

# LOBSTER CULTURE

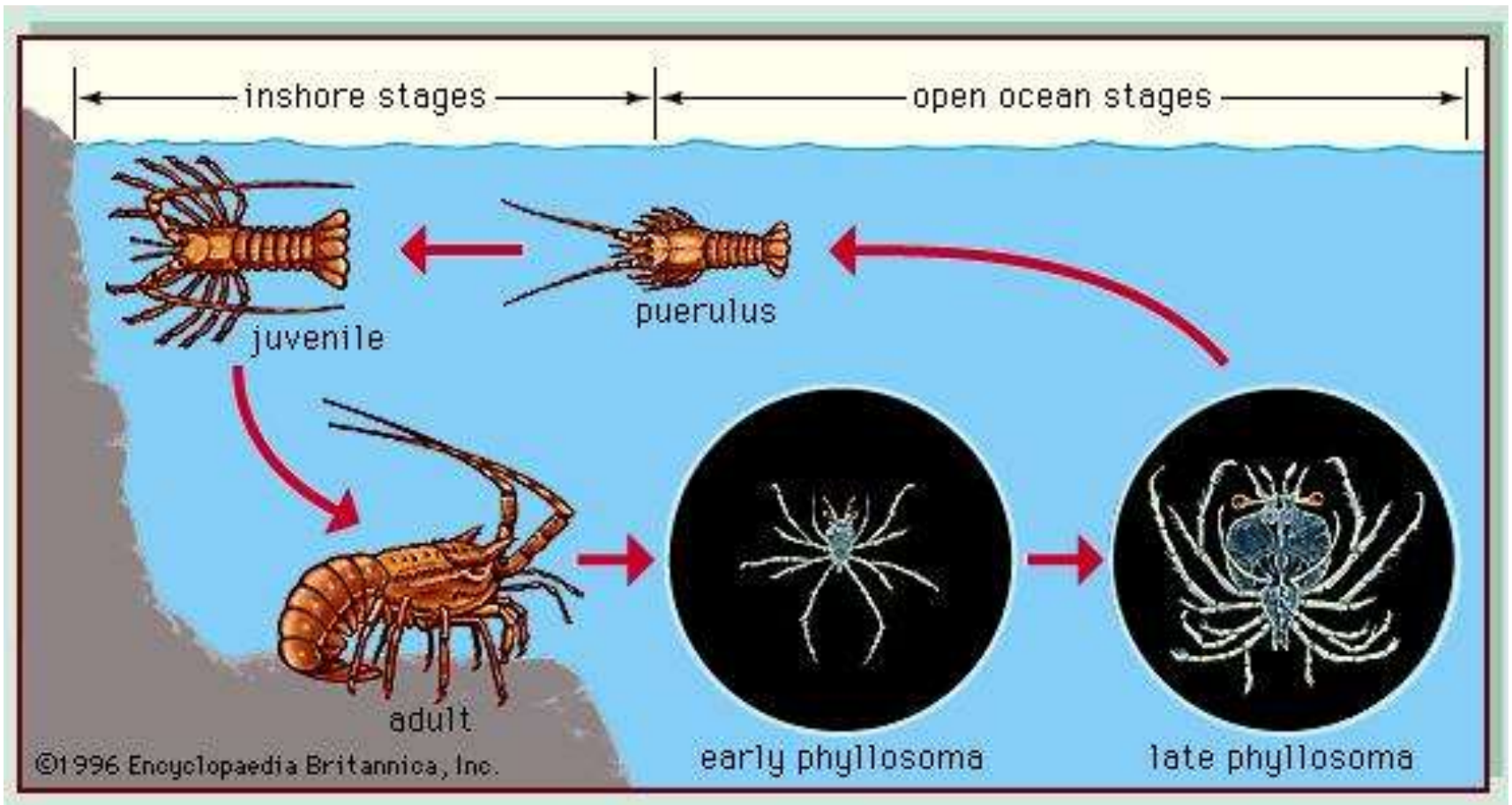


# INTRODUCTION

- 8 species of spiny lobsters, six shallow water and two deep sea species, and 2 species of slipper or sand lobsters (squat lobsters) constitute the lobster fishery of India. The slipper or sand lobsters are with a dorsoventrally flattened body and short scalelike antenna without whip like flagellum.
- Shallow water rock lobsters are *Panulirus homarus*, *P. ornatus*, *P. penicillatus*, *P. polyphagus*, *P. versicolor*, and *P. longipes* (Crustacea, Decapoda, Panuliridae). Deepwater lobsters are *Puerulus sewelli* and *P. somniosus* (Crustacea, Decapoda, Puerulidae). Sand lobsters are *Thenus orientalis* and *Scyllarus sordidus* (Crustacea, Decapoda, Scyllaridae).
- Highly priced in domestic as well as export markets.
- Spiny rock lobsters only have culture significance and are exported live or processed. 'Lobster tail' – the processed meat of abdominal region of spiny rock lobsters fetch high price in export market. Curated shells are used as curios.
- Culture is essential to protect their natural population which is dwindling fast due to overexploitation.
- *P. homarus*, *P. polyphagus* and *P. ornatus* are suitable for culture in India.

