

C39 Turnitin L. R. Telly Savalas

by Lalu Rudyat Telly Savalas C39

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Mataram, 7th December 2018

Acceptance of Abstract for the 3rd International Conference on Science and Technology (ICST2018)

Dear **Lalu Rudyat Telly Savalas**
University of Mataram

Thank you for submitting an abstract to the 3rd International Conference on Science and Technology (ICST 2018) which will take place at Grand Madani Hotel, Jl. Udayana No.20, Mataram, NTB, Indonesia on December 10th 2018.

On behalf of the local organizing committee, we are delighted to inform you that the abstract number **A_ICST2018_82** titled **Biochemical Properties of *Terminalia cattapa* L Seed Lipase** has been accepted for oral/poster presentation.

We look forward to your valuable contribution to make ICST 2018 a successful event. Thank You.

Your faithfully,



Dr.ret.nat. Lalu Rudyat Telly Savalas
Chair of the 3rd ICST 2018



*3rd International Conference on
Science and Technology*

**ICST
2018**

Mataram, December 10th, 2018

PROGRAM TIMELINE OF 3rd ICST 2018

Mataram, 10th December 2018

No	Timeline	Program	PIC
1	07:30-08:30	Registration	Secretariat
2	08:30-09:00	Opening Ceremony Indonesia National Anthem (Indonesia Raya) Welcome speech : - Chair of Organizing Committee Opening Speech : Vice Chancellor/Rector University of Mataram Praying : Agus Kurnia, M.Ag	MC
3	09:00-09:30	Coffee break/Poster Presentation	Mursali Ghazali
4	09:30-10:45	Invited Speaker 1 : Assoc. Prof. Dr. Suriati Sofian (Malaysia) Invited Speaker 2 : Dr. Joven Valdez (Filipina) Moderator : Dr. Lalu Rudyat TS	Moderator
	10:45-12:00	Invited Speaker 3 : Dr. Noni Sambudi (Malaysia) Invited Speaker 4 : Fatwa Ramdani, D.Sc (Indonesia) Moderator : Dr. Safrizal Hadisaputra	Moderator
5	12:00-13:00	Lunch break/Poster Presentation	Guyup M.
6	13:00-14:30	Invited Speaker 5 : Dr. Teti Zubaidah (Indonesia) Invited Speaker 6 : Dr. Achmad Farajallah (Indonesia) Moderator : Dr. Islamul Hadi	Moderator
7	14:30-15:00	Coffee Break/Poster Presentation	Mursali Ghazali
8	15:00-17:30	Parallel Session	Moderator
9	17:30	Closing ceremony	MC



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List of Oral Presenter on 3rd ICST 2018

Room : Science 1

Session : 1

Time : 15:00-16:10

Moderator : Dr. Ni Komang TD

No	Abstract number	Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_88	Bambang Budi Santoso	Bambang Budi Santoso	The growth of moringa seedling originated from Various sizes of stem cutting
2	A_ICST2018_04	Muhammad Hidayatullah	Muhammad Hidayatullah	Measurements of Solution Concentration by Using a Capacitive Transducer
3	A_ICST2018_08	Ni Nyoman Kencanawati	Ni Nyoman Kencanawati	Economic Aspect of High Quality Recycled Coarse Aggregate for Sustainability Concrete
4	A_ICST2018_10	Muhammad Sarjan	Muhammad Sarjan	Influence of Attack Intensity of Sucking Pod (<i>Riptorus linearis</i>) to The Yield of Superior Soybean Varieties in Drought Stress Conditions
5	A_ICST2018_11	Alfred L Patty	Alfred L Patty	Physico-Chemical Properties and Antioxidant Analysis of Virgin Coconut Oil (VCO) using Ordinary Tall Coconut Cultivars of Halmahera
6	A_ICST2018_13	Evy Aryanti	Evy Aryanti	Morphological Characterization of Bamboos in University of Mataram
7	A_ICST2018_15	Dedy Suhendra	Made Ganesh Darmayanti	Tripolyphosphate-Crosslinked Chitosan Beads for Pb(II) Metal Ions Adsorption

List of Oral Presenter on 3rd ICST 2018

Room : Science 1

Session : 2

Time : 16:00-17:30

Moderator :

