PROGRAM BOOK

4th ICMA SURE 2021

INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY APPROACHES FOR SUSTAINABLE RURAL DEVELOPMENT

Organizing Committee

1.	**Steering Commitee**	:	Prof. Dr. Ir. Suwarto, M.S. (Rector of Unsoed) Prof. Dr. Ir. Akhmad Sodiq, M.Sc. Agr. (Vice Rector for Academic Affair) Prof. Dr. Rifda Naufalin, S.P., M.Si. (Chief of LPPM,Unsoed)
2.	**Chairman**	:	Dr. Norman Arie Prayogo, S.Pi., M.Si.
3.	**Secretary**	:	Sesilia Rani Samudra, S.Pi., M.Si.
5.	**Treasury**	:	Farid Hidayat, S.Akt
6.	**Program**	:	Condro Wibowo, S.TP., M.Sc., Ph.D. Dr. rer. nat. Erwin Riyanto Ardli, S.Si., M.Sc Ir. Juni Sumarmono, M.Sc. Ph.D Dr. Nur Choirul Afif, S.E., M.Si. Aulidya Nurul Habibah, S.Si., M.Si., Ph.D.
7.	**Parallel Session**		Dr. Nur Aini, S.TP., MP. Sri Maryani, S.Si., M.Si., Ph.D. Mekar Dwi Anggraeni, S.Kep.Ners., M.Kep., Ph.D. Dr. Nuning Vita Hidayati, S.Pi., M.Si. Amin Fatoni, S.Si., M.Si, Ph.D.

8.	**Publication**		R. Taufan Harisam, S.Pi., M.Si. Ren Fitriadi, S.S.T.Pi., M.P. Rima Oktavia Kusuma. S.Pi., M.P. Joni Johanda Putra, S. Kel., M.P. Muh. Sulaiman Dadiono. S.Pi., M.P.
9.	**Website and Multimedia**	:	Undiono, S.Kom. Deni Fauzi, A.Md. Koernia Nanda Pratama, S.Kep., M.Kep., Ns., Sp.Kep.Kom. Arief Kelik Nugroho, S.Kom., M.Cs. Monica Rosiana, S.E., M.Si.

Conference Program

Tuesday, September 7, 2021

Time (GMT+7)	Activity
07.00 AM – 08.00 AM	Zoom Registration
08.00 AM – 08.05 AM	Opening by the MC
08.05 AM – 08.10 AM	National Anthem "Indonesia Raya"
08.10 AM – 08.15 AM	Opening Remark by the Chairman of the ICMA-SURE
08.20 AM – 08.30 AM	Opening Remark by the Rector of UNSOED
08.30 AM – 09.30 AM	Keynote Speakers : **1. Prof. Dr. Ali Ghufron Mukti, M.Sc., Ph.D.** **General Director of Resources, Science and Technology, DGHE, Indonesia** **2. Prof. Dr. Agung Dhamar Syakti, S.Pi., DEA** **Chairman of Indonesian Association of Oceanologists**
09.30 AM – 09.35 AM	Presenting the Certificate for the Keynote Speakers
09.35 AM – 09.45 AM	Photo Session
09.45 AM – 10.30 AM	Presentation of Invited Speaker 1 **Dr. Ely Triasih Rahayu, M. Hum (Indonesia)** **Moderator : Mia Fitria Agustina, S.S., M.A.**
10.30 AM – 11.15 AM	Presentation of Invited Speaker 2 **Assc. Prof. Dr. Martha Ramirez Valdivia (Chille)** **Moderator : Istiqomah, S.E., M.Sc., Ph.D.**
11.15 AM – 12.00 PM	Presentation of Invited Speaker 3 **Prof. Dr. Osama Ibrahim (Egypt)** **Moderator : Dr.rer.nat. Erwin Riyanto Ardli, S.Si., M.Sc.**
12.00 PM – 01.00 PM	Lunch break
01.00 PM – 03.00 PM	**Parallel Session Seminar Batch 1** Topic 1. Tropical Biodiversity and Bioprospecting Topic 2. Integrated Marine and Coastal Area Management Topic 3. Food, Nutrition and Health Topic 4. Engineering and Renewable Energy. Topic 5. Entrepreneurship Topic 6. Social Engineering and Rural Development Topic 7. Basic Sciences (Mathematics, Physics, Chemistry and Biology)
03.00 PM – 03.30 PM	Closing for the First Day

Wednesday, September 8, 2021

Time (GMT+7)	Activity
07.00 AM – 08.00 AM	Zoom Registration
08.00 AM – 08.05 AM	Opening by the MC
08.05 AM – 08.45 AM	Presentation of Invited Speaker 4 **Assc. Prof. Dr. Chuleemas Boonthai IWAI (Thailand)** **Moderator : Dr. Nuning Vita Hidayati, S.Pi., M.Si., Ph.D.**
08.45 AM – 09.30 AM	Presentation of Invited Speaker 5 **Prof. Yasumasa Bessho, Ph.D (Japan)** **Moderator : Dr. Norman Arie Prayogo, S.Pi., M.Si.**
09.30 AM – 10.15 AM	Presentation of Invited Speaker 6 **Assc. Prof Dr. John Wesonga (Kenya)** **Moderator : Ir. Juni Sumarmono, M.Sc., Ph.D.**
10.15 AM – 10.30 AM	Break
10.30 AM – 12.30 PM	**Parallel Session Seminar Batch 2** Topic 1. Tropical Biodiversity and Bioprospecting Topic 2. Integrated Marine and Coastal Area Management Topic 3. Food, Nutrition and Health Topic 4. Engineering and Renewable Energy. Topic 5. Entrepreneurship Topic 6. Social Engineering and Rural Development Topic 7. Basic Sciences (Mathematics, Physics, Chemistry and Biology)
12.30 PM – 01.00 PM	Closing Ceremony

Dear Participants,

Thank you for registering to our virtual conference. The conference will be conducted on **October 7 & 8, 2021 from 8:00 AM to 15:30 PM WIB (GMT+7).** Please check the time difference (on your part) so that you won't miss our conference.

Here's the link to join our plenary sessions. This link is **for all plenary sessions**.

https://us06web.zoom.us/j/82005612435?pwd=Y3B3V2VveGpaOWJLT3g3S3Q2ZDhYZz09

Meeting ID: 820 0561 2435
Passcode: 872883

The link to join the parallel session:

Room	Topic	Zoom Link	Meeting ID & Password	Moderator
Tuesday, September 7, 2021				
A	**Tropical Biodiversity Bioprospection (TBB)**	https://us02web.zoom.us/j/89063075953?pwd=ektmQ25McTU2QkZYbnRUeXhRSExydz09	Meeting ID: 890 6307 5953 Passcode: r001	Sri Maryani, S.Si., M.Si., Ph.D
B	**Food, Nutrition and Health (FNH)**	https://us02web.zoom.us/j/83162511858?pwd=b245RVJnd0I5NkZ1UTNOanprQlZ6UT09	Meeting ID: 831 6251 1858 Passcode: r002	Dr. Nur Aini
C	**Engineering and Renewable Energy (ERE)**	https://us02web.zoom.us/j/82758358267?pwd=NDlsWGFKSEE4c3JCb3A0SmNpSlFiUT09	Meeting ID: 827 5835 8267 Passcode: r003	Condro Wibowo, S.TP., M.Sc., Ph.D
D	**Entrepreunership (ESHIP) and Basic Sciences (BS)**	https://us02web.zoom.us/j/5440903036?pwd=aE5LN3prNUdRY3hyK3ZBb3kwOVRLUT09	Meeting ID: 544 090 3036 Passcode: r004	Dr. Nur Choirul Afif, SE., M.Si
E	**Social Engineering and Rural Development (SERD)**	https://us02web.zoom.us/j/84347505079?pwd=Mk5Ic2FhZnJGQlpjbFVHeThRK25KUT09	Meeting ID: 843 4750 5079 Passcode: r005	Sesilia Rani Samudra, S.Pi., M.Si.

