

Traditional uses of ethnobotanical plants for construction of the Hut and hamlets in the Sitamata Wildlife Sanctuary of Rajasthan, India

Kanhaiya Lal Meena, Vimala Dhaka, Prakash Chandra Ahir

Department of Botany, M.L.V. Government College, Bhilwara - 311001, Rajasthan, India

Email address:

kanhaiyameena211@yahoo.com (K. Lal Meena)

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Abstract: An extensive survey of the Sitamata Wildlife Sanctuary of Rajasthan has been made to document the information about ethnobotanical plants being used by them to construct Hut and hamlets. 31 plant species of angiosperms have been recorded along with their plant parts used to construct of various types of Hut and hamlets in the sanctuary.

Keywords: Ethnobotanical Plants, Huts And Hamlets, Sitamata Wildlife Sanctuary, Rajasthan, India

1. Introduction and Review

The Sitamata wildlife sanctuary, is one of the pride owner of most unique ecosystem with first richest biodiversity in Flora & fauna in Southern Rajasthan. It is one and only of the important natural habitats for flying squirrel in India. As the name itself explains the sanctuary is also associated with mythological events, it is believed that Devi Sita (wife of Lord Ram) stayed here during the period of her exile in the ashram of Rishi Valmiki. The Valmiki ashram was situated in the sanctuary, thus sanctuary bears the name of Davy Sitamata and her famous temple is situated in the heart in the forest area. It is spread over the Aravalli and Vindhyanchal mountain ranges and in this forest teak trees of timber value are abundantly present.

The Sitamata wildlife sanctuary is situated in between 74°25' - 74°40' E longitudes and 24°04' - 24°23' N latitude. It is situated in the south region of the Rajasthan in ChittorGarh, PratapGarh and Udaipur districts and is extended in tehsils Barisadari, Chhoti sadari, Dhariya wad and PratapGarh. The sanctuary covers an area about 422.95 Sq. Km in which the total reserved forest area is 345.37 sq. Km and the protected forest area are 77.57 sq. Km (Fig. 1).

The Sitamata wildlife sanctuary of Rajasthan, located at the trijunction of Aravalli & Vindhyan Hill Ranges as well as Malwa Plateau, which harbors its unique and diverse biodiversity. It is important mainly because it forms the

northwestern limit of Teak-bamboo forests and the fauna occurring therein. It is exceptional for diversity and the interspersions of habitats, which includes an area of teak stands, wetlands, perennial streams, gentle undulating mountains, natural deep gorges and fine grooves of mixed woodlands.

The network of rivers (Jakham, the Karmoi and the Sitamata) and accompanied riparian vegetation is main characteristic of this sanctuary. All this has resulted in diverse micro and macro habitats that are home to quite a few conservation significant floral species like *Acacia catechu* (L. f.) Willd., *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. & Perr., *Boswellia serrata* Roxb. ex Cocl., *Buchanania lanzan* Spreng., *Celastrus paniculata* Willd., *Chlorophytum tuberosum* (Roxb.) Baker, *Dendrocalamus strictus* (Roxb.) Nees, *Ficus benghalensis* L., *Lagascea mollis* Cav., *Lannea coromandelica* (Houtt.) Merrill., *Madhuca indica* J. F. Gmelin, *Sterculia urnes* Roxb. and *Tectonia grandis* L. f. are major tree species viz. Starred Tortoise, Marsh crocodile or Mugger, Long-bill Vulture, White-rump Vulture, Scavenger Vulture, Pangolin, Ratel, Four horned antelope and Leopard. The forest is interspersed with about 30 villages and their agriculture field that creates a typical mosaic. The agricultural activities coupled with the heavy biotic pressure on domestic livestock, illicit cutting of wood, timber and bamboo and other Minor Forest Produces collection including encroachments, both inside and the periphery exerts enormous pressure on the vegetation are reported.

Further, though it is endowed with rich natural resources, it is affected by natural calamities and hazards like drought, fire, flood and storm, with drought being a common phenomenon. Various aspects of the study area were mostly extracted from the management plan.

