CHAPTER

22

Inshore Shrimps - Diversity and Life History Traits

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India being a tropical country has wide faunal diversity in the marine environment. Some of them form commercial fishery especially from inshore waters for domestic and international markets. The penaeid shrimps are notable among the resources that contribute towards the commercial fishery of the country. In 2017, 209513 t of penaeid shrimps were landed from both inshore and deep sea together. Fishery is mostly by trawlers- multiday which venture out to the sea from three to several days and single day trawlers that return within a day.

Diversity

The inshore marine waters are inhabited by shrimps belonging to different family main being penaeidae and sergestidae. There are more than 70 species of penaeid shrimps recorded from the Indian coast among which the species belonging to the genera *Metapenaeus, Penaeus* and *Parapenaeopsis* are of economic importance. The penaeid shrimps that occur in commercial fishery are mainly *Metapenaeus dobsoni, Metapenaeus monoceros, Metapenaeus affinis*, *Parapenaeopsis stylifera*, *Penaeus monodon*, *Penaeus indicus, Penaeus merguiensis, Penaeus pencillatus, Penaeus semisulcatus, Penaeus latisulcatus, Penaeus canaliculatus, Penaeus japonicus*, *Metapenaeus brevicornis, Parapenaeopsis sculptilis, Parapenaeopsis hardwickii, Parapenaeopsis cornuta, Metapenaeus kutchensis* etc. Species belonging to the genera *Metapenaeopsis*, *Solenocera*, *Trachypenaeus* and *Megokris* form minor fishery. Besides these *Acetes* spp of the sergestidae family are distributed throughout the Indian coast forming a fishery in the northwest coast of India.

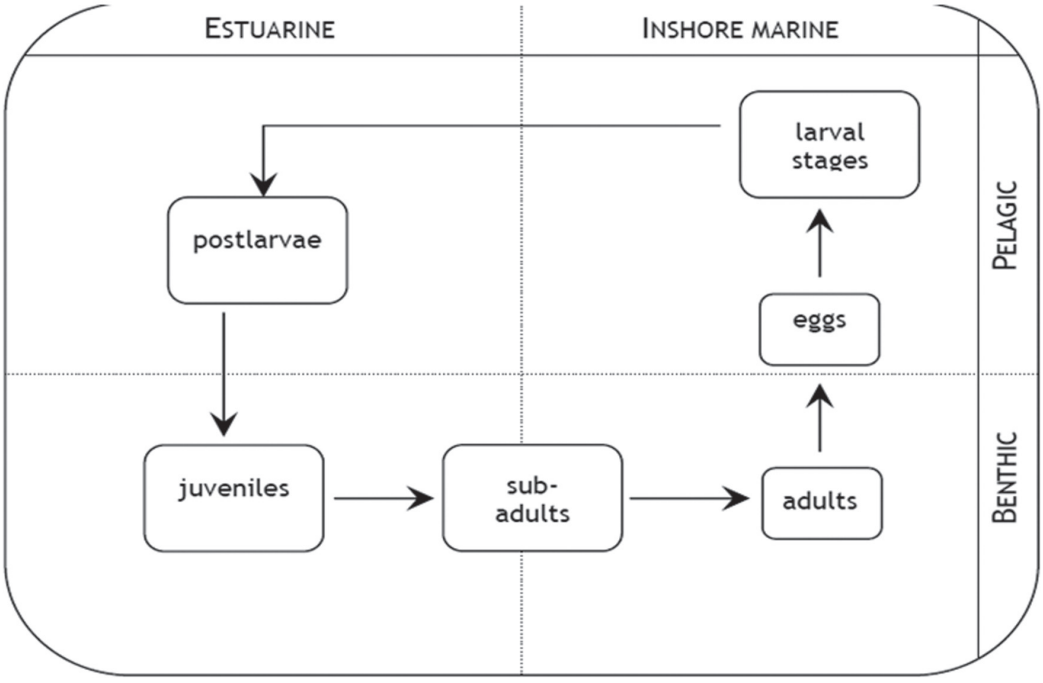
Life history

Penaeid shrimps may be burrowing or wandering in nature. Wandering species like *P.merguiensis* and *P.indicus* generally spawn at a depth of 7–30 m in offshore waters, usually near the nursery ground. The larvae spend part of their life cycle in nursery ground until adolescent stage when they start migrating to deeper and more saline waters.

