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Inshore shrimps - Family, Genera and species of commercial importance in India

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Crustaceans are important component of the marine ecosystem being food for several predatory fishes and are also valuable fishery resource in countries where they are fished on a commercial scale. Shrimps especially of the superfamily Penaeoidea (family Penaeidae) and Sergestoidea (family Sergestidae) are commercially exploited by different gears along the Indian coast from inshore waters. They contribute substantially to the crustacean landings of the country and the larger varieties - *Fenneropenaeus indicus*, *F. merguensis*, *F. pencillatus*, *Penaeus monodon* and *Penaeus semisulcatus* are foreign exchange earners as they have good demand in the international market. Similarly *Acetes* spp. forms good fishery in the northwest and northeast coast of the country. They belong to the family Sergestidae and are small in size and usually dried or made into paste and used for local consumption and poultry/aquaculture feed preparation. Classification of organisms in an area is essential to estimate the quantum of biodiversity and make decisions on their management and conservation. Perez Farfante and Kensley (1997) have listed total of 401 species of shrimps of which 120 species have been recorded from Indian waters (inshore and deepsea together). Almost all the inshore commercial shrimps are members of family Penaeidae.

Suborder Dendrobranchiata

Infraorder Penaeidea

1. Superfamily Penaeoidea

Family Penaeidae (commercially important inshore shrimps)
Family Sicyoniidae

Family Benthescymidae
Family Solenoceridae
Family Aristeidae

2. Superfamily Sergestoidea

Family Luciferidae
Family Sergestidae (Commercially important small size shrimps in inshore waters- *Acetes* spp.)

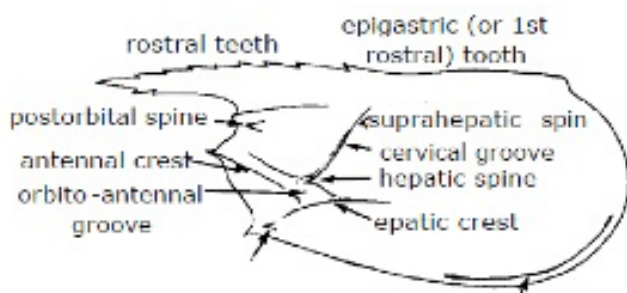
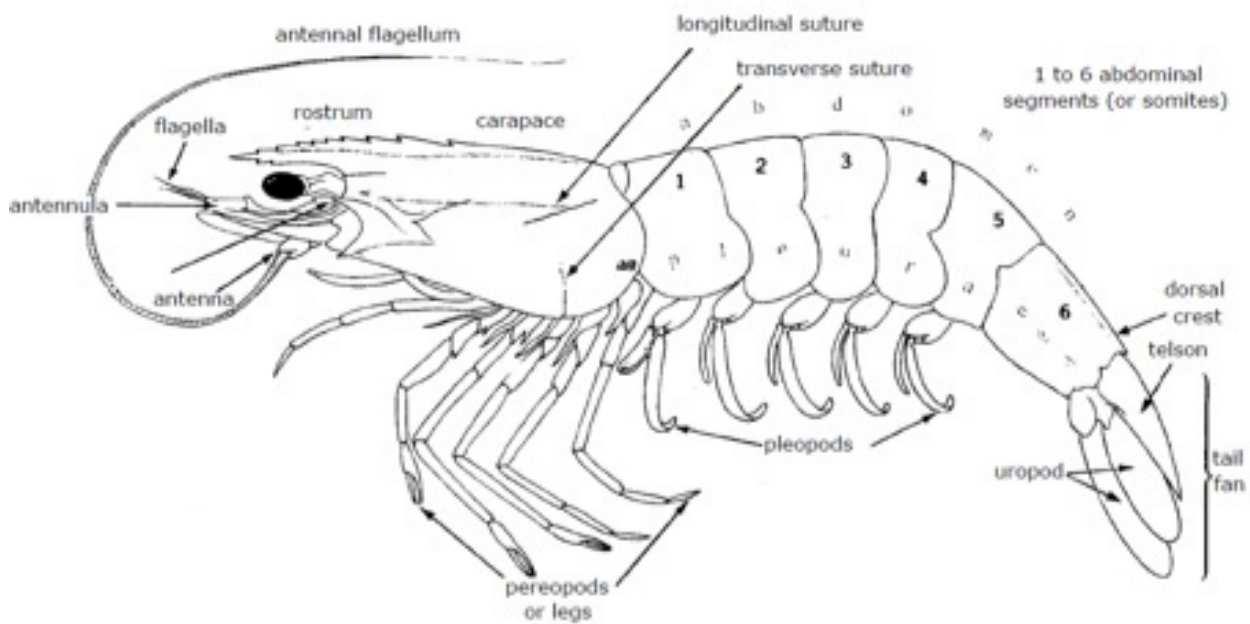
Infraorder Caridea

1. Superfamily Palaemonidae

Family Gnathophyllidae
Family Hymenoceridae
Family Palaemonidae (*Expalaemon styliferus* & *Nematopalaemon tenuipes*)
Superfamily Alpheoidea
Family Alpheidae
Family Hippolytidae (*Exhippolysmata ensirostris* & *Lysmata vittata*)
Family Ogyridae

Penaeidae: Rostrum well developed. Rostrum with ventral teeth and sometimes with dorsal teeth. Petasma semi open or semi closed. Thelycum open or closed.

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.



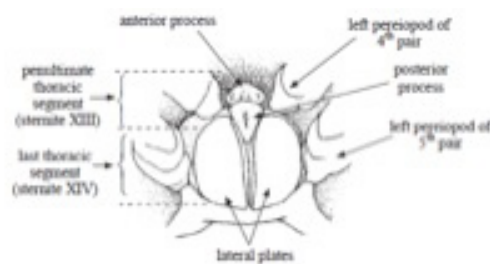
carapace (lateral view)



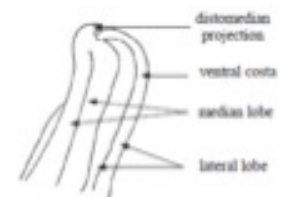
types of spined telsons



Rostrum in Penaeus



Thelycum

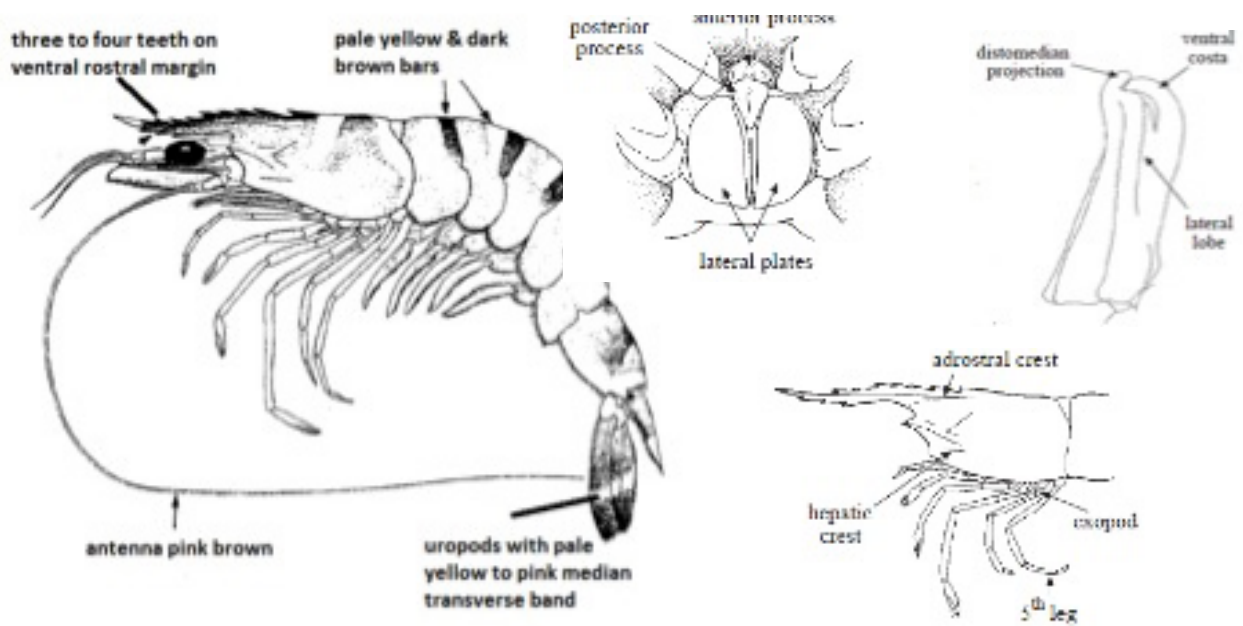


Petasma

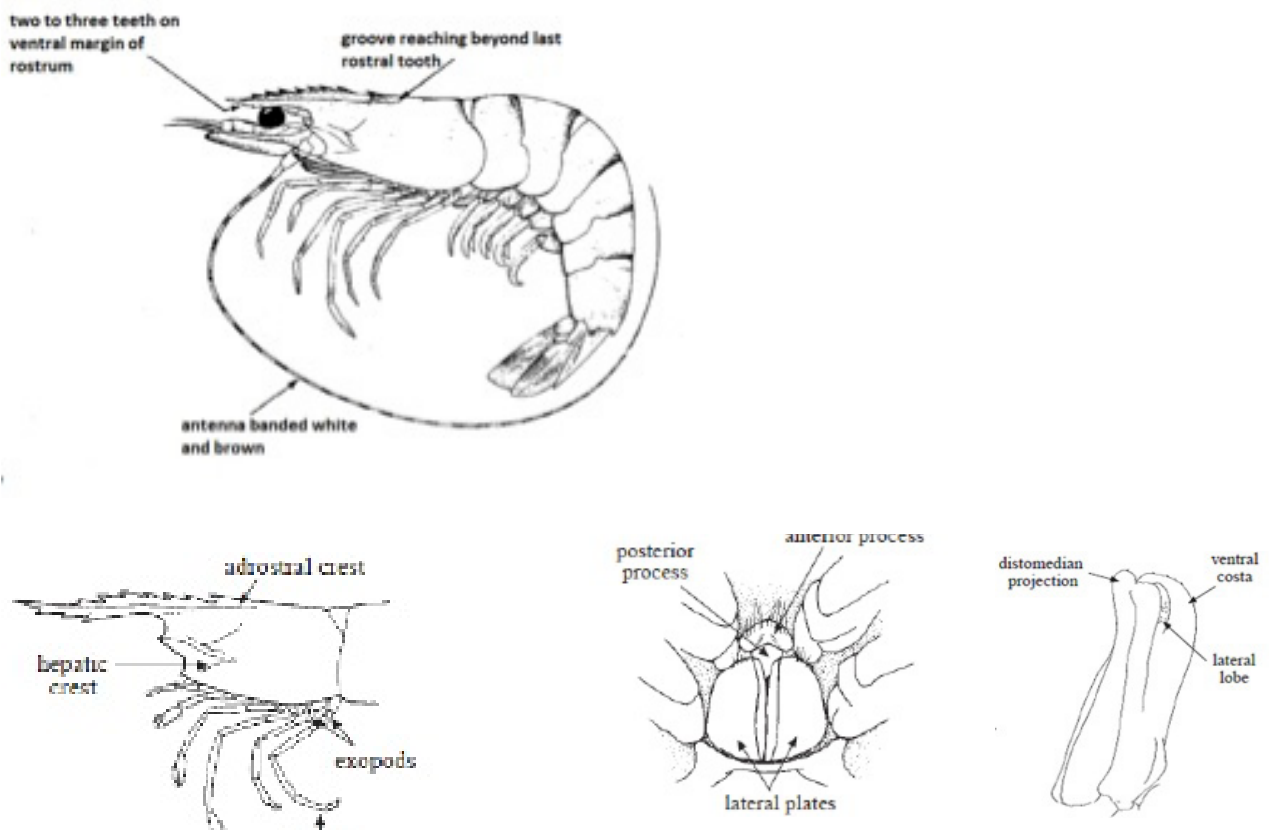
P. monodon: 3-4 teeth on ventral margin of rostrum, hepatic crest nearly horizontal, antennal flagella not banded. Fifth leg without exopod. Anterior process of thelycum subtriangular. Distomedian process of petasma slightly overhanging distal margin of costae. Body grey, abdomen with dark brown to dark grey and pale yellow transverse bands. Uropods with a pale yellow to pink median transverse band.

