

- Abe, T., Matsuzaki, K., Hatano, A. dan Sobue, H. 1955. Distribution of the Substituents in Heterogeneously Methylated Celluloses. *Textile Research Journal*. 4: 254-256.
- Adinugraha, M. P. 2005. Sintesis dan Karakterisasi Sodium Karboksimetilselulosa dari Selulosa Batang Semu Pisang Cavendish. *Tesis*. Yogyakarta : FTP UGM.
- Adinugraha, M. P., Marseno D.W. dan Haryadi. 2005. Synthesis and Characterization of Sodium Carboxymethylcellulose from Cavendish Banana Pseudo Stem (*Musa cavendishii* Lambaert). *Carbohydrate Polymer*. 62:164-169.
- Adiseno, B. 2008. Sintesis dan Karakterisasi Sodium Karboksimetilselulosa dari Tandan Kosong Kelapa Sawit serta Aplikasinya sebagai Penstabil Emulsi Santan Kelapa. *Tesis*. Yogyakarta : FTP UGM.
- Akyunin, S. K. 2015. Eksperimen Pembuatan Brownies Kukus yang Dibuat dengan Substitusi Tepung Kacang Koro Pedang (*Canavalia ensiformis*). *Skripsi*. Semarang : Universitas Negeri Semarang.
- Ambriz, S.L.R., Hernandez, J.J.L., Acevedo, E.A., Tovar, J. dan Perez. L.A.B. 2008. Characterization of a Fibre-rich Powder Prepared by Liquefaction of Unripe Banana Flour. *Food Chemistry*. 107:1515-1521.
- Anggreini, R. A. 2015. Potensi Anti Diabetik Tepung dan Konsentrat Protein Koro Pedang Putih (*Canavalia ensiformis*, L.) pada Tikus Sprague Dawley Diabetes Melitus Induksi Streptozotocin-Nicotinamide. *Tesis*. Yogyakarta : FTP UGM.
- Anonim. 1989. *Methyl Cellulose*. Joint FAO/WHO Expert Committee on Food Additives.
- Anonim. 2005. *Canavalia ensiformis* L. Germplasm. USDA (United State Department of Agriculture). Resources Information Network.
- Anonim. 2012. Koro Pedang sebagai Alternatif Pengganti Kedelai. *Seminar Pengembangan Koro Pedang di Jawa Tengah*. Semarang: Fakultas Pertanian dan Peternakan UNDIP.
- Anonim. 2016. Info Teknologi : Koro Pedang sebagai Pengganti Kedelai. <http://balitkabi.litbang.pertanian.go.id>. Diakses tanggal 12 Januari 2017.
- Aurelia, C. 2016. Pengaruh Konsentrasi Sodium Hidroksida dan Sodium Hipoklorit terhadap Sifat Fisik dan Kimia Selulosa dari Kulit Koro Pedang Putih (*Canavalia ensiformis*). *Skripsi*. Yogyakarta : FTP UGM.
- Biswas, A., Berfield, J.L., Saha, B.C. dan Cheng, H.N. 2013. Conversion of Agricultural by-Products to MC. *Industrial Crops and Products*. 46: 297-300.
- Brandt, L. 2001. Cellulose Ether. *Industrial Polymers handbook*. 3 : 1569-1613.

Casey, J. 1980. *Pulp and Paper Chemistry and Chemical Technology*. New York : Willey Interscience Publisher.

Chen, H. 2014. *Biotechnology of Lignocellulose: Theory and Practice*. Beijing: Chemical Industry Press.

Cicilia, S. 2013. Isolasi Selulosa dan Sintesis Carbocymethyl Cellulose dari Tangkai Enceng Gondok (*Eichornia crassipes* Solm). *Tesis*. Yogyakarta : FTP UGM.

Coates, J. 2000. *Interpretation of Infrared Spectra, A Practical Approach*. Chichester : John Wiley & Sons Ltd.

Croon, I., dan Manley, R. St. J. 1963. Cellulose Ethers : Preparation, Properties, Reaction, and Analyses. *Methods In Carbohydrate Chemistry*. 3:271-288.

