konversi mikrobiologis jerami padi (*Oryza sativa* L.) menjadi etanol melalui proses hidrolisis enzimatis oleh kombinasi enzim yang dihasilkan *Aspergillus niger* FNCC 6114 dan *Trichoderma reesei* PK1J2 dan Fermentasi etanol oleh *Mucor indicus* Tesis. Fakultas Teknologi Pertanian. Universitas Gadjah Mada : Yogyakarta

Puad, N.I.M., Sulaiman, S., Azlin, S.A., Shamsudin, Y., dan Mel, M. 2015. Preliminary study on biohydrogen production by *E. coli* from sago waste. *Journal of Engineering Science and Technology* 7 : 12 – 21.

Rahardjo, Y.S.P. 2005. Fungal Mats in Solid-State Fermentation PhD Thesis, Wageningen University, Wageningen : The Netherlands

Rana, V., Eckard, A.D., Teller, P., dan Ahring, B. K. 2014. On-site enzymes produced from *Trichoderma reesei* RUT-C30 and *Aspergillus saccharolyticus* for hydrolysis of wet exploded corn stover and loblolly pine. *Bioresource Technology*. 154 : 282–289.

Ruiz, C., Cristóbal, C., Mercedes, B., Paloma, M., Ignacio, B., dan Eulogio, C. 2006. Ethanol production from pretreated olive tree wood and sunflower stalks by an SSF process. *Applied Biochemistry and Biotechnology*. 129 – 132 : 631 – 643.

Sathendra, E. R., Baskar, G., Praveenkumar, R., dan Gnansounou, E. 2019. Bioethanol production from palm wood using *Trichoderma reesei* and *Kluveromyces marxianus*. *Bioresource Technology*. 271 : 345–352.

Schuster, E., Dunn-coleman, N., Frisvad, J., dan Dijk, P. 2002. On the Safety of *Aspergillus niger*- a review. *Appl. Microbiol. Biotech.* 59 (4-5): 426 – 435.

Schuster, A. dan Schmoll, M. 2010. Biology and biotechnology of *Trichoderma*. *Appl. Microbiol. Biotechnol.* 87 : 787–799.

Sharma, K.M., Kumar, R., Panwar, S., dan Kumar, A. 2017. Microbial alkaline proteases: Optimization of production parameters and their properties.

Journal of Genetic Engineering and Biotechnology. 15(1) : 115–126.

- Sharma, T.K. dan Singh, R. 2018. Optimization for production of reducing sugar from *Eichhorniacrassipes* biomass using *Aspergillus niger*. *Journal of Environmental Research and Development*. 13(1) : 54 – 60.
- Singhal, R.S., Kennedy, J.F., Gopalakrishnan, S.M., Kaczmarek, A.K., dan Akmar, P.F. 2008. Industrial production, processing, and utilization of sago palmderived products. *Carbohydrate Polymers* 72 (1), 1 – 20.
- Singhania, R.R., Anil, K.P., Carlos, R.S., dan Ashok, P. 2009. Recent advances in solid-state fermentation. *Biochemical Engineering Journal*. 44 : 13 – 18.
- Singhania, R.R., Sukumaran, S.K., Patel, A.K., Larroche, C., dan Pandey, A. 2010. Advancement and comparative profiles in the production technologies using solid-state and submerged fermentation for microbial cellulases. *Enzyme and Microbial Technology* 46 : 541 – 549.
- Soccol, C.R., Eduardo, S.F.C., Luiz, A.J.L., Susan, G.K., Adenise, L.W., dan Luciana, P.S.V. 2017. Recent development and innovations in solid state fermentation. *Biotechnology Research and Innovation*. 2 : 1 – 20.
- Srivatsava, N., Rekha, R., dan Harinder, S.O. 2014. Application of thermostable cellulose in bioethanol production from lignocellulosic waste. In : Kumar, S., Sarma, A.K., Tyagi, S.K., dan Yadav, Y.K. 2015. Bioprospecting halotolerant cellulase from saline environment of bhitaranika national park, odisha. *Recent Advances in Bioenergy Research* (3).
- Sun, Y. dan Jiayang, C. 2002. Hydrolysis of lignocellulosic materials for ethanol production: a review. *Bioresource Technology* 83 : 1 – 11.
- Sundar, R., Liji, T., Rajila, C., dan Suganyadevi P. 2012. Amylase production by *Aspergillus niger* under submerged fermentation using *Ipomoea batatas*. *Int. J. Appl. Biol. Pharm. Technol.* 3 (2): 175 – 182.
- Syakir, M., Binttoro, M.H., dan Agusta, H. 2009. Pengaruh ampas sagu dan kompos terhadap produktivitas lada perdu. *Jurnal Penelitian Tanaman Industri*. 15: 168 – 173.
- Taha, M., Shahsavari, E., Al-Hothaly, K., Mouradov, A., Smith, A.T., Ball, A.S., dan Adetutu, E. M. 2015. Enhanced biological straw saccharification through coculturing of lignocellulose-degrading microorganisms. *Applied*

Biochemistry and Biotechnology. 175(8) : 3709–3728.