P. semisulcatus: 2-3 teeth on ventral margin of rostrum, hepatic crest sloping anteroventrally. Adrostral crest reaching beyond last postrostral tooth. Antennal flagella banded. Fifth leg bearing a small exopod. Anterior process of thelycum subtriangular with raised edges. Body pale brown, sometimes greenish. Carapace often with two yellow cream dorsal transverse bands. Abdomen with brown grey and pale yellow dorsal transverse bands. Antennae banded white and brown.

Penaeus monodon

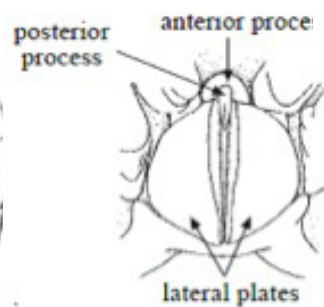
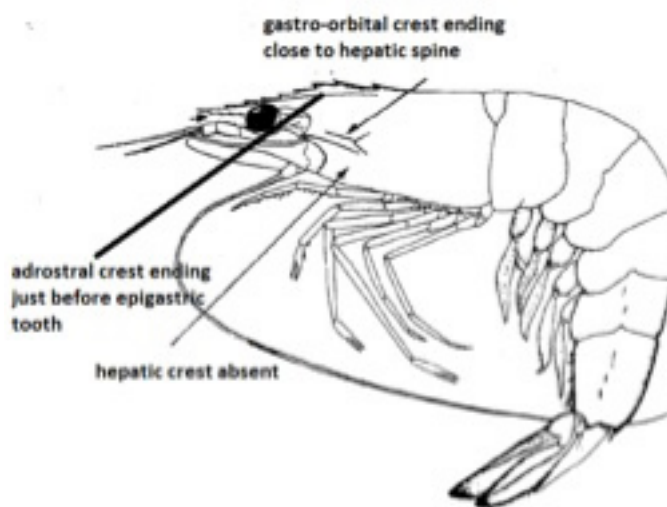
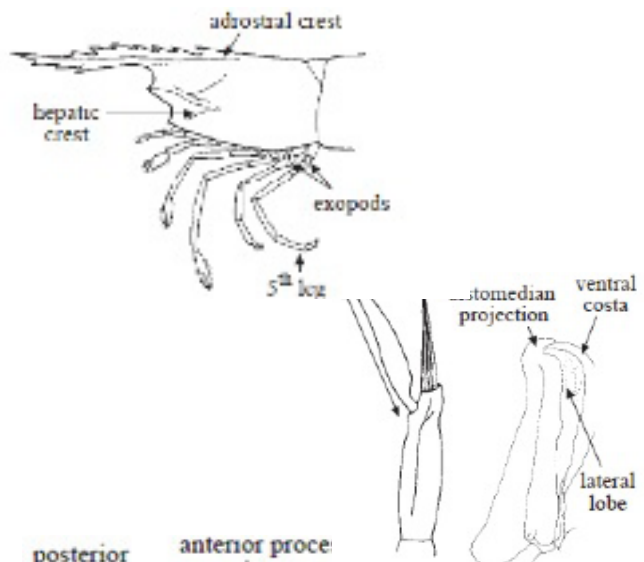


Penaeus semisulcatus

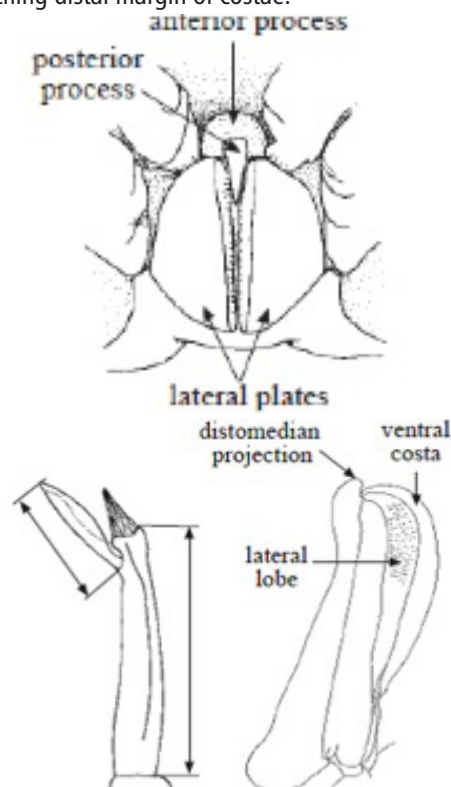
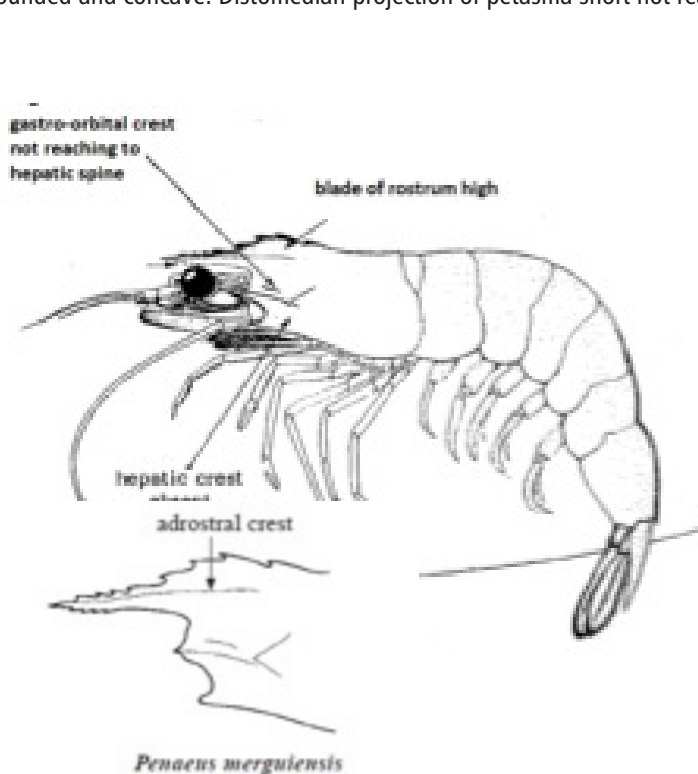


Fenneropenaeus: Rostrum serrated on dorsal and ventral margins. Hepatic carina generally absent, if present only feeble. Petasma semiclosed. Thelycum closed. Antennal and hepatic spines pronounced on the carapace.

F. indicus: Adrostral crest extending as far as or just before epigastric tooth. Telson lacking lateral spines. Thelycum formed by 2 semicircular lateral plates with their median margins forming tumid lips. Distomedian projection of petasma strongly curved and overhanging distal margin of costae. Body yellowish white, pereopods generally of same colour as body. Pleopods pink or red. Uropod pink or red.



F. merguensis: Adrostral crest extending to or just before epigastric tooth, tip of rostrum horizontally straight. Rostral crest very high and broadly triangular in large specimens and in females. Telson lack lateral spines. Anterior process of thelycum slightly rounded and concave. Distomedian projection of petasma short not reaching distal margin of costae.

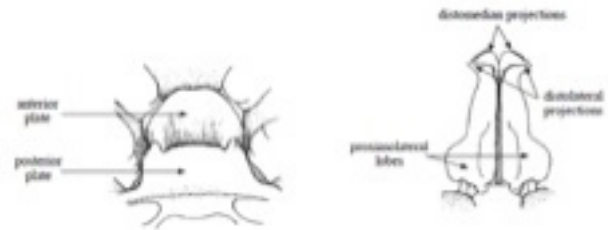


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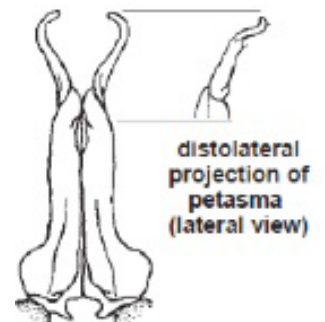
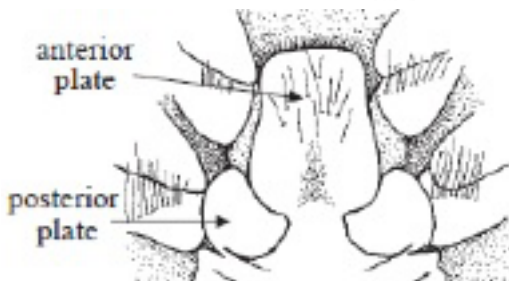
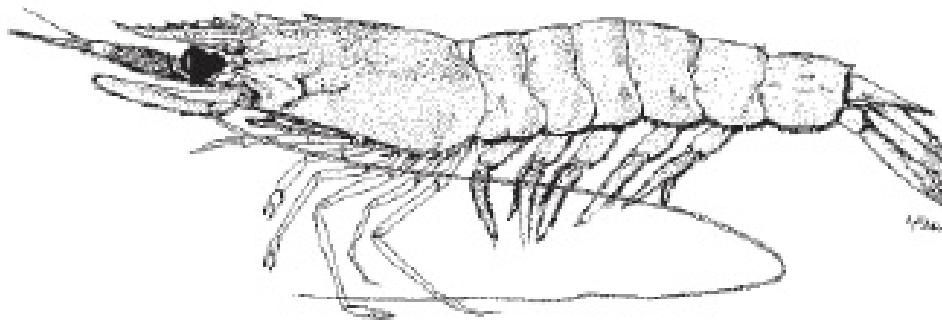
F. pencillatus: Rostral crest generally slightly elevated in young and adult males to moderately high in large females. Body slightly greenish and with numerous minute dark brown dots; distal half of uropods yellowish to greenish but always with reddish tips.



