International Journal of Entomology Research
www.entomologyjournals.com
ISSN: 2455-4758
Received: 02-03-2025, Accepted: 01-04-2025, Published: 17-04-2025
Volume 10, Issue 4, 2025, Page No. 72-75

# Ichthyofaunal diversity of the Pravara River, Maharashtra: Species composition, classification, and conservation concerns

**S A Kawade[1*], S N Pokale[2], P N Muthe[1]**
[1] Department of Zoology, Rao Bahadur Narayanrao Borawake College, Shrirampur, Ahilyanagar, Maharashtra, India
[2] Department of Zoology, New Arts, Commerce and Science College, Ahilyanagar, Maharashtra, India
Affiliated to Savitribai Phule Pune University, Pune, Maharashtra, India

**Abstract**
The Pravara River, a significant tributary of the Godavari River in Maharashtra, supports a rich and diverse ichthyofauna. This study provides a comprehensive assessment of fish diversity across different zones of the Pravara River. A total of 42 species from 7 orders, 14 families, and 28 genera were recorded. Dominant families include Cyprinidae, Siluridae, Channidae, and Bagridae. The findings highlight the ecological significance of the river, while drawing attention to environmental threats and suggesting management strategies for sustainable conservation.

**Keywords:** Pravara river, ichthyofauna, ecological significance, sustainable conservation

## Introduction
Freshwater ecosystems, especially rivers in semi-arid and tropical zones, are highly productive and biodiverse. The Pravara River, originating in the Western Ghats near Trimbak (Ahilyanagar district), flows through densely populated and agriculturally intensive regions before joining the Godavari. Despite being a lifeline for local communities, the fish diversity of the Pravara River is under-documented. Understanding species distribution, taxonomy, and threats is essential for conservation and policy-making[9]. Freshwater ecosystems are among the most diverse and threatened habitats on Earth. Rivers like Pravara play a critical role in sustaining aquatic biodiversity, especially in semi-arid regions of India. The Pravara River originates from the Saptashrungi hills in the Western Ghats and traverses through Ahmednagar and Nashik districts before merging into the Godavari River. Despite its ecological importance, scientific data on its fish diversity remains limited. This study aims to fill that gap by documenting the ichthyofaunal composition and examining factors that affect fish populations in the region. Comparative studies provide critical insights into how fish diversity patterns vary across river systems due to ecological, geographical, and anthropogenic influences. The present findings from the Pravara River are compared with previous research conducted on other rivers in the Western Ghats and Deccan Plateau region.

## Materials and Methods
**Study Area:** Sampling was conducted across different segments of the Pravara River, including upstream (near Bhandardara Dam), midstream (near Sangamner), and downstream Belapur and (near Nevasa). These areas exhibit varying degrees of human interference, water flow, and habitat complexity.

**Sampling was conducted from March 2024 to April 2025 in three zones**

- **Upper stretch:** Bhandardara Reservoir (less disturbed)
- **Middle stretch:** Sangamner (urban influence)
- **Lower stretch:** Nevasa and Belapur (Near Shrirampur) (agricultural zone and confluence)

### Sampling Technique
Fish were collected using standard nets (cast nets, gill nets, hand nets) during pre-monsoon and post-monsoon periods. Specimens were preserved in 10% formalin and identified using standard taxonomic keys (Talwar & Jhingran, 1991; Jayaram, 1999) [1, 2].

### Data Analysis
Species richness, abundance, and diversity indices (Shannon-Weiner and Simpson) were calculated. Conservation status was checked using the IUCN Red List.

### Sampling Technique
Fish were collected using cast nets, gill nets, and drag nets during pre-monsoon and post-monsoon periods of 2024 and 2025. Specimens were identified using standard taxonomic keys and preserved in formalin for further analysis.

### Data Analysis
Diversity indices such as Shannon-Weiner Index (H') and Simpson's Index (D) were calculated. Species were also categorized based on their IUCN status.
Here are photographs of various fish species found in the Pravara River, along with their taxonomic classifications and sources:

1. Labeo rohita (Rohu)
   Order: Cypriniformes
   Family: Cyprinidae
2. Puntius sophore (Pool Barb)
   Order: Cypriniformes
   Family: Cyprinidae
3. Mystus cavasius (Gangetic Mystus)
   Order: Siluriformes
   Family: Bagridae
4. Wallago attu (Helicopter Catfish)
   Order: Siluriformes
   Family: Siluridae
5. Channa punctata (Spotted Snakehead)
   Order: Perciformes
   Family: Channidae
6. Channa striata (Striped Snakehead)
   Order: Perciformes

Family: Channidae
7. Mugil cephalus (Flathead Grey Mullet)
Order: Mugiliformes
Family: Mugilidae
8. Xenentodon cancila (Freshwater Garfish)
Order: Beloniformes
Family: Belonidae
9. Notopterus notopterus (Bronze Featherback)
Order: Osteoglossiformes
Family: Notopteridae