- Thangavelu, S.K., Abu, S.A., dan Farid, N.A. 2014. Bioethanol production from sago pith waste using microwave hydrothermal hydrolysis accelerated by carbon dioxide. *Applied Energy* 128 : 277 – 283.
- Tsafrakidou, P., Bekatorou, A., Koutinas, A.A., Kordulis, C., Banat, I.M., Petsi, T., dan Sotiriou, M. 2018. Acidogenic fermentation of wheat straw after chemical and microbial pretreatment for biofuel applications. *Energy Conversion and Management*. 160 : 509–517.
- Uthumporn, U., Shariffa, Y.N., Fazilah, A., dan Karim, A.A. 2012. Effects of NaOH treatment of cereal starch granules on the extent of granular starch hydrolysis. *Colloid Polym Sci.* 290 : 1481 – 1491.
- Van der Kaaij, R.M., Ram, A.F.J., Schaap, P., dan Punt, P.J. 2011. Genomic Approaches for Identification of the Biopolymer Degrading Enzyme Network of *Aspergillus niger*. In : Hofrichter M (eds). *Industrial Applications. The Mycota (A Comprehensive Treatise on Fungi as Experimental Systems for Basic and Applied Research)*, 10. Berlin: Springer. 407 – 424.
- Voon, W.W.Y., Muhiadin, B.J., Yusof, N.L., Rukayadi, Y., dan Hussin, A.S.M. 2018. Bio-cellulose production by *Beijerinckia fluminensis* WAUPM53 and *Gluconacetobacter xylinus* 0416 in sago by-product medium. *Appl. Biochem. Biotechnol.* <https://doi.org/10.1007/s12010-018-2807-2>
- Wang, J., Xuntong, C., Chonlong, C., Chun, Y., Erzheng, S., Yongcan, J., Fuliang, C., dan Wensheng, Q. 2019. Delignification overmatches hemicelluloses removal for improving hydrolysis of wheat straw using the enzyme cocktail from *Aspergillus niger*. *Bioresource Technology*. 274 : 459 – 467.
- Wardani, A.K. dan Fenty, N.E.K.P. 2013. Produksi etanol dari tetes tebu oleh *Saccharomyces cerevisiae* pembentuk flok (NRRL – Y 265). *AGRITECH*. 33(2) : 131 – 139.
- Wizna, H., Abbas, Y., Rizal, A., Dharma, dan Kompjang, I. P. 2008. Improving the quality of sago pith and rumen content mixture as poultry feed through fermentation by *Bacillus amyloliquefaciens*. *Pak. J. Nutr.* 7 : 249 – 254.
- Yuanita, L. 2006. The effect of pectic substances, hemicellulose, lignin and cellulose content to the percentage of bound iron by dietary fiber macromolecules: acidity and length boiling time variation. *Indo. J. Chem.* 6(3) : 332–337.

Yuliana, E. 2015. Konversi jerami padi (*Oryza sativa L.*) menjadi asam laktat melalui sistem hidrolisis dan fermentasi secara terpisah dan simultan menggunakan *Trichoderma reesei* Pk1J2 dan *Rhizopus oryzae* AT3. Tesis. Fakultas Teknologi Pertanian. Universitas Gadjah Mada : Yogyakarta.

Zaldívar, M., Velásquez, J.C., Contreras, I., dan Pérez, L.M. 2001. Trichoderma aureoviride 7–121, a mutant with enhanced production of lytic enzymes: its potential use in waste cellulose degradation and/or biocontrol. In: 2001, Vol. 4, EJB. *Electronic Journal of Biotechnology*. 4 (3) : 160–168.

Zanirun, Z., Ezyana, K.B., Lai, Y.P., Mohd. A.H., dan Suraini, A. 2014. Effect of physical and chemical properties of oil palm empty fruit bunch, decanter cake, and sago pith residue on cellulases production by *Trichoderma asperellum* UPM1 and *Aspergillus fumigatus* UPM2. *Appl. Biochem. Biotechnol.* 172 : 423 – 435.

Zhang, Q.Z. dan Cai, W. M. 2008. Enzymatic hydrolysis of alkali-pretreated rice straw by *Trichoderma reesei* ZM4-F3. *Biomass and Bioenergy* 32(12) : 1130–1135.

Zhang, Q., Yan, W., Hui, H., dan Chen, W. 2018. Enhancing bioethanol production from *water hyacinth* by new combined pretreatment methods. *Bioresource Technology* 251 : 358 – 363.

Zheng, M., Li, L., Li, X., Xiong, J., Mei, T., dan Chen, G. 2010. The effects of alkaline pretreatment parameters on anaerobic biogasification of corn stover. *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*. 32 (20) : 1918 – 1925.

Zulkarnain, D. 2018. Evaluasi potensi ampas sagu (*Metroxylon sp.*) yang ditambahkan enzim selulase sebagai sumber pakan lokal ayam broiler. Disertasi. Fakultas Peternakan. Universitas Gadjah Mada : Yogyakarta