

# **Seed production of mud crab**

# Introduction

- **Commercially important Edible crab are** - *Scylla serrata*, *S. tranquebarica*, *S. pelagicus*, *S. olivacea*, *S. tranquebarica*, *S. paramamosain*
- *Scylla serrata*, *S. tranquebarica* both are commonly called mud crab
- mud crab **migrate to brackish water for growth while** they are juvenile and the **adults migrate from brackish water to the ocean for breeding and spawning**
- mud crab are cultural value

## ***Mud crab***

There are only two species of mud crabs occurring in most of the Indian brackish water areas and inshore seas.

- ***Scylla tranquebarica***: maximum size of 2.3 kg.
- ***Scylla serrata***: maximum size of 0.7 kg



Scylla serrata



Scylla tranquebarica



# Reproductive biology of crabs

- The males growing to larger sizes than females.

## Age at 1<sup>st</sup> maturity

- Males may be considered mature when they are capable of carrying the females and copulate successfully.
- Females are mature when they are capable of copulating and extruding eggs.
- The early maturing ovary is bright orange where as in mature ready to spawn female it is deep yellow

*Scylla tranquebarica* : 120 mm carapace width

*Scylla serrata* : 83 mm carapace width

# Sexual dimorphism

## Male

- Abdominal flap at the ventral side is slender and triangular.
- Only two pairs of abdominal appendages.
- Gonopore is located at the base of fifth walking leg.
- The Claws are comparatively larger

## Female

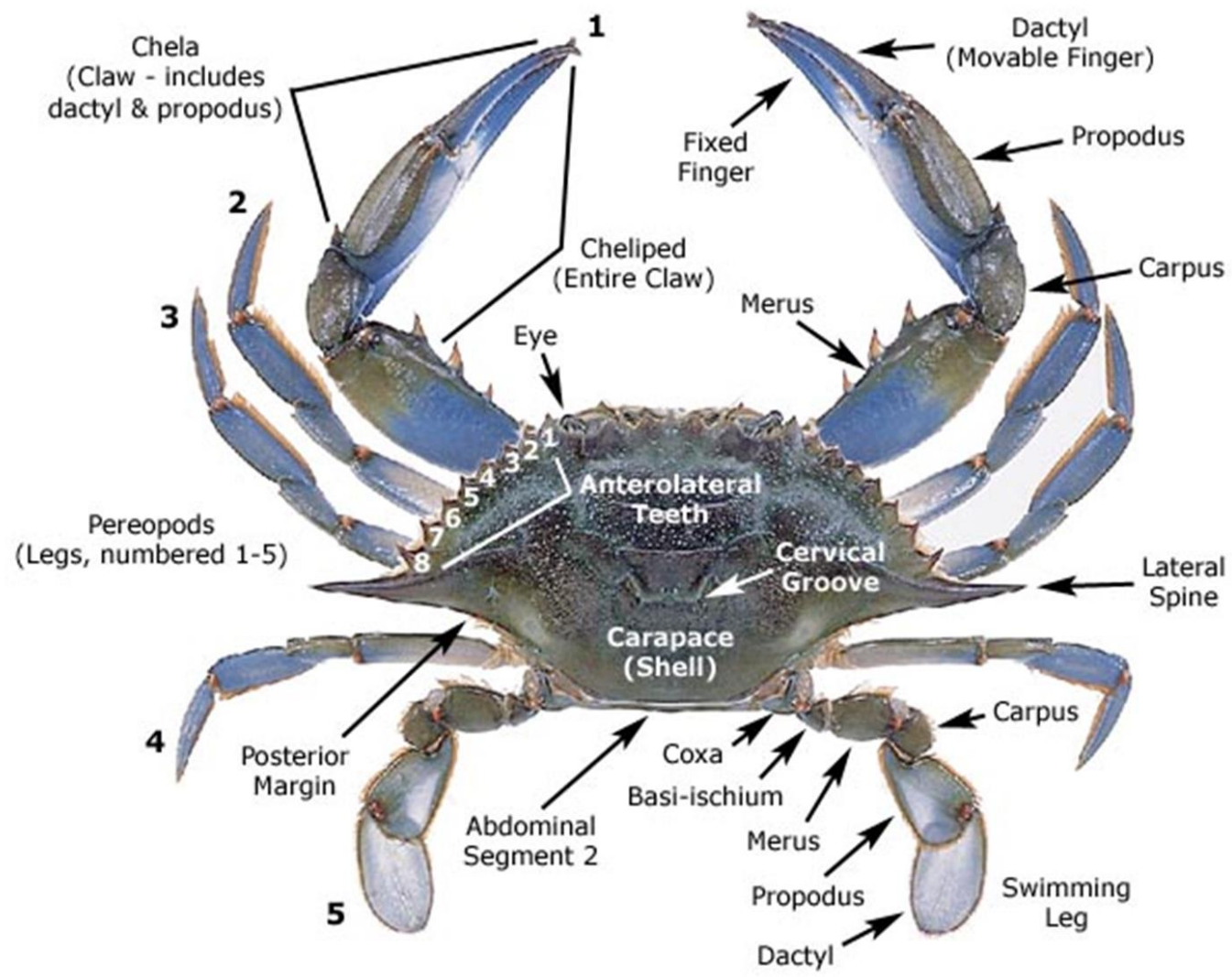
- Abdominal flap at the ventral side is broad and semi-circular in berried females.
- There are four pairs of abdominal appendages.
- Gonopore is located at the sterna of the sixth thoracic segment.
- The claws are smaller