Room	Topic	Zoom Link	Meeting ID & Password	Moderator
Wednesday, September 8, 2021				
A	**Tropical Biodiversity Bioprospection (TBB) and Engineering and Renewable Energy (ERE)**	https://us02web.zoom.us/j/89063075953?pwd=ektmQ25McTU2QkZYbnRUeXhRSExydz09	Meeting ID: 890 6307 5953 Passcode: r001	Aulidya Nurul Habibah, S.Si., M.Si., Ph.D
B	**Food, Nutrition and Health (FNH)**	https://us02web.zoom.us/j/83162511858?pwd=b245RVJnd0I5NkZ1UTNOanprQlZ6UT09	Meeting ID: 831 6251 1858 Passcode: r002	Mekar Dwi Anggraeni, S.Kep.Ners., M. Kep., Ph.D
C	**Engineering and Renewable Energy (ERE) and Basic Sciences (BS)**	https://us02web.zoom.us/j/82758358267?pwd=NDlsWGFKSEE4c3JCb3A0SmNpSlFiUT09	Meeting ID: 827 5835 8267 Passcode: r003	Amin Fatoni, S.Si., M.Si., Ph.D
D	**Social Engineering and Rural Development (SERD)**	https://us02web.zoom.us/j/5440903036?pwd=aE5LN3prNUdRY3hyK3ZBb3kwOVRLUT09	Meeting ID: 544 090 3036 Passcode: r004	Dr. Nuning Vita H., S.Pi., M.Si
E	**Food, Nutrition and Health (FNH)**	https://us02web.zoom.us/j/84347505079?pwd=Mk5Ic2FhZnJGQlpjbFVHeThRK25KUT09	Meeting ID: 843 4750 5079 Passcode: r005	Ren Fitriadi, S.S.T.Pi., M.P
F	**Tropical Biodiversity Bioprospection (TBB), Social Engineering and Rural Development (SERD) and Basic Science (BS)**	https://us02web.zoom.us/j/89801398866?pwd=SE1GeTBHN1J0NE1GeTA0TTFOaUVHdz09	Meeting ID: 898 0139 8866 Passcode: r006	Monica Rosiana, S.E., M.Si.

Parallel Session Guidelines

- The parallel session will be conducted virtually using zoom meeting platform on September 7&8, 2021, kindly refer to the updated.
- All moderators and presenters will be expected to use the virtual background
- Each virtual presentation is limited to **15 minutes (12 minutes presentation + 3 minutes Q&A)**. Kindly ensure that your presentation duration does not exceed 15 minutes. The presentation schedule will be strictly enforced by the moderator and technical host.
- Presentation should be in **Power Point**.
- Presenters should strictly follow the requirements for equipment and environment :
  - Laptop/desktop with camera and microphone/headset
  - Good and stable internet connection (wired connection recommended)
  - Bright and quiet environment
- All virtual presenters must be in the virtual room throughout his/her scheduled presentation session. Please log in to your scheduled presentation session at least 10 minutes in advance.
- If presenter have a problem during the parallel session.
- At the end of the session, please turn on your camera for the virtual group photo. Screenshot will be captured by the host.

Parallel Session
(Tuesday, September 7, 2021)

Tropical Biodiversity Bioprospection (TBB)

Moderator : Sri Maryani, S.Si., M.Si., Ph.D

Zoom Link :

https://us02web.zoom.us/j/89063075953?pwd=ektmQ25McTU2QkZYbnRUeXhRSExydz09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
TBB-7-1.1A	1. Endang Hilmi 2. Lilik Kartika Sari 3. Tri Nur Cahyo	The Percent of Mangrove Life and Growth in Vertical and Horizontal Aquaphonic of Rehabilitation System in North Jakarta Coastal, Indonesia	Tropical Biodiversity Bioprospection	**01.00 PM – 01.15 PM**
TBB-7-1.2A	1. Endang Hilmi 2. Isdy Sulistyo 3. Lilik Kartika Sari 4. Arif Mahdiana 5. Teuku Junaidi 6. Muslih 7. Rika Prihati 8. Cahyaning P. 9. Sesilia Rani S. 10. Norman Arie P. 11. Tri Nur Cahyo	The Mapping of Mangrove density in Segara Anakan Lagoon, Indonesia	Tropical Biodiversity Bioprospection	**01.15 PM – 01.30 PM**
TBB-7-1.3A	1. Fajar Hardoyono 2. Kikin Windhani 3. Herman Sambodo 4. Hary Pudjianto 5. Neni Widayaningsih 6. Nunik Kadarwati	Rapid Discrimination and Classification of There Varieties of Durian Fruit (Durio Zibethinus) Using Electronic Nose	Tropical Biodiversity Bioprospection	**01.30 PM – 01.45 PM**

TBB-7-1.4A	1. Windiariani Lestari 2. Harris Hermawan 3. Siti Rukayah 4. Dwi Nugroho W.	Swamp Fish Diversity in Rawa Biru, Merauke, Papua	Tropical Biodiversity Bioprospection	**01.45 PM – 02.00 PM**
TBB-7-1.5A	1. Yulia Sistina 2. Atang 3. Siwi Pratama M.W. 4. Sri Rahayu 5. Norman Arie P.	Anthropocentric to Life-centric : Reproductive Biotechnology for Conservation Mammals Model	Tropical Biodiversity Bioprospection	**02.00 PM – 02.15 PM**
TBB-7-1.6A	1. Trisnowati Budi A. 2. Lulu Lusianti Fitri 3. Edi Basuki 4. Trisno Haryanto 5. Intan Ahmad	The Resistance Level of German Cockroach, Blattella Germanica L to Fipronil after Reared in the Laboratory	Tropical Biodiversity Bioprospection	**02.15 PM – 02.30 PM**
TBB-7-1.7A	1. Imam Widhiono 2. Emmanule C. 3. Trisno Haryanto 4. Darsono	The Diversity of Stingless Bee and the Opportunities for Meliponiculture in Rural Community	Tropical Biodiversity Bioprospection	**02.30 PM – 02.45 PM**
TBB-7-1.8A	1. Agus Hery Susanto 2. Ali Romadhoni 3. Murni Dwiati	RAPD Profiles of Rhyncostylis gigantea (Lindl.) Ridl. Collected from Puspa Nirmala Orchids Banyumas, Central Java	Tropical Biodiversity Bioprospection	**02.45 PM – 03.00 PM**

Food, Nutrition and Health (FNH)

Moderator : Dr. Nur Aini

Zoom Link :

https://us02web.zoom.us/j/83162511858?pwd=b245RVJnd0I5NkZ1UTNOanprQlZ6UT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
FNH-7-1.1B	1. Susiana Candrawati 2. Emy Huriyati 3. Mustofa 4. Wiwiek Fatchurohmah 5. Khusnul Muflikhah 6. Rizki Amelia Sinensis 7. Viva Ratih Bening Ati	The Impact of Ucp-2 Ala55val Gene Polymorphism on Waist Circumference and Waist-Hip Ratio (WHR) Change Post Continuous Training Intervention in Obese Women	Food, Nutrition and Health	**01.00 PM – 01.15 PM**
FNH-7-1.2B	1. Taufiq Hameda Dhaka Kusuma 2. Hernayanti 3. Ratnaningtyas Nuniek Ina	Detoxification of Cadmium on Albino Rats (Rattus Norvegicus) with Natural Chelator of Fruiting Body Extract of Ganoderma lucidum	Food, Nutrition and Health	**01.15 PM – 01.30 PM**
FNH-7-1.3B	1. Hernayanti 2. Sasongko N. D. 3. Ratnaningtyas Nuniek Ina 4. Abbas Muachiroh 5. Saryono	Effect of Delta ALAD Gene Polymorphism on Haematological Profile and Mallondyaldehyde Level in Lead-Exposed Individual	Food, Nutrition and Health	**01.30 PM – 01.45 PM**
FNH-7-1.4B	1. Fajar Wahyu Pribadi 2. Chatarina Widiartini 3. Afifah	The Effect of Ethanol Extract of Rambutan Seeds (Nephelium	Food, Nutrition and Health	**01.45 PM – 02.00 PM**

		lappaceum L.) on Blood Glucose and Malondealdehyde (MDA) in Diabetic Rats		
FNH-7-1.5B	1. Lutfatul Latifah 2. Nina Setiawati 3. Aprilia Kartikasari 4. Hari Siswantoro	Nurse's perspective in fulfillment of postpartum education needs: online follow up care	Food, Nutrition and Health	**02.00 PM – 02.15 PM**
FNH-7-1.6B	1. Juni Sumarmono 2. Triana Setyawardani 3. Nur Aini	Effects of Collagen Hydrolysate on the Acid Whey Production and Product Recovery of GEREk-style Yogurt	Food, Nutrition and Health	**02.15 PM – 02.30 PM**
FNH-7-1.7B	1. Hery Winarsi 2. Erminawati 3. Gumintang Ratna Ramadhan	Formulation of cowpea sprouts yogurt rich in antioxidant, functional drink for diabetic	Food, Nutrition and Health	**02.30 PM – 02.45 PM**
FNH-7-1.8B	1. Sorta Basar Ida Simanjuntak 2. Hana 3. Elly Tuti Winarni 4. Gratiana Ekaningsih Wijayanti	Impact Different Levels of Chlorella vulgaris Supplementation on Physiological Response of Osphronemus gouramy	Food, Nutrition and Health	**02.45 PM – 03.00 PM**

