OPECS 2022

1ST Ocean Pollution and Ecotoxicology Symposium

Programme Book

Virtual Symposium
11-12 April 2022

Bridging Science and Communities Through Ocean Sustainability

ORGANIZING COMMITTEE

Patron

Professor Dr. Mazlan bin Abd Ghaffar

(Vice Chancellor of UMT)

Advisor

Professor Dato Dr. Nor Aieni binti Haji Mokhtar

(Head of Cluster, Ocean Science and Sustainable Environment)

Professor Dr. Marinah binti Mohd Ariffin

(Deputy Vice Chancellor (Research and Innovation) of UMT)

Chairman

Associate Professor Ts. *ChM.* Dr. Ong Meng Chuan

Dr Roswati binti Md Amin

Secretary

Dr. Nurul Huda binti Ahmad Ishak

Norsyamimi binti Ramli

Treasurer

Dr. Md Suffian bin Idris

Associate Professor *ChM.* Dr. Loh Saw Hong

Norfaiza binti Mohd Jaafar

Secretariat

Dr. Nurulnadia binti Mohd Yusoff

Associate Professor *ChM.* Dr. Hanis binti Mohd Yusoff

ChM. Dr. Farhanini binti Yusoff

Dr. Hing Lee Siang

Yong Jaw Chuen

Scientific

ChM. Dr. Tuan Mohamad Fauzan bin Tuan Omar

Associate Professor Ts. Dr. Kesaven Bhubalan

Associate Professor *ChM.* Dr. Faizatul Shimal binti Mehamod

Associate Professor Ts. Dr. Mohd Sabri bin Mohd Ghazali

Dr. Lee Jen Nie

Dr. Nur Hidayah binti Roseli

Dr. Chung Jing Xiang

Dr. Nurul Shahida binti Redzuan

Publicity

Dr. Suvik Assaw

Dr. Izan binti Dato Haji Jaafar

Dr. Roslizawati binti Ab Lah
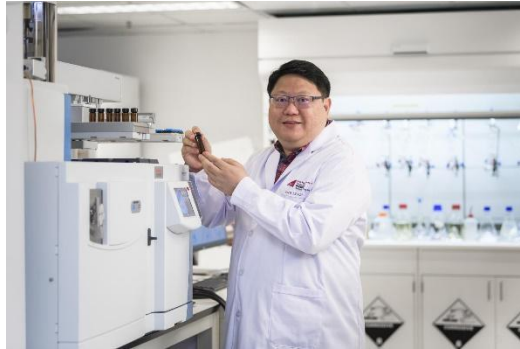
Idham bin Khalil

Technical

Dr. Afiq Durrani bin Mohd Fahmi

Dr. Melissa Beata Martin

Meii binti Mohamad Norizam

Protocol

Dr. Adiana binti Ghazali

Dr. Izyan Munirah binti Mohd Zaideen

KEYNOTE SPEAKER

Prof. Dr Kenneth Mei-Yee Leung is Chair Professor of Environmental Toxicology and Chemistry at Department of Chemistry (CHEM) in City University of Hong Kong, where he also serves as the Director of the State Key Laboratory of Marine Pollution and Acting Head of CHEM. His research interests encompass marine pollution, ecotoxicology, marine ecology, biodiversity conservation and ecological restoration using eco-engineering. So far, he has published over 250 peer-reviewed articles in these areas. Owing to his professional achievements and dedicated community services, he was selected as one of the "Ten Outstanding Young Persons" for Hong Kong in 2010 and appointed as a Justice of the Peace by the Hong Kong SAR Government in 2018. In 2017, he was awarded the 19th Biwako Prize for Ecology by the Ecological Society of Japan in recognition of his contributions to aquatic ecology in Asia-Pacific, and conferred as a Fellow of the Society of Environmental Toxicology and Chemistry (SETAC). He was selected as one of the top 100 Asian Scientists by Asian Scientist Magazine in 2018, and recognized as one of the top 2% scientists in Marine Biology & Hydrobiology in the world by the Stanford-Elsevier Indicators in 2021. In June 2021, his proposal on launching the Global Estuaries Monitoring (GEM) Programme was endorsed by the United Nations as a Decade Ocean Action Programme for the UN Decade of Ocean Science for Sustainable Development (2021-2030).

PLENARY SPEAKER 1

Prof. Dato Dr. Nor Aieni Haji Mokhtar served the public/academic sector since 1980, contributing significantly in the higher education and national capacity building for R & D and Innovation at the Ministry of Higher Education (UTM & UMT) and Ministry of Science, Technology and Innovation Malaysia. She was a former Vice Chancellor of Universiti Malaysia Terengganu (UMT- 1st Woman VC in East Coast) directly dealing with strategic transformational leadership for governance in Higher Education, Change Management, HR emphasis on Talent, Mentorship and Competency-Based Management, improved governance/legal/branding and sustainable financial management from 13 April 2015 until 12 April 2021. Currently, she leads the Task Force for Coastal Management and was appointed as head of UMT's Special Interest Group (SIG) Cluster of Ocean Science and Sustainable Environment, also as Distinguished Fellow of Institute of Oceanography and Environment at INOS, UMT, she hopes to encourage more young professionals, women marine scientists especially, to discover their untapped talent and unleash their potentials through Mentoring for the Early Career Ocean Professionals (ECOP) program. She was one of the appointed member in the UN Decade Advisory Board, IOC-UNESCO, representing Malaysia to support the implementation of the UN Decade of Ocean Science for Sustainable Development 2030, with particular interest on the data and information management, Ocean Literacy and ECOP. She spearheaded Social Innovation for Quality Education in transforming institutions by collaborating with industries, uplifting organisations and coastal community livelihoods in line with SDGs through Translational Research, one example program on Ocean Hope.

PLENARY SPEAKER 2

Prof. Dr. Zainal Arifin completed his B.Sc. in **Marine Science** at IPB University (Indonesia), M.Sc. at Dalhousie Univ. (Canada), and Ph.D at Simon Fraser Univ. (Canada). Currently, He is **a research professor** at Research Centre for Oceanography, National Research and Innovation Agency (BRIN). His research interest is in **fate and effect of contaminants (metals) in marine ecosystem**, and Indonesian Seas processes. He has published more than 85 research articles in English and Indonesian. **Zainal** has experiences in science management as the director of Research Centre for Oceanography – LIPI (2011 – 2015), the Deputy chair of Earth Science- LIPI (2015 -2019). Currently, he is as an executive director for National Commitee for IOC UNESCO Program. He is also active as a member of National Steering Commitee for GEF-Small Grant Project,member of Advisory Group of Intergovernmental Oceanographic Commision (IOC) - UNESCO, Western Pacific Region. He has recieved various awards such as, UNESCO-MAB Young Scientist Research Grant Award (1992), CIDA Fellowship (1994-1999), President Stipend-SFU Canada (1998-1999), Satyalancana Karya Satya, President Republic of Indonesia (2016).

PLENARY SPEAKER 3

Prof. Dr. Suchana Apple Chavanich has a broad base of ecological research interests that involve the study of nearshore species from tropical to polar regions. In addition, her research focuses on conservation and restoration of marine ecosystems and impact of climate change and marine debris on marine ecosystems. Currently, she is also the Project Leader of Coral Reef Conservation in the Western Pacific under the UNESCO/IOC Sub-Commission for the Western Pacific, and serves as a Thailand Reef Check Coordinator that teaches and stimulates local communities to protect and monitor coral reef health using ecologically sound and economically sustainable solutions. She is also considered to be Thailand's first female scientist to go diving in Antarctica and Arctic. Her research work on Arctic-Antarctica and coral reefs has inspired Thai and young people on the value of marine ecosystems. Because of her work, she has received several awards and recognitions both nationally and internationally.

INVITED SPEAKER 1
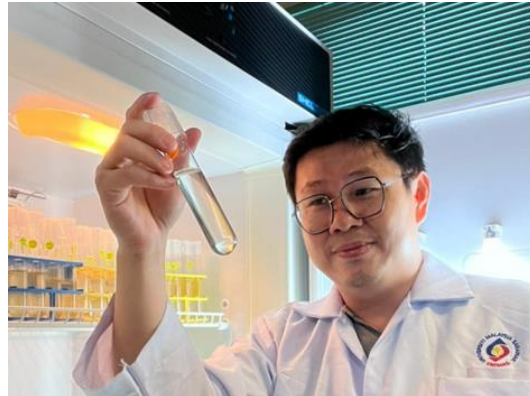
Dr Teng Sing Tung is a senior lecturer which began his academic career at the Universiti Malaysia Sarawak (UNIMAS), in 2016 with declared major in Aquatic Science. He holds a Bachelor of Science with honour and Master of Science in Marine Biotechnology from Universiti Malaysia Sarawak. He obtained his Ph.D degree, Aquatic Science, from Universiti Malaysia Sarawak, Malaysia in 2016. His research interest is Harmful Algal Blooms (HABs) which focuses on taxonomy and molecular systematic of harmful algae. Sing Tung contributed toward the taxonomy and diversity of *Pseudo-nitzschia* in the tropical Western Pacific region, a region with scant information of ASP when he was still working on his Ph.D degree. With the knowledge and skills on *Pseudo-nitzschia* taxonomy, he had described several new species of *Pseudo-nitzschia*, this included the descriptions of *P. kodamae*, *P. sabit*, *P. bipertita*, *P. limii* in Malaysia water. He discovered more than half of the species in the genus of *Pseudo-nitzschia* in Malaysia water. He discovered the first toxigenic *Pseudo-nitzschia* species and domoic acid contamination of shellfish in the tropical water of South China Sea.

INVITED SPEAKER 2

Prof. Dr Mohd Fadzil holds the position as a Director in Institute of Oceanography and Environment in UMT. He was raised as a Kuala Lumpur boy, but later continue his study to UK and Australia. Now he recide and enjoy his academic life in a beautiful city of Kuala Nerus Terengganu. His research interests are in coastal physical oceanography, with emphasis on field observation and numerical modeling. He has played an active role in examining the southern south china sea and leading scientific project regionally and internationally. He is a founder of Malaysia Marine Forecast (MFAST), the 1st ocean forecast system in Malaysia. He is also an associate members of Academy Sains Malaysia Special Interest Group in Oceanography. He enjoy writing and speaking on media outlet on current issues related to marine environment. He is an enthusiast cyclist, and he drinks latte a lot and whenever he has time (other than Ramadan) he try his best to improve his latte arts.

INVITED SPEAKER 3
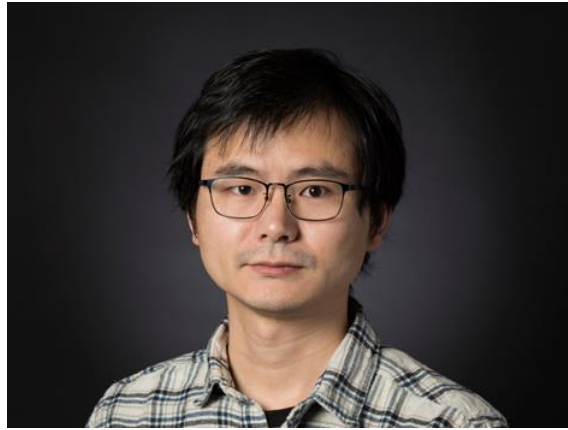
Dr. Shiye Zhao was trained as marine biologist and environmental chemist. After getting his PhD from East China Normal University, China, he conducted the postdoc research at Woods Hole Oceanographic Institution (WHOI), US and Florida Atlantic University (FAU) Harbor Branch Oceanographic Institute from 2017-2020. As a tenure-track researcher, he joined Japan Agency for Marine-Earth Science and Technology in 2020, where his current research focuses on developing a mechanistic understanding of how plastic debris influence the ocean ecosystem by employing modern tools of multi-disciplinary science.

INVITED SPEAKER 4

Prof. Dr. Wan Izatul Asma Wan Talaat, is a law professor at Universiti Malaysia Terengganu as well as a qualified Advocate & Solicitor of the High Court of Malaya. Her current and past research projects are mainly in environmental governance. She has to date secured more than 30 research grants amounting to almost MYR6.3million, where she acted as principal investigator in 21 of such projects, and published more than 200 research papers including academic books. Her works in environmental governance involving the interface between science and policy through informed decision-making by policy makers and implementers. She currently heads the Centre for Ocean Governance at the Institute of Oceanography and Environment (INOS-COG). She is also a Visiting Fellow at the Royal Malaysian Navy Sea Power Centre. She has been appointed to the IUCN World Commission on Environmental Law since 2014 (also sub-specialising in Ocean, Coastal, and Coral Reefs Specialist Group), and a member to the Environmental Law Network International. She currently represents Malaysia, upon nomination by the Ministry of Environment and Water, to COBSEA Expert Meeting under UNEP. Nationally, she serves as resource person to several ministries/government agencies in environmental and natural resources laws, and she currently co-chairs the National Technical Working Committee on seabed mining legal framework through appointment by the Department of Minerals and Geoscience. She also serves on the Committee on Law, Ethics, Discipline and Enforcement of the Malaysian Board of Geologist. In 2016, she headed the formulation of the 2018-2027 National Oceanography Strategic Plan under the National Policy on Science, Technology and Innovation of the MOSTI. She is also a national task force member on sea turtle management and conservation in Malaysia. She is also currently working with the Kuala Terengganu City Council Terengganu State Government, Xiamen University China, PLANMalaysia, WWF-Malaysia on the drafting, adoption and implementation of the Terengganu MSP.

