

# ORNAMENTAL FISH - PROSPECTS FOR CULTURE

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## Introduction

The aquaculture industry in Andhra Pradesh and elsewhere is stagnant incurring heavy loss due to failure of the shrimp crop. At present shrimp hatchery operators are aiming at diversification, which will be economically viable for the industry. Ornamental fish culture and trade is one area, which has a potential globally.

The art of keeping aquarium is ancient and it started around 800 B.C. in China with the gold fish *Carassius auratus*, which is in demand and a popular ornamental fish throughout the world even today. The marine aquarium keeping started late, commencing in 1930's. The hobby of maintaining marine ornamental fish at home and in public aquaria is rapidly increasing in many countries and hence the demand and trade of these fishes has increased and is now a lucrative business. These fishes are often called as "living jewels" due to their varied colour, shape and behaviour. The estimated world trade on ornamental fishes is around US \$ 4.5 billion of which fresh water sector forms 85% and marine sector 15%. However the value of marine ornamental fish is more, fetching around US \$ 1000 per kg as against US \$ 100 for the freshwater fishes.

The bulk of the ornamental fish trade is based in Asia especially in Singapore, the other countries involved in ornamental

fish trade are Indonesia, Thailand, Hong Kong, Sri Lanka and the Maldives. The largest importers of marine ornamental fishes are USA, Japan and Europe. The ornamental fish trade in India is a small scale one limited to freshwater fishes and no marine species is being exported from India. India's share in global ornamental fish trade is about Rs.10 crores. There is a vast potential to increase the level of exports to Rs.110 crores per year.

## Marine Ornamental Fish Resources of India

India has a rich source of ornamental fish resource distributed over widely in its vast EEZ and along its long coastline covering nine maritime states. The marine ornamental fishes are inhabitants of coral and rocky areas and also occur among marine flora. More than 600 species of ornamental fishes are reported of which around 300 species belonging to 35 families are known for their attractive colours and shapes. The ornamental fishes are abundant in the Gulf of Mannar, Palk Bay and Gulf of Kutch along the mainland coast and in the Lakshadweep and Andaman & Nicobar Islands. Among these areas, the lagoons and coral reef flats in the Lakshadweep Islands have the richest and diverse resource of ornamental fish. The important groups of marine ornamental fishes are clown

fishes, damsel fishes, angels, wrasses, moorish idols, surgeon fishes, tangs, butterfly fishes, trigger fishes, parrot fishes, bat fishes, scorpion fishes and sea horses etc.

Some countries have achieved significant progress in perfecting the technology of captive propagation and breeding of ornamental fish such as clown fish, snappers and groupers. Netherlands perfected breeding technology of clown fish, Singapore has lutjanid breeding technology, while Thailand, Australia and Indonesia have perfected the breeding technology of groupers. However the technology in India is limited to some species only. Recently the Central Marine Fisheries Research Institute perfected breeding and hatchery technology of clown fish.

### Resources of Andhra Pradesh

The state of Andhra Pradesh ranks first in aquaculture production in India. It has a coast line of about 980 km; two large estuarine systems at the mouth of the rivers Godavari and Krishna, backwater areas near Kakinada and rocky patches around Visakhapatnam and along the northern coast of Andhra Pradesh. No survey has been conducted to assess the ornamental fish resources of the Andhra coast. A preliminary survey revealed that there are about 20 species of ornamental fishes belonging to 13 families in the rocky patches near Visakhapatnam outer harbour. The details of fishes collected during the survey are presented below.

S.No.	Family	Popular Name	Species
1	Chaetodontidae	Butterfly fish	<i>Chaetodon vagabundus</i> , <i>C. auriga</i> , <i>C. lineolatus</i> , <i>Heniochus acuminatus</i>
2	Pomocanthidae	Angle fish	<i>Pomacanthus annularis</i>
3	Balistidae	Trigger fish	<i>Balistapus undulatus</i>
4	Acanthuridae	Surgeon fish	<i>Acanthurus nigricauda</i>
5	Callyodontidae	Parrot fish	<i>Callyodon sordidus</i>
6	Labridae	Wrasse	<i>Gomphosus</i> sp.
7	Pomocentridae	Damsel fish	<i>Abudefduf sexfasciatus</i>
8	Mullidae	Goat fish	<i>Upeneus vittatus</i> , <i>U. sulphureus</i> , <i>U. molluccensis</i> and <i>U. tragula</i>
9	Serranidae	Groupers	<i>Epinephelus tauvina</i> <i>E. malabaricus</i>
10	Syngnathidae	Sea horse	<i>Hippocampus kuda</i>
11	Ostracidae	Cow fish	<i>Lactoria cornuta</i>
12	Tetradontidae	Puffer fish	<i>Tetradon immaculatus</i>
13	Scorpaenidae	Scorpion fish	<i>Pterios volitans</i>

### **Scope and Prospects In Andhra Pradesh**

In Andhra Pradesh there are about 200 hatcheries, which mainly aim at production of tiger prawn seed. Almost all hatcheries are closed during off season due to lack of demand for the seed. During this period the ornamental seed production can be carried out to keep the hatchery in operation. The fish will reach marketable size within six months. The commercial production of clown fish, for which the hatchery and breeding technology has been perfected, can be taken up. This will enable productive hatchery operation throughout the year.

A complete survey of the Andhra Pradesh Coast has to be conducted to assess the availability, abundance and diversity of the species of ornamental fishes, which will aid in planning breeding and culture programmes. Ornamental fish culture and export is one of the recent areas in aquaculture diversification. About 99% of the ornamental fish sold globally are caught from the wild. There is ample scope for ornamental fish culture because of its high commercial value and significant market demand worldwide.

Ornamental fishes are known for their colour and shapes. Isolation and identification of genes responsible for colour

and shape variation is essential. Transgenic fish with desired colouration and shape could be produced by recombinant DNA technology. The conventional methods of strain identification and selective breeding are cumbersome. There are two goals in any genetic manipulation programme of ornamental fishes. First is the improvement of fish stocks to enhance their variability, reproductive fitness and adaptability to environmental changes. The second is the introduction or development of novel and exotic fish variants to sustain the colouration and shape, which would be of interest to aquarists. One more aspect of importance is the mutation that leads to production of new species with variation in shape and colour. The popular ornamental gold fish, *Carassius auratus* is a mutant of crucian carp. There is a scope to introduce mutation and study the effect of mutagenic agents for variations in colour and shapes.

The culture and trade of ornamental fish has great potential and can be attempted during the slack period of shrimp seed production. The only drawback is availability of breeding and hatchery technology for species that fetch high economic value. The technology has already been perfected for some species, which may be used as the candidate species for the present.

