

BOOK OF PROGRAM



IPB International Convention Center
Bogor, August 6-7th, 2019



SYMPOSIUM PROGRAM

Day 1: Tuesday, August 6th, 2019

Venue: IPB International Convention Center (ICC), Botani Square, Jl. Pajajaran, Bogor, West Java Indonesia

Time	Agenda	Location
08.00-08.45	Registration	
08.45-09.10	Welcoming Speech from - Chairman of ICICS 2019 - President of Indonesian Chemical Society - Rector of IPB University	Ballroom 1 and 2
09.10-09.15	Opening Ceremony by Rector of IPB University	Ballroom 1 and 2
09.15-09.30	<i>Coffee Break</i>	
09.30-09.55	Plenary session Speaker: Prof Tsuyoshi Kawai Chairperson: Sri Sugiarti, PhD Title: Photon-quantitative reaction of Photochromic Terarylenes and Their Higher Functionalization	Ballroom 1 and 2
09.55-10.20	Plenary session Speaker: Assoc Prof Yuan-Chung Cheng Chairperson: Sri Sugiarti, PhD Title: Molecular Modeling of the Dynamics of Light Harvesting in Photosynthetic Pigment-Protein Complexes	Ballroom 1 and 2
10.20-10.35	Discussion	Ballroom 1 and 2
10.35-11.00	Plenary session Speaker: Prof Masaki Kita Chairperson: Prof Wan Aini Wan Ibrahim Title: Bioorganic Studies on the Key Natural Products from Venomous Mammals and Marine Invertebrates	Ballroom 1 and 2
11.00-11.25	Plenary session Speaker: Prof Dr Dyah Iswanti Chairperson: Prof Wan Aini Wan Ibrahim Title: The Development of Electrochemical Biosensors and Its Applications for Healthcare and Environmental Issues	Ballroom 1 and 2
11.25-11.40	Discussion	
11.40-12.10	Technical Presentation	
12.10-13.15	<i>Lunch</i>	Ballroom 1 and 2
13.15-14.00	Poster Session I and Sponsor Stand Tour Poster assessors: Prof Masaki Kita Novriyandi Hanif, D.Sc	Ballroom 3

Time	Agenda	Location
14.00-14.20	Shuichi Shimma, Ph.D Prof Tsuyoshi Kawai Prof. Asep Kadarohman Parallel session Room 1 (Analytical Chemistry): Speaker: Shuichi Shimma, Ph.D Chairperson: Prof. Dr. Irmanida Batubara Room 2 (Material Science): Speaker: Akhmad Sabarudin, D.Sc Chairperson: Dr. Zaenal Abidin, M.Agr Room 3 (Environment): Speaker: Prof Lee Wah Lim Chairperson: Prof. Andrew S. Ball Room 4 (Natural Product): Speaker: Novriyandi Hanif, D.Sc Chairperson: Prof. Dr. Unang Supratman Room 5 (Education and Food Chemistry): Speaker: Prof Asep Kadarohman Chairperson: Prof Hamo D Pranowo Room 6 (Biochemistry): Speaker: Dr. Dodi Safari Chairperson: Assoc Prof Natusuhisa Oka Parallel session Chairperson of room 7: Prof Dr Dyah Iswanti Chairperson of room 8: Dr Maria Parisiowati Chairperson of room 9: Drs. Ahmad Sjahriza, M.Si Discussion	Room 1: Ballroom 1 Room 2: Ballroom 2 Room 3: Meeting room B Room 4: Meeting room C Room 5: Meeting room D Room 6: Meeting room E Meeting room F Adenium Room Plumeria Room
14.20-14.30	Parallel session Chairperson of room 1: Prof. Dr. Irmanida Batubara Chairperson of room 2: Dr. Zaenal Abidin, M.Agr Chairperson of room 3: Prof. Andrew S. Ball Chairperson of room 4: Prof. Dr. Unang Supratman Chairperson of room 5: Prof Hamo D Pranowo Chairperson of room 6: Assoc Prof Natusuhisa Oka Chairperson of room 7: Prof Dr Dyah Iswanti Chairperson of room 8: Dr Maria Parisiowati Chairperson of room 9: Drs. Ahmad Sjahriza, M.Si Discussion	Ballroom 1 Ballroom 2 Meeting room B Meeting room C Meeting room D Meeting room E Meeting room F Adenium Room Plumeria Room
15.20-15.30	Discussion	
15.30-16.00	Coffee Break	
16.00-16.50	Parallel session Chairperson of room 1: Dr. Hendrik Oktendy Lintang Chairperson of room 2: Dr. Agung Dhamar Syakti Chairperson of room 3: Dr. rer.nat. Rino R Mukti	Ballroom 1 Ballroom 2 Meeting room B

