

## KELENGKAPAN ARTIKEL

### Judul Artikel

Chronic Hepatotoxicity Test of Cassava Leaves Extract (*Manihot utilissima* Pohl.) on Wistar Rat (*Rattus norvegicus* L.)

### Nama Conference dan Web

International Conference on Sciences, Mathematics and Education (ICoSMED) 2022

Web: <https://icosmed-ung.org/>

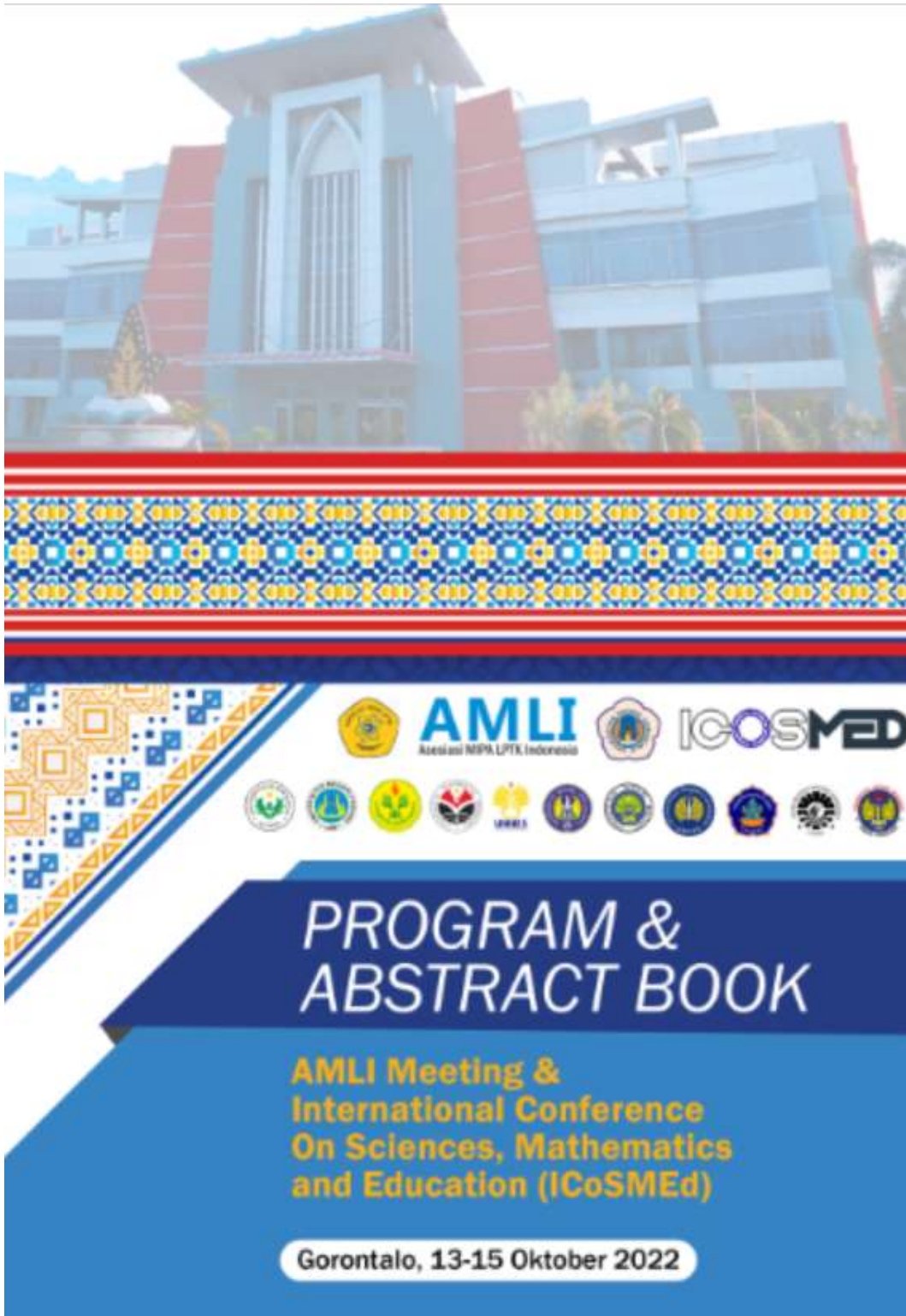
### Kelengkapan artikel

1. Sertifikat presenter
2. Program and Abstract Book
3. Submit dan LOA
4. Power point presentasi
5. Ethical approval penelitian