Engineering and Renewable Energy (ERE)
Moderator : Condro Wibowo, S.TP., M.Sc., Ph.D
Zoom Link :
https://us02web.zoom.us/j/82758358267?pwd=NDlsWGFKSEE4c3JCb3A0SmNpSlFiUT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	Time
ERE-7-1.1C	1. Nguyen Ngoc Thuy 2. Hoang Ha Anh	Factors influencing the adoption of "One Must Do, Five Reductions" in rice production in the Mekong River Delta: A case study in Soc Trang province	Engineering and Renewable Energy	**01.00 PM – 01.15 PM**
ERE-7-1.2C	1. Adi Candra 2. Siswandi 3. Januar Aziz Zaenurrohman 4. Indra Permanajati 5. Hill Ridhia Hati	Rate of infiltration using double ring infiltrometre and horton method in Slamet volcanoe deposits, Purwokerto, Indonesia	Engineering and Renewable Energy	**01.15 PM – 01.30 PM**
ERE-7-1.3C	1. Indra Permanajati 2. Januar Aziz 3. Adi Candra	Study of Types of Landslides in Karangjambu District, Purbalingga Regency, Central Java Province	Engineering and Renewable Energy	**01.30 PM – 01.45 PM**
ERE-7-1.4C	1. Rio Dhani Laksana 2. Dian Purnomo Jati 3. Intan Shaferi 4. Ade Banani 5. Daryono	Building a Web-based Capital Market Laboratory Information System	Engineering and Renewable Energy	**01.45 PM – 02.00 PM**
ERE-7-1.5C	1. Anis Fitriya 2. Supriyanto 3. Jajang	Forecasting the Composite Stock Price Index Using the Fuzzy Time Series Markov Chain Method	Engineering and Renewable Energy	**02.00 PM – 02.15 PM**

		During the COVID-19 Pandemic		
SERD-7-1.6C	1. Dwita Darmawati 2. Cut Misni Mulasiwi 3. Monica Rosiana 4. Ramita Kholifaturrohmah 5. Dwita Aprillia Floresti	Student Softskill Development Model	Social Engineering and Rural Development	**02.15 PM – 02.30 PM**
SERD-7-1.7C	Yochananta Wira Satya Putra	The Relationship of Academic Burnout and Self Directed Learning Readiness with Motivation in Medical Students of Jenderal Soedirman University	Social Engineering and Rural Development	**02.30 PM – 02.45 PM**
SERD-7-1.8C	1. Shofi Mahmudah Budi Utami 2. Muammar Kadafi 3. Ambhita Dhyaningrum	Culture Comparison in Contemporary Travel Writing	Social Engineering and Rural Development	**02.45 PM – 03.00 PM**

Entrepreunership (ESHIP)
Moderator : Dr. Nur Choirul Afif, SE., M.Si
Zoom link :
https://us02web.zoom.us/j/5440903036?pwd=aE5LN3prNUdRY3hyK3ZBb3kwOVRLUT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	Time
ESHIP-7-1.1D	1. Yanuar Eko Restianto 2. Adi Indrayanto 3. Lina Rifda Naufalin 4. Aldila Dinanti 5. Nur Chasanah 6. Aldila Krisnaresanti 7. Dadang Iskandar	Young generations' perceptions of e-commerce professions in Indonesia	Entrepreunership	**01.00 PM – 01.15 PM**
ESHIP-7-1.2D	1. Suliyanto 2. Dadang Iskandar 3. Lina Rifda Naufalin 4. Aldila Dinanti	SME Contribution: Show Their Potential with Website-based Digital Mapping	Entrepreunership	**01.15 PM – 01.30 PM**
ESHIP-7-1.3D	1. Karina Odia Julialevi 2. Dr. Icuk Rangga Bawono 3. Ayu Anggraeni Sibarani	The Effect of Tax Incentives for msmes in facing the COVID-19 Pandemic	Entrepreunership	**01.30 PM – 01.45 PM**
ESHIP-7-1.4D	1. Ervina Mela 2. Laeli Budiarti 3. Mustaufik 4. Dian Novita	The Popularity of Food Souvenirs in Lampung Indonesia	Entrepreunership	**01.45 PM – 02.00 PM**
ESHIP-7-1.5D	1. Novita Puspasari 2. Suliyanto 3. Weni Novandari	Mapping Digital Startup Entrepreneurship Problems in Banyumas	Entrepreunership	**02.00 PM – 02.15 PM**
ESHIP-7-1.6D	1. Adi Indrayanto 2. Nur Chasanah 3. Aldila K. 4. Rasyid Mei M.	Implementation Customer Relationship Management in KUB Central Agro Lestari with Soft	Entrepreunership	**02.15 PM – 02.30 PM**

		System Methodology		
ESHIP-7-1.7D	1. Lina Rifda N. 2. Jaryono 3. Tohir 4. Aldila K.	Analysis of Characteristics of Banyumas Batik SMEs as a Basis for Development of Digital Financial Literacy Education Model	Entrepreunership	**02.30 PM – 02.45 PM**

Social Engineering and Rural Development (SERD)
Moderator : Sesilia Rani Samudra, S.Pi., M.Si
Zoom link :
https://us02web.zoom.us/j/84347505079?pwd=Mk5Ic2FhZnJGQlpjbFVHeThRK25KUT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
SERD-7-1.1E	Iwan Purnawan	Anxiety in Healthcare Professionals During The COVID-19 Pandemic: Literatur Review	Social Engineering and Rural Development	**01.00 PM – 01.15 PM**
SERD-7-1.2E	1. Erna Wardani, 2. Indriyati Hadiningrum 3. Weksa Fradita Asriyama 4. Muhamad Ahsanu	Covid-19 Pedagogy In Online School Field Introduction Program At Junior And Senior High Schools In Purwokerto	Social Engineering and Rural Development	**01.15 PM – 01.30 PM**
SERD-7-1.3E	1. Rio Dhani Laksana 2. Refius Pradipta 3. Sigit Wibowo	Disquality of Peripheral Public Services and Performance Accountability Policies on the Performance of Public Service Providers during the Covid 19 Pandemic	Social Engineering and Rural Development	**01.30 PM – 01.45 PM**
SERD-7-1.4E	1. Rahadi Wasi Bintoro 2. Antonius Sidik Maryono 3. Sanyoto 4. Weda Kupita 5. Dessi Perdani Yuris P S 6. Rahmawati Hanif 7. Ayu Mulyana	Legal certainty for the establishment of heirth information for the success of agrarian reform	Social Engineering and Rural Development	**01.45 PM – 02.00 PM**
SERD-7-1.5E	1. Haryono	Enhanching Japanese	Social Engineering	**02.00 PM – 02.15 PM**

	2. Nadia Wirda Ummah	Vocabulary Knowledge and Abstract Writing Skill Through Inquiry Based Learning in Japanese Literature Study Program, Faculty of Humanities UNSOED	and Rural Development	
SERD-7-1.6E	1. Wiwik Novianti 2. Mite Setiansah 3. Nuryanti 4. RW Partoto 5. Fiani Rosyadan	Discussing Sex in Marriage: A Qualitative Study of Married Couple in Banyumas, Central Java	Social Engineering and Rural Development	**02.15 PM – 02.30 PM**
SERD-7-1.7E	1. Ririn Kurnia Trisnawati 2. Indriyati Hadiningrum 3. Rizki Februansyah	Being Productive During COVID-19 Pandemic: A Photovoice Study of Creative Writing Class	Social Engineering and Rural Development	**02.30 PM – 02.45 PM**
SERD-7-1.8E	1. Delta Iswara 2. Ashlabiellah Nur Safah L. 3. Azmi Indria Larasati 4. Raditya Bagas Wicaksono	Correlation Between Coping Strategies With Burnout In First-Year Medical Student At Faculty Of Medicine University Of Jenderal Soedirman	Social Engineering and Rural Development	**02.45 PM – 03.00 PM**

