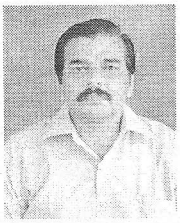
Silver Pompano : A Potential Species For Mariculture In India

Breeding And Seed Production Of Silver Pompano (Trachinotus blochii)

Senior Authors



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Focal Points at a Glance

CMFRI has now imparted a new dimension to sea cage farming and for farming in saline water ponds. The Mandapam centre of CMFRI succeeded not only in the development of another marine species (silver pompano) for sea farming but also in its seed production with salt content coming upto even 10 ppt. This success has opened up a new avenue of sea farming not only in marine cage farming but also in saline ponds having upto 10% salinity

Introduction

Among the many high value marine tropical finfish that could be farmed in India, the silver pompano, *Trachinotus blochii* is one of the topmost, mainly due to its fast growth rate, good meat quality and high market demand. The silver pompano is caught only sporadically in the commercial fishery and hence its availability is rather scarce. It is a much sought after species and hence the demand can only be met through aquaculture. The aquaculture of pompano has been successfully established in many Asia-Pacific countries like Taiwan and Indonesia. The farming can be successfully carried out in ponds, tanks and floating sea cages. The species is pelagic, very active and is able to acclimatise and grow well even at a lower salinity of about 10 ppt and hence it is suitable for farming in the vast low saline confined waters of India, besides its potential for sea cage farming.

Broodstock development and induction of spawning

At Mandapam Regional Centre of CMFRI, successful broodstock development, induction of spawning and fingerling production of silver pompano was achieved for the first time in India. Realising the aquaculture potential of pompano in India, broodstock development was initiated in the year 2008 at the Mandapam Regional Centre of CMFRI. Wild collected pompano ranging in size from 250 to 500 gm were stocked in sea cages of 6 meter diameter and 3.5 meter depth. The fishes were fed *ad libitum* once in a day with trash fish. In April 2011, 4 nos. of cage reared adult pompano (1 female and 3 males) were selected and transferred to an indoor FRP tank of 10 m^3 capacity with photoperiod control facility (14 L: 10 D) for pre-conditioning the fishes to induced spawning. The size of the female was 39.8 cm in total length and 2.245 kg in weight. The total length of the males ranged from 30.7 to 35.7 cm and weight from 1.750 to 2.1 kg. The brooders were fed *ad libitum* with squid meat and fish roe once a day. Water quality was maintained by providing a flow-through system throughout the period. Periodic cannulations were carried out to assess the maturity of the fishes for induction of spawning. On 5th July 2011, during the cannulation of the female, intra-ovarian eggs of diameter above 500 µ were observed. The maturity of the males was assessed, based on milt quality. On the same day, at 14:30 hours, the brooders were administered with HCG at a dosage of 350 IU per kg body weight. Spawning was recorded at around 04:30 hrs on 07/07/2011, approximately 38 hours after induction. The total number of eggs spawned was estimated to be 1.30 lakh. About 50 % fertilisation of these was noted (fertilised eggs were estimated at around 60,000 nos.). The eggs were collected by 500 µ mesh cloth and stocked in incubation tanks of 2 tonne capacity. The diameter of just fertilised eggs ranged from 0.85 to 1.0 mm. The eggs hatched after 18 hours of incubation at a temperature range of 30-31°c The newly hatched larva measured 2.0 mm in total length.

Larviculture

The newly hatched larvae were stocked at a density of 10,000 of them in FRP tanks of 2 m^3 capacity filled with 1.5 m^3 filtered seawater. The tanks were provided with mild aeration and green water at a cell density of 1 $x10^5$/ml. Sufficient copepods were also introduced into the larviculture tanks to ☞

provide enough nauplii to facilitate the first feeding of the larvae. On 3dph (day post hatch), mouth opening was formed which measured around 230 µ. The larvae were fed from 3dph to 9dph with enriched rotifers which were provided at a density of 5-6 nos. per ml in the larviculture tanks. Co-feeding with enriched *Artemia* nauplii was done during 10-13 dph and thereafter upto 19 dph with enriched *Artemia* nauplii alone by maintaining a density of 1-2 nos. per ml in the larviculture tanks. Weaning to larval inert feeds was started from 20 dph and the same was completed by 24 dph . From 25 dph feeding entirely on larval inert feeds was started. The metamorphosis of the larvae started from 18 dph and all the larvae metamorphosed into juveniles by 25 dph. During 20-25 dph gradings were done to separate the shooters. It was also noted that after the critical stage mortality during 3-5 dph, the subsequent mortalities were rather negligible.

Nursery Rearing

The newly metamorphosed young ones ranged in total length from 23 to 28 mm. Thereafter, the fingerlings were fed progressively with higher size range of larval inert feeds. The first phase of nursery rearing was done upto 35 dph in the hatchery with inert feeds and proper water quality management. On 35dph, the fingerlings with size range from 33-40 mm were ready for farm rearing. The survival as on 35 dph was estimated as 12%.

