BBC2023
Bioinformatic and Biodiversity Conference

The 4th Bioinformatics and Biodiversity Conference (BBC 2023)

Universitas Indonesia (Hybrid Conference)
November 4-5 2023

PROGRAM and ABSTRACT BOOK

Exploring Biodiversity through Bioinformatics: Enhancing Our Understanding of the Biosphere and Environment

bbc-mabbi.akademisi.co.id

HOST AND CO-HOST

MABBI AKADEMISI CONFERENCE ORGANIZER APTIKOM

SPONSORED BY

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BBC2023
Bioinformatic and Biodiversity Conference

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- Riza A. Putranto, Ph.D (MABBI)
- Dr. Eng. Wisnu Ananta Kusuma, M.T. (IPB)
- Kholis A. Audah, Ph.D (MABBI)
- Prof. Dede Djuhana, Ph.D. (UI)
- Prof. Dr. Dra. Titin Siswantining, DEA (UI)
- Dr. Dipo Aldila, S.Si., M.Si. (UI)
- Prof. Anom Bowolaksono, Ph.D. (UI)

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- Afiatry Putrika , S.Si., M.Si. (UI)
- Fadhillah, S.Si., M.Agri., Ph.D. (UI)
- Achmad Eka Satria, S.Si. (UI)
- Rico Laurence, S.Si. (UI)
- Fathan Mubina (UI)
- Yustin Sinta Dewi, S.Si. (UI)
- Aprilia Inggri Astuti, M.Si. (UI)

IT and Logistic

- **Rangga Ilham Akbar, S. Kom. (UI)**
- Harum Ananda, S.Si. (UI)
- Muhammad Remzy Syah Ramazhan, S.Si. (UI)
- Fariz Hafizi Roihan, S.Sn. (UI)
- Ardiansyah, S.T. (UI)
- Dipo Yudhisrana (UI)
- Widi Nugroho, S.Si (UI)
- Gregorino Al Josan (UI)
- Sri Widiyanti Rahayu Hilia, M.Si.
- Dr. Suci Lestari
- Nur Liana Sovyah Hanum, S.Si.

BBC2023
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Committee

Chairman of Scientific Committee — **Didik Huswo Utomo, Ph.D (MABBI)**

Member

- Dr.rer.nat. Arli Aditya Parikesit, S.Si., M.Si.
- Prof. Alhadi Bustamam, S.Si., M.Kom., Ph.D
- Dr. Eng. Wisnu Ananta Kusuma, M.T. (IPB)
- Muhammad Yusuf, Ph.D (UNPAD)
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- Satria Kautsar, Ph.D
- Dr. Mushthofa (IPB)
- Dr. Favorisen Rossyking Lumbanraja (UNILA)
- Dr. Maria Susan (Binus University)
- Husna Nugrahapraja, S.Si., M.Si., Ph.D. (ITB)

*Update per Day

The 4th Bioinformatics and Biodiversity Conference (BBC)
Hybrid (Jakarta, Indonesia) November 4-5, 2023

Main Room	Hall Multidisciplinary Research Laboratory FMIPA UI - PT Pertamina
BR 1-3	Online
BR 4	R 303 (3F / 3rd floor of Multidisciplinary Research Laboratory FMIPA UI - PT Pertamina
BR 5	R 502 (5F / 5th floor of Multidisciplinary Research Laboratory FMIPA UI - PT Pertamina
BR 6	R 605 (6F / 6th floor of Multidisciplinary Research Laboratory FMIPA UI - PT Pertamina

