ALGAPPA UNIVERSITY

(A state University Established in 1985)

Karaikudi – 630 003, Tamil Nadu, India

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Department of Fisheries Science

Newsletter

MATSYA

(2023-2024)

Publisher Details

Department of Fisheries Science
G1, Science Campus – MIS Building
Alagappa University,
Karaikudi – 630 003, Tamil Nadu
Email: fisheries@alagappauniversity.ac.in

Department Profile

About the Department

The Department of Fisheries Science was established in 2018 with the primary objective of cultivating proficient and skilled professionals in the fields of Fisheries and Aquaculture, including inland and marine segments. Prof. C. Govindasamy was the first Head of the Department and retired in June 2020. After him, Prof. E. Kannapiran successfully served as the Head of the Department till December 2023 as he was appointed as the Director, Centre for Distance and Online Education (CDOE), Alagappa University. It is steadfast in its commitment to provide excellent Postgraduate programmes. Operating under the Choice-Based Credit System, the department offers a Master of Science in Fisheries Science Programme, accommodating a capacity of 20 students. It maintains the percolation tank for the culture of freshwater fishes for student practical classes, aquarium and fish tanks in the entire University campus which provide therapeutic effects as it lowers blood pressure, reduces stress and has a calming effect on people.

Vision

To encourage sustainable fisheries and robust aquaculture practices for the constant supply of high-quality fish for everyone that complements the economic prosperity of the fishery business.

Mission

- To impart skill-based training across all fisheries sectors.
- To empower the fisheries sector through the dissemination of scientific knowledge, the application of cutting-edge technologies, skill development initiatives, and community engagement.
- To promote responsible fisheries practices and ensure a sustainable and thriving future for aquatic ecosystems and stakeholders.

Programs Offered

- M.Sc. Fisheries Science (Two year)
- Ph.D. in Fisheries Science

Faculty Members

S. No	Name	Designation
1	Dr. N.M. Prabhu	Associate Professor & Head i/c
2	Dr. R. Ravichandran	Adjunct Faculty
3	Dr. R. Srinivasan	Adjunct Faculty
4	Dr. R. Kumar	Adjunct Faculty
5	Dr. C. Santhosh Kumar	Adjunct Faculty
6	Ms. K. Ishwarya	Adjunct Faculty

Introduction of new academic programme

Dr. E. Kannapiran, Head i/c, launched new academic programme, Ph.D. in Fisheries Science from academic year 2023-24.

ALAGAPPA UNIVERSITY, KARAIKUDI-630 003
SCHOOL OF MARINE SCIENCES
DEPARTMENT OF FISHERIES SCIENCE
FISHERIES SCIENCE
PH.D. ENTRANCE EXAMINATION SYLLABUS

Unit-I

Biology of Finfish and Shellfishes: Principles of Taxonomy, Taxonomic classification of commercially important finfish and shellfishes. Biology of commercially important finfish and shellfishes: Digestive system, Respiratory system, Physiological system, Nervous system, Reproductive system, food and feeding habits, age & growth, life cycle, role of endocrine system in reproduction. Migration of fishes. Finfish and shellfish immunology. Infectious and Non-infectious Diseases. Techniques in identification of diseases.

Unit-II

Aquaculture: Shellfish and Finfish Hatchery Management, nursery site selection, design and equipment for small, medium and large scale production. Aquaculture systems: Extensive, semi-intensive and intensive culture of fish, Pen and cage culture in lentic and lotic water bodies, polyculture, composite fish culture-species selection, culture practices, harvesting. Integrated fish farming. Coastal Aquaculture and Mariculture. Biosecurity procedure for fish farming. Ornamental fish production. Nutritional bioenergetics, Finfish and shrimp feed processing

Unit-III

Fishery Resources and management: Global and Indian scenario of inland, coastal and marine fisheries. Resource potentials - problems and management of the fisheries resources. Principal method of exploitation of fishes. Traditional and modern fishing crafts and gears of India: Construction materials, types, principle and operations. Regulations for craft and gears. Remote Sensing and GIS in Fisheries Management. Marine fisheries and aquaculture legislations, Water policies, Deep sea fishing regulations.

Unit-IV

Fish Processing Technology: Biochemistry of fish. Types of fish spoilage, causative factors. Post-harvest management for finfish and shellfishes: Grading, quality evaluation, packing, storage and transportation. Principles and methods of chilling, Freezing, canning. Biochemical changes during processing. Packing: materials sources - types – packing. Quality assurance in Post-harvest and packing. Fishery By-products, Value added products - processing methods.

Unit-V

Aquatic Ecology, Biodiversity and Conservation: Aquatic ecosystem - components - structure and functions; factors influencing life in the oceans. Ecological concepts, biogeochemical cycles. Aquatic pollution. Biodiversity - factors influencing aquatic biodiversity, types of biodiversity. Natural resources and their conservation, Bioinvasion.

Field Visits

A series of field visits were conducted for the students of I- MSc Fisheries Science to facilitate experimental learning and practical knowledge under the supervision of Dr. R. Kumar and Ms. K. Ishwarya. These visits to different places in Tamil Nadu aimed to provide the students with hands-on experience into the subject. Throughout the visits, students engaged in immersive activities, enabling them to apply theoretical concepts in practical scenario. They were actively engaged in the learning process, demonstrating a keen interest and eagerness to acquire new knowledge.

RR Aqua Shrimp Farm, Ramanathpuram

I MSc Fisheries Science students visited RR Aqua Shrimp Farm, Ramanathpuram on 24th September, 2023.They gained insights into the cultural aspects of *Litopenaeus vannamei* .They acquired an understanding of the species' production, export, import dynamics, and its economic significance.

Visit to RR Aqua Shrimp Farm, Ramanathpuram

Quote

"Give a man a fish and you feed him for a day.
Teach a man to fish and you feed him for a lifetime."
- Maimonides

Karankadu Mangrove

The students of I M.Sc. Fisheries Science visited Karankadu Mangrove on 24th September, 2023.The primary objective of visiting Karankadu Mangrove was to explore and deepen understanding of its rich biodiversity. The visit encompassed a diverse array of fish species, mangrove trees, and birdy inhabitants, with a focus on gathering insights into the water quality and habitat characteristics. With the help of the boating service provided by the Forest department the students were taken into the shallow regions of the sea to observe the seagrass ecosystem. Observations on seagrasses thriving in shallow, salty, and brackish waters were conducted. Seagrasses were abundant within the intricate ecosystem of Karankadu.

Visit to Karankadu Mangrove

Keifer Seafoods, Tharuvaikulam

Students visited Keifer Seafoods, Tharuvaikulam on 12th October, 2023. They observed the various processes undergone upon the arrival of different species from the landing centre. Post-harvest processing of fishes include chilling, descaling, filleting, degutting, freezing.

Descaling of fishes

Filleting of fishes

Central Marine Fisheries Research Institute Tuticorin Regional Station

The students visited ICAR - Central Marine Fisheries Research Institute Tuticorin Regional Station on 12th October, 2023.They had the opportunity to learn about the culture of Pinctata fucata, its significance and its maintenance, as well as gaining knowledge about numerous fish species, including their taxonomy and habitats. They observed the preserved specimens of marine animals in the museum.

Visit to ICAR - Central Marine Fisheries Research Institute Tuticorin Regional Station

Therespuram and Tharuvaikulam

Students visited Therespuram and Tharuvaikulam landing centre on 12th October, 2023 .The primary objective was to acquire knowledge about the diversity of gastropods found in the landing centre, renowned as a prominent hub for gastropod collection. A diverse array of fish species spanning various taxa were encountered, each of which was identified with the assistance of Dr. Kannan. They also noted the usage of gears used in that area..

Students taking morphometric measurements of shark

How can you tell a fish's age?

Scientists figure out the age of a fish by counting growth rings on its scales or its ear bones (called "otoliths"). The rings mark seasonal changes in growth of fish, like the annual rings in tree trunks.

Otoliths grow like pearls, but the added material changes colour depending on the season. The summer ring is whiter and the winter ring is thinner and more translucent.

In scales, a series of fine rings appear as the scale grows. In summer the rings are wider apart. In winter the rings are closer together, because the fish grow more slowly. Each pair of rings indicates one year.

Visit to Tharuvaikulam fish landing centre

Boat construction at Tharuvaikulam

Cephalopod landing at Therespuram

Punnakayal estuary

Students visited Punnakayal estuary on 13th October, 2023.They conducted comprehensive exploration on diverse fish species belonging to various taxa. They also observed different crafts and gears used. They conducted a survey of the socio- economic conditions of fishermen, while also analysing the occupational risks associated with this status..

Visit to fish landing centre at Punnakayal estuary

Asvini Fisheries Private Limited, Palayakkayal

The students visited Asvini Fisheries Private Limited, Palayakkayal on 13th October, 2023.They observed the processing of Litopenaeus vannamei, examining various quality control parameters and observing different processing steps involved.