Transportation of fingerlings for farm trial

On 35 dph, one batch of fingerlings was transported to Narasapur (Antarvedi), in W.G. Dist of Andhra Pradesh, for farm rearing. From 33 dph onwards, the salinity of the fingerling rearing tanks was gradually reduced @ 3 ppt per every 6 hours till the salinity reached 25 ppt. The fingerlings were packed in polyethylene bags (15 L capacity) containing filtered and cooled seawater (25° c) and oxygen at the ratio of 1:3. The densities of fingerlings used for experimentation were 20, 25, 30, 35, 40, 45 and 50 nos / bag. The feeding of fingerlings was stopped one day prior to the date of transportation. Total duration of transportation was 40 hours. During transportation, the variation of temperature was from 25° to 30° c. In all the densities tested, the survival of the fingerlings was 100 %.

The bags containing the fingerlings, on reaching the farm, were floated inside the *haapas* (1.5 m x 1.5 m x 1 m) for a duration of 30 minutes. The water temperature at the farm was recorded as 35° c and salinity was 14 ppt. The fingerlings were slowly acclimatised to the ambient conditions of the farm before releasing them into the *haapas*. The fingerlings readily acclimatised themselves to the new environment and started taking feed immediately.

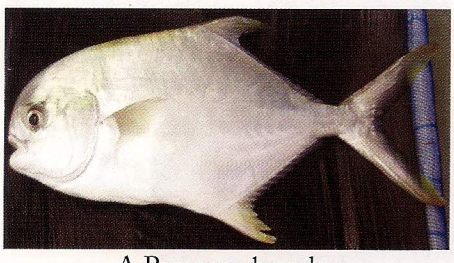
Prospects

The silver pompano is a hardy, active and fast growing species with good meat quality and it can be considered as one of the major species of high value tropical marine finfish suited for commercial mariculture in India. The larvae, fingerlings and adult are very hardy and can be easily acclimatised to lower salinities. The larvae and fingerlings can also be easily weaned to different types of feeds. The fingerlings are very tolerant to transportation stress and can be transported in comparatively higher packing densities to distant places for farming.

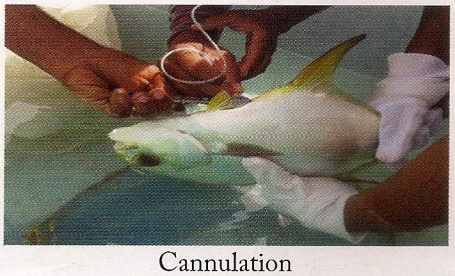
It is well understood that for commercialisation of aquaculture of any species, the vital requirement is the availability of technology for commercial level seed production. Eventhough the seed production technology of Florida pompano (*T.carolinus*) has been well established over the last 25 years, India is a late beginner in the aquaculture research of pompano and the first success of seed production achieved now is significant.

It is evident that any aquaculture venture can be popularised only if proper technology is available and the practice is of high commercial value. If the technology of pompano is standardised , the second aspect is already met as per the international market details available for Florida pompano. The dockside price for Florida pompano averaged to $8 per kg from 1994 to 2006. In the Indian domestic market the current price of pompano is about Rs.250/per kg. In the near future it appears that pompano aquaculture will become global in nature. In this emerging scenario, it is required for us to invest and establish infrastructure for the different stages from hatching to market pompano *viz.* (i) required broodstock facility for the production of viable fertilised eggs throughout the year (ii) hatchery facility for meeting the seed requirements and (iii) pompano grow-out facilities.

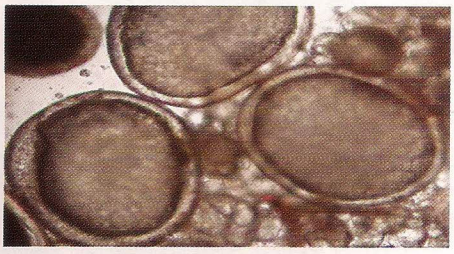
The present success in the seed production of pompano achieved by CMFRI can be considered as a milestone towards the development of pompano aquaculture in the country. However, standardisation of commercial level seed production technology is the next urgent step. Hence, investment on infrastructure for broodstock development and state of the art hatchery should be given topmost priority. It is felt that pompano is a potential mariculture giant which has vast domestic and global business prospects.



