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Dr. Syamsidah Rahmawati



The **5th ISIBio 2018**
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Research Center for Biotechnology - Indonesian Institute of Sciences

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***Innovative Bio-Production in Indonesia (Ibiol) :
Integrated Bio-Refinery Strategy to Promote Biomass
Utilization using Super-Microbes for Fuel and
Chemicals Production***

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Impact Ionic Liquid [Emim]OAc to Cellulose Hydrolysis Activities of Indigenous Microorganisms (IMO's) on Cassava Peels Substrat

Heri Satria^{1*}, Nurhasanah¹, Aspita Laila¹, Dian Herasari¹

¹Department of Chemistry, Faculty of Mathematics and Natural Sciences, University of
Lampung, Jl. Soemantri Brojonegoro No.1 Bandar Lampung 35145, Indonesia.

* Correspondence to : heri.satria@fmipa.unila.ac.id

Abstract

An ionic liquid (IL), 1-ethyl-3-methylimidazolium acetate ([Emim]OAc), was used as pretreatment catalyst follow by hydrolysis of cellulose on cassava peels using local selected indigenous microorganisms (IMO's). Under 20% (w/v) loading mass of substrate and liquid fermentation condition, cellulolytic of cellulose activities and growth of IMO's were investigated under a series of IL concentration. Optimal temperature and pH were 37°C and 5.6 respectively. Enzyme activity was determined by analyzing the hydrolysis of carboxymethylcellulose (CMC) at 37°C using the dinitrosalicylic acid. In general, 0.1 M of IL did not inhibit cell growth significantly. In addition, the hydrolytic activities of obtained-cellulases were most active in presence of 0.1 M of IL, while 0.5 M of IL pushed down the activity into an half and 1.0M extremely was losing the activity. The optimum experimental conditions for hydrolysis of pretreated cassava peels using 0.1 M of [Emim]OAc was established at 37°C, for 72 h when yield of glucose rose up to 65%.

Keywords: ionic liquid, indigenous microorganisms, cellulose hydrolysis, cassava peels

Mannanase Production from *Kitasatospora* sp. using Batch Fermentation Method

Rendi Palar¹, Radityo Pangestu¹, Maulana Permana Ajie², Nanik Rahmani¹
and Yopi¹

¹ Research Center for Biotechnology, Indonesian Institute of Sciences
Cibinong Science Center 16911, West Java, Indonesia

² Rhein-Waal University of Applied Science, Germany
E-mail:rendy.plr@gmail.com

Abstract

Mannanase is a hemicellulose-degrading enzyme which is capable to hydrolyze mannan-rich biomass to mannooligosaccharides. *Kitasatospora* sp., filamentous Actinomycetes, has ability to produce this enzyme. In our previous work, the enzyme was obtained in a flask-shaker level. This study scaled-up the process to a 2 L vessel continuous stirred bioreactor using batch fermentation method. Fermentation was conducted at 28°C, the aeration and motor rotation were set at 2 vvm and 400 rpm, respectively. Bacterial growth was analyzed through its dry cell weight and enzyme activity was tested by DNS method using locust bean gum as substrate. Results indicated that enzyme obtained from this method exhibited highest enzymatic activity was 52.34 ± 4.91 U/mL at 90 h of production time.

Keywords: Mannanase, Batch fermentation, *Kitasatospora* sp.

LIST OF PARTICIPANT

Full Name	Institution
Achrimidiasti Oktariflani	Pakuan University
Ade Andriani	P2 Bioteknologi LIPI
Ade Nena Nurhasanah	P2 Bioteknologi LIPI
Adi Santoso	Puslit Bioteknologi - LIPI
Adik bahanawan	Biomaterials Research Center, Indonesian Institutes of Sciences
Afdhal Fuadi	Teknologi Perikanan Laut FPIK IPB
Agnestania	LIPI
Agustina Senjayani	Science tech faculty - UIN Syarif Hidayatullah Jakarta
Ahmad Fathoni	puslit Bioteknologi LIPI
Aida Wulansari	Puslit Bioteknologi LIPI
Ajsam Aziz	Pakuan University
Aminah	Puslit Bioteknologi LIPI
Andini Sundowo	Research Center for Chemistry Indonesian Institute of Sciences
Ane dwi septina	Research & Development Centre for Social, Economy, Policy and Climate Change
Angger yuda yuliansyah	Universitas Pakuan
Anida ila rachman	Universitas Pakuan
Anis Sri Lestari	Puslit Biomaterial-LIPI
Anky zannati	Pusat Penelitian Bioteknologi LIPI
Apridah Cameliawati Djohan	Universitas Indonesia
Apriwi Zulfitri	Research Center for Biomaterial, Indonesia Institute of Sciences
Ari Sulistyo Wulandari	LIPI
Arief Muammar	Fakultas Biologi UGM
Arizah Kusumawati	Pusat Penelitian Bioteknologi LIPI
Aryani Leksonowati	Pusat Penelitian Biologi-LIPI
Asep Bayu	Pusat Penelitian Oseanografi - LIPI
Atit Kanti	Research Center for Biology-LIPI
Bella Saskia	Pakuan University
Betalini widhi hapsari	RC of biotechnology LIPI

