



Regional Training Course on Fish Larvae
Phase I: Larval Fish Identification and Fish Early Life History Science
16 November 2022,
SEAFDEC Training Department, Samut Prakan, Thailand

COUNTRY REPORT:
FISH LARVAE STUDY IN MALAYSIA

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List of publications on fish larvae in Malaysia



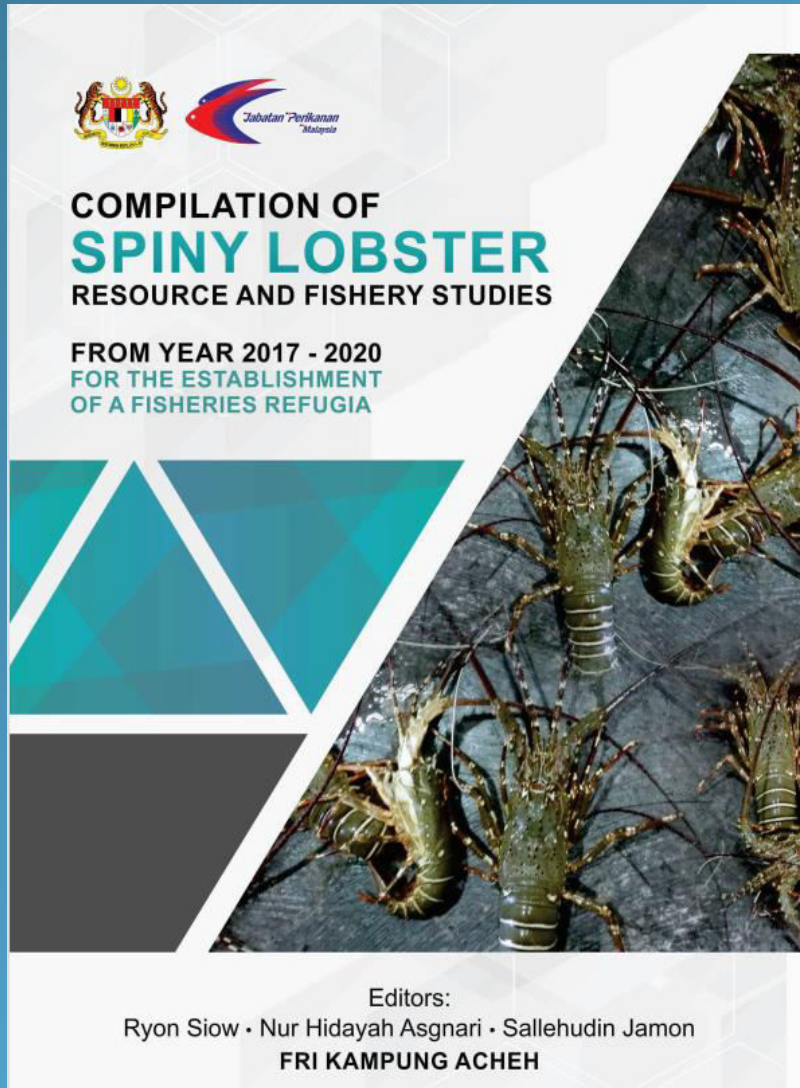
No	Year	Title	Status			
1	2021	<p>Abd Haris Hilmi Ahmad Arshad, Nur Hidayah Asgnari and Nadiyahatul Atikah Harun. 2021. Distribution and Density of Phyllosoma Lobster in East Johor and Pahang Waters of Peninsular Malaysia. 42-57pp in Eds: Siow, R., Nur Hidayah, A. and Sallehudin, J. 2021. Compilation of spiny lobster resource and fishery studies from year 2017-2020 for the establishment of a fisheries refugia. Fisheries Research Institute, Department of Fisheries Malaysia. 123 p.</p>	<p>Published Chapter of Book</p>			
		2	2020	<p>Nur Hidayah, A., Abd. Haris Hilmi, A. A., and Nadiyahatul Atikah, H. 2020. Distribution and Density of Mackerel Larvae (<i>Rastrelliger</i> spp.) in the Waters off the Northwest Coast of Peninsular Malaysia. International Journal of Fisheries and Aquatic Studies 2020; 8(4): 177-182.</p>	<p>Published paper</p>	
3	2021	<p>Nur Hidayah Asgnari, Nadiyahatul Atikah Harun and Abd. Haris Hilmi Ahmad Arshad. 2021. Distribution and density of anchovy larvae in Pangkor Island, Perak West Coast of Peninsular Malaysia. 5th International Congress on Fisheries and Aquatic Research (ICFAR). 10-12 November 2021. Pulau Pinang, Malaysia.</p>	<p>Conference (Oral)</p>			
4	2019	<p>Abd Haris Hilmi Ahmad Arshad, Nur Hidayah Asgnari and Nadiyahatul Atikah Harun. 2019. Distribution and Density of <i>Rastrelliger</i> spp. Larvae in Kedah Waters. 2nd International Conference of Sustainable Development Goals 2019 (ICSDG). 30-31 Julai 2019. Pulau Pinang, Malaysia.</p>	<p>Conference (Oral)</p>			



