

# Vegetation Spectrum And Natural Beauty of Bhadutala Forest In West Bengal, India

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**Abstract-** *Flora is systematic enumeration of plant species in a given community of a given ecosystem. It reflects the quality as well as the quality including health services of the ecosystem because the floral community are the producers which support the growth and development of all animals and microorganisms, nay ecosystem also. It reflects the inflow of nutrients and recycling processes through bio-geochemical turnover. Indiscriminate uses of different chemicals, pesticides nearby and inside the periphery of patchy land surroundings the forest leads a diffusion of chemicals and cause biomagnifications. The lush green vegetation becomes destroying by knowingly anthropogenic activities, by fire and other purposes. The indiscriminate way and the whole periphery based manmade activities losses the land and dwindling the ecosystem including wildlife too. The present article has been presented for the deciphering of knowledge to make the environment pristine. Different purposes produced by different leading factories for the modern development of human societies causes threat to the environment and loosing the biodiversity which significantly destroying the environment rapidly. The main reason is increasing load of human population which damaging the environment and degrading the ecosystem by pollution directly or indirectly. The present paper reflects the land based natural forest at Bhadutala, Paschim Medinipur, West Bengal, India with scenic natural beauty and the community structure including eco-degradation process which could be starting point of extension through community research by a group of workers in near future. Hope that interested people will come and take that opportunity to record the problems for future study and assessment about the dwindling ecosystem for our co-existence.*

**Keywords-** Bhadutala, Vegetation, Flora, Community composition and Eco-management.

## I. INTRODUCTION

Vegetation is a green cover on earth under specific physiognomic situation. So, obviously it varies from site to site under different climatic and topographic factors. Flora is a

composition of common plant elements in and ecosystem which plays a significant role in the environment to develop community. Fauna is similarly all animals including some micro-biota excluding specific plant kind in a community or habitat. Population is a general term that emphasised on a particular data to enumerate the flora or fauna through numerical study. The present study broadcasts Bhadutala vegetation at Salboni Block of of Paschim Medinipur District in West Bengal. In a static way the floral elements are not static but dynamic due to enforcement of power through nutrient flow and other stress. As the seasons change successively so the status of the current position of floral elements changes with the change of weather. Therefore, plant element has its maximum variations observed during monsoon so that the total elements change their composition time to time. Some parts of the canals and high ridges of the ecosystem are eco-fragile so the continuous change of habitat and land pattern is going on which manifests a havoc change in the structure and composition of species and ultimately change the community composition in non-climax vegetation. Waste land nearer to the bank of canal is going threat due to anthropogenic purposes and soil erosion is another factor that governs the havoc change hitherto to change the dynamics of vegetation. As a whole the changing habitats changing the composition from time to time also from season to season. It is because some plants become submerged or completely merged during complete flow of water during monsoon, so no vegetation was there in the canal during monsoon to late monsoon. The only late monsoon and winter broadcasts typical vegetation mainly herbs along the moist bank of canals at Bhadutala of Salboni Community Development Block under Paschim Medinipur District. The early summer and pre monsoon change the vegetation which having maximum phenological changes take place due to stress prone condition. The plants get flowers and fruits as early as possible which could be due to a natural threat. The other part of the canal sites e.g. high ridge bank is very dry with no herbs during monsoon to late summer except a few cacti, *Clerodendrum*, *Lantana*, *Eupatorium* and other succulent shrubs along with some thorny plants. The interesting episode is that the centre of the canal basin showing rice cultivation during winter to

