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Research Article

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Study of Macrophyte-Diversity with Rererence to their Phyto-Sociological Study in Chupisar, West Bengal

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ABSTRACT

Wetlands are among the most productive ecosystem in the world, comparable to rain forest and coral reefs. They are repositories of diverse species of microbes, plants, insects, amphibians, reptiles and mammals. Wetlands are "Biological rearing heaven" which provide immense food that attract many animal species for completion of their life cycle. The present paper deals with an eco-taxonomic study of a wetland named "Chupisar", in short "Chupi" which lies in the proximity (23°32'882"N and 88°15'269"E) of the holy river Ganga (Ganges) in the Eastern part of Burdwan District. It is like a large ox-bow lake resulting from loss of conformity with it. The lake is narrow stripe with clear bluish water. In most parts, it is not deep and is with remarkable growth of macrophytes of rooted, emergent, floating and submerged types. It is also an excellent visit spots migratory birds during winter season. The paper reports about the distribution of macrophytes in the wetland community of Chupisar with special reference to macrophyte composition, vegetation analysis along their phyto-sociological aspects. Not less than54 species , 48 genera under 29 families can be recorded during the field study.

Keywords: *Wetland, macrophytes, ecotaxonomic, rearing heaven, phytosociology.*

INTRODUCTION

Aquatic plants those who are photosynthetically active parts remain permanently or at least for several months in each year submerged in water or floating onto the water surface[1]. Since the wetland is considered as a transitional area between land and water as a half-way world between terrestrial and aquatic ecosystems[2]. Aquatic macrophytes are referred to as water plants, as well as amphiphytes and/or amphibian plants. These consist of mainly aquatic and wetland vascular plant species belonging to pteridophytes and angiosperms and exclude filamentous algae and grow as a natural biotic component in most shallow, still–slowly running water bodies and wetlands. In general, these represent plants which are found in and around the water bodies. Works on the floristic composition, ecology and distribution of hydrophytes in different parts of India were carried by several workers. Pioneer work was made by Cooke[3] who studied the aquatic plant in Bombay. Salgare and Sobha[4] studied macrophytes of patale Ganga, Pande[5] studied macrophytes of patale Ganga, Pande et al[6] studied macrophytes of Ghagra belt at Gonda district. But very little literature is available in this context in the lake Chupisar of Burdwan district, West Bengal.

The present investigation was, therefore, undertaken to study the species composition, vegetation analysis along their phyto-sociological aspects of different aquatic macrophytes in Chupi.

METHODS

Monthly survey was done by quadrate method for collecting aquatic macrophytes in the tenure 2010-2011. The Macrophytes of the site have been identified with the help of permanent literature available on

the taxonomy and were preserved in the Herbarium of Department of Botany, The University of Burdwan. The distribution pattern of macrophytes from this site was studied for a period of one year 2010-2011. All the macrophytes collected from this site were alphabetically arranged along with their family names according to Bentham and Hooker system of classification.

RESULTS

Table1: Aquatic macrophytes composition of along their phytosociological status in Chupisar, West Bengal, India