**Female**

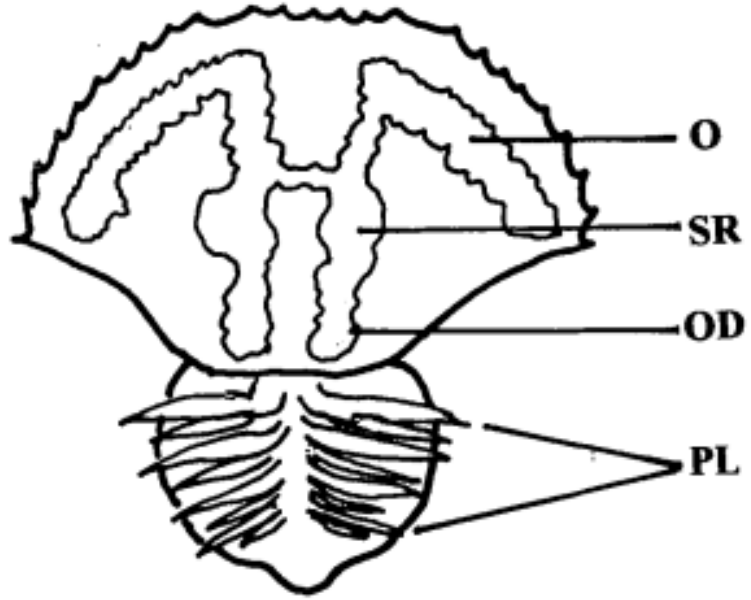


**Male**

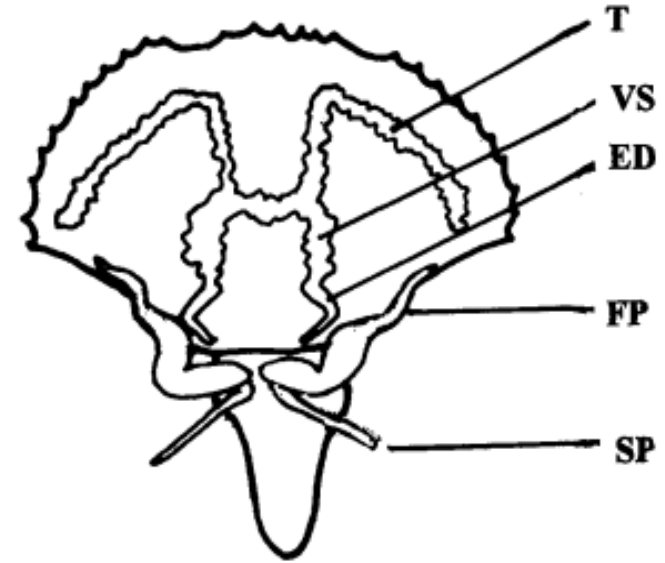








Female reproductive system. O-Ovaries; SR-Seminal receptacle; OD-Oviduct; PL-Four pairs of pleopods.



Male reproductive system. T-Testis; VS-Vas Deferens; ED-Ejaculatory duct; FP-First pair of pleopods; SP-Second pair of pleopods.

## **Mating behavior**

- Copulation takes place between a **hard shelled male and freshly moulted female**
- Courtship is initiated by a premating embrace between hard shell male and hard shell female which lasts for 2-3 days
- Premating embrace is accomplished by the male climbing over the female and holding her by his cheliped and first two pair of walking legs
- When female is about to moult the male leave the riding position
- few hour after the precopulatory moulting actual process of copulation is start

- The male turns the soft body female upside down using the cheliped and climbs on to her ventral side.
- The female unfolds the abdomen and holds the male in position.
- The embrace lasts for 6-8 hrs during which time male deposits the spermatophore in the seminal receptacle of the female.
- After this male and female separate

