

Biodiversity of Fresh Water Macrophytes in Dalpat Sagar Lake of Jagdalpur District (Chhattisgarh)

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Abstract

Aquatic plants play an important role in aquatic systems, where they provide food and habitat to fish, aquatic organisms and wildlife. In the present study presence of aquatic macrophytes were undertaken during March 2016 to February 2017. Assessment recorded from Dalpat Sagar Lake which is largest artificial Lake in Chhattisgarh state. Total 23 Aquatic plants are among the prolific ones on earth associated with both positive and negative impact on aquaculture. The complexity provided by macrophytes has been exhaustively studied in aquatic environments. However, macrophytes complexity has rarely been measured in a standardized fashion, making comparisons among different studied and the establishment of general conclusions difficult. The consequences of habitat structuring by macrophytes on invertebrates and fish in possible causes, mediated by habitat complexity, that lead to changes in these animal assemblages. Invasive macrophytes species may modify habitat structure and thus influence associated organisms.

Key words: Macrophytes, Aquaculture, Habitat, Environment.

Introduction

Macrophytes aquatic vegetation plays an important role the ecosystem of a Lake. The freshwater, perennial, large, lentic water bodies are popularly known Chhattisgarh. The large aquatic plants, also known as “aquatic macrophytes” are the important source of food, habitats, fodder, herbal medicine and domestic household materials for the people residing in its vicinities. Aquatic weeds are a natural part of the aquatic ecosystem, by many different animals either as food or as a habitats place. Many people find aquatic plants interesting and attractive.

However, as with any naturally occurring organisms, they may interfere with people’s activities either by their over-abundance or by their present. When this occurs the plants are considered “weeds” and some control is desired. Different types of macrophytes free floating submerged and emerged plants there are generally observed in aquatic ecosystem. Free floating macrophytes leaves & roots are floating; roots are not attached in sediment. Eichhornia crassipes is free floating aquatic plant in which roots play important role in removing nutrients. Aquatic plants are among the prolific ones on earth.

Macrophytes has been associated with positive and negative impact on aquaculture. As plant biomass increases seasonally this effect is magnified. Lake in important source of water, irrigation, fish culture, trapa culture, domestic use and other resource based activities. Plant biomass displaces part of the canals cross sectional area

resulting in higher water levels and increased of flooding floating plants, increase water loss through evapotranspiration. Independent of this controversy, from a purely biological point of view, macrophytes affect the structure of population in addition to the diversity and composition of other aquatic macrophytes.

On the other hand growth of these plants adversely affects aquaculture productivity as they take up the available nutrients from the water body, affect plankton production and interfere with sunlight penetration. The macrophytes are well known to antagonize the planktonic population of the Lake, there by the shed effect due to the surface area coverage or by high growth rate resulting in nutrient deficiency. Fresh water ecosystem is an integral part of geographical region. These systems provided habitats for many plant species, fishes, birds, insects, and others animals. There interaction with physical facts result in a balanced ecosystem, with plants providing food and shelter for other organisms that live in and close to the water.

Reported the limnological variables and nutritional content of submerged aquatic macrophytes in a tropical lagoon described by him that evaluate elemental composition (C, N and P) and carbohydrate, protein and lipids content of aquatic macrophytes. Albertoni *et al.*, (2014) worked on field evidence of the influence of aquatic macrophytes on water quality in a shallow eutrophic Lake over a period of 13 year. Gaikwad and Kamble (2014) reported qualitative analysis of surface water of panchganga river according to them commonly aquatic ecosystem has put forth challenging environment for florishment of aquatic flora and fauna. Sipaubá-Tavares *et al.*, (2003) described the effect of floating macrophytes cover of the water quality in fish pond. According to him aquatic plants contribute to nutrient transformation by a setting of the physical, chemical and microbial processes besides removing nutrients. Pereira *et al.*, (2012) worked on aquatic macrophytes as indicators of water quality in subtropical shallow lakes.

Material and Methods

Study area:

Bastar district of Chhattisgarh state extends from 19.067° N and 82.033° E. The maximum and minimum temperatures of the district are 39°C and 10°C respectively. The normal annual rainfall in the 591 mm. Dalpat Sagar Lake is one amongst the dug Lakes in the district, thus making it an artificial water body. The Lakes is almost 350 hectares and depth 30-50 fit spread and was dug for the main purpose of harvesting. Chhattisgarh takes its pride in housing one of the largest man-made, artificial Lake.

During the present study, monthly surveys to recorded, collected and identify the aquatic macrophytes were carried out from March 2016 to February 2017. During the study period to collected and recorded the macrophytes species. From the present study in 6 sites (A, B, C, D, E, F) were selected in Dalpat Sagar Lake. The plant species were identified with the help of available literatures particularly the local floras and monographs and also by matching the species at the herbaria of department of Botany, MGCGV University, Chitrakoot, Satna, M.P., India.