## SERTIFIKAT PRESENTER



PROGRAM BOOK AND ABSTRACT



## Keynote Speakers of ICoSMEd 2022



**Prof. Brian Yulianto**  
*Institut Teknologi Bandung*  
**Indonesia**



**Prof. Hadi Susanto**  
*Khalifa University*  
**Abu Dhabi, UAE**



**Dr. Gyöngyvér Molnár**  
*University of Szeged*  
**Hungary**



**Dr. Yovie Andriani HS**  
*Universiti Malaysia Seremban*  
**Malaysia**



**Prof. Muktiingsih N.**  
*Universitas Negeri Jakarta*  
**Indonesia**



**Dr. Win Thin Kyaw**  
*Research Institute for Humanity and*  
*Nature Medical Study on Mercury*  
*Toxicity in Myanmar*  
**Myanmar**



**Dr. Andi P. Motaragakusuma**  
*Research Institute for Humanity and*  
*Nature Theoretical and Practical*  
*Studies on TDCOP*  
**Japan**

## Invited Speakers of ICoSMEd 2022



Name : Prof. Dr. Evi Hulakati, M.Pd.  
 Affiliation : Universitas Negeri Gorontalo  
 Abstract ID : ICMD110V  
 Title : Developing Students' Mathematical Communication Skill in Junior High School with Various Level of Mathematics Achievement through Generative Learning Model  
 Room : VR03  
 Time : October 1, 2022 / 01:01PM



Name : Dr. Nicky Tumutan, M.Si.  
 Affiliation : Universitas Negeri Manado  
 Abstract ID : ICMD210V  
 Title : Some Notes on the Inclusion Between Morrey Spaces  
 Room : VR02  
 Time : October 1, 2022 / 01:01PM



Name : Yuli Rahmawati, Ph.D.  
 Affiliation : Universitas Negeri Jakarta  
 Abstract ID : ICMD310V  
 Title : Stimulating Students' Higher Order Thinking Skills: Dilemma-STEAM Teaching Model in Chemistry Learning  
 Room : VR05  
 Time : October 1, 2022 / 01:41PM



Name : Prof. Dr. Retno Dwi Suyanti, M.Si.  
 Affiliation : Medan State University  
 Abstract ID : ICMD410V  
 Title : The Effects of Collaborative Learning Oriented Project Based Learning (PjBl) Model with Animated Video Media on Students' Problem Solving  
 Room : VR03  
 Time : October 1, 2022 / 01:21PM



Name : Prof. Dr. Nita Kusumanawati, M.Sc.  
Affiliation : Universitas Negeri Surabaya  
Abstract ID : KM051NV  
Title : Potential Of Natural Dyeing using *Mangifera Indica* And *Muntingia calabura* Leaves with Bio-Mordant *Terminalia Catappa* as a Replacement for Metal Mordant  
Room : RV10  
Time : October 13<sup>th</sup>, 2022 / 01:01PM



Name : Dr. Agung W. Subiantono, M.Pd.  
Affiliation : Universitas Negeri Yogyakarta  
Abstract ID : KM061NV  
Title : Reinforcing biology education for health literacy goal: Challenges and opportunities  
Room : RV10  
Time : October 13<sup>th</sup>, 2022 / 01:21PM



Name : Dr. Ir. Ketut Sri maheni Jalyasih, M.Si.  
Affiliation : Universitas Pendidikan Ganesha  
Abstract ID : KM071NV  
Title : Carotenoid Characterization of Commercial Seaweeds in Bali, Potential Effect as Antioxidant, and Lowering Hypocholesterolemia  
Room : VR05  
Time : October 13<sup>th</sup>, 2022 / 01:21PM



