



CHINA-ASEAN COLLEGE
OF MARINE SCIENCES
中国-东盟海洋学院

Research and Innovation Achievements: China-ASEAN College of Marine Sciences (2016-2021)

Overview

China-ASEAN College of Marine Sciences (CAMS) has built up laboratories and research facilities that allow for various marine science studies to be carried out. With a team of experienced researchers and laboratory staff, CAMS keeps a thriving research culture. The ongoing research at CAMS has received external grants such as Fundamental Research Grant Scheme (FRGS) from Ministry of Higher Education (Malaysia) and internal grants provided by XMUM, with a total amount of RM593,980. Since 2018, CAMS faculty have produced 84 publications in indexed journals. The fields of research at CAMS include physical oceanography, environment, fisheries and biotechnology. To promote the College's research network and collaboration, CAMS has co-organised and/or co-sponsored conferences such as South China Sea Conference (SCS) in 2019 and the 4th & the 5th Xiamen Symposia on Marine Environmental Sciences (XMAS-IV and XMAS-V) in 2018 and 2020.



The 3rd South China Sea Conference 2019,
co-organised and co-sponsored by CAMS

Multidisciplinary Research

Fisheries studies undertaken by Prof. Chen Mingru address the issue of dwindling seafood resources. The main focus of her work includes marine fish population structure, population assessment and fish resources management, such as growth parameters, reproductive biology, stock status estimation of commercial bony fish and shark species.

Prof. Robin Robertson has been continuing her work on ocean mixing and the impacts of the tidal critical latitudes since joining XMUM. She used to be a PI for an ocean research voyage to Arafura Sea on RV Investigator, studying the role of ocean mixing in the atmosphere to ocean transfers of both energy from the wind and water from rainfall and the impacts on the water column. Prof. Liu Zhiyu from XMU has sent his team on research voyage to measure the ocean turbulence and estimate its contribution to mixing. Currently, they are collaborating to publish the results of this effort. Prof. Robertson's undergraduate research group at XMUM is examining the effects of vorticity on tidal critical latitudes and the impacts on mixing. They have won a Best Poster award competing against PhD students at the 2019 AOGS (Asia Oceania Geosciences Society) conference and are planning to submit a paper later this year. She is also collaborating with Prof. Xu Zhenhua and his students from Institute of Oceanology, Chinese Academy of Science and has produced several papers currently under review.

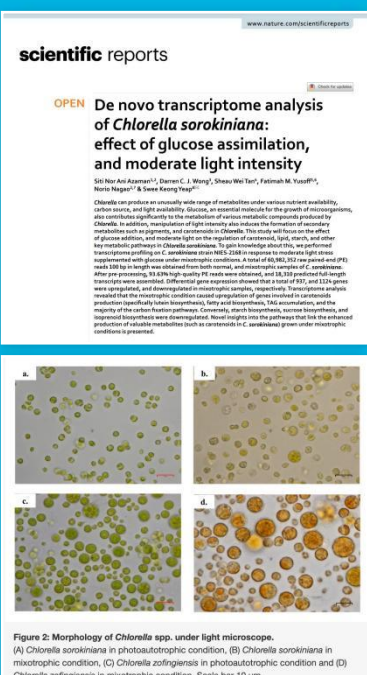
In marine biotechnology, Associate Professor Dr. Yeap Swee Keong has collaborated with researchers from Universiti Putra Malaysia and Australian National University to evaluate the effect of culturing *Chlorella sorokiniana* under the mixotrophic condition in order to produce bio-active metabolites, which can be used as health supplements. With biochemical and microscopic observation, fat accumulation, (particularly polyunsaturated fatty acids) and carotenoids were observed in *C. sorokiniana* cultured under glucose assimilation and moderate light stress. Transcriptome analysis revealed that the overproduction of these valuable metabolites was contributed by the over-expression of fatty acid biosynthesis, TAG accumulation and the carbon fixation pathways.