Prior to the publication of Hooker's flora (1872-97), local flora and lists were available for several regions of India but nothing was known in Rajasthan. The lacuna was, however, very amply filled during the middle part of the century and large number of technical and semi technical

papers were published.

The work on the flora and present day Botany has been pioneered by Linnaeus with his classic publication *Genera plantarum* (1737). In India the work on floral exploration had been initiated by Roxburgh (1820-1824) who published "Flora Indica". Later eminent botanists like Hooker and Thompson (1855) published an introductory essay to the flora India and the publication of "Flora of British India" (1872-1897).

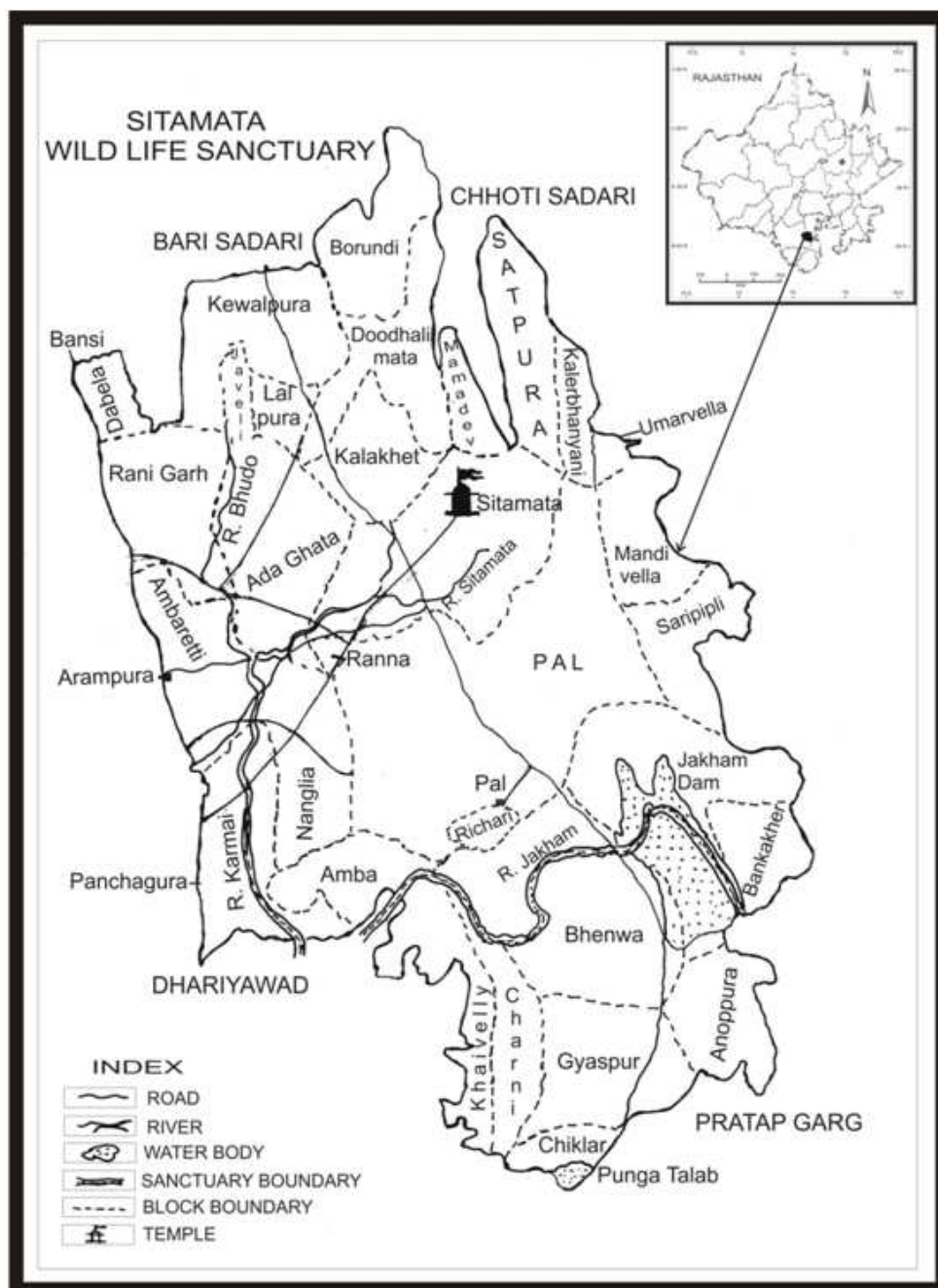


Fig. 1. The Sitamata Wildlife Sanctuary.

