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Ichthyofaunal Diversity with Reference to Species Composition of Niwali Reservoir, District Parbhani, (Maharashtra), India.

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Abstract

The present study investigates the ichthyofaunal diversity of the Niwali Reservoir, a medium-sized water body in Maharashtra, India, conducted from May 2023 to May 2025. During this period, a total of 13 fish species, representing 5 orders, 7 families, and 11 genera, were recorded. The order **Cypriniformes** was the most dominant, comprising 7 species (53.84%), followed by **Siluriformes** with 2 species (15.38%), while **Perciformes**, **Synbranchiformes**, and **Osteoglossiformes** were represented by one species each (7.69% each). These results indicate that cyprinids are the predominant group in Niwali Reservoir, consistent with their dominance in freshwater ecosystems across India. Despite having lower species richness compared to some other Indian reservoirs, Niwali Reservoir exhibits a relatively good species composition and supports a well-structured fish community, highlighting its ecological significance and potential as an important habitat for ichthyofaunal diversity.

Key words: Ichthyofaunal diversity, Jintur region fish, Niwali Reservoir.

Introduction

Freshwater ecosystems, including rivers, lakes, and reservoirs, are among the most productive and biologically diverse habitats on Earth. Reservoirs, as lentic aquatic systems formed by impoundments, perform multiple ecological and socio-economic roles: they serve irrigation, drinking water supply, fisheries, recreation, flood control, and provide a habitat for a variety of aquatic organisms (Mittermeier & Mitemeir, 1997). Among these, ichthyofauna (fish fauna) are especially important, both as indicators of ecological health and as resources for local communities.

India is recognized as one of the world's mega-biodiversity countries, with a considerable richness of freshwater fishes. Warm freshwater habitats in India harbor over 500–600 species (various sources). (Kar, C. Bohra , & L.K. Sigh,, 2003)The peninsular states of Maharashtra, in particular, are endowed with numerous reservoirs and dams that support both indigenous and exotic fish species. Studies in various reservoirs of Maharashtra have recorded species compositions ranging from about 24 species in Shekhdari Dam, Amravati District to about 37 species in Yeldari Reservoir, Parbhani District. (Farkade, Bhandarkar , & Sangve, 2023) .A comprehensive understanding of fishery resources, including their availability and distribution within a specific water body, is crucial for the effective and sustainable utilization of those resources. (S.K, Mane A.M , & Pulle J.S , 2006).Many

researchers have made valuable contributions in the field of ichthyology such as (Joshi & V.B. Sakhare,). Several earlier studies have reported positive correlations between biomass production and species abundance. (Ehrlich & E.O. Wilson, 1991).

The Niwali Reservoir, located in Jintur Tahsil of District Parbhani, Maharashtra, remains understudied in terms of its ichthyofaunal diversity despite its significance for local fisheries, livelihood, and ecology. Knowledge of species composition and diversity is fundamental for monitoring ecosystem health, detecting environmental changes (such as eutrophication, pollution, or invasion by exotic species), and for formulating resource management and conservation strategies.

The present study aims to fill this gap by investigating the **ichthyofaunal diversity with reference to species composition** of Niwali Reservoir, District Parbhani, Maharashtra, India. The study will document the richness, abundance, and taxonomic composition of fishes in the reservoir and discuss implications for conservation and sustainable fisheries management.

Materials and Methods

Study area

The present study was conducted at the Niwali Reservoir, a medium-sized water body located approximately 14 km from Jintur city in Parbhani district, Maharashtra. Geographically, the reservoir is situated at 19.640261° N latitude and 76.68932° E longitude. Niwali Reservoir is constructed on the Karapara River, a tributary of the Purna River in Jintur Tahsil of Parbhani district. (Maharashtra).

Fish sampling methods

Fish sampling was carried out once per month between 07:00 am and 09:00 am from April 2022–April 2024. Samples were obtained from three predetermined stations within the reservoir, representing different ecological zones. In addition to direct sampling, fish specimens were also collected from the local fish market of Jintur and from fishermen operating within the reservoir, in order to supplement the diversity record. Immediately after collection, specimens were carefully washed with reservoir water to remove debris and mucus. All collected specimens were transferred to separate plastic containers and subjected to preliminary documentation, including high-resolution photographs, to facilitate further reference. Labeling of specimens included sampling station, date, and other relevant field notes. For long-term storage, specimens were transferred into fresh formalin after 24–48 hours to ensure proper fixation. Specimens were identified on-site up to the lowest possible taxonomic level using standard identification keys and field guides (Jayaram, 2010; Talwar & Jhingran, 1991). Representative individuals were preserved in 10% formalin solution for laboratory confirmation and morphometric analysis.

