magnus Group

18-19 MAY 2022

VIRTUAL EVENT

2nd Edition of

WORLD AQUACULTURE AND FISHERIES CONFERENCE

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BOOK OF ABSTRACTS

2ND EDITION OF

WORLD AQUACULTURE AND FISHERIES CONFERENCE

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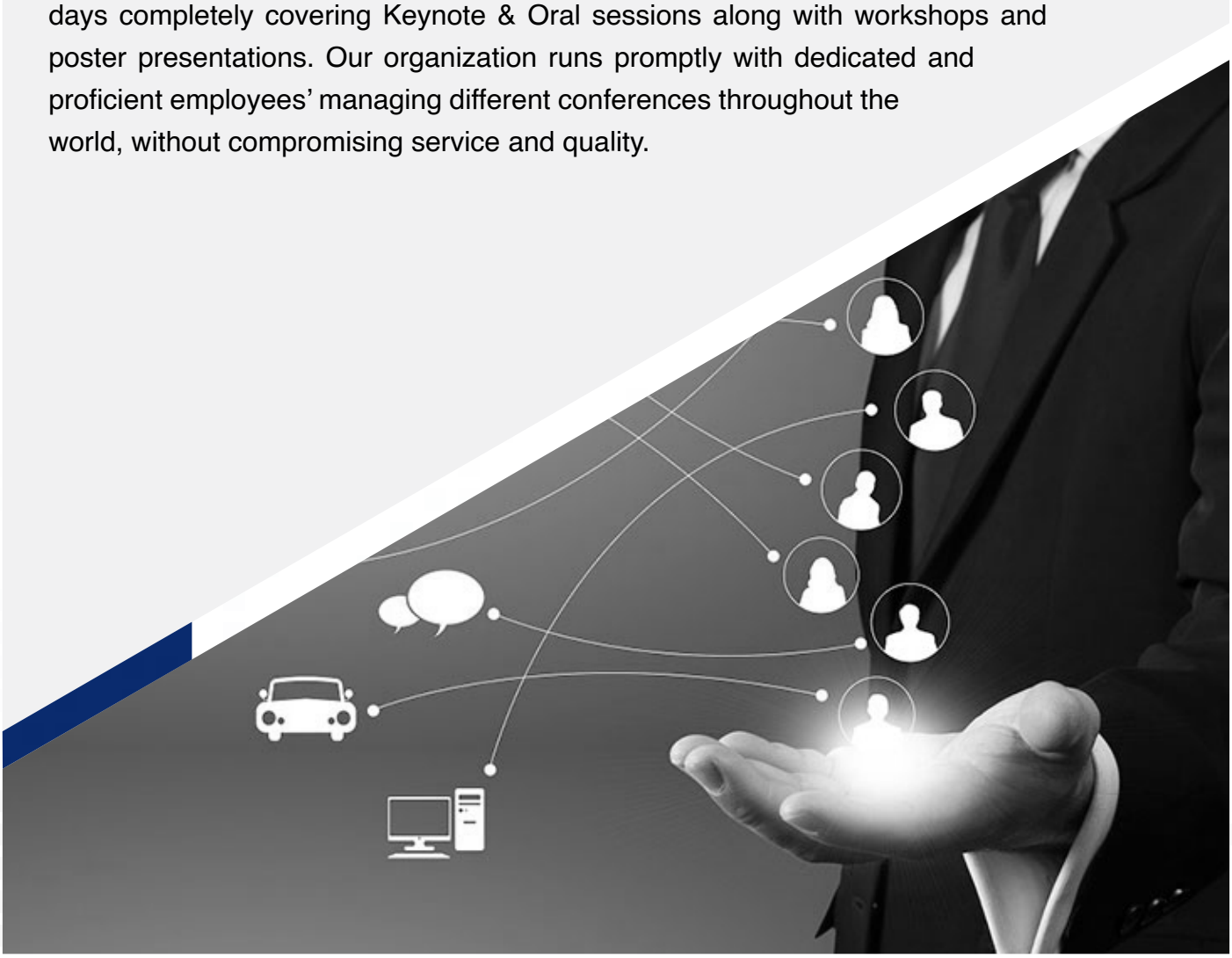
ABOUT MAGNUS GROUP

Magnus Group (MG) is initiated to meet a need and to pursue collective goals of the scientific community specifically focusing in the field of Sciences, Engineering and technology to endorse exchanging of the ideas & knowledge which facilitate the collaboration between the scientists, academicians and researchers of same field or interdisciplinary research. Magnus group is proficient in organizing conferences, meetings, seminars and workshops with the ingenious and peerless speakers throughout the world providing you and your organization with broad range of networking opportunities to globalize your research and create your own identity. Our conference and workshops can be well titled as 'ocean of knowledge' where you can sail your boat and pick the pearls, leading the way for innovative research and strategies empowering the strength by overwhelming the complications associated with in the respective fields.

Participation from 90 different countries and 1090 different Universities have contributed to the success of our conferences. Our first International Conference was organized on Oncology and Radiology (ICOR) in Dubai, UAE. Our conferences usually run for 2-3 days completely covering Keynote & Oral sessions along with workshops and poster presentations. Our organization runs promptly with dedicated and proficient employees' managing different conferences throughout the world, without compromising service and quality.



ABOUT WAC 2022

Magnus Group welcomes you to our Online Event entitled “2nd Edition of World Aquaculture and Fisheries Conference” WAC 2022 scheduled on May 18-19, 2022 is based on the theme “Milestones and impeccable innovations ushering to a new era of aquaculture and fisheries”. This gathering will cover the innovative methods, the most recent techniques and new research systems, developments, and the newest updates in Aquaculture , Fisheries and Marine biology.

WAC 2022 is an international platform that amalgamates world renowned experts of both academics and industries within the discipline of Aquaculture and Fisheries from all over of the world. The conference aims to bring all together like academicians, scientists, and business professionals, current and prospective fish farmers to share information and ideas about the development of aquaculture & fisheries

KEYNOTE FORUM

DAY 01

2ND EDITION OF

WORLD AQUACULTURE AND FISHERIES CONFERENCE

18-19 MAY

Tom Wedegaertner

Agriculture & Environmental Research Department,
Cotton Incorporated, Cary, NC, USA

Making the Most of Cottonseed Protein

As a by-product of cotton production, cottonseed protein is a sustainable source of high quality, plant-based protein that is widely available wherever cotton is grown. Unfortunately, the 11 million metric tons of cottonseed protein produced by the global cotton crop every year is mostly used in ruminant feeds due to presence of the anti-nutrient, gossypol. Cottonseed protein can be fed to non-ruminant species including aquaculture, but care must be taken to stay within the safe limits for gossypol. For several decades the cottonseed industry has been continuously working towards efforts to mitigate the negative effects of gossypol, however a commercially viable technology has been elusive. Chemical, physical and biological techniques are all effective at removing gossypol at laboratory scale, but scaling up to commercial production has not yet been accomplished. Considerable research has shown that cottonseed protein is not only very palatable, but it can also extend the use of the fish meal in aquaculture diets, if the safe levels of inclusion are not exceeded. Every species has a different tolerance for gossypol. For example, research has shown that shrimp can tolerate 1600 ppm gossypol in the diet, whereas performance in trout tends to decline when gossypol exceeds 250 ppm. Gossypol's biological activity is not only variable among species, but is also dependent on age, stress level and other dietary factors that interact with gossypol affecting its absorption and biological activity. It is possible to add ferrous sulfate (iron) to the diet to help reduce the absorption of gossypol, however, while the use of iron to increase cottonseed protein inclusion in the diet has been well documented in several monogastric species, gossypol limitations and the use of additional iron to the diet needs to be thoroughly investigated, in individual aquaculture species, before specific recommendations can be made to ensure safe use of cottonseed protein products in aquaculture feeds.

Audience Take Away:

- Learn about the nutrient profile of cottonseed protein, focusing on amino acids
- Understand that gossypol is biologically active
- Gain an understanding of gossypol's mode of action
- Gain an understanding of what factors influence gossypol's negative effects on production
- Learn about feed additives that diminish gossypol's toxicity
- Learn how to safely use cottonseed protein to extend the use of fish meal

Biography

Tom Wedegaertner has been working in various segments of the cottonseed industry for the past 40 years. He has been the Director of Cottonseed Research & Marketing at Cotton Incorporated for most of his lengthy career in the cottonseed industry. He holds an M.S. in Animal Nutrition and an M.B.A. in Marketing.

Diana Chan

Aquaculture Innovation Centre, Singapore

Aquaculture Challenges and Opportunities in City-State Singapore

Singapore is a city-state with a population of close to 6 million people. About 95% of the food consumed comes from foreign imports. Singapore is not an agricultural country but there are about 110-120 coastal foodfish farms with at least 10 land based farms. In order to reduce reliance on foreign food imports for local consumption, the local government has been very supportive in extending funding support and incentive schemes to help local farmers explore technology adoption for enhancing farm production and yield. This is especially more so when the nation is targeting to produce enough in order to achieve 30% of the total nutritional needs by 2030. With less than 1% arable land available for farming, innovation and technology development has become the key to driving the development of the local aquaculture industry towards super intensive aquaculture production. The talk would be highlighting the challenges and opportunities in Singapore aquaculture industry including some of the innovations and technology development.

Biography

Dr Diana Chan is Deputy Centre Director of Aquaculture Innovation Centre in Singapore with at least 13 years of aquaculture working experience through consultancy, applied research and training. She had held leadership appointment in academic and technology development at Temasek Polytechnic since 1997. Diana is co-Chair of the Technical Committee for Food Production under Singapore Standards Development Organisation and has served as the President of the World Aquaculture Society-APC from 2020-2021. She is also on the Global Conference Aquaculture Working Committee for Aquaculture Innovations, FAO. Diana's current interest in mudcrab hatchery is to supply crablets for farm grow-out and for conservation.

