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AQUACULTURE AND MARINE BIOLOGY

April 12-13, 2021 I Webinar

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NOTE:

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DAY 1 KEYNOTE SPEAKERS

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Eleanor Daniella Lokman

Department of Fisheries Malaysia (DOF), Malaysia.

Spatial Distribution of Ornamental Fish Farming and Off-Farm Employment in Perak Using Geographic Information System (GIS)

Ornamental fish is the export-oriented sub-sector relishes as one of the fastest-growing in Malaysia's agriculture sector and the possibility for further expansion of the industry is broad. However, importing activities are banned due to export restrictions by the European Union (EU), through DG SANTE audit, on farm management of aquatic animal health. Fisheries Bio-security Division (FBD) has developed a system containing spatial database of the compartmentalized farm, namely BioDOF-Map (Fisheries Biosecurity Control Management System). The objective of this study is to map on farm and off-farm employment carried out by farmers affected by the factors of the farms location, houses and nearby towns in Perak and Johor.

A total sample population consist of 75 ornamental fish farmers were involved. The study engaged non-spatial and spatial data to capture farm location effect on the farm operational activities especially in fisheries bio-security terms. Descriptive analysis used to describe respondents' socio-economic profiles. The relationship between fish farming and independent variables were cross-tabulated and chi-square was used to test the null hypothesis. Majority of the respondents were male and married, aged 41-50 years old (42.8%), 60.8% had SPM and 41.5% had farm scale of 10ha. Average total production is 2 million a year with (39%) breed goldfish and Koi (30%). There are significant relationship between farming activity and age, education level, total of production and income. Spatial analysis shows majority live less than 15 kilometres from town to house and farm. BioDOF-Map has facilitated DOF in farm monitoring and policy should be formulated to increase job availability in the vicinity of farmer's community.

Keywords: GIS, Fisheries Bio-security, Ornamental Fish, BioDOF-Map system, off Farm employment.

Biography:

Eleanor Daniella was born on 22nd of January 1983 in Muar, Johor. She attended Primary and Seconcary School in Kuala Lumpur and Selangor. She enrolled into University Putra Malaysia, Malaysia where she obtained a Diploma in Agriculture and graduated in 2003. Later graduated her Bachelor Degree in Agricultural Science in 2008 and Master Science in Rural Advancement. She is currently pursuing her Ph.D in Agricultural Extension in University Putra Malaysia. She served as a Research Officer at Malaysian Remote Sensing Agency, Ministry of Science, Technology and Innovation (MOSTI) from 2008 until March 2015. Currently, she is working as Senior Research Officer at the Department of Fisheries Malaysia, Ministry of Agriculture and Food Industry Malaysia, Putrajaya from March 2015 until present.

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V.B. Sakhare

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Impact Of Exotic Fishes on Indian Fish Fauna

The exotic fishes like *Cyprinus carpio, Ctenopharyngodon idella, Lebistes reticulates, Tinca tinca, Hypopthalmichthys molitrix, Tilapia mossambica, Salmo trutta fario,Salmo gairdneri gairdneri, Gambssia affinis,Salvelinus fontinalis, Salmo salar, Onchorynchus nerka, Aristichthys nobilis, Piaractus brachypomus,Clarias lazera and Clarias gariepinus* etc were introduced in Indian waters. The transplantation of these fishes into Indian waters has not been a very good experience. The present article is collective information on the exotic fishes and their impact on Indian fish fauna.

Tilapia (Oreochromis mossambicus): In India, the first consignment of tilapia was brought by the Central Marine Fisheries Research Institute (CMFRI), on August of, 1952 from Bangkok and the second by the Madras Fisheries Department in the same year from Ceylon. Tilapia is hardy but display some of the most undesirable characteristics. It bears at a very small size, is difficult to grow to a reasonable market size with huge differences in growth between the sexes. Due to all these characteristics, tilapias are referred as 'weed fish'. The introductions of tilapia into Indian waters have not been a very happy experience. It has adversely affected the indigenous gene pool.

The presence of tilapia in carp nurseries seriously affected the survival and growth of carp fry since tilapia not only feeds extensively on carp fry but its young compete directly with carp spawn and fry for food.

In Pawai lake of Mumbai the major carps have been badly hit with the accidental introduction of *O.massambicus*.Sreenivasan (1967) found that the growth of rates of *Catla catla, Labeo fimbratus and Cirrhinus mrigala* were adversely affected by tilapia in Ayyamkulam pond. He also reported that the growth of Chanos chanos was restricted to less than 100 gm/year, against the usual 500 gm/year in many water bodies of Tamil Nadu due to co-existence with tilapia. In Kabini reservoir tilapia has adversely affected the indigenous Cirrhina reba. During the period from 1980-81 to 1984-85, tilapia has caused decrease of Cirrhina reba's share in the catch from 70% to 20% (Murthy et al., 1986)

Tilapias also form an important fishery of the bheries in West Bengal. Impact of tilapia in the bheries is very severe. The carp fishery that contained up to 93% in 1959 was reduced to nil

by 1971, associated with an overall reduction in the yield to the extent of 87.7%.

