



DAA11 HANDBOOK

# 11<sup>th</sup> SYMPOSIUM ON DISEASES IN ASIAN AQUACULTURE (DAA11)

23 AUGUST 2022

BCCK, KUCHING SARAWAK

Organized by:



In Collaboration with:



## About this Handbook

Handbook of the 11<sup>th</sup> Symposium on Diseases in Asian Aquaculture (DAA11) 23<sup>rd</sup> – 26<sup>th</sup> August 2022 Kuching, Sarawak

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## Disclaimer:

This volume is the pre-symposium compilation of abstracts. Although oral presentations were selected from submitted abstracts by three independent reviewers, the contents are not peer-reviewed and apart from lay-out changes, the contents have been printed as received from the submitting authors. Some abstracts also need extensive English editing. Please consult with the authors before using information contained in any of the abstracts. The Fish Health Section of the Asian Fisheries Society does not guarantee that this Handbook is without flaws and therefore disclaims any liability for any error, loss or other consequence which may arise from persons relying on the information in this publication. The symposium programme is correct of the time of the printing, however the organizers reserve the right to make changes where necessary.

## Copies available from:

The Fish Health Section of the Asian Fisheries Society <http://www.fhs-afs.net/>

## Publication:

1. Selected papers from keynote speaker and participants will be published in Special Issue of Malaysian Fisheries Journal <http://fri.dof.gov.my/>

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## *Greetings*

Dear ladies and gentlemen,

On behalf of the Fish Health Section of the Asian Fisheries Society (FHS-AFS), I am pleased to welcome you to the 11<sup>th</sup> Symposium on Diseases in Asian Aquaculture (DAA11) Kuching, Sarawak. The early history of the FHS-AFS is closely linked with the Asian Fish Health Network (AFHN), which was initiated in 1985 with the support from the International Development Research Centre (IDRC), Canada. In 1989, the AFHN joined the Asian Fisheries Society (AFS) and the FHS was born as a formal section of the AFS. A year later, the FHS-AFS organized the 1<sup>st</sup> Symposium on Diseases in Asian Aquaculture (DAA1) in Bali, Indonesia.

What started in Bali in 1990 as a humble gathering has evolved as the biggest fish health event in Asia. Up until DAA10 in Bali in 2017, we managed to hold this symposium every 3 years for 27 years, which is impressive. To celebrate 30 years of the Symposium, we brought DAA11 to Malaysia, where the FHS-AFS was founded in 1989. DAA11 was initially planned to take place in 2020 but postponed to 2022 due to the Covid-19 pandemic. Due to travel restrictions associated with the pandemic, DAA 11 was organized as a virtual event.

DAA11 attracted 629 registered participants and 142 abstract submissions from 22 countries. With the theme of 'Land of Adventure: Exploring Aquatic Animal Health for Sustainable Aquaculture', DAA11 will cover wide ranges of aquatic animal health aspects including biosecurity in aquaculture, epidemiology, detection, prevention, and control of diseases in finfish, crustacean and shellfish. There are also sessions dedicated on trends in fish and shrimp health management. We hope this scientific programme will provide platforms for sharing knowledge, experience, and most importantly lessons learned of managing aquatic animal health in the region and beyond.

DAA11 is jointly organized by the FHS-AFS and the Malaysian Government. On behalf of the FHS-AFS, I would like to sincerely thank the Malaysian Government including the Sarawak Government, Ministry of Agriculture and Agro-Based Industry, and Department of Fisheries for their support and contributions to the organization of DAA11. This event will not be possible without the hard work of the DAA11 Technical Team of the National Organizing Committee. It is my duty to sincerely thank sponsors and exhibitors for their support to the event and to the Executive Committee and Senior Advisors of the FHS-AFS and the International Scientific Committee of DAA11 for their contributions to the development of a strong scientific programme. Last but not least, I would like to extend, my gratitude to the invited speakers and presenters for sharing their work at DAA11. I'm sure your talks will stimulate robust discussion and motivate the participants to further strengthen their networking in Asia and beyond. I hope all of you have a very productive symposium and look forward to seeing you in-person at DAA12 in 2025.

Best wishes,

**Dr Agus Sunarto**

Chairperson of the FHS-AFS



## *Welcome Message*

Dear Colleague and Friends,

On behalf of the Organizing Committee, I welcome all to the first ever virtual symposium on Diseases in Asian Aquaculture (DAA). While we regret that the COVID pandemic prevented us from holding the symposium in Kuching, we are excited about the opportunities of holding an innovative virtual symposium. The 11<sup>th</sup> DAA symposium marked the starts of new approaches and strategies, where the current pandemics have reminded us of our interconnectedness, that our health, animal health, and the environment are intrinsically linked - highlighting the urgent need to increase collaboration at the national,

regional, and global levels to address the issue of disease transmission in aquatic ecosystems, zoonotic diseases, antimicrobials resistance as well as aquatic animal welfare, promoting integrated and system based approach to One Health concept.

The DAA11 virtual will includes 4 days of information sharing, intellectual discussions and networking with strategic virtual exhibitions and trade displays covering wide range of topics on aquatic animal health management, development, and innovations presented by internationally recognized experts and researchers from all over Asia Pacific region and around the world. The symposium also provides an excellent platform for international partners to establish and enhance research collaborations, as well as market opportunities for aquatic products and aquaculture technologies. There will be ample time for virtual networking during the Symposium.

The promotion of aquatic animal health management is not just for specialists and scientists but for everyone in the community including farmers with lived experience, aquatic resources managers, veterinarians, aquatic animal health professional, academics, educators, students, all related fisheries industry players, and the general public. Reaching new frontiers requires fresh vision and novel strategies. Producing the symposium online fits perfectly with these aims as it will allow is to keep registration fees to a minimum and reach a wider audience than a traditional conference can possibly include.

I truly appreciate and thank our co-organizing partners, the Fish Health Section of the Asian Fisheries Society (FHS-AFS) and the Ministry of Modernization of Agriculture, Native Land and Regional Development (MANRED); our collaborators especially the Marine Fishery Resources Development and Management Department of the Southeast Asian Fisheries Development Center (SEAFDEC MFRDMD), Universiti Putra Malaysia (UPM), Universiti Malaysia Terengganu (UMT), Universiti Malaysia Sarawak (UNIMAS), International Islamic University Malaysia (IIUM), WorldFish, Malaysia Fisheries Society (MFS) dan Aquaculture Asia Pacific (AAP); and our sponsors; for their technical and financial supports, that has contributed towards the success of DAA11. My sincere appreciation also goes out to all the experts and researchers (who will be participating in the DAA11 Symposium), for their roles in sharing vital and beneficial scientific information as well as valuable experiences on aquatic animal diseases and prevention strategies, contributing and enriching the scientific, public, and private communities. I hope everyone will use these opportunities to enhance and build their capacity towards sustainable, stable, and competitive aquaculture industries for food security and aquatic ecosystem sustainability.

The virtual symposium represents an opportunity for DAA11 to inspire the world with a perspective of hope on research, diagnostics, and services of aquatic animal health in Asian aquaculture. We are certain all of you find this symposium stimulating, rewarding and meaningful.

