



**The 5th Regional Scientific and Technical Committee Meeting
For the SEAFDEC/UN Environment/GEF Project on Establishment and Operation of
a Regional System of Fisheries *Refugia* in the South China Sea and the Gulf of Thailand**

16-17 March 2022
(08:30 – 12:00 am, UTC+7)
Zoom platform

**Regional Training Course on Larval Fish Identification
and Early Life History of Marine Fishes**

I. INTRODUCTION

Larvae of marine fishes termed ichthyoplankton usually are pelagic, drifting in the sea and interacting with pelagic predators and planktonic prey. Most fish larvae, even species that ultimately are herbivores as juveniles or adults, are primarily carnivorous during the larval stage, feeding smaller planktonic organisms. In turn, larval fishes are the prey of larger nektonic and planktonic organisms. Escape from the precarious larval stage is accomplished via growth and ontogeny. Only a few individuals from thousands of newly hatched larvae survive the ever-present threats of starvation and predation during planktonic life. Surveys at sea generally estimate distributions, abundance, diversity, and structure of 'ichthyoplankton' communities, including associations of larvae with their predators and prey. Such surveys sometimes are a component of stock assessments used in fisheries management. Furthermore, many developed countries have long used ichthyoplankton data in stock identification, as an indicator of spawning locations and times, and as an index of spawning stock biomass (Heath, 1993; Richardson et al., 2010).

In Southeast Asia, early life stages in stock identification studies have been regionally conducted in the South China Sea (SCS) and the Gulf of Thailand (GoT) by SEAFDEC in collaboration with member countries since 1997 by MV SEAFDEC and since 2004 by MV SEAFDEC-2. At the Regional Training Program on larval fish identification held in 2007 and 2008 supported by the GEF/UNEP project on "Reversing Environment Degradation Trends in the SCS and GoT" some larval fish samples from the survey have been identified. Later a team of ichthyologists and fisheries biologists led by Dr. Yoshinobu Konishi has reanalyzed the findings from training and published a Larval Fish Identification Guide for the South China Sea and the Gulf of Thailand in 2008.

The SEAFDEC/UNEP/GEF project entitled "Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and the Gulf of Thailand" has been developed and implemented since 2016. The overall objective of the fisheries refugia initiative of the project is to improve the understanding and management of the links between fish stocks and critical fisheries habitats. The project focuses on sustainable use by implementing the fisheries refugia concept as "Spatially and geographically defined, marine or coastal areas in which specific management measures are applied to sustain important species during critical stages of their life-cycle." To achieve the project target objectives, identifying fisheries refugia sites, including the samplings and species identified for fish eggs and larvae, is one of the essential activities. The results from larval fish identification would further support the local knowledge to develop a critical science-based management policy.

Nevertheless, knowledge and human resources on ichthyoplankton studies, particularly species identification, are limited in many countries implementing the project. Many fish eggs and larvae were identified at family and genus levels except for some species. Considering the long-term sustainable management of fisheries, the capacity building on larval fish identification and early life history is urgently needed. Association with the above circumstance, the Regional Scientific and Technical Committee, at its third meeting held in 2020 in Viet Nam, requested the Project Coordination Unit (PCU) to arrange for a regional training course. Accordingly, with the support from the Research and Development Division (RDD) of the SEAFDEC Training Department, the 3rd Regional Training Workshop on Larval Fish Identification and Early Life History of Marine Fishes is scheduled within 2022 before the project's termination by the end of 2022. The training focuses on six fish groups related to the fisheries refugia target species, Scombridae, Carangidae, Engraulidae, Lutjanidae, Siganidae, and Serranidae. The workshop includes sharing experience on a country plan/strategy for fisheries resources survey and fish stock identification including scientific-based management to protect the critical stages of fish life-cycle.

II. OBJECTIVES

- To improve the knowledge and techniques of young national scientists or fisheries biologists to be able to work on early life history and identify the larval fish of 6 targeted groups at family, genus, or species levels.
- To create a communication and networking group among the scientists.

III. EXPECTED OUTCOMES

- Participants possess an improved understanding of early life history descriptions and skill on larval fish identification for further application for managing the fish stock at national and sub-regional levels.
- Regional cooperation on fish stock identification and management strengthened through communication networking.
- Awareness of the importance of the early life history study for fish stock identification and management is built for long-term sustainable fisheries management.

IV. EXPECTED OUTPUTS

- A networking group of scientists on larval fish identification and early life history study in the Southeast Asian Region, and
- Training materials to support future works at country published and shared online.
- Report of the training workshops published and shared online.
- Photographs catalogue of the identified larvae by family, genus, and species published online.

V. DATE AND VENUE

The regional training workshop is tentatively scheduled for 1-13 May 2022 at SEAFDEC/Training Department, Samut Prakan, Thailand. Accommodation for participants is at the TD dormitory.

VI. ORGANIZER AND FUNDING

The regional training workshop is convened by the Research and Development Division (RDD) of the SEAFDEC Training Department with the funding support from the Regional Program of the SEAFDEC/UNEP/GEF Fisheries Refugia Project.