Daoliang LI

China Agricultural University, National Innovation Center for Digital Fishery, Beijing, China

Novel information technologies for fish behavior recognition

There is an increasing recognition within the aquaculture industry that understanding the behavior of farmed animals can help provide solutions to farming problems. Behavior monitor would help farmers to observe animals behavior as welfare indicators for the better and effective management of aquaculture facilities. These behaviors including feeding, mating, swimming and abnormal behavior of aquatic animal during cultivation may help to reflect the growth status and achieve accurate predictions of the water quality environment. Until now, aquatic animal's behavior identification has been mostly based on manual monitoring, which is usually inaccurate, time-consuming and laborious. Until now, machine vision, acoustics technology, mathematical models and sensors provide the possibility of developing automatic, faster and cheaper methods for behavior recognition of farmed animals in aquaculture. Machine vision technology provides an automated, non-invasive, cost-effective method to record behavioral parameters; acoustic waves undergo little propagation loss in water, and their propagation distances are long, making them the best way to detect and identify small objects underwater; accelerometer has enabled long-term, real-time monitoring a range of physiological and behavioral variables that are either directly or indirectly relevant to framed animals health and productivity. This paper also forecast several different trends in farmed animal behaviors monitor to further improve the level of precision farming: 1) Using information fusion technique will be applied in dead zones where single equipment is inaccessible; 2) developing and expanding the function of underwater sensors, multi-functional sensor can detect multiple information of fish at the same time; 3) using a rapid, accurate deep learning algorithm to monitor behaviors based on images and videos. These future directions will have great significance to accelerate the development of new means and techniques for more effective behavior monitor. However, the accuracy and intelligence still need to be improved to meet intensive aquaculture requirements. Through close cooperation between fisheries experts and engineers, the precision and the level of intelligence for farmed animal behaviors monitor will be further improved based on the above methods.

Audience Take Away:

- The main significance of fish behavior monitor (growth status monitoring, predict water quality, change feeding conditions, and increase production welfare)
- Understand the current problems and technical difficulties of fish behavior monitoring, and solve problems in a targeted manner
- Current technologies in monitoring fish behavior (machine vision, acoustic technology, mathematical models, sensors)
- The development direction of information technology in the future fish cultivation process (information fusion, multi-functional sensors, deep learning)

Biography

Daoliang Li, is full professor and the director of the National Innovation Center for Digital Fishery, China Agricultural University. He is a Changjiang Scholars, which is the highest academic award issued to an individual in higher education by the Ministry of Education, the People's Republic of China. His principal research interest is ICTs in aquaculture and agriculture, especially for information processing, smart sensors and smart control system in fish farming. He is the editor-in-chief of International Journal of Information processing in Agriculture (https://www.sciencedirect.com/journal/information-processing-in-agriculture) and the Chair of the Work Group for Advanced Information Processing in Agriculture, International Federation for Information Processing. He also is member of Expert Committee of National rural informatization of China. He was the chairman of 1st to 12th International conference on computer and computing technologies in agriculture (www.iccta.cn). He coordinated more than 100 international and national research projects, such as FP6, FP7, Horizon2020 and has published more than 200 international journals papers, 8 books.

Amod Ashok Salgaonkar

International Seafood Professional, India

Increasing Importance of Blue Bonds / Sustainable Finance in Seafood Business

Emergence of sustainability-linked blue bonds and/or sustainable finance is playing a key role while getting any new big investments in the new set-ups or for expanding the already established seafood businesses. The trend is new however investors giving focus to the organizations who prioritizing and developing their businesses through such sustainable ways. Sustainable finance involves aspects of climate risk assessment and the integration of environmental, social, and governance (ESG) factors into investment strategies. Environmental, Social, and Governance (ESG) has gained increasing attention with many major investors investing only in companies having ESG performance reporting. It's crucial to see how sustainability-linked loan (SLL) and sustainability-linked bond (SLB) agreements will contribute to the seafood businesses in coming time when many countries governments & major business groups are committing to NET Zero carbon emissions in another 30-40 years.

Audience Take Away:

- What is Sustainable Finance
- Blue Bonds and Sustainability-Linked Loans
- Overview of the present status of the sustainable finance in seafood business

Biography

Mr Amod Ashok Salgaonkar is a diversified industry professional wearing multiple hats in his professional endeavor. He is having a mix bag of various experiences right from buying & merchandising, strategy & negotiations, marketing, planning & development of the businesses in different verticals of food & especially seafood business which involves modern trade, cash & carry, HoReCa, general trade & online segment. He views the industry by being involving directly through engagements in trade aspects & promotions, sustainability, climate change impacts etc. He is a seasoned management professional worked previously with a reputed organizations like Reliance Retail, Bharti-Walmart, METRO Cash & Carry India, HyperCITY Retail where he headed categories like seafood, meat, dairy & frozen. Core strength lies in bringing effective solutions to business challenges & building differentiation for strategic advantages for the business. He is presently involved in food business with a focus on seafood through a start-up besides having engagements at various national & international organizations.

J L Giovanna Hesley

BFA, MEd, MS Agriculture & Biosystems Engineering,
United States

Aquaponic Text/workbook

School gardens are a powerful tool for teaching many subjects and developing a healthy lifestyle. Ms. Hesley has created an aquaponics workbook for teachers of young scholars from 5 to 18 years. Each section contains lessons that focus separately It contains sections each with a focus on Botany, Biology, Chemistry, Ecosystems, Mathematics, Physics and food production. Lessons include the use of measuring devices as well as scientific tools and methods that assist in conducting experiments. Tools for creating a home or school garden are included. The workbook includes practical tips for modifying lessons for workshops and classrooms with up to 32 students. She will present an overview of the workbook and the reasons behind each of the lessons. National (US) Science and Mathematics standards are cited. Anecdotal experiences will be related.

Biography

Giovanna provides aquaponic systems strategies for commercial and home gardens. As an educator enhances school districts STEM/STEAM programs - science, technology, engineering, arts and mathematics, by incorporating aquaponics gardens

SPEAKERS

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Corazon P. Macachor

Cebu Technological University, Danao Campus

Innovation on coconut water-infused bottled milkfish and poverty reduction through entrepreneurship in cebu, philippines

Entrepreneurship alleviates poverty in developing countries particularly in Cebu, Philippines as an outcome of an academe technology transfer and partnership. This study optimized coconut water-infused bottled milkfish, protected the best formulation, transferred the patented technology and investigated the socio-economic profile of the Cocohub women members after a year of entrepreneurial activities managed by the Lamac Multipurpose Cooperative with the Department of Science and Technology interventions. Based on the Analysis of Variance at 5% level of significance, the sensory evaluation results of bottled products using fresh milkfish treated with brine solution containing fifty (50%) percent coconut water significantly differs from the rest of the formulations. The best formulation was subjected to protection from the Intellectual Property Office of the Philippines and transferred to the Cocohub women members of Colonia, Cebu. After a year of entrepreneurial activities under the program of the Department of Science and Technology-Smart Food Value Chain where coconut water-infused bottled milkfish is one of the enterprising transferred technologies of Cebu Technological University resulted to weekly income of the women members increased from P500.00 to P2,000.00. Hence, academe partnership with the industry and interventions from the Philippine government agency reduced the poverty of participative group of Filipino women of Colonia, Tuburan, Cebu, Philippines.

Biography

Dr. Corazon P. Macachor graduated Master of Science in Fisheries at the University of the Philippines in the Visayas, Quezon City in 1985 and Doctor of Philosophy at Cebu Technological University in 2004. She retired as University Professor last 2018. She patented 45 Utility Models, published 22 research articles in Journals and presently Food Consultant with CTU Danao in collaboration with the Department of Science and Technology, Lamac Multipurpose Cooperative, Bureau of Fisheries and Aquatic Resources, Local Government Units, Philippine Coconut Authority, Philippine Carabo Center, Department of Trade and Industry, Department of Agriculture and Cantumog Farmers Association.

Priyanka Soni[1]* and Josep Rotllant[2]

[1]Department of earth science, University of Southern California, Los Angeles, California, USA

[2]Department of Biotechnology and Aquaculture, Instituto de Investigaciones Marinas (IIM-CSIC), Vigo, Galicia, Spain

How fish color their skin? Mc2r a new actor in pigmentation development

The melanocortin system is a complex neuroendocrine signalling mechanism involved in numerous physiological processes in vertebrates, including pigmentation, steroidogenesis and metabolic control. In humans, five melanocortin receptors (MCR) have been cloned, identified and shown to have a wide distribution throughout the body and likely many diverse functions. It has also been shown that a high degree of identity and conservation in structural characteristics and pharmacology exists between Mcrs from fish and mammals. However, in fishes, the number, affinity, specificity, tissue distribution and physiological roles are far from defined and appear to be species-specific. A clear example is the Mc2r subtype. In humans, it is well known that Mc2r is expressed in the adrenal gland and controls steroidogenesis and in fact the same function has also been described in fish. However, the fact that Acth (a melanocortin agonist) may have a role in regulating fish pigmentation and that Acth acts on Mc2r, the involvement of Mc2r in fish pigmentation might be a possibility. Using CRISPR/Cas9 genome engineering tools we have generated "loss-of-function" mc2r mutant zebrafish. We demonstrate that Mc2r, apart from controlling steroidogenesis, also has a direct role in regulating fish pigmentation.

Audience Take Away:

- Genome engineering by using CRISPR/Cas9 – CRISPR/Cas9 technique is well recognized technique of genetic modification. A successful stable F2 generation is designed by knocking out Mc2r gene. Gene editing can help to find and remove disease causing genes from the sequences. This project will give other professional an opportunity to think of various stressors and related disorders in fishes causing a huge lose in Aquaculture industries
- Functionality of melanocortin receptor in fish pigmentation – This project will introduce 5 types of melanocortin receptors and their functionalities in fishes. Specially Mc2r responsible in stress control mechanism, additionally my results have showed Mc2r deletion can also cause hyperpigmentation in fishes
- Fish pigmentation and disorder – Aquaculture industry face huge lose due to abnormalities in fish color, this study will demonstrate the color pattern changes and 3 different kind of pigments distribution on fish scales. The comparison between mutant and control fish will show which pigment expends due to absence of Mc2r
- Zebra fish (Model species) mutation, sampling techniques, image analysis, machineries and data analysis SPSS software can represent a new approach to find the functionality of melanocortin receptors.

Biography

Priyanka soni studied Marine Environment and Resources at University of Basque country and currently pursuing her Ph.D. in University of Southern California in department of earth science. She received her master's degree in 2021. During her master's thesis she worked in supervision of Dr. Josep Rotllant at the Institute of marine research (IIM – CSIC, Spain) on abnormalities in fish pigmentation due to environmental stress conditions. Her interest areas are epigenetics, climate effects and biochemistry. This research work will be going to publish in Frontiers in Endocrinology.