Cruz, Da.S.F., Assuncao, R.M.N. dan Motta, L.A. 2012. Synthesis and Characterization of Methylcellulose from Cellulose Extrcted from Mango seeds for use as a Mortar Additive. *Polimeros*. 22:80-87.

Damaiyanti, P. 2014. Pengaruh Perendaman Koro Pedang (*Canavalia ensiformis*) Putih dalam Larutan Natrium Bikarbonat dan Asam Sitrat Terhadap Penurunan HCN, Serta Karakteristik Tepung dan Aplikasinya Pada Pembuatan Cookies. *Skripsi*. Yogyakarta : FTP UGM.

Datta, R. 1981. Acidogenic Fermentation of Lignocellulose. *Biotechnology and Bioengineering*. 23 : 2167-2170.

Dewi, P. R. R. 2016. Pengaruh Perebusan Koro Pedang Putih Terhadap Penghilangan Bau Langu Serta Aplikasi Tepung yang Dihasilkan pada Pembuatan Pai Susu. *Skripsi*. Yogyakarta : FTP UGM.

Fengel, D. dan Wegener, G. 1995. Kayu: Kimia Ultrastruktur, Reaksi-Reaksi. Terjemahan Hardjono Sastrohamidjojo dan Soenardi Prawirohatmodjo. Yogyakarta : Gadjah Mada University Press.

Fennema, O.R. 1996. *Food Chemistry*. Third Ed. USA : University of Wisconsin-Madison, Marcel Dekker Inc.

Ferdiansyah, M.K. 2013. Isolasi Selulosa dan Sintesis Karboksil Metil Selulosa dari Pelepeh Kelapa Sawit. *Tesis*. Yogyakarta : FTP UGM.

Filho, G.R., Assungcao, R.M.N., Meireles, C.D.S Vieira, J.G. dan Cerquiera D.A. 2007. Characterization of Methylcellulose Produced from Sugar Cane Baggase Cellulose: Crystallinity and Themal Properties. *Polimer Degradation and Stability*. 92: 205-210.

Fizriani, A. 2016. Optimasi Sintesis dan Karakterisasi Metil Selulosa dari Kulit Biji Kakao (*Theobroma cacao* L.). *Tesis*. Yogyakarta : FTP UGM.

- Ganjar, I., D.S. Slamet, D. Sukiswati dan L. Somali. 1979. A preliminary study on fermentation of *Canavalia ensiformis* seeds. *Buletin Penelitian Kesehatan*. 7: 1–5.
- Gierer, J. 1970. *The Reaction of Lignin during Pulping; A Description and Comparison of Conventional Pulping Process*. Svensk Papperstidning.
- Haggag, K., Sayad, S., El-Moez, S.A. dan El-Thalouth, I.A. 2014. Preparation and Characterization of Methylcellulose Derivatives from Cellulosic Wastes. *Research Journal of Textile and Apparel*. 3: 42-50.
- Hasan, P.N. 2014. Pengaruh Blansing dan Perendaman Koro Pedang (*Canavalia ensiformis*) Putih Terhadap Penurunan HCN, Serta Karakteristik Tepung dan Aplikasinya pada Pembuatan Donat. *Skripsi*. Yogyakarta : FTP UGM.
- Hiasa, S., Iwamoto, S., Endo, T. dan Edashige, Y. 2014. Isolation of Cellulose Nanofibrils from Mandarin (*Citrus unshiu*) Peel Waste. *Industrial Crops and Products*. 62 : 280-285.
- Hou, C., Chen, Y., Chen, W. dan Li, W. 2011. Microwave-assisted Methylation of Cassava Starch with Dimethyl Carbonate. *Carbohydrate Research*. 346: 1178-1181.
- Hutomo, G.S. 2012. Sintesis dan Karakterisasi Turunan Selulosa dari Pod Husk Kakao (*Theobroma cacao* L.). *Disertasi*. Yogyakarta : FTP UGM.
- Hutomo, G.S., Marseno, D.W., Anggrahini, S. dan Supriyanto. 2012. Ekstraksi Selulosa dari Pod Husk Kakao Menggunakan Sodium Hidroksida. *Agritech*. 32: 223-229.
- Hutomo, G.S., Marseno, D.W., Anggrahini, S. dan Supriyanto. 2012. Synthesis and Characterization of Sodium Carboxymethylcellulose from Pod Husk of Cacao (*Theobroma cacao* L.). *African Journal of Food and Science*. 180-185.
- Imeson, A. 1999. *Food Stabilizer, Thickener, and Gelling Agents*. India : Blackwell Publishing Ltd.
- Johar, N., Ahmad, I. dan Dufrense, A. 2012. Extraction, Preparation, and Characterization of Cellulose Fibres and Nanocrystals from Rice Husk. *Industrial Crops and Products*. 37 : 93-99.
- Kahar, P. 2013. Synergistic Effect of Pretreatment Process on Enzymic Digestion of rice Straw for Efficient Ethanol Fermentation. *Intech*. 326-341.
- Klemm, D., Philipp, B., Heinze, T., Heinze, U., dan Wagenknecht, W. 1998. *Comprehensive Cellulose Chemistry. Volume 1: Fundamentals and Analytical Methods*. Weinheim: Wiley-VCH Verlag GmbH.
- Kumar, A., Negi, Y.S., Bhardwaj, N.K. dan Choudhary, V. 2012. Synthesis and Characterization of MC/PVA Based Porous Composite. *Carbohydrate Polymers*. 88: 1364-1372.