Visit to Asvini Fisheries Private Limited, Palayakkayal

Events

Swachhata Pakhwada

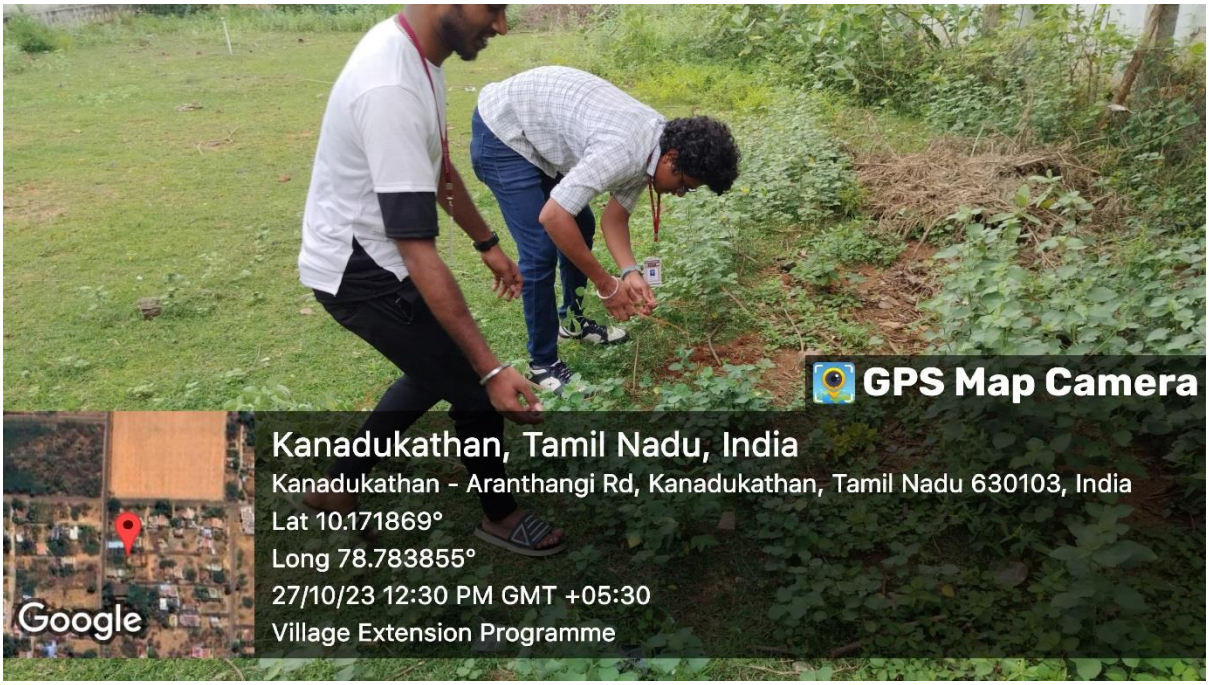
The "Swachhata Pakhwada" concept is inspired by Hon'ble Prime Minister's vision to make swachhata "everyone's business" and therefore, involving all Central Government Ministries and Departments in swachhata related activities. In the UGC initiative, 31 students and staff from the Department of Fisheries Science participated in the Swachhata Pakhwada 2023 activities organised by Alagappa University, Karaikudi during September 1-15, 2023. The activities include

- Curbing single use plastics & discourage use of plastics
- Reuse of plastics and glasswares
- Continuous focus on hygiene and sanitation
- Innovative initiatives during campaigns on health and hygiene

Student participation in Swachhata Pakhwada 2023

Village Extension Programme

For the academic year 2023-24, Department of Fisheries Science along with the Department of Animal Health and Management and Department of Tamil, Alagappa University organized this programme from 27th to 29th October 2023 in Kanadukathan village, Sivaganga District. Dr. C. Santhosh Kumar and Ms. K. Ishwarya, Adjunct Faculty, Department of Fisheries Science co-ordinated the activities of the students of the Department of Fisheries Science.



National Science Day

National Science Day is celebrated in India on February 28 each year to mark the discovery of the Raman effect by Indian physicist Sir C. V. Raman on 28th February 1928. The students prepared a model of aquaphonics. On 28th February, 2024, preserved specimens of various types of finfish and shellfishes and scuba diving equipments were displayed for the public. Students from various schools visited the Department..

Fish are excellent communicators

- ✓ Even though fish do not have vocal chords, they still excel at communicating with one another. They accomplish this through various sounds, scents, electrical pulses and motions.
- ✓ Elephantfish communicate using electricity. Through unique electrical signals, they can tell each other apart. These signals say how old they are, how big they are, how far away they are and even whether they're male or female. Males use them to serenade females, and pairs "sing" duets together.

3rd National Seminar on the

"Next Generation Technology for Sustainable Fisheries"

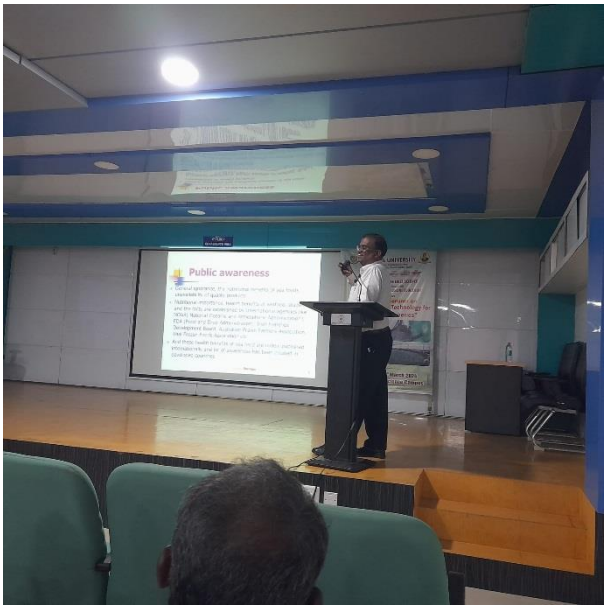
The 3rd National Seminar on the "Next Generation Technology for Sustainable Fisheries" jointly hosted by the Department of Fisheries Science and Centre for Distance & Online Education was held on 18.03.2024 and 19.03.2024 at Science Campus, Alagappa University, Karaikudi. Presiding over the event Prof. G. Ravi, Vice-Chancellor, said that fish stock has been reduced drastically due to overfishing and bycatch. Managing fish populations is no easy task. It requires cooperation at all levels of government, from local communities to nations across the globe. He cited the flagship scheme of "Pradhan Mantri Matsya Sampada Yojana (PMMSY) which aims at sustainable and responsible development of fisheries sector. Fisher folk need to be encouraged to use new generation technology to reap the benefits of sea wealth and aquaculture that would ultimately contribute to the economy of the nation.

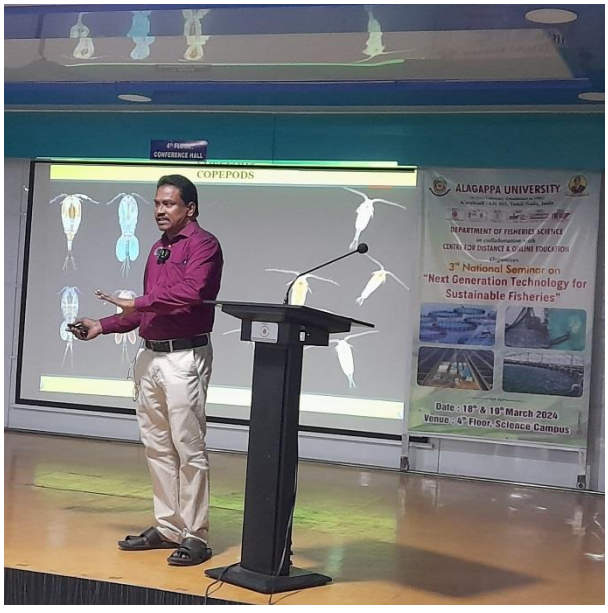
The chief guest, Dr. Anup Mandal, Project Director, Rajiv Gandhi Centre for Aquaculture, in his inaugural address said that many of the fish species which are consumed in his childhood days are missing. He concluded his speech by saying that the seminar and conferences like this is the need of the hour as the aquaculture is improving. In his keynote address, Mr. K. Arivukkarasu, Assistant Director (Aqua), MPEDA, emphasized the need to concentrate on marine research related to the protection of biodiversity of coastal ecosystem. .

Hon'ble Vice-Chancellor Prof. G. Ravi and Dr. Anup Mandal, Project Director, Rajiv Gandhi Centre for Aquaculture lighting the lamp

Prof. E. Kannapiran, Director, Centre for Distance & Online Education and Dr. N.M. Prabhu, Head , Department of Fisheries Science lighting the lamp

Dr. P.E. Cheran, Consultant, Pondicherry, emphasized that in India aquaculture industry and fisheries need to be augmented using modern technology to increase fish production. Earlier Prof. E. Kannapiran, Director, Centre for Distance & Online Education, welcomed the participants. Dr. N.M. Prabhu, Head of the Department of Fisheries Science presented the thematic address and Dr. R. Kumar proposed a vote of thanks. Eminent speakers from other universities, research institutions and aquaculture consultants presented the recent technologies available for sustainable fisheries. Students and faculty members from various science departments of the University and affiliated colleges participated in the seminar.





Theme

This Seminar will enlighten the Next Generation Technology for Sustainable Fisheries. Further this seminar is aimed to motivate and create the knowledge on recent trends, developments in sustainable fisheries and its business opportunities among young students and research scholars.

Targeted audience

Faculty Members, Teachers, Scientists, Research Scholars, Students, Professionals, Policy makers and Administrators who are involved in Fisheries.

Registration

Registered participants will be provided with certificate & lunch

Scan QR code for registration

Accommodation

The participants should make their own arrangements for travel and accommodation.

