

# Penaeus monodon culture

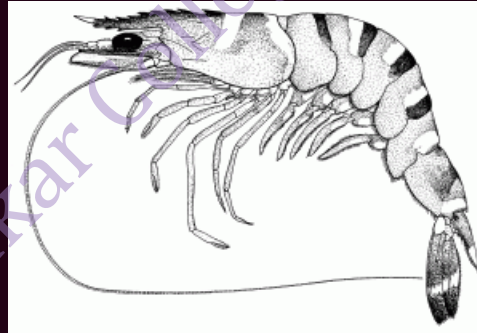


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# Breeding technique



# Broodstock

- Healthy females (25-30 cm body length and 200-320 g weight) and males (20-25 cm; 100-170 g) captured from the wild are preferably used as broodstock in the induced ovarian maturation process. Broodstock from greater depths (60-80 m), or more than 20 miles offshore, are preferable due to the lower prevalence of shrimp diseases, which are higher in coastal shrimp farming areas.

**Figure 3.2** Broodstock size female Black Tiger Prawn suitable as a 'spawner' in a hatchery

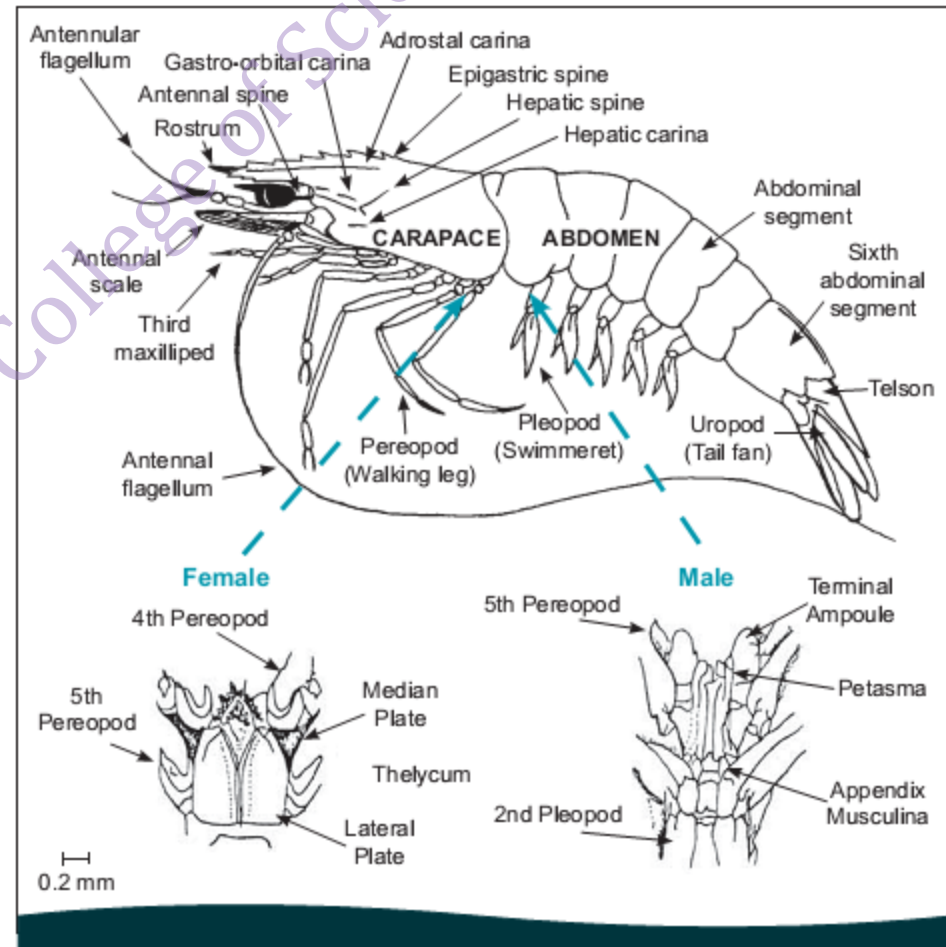


- Whether the spawners are caught directly from the sea or from an induced maturation tank, they generally spawn on the first or second night in the hatchery. However, spawning can be delayed for long distance or overnight transportation if each spawner is placed tightly in a PVC pipe to straighten its body. Gravid females should be placed individually in a small spawning tank to avoid the spread of disease that may occur in mixed spawning.

