

Qualitative Plankton Diversity of Two Carp Culture Ageing Ponds of LNMU Campus Darbhanga, India

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ABSTRACT

Plankton diversity is an important criteria for assessment of the water quality. In this study we tried to assess the plankton species diversity in two ponds of LNMU, Campus Darbhanga viz. Anandbag pond and Manokamna Temple pond. Plankton diversity of both ponds were recorded from January 2018 to June 2018. A total three classes of phytoplankton and Zooplankton were recorded which contain 18 phytoplankton species and 14 Zooplankton species from both ponds. Out of which 9 species of phytoplankton and 11 species of Zooplankton were common in both ponds. Anandbag pond alone had 12 species of phytoplankton and 12 species of Zooplankton. Manokamna Temple pond had 15 species of phytoplankton and 13 species of zooplankton. Manokamna Temple pond was rich in phytoplankton as well as Zooplankton. A pivotal relationship was observed between phytoplankton and zooplankton diversity.

Keywords: Plankton diversity; Phytoplankton; Zooplankton; Pond

INTRODUCTION

Pond is the smallest unit of fresh water ecosystem that are rich in biodiversity. The biodiversity of pond ecosystem is threatened by anthropogenical abuse. Pond water getting polluted due to domestic waste, sewage, industrial and agricultural effluents etc. Plankton is part of aquatic life, which is composed of tiny organisms living and drifting in the direction of water current. Phytoplankton is the primary producer of the community, where as zooplankton is the primary consumer and secondary producer [1]. According to the report of the NASA (2009), phyto- plankton account half of all photosynthetic activity on the earth. Therefore, phytoplanktons are responsible for much of the oxygen present in the atmosphere, half of the total amount produced by all plant [2]. The phytoplankton is very important to water body and also contribute to general economy of pond. Phytoplankton is the vital source of energy as primary producers and serve as direct source of food to some aquatic animals [3]. Phytoplankton play important role in the biosynthesis of organic matter in aquatic zooplankton, constitutes important food for fishes. Zooplankton plays pivotal role in food chain and food web of pond ecosystem.

However, there is a dearth of literature related to the Plankton of Darbhanga, district pond especially those located in LNMU, Campus, Darbhanga. The present investigation has been undertaken to assess the limnological knowledge of planktonic diversity of two representative ponds of LNMU, Campus, Darbhanga.

MATERIALS AND METHODS

The study was conducted during January 2018 to June 2018 on two ponds viz. Anandbag pond and Manokama Tample Pond in LNMU, Campus Darbhanga, India. Darbhanga is situated in 25.53° to 26.27° (North) latitude and 85.45° (East) longitude and average of temperature variation in this area are 12°C to 38°C with average rainfall of 1638mm. Darbhanga could be easily be called as a "Ponds City". Both ponds are used as fish farming and irrigation. Planktons samples were collected one in every month from the 5 randomly selected places of the pond at a depth of 25cm below the surface. Plankton samples for this study were collected with plankton net made of bolting silk cloth no.25 with mesh size 0.03-0.04mm [4]. Phytoplankton samples were preserved in 0.3Lugol's iodine, while Zooplankton were preserved in 4% buffer formalin solution. In laboratory, plankton analysis was done by the method of Lackey 1938. The identification of plankton species was done with the aid of plankton identification key and monograph by Belligner 1992 [5].

RESULTS

Three Classes of phytoplankton (Chlorophyceae, Cynophyceae

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and Bacillariophyceae) were recorded from Aanand bag pond and Manokama Trample pond.12 species of phytoplankton (Euglena, Spirogyra Volvox, Pediastrum, Cosmerium, Rhizoclonium, Nostoc, Anabaena, Microcystis, Pinnularia, Fragilaria, Nitzhiapalea) were recorded in Anandbag Pond. 15 species of phytoplankton (EuglenaSpirogyra, Volvox, Cosmerium, Cladophora, Rhizoclonium, Nostoc, Spirulina, Ocillatoria, Anabena, Cymbella, Synendra, Fragilaria, Naviculla, Nitzhiapalea) recorded in Manokama Trample pond. Three classes of Zooplankton(Cladocera, Rotifers and Copepoda) were recorded from Anandbag pond and Manokamna Temple pond. 12 species of Zooplankton (Bosmina, Daphnia, Ceripdephnia, Alona, Monia, Chydorus, Brachionus, Euchlanis, Nothola, Rotara, Filinia, Diaptomous) were recorded in Anandbag pond. 13 species of Zooplankton (Bosmina, Daphnia, Ceripdephnia, Alonella, Monia, Chydorus, Brachionus, Trichosera, Nothola, Rotaria, Filinia, Diaptomous, Cyclopus) were recorded in Manokamna Temple Pond.

DISCUSSION

In the fish pond the diversity and density of plankton was also affected by the fish predation as feeders. Among phytoplankton, green algae are preferably fed by the cultured carps, especially by Labeo rohita [6]. The low diversity of phytoplankton in the ponds can be attriubed to the cumulative effect of blue-green algae and the grazing effect of cultured carps. Total twenty seven phytoplankton species were recorded in both the ponds. Among them nine species were found to be common in both the ponds. 12 species were recorded from Anandbag pond and15 species were recorded from Manokamna Tample pond (Euglena, Spirogyra Volvox, Pediastrum, Cosmerium, Rhizoclonium, Nostoc, Anabaena, Microcystis, Pinnularia, Fragilaria, Nitzhiapalea) were recorded in Anandbag water pond. Euglena, S pirogyra, Volvox, Cosmerium, Cladophora, Rhizoclonium, Nostoc, Spirulina, Ocillatoria, Anabena, Cymbella, Synendra, Fragilaria, Naviculla, Nitzhiapalea were recorded in Manokama Trample pond. Zooplankton is one of the most biotic components that influence the food chain and food web of any limnological water bodies [7], total twenty five Zooplankton were found in both ponds. Among them 11 species were common in both ponds. 12 species were recorded from Anand bag pond and 13 species were recorded from Manokamna Temple pond. Bosmina, Daphnia, Ceripdephnia, Alona, Monia, Chydorus, Brachionus, Euchlanis, Nothola, Rotaria, Filinia, Diaptomous were recorded in Anandbag pond. Bosmina, Daphnia, Ceripdephnia, Alonella, Monia, Chydorus,

Brachionus Trichosera, Nothola, Rotaria, Filinia, Diaptomous, Cyclopus were recorded in Manokamna Temple Pond.

CONCLUSION

A pivotal relationship was observed between phytoplankton and Zooplankton diversity. Both ponds are highly productive for fish farming but Manokamna Tample pond is eutrophic condition,grater diversified and phytoplankton is being the dominance group than Anandbag pond. On the basis of study and findings that the people of this region will care for the proper and better upkeeps of both ponds for the purpose of the economy.

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