

Floristic diversity of Rasik Beel and its adjoining areas in Coochbehar district of West Bengal, India

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[Received 19.05.2013; accepted 20.12.2013]

Abstract

Rasik Beel falls under Cooch Behar Forest Division and is a large natural wetland of North Bengal, one-third of which is protected and the remaining part used for all purposes. Vegetation of the area partially matches with 4D/SS2 and 4D/SS4 vegetation types in Champion & Seth's (1968) forest type classification. Floristic survey of this beel complex recorded the occurrence of 614 species of plants, belonging 421 genera of 146 families. Of these, 456 species are belonging to Magnoliopsida, 119 species for Liliopsida, 3 species of gymnosperms and Pteridophytes are represented by 36 species. Floral diversity in both aquatic and land vegetation are very rich.

Key words: Rasik Beel, aquatic & land vegetation, plant diversity.

INTRODUCTION

Flora of British India (Hooker 1872 – 1897) had covered all terrestrial and aquatic flora of India. Trees and shrubs of the Northern part of West Bengal had been explored by Cowan & Cowan (1929). Banerjee (1993) and Das *et al.* (2003) worked on Jaldapara National Park and Biswas *et al.* (2012) published a detail dicotyledonous flora of Gossaihat Beel. Wetlands of India were floristically explored by many people including Biswas & Calder (1937), Subramanyam (1962), Deb (1976), Cook (1996) and Fassett (2000). Pal & Dutta Choudhury (2010) and Das (2013) worked on the wetlands of Assam. The conservation of wetlands and their macrophytic flora in India was reviewed by IUCN (1971), Gopal (1973), WWF India (1993) and Williams (1997). Bandyopadhyay *et al* (2005) listed aquatic and wetland vascular plants of Cooch Behar district. But, a detail study on Rasik Beel area was not done previously.

Shifting of the courses of rivers in this part of the country was a common phenomenon in recent-past. That has created a number of large and small Ox Bow lakes in this region like Rasik Beel, Nildoba Beel, Raichangmari Beel, Bochamari Beel, etc. The Rasik Beel is located very near to two IUCN recognized biodiversity Hotspots, namely 'Himalaya' and 'Indo-Burma'. It is situated in the Tufanganj Subdivision of the District of Coochbehar in the northern part of West Bengal and geographically located at the central part of the lake is 89°44'10" E Longitude and 26° 25' 40" N Latitude. It is an Ox Bow Lake and is a left over detached part of the river Raidak. The area of the Beel is 178 hectares. Two branches of this

river are now flowing through two sides of the Rasik Beel in north-south direction and are referred as Raidak I and Raidak II. This wetland complex is surrounded by Chengmari, Baro Salmari, Atiamochar and Takomari protected forests. The Rasik Beel is a wetland complex of five different wetlands formed by a common water flow. In Champion & Seth's (1968) classification the area's vegetation partially matches with 4D/SS₂ and 4D/SS₄ Tropical Seasonal Forest: *Syzygium cumini* swamp forest and Low Swamp Forest. In the surrounding area, there are about eight villages mostly inhabited by tribal people.

Methodology

Random survey was made throughout the beel area during the years 2007 to 2012. Plants growing in the beel and of the surrounding forest lands were collected, tagged and recorded in the field note book immediately. Specimens were then processed and identified through conventional techniques (Jain & Rao 1977) in the Taxonomy and Environmental Biology Laboratory of the University of North Bengal. Preliminary identification of specimens were made using literature like Grierson *et al.* (1983 – 2001), Bora & Kumar (2003); Hajra *et al.* (1995, 1997); Sharma *et al.* (1993a, 1993b, 1993c); Singh *et al.* (2000) and Anonymous (1997). Finally the specimens are matched at NBU and CAL and stored in the NBU herbarium.

RESULT AND DISCUSSION

The flora

After the comprehensive floristic survey, it is realized that the Rasik Beel wetland complex is bestowed with immensely rich flora. A total of 575 species under 391 genera belonging to 124 families of angiosperms, 3 genera and 3 species of gymnosperms under 3 families, besides 36 species of fern and fern allies under 27 genera belonging to 19 families have been recorded from Rasik Beel wetland area during the present exploration. The reason for sustenance of enormous richness in floral diversity within the area is because of the perennial nature of this water body, a large portion of which kept undisturbed for many years. However, 2/3rd area of the beel is open for fishing and water sports in the name of ecotourism. Such activities generally force changes in the habitat, which, in turn, promote the changes in the floristic composition of vegetation and their natural complex inter-relationships. The other reason could be the sufficient rainfall varying from 200 – 400 cm per annum distributed in 7 – 8 months of the year forced many terrestrial species to adopt in a marsh habitat and these are enriching the marginal flora of the water body.