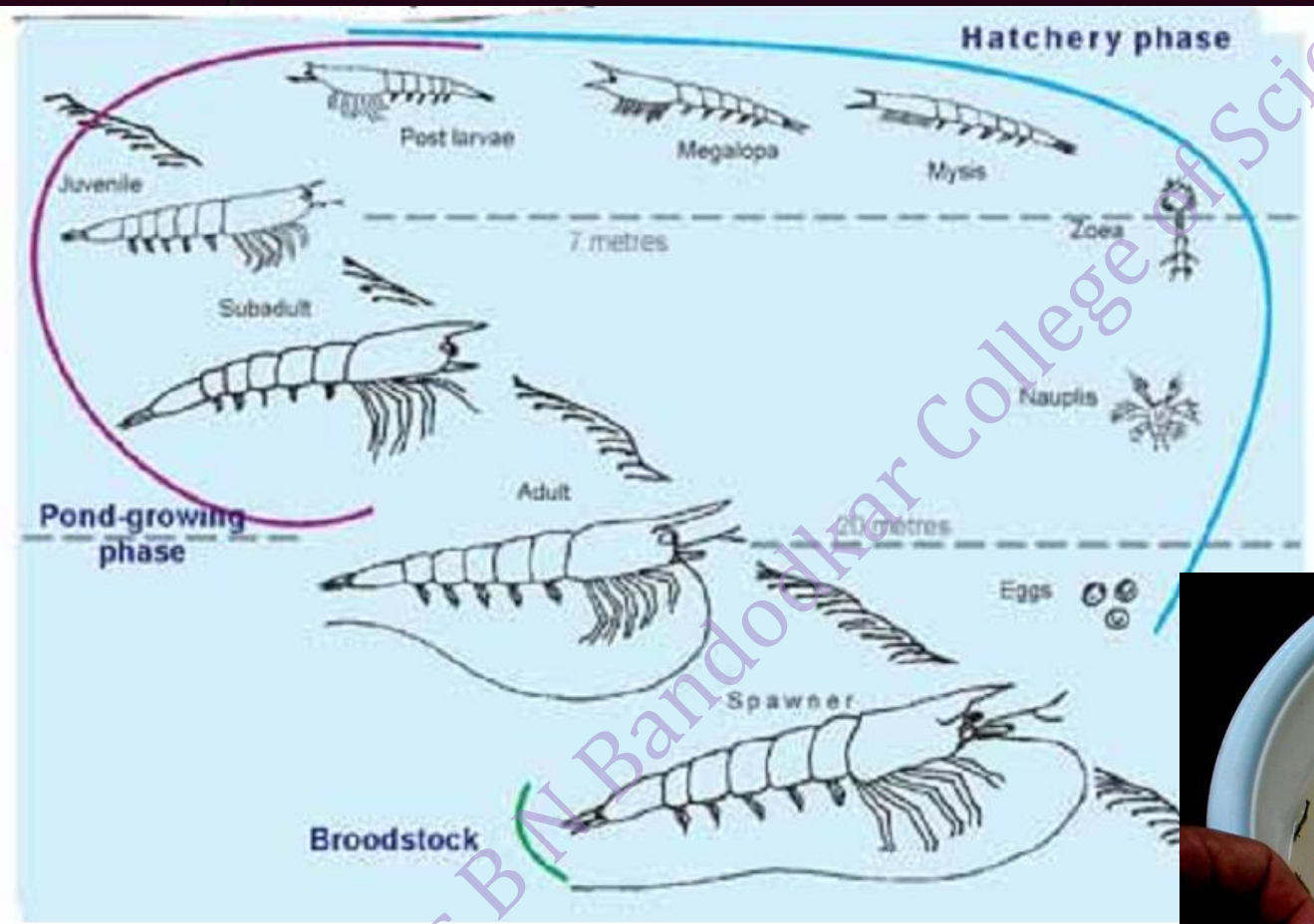
# Identification of sex

- In female 4<sup>th</sup> pereopod develops **thalicum**
- Whereas in Male the 5<sup>th</sup> pereopod has **patasma**

Figure 3.1 The morphology and body parts of a prawn (modified from Motoh 1981 and SEAFDEC 1988)



# Life cycle



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# Life cycle

- Penaeid prawns migrate to oceanic waters to breed. Females can produce more than 800,000 eggs at a time. Twelve to 20 hours after spawning the eggs hatch into **nauplii**, the first of three planktonic larval stages.
- While nauplii do not feed, second stage larvae called protozoae graze on microscopic algae (phytoplankton). Protozoae in turn develop into final **mysis stage** larvae that progressively switch to a diet of other small planktonic animals (zooplankton).
- Two to 3 weeks after spawning the larvae develop into **postlarvae**, which resemble small adult prawns.