In as many as 60 papers, the nomenclature, notes on additions to the flora of Rajasthan or new records for India from this State and notes on extended distribution of

various taxa have been reported. Out of 42 publications on floristics, the grasses were dealt in 7, sedges in 3 and both the grasses and sedges in 2 papers, contribution on

halophytes in one, while the hydrophytes or marshland plants in 5 and weed flora of various places have been reported in 2 papers. The aspects of economic and harmful plants and the plant introduction, afforestation etc. have been covered in more than 50 papers (Jain, 1970). Shringi (1981) has enumerated the grasses of Jhalawar district. Account of medicinal plants from tribal area of Rajasthan has been provided by Sebastian & Bhandari (1984a, 84b, 1988), Vyas (1987), Rajawat (1990), Sharma (1991), Singh & Pandey (1998), Gupta & Jiyalal (1997), Katewa & Arora (1997), Katewa & Guria (1997), Katewa & Sharma (1998), Sharma & Asawa (1999), Sharma (2002), Deora *et al.* (2002), Rathore (2002), Trivedi (2002), Jain *et al.* (2004, 2005b), Joshi, 1995, Katewa *et al.* (2003), Katewa & Galav (2005), Katewa & Jain (2006), Meena & Yadav (2006, 2007, 2008, 2009, 2010a, 2010b, 2010c, 2010d), Meena (2011, 2012), Meena *et al.* (2013), Ahir *et al.* (2012), Meena 2013 added further the ethnobotanical work from Rajasthan.

2. Material and Methods

Ethnobotanical survey was conducted in the Sitamata Wildlife Sanctuary, Rajasthan, India. Field trips conducted with by local people. Generally tribals, who know about the Sanctuary villages, tribes generally do not want to give all the information about plants because they believe that when the plant is disclosed its properties will be lost. For this reason the information collected from the tribes is an important aspect of ethnobotanical study. The peoples who can provide information about plants were consulted and includes experience men and women, elders, birth attendants, bhopa, woodcutters, shepherds and headmen of the community. For authenticity about medicinal properties of plants the information collected during fieldwork were verified at different places through different informants and in different seasons.

Each of the plant species recorded have been collected with the help of the informants and photographs were also taken. The species were identified with the help of reputed flora of India Series- 2 (Flora of Rajasthan volume 1-3, Shetty & Singh (1987-1993) Botanical Survey of India) and recently published Flora of South Central Rajasthan by Yadav & Meena (2011). The voucher specimen was deposited in the Herbarium of Department of Botany, MLV Government College, Bhilwara.

3. Observations

Cultural exuberance of the tribes of the Sitamata wildlife sanctuary is rightly being depicted in several of its elements. The tribes believe in their own god “*Bheru bawji*” as well as “*Mataji*” and they prey with them for all purposes. They construct small houses or huts, with one room and veranda made of mud and wood like *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. Perr., *Terminalia catappa* L., *Nyctanthes arbor-tristis*, *Bambusa* sp. etc. and are built on

the slopes of the hills with their agriculture fields. Maize is the staple food grown by all tribal families. The tribal family honors their guest by a dish prepared from goat or hen. Different duties are allotted for both male and female. The men do the physical labor such as ploughing, harvesting, building the houses as well as hunting. The female carries domestic duties including cooking, nursing and milking the animals and also taking care of the children.

Marriage too like any other tribal communities is held in high position. The tribal communities have permitted freedom in selecting their partners. Young males between the ages of 10 -24 generally marry females who are between 14 - 18 years.

Dresses of tribes are quite exquisite. Both the male and females of tribal communities developed an individual style of dressing. Several silver ornaments are in fashion. The woman usually wears black, blue or red blouses with huge petticoats. Men are noted for their white or red turbans.

