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**

Effect of Delta ALAD Gene Polymorphism on Haematological Profile and Malondialdehyde Level in Lead-Exposed Individual

HERNAYANTI[1)], NURTJAHJO DWI SASAONGKO[1)], NUNIEK INA RATNANINGTYAS[1)], MUACHIROH ABBAS[1)], and SARYONO[2)]

[1)]*Faculty of Biology, University of Jenderal Soedirman, Purwokerto, Indonesia*
[2)] *Faculty of Health Sciences, University of Jenderal Soedirman, Purwokerto, Indonesia*
Correspondence Email: hernayanti@.unsoed.ac.id

Abstract

Introduction: Lead is a toxic of heavy metal which generates free radical in the body that caused inhibited δ-ALAD synthase and hem production. **Aim of research:** This study was aimed to examine the effect of δ-ALAD gene polymorphism on haematological profile and MDA level among lead-exposed individuals. **Method:** This research was done by a cross-sectional method. Venous blood samples were collected from 30 people of car repair workers.. A *Polymerase Chain Reaction*was used by applying a *Restriction Fragment Length Polymorphism (*PCR-RFLP) markers for detecting δ-ALAD genotyping and Msp-I as the restriction enzyme. Blood-leads and haematological profile were analyzed by AAS and Haematology Analyzer, meanwhile the MDA level was analyzed by TBARS method. **Result :** The results showed that 10 of 30 people were showing polymorphisms δ-ALAD gene,the DNA located at 916 bp, 582 bp and 334 bp. while 20 respondents was detected as non-polymorphism of δ-ALAD gene, cut in 916 bp.. The blood-lead, MDA level, hemoglobin, erythrocyte and leucocyte count of individuals with polymorphisms were higher than the non-polymorphisms. The independent t-test showed a significant difference for all parameters ($p<0.01$).**Discussion:** δ-ALAD gene polymorphism affected haematological profile by inhibited δ-ALAD activity, elevated MDA level, lowering hem production result in anemia.disease.

Keywords: lead exposure, δ -ALAD polymorphism, MDA, haemoglobin

Introduction

Lead is toxic to human especially for lead-exposed individual i.e auto repair workers, welders, car mechanics, policemen, taxi driver, plastic and pesticide-industrial workers. Exposure to lead in humans mainly occurs through petroleum products (leaded-gasoline), leaded paints and drinking water. Leaded-gasoline enter to a human body by inhalation and couple with sulfhydryl groups (-SH), a material for regulating the enzymatic process, thereby inhibiting the activity of this enzyme. Even though in low-level chronic lead exposure may affect various diseases such as anemia, hypertension, renal failure and decreased immunity [1,2,3]. Chronic toxicity of lead exposure occur if the lead level of about 40–60 ppm. A case study in Poland lead cause environmental pollution due to the burning of coal. Lead occupied is the first place in waste management and the second in road transport [4]. Recent studies indicate that lead generate oxidative stress through stimulation of reactive oxygen species (ROS) as well as reactive nitrogen species (RNS) and depletion of antioxidant enzymes.This process result in accumulation of free radicals and trigger the lipid peroxidation process that caused damage of cell membrane of poly unsaturated fatty acid, enzymes, proteins and DNA. The number of free radicals that enter into the body indicated by the elevation of Malondyaldehide level (MDA) [5,6,7]. This means that lead exposure is dangerous for the environment, and the human health.

If the polymorphisms gene is found in population the susceptibility to lead exposure will increase. Polymorphism at the DNA level can decrease enzyme activity by 20-30% [8]. ALAD gene, which is located in the chromosome 9q34.ALAD gene polymorphism, causes amino acid substitution from Lysine to Asparagine and substitution G to C.The existence of polymorphisms gene ALAD (G177C) that regulate the expression of δ-ALAD in hem synthesis, could increase the risk of anemia in lead-exposed individual [9,10,11]. Research conducted in Malaysia,India, and Vietnam, showed that polymorphism of δ-ALAD gene with allele ALAD-2 in India 10,8%, Malaysia 8,8% and Vietnam 4,3%.

They have more susceptibility to suffer from anemia compare to a healthy individual, because the production of hem is lower than non polymorphisms [12]. This research aimed to conduct the molecular analysis of ALAD gene polymorphism among lead-exposed workers and to know the effect of ALAD gene polymorphism on hematological profile and MDA level among auto repair workers.