We are looking forward to warmly welcoming you to DAA11 Virtual

**Haji Mohd Sufian Bin Sulaiman**

Director General of Fisheries Malaysia

Chairman of the National Organizing Committee for DAA11

# The Executive Committee of the Fish Health Section-Asian Fisheries Society (FHS-AFS ExeCom)

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Prof. Han-Ching Wang (Taiwan)  
Dr. Liang Yan (P.R. China)  
Ms. Varinee Panyawachira (Thailand)

#### **ePoster**

Dr. Siow-Foong Chang (Singapore)  
Dr. P.K. Pradhan (India)  
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Dr. Padilah Bakar (NaFisH)  
Dr. Azila Abdullah (NaFisH)  
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Ms. Noor Hanis Abu Halim (NaFisH)  
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Dr. Padilah Bakar (NaFisH)

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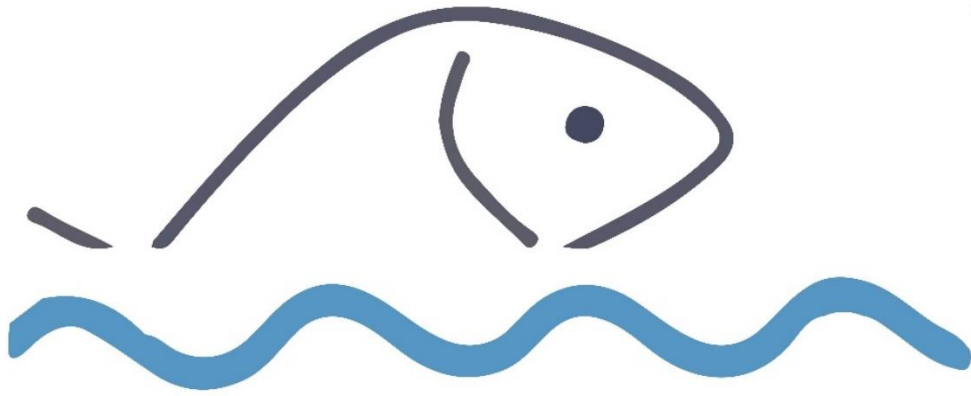
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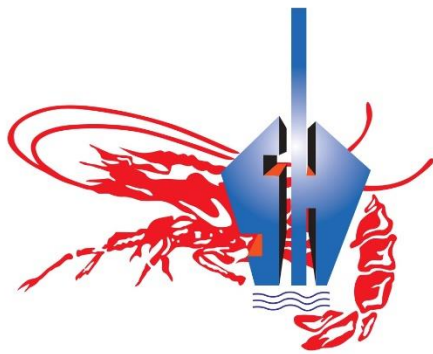
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# Program at a Glance

23<sup>rd</sup> -26<sup>th</sup> August 2022



DATE	MALAYSIA TIME (MYT), UTC +8	PROGRAM	Mode
DAY 1 23 <sup>rd</sup> August (Tuesday)	08:00 - 09:45	Registration	Hybrid
	09:50 - 10:30	Opening Ceremony	Hybrid
	10:40 -11:10	Plenary I – Dr. Melba B. Reantaso	Hybrid
	11:30 -17:00	Farmers Day for Malaysian Farmer	Physical
	Session 1: Biosecurity in Aquaculture		
	11:10 - 11:40	Keynote 1 – Dr. Edgar Brun	Virtual
	11:40 - 12:40	Oral Presentation	Virtual
	12:40 - 13:10	3-Minute Presentation	Virtual
	Session 2: Epidemiology (Parasitic, Bacterial and Viral Diseases)		
	14:00 - 14:30	Keynote 2 – Prof. Dr. Kenton L.I. Morgan	Virtual
	14:30 - 15:30	Oral Presentation	Virtual
	15:30 - 16:20	3-Minute Presentation	Virtual
	DAY 2 24 <sup>th</sup> August (Wednesday)	08:30 - 09:00	Plenary II – Dr. Rohana Subasinghe
Session 3: Detection Method/Diagnostic (Parasitic, Bacterial and Viral Diseases)			
09:00 - 09:30		Keynote 3 – Prof. Karin Pittman	Virtual
09:30 - 11:30		Oral Presentation	Virtual
11:30- 12:00		3-Minute Presentation	Virtual
Session 4: Prevention and Control Measures (Parasitic, Bacterial and Viral Diseases)			
14:00 - 14:30		Keynote 4 – Dr. Huang Jie	Virtual
14:30 - 15:45		Oral Presentation	Virtual
15:45 - 16:00		3-Minute Presentation	Virtual
16:00 – 16:30		Presentation of EoI to Host DAA12 in 2025	Virtual
DAY 3 25 <sup>th</sup> August (Thursday)	Session 5: Trends in Fish Health Management		
	09:30 - 10:10	Keynote 5 – Dr. Kua Beng Chu	Virtual
	10:10 - 15:00	Oral Presentation	Virtual
	15:30 - 16:00	3-Minute Presentation	Virtual
	16:00 – 19:00	The 12 <sup>th</sup> Triennial General Meeting of FHS-AFS (TGM12)	Virtual
DAY 4 26 <sup>th</sup> August (Friday)	Session 6: Trends in Shrimp Health Management		
	09:30 - 10:00	Keynote 6 – Prof. Chu-Fang Lo	Virtual
	10:00 - 12:15	Oral Presentation	Virtual
	14:45 - 15:25	3-Minute Presentation	Virtual
	15:25- 16:00	Presentation of upcoming DAA12	Virtual
	16:00 – 17:00	Awards & Closing Ceremony	Virtual

# Scientific Programme Schedule

Plenary	Keynote	Oral Presentation	3-Minute Presentation
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DAY 1: 23 August 2022 (Tuesday)	
SESSION 1: BIOSECURITY IN AQUACULTURE	
08:00 - 09:50	Registration
09:50 – 10:30	Opening Ceremony
Moderator: Dr. Eduardo Leano (Philippines/Thailand)	
10:40 – 11:10	<b>Plenary I: Drivers and pathways to disease emergence in aquaculture and possible solution</b> <i>Melba G. Bondad-Reantaso</i>
Moderator: Dr. Venmathi Maran Balu Alagar (Malaysia)	
11:10 - 11:40	<b>Keynote 1: Biosecurity and sustainability</b> <i>Edgar Brun</i>
11:40 - 11:55	<b>OP-01: Australia's new national aquatic animal disease reporting system</b> <i>Yuko Hood, Joshua Allas, Max de Kantzow and David Gale</i>
11:55 - 12:10	<b>OP-02: Diagnosis in a fish farmer's backpack</b> <i>Jerome Delamare-Deboutteville, Suvra Das, Oleksandra Silayeva, Shaun Wilkinson, Fernando Cagua, Ha Thanh Dong, Saengchan Senapin and Andrew C Barnes</i>
12:10 - 12:25	<b>OP-03: The threat of antimicrobial resistance and solutions in reducing antimicrobials use</b> <i>Ikhsan Natrah, Sarmila Muthukrishnan, Norfarrah Mohamed Alipiah, Md Yasin Ina-Salwany, Chong Chou Min, Low Chen Fei and Nurliyana Muhammad</i>
12:25 - 12:40	<b>OP-04: bioDOF-Map system, a web-based GIS application for mapping fisheries biosecurity activities in malaysia</b> <i>Eleanor Daniella Lokman, Norsida Man and Suhaida Aini</i>
Moderator: Assoc. Prof. Dr. Mohammad Noor Amal Azmai (Malaysia)	
12:40 – 12:55	<b>3MP-01: Occurrence, antibiotic resistance and plasmid profiling of <i>Vibrio</i> spp. isolated from cultured shrimps in Peninsular Malaysia</b> <i>Wan Haifa Haryani Wan Omar, Mohd Zamri-Saad, Mohammad Noor Azmai Amal, Natrah Fatin Mohd Ikhsan and Md Yasin Ina-Salwany</i>

