



# Diversity of Aquatic Macrophytes of Ahiran Lake of Murshidabad District of West Bengal With Physicochemical Water quality Parameters

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## Abstract

The Ahiran Lake(wetland) is an ox- bow lake of Ganges River. It is considered to be an important wetland of Murshidabad district. It also serves as a home to a wide range of migratory birds. The diversity of aquatic macrophytes are the main source of food and fodder for the aquatic ecosystem of the wetland. Mostly these aquatic macrophytes are naturally occurring and well adapted to the environment and thus play an important role in maintaining the ecosystem of the wetland. The aquatic macrophytes which are naturally available can reduce the water pollution level by absorbing the nutrients of water. However, the hugely increasing human population, large-scale changes in land cover, and large-scale urban development lead to wetland degradation and creating a threat to the environment. Therefore necessary actions from Government like conservation, preservation of the aquatic species, and monitoring of the wetland at regular intervals are of utmost necessity to help the environment.

## Keywords

Ahiran Lake, Macrophytes, Ecosystem, Development, Murshidabad.

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## 1. INTRODUCTION

In terms of human development and land use, wetlands have so far been considered as wastelands or regions with very limited developmental potential. Mostly wetlands have been drained or filled-in so that the land area could be used for so called beneficial human activities. The view point regarding wetlands has changed with time and they are now considered to be the most important bio-diverse areas of the world and also as highly productive ecosystem where terrestrial and aquatic habitats merge. Wetlands are essential for survival of human as they contribute for countless benefit to humanity ranging from fresh water supply, food and building materials, control of flood and erosion and biodiversity. Ahiran Lake are reservoirs of many

biologically diverse vegetation, aquatic macrophytes being one of them. Aquatic macrophytes are the macroscopic plants like angiosperms, ferns, mosses, liverworts, and some freshwater macro-algae that occur seasonally or permanently in wet environments. These aquatic macrophytes may be classified into waterlogged, aquatic, floating aquatic, growing aquatic, free-floating, and marshy are amphibious. The aquatic macrophytes that are observed in wetlands are the principal source of food, and fodder in the aquatic ecosystem because of their diversity and abundance. Wetland are significantly used for productive ecosystem that can successfully convert solar energy into organic carbon in the presence of rich nutrients available from natural sources. The investigations carried out by

CIFRI showed that the rate of primary productivity through macrophyte and plankton phases from floodplain wetlands is many times higher than those reported from other inland open water ecosystems. Ahiran Lake is situated at murshidabad and for many reasons like extension of NH 34, cultivation purpose etc now the biodiversity is decreased. Many migratory birds like Red crested Pochard, Gadwall, Cotton Teal, Pintail etc are the main attraction of this lake. The major flora of this lake are Water hyacinth (*Eichhornia crassipes*), *Trapa natans*, Kureli (*Hydrilla verticillata*), *Nymphaea pubesens* Willd etc.

### 1.1. OBJECTIVE OF STUDY:

The main objective of my work is-

- a) To study the diversity of aquatic macrophytes of Ahiran Lake of Murshidabad district of West Bengal.

- b) To analyze the water quality parameters and their correlation with the diversity of macrophytes.
- c) To save the study area as a part of our environment.

### 2. Materials and Methods:

**2.1. Study Area:** My study area is situated on Ahiran mouza of Suti police station, J.L no 102, dagh no 2875, Murshidabad District, West Bengal. It extends on 24°30'North to 24°26'50" South latitudes and 88°02' East to 87°58'48" West longitudes. The southern side of Ahiran Beel is Ahiran village and Agargarpara village, eastern side surrounded by Bangabari village, northern side surrounded by National Highway 34 and Western side by big agricultural field. The Ahiran Mouza is under Raghunathganj Beal of Farakka Range of Nadia Murshidabad forest division.



Location of Study Area

### 2.2. Collection of samples and analysis:

Different species of macrophytes were collected by random sampling method on monthly basis throughout the year. All the collected sample plants were then kept in different plastic bags and transferred to the laboratory to wash the silts, snails, epiphytes and other under water materials. The water sample was also simultaneously collected in different plastic bottles and then stored in dark and cool place for further studies. For determining the

water quality some chemical parameters of the collected samples had been tested, viz – temperature, pH, Dissolved oxygen, turbidity, alkalinity, biochemical oxygen demand, hardness etc.