Address for communication

Dr. N. M. Prabhu
Mobile: 9444154070
Email : prabhunm71@gmail.com

Organizing Committee

Patron
Honourable **Prof. G. Ravi**
Vice-Chancellor, Alagappa University

Co-Patron
Dr. A. Senthilrajan, Registrar

Organizing Secretaries
Prof. E. Kannapiran
Director, Centre for Distance and Online Education

Dr. N. M. Prabhu
Head i/c, Dept. of Fisheries Science

Organizing Members

Dr. R. Kumar
Dr. R. Ravichandran
Dr. R. Srinivasan
Dr. M. Bodhaguru
Dr. C. Santhosh Kumar
Ms. K. Ishwarya

Advisory Committee Members

Dr. R. Jayakumar, Principal Scientist, ICAR-Central Institute of Brackishwater Aquaculture, Chennai

Dr. J. Ravindran, Principal Scientist, CSIR-CECRI, Karaikudi

Mr. P.K. Senthil Kumar, Chief- Projects, Poseidon Biotech / General Secretary, Society of Aquaculture Professionals

Dr. J. Godfred Ponraj, Chief General Manager – marketing, TIL Biosciences (Animal Health Division), Chennai

3rd National Seminar on

"NEXT GENERATION TECHNOLOGY FOR SUSTAINABLE FISHERIES"

Time	Day 1 (18.03.2024)
10:30 - 11:15 am	**Inaugural function**
11:15 - 11:30 am	**Tea Break**
	Session 1 Chair Persons: **Dr. J. Godfred Ponraj, Dr. A. Veera Ravi, Dr. B. Vaseeharan**
11:30am - 12:15 pm	**Shrimp Aquaculture - Profitable and Sustainable Farming** **Dr. P.E. Cheran** Consultant, Pondicherry
12:15 – 01:00 pm	**MPEDA: Roles And Regulations in Fisheries** **Mr. K. Arivukkarasu** Assistant Director (Aqua), Marine Products Export Development Authority (MPEDA)
1:00 - 2:00 pm	**Lunch Break**
	Session 2 Chair Persons **Prof. P. Srinivasan, Dr. V. Nithya, Dr. S. Paramasivam**
2:00 - 2:45 pm	**Advance Technology used for Genetically Improved Farmed Tilapia (GIFT) Aquafarming** **Dr. Anup Mandal** Project Director, Rajiv Gandhi Centre for Aquaculture (RGCA)-MPEDA, Sirkali
2:45 – 3:30 pm	**Aquamimicry and Aquaponics: The Promising Sustainable Aquaculture Technologies** **Dr. P. Santhanam** Professor, Marine Planktonology & Aquaculture Laboratory, Department of Marine Science, School of Marine Sciences, Bharathidasan University
3: 30 - 3:45 pm	**Tea Break**
3:45 – 4: 30 pm	**Advances in Aquaculture Technology: How full fill human needs, Prospects and Employment Opportunities in India and Overseas** **Dr. Inayathullah Neyasudheen** Aquaculture Specialist & CEO-Shrimp Care Solutions & Sophisticated Biosciences Laboratory Pvt Ltd., Tamilnadu

3rd National Seminar on

"NEXT GENERATION TECHNOLOGY FOR SUSTAINABLE FISHERIES"

Time	Day 2 (19.03.2024)
	Session 3 Chair Persons **Dr. K. Balamurugan, Dr. V. Sugumar, Mr. P.K. Senthil Kumar**
10:00 – 10:45 am	**Seabass Production** **Dr. V. Shanmuga Arasu** Sr. Scientific Officer, Rajiv Gandhi Centre for Aquaculture (RGCA)-MPEDA, Sirkali
10:45 – 11:15 am	**AI and Aquatics Inteligence: The Future** **Dr. S. Santhosh Kumar** Assistant Professor, Department of Computer Science, Alagappa Univeristy
11:15 am - 12:00 noon	**Microplastic pollution - Impacts on the marine environment and its resources** **Dr. R. Rajaram** Professor, Department of Marine Science, School of Marine Sciences, Bharathidasan University
12:00 – 12:15 pm	**Tea Break**
12:15 - 1:00 pm	**Emerging and re-emerging diseases in Indian Coastal Aquaculture** **Dr. A. Gopalakrishnan** Associate Professor, Faculty of Marine Sciences, Centre of Advanced Study in Marine Biology, Annamalai University, Parangipettai
1:00 - 2:00 pm	**Lunch Break**
	Session 4 Chair Persons **Dr. A. Arun, Dr.M.Biruntha, Dr. P. Kumar**
2:00 - 2:45 pm	**Post-harvest losses in fish: An economic perspective** **Dr. Pe. Jeyya Jeyanthi** Senior Scientist, Extension, Information and Statistics Division, ICAR Central Institute of Fisheries Technology, Cochin
2:45 - 3:15 pm	**Usage of Auto Feeders in Shrimp farming** **Mr. P.K. Senthil Kumar** Chief-Projects, Poseidon Biotech / General Secretary, Society of Aquaculture Professionals
3:15 - 4:00 pm	**Overview of Major Shrimp Diseases in India: Current Status and Management Aspects** **Mr. G. Sathiyaraj** Sr. Scientific Officer, Rajiv Gandhi Centre for Aquaculture (RGCA)-MPEDA, Sirkali
4:00 - 4:15 pm	**Tea Break**
4:15 – 5:00 pm	**Valedictory function**

Programme schedule

Skill Development Training Programme on

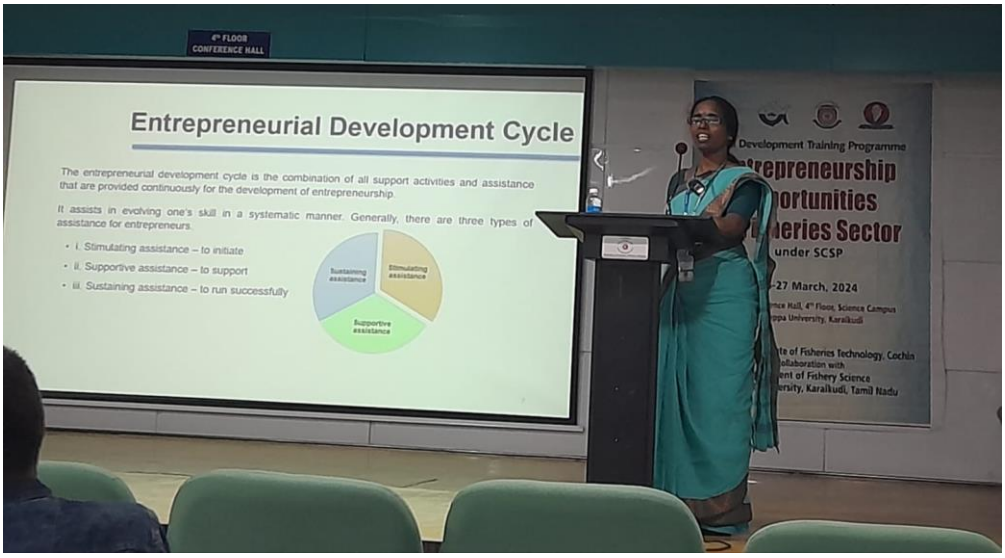
Entrepreneurship Opportunities in Fisheries Sector

ICAR - Central Institute of Fisheries Technology (ICAR-CIFT), Cochin, Kerala in collaboration with the Alagappa University hosted a Skill Development Training Programme on "Entrepreneurship Opportunities in Fisheries Sector" under SC Subplan in the Department of Fisheries Science, Alagappa University, Karaikudi from 25.03.2024 to 27.03.2024.

Dr. N.M. Prabhu, Head of the Department of Fisheries Science and Organizing Secretary welcomed the participants and insisted that the programme is organized to promote entrepreneurship skills needed for a successful entrepreneur in fisheries sector among the students. Prof. E. Kannapiran, Director, Centre for Distance & Online Education, inaugurated the training program. Presiding over the Inaugural function, Dr. M. Jothi Basu, Controller of Examinations, said that there is great demand for seafood/seafood based products in ready to eat form in the western markets. Our country is gifted with huge water resources and wide diversity of aquatic fauna. This provides us a great opportunity to exploit these resources for domestic consumption as well as for exporting. There is a good scope to increase the export of value added products by our seafood processing industry. Skill development training programs like this is needed for the students to meet the requirements of the seafood processing industries.

Inaugural session. Dr. Pe. Jeyya Jeyanthi handing over the books to Dr. N.M. Prabhu, Head i/c, Department of Fisheries Science in presence of Dr. M. Jothi Basu, Controller of Examinations

The Organizing Secretary Dr. Pe. Jeyya Jeyanthi, Senior Scientist, ICAR-CIFT, Cochin, in her address said that ICAR-CIFT helps prospective entrepreneurs, by providing pro-active and value-added business support in terms of technical consultancy, infrastructure facility, experts' guidance and training to develop technology based business ideas and establish sustainable enterprises. In her keynote address, Dr. A. Jeyakumari, Senior Scientist, ICAR-CIFT said that the training program will enlighten the opportunities and create awareness about the business opportunities among young students and research scholars of scheduled students under SC subplan. Dr. R. Kumar proposed the vote of thanks.



Dr. Pe. Jeyya Jeyanthi, Senior Scientist, ICAR-CIFT, Cochin explaining the Entreprenerrial development cycle

The program coordinators, Dr. Pe. Jeyya Jeyanthi, Dr. A. Jayakumari and Dr. V. Renuka, senior scientists from ICAR-CIFT, Cochin gave training on various aspects related to fish handling, preparation of value added fish products and marketing of the seafood products. A total of 56 students including 20 students belonging to Scheduled Castes actively participated in the programme. All the participants were provided with free training kit, working lunch and certificate. Participants belonging to scheduled caste community from affiliated colleges were provided travelling allowance and free accommodation in the university hostels during the training program under SC subplan.

