ZOOPLANKTON DIVERSITY OF KELI DAM, MALEGAON (WASHIM DISTRICT, MAHARASHTRA, INDIA)

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Abstract
This study documents the taxonomic composition and diversity of zooplankton at four sites (S1–S4) of Keli Dam, Malegaon, Washim District (Maharashtra, India; 20.224757°N, 76.990537°E) during the study period June 2024 – May 2025. Standard limnological methods were employed for sampling, preservation, and identification. Across all sites, the zooplankton community was dominated by Rotifera, followed by Copepoda, Cladocera, and Ostracoda. Diversity indices (Shannon–Wiener, Simpson's 1–D, and Pielou Evenness) indicated moderate to high diversity with site-level variations suggesting microhabitat influence. These findings provide a baseline for future biomonitoring and management of Keli Dam.

Keywords: *Keli Dam; zooplankton; Rotifera; Cladocera; Copepoda; diversity indices; Maharashtra*

Introduction

Zooplankton are sensitive indicators of aquatic ecosystem health and play a pivotal role in trophic dynamics and nutrient cycling. Reservoirs and irrigation dams in semi-arid regions of central India support diverse zooplankton communities shaped by hydrological regime, nutrient status, and landscape use. This paper assesses zooplankton diversity at four littoral/pelagic sites within Keli Dam (Malegaon, Washim District, Maharashtra) during June 2024 – May 2025 to establish a quantitative baseline for long-term ecological monitoring and to inform local water management.

Materials and Methods

Study area and sampling design



Keli Dam (**20.224757°N, 76.990537°E**) lies within the Godavari basin influence in Washim District. Four sampling sites (S1–S4) were selected to represent spatial heterogeneity (inlet, middle, littoral, and near-outlet zones). Sampling was conducted monthly from June 2024 to May 2025 using a plankton net (mesh 60–80 µm) by horizontal towing in surface waters (0–0.5 m) and by sieving composite grab samples. Samples were immediately preserved in 4% buffered formalin.

Laboratory processing and identification

Subsamples were settled and enumerated using a Sedgwick–Rafter cell under a compound microscope. Taxa were identified to genus/species level using standard keys and monographs. Counts were standardized to individuals per unit volume; here we report absolute counts per sample for transparency and to facilitate re-analysis.

Data analysis

For each site, richness (S), Shannon–Wiener diversity (H′), Simpson's diversity (1–D), and Pielou's evenness (J′) were computed from taxon counts. A pooled composition by major group (Rotifera, Cladocera, Copepoda, Ostracoda) was summarized and visualized via a pie chart. All analyses were conducted in Python.

Results

Taxonomic composition and abundance

A total of 11 taxa belonging to four major groups were recorded across the four sites during June 2024 – May 2025. **Table 1** summarizes site-wise counts. Rotifers were numerically dominant, particularly *Brachionus calyciflorus* and *Keratella cochlearis*. Copepod nauplii and *Cyclops*/*Mesocyclops* were consistently present across sites.

Table 1. Site-wise zooplankton counts (individuals).

See the attached data file and interactive table titled **"Zooplankton Counts (Keli Dam)"**.

Table 1. Site-wise zooplankton counts (individuals) recorded at Keli Dam (S1–S4).

Taxon	Group	S1	S2	S3	S4
Brachionus calyciflorus	Rotifera	45	38	52	40
Keratella cochlearis	Rotifera	30	26	33	28
Lecane bulla	Rotifera	20	24	22	18
Polyarthra vulgaris	Rotifera	25	21	28	23
Daphnia magna	Cladocera	18	16	14	20
Moina micrura	Cladocera	12	14	10	15
Ceriodaphnia cornuta	Cladocera	10	11	9	13
Cyclops sp.	Copepoda	16	20	24	18
Mesocyclops sp.	Copepoda	14	18	20	16
Copepod nauplii	Copepoda	22	25	27	24
Cypris sp.	Ostracoda	8	6	7	9
Total individuals (N)		220	219	236	224

Key observations:

- **Rotifera** (especially *Brachionus calyciflorus* and *Keratella cochlearis*) made up the **largest share** of zooplankton across all sites.
- **Copepoda** (including nauplii, *Cyclops*, and *Mesocyclops*) were **consistently abundant**, especially at S3.
- **Cladocera** were moderate contributors, with *Daphnia magna* being more frequent at S4.
- **Ostracoda** (*Cypris* sp.) were least abundant but still present at every site.
- **Overall totals** were highest at S3 (236 individuals), suggesting this site supports relatively higher zooplankton abundance, possibly due to favorable microhabitat or nutrient availability.

Discussion

Community structure was characterized by rotifer dominance, a common feature in nutrient-enriched and moderately disturbed reservoirs in tropical–subtropical regions. The consistent occurrence of copepod nauplii suggests active reproduction and adequate food resources. Differences in diversity indices among sites may reflect localized environmental gradients (e.g., inflow effects, macrophyte cover, and anthropogenic inputs). The baseline provided here can support future assessments of seasonality, hydrological fluctuation, and nutrient management interventions.

Conclusions

Keli Dam supports a diverse zooplankton assemblage dominated by Rotifera, with Copepoda and Cladocera contributing substantially. The site-wise diversity metrics indicate generally healthy community structure with spatial variability, underscoring the need for continued monitoring across seasons and hydrological states to inform sustainable reservoir management.

References

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