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Notes on the larval rearing scheme at SEAFDEC/A

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Notes on the larval rearing scheme at SEAFDEC/AQD

For tiger shrimp, milkfish, and sea bass, larval rearing starts with the hatching of artificially spawned eggs. The eggs are stocked in larval rearing tanks, hatched, and metamorphosed larvae are fed and reared with good water management. Fry are harvested after about 30 days.

Stocking

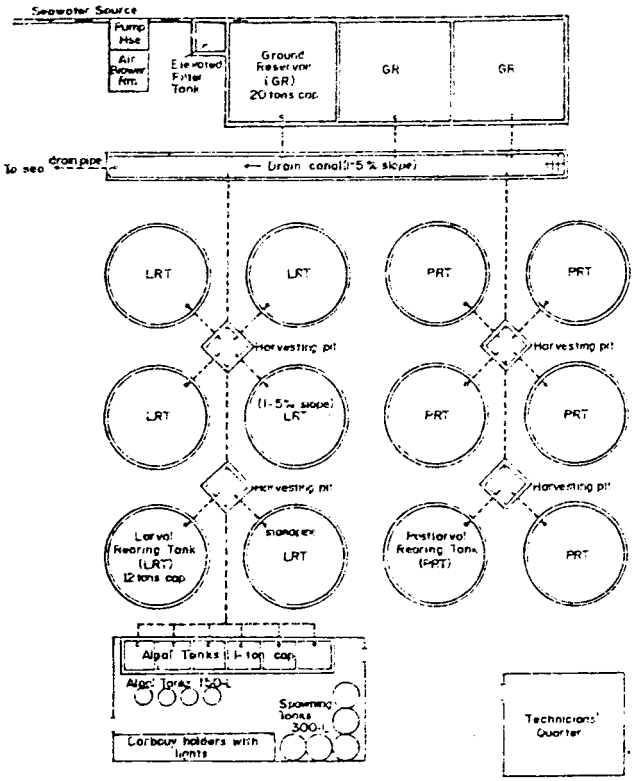
Tiger shrimp are stocked at about 50-100 larvae per liter. Milkfish are stocked at 30/l. Sea bass are initially stocked at 30/l but as they grow, this is thinned out to 15/l on the 10th day, then to 6/l on the 20th day. To minimize cannibalism, sea bass larvae are size-graded when the difference in length is about 30%.

Feeding management

A combination of live natural foods and artificial feeds are given to larvae. It is important to synchronize natural food production and larval rearing to ensure availability of food for larvae. A production schedule can be of help.

Of the live natural foods, the phytoplankters *Chaetoceros, Skeletonema* and *Tetraselmis,* and the brine shrimp *Artemia* are fed to tiger shrimp. Milkfish and sea bass are fed the rotifer *Brachionus* and *Artemia.* The algae *Chlorella* "conditions" the water in the tank.

A sample layout of a tiger shrimp hatchery. Milkfish may also be raised in this hatchery.



Algal cultures. Since it is expensive for hatchery operators to maintain pure algal cultures, starter cultures may be bought from R & D institutions like SEAFDEC/AQD. *Artemia* is commercially available; its preparation is explained by the manufacturer on the can label.

To mass propagate *Chaetoceros, Skeletonema,* and *Tetraselmis,* 1-liter starter cultures are needed. A portion is diluted (with water) and the rest used as starter for the next batch. The phytoplankters are cultured in successively bigger containers until they reach their peak density (in about 4-5 days). Cultures of *Chaetoceros* and *Skeletonema* are fertilized with urea (100 grams per ton), sodium phosphate (10 g/t), ferric

chloride (3 g/t), and sodium metasilicate (2g/t). *Tetraselmis* culture is fertilized with urea (150 g/t), 21-0-0 (100 g/t), and 16-20-0 (15 g/t).

Cultures of *Chlorella* and *Brachionus* are started at least a month before larval rearing. To propagate *Chlorella* outdoors, a 10-liter starter culture is needed to seed a 100-liter tank. Ammonium phosphate (or 16-20-0) and urea (or 46-0-0) at 16 mg per liter and ammonium sulfate (or 21-0-0) at 100 mg/l are used as fertilizers. The culture reaches peak density in 3-4 days. At this stage, *Chlorella* can be cultured in progressively large containers until it reaches 10 tons. Sodium hypochlorite (100 ml per ton) can prevent growth of diatoms. *Brachionus* may be introduced at 5-10 individuals per ml to the *Chlorella* tanks. When the algal culture changes from dark to pale green, *Brachionus* may be harvested.

Water management

The quality of the water in the tank deteriorates after some time due to the accumulation of feces, decomposition of uneaten food and dead larvae. Regular water change dilutes the concentration of toxic metabolites. Rearing water is disinfected with hypochlorite, an oxidizing agent that kills or retards the growth of pathogens, and neutralized with thiosulfate.

Harvest

Harvest the fry by partially draining the water in the tank. Using a fine-mesh net or a small basin, scoop the fry and transfer to containers, preferably big white basins. The total number of fry may be visually estimated if they are all placed in uniform containers.

If to be transported for 8 hours or less, fry are packed in double-layered oxygenated plastic bags containing 8-15 liters of water. For tiger shrimp, about 2,000-2,500 PL_{25-30} may be packed in a bag. Older fry (PL_{40-50}) are packed at 500/bag. For 21-day old milkfish, density is 300 per liter of water. For 1-cm sea bass fry, density is 500 /l.

References:

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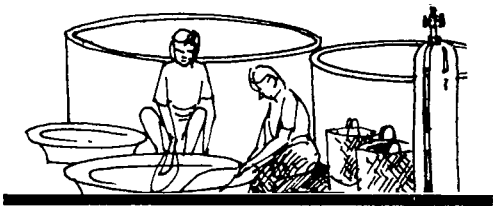
(2) FD Parado-Estepa, ET Quinitio, EL Borlongan. 1991. ***Prawn Hatchery Operations.*** Aquaculture Extension Manual (AEM) No. 19. SEAFDEC/AQD. 43 pp.

(3) M Duray. 1993. *Larviculture of marine fishes at SEAFDEC/AQD.* In: CT Villegas et al.

(4) RSJ Gapasin and CL Marte. 1990. ***Milkfish Hatchery Operations.*** AEM No. 17. SEAFDEC/AQD. 24 pp.

(5) MM Parazo, DM Reyes Jr, EM Avila. 1991. *Hatchery rearing of sea bass Lates calcarifer Bloch.* **The Philippine Scientist** 28: 65-76.

(6) MM Parazo, LMB Garcia, FG Ayson, AC Fermin, JME Almendras, DM Reyes Jr, and EM Avila. 1990. ***Sea Bass Hatchery Operations.*** AEM No. 18. SEAFDEC/AQD. 38 pp.



Video programs available at AQD

- Hatchery and nursery production of prawn fry. 10 min.
- Caring for milkfish larvae. 14 min.
- Milkfish fry acclimation and fingerling production in freshwater. 10 min.
- Milkfish fry collection, handling, and storage. 16 min.
- Culturing microorganisms for larval rearing. 12 min.