Day/Date	Venue	Time (+7 GMT)		Duration	Program	PIC	
		Start	End				
Sat/Nov 4, 2023	*Tech. Admin: FMIPA UI*						
	Lobby - Hall	08.30	09.00	30'	Registration	Secretary	
	Main Room - Hall	09.00	09.10	10'	Opening Ceremony by MC	MC: Dr. Yulia Mariana Tesa Ayudia Putri	
	Main Room - Hall				Sing Indonesia Raya together	MC: Dr. Yulia Mariana Tesa Ayudia Putri	
	Main Room - Hall				Praying		
	Main Room - Hall				Mitigating Hospitality	K3L UI	
	Main Room - Hall	09.10	09.15	5'	Opening Remark by BBC 2023 Chair	Prof. Alhadi Bustamam, S.Si., M.Kom., Ph.D	
	Main Room - Hall	09.15	09.20	5'	Opening Remark by MABBI Chair	Dr. Eng. Wisnu Ananta Kusuma, M.T.	
	Main Room - Hall	09.20	09.25	5'	Opening Remark by Dean FMIPA UI	Prof. Dede Djuhana, Ph.D.	Online
	Main Room - Hall	09.25	09.30	5'	Opening Ceremony - Virtual Gong	MC: Dr. Yulia Mariana Tesa Ayudia Putri	
	Main Room - Hall	09.30	09.40	10'	Rantak Traditional Dance	Density	
	Main Room - Hall	09.40	09.50	10'	Photo Session	MC: Dr. Yulia Mariana Tesa Ayudia Putri	
	Main Room - Hall	09.50	10.20	30'	**Keynote Talk 1**	**Prof. Jatna Supriatna, M.Sc. Ph.D.**	Offline
	Main Room - Hall	10.20	10.30	10'	Q&A	Session Chair: Dr. Eng. Wisnu Ananta Kusuma, M. T.	Online
	Main Room - Hall	10.30	10.40	10'	Coffee Break		
	Main Room - Hall	10.40	11.10	30'	**Keynote Talk 2**	**Prof. Kenta Nakai, Ph.D.**	Online
	Main Room - Hall	11.10	11.20	10'	Q&A	Session Chair: Husna Nugrahapraja, S.Si., M.Si., Ph. D.	
	Main Room - Hall	11.20	11.30	10'	Industry Talk - Seleris	Seleris	
	Main Room - Hall	11.30	12.00	30'	**Keynote Talk 3**	**Assoc. Prof. Beben Benyamin**	Online
	Main Room - Hall	12.00	12.10	10'	Q&A	Session Chair: Husna Nugrahapraja, S.Si., M.Si., Ph. D.	Online
	Main Room - Hall	12.10	12.15	5'	MC Break Announcement	MC: Dr. Yulia Mariana Tesa Ayudia Putri	
	Main Room - Hall	12.15	12.30	15'	VR Booth and Unmoderated Poster Session	Tech Admin (main hall and all BR)	
	Main Room - Hall	12.30	13.00	30'	Lunch Break		
	Main Room - Hall	13.00	13.30	30'	**Keynote Talk 4**	**Dr. Rosie Drinkwater**	Online
	Main Room - Hall	13.30	13.40	10'	Q&A	Session Chair: Sabhrina Gita Aninta, Ph.D.	Online
	Breakout Room	13.40	13.50	10'	Parallel session preparation	Online participant: join to BR	
	Breakout Room					Offline participant: move to Parallel Room	
	Breakout Room	13.50	17.10	150'	Oral parallel session (session I) + Coffee break	Managed online (oral speakers who are present are still there with their respective equipment in the committee-provided room).	

(6 BR x 12 presenter)