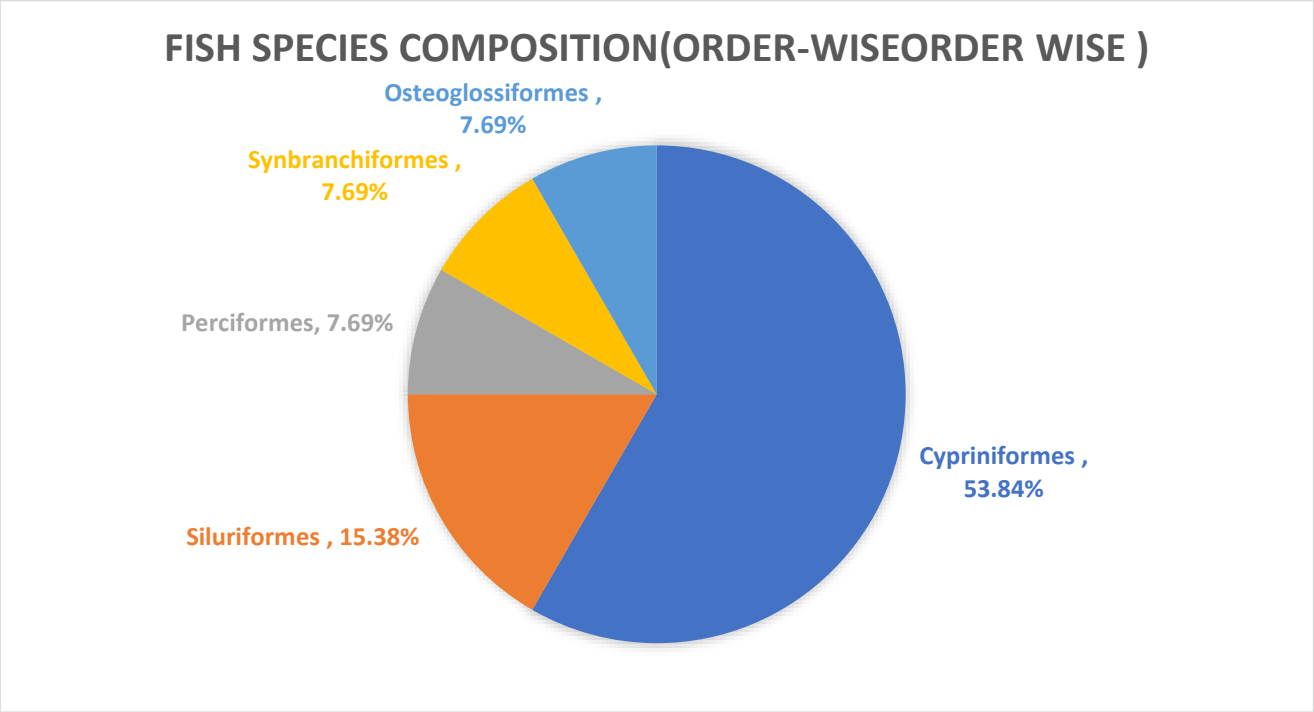
Identification and processing of specimens

Fish identification was carried out using standard morphometric and meristic characteristics such as body shape, fin formula, scale patterns, coloration, and other diagnostic characteristics. Identification was performed up to the species level wherever possible, with the help of standard taxonomic keys and reference literature (Jayaram, 2010; Talwar & Jhingran, 1991). FishBase (Froese & Pauly, 2025) was also consulted to confirm synonyms and updated nomenclature.

Morphometric and meristic data (e.g., total length, standard length, fin ray counts, and scale counts) were recorded with digital calipers and magnifying hand lenses. Identified specimens were compared with descriptions available in regional ichthyofaunal checklists to validate taxonomic status. Voucher specimens were deposited in the Zoology research centre of DSM college Parbhani, for departmental reference collection for future verification.

Result and Discussion

A total of **13 ichthyofaunal species** belonging to **5 orders, 7 families, and 11 genera** were recorded from Niwali Reservoir during the study period (Table X). The order **Cypriniformes** was the most dominant group, contributing **7 species (53.84%)**, followed by **Siluriformes (2 species, 15.38%)**, and the orders **Perciformes, Synbranchiformes, and Osteoglossiformes** with one species each (7.69% each). This result indicates that Cyprinids are the predominant group in the reservoir, which is in accordance with their dominance in most freshwater ecosystems of India.