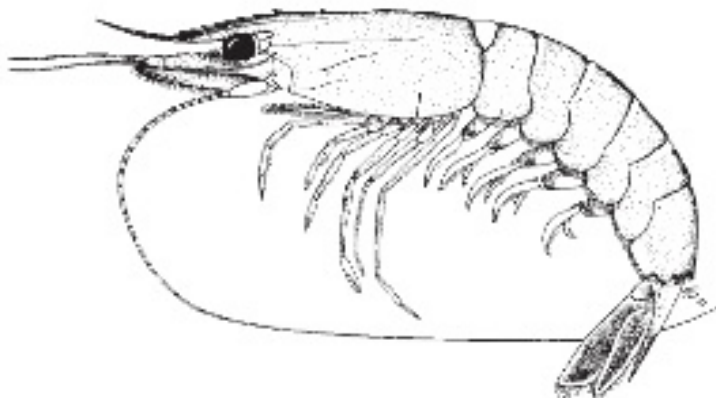
Parapenaeopsis: Rostrum serrated only on dorsal margin. Telson without fixed subapical spines but with lateral movable spines. Exopod present on all pereiopods. Third pereiopod without epipod. Body slender integument thin.



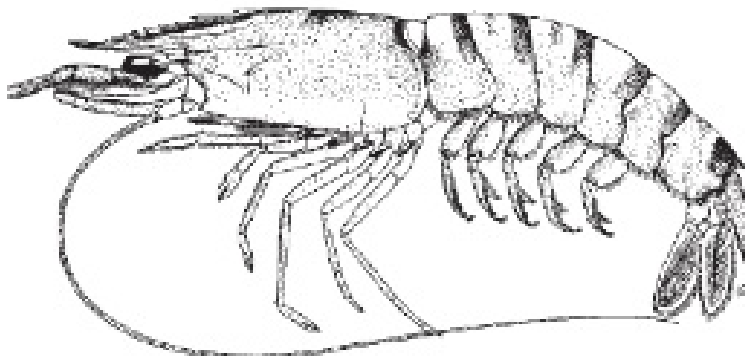
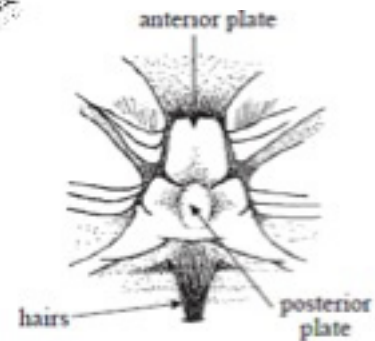
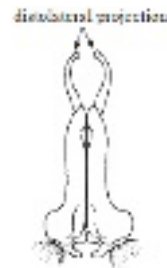
P. cornuta: Petasma with long and slender horn like distolateral projections with the distal part curving inwardly. Thelycum oblong and concave and fused posteromedially with posterior plate. A median tuft of long setae behind the thelycum. Transverse brown bands on abdomen.



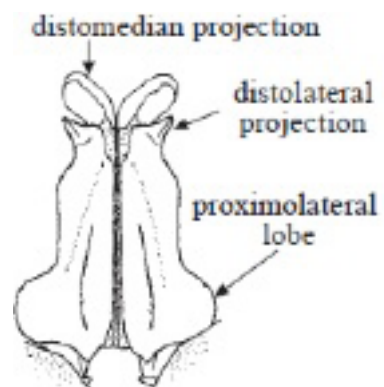
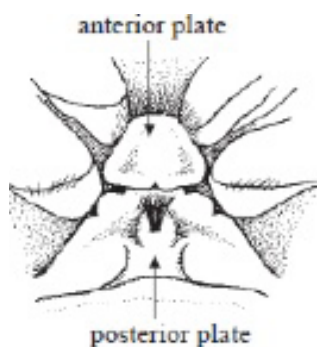
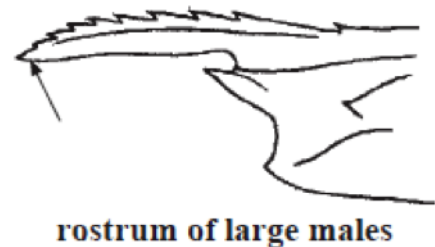
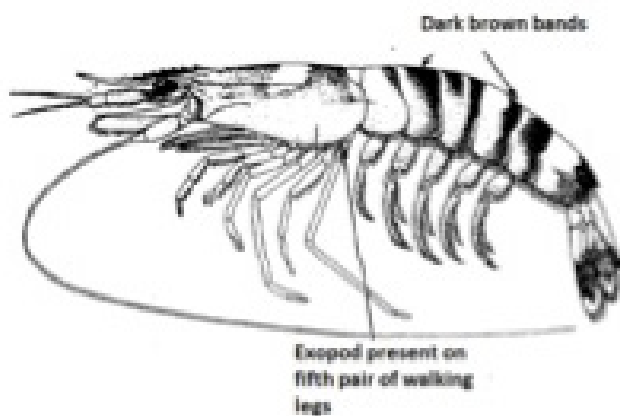
P. hardwickii: Distomedian projection of petasma wing like, wider than long. Anterior plate of thelycum concave, rounded anteriorly, posterior plate flat, anteromedian margin bearing a transverse row of long setal hairs. Body grey sometimes with a touch of pink.



P. maxillipedo: Distolateral projection of petasma slender, long and horn like. Thelycum subquadrate, posteriorly depressed and medially fused to posterior plate. Median tuft of long setae behind the thelycum. Pale brown in colour. Abdomen with dorsal transverse dark bands. Uropods greenish to red brown with a Pale stripe along margins.

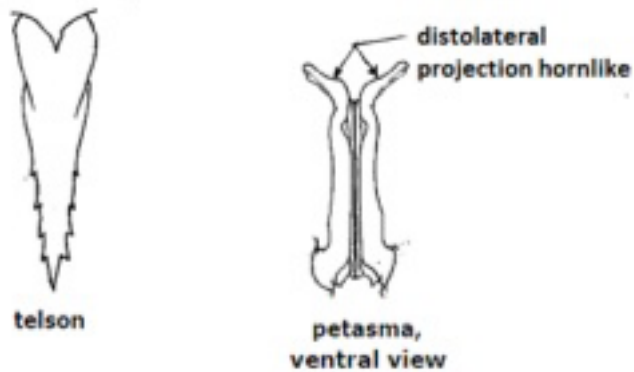
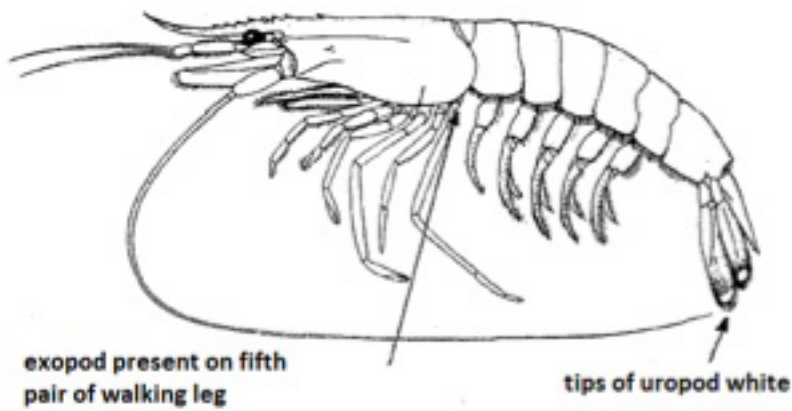


P. sculptilis: Rostrum sigmoid in females and upcurved in large males, curving downwards. Distomedian projection long and rabbit ear shaped. Distolateral projection of petasma directed anteriorly and short. Thelycum with anterior plate distally rounded and broadly articulating with posterior plate. The latter has a median tubercle bearing a tuft of long setae. Body pale with black transverse bands. Carapace dark brown dorsally except for a white band about its middle.

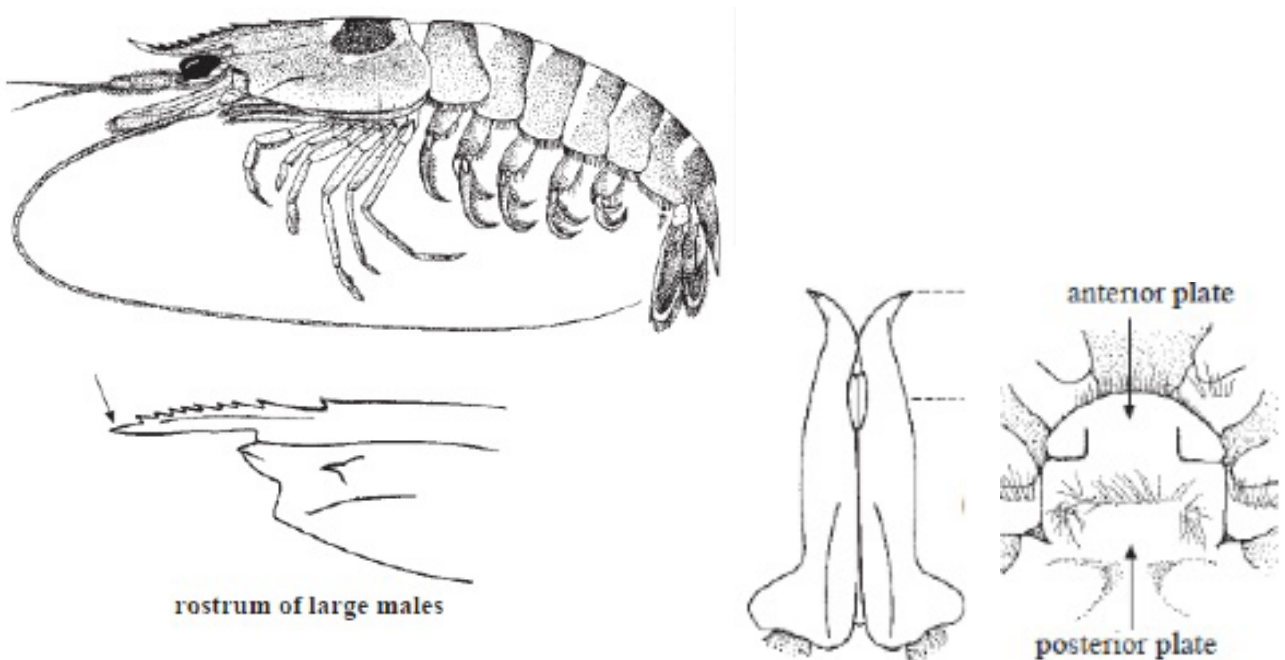


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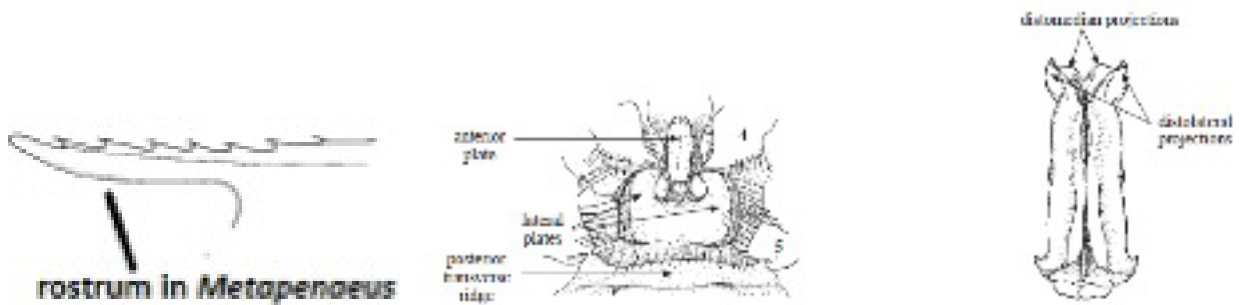
P. stylifera: Distolateral projection of petama slender, horn like and directed anterolaterally. Anterior plate of thelycum square, concave with a slender stem like posterior process. Posterior plate deeply notched anteromedially. Body pale brownish or pinkish in colour.