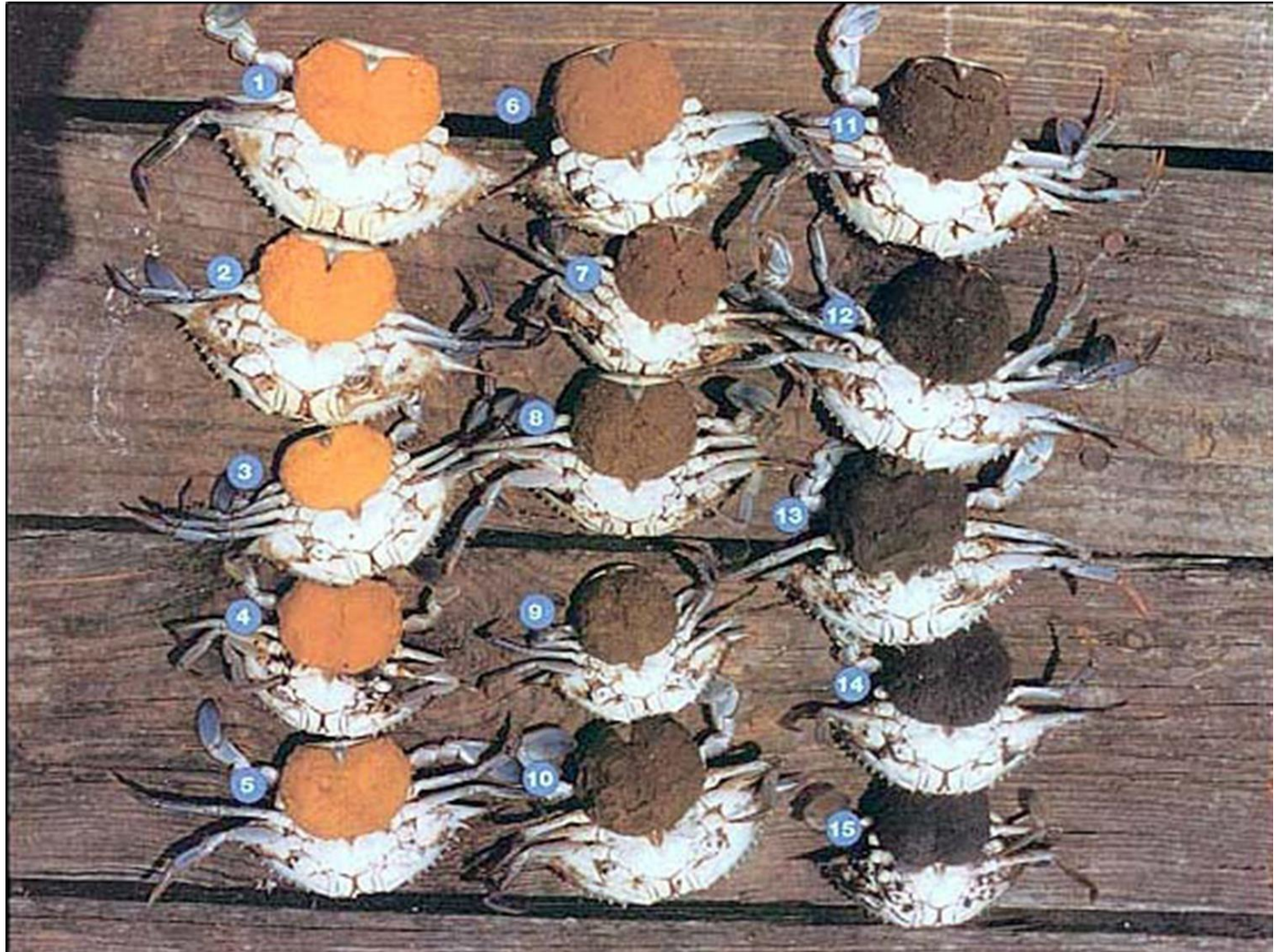
# Spawning

- During spawning the ova are extruded by the female.
- The eggs are fertilized by the sperm stored in the spermatheca.
- Fertilized eggs are attached to the ovigerous setae of the abdominal appendages.
- Fertilization is internal.
- **Fecundity of *Scylla tranquebarica* is 2-3 million and of *Scylla serrata* is 0.5 – 2.5 million.**

## **Incubation and hatching**

- Berried females carry the eggs for 2 weeks.
- The egg changes the colour from orange to brown.
- Just before hatching the eggs become black.
- The females migrate to the sea for spawning.