The study area is located very near to the “Himalaya Biodiversity Hotspot” in the East Himalayan region – an area which is very much well known for its extremely rich and diversified biological resources. The water courses and surrounding vegetation of Rasik Beel provided enormous variation leading to the creation of diversified micro-habitat structures allowing wide diversity of plants to find their suitable home in the area.

The detailed analysis of the total angiosperm flora of the wetland complex and its surrounding area revealed that the distribution and variation in dicots is more prominent over the monocots. It further revealed the existence of numerous important plant species those are directly or indirectly beneficial for the human sustenance. Many of these species have been recorded for their varied potential as food, medicines, etc. for the local inhabitants. Besides, the area is a rich repository of various plant resources including large number of valuable and durable timber-yielding species. A huge number of algal elements are distributed throughout the water body including the species of *Spirogyra*, *Chara*, *Nitela*, *Oedogonium*, *Anabaena*, *Nostoc*, etc.

Numerical Distribution of Taxa

The present floristic work on Rasik Beel wetland complex deals with an account of 124 Angiosperm families, out of which 97 are of Magnoliopsida and the remaining 27 are of Liliopsida. Again, there are 456 species under 312 genera recorded from the 97 families of Magnoliopsida and 119 species belonging to 79 genera from 27 families of Liliopsida. Only 3 species of Pinophyta belonging to 3 genera under 3 families and a total of 36 species of ferns and fern-allies were recorded under 27 genera belonging to 19 families (Table 1). So, like most of the tropical vegetation dicotyledons are dominating with 66.5 % families, 74.1 % genera and 74.3 % species.

Table 1. Numerical distribution of different floristic elements in Rasik Beel wetland complex

Taxa	Numerical representation					
	Family		Genus		Species	
	No.	%	No.	%	No.	%
Pteridophyta	19	13.0	27	6.4	36	5.9
Pinophyta	03	2.0	03	0.7	03	0.4
Magnoliopsida	97	66.5	312	74.1	456	74.3
Liliopsida	27	18.5	79	18.8	119	19.4
TOTAL	146		421		614	

Table 2 provided the detailed numerical representation of different category of taxa, from family to species, represented in Rasik Beel vegetation. A close look into this table expresses the floristic diversity in the study area.

Table 2. Numerical representation of Angiospermic taxa for the flora of Rasik Beel

A. Magnoliopsida

Family	Genus	Species	Family	Genus	Species
Ranunculaceae	2	2	Onagraceae	1	4
Dilleniaceae	2	2	Trapaceae	1	1
Magnoliaceae	1	1	Passifloreae	1	1
Anonaceae	4	5	Caricaceae	1	1
Menispermaceae	3	4	Cucurbitaceae	9	10
Nymphaeaceae	1	3	Cactaceae	1	1
Papaveraceae	1	1	Molluginaceae	1	2
Fumariaceae	1	1	Apiaceae	4	4
Brassicaceae	4	4	Araliaceae	1	1
Capparidaceae	2	2	Rubiaceae	11	15
Cleomaceae	1	3	Asteraceae	26	30
Violaceae	1	1	Campanulaceae	1	1
Bixineae	1	1	Lobeliaceae	1	2
Polygalaceae	2	3	Myrsinaceae	2	2
Caryophyllaceae	3	5	Sapotaceae	1	1
Portulacaceae	1	2	Ebenaceae	1	1
Tamaricaceae	1	1	Oleaceae	1	3
Elatinaceae	1	1	Apocynaceae	7	7
Hypericineae	1	1	Asclepiadeae	6	6
Guttiferae	1	1	Buddlejaceae	1	1
Ternstroemiaceae	1	1	Gentianaceae	3	3
Dipterocarpaceae	1	1	Hydrophyllaceae	1	1
Malvaceae	4	8	Boraginaceae	2	2
Bombacaceae	1	1	Convolvulaceae	5	10