- Young prawns move into estuaries and develop into juveniles. The life cycle is completed when the prawns, now half to 1 year old, move out to sea to mature and mate.

# Fertilization

- Broods are kept in a spawning tank, fertilization is external.
- **Artificial insemination is also done-** A technique of implanting electroejaculated **spermatophores** from the males into the thelycum of newly moulted, **eyeablated** females.
- Alternatively, broodstock are reared in ponds from hatchery juveniles. Although the technology for induced maturation has already been achieved and perfected, wild spawners were still preferred by most hatchery operators over the hand reared stock, mainly because of better quality eggs and superior fry produced for pond stocking.

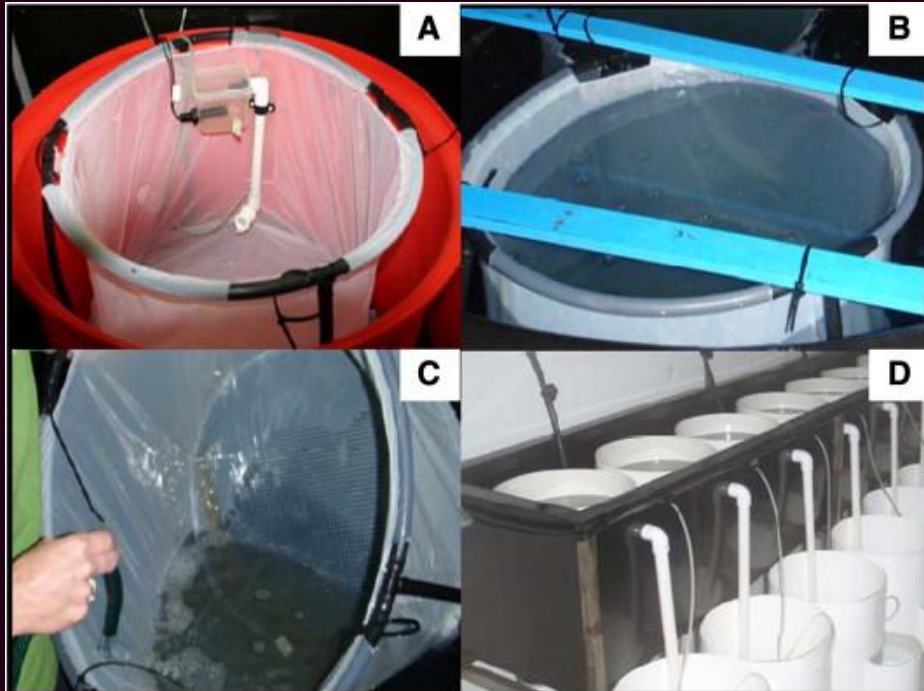
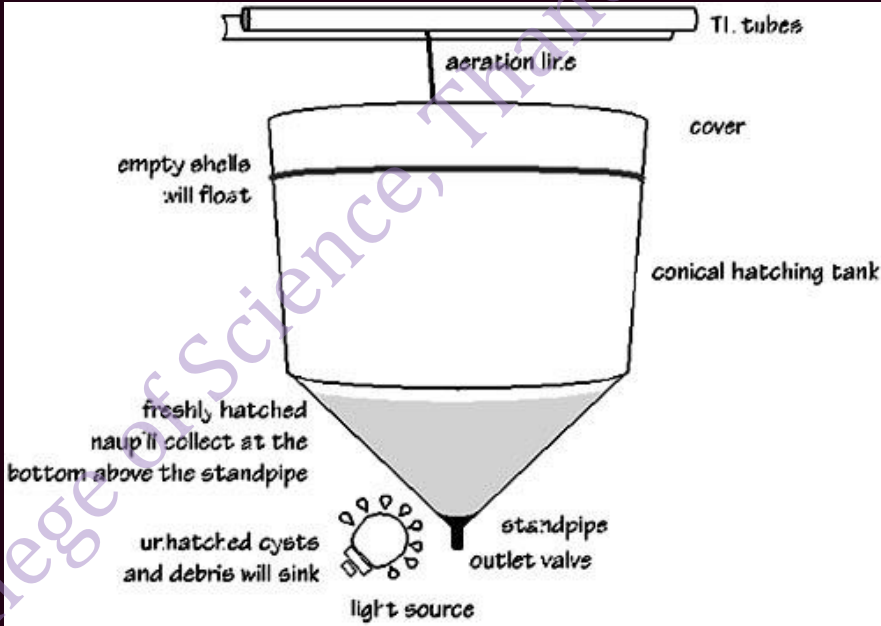