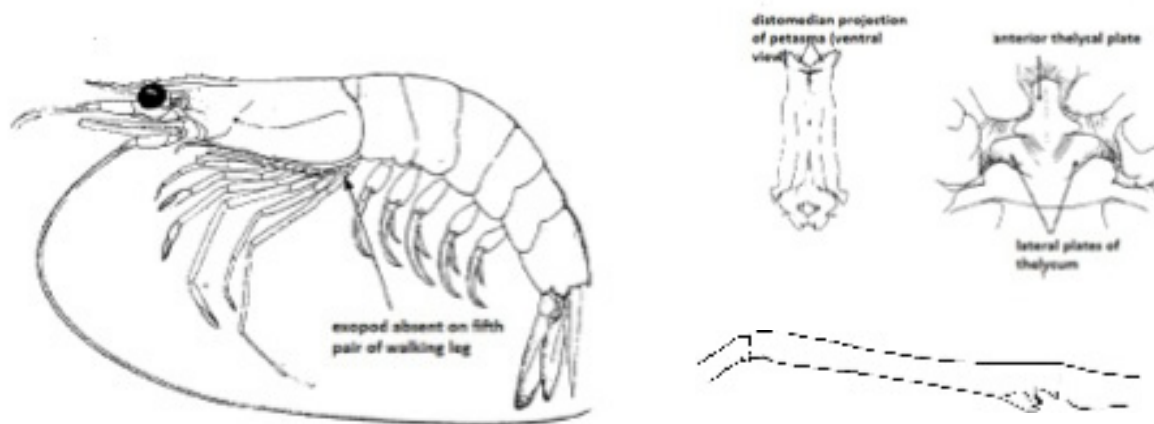
P. uncta: Distolateral projection of petasma tapering to ends each with a long dorsomedian spine like process. Anterior plate of thelycum wide and short with curved anterior margin and with two longitudinal ridges medially fused with the quadrate posterior plate. Body brown. Carapace with a large dorso-posterior dark brown patch.



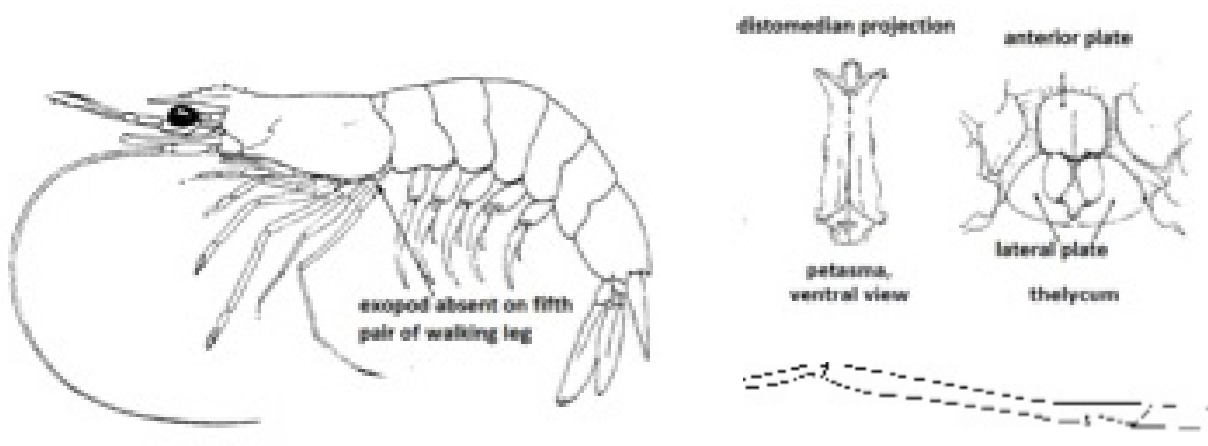
Metapenaeus: Rostrum serrated only on the dorsal margin. Telson generally without fixed subapical spine, but usually with movable lateral spines; antennular peduncle lacking parapenaeid spine. Pleurobrach present on somite XIII; exopods on maxillipeds and anterior four pairs of pereopods; fifth pereopod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



M. affinis: Merus of fifth pereopod bears a proximal notch followed by a twisted keeled tubercle. Distomedian projection of petasma crescent shaped. Anterior plate of thelycum long and deeply grooved. Lateral plates with strongly raised lateral margins forming two longitudinal crests. Body pale pinkish/pale greenish in colour.

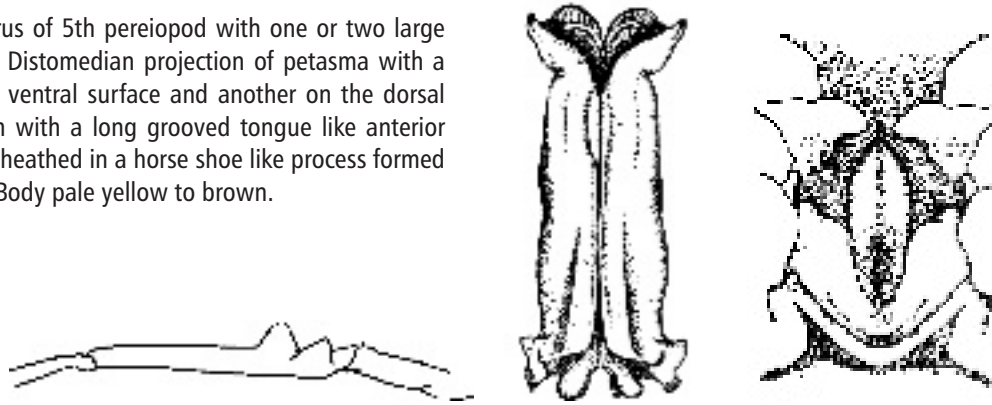


M. brevicornis: Distomedian projection of petasma with long and slender apical filament. Anterior plate of thelycum square and grooved; lateral plates boomerang shaped and enclosing 2 pear shaped plates. Distal part of uropods brown to rusty red sometimes only the tips are coloured.

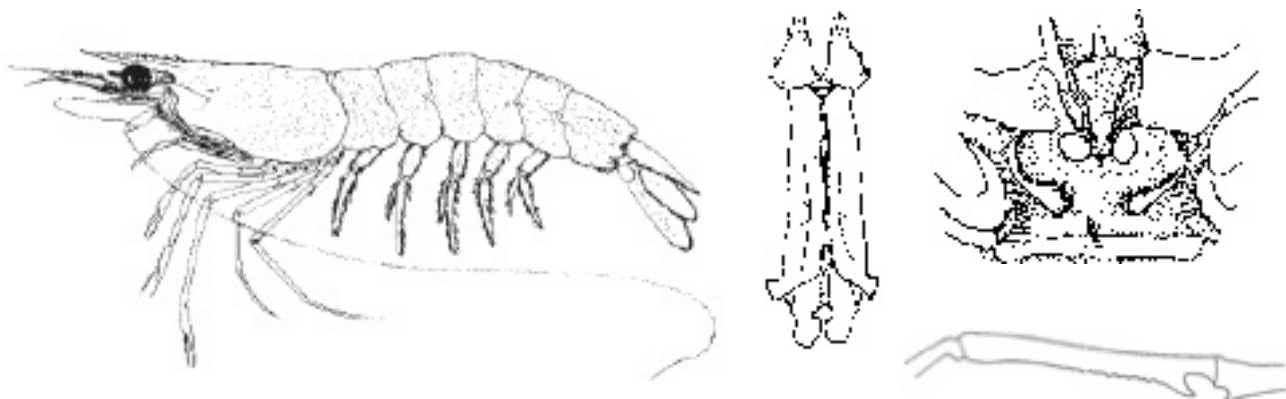


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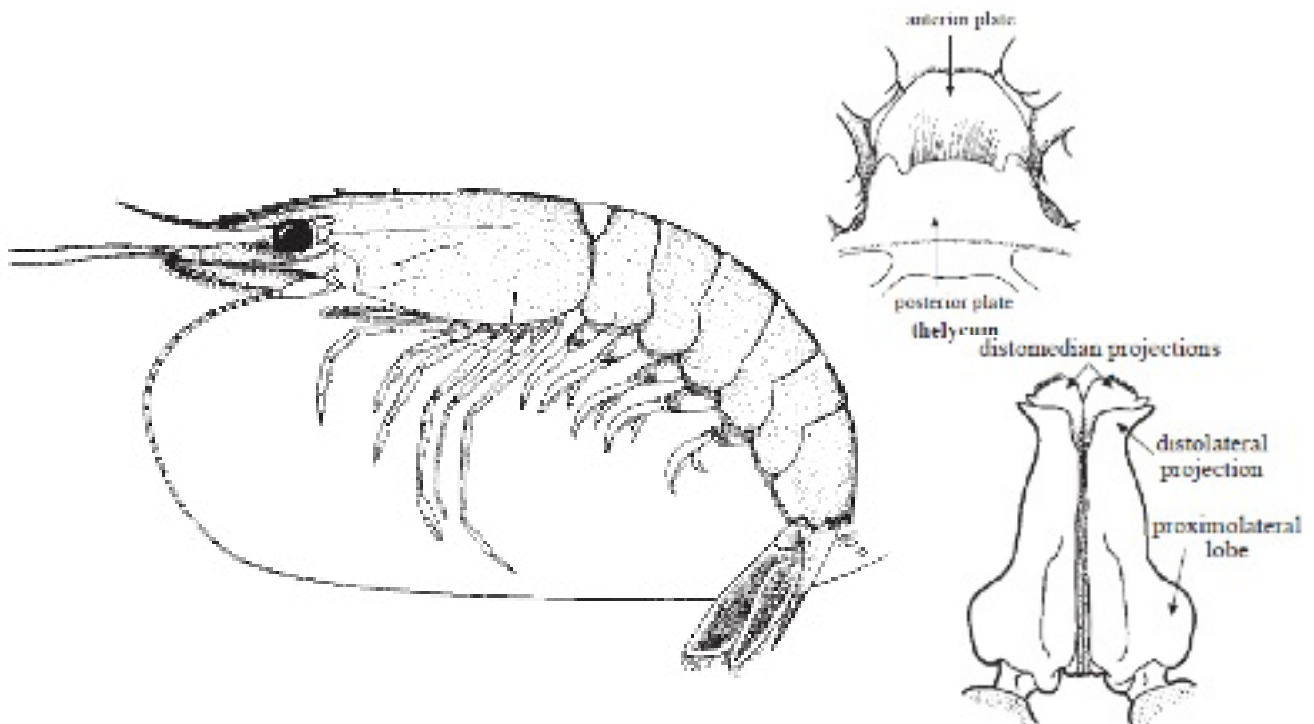
***M. dobsoni*:** Merus of 5th pereiopod with one or two large triangular teeth. Distomedian projection of petasma with a short filament on ventral surface and another on the dorsal surface. Thelycum with a long grooved tongue like anterior plate partially ensheathed in a horse shoe like process formed by lateral plates. Body pale yellow to brown.



