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Habitat Characterization and Diversity of Periphytic Community of Upper lake Bhopal, Madhya Pradesh, India (Habitat Characterization and Physico-Chemical Parameters)

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Abstract

Present study was based on diversity of Periphytic community on the different locations of the upper lake viz. (S1), (S2) and (S3) from the month of October, 2013 to December, 2013. Main work was on the habitat characterization of periphyton. Periphytometer are placed in the water body and left in place for a certain period of time which was used by us. It depends upon the rate at which periphyton accumulates on the substrate. As a rule, they should be removed just short of the point that the attachment surface becomes "saturated" and periphyton begins sloughing off. At the end of the collection period, the periphyton is collected simply by scraping it off the surface. Periphytic communities are important structural and productive components of freshwater ecosystems; yet factors regulating their temporal and spatial abundance are difficult to predict. Another advantage of this method is that periphyton integrates water quality conditions over time, which may provide a better representation of lake water quality status than do instantaneous measures of specific constituents. At present there are total 122 species were present around the world but in my research I have found only 34 different species of this group. Our study also reveals the water parameters which indicates us the deteriorated condition of upper lake, due to constant growth of algal blooms at Bhopal, Madhya Pradesh.

Key-Words: Periphyton, Substrate, Periphytometer, Constituents, Ecosystem, Physico-Chemical Parameters

Introduction

An aquatic ecosystem (habitats and organisms) includes rivers and streams, ponds, lakes, oceans and bays, swamps, marshes, and their associated animals. These species have evolved and adapted to watery habitats over millions of years. We studied the water quality of Upper Lake and its change during the various Limonological and water quality status of upper Lake of Bhopal. Presence of algal bloom is the main disadvantage of eutrophication. Quality of lake water is deteriorated day by day due to the turbidity of the lake water, present study of biodiversity and their identification is one of the most interesting fields of biological research with reference to the physico-chemical parameters of the upper lake, which gives us an idea about the morphological variation of any particular habitat. Presence of algal bloom is the main disadvantage of eutrophication. Fresh water is most dense at about 4 degrees Celsius (39.2 °F) at sea level. .

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Dense water parcels can be formed which intrude the deep water layer. In the final section, stratification relevant physical properties, such as sound, speed, oxygen level, carbon dioxide level, electrical conductivity, and density, total hardness, calcium hardness, are discussed. An empirical and theoretical approach for quantitative evaluation is easy to measure the physico-chemical properties which conclude the contribution which is related to the aquatic fauna of the lake. It is possible that many of the thicker valves in the profiles contain littoral material transported to the site of deposition by turbid interflows and underflows. "Biological diversity means the variability among living organisms from all sources including interalia, terrestrial, marine and other aquatic ecosystem and the ecological complexes of which they are past, their includes biological diversity within species and of ecosystems." India has been recognised as one of the world's top 12 mega diversity nations. Periphyton refers to communities of algae in aquatic systems that are attached to the sediment surface or to aquatic, macrophyte vegetation.

Due to this complex regulation, the relative importance and contribution that each factor may exert in shaping

the Periphytic community is difficult to evaluate and quantify[1]. Moreover, the Periphytic communities habitually include various species that all respond uniquely to changes in the environment, which consequently further blurs the interpretation of the regulation at the community level [2]. Under eutrophic conditions, Periphyton communities on artificial substrates such as Glass Slides should be most representatives of natural epiphytic communities. Physical habitat varies naturally, as do biological characteristics; thus expectations differ even in the absence of anthropogenic disturbance.

Material and Methods

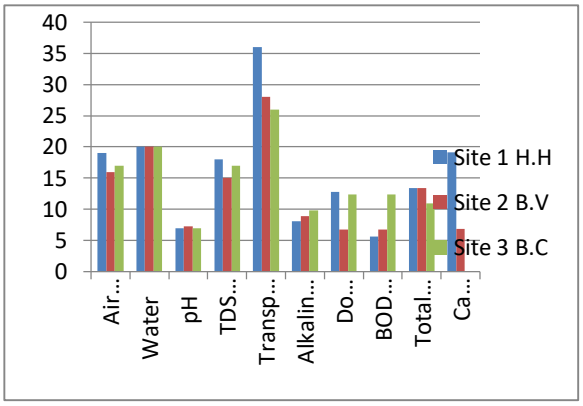
The physico chemical parameter were analysed by following method for water chemistry as given in [3] and [4]. Water sample were collected in 1 litre plastic cane with the help of rutted water the help from each station analysis of some of the physico chemical parameter were carried out immediately which include air and water temperature depth transparency. Free carbon dioxide fixing of sample for dissolve oxygen, pH, Conductivity, and TDS water sample for other physico chemical parameters were stored and cared to the laboratory and then immediately within 4-6 hours[5]. Preserved sample is now analysed with the help of certain instruments like forceps, microscope etc. We used light binocular microscope to analyse my collected and preserved sample. After that we will be able to identify the required organisms i.e. Periphyton there are almost 122 species of this group out these 34 we had identified from the collected and preserved sample from the sampling station.