12:40 – 12:55	<b>3MP-02: Fish kill events and harmful algae blooms in peninsular Malaysia waters</b> <i>Roziawati Mohd Razali, Nurin Izzati Mustapa and Harman Muhd-Farouk</i>
	<b>3MP-03: Presence of microplastics in fish parasites: a threat?</b> <i>Najihah Mohamad, Kua Beng Chu, Rohaiza Asmini Yahya, Muhammad Syafiq Musa and Ku Kassim Ku Yaacob</i>
	<b>3MP-04: Antimicrobial resistance surveillance from farmed aquatic foods in wet markets and antimicrobial use prevalence in Bangladesh's aquaculture</b> <i>Shafiq Rheman, Md. Abir Hasan, Laura Khor, Chadag Vishnumurthy Mohan and Jerome Delamare-Deboutteville</i>
	<b>3MP-05: An assessment on the emerging risks associated with aquaculture escapees: the Malaysian case studies</b> <i>Haslawati Baharuddin, Padilah Bakar, Rimatulhana Ramly, Mohamad Sufiyan Salmi, Iftikhar Ahmad Abdul Rafi and Kua Beng Chu</i>
13:00-14:00	Lunch
<b>SESSION 2: EPIDEMIOLOGY</b>	
Moderator: Dr. P. K. Pradhan (India)	
14:00 - 14:30	<b>Keynote 2: Investment, training, resources, rigor and speed a paradigm for aquatic epidemiology</b> <i>Prof. Dr. Kenton L.I. Morgan</i>
14:30 - 14:45	<b>OP-01: In <i>Litopenaeus vannamei</i> peritrophin regulates the pathogenesis of white spot disease and acute hepatopancreatic necrosis disease</b> <i>Ramya Kumar</i>
14:45 - 15:00	<b>OP-02: Description of a Fish Epidemiology and Health Economics (FEHE) survey tool for performance and risk factor assessment</b> <i>Laura Khor</i>
15:00 - 15:15	<b>OP-03: Molecular epidemiology of Megalocytivirus in Malaysian freshwater angelfish (<i>Pterophyllum scalare</i>)</b> <i>Sandra Catherine Zainathan, Che Azarulzaman Che Johan, Muhd Danish Daniel Abdullah and Sharifah Noor Emilia Syed Jamil Fadaak</i>
15:15 - 15:30	<b>OP-04: Characterisation of <i>Edwardsiella ictaluri</i> recovered from clinical disease outbreaks in <i>Pangasianodon hypophthalmus</i> farms in Vietnam over a twenty-year period</b> <i>Christopher Payne, Kathryn Grace, Vo Hong Phuong, Le Hong Phuoc and Margaret Crumlis</i>

Moderator: Dr. Neeraj Sood (India)

15:30 -16:20	<p><b>3MP-01: Occurrences of <i>Vibrio</i> spp. in the samples of cockles (<i>Tegillarca granosa</i>) and Green Mussels (<i>Perna viridis</i>) cultured along West Coast of Johor</b> <u>Azlina Apandi, Fadzilah Yusof, Mohd Lazim Mohd Saif, Azmi Rani and Mohd Farazi Jaafar</u></p>
	<p><b>3MP-02: TiLV: New threat to Malaysia's native fish species</b> <u>Afzan Muntaziana Mohd Pazai, Fahmi Sudirwan, Shahidan Hashim, Zuraidah Roli, Munira Murni, Suphia Amiera, Mohd Syafiq Mohd Ridzwan and Azila Abdullah</u></p>
	<p><b>3MP-03: The surveillance of parasitic infestation on green mussels (<i>Perna viridis</i>) in several culture spots in West Coast Johor Water</b> <u>Mohd Lazim Saif, Azmi Rani, Fadzilah Yusof, Azlina Apandi and Mohd Farazi Jaafar</u></p>
	<p><b>3MP-04: Characterisation of pathogenic <i>Aeromonas</i> species from diseased tilapia and catfish farmed in East Nusa Tenggara, Indonesia</b> <u>Heri Kurniawan, Jimmy F. Turnbull, Andrew P. Desbois and Mags Crumlish</u></p>
	<p><b>3MP-05: Bacterial microbiota of freshwater prawn, <i>Macrobrachium rosenbergii</i> (de Man, 1879) cultured in cages and ponds in the Philippines</b> <u>Ma-ann Camarin, Erlinda Cruz-Lacierda, Rolando Pakingking Jr., Rex Ferdinand Traifalgar, Nathaniel Añasco and Mark Lawrence</u></p>
	<p><b>3MP-06: Occurrence of Tilapia Lake Virus (TiLV) in tilapia and tinfoil barbs at wild and culture sites in Malaysia</b> <u>Azila Abdullah, Afzan Muntaziana Mohd Pazai, Mohd Syafiq Mohammad Ridzuan, Munira Murni, Aina Nabila Abdul Rahman, Zuraidah Roli and Rimatulhana Ramly</u></p>
	<p><b>3MP-07: <i>In-vitro</i> antimicrobial activity of probiotics incorporated with micro feed against pathogenic <i>Vibrio parahaemolyticus</i></b> <u>Danial Iman, Fadhil Syukri, Siti Hajar Othman and Murni Karim</u></p>
	<p><b>3MP-08: Infectivity and genome persistence of Tilapia tilapinevirus in water samples</b> <u>Jidapa Yamkasem, Tharinthon Prasartset, Puntanat Tattiyapong, Kwanrawee Sirikanchanad and Win Surachetpong</u></p>
	<p><b>3MP-09: Global seahorses diseases: A review</b> <u>Marjorie Charam and Kua Beng Chu</u></p>
	<p><b>3MP-10: Genomes and virulence factors of novel <i>Pseudomonas koreensis</i> strain Isolated from aquaculture farm in Kuching, Sarawak, Malaysian Borneo</b> <u>Cindy Jia Yung Kho, Melinda Mei Lin Lau and Hung Hui Chung</u></p>

<b>DAY 2: 24 August 2022 (Wednesday)</b>	
<b>SESSION 3: DETECTION METHOD/DIAGNOSTIC (PARASITIC, BACTERIAL &amp; VIRAL DISEASES)</b>	
<b>08:00 - 08:30</b>	<b>Registration</b>
<b>Moderator: Dr. Agus Sunarto (Indonesia/Australia)</b>	
<b>08:30 - 09:00</b>	<b>Plenary II: State of global aquaculture</b> <i>Rohana Subasinghe</i>
<b>Moderator: Dr. Yuko Hood (Australia)</b>	
<b>09:00 - 09:30</b>	<b>Keynote 3: Fish wear their immune system on the outside-what this means for aquaculture and ecology</b> <i>Pittman Karin, Merkin Grigory, Okubamichael Mearge, Powell Mark, Andersen Linda and Carlo C. Lazado</i>
<b>09:30 - 09:45</b>	<b>OP-01: Profile of protein isolated from mucus of infected <i>Oreochromis</i> spp</b> <i>M. Faizal, M. Nur-Nazifah, M.R. Syafiq, G. Wan Norazlan, A. Azila and R. Rimatulhana</i>
<b>09:45 - 10:00</b>	<b>OP-02: Rapid CRISPR-based platforms for detection of major pathogens in penaeid shrimp and fish</b> <i>Thawatchai Chaijarasphong, Suthasinee Kanitchinda, Thanwarat Sukonta, Thanyawit Thammachai, Saengchan Senapin, Kallaya Sritunyalucksana, Pimkhuan Hannantanan, Jiraporn Srisala, Rungkarn Suebsing, Watcharachai Meemetta, Suwimon Taengphu and Mintra Kitthamarat</i>
<b>10:00 - 10:30</b>	<b>Virtual Tea break</b>
<b>10:30 - 10:45</b>	<b>OP-03: Application of a specific antibody to localize Tilapia Lake Virus (TiLV) in fish tissues using immunohistochemistry</b> <i>Puntanat Tattiyapong, Chutchai Piewbang, Somporn Techangamsuwan and Win Surachetpong</i>
<b>10:45 - 11:00</b>	<b>OP-04: An intelligent protozoan white spot fish disease detection</b> <i>Siti Naquiah Md Pauzi, Amiera Syazlin Md Azhar, Nor Hazlyna Binti Harun, Mohamad Ghozali Hassan, Noraini Yusoff and Kua Beng Chu</i>
<b>11:00 - 11:15</b>	<b>OP-05: Gut metagenome analyses of healthy and diseased tilapia <i>Oreochromis niloticus</i> cultured in Bangladesh</b> <i>Mohammad Shamsur Rahman, Nusrat Jahan Punom, Mst. Sabrina Akter, Md. Mostavi Enan Eshik, Shawon Ahmmed, Md Golam Rabbane and Mst. Khadiza Begum</i>
<b>11:15 - 11:30</b>	<b>OP-06: Glucose and glutamine contribute to de novo nucleotide synthesis to support viral pathogenesis</b> <i>Cong-Yan Chen, Der-Yen Lee, Shih-Shun Lin, Chun-Hung Liu and Han-Ching Wang</i>