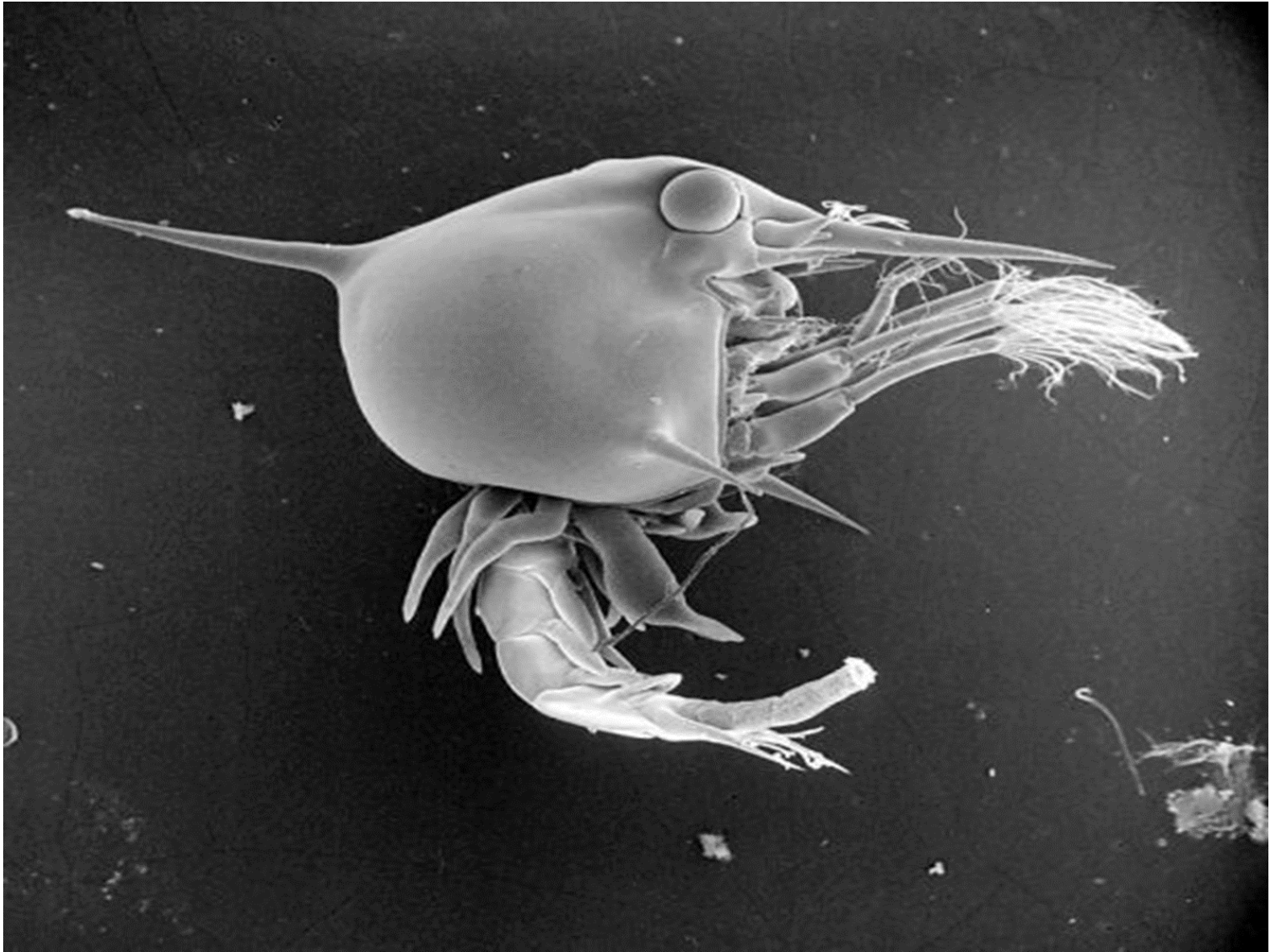




## *Larval stages*

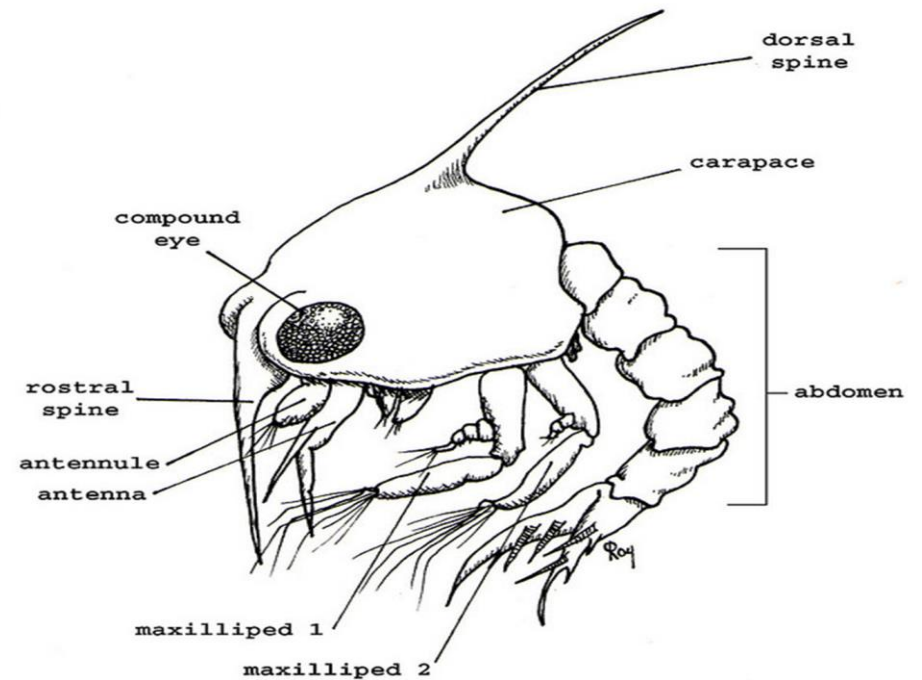
- The egg hatches in to a zoea larva.
- The newly hatched zoea measures 1.2mm.
- It moults once in 3-4 days.
- There are 5 zoeal stages.
- Zoea transforms into megalopa in 15-20 days.
- Megalopa develops into juvenile after 8-11 days.





## Zoea stage 1

- Consists of cephalothorax, 5 segmented abdomen and telson.
- Carapace bears four spine.
- Eyes are not stalked.



## *Megalopa larva*

- Megalopa has crab like appearance.
- Cheliped is well developed.
- Four pairs of legs and five pairs of pleopods.
- carapace is broader in relation to its length.