Venue	Start	End	Duration	ID	**BR 1 (Integrative Bioinformatics Approaches)**	ID	**BR 2 (Advancements in High-throughput Technologies and Next Generation Sequencing)**	ID	**BR 3 (Computational Approaches in Cheminformatics and Pharmacogenomics)**
					Moderator: Anissa Nofita Sari, S.Si., M.Si., Ph.D.		*Moderator: Husna Nugrahapraja, S.Si., M.Si., Ph.D.*		*Moderator: Didik Huswo Utomo, Ph.D.*
					Tech. Admin: Gregorino Al Josan		*Tech. Admin: Indah Fitrialita, S.Si.*		*Tech. Admin: Widi Nugroho, S.Si.*
					Tech. Admin: Achmad Eka Satria, S.Si.		*Tech. Admin: Nur Liana Sovyah Hanum, S.Si.*		*Tech. Admin: Sri Widiyanti Rahayu Hilia, M.Si.*
				ID	Title/Author(s)	ID	Title/Author(s)	ID	Title/Author(s)
Breakout Room	13.50	14.05	15'	1	Utilizing DNA Genetic Analysis on Horseshoe Crab from Jambi, Bangka Belitung, Central Java, and East Java, Indonesia: a Phylogenetic Study **Ni Kadek Dita Cahyani**	1	Eukaryote Diversity in the Sediment of Mangrove Ecosystem on Bedono Village, Demak, Central Java with Environmental DNA (eDNA) **Enita Setiawati Zega**	1	ADMINISTRATION EFFECT OF TENGGULUN LEAF METHANOL EXTRACT (Protium Javanicum Burm f.) ON MALONDIALDEHYDE LEVELS AND SUPEROXIDE DISMUTASE ACTIVITY IN THE BLOOD OF WISTAR RATS EXPOSED TO CIGARETTE SMOKE **Ni Made Puspawati**
Breakout Room	14.05	14.20	15'	2	Preliminary Analysis of Relationship between Phylogenetic and Genetic Gain of Nile Tilapia Varieties in Floating Cage Nets Culture of Rawa Pening Lake **Jacob Uktolseja**	2	Eukaryotic Communities in Balekambang Lake, Dieng Using Environmental DNA (eDNA) Method with 18S rRNA Gene **Fiska Aulia Rahma**	2	MOLECULAR DOCKING PHENOLIC COMPOUNDS ETHANOL EXTRACT OLEA EUROPEAN L AS A PRE-ECLAMPSIA TREATMENT **Yetti Anggraini**
Breakout Room	14.20	14.35	15'	3	Genetic Diversity of Scomberomorus sp. from Java and Kalimantan based on Cytochrome Oxidase Sub-Unit I Sequences **Mutiarisa Nur Alifah**	3	Environmental DNA Application to Identify Protozoan Community in The Sediments of Balekambang Lake, Dieng, Central Java **Shafa Tasya Nabila**	3	In Silico Screening of Active Compounds from Fabaceae Family as Antidepressant with Exponential Consensus Ranking **Fauzan Baihaqi**
Breakout Room	14.35	14.50	15'	4	Identification of Gene Candidates in Diterpenoid Biosynthesis of Curcuma Longa: An mRNA Sequencing Approach **Hafizh Fadhullah**	4	Protists Diversity in Mangrove Ecosystem of Bedono, Demak, Central Java: Environmental DNA Approach Using COI dan 18S rRNA Gene **RIZQI WIDYA NUR KHOLIFAH**	4	Arrhythmia Classification Using the Deep Learning Visual Geometry Group (VGG) Model **Rudolf Bob Martua Butarbutar**
Breakout Room	14.50	15.05	15'	5	Understanding the Binding Mechanisms of Cinnamoyl Esterase with Chlorogenic Acid: A Computational Investigation in Coffee-Fermenting Bacteria **Israini Wiyulanda Iskandar**	5	The Protist Community in Sediment of Balekambang Lake, Indonesia, with Environmental DNA Approach **Tadzkirotul Laili Nur Fahma**	5	A Deep-Learning Model Implementation of TabNet for Predicting Peptide-Protein Interaction in Cancer **Hanif Aditya Pradana**
Main Room - Hall	15.05	15.25	20'		**Coffee Break + Praying**				
Breakout Room	15.25	15.40	15'	6	Genetic Algorithm based Feature Selection on Deep Learning for Protein Secondary Structure Prediction **Afiahayati**	6	DNA Barcoding Reveals Gray Sharpnose Shark (Rhizoprionodon oligolinx) From Traditional Markets in Pekalongan, Central Java **Sapto Andriyono**	6	ARRYTHMIA DETECTION USING THE DEEP LEARNING MODEL YOLOV5(You Only Look Once Version 5) **Anditto Waskito**
Breakout Room	15.40	15.55	20'	7	The Potential of Staphylococcus epidermidis as a Biosurfactant Producer **Irma Mardiah**	7	Identification of candidate loci genes for controlling early days to heading in rice local mutant variety Rojolele Srinar using next-generation sequencing **Khairul Yusuf Nasution**	7	Design of Peptide Based Malaria Vaccine Candidate from Pfs48/45 Plasmodium Falciparum through Immunoinformatic Approach **Erwin Prasetya Toepak, S.Si., M.Si.**
Breakout Room	15.55	16.10	15'	8	Comparative Analysis of Triclustering Using THD-TRICLUSTER and γ-TRIMAX on Three-Dimensional Microarray Data **Heri Kurnia Andika**			8	Extraction, Identification and In Silico Analysis Bioactive Compound of Streptomyces bungoensis strain 15721 from Euphorbia sp. Rhizosphere as Antimicrobials and Anticancer Drugs Candidates **Dian Wijayanti**
Breakout Room	16.10	16.25	15'	9				9	Pharmacokinetic Insights into the Active Compounds of Seurapoh (Chromolena odorata (L) R.M.King & H.Rob) Leaf using a Computational Approach **Nur Balqis Maulydia**
Breakout Room	16.25	16.40	15'						
Breakout Room	16.40	16.55	15'						
Breakout Room	16.55	17.10	15'						
Breakout Room	17.10	17.20	15'		Closing oral parallel presentation session 1st day		Moderator each room		