CONFERENCE SCHEDULE

11 APRIL 2022 (MONDAY)

TIME	ACTIVITY
8.30 a.m.	Conference registration and preparation
8.45 a.m.	Opening Ceremony by Vice Chancellor UMT
	Keynote Speaker
9.00 a.m.	Prof. Dr. Kenneth Leung Mei Yee *Professor, State Key Laboratory of Marine Pollution, City University of Hong Kong*
	Plenary Speaker 1
9.30 a.m.	Prof. Dato Dr. Nor Aieni binti Hj Mokhtar *Distinguished Fellow, INOS, UMT* *Head of Cluster, Ocean Science and Sustainable Environment*
10.00 a.m.	Refreshment
	Invited Speaker 1
10.10 a.m.	Dr Teng Sing Tung *Universiti Malaysia Sarawak*
	Session 1
10.40 a.m.	OPECS-001
10.50 a.m.	OPECS-012
11.00 a.m.	OPECS-021
11.10 a.m.	OPECS-024
11.20 a.m.	Q&A
11.30 a.m.	OPECS-025
11.40 a.m.	OPECS-026
11.50 p.m.	OPECS-006
12.00 p.m.	Q&A
	Refreshment
12.20 p.m.	Session 2
12.30 p.m.	OPECS-009
12.40 p.m.	OPECS-010

12.50 p.m.	OPECS-030
1.00 p.m.	OPECS-031
1.10 p.m.	OPECS-032
1.20 p.m.	Q&A
1.30 p.m.	Rest
	Invited speaker 2
2.30 p.m.	Prof. Ts Dr. Mohd. Fadzil bin Mohd Akhir *Universiti Malaysia Terengganu*
	Session 3
3.00 p.m.	OPECS-002
3.10 p.m.	OPECS-004
3.20 p.m.	OPECS-005
3.30 p.m.	OPECS-027
3.40 p.m.	OPECS-028
3.50 p.m.	Q&A
4.00 p.m.	End of 1st day session

12 APRIL 2022 (TUESDAY)

TIME	ACTIVITY
8.15 a.m.	Conference registration and preparation
	Plenary Speaker 2
8.30 a.m.	Prof. Dr. Ir. Zainal Arifin, MSc. *National Research and Innovation Agency, Indonesia*
	Invited speaker 3
9.00 a.m.	Dr Shiye Zhao *Japan Agency for Marine Earth Science and Technology, Japan*
	Session 4
9.30 a.m.	OPECS-003
9.40 a.m.	OPECS-007

9.50 a.m.	OPECS-008
10.00 a.m.	OPECS-014
10.10 a.m.	Q&A
10.20 a.m.	OPECS-020
10.30 a.m.	OPECS-034
10.40 a.m.	OPECS-037
10.50 a.m.	Q&A
11.00 a.m.	Refreshment
	Plenary Speaker 3
11.10 a.m.	Prof. Dr. Suchana Apple Chavanich *Chulalongkorn University*
	Session 5
11.40 a.m.	OPECS-029
11.50 p.m.	OPECS-011
12.00 p.m.	OPECS-013
12.10 p.m.	OPECS-015
12.20 p.m.	Q&A
12.30 p.m.	OPECS-019
12.40 p.m.	OPECS-022
12.50 p.m.	OPECS-023
1.00 p.m.	OPECS-036
1.10 p.m.	Q&A
1.20 p.m.	Rest
	Invited Speaker 4
2.30 p.m.	Prof. Dr Wan Izatul Asma Wan Talaat *INOS, Universiti Malaysia Terengganu*
	Session 6
3.00 p.m.	OPECS-016
3.10 p.m.	OPECS-017
3.20 p.m.	OPECS-018
3.30 p.m.	OPECS-033
3.40 p.m.	OPECS-035

3.50 p.m.	Q&A
4.00 p.m.	Closing Ceremony by Dean FSSM
4.30 p.m.	End of symposium

KEYNOTE, PLENARY, AND INVITED SPEAKER

	SPEAKERS	TOPICS	DATE	TIME
Keynote speaker	**Prof. Dr. Kenneth Leung Mei Yee**	Marine Ecotoxicology and Climate Change: Understanding the Influence Of Multiple Stressors On Chemical Effect Thresholds	11-Apr-2022	09.00 – 09.30
Plenary Speaker 1	**Prof. Dato Dr. Nor Aieni binti Hj Mokhtar**	Un Decade of Ocean Science for Sustainable Development		09.30 – 10.00
Invited Speaker 1	**Dr Teng Sing Tung**	Is Amnesic Shellfish Poisoning (Asp) A Threat to Seafood Safety in Malaysia?		10.10 – 10.40
Invited Speaker 2	**Prof. Ts Dr. Mohd. Fadzil bin Mohd Akhir**	Decade of Ocean Science in UMT: Managing research, strategise outcomes and stay relevant		14.30 – 15.00
Plenary Speaker 2	**Prof. Dr. Ir. Zainal Arifin**	Ecotoxicological Research in the Framework of Sustainable Development Goals (SDGs)	12-Apr-2022	08.30 – 09.00
Invited Speaker 3	**Dr Shiye Zhao**	Microplastics in the Ocean's Interior		09.00 – 09.30
Plenary Speaker 3	**Prof. Dr. Suchana Apple Chavanich**	Marine plastic waste study in Thailand: Example of innovation and technologies for management		11.10 – 11.40
Invited Speaker 4	**Prof. Dr Wan Izatul Asma binti Wan Talaat**	How Marine Spatial Planning Facilitates In Pollution Control		14.30 – 15.00

PRESENTATION TOPICS

Date: 11-April-2022
Chairperson: Dr. Izan Binti Dato Haji Jaafar

SESSION 1 (MARINE POLLUTION)			
PRESENTER ID	**NAME**	**TOPIC**	**TIME**
OPECS-001	**ONG MENG CHUAN,** NORHAZIRAH ABD AZIZ, NG YENLIN ERIN, LAVANNIA RAVIKUMAR, JEMIMAH SHALOM PERAGAS, SYLVIA NG SIN EE, JOSEPH BIDAI	HEAVY METALS CONCENTRATION IN *Loligo chinensis* COLLECTED FROM TERENGGANU COASTAL WATERS	10.40 - 10.50
OPECS-012	**ROYSTON UNING**, MOHD TALIB LATIF, HARIS HAFIZAL ABD HAMID, MOHD SHAHRUL MOHD NADZIR, MD FIROZ KHAN, SUHAIMI SURATMAN	SEA-TO-AIR FLUXES OF *isoprene* AND *monoterpenes* IN THE COASTAL UPWELLING REGION OF PENINSULAR MALAYSIA	10.50 – 11.00
OPECS-021	**JEMIMAH SHALOM A/P B PERAGAS**, SYLVIA NG SIN EE, ONG MENG CHUAN	SPATIAL DISTRIBUTION OF HEAVY METALS IN ESTUARINE AND COASTAL SURFICIAL SEDIMENT: A CASE STUDY FROM THE MALAYSIAN WATERS	11.00 – 11.10
OPECS-024	**MOHD YUSOFF NURULNADIA**, BAHAROM MOHAMAD ZAHID, HAFIZ IKHWAN ABDUL HAMID	OCCURRENCE OF OCTYLPHENOL AND NONYLPHENOL IN THE SEDIMENT OF PENINSULAR MALAYSIA	11.10 – 11.20
OPECS-025	**NURIN HAZWANI JASRI**, NURULNADIA MOHD YUSOFF	ENDOCRINE DISRUPTING CHEMICALS IN THE SEDIMENT OF REDANG ISLAND DURING PRE AND POST-COVID 19 PERIODS	11.30 – 11.40
OPECS-026	**LIU JINJINGYUAN**, CHEN ZHENG, CHEN MENGLI	WARMING ENHANCES RELEASE OF DISSOLVED ARSENIC IN AN INTERTIDAL MUDFLAT	11.50 – 12.00
OPECS-006	**HASSAN RASHID ALI**, CHE DIN MOHD SAFUAN, MARINAH MOHD ARIFFIN, MOHAMMED ALI SHEIKH, NOOR AZHAR MOHAMED SHAZILI, AMINUDIN MOHAMMAD AFIQ-FIRDAUS AND ZAINUDIN BACHOK	CHANGES OF FATTY ACID COMPOSITION IN SCLERACTINIAN CORAL, GALAXEA FASCICULARIS (LINNAEUS, 1767) AFTER SHORT TERM (96 HOURS) EXPOSURE OF ANTIFOULING BIOCIDE, IRGAROL-1051	12.00 – 12.10

Date: 11-April-2022

Chairperson: Assoc. Prof. Ts. Dr. Mohd Sabri bin Mohd Ghazali

PRESENTER ID	NAME	TOPIC	TIME
	SESSION 2 (MARINE TECHNOLOGY)		
OPECS-009	**FEBRIAN MALDINI**, ADI SUSANTO, HERY SUTRAWAN NURDIN	THE ECO-TRAP DEVELOPMENT FOR SUSTAINABLE BLUE SWIMMING CRAB FISHING	12.30 – 12.40
OPECS-010	**MOHAMMAD FAKHRATUL RIDWAN BIN ZULKIFLI**, HEONG SHU QING	CORROSION BEHAVIORAL STUDY OF DOMESTIC WATER VIA MULTILAYER PERCEPTRON	12.40 – 12.50
OPECS-030	**ANATI WARDINA JOHARI**, DZULAIKHA KHAIRUDDIN	A REVIEW ON THE PHYTOREMEDIATION TECHNOLOGIES USING VARIOUS PLANTS TO REDUCE THE CONCENTRATION OF POLYBROMINATED DIPHENYL ETHERS (PBDEs) IN COASTAL WATER	13.00 – 13.10
OPECS-031	**NUR RABIATUL SYUHAIDAH MOHAMED RUSIDI**, WAN MOHD KHAIRUL WAN MOHAMED ZIN, SOFIAH HAMZAH, ALYZA A. AZMI	DEVELOPMENT OF NON-POLAR IMINE COMPOUND FUNCTIONALIZED MAGNETIC MESOPOROUS SILICA NANOPARTICLES FOR MICROPLASTICS REMOVAL FROM WATER	13.10 – 13.20
OPECS-032	**WAN NUR IWANI WAN RUSHDI**, WAN MOHD KHAIRULWAN MOHAMED ZAIN, SOFIAH HAMZAH, ALYZA A. AZMI	DESIGN OF MAGNETITE MESOPOROUS SILICA NANOPARTICLES FUNCTIONALIZED WITH 2-HYDROXYBENZALDEHYDE (IMINE-MSNPS) AS A POTENTIAL POLYSTYRENE MICROPLASTIC REMOVAL	13.20 – 13.30

Date: 11-April-2022
Chairperson: Dr. Noorlin Binti Mohamad

PRESENTER ID	NAME	TOPIC	TIME
	SESSION 3 (AIR POLLUTION)		
OPECS-002	**SAMSURI ABDULLAH,** AMALINA ABU MANSOR, AIMI NURSYAHIRAH AHMAD, MARZUKI ISMAIL	NONLINEAR AUTOREGRESSIVE NEURAL NETWORK MODELS FOR AIR QUALITY PREDICTION IN URBAN CITIES	15.00 – 15.10
OPECS-004	**AMALINA ABU MANSOR**, SAMSURI ABDULLAH, AIMI NURSYAHIRAH AHMAD, MARZUKI ISMAIL	SPATIO-TEMPORAL ANALYSIS OF INDOOR AIR QUALITY (IAQ) IN DIFFERENT MICRO-ENVIRONMENTS	15.10 – 15.20
OPECS-005	**AIMI NURSYAHIRAH AHMAD**, SAMSURI ABDULLAH, AMALINA ABU MANSOR, MARZUKI ISMAIL	INVESTIGATING THE NOCTURNAL OZONE (O3) TREND IN TERENGGANU	15.20 – 15.30
OPECS-027	**MOHD HAKKIM FIRDAUS BIN HAMZAH**, KU MOHD KALKAUSAR KU YUSOF, NURUL ADYANI GHAZALI, NOORLIN MOHAMAD	IRREGULARITIES OF TROPOSPHERIC OZONE FREQUENCY AND CONCENTRATION DURING MONSOONAL SEASON IN MALAYSIA FROM 2006 TO 2019	15.30 – 15.40
OPECS-028	**KU MOHD KALKAUSAR KU YUSOF**, NOORLIN MOHAMAD, SAMSURI ABDULLAH, MOHAMAD FAKHRATUL RIDWAN ZULKIFLI, NOORAIN MD ISA	ANALYSIS OF THE EFFECT OF MOVEMENT CONTROL ORDERS (MCOs) TOWARDS THE QUALITY OF RAINWATER CHEMICAL PATTERNS IN MALAYSIA DURING THE PANDEMIC COVID-19	15.40 – 15.50

Date: 12-April-2022
Chairperson: Dr Nurul Shahida Binti Redzuan

PRESENTER ID	NAME	TOPIC	TIME
	SESSION 4 (MICROPLASTIC)		
OPECS-003	**DEFRI YONA,** BILLY ARIF MAHENDRA, MOCHAMAD ARIF ZAINUL FUAD, AIDA SARTIMBUL	MICROPLASTICS CONTAMINATION IN MOLLUSCS FROM MANGROVE FOREST OF SITUBONDO, INDONESIA	9.30 – 9.40
OPECS-007	**NOVERITA DIAN TAKARINA**, DIAN UTAMI WULANINGSIH, JIHAN MIRANI KENRANINGRUM, MEILIANDY MAHALANA	MICROPLASTIC ABUNDANCE ON EDIBLE CRAB AND GASTROPOD IN BLANAKAN COAST AREA	09.40 – 09.50
OPECS-008	**NOVERITA DIAN TAKARINA ,** AILSA SHAFA NARISWARI, AMARA SAUSAN QOTRUNNADA, AMEERA SAFFA RAMADHINA	MICROPLASTIC ABUNDANCE ON FISH AND PRAWN FROM BLANAKAN PONDS	09.50 – 10.00
OPECS-014	**MAZNI MAT ZIN**, SHAMILA AZMAN, MOHD ISMID MOHD ISMAIL, MOHD KHAIRUL IDLAN MUHAMMAD	MICROPLASTICS CONTENTS IN NATURAL AND MARICULTURED MUSSEL FROM PASIR PUTIH ESTUARY IN JOHOR, MALAYSIA	10.00 – 10.10
OPECS-020	**AUDREY PRIMUS**, SHAMILA AZMAN	MICROPLASTIC UPTAKE BY *Cerithidea obtusa*	10.20 – 10.30
OPECS-034	**NOOR FAZREEN DZULKAFLI**, AHMAD MUKHRIZ MD RAZALI	ABUNDANCE OF MICROPLASTICS AND IT ASSOCIATION WITH HEAVY METALS IN COASTLINE SEDIMENTS OF KUALA SELANGOR, MALAYSIA	10.30 – 10.40
OPECS-037	**AMMARLUDDIN MOHD ALI**, SABIQAH TUAN ANUAR, WAN MOHD AFIQ WAN MOHD KHALIK, MAISARAH JAAFAR, KU MOHD KALKAUSAR KU YUSOF, YUSOF SHUAIB IBRAHIM	OCCURRENCE AND IDENTIFICATION OF MICROPLASTICS (MPs) FOUND IN THE SURFACE WATER OF LANGAT RIVER, MALAYSIA	10.40 – 10.50

