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Availability and utilization status of indigenous ornamental fishes in Bilaspur fish market, Chhattisgarh

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Abstract

A study on the availability and utilization status of indigenous ornamental fishes in the Bilaspur fish markets was carried out. Primary data on the availability of indigenous fish species in Bilaspur city was collected from two main local fish markets (Budhwari fish market and Sanichari fish market) and several ornamental fish shops. In this study, a total of 10 species of indigenous ornamental fish belonging to five different orders and seven families were identified. The most dominant order was the Cypriniformes (40%), followed by the Siluriformes (30%) and other orders. With four different fish species (*Brachydanio rario*, *Osteobrama cotio*, *Puntius ticto*, and *Salmostoma bacaila*), the Cyprinidae family was the most prevalent, followed by Siluridae (*Ompak bimaculatus*), Bagridae (*Mystus tengara*), Pangasidae (*Pangasius pangasius*), Notopteridae (*Notopterus notopterus*), Channidae (*Channa marulius*), Ambassidae (*Chanda nama*). All the indigenous ornamental fishes present in the Sanichari fish market and Budhwari fish market were used as food fish, whereas the fishes present at ornamental fish shops were utilized for ornamental purposes.

Keywords:

Indigenous fish, ornamental fish, fish market, Bilaspur

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Introduction

Ornamental fishes are attractive and colorful species of fishes that can be kept in a confined environment of an aquarium or garden pool (Jayasankar 1998; Mukherjee *et al.*, 2000; Singh and Ahmed 2005). Ornamental fishes are often called "living jewels" due to their brilliant color, shape, behavior, etc. (Jayasankar, 1998; Das *et al.*, 2005). Ornamental fish farming is an important commercial component of aquaculture, providing aesthetic requirements and up-keeping of the environment. India has a rich bio-diversity of 400 marine and 375 freshwater native ornamental fishes. Currently, global trade in ornamental fish is estimated at about \$22 billion (Rs1.08 trillion) of this, India accounts for a mere Rs 10 crores. MPEDA is targeting the annual production of 500 million ornamental fish. Since these are typically small in size, they are not measured by tonnage. India's overall domestic ornamental fish trade is worth about Rs.15 crore, and exports worth Rs. 5.6 crore. India's share in the global ornamental fish trade is negligible, and the present export is dominated by wild-caught species (Swain, 2010). About 600 ornamentals possess a rich diversity of ornamental fishes, with over 100 indigenous species, in addition to a similar number of exotic species that are bred in captivity. Approximately 98% of ornamental fish are captured in the wild by locals, for whom this is often the main livelihood (Dholakia, 2009). The major thrust in ornamental fish development today is optimizing

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production, generating employment, and improving the welfare of fishermen and their socioeconomic status (Whittington, 2000). Among ornamental fish, goldfish is the most admired ornamental fish throughout the world, and more species are being added to the list of fish traded in India as transportation facilities improve (Gupta and Banerjee, 2008).

Chhattisgarh is one of the largest states in India, blessed with a number of natural resources, including productive water in the form of rivers, tanks, reservoirs, ponds, etc. A major part of Chhattisgarh lies in the catchments of the Mahanadi and Godavari river systems. A total of 100 ornamental fish species have been reported by the various works from river Mahanadi (Singh et al., 2013).

Materials and methods

The present study was conducted in two fish markets (Sanichari fish market and Budhwari fish market) and ornamental fish shops in Bilaspur city, primary data was collected. Fish were identified with the help of the keys given by Jhingran (1991) and Jayaram (2010). Fish specimens were identified based on morphometric characteristics such as body form, color, size, shape, and position of fins, and meristic features such as the number of rays in a fin or the number of scales in a specific series, presence of distinctive organs such as barbells, or the lateral line and various body proportions such as the ratio of the length of the head to the total length of the body etc.