Jerina Kolitari[1]*, Laura Gjyli[2], Eugen Pepa[2], Erjola Shehu[1]

[1]Department Aquaculture and Fishery, Agricultural University of Tirana, Albania

[2]Department of Natural and Applied Sciences,University "Aleksander Moisiu", Durres, Albania

The Ghost nets in Adriatic Sea and impact in the fishery sector

Habitats, coastal zone and ecosystems services always attracted humans and human activities. But this intensive concentration of population and excessive exploitation of natural resources puts enormous pressure on our coastal ecosystems leading to biodiversity loss, habitats destruction, pollution, as well as conflicts between potential uses, and space congestion problems. Because the well-being of populations and the economic viability of many businesses in coastal zones depend on the environmental status of these areas, it is essential to make use of long term management tools, such as integrated coastal management, to enhance the protection of coastal resources whilst increasing the efficiency of their uses.Abandoned, Lost or otherwise Discarded Fishing Gear: is a significant and persistent form of marine litter. ALDFG poses threats to marine habitats and wildlife (e.g. entanglement and 'ghost' fishing, digestion, etc.), human safety (e.g. divers, boat crews, etc.) and property damage (e.g. damaging propellers). In most cases, the loss of gear is unwanted by the fisherman but in some cases fishing gear is intentionally discarded, mostly to avoid the waste management cycle and related cost or efforts.The issue of ALDFG has gained global recognition over the years.

Metodology : Detecting accumulation areas of ALDFG at Adriatic Sea. Collecting data, through interviews and questionnaires, from fishermen, scuba-divers, etc. to identify the accumulation areas of ALDFG Establishing a database with the identified locations and adding locations on a chart. With ROV (remotely operated underwater vehicle) monitoring. Establish contact relevant local authorities regarding the recovery activities in order to have support on the ground.

Results : A first domestic attempt was made to establish a basis for removal, in 2014/2015 targeted pilot-actions were performed in the wider area of the middle Adriatic, all the actions followed the procedure developed by the DFG project. gillnets, trammel-nets, trawl-nets, traps and small purse seine nets were found, more than 40 different ghost nets have been observed. fisheries that deploy unattended gear like gillnets or trammel-nets were the primary source of ghost-nets, these nets are used especially near the coasts in rocky habitats (underwater ridges) characterized by high biodiversity and continue to fish species of high economic value. however, lots of them are fairly fouling and lie on the seafloor (older ones) potentially posing less threat to biodiversity. Most derelict gillnets found were located in high-relief rocky reefs and boulder habitats relatively small in size (≤100 m2 in area), of relatively recent manufacture and in good condition, recovered from depths above 30 m. Lost fishing gear continue to trap fish 'unintentionally' also of particularly endangered and protected species, fish and crustaceans such as red scorpionfish and lobsters are endangered by lost fishing gear An additional risk for several crustacean and fish species of conservation concern like Palinurus elephas and Scorpaena scrofa, respectively. Fishermen tried to recover nets by themselves – to reduce loss, operational challenges of locating, recovering and disposing of removed nets, since the serious damage caused by ghost nets to the fisheries sector has not been assessed, the difficulty lies in convincing target groups to take an action for net removal.

Key words: Ghost nets, Discarded Fishing Gear, Adriatic Sea, fisherman

Audience Take Away:

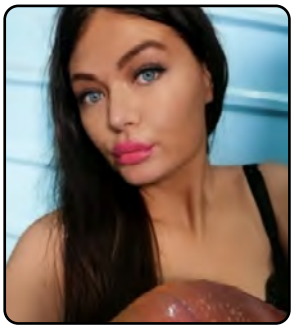
- Marine litter and ghost-nets fishing, for instance, are some of the most relevant threats for the water landscape. Effective measures to tackle marine litter in the region are seriously hampered by the lack of reliable scientific data. Within this context the need for accurate, coherent, and comparable scientific data in the Adriatic and Ionian Seas is clear in order to set priorities for action and address marine litter effectively, thus ensuring the sustainable management and use of the marine and coastal environment of the Adriatic-Ionian macro region.
- How will this help the audience in their job? Is this research that other faculty could use to expand their research or teaching? Does this provide a practical solution to a problem that could simplify or make a designer's job more

efficient? Will it improve the accuracy of a design, or provide new information to assist in a design problem? List all other benefits.

- The objectives of the project that is to develop an innovative model for addressing in a cooperative, perspective environmental issues related to pollution, overexploitation of fish-stocks, and ghost-fishing. Professional fishermen, engaged as fundamental pillars in any realistic sea-protection policy. The project is also addressed to the community of scientists and scholars, who could benefit from the data gathering and the in-depth studies carried out by the project. Then, it is addressed to the communities: families, students, tourists who are directly connected with the subject as fish-consumers.
- A staggering 640,000 tons of discarded fishing gear is left in our oceans each year. Ghost fishing gear refers to any fishing equipment or fishing related litter that has been abandoned, lost or otherwise discarded; also referred to as 'derelict fishing gear' and/or 'fishing litter'. It is one of the biggest threats to animals in our oceans.

Biography

Prof.Ass.Jerina Kolitari studied at Agricultural University of Tirana and graduated as MS in 2001. She then joined the researcher group of FAO-Adriamed and FAO -Medits (GSA 18) Project from 2009. The Project Coordinator in more than 10 international projects. She recived PhD degree in 2007 at the same University. At 2014 she obtained the position of an Associate Professor at Department of Aquaculture and Fishery Department at Agricultural University of Tirana, Albania. She has published more than 60 research articles in important journals. She presented in more than 30 international conferences their studies.



Lauren A. Bailey[1]*, Amber R. Childs[1], Nicola C. James[2], Murray I. Duncan[3], Alexander Winkler[4], Warren M. Potts[1]

[1]Department of Ichthyology and Fisheries Science, Rhodes University, Grahamstown, South Africa
[2]South African Institute for Aquatic Biodiversity, Grahamstown, 6140, South Africa
[3]Department of Geological Sciences and Hopkins Marine Station, Stanford University, United States
[4]Center of Marine Sciences, Campus de Gambelas, Universidade do Algarve, Portugal

By removing high performance aerobic scope phenotypes, capture fisheries may reduce the resilience of fished populations to thermal variability and compromise their persistence into the Anthropocene

For the persistence of fished populations in the Anthropocene, it is critical to predict how fished populations will respond to the coupled threats of exploitation and climate change for adaptive management. The resilience of fished populations will depend on their capacity for physiological plasticity and acclimatization in response to environmental shifts. However, there is evidence for the selection of physiological traits by capture fisheries. Hence, fish populations may have a limited scope for the rapid expansion of their tolerance ranges or physiological adaptation under fishing pressures. To determine the physiological vulnerability of fished populations in the Anthropocene, metabolic performance was compared between a fished and spatially protected Chrysoblephus laticeps population in response to thermal variability. Individual aerobic scope phenotypes were quantified using intermittent flow respirometry by comparing changes in energy expenditure of each individual at ecologically relevant temperatures, mimicking variability experienced as a result of upwelling and downwelling events. The proportion of high and low performance individuals were compared between the fished and spatially protected population. The fished population had limited aerobic scope phenotype diversity and fewer high performance phenotypes, resulting in a significantly lower aerobic scope curve across low (10 °C) and high (22 °C) thermal treatments. The performance of fished populations may be compromised with predicted future increases in cold upwelling events. This requires the conservation of the physiologically fittest individuals in spatially protected areas, which can recruit into nearby fished areas, as a climate resilience tool.

Audience Take Away:

- The information obtained from this study will provide much-needed insights into the link between fish behaviour and physiology and improve our understanding of the adaptive capacity of important coastal fishery species to the ever-increasing impacts of human-induced global change
- We highlight future research areas required to fully understand how physiology is influenced by the selective processes driven by fisheries. For example, long-term monitoring of the physiological and behavioural structure of fished populations, their fitness and catch rates are required
- We discuss how information on the phenotypic traits of individuals can be used to conserve the physiologically and behaviourally fittest individuals and allow them to reproduce. Behavioural and physiological-based management approaches will assist in conserving coastal fish populations, and in this way preserving human food security and the livelihoods of coastal settlements
- Policy makers will be provided with access to collected data, as well as prompted for future research collaborations. We present the need for policy intervention to alter harvest strategies to protect phenotypes that are most vulnerable to fisheries selection. We also encourage the protection of vulnerable phenotypes in Marine Protected Areas that supply fished areas. We encourage conservation through local fishing communities that rely on fishing as a primary source of income. In this way, local households can earn an income, as well as partake in protecting their coastal environments

Biography

Lauren Bailey obtained her Marine Sciences degree cum laude from Nelson Mandela University, South Africa in 2015. She then joined the physiology research group of Dr Ben Smit and received her honours degree. The Smit laboratory moved to Rhodes University where Lauren Bailey obtained her MSc degree in Animal Sciences. Lauren Bailey is currently a doctoral candidate supervised by Dr Warren Potts at the Ichthyology and Fisheries Science Department of Rhodes University. Her research interests focus on fish physiology and behavior, for which she has four peer-reviewed published manuscripts in counting.

John Thomas

Centre for Nanobiotechnology, Vellore Institute of technology,
Tamil Nadu, India

Efficacy of Antibacterial Compounds Isolated from Seaweeds for Controlling Aeromonas salmonicida Infections in Oreochromis mossambicus

Aquaculture is an important activity responsible for the production of protein rich animal food worldwide. Aquaculture production has increased, due to the continuous expansion of cultured fish and shellfish species. Sea weeds are valuable natural assets in aquaculture due to the presence of various bioactive active metabolites in them. Successful fish production and maintenance of disease free culturing systems in aquaculture with environment friendly practices is often affected by various environmental factors. Disease causing pathogens is one delivery systems, feed encapsulations processes and immersions of active ingredients which can possibly facilitate sustainable production by enhancing growth and immune responses in aquaculture animals. The focus of our study is on the identification of antibacterial and antioxidant compounds from two brown seaweeds, Gracilaria foliifera and Sargassum longifolium which have proven bioactive compounds. By a process of microencapsulation these bioactive compounds were encapsulated in the form of beads. Sodium caseinate and xanthan gum were mixed together to form the beads. This process helps to retain and protect the bio active ingredients from adverse reactions such as oxidation and nutritional deterioration. These microencapsulated beads were administered orally to Oreochromis mossambicus the experimental fishes, with average body weight of 10–12 g and challenged against the pathogenic bacteria Aeromonas salmonicida to assess their antibacterial efficacy to control this bacterial pathogen. Microencapsulated bio active compounds were further characterized by FTRaman, GC–MS, NMR, HPLC and SEM analysis. In this study, the effects of combined formulations of the different bioactive compounds were determined. Data obtained from the treatment of A. salmonicida infection in O. mossambicus using formulated bioactive compounds obtained from these seaweeds showed very high survival percentage in this species of fish.