Distribution and Density of Phyllosoma Lobster in East Johor and Pahang Waters of Peninsular Malaysia.



Abd Haris Hilmi Ahmad Arshad, Nur Hidayah Asgnari and Nadiyatul Atikah Harun



COMPILATION OF
SPINY LOBSTER
RESOURCE AND FISHERY STUDIES
FROM YEAR 2017 - 2020

FOR THE ESTABLISHMENT OF A FISHERIES REFUGIA

Distribution and Density of Phyllosoma Lobster in East Johor and Pahang Waters of Peninsular Malaysia

Abd Haris Hilmi Ahmad Arshad*, Nur Hidayah Asgnari & Nadiyatul Atikah Harun
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Abstract: This study was conducted to determine the distribution and density of phyllosoma in East Johor and Pahang waters of Peninsular Malaysia. Sampling was conducted twice at the sampling site in August 2017 and October 2018 using a larvae net with 500 µm mesh size through horizontal towing on the subsurface. Samples were observed under stereomicroscopy and identified to genus level. Phyllosoma samples were observed and differentiated into Panulirid and Scyllarid phyllosoma. Density of phyllosoma was calculated by using the number of phyllosoma and volume of water filtered. Density was standardized to 1000 m³ and the distribution was digitally mapped. This study showed that the phyllosoma of *Panulirus* spp. occurred along Tanjung Sedili waters and more distributed in August 2017 compared to October 2018. Phyllosoma of *Thenus orientalis* showed the highest density in October 2018 and distributed near island waters of Pulau Sibul, Pulau Tinggi, Pulau Pemanggil and Pulau Tioman. This indicated that August is one of the spawning seasons of Panulirid lobster in East Johor. The factors that contribute to the occurrence of phyllosoma on east Johor waters were also discussed.

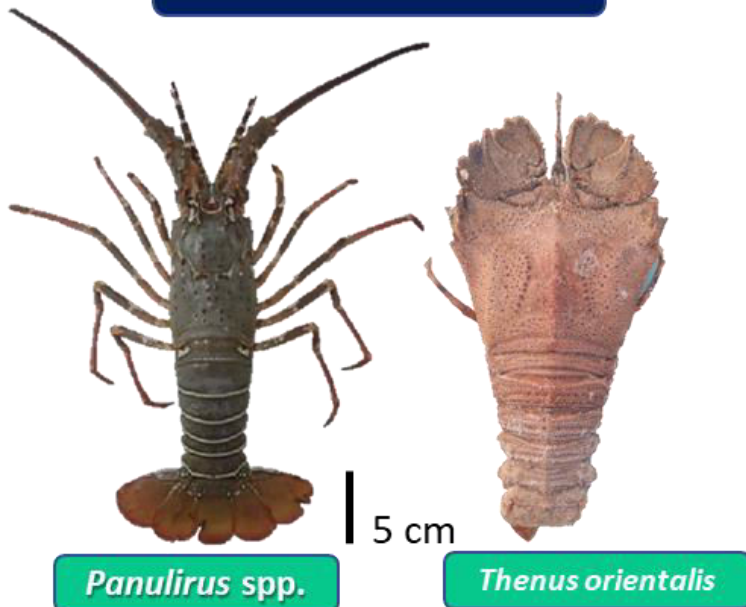
Keywords: Phyllosoma, *Panulirus* spp., *Thenus orientalis*, distribution, density

References:

Abd Haris Hilmi Ahmad Arshad, Nur Hidayah Asgnari and Nadiyatul Atikah Harun. 2021. **Distribution and Density of Phyllosoma Lobster in East Johor and Pahang Waters of Peninsular Malaysia.** 42-57pp in Eds: Siow, R., Nur Hidayah, A. and Sallehudin, J. 2021. **Compilation of spiny lobster resource and fishery studies from year 2017-2020 for the establishment of a fisheries refugia.** Fisheries Research Institute, Department of Fisheries, Peninsular Malaysia. 123 p.