No	Abstract number	Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_18	IGP Muliarta A	IGP Muliarta A	Phenotypic Performance of Promising Lines of Upland Functional Black Rice Resulted from Bulk Selection
2	A_ICST2018_20	Murniati	Murniati	Kinetics and Isothermal Adsorption of Cr (VI) using Zeolite Synthetic of Coal Fly Ash from Jeranjang PLTU West Lombok
3	A_ICST2018_23	Sri Seno Handayani	Sri Seno Handayani	The Effect of Neutralization on Chitin Extraction from the Scales of Nile Tilapia (<i>Oreochromis niloticus</i>)
4	A_ICST2018_24	Wayan Wangiyana	Wayan Wangiyana	Yield Components of Various Varieties of Peanut Relay Intercropped between Rows of Maize Inoculated with Arbuscular Mycorrhiza under Two Nitrogen Levels
5	A_ICST2018_25	Buan Anshari	Buan Anshari	Analysis of Double Shear Timber Connection with Angle Variation by Using Wood Dowel Fastener and Adhesive
6	A_ICST2018_27	I Made Sudantha	I Made Sudantha	The Effect of Liquid Biofungicides Dosage <i>Trichoderma Spp.</i> against Fusarium Wilt Diseases, Growth, and Yield of Onion
7	A_ICST2018_31	DM Ayu Lestari	DM Ayu Lestari	Analysis of Garbage Transportation System in Mataram City Using Dynamic Programming with GIS-Based Data
8	A_ICST2018_74	Amrullah	Amrullah	The Metric Dimension of The Bridges Graph
9	A_ICST2018_94	Nurul Ismillayli	Nurul Ismillayli	Biodegradable Superabsorbent Polymers For Water Retaining Additive in Dry Land Agricultural



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List of Oral Presenter on 3rd ICST 2018

Room : Science 2
Session : 1
Time : 15:00-16:00
Moderator :

No	Abstract number	Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_ 32	Deni Hamdani	Deni Hamdani	Encryption and Decryption of Text Using Hill Cipher Modified
2	A_ICST2018_ 33	Mashur	Mashur	Determination of Success Factors Smallholders Livestock in Realizing Beef Self Sufficiency in West Tenggara Barat
3	A_ICST2018_ 34	Salman	Salman	The Effect of Volume Fraction of Coconut Fiber with Sengon Core Powder on the Strength of Hybrid Sandwich Composites
4	A_ICST2018_ 35	Humairo Saidah	Humairo Saidah	NOAA Satellite Performance in Estimated Rainfall over Lombok Island
5	A_ICST2018_ 37	Susilawati	Susilawati	The Structure of M- Barium Hexaferrites Nanopowders using Co Precipitation Method
6	A_ICST2018_ 38	Made Wirawan	Made Wirawan	Effect of Glass Cover Gap on The Performance of Flat Plate Collectors with Granite Stone Absorber
7	A_ICST2018_ 39	Kisman	Kisman	Vegetative Morphological Traits of Soybean Brown Seeded Lines under Shade Stress

List of Oral Presenter on 3rd ICST 2018

Room : Science 2
Session : 2
Time : 16:00-17:15
Moderator :

No	Abstract number	Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_ 40	Muhammad Taufik	Muhammad Taufik	Acoustic Characteristics Board of Areca Nuts Fiber Composites
2	A_ICST2018_ 46	Annuurun Nisa	Annuurun Nisa	A Novel Multistage Triple-antigen Subunit Vaccine Provides Long Term Protection against Pulmonary <i>M. tuberculosis</i> infection in Mice
3	A_ICST2018_ 48	Mulyati	Mulyati	Soil Chemical Changes, Growth and Yield of Soybean (<i>Glycine max L.</i>) by Biochar Application on Sandy Soil
4				
5	A_ICST2018_ 72	Fitri Apriyanti	Fitri Apriyanti	THE EFFECT OF MONOSODIUM GLUTAMATE ADMINISTRATION TO THE PROSTAGLANDIN LEVELS ON PREGNANT ALBINO WISTAR RATS
6	A_ICST2018_ 59	Adi Saputrayadi	Adi Saputrayadi	Analysis Of Boraks And Formalin Content In Some Meatballs Traders In Mataram City
7	A_ICST2018_ 60	Wahid Yulianto	Wahid Yulianto	Study of Oxidative Stability, Physical Properties, Bacterial Count and Organoleptic Value on Sausages with Addition of Various Natural Antioxidant Ingredients
8	A_ICST2018_ 102	Rosyd Ridho	Rosyd Ridho	DESIGN AND DEVELOPMENT OF SEED AND PULP SEPARATION PROTOTYPE MODELS OF MANGOSTEEN FRUIT USING VERTICAL CYLINDER MECHANISM WITH STATIC BRUSH
9	A_ICST2018_ 95	Syahrul	Syahrul	Development of Fluidized Bed Drying Machine using Multiple Heating and Heating Pipe



