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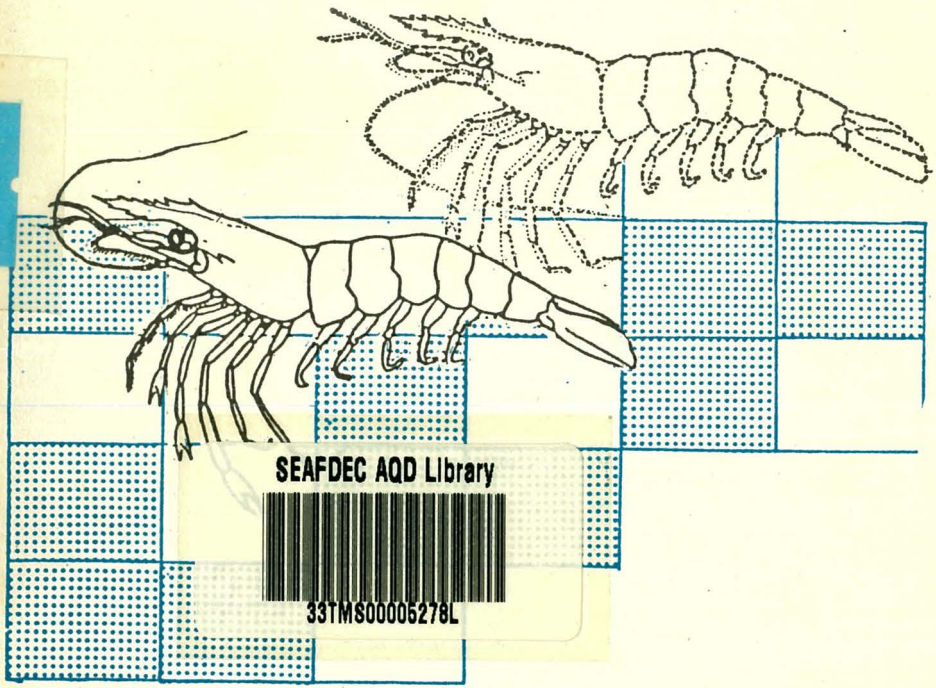
SELECTION OF MARINE SHRIMP FOR CULTURE



SEC/SM/9 SAFIS Manual No.9

SELECTION OF MARINE SHRIMP FOR CULTURE

Information and Publication Unit
Fishery Conservation and Extension Division
Department of Fisheries
Thailand

The Secretariat
Southeast Asian Fisheries Development Center
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This manual is a translation of the Thai information pamphlet entitled "การคัดเลือกพันธุ์กุ้งทะเลเพื่อการเพาะเลี้ยง" (Karn khad leuk phan kung thalae pheu karn phoa liang), 1981.

The translation was prepared by Mr. Vijai Srisuwantach, Senior Fisheries Biologist, National Inland Fisheries Institute, Department of Fisheries, Thailand, and was edited by the SEAFDEC Secretariat.

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At present, marine shrimp are one of the most economically valuable marine resources in Thailand. They fetch a high price, and market demand in the country and for export is also high. In 1982, the value of shrimp exports amounted to Baht 2,764 million (approx. US$ 120.68 million). About 20 per cent of the total production comes from coastal culture farms and 80 per cent from marine fisheries. However, there have recently been indications that it may be difficult to increase substantially the shrimp catches from Thai waters owing to the following three main factors:

1. Depletion of resources in the Gulf of Thailand and the impact of the new law of the sea, in particular the extended jurisdiction of the neighbouring countries by their declaration of exclusive economic zones (EEZs).

2. Water pollution causing deterioration of natural aquatic resources.

3. Over-exploitation due to the rapid development and expansion of the marine fishery industry.

Attention has, therefore, been directed towards the development of shrimp culture as a means to increase shrimp production in the country.