Results and Discussion

During the present study maximum genera of periphyton were recorded from the station/site-1 i.e. Hamidia hospital and the minimum were recorded from the third station/site boat club. There was much free floating vegetation which is present. Along with these we also calculate some limonological parameters such as air temperature was maximum 19*C at site1 and minimum at station 3rd i.e. 16* C,water temperature is same almost i.e. 20* C, pH of the water maximum is 7.3 from site2 and minimum at site 1 i.e. 7, transparency was recorded maximum 36 cm at site 1 and minimum at 28cm from sampling site 3, B.O.D was recorded maximum at site1 i.e. 5.6mg/l and minimum at 4.8 mg/l from site 2, T.D.S was recorded from site1 maximum i.e. 36cm and minimum was recorded 14 cm from our 3rd site, D.O was recorded maximum 12.8 mg/l and minimum was 6.8mg/l from the site 3rd , Total hardness maximum was 13.4 and minimum was 10.9, and Ca- Hardness 19.1 recorded maximum and 6.9 minimum recorded from our sampling site 3rd. Many researchers were also study on this Upper Lake is a high productive ecosystem having low euphotic zones. Biochemical oxygen demand (BOD) is the amount of oxygen required by microorganisms to decompose biologically degradable organic matter in water under aerobic conditions. Input of large amount of sewage effluents, human excreta, etc. are known to cause increase in BOD levels. High BOD value is the general cause of death and decay of Periphytic community which increases in eutrophic waters.Under these natural conditions epiphytic communities are responding largely to nutrients in the water column as described by [6] & [7]. In the broad sense, physical habitat in lakes includes all those physical attributes that influence or provide sustenance to aquatic organisms.

Table (i): A comparative data sheet of the all the sampling sites/station

FAMILY	GENRA
CHLOROPHYHACEAE	EUDORNIA VIRDIS CHALMYDOMONAS
CHALORELLACEAE	CHLORELLA ANKISTRODESMUS
CHROMONADACEAE	DINOBRYON
COSCINODISCAEAE	MELOSIRA
EUGLYPHIDAE	TRINEMA
MOINIDAE	MOINA
CYCLOPIDAE	CYCLOPS CYCLOPOID CALANOID(COPEPOD)
NAIDIDAE	DERO
TRICHOCERCIDAE	TRICHOCERCA
BRANCHIONIDAE	BRACHIOUS KERTELLA
PARAMECIDAE	PARAMECIUM
NOSTOCACCAE	ANABAENA
NITSCHIACCEAE	NITZSCHIA
FRAGILARIACEAE	ASTERIONELLA FRAGILARIA SYNEDRA
DIATOMACEAE	DIATOMA
TABELLARICEAE	TABELLARIA
COSCINODISCACEAE	MELOSIRA
OSCILLATORIACEAE	PHORMIDIUM
NAVICULACEAE	PLEUROSIGMA
LECANIDAE	MONOSTYLA
CHARACEAE	NITELLA
ULOTRICHACEAE	ULOTHRIX URONEMA
DESMIDICEAE	COSMARIUM SUBCREATUM CLOSTERIUM
CLOSTRIDIACEAE	CLOSTERIDIUM



Conclusion

The habitat characterization of various Periphytic Community which I had discovered so far.The presence of that diversity was making the aqua of the lake very dirty and turbid. Due to this the aquatic flora as well as the aquatic fauna was also deteriorated day by day. My present study had also revealed that the Periphyton is the very good pollution indicators. So we have to control by putting the waste medical and sanitary waste inside such water resources. So that the aqua pollution would be stopped permanently.

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