According to Jhingran (1985) tilapia is unsuitable for culture along with Indian major carps because of the adverse effect it cases on the growth and production of carps and its depredations on carp fry. Although under certain condition, as under monosex culture, it can grow in to a big size, tilapia is not preferred by consumers due to its usually small size. Das et al (1990) also strongly recommended banning of introduction of exotic fish species in our natural water.

CONCLUSION

There is an urgent need to educate fish farmers about the consequences of unauthorized introduction of exotic fishes and on the efforts needed for minimizing the risk factors. No exotic fish should be introduced unless it is scientifically recommended and approved. The unauthorized entry of the fish seed of undesirable species should be immediately stopped. It is duty of the extension officers/scientists to educate the farmers about the adverse consequences of culture of exotic fishes.

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Biography:

Dr. Vishwas Balasaheb Sakhare is Professor, Post Graduate Department of Zoology, Yogeshwari College, Ambajogai (India). He has 23 years' experience as an outstanding teacher and researcher. He has done pioneering work in the field of Reservoir Fisheries, Limnology and Fish biology. Dr. Sakhare has successfully organized National Virtual Conference on Fish and Fisheries of India (CFFI-2020), National Seminar on Changing Perspectives in Inland Fisheries (CPIF-2018),Workshop on Culture and Breeding of Ornamental fishes (CBOF-2017), National Workshop on Techniques of Scientific Writing (TSW-2014), National Conference on Emerging Trends in Fisheries and Aquaculture (ETFA-2012), National Conference on Current Perspectives in Limnology (NCCPL-2009) and Regional Workshop on Water Quality Assessment (Implications in Potability, Productivity and Pollution control).

Professor Sakhare has authored/edited more than 33 books. He is a recognized research guide of Dr.Babasaheb Ambedkar Marathwada University, Aurangabad and Solapur University, Solapur. Under his guidance four students have completed Ph.D. He has published more than 65 research articles and reviews in peer reviewed journals.

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DAY 1

SPEAKER PRESENTATIONS

Food and Feeding Habit of Air-Breathin Channa Punctatus (Bloch) from Wan Seservoir of Beed District, Maharashtra,India

Shivaji Jetithor, Vishwas Sakhare
Departmenty of Fishery Sciecne, Yeshwantrao Chavan Mahavidyalaya, Tuljapur, Maharashtra, India

In the present investigation, an attempt has been made to investigate the food and feeding habit of Channa punctatusfrom wan reservoir of Beed district, Maharashtra (India). It is observed that the Channa punctatus feed on a wide variety of food items. Fry are mainly zooplankton feeder while juveniles and adults are mainly piscivorous.

In present investigation, a total of 30 guts of Channa punctatus were examined. The gut content of fry of Channa punctatus mainly composed of crustaceans (52%), aquatic insects (32.10%), worms (5.25%), miscellaneous items (5.10%), and unidentified items (5.55%) .

In case of juveniles fish formed the main food item of the gut content forming 35.20%.The aquatic insects were next important food item in the diet contributing around 30.80%.The crustaceans, gastropods, worms, miscellaneous items and unidentified items formed 11.10%,10.2%,8.5%,3.2% and 1% respectively.

Fish formed an important dietary component of adults (55.20%), followed by crustaceans (14.2%), aquatic insects (9.3%), miscellaneous items (8.10%), worms (5.3%), unidentified items (5%) and gastropods (2.90%) .

From the above study, it can be concluded that the Channa punctatus fed on a wide variety of food items. Fry are mainly zooplankton feeder while juveniles and adults are mainly piscivorous.

Biography:

Dr.Shivaji Gyanba Jetithor is working as Assistant Professor in Department of Zoology/Fishery Science of Yashwantrao Chavan Mahavidyalaya, Tuljapur (Maharashtra).He has more than six years teaching experience in the field of Fisheries, Aquaculture and Environmental Science. He has published more than 15 research papers in the national and international journals and also attended more than 20 conferences. He is a recognized post graduate teacher and research guide of Dr.Babasaheb Ambedkar Marathwada University, Aurangabad.