<b>Moderator: Dr. Ng Wing Keong (Malaysia)</b>	
<b>11:30 – 12:00</b>	<p><b>3MP-01: Mass mortalities of golden pomfret (<i>Trichinotus blochii</i>) associated with oxygen crisis, multiple infections of parasites and <i>Vibriosis</i> at floating cages Pulau Aman, Penang</b>  <u>Padilah Bakar, Rimatulhana Ramly, Fahmi Sudirwan and Kua Beng Chu</u></p>
	<p><b>3MP-02: Experimental co-infection of Tilapia Lake Virus and <i>Streptococcus agalactiae</i> in red hybrid tilapia (<i>Oreochromis niloticus</i> × <i>O. mossambicus</i>) model</b>  <u>Lukman Basri, Mohammad Noor Amal Azmai, Mohd Zamri Saad, Ina Salwany Md. Yassin, Annas Salleh and Yasmin Abd Rahman</u></p>
	<p><b>3MP-03: Investigation of culture condition inducing viable but non-culturable (VBNC) state in <i>Nocardia seriolae</i></b>  <u>Akito Hayashi, Megumi Matsumoto, Motohiko Sano and Goshi Kato</u></p>
	<p><b>3MP-04: Mucosal responses in giant freshwater prawn, <i>Macrobrachium rosenbergii</i> fed with diet containing natural feed premix</b>  <u>Imelda Rantty, Siti Rokhaiya Biollah, Karin Pittman, Kho Li Yung and Siti Hawa Mohamad Ali</u></p>
	<p><b>3MP-05: Experimental challenges studies on pathogenicity of <i>Edwardsiella ictaluri</i> in striped catfish, <i>Pangasianodon hypophthalmus</i> (Sauvage)</b>  <u>Amira Syahidah Nordin, Mubarak Muhyuddin Noor Zainy, Muhammad Ansarullah Mohd Subari and Nur Nazifah Mansor</u></p>
	<p><b>3MP-06: Pathogenicity and LD<sub>50</sub> of <i>Pangasius nasutus</i> against <i>Edwardsiella ictaluri</i> through injection method</b>  <u>Syafiq Syauqi and Nur Nazifah Mansor</u></p>
	<p><b>3MP-07: <i>In-vivo</i> expression of Acute Hepatopancreatic Necrosis Disease related virulence genes in <i>Vibrio parahaemolyticus</i> and <i>V. harveyi</i> and its virulence towards <i>Penaeus vannamei</i> (Boone, 1931)</b>  <u>Sarmila Muthukrishnan, Mohamed Shariff, Ina-Salwany M. Y, Fatimah Md Yusoff and I. Natrah</u></p>
	<p><b>3MP-08: Phenotypic characterization of <i>Edwardsiella ictaluri</i> Isolated from cage-cultured <i>Pangasianodon hypophthalmus</i></b>  <u>Rimatulhana Ramly, Nur Erina Syahira Abd Talib, Amira Syahidah Nordin and Nur Nazifah Mansor</u></p>
	<p><b>3MP-09: PvRaf knockdown using RNA interference increased survival of <i>Litopenaeus vannamei</i> infected with White Spot Syndrome Virus</b>  <u>Joseph Carlo V. VergeJ and Mary Beth B. Maningas</u></p>
	<p><b>3MP-10: <i>In-vitro</i> evaluation of potential probiotics strain in biofilm formation</b>  <u>Sow Cyn Shieng, Fatimah Md Yusoff, Chong Chou Min, Jasmin M.Y and Murni Karim</u></p>
<b>12:00 - 14:00</b>	<b>Lunch</b>

<b>DAY 2: 24 August 2022 (Wednesday)</b>	
<b>SESSION 4: PREVENTION &amp; CONTROL MEASURES (PARASITIC, BACTERIAL &amp; VIRAL DISEASES)</b>	
<b>Moderator: Dr. Sandra Catherine Zainathan (Malaysia)</b>	
<b>14:00 - 14:30</b>	<b>Keynote 4: Emerging aquatic animal diseases and response actions to their emergencies in Asia and the Pacific Region</b> <i>Jie Huang</i>
<b>14:30 - 14:45</b>	<b>OP-01: Towards heuristic design of vaccines: Transforming transposon insertion sequencing (TIS) for identification of novel <i>in-vivo</i> virulence factors in fish pathogen</b> <i>Qiyao Wang</i>
<b>14:45 - 15:00</b>	<b>OP-02: Application of natural products: an effective approach to control fish parasites in aquaculture</b> <i>B. A. Venmathi Maran</i>
<b>15:00 - 15:15</b>	<b>OP-03: In silico selection and characterization of DNA aptamers against <i>Vibrio parahaemolyticus</i> LuxP periplasmic receptor protein</b> <i>Low Chen Fei, Siti Aisyah Razali, Nur Afiqah Md Yusof, Azyyati Mohd. Padzil, Syarul Nataqain Baharum, Nurul Hanun Ahmad Raston, Chong Chou Min, Natrah Fatin Mohd Ikhsan, Sarmila A/P Muthu Krishnan and Magdalena Lenny Situmorang</i>
<b>15:15 - 15:30</b>	<b>OP-04: Potential practical application of a live attenuated vaccine against herpesviral hematopoietic necrosis of goldfish</b> <i>Hiroaki Saito, Shungo Minami, Manami Yuguchi, Aiko Shitara, Hidehiro Kondo, Goshi Kato and Motohiko Sano</i>
<b>15:30 - 15:45</b>	<b>OP-05: Active and passive immune responses and protection of Nile tilapia (<i>Oreochromis niloticus</i>) immunized with Tilapia Lake Virus inactivated vaccines</b> <i>Thao Thu Mai, Pattanapon Kayansamruaj, Suwimon Taengphu, Chayanit Soontara, Pattarawit Kerddee, Dinh-Hung Nguyen, Saengchan Senapin, Janina Z. Costa, Jorge del-Pozo, Kim D. Thompson, Channarong Rodkhum and Ha Thanh Dongi</i>
<b>Moderator: Dr. Chang Siow Foong (Singapore)</b>	
<b>15:45 – 16:30</b>	<b>3MP-01: Organic acid profiles of three potential probiotics from whiteleg shrimp, <i>Litopenaeus vannamei</i></b> <i>Jikon Alvion J. Denwinner, Ang Chun Yao, Annita Yong Seok Kian, Lim Leong Seng, Sujjat Al-Azad, Francis Yong and Mohammad Tamrin Mohamad Lal</i>
	<b>3MP-02: Field assessments of oral vibrio vaccine indicate the potential for protection against Vibriosis in hybrid grouper, <i>Epinephelus fuscoguttatus</i> × <i>Epinephelus lanceolatus</i></b> <i>Aslah Mohamad, Md Shirajum Monir, Mohd Zamri Saad, Mohammad Noor Amal Azmai, Nurhidayu Al-saarie and Ina-Salwany Md Yasin</i>
	<b>3MP-03: Field efficacy of a feed-based inactivated <i>Vibrio harveyi</i> vaccine against vibriosis in cage-cultured asian seabass, <i>Lates calcarifer</i></b>