- Kumari M., Survase S.-A., dan Singhal R.-S. .2008. Optimization The Production of schizophyllan using *Schizophyllum commune* NRCM. *Journal of Bioresources Technology*. 1036 – 1043.
- Kuo, C. dan Lee, C. 2008. Enhanced Enzymatic Hydrolysis of Sugarcane Bagasse by N-methylmorpholine-N-oxide Pretreatment. *Journal of Bioresources Technology*. 866-871.
- Mailinda, R.A. 2012. Pengaruh Konsentrasi Natrium Hidroksida (NaOH) Terhadap Karakterisasi Selulosa dari Kulit Biji Kakao (*Theobroma cacao* L.). *Skripsi*. Yogyakarta : FTP UGM.
- Mansour,O.Y., Nagaty, A. dan El-Zawawy, W. 1994. Variables Affecting the Methylation Reactions of Cellulose. *Journal of Applied Polymer Science*. 54: 519-524.
- Marinho, F.D.M. dan Soares, C. D. V. 2013. Cellulose and Its Derivatives Use in the Pharmaceutical Compounding Practice. *Intech* : 141-163.
- Minifie, B.W. dan Chem.C. 1984. *Chocolate Cocoa and Confectionary Westport: The* AVI Publising.
- Mohdy, F.A.A., Halim, E.S.A. Ayana, Y.M.A. dan El Sawy, S.M. 2009. Rice Straw as a New for Some Beneficial Uses. *Carbohydrate Polymers*. 75:44-45.
- Montgomery, D.C. 1997. *Design and Analysis Experiment, 2nd ed.* New York : John Wileyand Sons.
- Murdiati, A, Anggrahini, S. Supriyanto. dan Alim, A. 2015. Peningkatan Kandungan Protein Mie Basah dari Tapioka dengan Subtitusi Tepung Koro Pedang Putih (*Canavalia ensiformis* L). *Agritech*. 35: 251-260.
- Mussatto, S.I. dan Teixeira, J.A. 2010. Lignocellulose as Raw Material in Fermentation Processes. *Technology and Education Topics in Applied Microbiology and Microbial Biotechnology*. 897-908.
- Nasatto, P.L., Pignon, F., Silveira, J.L.M., Duarte, M., Nuseda, M. dan Rinaudo, M. 2015. Methylcellulose, a Cellulose Derivative with Original Physical Properties and Extended Applications. *Polymers*.7:777-803.
- Naufalina, M. D. 2014. Pengaruh Pemberian Susu Kacang Koro Pedang (*Canavalia ensiformis*) terhadap Kadar Kolesterol LDL dan HDL pada Tikus Dislipidemia. *Skripsi*. Semarang : Universitas Diponegoro.
- Nelson, D.C. dan Michael, M.C. 2000. *Biochemistry of Lignocellulose*. New York : Worth Publishers.
- Nisa, A.K. 2016. Pengaruh Penambahan Natrium Bikarbonat dan Perebusan Koro Pedang Putih Terhadap Penghilangan Bau Langu Serta Aplikasi Tepung Yang Dihasilkan Pada Pembuatan Stick. *Skripsi*. Yogyakarta : FTP UGM.