Full Name	Institution
Bugi Ratno Budiarto	Pusat Penelitian Bioteknologi LIPI
Bustanussalam	Pusat Penelitian Bioteknologi LIPI
Carla Frieda Pantouw	Research center for biotechnology
Deazy Rachmi Trisatya	Forest Products Research and Development Center
Deddy Triyono Nugroho Adi	Research Center for Biomaterials, Indonesian Institute of Sciences
Deni Zulfiana	Research Center for Biomaterial LIPI
Deritha Elly Rantau	Research Center for Biotechnology - LIPI
Diah Sulistiarini	Pusat Penelitian Biologi, LIPI
Dian Anggraini Indrawan	Forest Product Research and Development Center
Dian Fitria Agustiyanti	Indonesian Institute of Science
Dian Noverita Widyaningrum	Research Center for Biotechnology - LIPI
Ditya Yoga Wanda	Pakuan University
Dwi Ajas Pramasari	RC Biomaterial - LIPI
Dwi Astuti	Research Center for Biotechnology
Dwi Widyajayantie	Research Center for Biotechnology LIPI
Dwi wulandari	Biotek-LIPI
Dyah Retno Wulandari	Puslit Bioteknologi LIPI
Effrida Angellia	Universitas Pakuan
Eka Fatmawati Tihurua	Pusat Penelitian Biologi LIPI
Eka Lestari	Pusat Penelitian Biomaterial
Eka Nurhasannudin	SGS Indonesia
Elsa Evangelica	Pakuan University
Endang Wahjuningsih	Fakultas Biologi Universitas Nasional
Enny Rimita Sembiring	Pusat Penelitian Bioteknologi - LIPI
Eny Ida Riyanti	BB Biogen
Eris Septiana	Puslit Bioteknologi LIPI
Erwin Al Hafizh	Research Center for Biotechnology Indonesian Institute of Sciences (LIPI)
Esti Rini Satiti	Pusat Litbang Hasil Hutan
Euis Hermiati	Research Center for Biomaterials, Indonesian Institute of Sciences

Full Name	Institution
Evan Maulana	LIPI
Farida Rahman	Institut Pertanian Bogor
Farizul Fadiyah	Lembaga Ilmu Pengetahuan Indonesia
Fauzia Mustikasari	Sampoerna Academy Boarding School
Fauzy Rachman	Puslit Bioteknologi-LIPI
Fenny Clara Ardiati	LIPI
Fifi Afiati	Research Center for Biotechnology
Fiqolbi Nuro	Research Center for Biotechnology LIPI
Firda Aulya Syamani	RC for Biomaterial - LIPI
Fitri Setyoningrum	Research Center of Biotechnology
Florentina Indah Windadri	Botany Div.- Research Center for Biology
Fuji Lestari	Bogor Agricultural University
Fumiyoshi Okazaki	Mie University
Gina Kartina	Bioteknologi LIPI
Gunawan Priadi	Indonesian Institute of Sciences
Hadi Susilo	Fakultas Sains dan Farmasi Unma Banten
Hana Nurbaiti Sobihah Hapsin	UIN Syarif Hidayatullah Jakarta
Hani Fitriani	Puslit Bioteknologi LIPI
Hani Mulyani	Research center for chemistry, Indonesian Institut of Sciences
Happy Mulyani	Universitas Setia Budi
Hariyatun	RC for Biotechnology - Indonesian Institute of Sciences
Hartati	Puslit Bioteknologi LIPI
Heri Satria	University of Lampung
Herman irawan	Research Center for Biotechnology
I Made Sudiana	Research Centre for Biology, LIPI
I Putu Gede Parlida Damayanto	Research Center for Biology - LIPI
Iis Rahayu Effendi	Universitas Pakuan
Ika Rahmatul Layly	BPPT
Ikhsan Matondang	Fakultas Biologi Universitas Nasional
Indira Riastiwi	Puslit Biologi LIPI
Indriawati	RC for Biotechnology-LIPI
Ismadi	P2 Biomaterial-LIPI