early summer when the canals have thin flow of water or no serious water flow even the nearby river is looking dead. A gentle flow of water discharges the typical propagules blowing from Chotanagpur plateau of Jharkhand state and causing the onset of sprouting vegetation very fast during flood in June-July and in vivid form spread over the land at the late session when the time span is not limited. As soon as the monsoon started the propagules cut off the vegetative part and settle the plant above the high ridge of the bank where the settlement becomes safe to community development. The herbs available in the basin of Canals are mostly ephemeral because they complete the life span very faster compared to the same plants available in other sites even some plants are now not physically visible due to scorching of heat of due to non-availability of water. But interesting phenomenon is that maximum plant species in embankment area presenting underground propagules for next year sprouting though the aerial parts become dead. That vivid explanation may be made by chor grass i.e. *Chrysopogon asiculatus* in high ridge of canal bank near the fallow land, there they buried rhizome part for the safe custody. Drought escaper easily escaping drought stress and showing propagules before the onset of hot summer for their work as challenge bit. Commas, pappus and dry achenes are good examples of such type found in *Calotropis gigantean*, *Eupatorium odoratum* and *Clematis gouriana*. We see very faster movement of double sided commas in chatim i.e. *Alstonia scholaris* found in the same site that rapidly disseminated and establishing new plant here and there. Dry and hard coated seeds found in *Xanthium*, *Ziziphus* spp., *Martynia* and even in *Bridelia* spp. which get easy settlement along the bank of canal near the forest and sprout during onset of monsoon. In the present study trees, herbs and shrubs of 158 plant species have been studied well under more than 65 varied families (as per new classification it may be 70) to know the pattern of ecological significance and role for community development at Bhadutala forest of Salboni area in Paschim Medinipur District. Eco-degradation causing loss of ecosystem, loss of habitats and loss of species through huge collection of resource by local people there by. This causes frequent movement of wild animals particularly elephants (migratory and resident both) as the floor of the forest has least amount of grass biomass and lesser amount of other shrubby fodder round the year. Another cause is loss of biomass due to forest fire made by the local resident which hampers the ground vegetation even the seeds and propagules may loss for ever. This could be a reason for species loss because some sites having insectivorous plants like *Drosera burmanii*. Indiscriminate grazing and browsing are the other phenomenon for loss of species as the site has no proper management. Therefore the present study argued to generate traditional knowledge as well as suggestion to pristine the ecosystem healthy wealthy and sound which could be the

slogan in near future to save the environment to flourish the ecosystem for our existence and for our greater sustenance.

## II. STUDY AREA

Study area falls under Salboni Community Development Block of Midnapore Sadar in Paschim Medinipur District of West Bengal state, India. It is a lower tract of Chotanagpur plateau with lateritic red soil along with alluvial parent rocky substances including high and low ridge. The tract is Bhadutala along the Canal banks which flow towards Godapiyasal and Siromoni areas of Paschim Medinipur. The Canal bank has shallow covering habitats having shrubberies, waste land, fallow land and undulated degraded land with high erosive soil profile. Significant loss of soil is due to flow of water during heavy monsoon and lower drainage system flow the heavy mass of soil through mullah and gully. Extremely stiffly bank and moist community have been taken as habitat for the study of flora and ecosystem as a whole to record the vegetation along with environmental composition. Only the winter season was taken in to account and study field was inclusively nearer to Bhadutala near the factories and along the slopes and almost entirely the rice field with moist and dry community of plant in the said area. Other study sites selected are forest land based habitats i.e. natural, degraded and plantation sited filled with mixed *Eucalyptus* spp.

## III. MATERIALS AND METHODS

Study was conducted in the forest ares, fallow land, canal bank and basin of some wet lands at Bhadutala with a programme scheduled for study of ecosystem and flora only for summer season when most of the composition available as dead or almost dry. The season was summer since March to April, 2017 with significant higher temperature i.e. 37-39 degree centigrade while in Januray it becomes very low i.e. from 6-9 degree centigrade. The degree of variation during the study period ranged between 26-39 degree centigrade with varied moisture content in both the wet land and waste land available at high ridge of the canal and cultivated land with moist community nearer to the pond and small reservoir. Moisture content ranged between 9 and 16% at bank of canal and sandy soil of the moist community rather than boulders. Regular visit have been made in the study sites along with the students of Botany, from College and University. Photographs were taken from field. plant specimens were collected time to time, preserved well, identified, to analyse the material and samples from Ecology Laboratory of Botany Department, Lalgarth Govt. College, Jhargram. Soil was carried out to know the moisture content study. Temperature metre was used to study the temperature, Abeny's level and other instruments

