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An examination of the variety of ornamental fish species found in Tamil Nadu, India

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Abstract
The state of Tamil Nadu on the south east coast of India boasts of a remarkable array of indigenous freshwater ornamental fishes sourced from the nearby Western Ghats, a biodiversity hotspot renowned for its aquatic life. These freshwater species, ranging from vibrant labyrinth fishlike gourami's to the colorful and diverse rasboras and barbs, contribute significantly to the region's ornamental fish trade. Additionally, the state benefits from the expertise of local breeders and farmers who specialize in cultivating exotic ornamental fishes and some of these indigenous species, ensuring a sustainable and thriving sector. The ornamental fish sector is an emerging industry with a significant global economic impact. The multibillion-dollar ornamental fish trade involves participation from over 125 nations, with developing countries acting as the primary producers and contributing over 60% of the global supply. This sector is largely dependent upon freshwater fish species.

Keywords: Color fish, aquarium, export, freshwater, trade, goldfish

Introduction

Ornamental fish, encompassing fish, invertebrates like corals, crustaceans, and mollusks, and even live rock, are aquatic animals popular in the aquarium hobby (Livengood and Chapman, 2007) [3]. Ornamental fish keeping is gaining popularity for mind relaxation and as a hobby (Gosh *et al*., 2003), leading to a growth in the global ornamental fish trade. Ornamental fish production is emerging as a significant global industry (Rani *et al*., 2014) [4]. This multibillion-dollar industry involves over 125 countries. It is estimated to be worth over US$15 billion, with more than 2 billion live ornamental fish traded globally (Satam *et al*., 2018) [5]. Hobbyists account for 99% of the global market, while public aquaria and research institutes utilize less than 1%.

Developing countries are the primary producers and suppliers in the global ornamental fish market, accounting for over 60% of the supply. Recent advancements in breeding techniques, transportation, and aquarium technology have led to an increase in the variety of ornamental fish species available. The global ornamental fish industry encompasses over 2,500 species, with freshwater species representing over 60% of the total, and marine species making up the remainder (Dev, 2016). Beyond the popular farm-raised varieties, the trade also includes a significant number of wild-caught fish and invertebrates. Neon tetras, angelfish, goldfish, danios, and discus are dominant species in the global trade, with guppies and zebra danios collectively accounting for over 14% of the total trade value. While freshwater fish are the mainstay of the ornamental fish sector, wild-caught marine species contribute nearly 15% to the total species traded.

India's inland and marine environments are home to a remarkable variety of ornamental fish. Over 195 indigenous varieties have been documented in the North-East Region and Western Ghats, while marine ecosystems contribute nearly 400 species. Wild-caught fish, primarily from the rivers of the North-East and Southern States, dominate India's ornamental fish exports, accounting for approximately 85% of the total. Of the 195 fish species identified in the North-East Region, 155 possess ornamental characteristics. This region is particularly notable for its exceptional freshwater ornamental fish biodiversity and high levels of endemism. Common ornamental species found here include Loaches, Eels, Barbs, Catfish, and Goby. The Western Ghats, recognized as one of the world's 34 biodiversity hotspots, also harbors a significant number of ornamental fish. Of the freshwater fish species found in the Western Ghats, 40 are considered ornamental, and 37 of these are unique to this region.

The Indian ornamental fish trade is predominantly freshwater-based (90%), with the vast majority (98%) of these fish being cultured and only a small percentage (2%) captured from the wild. The remaining 10% of the trade consists of marine fish, almost all of which are wild-caught (98%) and a negligible part cultured (2%). Most ornamental fish breeders in India focus on exotic species, with very few breeding native freshwater, marine, or brackish water varieties. Goldfish are the most popular choice among hobbyists, making their breeding a dominant activity in the Indian ornamental fish sector. Beyond common livebearers, breeders also favor specialized and high-demand varieties such as Oscars, Flowerhorns, Tetras, Discus, and Cichlids. This paper examines the current state of ornamental fish species, their trade, and related research, particularly in Chennai', a major ornamental fish center.

Materials and Methods

Data for this study were collected between 2022 and 2023 directly from ornamental fish exporters located in Kolathur, Chennai, India. Bimonthly surveys were used to gather information on the species of ornamental fish both cultured and exported. Furthermore, potential high-value species were identified through consultations with key stakeholders: fishers, traders, consumers, and experienced fishery professionals. A specific data collection form was designed for these consultations. The final analysis incorporated data

obtained from 40 aquarium fish keepers, 8 major aquarium fish traders, and 10 fishery professionals with expertise in ornamental fish.

Results and Discussion

The results of the survey taken at the Kolathur, Chennai, and ornamental fish farming area are listed below.

Asian arowana *Scleropages formosus*

Convict cichlid *Amatitlania nigrofasc*

Flower horn *Amphilophus hybrid*

Gold Fish *Carassius auratus*

Oscar Fish *Astronotus ocellatus*

Partipentazonz barb *Puntigrus partipentazona*

Gray bichir *Polypterus senegalus*

Siamese fighting fish *Betta splendens*

White discus *Symphysodon aequifasciatus*

Zebra tilapia *Heterotilapia buttikofer*

Angel fish *Pterophyllum scalare*

Black moor gold fish *Carassius auratus*

Blue acara *Andinoacara pulcher*

Bluespine unicorn fish *Naso unicornis*

Conclusion

India currently accounts for less than 1% of the global ornamental fish trade, yet it is often referred to as a "sleeping giant" due to its untapped potential resources. Establishing a regional hub for ornamental fish, similar to the aquaculture rainbow technology park created by Tamil Nadu Dr. J. Jayalalithaa Fisheries University, could significantly enhance overall exports. Promoting the concept of planted tanks could provide new opportunities for expanding the existing market. The rising popularity of marine aquariums that use synthetic salts indicates a growing trend that should be capitalized upon. Improving packaging techniques will enable our farmers to compete effectively with regional players, thereby elevating the current market level. The Indian domestic ornamental fish trade is experiencing an annual growth rate of 20%, with demand surpassing supply. While selective breeding and the development of new strains of ornamental fish are common practices elsewhere, this technology has yet to gain traction in India. As a result, indigenous ornamental fish struggle to gain widespread acceptance due to their lower attractiveness.

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