



Research article

Plant diversity assessment of Sariska tiger reserve in Aravallis with emphasis on minor forest products

Anil Kumar Dular

Department of Environmental Science

Maharaja Ganga Singh University, N.H 15, Jaisalmer Road, Bikaner, Rajasthan, India

*Corresponding Author: dular_ak@rediffmail.com

[Accepted: 17 March 2015]

Abstract: The Sariska tiger reserve in Aravallis has its own importance and specific characteristics endowed with unique biodiversity. In the present study an attempt has been made to ascertain the current status of plant species which provides minor forest products or non-timber forest products which is used for the sustenance of livelihood of local peoples inside and outside the reserve. Attention is focused on one of the important reserve forest Rajasthan with pace of their endemism and facing number of challenges. Minor forest product are the part of traditional forest management, but new demands on forest are leading communities to seek more formal monitoring processes to guide the allocation and management of their shrinking biological resources. Present study emphasize on the assessment and management of plant diversity in perspective of a sustainable harvest of minor forest product of the limited area of the forest. The sustainable harvest of minor forest products requires a bit more than blind faith in the productive capacity of tropical plants. The controlled exploitation of minor forest product holds great potential as a method for integrating the use and conservation of tropical forest.

Keywords: Biodiversity - Aravallis - Sariska tiger reserve - Minor forest product (MFPs).

[Cite as: Dular AK (2015) Plantdiversity assessment of Sariska tiger reserve in Aravallis with emphasis on minor forest products. *Tropical Plant Research* 2(1): 30–35]

INTRODUCTION

The biodiversity assessment is an essential tool to display the different ecological characteristics that can make sustainable harvesting and ecological impact of forest utilization on the floristic composition of the forest. According to the Champion & Seth (1968) the forest of Aravalli region falls under the broad category of Tropical Dry forests. Sariska Tiger reserve (74°14' – 76° 34' N and 25° 5' – 27° 3' E) is situated in the Aravalli hill range (Fig. 1) and lies in the semi-arid part of Rajasthan (Rodgers & Panwar 1988). It became a wild life sanctuary in 1955 and Tiger reserve in 1982. According to Department of Forest, Government of Rajasthan the total area of the Sariska Tiger Reserve is 866.0 km², of which 302.2 km² is buffer zone and 497.8 km² is core zone. Sariska core zone is comprised of three isolated; pockets: Core-I (273.8 km²), II (126.5 km².) and III (97.5 km²). The status of the Core I has been notified as a National park in 1982. Sariska is undulating to hilly and has numerous narrow valleys. Kiraska and Kankwari plateau and two large lakes Mansarovar and Somsagar. Silisad lake is situated just along the north eastern boundary of the reserve. The altitude of Sariska varies from 540 to 777 m asl. The vegetation of Sariska correspond to Northern tropical dry deciduous forests (sub group 5 B; 5/E I and 5/E2) and Northern tropical thorn forest (Sub Group 6 B) (Champion & Seth, 1968). The forest being scattered and sparse over a large area on various geological and soil formation and vary greatly in composition. Sariska is very rich in biodiversity with wide spectrum of flora and ample of wild life. The main economically valuable species are Dhok (*Anogeissus pendula* Edgew.), Salar (*Boswellia serrata*), Khair (*Acacia catechu*), Bamboos (*Dendrocalamus strictus*), Dhak (*Butea monosperma*), Kair (*Capparis decidua*), Ber (*Ziziphus mauritiana*) with having lot of ground flora comprised of shrubs, herbs, grasses and sedges etc. Several studies so far conducted in Aravallis like Nair & Nathawath (1957), Dennis *et al.* (1977), Sharma (1978, 1983), Parmar (1985), Rogers (1988, 1990, 1991), Khan (1995) which supported checklist of plant diversity in this natural reserve with their

economic uses at local. Samant & Dhar (1997), Joshi (2000), Gamble (1884), Ghate (1939), Legris & Meher (1982) valued this biodiversity in form of non-timber forest products or minor forest products as the source of income for the livelihood a long time before. A total number of 403 indigenous and naturalized plant species belonging to 271 genera under 86 families can be observed in Sariska Tiger Reserve. This also includes four species of Pteridophytes belonging to three genera and three families, and a species of Gymnosperm. Table 1 includes the number of families, genera and species, under Dicotyledons and Monocotyledons, Pteridophytes and Gymnosperm. Except for Poaceae (56 species) and Cyperaceae (17 species) the Monocotyledons are poorly represented. The remaining 16 species of Monocotyledons belong to 10 different families Dular (2004).