Material and Methods

Research design

This study was cross-sectional, with research subject was 40 out of 80 auto repair workers in Purwokerto, Indonesia. The inclusion criteria were men, aged 25-55, has been working as auto repair worker at least 3 years, and voluntary consent to involved in the research. Subject with anemia diseases was excluded. The research was done after obtaining ethical clearance from ethics commission of health research, Medical Faculty, Gadjah Mada University, Yogyakarta, with no KE/FK/294/EC.

Sample preparation

After signing informed consent, 10 mL blood samples were collected from the subject's mediana cubiti vein with the syringe. The samples then separated into 3 parts, 3 mL for DNA isolation, 3 mL for hematological profile examination, 6 mL for blood lead and MDA examination. Blood samples for lead and MDA examination collect in Eppendorf tube and centrifuged at 4000 rpm for 10 minutes duration. Supernatant with yellow color (plasma) that was formed after centrifugation then separated from erythrocyte for lead and MDA analysis.

DNA isolation was conducted using Guanidine Method. Gene amplification using PCR-RFLP method was conducted according to [9]. Primer forward: 5'-AGA CAG ACA TTA GCT CAG TA-3' and primer reverse: 5'-GGC AAA GAA CAG GTC CAT TC-3'PCR conditions were initial denaturation 95 °C 5 minutes. The PCR process was 30 cycles, comprises of 95 °C 5 minutes denaturation, annealing 55 °C 30 second, elongation 72 °C 30 second, and final elongation72 °C, 5 minutes and 260C, 10 seconds. The PCR product was digested using Msp1 enzyme. Finally, the digested product was analyzed by electrophoresis using 1.5% agarose gel and ethydium bromide and then visualized under UV rays. The result of electrophoresis was wild-type(non-polymorphism) : GG, located on 916 bp,allele heterozygote (ALAD polymorphism) with genotype GA located at 916 bp, 582 bp, and 334 bp. Alel homozygote with genotype AA located in 916 bp 1nd 334 bp.

Blood lead level examination was conducted using standard PbSO4 solution [13]. The standard PbSO4 solution was made in 2 ppm, 5 ppm, 9 ppm, and 15 ppm concentrations. AAS was used to analyze blood lead level, with the wavelength of 217.6 nm and 3.5 mÅ. The result will be displayed on the AAS in ppm. The hematological profile was conducted by SysmexHaematology Analyzer [11] and MDA level with TBA method, Cat Number: E-BC-K025-S [14] .

Statistical analysis

The data were displayed as the mean ± standard deviation (SD) and presented in frequency distribution table. The mean difference between polymorphism and none were analyzed by independence t-test.The result is considered significantly different if $p<0.05$.