Parallel Session
(Wednesday, September 7, 2021)

Tropical Biodiversity Bioprospection (TBB) and Engineering and Renewable Energy (ERE)
Moderator : Aulidya Nurul Habibah, S.Si., M.Si., Ph.D
Zoom Link :
https://us02web.zoom.us/j/89063075953?pwd=ektmQ25McTU2QkZYbnRUeXhRSExydz09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
TBB-8-2.1A	1. Endang Ariyani Setyowati 2. Edy Riwidiharso Rokhmani 3. Darsono 4. Imam Widhiono	Intensity and diversity of ectoparasites in domestic chickens (Gallus domesticus) in the highlands	Tropical Biodiversity Bioprospection	**10.30 AM – 10. 45 AM**
TBB-8-2.2A	1. F. Eko Dwi Haryono 2. Petrus Harry Tjahya Sudibyo 3. Taufan Harisam 4. Hendrayana	Sea Cucumber [Holothuridea spp.] Diversity Inhabit in Intertidal Zone of Southern Central Java Waters, Indonesia	Tropical Biodiversity Bioprospection	**10.45 AM – 11.00 AM**
ERE-8-2.3A	1. Arief Kelik Nugroho 2. Ipung Permadi, Teguh Cahyono 3. Swahesti Puspita Rahayu 4. Eddy MarYesnto	Classification of Medical Data Using Id3 algorithm as a Decisions Support	Engineering and Renewable Energy	**11.00 AM – 11.15 AM**
ERE-8-2.4A	1. Ari Fadli 2. Muhammad Syaiful Aliim 3. Yogi Ramadhani	Big Data Application to Overcoming COVID-19 Pandemic – a Systematic Literature Review	Engineering and Renewable Energy	**11.15 AM – 11.30 AM**
TBB-8-2.5A	1. Juni Safitri Muljowati 2. Arif Rahman Hikam	Relative Resistance Level of Phytopathogenic Fungi on Sunflower	Tropical Biodiversity Bioprospection	**11.30 AM – 11.45 AM**

		to Several Fungicides		
TBB-8-2.6A	1. Nandita Qothrunada 2. Taufik Budhi Pramono 3. Dadang Iskandar	Design and Construction of Water Quality Monitoring System in Aquaponic Systems	Tropical Biodiversity Bioprospection	**11.45 AM - 12.00 AM**
ERE-8-2.7A	1. Ren Fitriadi 2. Mustika Palupi 3. Sesilia Rani Samudra 4. Joni Johanda Putra	Application of Microbubble Technology to Increase Oxygen Content in The Aquaculture of Freshwater Pomfret (Colossoma macropomum)	Engineering and Renewable Energy	**12.00 AM - 12.15 AM**
TBB-8.2.8A	1. Ratna Stia Dewi 2. Aris Mumpuni 3. Mardiyah Kurniasih	Effectiveness of batik efluent absorption by mycelium Trametes sp. and Ganoderma spp. on the logboard	Tropical Biodiversity Bioprospection	**12.15 AM -12.30 AM**

Food, Nutrition and Health (FNH)
Moderator : Mekar Dwi Anggraeni, S.Kep.Ners., M. Kep., Ph.D
Zoom Link :
https://us02web.zoom.us/j/83162511858?pwd=b245RVJnd0I5NkZ1UTNOanprQlZ6UT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
FNH-8-2.1B	1. Mekar Dwi Anggraeni 2. Rahmi Setiyani 3. Endang Triyanto 4. Asep Iskandar 5. Desiyani Nani 6. Amin Fatoni	A Qualitative Exploration of the Antenatal Care Challenges during the Covid-19 Pandemic: A Study in rural area of Indonesia	Food, Nutrition and Health	**10.30 AM – 10. 45 AM**
FNH-8-2.2B	1. Prabadini Ruwielanisa 2. Hernayanti 3. Ari Asnani	The Potency of Ethanolic Extracts of Betel Leaves as An Anti-Biofilm against Methicillin-resistant Staphylococcus aureus	Food, Nutrition and Health	**10.45 AM – 11.00 AM**
FNH-8-2.3B	1. Zulfa Ulinnuha 2. Imastini Dinuriah 3. Siti Nurchasanah	Grafting performance of some scion clones on longan (Dimocarpus longan) mutants	Food, Nutrition and Health	**11.00 AM – 11.15 AM**
FNH-8-2.4B	1. Kharisun 2. M Rifan 3. Ratri NH 4. Rosi Widarawati 5. Ola Christable Adena	Application of NZEO-SRPlus Fertilizer On The Growth and Production Of Rice (Oryza Sativa L.)	Food, Nutrition and Health	**11.15 AM – 11.30 AM**
FNH-8-2.5B	1. Nuraeni Ekowati 2. Rina Sri Kasiamdari 3. Nuniek Ina Ratnaningtyas 4. Hendro Pramono	Effectiveness of Lentinula edodes Extract Through Cytotoxic Test and Apoptosis Mechanism of Cervical Cancer Cells	Food, Nutrition and Health	**11.30 AM – 11.45 AM**

FNH-8-2.6B	1. Nur Aini 2. Budi Sustriawan 3. Ervina Mela 4. Pradasivi Sekar Kinanthi	Characteristics of corn-almond cookies was affected by legumes and sweetener	Food, Nutrition and Health	**11.45 AM - 12.00 AM**
FNH-8-2.7B	1. Zulfa Ulinnuha 2. Risqa Naila Khusna	Flowering and Fruiting Phenology of Capsicum frutescens under Low Light Intensity	Food, Nutrition and Health	**12.00 AM - 12.15 AM**
FNH-8-2.8B	1. Nur Prihatiningsih 2. Heru Adi Djatmiko 3. Puji Lestari	Bioprospecting endophytic bacteria consortia from rice suboptimal lands for biological control of rice bacterial leaf blight pathogens	Food, Nutrition and Health	**12.15 AM -12.30 AM**

Engineering and Renewable Energy (ERE) and Basic Sciences (BS)
Moderator : Amin Fatoni, S.Si., M.Si., Ph.D
Zoom Link :
https://us02web.zoom.us/j/82758358267?pwd=NDlsWGFKSEE4c3JCb3A0SmNpSlFiUT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
ERE-8-2.1C	1. Maria Dyah Nur Meinita 2. Amron Amron 3. Agus Trianto 4. Dicky Harwanto	Utilization of Indonesian Seaweed for Bioenergy and Platform Chemical Production	Engineering and Renewable Energy	**10.30 AM – 10. 45 AM**
ERE-8-2.2C	1. Dani Nugroho Saputro 2. Arnie Widyaningrum 3. Agus Maryoto	Seismic Analysis Design Integrated Building Information Modeling (BIM) 3D	Engineering and Renewable Energy	**10.45 AM – 11.00 AM**
ERE-8-2.3C	1. Romanus Edy Prabowo 2. Hernayanti 3. Dwi Sunu Widyartini	The Biomass and Its Bioethanol Production of Seaweed from Rancababakan Waters of Nusakambangan Island Cilacap	Engineering and Renewable Energy	**11.00 AM – 11.15 AM**
ERE-8-2.4C	1. Adi Candra 2. Faturrahman 3. Didik Jati Mulyanto 4. Aristya Ferdian 5. Siswandi 6. Januar Aziz Zaenurrohman 7. Indra Permanajati	Slope stability in open pit coal mining using limit equilibrium at Satui area, South Kalimantan, Indonesia	Engineering and Renewable Energy	**11.15 AM – 11.30 AM**
ERE-8-2.5C	1. Farida Asriani 2. Gandjar Pamudji 3. Hesti Sulistiawati 4. Mohamad Daffa A P	Crack detection in concrete using otsu segmentation	Engineering and Renewable Energy	**11.30 AM – 11.45 AM**

BS-8-2.6C	1. Gratiana E. 2. Wijayanti Atang 3. Eko Setiyono	Differential expression of Vasa Homolog in the Gonad and Caudal Fin of Osteochilus vittatus	Basic Sciences	**11.45 AM - 12.00 AM**
BS-8-2.7C	1. Alice Yuniaty 2. Hexa Apriliana 3. Hidayah Juwarno	Salinity Tolerant Marker in Soybean Cultivars	Basic Sciences	**12.00 AM - 12.15 AM**
BS-8-2.8C	1. Y Kilawati 2. Y Maimunah 3. A Maizar	Evaluation of a confocal laser scanning microscope for counting virus-like particles in an intensive aquaculture system in Situbondo, East Java	Basic Sciences	**12.15 AM -12.30 AM**

