



Introduction (prawn)

- Freshwater prawn is a priced commodity among the species from freshwater aquaculture and commonly called as scampi.
- The commercially important fresh water prawn belong to the genus *Macrobrachium*.
- > 200 species recorded in the world but 30 species found in India.
- In india Among the Three species suitable for aquaculture are

M . rosenbergii , *M.malcolmsonii*, *M. gangeticum*

Historical background

- Modern farming of this species originated in the early 1960s when FAO expert Shao-Wen Ling, working in Malaysia, found that freshwater prawn (*Macrobrachium rosenbergii*) larvae required brackish conditions for survival.
- By 1972 the Hawaiian team led by Takuji Fujimura had developed mass rearing techniques for commercial-scale hatchery production of prawn postlarvae (PL).
- This development spawned the first commercial farms in Hawaii

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- Both Thailand and Taiwan Province of China became pioneers in modern giant river prawn culture
- The first major FAO project designed to expand the culture of this species began in 1978 in Thailand. Since then, giant river prawn culture has developed in every continent, particularly in Asia and the America.

Age at first sexual maturity

- Scampi attain first sexual maturity at length of 140-150mm & at 35-40gm weight
- Mating take places between hard shelled males & soft shelled females which have just completed their premating moult.
- It may take 1.2-21.8 hours. (9.1 hr)

Distinction between male & female

Male	Female
1. Mature male larger, second walking leg much larger & thicker.	1. Small in size, second walking leg thinner & shorter
2. Cephalothorax is larger, but abdomen is narrower.	2. Cephalothorax is smaller , abdomen is broader.
3.The endopodite of second pleopod has appendix masculina	Appendix masculina
4. Genital pores are present at the base of 5 th walking leg.	Genital pores are present at the base of 3 th walking leg

Hatchery management

- a) Site selection
- b) Freshwater & seawater requirement
- c) Brood stock rearing unit
- d) Incubation & spawning unit
- e) Larval rearing unit
- f) Artemia unit
- g) Egg causter preparation

Site selection

- Hatchery should be located in such place where
 - Pollution free F/W water & seawater
 - Healthy & disease free brood prawn
 - Availability of hatchery workers
 - Road for transportation
 - Climate condition/ environmental condition.

Preparation of artificial sea water (1000lt)

Name of salt	Quantity(kg)
Common salt NaCl	12kg
Sodium sulphate Na ₂ SO ₄	1.214kg
Magnesium chloride	1.520kg
Calcium chloride	3.520kg
Potassium chloride	880gm
Sodium bi carbonate	800gm
Potassium bromide	420gm
Boric acid	2gm
EDTA	4gm
Cobalt sulphate	20mg
Potassium iodide	40mg

Brood stock rearing unit

- Juvenile are stocked @ 3-4nos/meter square & adult@2nos/meter square at the sex ratio 1:4(M:F).
- For complete harvesting of the pond, rectangular, drainable ponds are advisable in prawn farming.
- Pond size : 0.2-1.6 ha with average depth 0.9m
- The prawn can be fed on a palleted containing 35-40% protein.@ 3-4% body weight about 3 times per day.

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- Prawn attain maturity within 4-7 months.
- For hatchery purpose Healthy & active berried females are chosen .
- Mating take place between hard shelled males & soft shelled females.

Incubation & spawning unit

- The berried females bearing dark grey coloured eggs in the abdomen are utilized for incubation & hatching .
- Dark grey coloured egg incubation period 2-3 days & orange coloured egg incubation period 19days
- The berried females are first disinfected by 0 .3ppm Copper sulphate or 15-20ppm formalin and
- The berried females of *M. rosenbergii* were kept in different salinities (0, 5,

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- 10, 14ppt) during incubation period. Maximum hatching rate (98 % and 97 %) was recorded when the
- berried females were kept in 0 ppt and 5 ppt salinities respectively
- Released into the larval rearing tank(hatching tub) having 5ppt salinity
- Egg hatching take place during night time

Larval rearing unit

- After hatching larval are disinfected with formalin @ 5 ppm & transfer into the larval rearing .
- The newly hatched zoea larva is 1.92 mm in length& they are planktonic in nature.
- They swim with tail first & ventral side upwards & head down at an oblique angle.
- Unhealthy larvae tend to accumulate at pond bottom
- Stocking density of larvae @ 100no/L
- The concrete of the inner surface should be coated with layers of epoxy resin to prevent harmful & smooth surface.