## FISHERY & BIOLOGY OF SPINY ROCK LOBSTER – *P. homarus*

- **Distributed** in NE and NW and SW coasts of India.
- Maharashtra and Gujarat leads in catch. Coasts of Thiruvananthapuram, Kanyakumari and Tirunelveli districts of Kerala and TN also supports **commercial fishery**.
- **Gears** - Bottom trawl, set-gill nets, traps and trammel nets.
- **Mainly occupy** rocky shore of 200m and rarely extend to mesopelagic zone.
- **Morphology** - Spiny or rock lobsters - subcylindrical dark green body with long cylindrical antenna with whip like flagellum. The carapace is covered with numerous spines and tubercles. No clawed legs. Max. size 31 cm, **Males are slightly larger than females**.
- Gregarious, nocturnal, omnivorous feeder and consumes detritus also. Feeds mostly on small mussels and polychaete worms.
- **Fecundity** is 10 million. Size at first maturity is ~ 7 cm for both sexes. Male mate with freshly moulted female, sperms stored as **spermatophores**. Sperms released by female by breaking the spermatophores with walking legs at the time of egg release.
- **Peak breeding season** in Indian waters:- Feb – April & June –Sept.



- Breeds nearshore, first larva is **PHYLLOSOMA** ('glass crab' – transparent and crab like). 2<sup>nd</sup> larva is Peurulus. Peurulus is considered as post larval stage.
- Larvae migrate to open ocean and comes back as juvenile stage is attained.

# LOBSTER CULTURE

- **Adaptable to captive conditions, less cannibalistic, fast growing. No serious diseases except Moulting Death Syndrome (MDS).**
- **Optimum water quality parameters for lobster farming are-**

<b>PARAMETER</b>	<b>OPTIMUM RANGE</b>
<b>Salinity</b>	<b>28 -35 ppt</b>
<b>pH</b>	<b>7.5 – 8.5</b>
<b>DO</b>	<b>4 ml/litre</b>
<b>Temperature</b>	<b>26 - 33°C</b>
<b>Total ammonia nitrogen</b>	<b>&lt; 0.1ppm</b>

## LOBSTER CULTURE.....

- Cage (fixed, hanging or floating), pond/pit and compartmental culture in tanks.
- Larval life is prolonged (~ 180 days).
- Hatchery production of seed is difficult due to difficulties in maintenance of water quality and supply of suitable feeds for almost 200 days. but experimental seed production is done by NIOT (National Institute of Ocean Technology, Chennai).
- Juveniles collected by stake nets from intertidal muddy or rocky shore are used as seeds.
- Demonstratory culture by CMFRI.
- **Pit culture (dugout intertidal pits)**: Coral reefs or rocky areas are used for lobster culture in Bhavnagar (Gujarat). Pits of 21 x 7 x 1m are dug and seeds are stocked @ 20no./m<sup>2</sup>. Pits are covered with monofilament net fixed at the margin with concrete. Crushed trash fish, small crabs, clams and marine worms are given as feed. Tides flush the pits twice daily. 3months culture. 100 -150 g size are harvested and sold @ Rs. 500 – 550/kg in Mumbai market. Or packed in bamboo baskets for live export.

## CAGE CULTURE

- **Wooden fixed cage** is normally 20-40 sq.m and even large cages of 200-400 sq.m are also used.
- **Floating cage** is made of nylon net material with a frame and buoy and located at a depth of 10-20 m.
- Seed lobsters of about 25-30 mm TL are stocked (100- to 200 per cage) and grown to a size of about 50 g (10-12 cm TL).
- Fed exclusively with either whole finfish or chopped fish or shellfish.