Name : Dr. Suharto Lisawih, M.Si.  
Affiliation : Universitas Negeri Semarang  
Abstract ID : KM081NV  
Title : Development of Four-Tier Diagnostic Test Instruments on The Topic of Temperature and Heat in Senior High School  
Room : VR05  
Time : October 13<sup>th</sup>, 2022 / 01:21PM



Name : Dr. Syafriani, M.Si., Ph.D.  
Affiliation : Universitas Negeri Padang  
Abstract ID : KM091NV  
Title : Analysis of earthquake potential in the West Sumatra region  
Room : VR13  
Time : October 13<sup>th</sup>, 2022 / 01:21PM



Name : Dr. Muzril, M.Si.  
 Affiliation : Universitas Negeri Malang  
 Abstract ID : KCM108NV  
 Title : Students' Interaction Pattern in Online Learning: A Study at Educational Science Department Universitas Negeri Malang  
 Room : VR12  
 Time : October 1, 2022 / 01:01PM



Name : Uca, S.Si., M.Si., Ph.D.  
 Affiliation : Makassar State University  
 Abstract ID : KCM110NV  
 Title : Integrations of Multi Sensor Satellite Imagery Data and DEM using HEC-RAS in Modeling Flood Affected Areas around the Mata Ailo River, Enrekang Regency, South Sulawesi, Indonesia  
 Room : VR13  
 Time : October 1, 2022 / 01:00PM



Name : Anesi, S.Pd., M.Si., Ph.D.  
 Affiliation : Universitas Negeri Makassar  
 Abstract ID : KCM121NV  
 Title : Bayesian Spatio-temporal Conditional Autoregressive modelling of Covid-19 in Sulawesi Island  
 Room : VR02  
 Time : October 1, 2022 / 01:21PM



Name : Dr. Lala Septem Riza, M.T.  
 Affiliation : Universitas Pendidikan Indonesia  
 Abstract ID : KCM131NV  
 Title : Usage of Machine Learning and Data Analysis in Education  
 Room : VR12  
 Time : October 1, 2022 / 01:21PM



Name : Sayooj Ahy Jone, M.Sc., M.Phil., (Ph.D.)  
 Affiliation : Alagappa University, India  
 Abstract ID : KCM140NV  
 Title : Mathematical Modeling on Propagation and Potential Strategies to Control Corruption Dynamics  
 Room : VR01  
 Time : October 1, 2022 / 01:01PM



The 1<sup>st</sup> **International Conference on Sciences, Mathematics, and Education (ICoSMEd)** will be held on October 23<sup>rd</sup> – 14<sup>th</sup>, 2022 at Faculty of Mathematics and Natural Sciences, Universitas Negeri Gorontalo, Indonesia. By emphasizing “*Upgrading Innovation Research In Mathematics, Science, And Education For Community Empowerment*” as the conference theme, we reassure researchers, scholars, as well as academicians from assorted backgrounds to provide and promote their research results in sciences, mathematics, education, and all kinds of related fields. As the impact of new normal, ICoSMEd 2022 will be implemented in a hybrid mode so that all presenters can take part without being limited by space and time.

## Scopes

The scope of the conference are given by

- Mathematics and Applied Mathematics
- Physics and Applied Physics
- Chemical Sciences
- Biological Sciences
- Life and Environmental Sciences
- Geosciences
- Computational Sciences
- Recent Trends in Science and Mathematics Education

## Organizing Committee

**Chair of ICoSMEd 2022** : Prof. Dr. Ani M. Hasan, M.Pd

**Vice Chairman** : Dr. Teddy Machmud, M.Pd.

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- Dr. Yulkifli, .M.Si. (Universitas Negeri Padang)
- Dr. Sugianto M.Si (Universitas Negeri Semarang)