The 4th Xiamen Symposium on Marine Environmental Sciences (XMAS-IV) co-sponsored by CAMS and participated by Prof. Chen, Prof. Robin (Scientific Advisory Committee), Dr. Teoh (Poster presenter) and Dr. Ng (Poster presenter)



Prof. Robin (4th from right) and members from XMU working in collaboration (Oct – Nov 2019) with Maritime Continent Observation of Atmospheric Convection, Biogenic Emissions, and Ocean Vertical Mixing, in the Indonesian Throughflow (Australian Marine National Facility grant RM34 million)



Assoc. Prof. Dr. Yeap and his collaborators published research project of *Chlorella sorokiniana* in Nature Scientific Reports and PeerJ journal.

For fundamental research, Dr. Teoh Hong Wooi has been involved in marine ecology and biology studies, focusing on the coastal ecosystem. He seeks to understand the dynamic system and functioning of the marine life by examining the energy flow through the food web and the relationship between marine animals and their abiotic environment. These are among the most important aspects of marine ecology that implicate fisheries production. Upon joining XMUM, Dr. Teoh has successfully obtained Fundamental Research Grant Scheme (FRGS) to study the impact of organic enrichment and water quality on the culture of blood cockle in order to address the dwindling cockle production in Malaysia. As this project requires expertise in many areas, Dr. Teoh has collaborated closely with researchers from University of Malaya and UCSI. Dr. Teoh has also obtained an internal grant from XMUM to keep his fundamental research in marine ecology ongoing.

CAMS members are also involved in research on the mangrove ecosystem. Dr. Ng Wei Lun has studied the population genetics of mangrove species and discovered a new mangrove hybrid on a site not far from XMUM. Since joining CAMS, Dr. Ng has embarked on several research projects focusing on organisms that thrive in the mangrove and coastal ecosystems, including microorganisms, birds, and, of course, the mangrove species themselves, with local and international collaborations. Together with several undergraduate students from the Marine Biotechnology Programme, a research article was published in *Malayan Nature Journal* on the characterisation of flowers of *Rhizophora* mangroves and their hybrids.



Dr. Teoh has successfully obtained Fundamental Research Grant Scheme (FRGS) to study the impact of organic enrichment and water quality on the blood cockle culture in the State of Selangor.



Characterisation of the flowers of Indo-West Pacific *Rhizophora* mangroves in Peninsular Malaysia was published in *Malayan Nature Journal* by Dr. Ng, Dr. Teoh and MBT students. (Flowers of *R. apiculata* and *R. stylosa*)

CAMS Seminar Series

“Water World: The Way to go”

Since 2017, CAMS has organized 13 Public Seminars Series featuring prominent local and international speakers in the field of marine biotechnology to share their knowledge and experience.

Speak	Titl
Professor Phang Siew	Marine Biotechnology and the Blue Economy
Dr. Chua Thia Eng	Managing Coastal Areas Towards Achieving Sustainable Development Goals: The Way Forward
Professor Wang Deli	A Tale of Light-Capturing Pigments: From Life Origins to Evolution
Professor Hew Choy Leong	Transgenic Salmon-Serendipity, Entrepreneurship and Perseverance
Professor Xue Xiongzhi	Xiamen ICM & Science Involvement
Professor Dai Minhan	On the Ocean & Ocean Science
Professor Gan Jianping	Earth is an Ocean World
Professor Lin Senjie	Recent Advances in Biological Oceanography
Professor Huang Bangqin	Marine Ecosystems & Global Change
Professor Kao Shuhji	Human, Nitrogen & Ocean
Professor Qian Linchao	海洋生物与中医药 (Marine Life & Traditional Chinese Medicine)
Mr Kelvin Lim Huah Seng	Integrated Business in Aquaculture Industry
Ms Ong Su	Insect Pests in Mangrove Restoration Projects in Peninsular