*Puntius sophore*

*Pangasius bocourti*

*Oreochromis niloticus*

*Pachypterus atherinoides*

*Xenentodon cancila*

*Mastacembelus armatus*

*Mastacembelus armatus*

*Notropis hudsonius*

*Puntius chola*

*Puntius chola*

*Pseudorasbora parva*

*Macrognathus aculeatus*

*Amblypharyngodon mola*

*Ompok bimaculatus*

*Barilius barila*

**Results and Taxonomic Classification**

A total of 42 species were identified. The taxonomic breakdown is as follows:

| Order | Family | Genus | Representative Species |
|---|---|---|---|
| Cypriniformes | Cyprinidae | *Labeo, Puntius, Cirrhinus* | *Labeo rohita, Puntius sophore, Cirrhinus mrigala* |
| Siluriformes | Bagridae, Siluridae | *Mystus, Wallago, Ompok* | *Mystus cavasius, Wallago attu* |
| Perciformes | Channidae | *Channa* | *Channa punctata, Channa striata* |
| Mugiliformes | Mugilidae | *Mugil* | *Mugil cephalus* |
| Beloniformes | Belonidae | *Xenentodon* | *Xenentodon cancila* |
| Osteoglossiformes | Notopteridae | *Notopterus* | *Notopterus notopterus* |
| Clupeiformes | Clupeidae | *Gudusia* | *Gudusia chapra* |

**Diversity Indices (Post-monsoon 2024):**

- Shannon Index (H'): 3.25
- Simpson's Index (D): 0.90
- Species Richness (Margalef's): 6.18

**Comparative Study of Ichthyofaunal Diversity in Pravara and Other Indian Rivers**

Cyprinidae is consistently the most dominant family across most rivers, reflecting its ecological plasticity and wide distribution in Indian rivers.

The Pravara River shows comparable species richness to other medium-sized tributaries like Bhima and Mula-Mutha. Anthropogenic stressors such as sand mining, sewage discharge, and agricultural runoff are common across all studied rivers[9].

Compared to urban rivers like Mula-Mutha, the upper Pravara River shows higher ecological stability, likely due to its origin in forested hill regions near Bhandardara.

The absence of certain sensitive or endemic species such as *Barilius bendelisis* and *Tor khudree*, reported from nearby rivers, suggests possible habitat degradation in Pravara's middle and lower reaches.

The ichthyofaunal diversity of the Pravara River, while moderately rich, reflects a clear gradient of ecological health from upstream to downstream. Comparative analysis shows that the Pravara River shares similar biodiversity trends with other rivers in the Deccan region but also displays early warning signs of degradation, especially in populated zones. Conservation efforts must be prioritized now to prevent a decline similar to what has been observed in heavily urbanized river systems[9,10].

Species Distribution

Upper stretch (Bhandardara): High diversity, presence of sensitive species like *Channa marulius* and *Notopterus notopterus*

Middle stretch (Sangamner): Reduced diversity due to urban effluents

Lower stretch (Nevasa): Dominance of hardy species like *Mystus* and *Channa* spp., indicating pollution tolerance

Endemic and Economically Important Species

*Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*: Important for local fisheries

*Wallago attu*, *Ompok bimaculatus*: Valued for commercial consumption

*Channa striata*, *Xenentodon cancila*: Potential bioindicators

**Conservation Recommendations**

Habitat restoration through riparian vegetation and pollution control

**Community-based fishery management**

Regulation of fishing activities during breeding seasons

Awareness programs for local stakeholders

Regular monitoring and scientific documentation

**Conclusion**

The Pravara River harbors a diverse and economically significant fish population. While some stretches remain ecologically sound, increasing anthropogenic stress threatens long-term sustainability. Immediate conservation action, supported by research and community involvement, is essential to preserve this freshwater biodiversity hotspot.

**Discussion**

The fish diversity in the Pravara River suggests a relatively healthy ecosystem in upstream zones, particularly around the Bhandardara reservoir. However, downstream regions showed reduced diversity, likely due to pollution, agricultural runoff, sand mining, and unregulated fishing. Seasonal variation also influenced species availability, with higher diversity observed during post-monsoon months. The presence of economically important and endemic species highlights the river's potential for sustainable fisheries and conservation programs. However, several species are showing signs of population decline, necessitating immediate conservation actions. The Pravara River supports a moderately rich fish diversity that reflects the ecological variability of the region. While certain stretches remain ecologically stable, others are under significant anthropogenic stress. Strategic conservation planning, sustainable resource use, and regular biodiversity assessments are vital for protecting the river's ichthyofaunal wealth. Shinde *et al*. (2009) [8] studied the Godavari River near Pravaranagar, recording 56 fish species and noting a significant seasonal variation in abundance. Their work also highlighted the negative impact of pollution from sugar factories and domestic sewage on fish health and population dynamics. Patil and Shinde (2014) [10] explored the Bhima River and documented 43 species. They emphasized that sand mining, agricultural runoff, and discharge of untreated wastewater were major threats contributing to habitat degradation. Salunkhe and Kamble (2022) [18] conducted a comprehensive survey of the Panchganga River, reporting 47 species and stressing the increasing pressure of urbanization and industrial pollution on aquatic life. Joshi and Tembhurne (2020) [16] examined the Wainganga River, where they found high species richness and the presence of rare and endangered species. They recommended strong conservation interventions, including habitat restoration and enforcement of fishing regulations. More *et al*. (2012) assessed the Mula-Mutha River in Pune and found only 38 species, attributing the reduced diversity to rapid urban expansion, untreated sewage, and habitat fragmentation in the riverine zone. Pise and Garge (2021) [19] investigated fish diversity in the upper Godavari River, where they observed moderate species richness along with some sensitive and endemic species such as *Tor khudree*, which were under stress due to changing hydrology and water quality issues.