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List of Oral Presenter on 3rd ICST 2018

Room : Science 3
Session : 1
Time : 15:00-16:00
Moderator :

No	Abstract number		Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_	62	Rita Desiasni	Rita Desiasni	5icipating building damages due to earthquake using averaged shear wave velocity in the upper 30 m depth (0-30) in Central Java
2	A_ICST2018_	63	Amirin Kusmiran	Amirin Kusmiran	Mechanical Fatigue Life Analysis of Steel Leaf Spring Structure Using Finite Element Method
3	A_ICST2018_	87	Taslim Sjah	Taslim Sjah	SUSTAINABLE FARM MODEL FOR DRYLAND AREA OF NORTH LOMBOK
4	A_ICST2018_	65	Kadek Wiratama	Kadek Wiratama	Analysis Aerodynamic Performance of Wind Turbine Diffuser Augmentation For Small Scale Rotor Three Blade Wind Turbine
5	A_ICST2018_	66	Yusra Pintaningrum	Yusra Pintaningrum	Myocardial Bridging or Acute Myocardial Infarction? : a Case Report
6	A_ICST2018_	69	Bulkaini	Bulkaini	Physical and Chemical Characteristics of Extensively 8aintened Bali Cattle in Bima District
7	A_ICST2018_	71	Sri Handayani	Sri Handayani	The Effect of Katuk (<i>Sauropus androgynus</i> (L.) Merr) Leaf Biscuit Consumption Toward Increasing Breastmilk Volume on the 10th day

List of Oral Presenter on 3rd ICST 2018

Room : Science 3
Session : 2
Time : 16:00-17:15
Moderator :

No	Abstract number		Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_	72	Fitri Apriyanti	Fitri Apriyanti	THE EFFECT OF MONOSODIUM GLUTAMATE ADMINISTRATION TO THE PROSTAGLANDIN LEVELS ON PREGNANT ALBINO WISTAR RATS
2	A_ICST2018_	73	Dian Soekmawaty	Dian Soekmawaty	The Effect Of Monosodium Glutamate Administration On
3	A_ICST2018_	75	Muhsinul Ihsan	Muhsinul Ihsan	Community Structure of Macro-Marine Biofouling in Lobster Trap on Awang Bay, Center Lombok
4	A_ICST2018_	76	Lukman	Lukman	Studies On Reproductive Performance Of Bali Cattle Raised Under Extesive Traditional Systems In The Dry Land Areas Of Woha Sub-Distric Bima Regency
5	A_ICST2018_	77	B.R.D. Wulandani	B.R.D. Wulandani	Potential inhibition of angiotensin converting enzyme by <i>Ficus glomerata</i> Roxb 6
6	A_ICST2018_	78	Muh. Prasetyo Nugroho	Muh. Prasetyo Nugroho	Study On Income Comparison Between Fattening And Breeding Of Bali Cattle At Collective Housing System In Narmada District West Lombok Regency West Nusa Tenggara Province Indonesia
7	A_ICST2018_	83	Sukmawaty	Sukmawaty	Thermal Energy Analysis In Drying Corn (<i>Zea Mays</i> L.) for Different Air Velocity Using Fluidized Bed Dryer
8	A_ICST2018_	86	RS Tejowulan	RS Tejowulan	EFFECT OF RICE STALK ASH ADDITION ON SOIL PROPERTIES AND YIELD OF RICE GROWN IN DIFFERENT
9	A_ICST2018_	85	Indriyatno	Indriyatno	Identification Of Medicinal Plants In Ampenan Selatan Village Mataram West Nusa Tenggara



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List of Oral Presenter on 3rd ICST 2018

Room : Humaniora
Session : 1
Time : 15:00-16:00
Moderator :