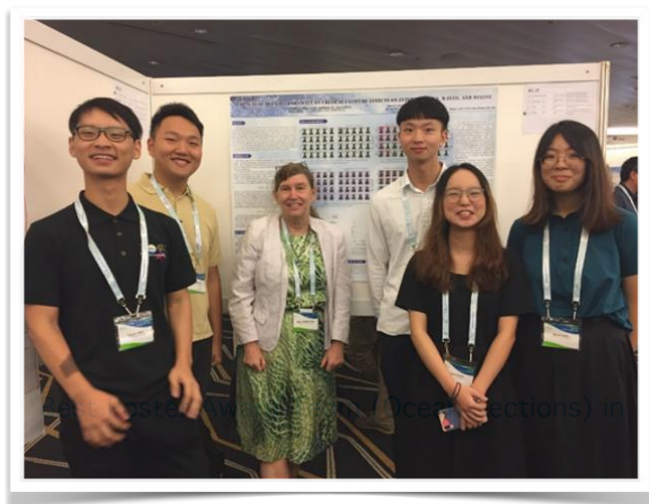
This seminar series features both local and international guest speakers, sharing insights on various marine aspects including the latest development.

Students' Innovation Achievements

In 2018, Zhou Tianyu, a 1609 undergraduate from Marine Biotechnology Programme won the Silver Prize at the 4th China College Students 'Internet+' Innovation and Entrepreneurship Competition with their project 'Fluorescent Zebrafish – The Water Quality Monitoring Elf'.



The Fluorescent Zebrafish team posing with their advisor (second from right).



AOGS 2019; From left: Zhou Tianyu, Shao Zhibo, Prof. Robin Robertson, Lin Weihong, Chen Jiarui and Zhou Muzhi.

Also in 2019, MBT student Lye Kit Wing participated in the 1st China-Malaysia Youth Innovation and Entrepreneurship Competition and won First Prize with their project "Sixth Sense" Innovative Non-Destructive Antiques Identification Solution.



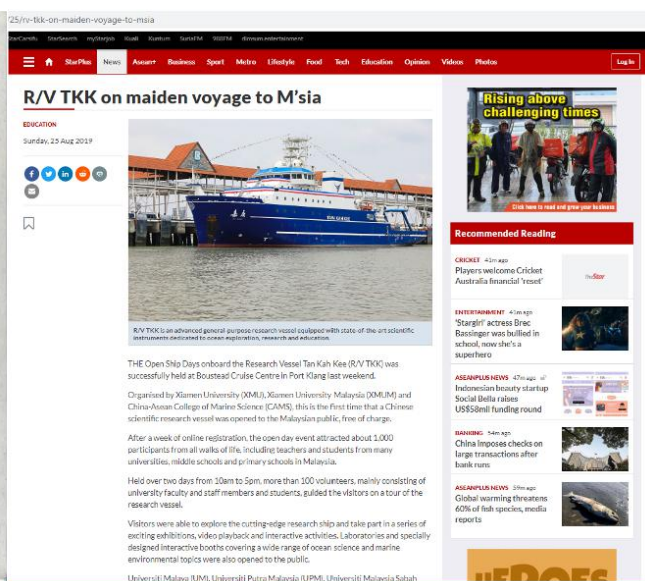
Sixth Sense Team Members with their award-winning project.

Teaching Voyage

21 XMUM undergraduate students joined a 9-day teaching voyage onboard Tan Kah Kee Research Vessel from Kuala Lumpur to Xiamen from 12 to 20 August 2019. This is a part of the College's annual student exchange program to provide undergraduates with an opportunity to participate in research on the deep sea. Postgraduate students from University of Malaya, Universiti Putra Malaysia and Universiti Malaysia Sabah, as well as undergraduate students from University of Delaware, also joined the voyage. During the voyage, students gained hands-on experience in collecting deep-sea sediment and biological samples such as macrobenthos and plankton as well as in measuring physical and chemical parameters of the deep water. They also operated a variety of equipment for deep water study under the supervision of the onboard technical staff. The collected samples contributed to a research paper featured in *Nature Research Highlights* (Volume 589 Issue 7843, 28 Jan. 2021).



RV Tan Kah Kee harboured at Boustead Cruise Centre in Port Klang.



RV TTK Open Day Press Release: Sin Chew Daily Newspaper Metro Edition, published on 18 August 2019 (left); The Star Online, published on 25 August 2019 (right).