- Oliveira, G.C., Filho, G.R., Vieira, J.G., Assuncao, R. dan Meireless, C. 2010. Synthesis and Application of MC Extracted from Waste Newspaper in CPV-ARI Portland Cement Mortars. *Journal of Applied Polymer Science*. 118 : 1380-1385.
- Oliveira, R.L., Vieira, J.G., Barud, H.S. dan Filho, G.R. 2015. Synthesis and Characterization of MC Produced from Bacterial Cellulose under Heterogeneous Condition. *Journal of The Brazilian Chemical Society*. 9: 1861-1870.
- Pujakaroni, A.S. 2014. Isolasi Selulosa dan Sintesis Sodium Karboksilmetil Selulosa dari Sabut Kelapa Sawit. *Tesis*. Program pasca sarjana UGM. Yogyakarta.
- Pushpamalar, J., Langford S.J., Ahmad M. dan Lim. 2006. Optimization of Reaction Conditions for Preparing Carboxymethyl Cellulose from Sago Waste. *Carbohydrate Polymers*. 64: 312-318.
- Rachtanapun, P. Luangkamin S. Tanprasert K.. dan Suriyatem R. 2012. Carboxymethyl Cellulose Film From Durian Rind. *LWT - Food Science and Technology*. 48: 52-58
- Ramos, L.A. Frollini, E. dan Hienze, T. 2005. Carboxymethylation of Cellulose in The New Solvent Dimethyl sulfoxide/tetrabutylammonium Flouride. *Carbohydrate Polymer*. 60:259-267.
- Reddy, J.P. dan Rhim, J.W. 2014. Isolation and Characterization of Cellulose Nanocrystals From Garlic Skin. *Materials Letters*. 129 : 20-23.
- Rossel, C.M., Santos, E., dan Collar, C. 2009. Physico-chemical Properties of Commercial Fibers from Different Sources : A Comparative Approach. *Journal of Food Research International*. 42: 176-184.
- Rydholm, S. A. 1965. *Pulping Process*. London: Interscience Publishers.
- Salvador, A., Sanz, T. dan Fiszman, S.M.. 2008. Performance of Methyl Cellulose in Coating Batters for Fried Products. *Food Hydrocolloids*. 22:1062-1067.
- Santosa, H. dan Yulianti. 2015. Alat Pengupas Kulit Ari Kacang Koro Pedang Secara Elektrik Mekanik untuk Peningkatan Pengolahan Pasca Panen Petani Pinggir Hutan di Kecamatan Modo Lamongan. *Symposium Nasional RAPI XIV*. UMS.
- Singh, R. K. 2013. Methylcellulose synthesis from corn cobs. *Journal of Thermal Analysis and Calorimetry*. 114: 809-819.
- Sjöström, E. 1998. *Kimia Kayu. Dasar-dasar dan Penggunaan*. Terjemahan Hardjono Sastrohamidjojo dan Soenardi Prawirohatmodjo. Yogyakarta : Gadjah Mada Universty Press.
- Souhoka, F.A. 2013. Metilasi Green Selulosa menggunakan Dimetil Karbonat (DMC) dengan Teknik Gelombang Mikro dan Sonokimia. *Tesis*. Yogyakarta : FMIPA UGM.

