

Phytosociological Studies on Moist Bank Communities of Marshy Vegetation at Sahib Bundh Wetland of Purulia in West Bengal

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Abstract- The paper reflects an interesting study report of vegetation available in moist bank community of Sahib Bundh (Big water reservoir) at the centre of the district town Purulia of West Bengal state in India. The site boasts 28 medicinal plants of marshy type which producing very vigorous growth. In the communities studied, *Alternanthera sessilis* (L.) R. Br. showed highest importance value index (IVI) i.e. 84.39 found during winter followed by *Alternanthera polygonoides* (L.) R. Br. ex Roem. & Schult. having IVI value 49.44. Here, lowest IVI value of such vegetation was observed in case of *Gnaphalium polycaulon* Pers. i.e. 1.60 during winter. Ecologically the result was significant because they showed good biomass production in connection with community development during succession in such wet land habitat. It may influence the other activities in the said community to develop more varied species diversity (faunal) and have enormous ecological role to manage the problems in near future. It also helps to monitor the environment in near future.

Keywords- Sahib bundh, Phytosociology, marshy plants, management.

I. INTRODUCTION

Purulia of West Bengal is a lateritic district in India which boasts a large number of surface water reservoirs (small bundh) since time immemorial. But fact is that most of the reservoirs become dry during summer as they are not deep and having lateritic PAN formation. In West Bengal, though the scenario is different because of the types of geology in varied geography. In the district vegetation ecology of different areas were made including hill vegetation (Das, 2007). Similarly mycorrhizal studies on medicinal plants have been made by some workers in different tracts of the district (Ghosh and Verma, 2015). But vegetation ecology including studies on medicinal plants of the marshy bank communities have not yet been published as these are very interesting on the basis of ecological succession. So, before going to the study of medicinal plants or mycorrhizal study need the preliminary study of marshy/moist bank communities of the tank, Sahib

Bundh. Therefore, the present study was conducted since a long year back to establish the ecology of vegetation in moist communities of Sahib Bundh which may be a turning point of further study in other bank communities of the state or country to establish the fact of successions.

As many as 476 wetlands of different kinds each exceeding a total area of 10 hectare have been identified in West Bengal state (Panda *et. al.*, 2009). In the district headquarter of Purulia Sahib bundh is one of them perhaps unique of its features enlisting as fresh water aquatic body boosts diversity of vegetation as well as greater reservoir for water supply as because ground water resources in this area are scarce (Masanta *et. al.*, 2007). Not only the above points, the fact is that Sahib bundh is a unique water body in the heart of Purulia town offer unique scenic beauty, abode of some common water plants as well as some fauna. It is also a breeding ground of some migratory birds during winter. Not only such activities play Sahib bundh but also it acts as a huge reservoir supplying huge water to the town. It has its scenic beauty though it acts as a reservoir during heavy rain. Some anglers come here to catch fish and enjoy their traditionalism. From time to time municipality and forest department conserve flora and fauna. Students, researchers, scientists, foresters, horticulturist, environmentalist, botanists, zoologists and people of common dwellers come there for different activities. The wet land is a specific site for migratory water birds as well as many local bird species. Tourists, enjoy eternal beauty and charming environment during winter during Purulia visit. It has its own historic importance. It is one of the important and a major wetland of West Bengal. Most of the soils in the surrounding areas of Sahib bundh are acidic in nature. The P^H ranges from 4.5 to 6.2. The average slope of the areas ranges between 5-15%. Status of degradation is severe and gully formation is common (Masanta *et al.*, 2007). There is a small island on the western portion of the embankment. The district science centre is situated on the northern bank of Sahib bundh while 'Subhas Park' of Forest Department is situated on the southern bank of this bundh. These two points are also centre of attractions for tourists and

out comers. So, remembering these facts, phyto-community study and study of eco-characters of the macrophytic plants were taken for research from 1997 to till date.

II. MATERIALS AND METHODS

The result was taken as per the monitoring of vegetation during different seasons followed by standard ecological methods (Mishra, 1998). Specimens and soil samples were collected time to time. Water samples were collected regularly to establish the fact which is related to community study. Seasonal variations and ecological interactions were recorded as per the standard method including vegetation study by lying quadrats at regular intervals followed by scooping. Roots and other parts were studied for biomass estimation at laboratory using hot air oven through destructive sampling method. References used in this article is mentioned at the end¹⁻¹¹.