Date: 12-April-2022
Chairperson: Dr Nursalwa Binti Baharuddin

PRESENTER ID	NAME	TOPIC	TIME
	SESSION 5 (OCEAN BIOLOGY AND FOOD SAFETY)		
OPECS-029	**LAILY HUNAWATUN SANI,** ONG MENG CHUAN, DZULAIKHA KHAIRUDDIN, MARFIAH AB WAHID	POLYBROMINATED DIPHENYL ETHERS (PBDEs) IN ENVIRONMENT AND ITS RISK ON CULTIVATED BLOOD COCKELS IN MALAYSIA	11.40 – 11.50
OPECS-011	**MOHD SYAFIQ MD PUZI**, FERDIUS MOHAMAT-YUSUFF, ZUFARZAANA ZULKEFLEE	DISTRIBUTION OF COLIFORM BACTERIA IN COCKLES CULTIVATION SITES IN THE WEST COAST OF PENINSULAR MALAYSIA	11.50 – 12.00
OPECS-013	**NURHANIN AQILA MOHAMMED NOOR**, FERDIUS MOHAMAT YUSUFF, AMIRUL AZUAN MD JONI	CONDITION INDEX AND HISTOLOGICAL CHANGES IN GILLS OF BLOOD COCKLE, *Tegillarca granosa* (Linnaeus, 1758) IN RESPONSE TO SHORT-TERM SEDIMENT DEPOSITION	12.00 – 12.10
OPECS-015	**ELIN SRI MULYANI**, ANI RAHMAWATI AND ADI SUSANTO	LEAD (PB) CONTENT IN BLOOD COCKLE (*Anadara granosa*) FROM BANTEN BAY	12.10 – 12.20
OPECS-019	**MOHD RAZALI MD RAZAK**, WAN SYAZZ, ZALEHA KASSIM	MORPHOMETRIC STUDY OF HORSESHOE CRAB'S SPAWNING POPULATION IN A COASTAL AREA OF PENINSULAR MALAYSIA	12.30 – 12.40
OPECS-022	**FIRDA AULIA NURAINI**, ANI RAHMAWATI, MUTA ALI KHALIFA	DIVERSITY OF MACROZOOBENTHOS IN SEAGRASS ECOSYSTEMS AT PAMUJAN BESAR ISLAND SERANG REGENCY BANTEN PROVINCE INDONESIA	12.40 – 123.50
OPECS-023	**SUVIK ASSAW**, NABILAH MUSTAFHA, CHRYSTÈLE DUFAU AND JASNIZAT SAIDIN	TOXICITY EVALUATION OF ANTIFOULING COMPOUND (2-CHLORO-N-METHYL-MALEIMIDE) ON EMBRYOGENESIS OF LOCAL *Anabas testudineus*	12.50 – 13.00
OPECS-036	**ETIN NURKHOTIMAH**, ANI RAHMAWATI, MUTA ALI KHALIFA	POTENTIALLY PHYTOPLANKTON IDENTIFICATION TO HARMFUL ALGAL BLOOMS (HABS) IN COASTAL WATERS OF PAMUJAN BESAR ISLAND, BANTEN	13.00 – 13.10

Date: 12-April-2022
Chairperson: Dr. Izyan Munirah Binti Mohd Zaideen

SESSION 6 (LAW, MANAGEMENT AND POLICY)			
PRESENTER ID	**NAME**	**TOPIC**	**TIME**
OPECS-016	**CORRIENNA ABDUL TALIB,** FARUKU ALIYU, ADI MAIMUN, KANG HOOI SIANG, CHIN CHEE KEONG, MOHD ERFY ISMAIL & MOHD ALI SAMSUDIN	EFFECT OF DESIGN THINKING TO DEVELOP MARINE AND COASTAL ENVIRONMENTAL ATTITUDES	15.00 – 15.10
OPECS-017	**MILA WAHYUNINGSIH**, ADI SUSANTO, HERY SUTRAWAN NURDIN	SUSTAINABILITY OF MINI TRAWL FISHERIES AFTER THE COVID-19 PANDEMIC	15.10 – 15.20
OPECS-018	**ZALEHA KASSIM**, NAJEHAH SHAMMODIN, AHMAD ISMAIL	COMMUNITY PARTICIPATION IN MANGROVE FOREST CONSERVATION IN MENDANA STRAIT, KONG KONG, JOHOR	15.20 – 15.30
OPECS-033	**LUTHFIYYAH FITRIANI MURSYID**, ANI RAHMAWATI, MUTA ALI KHALIFA	COASTAL ECOTOURISM MANAGEMENT IN PAMUJAN BESAR ISLAND, BANTEN BAY, INDONESIA	15.30 – 15.40
OPECS-035	**MOCH FAJRI SAJATI LEYN**, ANI RAHMAWATI AND ADI SUSANTO	FISHERMEN ADAPTATION STRATEGIES DURING COVID-19 PANDEMIC IN TANJUNG PASIR FISH LANDING PLACE	15.40 – 15.50

ABSTRACT

Plenary lecture

Keynote Lectures

Invited Lectures

KEYNOTE

MARINE ECOTOXICOLOGY AND CLIMATE CHANGE: UNDERSTANDING THE INFLUENCE OF MULTIPLE STRESSORS ON CHEMICAL EFFECT THRESHOLDS

Kenneth M. Y. Leung

State Key Laboratory of Marine Pollution and Department of Chemistry, City University of Hong Kong, Kowloon, Hong Kong, China

Over the past 20 years, I have been working on environmental quality benchmarks such as water and sediment quality guidelines for regulating and managing chemical contaminants in Europe and then in China. Ideally, if we can know the effect threshold of a chemical (i.e., trigger value) and ensure its environmental concentration below this threshold, then the aquatic ecosystem and organisms therein should be protected. When I engage in this research area longer and deeper, I gradually realise that there are many unresolved problems in the scientific derivation of effect thresholds of chemicals. In this presentation, I will specifically discuss and highlight some of the major challenges in search of the trigger value for protecting aquatic ecosystems from chemical pollution with consideration of environmental conditions such as pH, salinity and temperature (i.e., multiple stressors) which are intrinsically influenced by climate change. Finally, I will suggest some possible solutions and advocate more research efforts to fortify the ecological realism in derivation of the trigger value for better environmental protection

PLENARY SPEAKER 1

UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

Noraieni Haji Mokhtar

UN Decade Advisory Board, IOC-UNESCO
Distinguished Fellow/Head of Ocean Science and Sustainable Environment Cluster,
Institute of Oceanography and Environment (INOS),
Universiti Malaysia Terengganu, Malaysia.
Email: noraieni@umt.edu.my

This paper highlights the aspiration and challenges of United Nations Decade of Ocean Science for Sustainable development, a common framework mandated to IOC-UNESCO and UN Bodies to ensure that ocean science can fully support countries to achieve the 2030 Agenda for Sustainable Development. The main motivation for the UN Decade of Ocean Science or Oceanography for Sustainable Development is to support efforts to reverse the cycle of decline in ocean health and create improved conditions for sustainable development. Ocean Science is a scientific discipline concerned with all aspects of the world's oceans and seas, including their physical and chemical properties, their origin and geologic framework, and the life forms that inhabit the marine environment. Top challenge is to understand and beat marine pollution, whilst multisectoral challenge demands co-creation with multi-stakeholders, from scientists and researchers, technologists and innovators to policy makers, communities, private sectors and philanthropists to ensure scientific work offer data, services and nature-based solutions for informed decision making. Special attention for capacity development is to empower and link science to communities in Small Islands and Developing States (SIDs), Least Developing States (LDS) as well as Indigenous People and Local Knowledge (IPLK). Call for action is for thematic collaborative programs, projects and activities to meet the goals and challenges through effective communication for Ocean Literacy, resource mobilisation for Public and within Scientific Fraternities and Industry Partners, reports and social media. Mainstreaming inclusivity and gender diversity via promoting active participation among young generation, namely the early Career Ocean Professionals (ECOP), leaving no one behind.

PLENARY SPEAKER 2

MARINE PLASTIC WASTE STUDY IN THAILAND: EXAMPLE OF INNOVATION AND TECHNOLOGIES FOR MANAGEMENT

Suchana Apple Chavanich

Chulalongkorn University, Thailand

Marine plastic pollution and microplastics have negative effects not only on marine ecosystems, but also on fisheries, aquaculture, human health, and food safety. There are several human health concerns associated with poorly managed marine plastic pollution and the consumption of microplastics through seafood. Thus, the presence of microplastics in seafood can pose a threat to food safety. Unfortunately, Thailand is currently ranked as the sixth worst contributor of marine plastic waste in the world. At present, awareness and implementation of the best practices in addressing the causes and solutions of marine plastics and microplastics are focused by both governmental and non-governmental sectors. In addition, community engagement has been conducted to raise the awareness on the potential effect of microplastics on marine animals and human health. In this presentation, examples of innovation and technologies of management of marine plastic waste in Thailand will also be discussed.

PLENARY SPEAKER 3

ECOTOXICOLOGICAL RESEARCH IN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT GOALS (SDG)

Zainal Arifin

Research Centre for Oceanography – BRIN, Jl Pasir Putih I, Ancol Timur, Jakarta 14430

Indonesia

email: zain003@brin.go.id

Sources of pollution in coastal ecosystems mainly come from anthropogenic activities in terrestrial areas, such as mining, smelter, agriculture and various industries. In the context of SDG 14 *i.e.,* sources of pollution are indentified and removed, the ecotoxicology research can be one of the basis in implementing the SDG. Although the removal of pollution sources in the global sphere focuses on marine plastic litter and exesive of nutrients' load, in the Southeast Asian region, the issue of persistent organic pollutants, heavy metals, and pharmaceutical products can not be ignored. Therefore, ecotoxicological research could broadly play important role to maintain clean and healthy ecosystems, as most countries in the region at the economic development stage. The most intense research work was previously on exesive nutrients' load, heavy metals, and polyaromatic hydrocarbons (PAHs), however in the last seven years, plastic litter and parmaceutical pollutions become a trending research field. In this paper, I will share several research works that have been done in Indonesia that may become a basis for exhange knowledge and to develop net-work among researchers in the region. Reflecting from more than 30 years working on marine pollution studies and in administrative aspects, I concluded that mono-dicipline of research may not able to provide solution to the real problem in the field. Hence, we need more efforts to reach out other stakeholders. In summary, contribution of ecotoxicology research to SDG14 and the Decade of Ocean Science will be more significant and effective only if the governments have strong support in achieving clean and healthy coastal ecosystems.

INVITED SPEAKER 1

IS AMNESIC SHELLFISH POISONING (ASP) A THREAT TO SEAFOOD SAFETY IN MALAYSIA?

Sing Tung Teng[1*,] Nursyahida Abdullah[1], Afiqah Halmiton Hanifah[1], Chui Pin Leaw[2], Lim Po Teen[2], Hong Chang Lim[3], and Suh Nih Tan[4]

[1]Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia.

[2]Bachok Marine Research Station, Institute of Ocean and Earth Sciences, University of Malaya, 16310 Bachok, Kelantan, Malaysia

[3]Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, Kota Samarahan, Sarawak 94300, Malaysia

[4]China-ASEAN College of Marine Sciences Xiamen University Malaysia, 43900 Sepang, Selangor, Malaysia

e-mail: tsteng@unimas.my

Abstract: Pseudo-nitzschia is a cosmopolitan diatom that is distributed widely in Western Pacific region. Some species in the genus produce a neurotoxin, domoic acid (DA) that is responsible for amnesic shellfish poisoning (ASP). Shellfish contamination by domoic acid has been reported in several countries in Asia. However, there are no confirmed cases of ASP in Malaysia water. A series of research and monitoring programs on the Pseudo-nitzschia were conducted covering more than 20 sampling sites in Malaysia water between the years 2008-2021. Eight novel species and 22 well-studied species of Pseudo-nitzschia were reported in Malaysia. 15 out of the 21 potential toxic species were recorded in Malaysia water including five toxic species; P. abrensis, P. batesiana, P. cuspidata, P. kodamae, P. lundholmiae, and P. subfraudulenta. In the year 2018, the bloom of Pseudo-nitzschia cuspidata was detected, for the first time, in a semi-enclosed lagoon in Miri, Sarawak. Low levels of DA were detected in the plankton samples and 8 µg g-1 tissue of DA was found present in the shellfish sample which is below the regulatory limit. DA contamination in shellfish that associated with bloom of P. cuspidata was documented for the first time in the Western Pacific region. The interactive key to species with global database was established in 3I interactive key. This interactive key would serve as a taxonomical database platform to assist species identification of Pseudo-nitzschia in this region.

INVITED SPEAKER 2

DECADE OF OCEAN SCIENCE IN UMT: MANAGING RESEARCH, STRATEGIES OUTCOMES AND STAY RELEVANT

Fadzil Mohd Akhir

Institute of Oceanography and Environment (INOS), Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu

The United Nations Decade of Ocean Science for Sustainable Development (2021-2030) was launched to support efforts to reverse the cycle of decline in ocean health to ensure ocean science can fully support countries in creating improved conditions for sustainable development of the Ocean. In UMT, as more than 50 marine scientists trying to remain progressive towards their academics research goal, do we have what it takes for the Decade challenges? Are we managing our research well, so that it transpire an important outcomes that are very much needed by our country? How can we stay relevant in this challenging and ever changing world to support policy-makers, industry and community? This talk will try to provide new perspective of how ocean and marine scientist should approach their research subject, strategic planning and making sure their outcomes are purposeful, so it will not only fulfils academic credentials but most importantly it serve a higher purpose.

INVITED SPEAKER 3

MICROPLASTICS IN THE OCEAN'S INTERIOR

Shiye Zhao

Japan Agency for Marine-Earth Science and Technology
Japan

Although hundreds of studies have surveyed plastic debris in surface ocean gyre and convergence zones, depth profile data detailing microplastics (MP) abundances throughout the entire water column beneath these surface accumulation areas are lacking. Based on our observation of MP at the South Atlantic Gyre, this lecture will provide the first-of-its-kind MP distribution from the surface to the near-sea floor underneath an offshore plastic accumulation zone. The dataset to be presented is derived from different sampling techniques (in-situ large-volume filtration, Manta net, and multiple opening/closing nets), together with FTIR imaging. High abundances of MP (up to 244.3 n m^{-3}) (characteristically <100 µm) are identified in the water samples, outnumbering previously measured pelagic copepods by up to 19-fold. Surprisingly, these high abundances were not at the surface but distributed in the water column-coming to rest in low current flow, abyssal waters. Higher density polymers (e.g., polyamide and alkyd resins) dominated the in-situ pump samples, in contrast to ocean net-based samples, typically occupied by polyethylene. Small MP captured by pumps are more highly weathered, less impacted by density gradients and have a longer lifetime in the water column, implying a unique threat to the subtropical gyre biome through bio-uptake.