4. Huts and Hamlets

Living in hamlets that comprise huts scattered sparsely constitute a village. The number of huts in a village may range from a small one like ten-twelve spread over two or more square kilometers. When large the village is called a “*Kheri*”, Dhani is usually made of several huts and tribals of different casts inhabit in different streets. In same localities, however, the tribes live in clusters of several shelters, on plain ground at the foot of the hills. Such shelters denote the accepted authority of one i.e. the father over the sons or the eldest brother over the younger.

Rare still are clustered double storage hutments called “*medi*”. Compact shelter-partners are also seen in villages with a mixed population of tribal and non tribal or in the outskirts of small towns. The typical tribal village is situated between the forest or adjacent to it, near source of natural water supply, whether a river or where water can be obtained through wells or baoris (Step wells)

A tribal generally constructs his hut, close to his agricultural field and often in the field (Plate 1 A). Usually, a tribal's field lies on the slopes below his hut on a hillock. Rarely, affluent tribes, may own two huts, one in the field if it is far away. Besides the huts and fields each village has sacred spots with deities houses in constructing *devras* or in constructing sites sheltered by trees like *Acacia leucophloea*, *Ficus religiosa* or *Ficus benghalensis*. The *devras* are also called as “*thanak*” Sacred spots may be in the center of the village or on the outskirts (Plate 1 B).

A large *Azadirachta indica* or *F. Religiosa* or *F. benghalensis* tree or a grove forms the community gathering place. Meetings are also held at the *Devras* or in the headman's hut. In front of the headman's hut there is another open house which serves the purpose of entertaining and lodging guests of the village. Such place is called as “*Pol*”. The pol is an open structure with a rectangular roof of timber supported by 3-5 long pillars linters and covered with a thick mat of *Butea monosperma*

leaves & straw of *Triticum aestivum* or with sticks of *Acacia nilotica* and strips of *Bambusa*, sometimes it is covered with Kelu (kelu is made by soils). It is at the pole that a guest is lodged or the folks assemble for their night palaver or discussion.

The tribal houses are essentially rectangular in construction with the roof sloping down from a common point beyond the upper ends of the two long walls of the huts. These two longer walls are called "Chanda". The roof style prevents overheating by direct scorching sunrays in summers and facilitates the torrential water drops to speedily flow down in rains. A house usually has only one room (sometimes more) separated in 3-4 portions, a corner forms the kitchen, an adjacent one the "Dormitory". While the cattle & the pet animals are kept on the outer side of the hut (Plate 1 C). The single entrance is usually on one side of a long wall, though an entrance through the smaller wall is also not uncommon. The house almost never has windows. The walls and the ground are plastered with clay mixed with cow dung or straw of *Triticum* or *Hordium* spp.

The cattle may also be tied at the side of the hut inside a fenced enclosure or a semi open construction. Within the hut compound there may also be a raised platform called Dhariya or some times dagla.

A typical tribal house consists of :

- i. The front wall (L.N. Barnewali Bheetri)
- ii. The back wall (L.N. Pachhewali Bheetri)
- iii. The side wall (Chanda)
- iv. The roof (Tapri)
- v. The gate

The four walls of a rectangular house are made up of mud and leaves of *Saccharum officinarum*. Now a days due

to low rainfall, the *Saccharum* is not available and therefore, straw of *Triticum aestivum* is commonly used. On the walls, the roof is made using *Phoenix sylvestris* or *Acacia catechu* stem as girder and leaves of *Phoenix sylvestris* to cover it. On two small front and back walls a lenter is applied which is known as Myar, on the Myar three short pillars are used known as *Mulvari*, the *mulvari* are supporting polls for three lenter, girders applied on side walls. These long lenter are called *Khankwari*. On khankwari transverse sticks of wood of *Acacia nilotica* or *Anogeissus pendula* are used but recently the bamboo is commonly used. After this the horizontal longitudinal strips of bamboo are applied and then this is covered by kelu.

The gate is made up of wood of *Acacia nilotica*. Sometimes a rectangular screen made up of frame of bamboo filled with *Phoenix sylvestris* leaves. This screen is tied along one end to a pole to keep it moving for opening and closing.

