

MARINE ORNAMENTAL FISHES

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INTRODUCTION

The increasing popularity of keeping ornamental fishes in home aquaria in several countries has been responsible for their high demand. This has led to the substantial trade for these fishes in the international markets. The world trade on ornamental fishes was around US\$ 4.5 billion in 1994, of which freshwater ornamental fish trade formed about 85%. India's annual contribution to the world trade of ornamental fish is about Rs.10 crores and almost the entire trade is based on freshwater ornamental fish. There is considerable scope for initiating and developing export of marine ornamental fish from India. The marine ornamental fishes are inhabitants of coral and rocky areas and marine plants. They are abundant in the Gulf of Mannar, Palk Bay and Gulf of Kutch in the mainland coast and in the Lakshadweep and Andaman islands. Among all these regions, the lagoons and reef flats in the Lakshadweep group of islands are the richest both in regard to number of species and their numerical abundance.

DISTRIBUTION

1. Lakshadweep Islands: Of over 600 species of marine fishes reported from this region consisting of 36 islands more than 300 species belonging to about 35 families are known for their attractive colours and shapes. Among them, the wrasses (Labridae) constitute the largest group with 45 species followed by damsel fish (35 species), cardinal fish (22 species), groupers (21 species), blennies (20 species), surgeon or unicorn fishes (19 species), butterfly fish (16 species), goat fish (14 species), gobies (14 species), squirrel fishes (9 species), trigger fishes (10 species), scorpion fishes (14 species), and others. The Central Marine Fisheries Research Institute is presently engaged in the survey of ornamental fish resources of Lakshadweep. The study shows that 199 species are common in these islands.

Among them, the wrasses are the most dominant numerically constituting 37% of total population, followed by damsel fish (31.9%), parrot fish (8.4%), goat fish (8.2%), squirrel fish (4.7%), surgeon fish (4.6%), butterfly fish (2.1%), groupers (1.2%), trigger fish (0.8%), puffer fish blennies (0.6%), moorish idol (0.4%) and angel fish (0.1%).

Of the eight islands surveyed so far, Kalpeni is the richest in regard to numerical abundance of the above groups of fishes harbouring 28.8% of the population in all the eight islands followed by Amini (27.6%), Kadamat (15.4%), Chetlat (9.2%), Kavaratti (7.4%), Agatti (6.3%), Kiltan (3.2%) and Bitra (2.2%).

Of the 199 species of the above 12 groups, 72 species are dominant numerically and offer considerable scope for exploitation and export.

2. Andaman group of islands: These islands offer a variety of habitats such as rocky coasts with tidal pool, extensive backwaters, bays and mudflats which provide potential areas for exploitation of rich and varied marine fishes. About 150 species of ornamental fishes are known to be available in these islands which belong to the groups: squirrel fish, scorpion fish, groupers, butterfly fish, sat fish, angels, damsel fish, wrasses, blennies, surgeon fish, rabbit fish, trigger fish, bok fish, puffers and others. In the Marine National Park, Wandoor, Andamans, a recent survey showed that angel fishes are the most abundant forming 32% of the total followed by snappers and fusiliers (29%), surgeon fish (18%), coral fishes (12%), Spine foot (4%), wrasses (3%) and others (2%).

3. Gulf of Mannar and Palk Bay: This region has several islands with extensive coral reefs around them. About 100 species of ornamental fishes belonging to about 30 families are known from this region and butterfly fish, wrasses, damsel fish, rabbit fish, scorpion fish are among the dominant ones.

FISHERY

In India, marine ornamental fishes are least exploited presently. Gears like lift net, seine net, scoop net and traps can be used for the exploitation of ornamental fish. Studies conducted at Vizhinjam on the development of an ideal gear for the collection of ornamental fishes without causing any damage to the ecosystem have helped to design an ornamental fish trap of 4'x2'x2' size. These traps with live mussels kept inside as feed, can be immersed in the reef areas and retrieved next morning.

This gear yielded an average of 20-25 fishes per day. Ten such cages operating as one can yield 200 - 250 fishes a day without causing any damage to the ecosystem.

MANAGEMENT

Most of the marine ornamental fishes are abundant in coral reef areas in shallow waters. Exploitation of these fishes on a commercial scale is likely to result not only in quick over exploitation but also in the destruction of coral environment. Hence the policy of exploitation & export of ornamental fish from marine environment should consider the following:

1. Protection of environment

The clown fishes (*Amphiprion spp.*) are known to be symbiotic with sea anemones; most of the damsel fish live among coral colonies and any disturbance makes them hide deep in the corals rendering it virtually impossible to catch them. Similarly the surgeon fish, snappers, wrasses, squirrel fish and such others also live among corals. The exploitation therefore tends to destroy the corals and eventually the environment. The exploitation strategy should first consider proper measures to monitor the exploitation, and protection of environment; the formulated measures should be strictly implemented right from the very beginning instead of waiting till the adverse effects appear.

