

ORNAMENTAL FISH KEEPING AS COTTAGE INDUSTRY IN INDIA

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Abstract: Ornamental fish keeping is emerging as one of the most popular hobbies in the world. Aquarium fish and accessories industry is fast growing sector due to its tremendous economic opportunities and prospects. Ornamental fish is regarded today as a consumer based commodity in the pet markets. It supports thousands of rural people in the developing countries. Indian waters possess a rich diversity of ornamental fish. Other factors such as favourable climate, cheap labour and easy distribution make India suitable for ornamental fish culture. West Bengal in particular, mainly Kolkata is distribution and export centre. About 80% of ornamental fishes are from freshwaters and the rest from brackish and marine waters. Ornamental fishes are broadly classified as egg layers (oviparous) and live bearers (ovo-viviparous). Apart from the ornamental fish, there is a scope for the development of industry on live food and artificial feed and aquarium accessories required for ornamental fish keeping.

Ornamental fish farming can be a promising alternative for many people and it can be set as cottage industry as it requires little space and less initial investment than other forms of aquaculture. Unemployed youth can start earning with some basic skills and little investment. To attract youth in this sector there is need of more initiatives by the government like providing incentive to establish ornamental fish production units. In present scenario it could provide a great opportunity for entrepreneurship development and income generation for rural as well as urban people. In this paper an attempt has been made to explore the scope of ornamental fish keeping as cottage industry.

Keywords: Ornamental fish, Indigenous species, Exotic species, Aquarium accessories, Local economy, Cottage industry, Self-employment & Entrepreneurship

INTRODUCTION

Ornamental fish keeping and their propagation have been an attractive activity for many people in the world, which provides not only aesthetic beauty and pleasure but also financial benefits. Ornamental fish culture is the culture of attractive, colourful fishes of various characteristics, which are reared in a confined aquatic system. These fishes are kept as pets in confined space of an aquarium or a garden pool for fun and fancy [1],[2],[3]. The varied forms and fascinating beauty of the fishes have been attracting people from time immemorial, are named as 'Ornamental Fish' or "Aquarium Fish". Most of these fishes display beautiful bright colorations, while some possess bands and stripes. India has great potentials in Ornamental fish production due to the presence of rich biodiversity of species, favourable climatic conditions and availability of cheap labour. Indian waters possess over 100 indigenous varieties, in addition to a similar number of exotic species. Presently ornamental fish keeping hobby has been gaining popularity in various states of India [4]. Kolkata is leading in distribution and export and its adjoining districts have become the major ornamental fish-producing zones of India. About 90% of Indian exports go from Kolkata followed by 8% from Mumbai and 2% from Chennai. There are 150 full time and 1500 part time ornamental fish breeders in our country.

The success of ornamental fish culture greatly depends on the location and layout of the unit. At the first stage of starting of an ornamental fish farm very sophisticated or complicated equipment is not necessary. Only a clear understanding of habits and biology of the fishes basic needs is required, so it can be practiced even in urban areas with little alteration. As less manpower is needed, the women or the elders can run small home units. The basic necessities are like plenty of fresh water, quality brood stock and uninterrupted electric supply.

The ornamental fish culture and breeding activity is possible not only on large scale but on a small scale basis as well. With proper education and technical guidance, local people can be trained for eco-friendly breeding/rearing & collection techniques. It provides good opportunity even to small entrepreneurs. India can certainly become a major contributor in international trade of ornamental fishes. Apart from improving foreign exchange reserves. This trade can generate more job opportunities and self-employment in rural areas.

OBJECTIVE

- To study the diversity of ornamental fish.
- To analyze the status and scope of ornamental fish keeping in India.

METHODOLOGY

This is review article, so many related topics such as scope of ornamental fishes, trade of ornamental fishes, ornamental fishes in India etc. were studied and analyzed thoroughly.

DISCUSSION

As aquarium fish keeping has become increasingly popular in developed countries. It can be set up not only on large scale but on a small scale basis as well, which provides good opportunity even to local people. The main focus of discussion is on following points.