#### Guest Editors

- Dr. Hasan S. Panigoro, M.Si.
- Dr. Aang Panji Permana, S.T., M.T.
- Dr. Nicky Tumalun, M.Si.
- Yuli Rahmawati, Ph.D.
- Dr. Agung W. Subiantoro, M.Pd.
- Dr. Ir. Ketut Srie marhaeni Julyasih, M.Si.
- Dr. Suharto Linuwih, M.Si.
- Dr. Syafriani, M.Si., Ph.D.
- Dr. Suharto Linuwih, M.Si.
- Dr. Syafriani, M.Si., Ph.D.
- Dr. Munzil, M.Si.
- Uca Sideng, S.Si., M.Si., Ph.D
- Aswi, S.Pd., M.Si., Ph.D.
- Dr. Lala Septem Riza, M.T.
- Haerul Ahmadi, M.Si
- Resmawan, M.Si.
- Isran K. Hasan, M.Si.
- Djihad Wungguli, M.Si.



## Main Schedule

Time (Gorontalo Time)	Activities
<b>Thursday, October 13<sup>th</sup>, 2022</b>	
06:30 – 07:00AM	Registration
07:01 – 08:35AM	Opening Ceremony
08.36 – 08.50AM	Coffee Break
<b>Plenary Session I (Moderator: Dr. rer. nat. Mohamad Jahja, M.Si)</b>	
08:51 – 09:30AM (07:51 – 08:30AM Jakarta Time)	Prof. Brian Yulianto, Ph.D (Institut Teknologi Bandung, Indonesia)
09:31 – 10:10AM (09:31 – 10:10AM Kuala Terengganu Time)	Dr. Yosie Andriani HS (Universiti Malaysia Terengganu, Malaysia)
<b>Plenary Session II (Moderator: Dr.sc Yuyu Indriati Arifin, M.Si.)</b>	
10:11 – 10:50AM (08:41 – 09:20AM Burma Time)	Win Thiri Kyaw, Ph.D. (RIHN Medical Study on Mercury Toxicity in Myanmar, Myanmar)
10:51 – 11:30AM (09:51 – 10:30AM Jakarta Time)	Prof. Muktiningsih, N (Universitas Negeri Jakarta, Indonesia)
11:31AM – 00:10PM (07:31AM – 08:10PM for Abu Dhabi Time)	Prof. Hadi Susanto (Khalifa University, Abu Dhabi)
00.11 – 01.00PM	Lunch Break
01:01 – 01:30PM	Invited Speakers
01:31 – 03:00PM	Parallel Session
03:01 – 03:30PM	Coffee Break
03:31 – 05:00PM	Parallel Session
<b>Friday, October 14<sup>th</sup>, 2022</b>	
08.00-12.00AM	AML Annual Meeting
<b>Plenary Session III (Moderator: Drs. Mustamin Ibrahim, M.Si.)</b>	
02:00 – 02:40PM (03:00 – 03:40AM Japan Time)	Andi Patiware Metaragakusuma, Ph.D. (RIHN Theoretical and Practical Studies on TDCOP, Japan)

Time (Gorontalo Time)	Activities
02:41 – 03:20PM (08:41 – 09:20AM Budapest Time)	Dr. Gyöngyvér Molnár (University of Szeged, Hungary)
03:21–03:40PM	Coffee Break
Saturday, October 15 <sup>th</sup> , 2022	
08.00–11.30AM	AMLJ Annual Meeting
11.30–END	Closing Ceremony

## Opening Ceremony

List of opening ceremony activities.

1. Opening by MC
2. Dance Performance by Sanggar Seni 'Mbui Bungale'
3. National Anthem "Indonesia Raya"
4. Recite the Qur'an
5. Welcome Speech by Chairman
6. Speech by AMLJ
7. Opening speech by Dr. Ir. Eduart Wolok, ST, MT, IPM. (Rector UNG)

