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MACROPHYTIC DIVERSITY IN RANISAGAR AND BUDHATALAB POND IN RAJNANDGAON CHHATTISGARH

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ABSTRACT

Rio Earth summit held in 1992 emphasized the need to conserve the biodiversity of the earth, especially of the tropics. The meaning of conservation involves thorough understanding of the flora and fauna on regional basis including those of wetland as form the bulk of the wetland flora and has immense functional values. Differences in the number of species and the identity of genera between these surveys indicate that macrophyte assemblages are still changing and are dynamic in different Ponds. Aquatic macrophytes exhibited a heterogeneous assemblage of sixteen species in the studied of Ponds were distributed in a variety of taxonomic groups of angiosperms, Of these *Eichorniacrassipes, Vallisneriaspiralis, Hydrillaverticillata Ipomoea aquatica, Cynodondanctylon* occurs throughout the year. During monsoon, floating species of aquatic macrophytes viz. *Eichorniacrassipes, Vallisneriaspiralis, Hydrillaverticillata Ipomoea aquatica*. Conversely, the monsoon varieties of aquatic macrophytes were succeeded by the winter emergent species *viz. Lemna minor, Limnophillasessiflora, Otteliaalismoides*, Nagas minor. The species occurs during onset of summer are *Heliotropiumsupinum, Crozophorarottleri, Gnaphaliumpulvinatum, Glinuslotoides.* Significant phytosocial association had been recorded among the different aquatic macrophytes. *Hydrillaverticillata, Vallisneriaspiralis, chara sp.*, Nitellasp. were found to be association with others. *Vallisneriaspiralis, Najas* minor *Potamogetonpectinatus, Ceratophyllumdemersum* were found to be associated with other. *Otteliaallismoides, Limnophillasessiflora, Valisneriaspiralis* found to be associated with each other. The study represents the flora of Ranisagar and Budhatalab Pond of Rajnandgaon city of Chhattisgarh. Our aim is to study the especially focusing on the relationships between these resources and human health and wellbeing. Due to absence of river the "Bowl of rice state" irrigates the paddy field by ponds

only in this region, which comes in the food chain of the human. An awareness of environment, its impact with religion orthodox promote quality environment for human survival of this area.

KEYWORDS: Budhatalab, Rajnandgaon, Chhattisgarh, Macrophytes.

INTRODUCTION

The term macrophytes is defined as plants regardless of their organization and taxonomic status that are observable with the naked eye. Life on earth depends on fresh water. Our planet earth has a definite hydrological cycle, which sustains life on earth. Continuously moving above and below the soil surface, water maintains and links the planet's ecosystem. Some is returned directly to the atmosphere, partly via plants. The rest flows into and over the ground, permeating soil, moving through organisms, recharging underground aquifers, replenishing rivers and lakes and finally entering the oceans. The topic has been selected because Ranisagar and Budhatalab pond of Rajnandgaon district of Chhattisgarh state is the famous pond attached with Rajmahal palace of the king Digvijay Das. This pond has its own ancient history. Its geographical situation is located at Latitude in 21.10ºN and Longitude in 81.03ºE. This region have good number of fresh water ponds and dams with wetlands harboring a great variety of aquatic macrophytes. Wetlands are well known for high diversity in class in class, composition and four broad categories of function viz. physical/hydrological, chemical, biological and socioeconomic (Williams, 1990).

MATERIAL AND METHOD

Study site

Aquaticmacrophytes of Ranisagar and Budhatalab pond were studied through observation from feb. 2018 to apr. 2018. Rajnandgaon is a famous district of Chhattisgarh located at the national highway at Latitude in 21.10ºN and Longitude in 81.03ºE. It has an average elevation of 307 meters (1007 ft), average Temperature 29ºC, Humidity 90%, Rainfall 25mm and various types of plants like Teak, Saal, Acasia etc. are found there.

Geographical Location

Rajnandgaon is the capital city of Rajnandgaon District, in the state of Chhattisgarh. It is situated in the western part of newly created Chhattisgarh state the district lies between latitude 20^0 $70^{'}$ – 22^0 $29^{'}$ North latitude and 80^0 $23^{'}$ – 81^0 $29^{'}$ East longitude covering an area of 8222 sq.kms.

Climatic Condition

Rainfall

Rajnandgaon district has recorded minimum 182.5 mm, maximum 1024 mm and average 696.1mm rainfall in outgoing season.

Humidity

The relative humidity was always more than 55% but except for the summer month of March to May. Ombrothermically the number of dry months were only three in the year 2017, while remaining were wet months.

Temprature

The average minimum temperature was 20.1^{0}C and maximum 32.6^{0}C. The annual average temperature was 26.39^{0}C. The average maximum temperature was 36.65^{0}C in the month of May.

Sample collection

Macrophytes sample were collected from the Ranisagar and Budhatalab pond of Rajnandgaon in the sterilized bottle. Various species of macrophytes were there in different ranges.