Dr. V. Renuka, Senior Scientist, ICAR-CIFT, Cochin explaining the nutritional properties of fishes

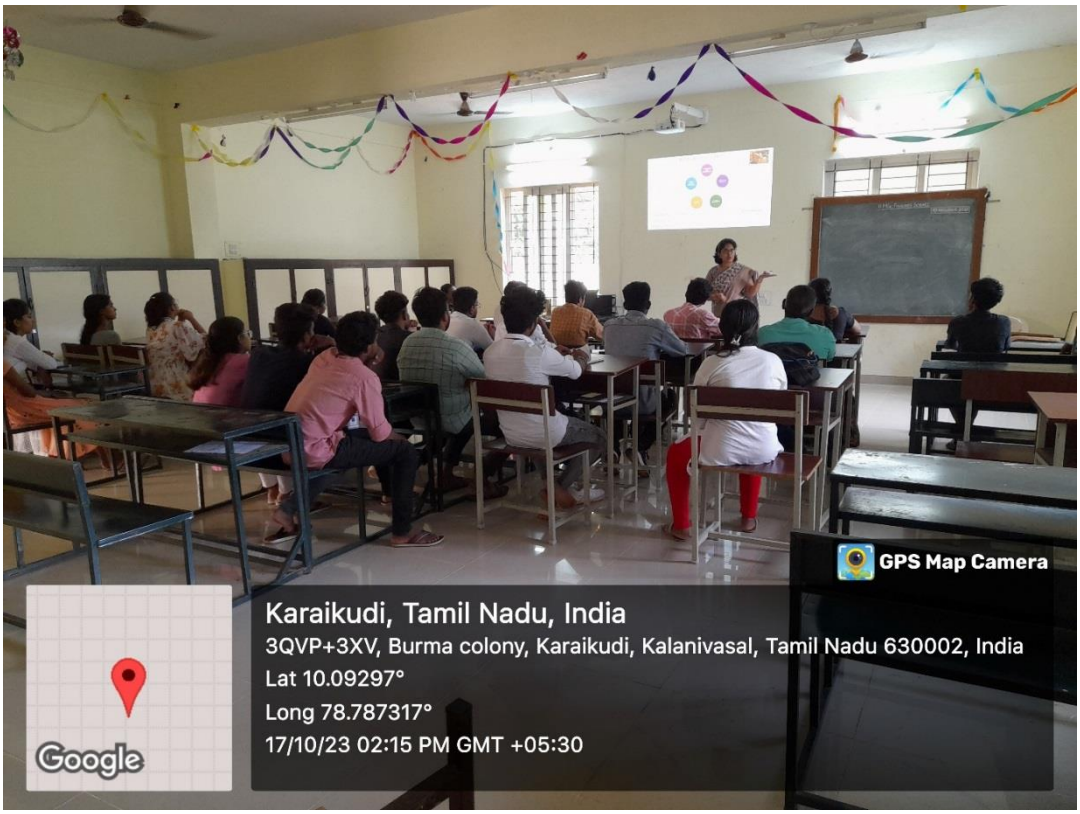
Hands-on training to the participants of the Skill Development Training Programme

In the Valedictory Function, Dr. N.M. Prabhu, Head of the Department of Fisheries Science and Organizing Secretary welcomed the participants and thanked the ICAR-CIFT for choosing Alagappa University for conducting such a training programme in Tamil Nadu for the first time. Presiding over the event, Prof. A. Senthilrajan, Registrar, Alagappa University emphasized the importance of fish handling and preservation. Skill development training programs like this is needed of the hour for the out-going students to overcome the unemployment among the youth. The Organizing Secretary Dr. Pe. Jeyya Jeyanthi, Senior Scientist, ICAR-CIFT, Cochin presented the report of the 3 days skill development training program. In his keynote address, Dr. V. Palanisamy emphasized that fish as the balanced diet with rich protein, vitamins and minerals, and a low caloric content. Sr. Prof. J. Jeyakanthan, Dean, Faculty of Science, Alagappa University delivered the valedictory address. He informed that Alagappa University has a Startup Cell / Incubation Cell with a fund of Rs. 3 crore to support the student start-up ideas. Dr. V. Renuka, Senior Scientist, Biochemistry & Nutrition Division, ICAR-CIFT proposed the vote of thanks. She said that the students and youth of Tamil Nadu lack awareness of the several training programs organized by the ICAR-CIFT and urged them to participate and get benefited from it.

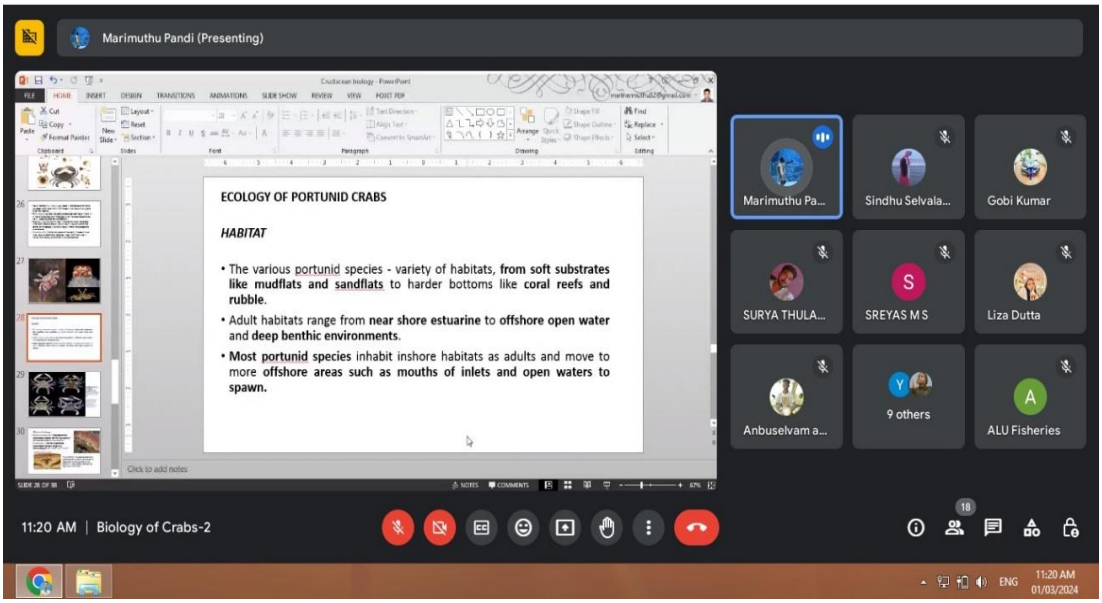
Value added products prepared during the Skill Development Training Programme

Prof. A. Senthilrajan, Registrar, Alagappa University distributing certificates to the participants of the Skill Development Training Programme

Guest Lectures



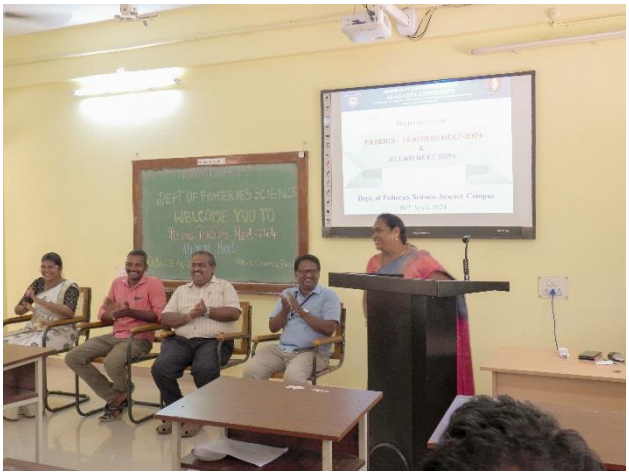
Guest lecture on Drug discovery and Ethical issues using animal models by Dr. P. Latha, Sri Padmavati Mahila Visvavidyalayam, Tirupati