<b>15:45 – 16:30</b>	<i>Zahaludin Amir Danial, Aslah Mohamad, Mohd Zamri Saad, Mohammad Noor Amal Azmai, Annas Salleh and Ina-Salwany Md Yasin</i>
	<b>3MP-04: <i>In-vitro</i> antimicrobial activity of plant extracts against fish pathogenic bacteria</b> <i>Siti Hawa Mohamad Ali, Imelda R., Kho LY., Siti Rokhaiy B. and David Y.</i>
	<b>3MP-05: Control of <i>Aeromonas</i> sp infection in nursery stage of <i>Pangasius nasutus</i> (Bleeker, 1863) through Bio-encapsulation of Herbal Extract; SirehMax in Live Feed</b> <i>Iftikhar Ahmad A. R., Hanan M. Y., M. Zudaidy J. and Nik Haiha N. Y</i>
	<b>3MP-06: Assessment of inhibitory properties of potential probiotics isolated from <i>Aeromonas hydrophilla</i> and <i>Streptococcus agalactiae</i></b> <i>Shafiq Johar</i>
	<b>3MP-07: Ultrafiltration membrane technology for virus mitigation control strategy in indoor shrimp farming system</b> <i>Norhafiza Ilyana Yatim, Diyana Kamarudin, N. Ali, S.C. Zainathan and S.N.K. Addis</i>

<b>DAY 3: 25 August 2022 (Thursday)</b>	
<b>SESSION 5: TRENDS IN FISH HEALTH MANAGEMENT</b>	
<b>09:00 - 09:30</b>	<b>Registration</b>
<b>Moderator: Dr. Supraneer Chinabut (Thailand)</b>	
<b>09:30 - 10:00</b>	<b>Keynote 5: Malaysian experiences: Environment-friendly alternatives to chemicals in aquatic animal health management</b> <i>Kua Beng Chu, Padilah Bakar, Ahmad Baihaqi Othman, Rohaiza Asmini Yahya and Wan Norhana Md. Noordin</i>
<b>10:00 - 10:15</b>	<b>OP-01: IgY as immunoprophylaxis in aquaculture</b> <i>Chou Min Chong, Phek Har Chua, Mohd Shafiq Mohd Nor, Nur Syahirah Yahya and Natrah Fatin Mohd Ikhsan</i>
<b>10:15 - 10:30</b>	<b>OP-02: <i>The effects of oral feed-based vaccination against vibriosis on gut microbiome of Asian seabass</i></b> <i>Jumria Sutra, Amalia Mohd Hashim, Mohd Termizi Yusof, Nurhidayu Al Saari, Ina Salwany Md Yusof and Mohammad Noor Amal Azmai</i>
<b>10:30 – 11:00</b>	<b>Virtual Tea break</b>
<b>11:00 - 11:15</b>	<b>OP-03: Ectoparasites recovered from whole cage freshwater treatment on cultured marine fish disease outbreak in floating cages</b> <i>Leong Tak Seng</i>

11:15 - 11:30	<b>OP-04: The prospect of using aptamers and digital aptasensors for real-time surveillance of diseases in aquaculture</b> <i>Tang Kok Mun</i>
11:30 - 11:45	<b>OP-05: Zoonotic potential of Group B Streptococcus in aquaculture</b> <i>Snehashish Snehashish, Ina Salwany Md Yasin, Syafinaz Amin Nordin and Mohammad Noor Amal Azmai</i>
11:45 - 12:00	<b>OP-06: Phytobiotic-based additive for consistently improved gut integrity and health across species</b> <i>Ruth Garcia Gomez, M. M. Isern Subich and W. G. Nuez Ortinc</i>
12:00 – 12:15	<b>OP-07: Refolded recombinant major capsid protein (MCP) from Infectious Spleen and Kidney Necrosis Virus (ISKNV) effectively stimulates serum specific antibody and immune related genes response in Nile tilapia (<i>Oreochromis niloticus</i>)</b> <i>Sarocho Jitrakorn, Boonyalit Throngnumchai, Triwit Rattanarojpong and Vanvimon Saksmerprom</i>
12:15 - 14:00	<b>Lunch</b>
14:00 - 14:15	<b>OP-08: Effects of <i>Piper betle</i> extract supplementation diet as a natural antibiotic growth promoter (NAGP) to kelah (<i>Tor tambroides</i>)</b> <i>Hanan Mohd Yusof, Ahmad Baihaqi Othman, Nik Haiha Nik Yusoff, Muhd Zudaidy Jaapar, Azila Abdullah, M Firdaus Nawi and Nur Nazifah Mansor</i>
14:15 - 14:30	<b>OP-09: In-vitro responses of peritoneal macrophages of marine red hybrid tilapia (<i>Oreochromis spp.</i>) model to vibriosis: A comparative study between vaccinated and non-vaccinated fish</b> <i>Tilusha Manchanayake, Ina Salwany Md. Yassin, Mohammad Noor Amal Azmai, M. Zamri Saad, Mohd Firdaus Nawi and Annas Salleh</i>
<b>Moderator: Dr. Andy Shinn (United Kingdom/Thailand)</b>	
14:30 – 15:15	<b>3MP-01: The Effect of Different Concentration of Probiotics (Lacto-sacc) Mixtures on Growth Performance and Feed Utilization of Empurau (<i>Tor tambroides</i>) Fingerlings</b> <i>Sing Ying Chua, Roslianah Asdari and Mohammad Bodrul Munir</i>
	<b>3MP-02: The effect of commercial cinnamon essential oil (EOCIN) against bacterial infection in farmed red snapper (<i>Lutjanus argentimaculatus</i>)</b> <i>Noor Hanis Abu Halim, Padilah Bakar, Rohaiza Asmini Yahya, Nurhidayati Ahmad Sobri, Wan Rozana Wan Ahmad and Kua Beng Chu</i>
	<b>3MP-03: The Management of Reared Tiger Grouper (<i>Epinephel us fuscoguttatus</i>) Infected with Marine Leech (<i>Zeylanicobdella arugamensis</i>)</b> <i>Fadzilah Yusof, Azmi Rani, Mohd Lazim Saif Azlina Apanidi and Mohd Farazi Jaafar</i>
	<b>3MP-04: Preliminary study of water quality in relation to benthic organism under aquaculture cages situated in Rambungan River, Lundu</b> <i>Kho Li Yung, Imelda R, Siti Hawa MA, David Y and Siti Rokhaiya B</i>
	<b>3MP-05: Dietary lacto-sacc improved growth performance and basic haematological parameters in empurau (<i>Tor tambroides</i>) fries reared in the aquaponics system</b>

	<i>Mohammad Bodrul Munir, Sharifah Lia Farliana Wan Alias and Roslianah Asdari</i>
14:30 – 15:15	<b>3MP-06: Field evaluation of palm oil adjuvanted feed-based streptococcosis vaccine efficacy in red hybrid tilapia</b> <i>Mohd Syafiq Mohammad Ridzuan, Azila Abdullah, Mohd Firdaus Nawawi, Norazzida Ramli and Hanan Mohd Yusof</i>
	<b>3MP-07: Disinfection of rotifer, <i>Brachionus plicatilis</i> leading to bacteria-free populations using SirehMAX™ solution</b> <i>Nur Fatin Afifah Osman Manah, Mohd Salleh Hasan, Nur Atikah Azmi, Shaharah Mohd Idris, Azila Abdullah and Nur Nazifah Mansor</i>
	<b>3MP-08: Development of acquired immune system in striped catfish <i>Pangasianodon hypophthalmus</i></b> <i>Dung Nguyen Ngoc, Oanh Dang Thi Hoang, Motohiko Sano and Goshi Kato</i>