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Development of Waterless Transportation Method of Tiger Prawn Penaeus monodon

Che Zulkifli Che Ismail
Crustacean Aquaculture Research Division, Fisheries Research Institute (FRI) Pulau Sayak, Malaysia

Waterless transportation of crustacean on marketing the aquaculture product was partly practice, especially on lobster and marine shrimps. However, less studies were done in this area. The present research was conducted to study and develop the method of waterless transportation of Tiger Prawn Penaeus monodon. The prawns were obtained from local farmers. The experiments were conducted to determine the best cooling method, the maximum weight loading and the maximum holding time for the prawn in waterless transportation. Shave wood was used as a moistened agent to ensure the wet air inside the styrofoam box. The prawns were packed in perforated plastic containers and loaded into the styrofoam box. Maximum weight of live prawn can be held by the biggest styrofoam box available in the Malaysian market was six kilogram. Ice was added into the styrofoam box. The pure oxygen was directly injected into the box and the box was sealed and wrapped using plastic film. The box was opened after certain hours and the survival rate were measured. The result shows that the best cooling method was slow cooling (two hour period). After twelve hours of transportation period, the survival rate of prawn was still remained above 80 percent. Based on the result, within twelve-hours period, the prawn can be transported all over Asian countries. Thus, the waterless transportation method was suggested practical to practice for transport the tiger prawn from point to another point.

Keywords: Waterless, Transportation, Tiger Prawn.

Biography:

Dr. Che Zulkifli bin Che Ismail. Served as Research Officer at Fisheries Research Institute FRI Pulau Sayak, Kota Kuala Muda, Kedah. My specialization is marine aquaculture in the areas of breeding technology, larval rearing, nursing the seeds and grow out. My job also includes providing technical advisory services to entrepreneurs in marine fish hatcheries and, breeders.

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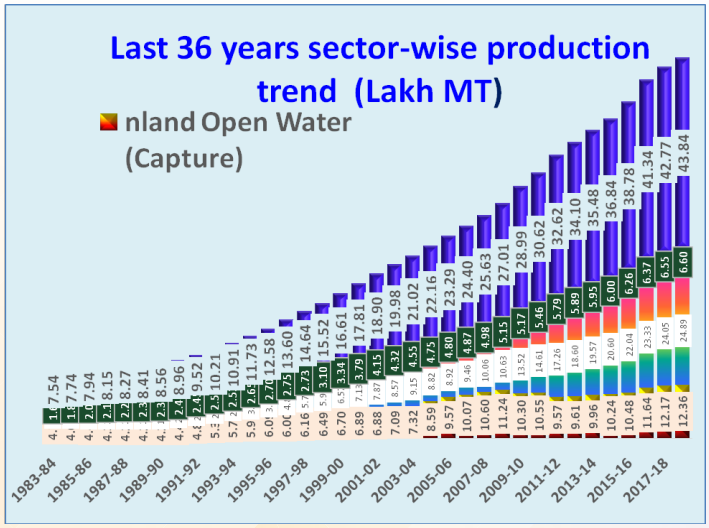
Sustainable Aquaculture and Fisheries Management of Bangladesh

Dr. Binay Kumar Chakraborty
Consultant and Researcher, Former P. Director, Department of Fisheries, Bangladesh

It is expected that World population will be grown from 6.9 bil. to 9.0 bil. and Global cereal demand to feed such population will grow from 2.1 bil.ton to 3.0 bil.ton in 2050 (FAO, 2009). Accordingly the population of Bangladesh will be risen up and would be a great challenge to secure the food security and quality food, safeguarding the environment and socioeconomic development of this increased population. Bangladesh has an inland water area of about 45,000 km^2 and about 710 km long coastal belt. Fish alone supply a per capita fish consumption of 62.58 g/day in our daily dietary requirement. The total fish production was reached up to 4.384 mill.mt in 2018-19. Overall growth rate of total fish production in 2018-19 is 2.52%. Increase focus on research development, secure ecosystem balance and innovation using both modern and traditional technology would be needed for a sustainable aquaculture technology to grow more fish utilizing all resources available in the country. In Bangladesh, some important technology like as Polycultutre of Indian major carps, Pangas, Tilapia, aquaculture of pabda, Gulsa, Tengra, Koi, Shing, Magur, mola etc. and Hilsa fisheries management, Beel nursery, Fish habitat rehabilitation, Fish centaury, Breeding ground conservation and Pen culture in river has been practiced to increase the production of fish. A sustainable aquaculture technology would be needed to develop breeding and genetics, quality brood, seed, feed and pollution free water. A good aquaculture practice (GAD) is implemented to control using of potential impacts on public health risks chemical, biological and emerging agents. A major challenge would be faced by numerous natural and anthropogenic causes such as climate change, natural disasters, industrialization, over fishing and environmental pollution to overcome for a sustainable aquaculture development. During the presentation a model of sustainable aquaculture and major challenges in development of aquaculture will be addressed and highlighted.



