

Spectrum of vegetation in March at Lalgarh Forest of Jhargram District in West Bengal, India

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Abstract

Ecological studies on some strata of vegetation have been done under varied microclimate in Paschim Medinipur of West Bengal¹³. But the spectrum analysis of vegetation in the site is not yet been studies well. The paper deals with heterogeneous but mixed *sal* (*Shorea robusta* Gaetn. f.) dominated dry deciduous lateritic forest of Binpur-I community Development Block (CDB) in Jhargram District in West Bengal. It reflects dominated tree species *sal* and its associates including some aspects of ground cover. Canopy cover of the forest is bi-layered which is more or less leafless during summer (February) with new sprouting of leaves but at the end of March no old leaves were observed though it shows luxuriant growth of shoots and floral buds (inflorescence) to become scenic. Forest fires cease plant covers and destroy growth cover at ground. So, the ground becomes almost barren due to scattered loss or destruction of visible form of species as a part or whole. A large number of climbers show their woody appearance but exhibits leafless. At the end of the month, some plants show luxuriant blooming of flowers. The scenic beauty attracts avifauna and the forest becomes beautiful in the premises of Forest Ecosystem.

After the re-naming of forest divisions (2008), Lalgarh-Jhitka forest range is now under Midnapur Forest division. Now, it becomes under new District Jhargram since 4th April, 2017 declared by Chief Minister, Smt. (Miss.) Mamata Banerjee who loves Jangal Mahal since the initiation of All India TMC party. Now it is under Jhargram Forest Division

of West Bengal⁷³. So, it becomes under the part of geographical territory of Binpur-I community Development Block of newly emerged district Jhargram though before that it was under Paschim Medinipur District of the same state. *Sal* dominated forest in Lalgarh is now under Binpur-I community Development Block (CDB) of Jhargram District⁷³. The

forest is 2 storied which is dry *sal* dominated and admixed with other heterogeneous plant species¹⁸. *Sal* associate species found here are *Terminalia arjuna*, *Terminalia crenulata*, *Madhuca indica*, *Pterocarpus marsupium*, *Terminalia bellirica*, *Terminalia chebula*, *Bombax ceiba*, *Odina woodier*, *Schleichera oleosa*, *Diospyros sylvatica*, *Diospyros melanoxylon* etc. Plantation site of the region is covered by a few numbers of *Eucalyptus* hybrids, *Acacia auriculiformis*, *Acacia mangium*, *Anacardium occidentale*, *Bambusa* spp. and *Tectona grandis*. According to the report of forest department the area is covered with 60% natural *Sal* and other covered with plantation species, scrub jungles and bushes of natural kind. According to Champion and Seth's classification, the forest is a type under major group-II, dry tropical forests group-5, tropical dry deciduous forest, sub-group-5 (b) Northern tropical dry deciduous forest (c) (i) dry *Sal* bearing forest (c) (ii) dry peninsular *Sal* forests. During February to March, *Sal* becomes leafless when ground flora is almost dry and becomes dead as the aerial part except a few climbers. The dominant species found there as *Sal* indicator called 'Atang' i.e. *Cobretum decandrum*. Beauty is that the leafless plants get flowering at the end of March when the forest floor becomes leafless due to ground fire made by local people. Loss of herbs and some saplings of *Sal*, the outcome species become dead due to dangerous flame at day and night along with heat shock due to heavy sun shine. Therefore, a dry leafless filled ashy ground cover shows almost species less condition but trunk of the trees with distal branches shows broom like appearance. In this study, a few herbs, shrubs and leafless trees

have been discussed with ecological significance in Lalgah forest of Binpur-I community Development Block under Jhargram District in West Bengal.

Study area :

Study area falls under Binpur-I community Development Block of Jhargram District (formerly Paschim Medinipur District) of West Bengal. The study situated along the metallic road Midnapore-Bhadutal to Lalgah. The road passes through the jungle of Jhitka-Lalgah¹⁸ which tends to Lalgah via Binpur-I CDB. Along the road, large *sal* vegetation was observed which was taken as study sites.

Extensive field visits were carried out to different places of the study site which falls in between Binpur-II CDB in one side (Jhargram District) and Salboni block in the other side (Paschim Medinipur District). The study site having different zones, like grass land, forest, degraded land, cultivated land, rice fallow land, highland, creeks, canals and low lying land which have been taken for vegetation association studies. The entire lateritic belt has a plantation of *Acacia* sp. and *Eucalyptus* mixed with Cashew Nut (*Anacardium* sp.). So, the sites with low fluctuations and high eco-niche have been omitted to avoid the biasness of the data. The quadrats at 5 different stations were selected and marked randomly for study. 20 x 20 m² areas were taken for study of tree species whereas 5 x 5 m² and 1 x 1 m² were taken to study the shrubs and herbs respectively. Girth of tree species at breast height (GBH in cm), height (in m) and number of trees, shrubs and herbs were recorded. To study the diversity