Mats prepared from *Phoenix sylvestris* leaflets are used to sitting in gatherings. A symbol of God Ganesha locally known as Mandpo prepared from wood of *Magifera indica* is used at the gate of the hut during marriage. A basket made of Bamboo is generally used as a trap for chickens as well as for fishing.

Slight variations in selection of timber observed in the neighboring villages are enumerated.

Beams : (Myar, Adia) *Phoenix sylvestris*, *Acacia nilotica*.

Pillars : (Khankwari) *Phoenix sylvestris*, *Acacia nilotica*.

Poles : *Anogeissus pendula*

Gates : *Acacia nilotica*, *Azadirachta indica*.

Uses of plants with their different parts in the construction of huts and hutments are given in table 1.

Table 1. Plants and plant materials used for making huts.

Sr. No.	Name of species	Plant parts used	Uses
1.	<i>Acacia nilotica</i> (L.) Willd. ex Del. ssp. <i>indica</i> (Benth.) Brenan	Stem & branches	Framework of roof, windows and doors
2.	<i>Acacia catechu</i> (L. f.) Willd.	Stem	Beams
3.	<i>Acacia leucophloea</i> (Roxb.) Willd.	Stem	Beams
4.	<i>Acacia senegal</i> (L.) Willd.	Stem	Supporting pillars
6.	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guill. & Perr.	Stem and tender branches	Framework of roof, windows and doors
8.	<i>Azadirachta indica</i> A. Juss.	Stem and branches	Framework of roof, windows and doors
9.	<i>Bambusa arundinacea</i> (Retz.) Roxb.	Culms	Framework of roof, Thatching of hut walls.
10.	<i>Boswellia serrata</i> Roxb. ex Coleb.	Stem	Pillars and doors
11.	<i>Butea monosperma</i> (Lam.) Taub.	Stem, branches and leaves	Doors, pillars and framework of roof
12.	<i>Cajanus cajan</i> (L.) Mill.	Stem	Roof
13.	<i>Calotropis procera</i> (Ait.) Ait. f. ssp. <i>hamiltonii</i> (Wight) Ali	Stem	Framework of roof
14.	<i>Capparis decidua</i> (Forssk.) Edgew.	Stem	Framework of roof

Sr. No.	Name of species	Plant parts used	Uses
16.	<i>Diospyros melanoxylon</i> Roxb.	Stem	Framework of roof, windows and doors
17.	<i>Gossypium herbaceum</i> L.	Stem	Doors and walls
18.	<i>Madhuca indica</i> J. F. Gmelin	Stem	Doors and beams
20.	<i>Phoenix sylvestris</i> (L.) Roxb.	Stem and leaves	Beams, walls, gates and roof
23.	<i>Saccharum bengalense</i> Retz.	Culms and leaves	Thatching of walls and roof.
24.	<i>Tectona grandis</i> L.	Stem & Leaves	Beams & roof
25.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Stem	Beams
26.	<i>Terminalia crenulata</i> Roth	Stem	Beams
27.	<i>Triticum aestivum</i> L.	Culms and leaves	Thatching of walls and roof.
28.	<i>Typha angustata</i> Bory & Chaub.	Culms and leaves	Walls and roof
29.	<i>Zey mays</i> L.	Culms and leaves	Walls and roof
30.	<i>Ziziphus mauritiana</i> Lam.	Stems and branches	Roof
31.	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Stems and branches	Framework of walls.

5. Local Terms Related to Huts & Shelters

Shelter : Asro
Hut : Jhunpari, tapri
Raw materials for making a hut : Jugar.
Rising walls on both sides of huts : Chando
Wall behind hut : Paseet
Wall : Bheet
Foundation : Anchhot
Small room : Orri
Roof : Chhappar
Plastered ground of hut : Lippen

Balcony : Mundari
Crosswise pole : Danda
Pillars : Thambo
Main vertical pole : Thambo
Gate constructed for entry into hut compound as well as field : Tati
The knob for closing door : Kari
Latch : Hakri, sankli
Window : Kiwari
Plastering (by clay / cow dung) : Lippen
A place meant for cattle resting : Dharyo, Chhapari
Sites for tying cattle (Thann) : Barro
Watch place (Machaan): Daglo, dagro (Plate 1D)



Plate 1A: A typical Hut of tribes surrounded by Agricultural field.



