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Traditional knowledge and uses of medicinal plants in Jharkhand state of India

Sanjeev Kumar, IFS[1]

1. Additional Principal Chief Conservator of Forest, CAMPA, Jharkhand ,India
   Department of Forest, Environment and Climate Change, Jharkhand, India

Email- sanjeevkumar201@gmail.com

Abstract

Jharkhand , an eastern state of India , is abound in medicinal plants and rich in related indigenous and traditional knowledge .The tribals like Santhal, Ho, Birhor,Oraon, Munda, and Bhumij use powder, oil, paste, juice and decoction of these plants to cure various diseases .Since time immemorial, forest has been the main source of medicinal plants . But due to extensive use of these plants and deforestation, some of the medicinal plants are on the verge of extinction. Similarly traditional knowledge (TK) related to conservation and sustainable use of these plants are also threatened due to acculturation in the society. The present paper depicts TK related to conservation and uses of medicinal plants in Jharkhand state of India. The study was conducted in Dhanbad, Bokaro, Gumla, East Singhbhum (Jamshedpur) ,West Singhbhum (Chaibasa) and Hazaribagh districts of Jharkhand. The survey was done in two steps-Reconnaissance survey and Survey for actual research work with questionnaires. During study fifty plants were recorded eg. *Abrus precatorius* L., *Acorus calamus L.*, *Adhatoda zeylanica* Medic. , *Allemanda cathartica* L., *Asparagus racemosus* Willd., *Bacopa monniera* (L.) , *Clitoria ternatea* L, *Hemidesmus indicus* R.Br ,*Vitex negundo* L., *Ocimum sanctum* L., *Rauvolfia serpentina* (L.)Benth.exKurtz, *Terminalia tomentosa* (DC) Wt. &Arn, *Terminalia Arjuna* (Roxb.exDC.)Wt. &Arn. , *Trachyspermum ammi* (L.)Spr. etc. The study reveals that these people possess comprehensive TK for treatment of various ailments like cough, cold, fever, jaundice, skin diseases, wounds etc. using these plants. Due to their utility local people could conserve these plants for a long period of time as sacred groves, by adopting sustainable methods, following taboo and respecting traditional spirits. Conservation of such traditional wisdom and biodiversity is required; hence besides other measures, documentation of this knowledge as educational material is also recommended.

Keywords: Human health and well -being, Biodiversity conservation, Knowledge management, Disease transmission , Sustainable forest management

Introduction

For centuries indigenous people have been living in and around forests in a substantial way which rendered them profound knowledge of sustainable management of natural resources. This

knowledge, which resulted from indigenous techniques and practices, cascade orally from generation to generation and called as traditional knowledge (TK). These are packaged in stories, folk songs, paintings, dances, ballads etc.

In recent years, apart from its historical perspectives and cultural values, traditional knowledge has been in prominence due to realization of its importance in Sustainable Forest Management, achieving Sustainable Development Goals (SDGs), biodiversity conservation and potential role in research, biotechnology and pharmaceutical applications.

Jharkhand is home of ancient wisdom which had been transmitted from generation to generation. Forests have been the lifeline of people living here. Due to globalization, commercialisation, scientific dilemma, acculturation in the society, loss of traditional and cultural systems and lack of interest in young generation there has been decline in the practice of such traditional knowledge. Some of such TK are on the verge of being lost for ever. But it is a fact that a large percentage of rural communities still rely upon local knowledge system to meet their medicinal demands. Hence their documentation is necessary for the posterity.

Methodology

A survey was conducted in Dhanbad, East Singhbhum (Jamshedpur) Seraikela, Simdega, Gumla, West Singhbhum (Chaibasa), Ranchi, Khunti, Hazaribagh, Jamtara, Deoghar districts of Jharkhand among Oraon, Santhal, Bhumij, Ho , Munda and Birhor tribes to explore the treasure of traditional knowledge possessed by these people to cure ailments using herbal medicine. The data and information presented in this paper have been collected after discussion with local people and members of Village Forest Protection Committees. A format was prepared to conduct the survey based on the principle of Ethnobotany. Semi structured questionnaire was prepared to get information on traditional knowledge related to medicinal plants. Data were also collected on strength and weakness of such TK and faith of respondents in these TK in the perspective of modern life. Some legends, taboos and social belief were also documented. Literature and other records were consulted to validate the data.