Social Engineering and Rural Development (SERD)
Moderator : Dr. Nuning Vita H., S.Pi., M.Si
Zoom Link :
https://us02web.zoom.us/j/5440903036?pwd=aE5LN3prNUdRY3hyK3ZBb3kwOVRLUT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
SERD-8-2.1D	Pramono Hari Adi	The influence of consumer etnocentrism, social identity, perceived quality on consumer buying interest with ethnic products with consumer attitude as intervening variables	Social Engineering and Rural Development	**10.30 AM – 10. 45 AM**
SERD-8-2.2D	1. Intan Shaferi 2. Alisa Tri Nawarini 3. Rio Dhani Laksana	The Effect of Financial Literacy, Monthly Income, Financial Behavior on The Financial Welfare of Coffee Farmers In Banjarnegara District	Social Engineering and Rural Development	**10.45 AM – 11.00 AM**
SERD-8-2.3D	1. Lita Heni Kusumawardani 2. Aprilia Kartikasari 3. Koernia Nanda Pratama	Parental Knowledge Influenced The Effectiveness of Role Play on Food Safety Behaviour in School-Age Children	Social Engineering and Rural Development	**11.00 AM – 11.15 AM**
SERD-8-2.4D	1. Adi Indrayanto 2. Lina Rifda Naufalin 3. Aldila Krisnaresanti 4. Jaryono 5. Aldila Dinanti	Website development of accreditation information system in higher education	Social Engineering and Rural Development	**11.15 AM – 11.30 AM**
SERD-8-2.5D	1. Tohir 2. Jaryono 3. Lina Rifda Naufalin 4. Aldila Krisnaresanti	Analysis of the Implementation of the Student Educational Internship Program in the Economic Education Study Program during the Covid-19 Pandemic	Social Engineering and Rural Development	**11.30 AM – 11.45 AM**

SERD-8-2.6D	1. Wahyu Ekowati 2. Dian Ramawati 3. Keksi Girindra Swasti 4. Hasby Prie Choiruna	Exploration of the psychological pandemic response of urban community in Banyumas	Social Engineering and Rural Development	**11.45 AM - 12.00 AM**
SERD-8-2.7D	1. Wahyuningrat 2. Bambang Tri Harsanto 3. Tobirin 4. Dwiyanto Indiahono	Building Partnership Alliances in Rural Areas for Local Economic Development	Social Engineering and Rural Development	**12.00 AM - 12.15 AM**
SERD-8-2.8D	1. Chusni Hadiati 2. Nadia Gitya Yulianita 3. Usep Muttaqin	Felicity Condition of Expressive Speech Act Uttered by Public Figures in Covid-19 News	Social Engineering and Rural Development	**12.15 AM -12.30 AM**

Food, Nutrition and Health (FNH)
Moderator : Ren Fitriadi, S.S.T.Pi., M. P
Zoom Link :
https://us02web.zoom.us/j/84347505079?pwd=Mk5Ic2FhZnJGQlpjbFVHeThRK25KUT09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
FNH-8-2.1E	1. Eka Oktaviani 2. Suprayogi 3. Zulfa Ulinnuha	Amylose profile and antioxidant activity of f7 lines derived from a crossing of black rice and mentik wangi varieties	Food, Nutrition and Health	**10.30 AM – 10. 45 AM**
FNH-8-2.2E	1. Riviani 2. Maria Dyah Nur Meinita 3. Nuri Fitria 4. Nadhila Salwa 5. Dewi Wisudyanti	Antibacterial Activity of Mudskipper (Boleophthalmus Boddarti) Mucus Extract Against Pathogen Bacteria	Food, Nutrition and Health	**10.45 AM – 11.00 AM**
FNH-8-2.3E	1. Bambang Heru Budianto 2. Edi Basuki	Survival of Adult Stadium Tetranychus urticae in Some Cultivar of Cassava (Manihot esculenta CRANTZ)	Food, Nutrition and Health	**11.00 AM – 11.15 AM**
FNH-8-2.4E	1. Purnama Sukardi 2. Afifatul Muawanah 3. Anandita Ekasanti' 4. Tjahyo Winanto 5. R. Taufan Harisam 6. Norman Arie Prayogo	Growth and enzyme activities of Chanos-chanos Forskäl fed Nanochlorophsis-based Microcapsule supplimented with lysin	Food, Nutrition and Health	**11.15 AM – 11.30 AM**
FNH-8-2.5E	1. Harwanto 2. Eko Hendarto 3. Efka Aris Rimbawanto 4. Munasik	Effect of Fermented Cattle Urine as The Source of	Food, Nutrition and Health	**11.30 AM – 11.45 AM**

	5. Nur Hidayat 6. Bahrun	Nitrogen Fertilizer on Sorghum Fodder Productivity		
FNH-8-2.6E	1. Ratna Satriani 2. Budi Dharmawan	Economic Analysis of Rice Business and Feasibility of Farmer Households in Sawangan Wetan Village Patikraja District, Banyumas Regency	Food, Nutrition and Health	**11.45 AM - 12.00 AM**
ERE-8-2.7E	1. Elva Nadila 2. Fatimah Azzahro 3. Fifi Yulisa Hasanah 4. Saryono	Composition and Potency of Young Coconut Water for Health (Cocos nucifera L.): A Systematic Review	Food, Nutrition and Health	**12.00 AM - 12.15 AM**
FNH-8-2.8E	1. Mekar Dwi Anggraeni 2. Amin Fatoni 3. Eni Rahmawati 4. Ismei Nartiningsih	Estimation of Neonatal Jaundice from the chest images captured with smartphone	Food, Nutrition and Health	**12.15 AM -12.30 AM**

Tropical Biodiversity Bioprospection (TBB), Social Engineering and Rural Development (SERD) and Basic Science (BS)

Moderator : Monica Rosiana, S.E., M.Si.

Zoom Link :

https://us02web.zoom.us/j/89801398866?pwd=SE1GeTBHN1J0NE1GeTA0TTFOaUVHdz09

ID NUMBER	PRESENTERS	TITLE	TOPIC	TIME
TBB-8-2.1F	1. Sesilia Rani Samudra 2. Ren Fitriadi 3. Muhamad Baedowi 4. Lilik Kartika Sari	Water Quality Analysis of Banjaran River, Banyumas Regency	Tropical Biodiversity Bioprospection	**10.30 AM – 10. 45 AM**
SERD-8-2.2F	1. Monica Rosiana 2. Sri Murni Setyawati 3. Sigit Wibowo Dwi Nugroho	The Existence of Cooperatives as a Way of Eradicating Dependence on Moneylenders (Marketing Perspective)	Social Engineering and Rural Development	**10.45 AM – 11.00 AM**
TBB-8-2.3F	1. Norman Arie P. 2. Asrul Sahri Siregar 3. Sri Bayun 4. Purnama Sukardi	Identification and Gene Expression Kisspeptin in Hard Lipped Barb	Tropical Biodiversity Bioprospection	**11.00 AM – 11.15 AM**
BS-8-2.4F	1. Sri Maryani 2. Ari Wardayani 3. Bambang H. Guswanto	Boundedness of the solution operator families of the Navier Lame equation in whole space	Basic Science	**11.15 AM – 11.30 AM**

Detoxification of Cadmium on Albino Rats (*Rattus norvegicus*) with Natural Chelator of Fruiting Body Extract of *Ganoderma lucidum*

Hameda Dhaka Kusuma Taufiq[1*], *Hernayanti* Hernayanti[1],and *Nuniek* Ina Ratnaningtyas [1]

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Abstract. Cadmium is a heavy metal pollutant sourced from various industries and toxic to the kidneys. Cadmium exposure can be used natural chelator of ethanol extract of the fruiting body of *Ganoderma lucidum*. The aim of the study was to determine the effect and effective dose of the ethanolic extract of the fruiting body of *G. lucidum* on reducing the toxicity effect of cadmium in male albino rats (*Rattus norvegicus*) Wistar strain. The research design was experimental research, which consisted of 5 treatment levels. The research parameters were blood cadmium, β2-microglobulin, malondialdehyde, and superoxide dismutase levels. The ethanolic extract of fruiting body of *G. lucidum* was tested by gas chromatography-mass spectrometry (GCMS) to determine natural chelator compounds. The results of each parameter had a significant effect, which decreased blood cadmium, β2M and MDA levels, and increased SOD level that linear according to the addition of the dose of ethanol extract of the fruiting body of *G. lucidum*. Blood cadmium levels with β2M and MDA levels had a positive correlation, while blood cadmium levels with SOD levels had a negative correlation. The dominan compound detected was 9-hydroxy linalool which has potential as a chelator. The dose of 750 mg.kgBW^{-1} is the effective dose of the ethanolic extract of fruiting body of *G. lucidum* based on a decrease in blood cadmium levels (54.10%), β2M (63.94%) and MDA (20.31%), as well as an increase in SOD levels (14.20%) compared to sick control.