Adult Lobster



Methodology



Figure: Towing of larva net

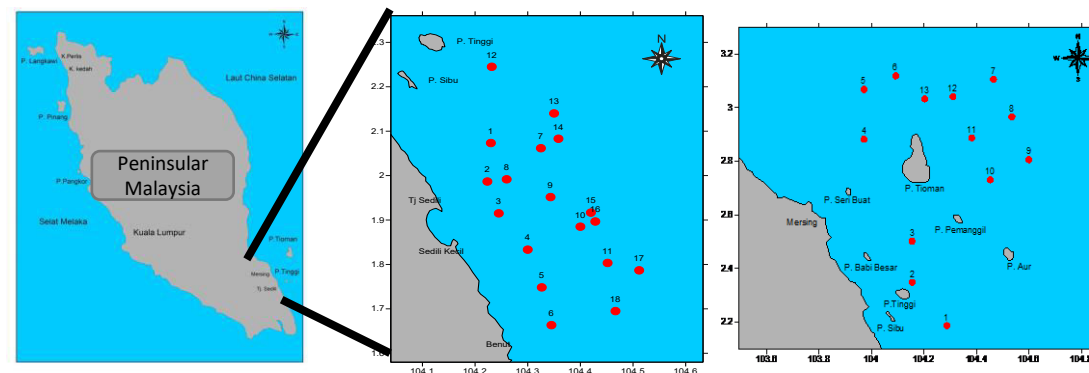
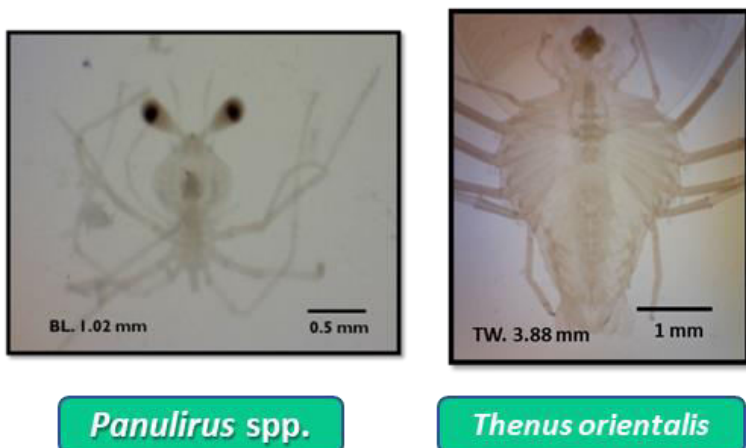


Figure: Sampling location in 2017 & 2018.

Phyllosoma



Conclusion

- Phyllosoma of *Panulirus* spp. in East Johor waters was high density in **August**, especially off Tanjung Sedili waters.
- The high density of phyllosoma may be influenced by the **occurrence of upwelling and by artificial reefs** located in the waters of Tanjung Sedili and Pulau Tinggi, Johor.
- This information could be used in **establishing a reef fishery of lobster on the East Coast of Johor and Pahang waters.**

Distribution and Density of Mackerel Larvae (*Rastrelliger* spp.) in the Waters off the Northwest Coast of Peninsular Malaysia.

Nur Hidayah, A., Abd. Haris Hilmi, A. A., and Nadiyatul Atikah, H.



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Distribution and density of mackerel larvae (*Rastrelliger* spp.) in the waters off the northwest coast of peninsular Malaysia

Nur Hidayah Asgnari, Abd Haris Hilmi Ahmad Arshad and Nadiyatul Atikah Harun

Abstract

This study was conducted to determine the density and distribution of *Rastrelliger* spp. larvae in northern part of West Coast of Peninsular Malaysia. Sampling was conducted thrice at the sampling site (August 2018, September 2018 and October 2019). Larvae were sampled using a larvae net with 500 μ m mesh size. Oblique towing of larva net was carried out in study location which was between south of Langkawi Island to south of Kedah waters. Fish larvae samples were observed under stereomicroscopy and identified to family, genus or species level. Larvae were then preserved in 4% formalin. The result showed that the distribution of larvae was occurred more spawning in September compared to August and October. The average size of larvae was 3.1 ± 0.7 mm ($n=151$). The highest density of *Rastrelliger* spp. larvae was recorded in September with 38 larvae/1000 m^3 where the sampling station was located near fish aggregation device site in Yan. Biological information in this study can be used for fishery resources management in order to ensure the sustainability of fisheries resources.