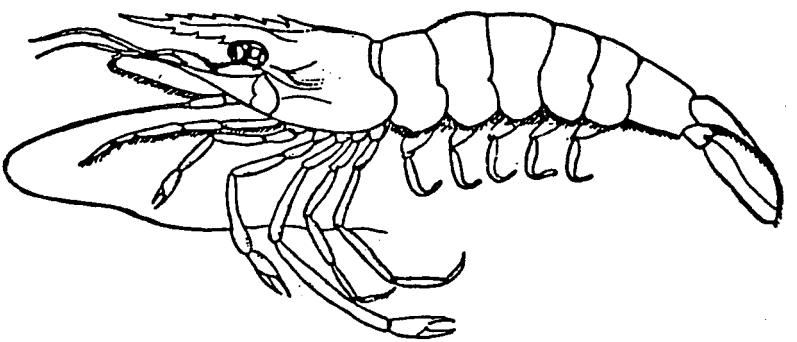
Criteria for selection of the culture species should include high economic value and high market demand, easy culture, and fast growth. The purpose of this paper is to compare the general characteristics, as well as growth and spawning, of different species of marine shrimp. The advantages and disadvantages of each species are also discussed in order to serve as a basic guideline for shrimp farmers in selecting species for culture.

I. SUITABLE CULTURE SPECIES

1. *Penaeus monodon* Fabricus

English common name: Giant tiger prawn

Thai local name: Kung kula dum (กุ้งกุลาดำ, กุ้งเสือดำ)



General characteristics

It is the biggest species of penaeid prawn. Body colour is dark brown with dark transverse bands on the abdominal segments. Rostrum teeth on dorsal and ventral margins are 7 and 3 respectively.

Growth

This species is fast growing and attains 20 cm in total length with a weight of 70 g in 6 months of growing period. It tolerates high temperatures and is easy to culture. It feeds on phytoplankton, zooplankton and meat.

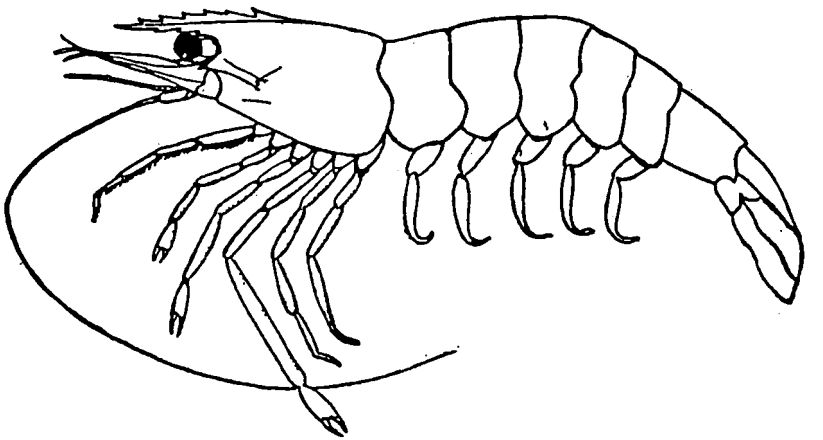
Spawning and habits

P. monodon breeds throughout the year. The peak breeding time appears to be from May to August. When cultured in ponds, it is often found at the bottom of the pond during daytime. It is widely distributed in the coastal waters of Thailand.

2. *Penaeus semisulcatus* de Haan

English common name: Green tiger prawn

Thai local name: Kung kula lai (กุ้งกุลาลาย, กุ้งเสือเขียว)



General characteristics

Body colour is light brownish-green with greenish-brown bands on the abdominal segments. Rostrum almost straight with 6-7 dorsal rostrum teeth and 2-3 ventral rostrum teeth.

Growth

This species migrates to the open sea when it reaches the adult stage. It shows less tolerance of water quality changes in the restricted conditions of pond culture.