1. Diversity of ornamental Fish

2. Status of ornamental fish In India

1. DIVERSITY OF ORNAMENTAL FISH

There are more than 30,000 fish species reported around the world, of this about 800 belong to ornamental fishes. More than 100 varieties of indigenous freshwater ornamental fish species are known in Indian waters. They come under eight closely related families namely, **Anabantidae, Callichthyidae, Characidae, Cichlidae, Cobitidae, Cyprinodontidae, Cyprinidae and Poeciliidae.**

Ornamental fishes due to the nature of breeding are broadly classified as egg layers (oviparous) and live bearers (ovo-viviparous). Majority of aquarium species are egg layers and normally external fertilization occurs. Based on this, it is again categorized into the following types.

1. Egg scatter laying non-adhesive eggs
2. Egg scatter laying adhesive eggs
3. Egg buriers
4. Mouth incubators
5. Nest-builders and
6. Egg-carriers

Exotic Live Bearers: *Guppy, Poecilia reticulata; molly, Poecilia latipinna; swordtail, Xiphophorus helleri; platy, Xiphophorus maculatus*

Egg Layers: *Gold fish, Carrassius auratus; koi, Cyprinus carpio; tiger barb, Puntius tetrazona, Siamese fighter, Betta splendens; serpae tetra, Hyphessobrycon serape gouramies, fighters, oscars, discus, chichlids, gouramies, and on-growing of some imported fish like silver shark, Balatocheilus melanopterus; angel, Pterophyllum scalare, red – tailed black shark, Labeo bicolor; red finned shark, Labeo erythurus, etc..*

Fishes of Aquarium Among the preferred fish, there are common **exotic live bearers** like guppy, *Poecilia reticulata*; molly, *Poecilia latipinna*; swordtail, *Xiphophorus helleri*; platy, *Xiphophorus maculatus* and **egg layers** like gold fish, *Carrassius auratus*; koi, *Cyprinus carpio*; tiger barb, *Puntius tetrazona*, Siamese fighter, *Betta splendens*; serpae tetra, *Hyphessobrycon serape* and on-growing of some imported fish like silver shark, *Balatocheilus melanopterus*; angel, *Pterophyllum scalare*, red – tailed black shark, *Labeo bicolor*; red finned shark, *Labeo erythurus*.

About 80% of ornamental fishes are from freshwaters and the rest from brackish and marine waters. Most of the ornamental species are warm water tropical except some eurythermal carps like gold fish, koi, which are cold temperate in origin and now having a world wide distribution. Ninety per cent of the freshwater ornamental species are farmed and wild species through capture are only 10%. In case of marine and brackish water species reverse is the case.

The **native ornamental fish** include honey gourami, *Colisa chuna*; rosy barb, *Puntius conchonius*; zebra fish, *Brachydanio rerio*; glass fish, *Chanda nama*; Reticulate loach, *Botia lohachata*. Presently only about 52 native fish species from West Bengal have been earmarked as aquarium fish [5].

Fresh water Ornamental fishes

More than 100 varieties of indigenous freshwater ornamental fish species are known in Indian waters. Some of the species fetch high price in the world market and support trade outside the country.

Brackish water Ornamental fishes:

Brackishwater ornamental fishes such as *monodactylus argenteus* M.sebae and *Scatophagus argus* are common in Indian waters and they could be collected, reproduced cultured and trade. The brackish water pearlspot (*Etroplus suratensis*) orange chromide (*Etroplus maculatus*) and brackish water Indian glass fish *Ambassis* sp. have been successfully bred in low saline fish ponds. These are potential ornamental fishes, suitable for planned mass production and export.

Marine Ornamental fishes

India has a vast coastline of 8,129 km with around 400 species of ornamental fishes belonging to 175 genera, coming under 50 reef families occurring in the Indian seas [6]. The marine ornamental fish industry has been expanding in recent years and the global marine ornamental fish trade is estimated at US \$ 200-330 million [7]. Potential marine ornamental fish species resources are clown fish, damsel fish, moorish idol, lion fish, parrot fishes, box fishes or trunk fishes, marine angels, butterfly fish, scorpion fish, blennies fish, sand smelt fish and seahorses fish, cleaner wrasse, cardinal fishes, surfeishes/unicon fish, hawk fishes, bat fishes, puffer fishes, trigger fish, rabbit fish, squirrel [7].

