



CMFRI paves way for Culture production of Groupers, Cuttlefish and Clownfish

Groupers: Breeding and Seed Production

Groupers are highly esteemed marine food fish which are in great demand in the export market. The technology for breeding protogynous marine finfish has not been developed in the country until recently. The reason is that Groupers happen to be functional females initially, reverting later to be functional males. This peculiarity renders breeding them in captivity a challenging task.

In the onshore and indoor fully controlled mariculture facility developed at the Fishing Harbour Laboratory of the CMFRI, at Kochi, fingerlings of *Epinephelus tauvina*, reared in 5 tonne capacity FRP tanks from February 1996 onwards, were given specially formulated maturation diet from May 1998. Some of them were treated for sex reversal. The experiment resulted in successful sex reversal, maturation and spontaneous spawning. About two lakhs of viable eggs were released by one female and fertilisation was 100%. All the larvae survived for about 10 days. Thereafter, there was mortality due to deformation of the body. The system defects are being overcome to ensure successful rearing of the larvae into fingerlings.

The encouraging results in this experiment, obtained for the first time in India are: successful rearing of groupers for a period of over 3 years, broodstock development, sex reversal, maturation and spontaneous spawning in onshore, and indoor fully controlled systems. These results have paved the way for breeding and hatchery production of seed of the groupers, a valuable fish.

Breakthrough in captive breeding of spineless Cuttlefish, *Sepiella inermis*

S.inermis is an important cephalopod component of bycatch of shrimp trawlers all along the coastal belt of India. Cuttle fishes lay egg masses in sheltered and calm areas in the inshore

waters. The Tuticorin Research Centre of CMFRI collected egg masses from Manapad, near Tuticorin on the east coast of India in September 1998 and kept in filtered sea water. It took ten days for the entire egg mass to hatch out and release the young ones. The mantle length of the hatchlings was 2mm. Initially the hatchlings were fed with only mysids but subsequently they were given a mixed diet of acetes and mysids. The hatchlings showed good growth rate. In a period of 75 days they weighed each 37.9g (mean) and had a length 57.2mm (mean).

The two and half month old cuttlefishes mated and spawned in the rearing tanks. This development is in contrast to the general practice of collecting the egg masses from the natural spawning grounds for seed production. Now, for the first time in the country hatchery production of cuttlefish seed has become possible from the second generation.

After mating, the female cuttlefish deposited eggs on the aeration tubes and on nylon ropes inside the tank. The first batch of eggs were obtained on 18 Nov 1998. Once it was observed that nylon ropes were ideal substrates for egg deposition, additional ropes were provided in the rearing tanks to facilitate deposition of more eggs. Eggs were deposited one by one at an interval of approximately 40 seconds. There was fertilisation of all eggs and development of viable embryos inside them. After an incubation period of 13 days the first batch of hatchlings came out.

With this landmark achievement, *S.inermis* has emerged as a potential species for mariculture. The fast growth rate, short life cycle, high fecundity, good hatching rate and absence of larval stages are the advantageous features of *S.inermis* as an attractive culture species.

Clownfish :Hatchery Seed Production

The clownfishes are popular among marine fish aquarists due to their

generally small and hardy nature, attractive colours, high adaptability to life in captivity and the interesting display of behaviour due to their association with sea anemones. A technology for hatchery production of the clownfish, *Amphiprion chrysoaster* was developed at the Vizhinjam Research Centre of the Central Marine Fisheries Research Institute, for the first time in India.

The broodstock was raised by following a well drawn feeding schedule with minced beef and boiled mussel meat. The brooders, 8 to 9 cm in length spawned frequently in the brooder tanks. The interval between successive spawnings of a pair varied from 10 to 45 days, with a release of 300 to 800 eggs at each spawning.

The orange coloured stalked, capsule shaped eggs, having a length range of 1.7 to 2.9 mm hatched out in six to seven days. Peak hatching took place between 1900 to 2200 hrs. Hatching was to the extent of 100%, when the eggs were transferred to hatching tanks on the previous day of expected hatching. The length of the newly hatched larvae ranged from 2.5 to 3mm. The larvae were fed with the rotifer (*brachionus rotundiformis*). The average length of the young ones after metamorphosis into juveniles, between 12 to 15 days, was 8mm.

The major technological aspects of clownfish rearing include successful development of broodstock, methods of hatching the eggs, development of a biological detoxifying filtration system for larval rearing and appropriate larval feeding schedule. All these hurdles have been successfully overcome now, and by upscaling the presently developed technology large scale production of young ones of clown fish for the export market could be achieved. The present technology can be considered as a milestone towards the development of a marine ornamental fish trade in India.