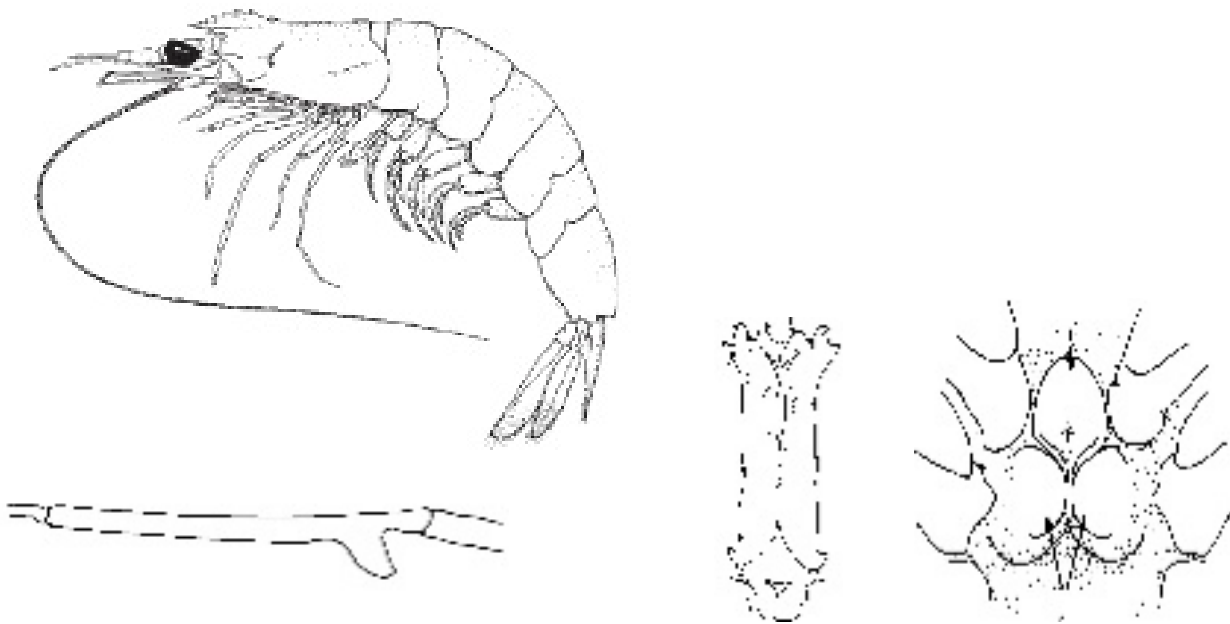
***M. ensis*:** Merus of 5th pereiopod with a proximal notch in adult males. Distomedian projection of petasma convoluted, greatly swollen and directed forward, triangular in shape, concealing almost entirely distolateral projections in ventral view. Anterior plate of thelycum lone and deeply grooved. Body pink to greenish grey.



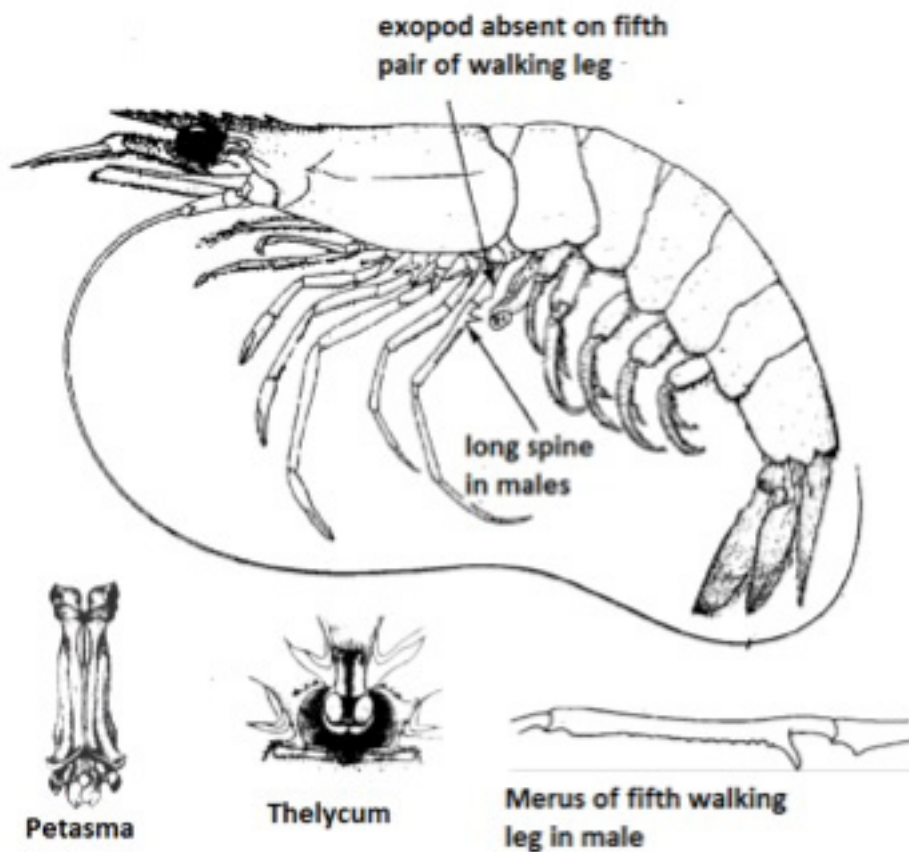
***M. kutchensis*:** Distomedian projection of petasma bifid and transversely placed. Thelycum with an anterior median plate extending beyond and lying in level with the coxal projections. The posterior lateral plates larger, rounded and swollen. Body in fresh condition in the shade of carrot.



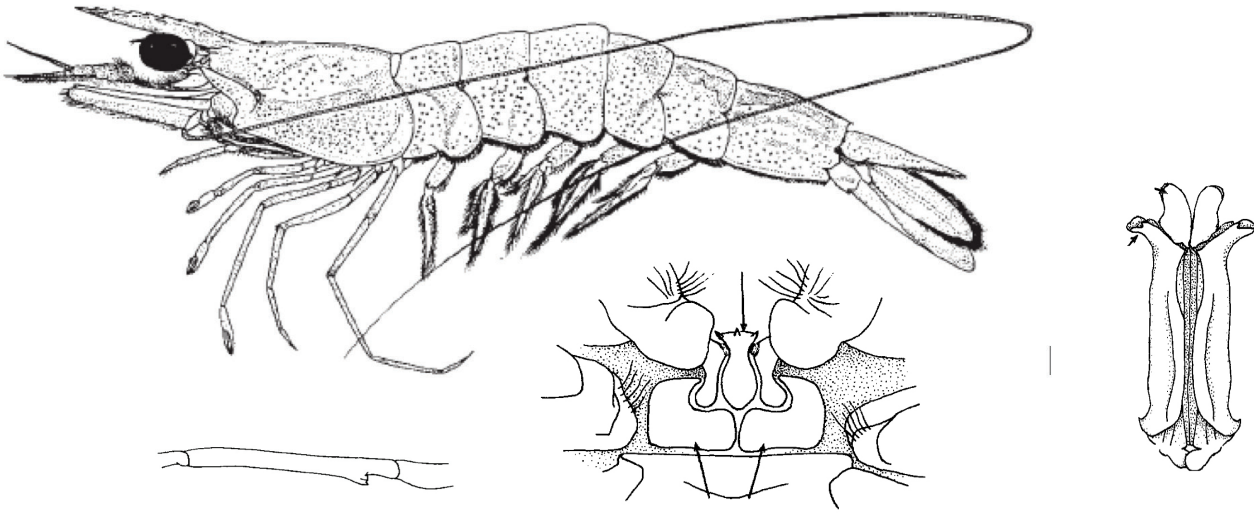
M. lysianassa: Rostrum short and crest high. Distomedian projection with a minute filament on their median margins. Distolateral projection of petasma bifurcate distally. Anterior plate of thelycum tongue like and grooved. Posterior plates suboval.



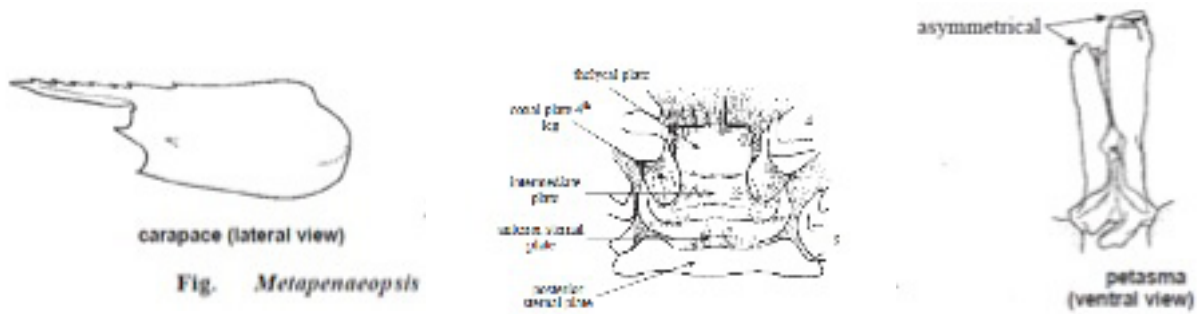
M. monoceros: Distomedian projection of petasma hood like. Lateral thelycal plates with salient end parallel ear shaped lateral ridges. Body greenish. Distal part of uropods purple- blue.