Fig 1: Sample collection

Results and discussion

In our study, ten indigenous ornamental fish species belonging to five orders and seven families were identified from the Bilaspur fish markets, Cyprinidae family was dominant, with four representative species (*Brachydanio rario*, *Osteobrama cotio*, *Puntius ticto*, and *Salmostoma bacaila*) followed by Siluridae (*Ompak bimaculatus*), Bagridae (*Mystus tengara*), Pangasidae (*Pangasius pangasius*), Notopteridae (*Notopterus notopterus*), Channidae (*Channa marulius*), Ambassidae (*Chanda nama*), family having single species (Table 1).

Table 1: Fish list with order and family

Fish species	Family	Order
<i>Salmostoma bacaila</i>	Cyprinidae	Cypriniformes
<i>Puntius ticto</i>	Cyprinidae	Cypriniformes
<i>Brachydanio rario</i>	Cyprinidae	Cypriniformes
<i>Osteobrama cotio</i>	Cyprinidae	Cypriniformes
<i>Ompak bimaculatus</i>	Siluridae	Siluriformes
<i>Mystus tengara</i>	Bagridae	Siluriformes
<i>Pangasius pangasius</i>	Pangasidae	Siluriformes
<i>Notopterus notopterus</i>		Notopteridae
<i>Osteoglossiformes</i>		
<i>Channa marulius</i>	Channidae	Anabantiformes
<i>Chanda nama</i>	Ambassidae	Perciformes

Panigrahi et al. (2009) recorded 30 species of indigenous fish as potentially aquarium fish belonging to 22 genera and 13 families, as the dominance of the Cyprinids family. Paul and Chanda (2014) observed 48 indigenous ornamental freshwater species belonging to 32 genera, 18 families, and seven orders, with the maximum number of species from the Cyprinids family followed by Bagridae and Ambassidae. Dey et al. (2015) documented 46 indigenous ornamental fish species belonging to 11 orders, 21 families, and 29 genera were documented. Among the orders, Cypriniformes represented the largest diversity.

In the Sanichari fish market, eight fish species were present, and five species were in the Budhwari fish market and ornamental fish shop. Fish in the Sanichari and Budhwari fish market are used as food fish. The indigenous ornamental fish in ornamental fish shops are used for ornamental purposes (Table 2). The indigenous ornamental fish are used as food (50%), ornamental (30%), and food and ornamental (20%) (Fig 8).

Conclusion

The results revealed trade in indigenous ornamental fishes has both environmental and economic benefits. These alluring aquatic species have deeply ingrained themselves within various cultures and leisure pursuits. At the same time, the current scenario also