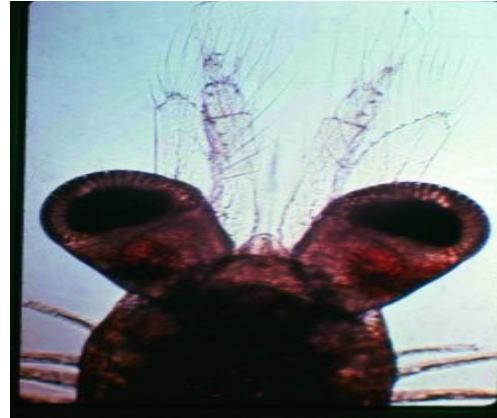
- optimum salinity 12-14ppt
- temperature 29-31c
- DO- maintained at saturation level by aeration
- pH - 7.5-8.5
- Most commonly used live feed for larval rearing is artemia nauplii & egg causter.
- The larval cycle completed within 35
- and 37 days

Identifying characters of larval stages of prawn

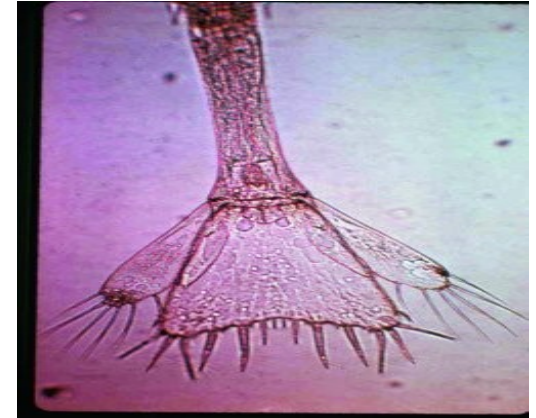
Larval stage	Distinguishing features
i	Sessile eye
ii	Stalked eye
iii	Uropod present
iv	Two dorsal rostral teeth uropod biramous with setae
v	Telson narrow elongated
vi	Pleopod buds appear
vii	Pleopods biramous and bare
viii	Pleopods with setae
ix	Endopods of pleopods with appendix interna
x	3-4 dorsal rostral teeth
xi	Teeth on half of the upper dorsal margin



zoea-1



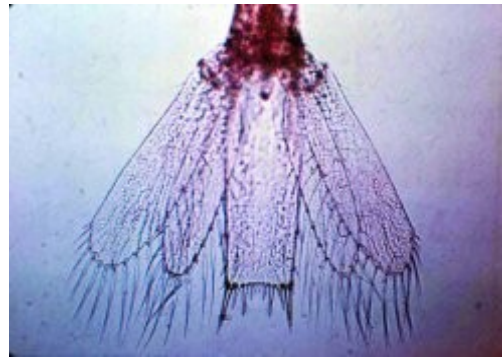
zoea-2



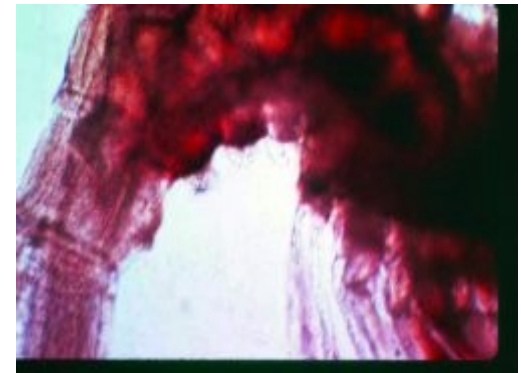
zoea-III



Zoea-IV



zoea -v



zoea-VI

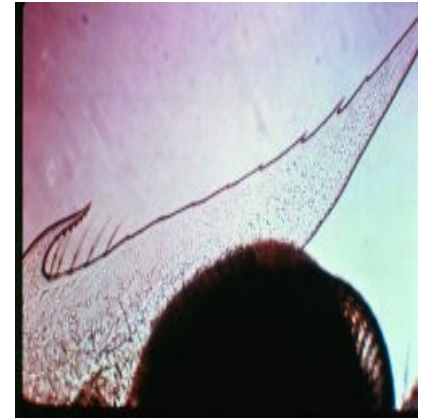
larval stages of *Macrobrachium rosenbergii*



