

S. Lakshmi Pillai

Crustacean Fisheries Division

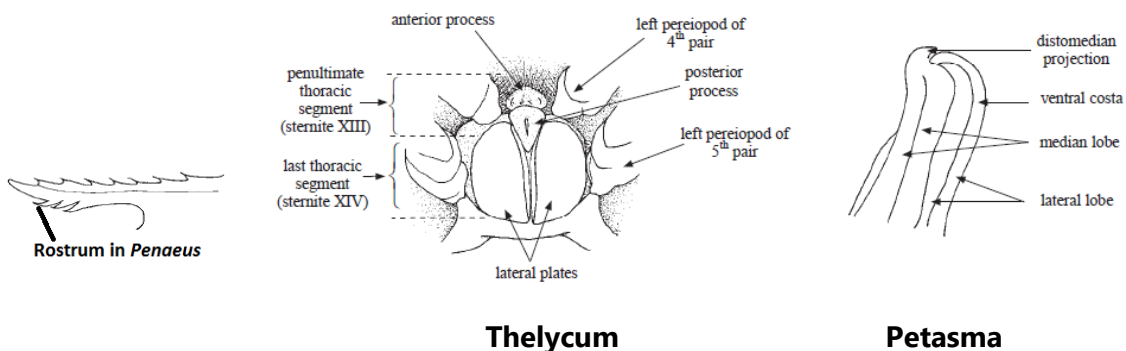
ICAR -Central Marine Fisheries Research Institute, Kochi

Family penaeidae includes majority of the commercial marine shrimps. There are also few species of commercial importance belonging to the families Solenoceridae, Sergestidae and Carideae. They are commercially exploited mostly by single and multiday trawlers.

Major commercial coastal species are *Penaeus indicus*, *Penaeus monodon*, *Metapenaeus dobsoni*, *Penaeus semisulcatus*, *Metapenaeus monocoeros*, *Metapenaeus affinis*, *Penaeus canaliculatus*, *Penaeus japonicus*, *Penaeus pencillatus*, *Penaeus merguensis* and *Parapenaeopsis stylifera*. Besides species belonging to genera *Metapenaeopsis*, *Trachysalambria* and *Solenocera* also form minor fishery in some maritime states. The juveniles except *P. stylifera* are caught from estuaries/backwaters using stakenets, bagnets etc. along with other fishes. They complete their life cycle in two phases- in the sea and in the estuaries/backwaters. They move to the sea from the estuaries to spawn. *P. stylifera* are stenohaline and complete their life cycle in the sea.

General characters of the commercially important genera:

Penaeus- Rostrum serrated on dorsal and ventral margins. Hepatic carina prominent. Thelycum closed. Abdomen smooth. Petasma with ventral costa long, reaching distal margin of lateral lobe.



Parapenaeopsis: Rostrum serrated only on dorsal margin. Telson without fixed subapical spines but with lateral movable spines. Exopod present on all pereopods. Third pereopod without epipod. Body slender integument thin.

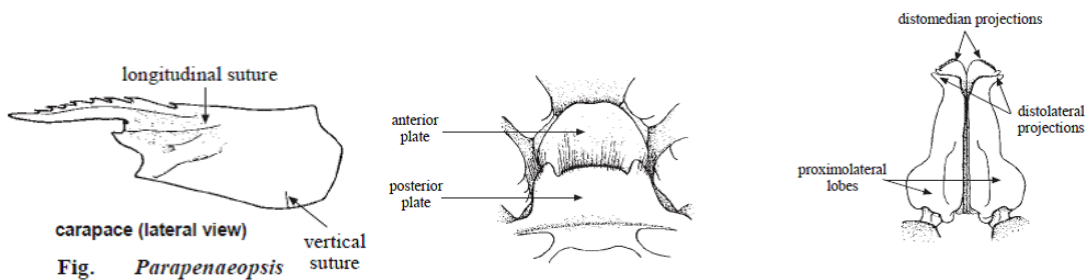
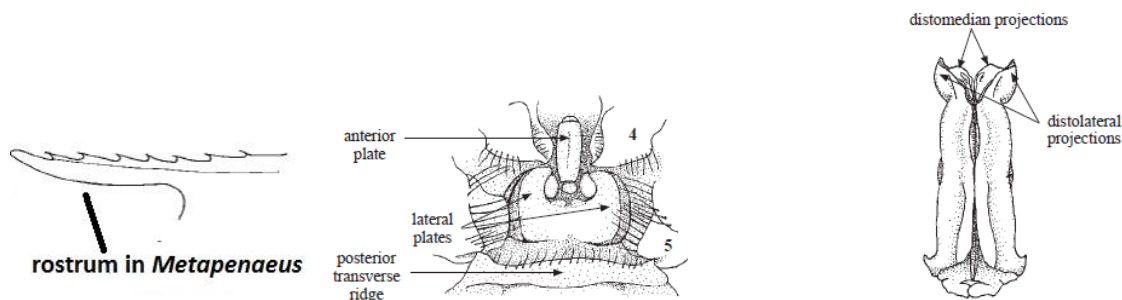