1 Background

Environmental problems generally occur due to increased contaminants that can cause air, land, and water pollution. These problems occur when contaminants are not managed properly and wisely [1]. Cadmium is a type of heavy metal that is very stable [2]. Sources of cadmium exposure can come from the mining industry, metallurgical industry, burning fossil fuels, battery industry, and cigarette smoke [3].

A case study of cadmium exposure occurred in welding workshop workers in Purwokerto which was interpreted from a blood cadmium level of 0.049 ppm [4]. Another reported case of cadmium exposure occurred in active smokers at the Padang city bus terminal, which was indicated by a relatively high blood cadmium level of 0.016 ppm [5]. The two exposure cases described high levels of blood cadmium compared to the limit of blood cadmium levels of 0.0012 ppm [6].

Cadmium has a nephrotoxic effect or is toxic to the kidneys. Cadmium poisoning in the body will be detoxified by the liver and excreted by the kidneys [7]. The effects of cadmium exposure on the kidneys occur due to damage to the glomerulus and proximal tubules of the kidney. This effect causes kidney function failure which is interpreted from a decrease in the value of the glomerular filtration rate (GFR) and tubular reabsorption capacity [8]. The decreased renal filtration rate causes the manifestation of several types of proteins in the proximal tubule such as β2-microglobulin (β2M) [9]. β2M levels are an early indicator of dysfunctional detection in the glomerulus and proximal tubules of the kidney [10].

The accumulation of cadmium in the kidneys triggers the production of reactive oxygen species (ROS) as free radicals, resulting in kidney membrane damage [11]. Malondialdehyde (MDA) which increases in line with the level of kidney damage [12]. The effect of increasing ROS due to cadmium exposure triggers a decrease in the activity of an antioxidant enzyme, namely superoxide dismutase (SOD). SOD enzyme levels decrease when free radical levels due to cadmium are high [13].

Handling of poisoning due to exposure to cadmium is generally done by administering an antidote in the form of a chemical compound, namely dimercaprol as a chelator. The use of dimercaprol as a cadmium chelator has several side effects, namely hemolysis of red blood cells to an increase in blood pressure [14]. Based on these side effects, it is necessary to have an alternative natural chelator from natural ingredients [15].

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Sources of natural chelators can use the *Ganoderma lucidum* mushroom which is a medicinal mushroom [16]. The use of a dose of 500 mg.kg BB^{-1} extract of *G. lucidum* was able to provide a protective effect for the kidneys (nephroprotective) against cadmium in terms of kidney histology, creatinine, urea, and uric acid levels in male albino rats [17]. The content of active compounds in the fruiting bodies of *G. lucidum* include flavonoids, gallic acid, and coumarin acid [18]. The content of other active compounds that are dominant in the fruiting body of *G. lucidum* are terpenoids consisting of various derivatives [19]. Flavonoid compounds have the potential as chelators to metals [20]. The terpenoid content in *G. lucidum* has the ability to reduce free radicals such as superoxide radicals and hydroxyl radicals by triggering the production of the body's antioxidant enzymes including SOD, catalase (Cat) and glutathione peroxidase (Gpx) [21]. Based on this description, a study was conducted to determine the effect and effective dose of the ethanolic extract of the fruiting body of *G. lucidum* on reducing the toxicity effect of cadmium in male albino rats (*Rattus norvegicus*) Wistar strain.

2 Material and Method

The research method was experimental which consisted of 6 treatment groups, namely P_0 (without cadmium induction and ethanol extract of *G. lucidum*), P_1 (cadmium induced), P_2 (induced cadmium and ethanol extract of *G. lucidum* 250 mg.kg^{-1}BW), P_3 (induced by cadmium and ethanol extract of *G. lucidum* 500 mg.kg^{-1}BW), and P_4 (induced by cadmium and ethanol extract of *G. lucidum* 750 mg.kg^{-1}BW). The test animals used were male albino rats (*Rattus norvegicus*) Wistar strain and simplisia strain fruiting bodies of *G. lucidum* which are a collection of CV. Asa Agro Corporation Cianjur number 21.

1.1 Extraction of *G. lucidum* Fruit Body

The fruit body sample of *G. lucidum* was in powder form which was extracted by maceration method. *G. lucidum* fruiting body powder as much as 100 g was soaked in 1,000 mL of 96% ethanol (1:10) [22]. *G. lucidum* powder was soaked in a beaker glass which was stirred for 10 minutes, then covered with aluminum foil and left at room temperature for 24 hours. The extracted macerate was evaporated using a vacuum rotary evaporator at a temperature of 45°C to obtain a thick extract [15]. The thick extract obtained was then weighed to determine the weight of the extract obtained. The weight value of the extract was calculated using the equation for the percentage of extract yield [23]. the active compound in the ethanolic extract of the fruiting body of *G. lucidum* using the (GCMS) method. The results of the mass spectra were analyzed by comparing the results and the National Institute of Standards and Technology (NIST) databases 27 and 147, as well as the WILEY 7 database [24].

1.2 Animal Treatment

Cadmium induction was carried out using $CdSO_4$ orally, with a dose of 25% of the LD_{50} $CdSO_4$ which was 14 mg.kg^{-1} BW [25]. Each dose was dissolved in 12.38 mL of distilled water. Cadmium induction was carried out for 10 days orally, using a 2 mL syringe for the treatment P_1, P_2, P_3, and P_4.

Giving the ethanol extract of the fruiting body of *G. lucidum*, the dosage of the extract was made first. The yield of the ethanol extract of the fruiting body of the fungus *G. lucidum* was made in doses of 250 mg.kg^{-1} BW (P_2), 500 mg.kg^{-1} BW (P_3), and 750 mg.kg^{-1} BW (P_4) [17]. Each dose was dissolved in 10 mL of distilled water. The ethanol extract of the fruiting body of *G. lucidum* was administered orally for 14 days using a syringe, which was given as much as 2 mL per test animal every day.

1.3 Sample Preparation

Blood samples of test animals were taken after treatment (posttest) on the 32nd day. Test animals were anesthetized using ether before sampling was carried out. Blood samples were taken through the orbital plexus vein [26]. Blood samples were centrifuged to separate the natant and supernatant (serum) for 10 minutes at a speed of 6,000 rpm [15].

1.4 Parameter Measurement

Examination of blood cadmium levels begins with the preparation of a standard solution. The concentration of the mother standard solution is 1.000 mg L^{-1}. A total of 0.5 mL of blood and 0.5 mL of each standard solution were added to a different Erlenmeyer flask, and 3 mL of HNO_3-H_2O_2 (2:1, v/v) was added, then closed. The solution was homogenized and incubated for 1-2 hours by heating at 60-70°C. A total of 2 mL of nitric acid and 3-4 drops of H_2O_2 were added, and again heated on a hot plate at 80°C until the solution turned clear. The solution was stored at 37°C and diluted with 1 mL 0.1 mol. dm^{-3} HNO_3. The solution was then filtered using Whatman paper no. 42 and diluted with distilled water to 10 mL. The standard solution and the sample were then read for their absorbance values at AAS λ 228,6 nm with a current of 3.5 mA [27].

The examination of β2M levels was carried out using the Rat β2-*microglobulin* reagent kit, carried out by making a standard solution which was diluted using a standard diluent. The mother standard solution had a concentration of 480 µg.mL^{-1}. A total of 50 µL of the standard solution was added to the standard well, and 40 µL of the sample and 10 µL of anti-β2M antibody were added to the sample well. Each well was added 50 µL of streptavidin-HRP and homogenized. All wells were closed using a sealer and incubated for 60 seconds at 37ºC. The sealer cover was opened and the well plate was washed using 0.35 mL of wash buffer solution for 30 to 60 seconds with 5 repetitions of washing, then the well plate was dried. A total of 50 µL of substrate

solution A and 50 µL of substrate solution B were added to each well and closed with a new sealer and incubated for 10 minutes at 37ºC. in dark conditions. After incubation, the sealer was opened and added to each well as much as 50 µL of stop solution. A color change in the solution from blue to yellow was observed. The solution in the well was read for optical density (OD) using a microplate reader λ 450 nm [28].