RESULT

1. Gene ALAD polymorphism

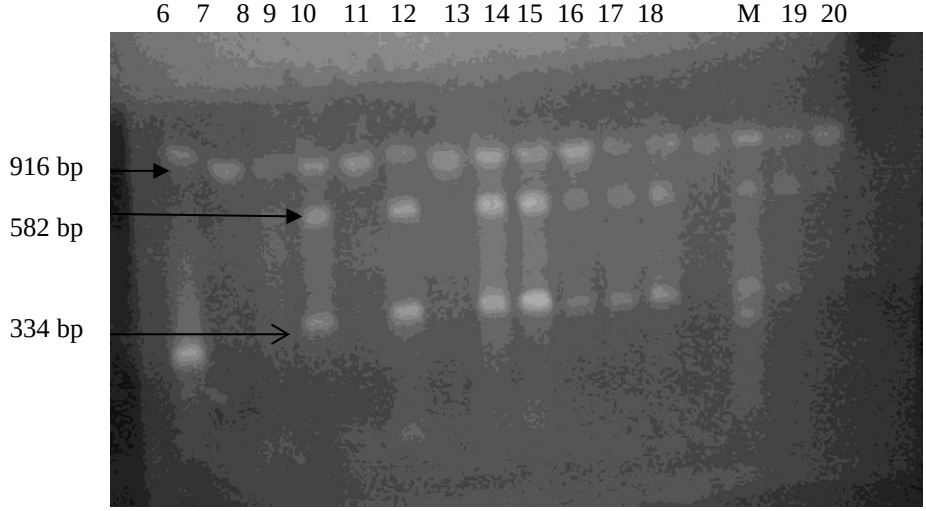

Fig 1. ALAD gene after digested by Msp-1 enzyme
Note: No. 7, 10,12, 18 and 21 genotype of respondents of non polymorphism ALAD gene, with GG genotype (ALAD 1-1). DNA band unfragmented 916 bp
M : Marker
No. 6, 9,11,13,14,15,16,17,and 20, genotype of respondents with polymorphism ALAD gene,with GA genotype (ALAD 1-2). DNA fragmented into 3 fragment 916 bp, 582 bp and 334 bp

ALAD G177C gene polymorphism have two alleles (ALAD1 and ALAD2) and three phenotypes (ALAD1-1, ALAD1-2 and ALAD2-2)[15]. Recent studies reported that carriers of ALAD2 allele have higher blood lead concentrations than ALAD1 allele. In this research among 30 respondents from10 respondents (30%) were identified to have ALAD gene polymorphism with genotype GA (ALAD 1-2) and 20 respondents (70%) were individual without ALAD gene polymorphism with genotype GG (ALAD 1-1). DNA band of the respondent with polymorphism was fragmented into three fragments. The fragments length were 916 bp, 582 bp and 334 bp (heterozygote mutant), while Respondents without polymorphism, the fragment length was 916 bp (Figure 1).

Rujito et al, 2015 [16] repoted their research in gas station workers that individu with ALAD 1-1 found by 94,7% while ALAD 1-2 by 5,3% but not found the ALAD 2-2 genotype. Individu with ALAD 1-2 have higher blood lead level than ALAD 1-1. Further research conducted by Puspitaningrum [17,18] found individuals with genotype ALAD1-2 as much as 48.3% and 51.7% were carrier of ALAD 1-1. in elementary school Jakarta while from UNJ Jakarta found six carrier individuals with genotype ALAD1-2 from 50 students. These study indicated the relationship between ALAD gene polymorphism and blood lead level. Individu with polymorphism ALAD gene 1-2 have higher lead level than non polymorphisms individual with ALAD gene 1-1.

Blood Lead level

The result of blood lead level among respondents with and without ALAD gene polymorphism is presented in Table 1. All respondent have blood level above normal level (0.2 ppm). It means that all respondents are exposed to lead. From the table, it can be seen that blood lead level in respondents with ALAD gene polymorphism is higher than that of respondents without ALAD gene polymorphism and the mean was 0.69 ± 0.045 ppm and 0.39 ± 0.083 ppm, respectively.

Table 1. The differences of blood lead level between ALAD gene polymorphism and none

Group	Blood lead level (ppm)	p-value
Polymorphism	0.69 ± 0.045	0.001
Non-polymorphism	0.39 ± 0.083	

All respondent, who are auto repair workers, were exposed to lead especially from spray car paints that contain lead (Pb). The paints have very small particles that are easily inhaled through the respiratory tract,spray car paints contain 4% Pb-oxide, 14% Fe Pb-oxide, 21 Pb-phosphate, 3% Fe Pb-sulphate, and 2% MnPb-oxide. In the lung, these particles can be easily absorbed into blood circulation and circulated to the whole body [19,20]. In addition, tetraethyl lead (TEL) emission of motor vehicles is also increasing the exposure of auto repair workers. TEL is converted into Pb triethyl, a free radical compound, which can easily penetrate the cell membrane and can easily bond to –SH group compound. It causes inhibition in the enzyme that content –SH group activities, including Delta Amino levulinic Acid Dehydratase Enzyme (δ - ALAD), which plays an important role to produce hem [21].The increase of blood lead level among respondents with ALAD gene polymorphism is in line with a research conducted by Wan et al. [22] stated that someone susceptibility to the lead compound will increase if the polymorphism of ALAD gene exists. This research showed that respondents with ALAD gene polymorphism were more susceptible to the

toxic compound. They have higher blood lead level than non-polymorphism respondents.

2. Malondyaldehide (MDA) level

The result of MDA level among respondents with and without ALAD gene polymorphism is presented in Table 2.