used to study the floras. Flora and monographs along with the literature was consulted to identify the plants. Herbarium specimens was prepared and housed in the laboratory of Lalgah Govt. College for further study. Phenological studies were continued since February 2017 till date with the parity of plant material available and collected from Jhitka Forest under then Paschim Medinipur (Now Jhargram). Some living plant materials were placed at earthen pot to know the vegetative stage of the plant under artificially nurtured condition. Literature 1-42 was used to support the document and also for further study.

#### IV. RESULTS AND DISCUSSION

The present study revealed 158 plant species under 65 varied families to know the pattern of ecological status of vegetation in Bhadutala forest. But under varied situations we all collected and studied 58 plant species under 56 genera and 29 families in which 10 plant species under monocotyledons and 48 species under dicotyledons. The ratio of monocot to dicot species was 1: 4.8. Here, highest frequency of species was encountered in case of families like Asteraceae (6) and Poaceae (5) followed by Lamiaceae (4). Lowest frequency i.e. lowest number encountered in families like Acanthaceae, Alangiaceae, Asclepiadaceae, Capparaceae, Combretaceae, Cucurbitaceae, Ehretiaceae, Martyniaceae, Meliaceae, Onagraceae, Rutaceae, Scrophulariaceae, Solanaceae and Ulmaceae (Table 1). Some plant species were very important because they provide economically significant yield as timber, fruits, flowers and whole plants as medicinal one. Randia and Gardenia found there as ornamental which have low frequencies along with *Pterocarpus* sp. The high ridge of forest had a less to lesser number of grasses as because during winter almost all sites become dry that cannot produce the vegetative growth except a few thorny plants like *Solanum xanthocarpum* and *Ziziphus* sp. showed near the forest. The only plant *Tridax procumbens* showed greenish patch along with a grass like *Cynodon* sp. at the dry bank of canal which

have immense importance to the grazed animals. *Calotropis gigantea* was used by goat and buffaloes as fodder which was non-fodder plant for other animals. The small patch of rice field in and around the river bed showed minimal growth of *Coldenia procumbens*, *Spheranthus indicus* and *Grangea maderaspatana* which were plenty in the small patch of fallow land inside the forest (Table 1). The first one has anticancer property as per the report. It is under the family Ehretiaceae may be used for future study that have a controversial position i.e. under the family Ehretiaceae or Boraginaceae or Cordiaceae. No flower or fruits have been recorded till the end of the January. Scattered patch of dry grass like *Chrysopogon aciculatus* (Golden false beard grass) have been recorded which have underground rhizome will revive soon during monsoon. Some important medicinal plants like *Azadirachta indica*, *Aristolochia indica*, *Ichnocarpus frutescens* and *Hemidesmus indicus* were frequently found in and around the study site during monsoon but not now seen. It could be a repository for future study and research. Some climbers like *Tiliacora acuminata*, *Combretum decandrum* and *Capparis* sp. were found as hedge along with important medicinal plant like *Cocculus hirsutus* in the study site. Small herbaceous plants like *Dentella repens*, *Spermacoce hispida*, *Ocimum americanum*, *Eragrostis tenella*, *Cyperus kyllinga*, *Tragia hispida*, and *Blumea lacera* were found as common weeds which showed flowers but in normal condition none place showed the same plant under flowering condition. Sal (*Shorea robusta*) is omnipotent and grows luxuriantly along with mahul (Fig. 9), randia (Fig. 24-26), sonali (Fig. 15) and piyal though the forest has plenty ban gandharaj (Fig. 4) and Jarul (*Lagerstroemia* spp.). This is because all plants of moist community became ephemeral rather than normal. This could be a new angle for further study and research in the said area. Avifauna and some reptiles have their own position in the same ecosystem but the actual diversity was till date obscure so that it need immediate study of woodland bird species including reptiles.