Audience Take Away:

- Infections are common in aquaculture farms and ponds. Nowadays antibiotics are being used to treat the infections. However the use of antibiotics can cause resistance. Natural products can be used as an alternative for treating infections. The audience will be able to understand the importance of the use of natural products in aquaculture and also know the process for preparing the feed.

Biography

Dr. John Thomas completed M.Sc Microbiology from University of Madras in 2004. M.Phil in Microbiology from Bharadhidasan University, Trichy in 2007. He then Completed Ph.D in Microbiology (Aquaculture specialization) in the year 2010 from Thiruvalluvar University, Tamil Nadu, India. He is currently working as an Assistant Professor Senior in VIT, Vellore. He has published more than 35 research articles in Scopus indexed Journals. He also has 8 book chapters and two patent published. He has completed some Research projects funded by Govt. of India.

S. Nandini* and S.S.S. Sarma

Laboratorio de Zoología Acuática, Unidad de Morfofisiología y Funcion. Universidad Nacional Autonoma de Mexico, Campus Iztacala. Av. de los Barrios, no 1, Col. Los Reyes Iztacala, Tlalnepantla, CP 54090, Estado de Mexico

Freshwater Aquaculture in Mexico: Predator and Prey

Aquaculture has a long history in the world since it provides a cheap source of protein to millions of people. In several countries it is also practiced on private property as DIY projects. Mexico is a megadiverse country with high fish diversity. In freshwaters the families Goodeidae and Cichlidae are particularly well represented with 40 species. However, as in most countries, the most commonly fish consumed are carps (7 species) and tilapia (5 species). Among the most important native fish for aquaculture is the genus *Chirostoma* with 5 species distributed mostly in lakes and reservoirs of Central Mexico. *Chirostoma* are zooplanktivorus throughout life and hence the importance of adequate zooplankton for their culture. Studies show that *Chirostoma* fed live rotifers and cladocerans have improved somatic growth and survivorship compared to those offered formulated diets. The importance of live zooplankton is crucial to ensure adequate survivorship and growth during the early stages in the life of fish larvae. Some of the important factors in selecting appropriate prey for fish larvae are the growth rates of the rotifer or cladoceran and the prey preference and functional response of the predator on the given prey. *Brachionus calyciflorus* among rotifers, and *Moina macrocopa* among cladocerans, have high growth rates. Both species are also rich in nutrients, especially fatty acids and proteins. They are also widely distributed in tropical countries and cultures are easy to establish. They feed on a large variety of diets and these, among other factors, reduce the costs of maintenance of these prey species. Many larval fish also show a high preference for *B. calyciflorus* and *M.macrocopa*. All the above mentioned aspects will be discussed in detail during the presentation.

Audience Take Away:

- Fish species being cultured in Mexico
- Edible and ornamental fish aquaculture
- Live prey culture techniques
- Simples experiments to determine adequacy of prey
- Methods to improve larval fish survival

Biography

Dr. Nandini Sarma completed her PhD at the University of Delhi, India in 1995. After a post graduate diploma in Belgium and a post-doctoral fellowship, she arrived in Mexico in 1997. Ever since she has been working at the National Autonomous University of Mexico (UNAM). She has guided more than 70 students for their bachelors, masters and doctoral degrees, and published more than 290 articles in prestigious international journals. Her research interests include basic and applied aspects of freshwater zooplankton ecology. She has worked on the larval feeding behavior of more than 10 species of endangered fish and amphibians.

S.S.S. Sarma

Laboratory of Aquatic Zoology, Division of Research and Postgraduate Studies, National Autonomous University of Mexico Campus Iztacala, Av. de Los Barrios No. 1, C.P. 54090, Los Reyes, Tlalnepantla, State of Mexico, Mexico

Recent developments in the aquaculture of shrimps

Aquaculture of shrimps is a highly lucrative industry, and it accounts for more than half of the total shrimps sold globally. Among the common species cultured in Mexico are *Litopenaeus vannamei, Penaeus stylirostris* and *Penaeus setiferus*. South-Asia, China, India, Brazil, Mexico and Ecuador are some of the leading producers of shrimps through aquaculture operations. Globally, improvements are being made to reduce operational costs and implement novel and effective disease control strategies. In this review we present information on the currently cultured shrimp species, operational problems including the production and administration of both, live and dry feed. Aquacultural operations involve unavoidable release of large quantities of nutrient-rich wastewaters into natural systems. Some suggestions to harvest such wastewater to minimize possible environmental damage have been outlined. In addition, due to lack of awareness among the aquaculturists to control the diseases, most shrimp industries occasionally become unstable. In this review we have mentioned some aspects of crop security as means to guarantee breakeven returns to the investors.

Audience Take Away:

- Some aspects of recent developments may be useful for general shrimp culture
- Development in the area of shrimp cultures including emphasis on live zooplankton
- It is possible that the aspects covered in this talk can be used for teaching in other universities too

Biography

Dr. S.S.S. Sarma, PhD obtained in 1988, is an aquatic ecologist, known for his research contributions in the field of freshwater zooplankton. He is full time Professor of the National Autonomous University of Mexico (= Universidad Nacional Autónoma de México, known in the abbreviated form as UNAM) at its north Mexico City Campus, FESI, Tlalnepantla. He has published more than 300 articles and book chapters of which about 265 scientific works are from the SCI indexed journals (Web of Science, Core collection).

Samar S. Seoud*

Researcher at Veterinary Medicine, Mansoura University, Egypt

Correlation between water quality and Amyloodinium ocellatum parasitic infestation in European seabass (Dicentrarchus labrax)

Amyloodinium ocellatum is one of the most important ectoparasitic protozoa infecting marine species especially during early life stages (fries and fingerlings). Whether the environmental parameters and water quality affecting the occurrence of Amyloodinium infestation is worth to be investigated as a tool for proper control strategies. The present study was carried out on cultured European seabass fries that were collected during the period from April to April . The collected samples subjected to full clinical, parasitological and histopathological examination studies. The results revealed a heavy infestation with Amyloodinium ocellatum causing severe hyperplasia in the affected gill epithelia with fusion of the secondary gill lamella and moderate hyperplasia in the skin with desquamation of the covering epithelium. Interaction between the environmental stressors and Amyloodinium ocellatum infestation showed that pH and salinity were positively correlated with Amyloodiniosis. In conclusion, the severity of infestation by A. ocellatum is evaluated by interaction of this pathogenic parasite with variable environmental stressors. In conclusion, infestations of European seabass by A. ocellatum can be avoided if defined patterns of quarantine, biosecurity and disinfection protocols are kept in mariculture facilities.

Biography

Dr. Samar Saad Mohamed Seoud is currently working in the Department of Internal Medicine, Infectious and Fish Diseases, Faculty of Veterinary Medicine, Mansoura University, Egypt. She got the Master's degree of Veterinary Medical Sciences (M.V.Sc.) in the Department of Fish Diseases & Management from Internal Medicine, Infectious and Fish Diseases Department, Faculty of Veterinary Medicine, Mansoura University, Egypt. She received her Bachelor of Veterinary Medical Sciences (B.V.Sc.) from the Faculty of Veterinary Medicine, Zagazig University, Egypt.

Simone Smith-Godfrey
CSIR Smart Mobility, South Africa

The Use of Marine Spatial Planning for the Management of the Blue Economy

The paper reviews Marine Spatial Planning from its very definition and investigates the models of Marine Spatial Planning existing currently, entrenched in institutions. It also considers the relationships in where its custodianship currently falls within the myriad of blue economy government structures. It goes further in its analysis by focusing on the traditional tools of Marine Spatial Planning, what restrictions exist and the limitations that surrounds the institutionalization of it within blue economy governments. The rationale behind Marine Spatial Planning as a form of planning for survival of all; humankind, animals and plants within the oceans as well as acting as a mechanism for conservation are considered in this examination. The rationale behind blue economy resource management is then considered by the hand of the promoting of equality of participation in blue economy activities where Marine Spatial Planning finds its biggest application utilization. It stretches the concept further by isolating how private sector participation specifically may be governed by Marine Spatial Planning so the future of blue economy resources is safeguarded and future generations' participation is included in its scope of planning. The role Marine Spatial Planning can play within the development of coastal economies, access to opportunities the stimulation of the private sector, especially in youth employment and wealth creation through entrepreneurship re also highlighted. Marine Spatial Planning's application as an institution governing the participation of entities within coastal countries Exclusive Economic Zones has its own tools which are limited at this stage to surveys and earth observation systems. Lastly Marine Spatial Planning is reviewed based on the legislation it requires and the data management that it contributes to.

POSTER

DAY 01

2ND EDITION OF

WORLD AQUACULTURE AND FISHERIES CONFERENCE

18-19 MAY

Marnelle B. Sornito

Sea cucumber Research and Development Center, Mindanao State University at Naawan, Naawan, Misamis Oriental 9023, Philippines

Composition and distribution of top commercially exploited sea cucumbers in selected areas of Mindanao, Philippines with notes on their market value and conservation status

Sea cucumbers provide a significant source of livelihood in coastal communities; however, the resource is in peril due to overharvesting and lack of sustainable management. The study aims to highlight the composition and distribution of the most exploited sea cucumber species in the five major sea cucumber grounds in Mindanao with notes on their market value and conservation status. Daily sea cucumber catches monitoring by an assigned enumerator was employed from February 2020 to January 2022. Thirteen (13) sea cucumbers were recorded in the monitoring sites as most exploited with the top five species namely, *Actinopyga echinites, Bohadschia marmorata, Holothuria gracilis, H. scabra,* and S*tichopus horrens*. The sandfish, H. scabra is listed as endangered while *A. echinites* and *S. herrmanni* are vulnerable based on the IUCN red list. The remaining species are either data deficient, least concerned, or unidentified status. Three species are of high value (350-7,500 beche-de-mer/kg) namely: *A. lecanora, H. scabra*, and *S. herrmanni* while eight species are of medium value (500-4,000 beche-de-mer/kg). *H. atra* and *H. gracilis* are both low values (100-600 beche-de-mer/kg). The top three highest species compositions are A. echinites (31%) followed by *S. horrens* (23%) and *B. marmorata* (16%). The brown-spotted sandfish or *B. marmorata* is consistently among the top five exploited species in the five sites, followed by *H. scabra* in four sites, *A. echinites* in three sites, and the remaining in 1-2 sites. The study revealed that the five major fishing grounds produce mostly medium value sea cucumbers with one species listed as endangered and two as vulnerable. The results offer opportunities for sea cucumber research that is necessary for the formulation of local policies and management interventions for the sustainability of the sea cucumber resource.