Species Composition

Within Cyprinidae, *Labeo rohita*, *Labeo calbasu*, *Catla catla*, *Cirrhinus mrigala*, *Bangana ariza*, and *Systomus sarana* were frequently encountered, reflecting the importance of this family in inland capture as well as aquaculture practices. Their dominance can be attributed to their wide ecological tolerance, fast growth, and higher economic value. The presence of multiple synonyms for these species (e.g., *Cyprinus rohita*, *Morulius calbasu*, *Gibelion catla*) indicates their long history of taxonomic revisions and wide distribution across Indian waters.

The order **Siluriformes** was represented by *Wallago attu* (Siluridae) and *Sperata seenghala* (Bagridae), both large predatory catfishes. Their occurrence highlights the presence of higher trophic-level predators in the reservoir ecosystem, which play a key role in regulating fish community structure.

Under **Perciformes**, *Channa punctatus* (Channidae) was reported, a hardy species known for its air-breathing capacity and adaptation to stagnant waters. In addition, *Oreochromis niloticus* (Cichlidae) was recorded, which is an exotic species widely introduced for aquaculture and has established in many Indian reservoirs. Its presence raises ecological concerns due to possible competition with native species.

The order **Synbranchiformes** was represented by *Mastacembelus armatus* (Mastacembelidae), a benthic species that prefers sandy and muddy substrates, contributing to niche diversity in the reservoir.

Lastly, the order **Osteoglossiformes** was represented by *Chitala chitla* (Notopteridae), a commercially important featherback fish, which adds to the economic and ornamental value of the ichthyofaunal diversity.

Ecological and Fishery Implications

The dominance of Cyprinids and the presence of large catfishes indicate that Niwali Reservoir supports a healthy population of both herbivorous/omnivorous as well as carnivorous fishes, reflecting a balanced trophic structure. The occurrence of exotic species (*Oreochromis niloticus*) is noteworthy, as it may alter the native biodiversity through competition and hybridization.

The ichthyofaunal diversity observed in the present study is comparable to other medium reservoirs of Maharashtra, where Cyprinids dominate followed by Siluriforms and Perciforms (Khedkar et al., 2014; Pawar et al., 2017). The findings highlight the ecological significance of Niwali Reservoir as a potential resource for inland fisheries and biodiversity conservation.

The Niwali Reservoir, a medium-sized reservoir, exhibits a relatively good fish species composition despite having lower diversity compared to some other Indian reservoirs. Arvind Balasaheb Harkar (2025) reported 21 fish species belonging to 5 orders and 6 families from the nearby Vishnupuri Reservoir, and Harkal and Kolapwar identified 25 species from the Painganga River. While other reservoirs such as Nath Sagar Dam (43 species; Hiware & Pawar, 2006), Govindsagar Reservoir (51 species; Kumar, 2002), Bori Reservoir (21 species; Joshi & Sakhare), Rawanwadi Lake (29 species; Kalbande et al., 2007), Rana Pratap Sagar Lake (39 species; Verma et al.), and Gandhi Sagar Reservoir (72 species; Ridhi, 2006) show higher species richness, the Niwali Reservoir still supports a notable and well-structured fish community, indicating its potential as an important habitat for ichthyofaunal diversity.

Table 1.SHOWING THE FISH DIVERSITY AND SPECIES COMPOSITION OF NIWAI RESERVOIR.

Sr. no	Order	Family	*Genus*	*species*	Synonames
01	Cypriniformes	Cyprinidae	*Labeo*	*rohita*	*Cyprinus rohita*, *Rohita buchanani*
02				*calbasu*	*Cyprinus calbasu*, *Morulius calbasu*, *Cirrhine micropogon*, *Labeo velatus*
03				*boggut*	*Chondrostoma boggut*, *Tylognathus striolatus*
04			*Catla*	*catla*	*Gibelion catla*, *Leuciscus catla*, *Cyprinus abramioides*
05			*Cirrhinus*	*mirgala*	*Cyprinus mrigala*, *Cirrhina rubripinnis*, *Cirrhina plumbea*, *Cirrhina macrops*, *Cirrhinus macrops*
06			*Bangana*	*ariza*	***Gymnostomus ariza***, *Cyprinus ariza*, *Cirrhinus ariza*, *Labeo ariza*, *Cyprinus reba*, *Gobio isurus*
07			*Systomus*	*sarana*	*Cyprinus sarana*, *Barbodes sarana*, *Barbus diliciosus*, *Barbus polydori*, *Puntius roseipinnis*,
08	Siluriformes	Siluridae	*Wallago*	*attu*	*Wallago russellii*, *Wallagonia athu*, *Silurus macrostomus*,

