



Medicinal plant diversity in Aravallis

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Abstract

Aravallis ranges are one of the very important features of western part of India which runs from Gujarat to Delhi. It traverses in four states viz., Gujarat, Rajasthan, Haryana and Delhi. Maximum part of Aravallis is confined to Rajasthan. As many as 13 wildlife sanctuaries are confined to Aravallis; 10 in Rajasthan, 2 in Gujarat and 1 in Delhi. As many as 3 protected areas are confined to confluence of Aravallis and Vindhyas, all are in Rajasthan. Forest Department, Rajasthan and Foundation for Revitalization of Local Health Traditions, Bangalore jointly has listed 39 species in the "red list of medicinal plants" from Rajasthan state. Most of these listed medicinal plants are present in 16 protected areas. Out of these 16 protected areas, 6 are rich in medicinal plants. Phulwari, Sitamata, Kumbhalgarh, Mt. Abu. Balaram Ambaji and Jassore sanctuaries having 22, 18, 14, 12, 11 and 10 species respectively. The study reveals, that southern part of Aravallis is more rich than northern and central Aravallis. The "nals" of southern part of Aravallis are especially rich in medicinal plant diversity

Keywords: Medicinal plant diversity, Aravallis, Protected areas

Introduction

Rajasthan is the largest state of the Indian union, occupying an area of about 34.22 million ha. The state may be divided into many regions like Western arid zone, semi-arid zone, South-eastern zone, Chambal ravines, Aravalli zone and Eastern zone. The most striking geological feature of Rajasthan is the Aravalli mountain range-the one of the oldest folded mountain ranges in the world. Aravallis intersects Rajasthan state end to end diagonally covering about 30% area of the state. This mountain chain is extending from Champaner in Gujarat in the South-west to near Delhi in the North-east for a distance of about 692 km. Within Rajasthan, this range runs from Khed Brahma in the South-west to Khetri in the North-east for a length of about 550 km. The Aravallis are rich in medicinal plants. There are certain features which make southern Aravallis rich in the medicinal and other type of plants. High rainfall, presence of soil layer of varying depth on hill slopes, presence of perennial or semi-perennial streams and water courses, inaccessibility in many pockets owing to towering height, deep valleys and parallel running mountain chains, presence of 'nals' etc. are certain factors which makes ecological conditions of this zone congenial to variety of medicinal plants. Presence of 'nals' is very interesting feature of Aravallis, especially of southern Aravallis. Narrow valleys between two parallel running mountain chains are called *nals* in

the local dialect. Sometimes a deep fold, present in a hill itself is also called *nal*. Essentially a nallah or stream or a river is always present in a *nal*. Stream of the *nal* may be perennial, seasonal or ephemeral. Most of streams in southern Rajasthan are supporting good riparian forests. Moisture regime becomes better in the *nal* area. Deposition of eroded soil is seen in the valleys which makes them fertile. A rich growth of plants is seen in fertile valleys. *Nals* and inner slopes are especially rich in medicinal plants. Aravallian forests and other habitats support many plants species of medicinal value in the state.

Many researchers have studied medicinal plant wealth of Rajasthan, especially ethnomedicinal plants like Joshi¹⁻³, Katewa,⁴ Katewa and Jain,⁵ Purohit and Dave,⁶ Purohit et al,⁷ Sebastian and Bhandari,^{8,9} Sharma et al¹⁰ and Singh and Pandey.¹¹

A Conservation Assessment and Management Prioritization (CAMP) workshop was organized in Rajasthan for the medicinal plants of the state at Jaipur from 10-13 September, 2007 by the Forest Department, Rajasthan and Foundation for Revitalization of Local Health Traditions, Bangalore jointly. During this CAMP workshop 6 species were assessed Critically Endangered (CR), 13 species Endangered (EN), 18 species Vulnerable (V), 1 species Near Threatened (NT) and 1 species Data Deficient (DD). Thus total 39 medicinal plants were red listed from Rajasthan state.