Biography:

Dr. Binay Kumar Chakraborty is a Fisheries Scientist and Consultant in the Department of Fisheries, Bangladesh. A leading Fisheries Biologist, Dr. Chakraborty has been involved for a long period in many studies and worked in the Department of Fisheries, Bangladesh. He has played an important key role as a researcher and extension worker especially in the field of mud eel and mud crab, and Aquaculture and fisheries management field. He has obtained PhD degree in 2004. In 1997, he has completed a special degree on planning in the Swansea University, Wales, UK. He has been acting as a reviewer more than 12 different international journals and editorial board member of International Journal of Oceanography & Aquaculture, Asian Biological Research Foundation (ABRF) and International journal of Advanced Academic study. He is also Life Member of the more than 12 national and international Societies. He has attended in the International Seminars of UK, Philippine, Vietnam, China, Malaysia, Italy, Oman, Thailand, India, Nepal and Bhutan. Gloval Environment and Social Association and International foundation of Environment and Ecology, India awarded him two times as a ”Life Time Award Achievement - 2020” and International academy of Science and Research, India, presented him as a ”Scientist of the Year 2018 Award”. He has received award of fellowship 2019, from Asian Biological Foundation, India; Fellow Award 2010 of the Crop and Weed Science Society, Bidhan Chandra Krishi Biswabidyaloya, India; Award of Fellowship, 2007, from the Zoological Society, Calcutta University, India and other organizations. About 15 books and 60 scientific papers are published by national and international publishers and organizations

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New Innovation of Kappa-carrageenan Encapsulating Magnetite Nanoparticles in Removing Heavy Metals from Wastewater

Regina Leong Zhi Ling, Yeap Swee Pin, Teo Swee Sen
UCSI University, Malaysia

The COVID-19 pandemic has posed a huge challenge to country and all community in the worldwide. It heightens the importance of good personal hygiene and good water quality which are indispensable to protect the health of all living organisms and environment. In wastewater treatment, adsorption was suggested to be the most efficient application in eliminating pollutants and heavy metals with high removal rates. Besides, seaweed Kappaphycus alvarezii has proved with capability in removing contaminants by absorption. Hence, this study aims to evaluate the efficiency of nanocomposite adsorbent surface modified with K. alvarezii carrageenan in removing heavy metals in wastewater. The magnetite nanoparticles (Fe3O4) were prepared using co-precipitation and surface coating with κ-carrageenan from K. alvarezii with pH 3, 5, 7, 9 and 12 to serve as biofilter in wastewater treatment. Water quality testing were carried out to determine the efficiency of adsorbents to removal copper ions (Cu2+). Adsorption capacity (mg/L) and the percentage of Cu2+ removal was calculated. Analysis results showed that adsorption capacity of κ-carrageenan-Fe3O4 adsorbent with pH 3 showed the highest adsorption with 2.97mg/L to remove Cu2+ in the wastewater. The percentage of Cu2+ removal in the wastewater had reached 90%. This might be the combination of negatively charged κ-carrageenan and positively charged Fe3O4 are well coated in pH 3 and achieved the capability to attract the pollutants with their specific functional groups. A good water quality is essential in our daily lives which provides a safe and healthy water source to the community and the environment.

Biography:

Regina from Malaysia, currently a postgraduate student that study on significance of seaweed as biocomponents for sustainable bioproducts and byproducts.She has studied on designing a prototype from byproduct in wastewater treatment which really reducing the pollutants from the polluted water. As we all knew, most of the wastes are ended up in the landfill which resulting in insufficient landspace and release contaminants to the environment. Hence, Her aim to make our environment better and safe for all the living organisms to sustain their lives through my research contributions.

Massive invasion of the alien biofouling mussel Mytella strigata (Hanley, 1843) in Muthalapozhi estuary, along the coast of Kerala, India and destruction of clam fishery- a case study.

Mariyam Fazula A
Central Marine Fisheries Research Institute, Vizhinjam Regional Centre, India.

Bioinvasion of different species to the native aquatic ecosystems is one of the serious threats faced by the world. The invasive tropical American brackish water mussel Mytella strigata has recently got introduced to India, mainly in the Vembanad estuary of Kerala, India. After one year of its introduction currently, this non-indigenous mussel species is spreading rapidly in the estuaries and backwaters of the Kerala coast. Muthalapozhi estuary is located in the Trivandrum district of Kerala (latitude 83° 7'54" N and longitude 76°47'08" E), where the estuary meets the Arabian Sea. In addition to the good finfish fisheries, the estuary is also a commercial fishing and landing area for clams. Currently, hundreds of fishermen, including women, depend on the estuary for their livelihood. The present study investigated to disclose distribution and massive settlement of M. strigata in Muthalapozhi estuary and the destruction of the native clam fishery. From the interview and discussion with the clam pickers, it has been revealed that native clam abundance in the estuary is severely affected by the alien mussel resulting reduction in the fishery. This low-value mussel can grow up to 8 to 10 cm in length and attaches to wooden structure, the hull of the boats, rocks, stationary fishing gears, fish cages, etc. The rapid growth and massive settlement of Mytilla srigata also adversely affected the livelihood of the local fishermen. These mussels, which are able to survive the changing hydro-biological parameters.