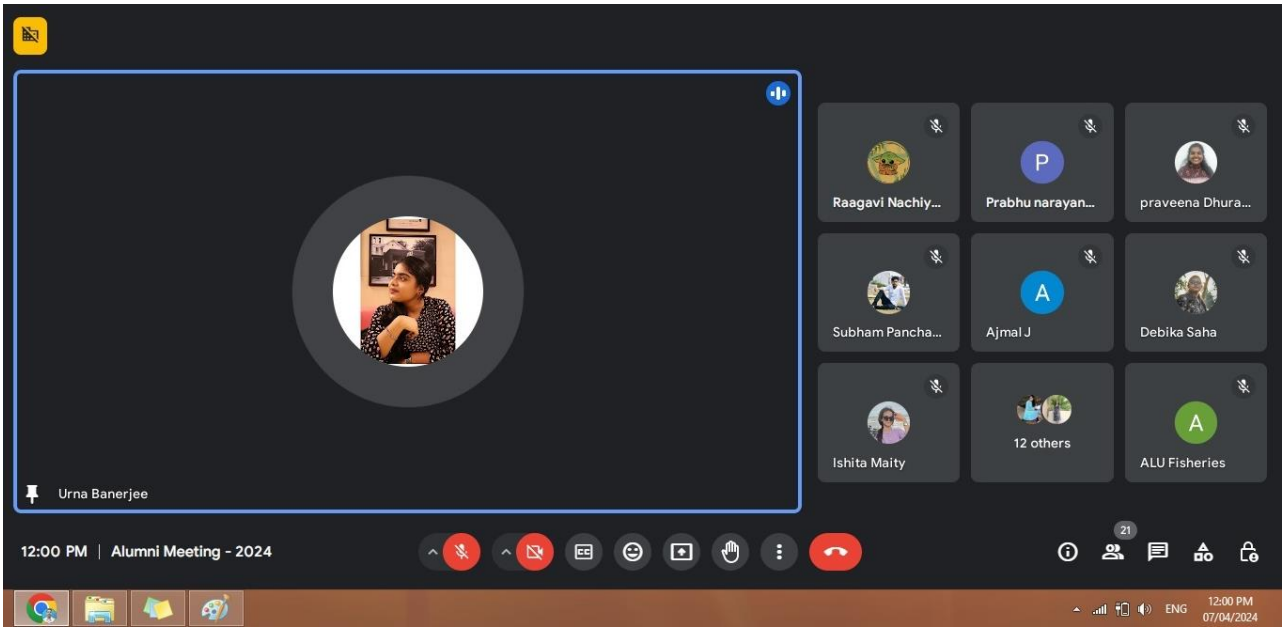


Online lecture on Biology of Crabs by Dr. P. Marimuthu, Sathyabama Institute of Science and Technology, Chennai

Parents and Alumni Meet – 2023-24

A few parents attended the Parents-Teachers Meet-2024 organised at the Department of Fisheries Science. For the parents who are living in other states like West Bengal, Assam, Kerala, an online meeting was also conducted for their convenience. Parents were much satisfied with the activities especially field visits and training programmes as well as with the facilities of the Department. Parents gave a very good feedback about the Department and the Faculty members. They assured their support to the growth and wellness of the Department. For the Alumni Meet-2024 few alumni students joined the meeting through online. Many of the current students interacted with their seniors and super-seniors and learned from their experiences.





Parents and Alumni Meet – 2023-24 conducted in dual mode

Freshers Day Celebration

The Department of Fisheries Science at Alagappa University organised the Fresher's Day celebration on 11th September, 2023. The event was hosted to welcome the new batch of M.Sc. students through cultural programs and games. Faculty members and II year students interacted with the freshers to help them settle in smoothly

Farewell Party

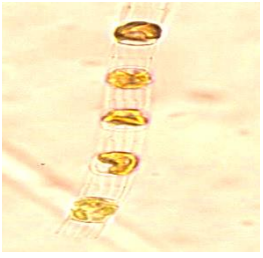
The Department of Fisheries Science hosted the Farewell event on 10th April, 2024 to bid farewell to the graduating batch. The event was celebrated with the speeches, cultural programs like Dance, Music and memories of the students. The faculty and junior students wished better fortune with new opportunities in their careers.

MICROALGAE

Dr. C. Santhosh Kumar
Adjunct Faculty, Department of Fisheries Science

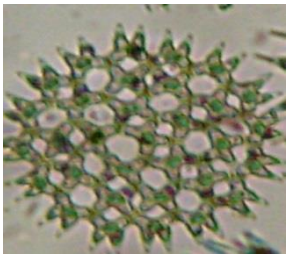
Microalgae are tiny, photosynthetic, unicellular organisms that can range in size from 0.2 to 2 μm to filamentous forms that are 100 μm or larger. Microalgae are a diverse category of photosynthetic organisms classed based on the types and combinations of pigments used in photosynthesis by various species. They are a viable source of active chemicals and can thrive in a variety of applications, producing a diverse spectrum of bioactive molecules that are novel in the food, feed, cosmetic, pharmaceutical, and agro-ecological sectors. Microalgae are an excellent vegan source of ω3-LC-PUFA and other nutrients. They can synthesise all of the necessary amino acids within their cells, including high protein and mineral content. Microalgae's rapid high productivity and substantial lipid accumulation potential attracted the attention of scientists looking for a renewable source of biofuels.

Diatoms (class Bacillariophyceae) are microalgae with a single cell. They are found in habitats that are both fresh and salt water environments. Chlorophylls a and c, two light-absorbing molecules found in diatoms, use photosynthesis to convert solar energy into chemical energy. This provides much-needed oxygen; it is believed that diatoms produce 20–50% of the oxygen on Earth each year. Diatoms are the base of the food chain, giving zooplankton and other microorganisms sustenance. A toxic algal bloom is the rapid proliferation of microalgae or cyanobacteria, as well as some dinoflagellates, that can harm humans, animals, or the local ecosystem



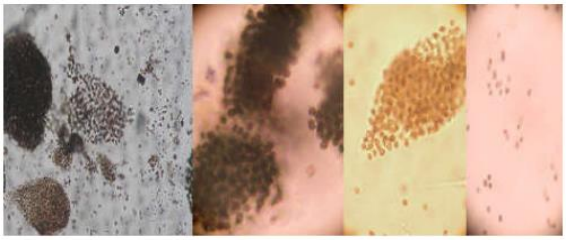
Skeletonema costatum

Protoperidinium sp.



Pediastrum duplex

Algal Bloom



Microcystis aeruginosa

ZOOPLANKTON

Dr. C. Santhosh Kumar

Adjunct Faculty, Department of Fisheries Science

Zooplankton contribute significantly to energy conservation from primary producers (phytoplankton) to higher trophic levels. The presence and distribution of zooplankton influence the potential of pelagic fisheries. In the aquaculture industry, zooplankton is an excellent food supply for cultured fish, particularly fry, fingerlings, and juveniles. The zooplankton ecosystem contains creatures of all sizes, ranging in length from many metres to microscopic protozoans. Holoplanktonic species spend their entire lives in the pelagic environment, whereas meroplanktonic forms are temporary zooplankton that contain the eggs and larvae of numerous benthic invertebrates and fish. Amoebas, ciliates, and flagellates are examples of micro- and nanozooplankton that are mostly composed of protozooplankton. Cnidarians, Rotifera, Chaetognatha, Gastropods, Polychaeta, Copepods, Cladocerans, Krill, and certain tunicates, including the holoplanktonic classes Appendicularia and Thaliasia, are examples of zooplankton that inhabits both freshwater and marine environments.

Zooplankton is utilised as a bioindicator for assessing aquatic ecosystem health. In all oceans, seas, estuaries, rivers, and lakes, copepods are arguably the most ubiquitous and prolific holoplanktonic animals on the planet. Fish larvae in aquaculture require a balanced diet to avoid hunger and for continued development and reproduction. According to research, zooplankton is a better live food than other live meals due to its superior digestion and suitability as a live prey species for various sizes (e.g. Moina, copepods, rotifer, artemia). Zooplankton are useful markers of long-term nutrient pollution change because they respond swiftly to changes in nutrient intake to the waterbody.

SEA CUCUMBER

Ms. K. Ishwarya

Adjunct Faculty, Department of Fisheries Science

Sea cucumbers are marine invertebrates belonging to the class Holothuroidea, which has 1,200 species and is a class under the phylum Echinodermata. The body is soft and cylindrical, with dimensions of 2 to 200 cm (0.5 to 6.5 feet) in length and 1 to 20 cm (0.4 to 8 inches) in thickness. Its dull, black hue and many warts give it a cucumber-like appearance. All that remains of the internal skeleton are several differently shaped, little calcareous structures (called ossicles) in the skin. From the mouth to the anus, the majority of species have five rows of tube feet. Both breathing and waste release occur via the anal hole. Ten or more retractile tentacles surround the mouth, which are employed for digging and grabbing food (nutrient-rich muck or tiny aquatic creatures) like earthworms. It is an omnivore species. Locomotion is typically slug-like, yet certain deeper species may swim.

Sea cucumbers may be found in all seas, mainly in shallow water but sometimes at depths of many thousands of metres. They are most prevalent in the Indian Ocean and western Pacific. The genus Holothuria contains 80 to 100 species of big, warty sea cucumbers that are particularly prevalent on coral reefs. It is a benthic, which means they inhabit the ocean bottom. However, their larvae are planktonic, which means they drift with the ocean currents. Sea cucumbers are found in the Andaman and Nicobar Islands, the southeast coast of India, the Gulf of Mannar, the Gulf of Kutch, and Lakshadweep.

Life history

Sea cucumbers reproduce both sexually and asexually. Sexual reproduction is more common, however, the process of reproduction is not very intimate. Unlike most terrestrial species, sea cucumber eggs are externally fertilized—the animal releases both eggs and sperm into the water, and fertilization happens when the two meet. Male trigger spawning with both the sex being broadcast spawners. Spawning occurs in spring and summer during bright, sunny days in warm, shallow waters. This kind of reproduction requires a huge number of male and females to be present at the same time. The average lifespan in the wild is about 5 to 10 years.

Defence adaptation

Certain sea cucumbers can confuse the attackers by release sticky threads to warn off potential predators. Others may mutilate their body in self-defense. They aggressively constrict their internal organs out of the anus. The lost bodily components are immediately restored.