The burrowers like *P. monodon* show marked nocturnal activity, burrowing into the bottom substratum during the day and emerging at night to search for food. This diurnal activity is closely associated with changes in light intensity but may also be due to other factors.

In penaeid shrimps the location of the spawning grounds in respect of depth or distance from the coast seems to vary with the adult size and habits of parents. Small species like *M dobsoni, P.stylifera* which shoal comparatively in shallow coastal waters also spawn there. Eggs and larvae of both species have been collected in large numbers up to about 12-13 fathoms, beyond this they are few and are seldom present in offshore plankton. The eggs of penaeid shrimps are demersal. The nauplii hatching out of these eggs, soon rise to the surface and are planktonic in habit. The first larval stage is termed nauplii, are free swimming. These do not feed and passes through different moult stages. The next stages are protozoea, mysis and early post larvae which are also planktonic and carried towards the

shore by tidal currents. After the PL6 stage they change to benthic habit. The penaeid shrimps are generally preyed upon by the demersal fishes of the area where they exist.



Species like *P. stylifera* do not have an estuarine phase, but is believed to migrate within the sea from coastal to deeper waters during July-August. Shoreward migration is during October as after the southwest monsoon they are caught from this month onwards. It is found in large shoals in the shallow waters and is an important species in inshore and offshore fishery.

Penaeid shrimps are heterosexual (petasma in male and thelycum in female). Males are usually smaller than females. The endopodites of the first pair of pleopods are modified as petasma in males. The thelycum is located on the ventral part of the thorax between the last three pairs of the thoracic legs. In males the opening of the genital duct is on the last pair of pereiopods and in females it is situated on the bases of the coxae of the third pair of pereiopods. They spawn throughout the year with spawning peaks which may change based on the environmental conditions. Fertilisation is external. The eggs are shed in water and the larvae are planktonic. The adults do not care for the eggs or young ones.

There are five maturity stages recognised in penaeid shrimps- immature, early maturing, late maturing, mature and spent. They are carnivorous in their feeding habit. Fecundity is high, varies with species, size of ovary and size of female. Their life span is usually between 2 to 2.5 years.

M. dobsoni matures at around 64-66 mm total length. Fecundity ranges from 35,000 to 1,59,000. The ova diameter measure from 0.35 to 0.44 mm (90 to 125 mm total length). Largest female measured

130 mm and male 125 mm total length in the fishery. Their gut content mostly consisted of crustacean remains and digested matter.

P. stylifera females mature at around 71 mm total length. They produce 35,000 to 2,39,00 eggs based on their length (88 to 115 mm total length). Largest females measure 125 mm total length and males 120 mm in total length.

P. indicus matures at around 120 mm total length. Their gut content consisted of digested matter, crustacean remains, bivalve shells and fish scales.

P. monodon females mature between 196-200 mm total length. Fecundity range from 5,00,000 to 7,50,000. The gut content consisted of crustacean appendages, digested matter.

M. monoceros females mature at around 114 mm total length. The mature ova are opaque, measure between 0.14 and 0.26 mm with majority of them in the range of 0.17 and 0.23 mm. Their fecundity ranged from 49,000 to 3, 90,000.

S. crassicornis females mature at around 60-65 mm total length. Fecundity ranged from 28,000 to 1,00,00 (61 to 102 mm total length).

S. choprai females mature at around 66.5 mm total length. Mature ova diameter ranged from 0.24 to 0.35 mm.

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