

**DAFTAR PUSTAKA**

- Ali Usama F. and Hala S. Saad El-Dein. 2008. Production and Partial Purification of Cellulase Complex *Aspergillus niger* and *A. nidulans* Grown on Water Hyacinth. J. Appl. Sci. Research. 4: 875-891.
- Anonim. 2008. Cellulase. Dari: <http://en.wikipedia.org/wiki/Cellulase>
- 2009a. Gel Filtration Principles and methods. Dari: *Amersham Biosciences*. [www.chromatography.amershambiosciences.com](http://www.chromatography.amershambiosciences.com).
- 2009b. Protein purification. Dari: *Amersham Biosciences* [www.chromatography.amershambiosciences.com](http://www.chromatography.amershambiosciences.com)
- 2009c. Protein assay technical handbook. Dari: Pierc [www.piercenet.com/path95h](http://www.piercenet.com/path95h).
- Araujo and D'Souza, J. 1986. Charateristic of cellulolytic enzyme component from *Aspergilus terreus* and its mutant. J.Ferment. Technol. 64: 461-467.
- Begum. F., Nurul Absar and M. Shah Alam. 2009. Purification and Characterization of Extracellular Cellulase from *A. oryzae* ITCC-4857.01. J. Appl. Sciences Research. 5: 1645-1651.
- Beldman, G., Searle-van L, M., Rombouts, F., and Voragen, F. 1985. The Cellulase of *Trichoderma viride*. Purification, Characterization, and Comparison of all Detectable Endoglucanases, Exoglucanases and beta-Glucosidases. Eur J Biochem. 146: 301.
- Belter, P.A., Cussler, E.L., H. Wei-Shou. 1988. Bioseparations Downstream processing for biotechnology. A Willey-interscience publication.
- Bollag, et al., 1996. Protein Methods. A Joh: Willey and sons, inc. GE Healthcare life sciences. 8/262009. Instruction for sephadex media. <http://www5.gelifescience.com/aptrix/upp00919.nsf/content/EE755AF81C96972FC1256>
- Bon, E. P. S., and Ferrara, M. A. 2007. Bioethanol Production via Enzymatic Hydrolysis of Cellulosic Biomass. Document prepared for "The Role of Agricultural Biotechnologies for Production of Bioenergy in Developing Countries", an FAO seminar held in Rome on 12 October 2007, <http://www.fao.org/biotech/seminaroct2007.htm>

Boyer R.A. 1986. *Modern Experimental Biochemistry*. The Benjamin/ Cummings Pub.Co.Inc. Canada.

Bradford, M.M. 1976. A Rapid and Sensitive Method for Quantification of Microgram Quantities of Protein Utilizing the Principle of Protein-dye binding. *Anal. Biochem.* 72: 248–254.

Cammack, R., Teresa K. A., Peter N. C., J. Howard P., Anthony D. S., John L. S., Francis W. 2000. *OXFORD DICTIONARY OF Biochemistry and Molecular Biology REVISED EDITION*. Oxford University Press.

Chand, A. P., Aruna, A.M., Maqsood and Rao, L.V. 2005. Novel mutation method for increased cellulase production. *J. Appl. Microbiol.* 98: 318–323.

Chinedu S. Nwodo, C. Obinna Nwinyi, and V.I. Okochi. 2008. Properties of Endoglucanase of *Penicillium chrysogenum* PCL501. *Australian J. Basic and Appl Sciences.* 2: 738-746.

Coligan, J.E., B.M. Dunn, H.L. Ploegh, D.W. Speicher and P.T. Wingfield. 1996. *Current Protocol in Protein Science*. John Wiley & Sons, Inc. USA.

Dhake A.B., M.B. Patil. 2005. Production of  $\beta$ -Glucosidase by *Penicillium purpurogenum*. *Braz. J. Microbiol.* 36: 170-176.

Dien. B. S., 2008. Hard Cell Walls & Soft Enzymes: Challenges and Opportunities in Developing Enzymes for Cellulosic Biofuels. NCAUR-ARS, Peoria, IL

Eklund, C. 1967. *Laboratory Manual for General Microbiology*. Printice Hall Inc. New Jersey.