## Annual Meeting of AMLJ 2022

Time (Gorontalo Time)	Activities	Places
Friday, October 14 <sup>th</sup> , 2022		
08.00-08.30AM	Registrasi Peserta	FMIPA Kampus IV UNG
08:31-09:00	Rapat Tahunan AMLJ 1. Sambutan Panitia/Dekan FMIPA UNG 2. Sambutan dan Laporan Ketua AMLJ	Ruang Sidang FMIPA Kampus IV UNG
09:00-11:00	Dekan dan Wakil Dekan Moderator : Ketua AMLJ Notulen : WD1 FMIPA UNG	Ruang Sidang FMIPA Kampus IV UNG
	Ketua Jurusan/Sekjur/Koorprodi/Ka Laboratorium Fisika/Pend. Fisika Moderator : Ketua Jurusan Fisika UNG Notulen : Sekretaris Jurusan Fisika UNG	Ruang Kuliah Lantai 2 FMIPA Kampus IV UNG
	Ketua Jurusan/Sekjur/Ka laboratorium/ Koorprodi Kimia/Pendidikan Kimia Moderator : Ketua Jurusan Kimia UNG Notulen : Sekretaris Jurusan Kimia UNG	Ruang Kuliah Lantai 2 FMIPA Kampus IV UNG
	Ketua Jurusan/Sekjur/Ka laboratorium/ Koorprodi Biologi/Pend. Biologi Moderator : Ketua Jurusan Biologi UNG Notulen : Sekretaris Jurusan Biologi UNG	Ruang Kuliah Lantai 2 FMIPA Kampus IV UNG

**Room** : Hybrid Room 4 (HR4)  
**Moderator** : Drs. Mustamin Ibrahim, M.Si  
**Host** : Siti Ainun Mabaia  
**Time (Gorontalo Time)** : Thursday, October 13<sup>th</sup>, 2022, 01.30-05.00PM

Abstract ID	Presenter	Title	Time
ICM92702	Rusdi	Association between Bird Species and Mangrove Plants on Rambut Island, Kepulauan Seribu District, Jakarta, Indonesia	01:30-01:45PM
ICM92719	Rusdi	Analysis of Microplastic Pollution in Water and Green Mussels in Jakarta Bay, Indonesia	01:46-02:00PM
ICM10054	Endang Sulistyarni Gultom	E-Worksheet on Fungi Material for High School	02:01-02:15PM
ICM101115	Sunu Kuntjoro	Differences in the conditions of swiftlet bird ( <i>Aerodramus fuciphagus</i> ) nesting sites	02:16-02:30PM
ICM90201	Nugrahaningsih	Chronic Hepatotoxicity of Cassava Leaves Extract ( <i>Manihot utilissima</i> Pohl.) on Wistar Rat ( <i>Rattus norvegicus</i> L.)	02:31-03:45PM

**Room** : Hybrid Room 5 (HR5)  
**Moderator** : Dr. Akram La Kilo, M.Si  
**Host** : Muhammad Tegar S.  
**Time (Gorontalo Time)** : Thursday, October 13<sup>th</sup>, 2022, 01.30-05.00PM

Abstract ID	Presenter	Title	Time
ICM93001	Hanny Sangian	Study of Compositions of Gasoline, Ethanol, and Water in Stable Emulsions Blended in Low Temperatures	01:31-01:45PM
ICM101106	Maryati Doloksaribu	Ceramic Oxide $MgO - SiO_2 - Al_2O_3$ as Capacitor	02:01-02:15PM
ICM101104	Jasmidi	Sarulla Natural Zeolite Phosphate Modification on	02:16-02:30PM

ICOSMED 2022 - Universitas

## SUBMIT DAN LETTER OF ACCEPTANCE

UNNES

Gmail interface showing an email from **ICosMed 2022** (icosmed2022@easychar.org) received on Fri, Sep 2, 2022, 3:37 PM. The email subject is "ICosMed 2022 submission 3315".

**Dear authors,**  
 We received your submission to ICosMed 2022 (International Conference On Sciences, Mathematics, And Education 2022).  
 Authors : Wih Nugrahaningsih, Tauliqur Rohman and Endah Peniali  
 Title : Chronic Hepatotoxicity of Cassava Leaves Extract (*Manihot utilissima* Pohl.) on Wistar Rat (*Rattus norvegicus* L.)  
 Number : 3315  
 The submission was uploaded by Wih Nugrahaningsih <wih.nugrahaningsih@mail.unnes.ac.id>. You can access it via the ICosMed 2022 EasyChair Web page  
<https://www.easychair.org/conferences/?conf=icosmed2022>  
 Thank you for submitting to ICosMed 2022.