Keywords: *Rastrelliger* spp., larvae, density, distribution and spawning area

1. Introduction

Mackerel, *Rastrelliger* spp. are commercial fish as food source for human consumption in Malaysia. This is due to low market price, its abundance and highly demand among Malaysian [1]. *Rastrelliger* spp. are belong to family of Scombridae which locally known as "Kembung"

References:

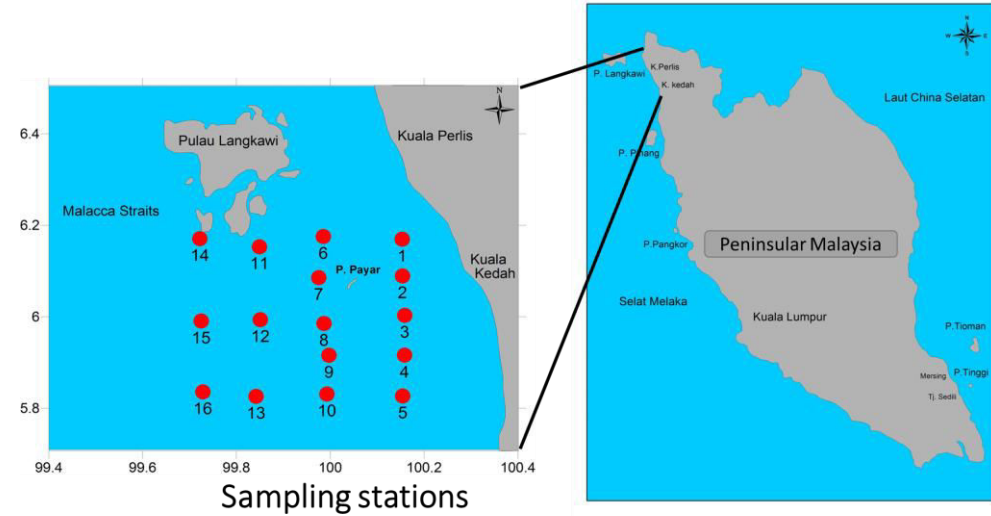
Nur Hidayah, A., Abd. Haris Hilmi, A. A., and Nadiyatul Atikah, H. 2020. Distribution and Density of Mackerel Larvae (*Rastrelliger* spp.) in the Waters off the Northwest Coast of Peninsular Malaysia. International Journal of Fisheries and Aquatic Studies 2020; 8(4): 177-182.



Methodology



FAD (*Tuas* or *unjam*)



Result

Morphology of *Rastrelliger* spp. larvae

Head:
Head and snout round

Head:
Pigment over brain poor (preflexion to flexion stage)

Caudal fin:
Not fully develop

Discussion: The clear black pigment spot on the head as in Figure 6 which adopted from Leis and Carson-Ewart (2000).

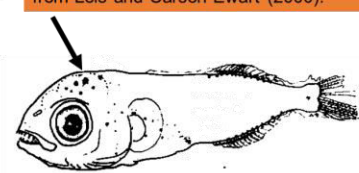


Figure 6: General morphology of *Rastrelliger* spp. larvae (adopted from Leis and Carson-Ewart, 2000)

Mouth:
Both jaw tips nearly join

Operculum:
No preopercle spines

Gut:
Compact

Anus:
Gap between anus and anal-fin origin wide

Discussion:

- The morphology of larvae in this study showed the characteristics of *Rastrelliger* spp. that are elongate to moderate in depth, compressed and deeper in head and gut than in tail (Figure 5).
- In this study, the larvae of *Rastrelliger* spp. were difficult to identify until species level due to similar characteristics and external morphology were overlap among *R. kanagurta* and *R. brachysoma*.
- A conformation study by using genetic approach should be advice to validate the result.

Conclusion

- The highest density of *Rastrelliger* spp. larvae found in September where the sampling station was located near unjam site in Yan.
- This study also found that the more spawning occurred in **September** compared to August and October.
- Biological information in this study can be used for fishery resources management in order to ensure the sustainability of fisheries resources.

Conference (Oral) 2021

Distribution and density of anchovy larvae in Pangkor Island, Perak West Coast of Peninsular Malaysia.