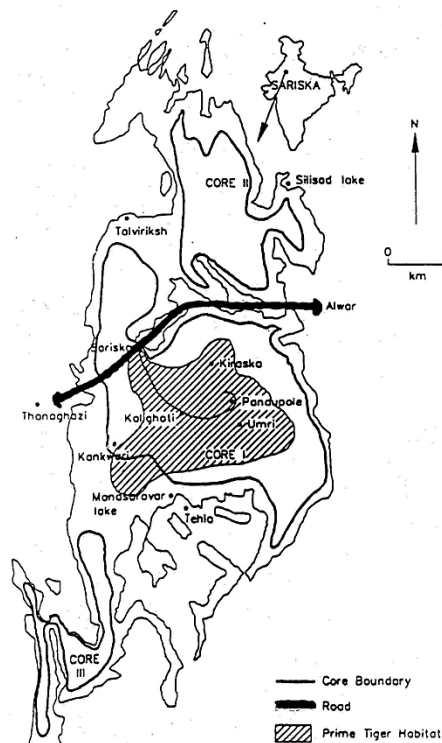


Figure 1. Study site: Sariska Tiger reserve, Rajasthan, India.

Table 1. Shows current status of vegetation in Sariska Tiger Reserve.

	Families	Genera	Species
Monocotyledons	13	59	90
Dicotyledons	69	208	308
Total Angiosperm	82	267	398
Pteridophytes	3	3	4
Gymnosperm	1	1	1
Total	86	271	403

The main objective of this study is to give a concise overview of the ecology and exploitation of minor forest products in term that can be easily understood by non-specialists. This study is useful for green business and other commercial purposes who are indulge in exploitation of non-timber tropical forest products. The controlled exploitation of minor forest products has great potential as a method for integrating the use and conservation of tropical forests. This study attempts to narrow the gap between the potential and the reality of this land-use practice. It is also required that minor forest products as a source of livelihood for the indigenous peoples, the exploitation of the minor forest products have a measurable impact on the structure and the dynamics of the tropical plants population.

MATERIALS AND METHODS

Personal observations were taken in the field by visiting the study area and its different landforms. Plant samples (leaf, flower etc.) were brought to Indira Gandhi Centre for Human Ecology, Environmental and Population Studies, herbarium sheets for important species were prepared and help and cooperation was sought from the Herbarium of Department of Botany, University of Rajasthan, Jaipur for finding out their feasibility of uses as non-timber forest products. Interview has been taken for counter check of their utility by local dwellers inside or outside the reserve. The inventorisation of such species and their parts utilize checked by literature (Dular 2004). During the study potential useful sources include both published and unpublished grey literature about the region and species of interest. Review of plant specimens at departmental herbarium provide information on the distribution, habitat, flowering and fruiting phenology of different species of non- timber product use.

RESULTS

Analysis of interview schedule has revealed that there is large number of plant species with economic value termed as minor forest products. Plant species are utilized for variety of purposes. Table 2 includes a list of twenty nine plants species which are providing edible fruits. Table 3 includes twenty one plant species utilized as fodder. Table 4 includes name of fourteen plant species yielding gum, resins, tannins and dyestuff. Table 5 includes name of fifteen plant species which are providing some other minor forest produce.

Table 2. Includes the list of plant species which are providing edible fruits in Sariska Tiger Reserve.