Biography:

Mariyam Fazula A completed Bachelor degree in Zoology and post-graduation in Aquatic Biology and Fisheries from University of Kerala currently she is Junior Research Fellow at Molluscan Division of ICAR- Central Marine Fisheries and Research Institute, Vizhinjam Regional Centre, Thiruvananthapuram, Kerala, India and registered her PhD degree at University

Species composition of Groupers alongVizhinjam Coast, Kerala, India

Ponni J Mohan
Central Marine Fisheries Research Institute, Vizhinjam Regional Centre, India

Groupers are considered as most valuable commercial fish resources of the family Serranidae. Grouper species are highly priced and are heavily exploited mainly for commercial and recreational purposes. The average annual landing of Rock cods in India during 2013 - 2019 was 42060.43t and that of Vizhinjam was 68.59t. Vizhinjam (80 22'45"N Latitude and 760 59'29"E Longitude) is one of the major fishing village and Landing centre in Kerala. In Vizhinjam, during 2019, 117.485 tonnes of groupers were landed of which 70.6% and 29.4% were contributed by Epinephelus and Cephalopholis species respectively. Both the Pre-monsoon and Post-monsoon periods of 2019 exhibited the highest landings of grouper compared to the Monsoon period. Epinephelus species landed included *E. bleekeri, E. diacanthus, E. cholorostigma, E. undulosus, E. areolatus, E. ongus, E. radiates, E. merra, E. longispinis and E. latifasciatus* and Cephalopholis species was contributed by *C. sonnerati and C. argus. Annual landing of Cephalopholis sonnerati* was high i.e., 36254 tonnes followed by *Epinephelus bleekeri* (23763 tonnes) and *Epinephelus diacanthus* (19497 tonnes).

Here these fish species are mainly being commercially exploited using different gears like Hook & line, outboard gill net, outboard boat seine, and other non-motorized gears within 10-150m of depth range. Although Trawlers are popular to be involved in fishing of demersal fish resources, in Vizhinjam the maximum catch of groupers was contributed by Hook and line with an average effort in Unit operations and average effort in actual fishing hours as 12107.42 and 53091.25 respectively. The smaller fishes are usually sold in local markets and the larger ones (mostly above 35cm) are exported. These are sold at an average rate of Rs.300/kg and are preferred widely in domestic consumption because of the delicious taste and good quality of the meat. Number 9 and 13 Hooks are usually used in the capture. Shimmering bait locally known as "Minusam" is the most commonly used artificial bait and Odonous niger is the most commonly used fresh bait in the capture of groupers.

Biography:

Ponni J Mohan is a third year PhD student, registered at Kerala University of Fisheries and Ocean Studies (KUFOS), Kochi, Kerala and doing her doctoral work at Vizhinjam Regional Centre of CMFRI, Thiruvananthapuram, Kerala, India. She holds a Master's Degree in Zoology from University of Kerala.

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Effect of Selected Vegetable Oils on Growth of Labeo rohita (Hamilton, 1822) Fingerlings

Mahendra Kumar Yadav
Department of Aquaculture, College of Fisheries, India

The present study comparative efficacy of selected vegetables in relation to fish growth was tested for this purpose four vegetable oils (sunflower oil, mustard oil, sesame oil & soybean oil) were supplemented (@10 %) in basal diet (comprising GOC (40%), RB (40%) wheat flour and mineral mixture (20%) having four treatments and one control, in triplicate an experiment was conducted in complete randomized design and experiment was run for 60 days. Healthy fingerlings (15 tanks) of L rohita were started in plastic tanks of 200 lit. These were fed on experimental diet at 3 per cent of their body weight twice in day in split dose. The growth performance and selected water quality parameters were monitored at an interval of 15 days. The impact of vegetable oils supplication was not visible from the recorded water quality parameters. As the values were more or less same in the treatments groups. However the impact of oils supplanted diet was clearly evident from the enhanced the growth rate. The respective maximum value of weight gain, per cent weight gain, SGR, GCE and PER 7.417±.136, 60.076±1.557, 0.784±.016, 0.266±.005 and 0.322 ±.003 in T5. However the FCR (6.20) was highest in control. From the friendly of present study is clear that soybean oil at the rate of 10 obtaining maximum growth of fish use of 10 per cent supplementation in Labeo rohita diet is recommended.

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Use of multi-strain probiotics in Linseed meal based diet for Labeo rohita fingerlings

Muhammad Mudassar Shahzad
Department of Zoology, Division of Science and Technology, University of Education, Lahore, Pakistan.