Audience Take Away:

- The study provides relevant information that can apply towards conservation and fishery management of the sea cucumber resources in the country.
- The audience can use the information for further sea cucumber research for the formulation of size and species-specific policies and management initiatives for the sustainability of sea cucumber resource especially that the Philippines has insufficient policies and management regarding the resource.
- Our study is relevant for the policy makers, fishery managers, academe, researchers, and local government units specially here in Philippines. The information provides opportunities for research and management interventions relating to sea cucumber resources.
- This study can be used for other faculty to expand their research or teaching especially on the sea cucumber fisheries.

Biography

Ms. Marnelle is a young science research assistant of the Sea cucumber Research and Development Center of the Mindanao State University at Naawan, Naawan, Philippines. She is also a graduating student of Master of Science in Marine Biology of the same university. She focuses on sea cucumber research primarily on the fisheries and some commercially exploited holothurians, the Holothuria scabra and Actinopyga echinites. She is supervised by Dr. Wilfredo H. Uy, a professor and researcher who specialized on seagrass ecology and the program leader of the sea cucumber research.

KEYNOTE FORUM

DAY 02

2ND EDITION OF

WORLD AQUACULTURE AND FISHERIES CONFERENCE

18-19 MAY

Tran Huu NGHI

Director, the Centre for Tropical Forest Research Viet Nam

Hydropower Plant Development, Forest Recompensing and Water Governance in Central Highlands of Viet Nam

By 2016 about 98% of households in rural area of Viet Nam were electrified. The total of power system production of the country reached 159.45 billion kWh in 2016, of which contribution from hydropower plants occupy more than 30%. So far, Viet Nam planned to convert about 50,000 ha of forestland to hydropower plant construction. But in reality, the recompensing forest plantation after dam construction has not been successfully implemented due to lack of participation from local communities and inaccurate planning process.

Central Highlands is one of largest natural forest area left in the country. But deforestation has taken place seriously lead to degradation of forest, biodiversity lost, soil erosion and severe drought in last two decades. The total of recompensing forest plantation in Central Highlands is about 20,000ha (including hydropower plant and other purposes). But by 2016 only 5000ha forest planted equivalent to 20% of total area has to be planted. The implementation process reflected low level of participation from stakeholders, especially local people from planning to monitoring and evaluation of the project. The interaction from policy level, local authorities, civil society, and communities are very weak in this region.

This paper analyzed related forest and watershed management policies and their implementation on the ground. It also assessed the roles of civil society in water governance in Central Highlands. The policy recommendations to contribute to improvement of natural resources governance in the country are derived from this analysis as well as multi-stakeholder dialogues.

Biography

Tran Huu NGHI Msc. Tropical Forest Management, Goettingen University, Germnay. More than 25 years of working in the forestry sector in Viet Nam. Most of the time, he worked for international development programs/projects in the field of natural resource management and local governance in Mekong region, such as GIZ, MRC, and Tropenbos International.

Virendra Goswami

IIT & 'Environment and Peace Foundation, India Evaluating Integrated Multi-Trophic Aquaculture (IMTA) as an approach to disease and environment management for sustainable semi-intensive pond culture of Penaeus monodon (Fabricius, 1798)

Remediation of Water Pollution by Catalytic Oxidants Over the Oceanic Transitional Areas (OTAs)

It aims to develop Physicochemical and spectroscopic methods to characterize the in-situ chemical speciation of the inorganic contaminants and develop technologies for remediation of water pollution by catalytic oxidants over Oceanic Transitional Areas (OTAs). Next, to control Water Pollution resulting due to the toxin, toxic gases, Green House Gases over the subsurface oceanic regions, by making use of Catalytic Oxides of the first-row transition metal oxides in order to save marine life by inhibiting the effect of Global Warming and controlling the marine pollution through the remediation of the water treatment processes. Water gets polluted due to the toxin, toxic gases, and toxic entities viz. Chemical (e. g. lead, mercury, hydrofluoric acid, and chlorine gas), Biological, Physical, and Radiations.

The oxidation process would be employed to treat groundwater contaminants by making use of the Physio-Chemical properties of these catalytic oxidants involving chemical oxidation in subsurface systems and above groundwater systems by regeneration of Granular Activated Carbon (GAC) and using the 'High-Affinity ToxinReceptors' (HART); to entrap toxins, Chemical toxicants, as well as by innovative catalytic processes to convert GHG (Methane, CO2) to ethanol. Next, to control Marine Pollution over Oceanic Transitional Areas (TAs), the studies are focused to explore Multiple Stressors on the ocean, Sea-level Variability

Mechanisms, Sub-Mesoscale Dynamics, by the comprehensive studies of Ocean Systems Interactions, Risks, Instabilities, and Synergies (OSIRIS). Also, to investigate the aquifer materials, target and non-target contaminants in water treatment processes, and their Correlation with Climate Variability. Finally, efforts have been made to develop a Correlational Predictive Model of Chemical Reaction Kinetics in order to investigate process fundamentals & assess contaminant transformation over the areas of strong gradients in the physical environment associated with Oceanic Transitional Areas.

Biography

Dr. Virendra Kumar Goswami, PH.D. Indian institute of technology (IIT), Kharagpur, MS from University of Wisconsin, USA. Post doctorate fellow (PDF) at the University of Illinois, Chicago, USA. 'Visiting scientist' to United Nations Industrial development organization (UNIDO), ICTP, Italy. Expert panelist international civil aviation organization (ICAO), Canada and the United Nations. 'Founder president' Environment & Peace foundation'& wing commander (Retd.) With more than 550 hours of Flying as a supernumerary aircrew.

SPEAKERS

DAY 02

2ND EDITION OF

WORLD AQUACULTURE AND FISHERIES CONFERENCE

18-19 MAY

Elgen M. Arriesgado[1], Jay D. Tering[2]*, Mark A. Dela Peña[2], Romeo D. Pinaso Jr.[2], Leonard Chabon[2], Victor R. Navarro[1], Rustan C. Eballe[3], Dan M. Arriesgado[1]

[1]School of Marine Fisheries and Technology, Mindanao State University at Naawan, Naawan, Misamis Oriental, Philippines

[2]Research Division, Mindanao State University at Naawan, Naawan, Misamis Oriental, Philippines, research

[3]Extension Division, Mindanao State University at Naawan, Naawan, Misamis Oriental, Philippines, extension

Evaluating Integrated Multi-Trophic Aquaculture (IMTA) as an approach to disease and environment management for sustainable semi-intensive pond culture of Penaeus monodon (Fabricius, 1798)

Waste inorganic (nitrogen and phosphorus containing compounds) products from aquaculture results in the environmental degradation of water bodies. The problems on waste accumulation, environmental deterioration, and diseases in aquaculture have been minimized by eco-based method of aquaculture like integrated multi-trophic aquaculture or IMTA. IMTA is the farming of aquaculture species of different trophic levels that allows uneaten feed, waste, and by-products of one species to be utilized as fertilizers, feed, and energy for the other crops, and take the advantage of synergistic interactions among the species. The study aims to evaluate the performance of IMTA as an approach to disease and environmental management towards the development of a sustainable and ecologically balanced culture technology. An experiment was conducted with seven treatment combinations; (T0) P. monodon in monoculture; (T2) P. Monodon, green water using tilapia (T3) P. monodon, C. chanos, U. fasciata, P. viridis; (T4) P. monodon, C. chanos, G. verrucosa. Culture experiment was done in Naawan, Misamis Oriental with 12 ponds measuring 200-m2 and with a feeding rate of 5%. No significant difference ($P<0.05$) was observed on the growth and survival of P. monodon among treatments (16.92 – 21.81 grams; 46.29 – 58.87 %) except for T0 (13.21 grams; 16.64%). All water parameters are with the optimum values for shrimp culture except for the salinity which is higher than what is required. Ammonia level in the control treatment reached the maximum optimum value of 0.1ppm which can become toxic when pH and temperature rises. IMTA treatment ponds harvested shrimp of approximately 27-kg and a total production 87.87 – 91 kg. Microbial analysis shows the potential of IMTA to prevent the growth of pathogenic bacteria. RT-PCR results indicate that IMTA pond treatments can minimize the occurrence of White Spot Syndrome Virus (WSSV) which was observed in the control treatment.

Audience Take Away:

- IMTA, a globally used technology for an eco-friendly aquaculture, can also be used to culture Penaeus monodon combined with the other commercially important organisms in the country. This is different than the traditional polyculture system because IMTA mimics the natural environment.
- The industry of P. monodon fell to the bottom due to environment deterioration and disease outbreak brought by improper farming practices. This study addressed these 2 problems in 1 solution. In this presentation, data showing the efficiency of IMTA system in nutrient recycling and its potential to minimize the occurrence of shrimp diseases will be discussed.
- The ultimate goal is to revive and boost the P. monodon industry in the local market and abroad despite the existence of diseases that remains a threat and struggle to shrimp farmers. This technology does not require expensive materials and more laborers because the process of biomitigation comes naturally. It eliminates the cost for water exchange but still give higher production.
- The IMTA pond system is easier and more convenient compared to the cage system. Cage aquaculture is risky in the island of Mindanao, Philippines because of the number of typhoon occurrences.
- Further studies can be done based on this research outcomes that could enhance and innovate the environment-and-economic friendly aquaculture technology especially in reviving the P. monodon industry. Like the IMTA cobimnation of P. monodon and S. guttatus with other seeweed and biofilter species.

Biography

Mr. Jay D. Tering is graduate of Bachelor of Science in Fisheries last June 2018 at Mindanao State University at Naawan. He worked as shrimp technician in Charoen Pokphand Foods Philippine Corporation then later promoted as shrimp feed sales technician and shrimp farm consultant. From November 2021 up to present, Mr. Tering is working as a science aide in the Penaeus monodon IMTA project of Mindanao State University at Naawan.