## Breeding season

- Mud crab breed through the year
- Peak season is depend on the climate condition

## The season of peak breeding activity and peak juvenile abundance in India

Region	Peak breeding season	Peak juvenile abundance
Kerala coast	September to February	May to October Vembanad back water
Tamil Nadu coast	September to April	December to may in Pulicate lake
Andhra Pradesh	October to February and may to June	December to April and July to august in Kakinada
Orissa coast	November to January	March to June in Chilka lake
West Bengal coast	May to august	November to February in Hoogly matla estuary

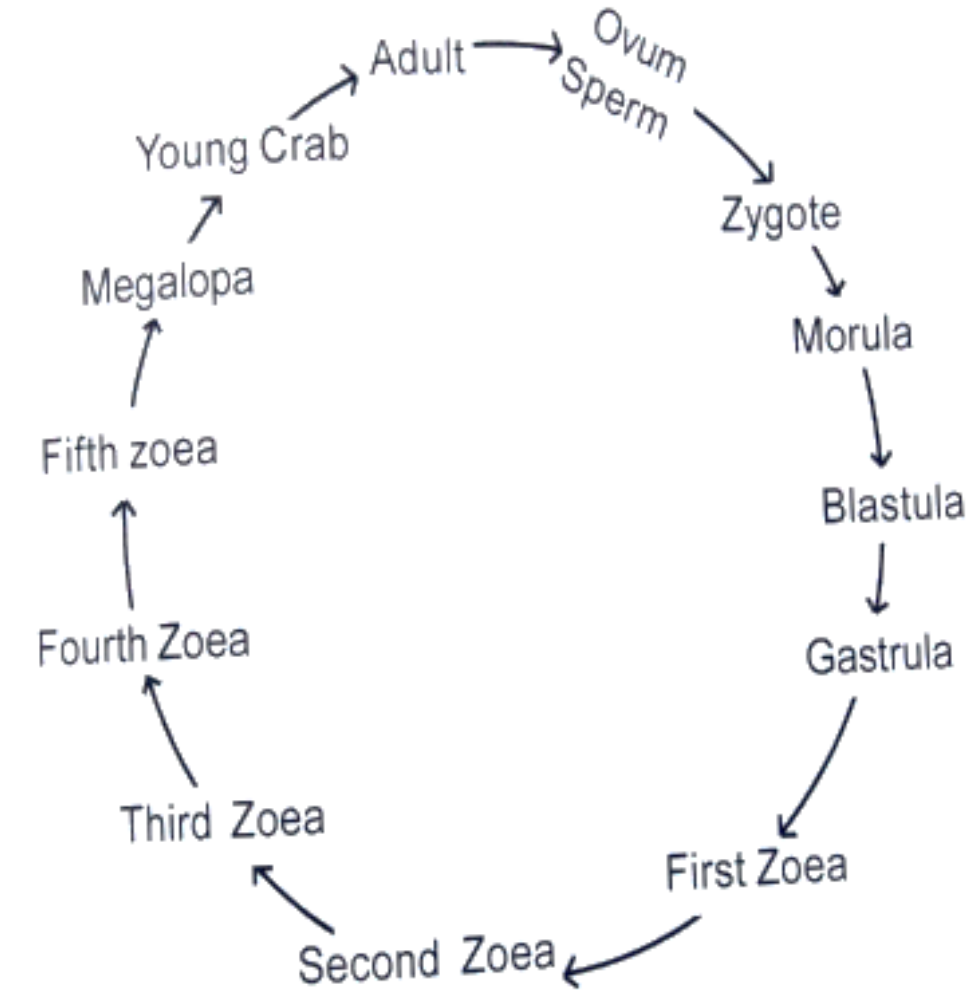
## **Larval development**

- The Zoea larvae undergoes 5 successive moults to become the Megalopa larvae
- Five zoeal stage each take 3-4 days
- To develop a Megalopa from a Zoea it takes 15 to 20 days
- Megalopa develops into juvenile crab after 8 to days

- newly hatched Zoea larvae of crab measure 1.2mm and it consist of a cephalothorax and a five segment abdomen and telson
- carapace bears 4 spines one dorsal spine bent backwards, rostral spine bent forwards and two lateral spine closely pressed against the side of the body
- The eye are not stalked
- First antenna – conical second antenna- has 2 rudimentary process
- First maxillae – consist of coxa
- First maxilliped has short coxa and long basis
- segmentation of endopodite is not sharply demarcated
- Second maxilliped- has also coxa, basis and endopodite
- Telson are rudimentary

