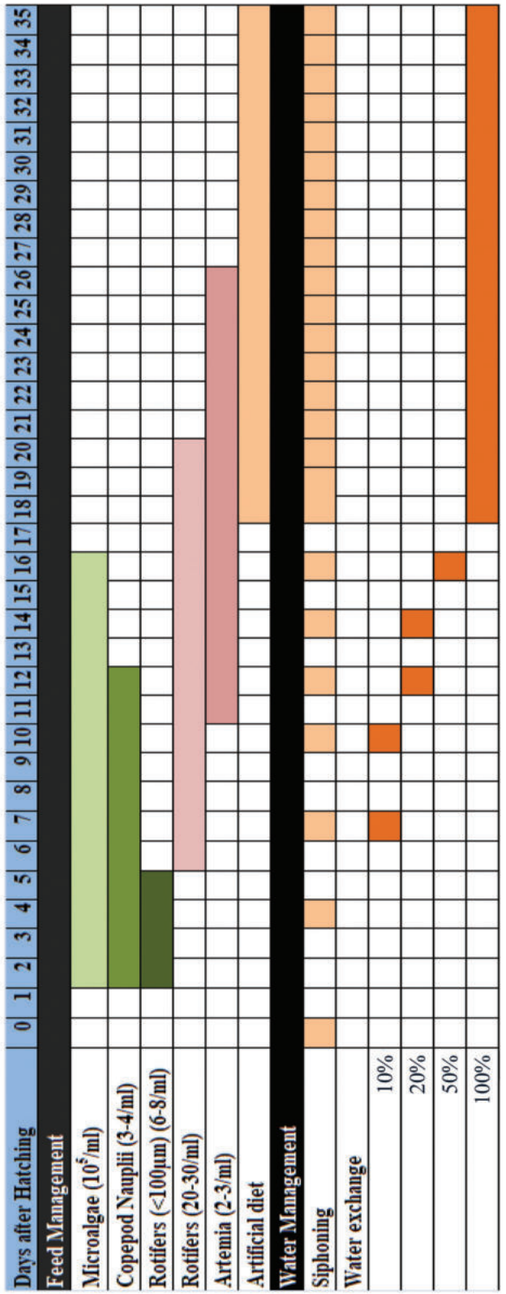
21st DPH

Nursery rearing

The nursery rearing of golden trevally was standardized with different feed and culture conditions. Pellet feed with 45 % protein and 10 % lipid was ideal during the nursery rearing. Feed are fed @ 10 % of the biomass for 3-4 times in a day. Nursery rearing was carried out in FRP as well as RCC tank with 100% water exchange daily. It is better to do nursery rearing at lower salinity (10-15 ppt) with a stocking biomass of less than 5 kg/m^3.

Fingerlings in nursery rearing



Consultancy Services offered by CMFRI:

- Layout and hatchery designing for finfish
- Training on live feeds
- Training on broodstock development and larval rearing of finfish
- Technical service for nursery rearing and grow-out culture in ponds & cages

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BREEDING & SEED PRODUCTION OF GOLDEN TREVALLY *(Gnathanodon speciosus)*

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Introduction

Among the many high-valued marine tropical finfish that could be farmed in India, the golden trevally or the banded horse mackerel or golden king fish, ***Gnathanodon speciosus*** (Forsskal, 1775) of the family Carangidae (Jacks and pompanos), sub family Caranginae, is an ideal candidate species, due to its faster growth rates, good meat quality, and market demand for both consumption and ornamental purposes. Golden trevally is generally is a reef associated fish and lives in company of larger fishes like skates, sharks, groupers etc, especially the juveniles acts as pilots for sharks. It is widely distributed throughout the tropical and sub-tropical waters of the Indian and Pacific Oceans. These fishes are basically bottom feeders but are globally known to be trophies by anglers and fish gaming enthusists. It is a silver grey fish with yellowish colouration on belly, with scattered black patches and all fins coloured yellow and a black tail. The juveniles are more golden in colour with the black bands giving them a very attractive look and hence a preference for aquarium keeping. The golden trevally landing observations showed decreasing trends in its landing estimates i.e. 1106 t in 2019 reduced to 375 t in 2023.

Therefore, it was felt a necessity to develop seed production technology of golden trevally and accordingly breeding and seed production technology of golden trevally, *Gnathanodon speciosus* was initiated and perfected at Visakhapatnam Regional Centre of ICAR-Central Marine Fisheries Research Institute, Visakhapatnam, Andhra Pradesh.