Time	Agenda	Location
16.50-17.00	Chairperson of room 4: Ass Prof Mihoko Yamada Chairperson of room 5: Dr. Pham Van Hung Chairperson of room 6: Siti Aisyah, Ph.D Chairperson of room 7: Dr. Gustini Syahbirin, MS Chairperson of room 8: Dr. Muhammad Yudhistira Aziz Chairperson of room 9: Dr. Yenny F Yun Discussion GALA DINNER	Meeting room C Meeting room D Meeting room E Meeting room F Adenium Room Plumeria Room

Day 2: Wednesday, August 7th, 2019

Venue: IPB International Convention Center (IICC), Botani Square, Jl. Pajajaran, Bogor, West Java Indonesia

Time	Agenda	Location
07.30-08.30	Registration	
08.30-09.00	Technical Presentation	
09.00-09.25	Plenary session Speaker: Prof Yun H Taufiq-Yap Chairperson: Akhmad Sabarudin, D.Sc Title: Catalysts For Sustainable Biofuels Production	Ballroom 1 and 2
09.25-09.50	Plenary session Speaker: Prof Takumi Konno Chairperson: Akhmad Sabarudin, D.Sc Title: Non-Coulombic Ionic Crystals with Unusual Arrangement of Complex Cations and Inorganic Anions	Ballroom 1 and 2
09.50-10.05	Discussion	
10.05-10.20	Preparation for parallel session/Coffee break	
10.20-10.40	Parallel session Room 1 (Analytical Chemistry): Speaker: Prof Wan Aini Wan Ibrahim Chairperson: Dr Roza Linda Room 2 (Material Science): Speaker: Dr. rer.nat. Rino R Mukti Chairperson: Dr. Anita Herawati Permana Room 3 (Environment): Speaker: Dr. Agung Dhamar Syakti Chairperson: Dr. Irma H. Suparto Room 4 (Natural Product): Speaker: Dr. Mihoko Yamada Chairperson: Dr. Trivadia Room 5 (Education and Food Chemistry): Speaker: Dr. Pham Van Hung	Room 1: Ballroom 1 Room 2: Ballroom 2 Room 3: Meeting room B Room 4: Meeting room C Room 5: Meeting room D