Fig. *Parapenaeopsis*

Thelycum

Petasma

Metapenaeus: Rostrum serrated only on the dorsal margin. Telson generally without fixed subapical spine, but usually with movable lateral spines; antennular peduncle lacking parapenaeid spine. Pleurobrach present on somite XIII; exopods on maxillipeds and anterior four pairs of pereopods; fifth pereopod without exopod.

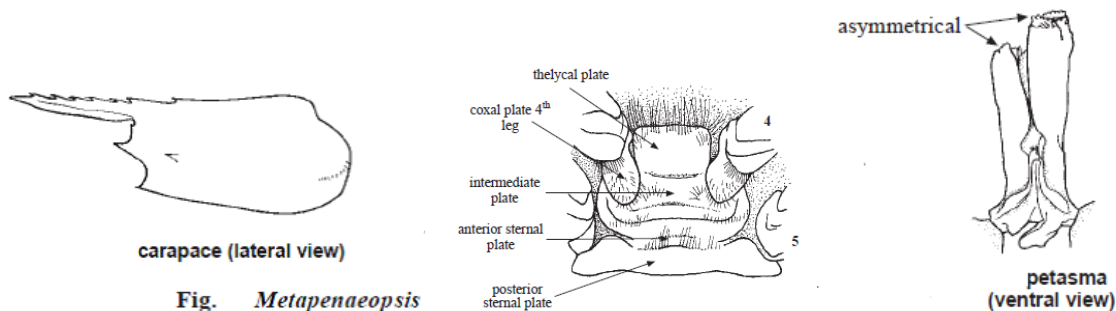


rostrum in *Metapenaeus*

Thelycum

Petasma

Metapenaeopsis: Rostrum serrated only on the dorsal margin. Telson with two or more pairs of conspicuous spines anterior to subapical spines. Third maxilliped and second pereopod with basal spine; petasma asymmetrical.



carapace (lateral view)

Fig. *Metapenaeopsis*

petasma (ventral view)

Thelycum

Petasma

The maturity stages in these shrimps can be discerned externally through the chitinous exoskeleton and the stages are divided into five – immature (IM), early mature (EM), late mature (LM), mature (M) and spent (SP). To determine the gonado somatic index (GSI) the ovary is dissected out, weighed and GSI is calculated using the formula

$$\text{GSI} = \text{Gonad weight} / \text{Weight of whole animal} \times 100$$

Size at maturity for *P. indicus* was estimated as 120 mm total length (TL), *M. dobsoni* 64 mm TL, *P. stylifera* 71 mm TL, *M. monoceros* 114 mm TL.

Penaeid shrimps have high fecundity and fecundity varies based on species, weight of ovary and size of females. In *M. monoceros* fecundity range from 49,000 to 3, 90,000. *P. stylifera* produce 35,000 to 2,39,00 eggs (88 to 115 mm total length). Fecundity in *M. dobsoni* range from 35,000 to 1,59,000.

Estimates of size or age at maturity and fecundity are crucial parameters in calculating spawning stock biomass (SSB) and spawning potential ratio (SPR) in fishery stock assessments.

For gut content analysis, the stomach is dissected out preserved in 2% formalin. It is pressed between two fingers to determine its condition – full, half, one fourth, traces or empty. From full or half filled stomach, the contents are placed in a petri dish and identified up to the lowest possible taxon, using a microscope. Penaeid shrimps are carnivorous and the different food items found in their stomach are usually crustacean remains, fish scales, semi digested matter, zooplankton.

For more information read:

E.V. Radhakrishnan, Josileen Jose and S.Lakshmi Pillai (eds). 2011. Handbook of Prawns. Central Marine Fisheries Research Institute, Kochi-18 125 pp.

FAO species identification sheets. 1983. Fishing Area 51(Western Indian Ocean), 190 pp.

FAO species identification sheets for fishery purposes. 1998.The living marine resources of the western Central Pacific. Volume 2. Cephalopods, crustaceans, holothurians and sharks, 687 – 1396 pp.

George, M. J. 1970. Synopsis of the biological data on penaeid prawn *Metapenaeus dobsoni* (Miers, 1878). FAO fisheries synopsis No.97, 57(4): 1334-1337.

Rao, P.V. 1965. Synopsis of the biological data on penaeid prawn *Parapenaeopsis stylifera* (H. Milne Edwards, 1837). FAO Synopsis No. 106, 57 (4): 1575-1605.