Farabee, M.J. 2001. Enzyme: Organic catalyst. W.H-Freeman & Co. USA.

Fawzi E.M. 2003. Production and purification of  $\beta$ -glucosidase and protease by *Fusarium proliferatum* NRRL 26517 grown on *Ficus nitida* wastes. *J. Annals of Microbiol.* 53: 463-476.

Fengel, D, dan Wegener, G. 1985. Kayu:Kimia, Ultrastruktur, Reaksi-reaksi. Gadjah Mada University Press. Yogyakarta



Gashe B.A. 1992. Cellulase production and activity by *Trichoderma* sp. A-001. J. Appl. Bacteriol. 73: 79-82.

Ghose, T.K. 1987. International Union of Pure and Applied Chemistry (IUPAC) Applied Chemistry Division Commision on Biotechnology: Measurement of Cellulase Activities. Pure & Appl. Chem. 59: 257-268.

Glikzman, M. 1984. Food Hydrocolloid vol III. CRC Press.Inc. Boca Raton.Florida.

Gomes Isidore, Mohammad Shaheen, Sabita Rezwana Rahman and Donald James Gomes .2006. Comparative Studies on Production of Cell Wall-Degrading Hydrolases by *Trichoderma reesei* and *T. viride* in Submerged and Solid-State Cultivations. J. Bangladesh Microbiol 23: 149-155.

Hames B.D., Hooper N.M. 2000. Biochemistry.The instant Notes. Ed ke-2. Hongkong: Springer,Verlag: 83-84.

Harris, E.L.V. and Angal S., 1994. Protein Purification Methods a practical approach. Oxford University Press.

Inglin M, Benjamin A. F. and J. R. Loewenberg. 1980. Partial Purification and Characterization of a New Intracellular  $\beta$ -Glucosidase of *Trichoderma reesei*. J.Biochem. 185: 515-519.

Issam, S.M., Gargouri M, Limam F., Fattouch S., Maugard T., Legoy M. D., Marzouki N. 2003. Production, purification, and biochemical characterization of two beta-glucosidases from *Sclerotinia sclerotiorum*. Appl Biochem Biotechnol. 29-40.

Kansarn S, Naoyoshi M, Kono T. and Okada Gentaro. 2000. Purification and characterization of an Endo-cellulase from *Acremonium cellulolyticus*. J. Appl. Glycosci. 2:177-185.

Kaur J. 2007. Purification and characterization of  $\beta$ -glucosidase from *Melanocarpus* sp. MTCC 3922. Electro. J. Biotech. 10.

Prayitno. 1999. Purifikasi dan Karakterisasi Selulase dari *Aspergillus niger* L-23. Thesis. Bioteknologi. UGM Yogyakarta.



Jung-Dae, H., Byoung-Soo, J., Sang-Woo, H., Chang-Bum, Y., Min-Kyun, K. 1999. Isolation and Characterization of *Bacillus subtilis* CH-10 Secreting Cellulase from Cattle Manure. *Microbiol Korea: Natur sciences and mathematics/Life sciences.* 35: 277-282.

Knowles J., Lethtovaara P., Reeri T.T. 1987. Cellulase families and their genes. *Trends Biotechnol.*

Laemmli, U.K. 1970. Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* 277:680–685

Xing-hua, L. Yang Hua-jun, Roy Bhaskar, Wang Dan, Yue Wan-fu, Jiang Li-jun, Park Enoch Y, and Miao Yun-gen. 2009. The most stirring technology in future: Cellulase enzyme and biomass utilization. *African J. biotechnol.* 8: 2418-2422.

Lynd, L. R., Weimer, P. J., van Zyl, W. H., Pretorius, I. S. 2002. Microbial Cellulose Utilization: Fundamentals and Biotechnology. Review. *Microbiol. and Molecular Biology.*

Mahalingeshwabrhaa K. T, J. O Els Olomogna Ikwa and Rameshm Aheshwari. 1993. Purification and characterization of an extracellular  $\beta$ -glucosidase from the thermophilic fungus *Sporotrichum thermophile* and its influence on cellulase activity. *J. General Microbiol.* 139: 2825-2832.