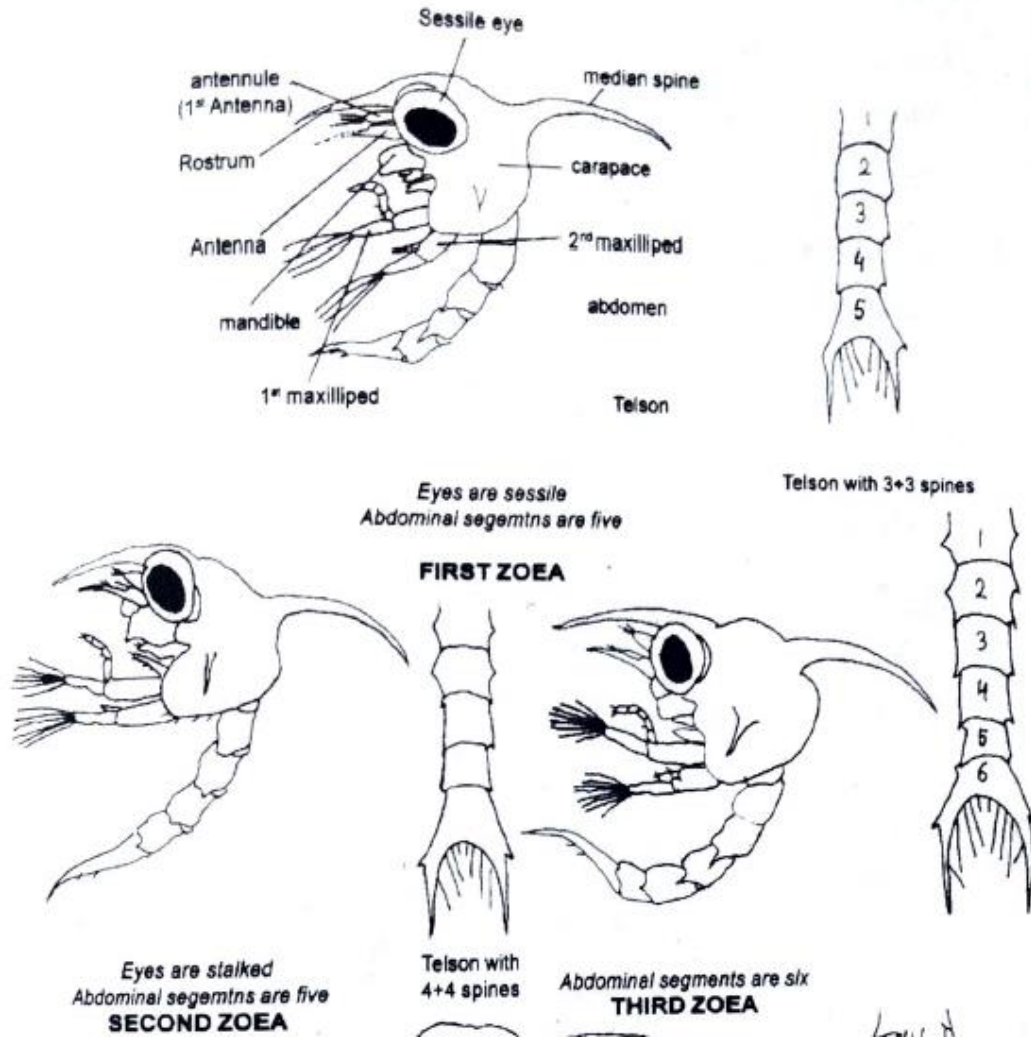
- The Megalopa larvae has a crab like structure
- Five pair of pleopods present which becomes locomotory function
- Cheliped are catch to prey is well developed