After finalization of red list of medicinal plants of Rajasthan, no specific works has been done by any worker to know the status of red listed medicinal plants in various protected areas of Aravallis. Present paper highlights the status of these 39 species in various sanctuaries confined to Aravallis in Rajasthan, Gujarat and Delhi.

Materials and Methods

As many as 13 wildlife sanctuaries confined to Aravallis and three other protected areas present at the confluence of Aravallis and Vindhya. These protected areas were surveyed to know the status of red listed medicinal plants. List of protected areas is shown in Table 1.

As many as 13 wildlife sanctuaries are confined to Aravallis; 10 in Rajasthan, 2 in Gujarat and 1 in Delhi. As many as three protected areas are confined to confluence of Aravallis and Vindhya, all are in Rajasthan.

A detailed survey was made in all these 16 protected areas from 2007 to 2016 to know the status of medicinal plants in wild. Existing published literature¹²⁻¹⁴ was also scanned.

Results and Discussion

The findings of survey are shown in Table S1 (see online Supplementary file 1). Table S1 indicates that out of these 16 protected areas, 6 are rich in medicinal plants. Phulwari, Sitamata, Kumbhalgarh, Mt. Abu, Balaram Ambaji and Jassore sanctuaries having 22, 18, 14, 12, 11 and 10 species respectively. Most of these sanctuaries are connected with corridors also. Jaisamand Sanctuary possess 12 species which is also situated in southern Aravallis. Sariska sanctuary (also a Tiger Reserve) possess 12 species of medicinal plants which is situated in northern Aravallis. Todgarh- Raoli supports 8 species of medicinal plants, which is a part of central Aravallis. Table S1 indicates that southern part of Aravallis is more rich than northern and central Aravallis. Protected areas of southern Aravallis and many territorial forest blocks like Kamalnath, Keora-ki-Nal, Samali, Ladan, Tinsara, Ramkunda, Har, Madri, Nal Sandol, Kirat, Raydari, Khokhariya-ki-Nal, etc. are rich in medicinal plants where

besides red listed 39 species many other species also grow commonly. Some worth recording species of this area are *Milusa tomentosa*, *Cissampelos pariera*, *Cocculus hirsutus*, *C. pendulus*, *Tinospora cordifolia*, *Caesaria elliptica*, *Sida acuta*, *S. cordata*, *Bombax ceiba*, *Helicteres isora*, *Corchorus depressus*, *Tribulus terrestris*, *Aegle marmelos*, *Balanites aegyptiaca*, *Azadirachta indica*, *Moringa oleifera*, *Abrus precatorius*, *Butea monosperma*, *Desmodium gangeticum*, *Mucuna pruriens*, *Pongamia pinnata*, *Cassia fistula*, *Tamarindus indica*, *Acacia catechu*, *Terminalia bellerica*, *Syzygium cumini*, *Diplocyclos palmatus*, *Centella asiatica*, *Gardenia turgida*, *Eclipta alba*, *Madhuca indica*, *Nyctanthes arbor-tristis*, *Carissa spinarum*, *Hemidesmus indicus*, *Encostemma hyssopifolium*, *Ehratia laevis*, *Evovulus alsinoides*, *Solanum nigrum*, *Withania somnifera*, *Martynia annua*, *Adhatoda zeylanica*, *Barlaria cristata*, *Ocimum canum*, *Boerhavia diffusa*, *Achyranthes aspera*, *Aristolochia bracteolata*, *A. indica*, *Peperomia pellucida*, *Euphorbia fusiformis*, *Curcuma amada*, *C. angustifolia*, *C. aromatic*, *C. inodora*, *C. pseudomontana*, *Enset supertubum*, *Curculigo orchoides*, *Dioscorea bulbifera*, *D. hispida*, *D. pentaphylla*, *Aloe vera*, *Asparagus asiaticus*, *A. royaleanus*, *A racemosus*, *Chlorophytum laxum*, *C. breviscopum*, *C. orchidastrum*, *C. tuberosum*, *Pandanus fascicularis*, etc. Ladan forest block is very rich in *Ensete superbum*. Probably western India's largest population of *E. superbum* is confined in this block. Forests of southern Aravallis should be well protected and managed as far as medicinal plants are concerned.