Nur Hidayah Asgnari, Nadiyatul Atikah Harun and Abd. Haris Hilmi Ahmad Arshad

ICFAR
5th INTERNATIONAL CONGRESS ON FISHERIES AND AQUATIC RESEARCH

10-12 November 2021
Penang - Malaysia

<http://www.icfar.gen.tr>



5th International Congress on Fisheries and Aquatic Research

(FACC-06) Distribution and density of Engraulidae larvae and eggs in Pangkor Island, Perak: West Coast of Peninsular Malaysia

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Capture Fisheries Research Division, FRI Kampung Acheh, Department of Fisheries Malaysia,
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Nur Hidayah Asgnari

Category/Section: Fisheries, aquaculture, and climate change

Abstract:

This study was conducted to determine the distribution and density of engraulidae larvae and eggs in Pangkor Island, Perak: West Coast of Peninsular Malaysia. Sampling was conducted twice at the sampling site (February 2019 and October 2020) by which the larval distribution was estimated/analysed from spawning distribution in previous months. Larvae were sampled using a larvae net with 500 µm mesh size. Oblique towing of larva net was carried out in study location in Perak waters which was between north of Pangkor Island to south of Sembilan Island. Fish larvae samples were observed under stereomicroscopy and identified to family level. Larvae were then preserved in 4% formalin. Density of larvae were calculated by using the number of larvae and volume of water filtered. Density was standardized to 1000m³ and the distribution was mapped using Surfer* 8. The result showed that the distribution of engraulidae larvae was occurred more spawning in February compared to October. The average size of larvae were 2.0 ± 1.4 mm (n=32) and eggs were 0.9 ± 0.1 mm (n=52). The highest density of engraulidae larvae was recorded in October 2020 with 8 larvae/1000 m³ where the sampling station was located near shoreline which less than 1 nautical mile from Pangkor Island. Top five highest composition percentage of other family were Scombridae (25.3%) followed by Gobiidae (21%), Carangidae (12.3%), Clupeidae (7.5%) and Mugillidae (6.1%). Biological information in this study can be used for fishery resources management in order to ensure the sustainability of fisheries resources. The investigated setting is fundamental finding for sustainable fishery management of the selected fishery resources at the national, regional and global levels.

Keywords: Engraulidae, larvae, density, distribution and spawning area

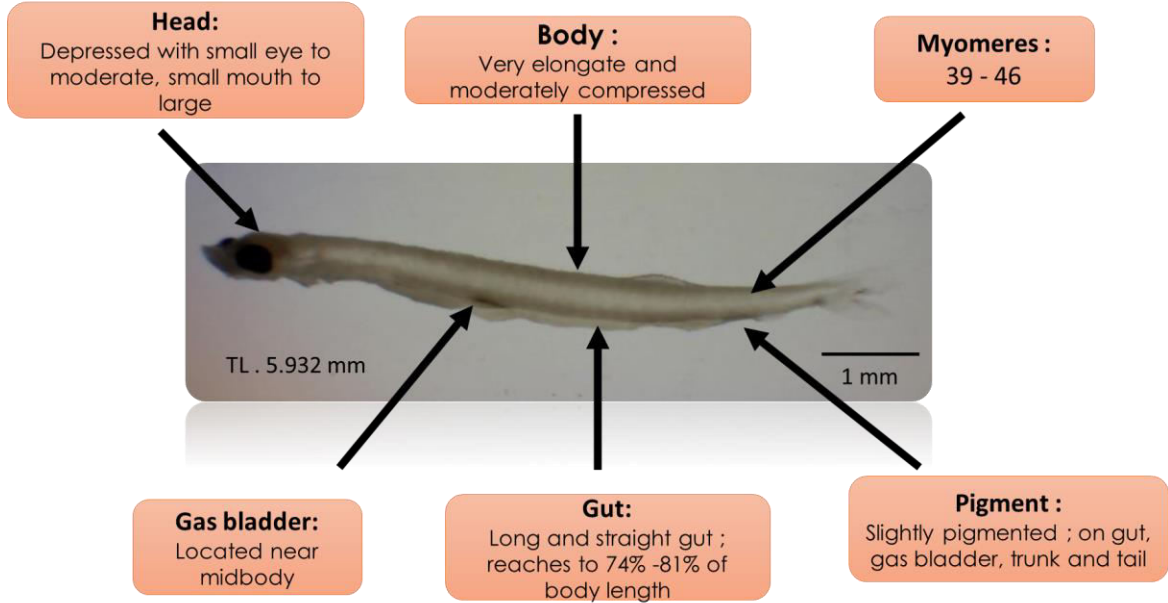
Refences:

Nur Hidayah Asgnari, Nadiyatul Atikah Harun and Abd. Haris Hilmi Ahmad Arshad. 2021. **Distribution and density of anchovy larvae in Pangkor Island, Perak West Coast of Peninsular Malaysia.** 5th International Congress on Fisheries and Aquatic Research (ICFAR). 10-12 November 2021, Pulau Pinang, Malaysia.