Time	Agenda	Location
	Chairperson: Assoc Prof Yuan-Chung Cheng Room 6 (Biochemistry): Speaker: Assoc Prof Natsuhisa Oka Chairperson: Dr. Dodi Safari	Room 6: Meeting room E
	Parallel session Chairperson of room 7: Prof. Dr. Morina Adfa Chairperson of room 8: Dr. Khomaimi Hasan Chairperson of room 9: Dr. Supriyono, M.Si	Meeting room F Adenium Room Plumeria Room
10.40-10.50	Discussion	
10.50-11.40	Parallel session Chairperson of room 1: Dr. Roza Linda Chairperson of room 2: Dr. Anita Herawati Permana Chairperson of room 3: Dr. dr. Irma H. Suparto Chairperson of room 4: Dr. Trivadila Chairperson of room 5: Assoc Prof Yuan-Chung Cheng Chairperson of room 6: Dr. Dodi Safari Chairperson of room 7: Prof. Dr. Morina Adfa Chairperson of room 8: Dr. Khomaimi Hasan Chairperson of room 9: Dr. Supriyono, M.Si	Ballroom 1 Ballroom 2 Meeting room B Meeting room C Meeting room D Meeting room E Meeting room F Adenium Room Plumeria Room
11.40-11.50	Discussion	
11.50-12.35	Poster Session II and Sponsor Stand Tour Poster assessors: Prof Dr. Dyah Iswanti Dr. Grace Saidajeno Prof. Dr. Purwaningsih Sugita, MS Prof Takumi Konno	Ballroom 3
12.35-13.30	Lunch	
13.30-14.10	Parallel session Chairperson of room 1: Dr. Sri Mulijani Chairperson of room 2: Dr. Dimas Andrianto Chairperson of room 3: Dr. Wulan Tri Wahyuni Chairperson of room 4: Dr. Lany Nurhayati Chairperson of room 5: Nina Ariesta, M.Si Chairperson of room 6: Dian Arisujaya, M.Si Chairperson of room 7: Dr. Munawar Khalil Chairperson of room 8: Dr. Yuana Nurulita Chairperson of room 9: Dr. Reflida	Ballroom 1 Ballroom 2 Meeting room B Meeting room C Meeting room D Meeting room E Meeting room F Adenium Room Plumeria Room
14.10-14.20	Discussion	
14.20-15.00	Parallel session Chairperson of room 1: Dr. Sri Mulijani Chairperson of room 2: Dr. Dimas Andrianto Chairperson of room 3: Dr. Wulan Tri Wahyuni	Ballroom 1 Ballroom 2 Meeting room B

Time	Agenda	Location
	Chairperson of room 4: Dr. Lany Nurhayati Chairperson of room 5: Nina Ariesta, M.Si Chairperson of room 6: Dian Arisujaya, M.Si Chairperson of room 7: Dr. Munawar Khalil Chairperson of room 8: Dr. Yuana Nurulita	Meeting room C Meeting room D Meeting room E Meeting room F Adenium Room
15.00-15.10	Discussion	
15.10-15.45	Preparation for plenary session/Coffee break	
15.45-16.10	Plenary session Speaker: Prof Harno D Pranowo Chairperson: Prof Lee Wah Lim Title: The solvation structure and dynamics of Cu ²⁺ investigated using an ab initio quantum mechanical charge field molecular dynamics (QMCF MD) simulation approach	Ballroom 1 and 2
16.10-16.35	Plenary session Speaker: Prof. Andrew S. Ball Chairperson: Prof Lee Wah Lim Title: Development and evaluation of a robust detection methods for soil transmitted helminths of public health importance in wastewater	Ballroom 1 and 2
16.35-16.50	Discussion	
16.50-17.10	Closing	Ballroom 1 and 2

Gala Dinner

Tuesday, August 6th, 2019

Venue: IPB International Convention Center (IICC), Botani Square, Jl. Pajajaran, Bogor, West Java Indonesia

Time	Agenda
18:15 - 18:45	Registration
18:45 - 19:00	Opening Traditional Dance
19:00 - 19:15	Opening Speech by The Dean of Faculty of Mathematics and Natural Science IPB University
19:15 - 19:25	Dance performance
19:25 - 19:40	Launching of Journal of the Indonesian Chemical Society and Proceedings of the Indonesia Chemical Society
19:40 - 21:00	Dinner and Entertainment

SCHEDULE PRESENTATION

Day 1: Tuesday, August 6th, 2019
Venue: IPB International Convention Center (IICC), Botani Square, Jl. Pajajaran, Bogor, West Java Indonesia