S.No.	Name of the species	Families	Local name
1.	<i>Acacia leucophloea</i> (Roxb.) Willd.	Mimosaceae	Rijua
2.	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Bel
3.	<i>Alangium salvifolium</i> (L.f.) Wang.	Alangiaceae	Ankol
4.	<i>Annona squamosa</i> L.	Annonaceae	Sitaphal
5.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem
6.	<i>Carissa spinarum</i> L.	Apocynaceae	Karamda
7.	<i>Capparis decidua</i> (Forsk.) Edgew.	Capparaceae	Kair
8.	<i>Cordia gharaf</i> (Forsk.) Ehrenb.	Ehretiaceae	Gondi
9.	<i>Cordia dichotoma</i> Forsk.	Ehretiaceae	Lasoor
10.	<i>Diospyros melanoxyton</i> Roxb.	Ebenaceae	Timbru
11.	<i>Feronia limonia</i> (L.) Swingle	Rutaceae	Kutbel
12.	<i>Grewia asiatica</i> L.	Malvaceae	Phalsa
13.	<i>Grewia tenax</i> (Forsk.) Fiori	Malvaceae	Chabeni
14.	<i>Holarrhena pubescens</i> Wall. ex Dc.	Apocynaceae	-
15.	<i>Holoptelea integrifolia</i> (Roxb.) Planch.	Ulmaceae	Kanju
16.	<i>Madhuca longifolia</i> (Koenig ex L.) Macbre.	Sapotaceae	Mahva
17.	<i>Mangifera indica</i> L.	Anacardiaceae	Aam
18.	<i>Mimusops hexandra</i> (Roxb.) Dubard	Sapotaceae	Khirmi
19.	<i>Moringa oleifera</i> Lam.	Moringaceae	Sainjana
20.	<i>Pandanus odorifer</i> (Forssk.) Kuntze	Pandanaceae	Kavedo
21.	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Ambla
22.	<i>Prosopis cineraria</i> (L.) Druce	Mimosaceae	Khejari
23.	<i>Rhus mysorensis</i> G. Don	Anacardiaceae	Dasni
24.	<i>Sapindus emarginatus</i> Vahl	Sapindaceae	Ritha
25.	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamun
26.	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Imli
27.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Bahera
28.	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Rhamnaceae	Bordi
29.	<i>Ziziphus xylopyrus</i> (Retz.) Willd.	Rhamnaceae	Ghat Bor

Table 3. Includes the list of plant species utilized as fodder in Sariska Tiger Reserve.

S.No.	Name of the species	Families	Local name	Purpose
1.	<i>Acacia leucophloea</i> (Roxb.) Willd.	Mimosaceae	Rijva	Green leaf twigs
2.	<i>Acacia nilotica</i> (L.) Del.	Mimosaceae	Babul	Green leaf twigs
3.	<i>Acacia senegal</i> (L.) Willd.	Mimosaceae	Kumta	Green leaf twigs
4.	<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	Ardu	Green leaf twigs
5.	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guillem. & Perr	Combretaceae	Dhavdo	Green leaf twigs
6.	<i>Boswellia serrata</i> Roxb. ex Colebr.	Burseraceae	Salar	Green leaf twigs
7.	<i>Butea monosperma</i> (Lam.) Taub.	Papilionaceae	Palas	Dried leaves
8.	<i>Capparis decidua</i> (Forsk.) Edgew.	Combretaceae	Kair	Green leaf twigs
9.	<i>Capparis sepiaria</i> L.	Combretaceae	Kanthari	Green leaf twigs
10.	<i>Delonix elata</i> (L.) Gamble.	Caesalpiniaceae	Sanderso	Green leaf twigs
11.	<i>Dichrostachys cinerea</i> (L.) Wight & Arn.	Leguminosae	Goyakhair	Green leaf twigs
12.	<i>Ehretia laevis</i> Roxb.	Ehretiaceae	-	Green leaf twigs
13.	<i>Firmiana simplex</i> (L.) W.Wight	Malvaceae	Kadayo	Green leaf twigs
14.	<i>Grewia flavescens</i> Juss.	Tilaceae	-	Green leaf twigs
15.	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Mimosaceae	Jungle Jalebi	Green leaf twigs
16.	<i>Prosopis chilensis</i> (Molina) Stuntz	Mimosaceae	-	Green leaf twigs
17.	<i>Prosopis cineraria</i> (L.) Druce	Mimosaceae	Khejari	Green leaf twigs
18.	<i>Woodfordia fruticosa</i> (L.) Kurz	Lythraceae	Dalia	Green leaf twigs
19.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Bordi	Green leaf twigs
20.	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Arn.	Rhamnaceae	Pala	Dried leaves
21.	<i>Ziziphus xylopyrus</i> (Retz.) Willd.	Rhamnaceae	Ghatbor	Green leaf twigs

Table 4. Includes the list of plant species yielding gum, resins, tannin and dye stuff in Sariska Tiger Reserve.