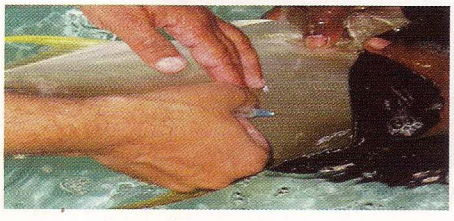
A Pompano brooder



Cannulation

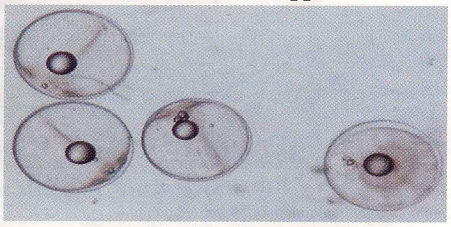


Intra-ovarian eggs



Hormonal administration

Eggs sieved from the spawning tank



Fertilised eggs

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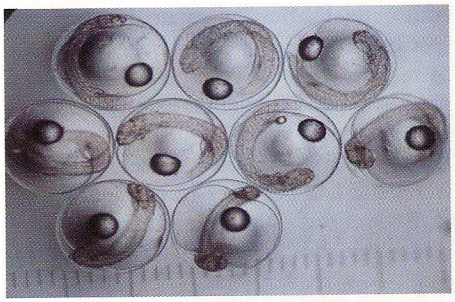
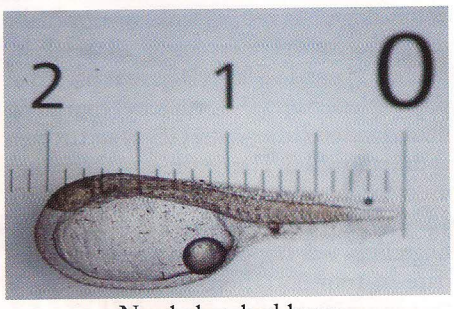
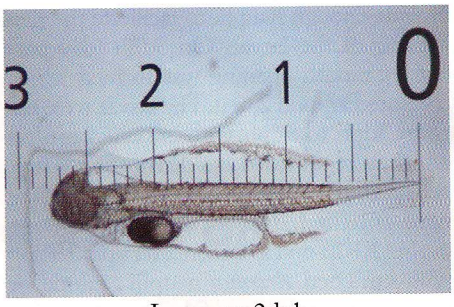


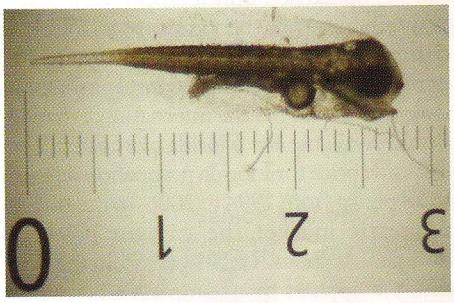
Embryonic Development



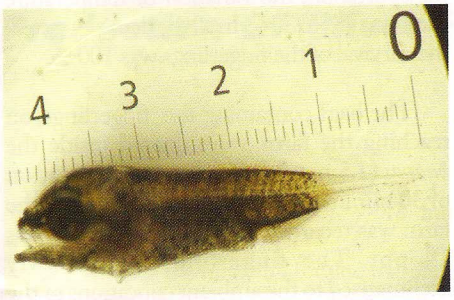
Newly hatched larva



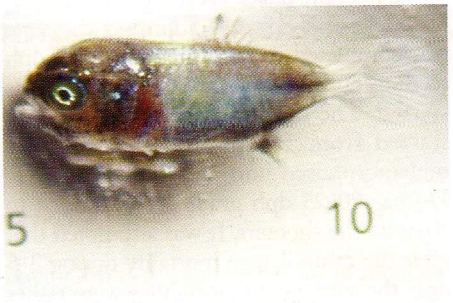
Larva on 2dph



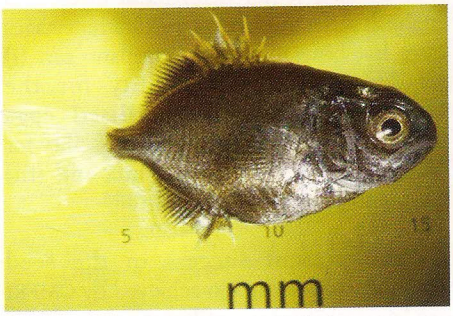
Larva on 3 dph



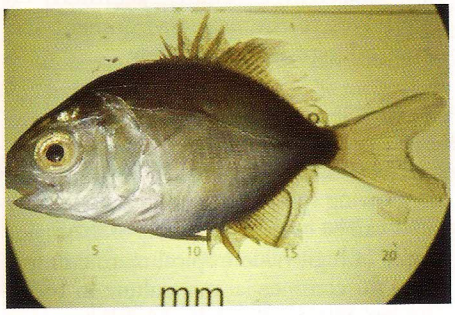
Larva on 9 dph



Larva on 12 dph



Fingerling on 20 dph

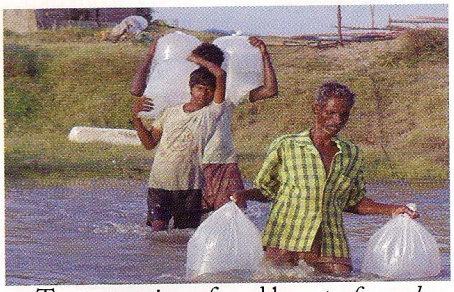


Fingerling on 28 dph

Fingerlings on 45 dph

Packed fingerlings ready for transport

Handing over of the fingerlings to the farmer



Transportation of seed bags to *for seed transfer haapas* at Antarvedi, Narasapur, *A.P*

Releasing of seeds into *haapas*

A view of culture pond with *haapas*