Beche-de-mer

Beche-de-mer or Trepang is the commercial name given to processed sea cucumber. Holothuria scabra is the most abundantly used in India. Trepang, or beche-de-mer, is a product made from sea cucumber. The creatures are gathered from the shallow sea bottom, cleaned in clean seawater to get rid of any filth, sand, or extraneous material, and then gently cooked over a fire in aluminium or galvanised iron tubs without adding any more water. After that, they are thoroughly scrubbed, cleaned, and boiled until their bodies release enough water to cover them. An animal is boiled for 50 minutes or until it is half the size it was originally. To prevent it from drying out, the material is covered with sand and sprayed with seawater. The hole is uncovered after eighteen hours, and the skins are physically peeled off and placed in a basket. De-skinning is done first, followed by washing and boiling in sea water. Water is drained and sun-dried on mats. Buyers may smoke if they want to.

Economic value

In the tropics, sea cucumbers are among the most important marine resources. Due to their high price and widespread consumption, particularly in East Asia, many nations with tropical coastlines harvest them in considerable quantities by traditional methods. Large population losses and management issues have resulted from this, and naturally, the trade in organisms involves many colourful personalities. India at present is earning a foreign exchange of over one core of rupees by exporting processed sea cucumber. The Chinese consume processed sea cucumber and Japanese consume the sea cucumber in the fresh condition. For over a millennium, the coast of Tamilnadu has been home to a small-scale cottage industry for making processed sea cucumber.

The trading of sea cucumbers is illegal in India. Consider its declining numbers. Sea cucumber collection and trade is banned under schedule 1 of the wildlife protection Act of 1972. Sea cucumbers recycle nutrients, which is a significant contribution to marine ecosystems. Unfortunately, since many cultures consider sea cucumbers to be delicacies, human eating is endangering the variety of sea cucumbers.

MANGROVE FISHERY

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Mangroves are a distinctive form of coastal environment found in tropical and subtropical areas. They are thick forests of salt-tolerant trees and plants that grow in intertidal zones where land meets water. These ecosystems are distinguished by their capacity to resist extreme circumstances such as salty water, tidal variations, and muddy, oxygen-depleted soils.

Mangroves serve as a buffer zone between sea and coast, preventing erosion and providing protection from natural catastrophes such as cyclones and tsunami. Mangroves are ecologically significant in many tropical nations, with well-documented evidence. Mangroves serve as breeding and rearing sites for many animal species, such as fish, crabs, and mollusks. The loss of habitat in this unique ecosystem directly impacts the regional fishing.

According to the Indian State Forest Report 2021, mangrove cover in India is 4992 square kilometres or 0.15% of the country's total geographical area. The Sundarbans in West Bengal are the world's biggest mangrove forest. It is designated as a UNESCO World Heritage site. Aside from the Sundarbans, the Andamans, Kachchh, and Jamnagar regions of Gujarat also contain significant mangrove cover.

Nutrient leaching

Mangrove leaves, timber, propagules, flowers, bracts, and other organic components constantly fall to the intertidal forest floor. Herbivores are unable to digest these leaves or other debris, making them inaccessible as nutrition sources at higher trophic levels. When bacteria and fungi metabolize leaf litter, nutrients are released via a route known as the detrital food loop. Shrimp, mullet, and many other creatures in the mangrove prop root ecosystem consume the debris, which then enters the food chain. The dissolved organic matter (DOM) is formed by the breakdown of the waste, and the recycling of the leached nutrients reaches the mangrove bottom and the adjacent Thus, the nutrient input in clear tropical seas is considerable because the concentrations are low The involvement of grapsid crabs in burrowing affects soil, which therefore affects the productivity and reproductive output of Rhizophora.

Mangrove supporting fishery

Mangroves serve fisheries by providing nursery sites for fish and shellfish, increasing fishing productivity, and contributing to local livelihoods and food security. Mangroves operate as natural filters, capturing and eliminating pollutants and excess nutrients from coastal waterways before they enter the open ocean. Their involvement in water purification benefits marine ecosystem health and helps to keep delicate coastal habitats in balance.

Fish benefit from two distinct amenities that mangroves provide. A sheltered home for larvae and early juveniles is created by the aerial roots, and many fish rely on the detrital food web that is formed by the litter fall. When marine plankton larvae find a suitable location, they will change into their juvenile selves in mangrove and seagrass ecosystems, which will allow them to spawn new fish for the fishery. When juveniles mature into young adults, they often carry on feeding in mangrove and sea grass habitats before returning to open reef settings to reproduce and restart the cycle.

Publications

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Molecular Taxonomy and Distribution Status of *Odontanthias perumali* (Talwar 1976) From Bay of Bengal, Eastern Indian Ocean

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Received: 3 July 2022 / Revised: 2 February 2023 / Accepted: 14 September 2023

Abstract
The first Anthiadinae species of the genus *Odontanthias* Bleeker, 1873, is recorded from the Southeast coast of India. Two specimens of ray-finned fish *Odontanthias perumali* were captured by trawler at depth of about 80-150 m having morphological characters: pectoral fin rays 17-18, lateral-line scale 30-31, maximum depth of body 2.6 to 2.7 SL, vomerine-tooth patches diamond-shaped. This is the first report with color photographic images of key character of *O. perumali* from the East coast of India. The COI gene phylogenetic analysis confirmed the existence of *Odontanthias perumali* in the Southeast coast of India. This study will contribute to species identification within this genus distributed in the Indian waters.

Keywords Bay of Bengal · Morphology · *Odontanthias perumali* · Reef fish · Southeast coast of India · Tooth patches

Introduction

The subfamily Anthiadinae of family Serranidae contains 29 genera with more than 231 species (Parenti and Randall 2020). Anthiadinae occur worldwide in shallow to moderate depths of tropical, subtropical and temperate seas. They are of small to medium size fishes, usually brightly colored and are generally associated with coral reefs or rocky bottoms (Anderson 2006). Generally, *Odontanthias* genus is very colorful in nature with major portion of body in pink with yellow followed by white color due to deepwater coral reefs (100–300 m) and it also rarely collected by trawlers.

The genus *Odontanthias* is characterized by: Dorsal fin spine X, fin rays 12-19; anal fin spine III, fin rays 7-8; pectoral rays 15-19; lateral line complete (rarely incomplete); vertebrae counts 26; mouth medium in size; teeth vomer, palatines and mesopterygoids with large patches of small villiform teeth; posterior margin of preopercle strongly serrate with a flat spine; body depth 1.9-2.7, head length 2.35-2.85 both in standard length (Randall and Heemstra 2006). *Odontanthias* is recognized by 17 species distributed in Indo-Pacific, still undescribed species of Anthiadinae remain to be discovered (Anderson 2006; White 2011; Zajonz et al. 2020). There is a need for detailed description and more clear taxonomic status of *Odontanthias* for better understanding of this group. Sex based morphology and color pattern differentiation (Protogynous hermaphrodites) are difficult as the description of species were based on very limited samples only (Randall and Heemstra 2006). *Odontanthias perumali* was identified as a new species from the Southwest coast of India (Talwar 1976). According to the major review work on this group, Randall and Heemstra (2006) considered *O. perumali* as a junior synonym of *O. rhodopeplus*. Further, the detailed examination of *Odontanthias perumali* differs sufficiently in morphology and coloration and should be resurrected from this synonymy (Bineesh 2015). Based on genetic data *O. perumali* considered as a valid species (Bineesh 2015; Zajonz et al. 2020). The present study reports the occurrence of *Odontanthias* genus from Southeast coast of India. The comprehensive description of *O. perumali* was discussed in detail with congeners and updated current distribution status too.

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Material and Methods

Two specimens were collected from Southeast coast of India at Tuticorin Fishing harbor (off Gulf of Mannar 08°39'51.00"N/78°58'46.01"E) and Chennai fishing harbour (off Chennai 12°43'39.08"N 81°55'06.01"E) by using

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First Record of Redfin Emperor *Monotaxis heterodon* (Lethrinidae) from Indian Waters with Molecular Confirmation

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Abstract—Lethrinidae is one of the commercially important fish in India. The present study provides detailed morphometric, meristic characters and colour patterns of *Monotaxis heterodon* (Bleeker, 1854). The unique key characters of *M. heterodon* are having 24 vertebrae, the teeth patterns of both the jaws having molar teeth present in both jaws 4+3 but 6 canines in upper jaw and 4 canine teeth in lower jaw. Specifically, this species has dark brownish lips, no black spots at base of soft dorsal fin and 13 scale rows below lateral line to anal-fin origin. The *COI* gene sequence and phylogenetic analysis confirmed that *Monotaxis heterodon* and *Monotaxis grandoculis* were genetically distinct species and conform the distribution of *M. heterodon* in Indian Exclusive Economic Zone. In addition, molecular analysis using partial mitochondrial *COI* gene suggests that genetic distance within *M. heterodon* group was 0.32% of group mean distance between *M. heterodon* and *M. grandoculis* was 8.37%. Further, the present study revealed the range of extension of its known geographical distribution in addition to the ichthyofaunal biodiversity of southeast coast of India.