**Table 1. Plants of Bhadutala area under different microhabitats including English, Bengali and family name(s)**

SL. No.	Scientific Name	English Name	Bengali Name	Family
1.	<i>Ipomoea carnea</i> Jacq.	Pink Morning Glory	Uridam/Jhoradan/ Ha-Kalmi	Convolvulaceae
2.	<i>Phoenix sylvestris</i> L.	Date Palm	Khejur	Arecaceae
3.	<i>Phoenix acaulais</i> Roxb.	Forest Date palm	Ban Khejur	Arecaceae
4.	<i>Lippia geminate</i> Kunth	Bushy Matgrass/Pitiona	Motmotia ful	Verbenaceae
5.	<i>Limonia acidissima</i> L. = <i>Feronia elephantum</i> = <i>F. limonia</i>	Elephant-apple	Kothbel/Kaith	Rutaceae

6.	<i>Saccharum spontaneum</i> L.	Serio grass	Kans ghas	Poaceae/ Graminae
7.	<i>Solanum xanthocarpum</i> Schard & Wendl.	Yellow berried Night shade	Kantikarii	Solanaceae
8.	<i>Pithecellobium dulce</i> (Roxb.) Willd.	Manila Tamarind	Jilapi/Jalebi	Mimosaceae
9.	<i>Vachelia nilotica</i> (L.) P. J. H. Hurter & Mabb. = <i>Acacia nilotica</i> (L.) Willd. ex. Dellile = <i>A. Arabica</i> (Lam.) Willd.	Gum Arabica/ Prickly Acacia	Babla/Babul	Mimosaceae
10.	<i>Croton bonplandianum</i> Baill.	Bonpland's Croton	Ban Tulsi	Euphorbiaceae
11.	<i>Ziziphus</i> sp.	Shrubby Boir	Pal Kul	Rhamnaceae
12.	<i>Borassus flabellifer</i> L.	Asian Palmyra Palm/Toddy Palm	Tal	Arecaceae/ Palmae
13.	<i>Oryza sativa</i> L.	Asian Rice	Dhan	Poaceae
14.	<i>Evolvulus nummularius</i> (L.) L.	Agracejo/Rastrero	Bhnui-Akra	Convolvulaceae
15.	<i>Cyperus rotundus</i> L.	Nutgrass/Nut sedge	Mutha	Cyperaceae
16.	<i>Desmodium triflorum</i> (L.) DC.	Three flower beggarweed/ Creeping tick trefoil	Kudaliya	Fabaceae
17.	<i>Tridax procumbens</i> L.	Tridax daisy/Coat buttons	Tridaksha	Asteraceae/ Compositae
18.	<i>Spermacoce hispida</i> L.	False button weed	Madanghati	Rubiaceae
19.	<i>Mecardonia procumbens</i> (Mill.) Small	Baby jump-up	Garur bramhi	Scrophulariaceae
20.	<i>Eclipta prostrate</i> L. = <i>E. alba</i> (L.) Hassk.	False daisy	Kesut/Kesta	Asteraceae
21.	<i>Cassia tora</i> L.	Sickle Pod/Sickle Senna	Jhunjhuni	Caesalpiniaceae
22.	<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Durba/Duba	Poaceae
23.	<i>Kylinga brevifolia</i> Rottb.	Green head sedge/Short leaf spike sedge	Nirbis	Cyperaceae
24.	<i>Blumea oxyodonta</i> DC.	-	Kukshima	Asteraceae
25.	<i>Eragrostis tenella</i> (A.Rich.) Hochst. ex Steud	Love Grass/Feather love grass	-	Poaceae
26.	<i>Coldenia procumbens</i> L.	-	Tripunkhi	Ehretiaceae/ Boraginaceae
27.	<i>Helichrysum luteoalbum</i> (L.) Rehb. = <i>Gnephaliium luteoalbum</i> L.	Jersey Cudweed/ Weedy Cudweed	Scora	Asteraceae
28.	<i>Stereblus asper</i> Lour.	Sand Paper tree	Seora	Moraceae
29.	<i>Morinda angustifolia</i> Roxb.	Narrow leaved Indian Mulberry	Daruharidra	Rubiaceae
30.	<i>Azadirachta indica</i> A. Juss.	Margosa tree	Neem/Nim	Meliaceae
31.	<i>Clerodendrum viscosum</i> Vent.	Clerodendrum	Ghetu/Glory tree	Verbenaceae
32.	<i>Ziziphus oenoplea</i> (L.)	Jackal jujube/	Kankul	Rhamnaceae