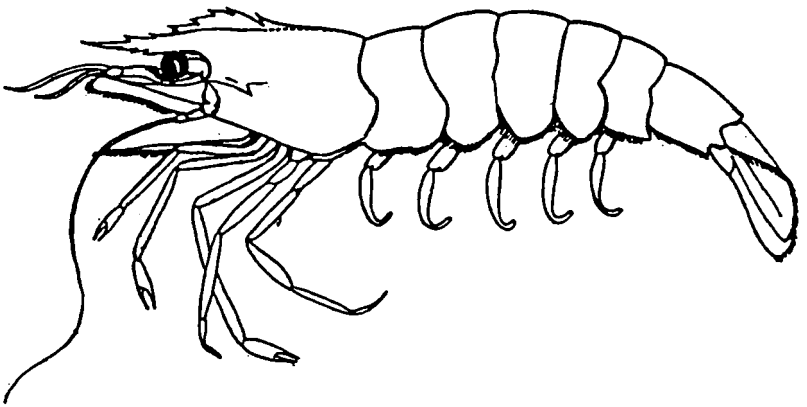
Spawning and habits

This species spawns throughout the year. It lives at the pond bottom during daytime, seeking food during night time. It is carnivorous, i.e. it feeds on snails.

3. *Penaeus merguiensis* de Man

English common name: White prawn; Banana prawn

Thai local name: Kung chaebauy kao (กุ้งแชบ๊วยขาว)



General characteristics

Body colour is cream. Rostrum teeth on dorsal and ventral margins are 6-7 and 4-5 respectively. Rostral blade of adult shrimp is triangular in shape.

Growth

Based on specimens from trawlers, the maximum total length of this species found was 20 cm and weight 30 g. After a two-month grow-out period, it reaches 12 cm in length, and attains 15 cm after a four to five months' growing period, with a weight of about 30 g.

Spawning and habits

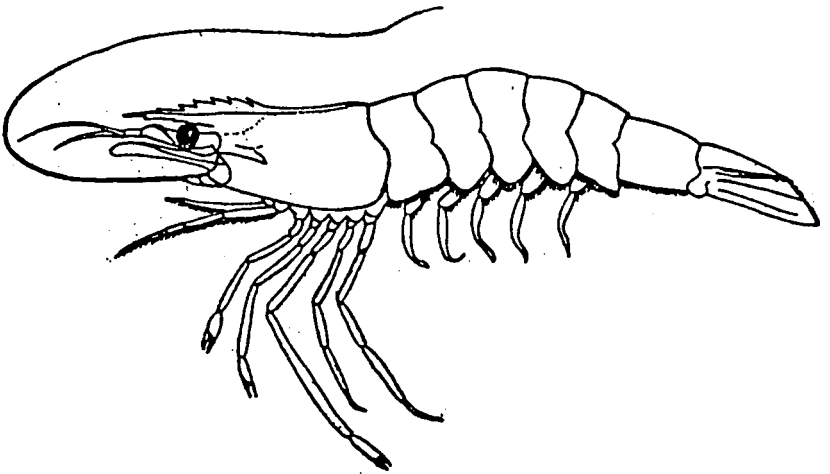
It spawns throughout the year. Most of the gravid females can be found in the estuarine areas just at the beginning and at the end of the rainy season, with a peak from May to November.

This species is one of the most suitable for culture and also the main species cultured in Thailand because the seed is easy to obtain and the adults fetch a high market price.

4. *Penaeus indicus* H. Milne-Edwards

English common name: Indian prawn

Thai local name: Kung chaebauy (กุ้งแชบ๊วย)



General characteristics

It is similar to *P. merguiensis* especially at the young stage. At the adult stage, the main characteristics of *P. indicus* are body colour reddish-white, covered with numerous red spots. Tail fans are brown-red in colour. Rostrum almost reaches posterior border of carapace. Dorsal rostrum teeth and ventral rostrum teeth are 6-7 and 4-5 respectively.

Growth

The growth of this species is similar to *P. merguiensis*. It is quite fast growing.