Freshwater Ornamental fishes

- Badis : *Badis badis*
- Indian garfish : *Xentodon cancila*
- Siamese fighting fish : *Betta splendens*
- Dwarf gourami : *Colisa lalia: Colisa chuna*
- Chinese paradise : *Macropodus opercularis*
- Pearl gourami : *Trichogaster leeri*
- Silver gourami : *Trichogaster microlepis*
- Snake skinned gurami : *Trichogaster pectoralis*
- Blue gourami : *Trichogaster trichopterus*
- Kissing gourami : *Helostoma temminki*
- Zebra danio : *Brachydanio rerio*
- Goldfish : *Carassius auratus*
- Koicarp : *Cyprinus carpio var koi*
- Redtailed black shark : *Labeo bicolor*
- Bridle shark : *Labeo frenatus*
- Rosy barb : *Puntius conchonius*

Marine Ornamental fishes

- Clown fish : *Amphiprion akallopisos*
- Tomato clown : *Amphiprion frenatus*
- Rose clown : *Amphiprion preideration*
- Sea angle : *Holacanthus annularis*
- Mooris idol : *Zanclus spp.*
- Scorpion fish : *Pterois spp. P. antennata P.vadiata, P.volitans*
- Bloonion fish : *Canthegaster spp*
- Butterfly fish : *Chelmon rostratus*

New cross breeds are also developed which are more attractive and have more price in export market. The high demands for ornamental breeds are Molly, Guppy, Platy, Swordtail, Gouramis, Barbs, old Fishes, Siamese fighter fish, Catfish, Angel, Cichlid, Tetra, Carps.

2. STATUS OF ORNAMENTAL FISH IN INDIA

Ornamental fish has emerged as a resource with consider able economic potential. India is endowed with rich resources of freshwater and marine ornamental fishes. India can certainly become a major contributor in international trade of ornamental fishes. The ornamental fishery resources of India and their territories are greater than those of Sri Lanka, Africa, Singapore, Malaysia and Maldives put together. India has a vast coastline of 8,129 km with around 400 species of ornamental fishes belonging to 175 genera, coming under 50 reef families occurring in the Indian seas [6].

Indian waters possess a rich diversity of ornamental fish, with over 250 indigenous varieties with rich biodiversity hotspots like north-eastern states, Western ghats, Andaman & Nicobar islands and Lakshadweep. Kerala, Tamil Nadu and West Bengal mainly practice ornamental fish farming in India. . Presently ornamental fish keeping hobby has been gaining popularity in various states of India and the annual growth rate of this trade in domestic market is 20% [8],[9],[10].

India is blessed with a rich diversity of freshwater fishes both in the North-Eastern hills and Western Ghats. Among the 300 species of freshwater fishes in the Western Ghats, 155 are considered ornamental; of which 117 are endemic to the Western Ghats. At present, only a small fraction of the endemic fish diversity is utilized in ornamental fish trade in the domestic market and major share of ornamental fishes marketed in India are exotic varieties.

The fish fauna of the Western Ghats include variety of barbs, rasboras, killifishes, glass fishes, catfishes, catopra, hill trouts, and danios, which are suitable candidates for ornamental fish trade. Presently, nearly about 100 native species are reared as aquarium fish. West Bengal is a pioneering state in respect of ornamental fish breeding and fish production. It contributed 90% of earnings from export of ornamental fishes from India in 2001-2002 [11]. Prominent among the freshwater Indian ornamental fish are loaches, eels, barbs, catfish and goby.

The fish fauna of the Western Ghats include variety of barbs, rasboras, killifishes, glass fishes, catfishes, catopra, hill trouts, and danios, which are suitable candidates for ornamental fish trade. The Western Ghats of India is one of the 34-Biodiversity 'hotspot' areas of the World [12]. The potential of streams and rivers of the Western Ghats as a rich source of the ornamental fish is yet to be recognized. West Bengal in particular is suitable for ornamental fish culture, with Kolkata as a distribution and export centre the adjoining districts have become the major ornamental fish-producing zones of India. About 90% of Indian exports go from Kolkata followed by 8% from Mumbai and 2% from Chennai [13].