# Life cycle of mud crab

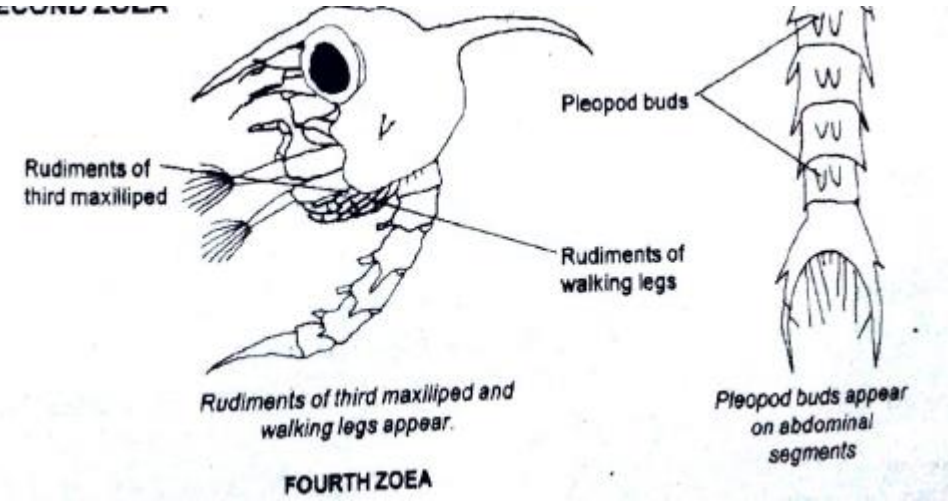


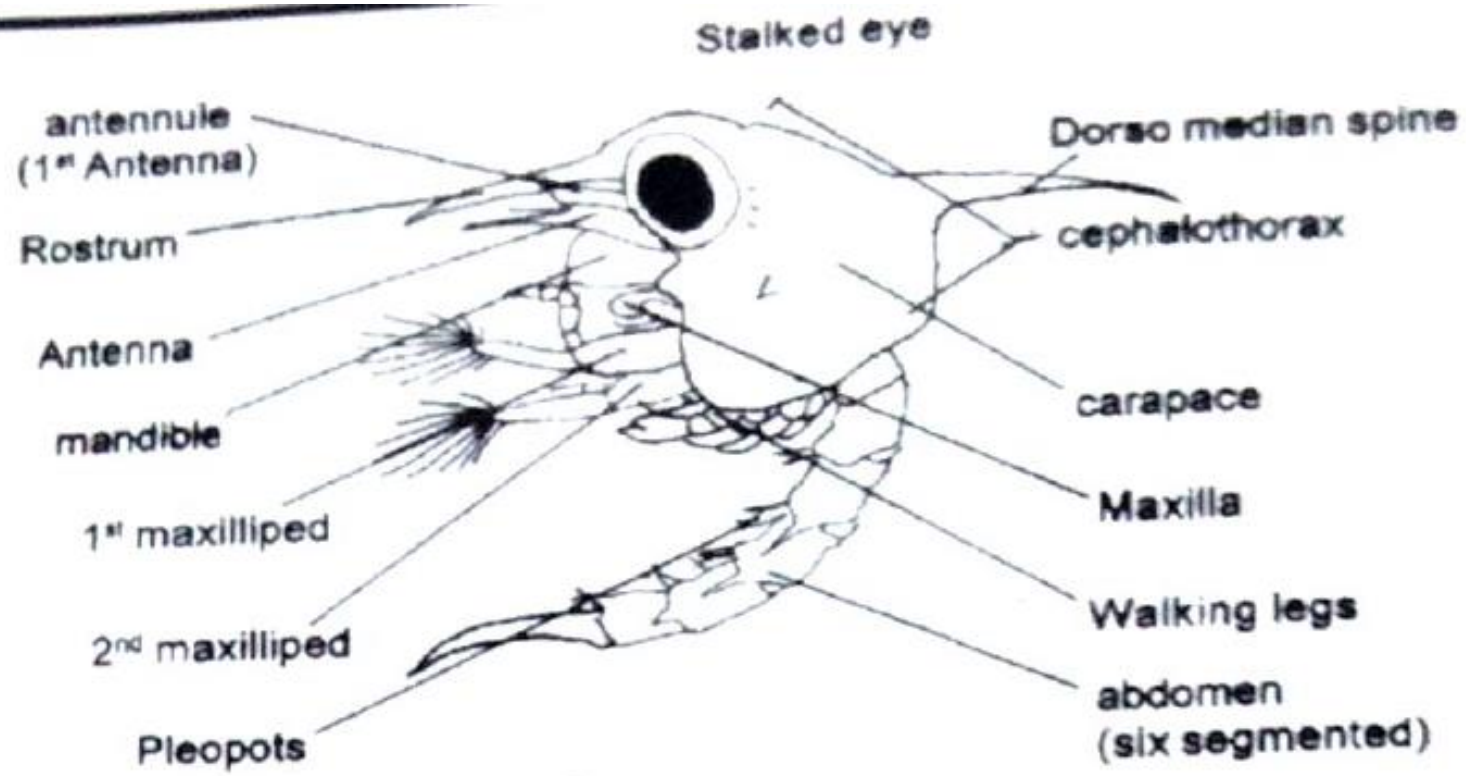


# Larval stage of mud crab



**SECOND ZOEIA**

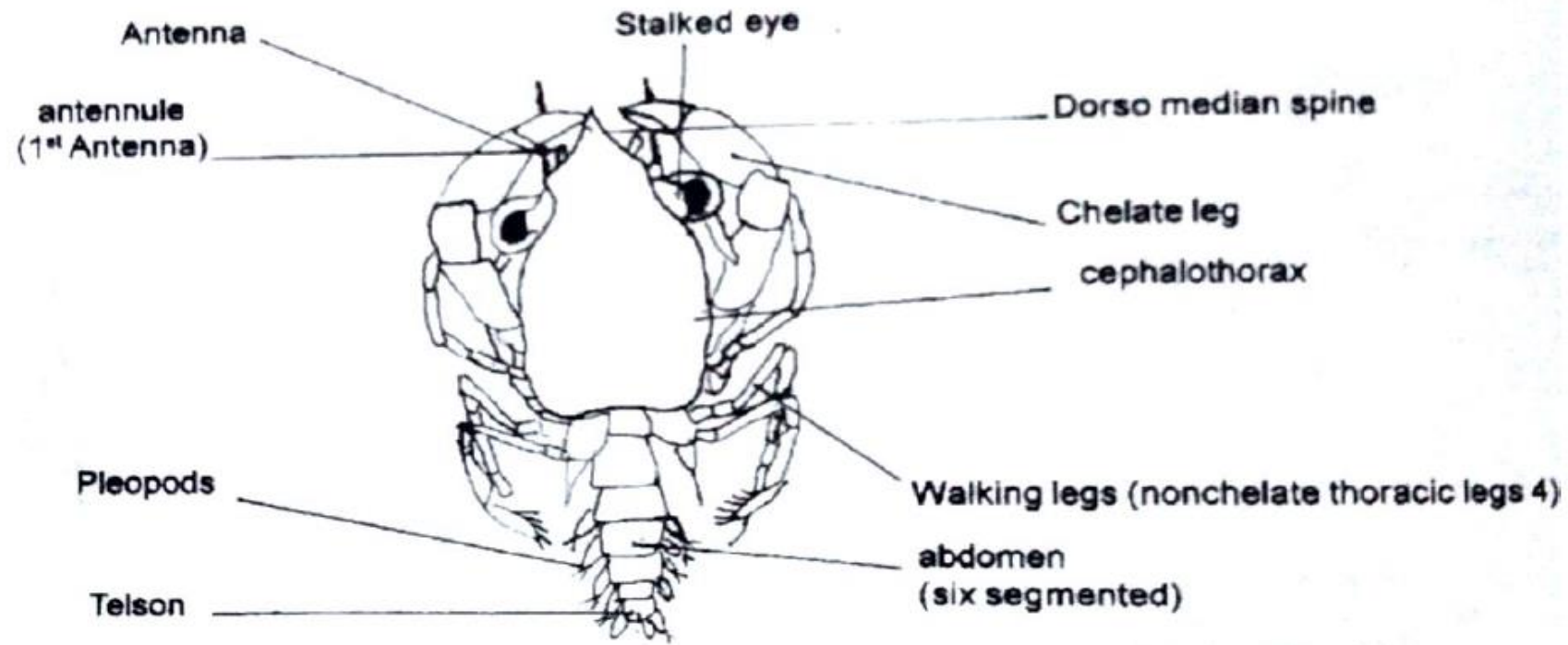




*Pleopots with setae*  
**FIFTH ZOEAE**

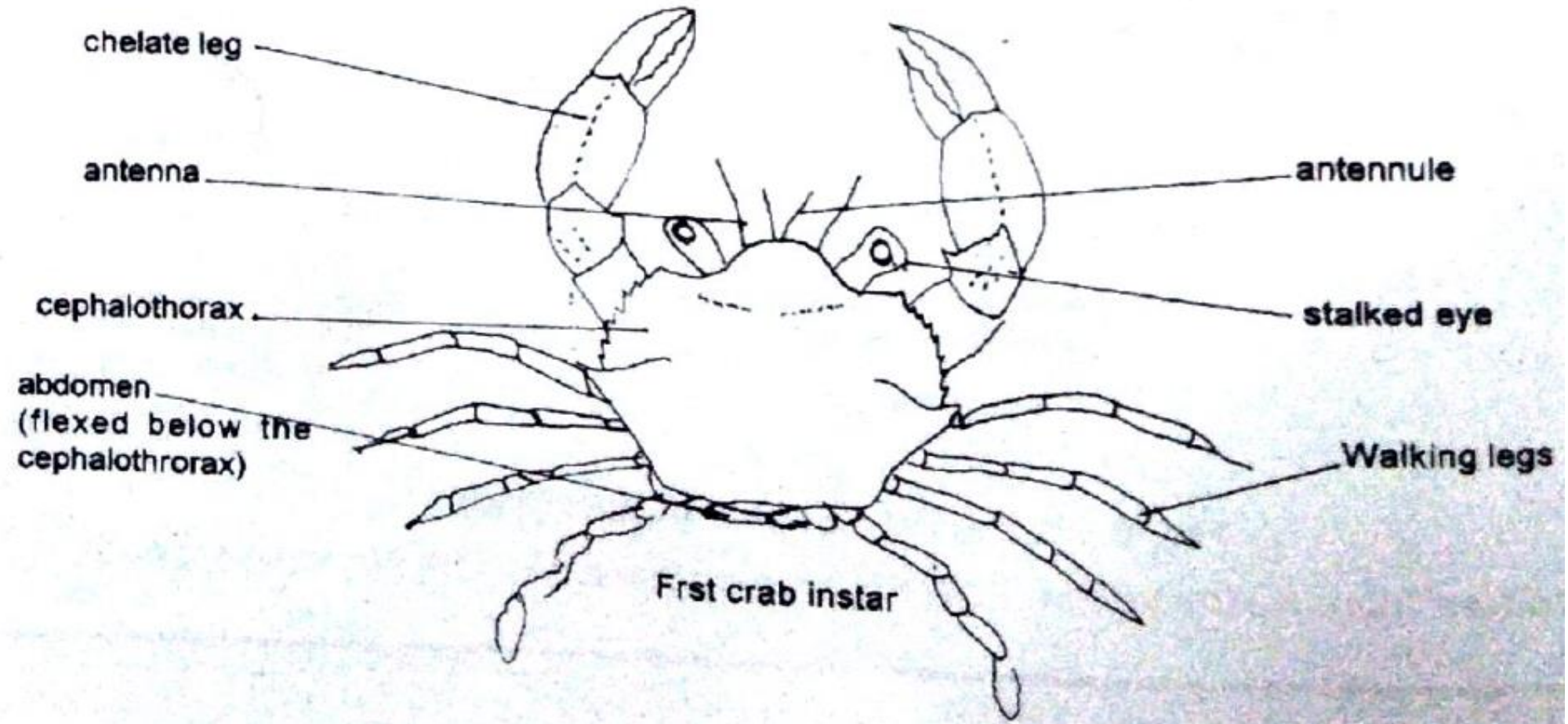


**Telson with 5+5 spines**



Megalopa larva

### Megalopa larva



Larval stage	Distinguishing features
Zoea 1	Eye are sessile abdominal segment are 5 telson is with 3+3 spines
Zoea 2	Eye are stalked abdominal segment are five telson has 4+4
Zoea 3	There are five abdominal segment
Zoea 4	Pleopods buds appear in abdominal segment
Zoea 5	Setae are present in pleopods telson with 5+5 spines
Megalopa	Carapace length is more than the width abdomen with five pair of pleopods Four pair of legs are seen
Crab I	Carapace with nine Anterio lateral spine on either side first pair of Cheliped and three pair walking legs five pair of legs