	Miller	Wild Jujuba		
33.	<i>Capparis sepiaria</i> L.	Caper bush	Kaliakra	Capparaceae
34.	<i>Cocculus hirsutus</i> (L.) Diels	Broom Creeper	Dadaya/Huyer	Menispermaceae
35.	<i>Caesalpinia bonducella</i> (L.) Fleming = <i>C. bonduc</i> (L.) Roxb.	Nickernut/ Fever Nut/Physic Nut	Nata	Caesalpinaceae
36.	<i>Lantana camara</i> L.	Yellow sage	Kutus	Lamiaceae
37.	<i>Dentella repens</i> (L.) J.R.Forst & G. Forst	Creeping lick stoop	Bhumipat phool	Rubiaceae
38.	<i>Ludwigia perennis</i> L.	Cylindric fruit primrose-willow	Jal labanga/Ban labanga	Onagraceae
39.	<i>Ocimum americanum</i> L.	Hoary basil	Ban tulsi	Lamiaceae/ Labiatae
40.	<i>Ficus benghalensis</i> L.	Banyan tree	Bot	Moraceae
41.	<i>Jatropha gossypifolia</i> L.	Black physic nut/ Bellyache bush/ Cotton-leaf physicnut	Bharenda	Euphorbiaceae
42.	<i>Coccinia grandis</i> (L.) Voigt.	Ivy gourd/ Scarlet gourd	Tite Kundri	Cucurbitaceae
43.	<i>Tephrosia purpurea</i> (L.) Pers.	Wild Indigo	Ban Nil/Lahamori /Sarpunkha	Fabaceae
44.	<i>Tiliacora acuminata</i> (Lam.) Hook. f. & Thoms.	Teliakoara	Teli lata	Menispermaceae
45.	<i>Chrysopogon aciculatus</i> (Retz.) Trin.	Mackie's pest/ Lesser Spear grass	Chorkanta	Poaceae
46.	<i>Tragia hispida</i> Willd.	Stinging Nettle	Bichuti	Euphorbiaceae
47.	<i>Martynia annua</i> L.	Tiger's Claw	Baghnokh	Martyniaceae /Pedaliaceae
48.	<i>Calotropis gigantea</i> (L.) Ait.	Madar/Swallow wort	Akanda	Asclepiadaceae
49.	<i>Eupatorium odoratum</i> L. = <i>Chromolaena odorata</i> (L.) R.M. King. & H. Rob.	Christ mas bush/ Common flosch flower/Siam weed/jack in the bush	Ban karpur/Kaslimasala/ Sial muti/Banmara	Asteraceae
50.	<i>Combretum decandrum</i> Jacq.	-	Atang	Combretaceae
51.	<i>Dicliptera bupleuroides</i> Nees	-	Lal Jhanti/lal sira	Acanthaceae
52.	<i>Hyptis suaveolens</i> (L.) Poit.	Bush tea-bush	Bilati tulsi	Lamiaceae
53.	<i>Anisomeles ovata</i> W. T. Aiton = <i>A. indica</i> (L.) Kuntze.	Catmint	Gopali/Gobru	Lamiaceae
54.	<i>Alangium salvifolium</i> (L. f.) Wangerin	Sage-leaved alangium	Ankar/Ans phal	Alangiaceae
55.	<i>Holoptelea integrifolia</i> (Roxb.) Planch	Jungle cork wood tree	Nata karanja/Challa	Ulmaceae
56.	<i>Haldina cordifolia</i> (Roxb.) Rids. = <i>Adina cordifolia</i> (Roxb.) Benth. & Hook. f. ex B. D. Jacks.	Heart leaf Adina	Karam	Rubiaceae