INVITED SPEAKER 4

HOW MARINE SPATIAL PLANNING FACILITATES IN POLLUTION CONTROL

Wan Izatul Asma Wan Talaat

Professor of Law and head of Centre for Ocean Governance,
Institute of Oceanography and Environment, Universiti Malaysia Terengganu

The sea, both its space and resources, are pertinent for nation growth where numerous economic activities including fisheries, shipping, marine eco-tourism as well as oil and gas exploration and mining depend on. Marine spatial planning (MSP) is a process that brings together multiple users of the ocean – including energy, industry, government, conservation and recreation – to make informed and coordinated decisions about how to sustainably use marine resources. MSP is defined in many ways but it's basically about planning when and where human activities take place at sea to ensure these activities are as efficient and sustainable as possible. According to UNESCO-OIC, MSP is a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process. Characteristics of MSP include ecosystem-based, area-based, integrated, adaptive, strategic and participatory. It employs a practical way in order to create and establish a more rational use of marine space and the interactions among its uses by balancing demands for development with the need to protect the environment as well as to deliver social and economic outcomes in an open and planned way. In addressing pollution, MSP helps through its area-based and participatory characteristics. Area-based management approaches can contribute to major issues like pollution control specifically relating to Sustainable Development Goal Targets, which involves participatory decision-making. Area-based and participatory management approach of MSP would allow strong engagement and commitment, most particularly from the local authority and the local community, in addressing pollution in a specific area.

Keywords: Marine Spatial Planning, Pollution Control, Area-based management, Participatory Management

ABSTRACT
FOR
ORAL PRESENTATION

OPECS-001

HEAVY METALS CONCENTRATION IN *Loligo chinensis* COLLECTED FROM TERENGGANU COASTAL WATERS

ONG MENG CHUAN[*1,2,3], NORHAZIRAH ABD AZIZ[1], NG YENLIN ERIN[1], LAVANNIA RAVIKUMAR[1], JEMIMAH SHALOM PERAGAS[1], SYLVIA NG SIN EE[1], JOSEPH BIDAI[2]

[1]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu
[2]Institute of Oceanography and Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu
[3]Ocean Pollution and Ecotoxicology (OPEC) Research group, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu

*Presenting author e-mail: ong@umt.edu.my

Abstract: Seafood especially squid, *Loligo chinensis* has a high demand to local communities due to their taste and great nutritional content. However, a lack of information on the heavy metals content in squid from this region was studied by the researcher. Therefore, to assess the human health risk assessment by consuming this squid, 6 heavy metals (Pb, Cu, Zn, Cd, Hg, Cr) in the different tissues of the commercially important squid from Terengganu coastal waters were investigated. In this study, 4 organs, mantle, tentacle, bone and internal organ were selected and analyzed for these elements using a fast and sensitive detector, Inductively Coupled Plasma Mass Spectrometry (ICPMS) after closed digestion with acid. The result shows the concentration of all elements studied following the sequence: Zn>Cu>Cr>Pb>Cd>Hg. Generally, the average concentrations in the mantle, which people consumed were below compared to the limit set by Malaysian Food Regulation, European Commission, Ministry of Public Human Health and China National Standard. According to Provisional Tolerable Weekly Intake (PTWI), this part was also estimated for human safety consumption. This intake of metals through the consumption of the squid was estimated based on both metals concentration in the mantle and the amount how much people were allowed to consume it. The calculated weekly intake was lower compared to the limit set by the Joint FAO/WHO Expert Committee on Food Additives but slightly higher for Cr and Cd. In addition, the target hazard quotients (THQ) were also used to evaluate the potential risk of these elements in the squid mantle toward the human body. The high THQ value for Cr and Cd also were observed in the squid mantle. However, overall results indicate that the intake of these elements does not present an appreciable hazard risk on local communities health.

Keywords: squid, heavy metals, seafood safety, human consumption, human safety

OPECS-002

NONLINEAR AUTOREGRESSIVE NEURAL NETWORK MODELS FOR AIR QUALITY PREDICTION IN URBAN CITIES

SAMSURI ABDULLAH[*1], AMALINA ABU MANSOR[2], AIMI NURSYAHIRAH AHMAD[1], MARZUKI ISMAIL[2,3]

[1]Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Terengganu, Malaysia
[2]Institute of Tropical Biodiversity and Sustainable Development, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Malaysia
[3]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Malaysia

*Presenting author e-mail: samsuri@umt.edu.my

Abstract: This study provides nonlinear autoregressive (NAR) neural network models for the time series prediction on an hourly basis of the Air Pollutant Index (API) in urban cities in Malaysia. Urban cities are generally having higher pollutants concentrations along with the urbanization process. High pollutants concentrations led to health problems, especially respiratory illness, either in the short or long term. Forecasting of API is required in providing the theoretical guidelines for air quality management. 25 - 47% constitutes for good API, and 53 – 75% constitutes for moderate API level. Results revealed the NAR models executed higher R^2 at Cheras (98.39%), Seberang Jaya (99.18%), Seremban (98.80%), and Kuala Terengganu (99.23%). The optimum NAR model architectures which are trained using the Levernberg-Marquadt training algorithm are 1:3:1, 1:7:1, 1:9:1, and 1:14:1, for Cheras, Seberang Jaya, Seremban, and Kuala Terengganu, respectively. NAR neural networks are capable of modeling and forecasting nonlinear time series for air quality management.

Keywords: Air pollutant index, urban, Malaysia, artificial neural network, forecasting.

OPECS-003

MICROPLASTICS CONTAMINATION IN MOLLUSCS FROM MANGROVE FOREST OF SITUBONDO, INDONESIA

DEFRI YONA[*1,2], BILLY ARIF MAHENDRA[1], MOCHAMAD ARIF ZAINUL FUAD[1,2], AIDA SARTIMBUL[1,2]

[1]Marine Science Department, Fisheries and Marine Science Faculty, Brawijaya University-Indonesia
[2]Marine Resources Exploration and Management (MEXMA) Research Group, Fisheries and Marine Science Faculty, Brawijaya University-Indonesia

*Presenting author e-mail: defri.yona@ub.ac.id

Abstract: Microplastics have been a major issue in the marine environment. It can be found in the water column, sediment and in the marine organisms. Mangrove ecosystem that lies between the land and the sea is also vulnerable from the contamination of microplastics pollution caused by both land and marine-based activities. Mangrove ecosystem is home to many different faunas including molluscs. Microplastics present in mangrove could be potential threats to the organisms. Thus, this study was conducted to evaluate the occurrence of microplastics in two different types of molluscs, which were bivalvia (*Geloina erosa*) and gastropoda (*Telescopium telescopium*) from the mangrove forest in Situbondo, East Java Province, Indonesia. Microplastics were analysed from 40 individual molluscs representing two different species. Overall, 459 particles of microplastics were retrieved from the samples. All samples of *G. erosa* contained microplastics particles (100 %) and only one sample of *T. Telescopium* was found without microplastic. Four types of microplastics were identified from the samples: fiber, fragment, film and microbeads. Each type was present in higher number in *G. erosa* than in *T. Telescopium* and fiber was the dominating type in both species. Fragment was found in rather high numbers after fiber, while film and microbeads were found in very low number in both species. For the total number of microplastics, *G. erosa* (15.55±8.51 particles/individual and 1.72±1.58 particles/g of tissue wet weight) contained higher number of microplastics particles than *T. Telescopium* (7.40±4.22 particles/individual and 1.06±0.81 particles/g of tissue wet weight). *G. erosa* was bigger in the size of the soft tissues than *T. telescopium* and it might be the reason for the higher number of microplastics present in *G. erosa*. The result of this study showed that there is a positive relationship between the size of organism and the occurrence of microplastics.

Keywords: Bivalvia, gastropoda, contamination, soft tissues

OPECS-004

SPATIO-TEMPORAL ANALYSIS OF INDOOR AIR QUALITY (IAQ) IN DIFFERENT MICRO-ENVIRONMENTS

AMALINA ABU MANSOR[*1], SAMSURI ABDULLAH[2], AIMI NURSYAHIRAH AHMAD[2], MARZUKI ISMAIL[1,3]

[1]Institute of Tropical Biodiversity and Sustainable Development, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Malaysia
[2]Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Terengganu, Malaysia
[3]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Malaysia

*Presenting author e-mail: linadila@gmail.com

Abstract: Poor indoor air quality brings negative health effects to young children, especially to pupils. This study monitored the chemical and physical parameters with different surrounding activities of residential and institutional areas. Data were measured for three days starting from 0800 to 1200 hours. The chemical and physical parameters inside the classroom including PM_{10} (mg/m^3), CO_2 (ppm), air temperature (°c), air movement (m/s), and relative humidity (%) were monitored. Data obtained were compared with the guideline standard based on the Industrial Code of Practice on Indoor Air Quality (ICOP-IAQ), Malaysia. Results show that the physical parameters exceeded the acceptable limit set by the ICOP-IAQ 2010. The maximum temperatures were in the range of 30.8 – 31.0°C. The maximum RH ranged 88.6 - 86.8% which exceeded the guideline, while the other pollutants complied with the guideline. Exceedance in RH and T can affect perceived IAQ comfort, causing irritation symptoms in eyes and airways which can influence the students' performance and synergistic effects may occur with air pollutants as well. Constructing spatial mapping showed the critical area in the middle of the classroom where the density of occupants was the highest and area whereby intrusion from outdoor pollutants through an opening such as doors, window, crack, and crevices.

Keywords: Temporal, indoor air quality, thermal comfort, children, spatial mapping.

OPECS-005

INVESTIGATING THE NOCTURNAL OZONE (O$_3$) TREND IN TERENGGANU

AIMI NURSYAHIRAH AHMAD[*1], SAMSURI ABDULLAH[1], AMALINA ABU MANSOR[2], MARZUKI ISMAIL[2,3]

[1]Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Terengganu, Malaysia
[2]Institute of Tropical Biodiversity and Sustainable Development, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Malaysia
[3]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, Kuala Nerus, 21030, Malaysia

*Presenting author e-mail: aimisyahirah2@gmail.com

Abstract: Ground level ozone (O$_3$) is a secondary pollutant that involves several types of reactions arising from photochemical reactions. This study determines the trend of ozone concentrations during night time in Kuala Terengganu. Data from 2018 to 2020 on hourly basis including ozone (O$_3$), temperature and solar radiation were used. O$_3$ concentration reaches a peak during the middle of the day around 14:00 hours until 15:00 hours while there was starting slower O$_3$ concentration during night time around 20:00 hours due to the photochemical reaction of O$_3$ precursors. The O$_3$ concentration was decreasing slowly towards evening starting at 16:00 hours and night time around 21:00 hours due to the absence of sunlight and redox reactions. In conclusion, the O$_3$ concentration decreases progressively until evening starting at 16:00 hours and then keeps on decreasing more gradually during the night time (21:00 hours) until morning (07:00 hours) because of lack of solar radiation.

Keywords: ozone, nocturnal, air quality, trend, pollutants

OPECS-006

CHANGES OF FATTY ACID COMPOSITION IN SCLERACTINIAN CORAL, *GALAXEA FASCICULARIS* (LINNAEUS, 1767) AFTER SHORT TERM (96 HOURS) EXPOSURE OF ANTIFOULING BIOCIDE, IRGAROL-1051

HASSAN RASHID ALI[1], CHE DIN MOHD SAFUAN[2], MARINAH MOHD ARIFFIN[3], MOHAMMED ALI SHEIKH[1], NOOR AZHAR MOHAMED SHAZILI[2], AMINUDIN MOHAMMAD AFIQ-FIRDAUS[2] AND ZAINUDIN BACHOK[2*]

[1]Tropical Research Centre for Oceanography, Environment and Natural Resources, The State University of Zanzibar, P. O. Box 146, Zanzibar-Tanzania
[2]Institute of Oceanography and Environment, University Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia
[3]Faculty of Science and Marine and Environment, University Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia

*Presenting author e-mail: zainudinb@umt.edu.my

Abstract: Antifouling biocide such as Irgarol 1051 has been widely used as a replacement of tributyl tin (TBT). In Malaysia we reported the level of Irgarol in coastal water up to 2021ng/L. This study therefore, examined the effect of Irgarol 1051 on fatty acids composition of reef building coral *Galaxea fascicularis.* The corals were exposed to different dosages of Irgarol 1051 laboratory under short term exposure (96 hrs). The findings revealed no clear different (p
> 0.05) between untreated samples (fresh and control) and were dominated by Polyunsaturated Fatty Acids (PUFA), followed by Saturated Fatty Acids (SAFA) and Monounsaturated Fatty Acids (MUFA). In contrast, the treated samples of *G. fascicularis* (20, 100 and 500µg/L) were significant different ($P < 0.05$) where both SAFA and PUFA were significantly lowered than untreated samples especially at the samples exposed to higher dosage of Irgarol 1051 (100 and 500µg/L). As the level of dosage increased, saturated fatty acid such as 16:0 and unsaturated fatty acid from ω3 and ω6 series were largely affected by the toxicology effect of the Irgarol 1051. The results indicate that Irgarol 1051 significantly affecting the health of the corals even at the lowest dosage of Irgarol 1051 applied in this study. It is suggested that the antifouling biocide may have implication on metabolisms of the corals.

Keywords: Booster biocides, Irgarol, fatty acids, *Galaxea fascicularis*, coral reefs, South China Sea

OPECS-007

MICROPLASTIC ABUNDANCE ON EDIBLE CRAB AND GASTROPOD IN BLANAKAN COAST AREA

Noverita Dian Takarina*, Dian Utami Wulaningsih*, Jihan Mirani Kenraningrum*, Meiliandy Mahalana*

Department of Biology, Faculty of Mathematics and Natural Science, University of Indonesia, Pondok Cina, Beji, Depok, West Java Indonesia 16424

*Presenting author e-mail: jihan.mirani@ui.ac.id

Abstract: Blanakan is a coastal area that are dominated by fishing area, silvofishery pond, and tourism activities**.** These activities can cause pollution. Microplastics is one of pollutant that can be formed due to the decomposition of plastic waste around the coast and can contaminat the water, sediment, and biota. The small size of microplastics can make it easier for these particles to be carried away by currents and then trapped in biota. Hence, this study is aimed to investigate the abundance of microplastic in the water, sediment, edible crab and gastropod from Blanakan coastal areas. Method used for sampling is random sampling on water, sediment, and biota samples was carried at three stations with three replication. The total abundance of microplastic ranged between 320-380 particles/L in water, 280-2200 particles/Kg in sediment, 3.5- 25 particles/ individual in crab, and 5.5-8 particles/individual in gastropod The forms of microplastics found in water, sediment, and biota in Blanakan Coastal were fragments, films, fibers, and pellets. Pellet forms are commonly found in the sediment samples and fiber forms are found in the water samples, crab, and gastropod.

Keywords: Blanakan**,** microplastic, abundance, gastropod, coast.