MDA levels were checked using a commercial MDA reagent kit. The first stage of checking MDA levels is the preparation of a standard solution, where the standard solution used is a TEP solution that has a concentration of 1 mM. MDA levels were checked using the thiobarbituric acid reactive substance (TBARS) assay method [29]. A total of 400 µL of test animal serum samples and 400 µL of each concentration of standard solution were put into different measuring cups, then 400 µL of 20% TCA was added. The solution was homogenized and then centrifuged using a centrifuge for 10 minutes at 4,000 rpm. The supernatant was taken as much as 400 µL and added 1,000 µL of 0.67% TBA. The solution was heated in a water bath for 10 minutes at 95ºC. The solution was cooled at room temperature, then the absorbance value was read on spectrophotometry λ 532 nm.

Examination of SOD levels SOD was measured with the RanSod reagent kit. A total of 1,500 µL of buffer solution and 300 µL of xanthine oxidase were put into 3 different test tubes. The first tube is a blank, the second tube is added 60 µL of standard solution as a standard, and the third tube is added 60 µL of serum sample as a sample. Each solution in the tube was homogenized and the absorbance value was read using spectrophotometry 520 λ nm [30].

1.5 Data Analysis

The absorbance values of the standard solutions of cadmium, β2M and MDA from each dilution series were analyzed to produce a regression curve. Measurement of blood cadmium, β2M, and MDA levels using the regression equation formula generated from the absorbance readings for each series of dilutions of standard solutions of cadmium, β2M, and MDA [31]. The formula for the regression equation is as follows: y = a + bx. Description: y= sample absorbance value, a= intercept (intercept of the curve line on the Y axis), b= slope (slope), x= blood cadmium level, β2M, or sample MDA.

Calculation of SOD levels was obtained from the standard absorbance results and each sample obtained, then entered into the equation for measuring SOD levels as follows [30]: SOD levels = (Sample absorbance/standard absorbance) × 30,65 U.mL^{-1}.

Statistical analysis was obtained from the results of calculating blood levels of cadmium, β2M, MDA, and SOD from each sample, then statistically processed using SPSS software. The resulting data were analyzed using the analysis of variance (ANOVA) method at an error rate of 1%. If the results of the ANOVA analysis are significant, then proceed with DMRT (Duncan multiple range test) analysis to determine the most effective dose of the ethanolic extract of the fruiting body of *G. lucidum* in reducing cadmium toxicity.

3 Result and Discussion

Based on Fig 1., the mean blood cadmium levels, β2M, MDA and SOD interpreted that each treatment had different values. Treatment P_0 which is a healthy control, with the lowest mean blood cadmium, β2M, and MDA and the highest SOD compared to the other four treatments. The mean blood cadmium, β2M, and MDA levels were the highest in the P_1 treatment, while the lowest mean SOD levels in the P_1 treatment indicated that cadmium had been induced in the body.

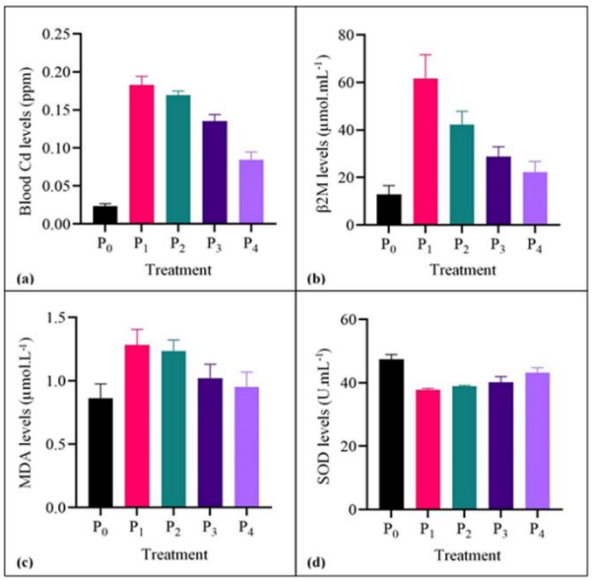

Fig 1. Histogram of mean levels of research parameters in male albino rats; **a)** average blood Cd levels; **b)** mean grade β2M; **c)** the average level of MDA; **d)** the average level of SOD; P_0: Healthy control (without induced cadmium and ethanol extract of *G. lucidum* fruiting body); P_1: negative control (cadmium induced); P_2: induced cadmium and 250 mg.kgBW^{-1} ethanol extract of the fruiting body of *G. lucidum*; P_3: induced cadmium and 500 mg.kgBW^{-1} ethanol extract of the fruiting body of *G. lucidum*; P_4: induced cadmium and 750 mg.kgBW^{-1} ethanol extract of *G. lucidum* fruiting body

Measurement of blood cadmium levels at the beginning of cadmium induction had relatively high levels. Cadmium is still quite high in the blood and then decreases after several months post-induction. The decrease in levels was because cadmium had been distributed to several tissues and accumulated in the kidneys as an excretory organ [32]. Cadmium levels in the body are distributed in the blood and some tissues to accumulate in the kidneys [33].

Cadmium induction in this study which lasted for 10 days and examination at 15 days post-induction (day 32) could still measure blood cadmium levels from test animals. This is in accordance with the study of blood

cadmium levels were still measurable after cadmium induction in Sprague-Dawley rats [34]. The study showed a decrease in blood cadmium levels followed by an increase in kidney cadmium levels in line with the length of the induction time for 30 days. The decrease in blood cadmium levels for a long time occurs because the Cd-MT binding has been reduced in the kidneys.

The effect of cadmium exposure on the kidneys in this study was seen from the levels of β2M. Blood cadmium levels in line with an increase in serum β2M levels [35]. β2M is a biomarker with high sensitivity to kidney damage due to cadmium exposure [36]. The use of serum β2M biomarkers for short-term exposure to cadmium was considered appropriate because serum β2M levels decreased with increasing dose and exposure time [37].

The mechanism of cadmium exposure in the kidney, due to the release of the Cd-MT complex in the proximal renal tubule. The Cd-MT complex is released, with MT being degraded by endosomes and lysosomes, while cadmium accumulates in the cytosol of the proximal tubule [38]. Studies exposure to cadmium in the kidneys on pregnant female mice, that increases the production of free radical compounds that trigger cell damage through the mechanism of lipid peroxidation [39]. The event of lipid peroxidation in the kidneys due to exposure to cadmium increased MDA levels in serum, liver, and kidney of rats [40].

Exposure to cadmium results in a decrease in the body's antioxidant enzymes such as SOD. Studies of cadmium exposure in rats showed that SOD levels decreased in line with a decrease in the body's antioxidant activity. A decrease in SOD levels interprets the effects of cadmium exposure and an increase in ROS in the body [41]. The role of SOD as an antioxidant enzyme in the body decreases, causing oxidative stress that triggers an increase in ROS. The body's inability to neutralize ROS, triggers a continuous effect of lipid peroxidation and decreases SOD levels [42].

Table 1. Analysis of variance test for blood cadmium, β2M, MDA and SOD levels

Parameter	*p-value*	Remarks
Blood Cd	0.000	Significant
β2M	0.000	Significant
MDA	0.000	Significant
SOD	0.000	Significant

Table 1. shows that each parameter has a significant effect on changes in blood cadmium levels, β2M, MDA and SOD. The results of the DMRT test at the 99% confidence level (Table 2.), interpreted that the P_4 treatment or a dose of 750 mg.kgBW^{-1} ethanol extract of the fruiting body of *G. lucidum* was an effective dose in reducing blood cadmium levels (54.10%), β2M (63.94%) and MDA (20.31%) and increased SOD levels (14.20%) compared to sick control (P_1), because they tended to have levels towards healthy control values (P_0). Based on Fig 2., blood cadmium levels have a positive correlation with β2M and MDA levels, and a negative correlation with SOD levels.