Time	Agenda		
08.00-08.45	Registration		
08.45-09.10	Welcoming Speech		
09.10-09.15	Opening Ceremony		
09.15-09.30	Coffee Break		
09.30-09.55	Plenary session Speaker: Prof Tsuyoshi Kawai		
09.55-10.20	Plenary session Speaker: Assoc Prof Yuan-Chung Cheng		
10.20-10.35	Discussion		
10.35-11.00	Plenary session Speaker: Prof Masaki Kita		
11.00-11.25	Plenary session Speaker: Prof Dr Dyah Iswanitini		
11.25-11.40	Discussion		
11.40-12.10	Technical Presentation		
12.10-13.15	Lunch		
13.15-14.00	Poster Session I and Sponsor Stand Tour		
14.00-15.30			
		Parallel session	
	Ballroom 1	Ballroom 2	Meeting Room B
	Invited Speaker: Shuichi Shimma, Ph.D OP A1-A5	Invited Speaker: Akhnad Sabarudin, D.Sc OP B1-B5	Invited Speaker: Prof Lee Wah Lim OP C1-C5
	Meeting Room C	Meeting Room D	Meeting Room E
	Invited Speaker: Novriyandi Hanif, D.Sc OP D1-D5	Invited Speaker: Prof Asep Kadarohman OP E1-E5	Invited Speaker: Dr. Dodi Safari OP F1-F5
	Meeting Room F	Adenium Room	Plumeria Room
	OP G1 - G7	OP H1 - H7	OP I1 - I7
15.30-16.00	Coffee Break		
16.00-16.50			
		Parallel session	
	Ballroom 1 :	Ballroom 2 :	Meeting Room B:
	OP A6 - A10	OP B6 - B10	OP C6 - C10
	Meeting Room C:	Meeting Room D:	Meeting Room E:
	OP D6 - D10	OP E6 - E10	OP F6 - F10
	Meeting Room F:	Adenium Room:	Plumeria Room:
	OP G8 - G12	OP H8 - H12	OP I8 - I12
16.50-17.00	Discussion		

Day 2: Wednesday, August 7th, 2019
Venue: IPB International Convention Center (IICC), Botani Square, Jl. Pajajaran, Bogor, West Java Indonesia

Time	Agenda		
07.30-08.30	Registration		
08.30-09.00	Technical Presentation		
09.00-09.25	Plenary session Speaker: Prof Yun H Taufiq-Yap		
09.25-09.50	Plenary session Speaker: Prof Takumi Konno		
09.50-10.05	Discussion		
10.05-10.20	Preparation for parallel session/Coffee break		
10.20-11.50		Parallel session	
	Ballroom 1	Ballroom 2	Meeting Room B
	Invited Speaker: Prof Wan Aini Wan Ibrahim OP A11-A15	Invited Speaker: Dr. rer.nat. Rino R Mukti OP B11-B15	Invited Speaker: Dr. Agung Dhanar Syakti OP C11-C15
	Meeting Room C	Meeting Room D	Meeting Room E
	Invited Speaker: Dr. Mihoko Yamada OP D11-D15	Invited Speaker: Dr. Pham Van Hung OP E11-E15	Invited Speaker: Assoc Prof Natsuhisa Oka OP F11-F15
	Meeting Room F	Adenium Room	Plumeria Room
	OP G13 - G19	OP H13 - H19	OP I13 - I19
11.50-12.35	Poster Session II and Sponsor Stand Tour		
12.35-13.30	Lunch		
13.30-14.10		Parallel session	
	Ballroom 1	Ballroom 2 :	Meeting Room B:
	OP A16 - A19	OPB16 - B19	OP C16 - C19
	Meeting Room C	Meeting Room D	Meeting Room E:
	OP D16 - D19	OP E16 - E19	OP F16 - F19
	Meeting Room F:	Adenium Room:	Plumeria Room:
	OP G20 - G23	OP H20 - H23	OP I20 - I22
Time	Agenda		
14.10-14.20	Discussion		
14.20-15.00		Parallel session	
	Ballroom 1 :	Ballroom 2 :	Meeting Room B:
	OP A20 - A23	OPB20 - B23	OP C20 - C23
	Meeting Room C	Meeting Room D	Meeting Room E:
	OP D20 - D23	OP E20 - E23	OP F20 - F23
	F Room:	Adenium Room:	
	OP G24 - G26	OP H24 - H26	
15.00-15.10	Discussion		
15.10-15.45	Preparation for plenary session/Coffee break		