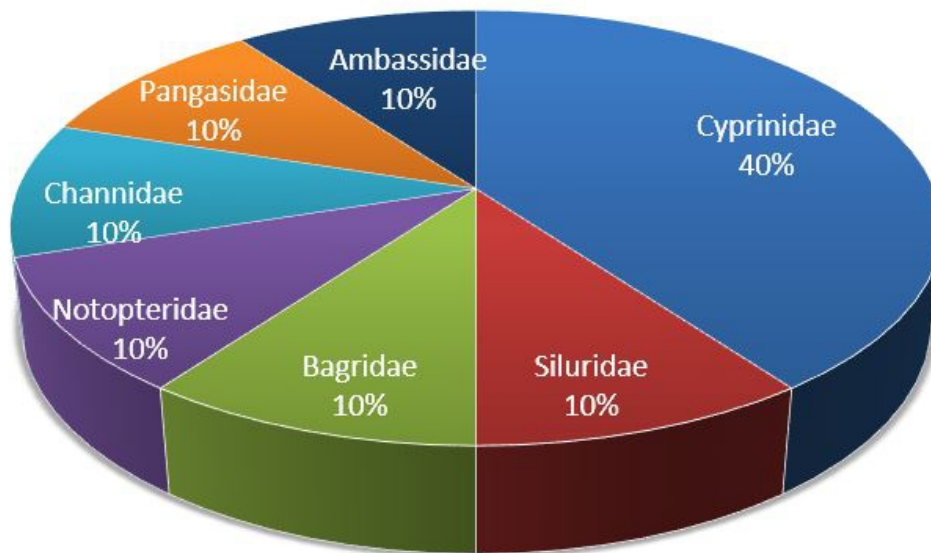


Fig. 2: Family-wise distribution of fish

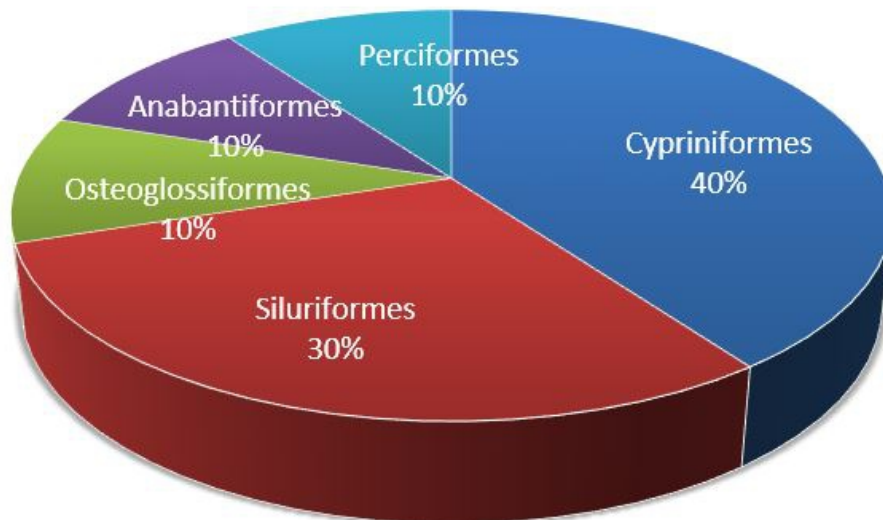


Fig. 3: Order-wise contribution



Fig. 4: *Salmostoma bacaila*



Fig. 5: *Ompak bimaculatus*



Fig. 6: *Puntius ticto*

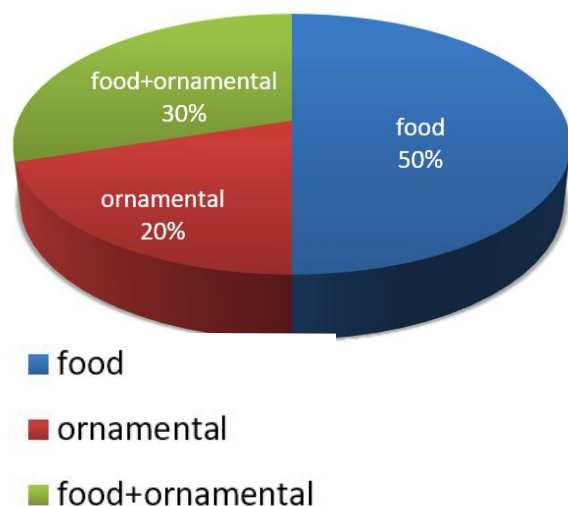


Fig. 7: *Notopterus notopterus*

Table 2. Availability and utilization status of indigenous ornamental fish

Scientific name	Sanichari fish market	Budhwari fish market	Ornamental fish shops	Utilized as (Food/ornamental)
<i>Notopterus notopterus</i>	+	-	+	Food+ ornamental
<i>Channa marulius</i>	+	+	-	Food
<i>Puntius ticto</i>	+	+	-	Food
<i>Pangasius pangasius</i>	+	+	+	Food + ornamental
<i>Chanda nama</i>	-	-	+	Ornamental
<i>Osteobrama cotio</i>	+	-	+	Food + ornamental
<i>Salmostoma bacaila</i>	+	+	-	Food
<i>Mystus tengara</i>	+	+	-	Food
<i>Brachydanio rario</i>	-	-	+	Ornamental
<i>Ompak bimaculatus</i>	+	-	-	Food
Total species	8	5	5	

(+ present, - absent)

**Fig. 8:** Utilization of indigenous ornamental fish

reflects that ornamental fish have a higher value than food fish. It is, therefore, an appropriate need of the hour to generate awareness towards conservation and sustainable harvest of indigenous ornamental fish.

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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