DAY 4: 26 August 2022 (Friday)	
SESSION 6: TRENDS IN SHRIMP HEALTH MANAGEMENT	
09:00 - 09:30	Registration
Moderator: Prof. Dr. Kallaya Sritunyalucksana (Thailand)	
09:30 - 10:00	<b>Keynote 6: The quorum sensing (QS) system modulates virulence of <i>Vibrio parahaemolyticus</i> AHPND by regulating the expression of the pirAvp/pirBvp genes through AphBvp</b> <i>Chu-Fang Lo, Shin-Jen Lin and Hao-Ching Wang</i>
10:00 - 10:15	<b>OP-01: <i>Piper betle</i> L. leaf extracts inhibit quorum sensing of shrimp pathogen <i>Vibrio harveyi</i> and protect <i>Penaeus vannamei</i> postlarvae against bacterial infection</b> <i>John Paul Matthew D. Guzman, Pattanan Yatip, Chumporn Soowannayan and Mary Beth B. Maningas</i>
10:15 - 10:30	<b>OP-02: Involvement of white spot syndrome virus viral proteins in modulating shrimp glycolysis</b> <i>Yen Siong Ng, Saengchan Senapin, Pakkukul Sangsuriya and Han-Ching Wang</i>
10:30 - 10:45	<b>OP-03: Shrimp GDH may be regulated by SIRT4 during WSSV replication</b> <i>Tan Yu Kent and Han-Ching Wang</i>
10:45 – 11:15	Virtual Tea break
11:15 - 11:30	<b>OP-04: WSSV-induced metabolic reprogramming in shrimp hemocytes to benefit its re0lication</b> <i>Han-Ching Wang</i>



11:30 - 11:45	<b>OP-05: Quorum quenching activity in microalgae and its associated bacteria: an alternative antimicrobial therapeutics</b> <i>Sarmila Muthukrishnan, Natrah Fatin Mohd Ikhsan and Nur Ain Yahya</i>
11:45 - 12:00	<b>OP-06: Microbiome signatures from stocking to emergency harvest in Thailand <i>Penaeus vannamei</i> pond experienced Yellow Head Virus outbreak</b> <i>Anuphap Prachumwat, Wiraya Eamsaard, Piyanuch Wechprasit, Apirak Hoonlor, Diana Minardi, Grant D. Stentiford and Kallaya Sritunyalucksana</i>
12:00 - 12:15	<b>OP-07: Dietary montmorillonite clay protected <i>Penaeus vannamei</i> challenged with <i>Vibrio parahaemolyticus</i> (AHPND) and modulated stomach microbiota of shrimp Survivors</b> <i>Wing-Keong Ng, Mei-Ling Mong and Abdul Azim Abdul Hamid</i>
12:15 - 14:45	<b>Lunch</b>
<b>Moderator: Dr. Chadag Vishnumurthy Mohan (India/Malaysia)</b>	
14:45 – 15:25	<b>3MP-01: The effectiveness of probiotic Used in super intensive culture of white shrimp (<i>Penaeus vannamei</i>) for its health and water quality management</b> <i>Azmi Rani, Fadzilah Yusof, Mohd Lazim Saif Azlina Apandi and Mohd Farazi Jaafar</i>
	<b>3MP-02: Preliminary study on the effect of moist formulated feed on health status of disease infected <i>Penaeus monodon</i> broodstock</b> <i>Mohammed Suhaimie Abd Manaf, Mohd Firdaus Azmi, Nor Aida Suzana Abdul Rahman and Rosnani Yaakub</i>
	<b>3MP-03: Blue-green algae and assessment of microcystin in shrimp aquaculture farms of Sarawak</b> <i>Lim Mui Hua</i>
	<b>3MP-04: Scientometrics of climate change and shrimp disease: An overview</b> <i>Mohamad N. Azra, Mohd Ihwan Zakariah, Mohd Iqbal Mohd Noor and Mazlan Abd Ghaffar</i>
	<b>3MP-05: Microsporidian parasite, <i>Enterocytozoon hepatopenaei</i> at early stage of culture of whiteleg shrimps (<i>Peneaus vannamei</i>) in West Malaysia</b> <i>Rohaiza Asmini Yahya, Padilah Bakar, Wan Muhammad Hazim Wan Sajiri, Nur Samihah Mazlan, Nur Ashikin Arbi and Kua Beng Chu</i>
	<b>3MP-06: Unveiling the potential of medicinal plants in combating shrimp Acute Hepatopancreatic Necrosis Disease (AHPND) disease</b> <i>Tan Wen Chian, Nisha Krishnan, Loh Jiun Yan, Baskaran Gunasekaran and Hok Chai Yam</i>
15:25 - 16:00	<b>Presentation of upcoming DAA12</b>

## **In-vitro responses of peritoneal macrophages of marine red hybrid tilapia (*Oreochromis* spp.) model to vibriosis: A comparative study between vaccinated and non-vaccinated fish**

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Vibriosis, an infection caused by Gram-negative bacteria of the genus *Vibrio* is a major disease in global aquaculture. Vaccination is an effective preventive measure against vibriosis. Phagocytosis, the fundamental cellular mechanism that eliminates invading pathogens is governed by phagocytic cells like macrophages and neutrophils. To gain insight into the mechanism of vaccination and its role in influencing macrophage activity in reducing the number of live *Vibrio* species prior to the establishment of infection in the host, *in vitro* responses of peritoneal macrophages of vaccinated and unvaccinated marine red hybrid tilapia were compared in terms of phagocytosis, intracellular killing, and macrophage death rates. A total of 90 healthy marine red hybrid tilapia were divided into three equal groups. Group 1 and 2 were vaccinated using feed-based oil-adjuvanted and non-adjuvanted killed whole cell *V. harveyi* vaccine, respectively. Group 3 was not vaccinated. Vaccine feed was given on weeks 0, 2 and 6. Peritoneal macrophages were collected at week 0 and 10. Macrophages were exposed to *V. harveyi* or *V. alginolyticus* and harvested at 0-, 30-, 60- and 120-minutes post-infection. The rate of phagocytosis, intracellular killing rate of bacteria and rate of macrophage cell death were calculated. In general, post-vaccinated macrophages of all treatment groups showed a significant ( $p < 0.05$ ) increase in phagocytosis than pre-vaccinated macrophages following *V. harveyi* and *V. alginolyticus* challenge. Macrophages of post-vaccine oil-adjuvanted group showed significant ( $p < 0.05$ ) increase in intracellular killing of *V. harveyi* and *V. alginolyticus*. Macrophages of post-vaccinated Group 2 fish showed higher cell death rate following *V. harveyi* and *V. alginolyticus* infection than that of post-vaccinated Group 1 fish. This study proved that the macrophages of tilapia immunized with oil-adjuvanted vaccine were more efficient in phagocytosis, intracellular killing, and more resistance compared to non-adjuvanted vaccinated and unvaccinated tilapia in the presence of *V. harveyi* or *V. alginolyticus*.

**Keywords:** *Vibrio harveyi*, *Vibrio alginolyticus*, vibriosis, marine tilapia, fish peritoneal macrophages, immunofluorescence

### **Short Biography**

Dr. Manchanayake is a PhD student at the Faculty of Veterinary Medicine, University Putra Malaysia. She completed her MSc in Aquatic Resource Management and Aquaculture from the University of Peradeniya, Sri Lanka. She served as a Veterinary Researcher at the Veterinary Research Institute, Sri Lanka. Dr. Manchanayake has authored several publications in various journals and books. His publications reflect his research interests in Veterinary Pathology.