No	Abstract number	Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_02	I Wayan Suteja	I Wayan Suteja	Review of Motorcycle Rider Attitude to Traffic Safety issue in Mataram City
2	A_ICST2018_06	Desy Komalasari	Desy Komalasari	Prediction of Tourist Traces Probabilities Using Diagonalized Transition Matrices of Markov Chain in <u>West Lombok Regency</u>
3	A_ICST2018_14	Santi Farmasari	Santi Farmasari	From an International Standard School to a Regular School: Teachers' Agentic Responses toward a Change Policy of English Teaching and Assessment
4	A_ICST2018_17	Ida Ayu Oka Suwati Sideman	Ida Ayu Oka Suwati Sideman	Traffic Management of Gunung Sari Intersection based on Problem Solving Hierarchy
5	A_ICST2018_19	Syahrial Ayub	Syahrial Ayub	Student Oriented Learning Model (in Floating and Downing Concept)
6	A_ICST2018_21	Agustono Setiawan	Agustono Setiawan	Zonation and Analysis of Drainage Network Capacity for Better Flood Control in The Unus Drainage System at Mataram City
7	A_ICST2018_36	Pathul Indriana	Pathul Indriana	Reciprocal Teaching on Students' Reading Comprehension Achievement

List of Oral Presenter on 3rd ICST 2018

Room : Hunaniora
Session : 2
Time : 16:00-17:15
Moderator :

No	Abstract number	Precenter's name	First Author's name	Title of the Article
1	A_ICST2018_43	Aris Doyan	Aris Doyan	The Development of Physics Module Oriented Generative Learning to Increase The Cognitive Learning Outcomes and Science Process Skills of The Students
2	A_ICST2018_58	Satutik Rahayu	Satutik Rahayu	VCD media development models of the character-based innovative learning natural science at junior high school For the lectures of learning strategies
3	A_ICST2018_70	Nurul Hikmah Annisa	Nurul Hikmah Annisa	THE EFFECT OF SASAK MUSIC THERAPY ON LABOR PAIN
4	A_ICST2018_81	Agus Kurnia	Agus Kurnia	Determinants of Student Development to Achieve the Vision of the Faculty of Mathematics and Natural Sciences, Universitas Mataram
5	A_ICST2018_89	Rini Srikus Saptaningtyas	Rini Srikus Saptaningtyas	The Area of Sedayu Beach Arrangement As a Beach and Turtles Tourism Destination in North Lombok Regency
7	A_ICST2018_90	P. Ayu Suci Lestari	P. Ayu Suci Lestari	Learning Device With Discovery Learning Model And Cognitive Conflict Approach In Subject Matter Heat And Temperature



List of Poster on 3rd CST 2018

No	Abstract number	Precenter's name	First Author's name	Title of the Poster
1	A_ICST2018_01	Yuliadi Zamroni	Yuliadi Zamroni	First Record of Some Amblyopine and Oxudercine Gobies (Teleostei, Gobiidae) in The Lesser Sunda Islands
2	A_ICST2018_03	Novita Tri Artiningrum	Novita Tri Artiningrum	Somatotype of Sasak Children at Different Altitude in Lombok Island
3	A_ICST2018_05	Emmy Yuanita	Emmy Yuanita	Synthesis and Antitumor Evaluation of Bromo-Substituted 1,3,6-Trihydroxyxanthone
4	A_ICST2018_09	Emmy Yuanita	Sudirman	Synthesis of Polyurethane by Polymerization of Polyols Nyamplung (<i>Chalophyllum inophyllum</i>) Oils using Toluene Diisocyanate
5	A_ICST2018_16	Alfine Rijaldie Malik	Alfine Rijaldie Malik	Chemical, Microbiological, and Sensory Properties of Pickled Pindang's Eggs Affected by <i>Lactobacillus plantarum</i>
6	A_ICST2018_12	MURSAL GHAZALI	MURSAL GHAZALI	Diversity and Distribution of <i>Sargassum</i> sp. in Lombok Island, West Nusa Tenggara
7	A_ICST2018_22	Jannatin	Jannatin	The Development of Teaching Module in Introduction to Solid State Course to Increase Mastery in Crystal Structure Concepts among Pre-Service Student Teacher
8	A_ICST2018_26	Earlyna Sinthia Dewi	Earlyna Sinthia Dewi	The Antibacterial Activity of Tomato (<i>Lycopersicon esculentum</i> L.) Extract on <i>Bacillus cereus</i> Causes of Food
9	A_ICST2018_28	Erni Romansyah	Erni Romansyah	Kinetics Modelling of Change on Brix Value of Lime (<i>Cytrus amblycarpa</i>) during Storage

