

Research Article

ETHNOBOTANY AND ENVIRONMENTAL MANAGEMENT BY THE TRIBAL COMMUNITIES OF PATRATU, HAZARIBAGH DISTRICT, JHARKHAND

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ABSTRACT: Ethnobotany of different tribal communities of Pataru, Hazaribagh District, Jharkhand were studied on the basis of the information from 8 local Vaidyas or medicinal men. All total 38 plants are used by them. Among those, 8 plants are of very common use and for another 30 plants, some new information are added which were not been recorded earlier. The tribal names, botanical names, useable parts and the respective uses are documented. Information regarding type of uses after preparation of medicines are also included. The management practices followed during collection of the plant parts in favor of natural conservation are also discussed.

Key words: Ethnobotany, Tribal communities, Hazaribagh, Jharkhand.

INTRODUCTION

Ethnobotanical information and the management practices by the Tribal communities of Patratu, Hazaribagh District, Jharkhand had been gathered from 8 tribal medicinemen or local vaidyas, inhabitant of the seven villages.

Patratu area is nearly 324 sq km of which forest covers nearly 25,534.41 acres. The rest part is mainly the major cultivated land as 6393.78 acres, minor cultivated land 15321.87 acres, barren land 1043.93 acres, fellow land or the grazing shrubby areas as 1027.60 acres. The highly rich cultivated area of double cropping condition is 1508.50 acres. The total

population according to the census report (Anonymous 1991) is 2,13,160 of which male is 1,18,770 and female 94390. Amongst the total population the schedule tribes are 45735 of which male 23756 and female 21997 belonging to different age groups. Patratu area is with 85 villages having 17 panchayets. The roofing houses in the villages are 83 and the rest 2 villages without any permanent roofing house and man.

The field study of was under taken among the tribal communities of Munda, Oraon, Santhal, Malahar and Harijan to search out the information specially the tribal medicines or can be said as ethnomedicine. In this regard a few

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information on the management practices for the preservation, maintenance and finally the conservation strategies of these medicinal plants had been gathered from these communities.

All these information are based on the 8 tribal practitioners called as local vaidyas, inhabitant of the 7 villages of Patratu region. Amongst the 8 practitioners, three persons belonging to Munda community, two to Oraon community and for the rest each one for Santhal, Malahar and Harijan.

All total there are 38 plants or plant parts which are used by the tribal practitioners or medicinemen and all are belonging to higher vascular plants. Out of them 30 plants or plant parts are exclusively used for medicinal purposes having some new information and the 8 plants are of very common uses as reported earlier. However, 11 plants are used in social, ceremonial or in agricultural practices and 6 plants are used for religious purpose. Of course, there are common uses of some plants. They are solely dependent on local and natural forest resources for their regular uses as well as for the practices.

Although this region is somewhat enriched with some of the modern facilities like communication, tribal communities are still in their traditional belief for the treatments, cure and remedy by the local tribal medicinal plants. Thus, they are mostly involved in traditional treatment system.

Bodding (1925, 1927) was the first person who had studied on Santal Medicine and the connected folklore. Later Gupta (1969, 1981) had added many of the plants used for the medicinal uses by the tribal communities of Chotonagpur. Subsequently many of the informations had been added for the medicinal plants used by the tribal communities of the then Bihar and the Chotonagpur regions including

Purulia, Midnapore and Bankura districts of West Bengal by Jain (1965), Jain and De (1966), Jain and Tarafder (1964, 1970) Jain *et al.* (1976), Saha (1981), Tarafder and Choudhury (1981), Srivastava and Verma (1984), Jain and Pal (1982), Jain and Rao (1983), Pal and Biswas (1982), Pal and Jain (1998), Maity and Manna (2000).

In the present study valuable information from the medicine men are obtained about the maintenance of these plants for future uses. Thus they are protecting these plants for environmental management and have the role in the conservation and the uses of plant genetic resources in India as expressed by Arora (1996, 1997), Gadgil (1993, 1998) and on the global basis (Cotton 1996, Cunningham 1993).

Many of the new information are added in regards to same types of uses of the same plants by the different tribal medicine men. Moreover, some additional information on the prescribed forms for taking these herbal medicines are added. Many of the information are although presented by the earlier workers but the applications and sometimes the dose, duration and even the ingredients are not properly presented. Due to lack of such information this account is here presented.

Furthermore, the medicine men have some conserved idea in regards to their practices. Due to this conserve idea it is beneficial for the maintenance and preservation of the plants in nature. Thus, in the other way by their strict guidelines they are helping in the conservation of natural resources as a genetic resource for future.

MATERIALS AND METHODS

Survey works on plants and plant parts used by local vaidyas or medicinemen or the practitioners were done during 2001-2002.

Investigation is based on 8 medicinemen inhabitants of 7 villages. The details of the names of local vaidyas and their respective age, sex, caste, occupation and inhabitant, etc. are presented. The medicinal uses of plants, plant parts, names of the plants, local or regional names, uses along with the dose and duration, etc. are presented in alphabetical sequences for 30 plants. In addition, the previous reports of all the individual plant or plant parts are also compiled together.