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Icosmed UNG <icosmed@ung.ac.id> to me

Sat, Sep 24, 2022, 6:49 PM

Dear Mr./Mrs./Ms. Wih Nugrahaningah,  
Abstract ID: ICM90201

We are pleased to inform you that your abstract entitled:

**"Chronic Hepatotoxicity of Cassava Leaves Extract (*Manihot utilissima* Pohl.) on Wistar Rat (*Rattus norvegicus* L.)"**

**has been accepted** to be presented at the International Conference On Sciences, Mathematics, and Education 2022 which will be held on October 13th - 14th, 2022 in Universitas Negeri Gorontalo, Indonesia via hybrid mode. The **Letter of Acceptance** is attached below.

Please note that the paper can only be presented if the registration fee has been paid. The information about the registration fee can be found at <https://icosmed-ung.org/registration-and-payment/>. The payment for the registration fee is due on September 29th, 2022. You have to register by uploading the proof of payment via <https://forms.gle/rM2oibwmsZKNoRWA>.

If you want to publish your paper in ICoSMEd 2022, you are kindly requested to submit the full paper as soon as possible via <https://submission.icosmed-ung.org/>. Please be reminded that the deadline for the full paper submission is November 25th, 2022.

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[icosmed-ung.org/](https://icosmed-ung.org/). Please be reminded that the deadline for the full paper submission is November 25th, 2022.

Should you have any questions and more information, please email us at [icosmed@ung.ac.id](mailto:icosmed@ung.ac.id). For more detailed information, please find it on our website <https://icosmed-ung.org/>.

Yours sincerely,

Prof. Dr. Ani M. Hasan, M.Pd.  
Chair of ICoSMEd 2022

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## International Conference On Sciences, Mathematics, and Education 2022

October 13<sup>th</sup> - 14<sup>th</sup>, 2022, in Hybrid Mode

"Upgrading Innovation Research in Mathematics, Science, and Education for Community Empowerment"

Date : Gorontalo, September 24<sup>th</sup>, 2022  
Number : 2587/UN47.B4/DL17/2022  
Subject : Letter of Acceptance  
Abstract ID : ICM90201

Dear Mr./Mrs./Ms. Wh Nugrahaningsih,

We are pleased to inform you that your abstract entitled

**"Chronic Hepatotoxicity of Cassava Leaves Extract (*Manihot utilissima* Pohl.)  
on Wistar Rat (*Rattus norvegicus* L.)"**

has been accepted to be presented at the *International Conference On Sciences, Mathematics, and Education 2022* which will be held on **October 13<sup>th</sup> – 14<sup>th</sup>, 2022** in Universitas Negeri Gorontalo, Indonesia via hybrid mode.

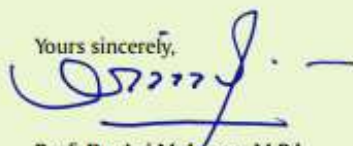
Please note that the paper can only be presented if the registration fee has been paid. The payment for registration fee is due on **September 29<sup>th</sup>, 2022**. You have to re-register your **Abstract ID: ICM90201** by uploading the proof of payment via <https://forms.gle/nM2cijbwmSZKNqRWA>.

If you want to publish your paper in ICoSMED 2022, you are kindly requested to submit the full paper as soon as possible via <https://submission.icosmed-ung.org/>. Please be reminded that the deadline for the full paper submission is **November 25<sup>th</sup>, 2022**.

Should you have any questions and more informations, please email us at [icosmed@ung.ac.id](mailto:icosmed@ung.ac.id) while for more detailed information, please find it in our website <https://icosmed-ung.org>.

Looking forward to meeting you in Gorontalo or via online.