10	A_ICST2018_29	I Gede Putra Nugraha	I Gede Putra Nugraha	Marketing Strategy of Buleleng Museum in Efforts to Increase The Number of Visitors
11	A_ICST2018_30	Made Dian Putri Agustina	Made Dian Putri Agustina	The Effect of Entrepreneurship Orientation through Innovation on Marketing Performance in Silver Crafts Industries in Celuk Tourism Village, Gianyar Regency
12	A_ICST2018_41	Erin Ryantini Gunawan	Erin Ryantini Gunawan	Profile of Fatty Acid Amides Synthesized from Ketapang Kernel Oil
13	A_ICST2018_44	Guyup Mahardhian Dwi Putra	Guyup Mahardhian Dwi Putra	Design and Construction of Semi-Automatic Soybean Packaging Control System
14	A_ICST2018_45	Islamul Hadi	Islamul Hadi	Troops of Pitu (<i>Tracyptihucus auratus</i>) Newly Found in Southern Lombok
15	A_ICST2018_47	Baiq Nila Sari Ningsih	Baiq Nila Sari Ningsih	Deep Reading as Instrument to Increase Student's Learning Comprehensiveness in Food Chemistry Course
16	A_ICST2018_51	Siti Alaa	Gita Mardialina	Innovation to Increase the Tensile Strength of Sade Woven Yarn using The Sizing Method
17	A_ICST2018_52	Nurul Fitriyani	Uny Madya binti Wasio	Comparison of The Effectivity between Jackknife and Bootstrap for Parameter Estimation in Regression with Assumption Violation
18	A_ICST2018_53	Rucitra Widayarsi	Rucitra Widayarsi	Drying Kinetics of Moringa Oleifera Leaves on Antioxidant Activities and Nutrition Content
19	A_ICST2018_55	Alfina Taurida Alaydrus	Alfina Taurida Alaydrus	IDENTIFICATION OF SOIL POLLUTION BASED ON RESISTIVITY AND TEMPERATURE PARAMETERS IN PELANGAN VILLAGE OF SEKOTONG DISTRICT, WEST LOMBOK
20	A_ICST2018_56	Muhamad Ali	Muhamad Ali	High-throughput in vitro Construction of Protein Library: A Potential Technology for Containing an Emerging Pandemic Avian Influenza
21	A_ICST2018_68	Tri Mulyaningsih	Tri Mulyaningsih	TWO NEW VARIETIES OF GYRINOPS VERSTEEGII (THYMELAEACEAE) FROM SUMBAWA ISLAND INDONESIA
22	A_ICST2018_79	Muhamad Ali	Muhamad Ichsan	Reducing the abdominal fat of broiler chicken by corn-based diets

23	A_ICST2018_80	Muhamad Ali	Yunita Sabrina	Generation of Monoclonal Antibody: from Production in Animal, Plants, and Microbes to Cell-free in Microtubes
24	A_ICST2018_82	Lalu Rudyat Telly Savalas	Meilinda Pomeistya	Biochemical Properties of Terminalia cattapa L Seed Lipase
25	A_ICST2018_54	Siti Raudhatul Kamali	Siti Raudhatul Kamali	Identification of Zeolite Minerals in Rocks of The Lombok Island
26	A_ICST2018_50	Faturrahman	Faturrahman	Heterotrophic Bacteria from The Digestive Tract of Rice Field Eel (<i>Monopterus albus</i>) and Its Potency as Probiotic
27	A_ICST2018_49	Surya Hadi	Surya Hadi	Exploration of Nicotine Content of Tobacco (Nicotina tabacum) from Cultivated Areas of Lombok Island
28	A_ICST2018_67	Safrizal Hadisaputra	Safrizal Hadisaputra	Density Functional Study of Pinostrobin as Corrosion Inhibition of Iron in Acidic Medium
29	A_ICST2018_64	Laili Mardiana	Laili Mardiana	Performance Analysis Of The Resistivity Meter Data Logger System Based On Multimeter And Ina219 Sensor
30	A_ICST2018_84	Muhamad Ali	Muhamad Amin	Probiotics as a Potential Approach to Enhance Feed Digestibility and Immune Systems of Animals
31	A_ICST2018_61	Mustika Hadijati	Mustika Hadijati	Autoregressive Prewhitening on The Nonparametric Regression Model of Jangkok Watershed River Water Discharge in Lombok Island
32	A_ICST2018_57	Sapriani Hamdiani	Sapriani Hamdiani	Green Nanofiller from Solid Cattle Waste for Strengthening Biocomposit of Recycled-Low Density Polyethylene
33	A_ICST2018_07	Ni Komang Tri Dharmayani	Ni Komang Tri Dharmayani	Antimicrobial Activity of Aceton Extract from Steam Bark of Swietenia Macrophylla (Meliaceae) Indonesia
34	A_ICST2018_91	Lovy Herayanti	Lovy Herayanti	Blended Learning Model Based On Inquiry, Collaborative And Tutorial To Improve Students 'Critical Skills On Basic Physics Course
35	A_ICST2018_92	G Gunawan	M Rangga	The Effect of Problem-Based Learning with Virtual Laboratory Toward Students' Problem-Solving Skills on Physics Concepts