OPECS-008

MICROPLASTIC ABUNDANCE ON FISH AND PRAWN FROM BLANAKAN PONDS

Noverita Dian Takarina, Ailsa Shafa Nariswari*, Amara Sausan Qotrunnada,
Ameera Saffa Ramadhina

Department of Biology, Faculty of Mathematics and Natural Science, University of
Indonesia, Pondok Cina, Beji, Depok, West Java Indonesia 16424

*Presenting author e-mail: ameera.saffa@ui.ac.id

Abstract: Plastic is used material due to its strong ability and is not easily degraded. However, due to ultraviolet radiation, climate change, weathering, and physical abrasion so that it is plastics can be degraded into tiny particles— fragments of plastic particles that are less than five mm called microplastic. Microplastic consist of a mixture of bioaccumulative and toxic for the environment, and most likely can be ingested by biota in the water's ecosystem. Thus, biota such as fish and prawn can accumulate microplastic. Blanakan is one of a coastals area in Indonesia that is shaped like a bay, which allows the distribution of microplastics that comes from the pollution of human activities in the surrounding area. There are many ponds located in Blanakan that can be affected by the pollution of microplastics. This study is held to investigate the abundance of microplastic contamination in the water, sediment, speckled prawn, tiger prawn, white prawn, and milkfish from the ponds in Blanakan. Method used for the water, sediment, and biota sampling was carried out three times at each station. The total abundance of microplastics found in the water ranged 320— 340 particles/L, while in the sediment ranged 2080—2640 particles/Kg. In speckled prawn ranged 1.4—1.7 particles/individual, in tiger prawn ranged 1—1.84 particles/individual, in white prawn ranged 0.5—1.235 particles/individual, and in milkfish ranged 4.6—13.6 particles/individual. The composition of the microplastics that can be from the highest to the lowest is in the sediment > water > milkfish > speckled prawn > tiger prawn > white prawn. The dominant form of microplastics found in this research fiber > pellet > fragment > film.

Keywords: abundance, Blanakan ponds, microplastics, prawn, milkfish.

OPECS-009

THE ECO-TRAP DEVELOPMENT FOR SUSTAINABLE BLUE SWIMMING CRAB FISHING

FEBRIAN MALDINI[*1], ADI SUSANTO[1,2], HERY SUTRAWAN NURDIN[1,2]

[1] Department of Fisheries Science, Faculty of Agriculture, University of Sultan Ageng Tirtayasa, Jl. Raya Palka Km. 4 Sindangsari, Pabuaran, Serang Banten Indonesia, 42163
[2] Center of Excellence Local Food Innovation, University of Sultan Ageng Tirtayasa, Jalan Raya Raya Palka Km. 4 Sindangsari, Pabuaran, Serang Banten Indonesia, 42163

*Presenting author e-mail: 4443180057@untirta.ac.id

Abstract: Blue swimming crab (*Portunus pelagicus*) is a high economic value of capture fisheries commodity in Indonesia. The fishers use a polyethylene collapsible trap (commercial trap/ CT) with a 1.25-inch mesh size to catch the swimming crab. The fishers used traps without escaping-vent, which caused small and young crabs could not to have any chance to escape. This condition induces growth overfishing in Banten Bay such that the catch continued to downward in less than five years. The purpose of this study is to develop a design of an eco-trap (ET) for sustainable blue swimming crab fisheries in Indonesia. The eco-trap means the collapsible trap has a high proportion of legal size crab and has high productivity. The experiment was conducted on Banten Bay from February to March 2022. We compared the performance between CT (slope of funnel 20° and 1.25 inch of wall mesh size) and ET (slope of funnel 40° and 2.50 inch of wall mesh size). The results show the productivity of ET reach 2 times higher than CT. The average crab weight on ET also higher (147.7 g) compare to CT (110.5 g). Moreover, the application of a bigger wall mesh size (2.50 inches) increased the carapace width of caught crab from 119 mm on CT to 124 mm on ET. We conclude that the ET design has a good performance and is suitable enough as commercial fishing gear to promote sustainable blue swimming crab fishing in Banten Bay.

Keywords: carapace width, design, escape gap, productivity

OPECS-010

CORROSION BEHAVIORAL STUDY OF DOMESTIC WATER VIA MULTILAYER PERCEPTRON

MOHAMMAD FAKHRATUL RIDWAN BIN ZULKIFLI[1] and HEONG SHU QING[1]

[1]Maritime Technology Programme, Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

*Presenting author e-mail: fakhratulz@umt.edu.my

Abstract: Corrosion of pipes will affect human health since the deposits such as copper and lead will leach into the drinking water. Thus, a study is done to predict the corrosion behavior of copper in domestic water using multilayer perceptron (MLP) in artificial neural network (ANN). The experiment data is obtained from a secondary data where copper coupons were installed in non-chlorinated water and chlorinated water, in a drinking water treatment plant (DWTP). They were normalized and categorized into 3 cases: non-normalized data, min-max normalization (0 to 1) and adjusted min-max normalization (0.1 to 0.9). Each set of data was separated into 70% for training, 15% for testing and 15% of validation. Multilayer perceptron (MLP) models were developed and trained with Levenberg-Marquardt (LM), Scale conjugate gradient (SCG) and Bayesian Regularization (BR) training algorithms. Correlation coefficients (R^2) and mean square error (MSE) were used to determine and compare their model performances. In conclusion, adjusted min-max normalization showed the best performance in model evaluation. LM has the best performance among the other training algorithms as it had the highest R^2 of 0.98539 and lowest MSE of 0.0016. On the contrary, BR had the worst model performance where R^2 is 0.54340 and MSE value is 0.0444) in comparison with the others. In conclusion, a reliable prediction model was developed using MLP, by using adjusted min-max normalization method and LM training algorithm, with 9 hidden layers.

Keywords: Artificial Neural Network, Corrosion, Drinking Water, Multilayer Perceptron

OPECS-011

DISTRIBUTION OF COLIFORM BACTERIA IN COCKLES CULTIVATION SITES IN THE WEST COAST OF PENINSULAR MALAYSIA

MOHD SYAFIQ MD PUZI[1], FERDIUS MOHAMAT-YUSUFF[1,2], ZUFARZAANA ZULKEFLEE[1,*]

[1]Department of Environment, Faculty of Forestry and Environment, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia
[2]International Institute of Aquaculture and Aquatic Sciences, UPM, Lot 960, Jalan Kemang 6, 71050 Port Dickson, Negeri Sembilan, Malaysia

*Presenting author e-mail: zufarzaana@upm.edu.my

Abstract: Shellfishes such as cockles usually grow in shallow intertidal and subtidal coastal zones and estuaries. Unfortunately, these areas are the major recipients of a variety of point and non-point source pollutants, especially those brought by the connecting river. Hence, fecal contamination may possibly occur from sewage and animal waste that gets deposited in the area. The study aimed at determining the presence and distribution of coliform bacteria in seawater and cockle samples collected from three cockle farms, namely the Sungai Buloh, Bagan Pasir Laut and Sungai Ayam farms located at the west coast of Peninsular Malaysia. Two coliform enumeration techniques were used, which are the membrane filtration and the petrifilm plate techniques for the determination of total coliform, fecal coliform and *Escherichia coli.* Samples were collected from three sampling points designated at each cockle farm representing the area of freshwater and seawater confluence, the mouth of the river and the open sea area. In general, the result shows a declining trend of fecal contamination by the reduction in the number of coliforms present from the confluence area towards the open sea. Bagan Pasir Laut has the highest fecal coliform contamination while the Sungai Buloh farm has the highest *E. coli* contamination. Ambiguity in the results showing presence of total coliform but absence of *E. coli* in certain areas could be due to the threshold salinity tolerance of the bacteria as well as other influencing factors that was not considered in the study. Nevertheless, the study presented the importance of monitoring fecal contamination in intertidal and subtidal zones especially areas developed into cockle farms as to ensure environmental safety, food security and human health and wellbeing.

Keywords: Bivalves**,** *Escherichia coli*, fecal coliform, fecal contamination, total coliform

OPECS-012

SEA-TO-AIR FLUXES OF *isoprene* AND *monoterpenes* IN THE COASTAL UPWELLING REGION OF PENINSULAR MALAYSIA

ROYSTON UNING[*1, 3], MOHD TALIB LATIF[1], HARIS HAFIZAL ABD HAMID[1], MOHD SHAHRUL MOHD NADZIR[1], MD FIROZ KHAN[2], SUHAIMI SURATMAN[3]

[1]Department of Earth Sciences and Environment, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 Bangi, Malaysia
[2]Department of Chemistry, Universiti Malaya, 50603 Kuala Lumpur, Malaysia
[3]Institute of Oceanography and Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Malaysia

*Presenting author e-mail: royston@umt.edu.my

Abstract: Volatile organic compounds (VOCs) affect oxidant loadings and secondary organic aerosol formation in the lower atmosphere. The marine environment is thought to be an important global source of biogenic VOCs (BVOCs). Despite that, there is relatively limited knowledge on coastal upwelling BVOCs. This paper presents sea-to-air fluxes and spatial and temporal distributions of the BVOCs, isoprene and monoterpenes, in the coastal upwelling region off the east coast of Peninsular Malaysia (ECPM). The overall fluxes ranged between 10^7 and 10^8 molecules/cm^2/s, which is comparable with open ocean values. Isoprene dominated the overall fluxes with an average percentage of 65% compared to monoterpenes (total) (35%). Among the monoterpene compounds, β-pinene showed the highest average flux, followed by α-pinene and limonene. The spatial distribution suggests that isoprene fluxes potentially correspond to the sea surface water nutrients compared to monoterpenes. A significant relationship between isoprene and monoterpene (total) fluxes was observed (R = 0.73, P < 0.01), which may indicate that both isoprene and monoterpenes are controlled by an identical biological factor (e.g., chlorophyll-a). This study concludes that the upwelling region off the ECPM is potentially an important source of atmospheric isoprene and monoterpenes.

Keywords: Biogenic volatile organic compounds, floating flux chamber, TD-GC-MS, spatial, temporal

OPECS-013

CONDITION INDEX AND HISTOLOGICAL CHANGES IN GILLS OF BLOOD COCKLE, *Tegillarca granosa* (Linnaeus, 1758) IN RESPONSE TO SHORT-TERM SEDIMENT DEPOSITION

NURHANIN AQILA MOHAMMED NOOR[1], FERDIUS MOHAMAT YUSUFF[*1], AMIRUL AZUAN MD JONI[1]

1Department of Environmental Sciences, Faculty of Forestry and Environment, Universiti
Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

*Presenting author e-mail: ferdius@upm.edu.my

Abstract: Excess sediment erosion and deposition resulted from land clearance for development, agriculture, and long-term climate-change posing threat to aquatic organisms, especially in low energy area. Thus, this study evaluates the condition index and gill histological changes of the mudflat species, Tegillara granosa towards sediment deposition. Blood cockle and sediment were collected from the estuary of Sungai Buloh, Kuala Selangor. Blood cockle was deposited with one-off sediment deposits (3 cm, 7cm, and 15 cm) and gradual sediment deposition (3 cm). Condition index at all concentrations and deposition shows no significant effect (p > 0.05) on cockle when exposed to 3, 5, and 7 days of sediment deposits. This indicates that energy reserve such as glycogen and total lipid was not utilized and blood cockle able to survive the short-term sediment deposition. However, histopathological changes such as degeneration of epithelial, crumpled thin epithelial, and vacuolation in frontal tip of gill were observed in 15 cm one-off deposits and thin continuous 3 cm sediment deposits. In conclusion, cellular level observation is important to access the short-term stress response of organisms towards sediment deposits. Behaviour observation and long-term effects of sediment deposits are recommended to well understand the response and adaptation of blood cockle towards extreme event of sediment deposition.

Keywords: Sediment deposit , native sediment, Tegillarca granosa, gill, Condition index

OPECS-014

MICROPLASTICS CONTENTS IN NATURAL AND MARICULTURED MUSSEL FROM PASIR PUTIH ESTUARY IN JOHOR, MALAYSIA

MAZNI MAT ZIN[1,2], SHAMILA AZMAN[1], MOHD ISMID MOHD ISMAIL1[1], MOHD KHAIRUL IDLAN MUHAMMAD[1]

[1] School of Civil Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Johor Bharu, Johor, Malaysia
[2] School of Civil Engineering, College of Engineering, Universiti Teknologi MARA Johor Branch, Pasir Gudang Campus, 81750 Masai, Johor, Malaysia

*Presenting author e-mail: mazni@graduate.utm.my

Abstract: Mismanaged of plastic waste entering aquatic environment undergoes degradation by natural processes fragment into mini plastic debris known as microplastics (MPs) with diameter in the range of 1µm to 5mm.The prevalence of MPs in mussels and their habitat is currently debated as whether the primary contributors are from anthropogenic activities in the surrounding environment or the use of plastic-based items in cultivation operation. Hence, this study aims to investigate the presence of microplastics (MPs) in natural and maricultured mussels (P.veridis), which include physical characteristics to compare microplastics (levels, type, size, colour) uptake depending on mood of living from Pasir Putih estuary in Johor Malaysia. Located in the straits of Johor, this is highly relevant because of the geographical influence based on environmental parameters such as water temperature and salinity in water that support the life of *P. viridis*. The location of *P. viridis* cultivation is not far from coastal settlements (±400-500m) from settlements. A number of specimens were collected from 2 sampling stations at the Pasir Putih estuary. The extracted soft tissues were digested with 10% KOH solution and the density was separated using NaCl solution. The observation of microplastics was conducted by Stereo microscope with my-solution premium (IMT Cam3) software of 40x-45x magnification. Attenuated Total Reflection (ATR) spectroscopy was used to verify microplastics. Microplastic abundance in cultured *P.veridis* samples varied from 0 to 6.67 items/individual, with the average values of 2.23 ± 1.04 items/individual and 0.4 ± 0.24 items/gram. Meanwhile, for the wild *P.veridis,* the microplastic present is average values of 1.29 ± 1.19 items/individual and 0.44 ± 0.34 items/gram. The prominence of MPs revealed in mussels not only affects health but also presents a pathway for human exposure via a dietary intake, resulting in health issues.

Keywords: Perna veridis, mariculture, seafood, microplastics

OPECS-015

LEAD (PB) CONTENT IN BLOOD COCKLE (*Anadara granosa*) FROM BANTEN BAY

ELIN SRI MULYANI*[1], ANI RAHMAWATI[1] AND ADI SUSANTO[1]

[1] Department of Fisheries Science, Faculty of Agriculture, University of Sultan Ageng Tirtayasa, Jl. Raya Palka Km. 03 Sindangsari, Pabuaran, Serang Banten Indonesia, 42163

Presenting author email: elinsrim@gmail.com

Abstract: Banten Bay is one of the primary fishing grounds for blood cockle (*Anadara granosa*) in Banten Province. Industrial and boat activity around the coastal area of Banten Bay influence the heavy metals concentration, especially lead (Pb) on the water, sediment, and organisms. Blood cockles are animals that live on the bottom of the waters that can be used as bioindicators of heavy metal pollution. This study aims to analyze the lead content in blood cockle from Banten Bay. This research was conducted in September-October 2021. The sampling location was divided into 3 points of stations. Blood cockle samples were taken twice at each station. Sampling was carried out by participating in blood clam catching activities carried out by dredges. The supporting environmental parameters are temperature, salinity, acidity (pH), dissolved oxygen (DO), and brightness. The results show the highest heavy metal content was found in adult blood cockle of 1.15 mg.kg^{-1}, while the lowest was found in small blood cockle was 0.56 mg.kg^{-1}. We found that the content of lead in blood cockle from Banten Bay was under the maximum quality standard 1.5 mg.kg^{-1}. We conclude that blood clams are still safe for human consumption.