measuring nape, nails, pegs, Abeny's level and temperature metre was used in field. Photo camera was used to record the picture. Soil was carried out in laboratory and determined the p^H and other physical parameters of soil. The overall study includes the late winter to summer as per the latest ecological methods following different literature^{9-12,14-16,18,20-22,24-30,32-67}. As reference study, vegetation monitoring was done following the concept of Greipsson⁴⁶. Parameter taken for stability study and concept of structure and function of elements in ecosystem along with dynamics of vegetation idea of Dash and Dash³², Das^{15,17} were taken. The management of the policymaker and similar managerial system was taken from internet to get idea regarding the present day scenario of *sal* dominated forest in lateritic southwest Bengal. Books, Journals and magazine including registers of different departments were also consulted for literature work. Interviews and cross references were studied using Participatory Rural Appraisal (PRA) technique in field. Plant specimens from field were also collected and processed for presentation as herbarium specimens and for identification using botanical and ecological data collection standard. Specimens were carefully studied, critically examined and cross checked with the specimens housed in different herbaria consulted as far as practicable. For conformity of specimens, local floras were consulted⁴⁸⁻⁵⁰. To consult some publications, Taxonomy and similar research papers from website have been downloaded and followed by Das⁷⁵ and Das and Das²⁶. Some books published by West Bengal Forest Directorate, Research Wing (2005, 2010) and Botanical Survey of India¹⁰ have also been consulted to analyze the report

along with my collections that the plants are either medically important or economically important. Methodology used for abundance study followed by Groom *et al.*⁴⁷, along with the thesis of Das¹⁴ and project work of Das⁷⁴⁻⁷⁵. Other literature used from relevant resources^{10,71-75}. Relevant literature have been collected and consulted for the preparation of the manuscript. The voucher specimens were housed in my personal custody and processing going on for future study.

Sal is dominant species as it is found everywhere in the forest of Lalgargh (Table-1, 2). Among shrubs, *Croton oblongifolius* shows highest dominance among the species persists during March (Table-3). It is coppice species and forest hardy species due to coppice and species hardy characters respectively. But the site where *Sal* is present, its associated species *Atang (Combretum decandrum)* was found there. Soil is red, lateritic, and dry. Soil p^H is acidic ranging from 6.5 to 6.7. Temperature inside the forest patch is 35° ±1.2° C whereas outside the forest it varies from 36-38°C. The average temperature outside the forest is 37° C during hot summer *i.e.* during March. Number of rainy days (heavy) was recorded in March 2017 was three (3) days which helps to grow the new offspring of weeds including sprouting of new leaves in case of deciduous trees. As the ground cover almost cleared due to unwanted ground fire, so the ground area clearly show new sprouting of *sal* saplings here and there. Some plants show blooming of flowers (*Butea superba*, *Holarrhena antidysenterica*, *Ziziphus rugosa*, *Madhuca indica* and *Odina woodier* etc.). The beauty

of *Sal* flowers and sweet perfume of *sal*, *mahua* or *mahul* (*Madhuca indica*), *Piyal* (*Buchanani lanzan*) decorating the forest as a pleasant land and charming ground of

avifauna. It is therefore regarded as a playground of botanists, zoologists, ecologists, environmentalists and nature lovers.

Table-1. Trees per 20 x 20 m² Quadrat at Lalgargh Forest, Jhargram District during March

Sl. No.	Species Name Local Name (Scientific Name) FAMILY	GBH in Cm/Height Range in mt	NO.
1	Bahera (<i>Terminalia bellerica</i>) COMBRETACEAE	64, 28 (13-16mt)	2
2	Kumbhi (<i>Careya arborea</i>) LECYTHIDACEAE	22 (14mt)	1
3	Kusum (<i>Schleichera oleosa</i>) SAPINDACEAE	39 (13-15mt)	1
4	Piyal (<i>Buchanania lanzan</i>) ANACARDIACEAE	31 (9-10mt.)	1
5	Sal (<i>Shorea robusta</i>) DIPTEROCARPACEAE	63, 41, 22, 28, 36, 33, 42, 44, 60, 52, 43, 44, 40, 37, 36, 17, 16, 17, 16, 18, 22, 26, 28, 30, 11, 13 (7-17mt)	26 (83.87%)
	TOTAL:		31

N.B.: Frequency and Density of *Shorea robusta* (sal) is highest (83.87%)

Table-2. Shrubs per 5 x 5 m² Quadrat at Lalgargh Forest, Jhargram District during March

Sl. No.	Species Name Local Name (Scientific Name)	FAMILY	No.
1	Atang (<i>Combretum decandrum</i>)	COMBRETACEAE	6
2	Boichi (<i>Flacourtia indica</i>)	FLACOURTIACEAE	2
3	Croton (<i>Croton oblongifolius</i>)	EUPHORBIACEAE	2
4	Lat Kanchan (<i>Phanera vahlii</i>)	SAPINDACEAE	1
5	Lat palash (<i>Butea superba</i>)	FABACEAE	2
6	Madar patna (<i>Ventilago maderaspatna</i>)	RHAMNACEAE	1
7	Mayna kanta (<i>Vangueria spinosa</i>)	RUBIACEAE	4
8	Sal saplings (<i>Shorea robusta</i>)	DEPTEROCARPACEAE	8 (27.58%)
9	Vutbhairabi (<i>Eupatorium odoratum</i>)	ASTERACEAE	3
	TOTAL:		29