S. No.	Name	Family	Local name	Nature	Local use
1	*Aerva lanata* L.Juss.ex Schultes	Amaranthaceae	Bhadra	H,E	Used as vermifuge, Diuretic and lithontriptic
2	*Alternanthera sessilis* L.	Amaranthaceae	Salunte sakh	S	Edible "sakh", and used in febrifuge, Diarrhoea.
3	*Aponogeton natans* (L.) Engl. & K. Krause	Aponogetonaceae	_____	S	Tubers edible
4	*Azolla pinnata* R. Brown ssp. Asiatica R.M.K Saunders et. K. Fowler	Salviniaceae	_____	FF	Used as possible source of biofertilizer.
5	*Bacopa monnieri* (L.) Pennell	Scrophulariaceae	Brahmi	H, E	Edible, used as vegetable, and it used as specially intellect promoting
6	*Centella asiatica* (L.) Urban	Apiaceae	Thankuni	R, E	Used as antibacterial, anti-inflammatory, antifebrile.
7	*Ceratophyllum demersum* (L)	Ceratophyllaceae	Patajhanjhi	FF	Local people used as brush.
8	*Coix lachryma-jobi* L.	Poaceae	Gorgoranda/Pori chokher jol	E	Fruits used in making garlands. Root used in menstral disorders.
9	*Colocasia esculenta* (Linn.) Schott	Araceae	Kochu	S	Rhizome edible.
10	*Commelina bengalensis* L.	Commelinaceae	____	H,E	Use as fodder.
11	*Cynodon dactylon* (L.) Pers.	Poaceae	Durba ghas	E	valuable herbal medicinal and used as first aid for minor injuries. "Durba ghas" is also used in Hindu rituals.
12	*Cyperus articulatus* L.	Cyperaceae	_____	E	The tall stems and/or the rhizomes are dried and powdered, or are prepared as a tea and used as a good luck charm. Women will cultivate the plant and bathe their children with it to prevent sickness and injury, and give it to their husbands to bring good luck in hunting and fishing
13	*Cyperus* exaltatus Retz	Cyperaceae	____	E	Rhizome used as febrifuge.
14	*Cyperus rotandus* L.	Cyperaceae	Mutha	E	Rhizomes gives successful results I the treatment of meanstruation.
15	*Echinocloa crusgalli* (L). Beauv.	Poaceae	Shyamaghash	E	Used as fodder
16	*Eclipta alba* (L.) Hassk.	Asteraceae	Kesudh	P,S	The leaf extract is considered to be powerful liver tonic, rejuvenative, and especially good for the hair.
17	*Eichhornia crassipes* (Mart.) Solms.	Pontedariaceae	Kochuripana	FF	Purifying water by absorbing heavy metals from the wetland.
18	*Enhydra fluctuans* Lour.	Asteraceae	Hinche sakh	H, RF	Plant edible, used as "Sakh"

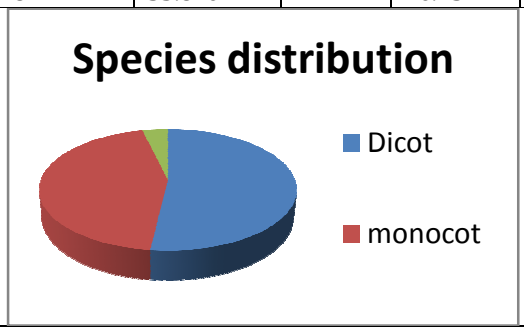
19	*Euphorbia zornioides* Boiss.	Euphorbiaceae	____	H,E	Used as fodder.
20	*Gnaphalium luteoalbum* L.	Asteraceae	____	H,E	Plant applied as a poultice to heal fractured bones.
21	*Heliotropium indicum* L.	Boraginaceae	Hathi-sur	H,E	Leaves are used in fever, ulcers, wounds, localized inflammation .
22	*Hemigraphis hirta* (Vahl.) And.	Euphorbiaceae	____	H,E	Plant used for gout.
23	*Hydrilla verticillata* (L. f.) Royle	Hydrocharitaceae	____	S	Used as fodder.
24	*Hydrolea zeylanica* (L.) Vahl	Hydrophyllaceae	____	S	Plant possesses healing properties. It also possesses some antiseptic properties.
25	*Hygrophila schulli* (Buch.-Ham.) M.R.Almeida & S.M. Almeida.	Acanthaceae	Kulekhara	H, E	It can be extensively used in Ayurvedic system of medicine for various ailments like rheumatism, inflammation, jaundice, hepatic obstruction, pain, etc.
26	*Hygrorhiza aristata* (Retz.) Nees	Poaceae	_____	H, E	_____
27	*Hymenoacne acutangula* (Steudel) Gilliland	Poaceae	_____	H,E	Used as fodder
28	*Ipomoea aquatica* Forsskal	Convolvulaceae	Kalmisakh	R, F	Local people used the leaves and young shoot as vegetables.
29	*Ipomoea fristulosa* (Martius ex choisy)	Convolvulaceae	Bonkalmi	PS	Local people use the dried plants as fuel.
30	*Limnophila heterophylla* Benth.	Scrophulariaceae	_____	H,E	_____
31	*Lippia geminata* Kunth	Verbenaceae	_____	H,E	_____
32	*Ludwigia adsendens* (L.)H.Hara	Onagraceae	_____	S, FF	The Whole plant paste is applied against ulcers and skin diseases
33	*Ludwigia parviflora* Roxb.	Onagraceae	_____	R,E	_____
34	*Marsilea minuta* L.	Azollaceae	Susni sakh	F	A juice made from the leaves is diuretic and febrifuge. It is also used to treat snakebite and applied to abscesses.
35	*Medicago sativa* L.	Leguminosae		H, E	e leaves for treating poor digestion. They made a cooling poultice from the seeds for boils. At the time, alfalfa was also believed to be beneficial to people suffering from arthritis and water retention.
36	*Monochoria vaginalis* (Burm.f.) Presl.ex.Kunth	Pontedariaceae	Nanka	FF	Root chewed in toothache. It also used in stomach and liver complaint.
37	*Nymphaea pubescens* Willdenow	Nymphaeaceae	Padma	PS	he young leaves and unopened flower buds can be boiled and served as a vegetable. The seeds, high in starch, protein, and oil, may be popped, parched, or ground into flour. Potato-like tubers can be collected from the species