Table 2. The differences of MDA level between polymorphism and without ALAD gene polymorphism

Group	MDA level(µmol/L)	p-value
Polymorphism	1.71 ± 0.30	0.000
Non-polymorphism	1.19 ± 0.33	

This research showed that respondents with ALAD gene polymorphism have MDA level higher than the respondents without ALAD gene polymorphism. MDA level in a normal individual is approximately < 1 µmol/L, but MDA level increase >1 µmol/L, both in respondents with ALAD gene polymorphism and without polymorphism. Lead induced oxidative stress as indicated by significant decrease of antioxidant enzymes such as SOD, GPx and CAT levels. The end product of lipid peroxidation namely Malondialdehyde (MDA) which is produced from damage to polyunsaturated fatty acids. MDA is a good indicator of lipid peroxidation and as a biomarker of oxidative stress [23,24,25]. The increase of MDA level also due to lead detoxification process by the liver is disturbed by lead. Lead inhibits Glutathion-S Transferase (GST), an enzyme that has a role in detoxification process in the liver, so the detoxification processed is impaired. Liver cannot be eliminated lead result in accumulation lead in the liver [26,12]. Lead induces liver membrane cell damage by trigger the lipid peroxidation process result in the elevation of MDA level.

The study of 25 students in Isparta, Turkish who worked on the mechanical car for 5 weeks with working time of 8 hours/day, also found an increase in MDA levels exceeds the normal, the average MDA level is approximately 1.37 ± 0.8 µmol / L and blood Pb is approximately 0.79 ± 0.05 ppm. Mechanical workers in Poland also experienced elevated MDA levels of 1.32 ± 0.2 µmol / L, with blood Pb levels ranging from 0.43 ± 0.05 ppm [27].

Haematological parameters include Hb level, erytrocyte count and total leukocyte count is shown in Tabel 3 (Hb level), Tabel 4 (Erytrocyte count) and Tabel 5 Total Leukocyte count. There are significant differences between hemoglobin level, erythrocyte count and leucocytes number of ALAD gene polymorphism and without polymorphism ($p<0.05$).

3. Hemoglobin level (g/dL)

The result of Hb level in polymorphism and non polymorphism ALAD gene is shown in Table 3.

Table 3. Hemoglobin level

Group	Hb level(g/dL)	p-value
Polymorphism	10.46 ± 0.92	0.001
Non-polymorphism	13.35 ± 0.54	

This research showed that the Hb level of respondents with ALAD gene polymorphism was lower than respondents without ALAD gene polymorphism. ALAD gene polymorphism can decrease of enzyme activity by 20-30% [Chuang et al, 2006) so it decreases the ALAD enzyme expression. Respondents with gene polymorphism genetically have ALAD enzyme lower than respondents without polymorphism. Lead exposure will inhibit the activity of δ – ALAD, a cytosolic enzyme that catalyzes the formation of porphobilinogen from δ-aminolevulinic acid (ALA),and collaborates

with ferrochelatase catalyzes the corporation of Fe into protoporphyrin to form hem. Inhibition of δ-ALAD, a major enzyme in heme biosynthesis leads to a reduction of the heme production, so this causes decreasing of hemoglobin level.

Nakhee et al [28] comparing the related blood lead level and hemoglobin in lead occupied with high blood lead level >10 μg/dL and healthy individual with low blood lead levels (< 10 μg/dL), showed that the average of Hb in lead exposed-individual are 12.6 g/dL while the average of Hb in healthy individual are15.2 g/dL. This result indicated that lead exposed- individual with high blood lead level greater than 10 μg/dL are at risk had lower Hb compare to healthy individual with low level blood lead. Genetically, the decrease of ALAD production couple with inhibition of lead on ALAD activity and the high level of blood lead that causes hemoglobin level among subject with ALAD polymorphism gene lower than individual without polymorphism [10,18]

4. Erythrocyte Count

Tabel 4. Erythrocyte count

The data of erythrocyte count in respondent with polymorphism and non polymorphism ALAD gene is shown in Table 4.

Group	Erythrocyte count (x 10^6 /μL)	p-value
Polymorphism	3.05± 0.31	0.001
Non-polymorphism	4.37± 0.16	

The data showed that respondent with ALAD gene polymorphism has erythrocyte count lower than respondent without polymorphism (non polymorphism). This is caused by after lead enters to blood will be bound about 90% by erythrocytes. Lead in erythrocytes leads to cell membrane destabilization, impair the integrity of the permeability of erythrocyte membran decreases membrane fluidity and increases hemolysis rate. Lead is considered a hemolytic agent because it causes the destruction of erythrocytes through the formation of lipid peroxides in cell membranes [29,30].