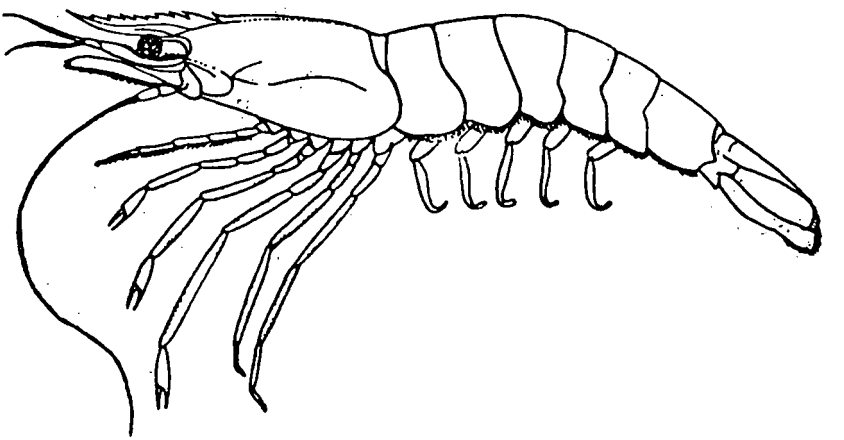
Spawning and habits

It spawns throughout the year. There are usually no problems of availability of seed and spawners obtained from the wild. It is usually caught during daytime in coastal areas with clay bottom.

5. *Metapenaeus ensis* de Haan

English common name: School prawn; Greasy back prawn

Thai local name: Kung ta kard (กุ้งตะกาด)



General characteristics

Body colour is light tan with blue speckling. Eight to ten dorsal rostrum teeth, but no ventral rostrum teeth. Postrostral continuing to posterior border of carapace.

Growth

The species attains a length of 11-14 cm, and weighs 13-20 g at 3-4 months old.

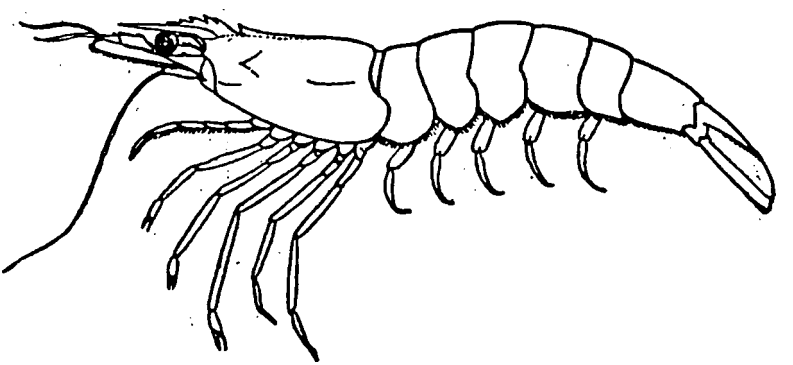
Spawning and habits

The species spawns throughout the year. Widely distributed, usually found in coastal and brackishwater areas. It seeks food in daytime. It is easy to culture and fast-growing.

6. *Metapenaeus brevicornis* (M. Milne-Edwards)

English common name: Yellow prawn; Flower prawn

Thai local name: Kung hua mun/Kung lee
(กุ้งหัวมัน, กุ้งลี่)



General characteristics

Rostrum is very short. Telson is without spines. Six dorsal rostrum teeth, but no ventral teeth.

Growth

The species attains a total length of 8-11 cm and weighs 10-15 g at 3-4 months old.

Spawning and habits

It spawns throughout the year. The species is quite active and often caught together with *P. merguiensis* and *M. ensis*. It is usually found in muddy areas in mangrove forests. It seeks food during daytime. It is possible to culture it together with *P. merguiensis* and *P. semisulcatus*.

II. ADVANTAGES AND DISADVANTAGES IN CULTURE OF EACH SPECIES

1. *P. monodon*

Advantages:

- Large size, tasty meat, high price and high market demand.
- Can survive in very low salinity down to 1 ppt but growth rate would be relatively slower.
- Can survive in up to 40 ppt of salinity.
- Tolerates high temperatures up to 32°C but will die in temperatures lower than 15°C.

Disadvantages:

- Natural seed supply is relatively scarce, hence its high price.
- Difficulty in obtaining spawners.
- Long duration of culture to marketable size.
- Survival rate in culture pond is uncertain.

