VIII

NURSERY REARING OF ASIAN SEABASS

S.R.Krupesha Sharma,
Praveen Dube and K.K.Philipose

Overview

Seabass, *Lates calcarifer*, is an economically important food fish in many countries. This species is widely distributed in the tropical and subtropical areas of the western Pacific and Indian ocean including Australia, Southeast Asia, the Philippines and countries bordering the Arabian sea. Seabass spend most of their life in a lagoon which connects to the sea. They spend two to three more years in estuarine areas until they mature, then migrate to the sea water around the mouth of a river or lagoon for spawning. Larvae and juveniles live in the sea grass bed in coastal areas for about six months, attaining a size of about 2 to 5 inches. The fish migrate to freshwater when they grow bigger.

Why nursery rearing?

Nursery rearing of seabass fry in ponds and cages to stockable juvenile size is essential before release into the grow-out ponds. The nursery rearing can be carried out either in earthen ponds or indoor cement tanks or hapas. The main purpose of the nursery is to culture the fry from hatchery (1-2.5 cm in size) to juvenile size (8-10 cm). This can solve the problem of space competition in the nursery tanks. Nursery rearing is an important phase in the seed production since this transitional phase can be used for acclimatization and weaning to artificial feed and environmental conditions that could be provided in the growout systems. In nurseries the fry can be stocked in higher densities and reared. This would save the space and time in growout phase. Beyond the nursing period, the juveniles can be graded into different size groups and stocked in separate grow-out ponds. It has been observed that the juveniles from the nurseries perform better in terms of growth and survival than those stocked directly into the grow-out ponds.

Nursery pond size ranges from 1000 to 2000 m^2 with a water depth of 80 – 100 cm. Pond with separate inlet and an outlet gate to facilitate water exchange is recommended. Pond bottom should be flat and sloping towards the drainage gate. Inlet and outlet gates are provided with a fine screen (1 mm mesh size) to cages can be fixed in PVC frames of floating frame, sinker and top lid. Around 2000 – 3000 fry can be stocked and monitoring of the fry is easy in net cages. Also, the maintenance cost of the net cages is lesser than the hapas. The only constraint is that, a floating feed should be used in cages for rearing seabass. The mesh size of the cage is 2 mm, 4 mm, 6 mm and 8 mm. The fry will grow faster in net cages than hapas as it facilitates more aerations and water circulation movements inside the cages.

The best nursing of seabass fry is nursing in tanks. Cement tanks supplied with oxygen and drain pipes are used for nursing of the fry. This paper focuses mainly on raring fry in indoor cement tanks.

From the hatchery the fry are transported to nursery site. In transporting by truck, a mixture of crushed ice and sawdust is needed to control the water temperature in the plastic bags during transport. The mixture is spread uniformly on the floor of the truck before the plastic bags are laid upon it. The proportion of crushed ice and sawdust is 1:1 for long period transport (12–16 hours) and 1:2 for short period (4–5 hours). Transportation should be carried out at night time. By this method, it is possible to control the water temperature between 19–23°C.

Nursery rearing in indoor cement tanks

Rearing system: Immediately on arrival, the fishes are given a fresh water dip and placed in cement tanks of 10' X 6' X 5' containing 7000 l of sea water. 2500 fingerlings can be reared in a tank of this size. Continuous aeration is to be ensured (Fig.1). The juveniles are reared in nursery rearing tanks up to 45 days before they are shifted to grow-out ponds or open sea cages.

Fig.1. Continuous aeration system in nursery rearing tanks

Feeding regimes: During the nursery phase extruded slow sinking feed is preferred. Crumbled feed should be provided according to the requirements and subsequently the pellet size can be increased. The size of the pellet during the nursery phase is highly correlated with the mouth size of the seabass fry.

From second day onwards the fish are fed with commercial fish feed with a pellet size of 0.5 mm diameter at four per cent of the body weight four times a day (6.00 AM, 12.00 PM, 6.00 PM and 12.00 AM) for the first 15 days. Then the pellet size is increased to 1 mm for next 15 days while the feeding rate and frequency remaines unchanged. For the remaining 15 days, the fishes are fed with a pellet size of 2 mm. Eighty per cent of the water is replaced 5 min after feeding with 20 min flow -through thereafter. It should be ensured that the feed is consumed immediately after feeding with no visible feed pellets settled at the bottom.

Water quality parameters:

Water quality parameters such as temperature, pH, salinity and oxygen are monitored daily using portable instruments, while critical parameters such as unionized ammonia (NH_3) and nitrite (NO_2) are measured fortnightly.

Grading and fish samplings:

Owing to the cannibalistic nature of the fish, size selection or grading is necessary during the whole nursery period. Grading of fish is done for once in every week with an automatic grader and grouped into different sizes. After grading, representative samples are collected for studying growth parameters.

The mechanical grader available in the market can be used for grading the fries. This exercise will give more survival rate with better growth as the seabass fry are getting the suitable feed according to their mouth size. Also, the cannibalistic characteristics will drastically come down due to timely grading.

Fig.2. Automatic grader

The fishes are graded every 15 days with an automatic grader (Fig.2) and grouped into different sizes. After grading, representative samples are collected for studying growth parameters like Average Daily Growth Rate (ADGR), Specific Growth Rate (SGR), Survival Rate (SR), Biomass, Biomass Increase (BI), Feed Conversion Ratio (FCR) and Protein Efficiency Ratio.