Keywords: Banten Bay, bioindicator, blood cockle, heavy metal.

OPECS-016

EFFECT OF DESIGN THINKING TO DEVELOP MARINE AND COASTAL ENVIRONMENTAL ATTITUDES

[1]CORRIENNA ABDUL TALIB, [2]FARUKU ALIYU, [3]ADI MAIMUN, [4]KANG HOOI SIANG, [5]CHIN CHEE KEONG, [6]MOHD ERFY ISMAIL & [7]MOHD ALI SAMSUDIN

[1,3,4]Universiti Teknologi Malaysia, Johor, Malaysia
[2]Sokoto State University, Sokoto, Nigeria
[5]Teacher Education Institute Malaysia Tuanku Bainun Campus, Pulau Pinang, Malaysia
[6]Universiti Tun Hussein Onn Malaysia, Johor, Malaysia
[7]Universiti Sains Malaysia, Pulau Pinang, Malaysia

*Presenting author e-mail: corrienna@utm.my

Abstract: This paper analyzed the effect of design thinking approach to develop marine and coastal environmental attitudes. The paper employed survey design and utilized a sample of thirty-five students using online questionnaire through google form. Their responses were analysed, and the findings revealed that students agreed that there is a need to prevent any types of plastic product in becoming rapidly increasing in the environment, even if it means scarifying something to slow down marine and coastal pollution. Some students were not aware that marine and coastal pollution is personally affecting them despite its huge effect on their lives. Also, students agreed that there is a need for the awareness that although there are continual contaminations of rivers and oceans, nature's purifying processes soon return them to normal when there is good management from them. The paper recommended that an approach such as design thinking focusing on the marine and coastal pollution could be used in schools and the government need to introduce harsh measures to halt marine and coastal pollution, since very few people will regulate themselves.

Keywords: design thinking, marine coastal, environment, attitudes, pollution

OPECS-017

SUSTAINABILITY OF MINI TRAWL FISHERIES AFTER THE COVID-19 PANDEMIC

Mila Wahyuningsih[*1], Adi Susanto[1], Hery Sutrawan Nurdin[1]

1 Department of Fisheries, Faculty Of Agriculture, University of Sultan Ageng Tirtayasa, Serang, Indonesia.

*Presenting author email: milawahyunningsih21@gmail.com

Abstract: Covid-19 pandemic has a significant effect on the capture fisheries sector, especially on the sustainability of small-scale fisheries. The purpose of this study is to determine the economic sustainability of small-scale mini trawl fisheries after the Covid-19 pandemic in Banten Province. The primary data was obtained through surveys, observations, and deep interviews. Surveys and deep interviews were conducted using questionnaires with 10 fishers in total. Feasibility economic analysis was conducted to determine the sustainability status of mini trawl fisheries using several criteria including, number of net profit, return of Investment (ROI), payback period (PP), and Revenue Cost Ratio (R/C Ratio). The results show the Covid-19 pandemic caused decreasing in net profit from US$ 1,652 to 1,210 per year, decreasing in the R/C ratio from 1.09 to 1.06 decreasing ROI from 60% to 44%, and increasing PP from 21 months to 31 months. However, the small-scale mini trawl fisheries in Banten Bay have good economic sustainability and adapt to the COVID-19 pandemic.

Keywords: Banten Bay, economic, ratio, small-scale,

OPECS-018

COMMUNITY PARTICIPATION IN MANGROVE FOREST CONSERVATION IN MENDANA STRAIT, KONG KONG, JOHOR

ZALEHA KASSIM[*1], NAJEHAH SHAMMODIN[2], AHMAD ISMAIL[3]

[1]International Institute for Halal Research and Training, International Islamic University Malaysia
[2]Graduate Intern, IIUM
[3]Malaysian Nature Society

*Presenting author e-mail: drzack@iium.edu.my

Abstract: Mangrove forest of Kong Kong in Johor, despite gazetted for wildlife refuge, is threatened due to the escalating exploitation for tourism, aquaculture, ship docking and transportation purposes. Adding to past concerns on the already widely contaminated Johor waters, the declining health of Kong Kong mangrove forest raised the urgency to gather data beyond the naked eye; the underlying reasons that encourage human activities in the proclaimed forest reserve. The fundamental elements that influence the local community's participation in mangrove forest conservation ought to be highlighted as a determining factor in the effectiveness of this nature preservation effort. An initiative to empower Kong Kong local community participation in mangrove forest conservation was performed between 2017 to 2018. Through Knowledge Transfer Program, a survey was conducted among representatives of the local community of Kong Kong. The representatives (N = 79) of Selat Mendana community's willingness to participate in mangrove conservation effort were examined based on their socioeconomic dependence towards Kong Kong mangrove forest resources and their perceived values of the forest to themselves. 56.9% (n = 45) from the overall respondents depended on mangrove forest resources as a source of income for commercial and tourism purposes, while 60.8% (n = 48) of the respondents possess commercial property to meet the aforementioned demands, in which these factors significantly influenced their socioeconomic dependence on the forest resources ($p < .05$) but not on their perceived participation in mangrove forest conservation ($p > .05$). The respondents' mangrove resource dependence and perceived participation in mangrove forest conservation were negligibly correlated ($p = .09$, r = .19). To conclude, a local community of an area play vital role in the effectiveness of a nature preservation effort as they share space with the surrounding ecosystem.

Keywords: Community participation, mangroves, conservation, socioeconomic dependency

OPECS-019

MORPHOMETRIC STUDY OF HORSESHOE CRAB'S SPAWNING POPULATION IN A COASTAL AREA OF PENINSULAR MALAYSIA

MOHD RAZALI MD RAZAK[*1], WAN SYAZZ[2], ZALEHA KASSIM[3]

[1]Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia.
[2]Kulliyyah of Science, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia.
[3]International Institute for Halal Research and Training (INHART), International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia.

*Presenting author email: razalimdrazak@gmail.com

Abstract: Two Asian horseshoe crabs *Tachypleus gigas* and *Carcinoscopius rotundicauda* are commonly found on some coastal habitat in the east coast of Peninsular Malaysia during their spawning season. The number is small if compared to the Atlantic species, *Limulus polyphemus* which could be related to their foraging ground on sea bottom. It is not easy to ascertain the reason of the small landing population of horseshoe crab in the east coast of the Malay Peninsula. Some morphometric information on spawning population of horseshoe crab was studied at mangroves and sandy beach habitat in Balok coastal area of Pahang. Morphometric parameters measured in this study included body weight (Wt), inter-ocular length (IOL), dorsal prosoma breadth (DPB), dorsal body length (DBL), ventral prosoma breadth (VPB), telson length (TL), central height (CH), frontal length (FL), frontal margin height (FMH), and regional length (RL). Weight of *T.gigas* ranged from 290 to 1200g and 180 to 420g for female and male respectively while *C. rotundicauda* ranged from 260 to 340g and 100 to 260 for female and male respectively. Parameter with the highest mean value is weight. The lowest mean value was found for IOL with 88.64±6.62mm (male) and 120.42±9.95mm (female) and 62.87±14.39mm (female) and 77.0±6.57mm (male) for *T.gigas* and *C. rotundicauda* respectively. Statistically it was found that the males and females *T. gigas* could grow with the same rate in DPB and DBL. Nonetheless, male *C. rotundicauda* has the most increase of size of prosomal breadth in DPB than DBL. There was no evidence of imbalance growth of both sexes of the species collected from the study area. The findings indicate a good growth condition for both species. The relationship between the surrounding bottom habitat and the diet of horseshoe crab should be studied further to understand the contribution of sea bottom habitat to horseshoe crabs.

Keywords: Horseshoe crab, morphometric, peninsular Malaysia, population

OPECS-020

MICROPLASTIC UPTAKE BY *Cerithidea obtusa*

AUDREY PRIMUS[*1], SHAMILA AZMAN[1]

[1] Department of Water and Environmental Engineering, School of Civil Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Johor Bahru, 81310, Johor

*Presenting author email: paudrey2@graduate.utm.my

Abstract: This study investigates the issue of microplastics pollutants that are often found in marine organisms. This issue has become an ongoing obstacle due to the large-scale usage and production of plastics from various industries. This study was conducted to determine the microplastic accumulation in mud creepers (*Cerithidea obtusa*) collected from Larkin Central Market in Johor Bahru. This study determined the physical characteristics of microplastics, such as type, size, and colour, and differences between microplastic collections in three (3) different mud creepers sizes. This study proved the presence of microplastics in *Cerithidea obtusa.* The abundance of microplastics were 7.67 ± 4.62 particles/9 individuals, 4.00 ± 1.73 particles/9 individuals and 4.00 ± 1.00 particles/9 individuals for pooled samples of small, medium and large mud creepers respectively. The microplastic sizes found on *Cerithidea obtusa* are from < 0.25 mm (19 %), 0.25 mm - 0.5 mm (20 %), 0.5 mm - 1.0 mm (26 %) and 1 mm – 5 mm (35 %). The microplastic colour with the highest percentage was black (68 %), followed by red (17 %), blue (12 %) and green (3 %). Fibre was the type of microplastic that was dominant in this study. The fibres ingested by *Cerithidea obtusa* were of polyester/polyethylene terephthalate (PET) origin. The results of this study can be used as baseline knowledge for microplastic contamination in *Cerithidea obtusa* found in Johor. The study also showed that microplastic can find its way into the human bodies through the smallest ways such as seafood consumption.

Keywords: Microplastics, mangrove, *Cerithidea obtusa*, Johor

OPECS-021

SPATIAL DISTRIBUTION OF HEAVY METALS IN ESTUARINE AND COASTAL SURFICIAL SEDIMENT: A CASE STUDY FROM THE MALAYSIAN WATERS

JEMIMAH SHALOM A/P B PERAGAS[*1], SYLVIA NG SIN EE[1], ONG MENG CHUAN[1,2,3]

[1]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu
[2]Institute of Oceanography and Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu
[3]Ocean Pollution and Ecotoxicology (OPEC) Research group, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu

*Presenting author e-mail: Jemimah.shalom.umt@gmail.com

Abstract: Estuarine and coastal waters have been greatly affected by the development and industrialisation that is happening in Malaysia. The development has caused the runoff and discharge of tons of pollutants into the Malaysian water systems. Multiple papers were analysed, and the data from the relevant articles were to study the concentration of metals present in surficial sediments. It was identified that the average heavy metal concentration in estuarine waters follows a sequence of Zn > Pb > Cu > As > Cd > THg. At the same time, the average heavy metal concentration in coastal waters follows a sequence of Zn > Cu > Pb > As > Cd > T-Hg. Both these results show that Zn metal holds the highest concentration in Malaysian waters. This corresponds with multiple studies stating how Zn is used in smelting and ore processing activities which are common in Malaysia. The correlation coefficient analysis generally shows a positive correlation for both the estuarine and coastal data indicating, that the metals identified have derived from the same source. The index of geo-accumulation (Igeo) generally classes the estuarine and coastal waters under the slightly to moderately polluted class (1-2). However, the Igeo levels measured in estuarine data show that the estuarine waters are more polluted than coastal waters. This corresponds to the Pollution Load Index (PLI), which also indicates that there are more areas polluted in the estuarine data compared to the coastal data (PLI > 1). Therefore it was identified that the estuary is more contaminated compared to the sediments in Malaysian coastal waters.

Keywords: heavy metals, estuarine, coastal, pollution, sediment

OPECS-022

DIVERSITY OF MACROZOOBENTHOS IN SEAGRASS ECOSYSTEMS AT PAMUJAN BESAR ISLAND SERANG REGENCY BANTEN PROVINCE INDONESIA

FIRDA AULIA NURAINI[*1], ANI RAHMAWATI[1], MUTA ALI KHALIFA[1]

[1] Department of Fisheries Science, Faculty of Agriculture, University of Sultan Ageng Tirtayasa, Jl. Raya Palka Km. 3 Sindangsari, Pabuaran, Serang Banten Indonesia, 42163

Presenting author e-mail: firdaaulianuraini@gmail.com

Abstract: Seagrass ecosystems of Pamujan Besar island function as a feeding ground, nursery ground, and spawning ground for marine biota. There is a change in the area of the seagrass ecosystem on this island, which is caused by human activities such as sea dredging, these activities can affect the diversity of macrozoobenthos in the seagrass ecosystem. The purpose is to analyze the diversity of macrozoobenthos, the density of seagrass, and the relationship between density and cover of seagrass with abundance macrozoobenthos. The method used is a survey in Pamujan Besar Island, using a line 50 meters straight from the coast to the sea, with a distance between transects of 100 m. The quadrat transect uses a scale of 50 cm x 50 cm starting from the 0 m point to 50 m, every 5 m. Macrozoobenthos index of diversity is 2.091 (species diverse medium category). Macrozoobenthos index of uniformity is 0.938 (species uniformity high category). Macrozoobenthos index of domination is 0.938 (species domination low category). There were 4 types of seagrass species found, namely *Enhalus acoroides*, *Thalassia hemprichii*, *Cymodocea rotundata*, and *Cymodocea serrulata*. The average seagrass cover is 32% (medium category), while the average density is 8 ind/m^2. The relationship between macrozoobenthos abundance and seagrass cover was classified as "low" with a correlation coefficient value of R = 0.3038. The relationship between the abundance of macrozoobenthos and the density of seagrass has a correlation coefficient value of R = 0.1167 which means it has a "very low" relationship.
Keywords: macrozoobenthos, pamujan besar island, relationship, seagrass

OPECS-023

TOXICITY EVALUATION OF ANTIFOULING COMPOUND (2-CHLORO-N-METHYL-MALEIMIDE) ON EMBRYOGENESIS OF LOCAL *Anabas testudineus*

SUVIK ASSAW[1,2*], NABILAH MUSTAFHA[1], CHRYSTÈLE DUFAU[3] AND JASNIZAT SAIDIN[4]

[1]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.
[2] Ocean Pollution and Ecotoxicology (OPEC) Research Group, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia
[3] Laboratoire de biotechnologie et Chimie Marines (LBCM),Université de Bretagne-Sud (UBS)- BP 92116-56321 Lorient Cedex – France
[4]Institute of Marine Biotechnology, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

Corresponding author: aasuvik@umt.edu.my

Abstract: One of the most damaging consequences of biofouling issues is reduced fuel efficiency. To overcome this issue, many researchers tried to create environmental antifouling paint that is non-toxic while also maintaining the same efficiency. In this study, the compound 2-chloro-methylimide exhibited potent antifouling properties. There is little information about the adverse effects of this compound on embryonic development of local freshwater fish *Anabas testudineus*. The climbing perch were injected with ovaprim (0.5ml/kg) hormone into the muscle to trigger the spawning. By using microplate 96-well, embryos were exposed to different concentrations of 2-chloro-N-methyl-maleimide ranging from 0.38 to 25 nmol. Toxicity effects of the tested compound were observed according to four apical observation described by OECD test guideline 236 which were coagulated of embryo, lack of somite, lack of heartbeat and non-detachment of the tail. The embryo was observed every two hours until hatching which takes approximate 20 hours. At the highest tested concentrations (25 nmol) embryos mortality was 100% after 2 hour-post fertilization (hpf) while at 1.5, 0.75 and 0.38 nmol showed no mortality and no malformations detected. After 24-h, the 50% median lethal concentration (LC_{50}) for climbing perch using 2-chloro-N-methyl-maleimide showed that the malformations of eggs occurred below the 50% inhibition concentration (IC_{50}) values which was 9.95 nmol. Moreover, the lowest concentrations also found to causes malformations to the embryo such as heart and notochord malformation. It is concluded that the compound (2-chloro-N-methyl-maleimide) was toxic since it gives the effect to the early development of embryos in climbing perch.