Venue	Start	End	Duration	ID	**BR 4 | R 305 (3F) (Emerging Computational Strategies for Understanding Disease Mechanisms and Therapeutic Targets)**	ID	**BR 5 | R 502 (5F) (Bioinformatics Solutions for Advancing Biomedical Science, Clinical Bioinformatics and Health Informatics)**	ID	**BR 6 | R 605 (6F) (Advancing Biodiversity Conservation through Data Science and Artificial Intelligence)**
					Moderator: Afiatry Putrika , S.Si., M.Si.		*Moderator: Fadhillah, S.Si., M.Agri., Ph.D.*		*Moderator: Devvi Sarwinda, M.Kom.*
					Tech. Admin: Ahmad Ihsan Farhani, S.Si.		*Tech. Admin: Muhammad Remzy Syah Ramazhan, S.Si.*		*Tech. Admin: Harum Ananda, S.Si.*
					Tech. Admin: Dr. Suci Lestari		*Tech. Admin: Fathan Mubina*		*Tech. Admin: Windya Fajira, S.Si.*
				ID	Title/Author(s)	ID	Title/Author(s)	ID	Title/Author(s)
Breakout Room	13.50	14.05	15'	1	Feature Reduction of Lung Cancer Microarray Data Using Mutual Information Selection and PyCaret Supported Recursive Feature Elimination **Andrew Jonathan Brahms S.**	1	Development of a Heart Rate Measurement System Based on Remote Photoplethysmography Techniques and Signal Processing Using Facial Video **Rinaldi Anwar**	1	How eDNA could detect more nocturnal marine fish species than visual census **Muhammad Danie Al Malik**
Breakout Room	14.05	14.20	15'	2	Mapping small interfering RNA targeting nucleoprotein gene of the influenza A viruses **Risza Hartawan**	2	Leprosy Early Detection Through Binary Segmentation Using ResU-Net **Andrew Jonathan Brahms S.**	2	Revealing the Diet Composition of the Crab-eating Frog, Fejervarya cancrivora using DNA Metabarcoding (Amphibia: Dicroglossidae) **Fajrin Shidiq**
Breakout Room	14.20	14.35	15'	3	Radiomics in Lung Cancer: A Pioneering Comparative and Integrative Bibliometric Analysis **Achmad Shidiq**	3	SARS-CoV-2 variants genome analysis of Indonesian isolates and their responses to available vaccines **Kholis Abdurachim Audah**	3	Sediment Bacterial Community Response to Anthropogenic Activities in Bawean Mangrove Ecosystems **Viky Vidayanti**
Breakout Room	14.35	14.50	15'	4	The Potential of Indonesia's Plant Biodiversity as a Drug Candidate for Thrombophilia Factor VIII Using In Silico Approach **Cecilia Tiffanny**	4	Molecular Docking and Molecular Dynamic Simulation on the Interaction of Saffron's Active Compounds with p53 Protein **Sendi Handika Putra**	4	Transcriptome analysis on pico-scale samples of developing Plantago ovata seed coats **Lina Herliana**
Breakout Room	14.50	15.05	15'	5	Computational DNA Aptamers Sequence Optimization Using Structure-Guided Random Mutations Approach **Donny Marcius**	5	Study of Anti-Bacterial and Anti-Inflammatory Properties of Indonesia's Flora Biodiversity as Potential Drug Candidates for Diabetic Ulcer Through In Silico and In Vitro Approach **Cecilia Tiffanny**	5	Implementation of Silhouette Coefficient for Optimizing the Order Preserving Triclustering (OPTricluster) Algorithm on Gene Expression Data from Pancreatic Acinar Cells **Yandra Windesia**
Main Room - Hall	15.05	15.25	20'		**Coffee Break + Praying**				
Breakout Room	15.25	15.40	15'	6	Natural Compound Virtual Screening as Potent Inhibitors of Plasmodium falciparum Histo Aspartic Protease using Ensemble Docking and Molecular Dynamics **Dicki Rachman**	6	Identification of Indonesian Ethnomedicinal Plants as Potential Drug Candidates for Acute Respiratory Infection Using Computer-Aided Drug Design and SIMRS Model **James Jackson**	6	Identification of PEBP Genes Family in Vanilla (Vanilla planifolia) **Rubi Heryanto**
Breakout Room	15.40	15.55	20'	7	Prediction of potential hypoxia-invasive genes in breast cancer cell lines: DEG analysis approach **Ay Ly Margaret**	7	ANALYSIS OF THE ABILITY OF THE NANO MIXTURE OF CORIANDER SEED ETHANOL EXTRACT (Coriandrum sativum L.) AND ETHANOL EXTRACT OF PUTRI MALU LEAVES (Mimosa pudica L) IN LOWERING BLOOD GLUCOSE LEVELS IN HYPERGL WISTAR RAT **Sri Wahjuni**	7	Advancing Biodiversity Conservation in Indonesia Through Crowd-Sourced Science **Muhammad Iqbal**
Breakout Room	15.55	16.10	15'	8	Exploring Malaria Disease Biomarkers: An Integrated Approach Using Network Topology and Enrichment Analysis **Nana Oktaviana**	8	The Effect of Tilapia Skin and Pomegranate Flower Extract Hydrogel on the Expression of Angiogenic and Histopathological Factors in Second Degree Burn Injury **Jihan Nur Azizah**	8	Smart Taxonomy based Artificial Intelligence for Endemic Oryzias Species **Irma Andriani**
Breakout Room	16.10	16.25	15'	9	Mask R-CNN for Detection and Classification Comet Assay Images **Stanislaus Jiwandana Pinasthika**	9	Developing an Expert System for Web-Based Hepatitis Diagnosis Using the Certainty Factor Method **R. Rizal Isnanto**	9	CLASSIFICATION AND DETECTION FOR ECG ARYTHMIA IN CARDIAC TELEMONITORING SYSTEMS USING THE FASTER R-CNN METHOD **Thyeadi Tungson**
Breakout Room	16.25	16.40	15'	10	Regularized Cox Proportional Hazard Regression on Patients with Cervical Cancer **Shofi Andari**	10	The Effect of Sea Cucumber Extract as an Inhibitor of Adipogenesis Process in Mesenchymal Cells Derived from Umbilical Cord: Study on the Role of NF?B **Devana Alifia Afifah**		
Breakout Room	16.40	16.55	15'	11	Exploration of metastasis predictor genes in breast cancer through single-cell RNA expression analysis **Hana Ratnawati**	11	Metabolic Profile Analysis of Red Ginger (Zingiber officinale var. rubrum Rosc.) by GC-MS and HPLC **Azminah**		
Breakout Room	16.55	17.10	15'	12	A Support Vector Machine (SVM) for Predicting Breast Cancer Severity **Kunti Robiatul Mahmudah**				
Breakout Room	17.10	17.20	15'						