57.	Sphaeranthus indicus L.	East Indian Globe thistle	Chagal nudi/Mundi/Gorkhmundi	Asteraceae
58.	Tamarindus indica L.	Tamarind	Tentul	Caesalpinaceae

N.B.: = Synonym

**FIGURES IN RESULT (Fig. 1 -53)**



Fig. 1 sal vegetation (*Shorea robusta*) at Bhadutala, Midnapore District



Fig. 4 Tree of Ban gandharaja



Fig. 2 Almost nil ground cover



Fig. 5 Base of the tree



Fig. 3 Metallic road inside the forest



Fig. 6 A flower enlarged



Fig. 7 Sal pole as fuel transporting



Fig. 8 Fuel wood collected by woman



Fig. 9 Mahul tree (*Madhuca indica*)



Fig. 10 A bunch of flowers over sal plant



Fig. 11 Mahul flowers



Fig. 12 Kusum tree



Fig. 13 Eucalyptus tree



Fig. 14 Bijasal or piyasal plant (*Pterocarpus* sp.)



Fig. 15 Sonali (*Cassia fistula*)



Fig. 16 *Ixora* sp.



Fig. 19 Seedling after rain



Fig. 17 Girgiti (*Calotes versicolor*) on tree



Fig. 20 Kutus (*Lantana camara*)

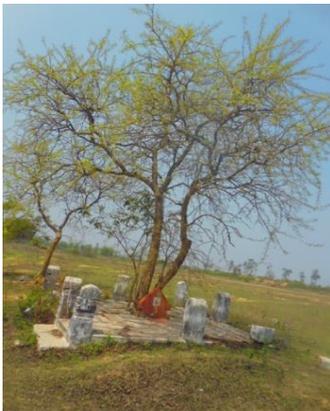


Fig. 18 Bel (*Aegle marmelos*) at Sacred place,



Fig. 20 *Jatropha gossypifolia*



Fig. 21 *Jatropha curcas*



Fig. 22 Amra (*Spondias dulcis*)



Fig. 23 Dry sal vegetation,



Fig. 24-26 Basal part, middle and above part of Randia tree.



Fig. 27-29 different parts of a plant Randia in March in full bloom.



Fig. 30 Flowers of Randia on ground,



Fig. 31-32 Almost dry and burned forest sal saplings



Fig. 37 Bahera plant



Fig. 33 The forest fire ruined the vegetation backside is lush green, the advant growth in March, 2017.



Fig. 38 Kurchi



Fig. 34 Bahera plant with Hemidesmus indicus



Fig. 39 Vera plant



Fig. 35-36 Commas of Anantamul seeds



Fig. 40 Moynakanta,



Fig. 41 Sal saplings



Fig. 42 Gardenia latifolia

## V. CONCLUSION

The study is important because this is the first time report on the Bhadutala vegetation and surroundings at Salboni CDB, Paschim Medinipur, West Bengal which could be a starting point of taxonomic as well as ecological research in near future. The record may be a general Key guide to the beginners and amateur field worker in the field of Botany,

Zoology, Environmental Study, Ornithology, ornithophily and nature lover to use the data for future study. The land planner and policy maker may be made the new plan to protect the habitat as the habitat is facing great threat particularly forest fire of manmade kind. Pollution and human pressure causing the site more and more fragile, which need immediate protection to protect the site from serious anthropogenic threat to make the vegetation and habitat pristine.

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