III. RESULT AND DISCUSSION

The importance value index (IVI) of marshy plants found in moist communities of Sahib bundh, Purulia flooded with 28 plants of marshy type which producing very vigorous growth. In the communities studied, *Alternanthera sessilis* (L.) R. Br. showed highest IVI i.e. 84.39 found during winter followed by *Alternanthera polygonoides* (L.) R.Br. ex Roem. & Scht. having IVI value 49.44. Here, lowest IVI value of such vegetation was observed in case of *Gnaphalium polycaulon* Pers. i.e. 1.60 during winter (Table 1). During hot summer, highest IVI of species was observed in case of *Alternanthera sessilis* i.e. IVI value 111.79 followed by *Alternanthera polygonoides* i.e. IVI value 25.17. Lowest IVI of species in such communities during hot summer was observed in case of *Hybanthus enneaspermus* (L.) Muell. i.e. 2.96. During monsoon highest IVI of species in the same study area was observed in case of *Alternanthera sessilis* (L.) R. Br. i.e. IVI value 31.02 followed by *Ipomoea aquatica* Forsk. having IVI value 30.84. Here, lowest IVI value of species was found in case of *Vernonia cinerea* (L.) Less. was 4.38 during monsoon. Highest IVI of species in each and every season showed no change which is same in case of species like *Alternanthera sessilis* which showed varied ecological stand point in connection with seasons. From the result it was found that *Alternanthera sessilis* showed a wide range of IVI in between values 31.02 to 111.79. Here, lowest IVI of such species was observed during monsoon (IVI=31.02), higher IVI was observed during winter (IVI =84.39) and highest during hot summer (IVI=111.79). Lowest IVI values of species during winter, hot summer and monsoon were 1.60 in case of *Gnaphalium polycaulon* Pers.; 2.96 in

case of *Hybanthus enneaspermus* (L.) Muell. and 4.38 in case of *Vernonia cinerea* (L.) Less. respectively.

Table 1 Comparative IVI of plant species of Bank Communities of Sahib Bundh, Purulia, West Bengal.

Sl. No.	Name of Species	Season wise IVI of Plants		
		Winter	Hot Summer	Monsoon
1.	<i>Achyranthe aspera</i> L.	-	-	17.27
2.	<i>Aerua lanata</i> (L.) Juss.	6.29	3.36	16.42
3.	<i>Aerva monsoniae</i> (Linn. f.) Mart	6.0	-	-
4.	<i>Ageratum conyzoides</i> L.	10.73	12.65	8.74
5.	<i>Alternanthera polygonoides</i> (L.) R. Br. ex Roem. & Scht.	49.44	25.17	24.70
6.	<i>Alternanthera sessilis</i> (L.) R. Br.	84.39	111.79	31.02
7.	<i>Amaranthus spinosus</i> L.	3.12	3.05	-
8.	<i>Andrographis echinoides</i> (L.) Nees.	15.61	12.86	-
9.	<i>A. paniculata</i> (Burm f.) Wall. ex Nees	9.70	5.31	-
10.	<i>Blumea lacera</i> (Burm. f.) DC.	7.72	4.83	-
11.	<i>Cyperus difformis</i> L.	3.30	5.79	18.19
12.	<i>Dentella repens</i> (L.) J. R. & G. Forst.	5.15	8.13	7.80
13.	<i>Desmodium gangeticum</i> (L.) DC.	-	-	16.94
14.	<i>D. triflorum</i> (L.) DC.	6.87	8.35	18.14
15.	<i>Digitaria sanguinalis</i> (L.) Scop.	8.72	9.34	22.72
16.	<i>Eclipta alba</i> (L.) Hassk.	2.76	5.14	-
17.	<i>Glennus oppositifolius</i> (L.) A. DC.	5.84	5.67	-
18.	<i>Gnaphalium polycaulon</i> Pers.	1.60	9.66	-
19.	<i>Hybanthus enneaspermus</i> (L.) Muell.	4.94	2.96	7.68
20.	<i>Ipomoea aquatica</i> Forsk.	7.08	6.81	30.84
21.	<i>Ludwigia adscendens</i> (L.) Hara	6.65	4.74	9.07
22.	<i>Cyperus brevifolius</i> (Rottb.) Hassk.	3.98	5.50	18.32
23.	<i>Oldenlandia corymbosa</i> L.	-	-	6.89
24.	<i>Phyllanthus fraternus</i> Webster.	-	-	6.30
25.	<i>P. reticulatus</i> Poir.	9.09	15.28	27.65
26.	<i>Polygonum hydrogiper</i> L.	13.57	12.46	-
27.	<i>P. plebejum</i> R. Br.	6.15	7.10	-
28.	<i>Vernonia cinerea</i> (L.) Less.	6.33	4.72	4.38
	Total of IVI	285.03	290.87	293.07