Day/Date	Venue	Start	End	Duration	Program	PIC
Sat/Nov 4, 2023					Virtual Poster Hall	
					Judge:	
					Tech. Admin:	
	Virtual Poster Hall	08.30	16.00	450'	Open for all participant	
	Virtual Poster Hall	13.30	15.30	150'	Poster Judging Time (Please ensure that the presenter is engaged in the Q&A section of their own poster related to the Virtual Poster Hall)	Technical Admin Poster Hall and Judges

Day/Date	Venue	Time (+7 GMT)		Duration	Program	PIC	
		Start	End				
Sun/Nov 5, 2023	*Tech. Admin: FMIPA UI*						
	Lobby - Auditorium	08.30	09.00	30'	Registration	Secretary	
	Main Room - Hall	09.00	09.10	10'	Opening Ceremony by MC	MC: Abdillah Dhiyaa Bramantyo, S.Si.	
	Main Room - Hall	09.10	09.35	25'	**Keynote Talk 5**	**Prof. Alhadi Bustamam, S.Si., M.Kom., Ph.D**	offline
	Main Room - Hall	09.35	09.50	15'	Industry Talk - Kalbe Digital	Kalbe Digital	offline
	Main Room - Hall	09.50	10.00	10'	Q&A	Session Chair: Didik Huswo Utomo, PhD	offline
	Main Room - Hall	10.00	10.10	10'	Coffee Break		
	Main Room - Hall	10.10	10.40	30'	**Keynote Talk 6**	**Prof. Yuko Makita, Ph.D.**	online
	Main Room - Hall	10.40	10.50	10'	Q&A	Session Chair: David Agustriawan, S.Kom., M.Sc., Ph.D.	online
	Main Room - Hall	10.50	11.20	30'	**Keynote Talk 7**	**Afiahayati, S.Kom., M.Cs, Ph.D.**	online
	Main Room - Hall	11.20	11.30	10'	Q&A	Session Chair: David Agustriawan, S.Kom., M.Sc., Ph.D.	online
	Main Room - Hall	11.30	12.00	30'	**Keynote Talk 8**	**Assoc. Prof. Dr. Treenut Saithong**	online
	Main Room - Hall	12.00	12.10	10'	Q&A	Session Chair: Dr. Harpreet Singh	online
	Main Room - Hall	12.10	12.15	5'	MC Break Announcement	MC: Abdillah Dhiyaa Bramantyo, S.Si.	
	Main Room - Hall	12.15	12.45	30'	Lunch - Break		
	Main Room - Hall	12.45	12.55	10'	Announcement (Best Presenter oral (6 topics) and poster (1)	MC: Abdillah Dhiyaa Bramantyo, S.Si.	
	Main Room - Hall	12.55	13.00	5'	Closing Statements from BBC 2023 General Chair	Dr. Retno Lestari, M.Si.	
	R 204 (2F)	**13.00**	**16.00**	**180'**	**MABBI Gathering**	Moderator: Didik Huswo Utomo, PhD	
	R 204 (2F)	13.00	13.05	5'	Opening Ceremony	Moderator: Didik Huswo Utomo, PhD	
	R 204 (2F)	13.05	13.25	20'	INPL Launching	Kholis Audah, Ph.D.	
	R 204 (2F)	13.25	13.35	10'	Briefing	MABBI Chair: Dr. Eng. Wisnu Ananta Kusuma, M.T.	
	R 204 (2F)	13.35	14.35	60'	Discussion: Each Task Force	MABBI Board	
	R 204 (2F)	14.35	15.35	60'	Plenary Discussion	MABBI Board	
	R 204 (2F)	15.35	15.45	10'	Conclusion	MABBI Board	
	R 204 (2F)	15.45	15.50	5'	Closing Statements	MABBI Chair: Dr. Eng. Wisnu Ananta Kusuma, M.T.	
	R 204 (2F)	15.50	16.20	30'	After Event - Light Discussion	MABBI member	