Abinawanto. A

Cellular and Molecular Mechanisms in Biological System (CEMBIOS) Research Group, Department of Biology, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, Depok 16424, Indonesia

Fish sperm cryopreservation as the promising solution to the aquaculture production in the future

Domesticated of fish widely distributed in Southeast Asia. The populations of fish in the wild has been decreasing due to the spawning difficulties and overfishing. Another factors like water pollution, and habitat degradation, are also threatening the fish populations. Therefore, the fish supply has been swift from wild population to aquaculture productions to meet the market demand. As the bioecology of the fish in general has been well documented, along with the successfully developed breeding technologies, the aquaculture productions are playing a key role in many emerging economies. Spawning difficulties appeared due to the asynchronous gonad maturation of the fish. Therefore, sperm cryopreservation is one of the potential solutions to overcome the asynchronous gonad maturation. Cryopreservation is a cell-storage technique that maintains very low temperatures to maintain cell structure over a long period of time. The fish sperm of many species have been cryopreserved successfully. Cryoprotectant is a successful substance plays a vital role in preserving spermatozoa or cryopreservation of fish sperm from cold and heat shocks. Cryoprotectant consists of two types based on the ability of penetrating the cell membrane: intracellular (permeating) and extracellular (non-permeating) and combining both types of cryoprotectant. In this paper we reported the effect of intracellular and extracellular croprotectant on the sperm quality after storage in a certain period of time. This method might overcome the aquaculture production in the future

M. A. Motalib Hossain

Nanotechnology and Catalysis Research Centre, Institute for Advanced Studies, University of Malaya, 50603, Kuala Lumpur, Malaysia

Design and development of universal biomarker for the mini barcode to identify fish species

Mislabeling fish products is a crucial and growing issue concerning public health and economic concerns in the global fish business. Although DNA barcoding is an effective sequencing-based approach for identifying fish species adulteration, it is sometimes difficult to amplify PCR products with full-length barcode biomarkers (~650 bp) because of DNA degradation, particularly in extensively processed fish items. On the other hand, short-length barcodes showed higher stability under severe food processing treatments. Consequently, mini barcodes would be a suitable substitute for full-length DNA barcodes for identifying species in DNA degraded processed fish products. Therefore, this study aimed to explore the usefulness of DNA barcoding for identifying different types of fish products by developing a medium-sized mini barcode. We developed a set of universal primers targeting the mitochondrial 16s rRNA gene to amplify a 198-bp sequence to detect fish species in processed fish products. The designed universal primers set showed high specificity, amplifying only tested fish species (38 species), and no PCR products were found from 22 other non-target species (animals and plants). During the specificity evaluation, eukaryotic endogenous control was utilized to exclude the possibility of any false-negative detection. In addition, the validation of the developed primers set was performed on various heat-treated fish samples (boiled, autoclaved, and microwaved) and shown to be highly stable under all processing treatments. As a result, 92% of the analyzed commercial fish products were successfully identified with 96–100% sequence similarities. The developed universal biomarker is a useful tool for detecting fish species in highly processed foods, and it could be beneficial in identifying fish species replacement, protecting consumers' health and financial interests.

Audience Take Away:

- How to design the universal biomarker for fish species
- How to optimize the universal biomarker
- How to develop mini barcode for the fish identification
- The superiority of mini barcodes over full length barcodes

Biography

Dr. M. A. Motalib Hossain is working as a Postdoctoral Research Fellow at Nanotechnology & Catalysis Research Centre, University of Malaya, Malaysia. He received his Ph.D. from the University of Malaya in 2017 at the same institute. His research focuses on the synthesis of nanomaterials, the development of DNA biosensors, DNA Biomarkers, conventional and real-time multiplex PCR systems, and food authentication. For the first time, he developed double genes targeted multiplex PCR assay; this new concept has enhanced security in molecular diagnosis. He has contributed 43 papers in ISI top-ranking journals with 5 international Conference Proceedings. His work made two patents and one international science news.

Lopez-Peraza Diana J*, Lozano-Huerta Ricardo, Bermudes-Lizarraga Jose F, Nieves-Soto Mario

Faculty of Marine Sciences (FACIMAR), Autonomus University of Sinaloa, Mazatlan, Sinaloa, Mexico

Effect of the enrichment time with the tuna orbital oil emulsion on the fatty acids profile of juveniles of *Artemia franciscana*

Artemia is deficient in polyunsaturated fatty acids (PUFAs), particularly in arachidonic (ARA, 20:4n-6), eicosapentaenoic (EPA, 20:5n-3), and docosahexaenoic acid (DHA, 22:6n-3). The aim of this study was to determine the optimal time in which the higher contents of PUFAs in juveniles of *Artemia franciscana* were obtained by the effect of enrichment with the tuna orbital oil emulsion. Six enrichment periods were evaluated: 3, 6, 9, 12, 15 and 18 h, in addition to a control treatment (0 h). The most abundant fatty acids in *A. franciscana* were monounsaturated (43.10% ± 4.35 –52.92% ± 5.82%), followed by saturated (33.83% ± 1.71 –42.33% ± 2.31%) and PUFAs (8.86% ± 2.83% –21.32% ± 2.38%). ARA decreased over the enrichment time; the maximum content was 5.74 ± 0.37% at 3 h, which was not statistically different with respect to the content recorded at 0 h. The highest content of EPA was at 3 h (6.47% ± 1.44%), without significant differences with the content registered at 0 h, while that from 6 h and until 15 h tended to decrease significantly. At 6 h, the content of DHA (8.84% ± 2.72%) was significantly higher compared to the rest of the treatments, which did not differ among themselves, or with the control. After to the 6 h and until 15 h, the content of PUFAs tended to decrease, which could indicate the metabolization of them by *A. franciscana,* coupled with the possible oxidation of these fatty acids in the enrichment solution.

Audience Take Away:

- The audience will learn a little more about the improvement of the nutritional quality of the live prey that is usually used in aquaculture, such as Artemia. Despite Artemia is widely used in aquaculture, the information about the physiology and nutrition of late stages (juveniles and adults) is scare, because studies have been focus on early stages (nauplii and metanauplii). This work provides useful information that can be used by students and researchers to improve the nutritional quality of the species, specially concerning to the fatty acids content, which can be used for future research in the feeding of organisms in culture.

Biography

Dr. Diana studied Biology at the Autonomous University of Sinaloa (AUS), Mexico and graduated as Aquaculture Biologist in 2007. She then joined to the Aquaculture Department of CICESE, B.C., Mexico and received her Master and Doctor degrees in 2009 and 2014, respectively at the same institution. Immediately after obtaining her doctorate, she joined to the Autonomous University of Sinaloa where she currently holds the position of professor and researcher, and she is a member of the research group of "Ecophysiology of aquatic organisms and support crops for aquaculture" of the AUS (CA-UAS-162). She has published 12 research articles in SCI(E) journals.

Thao Phuong Huynh Ngo

Division of Aquacultural Biotechnology, Biotechnology Center of Ho Chi Minh city, Vietnam

Tilapia lake virus (TiLV) from Vietnam is genetically distantly related to TiLV strains from other countries

Tilapia lake virus (TiLV) is reported as a threat to tilapia aquaculture in 16 countries from four continents with outbreaks causing up to 90% mortality. Our study is the first one working on TiLV from Vietnam. We propagated successfully a TiLV isolate HB196-VN-2020 from a diseased tilapia sample using an E-11 cell line and evaluated its virulence in different weights of red hybrid tilapia and three serial 10-fold diluted viral titers. Small fish (4.5 ± 1.98 g) were proved to be more susceptible to TiLV infection at the viral titer of 9.1×10^5 $TCID_{50}$ $fish^{-1}$ than large fish (20.8 ± 7.5 g) with the mortalities of 92.5% and 12.5%, respectively. Phylogenetic analysis of the concatenated 10 segment coding regions placed two Vietnamese TiLVs (RIA2-VN-2019 and HB196-VN-2020) in a separate clade, distantly related to other reference 21 isolates. Reassortant detection analysis revealed seven potential reassortment events among 23 TiLV genomes, indicating the mixed infection of multiple TiLV isolates at the farms and the fish movement among different regions. However, additional sequences from various sampling locations and times are required to better understand the impacts of genetic diversity and ressortments on the evolution, migration and natural selection of TiLV in Vietnam and other countries.

Audience Take Away:

- For the first time, two genomes of Tilapia lake virus (TiLV) from Vietnam have been characterized and compared to those of other TiLV strains in other countries
- Small fish were proved to be more susceptible to TiLV infection than large fish
- Phylogenetic analysis of the concatenated 10 segment coding regions placed two Vietnamese TiLVs in a separate clade, distantly related to other reference 21 isolates
- Several potential reassortment events among TiLV isolates were detected, indicating the mixed infection of multiple TiLV isolates at the farms and the fish movement among different regions

Biography

Dr Thao Phuong Huynh Ngo studied Biotechnology at Van Lang university, Vietnam for Engineering degree in 2000-2004 and gradated as Master of Science in Molecular Biology in 2006 from Northumbria university, Newcastle upon Tyne, United Kingdom. Then she joined the research group of Prof Sandra Adams at Stirling university, Scotland, United Kingdom. She received her PhD degree in 2017 at the same institution. She has had experience working at Biotechnology Center of Ho Chi Minh city, Vietnam since 2006 and worked as Head of Aquacultural Biotechnology Division since 2008. She is a molecular microbiologist with expertise in fish vaccine development and efficacy testing.

Farooz A. Bhat*, T. H. Shah and Asim Bazaz

Division of Fisheries Resource Management, Faculty of Fisheries, Rangil, Ganderbal Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, Srinagar, Kashmir, India – 190006

Present status of Fish & Fisheries and Conservation of fishes of Kashmir Himalaya through induced breeding techniques in Kashmir Himalaya, India

Kashmir valley located in the North Western Himalaya is famous for being an abode of diverse network of lentic and lotic ecosystems with diverse fish fauna. The demotechnic growth, urbanization of rural centers and deforestation has resulted in the deterioration of fresh water ecosystem in Kashmir, at an alarming level. Consequently the aquatic ecosystems are being variably reduced to the sinks of wastes emanating from human settlements, agricultural fields, orchards, surface run off etc. Needless to mention such aggressive anthropogenic interferences have adversely affected the indwelling biota in general and fish in particular. With the result the important fish germplasm from the region is either extirpated from certain water bodies and are restricted to certain patches or some have become extinct. Over the years, the fish diversity and fish catch of the fishes in the region especially of indigenous fishes has decreased. Schzithoarcines (snow trouts), common carps and trouts (exotics) are the commercially important fishes. The technology of breeding of exotic trouts is well established but that of snow trouts and common carps in the region is not yet properly established.