IV. CONCLUSION

The sahib bundh is a treasurer of some plants of marshy kinds which is used for the tribal of some kinds running the year. Not only that it boosts some medicinal plants that play the key role for the treatment of different ailments of animals and pet animals nearby round the year. The dominant tribes associated with the bundh are Santhal, Bhumij and Majhi which is similar to the conclusion made by Dey *et al.* (2010). The communities use large number of plants for the purpose of vegetable. The recent publication from Dhara area of Gar-Panchakot hills revealed 54 medicinal plants which have immense ecological significance (Ghosh and Verma, 2015). Some of the plants are similar which are available in Sahib bundh also but the uses are different. Obviously there are some scopes to study more. Many more studies on environmental degradation, habitat conservation, and medicinal plant research and so on going in a rapid rate. Research revealed that, from 2009 to 2014 and from 2015 to 2019 the trend of research on medicinal plants has been diversified rather than on the cultivation or domestication of plant species with the demonstrated potential (Manzano *et al.* 2020). Therefore, there is a lacuna to study the qualitative as well as quantitative research on medicinal plants which are actually grown based on the marshy habitats. Not only to study the details of the socio-economic potential, but need to

include the phyto-sociology study to manage the species for future conservation. So, more elaborate studies may be made not only at Sahib bundh but other wet land habitats in India and abroad. Hope that researchers would be reluctant to run the smooth research on such problem to study more on succession in a rapid way and quantify the base of the research.

PHOTO PLATES (1-13)



Figure 1. An overview of Sahib Bundh wetland, Purulia, West Bengal, India



Figures 2-3: Left: Little Grebe (*Tachybaptus rufficollis*), White breasted Water-hen (*Amauromi phoenicurus*) at right.



Figure 4. An Overview of Sahib Bundh from Raghavpur site of Purulia Town.



Figure 5. : An Overview of Sahib Bundh from Garage site of Purulia Town.

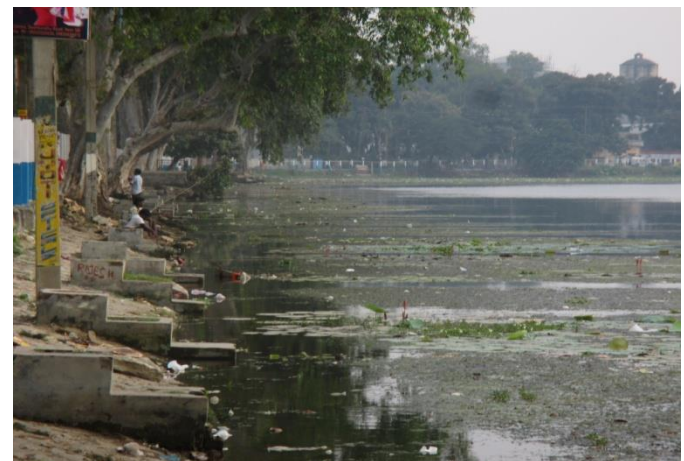


Figure 6. : Pollution due to anthropogenic activities and ignorance of people of the municipal area, a threat to wetland degradation. Fishing is another threat to indigenous fishes and tortoise.



Figures 7-8. : Newly constructed building near Sahib Bundh at the left; Right one is old platform (Ghat/Station) for bathing, related with eco-degradation.



Figures 9-10. *Nymphoides* sp. of Gesneriaceae at the left along with *Jussiaea* sp. of Onagraceae; at the right is Lotus (*Nelumbo* sp. of Nymphaeaceae).



Figure 11. *Nymphaea* sp.



Figure 12. *Nymphaea* sp. and *Eichhornia* sp.



Figure 13. Egret in wetland

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Conflict of Interest:

None.

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