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Hajar Rastegari  
Haslawati Baharuddin  
Hidayah Manan  
Hirzahida Mohd Padil (record not found)  
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Hon Jung Liew  
Hung-Hui Chung  
Ina- Salwany Md Yasin  
Jackie Peter  
Jeffry Ling  
Jerome Delamare-Deboutteville  
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Kua Beng-Chu  
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Mohamad Nor Azra Md Adib  
Mohammad Munir  
Mohammad Noor Amal Azmai  
Murni Karim  
Natrah Fatin Mohd Ikhsan  
Naziah Muntil  
Ng Wing-Keong  
Noor Affizah  
Nor Azman Kasan  
Norhafiza Ilyana Yatim  
Nur Athirah Mohd Jazman  
Nur Fatimah Abd Halid  
Nur Nazifah Mansor  
Padilah Bakar  
Reza Heydari  
Rimatulhana Ramly  
Roslianah Asdari  
Roslina Ahmad Nawawi  
Samsur Mohamad  
Sandra Catherine Zainathan  
Shaharah Mohd Idris  
Shuhadah Mustapha  
Siti Norita Mohamad  
Sylmie Al-Harir  
Tak Seng Leong  
Tilusha Manchnayake  
Venmathi Maran Balu Alagar  
Putri Nurul Sikira Mustaffa  
Aida Nabilla  
Waiho Khor  
Wan Norhana Md Noordin  
Mohd Firdaus Naw  
Abdul Hafiz Mohd. Zaki  
Abdul Hakim  
Abdul Halim Yousof  
Abdul Rahman Ahmad Pauzi

Nazri Ishak  
Ng Kooi tiam  
Pang Anak Nyukang  
Nik Ahmad Tarmizi Nik Ismail  
Nik Nazli Effendy Ramli  
Nordiskandar Nor Tajudin  
Nummeran Mohd Nordin  
Nurassyaima Kamari  
Nurdin Shafie  
Osman Hamzah  
Perceval Conder  
Raja Yana Meleessa Raja haron Arashid  
Rizman Zulkarnaen Suardi  
Rizwan Nordin  
Roslan Abu Hasan  
Roslee Dela Cerna  
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Ruzaidi Mamat  
Ryanto Saifuddin  
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Sabda Safiee  
Saiful Azuan Jamalludin  
Shafiq Rheman  
Shahidan Hashim  
Shahrul Naim Abd. Razak  
Shahrul Nizam Baharuddin  
Shallehuddin Abdul Taib  
Shamsol Muhammad  
Simen Mudin  
Snehashish Snehashish  
Sow Cyn Shieng  
Sufian Ahmad  
Sukri Deris  
Syafiq Johar  
Syafiq Syauqi  
Syed Amirrudin Syed Suhaini  
Syed Mohamad Azim Syed Mahiyuddin  
Syed Yusuf Wan Drahman  
Teoh Pik Neng  
Tn. Mohd. Hakimi Tn. Mood  
Wan Amizan Wan Ahmad  
Yau Chang Siew  
Zahaludin Amir Danial  
Zaidil Abdilla Ahmad Salehuddin  
Zainal Hanapi  
Zakaria Che Din  
Noraini Md Nor  
Adillah Ibrahim  
Afzan Muntaziana Mohd Pazai  
Ainul Riza Abu Seman  
Aminah bt. Ignasius  
Amy Aineda Omar  
Amy Noor Zaina Amir Hamzah  
Anis Mazidah Abd Samad  
Aqilah Mohd. Yusof  
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Azlina Apandi  
Azura bt. Markus  
Azwa Abdul Hamid  
Chai Pui Shan

Abdul Razak Man  
Abdul Razak Hamzah  
Abdullah bin Jaafar

Abu Bakar Al-Siddiq Abd Salam  
Abu Bakar Tumin  
Abu Yazid Yusnizab Muhammad  
Affan Nasruddin Roshidi  
Ahmad Fauzi Mohd Khosim  
Ahmad Helmi Hj. Chik  
Ahmad Najmi Nasruddin  
Ahmad Redzuan Ramli  
Ahmad Rohaimae Abdullah  
Ahmad Sabri Katiman  
Ahmad Saifullah Mohammad  
Aiman Zulkilee  
Albert Apollo Chan  
Alistair Patrick  
Alvin Aldreen  
Alvin Clinton Anak Suder  
Amadi Tubah  
Amar Fakar Adzuan Roslan  
Amer Shahjehan Hassan  
Amir Hamzah Ramli  
Arifin Drahan  
Arthur Besther Sujang  
Aslah Mohamad  
Asrani Abdullah  
Azaharie Anuar  
Azizul Abu Hasan  
Azmi Rani  
Azri Md Yusoff  
Azrim Sulong  
Bakri Saad  
Basri Abd. Rashid  
Basri Man  
Benedict Iber  
Brendan Tan Heng Wee  
Buniamin bin Kiprawi  
Che Shahidi Che Mod  
Che Zulkifli Che Ismail  
Chin Han Kiat  
Chrysostom anak Thomas  
Danial Iman Haris Nor Azma  
David Yambun  
Dokanaer Kasto Anak Muning  
Dzulfikkar Baitul Ma'mur  
Fairol Tajuddin Suhaili  
Faizal Ibrahim Suhaili  
Fakhruddin Bokhari  
George Bobby  
Hafiz Syahri  
Mohd Sofi Yaacob  
Hanan Mohd Yusof  
Hasbullah bin Harun  
Hasyaruddin Abdul Halim  
Haziq Aiman  
Hilal Abd Aziz  
Darhan Nawawi  
Zainudin Abd. Wahab  
Iftikhar Ahmad Abdul Rafi  
Irfan Hakimi

Cindy Kho Jia Yung  
Dayang Zafirah Abang Jashmady  
Doreen Wee Siew Leen  
Emylin Badut  
Erin Tan  
Fadzilah Yusof  
Faizah Nor Mohamed  
Faridah Zulkefly  
Haliza Sulaiman  
Hanisah Azmi  
Haryati Abd. Wahab  
Hasaniah Ahmad Kamalluddin  
Hasnisa Abdul Hamid  
Hazreen Nita Mohd Khalid  
Hemalatha Raja Sekaran  
Hidaya Dmulliany Mohd Sidek  
Iffah Nadhirah  
Intan Nurlemsha Baharom  
Jafrizah bt. Abd. Razak  
Kamisa Ahmad  
Keni Anak Ngijwol  
Khaitrul Ediana Mohd Tahir  
Khazlita Adzim  
Kho Li Yung  
Lim Ai Gaik  
Liyana Ramli  
Liza Long  
Lourdemary George  
Mariam Marip  
Maznah Yusoff  
Munirah Zainol Abidin  
Muslihah Abdul Rahaman  
Najihah Mohamad  
Bakri bin Miswan  
Noor Amira bt. Muslim  
Noor Asma bt. Mohammad  
Noor Hasmayana bt. Yahaya  
Noor Ikhwanie Zainal  
Noor Suhailis Zelani  
Nor Asnisawati bt. Yusof  
Nor Azlina Abdul Rahman  
Nor Haida Ishak  
Nor Khalilah bt. Zainuddin  
Noor Mahya Yusof  
Nor Mastura Hasan  
Noraisah Zainuddin  
Noraishah bt. Hashim  
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Norashikin Daliyana  
Norasmah Mantali  
Norhabina Abd. Aris  
Noridayu Alias  
Norma Said  
Normadiha Mat Nor  
Nur Amirah Nazirah Jasemi  
Nur Aqilah Mohd Salim  
Nur Ashikin Arbi  
Nur Erna Liyana Adam  
Nur Fadhilah Zainul Mustaffa  
Nur Fatin Afifah Osman Manah