- Srakar, N. 1995. Kinetics of Thermal Gelation of Methylcellulose and Hydroxypropylmethylcellulose in Aqueous Solutions. *Carbohydrate Polymers*. 26:195-203.
- Sudarmadji, S., B. Haryono, dan Suhardi. 2010. *Analisa Bahan Makanan dan Hasil Pertanian*. Yogyakarta: Liberty.
- Sudiyono. 2010. Penggunaan  $\text{Na}_2\text{HCO}_3$  untuk Mengurangi Kandungan Asam Sianida (HCN) Koro Benguk pada Pembuatan Koro Benguk Goreng. *Agrika*. 4: 48–53.
- Suharsi, T.K., M. Surahman, dan S.F. Rahmatani. 2013. "Pengaruh Jarak Tanam dan Pemangkasan Tanaman pada Produksi dan Mutu Benih Koro Pedang (*Canavalia ensiformis*)."  
*Jurnal Ilmu Pertanian Indonesia*. 18 : 172-177.
- Suyati, 2008. Pembuatan Selulosa Asetat dari Limbah Serbuk Gergaji Kayu dan Identifikasinya. *Tesis*. Bandung : Institut Teknologi Bandung.
- Togrul, H. dan Arslan, N. 2003. Production of Carboxymethyl Cellulose from Sugar Beet Pulp Cellulose and Rheological Behaviour of Carboxymethyl Cellulose. *Carbohydrate Polymers*. 54:73-82.
- Vargas-Radillo, J. J., Lopez, M. A., Rodriguez-Macias, R., Bariantos-Ramirez, L., Manriquez-Gonzalez, R. dan Navarro-Arzate, F. 2013. Fermentable Sugar From *Lupinus rotundiflorus* by Cumulative Pretreatment Using UV-Light, Freezing, and Boiling in Alkaline Medium, Followed By Enzymatic Hydrolysis. *Bioresources*. 8: 4016-4028.
- Viera, R.G.P., Filho, G.R., Assungcao, R.M.N., Meireles, C.D.S., dan Oliveira, G.S. 2007. Synthesis and Characterization of Methylcellulose from Sugar Cane Bagasse Cellulose. *Carbohydrate Polimers*. 67 : 182-189.
- Viera, R.G.P., Filho, G.R., Assungcao, R.M.N., Meireles, C.D.S., Silva, W.G. dan Motta L.A.C. 2009. Production, Characterization and Evaluation of Methylcellulose from Sugarcane Bagasse for Application as Viscosity Enhancing Admixture for Cement Based Material. *Carbohydrate Polymer*. 78:779-783.
- Wahyuningtas, A. 2016. Sintesis Dan Karakterisasi Methyl Cellulose (mc) Dari Biji Salak (*salacca Edulis Reinw*) Pondoh Super. *Tesis*. Yogyakarta : FTP UGM.
- Wang, Q. dan Li, L. 2005. Effect of Molekuler Weight on Thermoreversible Gelation and Gel Elasticity of Methylcellulose in Aqueous Solution. *Carbohydrate Polymer*. 62:232-238.
- Windrati, W.S., Nafi, A. dan Augustine, P. D. 2010. Sifat Nutrisional Protein Rich Flour (PRF) Koro Pedang (*Canavalia ensiformis* L.). *Agrotek*. 4: 18–26
- Windrati, W.S., Herry, B. dan Diniyah, N. 2014. Pengembangan Teknologi Pangan Berbasis Koro-koroan sebagai Bahan Pangan Alternatif Pensubstitusi Kedelai. *Penelitian Unggulan Perguruan Tinggi*. Jember : FTP Universitas Jember.



**OPTIMASI SINTESIS DAN KARAKTERISASI METIL SELULOSA DARI KULIT KORO PEDANG PUTIH  
(*Canavalia ensiformis* L. (DC.))**

THERESIA ARUMSARI, Prof. Dr. Ir. Agnes Murdiati, M.S.; Prof. Dr. Ir. E. Purnama D., M.Sc.

Universitas Gadjah Mada, 2017 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Wustenberg, T. 2015. *Cellulose and Cellulose Derivatives in Food Industry*. Jerman : Wiley-VCH Verlag GmbH and Co. KGaA Weinheim.

Yasar, F., Togrul, H., dan Arslan, N. 2007. Flow Properties of Cellulose and Carboxy Methylcellulose from Orange Peel. *Journal of Food and Engineering*. 81:187-199.

Ye, D. dan Fariol, X. 2007. Preparation and Characterization of Methylcelluloses from Some Annual Plant Pulp. *Industrial Crops and Products*. 26 : 54-62.

Ye, D., Montane, D., dan Farriol, X. 2005. Preparation and Characterization of Methylcellulose from *Miscanthus sinensis*. *Carbohydrate Polymer*. 62:258-266.