BBC2023
Bioinformatic and Biodiversity Conference

Keynote Speakers

Prof. Alhadi Bustamam, S.Si., M.Kom., Ph.D.
Universitas Indonesia, Indonesia

Prof. Jatna Supriatna, M.Sc. Ph.D.
Universitas Indonesia, Indonesia

Prof. Kenta Nakai, Ph.D.
The University of Tokyo, Japan

Prof. Yuko Makita, Ph.D.
Maebashi Institute of Technology, Japan

Assoc. Prof. Beben Benyamin
University of South Australia, Australia

Afiahayati, S.Kom., M.Cs, Ph.D.
Universitas Gadjah Mada, Indonesia

Assoc. Prof. Dr. Treenut Saithong
KMUTT, Thailand

Dr. Rosie Drinkwater
Ludwig Maximilian University of Munich, Germany

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BR 5 | R 505 (5F)
(Bioinformatics Solutions for Advancing Biomedical Science, Clinical Bioinformatics and Health Informatics)

13.50	14.05	Development of a Heart Rate Measurement System Based on Remote Photoplethysmography Techniques and Signal Processing Using Facial Video
		Rinaldi Anwar
14.05	14.20	Leprosy Early Detection Through Binary Segmentation Using ResU-Net
		Andrew Jonathan Brahms S.
14.20	14.35	SARS-CoV-2 variants genome analysis of Indonesian isolates and their responses to available vaccines
		Kholis Abdurachim Audah
14.35	14.50	Molecular Docking and Molecular Dynamic Simulation on the Interaction of Saffron's Active Compounds with p53 Protein
		Sendi Handika Putra
14.50	15.05	Study of Anti-Bacterial and Anti-Inflammatory Properties of Indonesia's Flora Biodiversity as Potential Drug Candidates for Diabetic Ulcer Through In Silico and In Vitro Approach
		Cecilia Tiffanny

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BR 5 | R 505 (5F)
(Bioinformatics Solutions for Advancing Biomedical Science, Clinical Bioinformatics and Health Informatics)

15.25	15.40	Identification of Indonesian Ethnomedicinal Plants as Potential Drug Candidates for Acute Respiratory Infection Using Computer-Aided Drug Design and SIMRS Model
		James Jackson
15.40	15.55	ANALYSIS OF THE ABILITY OF THE NANO MIXTURE OF CORIANDER SEED ETHANOL EXTRACT (Coriandrum sativum L.) AND ETHANOL EXTRACT OF PUTRI MALU LEAVES (Mimosa pudica L) IN LOWERING BLOOD GLUCOSE LEVELS IN HYPERGL WISTAR RAT
		Sri Wahjuni
15.55	16.10	The Effect of Tilapia Skin and Pomegranate Flower Extract Hydrogel on the Expression of Angiogenic and Histopathological Factors in Second Degree Burn Injury
		Jihan Nur Azizah
16.10	16.25	Developing an Expert System for Web-Based Hepatitis Diagnosis Using the Certainty Factor Method
		R. Rizal Isnanto
16.25	16.40	The Effect of Sea Cucumber Extract as an Inhibitor of Adipogenesis Process in Mesenchymal Cells Derived from Umbilical Cord: Study on the Role of NF?B
		Devana Alifia Afifah
16.40	16.55	Metabolic Profile Analysis of Red Ginger (Zingiber officinale var. rubrum Rosc.) by GC-MS and HPLC
		Azminah

