1994

Siganid culture in floating cages

Aquaculture Department, Southeast Asian Fisheries Development Center


http://hdl.handle.net/10862/2537

Downloaded from http://repository.seafdec.org.ph, SEAFDEC/AQD's Institutional Repository
Why not try this?

Siganid culture in floating cages

(As a preliminary guide for fish farmers on the culture of siganids in sea cages the following techniques were lifted from the Manual for Culturing Siganids in Floating Cages prepared by E. Carumbana and J. Luchavez, Marine Laboratory, Silliman University, 1979).

The scarcity of siganid in the market reflects the need for wise resource management and improved fishery. The culture of siganid can augment the market demand thus fishing pressure is decreased.

Siganid culture can be done in sea cages. The size of the cage may be big or small, depending upon how much money the fish farmer can afford for this project.

Materials needed for sea construction

A sea cage measuring 4 x 3 x 3 cm can be constructed using the following materials:

- 3 bamboo poles
- 4 m nylon fish net (5 mm mesh)
- 1/4 kg nylon cord (no. 100)
- 1/4 kg nylon cord (no. 15)
- 1/4 roll nylon rope (no. 12)
- 1 bag cement
- 20 m rubber line (cut from old tires)
- Labor expenses for 5 days

The cage should be anchored firmly to the bottom with bamboo framing as its float. The opening at the center on the upper side of the cage should be kept closed, except when feeding the fish. At least two sea cages will be needed for a ten-month rearing period.

Stocking the fry

The fry may be stocked directly from the collecting site into the sea cage, or they may be placed first in large holding tanks with fresh, clean sea water at room temperature for about one week. With siganid fry measuring 62 mm from the snout to the base of the tail, the initial stocking rate in one sea cage (4x3x3 m) should be 1000. After three months, half of the siganids may be transferred to another sea cage. The fish may then be kept until ten months from the original date of stocking. The bigger individuals may be harvested at periodic intervals.

Feeding

Siganids are primarily plant eaters; they feed on green filamentous algae, or "lumot", (and possibly the small animals trapped in the lumot). They also readily feed on leaves of terrestrial plants, particularly malunggay (horseradish), kangkong (water spinach), camote (sweet potato) leaves, and also boiled squash. These vegetables are good sources of vitamins and minerals which can contribute to the healthy growth of the fish inside the cage.

The siganids should be fed every day. About 4-5 kg of green algae will be enough to feed 1000 juveniles in one sea cage. After

16 Aqua Farm News Vol. XII (No. 5) September-October 1994
Captive siganids sometimes develop exophthalmia, cataracts, abnormal coloration, bloated abdomens, body lesions and fin rot that lead to mortality. *S. argenteus* juveniles developed exophthalmia in supersaturated (11%) water with 6.7 ppm oxygen at 33 °C. Cataracts can be due to Vit. B deficiency. Pathogenic bacteria are responsible for some cases of mortality among siganids. Mass mortality of cage-cultured *S. canaliculatus* occurred in northeast Singapore due to a Gram-positive bacterium similar to *Streptococcus faecium*. The fish changed body color, moved sluggishly, and later became blind. They exhibited violent movements, convulsion and seizure just before death. Another bacterium *Pseudomonas purrefaciens* also caused a disease outbreak among the *S. rivulatus* stock in the Saudi Arabian mariculture facility in the Red Sea. Chief clinical signs of the disease were discoloration, exophthalmia, hemorrhagic necrosis on the body and mouth, and frayed fins.

There are 35 reported species of parasites in *S. argenteus*, *S. luridus*, and *S. rivulatus* in the Red Sea. Of these, the myxosporean *Ceratomyxa* and *Zschokkella* produced acute desquamation of gallbladder epithelium and chronic congestion and distention of the hepatic biliary canaliculi, while the larval nematode *Hysterotherylacia* caused massive necrosis and fibrosis of the liver. The acanthocephalan worm *Scherocollum* also parasitizes these three siganid species, specially during extensive grazing prior to spawning of the fish. Sporozoans also cause nodular enlargement of the liver in *S. rivulatus*.

Parasitic monogenean trematodes found in siganids have caused tissue ischemia in *S. canaliculatus* and heavy mucus secretion in gills followed by suffocation among *S. spinus*. Infestation of the gills by a microsporidian also leads to death in *S. canaliculatus*. At SEAFDEC/AQD, *S. guttatus* broodstock are sometimes infested with nematodes that cause the fish to feed poorly, as well as with the ectoparasitic copepod *Caligus epidemicus*.

Cleaning the sea cage

In order to promote growth and feeding efficiency, the sea cage must be cleaned at least three times a week. Fouling organisms growing on the cage nets may be removed by using a nylon brush or an inexpensive broom. Excess food and fecal matter may be removed by scooping them out through the cage opening. The cleaner should inspect for holes around the cage walls to prevent the fish from escaping.

Harvesting

The siganids may be harvested selectively. After 5-6 months, the big fish may be harvested, leaving the small ones to grow further. Marketable sizes of siganid range from 200 to 300 g in weight. Subsequently, selective harvesting may be done every two-months.

Economics of siganid mariculture

Studies showed that fry weighing 4.55 g grow to an average weight of 52.06 g after four months. The total fish yield will be 46.85 kg if the stocking rate in the two sea cages is 1000, assuming a mortality rate of 10%. The fishfarmer will have a minimal profit after four months but if he allows the fish to grow to a bigger size and harvest selectively, more profit may be expected after ten months. The sea cages can be used for 4-5 ten-month rearing periods, if the bamboo floats and nylon cords are replaced every two years. The fishermen can therefore realize more profits after the first rearing period.