Irwan Paiman  
J. Denwinner Jikon  
Jackson Clive Jusak  
Jamil Musel  
Jidy Joseph  
Johari Tim  
Ka Hong Tee  
Kaharudin Md. Salleh  
Kamarul Anwar Mohamed Zabri  
Kasim Tawe  
Kok Mun Tang  
Kon Yeu Hooi  
Liew Vui Kien  
Lindy Enggong  
Lukman Basri  
Luther Moguup John  
Mamat Amin Abd. Rahman  
Marzie Ryn Romin  
Marzuki Morad  
Mohamad Azlan Amran  
Mohamad Fitri Arris  
Mohamad Ikraf Mohamad Sharif  
Mohamad Iskandar Ishak  
Mohamad Nazri Puasa  
Mohamad Sani Thalib  
Mohamad Sufiyan Salmi  
Mohammad Hafiz Hassan  
Mohammed Roshaziat Mustaffa  
Mohammed Suhaimee Abd. Manaf  
Mohammad Kamruzzaman Hossain  
Mohd Armia Mohd Salleh  
Mohd Asmadi Alawi  
Mohd Asraf Said Azman  
Mohd Azhar Mohd Zin  
Mohd Azrul Mahmud  
Mohd Fazhan Mohd Hanafiah  
Mohd Firdaus Ahmad Pauzi  
Mohd Firdaus Azmi  
Mohd Ghazali A Manap  
Mohd Hariz Ab Halim  
Mohd Hazrul Muhammad  
Mohd Lazim Mohd Saif  
Mohd Maliku Seman  
Mohd Nizam Ismail  
Mohd Nor Azman Ayub  
Mohd Nor Isyam  
Mohd Nur Aminullah Abu Bakar  
Mohd Ridzuan Mohamad Mokhtar  
Mohd Samsul Rohizad Maidin  
Mohd Shafiq  
Mohd Syafiq Mohammad Ridzuan  
Mohd Syapul Othman  
Mohd Yazreen Syahmie Yusoff  
Mohd. Akmal Ali  
Mohd. Akmal M. Kamel  
Mohd. Amirul Airi Pauzi  
Mohd. Arif Syakir Rosid  
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Nurfadhlina Chan Mahadie Chan  
Nurhidayati Ahmad Sobri  
Nurhuda Ibrahim  
Nurul Aqilah Che Wan  
Nurul Aziati Ab. Aziz  
Nurul Farhanis Syatila Kamaruzaman  
Nurul Najiha Sallehudin  
Nurul Nassita Lias  
Nurul Salma Adenan  
Nusrah Alifah Ahmad  
Ong See Ling  
Pang Shek Qin  
Radhuhaida Ramli  
Rathi Sai Muniandy  
Raziyani Ibrahim  
Rohana Shapiin  
Roshazia Aini Abu Bakar  
Roshilawati Bidin  
Rosmawati Ghazali  
Rosnah Mah Hasan  
Rozana Johari  
Roza Mohd. Idris  
Roziawati Mohd Razali  
Saadiyah Ibrahim  
Ummi Rodiah Abd Aziz  
Santhana Dass A/L Irudaiam  
Shamila Zainol  
Siti Arbaiyah Bokhri  
Siti Asiah Awang  
Siti Hasshura Hashim  
Siti Hawa Mohamad Ali  
Siti Norasiah Darahman  
Siti Norjannah Johari  
Siti Qhairun Nisa Rahman  
Siti Rokhaiya Biollah  
Siti Sutina bt. Omar  
Sufiah Hashim  
Sugania Vijayan  
Sumawati Amad Bugis  
Suriati Muhamad  
Syarifah Shafura Wan Abdul Molok  
Vaani Muniandy  
Wan Haifa Haryani Wan Omar  
Wendy Ferrina Tarry  
Wong Yien Ping  
Yeo Moi Eim  
Zawati Awang  
Zeti Hafiza Zakaria  
Zul Asyraf bin Mohd. Jamri  
Zuraidah Roli  
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Mohd. Fazlan Abdul Ghani	Eleanor Daniella Lokman
Mohd. Fazli Long	Goh Ann Jie
Mohd. Husaini Rosli	Imelda Rantty
Mohd. JohariA. Latiff	Intan Ashikin
Mohd. Nasir Muhamad	Jumria Sutra
Mohd. Nazuri Rudin Jali	June Moh Hwei Yieng
Mohd. Nor Effendi bin Abd. Aziz	Kelly Teh
Mohd. Redhvan bin Arif	Kumari Geetha Muniandy
Mohd. Riduan bin Adnan	Laura Khor
Mohd. Rozhan bin Zakaria	Lim Mui Hua
Mohd. Sayuti bin Ismail	Lizawati bt. Mohamed
Mohd. Shafiq Abu Bakar	Marjorie Charam
Mohd. Sharifuddin Abdul Manan	Masazurah A. Rahim
Mohd. Shubli bin Md. Saad	Melinda Lau
Mohd. Shukri bin Yusof	Melissa Wong
Mohd. Sukri bin Jusoh	Noor Faizah Ismail
Mohd. Syafiq bin Manan	Noor Hanis Abu Halim
Mohd. Syairazi Che Man	Noorul Azliana Jamaludin
Mohd. Taufiq bin Md. Nordin	Noradiana Noran
Mohd. Yusof bin Mohd. Yasin	NorFatmahwati Yakup
Mohd. Zuraire bin Ab. Rani	Nur Amalin Nadia Mat Nasir
Muhaffiz Hamid	Nur Anissa Ainnina Daud
Muhamad Izzuan Razali	Nuraida Zulkifli
Muhamad Noor Zainal Abidin	Rabi Atun Abdullah (record not found)
Muhamad Nor Lamzahu Ismail	Rizmanisha Jasmin
Muhamad Yusof Nor Jasman	Rohaiza Asmini Yahya
Muhamad Zamri Abdul Murad	Sarmila Muthukrishnan
Muhammad Afiq Muhaimin Mohd Ashhar	Sarmiza Saperi
Muhammad Aliff Iqbal Abdul Hisam	Shaaleni Pandian Muruthy
Muhammad Amirul Razak	Sharifah Lia Farliana binti Wan Alias
Muhammad Amirul Siddiq Abd Rashid	Siti Naquiah Md Pauzi
Muhammad Anas Razali	Siti Nurul Annisa Temrin
Muhammad Asyraf Abd Latip	Sridevi Devadas
Muhammad Danial bin Abdullah	Stephenie Kawi
Muhammad Fadzil Haron	Syamsuria Abdul Latip
Muhammad Faizal Mohd	Umang Jabu
Muhammad Farouk Harman	Wen Chian Tan
Muhammad Fathullah Ruslan	Zarina Zainuddin
Muhammad Firdaus Ahmad Zamri	Nor Aida Suzana Abdul Rahman
Muhammad Hanaffi Ayob	Norazila Jelani
Muhammad Haziq	Nur Amalina Mohd Razikin
Muhammad Hazizi Ismail	Nur Simaa Ismail
Muhammad Helmi Mohamad	Nuramirah Abdul Manaf
Muhammad Izham Szali	Nurhidayati Ahmad Sobri
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Muhammad Na'im Syafiq Othman	Meisam Tabatabaei
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Muhammad Safwan bin Othman	Yik Sung Yeong
Muhammad Safwan Khairul Asri	Rohani Mustafa
Muhammad Saufi Ahmad Khairuddin	Rosmaria Abu Darim
Muhammad Syafiq Izzuddin Abdul Hadi	Azizul Fariha Ghazali
Muhammad Thaqif Mohamad Bakri	Siti Nabila Mohd Sharif
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Muhd. Sharir bin Sha'arani	Fazlan Abu Bakar
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Noor Azean	Intan Syazlin
Anuar Deraman	Haslizan Abdul Latif
YM Ku Kassim Ku Yaacob	Aiman Zulkiflee
Husaini Rosli	Mohd Zamri Mohamed Zin
Mohamad Hafiz Mushidi Shakori	Amirah Fatimah Md Nordin

Riduan Riduan  
Mohamad N. Azra

Mohd. Hafizi Wan Hussin

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Karin Pittman

### **Phillipines**

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Ma-ann Camarin  
Mary Nia Santos  
Jeryl Belle Rafanan

Joseph Carlo Vergel  
John Paul Matthew Guzman  
Sonia Somga

### **Republic of Korea**

Olumide Olowe

### **Singapore**

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Markus Schrittwieser  
Panqin Cai  
Qinghui Tan  
Siow Foong Chang  
Zuridah Merican

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### **Thailand**

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Eduardo Leano  
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### **Vietnam**

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