Metabolic Profile Analysis of Red Ginger (Zingiber officinale var. rubrum Rosc.) by GC-MS and HPLC

Azminah, Azminah[1,*]; Kristina, Euodia Hana[1]; Salsabillah, Aisyah[1]; Yunita, Oeke[1]

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This research aims to conduct a metabolic profile analysis of red ginger (Zingiber officinale var. rubrum Rosc.) using Gas Chromatography-Mass Spectrometry (GC-MS) and High-Performance Liquid Chromatography (HPLC). Red ginger is known to contain bioactive compounds that have the potential to provide significant health benefits. Red ginger samples were extracted using methanol as a solvent, and the compounds in the samples were analyzed using GC-MS and HPLC. The analysis results allowed for the identification of various metabolite compounds, including 6-gingerol, 8-gingerol 10-gingerol, 6-shogaol, and other related compounds. Additionally, this research also includes the relative quantification of these compounds in red ginger. The research results showed variations in the metabolic profile of red ginger, including significant differences in the types and amounts of detected compounds. This information can be valuable for a deeper understanding of the health potential and applications of red ginger in the pharmaceutical and nutraceutical fields. Furthermore, this research can serve as a basis for the development of cultivation and processing techniques for red ginger that can enhance the content of specific bioactive compounds. This research has important implications in supporting the development and utilization of red ginger as a source of natural compounds with the potential to benefit health and other industries.

Keywords: Red Ginger, GC-MS, HPLC, Metabolic Profile

Introduction

In Indonesia, red ginger has been utilized for its antibacterial, antioxidant, and wound-healing properties [1]. The weekly demand for red ginger exports is about 4 tons [2]. Compared to other ginger types, red ginger (*Zingiber officinale* Roxb. var. *rubrum*, Zingiberaceae) has a distinctively stronger scent and hotter taste. Gingerol, a blend of several chemicals with antibacterial, anti-inflammatory, and antioxidant properties, is one of the primary phenolic components in ginger. The primary component of fresh ginger, 6-gingerol, has a variety of pharmacological actions in addition to 8-gingerol and 10-gingerol [3]. Rhizomes had a significantly larger gingerol content (104.39 µg/g) than stems (0.84 µg/g) and leaves (4.13 µg/g) [4]. According to Chumroenphat et al. (2018), peeled ginger rhizomes have 68.15 mg/100 g fresh weight of 6-gingerol, whereas fresh ginger rhizomes have the maximum concentration (75.25 mg/100 g fresh weight) [5].

The purpose of this study is to use High-Performance Liquid Chromatography (HPLC) and Gas Chromatography-Mass Spectrometry (GC-MS) to analyze the metabolic profile of red ginger (*Zingiber officinale* var. *rubrum* Rosc.).

Research Method

GC-MS analysis

Gas chromatography system used, GC-MS Brand:- SHIMADZU-AOC-20i, Auto Injector Model: QP-2010 SE, Column Length 60.0 m, Column Diameter 0.25 mm, Column Flow 0.4 mL/min, Column pressure 100 kPa. Oven temp 250°C, Interface temp 200°C, Low vacuum 8.9e+000 Pa, Ion Source voltage 70 V.

HPLC analysis

Gradient elution was used for instrumental analysis in the following circumstances: The detection was performed at a wavelength of 280 nm while the system pressure was kept at 1000 Pa. Throughout the analysis, the flow rate was maintained at 1.2 mL/min. 0.1% trifluoroacetic acid (TFA) in water (A) and acetonitrile (B) made up the mobile phase. Twenty microliters was the injection volume. At 280 nm, UV detection was used to find the analytes. After gathering chromatographic data, peak analysis was carried out using peak area and retention time.

Results and Discussion

The number of compounds contained in the test sample can be seen using the chromatogram in Figure 1, that is produced as a consequence of the GCMS analysis. More than 50 red ginger compounds were found to be prevalent in all test samples, according to the study of the chromatogram for each sample. The analysis's findings revealed that the terpenoid group contains a number of compounds, including monoterpenes, diterpenes, and sesquiterpenes, with sesquiterpene components being the most prevalent.