Presenter Name	ID	Code	Title
Arif Rahman	333	P114	Natural Local Sources for Effective Adsorption of Methylene Blue
Armi Wulanawati	136	P132	Synthesis and Characterization of Composite Magnetite-Bentonite from Indonesian Local Minerals
Aspiyanto	288	P95	Potential of Natural Rubber And Maleic Anhydride Copolymer As Pour Point Depressant
Bella Pratiwi	250	P75	A Review on Potency of Membrane Technology In Separating Folic Acid from Fermented Spinach (<i>Amaranthus</i> Sp.) and Fermented Broccoli (<i>Brassica Oleracea</i> L.)
Binaria Lumban Gaol	379	P127	Dissolution Study of Bromelain Resulting from Partial Purification of Pineapple Stem (<i>Ananas Comosus</i> [L.] Merr) Encapsulated in Chitosan-Guar Gum and Its Activity Test as an Antiplatelet
Cecep Sabana Rahmatillah	367	P122	The Effect of Isopropanol and n-Butanol as Solvents on the Synthesis TiO ₂ /ZSM-5 Composite
Charlena	342	P117	Implementation of Good Laboratory Practice (GLP) in the Chemistry Laboratory, Department Of Chemistry, Faculty Of Mathematic And Natural Sciences, Indonesian Islamic University (UII)
Dedi Rohendi	371	P124	Coating of Nanotube Ti ₆ Al ₄ V Alloy with Hydroxyapatite-Chitosan-Polyvinyl Alcohol Composite
desi arrunillah	289	P96	Performance Test of MEA (Membrane Electrode Assembly) with Pt-Co / C Catalyst at Direct Methanol Fuel Cell (DMFC)
Devi Ratnawati	255	P78	Effect of Sonication Method as Conversion of Fish Oil Biodiesel with Bamboo Leaf Catalyst
Dewi Kurnia	321	P112	Double Coating Microencapsulation of <i>Solanum muricatum</i> Aiton Methanol Extract Using Sodium Alginate and Chitosan
Dian Arrisujaya	308	P105	Anti-inflammatory Activity from Marine Microalgae <i>Navicula salinicola</i> Extract with Human Red Blood Cells (HRBC) Stability Method
Diana Widiastuti	286	P93	Total Flavonoid Content and Antioxidant Activity of Methanol Extracts of <i>Diospyros discolor</i> Seed
Dwi Hudiayanti	307	P104	Phenolic Compound from the Tuber of Sao Pedro Petro Cassava (<i>Manihot esculenta</i> Crantz) and Its Toxicity Effect on <i>Artemia salina</i> Larva By BSLT
Galih Dwiki Ramanda	320	P111	Vitamin C and Iron Encapsulation in Coconut (<i>Cocos nucifera</i> L.) Liposomes
			Effect of NaOH Concentration and Soaking Time on Decreasing Lignin Level in Ketapang Fruit