					Silurus wallagoo, *Silurus muelleri*,
09		bagridae	*Sperata*	*seenghala*	*Platystoma seenghala*, *Bagrus aorellus*, *Bagrus lamarrii*, *Mystus seenghala*,
10	Perciformes	Channidae	*Channa*	*puntatus*	*Channa punctatus*, *Ophicephalus punctatus*,
11		Cichlidae	*Oreochromis*	*niloticus*	*Tilapia crassispina*, *Chromis nilotica*, *Tilapia nilotica*, *Chromis guentheri*,
12	Synbranchiformes	Mastacembalidae	*Mastacembelus*	*armatus*	*Mastacembelus marmoratus*, *Mastacembelus marmoratus*
13	Osteoglossiformes	Notopteridae	*Chitala*	*chitla*	*Notopterus maculatus*, *Mystus chitala*,

(Synonyms listing retrieved from FishBase: https://www.fishbase.se/search.php).

Table 2: **Ichthyofaunal Composition of Niwali reservoir.**

Fish 1 *Labeo boggut*

Fish 2 *Bangana ariza*

Fish 3 *Labeo calbasu*

	
Fish 5 *labeo rohita*	Fish 6 *Wallago attu*

	
Fish 7 *Oreochromis niloticus*	***Chitala chitala***:
	
Fish 9 *Cirrhinus mrigal*	Fish 10 *Systomus sarana*

Fish 11 *Sperata seenghala*

Fish 12 *Catla catla*

Fish 13 *Channa punctata*

Fish 14 *Mastacembelus armatus*

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References

A. B. Harkal (2025). Studies on Fish Diversity of Painganga River, Mahur region Nanded (M.H). *Journal of Research and Development, 17*(3), 7-9.

Ehrlich, P., & E.O. Wilson. (1991). *Biodiversity studies science and policy.*

Farkade, A. A., Bhandarkar , S. V., & Sangve, K. B. (2023). Diversity and abundance of ichthyofauna in Shekhdari dam, district Amravati, Maharashtra. *Species, 24*(73), 1-9. doi:doi: https://doi.org/10.54905/disssi/v24i73/e39s1531

A.B. Harkal (2025). Diversity and Seasonal Occurrence of Ichthyofauna of Vishnupuri. *Journal of Research and Development, 17*(3), 4-6.

Hiware, C., & Pawar, R.T. (2006). Ichthyofauna of Paithan Reservoir (Nath Sagar Dam) in Aurangabad Dist. Of. *APH Publishing Corporation, New Delhi.*

Jayaram, K.C (1981.). *The fresh water fishes of India.* ZSI.

Joshi, P., & V.B. Sakhare,. (n.d.). Ecology and Icthyo fauna of Bori Reservior in Maharastra fishing chimes. *22*(04), 40-41.

Kalbande S., Telkhade P., & Zade S. (2007). Fish Diversity of Rawanwadi Lake of Bhandara District Maharashtra, India. *Journal, 2*(2), 30-33.

Kar, D. A., C. Bohra , & L.K. Sigh,. (2003). fishes of Barak drainage, mizaram and Tripura; In: Environment, pollution and management. *APH publishing corporation, new Delhi*, 203-211.

Kumar, K. (2002). Management and development of Gobindsagar reservoir. A case study. *Proc. Nat. workshop reservoir Fish,*, 13-20.

Mittermeier, R., & Mitemeir, C. (1997). *Megadiversity Earth's biologically wealthiest Nation In mc Allister, D.E. A Lttamiltion and B. Harvery Global fresh water Biodiversity sea wind cemex, mexico city,".*

P.K, T., & Jhingran V.G (. (1991). *Inland fishes of India and adjacent countries.* I & II, Oxford & IBH Co. Pvt Ltd, New Delhi 1158 pp.

S.K, P., Mane A.M , & Pulle J.S . (2006). The Fish fauna of Pethwadas Dam TalukaKandhar in Nanded District, Maharashtra, India. *J. Aqua. Biol, 22*(2), 55-58.

Verma, P., Sharma, L.L., & Hegde.A.G. (n.d.). Aquatic Biodiversity of Rana Pratap Sagar Lake. *The 12th World Lake*, (pp. 67-70).

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