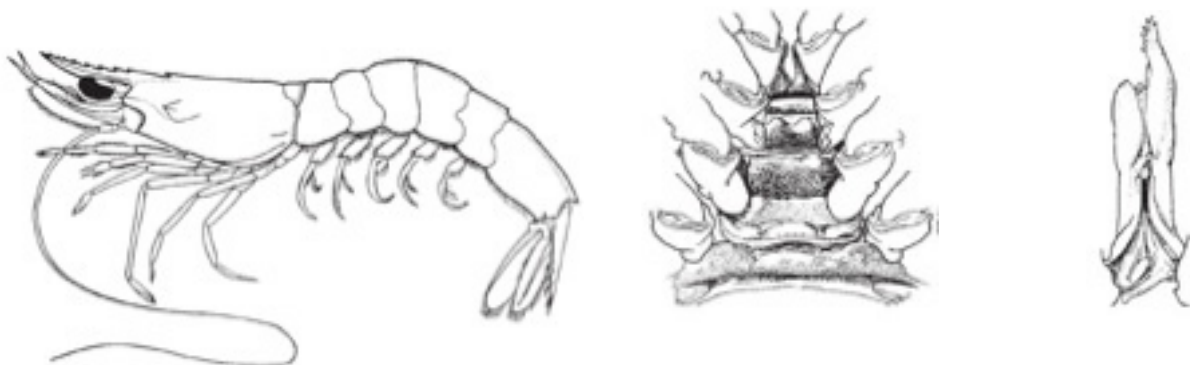
M. moyebi: Merus of fifth pereiopod with a proximal notch followed by a twisted keeled tubercle. Anterior plate of thelycum flask shaped and lateral plates kidney shaped.



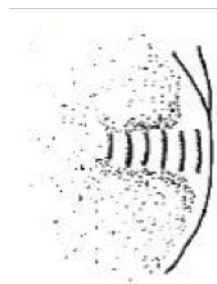
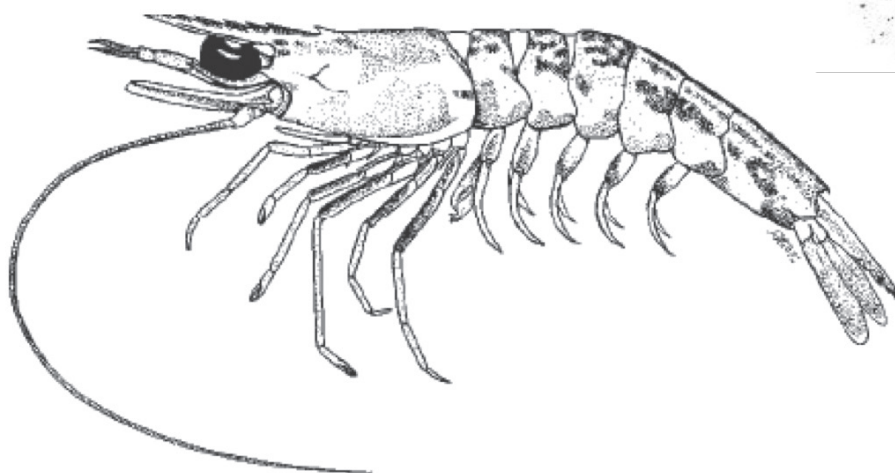
Metapenaeopsis: Rostrum serrated only on the dorsal margin. Telson with two or more pairs of conspicuous spines anterior to subapical spines. Third maxilliped and second pereiopod with basal spine; petasma asymmetrical.



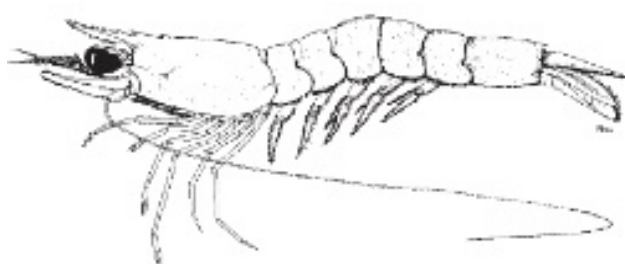
M. barbata: Left distoventral projection of petasma long. Thelycalplate broadly subquadrate. Posterolateral part of carapace with 16-27 stridulating organ. Body whitish mottled with irregular red blotches. Antennal flagella crossed with red and white bands.



M. stridulans: Carapace, abdomen and telson with red patches. Stridulating organ present consisting of 5-7 strong ridges in a wide straight band on the carapace.



M. toloensis: Stridulating ridges 14-22 in a curved band. Left distoventral projection of petasma short and left distoventral projection broadly swollen. Thelycal plate subquadrate with rounded corner. Body with dark red to brown mottling.

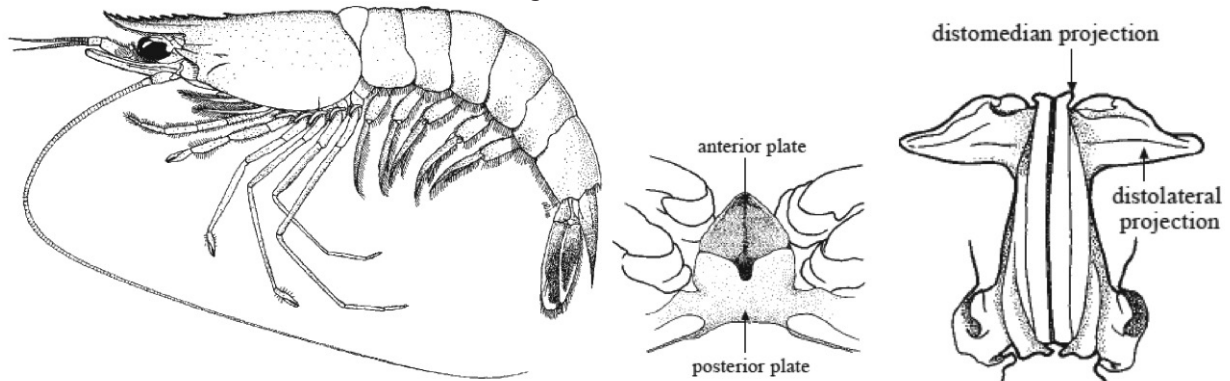


Trachysalambria: Rostrum serrated only on the dorsal margin. Third pereiopod with epipod; body thick set; third maxilliped lacking basal spine. Thelycum with plate on sternite XIV shallowly emarginated or occasionally produced in small median prominence, not continuous with medial protuberance; Petasma with disto-lateral projections tapering gently from relatively narrow base, extending almost straight laterally or curving slightly backwards.

T. aspera: Red band on the third and fourth abdominal segment. Rostrum slightly curved upwards with 7 dorsal teeth. Telson with 2 pairs of spines of which posterior pair is much longer. Petasma T shaped bearing a pair of distal pointed wing like process. Anterior plate of thelycum semicircular in outline. Uropods red with purple margins.

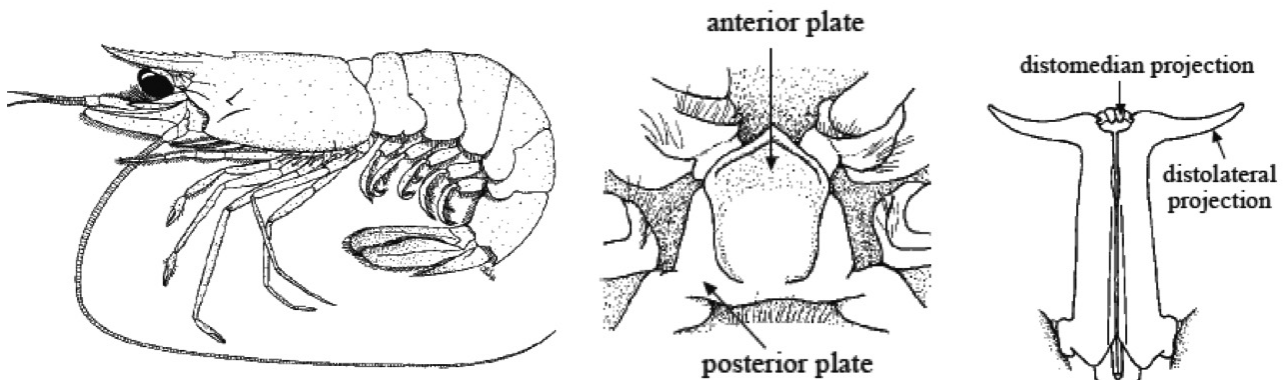


***T. curvirostris*:** Rostrum with 7-11 dorsal teeth reaching distal half of second antennular segment. Telson armed with 3 to 4 small movable lateral spines subequal in size. Petasma with broad wing like disto lateral projection directed laterally and curved distoventrally. Anterior plate of thelycum curved anteriorly with a middle groove posteriorly. Uropods bright red to reddish brown, sometimes dark brown with distinct white margins.

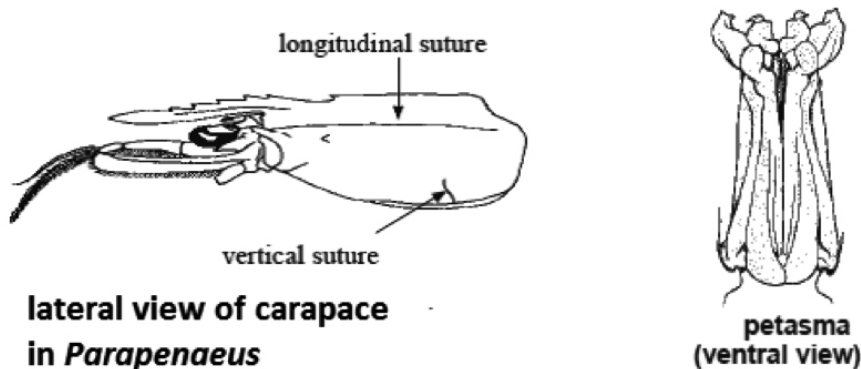


***Megokris*:** Third pereiopod with epipod; body thick set; third maxilliped lacking basal spine. Telson with 3 pairs of movable lateral spines. Petasma symmetrical. Thelycum closed with plate on sternite XIV very short medially, deeply excavate, embracing extremely long caudal extension of median protuberance. Petasma with disto-lateral projections either moderately broad to rather narrow basally and extending laterally tomesially or forward directed hook-like tip or extremely broad basally but narrowing rapidly, ending in forward directed tip.

***M. sedili*:** Distolateral projection of petasma horn like directed laterally their tips slightly curving forward. Anterior and posterior plates of thelycal plates with strongly raised lateral margins.