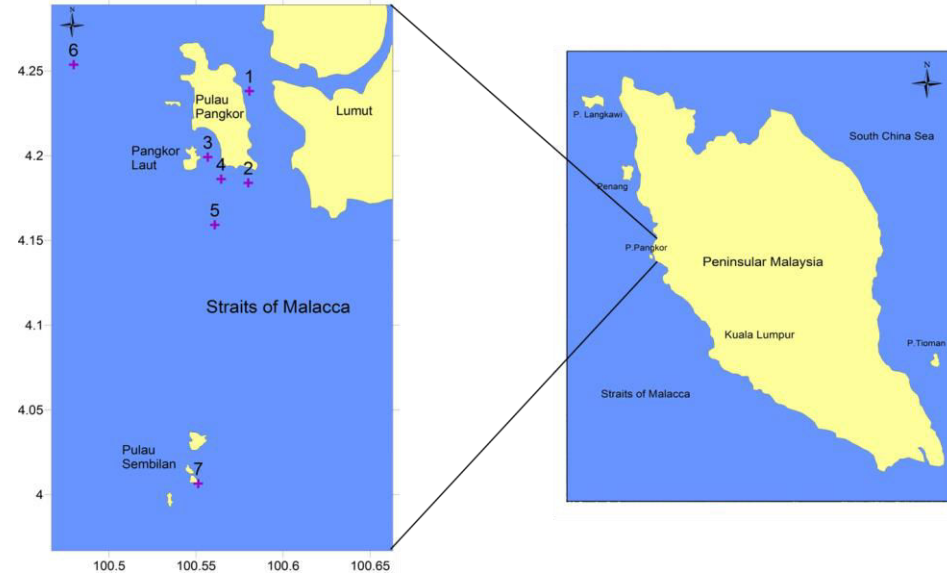


Methodology

Morphology of Anchovy larvae



SAMPLING LOCATION



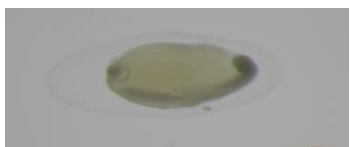
Conclusion

Larva of anchovy more concentrated in coastal area in Pulau Pangkor.

Eggs may be drifted by current and spawning period for anchovy was in February

Biological information in this study can be used for fishery resources management in order to ensure the sustainability of fisheries resources.

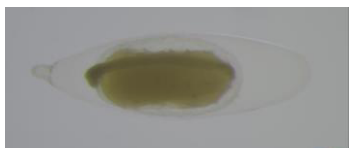
Result



Encrasicholina spp. egg



Anchovy larvae



Stolephorus spp. egg



Distribution and Density of *Rastrelliger* spp. Larvae in Kedah Waters.

Abd Haris Hilmi Ahmad Arshad, Nur Hidayah Asgnari and Nadiyatul Atikah Harun



Distribution and Density of *Rastrelliger* spp. Larvae in Kedah Waters.

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Abstract

Purpose – The purpose of this study is to determine the density, distribution and spawning area of *Rastrelliger* spp. larvae in Kuala Kedah waters.

Design/methodology/approach – Sampling was conducted twice which were in August and September 2018 using a larvae net. Larva *Rastrelliger* spp. were isolated and stored in a 4% of formalin. Fish larvae were observed under stereomicroscopy and each larva were identified until family or genus. Density and distribution of larvae are estimated according to the number of individuals per 1000 cubic meters of seawater.

Findings – The result of this study showed that the distribution and highest density of *Rastrelliger* spp. larvae is 6.7/1000m³ in September 2018 that were in the southern area of Kedah waters which near Yan. The composition of fish larvae for the Engraulidae family recorded the highest percentage in August and the Scombridae family recorded the highest percentage in September 2018 in Kedah waters.

Research implications – Biological information in this study can be used for fishery resources management in order to ensure the sustainability of fisheries resources.

Originality/value – The investigated setting is fundamental finding for sustainable fishery management of the selected fishery resources at the national, regional and global levels.