Mandels, M. and Weber, J. 1969. Production of cellulases. *Advances Chemis.* 95: 391–414.

Miettinen-Oinonen, Arja. 2004. *Trichoderma reesei* strains for production of cellulases for the textile industry. Espoo. VTT Publications 550.

Mulyono, A.M.W. 2008. Mutan jamur selulolitik *Trichoderma* sp. untuk meningkatkan kualitas onggok sebagai bahan pakan ayam broiler. *Disertasi. Program Pascasarjana Fakultas Peternakan, Universitas Gadjah Mada. Yogyakarta.*

Mulyono, A.M.W., M. Nurcahyanto, Sarjono, Zuprizal dan Z. Bachruddin. 2007. Mutasi *Trichoderma* sp. Untuk meningkatkan sekresi selulase. *Media Kedokteran Hewan.* 23:68-73.



Nawaz Shabana, M. Aslam Malana, Naheed Ikram, Samia Hafeez, M. Ishfaq Ghori and Amer Jamil. 2006. Kinetic Study of Carboxymethyl Cellulase from *Trichoderma Harzianum*. J. Pak. life sci. 4: 15-19.

Ohmine, K, H. Qoshima and Y. Harono. 1983. Kinetic study on enzymatic hydrolysis of cellulose from *Trichoderma Viride*. Biotechnol. Progress. 24: 2485-2562

Palmer, T. 1991. Understanding enzyme. Springerlink. USA.

Pratyasto, A. P. 2009. Seleksi Mutan *Trichoderma* PK<sub>1</sub>J<sub>2</sub> Penghasil Xilanase dan pola produksi Xilanasenya. Skripsi. Fakultas Teknologi Pertanian. Universitas Gadjah Mada, Yogyakarta.

Prayitno. 1999. Purifikasi dan Karaktrisasi selulase dari *Aspergilus niger* L-23. Thesis. Bioteknologi. UGM Yogyakarta.

Purich., Daniel L. R., Donald A. 2002. Reference A Comprehensive Guidebook to Enzyme Nomenclature, Reactions, and Methods. Elsevier Science. USA.

Rahmawati, 2007. Seleksi Mutan *Trichoderma* PK<sub>1</sub>J<sub>2</sub> Penghasil selulase dan pola produksi selulasenya. Skripsi. Fakultas Teknologi Pertanian. Universitas Gadjah Mada, Yogyakarta.

Raza, M. A and Shafiq-Ur-Rehman. 2009. Production and characterization of endo-β-1,4-glucanase from *thermophilic* fungus. African J. Biotechnol 8: 3297-3302.

Riou C., Jean-Michel Salmon, Marie-Jose Vallier, Ziya Gu-Nata, and Pierre Barre. 1998. Purification, Characterization, and Substrate Specificity of a Novel Highly Glucose-Tolerant β-Glucosidase from *Aspergillus oryzae*. Appl. And Environmental Microbiol. 64: 3607-3614.

Romadhani Y N, 2007. Pengaruh  $a_w$  awal, pH awal dan konsentrasi inokulum terhadap produksi selulase oleh mutan *Trichoderma* AA1 pada medium onggok. Skripsi. Fakultas Teknologi Pertanian. Universitas Gadjah Mada, Yogyakarta.



Saha Badal C.. 2004. Production, purification and properties of endoglucanase from a newly isolated strain of *Mucor circinelloides*. Process Biochemistry 39: 1871-1876.

SchlumbergerLtd.2007.Carboximethylcellulose.<http://www.glossary.oilfield.stb.com/Display.cfm?Term=carboxymethylellulose>.

Scopes, R.K., 1994. Protein Purification, Principles and Practice. Third edition. Springer-Verlag. New York.

Shafaq Amara, M. Aslam Malana, Naheed Ikram, M. Ishfaq Ghori, Kashif Younus Butt and Sibtain Ahmed. 2004. Kinetic Study of Carboxymethylcellulase from *Trichoderma reesei*. J. Pak. life sci. 2: 1- 4.

Shanjiang Y., Guan Yixin and Yu Lihua. 2002. Characterization of crude cellulose from *Trichoderma reesei* and purification of cellulose. Chinese J. Chem. Eng. 10:723-725.