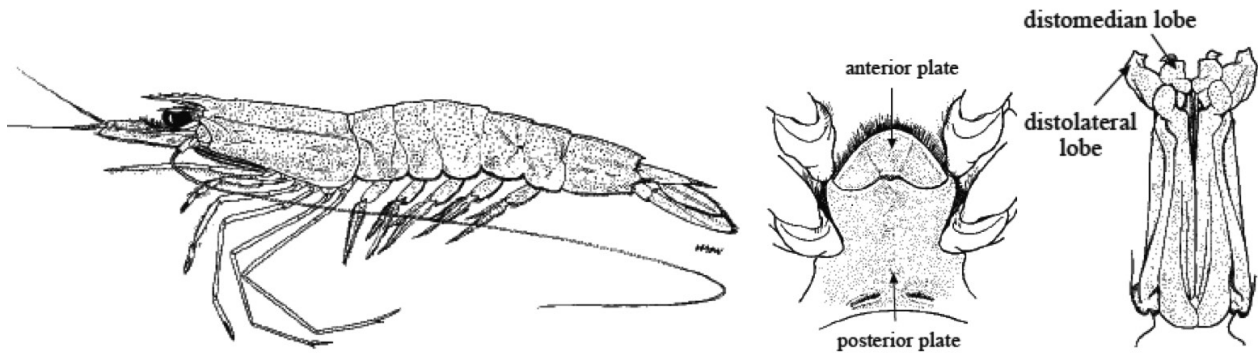
***Parapenaeus*:** Rostrum serrated only on the dorsal margin. Telson with only one pair of minute lateral spines anterior to subapical spines.



**lateral view of carapace
in *Parapenaeus***

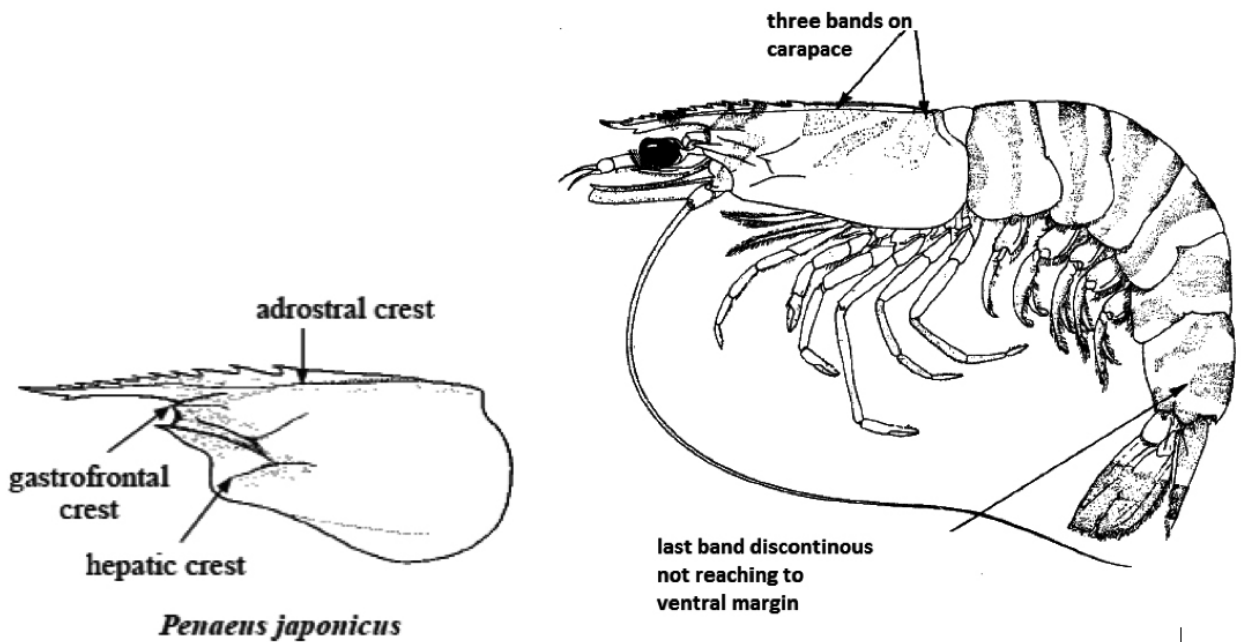
**petasma
(ventral view)**

P. longipes: Rostrum reaching just beyond the eyes. Third maxilliped reaches the tip of the antennal scale. The process on the distomedian lobe of the petasma directed backwards.

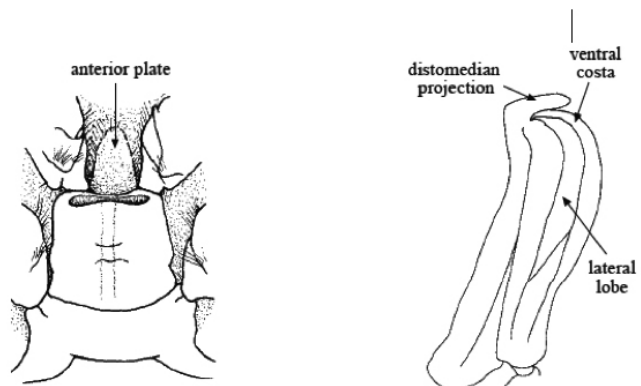


Marsupenaeus: Adrostral carina and sulcus extends behind epigastric tooth, gastrofrontal carina present. Gastro-frontal sulcus markedly bifid posteriorly; thelycum with a ventral undivided plate on sterniteXIV folded laterally, forming pouch opening anteriorly.

M. japonicus: Rostrum with single ventral tooth. Carapace with a round white colour spot. Last abdominal band discontinuous. Telson with lateral movable spines.



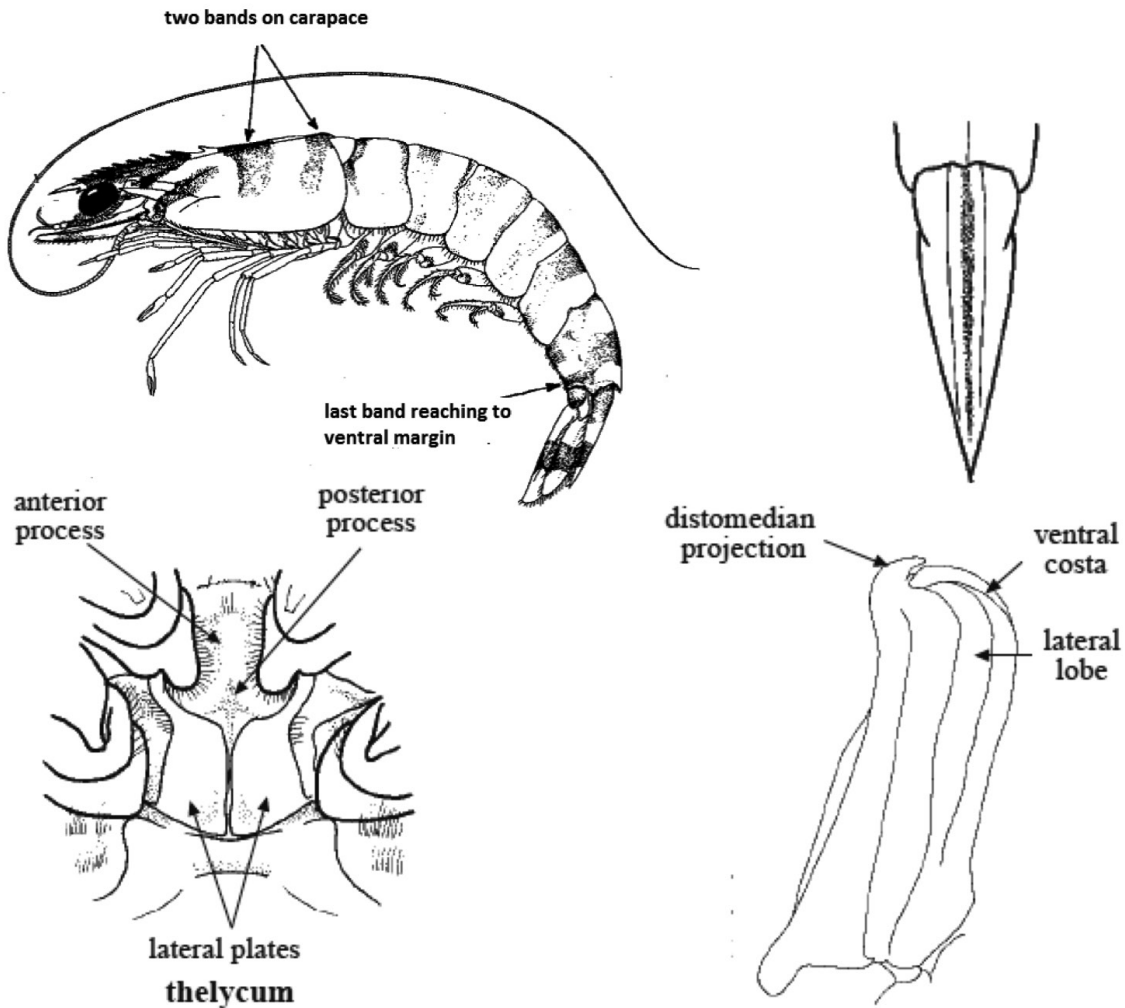
Telson with movable spines



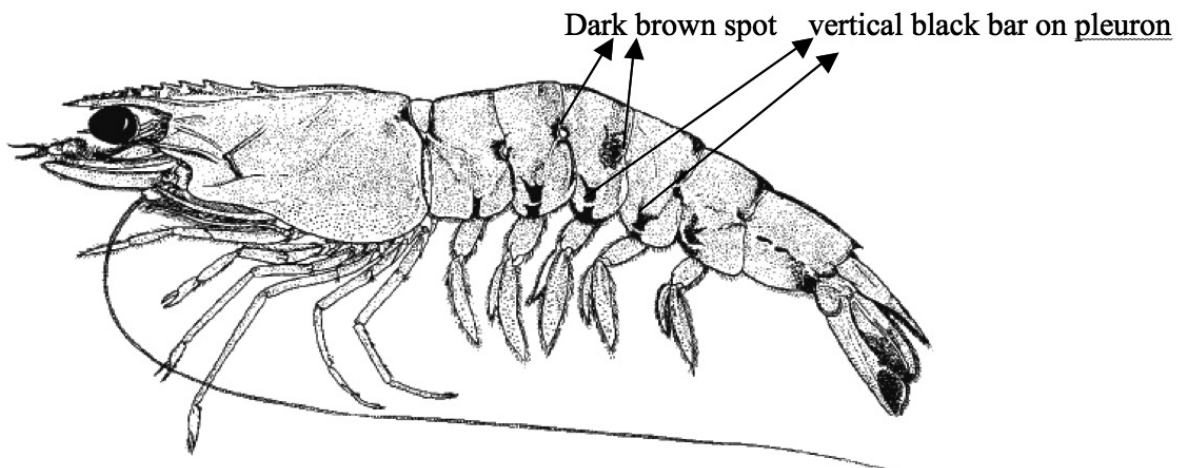
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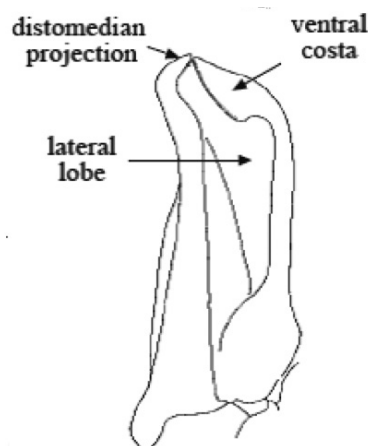
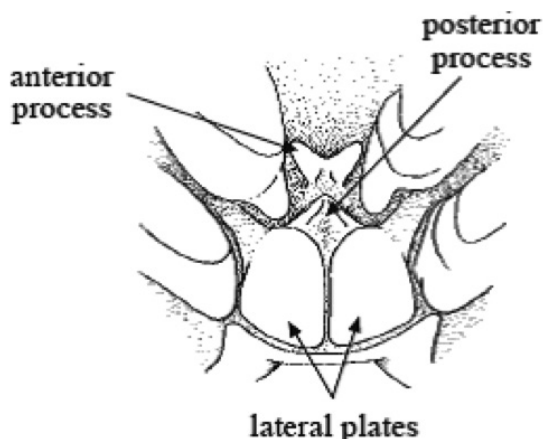
Melicertus: Adrostral carina and sulcus extends behind epigastric tooth; gastro-frontal carina present. Gastro-frontal sulcus not markedly bifid posteriorly; thelycum with a pair of lateral plate on on sternite 14 shielding sac like seminal receptacle opening midline. Telson usually armed with three pairs of movable lateral spines (absent only in *M. canaliculatus*).