Yours sincerely,



Prof. Dr. Ani M. basan, M.Pd.  
Chair of ICoSMEd 2022



Prof. Dr. Astin Lukum, M.Si.  
Dean of Faculty of Mathematics and Natural Sciences  
Universitas Negeri Gorontalo

# Chronic Hepatotoxicity of Cassava Leaves Extract (*Manihot utilissima* Pohl) Wistar Rat (*Rattus norvegicus*.)



Nugrahaningsih W.H

Biology Department, Mathematic and Natural Science Faculty, Universitas Negeri Semarang, Indonesia

## Background

- Cassava leaves have a potential to be developed as phytopharmaca
- Cassava leaves contain minerals as the agent of anti-hypotension.
- The safety of long term consumption of cassava leaves remains unidentified scientifically therefore it is necessary to test its' in-vivo chronic toxicity.
- The test focused on the liver (hepatotoxicity) because the liver is the first organ exposed to xenobiotics that enter the body



## Methods

- This research is an experimental research with time series design.
- This study used 36 Wistar rats divided into four treatment groups with various doses of cassava leaves extract given at 0, 80, 400, and 2000 mg/kg for 90 days.
- The hepatotoxicity parameters are the value of SGOT, SGPT, as well as body weight measurement that observed every 30 days.
- Clinical toxicity symptoms were observed daily during the treatment.
- At the end of the study, liver organ was taken to observe the morphology and to measure the relative weight of liver.

## RESULT AND DISCUSSION

Statistical analysis of the effect of using linear regression data on body weight every month resulted the value of  $p > 0.05$ . While the comparison analysis using one way ANOVA was resulted the value of  $p < 0.05$  after the 3rd month of treatment. Further LSD test obtained the value of  $p < 0.05$  only between groups K with P1, while between groups K with P2 and group P1 with P2 obtained the value of  $p > 0.05$

Table 1. The body weight of Wistar Rat that received cassava leaves extract in oral for 90 days

Dose	Month- (g)*		
	1	2	3
K (0 mg/kg BB)	172,22±37,85	195,22±36,61	209,44±44,10 <sup>a</sup>
P1 (80 mg/kg BB)	148,11±34,27	158,11±31,40	158,67±23,45 <sup>b</sup>
P2 (400 mg/kg BB)	157,67±37,69	168,78±29,79	186,33±34,82 <sup>ab</sup>
P3 (2000 mg/kg BB)	147,11±27,37	x <sup>**</sup>	x <sup>**</sup>

The results of linear regression of statistical analysis of the SGOT data in Table 1 were obtained by  $p > 0.05$  at month 1 and 2, while in the 3rd month it has the value of  $p < 0.05$ . The value of  $R^2$  obtained in of the 3rd month treatment shows the effect of cassava leaves extract by 21.1%. Comparative statistical analysis with one way ANOVA technique was obtained  $p > 0.05$  at month 1 and 2, while in the third month the value of  $p < 0.05$ . Further LSD test obtained p value  $< 0.05$  in group K with P2, and  $p > 0.05$  in group K with P1 and P1 with P2.

Table 1. The SGOT value of Wistar Rat that received cassava leaves extract in oral for 90 days.

Dose	Month- (U/L)*		
	1	2	3
K (0 mg/kg BB)	120,18±29,74	135,64±24,84	157,72±28,23 <sup>a</sup>
P1 (80 mg/kg BB)	146,97±39,41	168±56,94	183,54±63,84 <sup>ab</sup>
P2 (400 mg/kg BB)	118,46±33,30	135,78±22,08	222,42±59,53 <sup>b</sup>
P3 (2000 mg/kg BB)	142,41±42,81	x <sup>**</sup>	x <sup>**</sup>

Table 2. The SGPT value of Wistar Rat that received cassava leaves extract in oral for 90 days.