According to Omobowale et al. [31], a decrease of erythrocytes number caused by lead exposure causes the damage of renal proximal tubules, whereas in the tubule there is the erythropoietin hormone, which regulates the formation of erythrocytes. Lead inhibits the 5-nucleotidase pyrimidine enzyme activity, which has functions in the formation of erythrocytes (erythropoiesis). Inhibition of this enzyme results in decreased erythrocyte production and retention of ribosomal DNA in erythrocyte cytoplasm. Erythrocytes are found in immature forms such as blue spot erythrocytes (basophilic stipple of erythrocytes) and reticulocytes. The number of immature erythrocytes increases but the number of mature erythrocytes decreases [27,32].The presence of disturbances in erythropoietin causes decreased the function of cell progenitor erythrocytes, so the erythrocytes number decreases. Genetically, the decrease of ALAD production couple with inhibition of lead on ALAD activity, that causes erythrocytes count among subject with ALAD gene polymorphism are lower than the individual without polymorphism.

5. Total Leucocyte Count

The data of leucocyte count in respondent with polymorphism and non polymorphism ALAD gene is showed in Table 5.

Group	Total Leukocyte count (x 10^3 /μL)	p-value
Polymorphism	11.908 ±1.124	0.001
Non-polymorphism	7.256 ± 0.760	

The breakdown of the lipid membrane caused by lead exposure result in the chemotactic movement of polymorphonuclear cells (neutrophils) that act a phagocytosis process [33]. The elevation of total leucocytes count in polymorphism respondent due to the increased of neutrophils number, because lead radical's (Pb tri ethyl) is trigger the activity of granulocyte colony-stimulating factor (G-CSF) cytokines, which activating bone marrow to produce neutrophils, but bone marrow produces immature neutrophil more than mature neutrophil. This process leading to the phagocytosis process is impaired. Several studies discovered effect of lead in mice that lead to increase the total of leukocyte count, altering structure of monocyte,with the appearance of reactive monocyte enclosuring the cytoplasma to form basophilic aggregate and vacuole. These process indicate that the inflammatory response in condition chronic phase which are conducted by neutrophil and monocyte [34,35]. The next process is the activation of both humoral and cellular specific immune systems played by B and T lymphocytes. Increased lymphocyte count may be caused by helper cell T cell activation. The function of T helper is helping B cells to produce antibodies so that in the blood occur the increasing of lymphocytes count [36,37]. Mishra et al [38]examined the lead level of industry workers in Taiwan who had blood lead levels of 0.75-1.28 ppm, increased the number of T cell memory (CD 4+ and CD8+ cell), sesult in the increasing of lymphocyte number. Sarasua et al. [1] reported US residents that live in industrial areas with their soil polluted by lead have blood Pb > 0.15 ppm, leading to the elevating both of B lymphocytes number and levels of antibody IgA, IgG, and IgM. These process result in the increasing number of leukocyte in individual with polymorphisms of δ-ALAD gene.

Clinical implication

This study proves that people who have ALAD gene polymorphism with exposure to lead, have a chance of anemia, so an early prevention of anemia should be done.

Limitation in this study

This study did not examine of the ALAD levels, so the expression of the enzyme is not known actually decreased or still within the normal range.

Conclusion

Blood lead level and MDA level of individual with δ-ALAD gene polymorphisms were higher than the non-polymorphisms individual. The result of independent t-test in individual polymorphisms and non-polymorphisms showed a significant difference for all of the parameter. The observation of blood profile indicates that hemoglobin level, erythrocyte, and leukocyte number, in δ-ALAD gene polymorphism was lower than non-individual polymorphisms. In conclusion, δ-ALAD gene polymorphism affects the hematological profile and MDA level in lead exposed-individual and this condition cause anemia.

Acknowledgment

On this occasion, we thank the Reseach of Institutional BLU Fund for Fiscal Year 2018 with contract number 3726/UN.23.14/PN/2018, so this research can be solved.

References

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