Result and discussion

All the macrophytes aquatic plants from the base of most aquatic food chains are important habitat compositions of aquatic ecosystems and are functionally important in carbon assimilation and oxygen evolution. Macrophytes affect nutrient cycle, as examples through transference of chemical elements from

sediment to water, by both active and passive processes (e. g., decomposition; Carignan and Kalff (1980), Esteves and Camargo (1986), The main aim of this research was to assess the distribution of aquatic macrophytes in collected reaches of Dalpat Sagar Lake at Bastar District in Chhattisgarh. During the period of collection, aquatic weeds were collected with the help of iron hook in different sampling sites and boat. The macrophytes were collected and stores properly in polythene bags.

Collection and identification was base on according to Gupta and Gupta (2008) and Odum (1953). Total available 23 aquatic macrophytes species had been recorded from Dalpat Sagar Lake. Collect species was 23 aquatic macrophytes and 3 types classified according to habitat as free floating plants, submerged and emerged from Dalpat Sagar Lake (Bastar District).Number of plant species, their distribution in different study sites.The Most dominant species in Dalpat Sagar Lake. Result are Summarized in Table1 and Table 2.Presence of plant species, Free floating plants, submerged plants and emerged plants.

Free floating plants Aquatic plants that float on the water surface and are not rooted in soil.

Submerged plants have stems and leaves that grow entirely underwater.

Emerged plantsare rooted in the lake bottom, but their leaves and stems extend out of the water.



Study site A



Study sate B



Study site C



Study site D



Study site E Study site F

Table 1: Presence of aquatic macrophytes in the all selected site, Dalpat Sagar Lake, Bastar (Jagdalpur).

S.No.	Name of species	Site A	Site B	Site C	Site D	Site E	Site F
1	<i>Azolla pinnata</i>	+	+	+	+	+	+
2	<i>Wolffia</i>	+	+	+	+	+	+
3	<i>Spirogyra sps.</i>	+	+	-	-	+	+
4	<i>Lemna minor L.</i>	+	+	+	-	+	+
5	<i>Eichhornia crassipes</i>	+	-	+	-	+	+
6	<i>Salvinia</i>	+	+	-	+	+	+
7	<i>Spirodella</i>	+	+	+	-	+	+
8	<i>Pistia stratiotes</i>	+	+	+	+	+	+
9	<i>Ipomoea aquatic</i>	+	+	+	-	+	+
10	<i>Nymphoides indica</i>	+	-	-	-	-	+
11	<i>Nelumbonucifera</i>	+	+	+	+	+	+
12	<i>Trapa bispinosa</i>	+	+	+	-	+	+
13	<i>Chara globularis</i>	+	+	+	+	+	+
14	<i>Hydrilla verticillata</i>	+	+	+	+	+	+
15	<i>Najas graminea</i>	-	+	-	-	+	-
16	<i>Vallisneria spiralis</i>	+	+	+	+	+	+
17	<i>Ceratophyllum demersum</i>	+	-	-	-	+	-
18	<i>Typha domingensis</i>	+	+	+	+	+	+
19	<i>Polygonum glabrum</i>	+	+	+	+	+	-
20	<i>Cyperus amabilis</i>	+	+	+	+	+	+
21	<i>Sagittaria sagittifolia</i>	+	-	-	+	-	+
22	<i>Scirpus</i>	-	+	+	+	+	+
23	<i>Cynodon dactylon</i>	+	+	+	+	+	+

Table 2: Available of aquatic macrophytes from Dalpat Sagar Lake, Bastar (Jagdalpur).

S.No.	Type	Name of species		
1	Free floating	<i>Azolla pinnata</i>		
		<i>Wolffia</i>		
		<i>Spirogyra sps.</i>		
		<i>Lemna minor L.</i>		
		<i>Eichhornia crassipes</i>		
		<i>Salvinia</i>		
		<i>Spirodella</i>		
		<i>Pistia stratiotes</i>		
		Rooted plants with floating leaves		<i>Ipomoea aquatic</i>
				<i>Nymphoides indica</i>
				<i>Nelumbo</i>
				<i>Trapa bispinosa</i>
2	Submerged			<i>Chara globularis</i>
				<i>Hydrilla verticillata</i>
		<i>Najas graminea</i>		
		<i>Vallisneria spiralis</i>		
		<i>Ceratophyllum demersum</i>		
3	Emerged	<i>Typha domingensis</i>		
		<i>Polygonum glabrum</i>		
		<i>Cyperus amabilis</i>		
		<i>Sagittaria sagittifolia</i>		
		<i>Scirpus</i>		
		<i>Cynodon dactylon</i>		

Conclusion

The main objective of research work was to present the types of aquatic macrophytes in Dalpat Sagar Lake. Macrophytes were found the high area. On the basis of the study result we may conclude that some macrophytes. The present investigation reveals that there are 23 species. **Free floating plants** Aquatic plants that float on the water surface and are not rooted in soil, recorded of 12 species. **Submerged plants** have stems and leaves that grow entirely underwater, recorded of 5 species. **Emerged plants** are rooted in the lake bottom, but their leaves and stems

Extend out of the water, recorded of 6 species. Dalpat Sagar Lake is one amongst the dug Lakes in the district, thus making it an artificial water body.

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