In order to conserve the fishes and produce the quality seed of some prized fishes of Kashmir like *S. ecosinus* and *Cyprinus carpio* Var. *communis* attempts have been made. Therefore, the present study was undertaken to develop induced breeding technique of some important fishes in Kashmir. In present study, the effects of different doses of ovatide on induced spawning activities of females of *S. ecosinus* and *Cyprinus carpio* var. *communis* were treated with ovatide at the rate of 0.3, 0.5 and 0.7ml/kg body weight and the males were treated at the rate of 0.3ml/kg. The doses of ovatide at the rates of 0.3, 0.5 and 0.7 ml/kg body weight resulted in 83.3%, 100% and 83.3% in *S. ecosinus* and 66.6%, 88.8% and 66.6% in *C. c*. var. *communis* ovulation respectively. The Spawning fecundity at 0.3, 0.5 and 0.7ml ovatide /kg body weight was observed as 30,000, 35,150, 32,000 in *S. ecosinus* and 49577.33, 68931, 56747.6 in *C. c*. var. *communis*. The fertilization rate at 0.3, 0.5 and 0.7ml ovatide /kg body weight was observed 96%,99.5% and 98% in *S ecosinus* and 81.14%, 82.7%, 80.1% in in *C. c*. var. *communis*. The hatching rate at 0.3, 0.5 and 0.7ml ovatide/kg body weight was observed as 78%, 82% and 80% in *S ecosinus* and 70.02, 69.26, 71.08 in *C. c*. var. *communis*. The doses of ovatide at the rates of 0.5ml/kg body weight for female was found to be satisfactory for breeding performance in terms of ovulation, fecundity in both fishes and could prove helpful for the sustenance of the both fish species.

Audience Take Away:

- Will learn about the type and status of Fish germplam of Kashmir
- Will come to know about various Causes and Concerns of Fish decline from natural resources.
- Measure of various Ex-situ conservation especially with respect to induced breeding for mass seed production and ranching in natural water bodies.

Biography

Dr. Bhat has worked on the fish biodiversity, aquatic ecology, population dynamics, and distribution pattern of fishes in whole of Jammu and Kashmir. Dr. Bhat has worked on the ecology and fisheries of high altitude lakes of Ladakh like Pangong Tso, Tso Moriri and Tso Khar. Dr. Bhat has successfully completed several externally funded projects from various funding agencies like DBT, DST, NFDB, J&K Govt. Dr. Bhat has worked in several Consultancy projects for preparing the EIA/EMP including Fisheries Management. Dr. Bhat has been member, member secretary and Chairman of several statutory bodies of SKUAST-K, India. Dr Bhat is working as "EDITOR of SKUAST Journal of Research" since 2011. Dr. Bhat is acredited by National Acredition Board for Eduation and Trainings (NABET), New Delhi as Functional Area Expert (FAE) in Ecology and Biodiversity. Dr. Bhat has been supervisors of about Fifteen (15) Masters and Eight (8) Ph.D. scholars who have sucessfully completed their research/degrees. Dr. Bhat has published more than 110 research journals in high impact journals.

Mohammad Khairul Alam Sobuj

Marine Fisheries and Technology Station, Bangladesh Fisheries Research Institute, Cox's Bazar-4700, Bangladesh

Solvents efficacy on the extraction of bioactive compounds and antioxidant activity of *Padina tetrastromatica* and *Gracilaria tenuistipitata* seaweeds collected from Bangladesh

Seaweeds are now recognized as a treasure of bioactive compounds. Beneficial health effects of seaweeds vary with the different aspects especially geographical location of the seaweed. However, the seaweed of Bangladesh is still unexplored. So, this study was designed to explore the secondary metabolites and antioxidant activities of different solvent extracts (methanol, ethanol and water) of *Padina tetrastromatica* and *Gracilaria tenuistipitata* seaweeds. Here, we determined preliminary phytochemical composition, total phenolic content (TPC), total flavonoid content (TFC) and different antioxidant activity of crude extracts using different qualitative and quantitative in vitro assays. Overall, screening of phytochemicals revealed that both the seaweeds contain diverse type bioactive compounds including terpenoid, saponin, phlobatannin, cardiac glycosides, phenolic and flavonoid depending on the seaweed species and extraction solvents used. FT-IR spectroscopy also confirmed the presence of phenols, carboxylic acid, alkoxy, aromatics, alkene, amides and sulfonates at varying degree. Antioxidant activity of extracts were evaluated by 1, 1-diphenyl-2- picrylhydrazyl (DPPH), 2, 2-Azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS), reducing power (RP), phosphomolybdenum, nitric oxide (NO) scavenging and hydrogen peroxide assays. Here, methanolic extract of *P. tetrastromatica* showed the highest amount of total phenolic content (85.61 mg of GA/g), total flavonoid content (41.77 mg of quercetin/g), which showed as potent antioxidant properties confirmed by DPPH (77.07%, IC_{50}=0.40 mg/ml), ABTS (77.65%, IC_{50}=1.33 mg/ml), RP (53.24 mg AAE/g), phosphomolybdenum (31.58 mg AAE/g), nitric oxide (70.64%, IC_{50}=0.75 mg/ml) and hydrogen peroxide (67.89%, IC_{50}=3.08 mg/ml) assays followed by ethanol and water. These results confirmed the presence of diverse type of chemical composition with its antioxidant activity in the seaweeds which will be useful for pharmacological as well as in functional food application.

Audience Take Away:

- Here we find out that both the seaweeds are an amusing source of bioactive compounds with having wide range of antioxidant activity
- It was found that choice of extraction solvent and type of seaweed significantly influence on the availability of functionally bioactive compounds
- These seaweeds could be used as potent source of natural antioxidant as food supplement or functional feed.
- Additionally they will be very helpful for pharmacological industry in marine drug production in Bangladesh

Biography

Mohammad Khairul Alam Sobuj received MS degree from Department of Fisheries Biology and Aquatic Environment, Bangabandhu Sheikh Mujibur Rahman Agricultural University, Gazipur. He was working there as a research co-investigator under the supervision of S.M. Rafiquzzaman in the faculty lab on Seaweed. His working interest is to study about antioxidant activity, phytochemical analysis and isolation of bioactive compound, seaweed cultivation, seaweed biomass study, mangrove seaweed. He is now working as a Scientific Officer at under Ministry of Fisheries and Livestock. He has published 02 research articles in reputed journals.

Neelanjana Choudhury

Department of Zoology, University of Kalyani,Kalyani, Nadia, West Bengal, India

First report of Anthocyanin as nutralizer against Takumi (Flubendiamide 20% WDG) induced toxicity in *Labeo rohita*

Takumi (Flubendiamide 20% WDG) insecticide is used against various borer insect pests like, stem borer, pod borer, leaf folder, semilooper etc. Borer insects are major insect pests of Rice crop. Hence, the insecticide is popularly used to manage the borer pests in paddy fields. These agrochemicals after absorption, leaching and adsorption enters into the aquatic body producing severe toxication in non-target organisms. The commonly occurring fingerlings of *Labeo rohita* is exposed to Takumi in rice fields. Long term chronic toxicity (30, 60 and 90 days) was studied in *Labeo rohita* against the insecticide Takumi (Flubendiamide 20% WDG). The present investigation involves changes expressed at biochemical, haematological, histological, protein profile and genotoxic level. Significant decrease was observed for different biochemical parameters like, total protein, serum albumin and A/G ratio whereas some parameters increased, like glucose, cholesterol, SGOT, SGPT, creatinine, alkaline phosphatase and cortisol. Among Haematological parameters, significant decrease was observed for hemoglobin, RBC, PCV, MCHC and neutrophil. In contrary, WBC, monocyte and eosinophil showed increase in concentration. The degradation of DNA was highest in liver (-88.26) followed by muscle (-87.26) and heart (-79.67). Anthocyanins, glycosides of anthocyanidins, are phenolic compoundscausing purple colour in different crops. It has antidiabetic, anticancer, anti-inflammatory, antimicrobial, and anti-obesity effects, as well as used as preventive approach against cardiovascular diseases. Anthocyanins extracted from edible parts of plants have potential to treat toxicityin aquatic organisms.For curative measure, anthocyanin was isolated from purple fleshed sweet potato, DOP-92-120, without using alcohol or acetone and injected into the caudal vein of *Labeo rohita*. Administration of anthocyanin at a dose of 5mg/ml caused significant remedial feature in the non-target organism.

Audience Take Away:

- Levels of toxicity induced due to excessive application of insecticide (Flubendiamide 20% WDG) in non-target organismsHow different Biochemical, haematological, histological, protein profile and genotoxic parameters vary under insecticide intoxication
- How Anthocyanin may be isolated without using alcohol and acetone
- Curative measures of Anthocyanin against insecticide toxicity

Biography

Dr. Neelanjana Choudhury is presently working as Assistant Professor and Head, Departmentof Agriculture, AISECT University, Hazaribag, Jharkhand, India. She has completed her Doctoral degree under Joint guidance of Prof. Ashis Kumar Panigrahi (University of Kalyani, Kalyani, West Bengal) and Prof. JayantaTarafdar (Bidhan Chandra KrishiViswavidyalaya, Kalyani, Nadia, West Bengal) focusing on Aquatic Toxicology due to application of excessive pesticides in Agricultural fields. She has more than 9 years of Research experience in this area. She has successfully completed 3 Govt. funded projects (From, ICAR, DBT, ICAR-DUS). Also, she is playing an active role as Reviewer, Editor and Eminent editor in more than 12 International Journals.

Ana Claudia Sanchez Ortiz[1]*, Rafael Franco-Sapien[1], Ginna Alejandra Villalobos-Guzmán[1],Ma. del Carmen Flores-Miranda[2], Angel Isidro Campa Córdova[3]

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Use of medicinal plants as antimicrobials for sustainable aquaculture

The need to produce food under strict quality standards and reduce the impact on the environment, leads to development of food industry, particularly aquaculture practices. Minimizing the impact of this industry, implies the use of non-chemical antimicrobials and better practices for a sustainable management. The use of natural antimicrobials is essential to minimize the harmful effects of chemicals and minimize losses due to bacterial and viral pathogens. Medicinal plants offer a natural and sustainable alternative with high antimicrobial capacities, particularly if native species are used. Its use and administration in aquaculture systems must be evaluated for effective use. Basil, Ocimum basilicum L. and oregano, Origanum vulgare, are plants with a wide distribution in Mexico and their antimicrobial potential, particularly of steam-entrained extracts of oregano, against Vibrio parahaemolyticus, an important pathogen in aquaculture practice, was demonstrated. In addition to the above, it was sought to take advantage of the potential of a native plant, so the antimicrobial potential of the chicalote Argemone mexicana L. was also verified to inhibit the growth of V. parahaemolyticus. Plant tissue extracts were obtained by freeze-drying, alcoholic extraction and steam dragging of the dry leaves of each species. V. parahaemolyticus was obtained from a collection of the Center for Biological Research of the Northwest CIBNOR at La Paz, México. The use of medicinal plants as antimicrobials in aquaculture systems requires the evaluation of the dose and method of application, since direct application can result in a certain degree of toxicity to organisms, as was verified by adding basil and oregano in experimental shrimp farming. Therefore, the feasibility of administering medicinal plant extracts in the form of microencapsulates supplied with pelletized food was verified.