38	*Nymphoides indica*(Linn)O.Kuntze	Menyanthaceae	Chandmala	FF	Used as febrifuge and in jaundice.
39	*Oplismenus composites* (L.) P.Beauv.	Poaceae	_____	E	Used as fodder.
40	*Ottelia alismoides* (L.)Persion	Hydrocharitaceae	Jalsasa	FF	A decoction of the shoot is used as a stimulating wash for ulcer. The seeds possess tonic, purgative and emetic properties and are used in colic pain. Roots are considered astringent and cooling agent. Seeds are used in relieving colic pain
41	*Pistia stratiotes* Linn.	Araceae	Kachuripana	FF	Used as water purifier in ponds or ditch.
42	*Polygonum barbatum* Linnaeus sensu lato	Polygonaceae	_____	PS	A decoction of the shoot is used as a stimulating wash for ulcer. The seeds possess tonic, purgative and emetic properties and are used in colic pain. Roots are considered astringent and cooling agent. Seeds are used in relieving colic pain
43	*Polygonum orientale* L.	Polygonaceae	Bara panimarich	PS	The plant is a good tonic and vulnerary.The leafy stems are used in the treatment of hernias.
44	*Portulaca oleracea* L.	Portulacaceae	_____	HE	eaves are used to treat insect or snake bites on the skin, boils, sores, pain from bee stings
45	*Potamogeton crispus* Linn	Potamogetonaceae	_____	S	Food for some water fowls & ducks.
46	*Rumex maritimus* Linnaeus	Polygonaceae	_____	HE	_____
47	*Rungia pectinata* (L.)Nees	Acanthaceae	_____	HE	The juice of the leaves is considered cooling and aperient, and is given to children suffering from smallpox.
48	*Saccharum spontaneum* L.	Poaceae	_____	E	Used as fodder.
49	*Sagittaria sagittifolia* L.	Alismataceae	_____	HE	_____
50	*Schoenoplectus articulates* (L.) Palla of Lower Assam.	Cyperaceae	Bokadal	E	Used as fodder.
51	*Spilanthes acmella* Murr.	Asteraceae	_____	HE	Used as fodder.
52	*Utricularia bifida* L.	Lentibulariaceae	_____	S	used as a *medicine* for urinary disorders
53	*Vallisneria spiralis* L.	Hydrocharitaceae	_____	S	_____
54	*Xanthium indicum* Koenig.	Asteraceae	_____	HE	Dry stem used as fuel.