VII. PARTICIPANTS

- The SEAFDEC/UNEP/GEF Fisheries Refugia Project supports two scientists, each from six participating countries, namely Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Viet Nam.
- The Fisheries Refugia project also supports two scientists, each from other SEAFDEC Member Countries such as Brunei Darussalam and Myanmar, participating in the training workshop.
- In addition, the project supports one each from Singapore and Lao PDR to participate in the training workshop as an observer, as it would be applied the lesson learns and knowledge for fish stock identification and management extends to inland fisheries.
- Two extra quotas, the project would encourage and support a scientist from each active local NGO or CSOs working on identifying and protecting fish stock to participate in the training workshop.
- Considering the gender mainstreaming and gender equality policy under SEAFDEC, UNEP, and GEF in establishing and managing fisheries refugia, the project encourages female biologists and participants to attend the training workshop.

VIII. RESOURCE PERSONS AND SUPPORTERS

Key Resource Persons	Position/Institution
1) Dr. Yoshinobu Konishi	
2) Mr. Rangsan Chayakul	
3) Dr. Teerapong Duandee	
Scientists/Technical Supporters	Position/Institution
1) Ms. Siriporn Pangsorn	
2) Mr. Rakkiet Pungsri	

IX. LANGUAGES

- English language is used throughout the training workshop programs. Therefore, proficiency in English is required.

X. CERTIFICATE OF COMPLETION

- SEAFDEC Training Department will award all invited scientists/participants a Certificate of Completion.

TENTATIVE AGENDA AND SYLLABUS

Date/Time	Training Activity/Topic	Resource Person
1 May 2022 - Sunday		
	Participants arrive at SEAFDEC Training Department, Samut Prakan, Thailand	SEAFDEC Personnel
2 May 2022 - Monday		
0800-0830	Register	SEAFDEC Personnel
0830-0900	Opening ceremony & group photo	SEAFDEC & FR-PCU
0900-0920	Brief on schedule and anticipated outputs, outcomes	SEAFDEC Personnel
0920-0940	Refreshment	SEAFDEC Personnel
0940-1230	Country report on the research plan for fisheries resources survey and study on fish stock identification	Participants (20 minute each Countries)
1230-1330	Lunch break	SEAFDEC Personnel
1330-1430	Lecture: Review on morphological development of larval fish characters	Yoshinobu Konishi
1500-1700	Lecture & Practice: Method for calculation of abundance of fish larvae collected by sampling nets	Yoshinobu Konishi and SEAFDEC Personnel
3 May 2022 - Tuesday		
0900-1000	Lecture: Identification methods of the <i>Scombridae</i> larvae and juveniles in the Southeast Asian region	Yoshinobu Konishi
1030-1200	Practice: Species identification and morphological description of the <i>Scombridae</i> larvae and juveniles - 1	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1700	Practice: Species identification and morphological description of the <i>Scombridae</i> larvae and juveniles - 2	Instructor Team
4 May 2022 - Wednesday		
0900-1200	Practice: Species identification and morphological description of the <i>Scombridae</i> larvae and juveniles - 3	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1430	Lecture: Identification methods of the <i>Carangidae</i> larvae in the Southeast Asian region	Yoshinobu Konishi

Date/Time	Training Activity/Topic	Resource Person
1500-1700	Practice: Species identification and morphological description of the Carangidae larvae - 1	Instructor Team
5 May 2022 - Thursday		
0900-1200	Practice: Species identification and morphological description of the Carangidae larvae - 2	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1700	Practice: Species identification and morphological description of the Carangidae larvae - 3	Instructor Team
6 May 2022 - Friday		
0900-1000	Lecture: Identification methods of the Engraulidae larvae in the Southeast Asian region	Yoshinobu Konishi
1030-1200	Practice: Species identification and morphological description of the Engraulidae larvae - 1	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1700	Practice: Species identification and morphological description of the Engraulidae larvae - 2	Instructor Team
7 May 2022 - Saturday		
	Rest Day	
8 May 2022 - Sunday		
0900-1200	Practice: Species identification and morphological description of the Engraulidae larvae - 3	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1700	Presentation of case study on early life history of marine fishes based on the references for future work plan in country	Participants
9 May 2022 - Monday		
0900-1200	Lecture: Identification methods of the Lutjanidae , Siganidae and serranid Epinepharinae larvae in the Southeast Asian region	Yoshinobu Konishi
1200-1330	Lunch break	SEAFDEC Personnel

Date/Time	Training Activity/Topic	Resource Person
1330-1700	Practice: Species identification and morphological description of the Lutjanidae , Siganidae and serranid Epinepheninae larvae - 1	Instructor Team
10 May 2022 - Tuesday		
0900-1200	Practice: Species identification and morphological description of the Lutjanidae, Siganidae and serranid Epinepheninae larvae - 2	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1700	Practice: Species identification and morphological description of the Lutjanidae, Siganidae and serranid Epinepheninae larvae - 3	Instructor Team
11 May 2022 - Wednesday		
0900-1200	Practice: Species identification and morphological description of the Lutjanidae, Siganidae and serranid Epinepheninae larvae - 4	Instructor Team
1200-1330	Lunch break	SEAFDEC Personnel
1330-1700	Preparation of presentation on species identification and morphological descriptions of examined larvae and juveniles, and on future working subjects to be planned	Participants
12 May 2022 - Thursday		
0900-1200	Presentation on results of species identification and morphological descriptions of examined larvae and juveniles, and on future working subjects to be planned	Participants
1200-1330	Lunch break	SEAFDEC Personnel
1330-1400	Strengthening a Network on the Early Life History of Marine Fishes in SEAFDEC/TD	PCU
1400-1500	Closing ceremony	SEAFDEC Personnel
1800-2200	Farewell Dinner	SEAFDEC Personnel
13 May 2022- Friday		
	Participants leave SEAFDEC/TD for Home Countries	SEAFDEC Personnel