Current research was conducted to investigate the influence of probiotics added linseed meal based diet on hematology and carcass composition of Labeo rohita juveniles. Due to unavailability of these strains fingerlings are unable to digest and absorb their food properly. Hematological parameters are essential diagnostics, used to estimate the health status of fish. The usage of probiotics for fish health improvement is becoming common due to higher demand for environment friendly culture system in water. Linseed meal was used as test ingredient to prepare six experimental test diets by the addition of probiotics (0, 1, 2, 3, 4 and 5 g/kg) and 1% indigestible chromic oxide. According to their live wet weight, five percent feed was given to fingerlings twice a day. Fish blood and carcass samples (Whole body) were taken for hematological and carcass analysis at the end of experiment. Results indicated that probiotics supplementation has a critical role in improvement of fingerlings' body composition and hematological indices. Highest carcass composition (crude protein; 18.72%, crude fat; 8.80% and gross energy; 2.31 kcal/g) was observed in fish fed with test diet II that was supplemented with probiotics (2 g/kg). Moreover, maximum RBCs number (2.62× 106mm-3), WBCs (7.84×103mm-3), PCV (24.61), platelets (63.85) and hemoglobin (7.87) had also been reported in the fish fingerlings fed on 2 g/kg of probiotics supplemented diet. Present findings showed that probiotics supplementation at 2g/kg level in linseed by-product based diet was very useful for the enhancement of overall performance of L. rohita fingerlings in contrast to fingerlings fed on other test and control diet.

Keywords: linseed meal, L. rohita, hematology, probiotics, carcass composition.

Significance: Present results showed that probiotics supplementation was helpful to develop a cost-effective as well as eco-friendly fish feed by using plant by-product meal based diet.

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The challenges for artisanal fisheries communities in Northeastern Brazil in the post-covid cenarium

Erika Tavares Marques
Federal University of Pernambuco, Brazil

Background: In Northeastern Brazil aquaculture represents an important economic activity besides source of protein and income. The region has surpassed about 151,240 tons in 2020 becoming the second most productive region due to its availability of water, land, favorable climate and labor. The covid-19 triggered a public health crisis followed by an economic crisis due to the restrictions imposed by sanitary measures which affected the supply chain in the region.

Objective: The objective of this study is to analyze the challenges for the aquaculture sector in the Northeast of Brazil in the post-covid scenario.

Methods: This study is exploratory in nature using bibliographic research provided by articles and publications addressing the keywords aquaculture, covid, Northeast Brazil, implications.

Results: The prolongated drought (2012-2017) caused a sharp drop in production and Northeastern aquaculture is still recovering from the losses. Aside from climatic risks, the sector in the first half of 2020 was affected due to the pandemic, closing bars and restaurants, causing prices to fall before the Holy Week. Also restriction measures imposed by quarantine decrees affected the livelihoods of many fish-dependent communities. The producers looked for other sales channels like supermarket chains. Sanitary measures to control the pandemic and the appreciation of the dollar caused the fall in imports of fished. Despite the negative scenario, the producers managed to recover the losses of the first part of the year, advancing and closing the financial statement in the blue.

Conclusion: Despite the year marked by uncertainties and challenges, Brazilian aquaculture in the Northeastern Region had a positive performance, with growth of 0.5% in the year. There are still many doubts in the future scenario, especially with regard to the duration and severity of the pandemic, but a prolonged slowdown in the market is likely to introduce long-term transformations in the sector.

Biography:

Érika Alves Tavares Marques has her expertise in Environment and passion in water resources and solid waste. Currently is doing postdoctoral studies in Civil Engineering by the Federal University of Pernambuco. Doctor from the Federal University of Pernambuco of the Postgraduate Program in Development and Environment. Completed a Master's degree in Environmental Technology at the Pernambuco Institute of Technology in 2010. Specialization in Management and Environmental Control from the University of Pernambuco (2007). She holds a Bachelor's Degree in Biological Sciences from the Federal Rural University of Pernambuco (2006).

Advances in the production of microalgae in Patagonia Argentina: transfer to the productive sector

Antonela Martelli
Centro para el Estudio de los Sistemas Marinos (CESIMAR-CONICET) Argentina.

Microalgae are used in diverse ways in aquaculture and their main applications are related to nutrition and health. They are used directly, as the only component or as a food additive to provide basic nutrients, color the meat of salmonids or for others biological activities. The need for safer nutritional sources than traditional animal products has renewed interest in plants in general and in algae in particular. This work is mainly concerned with the nutritional role of microalgae in the aquaculture of mollusk larvae, echinoderms and crustaceans, as well as the live prey of some fish larvae feed on microalgae. As well as, take back all the biocomposites produced by microalgae that can be used in the pharmaceutical and nutraceutical industry. Finally, we present the first advances in the production of microalgae and the extraction of one of the most antioxidant compounds produced in nature, astaxanthin. We also show progress in the manufacture and optimization of a photobioreactor. Great advances are expected from new designs of production systems and operations, starting from new strains of microalgae and exploring production and extraction compounds and inserting them into the Food code for use in the food industry. We have a private investor interested in our research and development and we hope that our study will contribute to the health and nutrition of the community.

