PHYTOPLANKTON AND ZOOPLANKTON IN SELECTED RESERVOIRS OF SRI LANKA: A PRELIMINARY STUDY

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Introduction

Planktons are microscopic, floating organisms in water. These organisms are known to have cosmopolitan distribution and their abundance and diversity can vary in different regions. Unlike terrestrial organisms of the water body planktons show high diversity in temperate regions where climate variables are distinct (Fernando & Rajapaksha, 1983). Such changes in the environment lead to changes in microhabitats which support diverse groups of aquatic organisms. Although Sri Lanka does not experience large seasonal variations, the diversity of in freshwater habitats can be considered as high. The reasons for these variations could be mainly due to the origin and geological locality of the reservoirs. Due to these factors, reservoirs experience various types of climatic changes, bedrock influences and maturity.

As planktons are well known biological indicators, the presence, abundance and diversity of these organisms provide important information on environmental conditions along temporal gradients. Thus, they can be used to predict past and future scenarios of the environment using present day data. However, before using them for such applications it is necessary to understand the morphology, diversity and ecological characteristics of such organisms. Although literature is available for planktons in Sri Lankan freshwaters, no complete checklist with clear morphological characteristics are available. Therefore, the current study was aimed to overcome this limitation by undertaking an extensive survey covering all the lentic freshwater bodies in different climatic regions of Sri Lanka.

Methodology

Plankton samples were collected from 40 selected reservoirs covering all the major climatic regions of Sri Lanka. The regions of the country where the study reservoirs were located are , Nuwaraeliya (05), Anuradhapura (28), Kandy (04) and Puttalum (03). Plankton nets of pore size 10 µm, 50 µm and 70 µm were used for sample collection. Preservation of samples were done according to standard methods. Spacimens were observed under a research microscope (OLYMPUS CX 31) equipped with phase contrast optics. Keys of Yatigammana, (2004); Fernando, (1990); were used for identification. In addition photomicrographs in databases were also used for the clarification and confirmation of identification. Photomicographic recordings were made of all the species observed.

Results and Discussion

From all the reservoirs studied, a total of 90 plankton species were recorded. Of them, 60 species were phytoplankton, 23 spp. were zooplankton. However, 07 spp. remained unidentified. Of the 83 species identified, 32 belonged to the Class Chlorophyceae which can be considered as the dominant group. Two species belonged to the Class Euglenophyceae, 01 species belonged to the Class Xanthophyceae, 13 species belonged to Cyanophyceae, 10 spp. belonged to the Class Bacillariophyceae & 01 species belonged to the Class Dinophyceae. Among the zooplantoktons, Order Cladocera was the dominant group while Subclass Ostracoda was rare. The number of identified species of zooplankton are as follows: Rotifera spp (07), Cladocera spp(10), of Ostracoda spp(02) & Copepoda spp (04)(Figs. 1 & 2). Among the zooplankton, cladocerans were the dominant group. According to Yatigammana (2004), Cladocera is a good indicator organism of fresh water systems. They can be used to predict eutrophication, salinization and water level fluctuations. When considering the study reservoirs, many of them are located in the Dry zone (Anuradhapura district). Almost all the recorded species of Cyanobacteria. were observed from these reservoirs. In addition, toxin producing species such as *Cylindrospermopsis raciborskii*, *Microcystis* sp. and *Peridinium* sp. were also recorded from Dry Zone reservoirs at relatively high abundance. It was also noted that when these toxin producing algae are present, the diversity of both zooplankton and phytoplankton was low. It could be due to the allelopathic activity of such organisms. However, the diatom, *Aulacosiera granulata* was found in all the reservoirs and were abundant in reservoirs in the Wet Zone. *Aulacosiera granulate* is known to be very sensitive to nutrient levels of water and especially to phosphorus. Interestingly, zooplankton abundance and diversity were low in all the reservoirs which could be an indication of immature ecological structures of the reservoirs which is directly related to low water residence time, common to lentic systems that have high flushing rates.

Conclusion

The findings suggest that majority of the 40 reservoirs contain more phytoplankton than zooplankton and thus the primary production could be high. Lower abundance and diversity of zooplankton suggest that these aquatic systems are still in immature situation. Presence and high abundance of toxin producing algae especially in the Dry Zone areas give warning signs of human and animal health problems in the region and also contamination of other reservoirs.

References

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Appendix

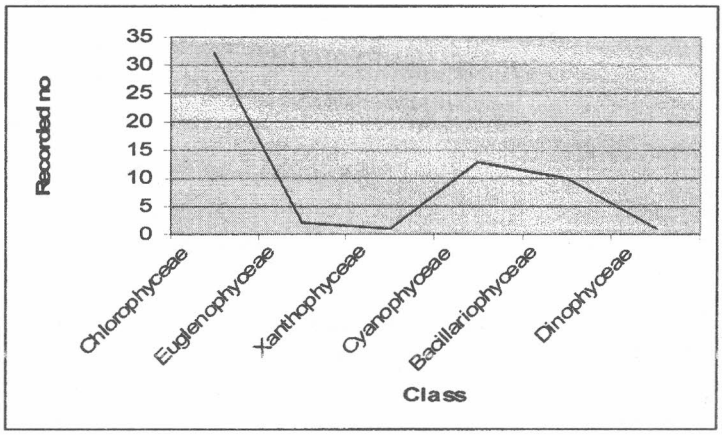

Fig. 1.Number of Phytoplankton recorded from the 40 reservoirs

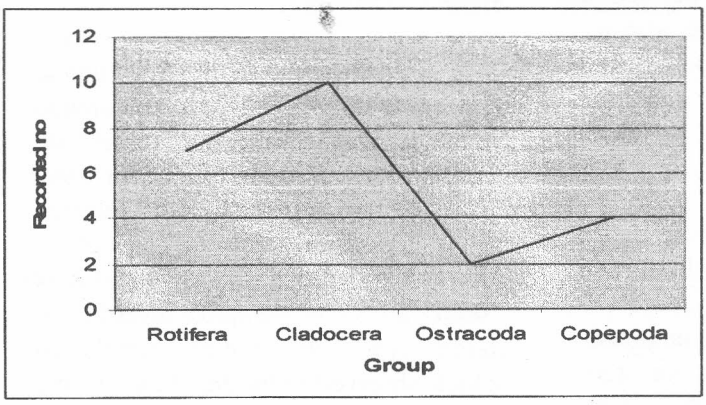

Fig. 2 .Number of Zooplankton recorded from the 40 reservoirs