The Study Area: Jharkhand

The study was conducted in Jharkhand, an eastern state of India. Jharkhand was carved out of the southern part of Bihar state on 15 November 2000. Jharkhand shares its border with the states of Bihar to the north, and Chhattisgarh to the west, Orissa to the south, and West Bengal to the east. It has an area of 79,714 km^2 Or 30,778 sq. mi (79,710 km^2). The name "Jharkhand" means "The Land of Forests". Jharkhand accounts for 3.4% of the total forest cover of the country and ranks 10th among all states. The recorded forest area of the state is 23,605 sq. km which is 29.61 % of the geographical area of the state. As per Champion and Seth (1968) Classification for Forests, the state has five forest types viz.Moist Peninsular Low Level Sal-3C/C2e (ii), Dry Peninsular Sal-5B/C1c, Northern Dry Mixed Deciduous Forest-5B/C2, Dry Deciduous Scrub-5/DS1, Dry Bamboo Brakes- 5/E9. These belong to two major forest type groups viz. Tropical Moist Deciduous-Group -3 and Tropical Dry Deciduous Forests-Group -5. The Forest Types of India: Revisited (2013) by ICFRE, Dehradun has revised them

as Moist Peninsular Sal-III/IIID, Dry Mixed Deciduous Forests-V/VC, Dry Sal Bearing Forests-V/VD and Dry Grasslands- V/VE. The important sps. which constitute the forests are-Sal, Teak, Mahua, Asan, Dhaura, Gamhar, Kusum, Palas, Arjun, Chironji etc. The richness of flora of Jharkhand (erstwhile Bihar) was described by H. H. Haines in his book titled The Botany of Bihar and Orissa (Haines 1921-1925) and the book A Forest Flora of Chotanagpur (Haines 1908). Working Plans of Forest Divisions are also valuable sources of information about flora of that area.

Results and Discussions

As a result of survey it was found these tribes have been using TK for centuries in their healthcare system to cop up with the problems of various diseases. Their long association with nature have enabled them to acquire knowledge about plants and their usage. Among the plant parts, leaves, shoots, fruits, bark, flowers, rhizomes, roots, tubers, seeds and bulbs are commonly used. These are used as fresh plants as a whole, powder, extract, juice, paste or decoction and taken with water, milk, ghee, candy or honey. People collect plants based on traditional knowledge and are dried in sunlight and in shade as per requirement. Medicinal plants are used not only by local practitioners as household remedy but through local markets these reach bigger places and are used as raw material for various pharmaceutical industries. They also use these medicinal plants on the advice of elders such as herbalists ,Vaidyas (Medicine man) and traditional practitioners. Medicine men act both as a healer and priest. Sometimes they chant 'Mantras' (Hymns) during preparation of medicines.

Fifty plant species have been enumerated and described below. Some additional plants have been mentioned in the table 1 also. The plant name is followed by family name and then vernacular name (VN). Table -1 summarises diseases and plants used in the treatment of these diseases.

Enumeration of Medicinal Plants used by people

1. *Abrus precatorius* L. (Fabaceae) VN- 'Ghunchi'; Seeds and fruit syrup are used in stomach disorder.

2. *Abutilon indicum* (L.) Sweet (Malvaceae); VN: 'Kanghi', 'Narinjhumke', 'Mirubaha'; Root paste is given in gastroenteritis. Half a cup is administered empty stomach for three to four days.

3. *Acorus calamus L.* (Araceae) VN –'Bach'; Rhizome and roots of the plant are used as medicine. Roots are used in cough and fever. Rhizome is used as laxative and diuretic.

4. *Aegle marmelos* (L.)Corr. (Rutaceae) VN: 'Bel'; Tender leaves and mucilage are given in Jaundice.

5. *Aerva lanata* (L.)Juss. (Amaranthaceae); VN: 'Lupu adah'; Root is crushed in water and administered in Dysentery.

6. ***Alangium salvifolium*** (L.f.) Wang (Alangiaceae) VN: 'Dhela'; Root is crushed and is administered with water to cure gastroenteritis. It is sometimes mixed with the crushed *Abutilon indicum* and given in gastroenteritis.