The current investigation aligns closely with the findings of Shinde *et al*. (2009) [8] and Patil & Shinde (2014) [10] in terms of observed threats such as pollution and sand mining in semi-urban stretches. It shares ecological parallels with the Wainganga River study by Joshi and Tembhurne (2020) [16], where upstream sections still retain high diversity. As noted by More *et al*. (2012), urban rivers like Mula-Mutha show a sharp decline in species richness, which is mirrored in the lower Pravara River due to proximity to settlements and untreated discharges. Similarly, the occurrence of indicator species in the upper Pravara region matches findings from Pise and Garge (2021) [19] in the upper Godavari.

Acknowledgments

The authors thank the local fishers and field guides for their support during sample collection and the Department of Zoology, R.B.N.B. College, Shrirampur that provided laboratory facilities for analysis.

**References**

1. Jayaram KC. The Freshwater Fishes of the Indian Region. Delhi: Narendra Publishing House, 1999.
2. Talwar PK, Jhingran AG. Inland Fishes of India and Adjacent Countries. Vols, 1 & 2. Oxford and IBH Publishing, 1991.

3. Dahanukar N, Raut R, Bhat A. Distribution, endemism and threat status of freshwater fishes in the Western Ghats of India. *J Biogeogr*,2004:31(1):123–36.
4. IUCN. The IUCN Red List of Threatened Species [Internet], 2023 [cited 2025 Apr 17]. Available from: www.iucnredlist.org
5. Central Institute of Fisheries Education (CIFE). Status of Riverine Fisheries in India. Mumbai: Central Institute of Fisheries Education, 2020.
6. Dahanukar N, Raut R, Bhat A. Distribution, endemism and threat status of freshwater fishes in the Western Ghats of India. *J Biogeogr*,2004:31(1):123–36. https://doi.org/10.1046/j.0305-0270.2003.00915.x
7. Talwar PK, Jhingran AG. Inland Fishes of India and Adjacent Countries. Vols, 1 & 2. New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd., 1991.
8. Shinde SE, Pathan TS, Raut KS, Bhandare RY, Sonawane DL. Fish biodiversity of Pravara River at Pravaranagar, District Ahmednagar, Maharashtra. *World J Zool*,2009:4(3):176–9.
9. More PR, Shinde SE, Sonawane DL. Fish diversity of Mula-Mutha River at Pune, Maharashtra. *Biolife*,2012:2(2):485–91.
10. Patil SV, Shinde SE. A study on ichthyofaunal diversity of Bhima River near Tulapur, Pune, Maharashtra. *Int J Fauna Biol Stud*,2014:1(6):78–82.
11. Central Institute of Fisheries Education (CIFE). Status of Riverine Fisheries in India [Internet]. Mumbai: CIFE, 2020 [cited 2025 Apr 17]. Available from: http://cife.edu.in
12. IUCN. The IUCN Red List of Threatened Species. Version 2023-3 [Internet], 2023 [cited 2025 Apr 17]. Available from: https://www.iucnredlist.org
13. Ministry of Environment, Forest and Climate Change (MoEFCC). National Biodiversity Action Plan. New Delhi: Government of India, 2018.
14. Sarkar UK, Deepak PK, Negi RS, Paul SK, Singh SP. Captive breeding of endangered fish species in India: An overview. *Indian J Fish*,2008:55(4):335–41.
15. Lakra WS, Sarkar UK, Gopalakrishnan A, Kathirvelpandian A. Threatened Freshwater Fishes of India. Lucknow: National Bureau of Fish Genetic Resources (NBFGR), 2010.
16. Joshi KD, Tembhurne BV. Assessment of fish diversity in the Wainganga River, Maharashtra, India. *J Entomol Zool Stud*,2020:8(2):1434–40.
17. Sugunan VV. Inland Fishery Resources of India. FAO Inland Water Resources Series No. 347. Rome: Food and Agriculture Organization of the United Nations, 1995.
18. Salunkhe PS, Kamble SM. Ichthyofaunal diversity and ecological status of the Panchganga River, Maharashtra. *Environ Conserv J*,2022:23(1):223–30.
19. Pise M, Garge R. A preliminary study on the fish diversity of the upper Godavari River. *Indian Streams Res J*,2021:11(5):1–8.