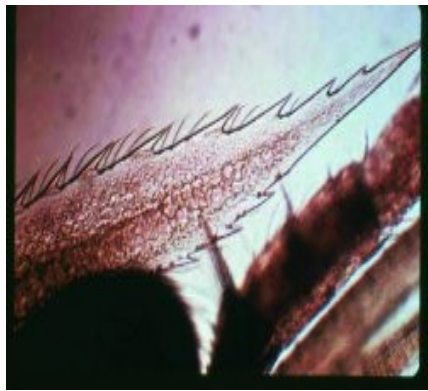
Zoea-VII



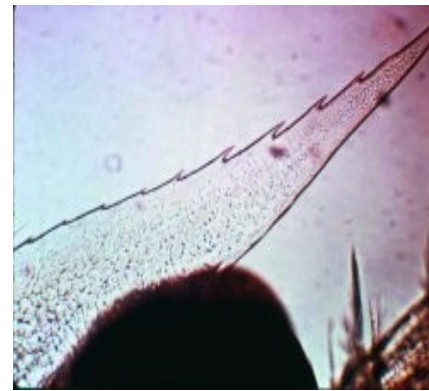
Zoea-VIII



Zoea-IX



Zoea X



Zoea-XI

Egg causter preparation

• Name of ingredient	Quantity
egg	2 nos
shrimp /prawn meat	25gm
Milk powder	25gm
Yeast	2gm
Corn flour	20gm
Agar agar	2gm
Cod liver oil	3ml
Vitamin	2gm

Introduction (shrimp)

- It has a fast growth rate, attains large size
- It has high resistance to handling stress &
- hence exhibits high survival rate during culture.

Age & size at first maturity

- According to Moto (1981) the males of 37mm carapace length & 35gm body weight
- Female of 47mm carapace length & 68gm body weight

Distinguished between male & female

Male	Female
1. Presence of petasma in the first pleopod	1. Petasma absence
2. Presence of appendix masculina in the 2 nd pleopod	2. Absence
3. Thelycum absent	3. Thelycum present in the sterna between pereopods IV & V
4. Gonopore is located at the based of 5 th walking led	4. Gonopore is located at the based of 3 th walking led
5. Smaller in size	5. larger in size

Mating

- Hard shelled male mates with a freshly moulted female. Eg *P. monodon* *P. aztecus*,
- *P. brasiliensis*, *P. californiensis*, *P. duorarum*, *P. esculentus*, *P. indicus*, *P. japonicus*, *P. kerathurus*, *P. latisulcatus*, *P. merguensis*,
- *P. monodon*, *P. notialis*, *P. orientalis*, *P. paulensis*, *P. penicillatus*, *P. plebejus*, and *P. semisulcatus*).
- This facilitates the insertion of spermatophore from the male into the seminal receptacle of the thelycum of female.
- Generally mating takes place at night immediately after female moults.
- In case of prawn having open thelycum mating usually takes place between hard shelled male & hard shelled female. Eg *L. vannamei*, *p. japonicus*

Hatchrey technology

- a) Brood stock rearing unit
- b) spawning unit
- c) Incubation & hatching unit
- d) Larval rearing unit
- e) Artemia unit
- f) Egg causter preparation

Brood stock rearing / maturation unit

- The basic requirement for seed production is healthy broodstock of desired size, so that it will yield maximum number & quality of viable eggs

Factor affecting Maturation

1. **Water quality:** polluted free, water level in the maturation tank kept 60-100cm & constant water flow@10litre/min.
2. **Salinity:** 30-36ppt is ideal for brood stock rearing.
3. **Temp:** 25-31°C
4. **pH:** 8-8.5
5. **Light :** 100lux is beneficial effects on growth & maturation of gonads.

- Food and feeding: meat of squid/mussel/clam most suitable. Feeding @ 12-15% body wt & diets containing 50% protein & 10% PUFA.

Spawning unit

- Spawning tank is made up of black fibre glass sheet & fabricated into cylindro-conical shape.

Hatching unit

- Before transferring eggs tanks are wash
- The fertilized eggs are transferred to hatching tanks containing 300-500 litre sea water.
- Aeration is done gentle in the tank.
- Water temp: 28-30°C & salinity 29-34ppt
- Nauplii hatches out within 10-12hrs

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- Percentage of hatching:
- Before harvesting stop the aeration & keep the light on for few minute.
- The nauplii swim up toward the light & immediately harvesting is done.
- A newly hatched nauplius larva is .34mm in size & dark yellow in colour.

Larval rearing

- Clindroconical shape are used for larvar rearing .
- Tank should be keep in separate to avoid cross contamination.
- Prior to stocking the nauplii, it should be cleaned & disinfected.
- The tank should have facilities fir aeration & water exchange.
- Stockin g density of nauplii: 100/litre
- Nauplius are non feeding stage.
- It moults onces in 4-6 hrs
- Nauplius Duration: 36-48 hrs