Presenter Name	ID	Code	Title
Ghufira	270	P86	The Effect of <i>Pandanus amaryllifolius</i> Roxb Extract on Corrosion Inhibitor in HCl Solution
Henny Purwaningsih	237	P136	Synthesis and Characterization of Nickel-Carbon Based Tapioca Starch Nanocomposites
I Nengah Wirajana	343	P118	Amylase and Cellulase From Fermentation of Purple Sweet Potatoes (<i>Ipomoea batatas</i> L. Poir) In the Soil
Intisari Peritwi	248	P74	Bromelain Nanoemulsion Formulation Resulting from Partial Purification of Pineapple Core (<i>Ananas Comosus</i> [L.] Merr) and In Vitro Testing as Anti Inflammation
Khairul Anam	293	P98	The Chemical Content, and Acute Toxicity of <i>Avicennia marina</i> Exudates
Lany Nurhayati	272	P87	Synthesis and Characterization of Ag Doped Nano TiO ₂ for Photodegradation of Pops Waste Under Sunlight
Lela Lailatul Khumaisah	330	P113	Effectiveness of Leaf and Stem Canar Susu (<i>Smilax macrocarpa</i> Blume) Extracts as Biolarvicidal Against <i>Aedes Aegypti</i>
Meiske S. Sangi	279	P90	Toxicity and Phytochemical Tests From Several Fractions Of Aren's (<i>Arenga pinata</i>) Midrib Flour
Moh Syaiful Anif	243	P72	A Novel Spectrophotometric Method for Determination of Oxypurinol in Urine Based on CT Complex Reaction
Muhammad Fathurrahman	259	P81	Synthesis of Silica Gel from Corn Cob Ash and Adsorption Test of The Metal Ion Copper (II)
Muhammad Yudhisitra Azis	388	P131	Qualitative Analysis Study of Glycoalkaloid Compounds In Potato (<i>Solanum tuberosum</i>) Tubers With LC/ESI-TOF-MS
Nanik Wijayati	287	P94	Effectivity Of Potash Alum [KAl(SO ₄) ₂ ·12H ₂ O] as Catalyst on Methoxylation Reaction Of 1,4-Phenene
Ni Made Suamiti	256	P79	Profile and Separation Ethyl Esters in Virgin Coconut Oil Enflurated from the Leave of <i>Cymbopogon nardus</i>
Nila Tanyela Berghuis	359	P120	Malic Acid Isolation from Banana Peels Compared to Apple and Kedondong
Norra Gus Priambodo	365	P121	Storage Time Effect of Lemongrass on the Yield and Chemical Composition of Lemongrass Oil
Nurleasari	260	P82	A Cytotoxic Limonoid from the <i>Chisocheton macrophyllus</i> (Meliaceae)
Poedji Loekitowati Hariani	257	P80	Synthesis and Characterization of Nanohydroxyapatite From Golden Snail (<i>Pomacea canaliculata</i> L) Shells and Its Antioxidant Activity
Poetri Bestari	283	P91	Accuracy of Ethanol Biosensor Based on <i>Acetobacter aceti</i> Biofilm for Determining the Halal Food Products
Rahmaniar Mulyani	357	P119	Relationship of T15458c and T15663c Mutation in the Cyb Gene of Mitochondrial DNA to The Oxphos Process In



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Isolation and Characterization of Lipase from Candlenut

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*Amir
Sri Mulijanti
7/8-2019*

Introduction

Lipase enzymes are an example of various industrial applications, such as food industry, medicine, cleaning industry, detergents, and so on. In recent processing, along with the increasing demand for lipase enzymes, in terms of both quantity and quality, research on various lipases, research on lipase is still growing. As a country rich in biodiversity, Indonesia has many natural lipase. In the preliminary study, the research team was able to isolate lipase from the seeds of candlenut and *Salpiscaria* species. In this study we will describe the biochemical characteristics, in this present research, candlenut seeds as a source of natural lipase. Candlenut (*Albizia lebbek*) seed used in the study with high fat content and is thought to have high lipase activity. In its fresh state, lipase activity of candlenut seed study was tested against triglyceride substrate. Hydrolysis of triglyceride releasing free fatty acids whose levels were determined by titration due the data was converted to lipase activity. Further characterization of candlenut lipase includes: determination of optimum temperature, reaction and determination molecular weights by SDS-PAGE and native-PAGE electrophoresis.

Methodology

Lipase was extracted from candlenut study (Fig. 2 E), and following purification, lipase activity from enzyme fraction was assessed by triglyceride hydrolysis (Fig. 1). The presence of lipase enzyme was confirmed by Sodium Dodecyl Sulfate Polyacrylamide Gel Electrophoresis (SDS-PAGE) and native-PAGE.

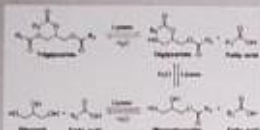


Figure 1. Hydrolysis of triglyceride with lipase. The released free fatty acids is determined by titration with sodium hydroxide.



Figure 2. A) Ripen candlenut fruit, B) Candlenut seeds, C) Candlenut study seedling, D) Fresh candlenut, E) Candlenut flowers.