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ii. Exploitation

Only non destructive methods of exploitation should be permitted. Among the non destructive methods, trap fishing is one of the best; however, some fish do not enter traps. In such cases net enclosures should be permitted. Though the marine ornamental fishes are more abundant in the island ecosystems, their exploitation and export on a small scale may have to be initiated in the mainland coast particularly in the Gulf of Mannar and Palk Bay and on the basis of experience gained, the same can be extended to the islands.

iii. Monitoring the exploitation and export

In view of the lucrative nature of the marine ornamental fish trade, several firms are likely to enter the trade and the exports may be channelized through different centres to different destinations. For the purpose of monitoring the exploitation and export, a single agency has to be created to monitor and oversee everything related to ornamental fish trade. The entire transportation, both domestic and abroad, should be channelized through this agency. Data on location of fishing, species wise number of fish transported along with the length of each specimen transported should be collected and maintained for future use. Total allowable catch for each ornamental fish species has to be fixed in the very beginning for each of the ecosystems so that the exploitation does not reach unmanageable levels.

iv. Breeding and culture

Steps to develop technology for breeding, seed production and culture of marine ornamental fishes in suitable localities, preferably in the Gulf of Mannar and Palk Bay areas, should be given the highest priority to conserve the wild stocks, protect the fragile coral environment, avoid conflicts, facilitate increase in export of marine ornamental fishes and provide continuous and increased employment opportunities.

v. Sanctuaries

One or two lagoons of the Lakshwadeep islands, particularly the Bangaram which is open for tourists may be identified as sanctuaries and all necessary steps taken to protect the lagoons from human intervention. The marine parks in the Gulf of Mannar and the Wandoor National Park in Andamans should receive further support to strengthen the conservation of marine biodiversity.

AQUARIUM MANAGEMENT

Marine aquarium management needs scientific and practical knowledge in selecting fish and the aquaria. The most difficult and probably the most vital aspect is to simulate near natural conditions in marine aquarium. For successful fish-keeping, environmental characters like temperature, oxygen, pH, and other factors like water circulation, filtration, lighting, feeding, plant health etc. should be taken into account. Further, the aquarist should have the basic ideas about the biology of the fishes and the different factors controlling their growth in the tank.

Though aquarium tanks are available in several sizes, the ideal one for a home is an all glass tank of 1.2x0.6x0.6m size with 12 mm thick float glass. Since the tank with water, gravel, plants, fishes and other accessories are very heavy, a strong stand either of wood, aluminium or iron is essential. The tank should be provided with a dome of triangular or rectangular shape for providing artificial light, to minimise evaporation and also to prevent foreign objects and insects falling into the tanks. Keeping the aquarium tank from direct sunlight and illuminating with artificial light will help to check the unnecessary algal growth in the tanks besides controlling the water temperature.

The water in the marine aquarium slowly gets polluted due to excreta, leftover foods, dead plants etc. These waste materials release large amount of ammonia into the water which is toxic to the fishes. Hence, to convert this ammonia into nitrite and nitrates, a biological filter can be used. A simple biological filter can be made by using a 1.2x0.6x0.6m size perspex sheet of 6 mm thickness. On the ventral side lengthwise and breadthwise 1" strips have to be fixed for keeping the filter slightly above the tank bottom. The entire sheet and bottom supports have to be perforated with 5 mm holes for effective water exchange. Vertical pipes can be fitted on the four corners of the pipe for air lift. Air tubes can be inserted through the vertical pipes into the bottom and when connected with a power filter or compressor there will be sufficient air lift in the tanks. Gravels of 3 to 5 mm size may be put on top of the filter upto about 8cm thickness.

A tank fitted with biological filter will take care of the quality of the water. The fishes require shelter for settlement. Necessary shelter can be provided by using dead corals, small boulders, earthen pots, dead barnacle shells, plants etc. For better aesthetic view, this can be designed with imagination.

Good quality seawater is the most important factor in the marine aquarium. Collected and stored in black containers for about eight days, this water can be filtered and used in the tank. After allowing the sand particles to settle down and keeping the tank without aeration for 24 hours fish can be introduced subsequently into the tanks and the power filters should work continuously. The water will remain crystal clear and one need to supplement only the water evaporated from the tank periodically. Full water change, in such a tank, needs only once in six months.

Before introducing the fishes directly into the tanks, it is necessary to quarantine them in separate tanks. This is essential to heal injuries while capturing. Fishes can be treated with 2% KMnO_4 solution or 2 ppm oxytetracycline (water soluble) in the quarantine tank. Fishes are normally kept one day in quarantine tanks and later released into the rearing tanks.

The holding capacity of the tank depends on the volume of the tank and its oxygen content. From the recent studies it is found that the ideal stocking density is one fish for every 15 to 20 litres of water and the oxygen level is 5 ml/l. Live and artificial feeds can be used in the aquarium. The live feed such as rotifers, cladocerans, copepods, brine shrimp etc. can be cultured in cement cisterns, plastic pools or FRP

tanks. These can be used as feed for young ones as well as for adults. Artificial feeds enriched with essential vitamins and growth promoting hormones are readily available in the market. This can also be prepared by the aquarist, by using animal protein (clam, mussel or anchovy), algae, minerals and vitamins. Tubifex worms, small fishes, shrimps, cooked mussels, clams, anchovies and *Acetes* also form excellent feed for marine ornamental fishes.

Fishes tend to get injuries and infection occasionally due to mutual aggressiveness and shock. Waterborne diseases also can affect fish health in tanks. The affected fishes can be detected by their sluggish movement, colour change, less feed intake etc. As soon as an infected fish is detected, it should be removed from the tank and kept in the quarantine tank. For injuries and fungal infection treatment with 2 ppt KMnO_4 solution and 2 ppm oxytetracycline is adequate. After cure, they can be shifted back to the main tanks.

An aquarium in a living room can influence the mental attitude of individuals. Sitting besides a tank and watching the pets moving around can decrease the stress and tension. This is one reason for the aquarium fast becoming an integral part of the modern drawing rooms.