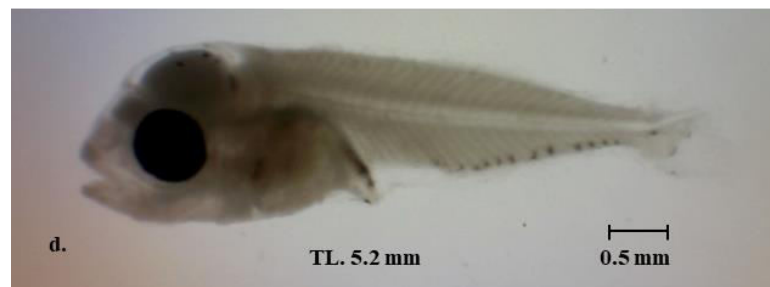
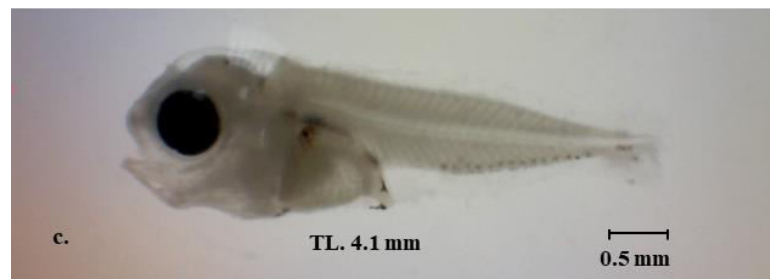
Keywords – *Rastrelliger* spp., density, distribution and spawning area

References:

Abd Haris Hilmi Ahmad Arshad, Nur Hidayah Asgnari and Nadiyatul Atikah Harun. 2019. **Distribution and Density of *Rastrelliger* spp. Larvae in Kedah Waters.** 2nd International Conference of Sustainable Development Goals, 30-31 Julai 2019, Penang, Malaysia.



Result



Methodology

Location of sampling area of *Rastrelliger* spp. in Kedah Waters

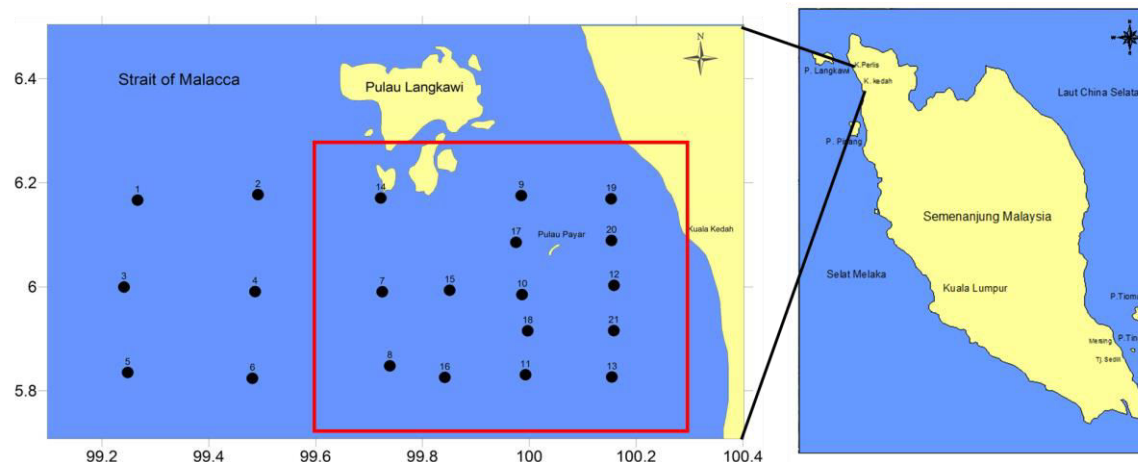


Figure 3: Location of sampling area on August (station 1-13) and September (station 7-21).

Conclusion

The highest density of *Rastrelliger* spp. larvae found in September where the sampling station was located near FAD site in Yan.

This study also found that the spawning occurred highly in September compared to August.

Biological information in this study can be used for fish resources management in order to ensure the sustainability of fisheries resources.