Keywords: Lethrinidae, *Monotaxis*, teeth patterns, *COI* gene, Indian exclusive economic zone

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INTRODUCTION

The family Lethrinidae consists of 5 genera and 45 species, including 4 new species added in the last decade (Fricke et al., 2023). In the family Lethrinidae, 30 species are represented from the genus *Lethrinus*, 11 species of *Gymnocranius*, *Monotaxis* having 2 species, *Gnathodentex* and *Wattsia* each have one species (Chen and Borsa, 2020; Fricke et al., 2022). However, five genera and 22 species representing the family Lethrinidae were recorded in India (Froese and Pauly, 2023). The genus *Monotaxis* is characterized by dorsal fin soft rays (10), anal fin soft rays (9), pectoral fin rays (14), lateral-line scale 44–47, inner surface of pectoral-fin base densely scaled and sides of jaws with round, flat molars (Shibuya et al., 2022). The *Monotaxis* genus is currently recognized with two valid species viz., *Monotaxis grandoculis* and *Monotaxis heterodon* (Randall, 2005; Zhao et al., 2021; Shibuya et al., 2022). *M. heterodon* was formerly considered as a junior synonym of *M. grandoculis* (Nakabo, 2002). Detailed study of both the species including morphological and genetic analysis showed that the distinguished species of *M. grandoculis* and *M. heterodon* as valid (Randall, 2005; Senou et al., 2007; Chen and Borsa, 2020; Zhao et al., 2021). Mitochondrial DNA, *COI* gene approach was employed to solve the identification problems on morphological similarity of *M. heterodon* at the genetic level (Zhao et al., 2021). Keeping in view of the above, the present study was aimed to confirm the existence of *M. heterodon* in the Indian Exclusive Economic Zone (IEEZ) waters from known range and unravelling them from *M. grandoculis* based on morphological and genetic characters. This is the first detailed morphometric, meristic, X-ray description, teeth pattern structure, scale morphology and molecular conformation of *M. heterodon* from the coastline of the mainland, IEEZ.

MATERIALS AND METHODS

Sample Collection

Two specimens of *Monotaxis heterodon* were landed in Nagapattinam fish landing centre (10°51′01.18″ N and 80°50′20.47″ E) along the southeast coast of India on 11th March 2022. The specimens were collected from by-catch of trawl net hauled at 30–50 m depth. The specimens were identified based on the taxonomic descriptions used by Randall (2005) and Shibuya et al. (2022). The counts and measurements method followed by Carpenter and Allen (1989), the

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RESEARCH

Meticulous Taxonomic Evidence and Molecular Confirmation of *Sphyraena forsteri* Cuvier, 1829 (Carangiformes: Sphyraenidae) from the Southeast coast of India

Sivaranjani Sekar[1] · Kannan Karuppiah[2] · Kumar Rajendran[3] · Madhuri Krishnamoorthy[1] · Divya Dharmaraj[1] · Kannapiran Ethiraj[3,4]

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Abstract
Bigeye barracuda is a commercially valued species as food and game fish in the Indo-Pacific region. The taxonomic details of bigeye barracuda *Sphyraena forsteri* Cuvier, 1829 is poorly reported in the literature from Indian waters. The current taxonomic study identifies the *S. forsteri* based on different sizes of the specimens ranging from 255 to 376 mm total length and 83–271 g weight collected from three different landing stations along the Southeast coast of India. Totally, forty-five specimens were examined which include 21 males (46.67%) and 24 females (53.33%). *Sphyraena forsteri* is diagnosed with enlarged eyes; covered with very tiny cycloid scales all over the body; 101–120 lateral line scales; cheek scales 5–6.5; seven branchiostegal rays. *Sphyraena forsteri* differs from its congeners by having the gill raker counts; upper limb rough with tiny bony setae, 10–20 small tubercle spines on the first-gill arch (in lower limb) uniformly arranged with 4 to 5 bony setae in a single group with one large spine, gill raker absent. The genetic confirmation of *S. forsteri* was investigated using 668 bp sequences of mitochondrial cytochrome oxidase subunit I gene. The species *S. forsteri* formed a stoutly supported clade against the five other congeneric species within the same family Sphyraenidae. This study provides a better taxonomic interpretation of *S. forsteri* with the molecular and combination of comprehensive morphological with detailed description of scale, otolith, vertebral characters of specimens from the Southeast coast of India.

Keywords Bigeye barracuda · DNA barcoding · Morphology · Southeast coast of India · Taxonomy

Introduction

The family Sphyraenidae (Rafinesque 1815) belongs to the order Carangiformes and comprises a single genus *Sphyraena* (Rose 1793). Globally, twenty-seven valid species and two new species in the last decade have been documented (Fricke et al. 2023). In Indian waters, eleven species have been reported namely, *Sphyraena barracuda* (Edwards 1771), *S. forsteri* (Cuvier 1829), *S. jello* (Cuvier 1829), *S. obtusata* (Cuvier 1829), *S. flavicauda* (Ruppell 1838), *S. novaehollandiae* (Gunther 1860), *S. qenie* (Klunzinger 1870), *S. acutipinnis* (Day 1876), *S. chrysotaenia* (Klunzinger 1870), *S. putnamae* (Jordan and Seale 1905) and *S. arabiansis* (Abdussamad et al. 2015). Sphyraenidae is the foremost largest coastal pelagic piscivore, especially on the coral reefs (Rose 1984) and plays a major role in the marine food chain. These are commercially important fishes due to their delicacy and great flavours (Smith 1956). Sphyraenids are commonly referred to as barracuda for their ferocious behaviours and predatory habit. They are distributed globally in tropical and sub-tropical waters of the Indo-Pacific region (Ballen 2019). Barracudas commonly occur at the depth of 6–300 m (Myers 1991).

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RESEARCH ARTICLE OPEN ACCESS

Antiviral Activity of Marine Actinomycetes, *Saccharopolyspora jiangxiensis* IMA1 against Influenza A/(H1N1) pdm09

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Abstract

Influenza viruses are major communicable pathogens responsible for respiratory diseases affecting millions worldwide and denoted by increased morbidity and significant mortality. Antiviral drugs and periodical vaccination are used to control Influenza infections. The utility of currently available drugs is of major concern due to emergence of drug resistance. This necessitates the development of novel antiviral drugs from natural resources. Broad arsenal of highly effective novel anti-influenza drugs can be developed from actinomycetes which have been explored for development of an array of antimicrobials. Fractions of methanol, ethanol, ethyl acetate and aqueous of the *Saccharopolyspora jiangxiensis* IMA1 were employed to assess the antiviral activity against Oseltamivir resistant influenza A/(H1N1)pdm09 virus. MTT, Plaque Reduction, Quantitative Reverse Transcription Polymerase Chain Reaction (qRT-PCR) and DAPI staining assays were performed to validate the study findings. Selectivity Index value of 18.38µg/ml concentration of the fraction was found to be effective to inhibit the growth of influenza viruses employing the Madin-Darby Canine Kidney cell line. Fraction produced a visually noticeable reduction in cytopathic effect as well as a reduction in viral titre as determined by the reduction in plaque formation. qRT-PCR assay clearly showed a linear relationship between the fraction concentration and the Ct values, demonstrating the virus growth inhibitory activity of the fraction. *S.jiangxiensis* IMA1 ethyl acetate fraction showed promising antiviral activity as revealed by inhibiting the amplification of influenza virus type A/(H1N1)pdm09. The research findings will be useful for the development of new antiviral drug from the bioactive actinomycetes extractions.

Keywords: Influenza A/(H1N1) pdm09, Actinomycetes, Antiviral Activity, DAPI Staining, Plaque Assay, qRT-PCR

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https://doi.org/10.1007/s12010-023-04489-8

ORIGINAL ARTICLE

Chitinase from *Streptomyces mutabilis* as an Effective Eco-friendly Biocontrol Agent

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Accepted: 11 April 2023 / Published online: 25 April 2023

Abstract

Blood sucking parasites not only cause economic loss but also transmit numerous diseases. *Dermanyssus gallinae*, an obligatory blood feeding ectoparasite causes huge production loss to the poultry industry. Mosquitoes act as vector for transmitting several viral and parasitic diseases in humans. Acaricide resistance limits the control of these parasites. The present study was aimed to control the parasites using chitinase that have selective degradation of chitin, an important component in exoskeleton development. Chitinase was induced in *Streptomyces mutabilis* IMA8 with chitin extracted from *Charybdis smithii*. The enzyme showed more than 50% activity at 30–50 °C and the optimum activity at 45 °C. The enzyme activity of chitinase was highest at pH 7.0. The kinetic parameters K_m and V_{max} values of chitinase were determined by non-linear regression using Michaelis–Menten equation and its derivative Hanes-Wolf plot. The larvicidal effect of different concentrations of chitinase was evaluated against all instar larvae (I–IV) and pupae of *An. stephensi* and *Ae. aegypti* after 24 h of exposure. The percentage of mortality was directly proportional to the chitinase concentration. Bioassay for miticidal activity showed that chitinase had excellent miticidal activity (LC_{50} = 24.2 ppm) against *D. gallinae*. The present study suggested the usage of *Streptomyces mutabilis* for preparation of chitinase in mosquito and mite control.

Keywords Chitinase · *Dermanyssus gallinae* · Larvicide · Miticide · *Streptomyces mutabilis*

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Original Article

Evolution and Phylodynamics of the Hemagglutinin Protein of Influenza A/(H1N1)pdm09 Virus Isolates from India from 2009 to 2020

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ABSTRACT: Influenza A/(H1N1)pdm09 virus evolves through continuous antigenic variation in both surface antigens, such as hemagglutinin (HA) and neuraminidase (NA) proteins, which affect its pathogenicity, the effectiveness of the host immune response, and drug resistance. This study reports the evolution and dynamics of 527 HA protein sequences of influenza A/(H1N1)pdm09 Indian isolates submitted from 2009 to 2020. These isolates were aligned with a reference sequence and 22 sequences representing different clades using MEGA X, and subjected to phylogenetic analysis. The strains were predominantly grouped in clades 6B.1 and 6B.2. Prediction of glycosylation sites using the BioEdit and NetNglyc servers showed 12 glycosylation sites distributed in both the stem and globular head regions of HA. Functional evaluation showed that there were 22 deleterious mutations that could affect the function of HA. In addition, 403 unique mutations were distributed across various isolates, indicating the dynamics of antigenic variation in Indian isolates. These results provide an understanding of the frequency, phylodynamics, and impact of mutations in Indian isolates of influenza A/(H1N1)pdm09 relative to global isolates. Monitoring the genomic evolution of the virus will support studies on strain selection for vaccine development and devising control and prevention measures to manage this respiratory infection.