# Breeding

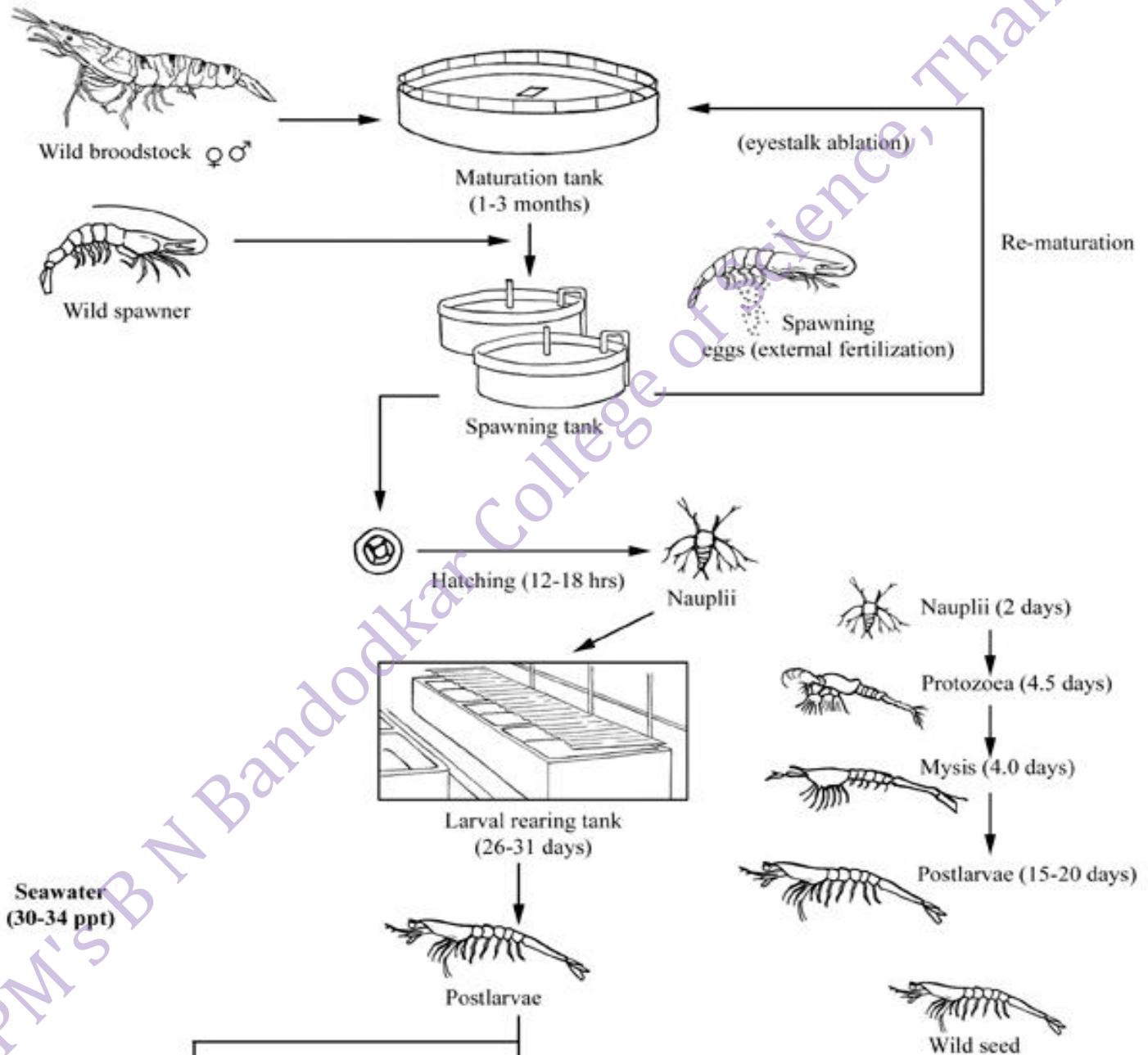
- Broods are kept in spawning tank. Mating occurs at night, shortly after moulting while the cuticle is still soft, and sperm are subsequently kept in a spermatophore (sac) inserted inside the closed thelycum of the female.



- Spawning occurs at night and fertilization is external with females suddenly extruding sperm from the thelycum as eggs are laid
- Eggs are transferred in hatching tanks with vigorous aeration.
- Larvae are kept in rearing tank at density of about 60- 100 per liter. Reared for 15 days with water circulation and aeration.
- After 20 days algal and zooplk are added for feeding.



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# Water parameters

- Salinity range of 10-25ppt. is recommended
- Temperature. The recommended optimum temperature range for good growth and survival rates of prawn is 25-30°C
- The minimum acceptable DO level is 3-4ppm.
- pH level. Optimum pH is 7-8.5. pH of 5 and below are lethal to prawns
- The pond must have optimum population of these planktons.

# Disease control & management of hatching tank

- Filtered water is circulated using sand filter or cartridge filter
- Vigorous aeration is maintained
- Treatment with **EDTA** reduces turbidity and heavy metals
- Treatment of **zeolite** reduces toxic gases
- Maintaining temperature at 28-30 °C avoid bacterial growth of cold temperature
- Disinfection must be done after every attempt of breeding in hatching and nursery tanks
- Old algal feed standing for long period be avoided.
- In some cases antibiotics and other pharmaceuticals have been used in treatment

# Management of outdoor hatchery/nursey

- The pond bed should be dried for minimum of 10 days, limed, ploughed thoroughly for removing the harmful gases, killing of parasites etc.
- The stocking density normally varies from 4,000 to 50,000 nos. of post larvae per ha.
- Feeding with formulated feed, regular water replenishment, water quality monitoring specially pH, dissolved oxygen and hardness, control of excess algal bloom, periodic monitoring of feeding behaviour should be continued.
- Predatory fish and adult prawns must be removed

Thank You



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