West Bengal is a pioneering state contributing major earnings from export of ornamental fishes from India in 2001-2002 [14]. There are more than 2000 people involved in this trade including ornamental fish breeders, growers, seed and live food collectors, traders and exporters in Westbengal. About 150 families are involved in ornamental fish farming to maintain their livelihood. More than 500 families use it as an additional income generating Business. A rich diversity of species and favourable climate, cheap labour and easy distribution has made West Bengal suitable for ornamental fish culture. India's contribution to global aquaria trade is

worth a mere 10 crore rupees [15].

Recent studies in the state of Kerala also show great potential for exploring the possibilities of marketing indigenous species to overseas markets. There are only 10 active exporters of ornamental fishes from India. During 1999 - 2000 India's share in international trade was only 0.06% of the world ornamental fish trade of US\$ 650 million. The tropical climate of India is ideal for culture and breeding of ornamental fishes found in fresh, brackish and seawater. Calcutta, Bombay and Chennai have already emerged as major centers for breeding fresh water ornamental fishes. These accounts for all the exports of ornamental fishes from India. The large-scale commercial farms, which are also limited in number are confined to the metropolitan cities and certain suburban regions.

However, the North East of India has many species of fish that have great potential in the ornamental fish trade and many of which are attractive to foreign markets. There is a great potential to expand the local industry [16]. The north-eastern states contribute around 85% of the total market and the rest comes from the southern states of India. There are about 58 indigenous ornamental fishes occurring in the North Eastern states are currently being exported. Most potential species from north-eastern states for aquarium fish are *Botia dario*, *Dania dangila*, *Puntius shalynius* and *Schistura reticulofasciatus*.

Even though there are quite a lot of indigenous fishes, having high potential as ornamental fishes, they have not been properly exploited. Compared to other sectors in fisheries, the ornamental fish industry does not pick up in India and due to various reasons. The main reasons are lack of breeding and rearing technologies for the native species, inadequate live transportation facilities, both on land and by air, poor market information system, and primitive catching and handling methods and improper quality assurance [17].

A review of literature reveals that although much work has been undertaken on the general fish resources of Himachal Pradesh no information is available on the potential aquarium fishes [18],[19],[20]. Currently, there is neither a domestic ornamental fish market nor documentation of export of ornamental fish in Himachal Pradesh. Ornamental fish trade can be a livelihood lucrative business for local communities to improve their livelihood [21].

Ornamental fishes of India are contributing about 1% of the total ornamental fish trade. India offers about 374 fresh water ornamental fish species and about 700 marine ornamental fish species out of total of 1539 species of ornamental fishes are traded worldwide. There is wide scope to increase production of ornamental fish varieties in India and speed up the successful entrepreneurship in ornamental fish trade.

CONCLUSION

Fisheries sector occupies a very important place in the socio-economic development of the country. Most importantly, it is the source of livelihood for a large section of economically backward population of the country. Ornamental fish keeping and setting of aquarium can be set as cottage industry as it requires little space and less initial investment than most other forms of aquaculture. As less manpower is needed, the women or the elders can run small home units. With slightly more sophisticated equipment such heaters, aerators and power filters, and practices such as selective breeding, stock manipulation and proper feeding, large units can be maintained in urban areas also. More research and development in both fresh and marine water fishes can lead to development of culture technologies for many species of demand in the aquarium trade in the globe. There is ample scope to develop entrepreneurship on the indigenous fish and exotic fish having ornamental value in the aquarium trade. Apart from the ornamental fish, there is a scope for the development of industry on live food and artificial feed and aquarium accessories required for ornamental fish keeping. There is need of more initiatives by the government like providing incentive to establish ornamental fish production units. In addition unemployed youth can be encouraged and private investment can be attracted to this industry, which would generate additional employment opportunities and assist in the improvement of livelihood of the community.

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