ANALYSIS OF FISH COMMUNITY STRUCTURE WITH EMPHASIS ON COMMERCIAL SPECIES IN PENTAKLI DAM, BULDHANA , MAHARASHTRA (INDIA)

S. S. Dabhade
Research Scholar, P.G. and Research Department of Zoology, R. A. Arts, Shri M. K. Commerce and Shri S. R. Rathi Science Mahavidyalaya, Washim
shri.dabhade10@gmail.com

S. D. Rathod
Professor, P.G. and Research Department of Zoology, R. A. Arts, Shri M. K. Commerce and Shri S. R. Rathi Science Mahavidyalaya, Washim
sdrathod15@gmail.com

Abstract
The present study was conducted at Pentakli Dam, located in the Buldhana district of Maharashtra, to assess the structure of the fish community with special emphasis on commercially important species. The survey identified thirteen fish species distributed across seven distinct families. *Indian Major Carps (Labeo rohita, Catla catla, Cirrhinus mrigala) were dominant, reflecting stocking efforts and strong consumer preference. Exotic species, including Tilapia (Oreochromis mossambicus), Grass Carp (Ctenopharyngodon idella), Silver Carp (Hypophthalmichthys molitrix), and Bighead Carp (Hypophthalmichthys nobilis), contributed substantially to the fishery. In addition, native predatory species such as Wallago attu, Channa marulius, Mystus cavasius, featherbacks, and spiny eels played a vital role in maintaining ecological balance while also supporting market demand. The results indicate a mixed fishery system in Pentakli Dam, with carps forming the economic backbone and native predators contributing to ecological regulation. This study underscores the need for balanced fishery management that promotes biodiversity, sustains livelihoods, and minimizes ecological risks associated with exotic introductions.*

Keywords: *Pentakli Dam, Fish Diversity, Indian Major Carp, Exotic Carp, Reservoir Fishery, Livelihood.*

1. Introduction

Inland fisheries constitute an important sector of India's food production and rural economy, contributing significantly to employment, nutrition, and income generation (FAO, 2020). Reservoirs and dams, created primarily for irrigation and hydropower, have emerged as productive fishery resources, often managed through a combination of natural recruitment and stocking (Sugunan, 1995).

Pentakli Dam in Mehkar taluka of Buldhana district functions as a medium-scale irrigation reservoir that also supports active fishery operations. Its fishery is characterized by a diverse mix of Indian Major Carps (IMCs), exotic carps, Tilapia, and native predatory species.

Carps, particularly Rohu, Catla, and Mrigal, dominate inland fisheries in India due to their fast growth, adaptability, and high consumer demand (Talwar & Jhingran, 1991). Alongside these, exotic species like Tilapia and Chinese carps (Grass Carp, Silver Carp, Bighead Carp) have become established in Indian reservoirs (De Silva et al., 2006). While these exotics boost productivity, they also raise ecological concerns about competition and biodiversity impacts (Welcomme, 2001).

Predatory fishes such as Wallago attu, Channa marulius, Mystus spp., and featherbacks play an important ecological role in controlling prey populations and maintaining community balance (Jayaram, 2010). Their market demand also adds economic value to the reservoir fishery.

The present study documents the fish species composition of Pentakli Dam, classifies species by their commercial relevance, and discusses their ecological and livelihood implications.

2. Materials and Methods

2.1 Study Area

Situated in Mehkar taluka of Buldhana district, Maharashtra, India, Pentakli Dam lies at geographical coordinates 20.2707°N and 76.4749°E. The dam is a medium irrigation project that also supports capture and culture fisheries. The dam sustains artisanal and cooperative fisheries, providing both food security and income for rural communities.

2.2 Data Collection

Field surveys were conducted at regular intervals across one year. Fish samples were collected through gill nets, cast nets, and direct observations at fish landing sites. Identification was carried out using standard taxonomic keys (Jayaram, 2010; Talwar & Jhingran, 1991). Vernacular names were cross-verified with local fishers.

2.3 Data Analysis

The fish species were classified into commercial categories such as Indian Major Carps, Exotic Carps, Tilapia, Catfishes, Snakeheads (Murrels), Featherbacks, and Spiny Eels. Their relative

commercial importance was evaluated based on observed abundance, consumer preference, and prevailing market price. The present study follows a descriptive ecological approach without the application of diversity indices, thereby providing a straightforward representation of the fish community structure.

3. Results and Discussion

3.1 Fish Species Composition

The study documented thirteen fish species classified under seven different families. Indian Major Carps (*Rohu*, *Catla*, and *Mrigal*) were the most abundant and commercially valuable, which reflects the influence of active stocking practices and strong local consumer preference (Mogalekar et al., 2017). Exotic fishes such as Tilapia and three Chinese carps were also present in significant numbers, indicating aquaculture-driven introductions in the reservoir (De Silva et al., 2006). Native predatory species such as *Wallago attu* (Pankaj), *Channa marulius* (Maral), and *Mystus cavasius* (Katarna) were recognized for their significant ecological roles and economic value. Other native fishes such as *Notopterus notopterus* (Featherback) and *Mastacembelus armatus* (Vaam) were recorded in moderate abundance and contributed to traditional consumption patterns in the local community (Ohol & Kamble, 2014).