Fish larvae in Pulau Pangkor, Perak Waters

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 TL. 5.932 mm 1.0 mm
Family : Engraulidae
*Genus : *Coila*, *Setipinna*, *Thryssa*, *Encrasicholina*, *Stolephorus*
Common name : Anchovies
Local malay name: Bilis
Commerciality : Commercial

 TL. 2.643 mm 1.0 mm
Family : Scombridae
*Genus : *Rastrelliger*, *Scomber*, *Scomberomorus*, *Auxis*, *Euthynnus*, *Thunnus*
Common name : Mackerel ,tuna, bonito
Local malay name: Kembang, Tenggiri
Commerciality : Commercial

 TL. 5.288 mm 1.0 mm
Family : Clupeidae
*Genus : *Amblygaster*, *Anodontostoma*, *Clupea*, *Sardinella*, *Tenualosa*
Common name : Herrings, Shads, Sardines
Local malay name : Tamban, Selangai
Commerciality : Commercial

 TL. 3.079 mm 1.0 mm
Family : Cynoglossidae
Genus : *Cynoglossus*, *Symphurus*, *Paraplagusia*, *Plagusia*
Common name : Tonguefish
Local malay name : Lidah
Commerciality : Commercial

 TL. 5.351 mm 1.0 mm
Family : Carangidae
*Genus : *Caranx*, *Carangoides*, *Decapterus*, *Alepes*, *Selaroides*, *Megalaspis*, *Somberoides*
Common name : Jacks, Pompanos, Runners and Scad
Local malay name : Pelata, Selar, Bawal
Commerciality : Commercial

 TL. 2.966 mm 1.0 mm
Family : Nemipteridae
Genus : *Nemipterus*, *Scolopsis*, *Pentapodus*, *Parascolopsis*
Common name : Threadfin bream
Local malay name : Kerisi, Pasir-pasir
Commerciality : Commercial

 TL. 3.307 mm 1.0 mm
Family : Sillaginidae
Genus : *Sillago*, *Sillaginodes*, *Sillaginopsis*
Common name : Smelt-whitings, Sand-borers, Sillaginids
Local malay name : Puntung damar
Commerciality : Commercial


 TL. 3.392 mm 1.0 mm
Family : Ambassidae
*Genus : *Ambassis*, *Parambassis*, *Gymnochanda*, *Tetracentrum*
Common name : Asiatic glassfishes
Local malay name : Seriding
Commerciality : Commercial


 TL. 2.171 mm 1.0 mm
Family : Bothidae
*Genus : *Bothus*, *Scaldfish*, *Parabothis*, *Laeops*, *Monolene*
Common name : Lefteye flounders
Local malay name : Sebelah
Commerciality : Commercial


 TL. 4.897 mm 1.0 mm
Family : Mugilidae
*Genus : *Mugil*, *Chelon*, *Crenimugil*, *Valamugil*
Common name : Mullet
Local malay name : Belanak
Commerciality : Commercial


 TL. 2.941 mm 1.0 mm
Family : Gerreidae
*Genus : *Gerres*, *Diapterus*, *Eugerres*, *Paraquula*, *Pentaprion*, *Ulaema*
Common name : Majorra
Local malay name : Kapas
Commerciality : Commercial

 TL. 3.685 mm 1.0 mm
Family : Sphyraenidae
Genus : *Sphyraenus*
Common name : Barracudas
Local malay name : Kacang- kacang, Alu- alu
Commerciality : Commercial

 TL. 2.206 mm 1.0 mm
Family : Mullidae
*Genus : *Upeneus*, *Parupeneus*, *Mullus*, *Mulloidichthys*, *Pseudupeneus*,
Common name : Goatfishes
Local malay name : Biji nangka
Commerciality : Commercial

 TL. 2.789 mm 1.0 mm
Family : Triacanthidae
Genus : *Triacanthus*, *Tripodichthys*, *Pseudotriacanthus*, *Trixiphichthys*
Common name : Tripodfishes
Local malay name: Lembu, Barat-barat
Commerciality : Commercial

 TL. 3.433 mm 1.0 mm
Family : Blenniidae
*Genus : *Scartella*, *Ecsenius*, *Parablennius*, *Blennius*
Common name : Combtooth blennies
Local malay name : Bleni
Commerciality : Non - Commercial

 TL. 5.755 mm 1.0 mm
Family : Gobiidae
*Genus : *Eviota*, *Bathygobius*, *Gobiodon*, *Gobius*, *Gobiosoma*, *Trimma*
Common name : True gobies
Local malay name : Gobi, Belodok
Commerciality : Non - commercial

*Genus – certain genus only

Reference

Leis, J. M. & Carson-Ewart, B. M. (2000). The Larvae of Indo-Pacific Coastal Fishes: An Identification Guide to Marine Fish Larvae, Leiden. *The Netherlands: Brill Publisher*, 850 pp.



THANK YOU