H= Hygrophilous, S= Submerged, E= Emergent, FF= Free floating, PS= partially submerged, R= Rooted, RE= Rooted Emergent , RF= Rooted floating

Table 2: Brief analysis of taxa among macrophytes of waterbody

Taxon		Total	Dicotyledons		Monocotyledons		Dicot: monocot
			Total	Percent	Total	Percent	
Angiosperm	Family	27	16	59.259	11	40.741	1.45
	Genera	47	25	53.191	22	46.809	1.13
	Species	52	28	53.846	24	46.154	1.16
Pteridophytes	Family	2					
	Genera	2					
	Species	2					

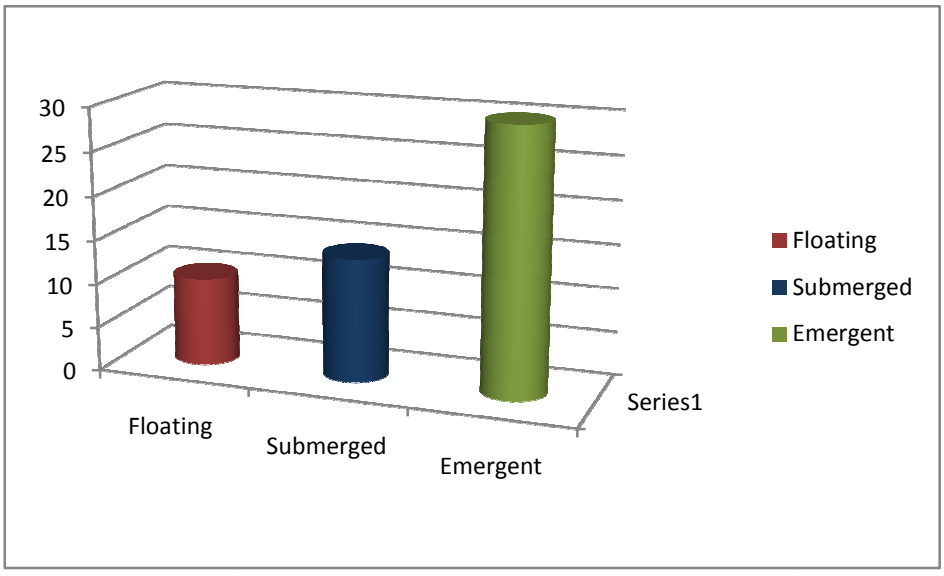


DISCUSSION

The study enumerated 52 angiospermic macrophytes out of which 28 species are dicotyledonous and 24 species are monocotyledonous. These species belong to 22 genera and 11 families of monocots so that the total number of genera is 47 and that of families is 27. Thus in the composition of macro hydrophytes , the ratio of dicots, monocots could be registered as1.16, 1.13 and 1.45 in terms of species, genera and families respectively. Present work has recorded 2 pteridophytic macrophyte species of 2 different genera under 2 different families. Poaceae is the most prevalent family with 7 genera which includes 7 species. Asteraceae, Cyperaceae, and Hydrocheritaceae come successively with 5,4 and 3 species respectively.

Rio Earth Summit held in 1992 emphasized the need to conserve the biodiversity of the earth that involves thorough understanding of the flora and fauna on regional basis. Aquatic macrophytes exhibited a heterogeneous assemblage of 54 species, 47 genera under 27 families in the studied wetlands (Table 1). Keddy (2000) classified macrophytes on the basis of wetlands habitat of macrophytes. The aquatic macrophytes are classified as submerged, floating and emergent growing in and covered by at least 25cm of water. In our present investigation, there recorded 10 floating species,14 submerged species, and 30 emergent species. So, there are gradually increasing in emergent type from floating type.

Floating type → Submerged→ Emergent type



This type of floristic composition indicates an intermediate seral stage in hydrosere which progressively converts a waterbody initially into a mesic and finally to a xeric habitat. This supports the view of land formation of Chupi as "transitional zone" forming a water logged low land.

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