Keywords: Anti-fouling, embryogenesis, toxic, environment,

OPECS-024

OCCURRENCE OF OCTYLPHENOL AND NONYLPHENOL IN THE SEDIMENT OF PENINSULAR MALAYSIA

MOHD YUSOFF NURULNADIA[1,2]*, BAHAROM MOHAMAD ZAHID[1], HAFIZ IKHWAN ABDUL HAMID[1]

[1]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu
[2]Ocean Pollution and Ecotoxicology (OPEC) Research Group, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia

*Presenting author e-mail: nurulnadia@umt.edu.my

Abstract: This study presents the level of octylphenol (OP) and nonylphenol (NP) in the sediment of South China Sea and Malacca Strait, Malaysia. The range of OP in Malacca Strait (1.00 – 27.16 ng/g) was greater than South China Sea (5.12 – 14.16 ng/g) whereas similar range of NP was found in South China Sea (1.32 – 23.76 ng/g) and Malacca Strait (0.79 – 27.59 ng/g). Three sampling points from South China Sea (E2A) and Malacca Strait (W32 and W43) showed comparably high levels of both OP and NP suggesting continuous input of these chemicals from nearby islands (Redang Island and Penang). Risk quotient (RQ) values of OP showed potential risk to benthic communities in 4/7 and 21/47 sampling points of respective South China Sea and Malacca Strait. Both water bodies (South China Sea and Malacca Strait) located far from the wastewater effluent and yet able to retain these chemicals in their sediment. This suggests that the wastewater treatment system as well as dilution effects does not prevent these chemicals to be ended up into the marine environment.

Keywords: endocrine disrupting chemical, Malacca Strait, South China Sea

OPECS-025

ENDOCRINE DISRUPTING CHEMICALS IN THE SEDIMENT OF REDANG ISLAND DURING PRE AND POST-COVID 19 PERIODS

NURIN HAZWANI JASRI, NURULNADIA MOHD YUSOFF

Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu

*Presenting author e-mail: s55926@ocean.umt.edu.my

Abstract: Most of the tourism activity was put on hold during movement control order period which include in Redang Island, Terengganu. As the number of tourists rapidly reduced, we assumed to see the difference of endocrine disrupting chemicals (EDCs) during pre and post period of Covid-19. EDCs are synthetic chemicals which used as surfactant in detergent products. This contaminant entering the water ecosystem through household wastewater. EDCs also known to cause feminization in fish. Sediment samples were collected in 2019 (pre Covid-19) and 2020 (post Covid-19) using Smith McIntyre grab on UMT RV Discovery. The extraction and measurement were done using HPLC-PDA in UMT. One-way ANOVA verified the similar contribution of EDCs in the sediment during both periods with $p>0.05$, suggest that number of tourists is not the main contributor of this contaminant.

Keywords: endocrine disrupting chemical, nonylphenol, octylphenol, Redang, sediment

OPECS-026

WARMING ENHANCES RELEASE OF DISSOLVED ARSENIC IN AN INTERTIDAL MUDFLAT

LIU JINJINGYUAN[1], CHEN ZHENG[2], CHEN MENGLI[1*]

[1] Tropical Marine Science Institute, National University of Singapore
[2] Department of Health and Environmental Sciences, Xi'an Jiaotong-Liverpool University, Suzhou 215123, China

*Presenting author e-mail: mengli.chen@nus.edu.sg

Abstract: Over the past decades, large amount of pollutant has been deposited in the coastal sediments. However, with the global warming, the changes in the benthic environment may trigger reflux of these pollutants. Here, we investigate the change in the arsenic (As) mobility in an intertidal mudflat in Singapore under simulated warming condition. In this study, we determined the depth profile of dissolved As, iron (Fe) and sulphide (S^{2-}) under different temperature treatments (29°C, 31°C, and 36°C). The results showed that the average Fe concentration in pore water across different temperature treatment fluctuated within 25%, however, the As concentration increased ~60% while increasing temperature from 29°C - 31°C to 36°C. A pronounced correlation (R^2=0.6-0.8) between concentrations of As and Fe in the pore water was observed in 29°C and 31°C but largely weakened at 36°C (R^2=0.05). Such correlation weakens with increasing depth, suggesting that the mechanism decoupling the Fe-As maybe sourced from the deeper section in the sediments. A possible mechanism involves changed porewater geochemistry by addition of S^{2-}, as its concentration increased largely with increasing depth and temperature. Our study illustrates a possible combined effect of environmental pollution with the on-going climate change; pointing the urgency of more mechanistic investigations in benthic pollutant dynamics.

Keywords: Arsenic, Pollution, tropical, Southeast Asia, climate change

OPECS-027

IRREGULARITIES OF TROPOSPHERIC OZONE FREQUENCY AND CONCENTRATION DURING MONSOONAL SEASON IN MALAYSIA FROM 2006 TO 2019

MOHD HAKKIM FIRDAUS BIN HAMZAH[*1], KU MOHD KALKAUSAR KU YUSOF[1], NURUL ADYANI GHAZALI[1], NOORLIN MOHAMAD[1]

[1]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21300 Terengganu, Malaysia.

*Presenting author e-mail: hakkimhamzah@gmail.com

Abstract: Nowadays environmental problems were severe and being less concerned due to massive globalization and neglect by humanity. As a second pollutant, ozone (O_3) is found in both the Earth's top atmosphere, known as the stratosphere, which contains around 90% of the ozone needed for ultraviolet (UV) filtration and the lower atmosphere, known as the troposphere, which contains just 10%. The aim of this study is to identified and analysed the irregularities of O_3 frequency and concentration during the monsoonal season by region in Malaysia. With a total of 40 stations, each region is separated into five categories namely Borneo, Central, Eastern, Northern and Southern. The data sources for O_3 consisted of 168 months which consisted of approximately 120,960 hours (24 hours × 5040 Days (168 months/ 14 years) of observation from January 2006 until December 2019 which was acquired from the Department of Environment (DOE). Grubb test with 5% significant level was selected in this study. Based on the analysis, the overall (2006-2019) raw data from 124,689 – 124,691, only 3170 - 8065 of the outliers' range were selected. In Northern regions, the frequency of O_3 irregularities was high with a total of 8065 followed by central (7889), eastern (6817), southern (6539) and Borneo (5636). However, a different story on the overall O_3 concentration as southern region (Larkin, Johor) indicated the highest concentration 198 ppbv whilst Borneo (Tawau, Sabah) only 65 ppb in 2014. Nonetheless, when compared to Northeast monsoon (NEM), Southwest monsoon (SWM) has a considerable impact on O_3 frequency and maximum concentration value.

Keywords: Irregularities, Tropospheric Ozone, Monsoonal season, Regional, Malaysia

OPECS-028

ANALYSIS THE EFFECT OF MOVEMENT CONTROL ORDERS (MCOs) TOWARDS THE QUALITY OF RAINWATER CHEMICAL PATTERNS IN MALAYSIA DURING THE PANDEMIC COVID-19

KU MOHD KALKAUSAR KU YUSOF[*1], NOORLIN MOHAMAD[2], SAMSURI ABDULLAH[3], MOHAMAD FAKHRATUL RIDWAN ZULKIFLI[4], NOORAIN MD ISA[5]

[1]Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21300, Kuala Terengganu, Terengganu Darul Iman
[2] Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21300, Kuala Terengganu, Terengganu Darul Iman
[3] Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, 21300, Kuala Terengganu, Terengganu Darul Iman
[4] Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, 21300, Kuala Terengganu, Terengganu Darul Iman
[5] Faculty of Forestry and Environment, Universiti Putra Malaysia, 43400, Serdang, Selangor Darul Ehsan

*Presenting author e-mail: kukausar@umt.edu.my

Abstract: Movement Control Orders was initiated by Malaysia's government on 18th March 2020 due to the pandemic COVID-19. During that time, most of the activities were restricted including industrial, transportation, tourism. A rapid control order gazetted by the parliament has diverged a daily human activity, hence it affects the quality of environment ecosystem including rainwater characteristic. In this study, sixteen rainwater variables including pH, conductivity, and ionic species (anion and cation) has been analyse using chemometric approach. The rainwater dataset was acquired from the Malaysia Meteorological Department (MMD), consisting of 34 weeks covered from January till August 2020. The pH value ranged from 4.12 – 5.50 with an average of 4.67. For conductivity measurement, the value for 34 weeks ranged between 0.60 – 4.20 mS/m, with an average of 2.03 mS/m. There were no ions that showed a high correlation with pH ($r \geq \pm 0.70$). Pb^{2+} and Cu^{2+} were the only ions that have moderate correlations, inversely proportionated to pH with both showed $r(32) = -0.598$, $p<0.05$ and $r(32) = -0.436$, $p<0.05$, respectively. For conductivity, Cu^{2+} was the only ion that formed the strongest correlation, $r(32) = 0.826$, $p<0.001$. The ions like SO_4^{2-}, NO_3^-, Pb^{2+} and Ca^{2+} exhibit a high correlation with conductivity, with a range of 0.734 – 0.788. By using PCA validated by DA, the rainwater characteristic showed a distinctives pattern amongst MCOs categories, whereby MCOs showed a great variability occurred compared CMCO and RMCO due to more activities were permitted especially for a higher demand industry like glove and mask production.

Keywords: Rainwater, COVID-19, movement control order, chemometric

OPECS-029

POLYBROMINATED DIPHENYL ETHERS (PBDEs) IN ENVIRONMENT AND ITS RISK ON CULTIVATED BLOOD COCKLES IN MALAYSIA

LAILY HUNAWATUN SANI*[1], ONG MENG CHUAN[2], DZULAIKHA KHAIRUDDIN[1], MARFIAH AB WAHID[1]

[1]Micropollutants and Pathogens in Water Research, School of Civil Engineering, College of
Engineering, Universiti Teknologi Mara, 40450 ,Shah Alam ,Selangor
[2]Faculty of Science and Marine Environment Universiti Malaysia Terengganu

*Presenting author e-mail: laili.una179@gmail.com

Abstract: Polybrominated diphenyl ethers (PBDEs) are a group of chemical compounds that are highly used as flame retardants in various products. Massive usage of this compound in products for years and its persistency has cause environmental problem worldwide. They were detected contaminating in soils, waters, airs, and living organisms including human body as they have characteristics such as persistence, bioaccumulation, and long-transport. Exposure on living organisms allow PBDEs to have a chance to induce some disfunction in the living organisms such as endocrine disruption, neurotoxicity, and neurodevelopmental deficit. Exposure pathways of PBDEs to human body are reported via ingestion of contaminated foods (such as seafood, poultry, meat, and breast milk) and dust ingestion, indoor air inhalation, and direct skin contact with PBDEs contained products. By their persistence, bioaccumulation, and transportation ability, PBDEs could reach the coastal water and damages the ecosystem including in the coastal of Peninsular Malaysia. The current review also provides a critical discussion regarding the occurrence of PBDEs contamination in Malaysian coastal and its risk on cultivated blood cockles. PBDEs are detected to have ability to bioaccumulating and biomagnifying in living tissues from one to another living organism. Thus, by contaminating the tissue of blood cockles which is one of nutrition source for human, PBDEs could be transferred to human body through food intake.

Keywords: PBDEs, pollutions, blood cockles, Malaysia

OPECS-030

A REVIEW ON THE PHYTOREMEDIATION TECHNOLOGIES USING VARIOUS PLANTS TO REDUCE THE CONCENTRATION OF POLYBROMINATED DIPHENYL ETHERS (PBDEs) IN COASTAL WATER

ANATI WARDINA JOHARI*[1], DZULAIKHA KHAIRUDDIN[1]

[1]School of Engineering, Universiti Teknologi Mara, Shah Alam

*Presenting author e-mail: anatiw1502@gmail.com

Abstract: Environment is an important element in living microorganisms' life as it depended on the environment. A great environment will provide positive impacts on the health of microorganisms while polluted environment is harmful to their life. Polybrominated Diphenyl Ethers (PBDEs) is one of the Persistent Organic Pollutants (POPs) that linger in our daily life as it is a chemical compound of Brominated Flame Retardant (BFR) that is coated to various materials surrounding us. As PBDEs is physically bonded to the products, it can be easily volatized and dispersed to the environment. It is also can be transmitted to the marine ecosystem as there are many contributors in the upstream river water such as discharge from industrial, human activities, as well as sewage and wastewater effluent. These contributors might expose PBDEs and endanger the marine ecosystem such as bivalves, which are known as filter feeders, fishes, other marine life and worst, pollute the ocean. Concerning the environment-friendly, phytoremediation is remediation that uses natural plants to mitigate the pollution problems in soil and water. There are many types of phytoremediation including rhizofiltration, phytoextraction, phytodegradation, phytostabilization, phytovolatization and phytodesalination. However, there are several of them that are not suitable for water remediation, and all plants do not have the same effectiveness towards the removal of pollutants as they are different in morphology, physiology, genetic background and root exudates. Therefore, this review aims to provide and discuss the most effective plants that are suitable in removing PBDEs in water regardless of their locality. Other researchers claim that rice plants were the most efficient plants for PBDEs phytoremediation, however it is known that rice plants are linked to human daily consumption. Phytoremediation is effective in the removal of POPs, thus protecting the marine ecosystem and ocean from being polluted.