DOSE	MONTH - (U/L)*		
	1	2	3
K (0 mg/kg BB)	47,58±9,65 <sup>a</sup>	66,47±13,03	69,04±12,49
P1 (80 mg/kg BB)	71,34±14,30 <sup>b</sup>	79,60±16,40	87,23±23,85
P2 (400 mg/kg BB)	67,58±27,19 <sup>b</sup>	75,94±19,54	77,38±12,50
P3 (2000 mg/kg BB)	74,93±27,80 <sup>b</sup>	x <sup>**</sup>	x <sup>**</sup>

- Cassava leaves extract with various doses gave effect the value of SGOT Rats after 60 days of treatment, with a percentage of influence of 21.1%. The average of SGOT value showed a significant difference in the 3rd month of treatment. Significant differences were seen starting at the dose between the control groups at a dose of 400 mg/kg.
- Various doses of cassava leaves extract didn't give a significant effect to the SGPT value of Wistar Rat's blood. The effect of cassava leaves extract on the levels of SGPT Rats per month experienced a decrease that was only 8.6%, 2%, and 0.4%. This enhancement indicates the body's adaptation of Wistar Rat to the cassava leaves extract orally thus in the 3rd month the value of the influence reached less than one percent. The real difference is that the average of SGPT level is only found in the 1st month, while the second and third months are similar. At the first month, there are significant differences between the control group with a dose of 80 mg/kg, the control group with a dose of 400 mg/kg and the control group with a dose of 2000 mg/kg.

- Gad (2007) stated that SGOT and SGPT values of normal Rats were in the range of 45.7-80.8 U/L and 1.5-30.2 U/L, but in this study the SGOT value of all groups were far above the normal range. (Table 1 and 2). This can be caused by several factors, such as the presence of a virus or worm infection, fat degeneration that can be seen through histopathological examination, and traumatic muscle injury due to fights during the treatment period (Lu, 1995; Bayard, 2006; Kee, 2008). In this case, the high values of SGOT and SGPT results of the study are thought to be strong due to parasitic worm infections which then form a cyst in the liver.

## CONCLUSION

- The extract of cassava leaves at low and middle doses have no chronically toxic effects on rats, while it has toxic effect on rats at very high dose. The symptoms of toxicity appear in the form of continuous bleeding in the area of the nose and mouth as well as mortality



ETHICAL APPROVAL



KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI  
UNIVERSITAS NEGERI SEMARANG  
FAKULTAS ILMU KEOLAHRAGAAN  
**KOMISI ETIK PENELITIAN KESEHATAN (KEPK)**  
Gedung F5, Lantai 2 Kampus Sekaran, Gunungpati, Semarang, Telp (024) 8508107

**ETHICAL CLEARANCE**  
Nomor: 049/KEPK/EC/2018

Komisi Etik Penelitian Kesehatan Universitas Negeri Semarang, setelah membaca dan menelaah usulan penelitian dengan judul :

Preclinical Trial Ekstrak Daun Singkong dan Daun Pepaya sebagai Antihipotensi Kategori Obat Herbal Terstandar

Nama Peneliti Utama : Dr.dr. Nugrahaningsih WH, M.Kes  
Alamat Institusi Peneliti : Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Negeri Semarang  
Lokasi Penelitian : Laboratorium Biologi UNNES, Laboratorium Teknik Pangan UNIKA Soegijapranata, Laboratorium Farmasi UNWAHAS, dan Laboratorium Kesehatan Hewan Semarang.  
Tanggal Persetujuan : 11 April 2018  
(berlaku 1 tahun setelah tanggal persetujuan)

menyatakan bahwa penelitian di atas telah memenuhi prinsip-prinsip yang dinyatakan dalam Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants dari WHO 2011 dan International Ethical Guidelines for Health-related Research Involving Humans dari CIOMS dan WHO 2016. Oleh karena itu, penelitian di atas dapat dilaksanakan dengan selalu memperhatikan prinsip-prinsip tersebut.

Komisi Etik Penelitian Kesehatan berhak untuk memantau kegiatan penelitian tersebut.

Peneliti harus melampirkan *informed consent* yang telah disetujui dan ditandatangani oleh peserta penelitian dan saksi pada laporan penelitian.

Peneliti diwajibkan menyerahkan:

- Laporan kemajuan penelitian
- Laporan kejadian bahaya yang ditimbulkan
- Laporan akhir penelitian

Semarang, 11 April 2018  
Ketua,

Prof. Dr. dr. Oktia Woro K.H., M.Kes.  
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