



PLANKTON DIVERSITY OF KUWANO RIVER IN BALRAMPUR CITY (U.P.) INDIA

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Abstract

A detailed investigation of the qualitative as well as quantitative micro and macro plankton in time and space in the Kuwano River was conducted. 18 species of phytoplankton were recorded. The number of phytoplankton increased in the month of January and decreased in the month of March. While 10 species of zooplankton were recorded. Zooplankton showed distinct quantitative variations. The number of zooplankton increased in the summer and decreased in the winter season. Different groups of zooplankton exhibited peaks in different months of the year.

Keywords: *Plankton, Kuwano River, Zooplankton, Phytoplankton, Qualitative, Quantitative variations, Benthos*

Introduction

The zooplankton population is a significant source of food for fish in a water body, whereas the phytoplankton population is the biological wealth of water for fishes in every aquatic system. It is evident that some fishes are typically active feeders on the plankton while others feed upon zooplankton throughout their life. So basically all the fishes are plankton feeders at some stage of their life cycle. Evaluation of plankton's value as fish food is aided by understanding of their composition, abundance, and dispersal. Phytoplankton and zooplankton each have a specific role in the development and upkeep of a water body. The real picture of any phytoplanktonic mass and zooplankton in a water body at the micro level can be understood only when adequate data of the above two planktonic biomass are available.

The selected water body is a rectangular, shallow, and perennial one having a concave basin and is used for the culture of fishes, especially major carp. The water body is getting eutrophicated fastly and blooming phytoplanktonic taxa, especially Chlorophyceae and, bacillariophyceae.

Material and Methods

Zooplankton were sampled with a mushroom-shaped scooping bottom sampler which collected a sample of about 10 cm× 10 cm. The entire collection was brought to the laboratory for further investigation as per the method. A sample of 200 ml. was taken out and passed through guarded sieves and washed with plenty of water. The organisms collected in the sieve were transferred to a bottle filled with water. The zooplankton was first identified in living conditions and preserved in a 5% formaldehyde solution.

The collection of phytoplankton was made by hauling 2-3 liters of water through the plankton net (Bolting silk no. 0.25, mesh size 0.03-0.04mm).

Result and Discussion

The members of green algae were found present throughout the years of investigation but in lesser numbers. The maximum (51-85%) was recorded in January and minimum (25-11%) in March (Table 1).

Table-1: Phytoplankton population of Kuwano river during Jan23- Dec 23

S.No.	Phytoplankton	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Freq. class
1	<i>Chaetophora sp.</i>	+	+	++	++	+	+	+	++	+++	++	+	+	A
2	<i>Chlamydomonas sp.</i>	+++	+	+	+	+	+	++	+	++	+	+	+	A
3	<i>Chlorella sp.</i>	+	-	+	-	-	-	++	-	+	+	++	+	A
4	<i>Hydrodictyon sp.</i>	+	+	+	-	+	+	++	-	+	-	+	-	A
5	<i>Ulothrix sp.</i>	++	++	-	++	-	-	-	++	+	++	+	+	A
6	<i>Zygnema sp.</i>	+	+	++	+	-	+	++	-	+	++	+	+	A
7	<i>Chladophora sp.</i>	+	++	+	++	-	+	+	+	++	+	++	+	A
8	<i>Scendesmus sp.</i>	+	+	+	+	+	-	+	+	++	+	+	+	A
9	<i>Pediastrum sp.</i>	+	+	+	++	-	-	++	-	+	++	+	-	A
10	<i>Spirogyra sp.</i>	++	+	-	+	+	+	+	-	+	+	+	+	A
11	<i>Stegioclonium sp.</i>	+	+++	+	+	+	-	+	++	++	++	+	+	A
12	<i>Nostoc sp.</i>	++	+	++	+	++	++	+	+	+	+	++	-	A
13	<i>Anabaena sp.</i>	++	++	+	+	+	+	++	++	++	+	+	+	A
14	<i>Oscillatoria sp.</i>	+	++	+	+	+	+	++	++	+	+	++	+	A
15	<i>Microcystis sp.</i>	+	+	++	+	+	+	++	+	++	++	+	+	B
16	<i>Hormidium sp.</i>	++	++	-	+	++	++	+++	+++	++	+	+	+	B
17	<i>Euglena sp.</i>	+++	++	+++	++	-	+	+	++	++	+	+	+	B
18	<i>Oedogonium sp.</i>	++	+	+	++	+	+	+	-	+	++	+	+	A

Note: +++++ = Abundant
 +++ = Common
 ++ = Frequent
 + = Rare
 - = Absent

No fixed pattern in the density of filamentous and non-filamentous forms could be assessed since it was during winter months, the non-filamentous forms were in plenty, and during the rest part of the year, the filamentous forms. The contribution of these algae towards the total density of phytoplankton ranged between 11-85% during the different months of the year, while *Spirogyra*, *Hydrodictyon*, *Oedogonium*, *Pediastrum*, *Scendesmus* were amongst the non-filamentous ones. By order of frequency of occurrence during the entire period of study, the genera encountered were *Spirogyra*, *Zygenma*, *Nostoc*, *Hydrodictyon*, *Chlamydomonas*, and *Oedogonium* and, *Euglena* sp. A total of 18 sp. to 16 genera were collected during the period of investigation. They were enlisted along the seasonal variation in their density and abundance (Table 1).

Zooplankton of the investigation of water bodies was collected in the year 2023 and their percentage was calculated in Table-2 during different months of the year, the highest value was

Table 2: Zooplankton population of Kuwano river during Jan 23- Dec 23

S.No.	Zooplankton	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Frequency class
1	<i>Crustacea Daphnia</i>	+	+	++	++	+++	+++	+++	++	+++	++	++	++	B
2	<i>Branchipus Hemiptera</i>	+	+	+	++	++	++	++	+	++	+	+	+	A
3	<i>Cicada</i>	+	-	+	++	++	++	++	-	+	+	++	+	A
4	<i>Ranatra</i>	+	-	+			++		++	++	++	++	+	A
5	<i>Laccotrephes griseus</i>	++	+	+++	++	++	+++	+++	+++	+++	+++	+	++	B
6	<i>Eristalis sp.</i>	++	+	+	++	++	+++	+++	++	+	++	+	+	A
7	<i>Psychoda sp.</i>	+	+	+	++	++	+++	++	+	++	++	+	+	A
8	<i>Tendipes</i>	+	+	+	++		+++	++	-	+	++	+	-	A

9	Maggots Larvae	+	++	+++	++	++	++	++	-	+	++	+	+	A
10	Wiggler Larvae	-	++	+++	++	++	++	++	-	+	++	+	-	A

recorded in the month of February. Their increasing trend was found to be from February to May and again in September. Thus two maxima in May and October and two minima in February and September were recorded. 10 sp. of zooplankton were found to be collected during the period of investigation. With major constituents were *Crustacea* (26-75%), *Hemiptera* (25-50%), and *Diptera* (26-80%). Among insects Maggots larvae and Wiggler larvae were found regular and abundant. Some insect larvae were irregular in shallow-depth zones but were completely absent in deep zones. The various zooplankton was not equal in their abundance in the shallow zones in their abundance.

Conclusion

During the investigation presence of zooplankton was maximum in the summer month (May) and minimum in the spring month (February). This is not in conformity with the findings wherein maximum zooplankton was observed in April and minimum in September, while other workers observed maximum in the month of June and minimum in the month of February in a lake of Lucknow (U.P.). The differences in the occurrence of peaks in zooplankton might be due to the different nature of the water bodies, differences in the composition of abiotic factors of water and the soil, and variations in the productivity of different water bodies.

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