Keywords: PBDEs, POPs, phytoremediation, marine ecosystem, coastal pollution

OPECS-031

DEVELOPMENT OF NON-POLAR IMINE COMPOUND FUNCTIONALIZED MAGNETIC MESOPOROUS SILICA NANOPARTICLES FOR MICROPLASTICS REMOVAL FROM WATER

NUR RABIATUL SYUHAIDAH MOHAMED RUSIDI*[1,2], WAN MOHD KHAIRUL WAN MOHAMED ZIN[2], SOFIAH HAMZAH[3], ALYZA A. AZMI[1,2]

[1] Microplastic Research Interest Group (MRIG), Universiti Malaysia Terengganu, Universiti
21030 Kuala Nerus, Terengganu, Malaysia.
[2] Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala
Nerus, Terengganu, Malaysia.
[3] Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

*Presenting author e-mail: rabiatulsyuhaidah@gmail.com

Abstract: Polystyrene Microplastics (PS MPs) is one of the type of plastics that has been widely used over the world and it is non- biodegradable. This type of MPs act as a carrier for other pollutants due to their small size and large surface area thus gives a major negative impact not only on human health, but also on the environment. This study is focusing on the development of non-polar imine compound with the presence of benzene ring (naphthaldehyde) functionalized magnetic mesoporous silica nanoparticles (naphthaldehyde-MSNPs) as a potential material for microplastics removal from water matrices. This naphthaldehyde-MSNPs have been characterized using Fourier Transform Infrared (FTIR) spectroscopy, Scanning Electron Microscopy (SEM) and X-ray Diffraction Analysis (XRD). The infrared spectra show extending vibrations at 446cm-1 and 552 cm-1 for the bare Fe_3O_4 nanospheres, while development of mesoporous structure on the surface of Fe_3O_4 demonstrated by the appearance of additional peaks at 799 and 1369 cm-1. This is assigned as Si-O bending vibrations, proving the loading of silica on the surface of Fe_3O_4 nanoparticles. Another peak at 3368 cm-1 observed is corresponds to the Si-OH stretching vibration, while the loading of naphthaldehyde-MSNPs indicates by the appearance of C=N vibrations at 1620 cm-1. For SEM analysis, the spherical shape of Fe_3O_4 particles was obtained. The size of the nanoparticles observed were increase from Fe_3O_4, $Fe_3O_4@SiO_2$ and mesoporous $Fe_3O_4@SiO_2$. The microstructure of MSNPs were characterized by XRD. After surface modification, the broader band has appeared at 20-30˚ (2θ) which shows the presence of silica. Imine-MSNPs and polystyrene is expected to show a strong intermolecular interaction, which will significantly affect the ability of the developed naphthaldehyde-MSNPs as a potential microplastics removal in water.

Keywords: Imine, mesoporous nanomaterials, microplastics removal; water

OPECS-032

DESIGN OF MAGNETITE MESOPOROUS SILICA NANOPARTICLES FUNCTIONALIZED WITH 2-HYDROXYBENZALDEHYDE (IMINE-MSNPS) AS A POTENTIAL POLYSTYRENE MICROPLASTIC REMOVAL

WAN NUR IWANI WAN RUSHDI*[1,2], WAN MOHD KHAIRULWAN MOHAMED ZAIN[2], SOFIAH HAMZAH[3], ALYZA A. AZMI[1,2]

1Microplastic Research Interest Group (MRIG), Universiti Malaysia Terengganu, Universiti
21030 Kuala Nerus, Terengganu, Malaysia.
2Faculty of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala
Nerus, Terengganu, Malaysia.
3Faculty of Ocean Engineering Technology and Informatics, Universiti Malaysia Terengganu,
21030 Kuala Nerus, Terengganu, Malaysia

*Presenting author e-mail: iwani100398@gmail.com

Abstract: Microplastics (MPs) are new emerging pollutants that have been discovered in both marine and freshwater ecosystems around the world. MPs are the fragment of any type of plastic with a diameter of less than 5 mm. Polystyrene microplastics (PS MPs) is one of the most common types of plastic waste found in freshwater around the world to its widespread in daily use. PS MPs also have strong sorption capacity of the pollutants due to their huge surface area. Once these microplastics are ingested by the organisms, they may enhance the toxicity and increase the bioaccumulation of the pollutants. This study will be focused on the interaction of the nitrobenzene and phenanthrene loaded onto polystyrene with polar substituents imine compounds. With nanotechnology approaches, the surface of magnetite mesoporous silica nanoparticles (MSNPs) will be modified with 2-hydroxybenzaldehyde. The surfacemorphological of the Fe_3O_4 nanoparticles was successfully characterized using SEM analysis. The size of Fe_3O_4 nanoparticles increased after coating with mesoporous silica. Chemical composition of Fe, O and Si were present in the nanomaterial through EDX analysis. The microstructure of MSNPs were characterized by XRD. After surface modification, the broader band has appeared at 20-30 ° (2θ) indicated the presence of silica. FTIR analysis was carriedout to observe the chemical properties. The strong peak at 567 cm-1 due to the stretching of Fe-O bond. The band at 1220 cm-1 corresponds to Si-O stretching. The peak at 1741 cm-1 is attributed to C=N stretching. These peaks show that imine-MSNPs has formed successfully. So, imine-MSNPs with polar substituents can be a good potential removal of polystyrene microplastics.

Keywords: Imine, magnetite, mesoporous silica, polystyrene microplastics, microplastics removal

OPECS-033

COASTAL ECOTOURISM MANAGEMENT IN PAMUJAN BESAR ISLAND, BANTEN BAY, INDONESIA

LUTHFIYYAH FITRIANI MURSYID[*1], ANI RAHMAWATI[1], MUTA ALI KHALIFA[1]

[1]Department of Fisheries Science, Faculty of Agriculture, University of Sultan Ageng Tirtayasa, Jl. Raya Palka Km. 3 Sindangsari, Pabuaran, Serang Banten Indonesia, 43163

*Presenting author e-mail: ufimursyid18@gmail.com

Abstract: Pamujan Besar Island is one of the small islands in Banten used for tourism. Tourism development on this island has problems caused by inappropriate management, facility damages because of natural factors and damages of ecosystems around the beach. This study aims to analyze the suitability of ecotourism, calculate the carrying capacity of the area for ecotourism, and the recommendation of ecotourism management in Pamujan Besar Island. This research conducted in August 2021 in Pamujan Besar Island. The research was carried out using a purposive sampling method, 4 stations in the mangrove area and 4 stations in the beach area. The research data use data directly obtained from the field. The analysis method uses analysis of the suitability of beach tourism and mangrove tourism suitability, carrying capacity of ecotourism, and ROS (Recreation Opportunity Spectrum). The results of the study for the ecotourism suitability in the beach recreation category at beaches E and F were very suitable, beaches G and H was not suitable. The suitability of mangrove tourism at mangrove B is suitable and mangroves A, C, D was declared unsuitable. The carrying capacity of beach and mangrove tourism in Pamujan Besar Island can tolerate human activities of 109 people/day. The recommendation of ecotourism management in Pamujan Besar Island is to maintain physical parameters (natural resources, topography, oceanography, water quality, climatology) and improve management parameters (infrastructure, transportation, communication, tourism conditions, fishery conditions, waste disposal) without ignoring social parameters (Education, workforce, demographics, perceptions, issues).
Keywords: Carrying capacity, Ecotourism, Pamujan Besar Island, Suitability

OPECS-034

ABUNDANCE OF MICROPLASTICS AND IT ASSOCIATION WITH HEAVY METALS IN COASTLINE SEDIMENTS OF KUALA SELANGOR, MALAYSIA

NOOR FAZREEN DZULKAFLI*, AHMAD MUKHRIZ MD RAZALI

Department of Science and Biotechnology, Faculty of Engineering and Life Sciences,
Universiti Selangor, 45600 Bestari Jaya, Selangor, Malaysia

*Presenting author e-mail: fazreen@unisel.edu.my

Abstract: Microplastic received increasing attention in recent years due to their ubiquitous in aquatic ecosystem and their roles as vectors for many pollutants, including the heavy metals. In this study, the abundance, and their interaction with heavy metals in surface sediments from two beaches in Kuala Selangor, Malaysia namely Pantai Remis and Pantai Jeram wereinvestigated. Density separation and visual sorting methods have been used to characterize the microplastic. The abundance of microplastics ranged from 1266 ± 133 to 1049 ± 58.0 items/kg of dry sediment, whereby the highest microplastic abundance was found in Pantai Jeram. Our results showed that the microplastics were mainly in five shapes: fragment, beads, films, fibres and pellets. The main type of microplastic that has the highest distribution on both beaches was fragments (83-78%), followed by beads (2 -2%), fibres (3- 6%), pellets (1-3%) and films (1-2%). Furthermore, heavy metals (Cr, Ni, Cu, Zn, Pb, As, and Cd) were found in the microplastics samples. This highlights the potential for microplastics to act as vectors of heavy metals.

Keywords: Microplastic characterization, heavy metals, coastal sediment

OPECS-035

FISHERMEN ADAPTATION STRATEGIES DURING COVID-19 PANDEMIC IN TANJUNG PASIR FISH LANDING PLACE

MOCH FAJRI SAJATI LEYN*[1], ANI RAHMAWATI[1] AND ADI SUSANTO[1]

[1] Department of Fisheries Science, Faculty of Agriculture, University of Sultan Ageng Tirtayasa, Jl. Raya Palka Km. 03 Sindangsari, Pabuaran, Serang Banten Indonesia, 42163.

Presenting author email: mochfajri.sajatileyn@gmail.com

Abstract: The COVID-19 pandemic began to enter Indonesia in early 2019 which had a wide impact on various sectors, including the capture fisheries. The fishermen around Tanjung Pasir Fish Landing Place are one of the community groups affected by the COVID-19 pandemic. The purpose of this research is to determine an impact and fishers adaptation strategy during the COVID-19 pandemic. The research was conducted from February to March 2022. Data were obtained through in-depth interviews with 31 fishers of surface gillnet and 29 fishers of long-line. The descriptive analysis was used to determine the impact and to identify the main strategies of fishers during COVID-19. The COVID-19 pandemic caused a decrease in fish prices (93.33% of respondents). Fish prices were decreased from 2.7 US$ per kg to 2.0 US$ per kg. The fish price was decreased on average by 30% during the COVID-19 pandemic. The decrease of fishing trip frequency was being perceived by 81.67% of fishers, and 41.67% of respondents perceived the restriction of fish distribution. The fishers strategies in Tanjung Pasir Fish Landing Place during COVID-19, as many as 26% of respondents did work outside the fishing profession and 23% of fishers were increased their fishing gear technology.

Keywords: Adaptation, COVID-19 pandemic, Impact, Tanjung Pasir Fish Landing Place.

OPECS-036

POTENTIALLY PHYTOPLANKTON IDENTIFICATION TO *HARMFUL ALGAL BLOOMS* (HABS) IN COASTAL WATERS OF PAMUJAN BESAR ISLAND, BANTEN

ETIN NURKHOTIMAH[*1], ANI RAHMAWATI[1], MUTA ALI KHALIFA[1]

[1]Department of Fishery Science, Faculty of Agriculture, University of Sultan AgengTirtayasa, Jl. Raya Palka Km.3 Sindangsari, Pabuaran, Serang Banten Indonesia, 42163

*Presenting author e-mail: 4443170078@untirta.ac.id

Abstract: There are many activities around the waters of PamujanBesar Island, Banten. This indicates that the waters are rich in organic matter and nutrients needed by phytoplankton. The algae bloom toxic species can cause Harmful Algal Blooms (HABs). The phenomenon of HABs has also occurred around the waters of PamujanBesar Island, including Jakarta Bay and Lampung Bay. The purpose of this study was to identify the phytoplankton species that have the potential to cause Harmful Algal Blooms (HABs) in the waters of Pamujan Besar Island, Banten. Water sampling was carried out vertically and horizontally method using a plankton net with eight stations on the water column. While the identification of phytoplankton was conducted using Sedgewick rafter and microscope Leica DM500 Binocular with 4× and 100× magnification at the Aquaculture Laboratory, University of Sultan Ageng Tirtayasa. The results showed that there are species that have the potential for HABs in the waters in Pamujan Besar Island, Banten. Among them are *Chaetoceros* sp., *Pseudo-nitzschia* sp., *Nocticula* sp., *Ceratium* sp., *Protoperidinium* sp., *Planktothrix* sp., and *Aphanizomenon* sp. Among the 7 species, the most commonly found is *Chaetoceros* sp. with the highest abundance is 6,092.36 ind/L. The highest abundance of phytoplankton has not yet reached the stage of Harmful Algae Bloomings (HABs).

Keywords: Activities, HABs, Pamujan Island, Phytoplankton

OPECS-037

OCCURRENCE AND IDENTIFICATION OF MICROPLASTICS (MPs) FOUND IN THE SURFACE WATER OF LANGAT RIVER, MALAYSIA

AMMARLUDDIN MOHD ALI[1,2], SABIQAH TUAN ANUAR[1,2],WAN MOHD AFIQ WAN MOHD KHALIK [1,2], MAISARAH JAAFAR[1,2], KU MOHD KALKAUSAR KU YUSOF[1,2] & YUSOF SHUAIB IBRAHIM[1,2]

[1]Faculty, Department of Science and Marine Environment, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

[2]Microplastics Research Interest Group (MRIG), Universiti Malaysia Terengganu, 21030, Kuala Nerus, Terengganu, Malaysia

*Presenting author e-mail: sabiqahanuar@umt.edu.my

Abstract: Microplastics (MPs) are found across the world, including in aquatic habitats. While several studies on MPs have been conducted in marine environments, there are relatively few investigations in freshwater ecosystems. In this research, the occurrence of microplastic in the surface water collected from Langat River, Malaysia, was investigated. The water surface was collected from six different points with varying salinity: coastal, estuary, and freshwater. Furthermore, the relationship between the water quality and the occurrence of MPs was studied. MPs were sorted visually according to their sizes, shapes, and colours after being examined under a stereoscopic microscope coupled with Axiocam microscopic digital camera. The size of MPs was categorized into large and small microplastics, small size range between 1μm-1mm, and large microplastic range between 1mm-5mm. The most abundant particle found in this study was fibres and fragment shapes. To further classify the polymer identification associated with the MPs, MPs were observed using Fourier Transform Infrared (FTIR) spectroscopy to characterized the functional groups. Polypropylene, polyethylene, polystyrene, and polyethylene terephthalate were recognized among the polymer types found in the samples. Other than that, the surface texture and elemental composition of MPs including cracks, pit holes, and texture and adherence particles were examined using a Scanning Electron Microscope (SEM) with Energy Dispersive X-Ray Analysis (EDX). The present findings revealed that the Langat River of Malaysia is undoubtedly affected by MPs of different sizes, shapes, colours, and types, which may pose a potential risk to the river ecosystems.

Keywords: Langat, Malaysia, microplastic, surface water, polymer

THANK YOU
FOR
YOUR PARTICIPATION
IN
OPECS 2022