7. ***Allamanda cathartica*** **L.** (Apocynaceae); VN: 'Pilajara'; The flowers is crushed is taken orally for treatment of jaundice.

8. ***Alstonia scholaris (*****L.) R.Br.** (Apocynaceae) VN- 'Chhatni'; Bark is used in gastrointestinal troubles. It is useful in malarial fever also.

9. ***Alysicarpus monilifer*** (L.) DC. (Fabaceae); VN: 'Banighas', 'Shusni'; Fresh roots are chewed in stomach cramp.

10. ***Andrographis paniculata*** (Burm.f.) Wall ex Nees. (Acanthaceae); VN: 'Kalmegh'; Some pieces of plants are kept in water pot overnight and the liquid is taken with 'gur' (Jaggery) in the morning to remove intestinal worms; it also purifies blood and relieves stomach pain and fever due to water contamination.

11. ***Anogeissus latifolia*** Bedd. (Combretaceae); VN: 'Dhau', 'Hesel'; Bark of ***Anogeissus latifolia and Diospyros tomentosa*** is mixed in equal quantity and ground to make a paste with water. It is administered every two hour in the treatment of cholera.

12. ***Asparagus racemosus*** Willd. (Liliaceae); VN: 'Satawar'; Tuber is crushed in water and administered in Dysentery.

13. ***Atylosia scarabeoides*** Benth. (Fabaceae) VN: 'Bankurthi'; Paste of the plant is orally administered in body swelling and gastric disorders.

14. ***Azadirachta indica*** A.Juss (Meliaceae) VN –'Neem'; Leaves are used in ulcers and eczema. Dry flowers tonic and stomachic.

15. ***Bombax ceiba*** L. (Bombacaceae) VN: 'Semal'; Gum exudates from stem are used in diarrhoea. Bark is crushed in water. It is also administered in diarrhea.

16. ***Borreria articularis*** (L.f.) Will. (Rubiaceae); VN: 'Hada pota'; Leave are crushed and made juice. Two spoons twice a day is administered in Diarrhoea and stomach cramp.

17. ***Buchanania lanzan*** Spr. (Anacardiaceae); VN: 'Piyar'; Juice of leaves is administered in dysentery.

18. ***Calotropis gigantean*** (L.) Br. (Asclepiadaceae) VN: 'Akaona'; Root is crushed with black pepper and made into pills. One pill is given at the interval of two hours in cholera.

19. ***Catharanthus roseus*** (L.)Don. (Apocynaceae); VN: 'Sadabahar'; Extract of leaves are administered one tea spoonful twice a day to cure Diarrhoea and cramp in stomach.

20. ***Catunaregam uliginosa*** (Retz.)Siva (Rubiaceae); VN: 'Pindar', 'Tholko'; Fruit is boiled in water and the juice so prepared, is administered in dysentery.

21. ***Celastrus paniculatus*** Willd. (Celastraceae); VN: 'Kujri'; Bano, Three spoons full oil are administered with sugar in Gastroenteritis. Seed oil is used in skin disease and tuberculosis also.

22. ***Centella asiatica*** (L.)Urban (Apiaceae); VN: 'Brahmi'; Whole plant is crushed with water and is given in Jaundice.

23. ***Cissampelos pareira*** L. (Menispermaceae) VN: 'Patha', 'Pithu sinya'; Root is powdered and used to cure dysentery and mitigate stomach cramp.

24. ***Costus spesiosus*** **(Koen. Ex Retz.) Sm.** (Zingiberaceae) VN- 'Kevuk kand'; Rhizomes are eaten as purgative and tonic.

25. ***Curculigo orchioides*** Gaertn. (Hypoxidaceae); VN: 'Kali musli'; The root is made paste and is given in diarrhoea.

26. ***Diospyros tomentosa*** Roxb. (Ebenaceae) VN: 'Kend', 'Tiril'; Bark is crushed with water and is used in Cholera.