Audience Take Away:

- This research can be replicated with other medicinal plants native to the different regions producing marine farming organisms.
- This research provides a practical solution to viral and bacterial pathogens, avoiding the use of antibiotics, providing an efficient but more environmentally friendly solution
- A strategy is proposed to improve the administration method of natural antimicrobials to minimize losses due to pathogens in aquaculture

Biography

Dra. Ana Claudia studied Marine Biology at UABCS, La Paz, BCS, México and graduated as master in science in 2009 and doctor in science in 2015 in the area of marine biotechnology. She then joined at 2017 to the University of Guadalajara as professor and researcher in marine, aquaculture and food biotechnology. She has published her work in international journals and leads a research proyect that involves doctoral students. Conducts collaborative research for the development of the aquaculture industry with another leading researchers

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Relative expression of Growth hormone receptor (GHR1) and its truncated variant (GHR1t) in adults and larvae of flatfish Paralichthys adspersus

The flatfish Paralichthys adspersus is a commercial species with sexual dimorphism, in which females growing faster than males. This characteristic will generate that one goal in the coming breeding programsis controlling the sex ratio to encourage a female bias in the culture population. However, another way to modify this growth pattern in P. adspersus is editing males to get higher growth. In that sense, we are testing a hypothesis based on the fact that in early adult stages, females express more levels of ghr1 than males, while males express more ghr1t, a truncated variant of ghr1, than females, acting as a negative regulator of growth. As the first step to test our hypothesis, we assessed the expression levels of ghr1 and ghr1t in the liver and muscle of adult males and females and the ventral section of pre-metamorphic, metamorphic, and post-metamorphic larvae of P. adspersus. For relative expression, we choose three housekeeping genes (HKGs) based on previous gene expression studies of P. adspersus and Paralichthys olivaceus. HKGs were ß-actin (ACTB), ß-tubulin (TUBB), and ubiquitin C (UBCE). Our results showed that the expression level of full version of ghr1 (ghr1f) in the liver is not significant in both sexes ($P > 0.05$), while the expression level of ghr1t is higher in males than in females ($P < 0.05$), presenting an expression ratio of ghr1t in males to females near 2:1. In the case of muscle, expression levels of ghr1f and ghr1t were not significant for both sexes ($P > 0.05$). Comparison between tissues showed that expression levels of ghr1f and ghr1t were higher in liver than muscle ($P < 0.05$), with a higher differential expression for ghr1tf. As a second step, we amplified the intron 8, generating a PCR product of 973 bp. Through the amplification and sequencing of this intron and the ghr1t 3´UTR we were able to characterize the presence of a polyadenylation signal sequence. It remains to be determined why this transcription termination signal is favored in males, increasing the ghr1t levels

Audience Take Away:

- At this point, colleagues could assess the application of analysis of structural regions of interest from the genome in marine aquaculture species and solve specific problems.
- We are focused on improving the growth rate of P. adspersus under aquaculture conditions. We proposed manipulating the sequence of the growth hormone receptor truncated variant at intron 8. Similar alternative splicing could be associated with commercial traits in aquaculture, and the potential success of our study will be a case study.
- Success histories in aquaculture species solving specific problematics are an example to follow applying the local context of each geographical region.
- Yes. This study aims to improve the growth in this species in approximately 15-20% per cycle of production.

Biography

Dr. López studied Fisheries Engineering at the National University of Tumbes, Peru, and graduated in 2001. He then joined the research group of Dr. Massaut at the National Center for Aquaculture and Marine Research (CENAIM-ESPOL), Ecuador. He received his Ph.D. degree in 2015 at the Center of Scientific Research and Higher Education of Ensenada (CICESE), Mexico. After three years of a postdoctoral fellowship at CIGOM consortium, Mexico, he obtained an Associate Researcher position at CIGOM-CICESE. Currently, Dr. López is an Associate Researcher at the National University of Santa, Peru, and has published more than 15 research articles in peer-review journals.

Mustapha HASNAOUI

Environmental, Ecological and Agro-Industrial Engineering Laboratory, Faculty of Sciences and Technics, University of Sultan Moulay Slimane, Beni-Mellal – Morocco

Rural aquaculture and food security in Morocco (semi-arid zone)

In recent decades, aquaculture dominated all animal production sectors in terms of growth and is increasingly contributing to food security, poverty reduction, creating jobs and sources of income. In front of a global situation of declining catch fisheries, population growth projections and increasing demands for aquaculture products, aquaculture will have to be developed to meet future demand for fish. For that, it is necessary to consider a combination of farming and catching activities at the dam lakes. These two activities can play an important role in promoting employment and food security, especially in rural areas through an optimal, rational and sustainable exploitation of fisheries resources with a participatory approach and a diversification of production methods. In the semi-arid zones, the accelerated development of aquaculture in floating cages is due to a better choice of species with good zootechnical performances, good culinary value and a reasonable cost of production. In Morocco, the species is Tilapia nilotica (Oreochromis niloticus) one of the most cultivated species in the world (Fitzsimmons, 2013). In 2014, the threshold of production of this species exceeded 5 million tons, whereas this production hardly exceeded 200 thousand tons in 1980 (FAO, 2016). The first experiences of commercial production of this species in floating cages in several Moroccan dams have shown that its production cost will be between 2,5 at 3$.kg-1 . At these prices, it will be possible to market large quantities of Tilapia weighing 500g to 1kg and thus generate significant turnover by stimulating the development of this vital sector of the national economy contributing to food security (animal proteins to rural populations and diversification of species in regional and national fish markets).

Audience Take Away:

- The audience will be able with formation on aquaculture.
- For the poor zones in the world, it's necessary to have a food security alternative et facilitate the access to any issue concerning ecosystemic services
- It's an adequate scientific solution
- Our experience shows that it's very important to make this work for agricultural and rural population
- Our conception is very easy and each one in arid and semi-arid zones can use it.

Biography

Dr. Mustapha HASNAOUI is a Professor of Biology and Environment at Sultan Moulay Slimane University in Beni-Mellal, Morocco. He obtained his Ph.D in Biology/aquaculture (2001) from Cadi Ayyad University in Marrakech, Morocco. He was promoted to Full Professor in 2014. He is Research Director and Director of the Environmental, Ecological and Agro-Industrial Engineering Laboratory in the Department of Biology, Faculty of Science and Technics in BéniMellal. He directs various researchs on hot and cold water fishs in collaboration with national and international institutions. Since April 2016, he is editor-in-chief of the Journal of Water and Environmental Sciences (JWES). He serves as member of editorial board for several international journals working on Environment and climate change.

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Incongruence between morphological and genetic data of *Scomber colias* in Tunisian waters

The Atlantic chub mackerel *Scomber colias* (Gmelin, 1789) is one of the important fisheries resources in Tunisian waters. The best management of this resource needs the knowledgement of populations differentiation. Therefore, morphological study including 13 morphometric, 4 meristic characters and sequences of mitochondrial DNA control region were carried out from three distant sampling sites along the coast of Tunisia in order to test a possible differentiation between the three populations.

Morphologic analysis of adults specimens revealed statistically significant differences for 13 standardized morphometric measurements and 2 meristic characters (the number of branchial spins Right(BrR) and Left (BrL)).In fact, in morphometric traits, the overall assignments of individuals into their origin groups were **83.87%** for the morphometric variables and **49%** for the meristic data, respectively. However, the genetic study revealed the absence of genetic structure between the three populations with a lower and insignificant fixation index (***ΦST=-0.004, P=0.701***).

Despite the non-convergence between the genetic and morphological data, a possible signal of differentiation between 3 groups of *Scomber colias* which belonging to the same population seems plausible. In future, geometric morphometry and microsatellites markers are required to confirm our results.

Key words: *Scomber colias*, morphology, genetic, différenciation, populations.

Wen-Miin Tian

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Ecosystem Characterization of a Wet-land Pond with Imaging Sonar

An acoustical-based procedure which incorporating truly synoptic measurements with quasicontinuous sampling of spatial-temporal fish information and benthic morphological characteristics was developed for observing, assessing, monitoring, and understanding aquatic ecosystems. In the current investigation, an isolated wet-land pond with dimensions of 40x40x2m for the purpose of sewage purification was selected for the verification and demonstration of this recently developed procedure. The procedure consisted three major components, which incorporated a synoptic image acquisition component with a mechanically scanned imaging sonar, a cumulative inversion processes for fish quantification, and a modeling technique (i.e., spatial statistics and phenomenological evaluations) for ecosystem characterization. Derived information of the individually detected fish includes: position, orientation and acoustic length. From the spatial-temporal-fish-morphology information system collected, ecosystem related information of the fish in the pond, such as abundance, distribution pattern, taxonomic groups, prominent length(s), movement and activity pattern, predator-prey interactions, bio-physical interaction as well as food web dynamics, were derived. In this specific pond, three trophic levels were identified and concluded, which include 1. Plankton (primary production), 2. tilapia (238 individuals, 20cm and 30cm in length), 3. snakehead fish (45 individuals, 60cm, 70cm and 90m in length). A stable ecosystem with prominent diffusion-advection movement pattern for forging activity characteristics and saturated environmental carrying capacity were concluded. The recently developed procedure was proved efficient for the quantification of ecosystem characteristics of underwater environment for both isolated as well as extended areas. This procedure can be directly and strictly applied to the normal sized aquacultural pond for the quantification of fish/shrimp abundance, prominent length as well as behavior characteristics.

Audience Take Away:

- Observing ecosystem structure and ecological processes at the spatial and temporal scales on which they occur were discussed
- A synoptic image acquisition component with a mechanically scanned imaging sonar were used for spatial-temporal data collection
- Both information of fish and benthic morphology were collected concurrently
- A modeling technique based on spatial statistics and phenomenological evaluations were developed for ecosystem characterization
- The developed procedure can be directly and strictly applied for the quantification of fish/shrimp abundance, prominent length as well as behavior characteristics in aquacultural pond

Biography

Dr. Wen-Miin Tian has his expertise in marine geotechnical engineering and underwater acoustic surveying on both stationary objects (e.g., artificial habitat) and mobile objects (e.g., fish and shrimp). For the last ten years, he has dedicated in integrating acoustic instruments, incorporating proper deployment capabilities and developing practical processing procedures for the quantifying and describing the spatial ecology of fish and their habitats.

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