36	A_ICST2018_	93	Hary Kurniawan	Hary Kurniawan	The Characteristics of Physical Properties of Sap (Arenga pinnata Merr.) during Cooking Using Semi-Automatic Machine Stirrer
37	A_ICST2018_	96	Marzuki	Marzuki	APPLICATION OF TROUBLESHOOTING WITH BASIC PHYSICAL LEARNING SOLUTION TO INCREASE ADMINISTRATION OF STUDENT PHYSICAL CONCEPT
38	A_ICST2018_	97	Baiq Uswatul Khasanah	Baiq Uswatul Khasanah	DEVELOPMENT OF BLACK BODY RADIATION BASE OF ADOBE FLASH LEARNING MEDIA AND ITS IMPLEMENTATION THROUGH THINK PAIR SHARE MODEL TO IMPROVE THE
39	A_ICST2018_	98	Muliatiningsih	Muliatiningsih	Alternative Utilization of Silicate Based Fertilizers in Improving Plant Resistance of Cocoa Plants
40	A_ICST2018_	99	Joni Rokhmat	Joni Rokhmat	THE ANALOGICAL APPROACH IN PHYSICS LEARNING WITH CAUSALITIC LEARNING MODEL TO INCREASE THE PROBLEM-SOLVING ABILITY OF PRE-SERVICE TEACHERS
41	A_ICST2018_	100	Hairil Anwar	Hairil Anwar	RESERVE BIOSPHERE RINJANI-LOMBOK AND PUBLIC WELFARE IMPROVEMENT
42	A_ICST2018_	101	Baiq Erna Listiana	Baiq Erna Listiana	In Vitro Regeneration of Agarwood Plant, Aquilaria filaria
43	A_ICST2018_	103	Mariamah	Mariamah	Improvement Of Independent Characters And Student Learning Outcomes Through Development Of Based Complex Analysis Books Drill Problem

The 3rd International Conference on Science and Technology ICST 2018
University of Mataram
Grand Madani Hotel, December 10th 2018

To whom it may concern:

Herewith the committee of the third ² International Conference on Science and Technology ICST 2018, University of Mataram declares that the following abstract entitled "Biochemical properties of *Terminalia catappa* L seed lipase", authored by Meylinda Pomeistya, Tuti Alawiyah, Erin Ryantin Gunawan, Jannatin 'Ardhuha and Lalu Rudyat Telly Savalas, has been presented in the aforementioned conference.

The 3rd ICST 2018
Chairman,



Dr.ret.nat. Lalu Rudyat Telly Savalas

Biochemical Properties of *Terminalia cattapa* L Seed Lipase

Meilinda Pomeistya¹⁾, Tuti Alawiyah²⁾, Eryn Ryantin Gunawan²⁾, Jannatin 'Ardhuha³⁾, Lalu Rudyat Telly Savalas^{3)*}