27. ***Diplocyclos palmatus*** (L.)Jeffrey (Cucurbitaceae) VN: 'Shivlingi', 'Kahu votke'; The root is made powder and mixed with black pepper. Half spoonful is administered twice a day for the treatment of gastroenteritis. Its root is also used in the treatment of typhoid.

28. ***Erycibe paniculata*** Roxb. (Convolvulaceae); VN: 'Kari', 'Karinjh'; The crushed bark is given in Cholera.

29. ***Fimbristylis ovata*** (Burm.f.)Kern. (Cyperaceae); VN: 'Bhidi mutha'; The root is crushed and is administered in Colitis. Two spoonsful twice a day is administered empty stomach.

30. ***Gloriosa superba*** **L**. (Liliaceae) VN –'Kalihari'; Root powder is given rheumatic fever.

31. ***Hemidesmus indicus*** **R.Br**. (Perplocaceae) VN- 'Anantmula'; Roots are used in skin diseases, fever, asthma, bronchitis. Also act as blood purifier.

32. ***Holarrhena antidysentrica*** Wall. (Apocynaceae); VN: 'Koreya'; Fresh root is powdered. It is administered with water and candy to cure dysentery.

33. ***Justicia adhatoda*** L. (Acanthaceae); VN: 'Adusa'; A decoction of leaves of ***Justicia Adhatoda*** and roots of Lygodium ***flexuosum*** is useful in the treatment of Typhoid.

34. ***Leucas cephalotes*** (Roth) Spr. (Lamiaceae); VN: 'Guma'; Whole plant is crushed with water and is mixed with candy. It is administered twice a day in Jaundice.

35. ***Morinda pubescens*** Sm. (Rubiaceae); VN: 'Chaili'; The bark is powdered and taken with water in Cholera.

36. ***Oxalis corniculata*** L. (Oxalidaceae) VN: 'Amti sag'; The whole plant is taken and is ground along with black pepper. It is taken with water in the morning to cure Typhoid.

37. ***Phyllantus emblica*** **L**. (Euphorbiaceae) VN –'Aonla'; The ripe fruit is eaten as a whet to the appetite. Is also used with other plants as a used as a remedy for *dysentery.*

38. ***Phyllanthus fraternus*** Webst. (Euphorbiaceae) VN: 'Bhuin Aonla'; The whole plant is crushed and given to cure Jaundice.

39. ***Pterospermum acerifolium*** Willd. (Sterculiaceae); VN: 'Muchkund'; Flowers are dried and powdered. Two spoonsful twice a day are administered in Jaundice.

40. ***Scoparia dulcis*** L. (Scrophulariaceae); VN: 'Chini sacam' 'Mithi ghas'; The whole plant is taken and made decoction with leaves of *Ficus religiosa* and *black pepper* and sugar candy is added. It is taken in the treatment of Typhoid. Leaves are also used in Jaundice.

41. ***Smilax ovalifolia*** **Roxb**. (Smilacaceae)VN- 'Ramdatwan'; Roots are used in sore and rheumatism.
42. ***Soymida febrifuga*** (Roxb) Juss. (Meliaceae); VN: 'Ruhin'; Decoction of bark is prepared and is administered twice a day in dysentery.

43. ***Spondias pinnata*** (L.f.) Kurz. (Anacardiaceae); VN: 'Amra'; Bark of stem is crushed in water. It is administered in Diarrhea.

44. ***Syzygium cuminii*** (L.)Skeels (Myrtaceae); VN: 'Jaman'; Vinegar prepared from it is mixed with extract of 'Mahua' and administered in the treatment of Cholera.

45. ***Terminalia bellirica*** (Gaertn.) Roxb. (Combretaceae); VN: 'Bahera'; Bark is made paste with water and given every two hour in the treatment of Cholera.

46. ***Terminalia tomentosa*** Wt. &Arn. (Combretaceae); VN: 'Asan'; Bark is ground and made paste with water and given every two hour in the treatment of Cholera.

47. ***Tridax procumbens*** L. (Asteraceae) VN: 'Kharha ghas', 'Puru'; Juice of leaves is administered orally in dysentery.

48. ***Urginea indica*** **Kunth**. (Liliaceae)VN-'Jangali pyaj'; A mashed bulb is given in fever and pneumonia.