# CAGE CULTURE



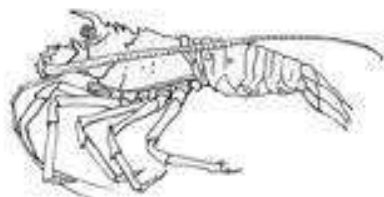
Lobster pueruli captured by fishers



Pueruli sold to middlemen, held for up to two days and sold to farmers



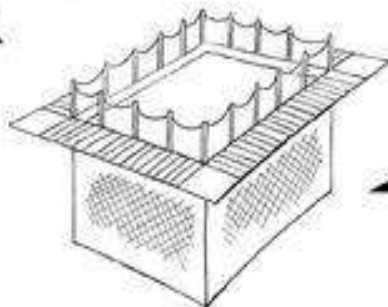
Lobster pueruli nursed in submerged cages for 3-6 months until 5-30 g



Lobster juveniles ready for stocking to grow-out cages



Harvested at 1 kg



Floating cage grow-out farm



Fixed cage sea-cages for grow-out to market size



## CULTURE IN HANGING (submerged) CAGES

- **CAGE CONSTRUCTION:** Suitable for sheltered bays. GI tray of 2 x 1 x 0.5 m with holes of 1cm dia at equal distances (to minimize fouler attachment surface area). PVC pipes of 0.3- .4 m dia are closely placed lengthwise inside the tray and fitted together by PVC gum. Another row of pipes is fixed above this row at right angles to the first row. Five or six such stacks of pipe is built and tied as a single unit. The GI tray carries two long support bars below it. The support bars are provided with hooks for attaching anchors or concrete blocks as sinkers from ropes or iron chains. The whole assembly is covered by strong monofilament net and hung from raftes at a depth of 150 – 200 m.
- **Stocking :** 30 -80 g size seeds have only 50% survival rate. But when 100 – 300 g medium size individuals are stocked @ 8 no./m<sup>2</sup>, 90% survival rate and 1.3 kg weight are attainable in 12 – 15 months.
- **Management:** Maintain a depth of 0.5 m off the bottom. Trash fish (@ 10% of stocking weight) is the major feed. PVC pipes give hideout from cannibalism. Periodical lifting to clean the net off foulers that may interfere with oxygen availability and flush out of metabolic wastes. Thinning if required.

## POND CULTURE

- Brackish water ponds of appropriate size are (~ 20m<sup>2</sup> and 1 m depth) are prepared. Ensure absence of predators and competitors.
- Provide hideouts by putting weighted PVC pipes, earthen pipes, or boulders or rocks.
- Stock with juveniles of 25 -30 g size @ 20 -30/m<sup>2</sup>.
- Supply trash fish, clam meat and/or artificial feed @ 10% of stocking weight twice a day (major quantity during night).
- Give moderate aeration and water exchange of 30% every two days (at least). Oxygen conformers and may not show signs of DO stress.
- Harvest by draining and seining or cast netting after 4 months.

# TANK CULTURE

- Two systems for indoor fattening - flow-through and recirculatory.
- Raceways, rectangular, square or circular tanks can be used. The most preferred are individual raceway tanks.
- FRP tanks of 4 x 2 x 1.5 m are suitable and are to be divided into compartments of convenient size or provide hideouts.
- Stand pipe is needed for complete draining.
- Stocked at 1.0-1.25 kg/m<sup>2</sup>.
- **Flow through systems** - the water that is pumped into a tank is used only once. Water flow is decided based on the stocking density and feeding intensity. The incoming water is to be free of sediments and should have water quality optima. Regular monitoring and management
- Recirculating systems - majority of the water is re-used after each pass through the tanks, first being treated to remove waste products before being returned to the tanks.
- Feeding with trash fish, clam meat and or/artificial dry feeds. Night feeding only is recommended.
- ~ 200g is obtained within 130 days and can be harvested.

## **PROSPECTS IN INDIA**

- **Capture fishery provide undersized ( 50g) specimens only. Overexploited.**
- **Abundant resources, 6 species of rock lobsters available.**
- **High value as live, and frozen lobster tail.**
- **Promising growth rate under Indian conditions as proved by demo and small scale culture done so far (NIOT, CMFRI, CIBA and small scale farmers in Gujarat).**
- **Enhanced growth and maturation by eye-stalk ablation.**
- **Packing and transport conditions for live shipment of lobsters are well developed and would not be a problem.**
- **Development of a successful export market require both continuity of supply and a reasonable volume of production.**

## **CONSTRAINTS (LIMITATIONS)**

- **In India the resource is limited to certain pockets along the coast and lobster landing is drastically declining in all the centres due to indiscriminate fishing.**
- **Therefore, before contemplating aquaculture, research is warranted to better determine the stock structures of spiny lobsters and to estimate recruitment patterns and survival rates.**
- **Prolonged larval life of almost 6 months due to which seed production becomes difficult. Maintenance of water quality and supply of good quality larval feeds are costly.**
- **Research on larval nutrition is required.**