N.B.: Frequency and Density of *Shorea robusta* (sal) saplings is highest (27.58%)

Table-3. Herbs per 1 x 1 m² Quadrat at Lalgarh Forest, Jhargram District during March

Sl. No.	Species Name Local Name (Scientific Name)	FAMILY	No.
1	Buripotka (<i>Dicptera roxburghiana</i>)	ACANTHACEAE	1
2	Putli, ChukaCroton (<i>Croton oblongifolius</i>)	EUPHORBIACEAE	4
3	Daruharidra (<i>Morinda citrifolia</i>)	RUBIACEAE	1
4	Isarmul (<i>Aristolochia indica</i>)	ARISTOLOCHIACEAE	1
5	Ramdanton (<i>Smilax macrophylla</i>)	SMILACACEAE	1
6	Ramkala (<i>Atylosia scarabeoides</i>)	FABACEAE	1
7	Salpani (<i>Desmodium gangeticum</i>)	FABACEAE	1
8	Bhutbhairabi (<i>Eupatorium odoratum</i>)	ASTERACEAE	3
			13 (30.76%)

N.B.: Frequency and Density of Croton (*Croton oblongifolius*) saplings is highest (30.76%)

FIGURES (1-3: Vegetation of *Sal* and *Simul*; 4-6: Avifauna; 7: VAMF spore in soil)



Fig. 1-3 *Sal* forest during late February, same in March. Flowers of *Bomabx ceiba* (Ornithophilous)



Fig. 4-7 Tailor bird, red vented bulbul, Blue Magpie Robin, VA Mycorrhizal Fungal Spore

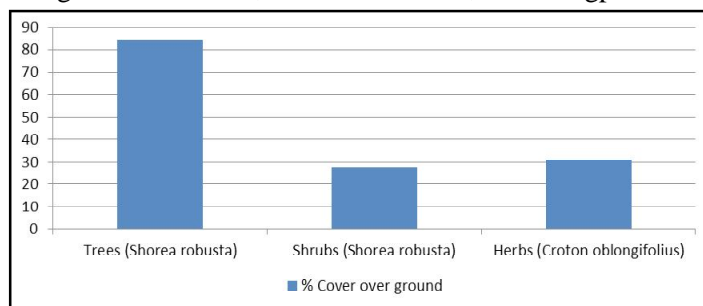


Fig. 8 Bar-graph showing *Sal* dominated forest in Lalgarh Forest

Southwest Bengal *Sal* forest is a natural site that has multi-layered tree species with multifunctional role to develop ecosystem (Fig. 1-7). Lalgarh forest is a heterogeneous *sal* (*Shorea robusta*) dominated dry deciduous natural forest which is also *Sal* dominated during March (Fig. 8). Here, *Sal* plays a multifunctional role in the natural ecosystem. Following are the recommendations suggested to manage the ecosystem pristine.

- (1) Detailed season-wise ecological study of vegetation or specific study of the vegetation at different pockets (stations) is highly recommended, if possible month-wise study should be incorporated in a plan to record the type and pattern of vegetation.
- (2) Almost in all seasons, people nearby forest collect NTFPs for their own purpose, it is essential but the forest fires which devastatingly loss the ground flora and some aspects of ecosystem, that must be stopped immediately. This is manmade forest fire. After forest fire eco-zone shows all climbers, saplings and poles which become dry, as a result materials are collected by people randomly from the forest as fuel wood in which no obligation or legal barrier persists. Therefore, collection becomes easier as the materials are non-woody even almost dead. So, random collection ceases the stock which is already alive but becomes dead. It should be stopped immediately by the help of Forest Department (FD) and Forest Protection Committees (FPCs) in the said premises.
- (3) As the pressure or force created, so the natural habitats feel disturbance can cause to alter the ecosystem. The passerine birds present inside jungle thicket, so it

should be protected from any kind of disturbances, say for example it may be declared as Medicinal Plant Conservation Area (MPCA), which helps to protect the avifauna for the same forest. They help to grow species from propagules in different ways. We always tell them key stone species *i.e.* if birds destroyed, automatically forest will be destroyed.

- (4) The frequency of woody climbers like lat palash (*Butea superba*) and lat kanchan (*Bauhinia vahlii* or *Phanera vahlii*) and Latkul (*Ziziphus rugosa*) is low and so it should be protected and to be planted artificially after moving the stock in nursery.
- (5) The ground cover protects micro-flora (VAMycorrhizae, Rhizobium, Other bacteria and different fungi), micro-fauna (Nematodes, parasites etc.) and also of other diverse kinds, as well as millipedes, centipedes, earthworms and insects. So, the site may be directed by any means which will protect the biodiversity of below ground kind along with above ground kind.
- (6) A site of the forest may be depicted as trainer's zone for students, researchers, birders, environmentalists and nature lovers. It will interact for nature studies which will facilitate the interest among local people, and other hand may be resource centre to convey the knowledge as databank site (DBS) in near future for future generations.

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