3.2 Community Composition by Category

The fish community composition of Pentakli Dam revealed a balanced structure of both native and exotic fishes. Indian Major Carps contributed 23% to the total fishery, while exotic carps also accounted for 23%. Tilapia, an exotic but widely consumed fish, formed about 8% of the population. Catfishes as a group were equally dominant with 23%, whereas Snakehead, Featherback, and Spiny Eel each contributed around 8%. This pattern indicates that while carps dominate the fishery in terms of abundance and economic value, the presence of predatory species plays a critical role in regulating ecological balance. Such a mixed fishery system is consistent with findings reported from other reservoirs in Maharashtra (Shaikh et al., 2011; Ubharhande & Sonawane, 2012).

Table 1. Fish Species of Pentakli Dam with Commercial Significance

Sr. No.	Scientific Name	Common Name (English)	Commercial Category	Origin	Fishery Importance
1	*Labeo rohita*	Rohu	Indian Major Carp	Native	High
2	*Catla catla*	Catla	Indian Major Carp	Native	High
3	*Cirrhinus mrigala*	Mrigal	Indian Major Carp	Native	High
4	*Oreochromis mossambicus*	Tilapia	Exotic (Tilapia)	Exotic	High
5	*Ompok pabda*	Pabda	Catfish	Native	Medium
6	*Mastacembelus armatus*	Spiny Eel (Vaam)	Spiny Eel	Native	Medium
7	*Notopterus notopterus*	Featherback (Supernas)	Featherback	Native	Medium
8	*Wallago attu*	Wallago / Pankaj	Catfish	Native	High
9	*Hypophthalmichthys nobilis*	Bighead Carp	Exotic Carp	Exotic	Medium
10	*Ctenopharyngodon idella*	Grass Carp	Exotic Carp	Exotic	Medium
11	*Hypophthalmichthys molitrix*	Silver Carp	Exotic Carp	Exotic	Medium
12	*Channa marulius*	Maral / Giant Snakehead	Snakehead	Native	High
13	*Mystus cavasius*	Katarna / Tengra	Catfish	Native	Medium

4. Conclusion

The fish community of Pentakli Dam represents a **diverse and commercially productive system** in which Indian Major Carps form the economic backbone, exotic fishes act as supplementary contributors, and native predators play a vital role in ecological balance. To ensure long-term sustainability of this reservoir fishery, regular stocking of native IMCs should be practiced to maintain productivity, while exotic species require controlled monitoring to minimize ecological risks. Conservation of ecologically important predators such as *Wallago attu* and *Channa marulius* is equally essential, alongside strengthening of cooperative fishery management for supporting rural livelihoods. Overall, Pentakli Dam serves as a **model of mixed reservoir fishery**, where

biodiversity conservation and commercial exploitation are effectively balanced.

References

1. De Silva, S. S., Subasinghe, R. P., Bartley, D. M., & Lowther, A. (2006). Strategies for increasing fish production in Asia. *FAO Fisheries Circular, 1011*. FAO, Rome.
2. FAO. (2020). *The State of World Fisheries and Aquaculture 2020.* Rome: Food and Agriculture Organization.
3. Jayaram, K. C. (2010). *The freshwater fishes of the Indian region.* Narendra Publishing House, New Delhi.
4. Mogalekar, H. S., Johnson, C., Patadiya, D. S., & Kolhe, S. (2017). Cultivable freshwater fishes of Maharashtra. *Journal of Aquaculture in the Tropics, 32,* 127–147.
5. Ohol, S. R., & Kamble, S. M. (2014). Diversity of fish fauna from Sangli district, Maharashtra. *Entomology Journal, 2(5),* 339–345.
6. Shaikh, H. M., Kamble, S. M., & Renge, A. B. (2011). The study of ichthyofauna diversity in Upper Dudhna project reservoir near Somthana in Jalna District (M.S.), India. *Journal of Fisheries and Aquaculture, 2(1),* 8–10.
7. Sugunan, V. V. (1995). *Reservoir fisheries of India.* FAO Fisheries Technical Paper No. 345. FAO, Rome.
8. Talwar, P. K., & Jhingran, A. G. (1991). *Inland fishes of India and adjacent countries (Vols. 1 & 2).* Oxford & IBH Publishing, New Delhi.
9. Ubharhande, S. B., & Sonawane, S. R. (2012). Study of freshwater fish fauna and water quality at Paintakli Dam in Buldhana District (M.S.), India. *Journal of Experimental Sciences, 3(7),* 52–56.
10. Welcomme, R. L. (2001). *Inland fisheries: Ecology and management.* FAO & Blackwell Science.