**3. Results and Discussion:** A total of 15 aquatic macrophytes were identified in Ahiran Lake during this study period among which *Eichhornia crassipes* (Water hyacinth) was the dominant species. The list of the dominant species is given below –

**Table 3.1. The List Of Dominant Aquatics Macrophyte Species Of Ahiran Lake Of Murshidabad**

SL NO.	SCIENTIFIC NAME	FAMILY
1	<i>Eichhornia crassipes</i>	Pontederiaceae
2	<i>Hygroryza aristata</i> (Retz.) Nees ex Wight & Arn.	Poaceae
3	<i>Scirpus</i> L.	Cyperaceae
4	<i>Fimbristylis</i> Vahl	Cyperaceae
5	<i>Cyperus</i> L.	Cyperaceae
6	<i>Aeschynomene aspera</i> L.	Fabaceae
7	<i>Trapa natans</i>	<i>Trapa natans</i>
8	<i>Nymphaea pubesens</i> Willd.	Nymphaeaceae
9	<i>Nymphoides hydrophylla</i>	Menyanthaceae
10	<i>Hydrilla verticillata</i>	Hydrocharitaceae

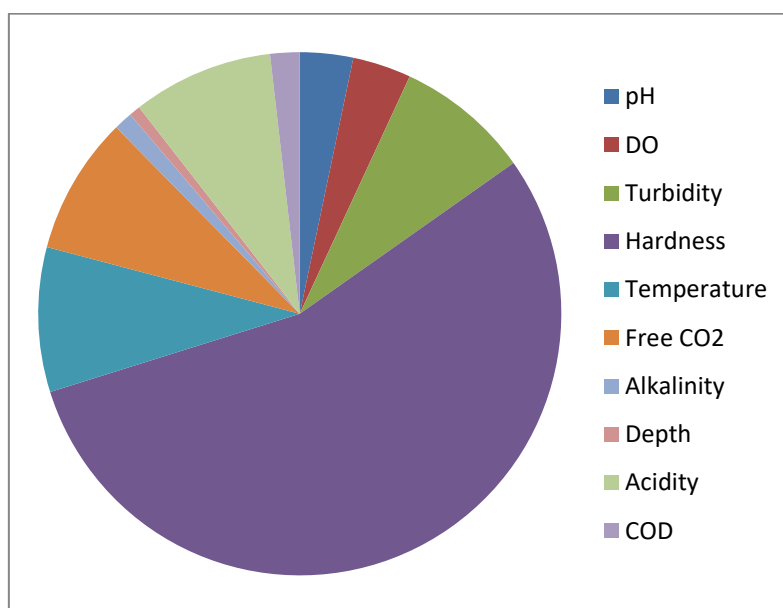
11	Valisneria spiralis	Hydrocharitaceae
12	Enhydra fluctuans	Asteraceae
13	Ipomoea aquatica	Convolvulaceae
14	Colocasia esculenta	Araceae
15	Echinochloa colona (L.)	Poaceae



**Figure 1. Aquatic Macrophyte of Ahiron wetland.**

**Table 3.2. RESULTS OF WATER QUALITY PARAMETERS OF AHIRAN LAKE OF MURSHIDABAD**

pH	8.50
Dissolved Oxygen (mg/lit)	9.35
Turbidity (cm)	21.5
Hardness (ppm)	142
Temperature (°C)	23.1
Free CO <sub>2</sub> (mg/lit)	22
Alkalinity (mg/lit)	3
Depth (meter)	1.8
Acidity (mg/lit)	22.5
COD (mg/lit)	4.7



**Figure: 2. Water Quality Parameters of Ahiran Lake**

The wetland is surrounded by agricultural fields and there is a stretch of NH 34 through the middle of the

wetland. The chemical fertilizers and pesticides get mixed with the water. Therefore, the overall water

quality of the wetland is not that good. Organic growth as well as the level of CO<sub>2</sub> is increasing day by day and simultaneously the level of Dissolved Oxygen is decreasing. However, some problems of eutrophication have also been noticed. The pH of water is 8.5 which shows the basic nature of water. The hardness is 142 ppm, and the COD is 4.7. The study also shows that there is a certain damage to the wetland every year specifically during summer and post-monsoon. Spatial and temporal fluctuation have been so far observed in biotic communities of wetland that leads to the diversity of both flora and fauna. Phytoplankton's make the base of the ecosystem because of possessing pigments that make use of the rich inorganic nutrients available in the wetland ecosystem and synthesize organic matter. Zoo plankton on the other hand hold the highest position in the pyramid. Therefore, both are important to balance the system.

#### 4.CONCLUSION:

*Ipomoea aquatic*, *Eichhornia crassipes*, *Nymphoides hydrophylla*, *Hydrilla verticillata* etc were some of the dominant macrophytic species in the selected wetland. Mostly these sp were the dominant sp and the rapid growth of these aquatic weeds indicates the water body was polluted. Therefore, the water quality was also showing signs of gradual

deterioration. As AHIRAN lake is of various ecological and economic importance so the kind attention must be given by the local authority and also the awareness of people must be increased to restore this water body.

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