Results

Candlenut seed shows lipase activity

Candlenut seed shows lipase activity was tested by hydrolysis of triglyceride free acid source of (VCO). The released free fatty acids were determined by Sodium hydroxide titration (Figure 1). It is revealed that in an amount of ripe candlenut has high lipase activity (based on the same proportion condition with control lipase) (data not shown). Temperature effect of candlenut lipase was tested by incubating triglyceride with lipase from candlenut study at different reaction temperatures. Data show that candlenut lipase at 37°C has higher activity in comparison to its activity at 25°C (Figure 3). Further temperature effects to candlenut lipase activity is currently underway.

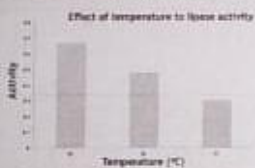


Figure 3. Candlenut lipase activity is various temperatures (activity unit). Activity was analyzed by VCO triglyceride hydrolysis. Sodium hydroxide titration to reaction free fatty acids was converted to lipase activity.



Figure 4. Description of lipase from various sources of candlenut seed by SDS-PAGE (poly acrylamide gel) and lipase from lipase from ripen candlenut seed. P-50 kDa band observed from different candlenut sources versus traditional markets in Lombok and Sumbawa islands (shaded and unshaded side).

Candlenut lipase is a complex protein consists of several subunits

Candlenut lipase was prepared from different sources and state of candlenut. All samples show similar patterns on SDS-PAGE separation (Figure 4 left panel). As can be seen, candlenut study consists of multiple protein (not shown in Figure 4). Mean protein band appears at molecular weight of c.a. 54 kDa, followed by two bands at c.a. 30 kDa, three bands at 25 to 20 kDa and the smallest protein bands is observed at 15 kDa. It is possible that the upper band at 30 kDa region is a polyphosphorylated or the lower protein subunit (Manning, 2015). However, since native-PAGE shows only one protein band at a much higher molecular weight (~120 kDa band in Figure 4, right panel), we speculate that candlenut lipase is a complex protein consists of different subunits. The speculation is supported by similar observation in lipase from coconut and *Salpiscaria* seeds whose lipase are being complex proteins consist of different subunits.

Future works

Future and immediate works will be the production and purification of lipase from germinating candlenut, since it is known that germinating phase of various seed is accompanied with maximum activity of lipase (Rahm, 2015). We are subsequently intended to further biochemical study of candlenut lipase, such as determination of optimum pH and reaction temperature. Additionally, since we have shown that candlenut lipase is a complex protein consists of different subunits, it is interesting to discuss which subunits of candlenut lipase shows the active subunits. The presence of various lipid ions from lower, lower to moderate or higher lipase activity, hence it is also of interest to investigate the effect of lipid ions to the activity of candlenut lipase. Last but not least, determination of substrate specificity of candlenut lipase may give valuable information for further utilization of candlenut lipase.

Conclusion

- Candlenut has high lipase activity
- Candlenut lipase is a complex protein consists of several subunits yet to be described in more detail.
- Future and immediate works will be the determination of active subunit of candlenut lipase, production and purification of it, pure from germinating candlenut, optimum pH and temperature, effect of lipid ions to candlenut lipase activity and determination of its broad specificity of candlenut lipase.

Acknowledgement

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References

- Manning, M, Blom, M, and Salgado, S. 2015. *Protein Purification: A Practical Approach*. London: Academic Press.
- Rahm, M. 2015. *Protein Purification: A Practical Approach*. London: Academic Press.
- Salgado, S, Blom, M, and Manning, M. 2015. *Protein Purification: A Practical Approach*. London: Academic Press.



IPB University
Bogor - Indonesia

Certificate

This is to certify

Dr. Lalu Rudyat Telly Savalas

has participated as

Presenter

THE 8th INTERNATIONAL CONFERENCE OF THE INDONESIAN CHEMICAL SOCIETY (ICICS)

"Chemistry For Human Welfare"

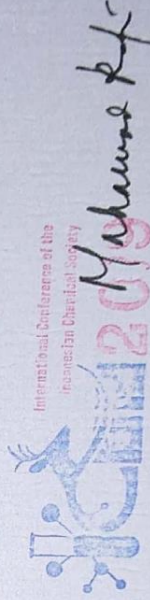
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