Calculations were done using following formulae

Frequency

Frequency was introduced by Raunkiaer (1934). Frequency refers to the degree of dispersion of the individual species in an area and is usually expressed in terms of percentage occurrence.

$$\text{Frequency (\%)} = \frac{\text{Total no. of quadrates in which a species occured}}{\text{Total no. of quadrates studied}} \times 100$$

Density

Density represents the numerical strength o f a species where the total number of individuals of each species is divided by the total number of quadrats studied.

$$\text{Density} = \frac{\text{Total no. of individuals of the species in all quadrates}}{\text{Total no. of quadrates studied}}$$

RESULT AND DISCUSSION

Macrophytes perform many ecosystem functions in aquatic ecosystems and provide services to human society. Habitat complexity provided by macrophytes like to increase the richness of taxonomy and density of both fish and invertebrates. In the pond major and minor microphytes results can observed in the table.02. According to the (table 0.2) *Echornia sp.* has highest frequency of 80% with density 8 and minimum frequency occupied by*Nelumboluteaof* 0.5% of density 5. In the pond 17 major types of macrophytes has been identified and various minor macrophytes were there which were microscopically very small which can't be quadrated. Another major species which were widely spread all over the pond are having frequency and density are *Valisnariaamaricana* (75%, 7.5), *Marsileaquadrifolia* (60%, 06), *Wolfia Sp.* (45%, 4.5), *Azollacarolimana* (52%, 5.2) and various minor macrophytes were identified which are having quit less frequency and density in the pond like *Myriophyllumexalbescens* (15%, 1.5), *Ceratophyllumechinatum* (25%, 2.5), *Nymphaeatuberosa*(20%, 2) and this macrophytes are generally found on the bank of the pond.

Table 1: List of some aquatic macrophytes in Ranisagar and Budhatalab pond of Rajnandgaon city of Chhattisgarh.

S. No.	Name of Macrophytes	Family	Life forms
1	*Vallisneriaamericana*	Hydrocharitaceae	Submerged floating weeds
2	*Myriophyllumexalbescens*	Haloragaceae	Submerged floating weeds
3	*Ceratophyllumechinatum*	Ceratophyllaceae	Submerged floating weeds
4	*Nymphaeatuberosa*	Nymphaeaceae	Rooted floating leaves weeds
5	*Nelumbolutea*	Nymphaeaceae	Rooted floating leaves weeds
6	*Marsileaquadrifolia*	Marsileaceae	Rooted floating leaves weeds
7	*Sagittaria Sp.*	Alismataceae	Rooted emergent with heterophile weeds
8	*Lemna minor*	Lemnaceae	Free floating suspended submerged
9	*Azollacarolimana*	Azollaceae	Free floating suspended submerged
10	*Wolfia Sp.*	Lemnaceae	Free floating suspended submerged
11	*Salviniarotundifolia*	Salviniaceae	Free floating suspended submerged
12	*Pistiastratiates*	Araceae	Free floating suspended submerged
13	*Nymphoides*	Menyanthaceae	Free floating suspended submerged
14	*Potamogetoncrispus*	Naidaceae	Rooted submerged hydrophytes
15	*Ipomoea aquatica*	Convolvulaceae	Rooted submerged hydrophytes
16	*Hydrilla Sp.*	Hydrocharitaceae	Rooted submerged hydrophytes
17.	*Echorniasp*	Pontederiaceae	Free floating suspended submerged

Table 2: Observation table.

S. No.	Name of macrophytes	Frequency (%)	Density
01.	*Vallisneriaamericana*	75	7.5
02.	*Myriophyllumexalbescens*	15	1.5
03.	*Ceratophyllumechinatum*	25	2.5
04.	*Nymphaeatuberosa*	20	02
05.	*Nelumbolutea*	05	0.5
06.	*Marsileaquadrifolia*	60	06
07.	*Sagittaria Sp.*	53	5.3
08.	*Lemna minor*	65	6.5
09.	*Azollacarolimana*	52	5.2
10.	*Wolfia Sp.*	45	4.5
11.	*Salviniarotundifolia*	40	04
12.	*Pistiastratiates*	35	3.5
13.	*Nymphoides*	30	03
14.	*Potamogetoncrispus*	35	3.5
15.	*Ipomoea aquatic*	10	01
16.	*Hydrilla Sp.*	25	2.5
17.	*Echornia sp.*	80	08

CONCLUSION

Quantitative analysis studies in Ranisagar and Budhatalab pondof Rajnandgaon district of Chhattisgarh state is revealed that there was a drastic change in C1 concentration in the water with seasonal changes. It was highest during summer - 346.99 mg/l while the concentration depleted up to approximately 66% during winter and rainy seasons when the concentration recorded were 113.12 and 131.12 mg/l respectively. Similarly substantial variation in total alkalinity was also recorded. Total alkalinity was found to be 322.00 mg/l during summer while it got reduced up to 33% during winter and rainy season with the total alkalinity values of 242.25 and 270.00 mg/l. No significant variations were found in respect to other factors like N03 -, Po4 - - etc. When these variations were correlated with vegetation studies it was found that *Typhaangustata, Nympheoidesindicum, Nelumbonucifera, and Nympheastellata* greatly flourished during summer with IVI values of 62.09, 64.59, 47.05 and 53.89 whereas their IVI values got enormously decreased upto 50 to 100% during winterand rainy seasons.

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