Plate 1B: Thanak of Tribes in Sitamata Wildlife Sanctuary.



Plate C: Huts for cattle and pet animals.



Plate 1D: Watch place (Machaan): Daglo, dagro

6. Discussion

The observations recorded during the present investigations of the flora of the Sitamata wildlife sanctuary may now be discussed in the light of researches carried out by earlier workers in this context.

The remarkable feature of Rajasthan is the Aravalli range, perhaps the oldest folded mountain range in the world. It intersects Rajasthan from end to end, diagonally running from Delhi to the plains of Gujarat for a distance of about 692 km. Within Rajasthan the range runs from Khetri in the northeast to Khed Brahma in the south-west for a length of about 550 km. The elevation of the Aravalli range gradually rises in south-west direction, as it is 335 m at Delhi and in Rajasthan 792 m at Khetri, 913 m at Harshnath, 920 m at Kho, 1055 m at Raghunathgarh, 1100 m at Bijapur and 1727 m at Mt. Abu. Further, south-west wards, the elevation gradually decreases to the plains of Gujarat.

The loftiest and the most clearly defined section of the Aravalli is in between Mt. Abu and Ajmer where the range stands like a barricade. Beyond Ajmer to the northeast, there are gaps in the Aravalli range near Sambhar, east of Sikar etc. Structurally, it is composed of rocks belonging originally to the Delhi system, folded in a Synclinorium occupying the site of geosyncline which has been deeply eroded. Aravalli range divides the whole of Rajasthan into two natural divisions i.e. three fifth lying on north-west and two fifth on the east and southeast.

The present status of forest everywhere is a matter of deep concern as they are gradually declining and disappearing from the countryside. Their presence in agricultural lands, grazing, fragmentation of the grove-owning families, erosion of cultural & religious beliefs, introduction of *Lantana camara* L., *Parthenium hysteriophorus* L., *Spigelia anthelmia* and taboos are the major reasons. In view of this, and due to failure of pure legal protective measures in guaranteeing conservation, it has become imperative to search for alternative solutions based on indigenous knowledge of the people. The tribes of this region conserve medicinal plants and the forest patches

rich in biodiversity and play an important role in their sustainable manner with their socioeconomic and religious practice with the belief in nature worship inherited from generation after generations. Tribe believes that if the habitat of the medicinal plant species is protected these species will be multiplied without any conservation practices.

The forest represents a long tradition of environmental conservation by the tribes of this Sanctuary. Therefore, there is an urgent need not only to protect forest, but also to revive and reinvent such traditional practices of nature conservation and environmental management. Initially only two species namely *Commiphora wightii* (Arn.) Bhandari and *Rosa involucrata* Roxb. were included in the threatened species from state by BSI but now this list has been increased and including the number of species in this category. The species like *Anogeissus sericea* Brandis var *nummularia* King ex Duthie *Ceropegia vincaefolia* Hook. emend. Ansari and *Chlorophytum borivilianum* Sant. et Fernand is rare and included in the red data book of Indian plants and some species like *Citrullus colocynthis* (L.) Schrad., *C. wightii* (Arn.) Bhandari and *Tecomella undulata* (Sm.) Seem, are reported as threatened species (Meena & Yadav, 2006, Meena, 2012). The gum of *C. wightii* (Arn.) Bhandari has an importance in international trade and it appears to be being extracted at unsustainable rates, causing declines, so presently it is included in IUCN Red List of Threatened species. In Rajasthan these species are widely distributed in the western part of the state, but here it is also reported as rare and threatened species in this district. Among the present species many are facing various threats in this region.

The danger of extinction on such species are ahead, therefore it is necessary to ensure the survival of germplasm by their protection, conservation, multiplication and maximum afforestation of such medicinal and economically important plant species. Because of limited resources of this tribe it is essential for a biotechnologist to come forward for *in-situ* conservation through tissue culture, establishment of botanical gardens or *ex-situ*

conservation by way of protecting the forest region of the state. The political as well as involvement of NGOs may play an important role in the protection of this valuable area of the state.

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