Conclusions

As many as 16 protected areas are confined to Aravallis and confluence of Aravallis and Vindhya. Out of these 16 protected areas, 4 from Rajasthan namely, Phulwari, Sitamata, Kumbhalgarh and Mt. Abu are rich in medicinal plants which contains 22, 18, 14, and 12 red listed species respectively. Two protected areas of Gujarat state namely, Balaram Ambaji and Jassore sanctuaries having 11 and 10 species respectively. The study reveals, that southern part of Aravallis is more rich than northern and central Aravallis.

Competing Interests

None.

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Supplementary Materials

Supplementary file 1 contains Table S1.

References

- Joshi P. Herbal drugs in tribal Rajasthan-from childbirth to child care. *Ethnobotany*. 1989;1:77-87.

Table 1. Area Surveyed to Know Occurrence of Medicinal Plants

Zone	Name of Protected Areas (Sanctuaries and National Parks)		
	Rajasthan	Gujarat	Delhi
Aravallis	Mount Abu, Phulwari-Ki-Nal, Sajjangarh, Jaisamand, Kumbhalgarh, Todgarh- Raoli, Nahargarh, Jamwa Ramgarh, Sariska and Sariska A.	Jassore Sloth Bear Sanctuary, Balaram Amabaji Sloth Bear Sanctuary	Asola Bhatti
Confluence of Aravallis and Vindhya	Sitamata, Bassi, Ranthambhore	-	-

2. Joshi P. Herbal drugs used in Guinea worm disease by the tribals of southern Rajasthan (India). *Int J Pharmacogn.* 1991;29(1):33-38. doi:[10.3109/13880209109082846](https://doi.org/10.3109/13880209109082846)
3. Joshi P. *Ethnobotany of the primitive tribes in Rajasthan*. Jaipur, (India): Printwell; 1995. p. 1-254.
4. Katewa SS. *Folk Herbal medicine and Drug Discovery*. Scientific Publishers, (India); 2012. p. 1-299.
5. Katewa SS, Jain A. *Traditional folk herbal medicines of Rajasthan*. Udaipur (Rajasthan), India: Apex Publishing House; 2006.
6. Purohit SD, Dave A. Micropropagation of *Sterculia urens* Roxb. - an endangered tree species. *Plant Cell Rep.* 1996;15(9):704-706. doi:[10.1007/bf00231929](https://doi.org/10.1007/bf00231929)
7. Purohit SD, Dave A, Kukda G. Micropropagation of safed musli (*Chlorophytum borivilianum*), a rare Indian medicinal herb. *Plant Cell Tissue Organ Cult.* 1994;39(1):93-96. doi:[10.1007/bf00037596](https://doi.org/10.1007/bf00037596)
8. Sebastian MK, Bhandari MM. *Medico-ethno botany of Mount Abu, Rajasthan, India*. *J Ethnopharmacol.* 1984;12(2):223-230. doi:[10.1016/0378-8741\(84\)90050-3](https://doi.org/10.1016/0378-8741(84)90050-3)
9. Sebastian MK, Bhandari MM. Medicinal plant lore in Udaipur District, Rajasthan. *Bull Med Ethnobot Res.* 1988;5(3-4):133-134.
10. Sharma SK, Jain A, Katewa SS. In situ conservation of medicinal plants in Rajasthan. In: Katewa SS, ed. *Folk Herbal medicine and drug discovery*. Scientific Publishers (India); 2012. p. 255-264.
11. Singh V, Pandey RP. Medicinal plant lore of the tribals of eastern Rajasthan. *J Econ Tax Bot.* 1980;1:137-147.
12. Shetty BV, Singh V. *Flora of Rajasthan*. Vol. I, II, III. Botanical Survey of India; 1987, 1991, 1993.
13. Singh V, Shrivastava AK. *Biodiversity of Ranthambore Tiger Reserve Rajasthan*. Jodhpur: Scientific Publishers (India); 2007.
14. Sharma S, Tiagi B. *Flora of North-East Rajasthan*. Ludhiana, New Delhi: Kalyani Publishers; 1979.

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