Family	Genus	Species	Family	Genus	Species
Sterculiaceae	4	4	Cuscutaceae	1	2
Tiliaceae	3	4	Solanaceae	6	12
Oxalidaceae	2	4	Scrophulariaceae	8	16
Balsaminaceae	1	2	Lentibulariaceae	1	3
Rutaceae	7	9	Menyanthaceae	1	2
Simarubeae	1	1	Bignoniaceae	3	3
Meliaceae	5	7	Acanthaceae	13	22
Icacinaceae	1	1	Verbenaceae	8	13
Celastraceae	1	1	Lamiaceae	7	10
Rhamnaceae	3	4	Nyctaginaceae	4	5
Vitaceae	3	5	Amaranthaceae	8	13
Leeaceae	1	3	Chenopodiaceae	1	2
Sapindaceae	1	1	Polygonaceae	3	10
Anacardiaceae	2	2	Aristolochiaceae	1	1
Moringaceae	1	1	Piperaceae	2	6
Leguminosae	25	44	Lauraceae	2	6
Rosaceae	3	3	Proteaceae	1	1
Crassulaceae	1	1	Euphorbiaceae	12	19
Droseraceae	1	1	Bischofiaceae	1	1
Combretaceae	3	5	Ulmaceae	1	2
Myrtaceae	4	6	Cannabaceae	1	1
Lecythidaceae	1	1	Moraceae	4	11
Melastomataceae	2	2	Urticaceae	7	8
Lythraceae	4	8	Salicaceae	1	1
Punicaceae	1	1			

B. Liliopsida

Family	Genus	Species	Family	Genus	Species
Hydrocharitaceae	4	4	Juncaceae	1	1
Burmanniaceae	1	1	Arecaceae	5	6
Orchidaceae	6	7	Typhaceae	1	1
Cannaceae	1	1	Araceae	10	11
Zingiberaceae	4	5	Lemnaceae	2	2
Costaceae	1	1	Alismaceae	1	1
Musaceae	2	4	Limnocharitaceae	1	1
Amaryllidaceae	1	1	Potamogetonaceae	1	2
Agavaceae	1	2	Aponogetonaceae	1	1
Hypoxidaceae	1	3	Najadaceae	1	1
Dioscoreaceae	1	4	Eriocaulaceae	1	2
Smilacaceae	1	2	Cyperaceae	7	17
Pontederiaceae	2	3	Gramineae	15	24
Commelinaceae	6	11			

Similarly, Tables 3 and 4 are showing the numerical distribution of gymnosperms and pteridophytes in Rasik Beel vegetation. It is not difficult to realize that all the three recorded gymnosperms are introduced ornamentals. On the other hand, record of 36 species of pteridophytes in the area is a good representation but, certainly, these plants are never dominating in the vegetation.

Table 3. Family-wise Numerical representation of Pinophyta of Rasik Beel Wetland.

Family	Genus	Species
Araucariaceae	1	1
Cupressaceae	1	1
Cycadaceae	1	1

Table 4. Family-wise numerical representation of Pteridophytes of Rasik Beel Wetland.

Family	Genus	Species	Family	Genus	Species
Adiantaceae	1	1	Ophioglossaceae	1	1
Athyriaceae	1	2	Parkeriaceae	1	2
Azollaceae	1	1	Polypodiaceae	5	6
Dennstaedtiaceae	1	1	Pteridaceae	2	4
Dryopteridaceae	2	2	Salviniaceae	1	2
Equisetaceae	1	1	Schizaeaceae	1	2
Gleicheniaceae	1	1	Selaginellaceae	1	2
Hemionitidaceae	1	1	Tectariaceae	1	1
Huperziaceae	1	2	Thelypteridaceae	3	3
Marsiliaceae	1	1			

The future

With the recognition of Rasik Beel as a popular tourist spot, the overall morphology of the area is changing very fast. Hundreds of people regularly visiting the place, tourism supporting structures like roads, hotels, offices, recreation facilities, animal cages, etc. are being constructed and all these are affecting the natural habitat of this 'supposed to be' protected area. Numerous species of exotic plants are now introduced for beautification and for raising plantations.

Rasik Beel needs to enjoy all the facilities of one *in situ* conservatory. But, on the contrary, it is now developing as one mixed structure. While, authorities need to consider declaring Rasik Beel as one Ramsar Site, the fact is that like many other protected areas in the country, it is also being exploited for earning revenue only.

Acknowledgements

Authors are thankful to the Divisional Forest Officer, Cooch Behar Forest Division, Government of West Bengal for allowing the survey work. The first author is also thankful to UGC for provide financial support to him.

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