Table 2. DMRT test 99% confidence level of blood cadmium, β2M, MDA and SOD

Treatment	Blood Cd (ppm)	β2M (μg.mL^{-1})	MDA (μmol.L^{-1})	SOD (U.mL^{-1})
P_0	0.023 ± 0.003^{a}	12.87 ± 3.71^{a}	0.86 ± 0.11^{a}	47.38 ± 1.54^{a}
P_1	0.183 ± 0.011^{d}	61.65 ± 9.97^{d}	1.28 ± 0.12^{c}	37.83 ± 0.38^{c}
P_2	0.169 ± 0.006^{d}	42.29 ± 5.53^{c}	1.23 ± 0.09^{c}	38.87 ± 0.28^{c}
P_3	0.136 ± 0.008^{c}	28.71 ± 4.16^{b}	1.17 ± 0,05^{bc}	40.15 ± 1.76^{c}
P_4	0.084 ± 0.011^{b}	22.23 ± 4.47^{ab}	1.02 ± 0.11^{ab}	43.20 ± 1.59^{b}

Note: the numbers accompanied by the same letter do not differ based on the DMRT test at a 99% confidence level

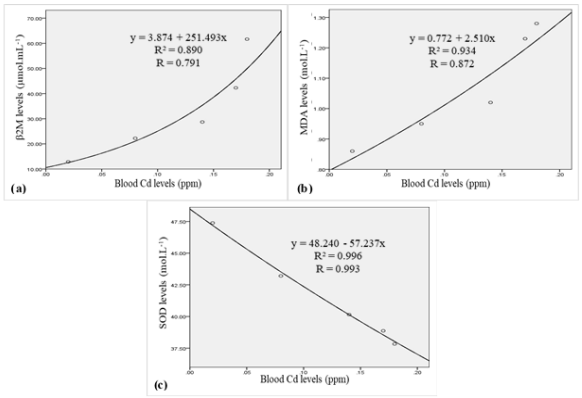

Fig 2. Regression curve of blood Cd levels with parameters β2M, MDA and SOD; **a)** positive correlation of blood cadmium - β2M; **b)** positive correlation of blood cadmium – MDA; **c)** negative correlation of blood cadmium – SOD

The thick extract obtained in this study was 52.34 g, so the percentage yield obtained was 5.23%. Induction of the ethanolic extract of the fruiting body of *G. lucidum*, showed a decrease in blood cadmium levels accompanied by a decrease in β2M and MDA levels and an increase in SOD levels. This is because the ethanol extract of the fruiting body of *G. lucidum* contains various compounds. The results of the identification of compounds in the ethanol extract of the fruiting body of *G. lucidum* using the GC-MS method, identified 10 dominant compounds in the extract of the fruiting body of *G. lucidum* which are presented in Fig 3. and Table 3.

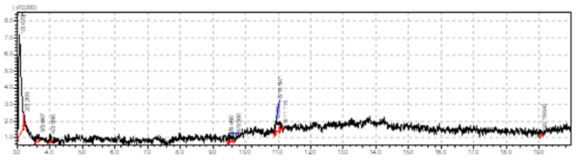

Fig 3. Chromatography GC-MS ethanol extract of the fruiting body of *G. lucidum*

Table 3. The dominant compound was identified in the ethanol extract of the fruiting body of *G. lucidum*

Peak	Retention Time	Compound Name	Concentration(%)	Compound Group
1	3.078	9-hydroxy linalool	56.88	Terpenoids
2	3.205	n-(4-chlorophenyl)-2-(3-fluoroanilino)nicotinamide	8.64	Vitamin
3	3.667	Cyclopentanepropanoic acid, 2-(3-oxo-1-octenyl)-3,5-bis[(trimethylsilyl)oxy]-, methyl ester (CAS)	4.51	Terpenoids
4	3.990	4-(5-Butyl-1,3-dioxan-2-yl)benzonitrile	4.32	Terpenoids
5	9.460	Pyridine-2,3-dicarboxylic acid, 1,4,5,6-tetrahydro-6,6-dimethyl-4-oxo-, diethyl ester	3.59	Alkaloids
6	9.500	Decanoic acid, 1,1a,1b,4,4a,5,7a,7b,8,9-decahydro-4a,7b-dihydroxy-3-(hydroxymethyl)-1,1,6,8-tetramethyl-5-oxo-9aH-cyclopropa[3,	5.12	Saturated fatty acids
7	10.895	(3s,3ar,8ar,9ar)-3-{[4-(2-methoxyphenyl)-1-piperazinyl]methyl}-5,8a-dimethyl-3a,7,8,8a,9,9a-hexahydronaphtho[2,3-b]furan-2(3h)-	3.77	Terpenoids
8	10.941	10-Hydroxy-5,7-dimethoxy-2,3-dimethyl-1,4-anthracenedione	6.98	Phenol
9	11.115	Acetic acid, 8-acetoxy-6-formyl-2-thia-6-azaadamantan-4-yl ester	3.36	Acetic acid
10	19.040	2-Phenanthrenecarboxaldehyde, 1,2,3,4,4a,4b,5,6,7,8,8a,9-dodecahydro-7-hydroxy-2,4b,8,8-tetramethyl- (CAS)	2.83	Terpenoids

The compounds detected included terpenoids, alkaloids, phenols, acetic acid, fatty acids and vitamins. The compound 9-hydroxy linalool was the dominant compound found in this study. Linalool is a derivative of the linalool compound from the terpenoid group. The molecular structure of linalool consists of a basic acyclic monoterpene structure which has a tertiary alcohol group containing a hydroxyl group [43]. The ethyl acetate and n-hexane extracts of the fruiting bodies of *G. lucidum* were identified using GC-MS to contain terpenoids, phenols, flavonoids, saponins and various types of fatty acids [44]. Terpenoid compounds and their derivatives are the dominant secondary metabolites found in *G. lucidum* [45].

The molecular structure of 9-hydroxy linalool, consists of the parent structure of linalool with a hydroxyl group on the third and ninth carbon chains. The presence of the two hydroxyl groups allows the 9-hydroxy linalool compound which is a terpenoid compound to have metal chelating and antioxidant abilities. Terpenoid compounds have the ability to reduce metal ions by dissociating protons from their hydroxyl groups [46]. The mechanism of proton dissociation of the hydroxyl group by donating protons from hydrogen atoms, so that they are able to oxidize heavy metal ions to become neutral and unreactive [47].

The decrease in MDA levels occurs because linalool is able to suppress oxidative stress in the body. Linalool has an antioxidant effect by reducing levels of free radicals in the body, so that the rate of lipid peroxidation decreases [48]. Oxidative stress conditions were returned to neutral by linalool, triggering an increase in SOD. This results in the inhibition of superoxide anion free radicals from being oxidized to hydroxy peroxide [49].

Identification of the compound content of the ethanol extract of the fruiting body of *G. lucidum* using GC-MS in this study did not detect any flavonoid content. The ethanolic extract of *G. lucidum* has a high terpenoid content compared to phenolic compounds such as flavonoids [22]. *Ganoderma lucidum* extract contains various terpenoid derivatives that have antioxidant and anti-inflammatory effects against *Plasmodium berghei* bacterial infection in mice [50].

The ethanolic extract of the fruiting body of *G. lucidum* contains flavonoids [51]. The levels of flavonoids in *G. lucidum* tend to be lower and only one type of flavonoid derivative was detected in this study, namely catechins [52]. Qualitative screening of flavonoid content of the mycelium of *G. lucidum* was detected as weak [53].

The undetected flavonoid content could be caused by the maceration time factor. The length of maceration time affected the flavonoid levels in the methanol extract of *G. lucidum* [54]. The factor of differences in the type of solvent on the extraction of *G. lucidum* affects the levels of identified flavonoids. The polarity of the solvent determines the level of flavonoid that can be extracted. Flavonoid compounds are thought to have polar and nonpolar structures. It depends on the structure of the compound, so that extraction using polar compounds is not always able to attract flavonoid compounds [55]. The one-stage extraction method is thought to have an effect on flavonoid levels. The use of the one-step method is only able to extract compounds with one type of solvent. The selection of the stratified extraction method is extraction with sequential solvents consisting of nonpolar, semipolar, and polar compounds. The method is considered capable of attracting certain compounds specifically based on the level of polarity of the solvent [56].

4 Conclusion

Ethanol extract of the fruiting body of *G. lucidum* was able to reduce cadmium-induced toxicity in albino rats by decreasing blood cadmium, β2M and MDA, and increasing SOD levels. The effective dose of the ethanolic extract of the fruiting body of *G. lucidum*, namely 750 mg.kgBW^{-1}, was able to reduce blood cadmium (54.10%), β2M (63.94%) and MDA (20.31%), as well as increase SOD levels (14.20%) compared to sick control.

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