49. ***Vitex negundo*** **L**. (Verbenaceae) VN –'Sindwar'; Paste of leaf is used as germicide.

50. ***Vitis auriculata*** Roxb. (Vitaceae) VN: 'Baiang', 'Amar lata', 'Togo Nari'; Tuber is powdered and one spoonful is taken in Colitis.

Fig-1 Gloriosa superba

Fig-2 Saraca indica

Fig-3 Bryonia palmata

Name of diseases and plants used in them can be grouped as follows:

1.Diseases related to respiratory system : *Acorus calamus, Aegle marmelos, Allium cepa, Clerodendrum viscosum, Justicia adhatoda Piper longum, Celastrus paniculatus, Sterculia urens.*

2. Diseases related to digestive system: *Aristolochia indica, Alstonia scholaris, Abutilon indicum, Alangium salvifolium, Alysicarpus monilifer, Andrographis paniculata, Aegle marmelos, Borreria articularis, Cissampelos pareira, Combretum nanum, Fimbristylis ovata, Holarrhena antidysentrica, Justicia adhatoda, Symplocos racemosa, Terminalia bellirica, Phyllanthus emblica, Terminalia chebula.*

3. Fever: *Andrographis paniculata, Catharanthus roseus ,Soymida febrifuga, Vernonia anthelmintica, Vernonia albicans, Costus speciosus, Gmelina arborea ,Hemidesmus indicus ,Pueraria tuberosa, Rauvolfia serpentina, Tragia involucrate, Vangueria spinosa*

4. Water borne diseases: *Aegle marmelos, Aerva lanata, Alangium salvifolium, Allamanda cathartica, Asparagus racemosus, Bombax ceiba, Buchanania lanzan, Calotropis gigantean, Cassine glauca, Catunaregam uliginosa, Centella asiatica, Cochlopermum religiosum, Desmodium polycarpum, Diospyros tomentosa, Diplocyclos palmatus, Morinda pubescens ,Phyllanthus fraternus, Pterospermum acerifolium, Scoparia dulcis , Spondias pinnata, Syzygium cuminii, Terminalia tomentosa, Vitis auriculata.*

5. Diseases related to Heart: *Terminalia arjuna, Boerhaavia diffusa, Zingiber officinale, Vitex peduncularis, Rauvolfia serpentina, Aristolochia indica*

In all the communities traditional conservation practices include conservation of sacred groves, taboos, certain social beliefs and selective harvesting of plants. There have been efforts from government also to conserve medicinal plants and practices of traditional knowledge. There is paradigm shift in forest management. The working Plan Code 2014, prepared for the management of forests envisages various aspects of management of medicinal plants in great deal. It also emphasises uses of traditional knowledge. Similarly the Forest Right Act (The Scheduled Tribes and Other Traditional Forest Dwellers ,Recognition of Forest Rights, Act 2006) also underpins right of forest dwellers to traditional knowledge related to biodiversity and cultural diversity. These efforts are additional strength towards the preservation of TK.

During the study it was found that despite all the modern advancement in the society, there is still practice of traditional knowledge in respect of medicinal plants. Hence a survey on the approaches of local communities was also done . Eighty five percent of respondents are in favour of the view that Traditional knowledge should be preserved for the posterity. The result of this survey has been summarised in table 2.

Table-2: Result of survey conducted to ascertain the approach of people towards TK related to medicinal plants in the modern context.(response of interviewees)

Question	Percentage of acceptance(Agree)	Disagree	Not sure
Traditional knowledge should be preserved for the posterity	85%	12%	3%
It (TK) should be documented	68%	22%	10%
Documentation of TK will benefit the society	82%	13%	5%
TK should be used in conjunction with modern knowledge	70%	15%	15%

Conclusion

The present civilization is likely to encounter two main problems in future, problem related to food security and other pertaining to medicines to cure diseases. Genetic diversity and TK associated with them have solution to these problems. Owing to their traditional knowledge on medicinal plants, the people have been able to save these natural resources for a long period of time. But there is remarkable acculturation in the society which poses threat to the continuation of such TK in pure form. Hence their documentation is necessary and can be made tool for forest conservation and biodiversity conservation. Their scientific validation and use in conjunction with modern science will continue to benefit the society.

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