INTRODUCTION

The influenza virus is a single-stranded RNA virus capable of causing acute and severe acute respiratory illness in humans. Of the four types of influenza virus (A, B, C, and D), A is the most prevalent and pathogenic type affecting humans and thus remains a major public health concern worldwide (1). Globally, approximately 1 billion cases with 650,000 deaths are reported annually (2). The virus has a segmented RNA genome that consists of eight segments (PB2, PB1, PA, NP, hemagglutinin [HA], neuraminidase [NA], M, and NS). Mutations, antigenic drift, and antigenic shift are associated with changes in the HA and NA proteins, which can result in increased transmissibility, pathogenicity, and immune escape (3,4). Hence, annual revision of vaccine components and selection of different subtypes and strains with distinct immunogenic features are essential to ensure immunity against the virus (5).

During infection, the receptor binding domain (RBD) of HA binds to sialic acid moieties of the host cell membrane, which aids the entry of the virus into host cells by endocytosis. Amino acid changes in the RBD affect the binding affinity of HA to the host cell surface, consequently affecting the virulence of the virus (6). Glycosylation of HA is associated with a wide range of biological properties, including immunogenicity and receptor specificity (7,8). In the HA glycoprotein, glycans are attached to asparagine residues of the short consensus sequence Asn-Xaa-Ser/Thr (where Xaa can be any amino acid except proline), which is known as N-linked glycosylation. The HA glycoprotein is divided into two main subunits: HA1 (the globular head comprising 327 residues) and HA2 (the stalk region comprising 222 residues). The glycosylation pattern is more variable in HA1 than in HA2, which is highly conserved. Glycosylation of HA1 plays a crucial role in guarding antigenic sites from neutralizing antibodies, and glycosylation of sites in the vicinity of the RBD promotes HA binding to host cell receptors, leading to activation of the innate immune response (9).

The emergence of influenza A/(H1N1)pdm09 in 2009 revived interest in influenza surveillance programs,

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MAGNITUDE AND CLINICO-EPIDEMIOLOGICAL PATTERN OF INFLUENZA FROM 2014 TO 2019 IN CHENNAI, INDIA

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ABSTRACT

Influenza is a highly contagious airborne disease that causes seasonal epidemics and pandemics. The present study is aimed to determine the epidemiological aspects of influenza virus in and around Chennai, Tamilnadu for a period of six years from 2014 to 2019.The study was attempted to identify and analyze the distribution of influenza viruses with respect to the age groups, seasonality and co-morbid conditions of patients during the study period besides studying the symptomatic profile of patients. Nasopharyngeal swabs were collected from ILI/OPD patients from Tertiary care centers. Real time PCR as per CDC guidelines was performed for detection of influenza viruses. A total of 3533 samples collected during the six years were subjected to Real Time PCR analysis, out of which 411 (11.63%) were found to be positive for influenza. The pdmA/H1N1 09 showed 59.12% positivity whereas 25.30% positivity

Press Release

அழகப்பா பல்கலை.யில் மீன்வள அறிவியல் துறை சார்பில் கருத்தரங்கம்

காரைக்குடி, மார்ச் 18: சிவகங்கை மாவட்டம், காரைக்குடி அழகப்பா பல்கலைக்கழக மீன் வள அறிவியல் துறை, தொலை நிலைக் கல்வி மையம், இணைய வழிக் கல்வி மையம் ஆகியவற்றின் சார்பில் 'நிலையான மீன் பிடிக்கான அடுத்த தலைமுறை தொழில்நுட்பம்' என்ற தலைப்பிலான 3-ஆவது தேசிய கருத்தரங்கின் தொடக்க விழா பல்கலைக் கழகத்தின் அறிவியல் வளாகத்தில் திங்கள்கிழமை நடைபெற்றது.

விழாவுக்கு துணைவேந்தர் க. ரவி தலைமை வகித்தார். அப்போது அவர் பேசியதாவது: வரையறுக்கப்பட்ட எண்ணிக்கையை காட்டிலும் அதிக அளவில் பிடிப்பதினால் மீன் வளம் குறைந்துவருகிறது. மீன்களின் எண்ணிக்கையை மேலாண்மை செய்வது எளிதானது அல்ல.

அதிகப்படியான மீன் அறுவடையை கட்டுப்படுத்த அரசு மட்டுமன்றி உள்ளூர் மக்கள், உலக அளவில் மக்கள் இணைந்து முயற்சிக்கவேண்டும். மீனவ மக்கள் நவீன தொழில்நுட்பங்களை பயன்படுத்தி மீன்பிடி தொழிலில் ஈடுபட முயற்சிக்க வேண்டும் என்றார் அவர்.

அழகப்பா பல்கலைக்கழகத்தில் திங்கள்கிழமை நடைபெற்ற கருத்தரங்கில் பேசிய துணைவேந்தர் க. ரவி.

விழாவில் சிர்காழி ராஜீவ் காந்தி மீன் வளர்ப்பு மைய திட்ட இயக்குநர் சிறப்பு விருந்தினராக கலந்து கொண்டு பேசினார்.

கொச்சி கடல்சார் உற்பத்தி, ஏற்றுமதி நிறுவன துணை இயக்குநர் அறிவுக்கரசு, பாண்டிச்சேரி மீன் வளர்ப்பு ஆலோசகர் பி.இ. சேரன் ஆகியோர் கலந்து கொண்டனர்.

முன்னதாக, பல்கலைக்கழகத்தின் தொலைதூர கல்வி, இணைய வழி கல்வி மைய இயக்குநர் எ. கண்ணபிரான் வரவேற்றார். துறைத் தலைவர் (பொறுப்பு) ந.மா. பிரபு கருத்தரங்கின் நோக்கம் குறித்து விளக்கிப் பேசினார். முடிவில் பேராசிரியர் ரா. குமார் நன்றி கூறினார்.

காப்பு கட்டி பால்குடம் எடுப்பதற்கு விரதம் துவங் பெண்கள் குத்துவிளக்கு பூஜையில் ஈடுபட்டனர். இளைஞர்கள் செய்து வருகின்றனர்.

காரைக்குடி அழகப்பா பல்கலையில்

திறன் மேம்பாட்டு பயிற்சி

காரைக்குடி அழகப்பா பல்கலைக் கழகத்தில் நடந்த திறன் மேம்பாட்டு பயிற்சி முகாமில் தேர்வாணையர் ஜோதிபாசு பேசினார்.

காரைக்குடி, மார்ச் 31: காரைக்குடி அழகப்பா பல்கலைக்கழக மீன்வள அறிவியல் துறை, கொச்சியில் உள்ள மத்திய மீன்வள தொழில்நுட்ப நிறுவனம் சார்பில் மீன்வள அறிவியல் துறையில் தொழில் சார்ந்த பணிபெறும் திறன் மேம்பாட்டுப் பயிற்சி தொடக்க விழா நடந்தது. மீன்வளத் துறை தலைவர் முனைவர் பிரபு வரவேற்றார்.

பல்கலைக் கழகதேர்வாணையர் முனைவர் ஜோதி பாசு தலைமை வகித்து பேசுகையில், உலக அளவிலான சந்தைப் பொருள்களில் கடல் உணவு மிகப்பெரிய பங்காற்றுகிறது. கடல்சார் உணவுகளை பதப்படுத்துதல், அதற்குரிய தொழிற்சாலைகள் அமைத்தல் போன்றவற்றுக்கு இது போன்றபயிற்சி திட்டங்கள் மாணவர்களுக்கு மிகவும் பயனாக இருக்கும். உள் நாட்டுக்கு தேவையான உற்பத்தி மற்றும் ஏற்றுமதிக்கு வழிவகுக்கும் என்றார்.

பல்கலைக்கழக தொலைநிலை மற்றும் இணையவழிக்கல்வி திட்ட இயக்குநர் பேராசிரியர் கண்ணபிரான் பயிற்சி திட்டத்தை துவக்கி வைத்தார். மத்திய மீன்வள தொழில்நுட்ப நிறுவன அமைப்பு செயலாளர் மற்றும் மூத்த அறிவியல் அறிஞர் முனைவர் ஜெயஜெயந்தி உள்பட பலர் கலந்து கொண்டனர். அழகப்பா பல்கலைக்கழக அறிவியல் துறை மாணவர்கள், பல்கலைக்கழக உறுப்புக் கல்லூரி மாணவர்கள், திருச்சி பாரதிதாசன் பல்கலைக்கழக கடல்சார் அறிவியல் துறை மாணவர்கள் உள்பட பலர் கலந்து கொண்டனர். மீன்வள அறிவியல் துறை உதவிப் பயிற்றுநர் முனைவர் குமார் நன்றி கூறினார்.

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"Fishing is not just about catching fish;
it's about understanding the delicate balance of nature."
- Aldo Leopold