Golden trevally broodstock

Broodstock development and spawning

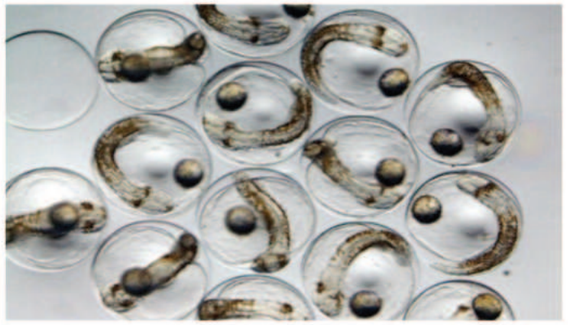
Wild collected juveniles of golden trevally (100 g) were reared in cages installed off Visakhapatnam coast. After three years of rearing in cages, fishes grown to a size of 3.5-4.0 kg. After which, adults were cannulated to assess the gonadal condition as well as sex of the fish.

The matured brooders were shifted from cage to land based system. The brooders brought from cages were given prophylactic treatment in 20 ppm formalin in fresh water for 10 minutes to avoid any external parasite. Then the fishes were stocked @ 1 kg/m^3 in ratio of 1:2 (female and male) in circular concrete tank of 35 m^3 capacity fitted with Re-circulatory Aquaculture System (RAS). The tank is connected with different components of RAS such as rapid sand filter to remove suspended solids, protein skimmer to eliminate dissolved solids and biological filter to reduce biochemical waste. The whole tank water is getting recirculated 300% per day, and the water is added at the rate of 3% to top up the loss happening due to protein skimmer and backwashes of rapid sand filter.

Brooders in RAS

The fishes are fed on fresh squid, clam meat and crab at 2:1:1 ratio fortified with squid oil, vitamin - mineral pre-mix in a day till satiation.

The brooders mature within 2 months with ova size of 400 -450 µm. Spawning is obtained either naturally or by inducing with hormone. The number of eggs spawned by golden trevally ranges from 0.8 to 1.5 lakhs. The spawned eggs from broodstock tank are collected by passing the surface water through an egg-collecting chamber fitted with a hapa of 500 µm. Collected eggs are treated with 15 ppm iodine solution for 10 minutes with strong aeration. Treated eggs are stocked in 100 l aquarium tanks @ 200 nos per liter. Bottom settled eggs are removed after 2 h of stocking. The size of the fertilized eggs ranged between 820-870 µm. The eggs hatched out after 12-14 hrs. of incubation at a temperature range of 28-30° C and salinity 30 ppt with mild aeration. Newly hatched out larvae are free floating on the water surface.



Embryonic devlopment

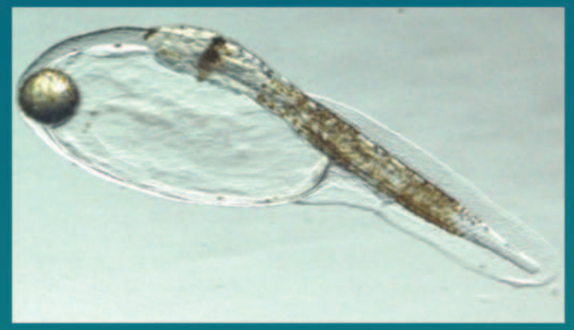
The overall fertilization and hatching rate were found to be 79 ± 1.55 % and 83.67 ± 0.81 %, respectively. Subsequent spawning of golden trevally was achieved at an interval of 7-9 days in RAS.

Larviculture

The newly hatched larvae measures 1.70-1.80 mm in total length. The mouth opening is formed 38-44 h post hatch. The newly hatched larvae are collected from the water surface of hatching tank and stocked in larval rearing tanks @ 10 no/ml. Water depth of the larval rearing tank is maintained at a minimum of 80 cm. Green water is used for larval rearing.

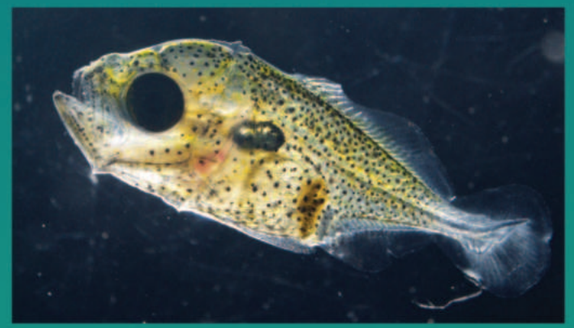
Hatching in progress

Rotifers and copepod nauplii were added from 2nd DPH onwards @ 6-8 nos./ml and 3-4 nos./ml. *Artemia nauplii* were used in larval rearing tank from 11th DPH. Weaning of larvae with inert diet was started from 18th day.



Just hatched out larvae

Metamorphosis of the larvae started from 22-25th day and was completed by 33rd day. The size of the metamorphosed fry ranged from 19 to 21 mm. Juveniles of golden trevally were harvested after 45-50 days of larval rearing and were shifted for nursery rearing. After 51 days of rearing post-hatch, the early fry reached an average size of 2.98 cm and 0.46 g with a survival rate of 2.71%. Longer duration of light (1000 lux) was provided for two to eight days of larval rearing; afterwards natural light period was followed. Feeding and water management during larval rearing is depicted below.



8th DPH