Singh Ajay, A. K. Agrawal, A. B. Abidi, And N. S. Darmwal. 1990. Properties of exoglucanase from *Aspergillus niger* AS-101. J. Gen. Appl. Microbiol. 36: 245-253.

Sun, Y., Cheng, J., 2002. Hydrolysis of lignocellulosic materials for ethanol production, review. Bioresour. Technol. 83: 1–11.

Sybirna, A. 2007. Bioethanol from plant residues, the environmentally friendly fuel of tomorrow. Institute of Cell Biology, NAS of Ukraina.

Takashima S., Akira Nakamura., Haruhiko Masaki and Takeshi uozumi. 1996. Purification and characterization of cellulases from *Humicola grisea*. Biosci. Biotech. Biochem. 60:77-82.

Tarigan, T. 2008. Studi Kondisi Fermentasi pada produksi selulase oleh mutan *Trichoderma* AA1 dengan medium cair. Skripsi. Fakultas Teknologi Pertanian. Universitas Gadjah Mada, Yogyakarta.

Teeri, T. T. 1997. Crystalline cellulose degradation: new insights into the function of cellobiohydrolases. Trends Biotechnol.

Wilson, K. and J. Walker. 2005. Practical Biochemistry: Principles and Techniques. Fifth edition. Cambridge University Press. Cambridge.

Ya-Ping Xue, Li-Qun Jin, Zhi-Qiang Liu, Jian-Fen Zhang and Yu-Guo Zheng. 2008. Purification and characterization of  $\beta$ -glucosidase from *Reticulitermes flaviceps* and its inhibition by valienamine and validamine. African J. Biotechnol. 7: 4595-4601.

Yazdi M. T., J. R. Woodward and A. Udorf. 1990. The cellulase complex of *Neurospora crassa*: activity, stability and release. J. General Microbiol. 136: 1313-1319.

Yeoh, H.H., T.K. Tan., S.K. Koh. 1986. Kinetik properties of  $\beta$ -glukosidase from *Aspergillus oryzae*. Appl. Mikrobiol Biotechnol. 25:25-28.

Young-Ki, Y., Jung-sup L., Hyung-Nam P., Myung-Nim M., Hong-Sub K., Jong-Se K., Chae-Young L and Young-ha R. 1996. Pirification of carboxymethyl Cellulase from Hybrid between *Aspergillus niger* and *Penicillium verruculosum*. J. Mikrobiol. 34: 90-94.

Yoshioka Hajime, Shin-Ichiro Anraku and Shinsaku Hayashida. 1982. Production and Purification of a Novel Type of CMCase from *Humicola grisea* var. *thermoidea* YH-78. Agric. Biol Chem. 46: 75-82.

Zaldivar, J., Nielsen, J., Olsson, L. 2001. Fuel ethanol production from lignocellulose: a challenge for metabolic engineering and process integration. Appl. Microbiol. Biotechnol. 56: 17–34.

Zanoelo Fabiana Fonseca, Maria de Lourdes Teixeira de Moraes Polizeii, He'ctor Francisco Terenzi, Joa'ao Ati'lio Jorge. 2004.  $\beta$ -Glucosidase activity from the thermophilic fungus *Scytalidium thermophilum* is stimulated by glucose and xylose. FEMS Microbiol. 240: 37–143.

Zhang Y-HP, Lynd LR. 2004. Toward an aggregated understanding of enzymatic hydrolysis of cellulose: noncomplexed cellulose systems. Biotechnol Bioeng.

----- 2006. A functionally-based model for hydrolysis of cellulose by fungal cellulase. Biotechnol. Bioeng. 94: 888-898.

Zhang, Y.H.P., Percival., Michael E. H., Jonathan R. M. 2006. Outlook for cellulase improvement: Screening and selection strategies. Research review. *Biotechnol. Advances.* [www.science@direct](http://www.science@direct).

Zhou, J., Yong-Hong W., Ju C., Ying-Ping Z., Si-Liang Z., Peng Y. 2008. Identification and purification of the main components of cellulases from a mutant strain of *Trichoderma viride* T 100-14. *Bioresource Technol.* Elsevier. Science Direct.