Full Name	Institution
R. Irni Fitriana Anggraini	Research Center for Chemistry, Indonesian Institute of Sciences
Rahayu Fitriani Wangsa Putri	Research Center for Biotechnology LIPI
Renna Eliana Warjoto	Fakultas Teknobiologi UNIKA Atma Jaya
Riyona Desvy Pratiwi	P2 Bioteknologi
Rohmah Pari	Forest Products Research and Development Center
Rohmatussolihat	Research Center for Biotechnology
Ruby Setiawan	Indonesian Institute of Sciences
Rudiyanto	Puslit Bioteknologi LIPI
Rugayah	Pusat Penelitian Biologi, LIPI
Rusli fidriyanto	Bioteknologi LIPI
Sabighoh Zanjabila	LIPI
Sarah Aryani Suriadi	Universitas Pakuan
Sarah Azhari Balqis	Universitas pakuan
Silvia Fidyati	UIN Syarif Hidayatullah Jakarta
Siti Kurniawati	Puslit Bioteknologi LIPI
Siti Sunarti	Pusat Penelitian Biologi, LIPI
Slamet Diah Volkandari	Research Center for Biotechnology, LIPI
Sri Endarti Rahayu	Fakultas Biologi - Universitas Nasional
Sri Indrayani	Research Center for Biotechnology
Stephanie	Atma Jaya Catholic University of Indonesia
Sukmiyati Agustin	Universitas Mulawarman
Supatmi	Puslit Bioteknologi LIPI
Swastika	Bioteknologi, LIPI
Sylvia J. R. Lekatompessy	Research Center for Biotechnology- LIPI
Sylvia J.R. Lekatompessy	Research Center for Biotechnology
Theodorus Eko Pramudito	PT. Wilmar Benih Indonesia
Titik Kartika	Research Center for Biomaterials, Indonesian Institute of Sciences
Tiwit Widowati	Puslit Bioteknologi LIPI
Tri Rizki Milazoni	Institut Pertanian Bogor
Tri Murningsih	Botany Div.- Research Center for Biology

Full Name	Institution
Triantarti	PUI Agroindustri Berbasis Tebu
Tutie Djarwaningsih	Pusat Penelitian Biologi, LIPI
Vincentia esti windiastri	Research Center for Biotechnology LIPI
Wa Ode Muliastuty Arsyad	Forest Product Research and Development Center
Wahyuni	Puslit Bioteknologi
Watumesa Agustina Tan	Atma Jaya Catholic University of Indonesia
Wida Banar Kusumaningrum	Pusat Penelitian Biomaterial LIPI
Widya Fatriasari	Research Center for Biomaterials, Indonesian Institute of Sciences
Wike Zahra Mustafawi	Puslit. Biologi LIPI
Witta Kartika Restu	Research Center for Chemistry, Indonesian Institutes of Sciences (LIPI)
Wulansih Dwi Astuti	Pusat Penelitian Bioteknologi LIPI
Yanni Sudiyani	PUI Bioetanol G2
Yanti	Atma Jaya Catholic University of Indonesia
Yashanti Berlinda Paradisa	Research Center For Biotechnology
Yasper Michael Mambrasar	Research Center for Biology - LIPI
Yatri Hapsari	Research Center for Biotechnology LIPI
Yoshifa Kriswidyani	Universitas Pakuan
Yudi Christian Lumbatua	Institut Pertanian Bogor
Pakpahan	Research Center for Biotechnology LIPI
Yuli Sulistyowati	Research Center for Biotechnology
Yuliana Galih Dyan	Research Center for Biotechnology
Anggraheni	Indonesian Institute of Science
Yuliawati	PUI Bioetanol G2
Yanni Sudiyani	PUI Bioetanol G2
Muryanto	Pusat Penelitian Oceanografi - LIPI
Asep Bayu	PUI Agroindustri Berbasis Tebu
Triantarti	PUI Agroindustri Berbasis Tebu
Lilik K Putra	PKT Kebun Raya-LIPI
Joko Ridho Witono	Balai Besar Pulp dan Kertas
Hendro Risdianto	