M. canaliculatus: Rostrum with single ventral tooth. Body yellow with red brown to brown transverse bands. Last abdominal band reaching the ventral margin. Uropods with a large brown transverse band.



M. latisulcatus: Each abdominal segments with a short vertical black bar on pleuron. Hinges on abdomen bear dark brown spots. Uropods bright yellow with distal half and outer margins of exopods bright blue.





Superfamily Sergestoidea

Family Sergestidae

Acetes indicus: One large and long clasping spine on the lower antennular flagella of adult males.

Lower antennular flagella



Petasma



Acetes johni: Two clasping spines on the lower antennal flagellum of adult males. Red mark on ventral side of last abdominal segment. Tooth present on distal inner margin of coxa of 3rd pereopods in females.

Lower antennular flagella



Petasma



Acetes japonicus: Two small clasping spines on the lower antennular flagellum of adult males. Distal part of capitulum of petasma is expanded like a bulb and has numerous hooks.

Lower antennular flagella



Petasma



Superfamily: Palaemonoidea

Family: Palaemonidae

Expalaemon styliferus: Dactyla of last three pereopods not abnormally long. Pleopods normal in length.

Nematopalaemon tenuipes: First two pereopods chelated. Dactyla of last three pairs of pereopod longer than propodus. Distal part of rostrum dark reddish brown. Reddish spot on basis of uropods.

Family: Hippolytidae

Lysmata vittata: Dactyla of last three pairs of pereopod much shorter than propodus. Lateral margin of telson convex. Apex of telson blunt with a pair of spines.

Exhyppolysmata ensirostris: Dactyla of last three pair of pereopods much shorter than propodus. Lateral margin of telson concave. Apex of telson sharply pointed without any spines.

Glossary of terms used in taxonomy

(from Perez Farfante & Kensly, 1997)

Plural form in parentheses

ADROSTRAL CARINA: Ridge flanking the rostrum, sometimes nearly reaching the posterior margin of the carapace.

ADROSTRAL SULCUS: Groove flanking the rostrum mesial to the adrostralarcarina, sometimes nearly reaching the posterior margin of the carapace.

ANTENNA (ANTENNAE): More lateral to the two paired, usually flagellate appendages projecting distally from the anterior end of the cephalothorax.

ANTENNAL CARINA: Ridge extending posteriorly along

Inshore shrimps - Family, Genera and species of commercial importance in India

dorsal extremity of antennal region , often continuous with antennal spine.

ANTENNAL PEDUNCLE: Five basal segments of the antenna, from which the flagellum arises distally.

ANTENNAL SPINE: Spine situated on the anterior margin of the carapace.

ANTENNULAR FLAGELLUM (ANTENNAL FLAGELLA): Multiarticulate paired filaments (sometimes flattened lamellate) of the antennule.

ANTENNULAR PEDUNCLE: Three basal segments of the antennule, from which the flagella arise distally.

BASIAL SPINE: Spine projecting from basis of the thoracic appendage.

BRANCHIA (BRANCHIAE): Respiratory organ (gill) associated with an appendage or with the body wall.

BRANCHIA L REGION: Area of the carapace overlying the branchial cavity.

BRANCHIOSTEGAL CARINA: Longitudinal ridge extending along anteroventral part of carapace, usually continuous with branchiostegal spine.

BRANCHIOSTEGAL- HEPATIC CARINA: Longitudinal ridge consisting of the fusion of the branchiostegal and hepatic carinae.

BRANCHIOSTEGAL SPINE: Short spine on or near anterior margin of the carapace ventral to the antennal spine and dorsal to the anteroventral angle of the carapace.

BRANCHIOSTEGITE: Expanded ventro-lateral part of the carapace covering the gills.

CARINA (CARINAE): A ridge or keel of the exoskeleton CARPUS (CARPI). Fifth podomere from the proximal end of a typically 7-segmented appendage.

CHELA (CHELAE): Pincer formed by the two distal podomeres of a pereopod in which the movable finger (dactyl) opposes a fixed finger formed by a distal extension of the propod.

CICATRIX (CICATRICES): Longitudinally disposed ridge(s) often present on lateral part of sixth abdominal somite.

COXA (COXAE): First or proximal podomere of a typically 7-segmented appendage.

COXAL SPINE: Spine projecting from the coxa of a thoracic appendage.

DACTYL: Terminal podomere of a typically 7-segmented appendage.

DISTOLATERAL PROJECTION: Distolateral , ventrally inclined projection or spur of the basis of the endopod of the male second pleopod.

DISTOMEDIAN PROJECTION: Distal relatively narrow extension of the dorsomedian lobule of the petasma.

DISTOVENTRAL PROJECTION: Outer distal flap articulating with distal extremity of ventrolateral lobule of petasma in members of the genus *Metapenaeopsis*.

DORSOLATERAL CARINA: Longitudinal ridge on dorsolateral region of carapace running dorsal to orbital region.

ENDOPOD: Mesial ramus of biramous appendage, especially one arising from the basis or from the protopodite of the pleopod

EPIGASTRIC TOOTH: Tooth on the carapace situated above the gastric region behind the first (posterior most) rostral tooth.

EPIPOD: Lateral exite of the coxa of a thoracic appendage sometimes branchial in function.

EXOPOD: Lateral ramus of a biramous appendage, arising from the basis , or from the protopodite.

GASTROFRONTAL CARINA: Short longitudinal ridge extending posteriorly from the ventral extremity of the orbital region.

GASTROFRONTAL SULCUS: Short longitudinal depression accompanying the gastrofrontal carina dorsally.

HEPATIC CARINA: Longitudinally or obliquely disposed ridge of variable length lying ventral to the hepatic region, sometimes extending almost to the anterior margin of the carapace.

HEPATIC REGION: Paired anterolateral areas of the carapace bounded anteriorly by the antennal region, posteriorly by the branchial region, and mesially by the gastric region.

HEPATIC SPINE: Lateral spine situated near the anterior margin of the hepatic region of the carapace.

HEPATIC SULCUS: Groove ventral to the hepatic region extending posteriorly sometimes from near the anterior margin of the carapace

ISCHIUM (ISCHIA): Third podomere from the proximal end of a typically 7-segmented appendage.

MANDIBLE: One of the heavily calcified jaws lying anterior to (beneath in ventral view) to other mouth parts.

MAXILLA (MAXILLAE): Paired mouthpart appendages of the fourth and fifth cephalic somites.

MAXILLIPED: One of a pair of three sets of thoracic appendages, arising posterior to the primary mouthparts. The two anterior pairs are often modified for feeding, while the third pair is often pediform, resembling the pereopods.

MERUS (MERI): Fourth segment from the proximal end of a typically 7-segmented appendage.

PARAPENAEID SPINE: Spine projecting from the distomesial margin of the first antennular segment.

PEREPOD: One of the first posterior paired appendages or legs of the cephalothorax

PETASMA (PETASMATA): The male genital structure consisting of the much enlarged and coupled endopods of the first pair of pleopods. The presence or absence of a petasma, or in juveniles, the position of the first endopods (situated more distally in females than in males), is the easiest means of distinguishing between the sexes in penaeidean shrimps.

PLEOPOD: One of the biramous paired appendages typically arising ventrally from each of the anterior five abdominal somites. In the shrimps they are primarily swimming organs.

PLEURON (PLEURA): One of the lateral flaps on each of the anterior five abdominal somites.

POSTANTENNAL SPINE: Spine located on anterolateral area of carapace on the posterior part of the antennal region.

POSTCERVICAL SPINE: Spine located immediately posterior to cervical carina.

POSTCERVICAL SULCUS: Subvertical carapace groove located posterior to cervical sulcus.

POSTORBITAL SPINE: Spine situated near the orbital margin posterior to the antennal spine

POSTROSTRAL CARINA: Dorsomedian ridge extending posteriorly from the base of the rostrum, sometimes nearly reaching the posterior margin of the carapace

PROPODUS (PROPODI): Sixth or penultimate segment of a typically 7-segmented appendage

PTERYGOSTOMIAN CARINA: Ridge running posterior to pterygostomian spine on antero-ventral part of carapace.

PTERYGOSTOMIAN REGION: Anteroventral area of the carapace.

PTERYGOSTOMIAN SPINE: Marginal spine arising from the anteroventral angle or border of the carapace.

ROSTRUM(ROSTRA): Anteromedian projection of the carapace between the eyes.

SCAPHOCERITE: Laterally rigid lamellate exopod of the antenna; the antennal scale

SOMITE: Each of the main divisions of the body.

STERNUM: Ventral surface of the cephalothorax or abdomen.

SULCUS (SULCI): Groove.

SUPRAHEPATIC SPINE: Spine arising from the edge of the cervical carina dorsal to the hepatic spine.

SUPRAORBITAL SPINE: Spine located posterior to the orbital margin of the carapace.

TELSON: Terminal unit of the abdomen bearing the anus.

THELYCUM (THELYCA): The female genitalia consisting of modifications of the posterior two, or sometimes three thoracic sternites (XII-XIV) serving for the storage or transfer of the sperm, usually in spermatophores, and often shielding seminal receptacles.

UROPOD: Paired biramous appendage attached to the sixth abdominal somite, usually combining with the telson to form a tailfan.

Suggested reading

Perez Farfante, I and B. F. Kensly. 1997. Penaeoid and Sergestoid shrimps and prawns of the world. Keys and diagnosis for the families and genera. *Mem. Mus.natn.Hist.nat.*, 175: 1-233.

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