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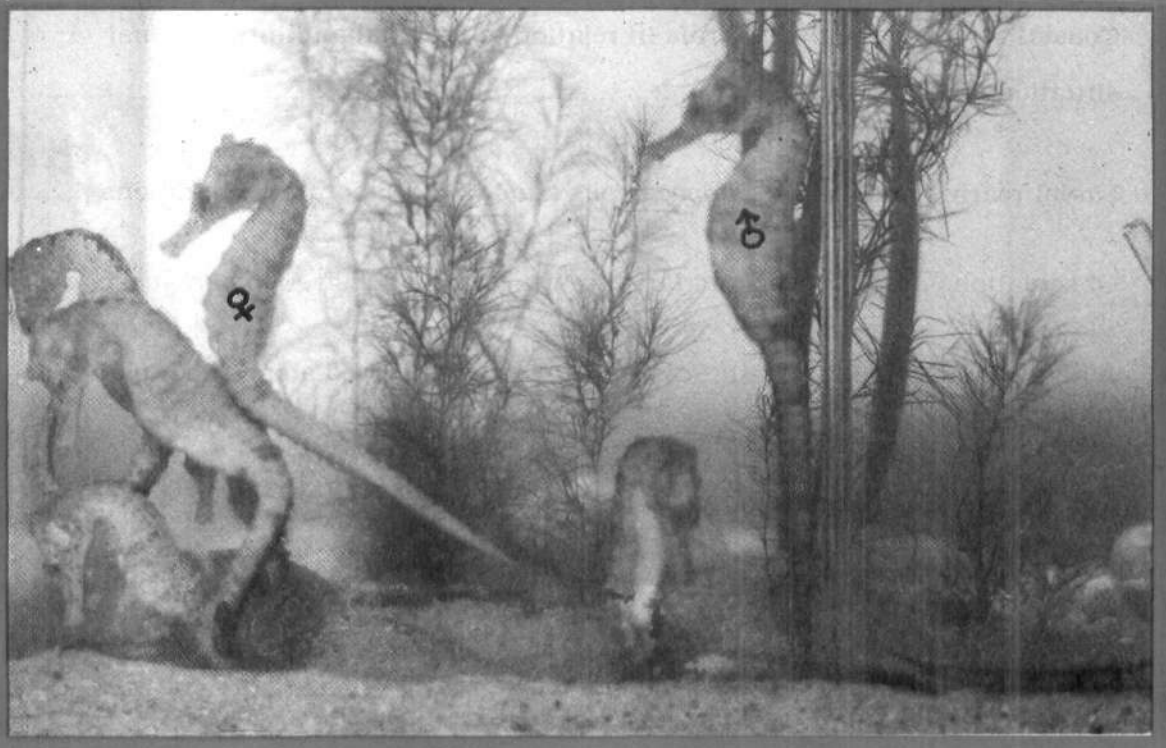

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## 917 OBSERVATIONS ON SPAWNING AND LARVAL REARING OF CLOWN FISH *AMPHIPRION SEBAE*

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### Introduction

The clown fish *Amphiprion sebae* is one of the very few marine ornamental fishes that has been successfully bred in temperate waters. In India for the first time successful larval rearing was accomplished at the Regional Centre of CMFRI, Mandapam Camp. The technique developed can be adopted in selected places and commercial clown fish hatcheries can be established. This not only helps in improving the export trade and foreign exchange inflow but also meet the ever increasing demand for this exquisitse fishes by the aquarists.

Fig. 1. Adult pair of clown fish *Amphiprion sebae* along with sea anemone.

### Brood stock maintenance

Adult pairs of clown fish *Amphiprion sebae* (Fig. 1)collected from the inshore waters of Gulf of Mannar along with the sea anemone were maintained in 1 tonne glass aquarium tanks. Biofilters were fitted for maintaining clear seawater. The temperature ranged from 28-32°C and salinity from 33-35 ppt in the brood stock tank. Fishes were fed with fish and bivalve meat and selected pairs were supplimented with live marine polycheate worms. Broodstock maintenance continued for 3 months.