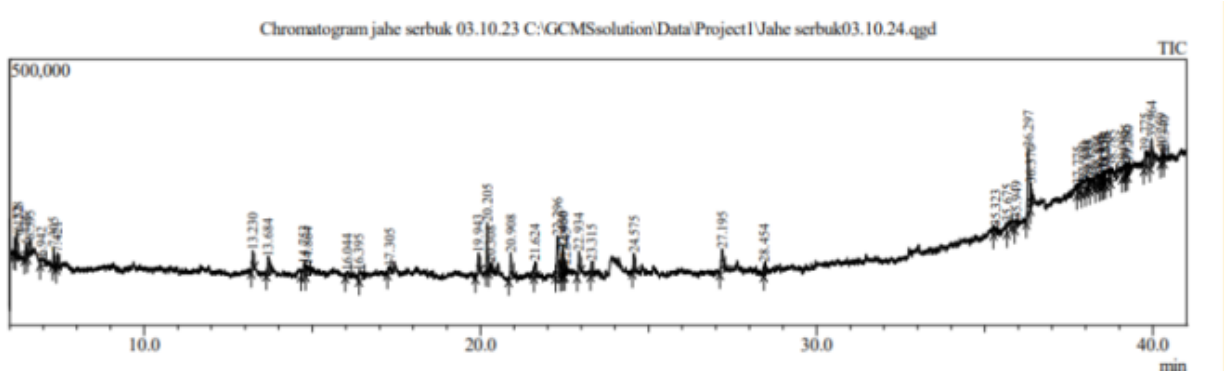
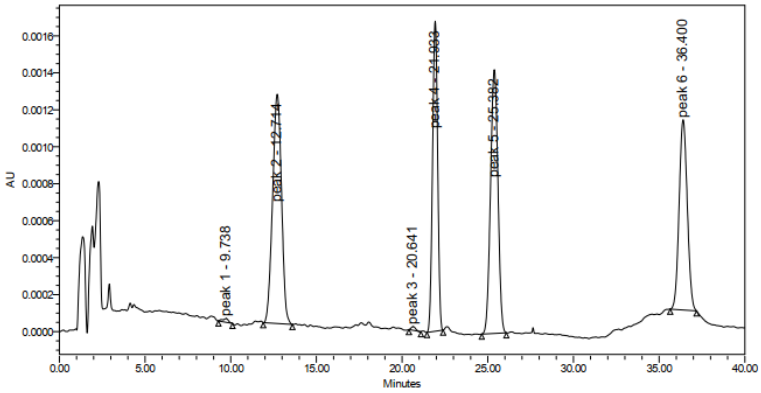


Figure 1. Chromatogram results of red ginger by GC-MS

The findings of this study are consistent with research [6] that yields a metabolite profile with the same primary component, namely the compounds β-Curcumene (15.88%), β-Sesquiphellandrene (15.57%), β-bisabolene (9.29%), and zingiberene (31.79%). The study's findings were reinforced by research findings [7] that indicate there is the molecules zingiberene, β-curcumene, β-sesquiphellandrene, and β-bisabolene are the six biggest components in their research.

Standard preparation was in accordance with previous research [8]. Conditions for gingerol analysis methods in culture of the red ginger used refers to the literature: 6-Gingerol ± 9.5 minutes, 8-Gingerol ± 20.0 minutes, 6-Shogaol ± 22.4 minutes, 10-Gingerol ± 33.8 minutes. The standard results for samples from ginger root 3 ppm, show Peak 2, 6-Gingerol ± 12.74 minutes, Peak 4, 8-Gingerol ± 20.0 minutes, Peak 5, 6-Shogaol ± 21.93 minutes, Peak 6, 10-Gingerol ± 36.4 minutes, as seen in Figure 2.



	Peak Name	RT (min)	Area (µV*sec)	% Area	Height (µV)	% Height
1	peak 1	9.738	480	0.31	21	0.38
2	peak 2	12.714	44763	28.49	1239	22.90
3	peak 3	20.641	352	0.22	20	0.37
4	peak 4	21.933	34728	22.10	1677	30.99
5	peak 5	25.382	42783	27.23	1426	26.35
6	peak 6	36.400	34005	21.64	1028	19.00

Figure 2. Results of analysis of red ginger root samples

Conclusion

Furthermore, this research can serve as a basis for the development of cultivation and processing techniques for red ginger that can enhance the content of specific bioactive compounds. This research has important implications in supporting the development and utilization of red ginger as a source of natural compounds with the potential to benefit health and other industries.

Reference

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