2. *P. semisulcatus*

Advantages:

- No great problem as regards seed production.
- Tasty meat.
- High price and high market demand.

Disadvantages:

- Slow growth rate.
- Requires high salinity.

3. *P. merguiensis* and *P. indicus*

Advantages:

- Fast growing, tasty meat, high market price, short growing period.
- Natural seeds and spawners easily obtainable.

- High survival rate for the first three months of growing period.

- Can grow up to marketable size even if cultured in limited area.

Disadvantages:

- High mortality if cultured in salinity less than 5 ppt and higher than 40 ppt.

- Postlarvae are difficult to identify.

- Problem of cannabalism.

- Dies in temperatures higher than 34°C.

- Higher mortality rate during transportation of postlarvae than for *P. monodon*.

- Higher mortality rate after three months growing period.

4. *M. ensis*

Advantages:

- Tolerates low salinity and high temperatures.

- Reaches marketable size within growing period of two months.

- Seed from natural waters easily obtainable.

- Can be cultured along with other marine shrimp.

- High survival rate in pond culture.

Disadvantages:

- Small size.

- Low market value.

5. *M. brevicornis*

Advantages:

- Spawns in culture pond.

- High tolerance of low salinity and high temperatures.

- Reaches marketable size within a culture period of two months.

- Seeds from natural waters easily obtainable.

- High survival rate in pond culture.

Disadvantages:

- At the same age, male and female have different sizes.

- Small size and low market price.

More information regarding marine shrimp culture can be obtained upon request from:

- Brackishwater Fisheries Division
  Kasetsart University Campus
  Bangkhen, Bangkok 10900, Thailand

- National Institute of Coastal
  Aquaculture (NICA), Songkhla,
  Thailand

SAFIS

0 What is SAFIS?

SAFIS is the Southeast Asian Fisheries Information Service. It is a project of the SEAFDEC Secretariat set up to provide extension materials for small-scale fishermen and fish farmers in the region.

0 What are its objectives?

The immediate objectives are to collect and compile fisheries extension manuals, brochures, pamphlets and related aids for small-scale fisheries development, and to translate selected literature into local languages for distribution to fisheries extension workers in Southeast Asia.

0 What services will SAFIS provide?

SAFIS will attempt to provide information and publications such as:

- lists of available texts in fisheries extension services,
- translation of suitable manuals,
- manuals of appropriate technologies,
- photocopies of appropriate fisheries extension literature,
- a current awareness service of regional fisheries.

0 How much will these services cost?

A nominal cost of US $0.15 per page will be charged for photocopying, handling, and surface mail. Airmail costs will be extra. The publication cost per manual will vary according to the book.

LIST OF SAFIS EXTENSION MANUALS

SEC/SM/1 Khumua liang pla namcheut (Freshwater Fish Farming: How to Begin)-- in Thai

SEC/SM/2 Oyster Culture

SEC/SM/3 Mussel Culture

SEC/SM/4 Ang pagpuna ug pagtapak sa pukot (Net Mending and Patching)-- in Cebuano-Bisaya

SEC/SM/5 Mussel Farming

SEC/SM/6 Menternak Ikan Airtawar (Freshwater Fish Farming: How to Begin)-- in Bahasa Malaysia

SEC/SM/7 Makanan dan Pemakanan Udang Harimau, *Penaeus monodon* (Nutrition and Feeding of Sugpo, *Penaeus monodon*)-- in Bahasa Malaysia

SEC/SM/8 Macrobrachium Culture

SEC/SM/9 Selection of Marine Shrimp for Culture

SAFIS is grateful for financial support received from the International Development Research Centre (IDRC) of Canada.

SAFIS is the Southeast Asian Fisheries Information Service. It is a project of the SEAFDEC Secretariat set up to provide extension materials for small - scale fishermen and fish farmers in the region. For additional information, contact the Project Leader of SAFIS

SEAFDEC Liaison Office
956 Rama IV Road
Olympia Building, 4th floor
Bangkok 10500, Thailand