**Spawning and egg development**

Fishes supplimented with polycheate worms matured faster and started spawning within 3 months and spawning continued till 4th month. Spawning occurred every 10th day invariably in morning between 0800 and 1200 hours. Females laid about 300 to 600 eggs on the substratum provided in the tanks. Subsequently the male fertilised the eggs. Mostly the male fishes fanned the cluster of eggs at regular intervals (Fig. 2). The dead and unfertilised eggs were selectively removed by the parents during the course of incubation which lasted 6-7 days. The eggs were 2-3 mm in length and 1 mm diameter and were adhered to the substratum by a stalk. For the first 2 days, the eggs were pale yellow/orange colour, later turned to dark brown and becasme silvery as the embryonic development progressed. Eye development took place on the 6th day.

Fig. 2. Male clown fish 'fanning' the cluster of eggs.

**Live feed culture**

Three different live feeds were used for the rearing of the larvae. Rotifers were cultured using marine *Chlorella* as feed and were enriched by blending cod liver oil and egg yolk to form an emulsion. The emulsion was added to the rotifer culture at the rate of 1 ml/l of rotifer culture having a density of 500-1,000 rotifers. After 6 hours they were seived, washed and used for feeding.

Copepods were produced by batch method. Adult copepods were seived through 250 µ mesh and inoculated to 250 litre tank at concentration 5-8 nos/ml. *Chlorella* and *Nanochloropsis* sp. were used as feed for copepod at the rate 0.1 lakh cells/ml. Continuous aeration was provided and after 10 days copepod nauplii were ready for feeding.

*Artemia* cyst were hatched in transparent containers provided with vigorous aeration and thereafter the nauplii were ready for harvest and feeding.

**Hatching and larval rearing**

After 5 days of incubation the fully developed eggs were transferred to the hatching tank (100 l). Unicellular algae dominated by *Chlorella* were added to the tank as water conditioner in addition to rotifer *Brachionus plicatilis* ( < 100 µ ) at a concentration of 10-15 nos/ml of sea water. Extreme care was taken while transferring the eggs not to expose to bright light and air. The eggs were given artificial fanning with the help of air stones. matching took place on the 7th day invariably in darkness between 1800-2000 hours, when the temperature and salinity were 28° C and 33 ppt respectively.

Approximately 70 % of the fertilised eggs were hatched out each time. The newly hatched larvae measured 2-3 mm in size and had a transparent body, large blue eyes, open mouth (250 µ ) and a small dark yolk sac. The larvae also had a fully developed heart, blood vessels and network of nerves and ganglia. Fins were in the process of development. Immediately after hatching, the larvae were floated on the surface vertically. After 3-4 hours of hatching they were transferred to rearing tanks (250 l) and were fed with enriched rotifers below 100

μ in size. At this stage a considerable level of mortality was observed. On the 5th day the larvae started feeding on copepod nauplii ( > 250 μ ) and larger rotifers (>100 μ). The larvae grew to 6-8 mm at the end of 7th day. During the growth, the depth of body increased faster than the length. The larvae were tan in colour with large silvery prominent eyes. Larvae swam freely in the water column with fully developed fins and the caudal fin showed jerky movements. On the 10th day, the larvae started accepting the *Artemia* larvae. Slight orange pigmentation started appearing near the dorsal part of the body. On the 12th day, two white bands appeared and later they became prominent and the colour of the lips changed to yellow. By the 15th day the larvae became juveniles by attaining all colouration patterns of the adult fish. At this stage, the fishes exhibited a change in the swimming patterns by going down to the bottom and touching their ventral portion with the tank bottom instead of swimming in the column. When this behaviour was observed the juveniles were transferred to 1 tonne FRP tanks having few sea anemones. Within a day, the fishes got accommodated in the anemone and accepted *Artemia* and minced earthworm. On the 30th day, the fishes started feeding on minced fish, prawn and clam meat.

**Remarks**

Mortality of larvae was found more on the 2nd and 7th day. This was due to the size of the feed supplied and nutritional insufficiency in terms of essential fatty acid content respectively. Bacteriological examination of dead larvae did not show any pathogen responsible for mortality, thus confirming that the feed could only be the sole factor. Later the mortality during the 7th day was overcome by extensively using copepods in combination with rotifers. The use of enriched rotifer and copepods resulted in higher survival of larvae.