~~Biography:~~

~~Érika Alves Tavares Marques has her expertise in Environment and passion in water resources and solid waste. Currently is doing postdoctoral studies in Civil Engineering by the Federal University of Pernambuco. Doctor from the Federal University of Pernambuco of the Postgraduate Program in Development and Environment. Completed a Master's degree in Environmental Technology at the Pernambuco Institute of Technology in 2010. Specialization in Management and Environmental Control from the University of Pernambuco (2007). She holds a Bachelor's Degree in Biological Sciences from the Federal Rural University of Pernambuco (2006).~~

Reservoir fisheries of India

V.B. Sakhare
Post Graduate Departmen of Zoology,Yogeshwari Mahavidyalaya, Ambajogai, Maharashtra,India.

The existing literature on limnology and fisheries of Indian reservoirs has been reviewed by covering more than 100 reservoirs located in various parts of the country. An assessment of environment-mediated production functions of reservoirs has been attempted. Since the ecosystem processes in reservoirs belonging to different geo-climatic regions exhibit wide variations depending on meteorological, morphometric and hydro-edaphic features of the impoundments, an effort has been made to gauge the influence of these abiotic variables on the production dynamics. Authentic information on water areas under different categories of reservoirs has been collected and interpreted in respect of all the Indian States. An attempt has also been made to resolve the anomalies pertaining to classification and nomenclature to the extent possible. Various fisheries management norms followed in the reservoirs of the country including the selection of species for stocking, stocking rate and introduction of exotic species have been reviewed. Indian reservoirs have been stocked with the Indo-Gangetic carps for many decades and the impact of this stocking has been assessed in terms of fish production and the indigenous faunistic diversity. Different modes of exploitation and the types of craft and gear employed in different reservoirs of the country are discussed. The reservoir fisheries resources and their utilization are dealt with separately in respect of each State along with a few case studies describing the water quality, biotic communities, craft and gear, and fisheries management practices followed. The status of reservoir fisheries in the States has been reviewed and the factors responsible for the slow rate of development identified.

Biography:

Dr. Vishwas Balasaheb Sakhare is Professor, Post Graduate Department of Zoology, Yogeshwari College, Ambajogai (India). He has 23 years' experience as an outstanding teacher and researcher. He has done pioneering work in the field of Reservoir Fisheries, Limnology and Fish biology. Dr. Sakhare has successfully organized National Virtual Conference on Fish and Fisheries of India (CFFI-2020), National Seminar on Changing Perspectives in Inland Fisheries (CPIF-2018),Workshop on Culture and Breeding of Ornamental fishes (CBOF-2017), National Workshop on Techniques of Scientific Writing (TSW-2014), National Conference on Emerging Trends in Fisheries and Aquaculture (ETFA-2012), National Conference on Current Perspectives in Limnology (NCCPL-2009) and Regional Workshop on Water Quality Assessment (Implications in Potability, Productivity and Pollution control). Professor Sakhare has authored/edited more than 33 books. He is a recognized research guide of Dr.Babasaheb Ambedkar Marathwada University, Aurangabad and Solapur University, Solapur. Under his guidance four students have completed Ph.D. He has published more than 65 research articles and reviews in peer reviewed journals.

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Study of the VP1 Epitopic Variation between Different Previous Isolates of FMDV type O

Atia Rasheed
Department of Microbiology University of Veterinary and Animal Sciences Lahore Pakistan.

The aim of the current study was to investigate the contribution of foot and mouth disease virus (FMDV), characterization and crossmatching of the circulating strains associated with the outbreaks. Epithelial tissue samples were collected and processed. After serotype conformation, isolation was done on LFBK αvβ6cell line and CPEs was observed after 16-48 hours. Total RNA was extracted by using the TRIzol method followed by the amplification of target gene by using Reverse Transcriptase Polymerase Chain Reaction (RT-PCR). Sequencing, Sequence alignment and 3-Dimensional protein analysis was performed of 5 representative samples. Conventional Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) revealed 5 samples positive for the FMDV. Typing of highly viral loaded FMDV positive samples revealed that the tested samples belong to FMDV serotype O. Sequence alignment and 3D protein structure prediction was done and a number of substitutions were observed on the main immunogenic site of the FMDV VP1 structure protein. This epitopic crossmatching is important in the disease occurrence and evaluation of vaccine effectiveness and its failure.