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ABSTRACT Germinating seeds have been known to be potential sources of lipase. During germinating, lipases activity is increased and the germinating seed acquires its energy from the breakdown of lipid storage. With lipid content above 50%, *Terminalia cattapa* L employs its lipase to mobilize triacyl glycerol. In this study, biochemical properties of *T. cattapa* L lipase was investigated. *T. cattapa* L seed were allowed to germinate and sludge from germinating seed was used as raw material to isolate lipase. *T. cattapa* L lipase has an optimum temperature of 45°C and optimum pH of 7.5. Upon separation on polyacrylamide gel in denatured condition, it was revealed that *T. cattapa* L lipase consists of at least three sub units (50 kDa, 32 kDa and 24 kDa) with a total weight of 140 kDa as analysed on native polyacrylamide gel electrophoresis. Immobilization of *T. cattapa* L lipase on a polyacrylamide gel has revealed that the enzyme retains its activity to significant level (above 70%) after repetitive use. This finding underlines the potential use of *T. cattapa* L lipase.

Keywords: *Terminalia cattapa* L, seed lipase, immobilized enzyme

Biochemical Properties of *Terminalia cattapa* L Seed Lipase

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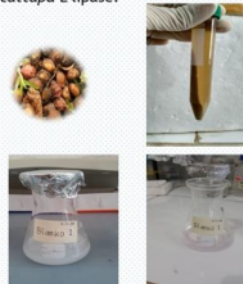
* telly@unram.ac.id

INTRODUCTION

Germinating seeds have been known to be potential sources of lipase. During germinating, lipases activity is increasing, and the germinating seed acquires its energy from the breakdown of lipid storage. With lipid content above 50%, *Terminalia cattapa* L employs its lipase to mobilize triacyl glycerol. In this study, biochemical properties of *T. cattapa* L lipase was investigated. *T. cattapa* L seeds were allowed to germinating and sludge from germinating seed was used as raw material from which lipase was isolated. *T. cattapa* L lipase has an optimum temperature of 45°C and optimum pH of 7.5. Upon separation on polyacrylamide gel in denatured condition, it was revealed that *T. cattapa* L lipase consists of at least three subunits (50 kDa, 32 kDa and 24 kDa) with a total weight of 140 kDa as analysed on native polyacrylamide gel electrophoresis. Immobilization of *T. cattapa* L lipase on a polyacrylamide gel has revealed that the enzyme retains its activity to significant level (above 70%) after repetitive use. This finding underline the potential use of *T. cattapa* L lipase.

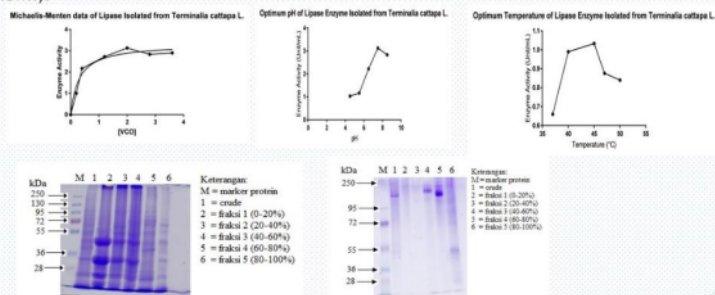
METHOD

T. cattapa seeds were allowed to germinating on a humid surface. Germinating seeds were processed into slurry and enzyme containing lysate was separated from debris by centrifugation. Lipase activity was assayed by VCO hydrolysis. Characterization was undertaken to find optimum temperature and pH. SDS-PAGE and native PAGE were performed to investigate the presence of subunits. Lastly, lipase was immobilized in 6% polyacrylamide gel. Immobilized lipase was assayed for its ability to hydrolyze VCO into individual fatty acid, which is further by acid-base titration.



RESULTS

T. Cattapa lipase is shown to obey Michaelis-Menten kinetics with an optimum pH of 7.5 and optimum temperature of 45°C. Lipase of *T. cattapa* has three subunits (lower left fig) whereas its total (native) size is c.a. 140 kDa (lower right figure). Immobilization of lipase has shown that *T. cattapa* lipase is stable (retains 70% of activity) after at least 3 times repetitive use (data not shown).



CONCLUSIONS

T. Cattapa L is a good source for lipase. Lipase of *T. cattapa* has an optimum temperature of 45°C and pH of 7.5. It follows Michaelis-Menten kinetics. The lipase has a molecular weight of about 140 kDa which consists of at least three subunits. Upon immobilization by using polyacrylamide, *T. cattapa* L lipase retains a high catalytic activity. This shows that *T. cattapa* L lipase has a potential use in the future.

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