S.No.	Name of the species	Families	Local name	Use
1.	<i>Acacia catechu</i> (L.f.) Willd.	Mimosaceae	Khair	Exudate
2.	<i>Acacia leucophloea</i> (Roxb.) Willd.	Mimosaceae	Rijva	Exudate
3.	<i>Acacia nilotica</i> (L.) Del.	Mimosaceae	Babul	Exudate
4.	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guillem. & Perr	Combretaceae	Dhavdo	Exudate
5.	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Neem	Exudate
6.	<i>Boswellia serrata</i> Roxb. ex Colebr.	Burseraceae	Salar	Exudate
7.	<i>Butea monosperma</i> (Lam.) Taub.	Papilionaceae	Palar	Petals as dye stuff
8.	<i>Cassia auriculata</i> L.	Caesalpiniaceae	Anwal	Bark
9.	<i>Commiphora wightii</i> (Arnott.) Bhandari	Burseraceae	Guggal	Exudate
10.	<i>Garuga pinnata</i> Roxb.	Burseraceae	Ghogar	Leaf gall
11.	<i>Pithecellobium dulce</i> (Roxb.) Benth	Mimosaceae	Jungal jalebi	Leaf gall
12.	<i>Sterculia uren</i> Roxb.	Malvaceae	Kadayo	Leaf gall
13.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Bahera	Leaf gall
14.	<i>Ziziphus mauritiana</i> Lam.	Rhamnaceae	Bor	Wood

Table 5. Includes the list of plant species providing some minor forest produce in Sariska Tiger Reserve.

S.No.	Name of the species	Families	Vernacular name	Economic value
1.	<i>Acacia catechu</i> (L.f.) Willd.	Mimosoaceae	Kair	Katha
2.	<i>Acacia nilotica</i> (L.) Del.	Mimosoaceae	Bawal	Katha
3.	<i>Ailanthus excelsa</i> Roxb.	Simaroubaceae	Ardu	Gum, match stick
4.	<i>Balanites aegyptiaca</i> (L.) Delile	Zygophyllaceae	Hingot	Soap making
5.	<i>Bombax ceiba</i> L.	Malvaceae	Seemal	Match stick
6.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Amaltas	Pulp of pod
7.	<i>Dendrocalamus strictus</i> (Roxb.) Nees.	Poaceae	Bans	Basket, hut making
8.	<i>Lannea coromandelica</i> (Houtt.) Merr.	Anacardiaceae	Madhol	Match stick
9.	<i>Madhuca longifolia</i> (Koenig ex L.) Macbr.	Saptoaceae	Madhuvo	Crude liquor
10.	<i>Mangifera indica</i> L.	Anacardiaceae	Aam	Fruits (seed oil)
11.	<i>Melia azedarach</i> L.	Meliaceae	Bakain	Leaves used to make plates and saucers
12.	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Aonla	Fruit pulp in soap making
13.	<i>Sapindus emarginatus</i> Vahl	Sapindaceae	Areetha	Fruit/Fuit shell for soap making
14.	<i>Terminalia belerica</i> Roxb.	Combretaceae	Bahera	Bark, fruit
15.	<i>Wrightia arborea</i> (Dennst.) Mabb.	Apocynaceae	Dudhi	Dyes from leaves blue dye from seeds

CONCLUSION

In this study emphasis was laid on the floral diversity with their uses as minor forest products or non-forest timber product for the subsistence of local dwellers inside and outside the Sariska Tiger Reserve. The study revealed that the loss biodiversity of the study area due to anthropogenic activities leads in scarcity of such minor forest products, which is basis of livelihood of local peoples. Due to the human interference in reserve will lead to deterioration of so many species which have great importance to generate economy for local peoples, and uses of such minor products relieve biotic stress on reserve so far.

ACKNOWLEDGEMENTS

Author has deep sense of gratitude to his supervisor Director Indira Gandhi centre for Human Ecology and Population studies, University of Rajasthan, Jaipur for their able guidance during the research tenure and also thankful to Dept. of forest, Government of Rajasthan and field director to Sariska and other staff members.

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