Precision Aquaculture- challanges and sustainability

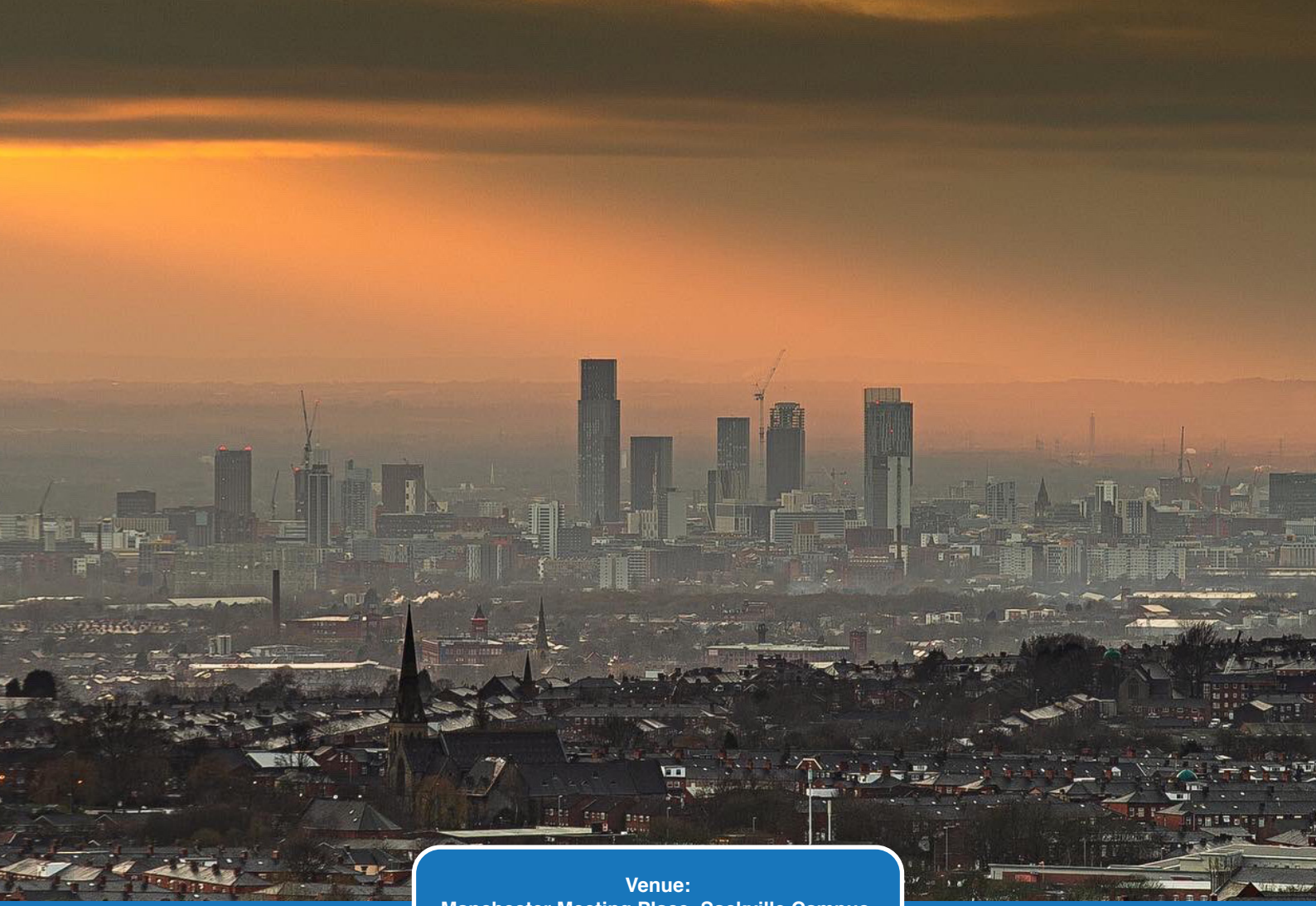
Tahmina Ajmal
Institute for Research in Applicable Computing (IRAC), School of Computer Science and Technology, University of Bedfordshire, Luton, UK

Precision Aquaculture relies on using advanced digital technology techniques to bring much needed sophistication in the aquaculture industry. There are at least three aspects that are critical to the success of the precision aquaculture system. These are Sensors, data analytics and control - together they can provide sufficient support for developing a framework for precision farm management. Various control engineering mathematical models exist that can provide a deterministic estimate of feature variables. However, these models can deliver much more useful information when these are combined with real-time data from sensors to provide better estimates than it is possible to obtain with either sensors or models alone. In this paper we explore these two aspects of the system looking at the existing systems in various countries (UK, China, Brazil) and at the future of technology. A novel Neural Network based time series forecasting system is presented that uses data from sensors in the aquaculture farm to support the development of early warning systems. The presented system is an improvement on existing systems achieved through linear interpolation and moving average filtering methods of data. It constructs the final system using ensemble empirical mode decomposition (EEMD)-based LSTM (long short-term memory) neural network (NN). This hybrid construction of the model improves accuracy of forecast. Finallly, this talk also shines light on sustainability aspects of the precision aquaculture system by performing a broad multi-criterion analysis.

Biography:

Tahmina Ajmal has background in electronics, sensors, and data analytics. She completed her PhD from University of Essex and joined University of Bedfordshire in October 2010 as Lecturer in Engineering. She has researched in various aspects of electronic engineering, but her focus has been on the application of digital technology to improve sustainability. Now she is increasingly working with Social Sciences on topics of sustainable digital transformation for society and businesses. Her recent projects are in aquaculture and reducing food waste. She has a large

NOTE:



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