The management practices of the tribal communities are also presented based on the information given by these local vaidyas or medicinemen.

A comparative list of 30 studied plants is also presented along with the specific uses.

OBSERVATION

The information is provided by the 8 medicine practitioners (local vaidyas) of Patratu area, Hazaribagh and the details of the medicinemen are as follows:

Plants are identified by the practitioners and the local or regional names are stated by themselves. Further information on the usable parts, time of collection, preservation,

preparation, dose, duration, etc. against the diseases are explained whenever asked. However, they use the common plants which are previously known or reported earlier but the collection, preservation, preparation, etc. along with doses and durations are the new and additional information that are incorporated in this study. All these information are presented below for each plant in alphabetical sequences based on common tribal names of this Patratu locality.

1. Aam : *Mangifera indica* L.; Family: Anacardiaceae; Tribal names : Uli darn, amati (Lodha), Tatxaman (Santhal); common name : Mango [Pl. 1A].

Mitra (1919), Tarafdar (1983), Pal and Jain (1998) had stated its various uses by the many tribal communities of India. Maiti and Manna (2000) had reported that the ingredient of the anti fertility pill is prepared and used by the Santhals of Purulia District, West Bengal, Presently it is informed that in jaundice the smashed stem bark mixed with water is formed a paste and this paste is applying on palms and feet twice daily for the treatment of jaundice until recovery.

2. Aginkher/Agnikhar: *Leonotis nepetifolia*

Table 1. Details of the medicine men taken part in discussion.

Serial no.	Names of medicinemen	Community	Nature of practice
1.	Kailash Munda	Munda	Frequent practice
2.	Baijnath Purty	Munda	Frequent practice
3.	Guthal Munda	Munda	Occasional practice
4.	Moti Oraon	Oraon	Regular medicine man
5.	Naran Ekka	Oraon	Regular medicine man
6.	Sanjul Majhi	Santhal	Regular medicine man
7.	Panchu Malahar	Malahar	Occasional practice
8.	Dhena Shau	Harijan	Regular medicine man

(L.) R. Br.; Family: Labiatae; Tribal names: Sidho, Agijanum (Lodha), Agia (Munda), Tonka-agia (Oraon); common name: Lionsear. [Pl. 1B].

Pal and Jain (1998), Tarafder and Raichoudhury (1981) had stated its use by the Santhals of Hazaribagh for curing skin diseases and paralysis respectively.

Presently it is known that the flowers of this plant are cooked with 'Karanch oil' (*Pongamia pinnata*) to form a paste and this paste is used as ointment, once in a day for consecutive days, to cure eczema and itching. Pal and Jain (1998) had stated to use the flowers with mustard oil (3: 2) to cure 'kha-sua' (a kind of skin disease). There is common information to use flowers or roots or the ash of burning plants for remedy of skin diseases along with different ingredients.

3. Akhband or Akhward: *Calotropis gigantea* (L.) R. Br. ex Ait.; Family: Asclepiadaceae; Tribal names: Akon (Lodhas), Arok (Santhals), and local name; Akand (Birhore and Bengali) [Pl. 1C].

This plant is of common uses by the different tribal communities of India (Pal and Jain 1998, Jain and De 1966) particularly the latex for the remedy of wounds and injury. In the present study it is revealed that the tribal peoples of Oraon, Harijan and Munda use the latex in toothache or tooth pain. It is applied twice in a day until recovery. Latex is soaked in cotton and is applied to the root of teeth to facilitate the teeth fallen down easily. The same prescription is administered by Moti Oraon, Guthal Munda, Naren Ekka and Dhena Shau.

4. Amra, Amara: *Smilax zeylanica* L.; Family: Smilacaceae; Tribal names : Khasur, Atikar, Ram - Datan (Lothas), Rampen (Santhals); Local name: 'Amra'; Kumarica (Bengali) [Pl. 1D].

The leaves are used by the tribals of Hazaribagh (Tarafder 1983) and the root paste or decoction is used in anemia (Tarafdar and Raichoudhury 1981). In the present study it is known that the fruit-pulp is mixed with lime water form a paste and this paste as a small pill (1/4 of a tea-spoon full) is used once in a day and continued for 4-5 days for the remedy of dysentery.

5. Aonla: *Emblica officinalis* Gaertn. f. or *Phyllanthus emblica* L.; Family: Euphorbiaceae. Tribal names : Miral-daru (Lodha), Amla (Oraon), Aouhal (Santhal); Local name: Dhatri, Aanla, Amrul, Amloki (Bengali) [Pl. 1E].

The use of fruits is long been known as an ingredient of *triphola* and much used by the tribals of India (Jain and De 1966). Half of a ripe fruit is taken daily for 4 to 5 days to relief cold and cough as prescribed by Mundas.

6. Bandar Kenoa: *Cassia fistula* L.; Family: Caesalpiniaceae. Tribals names: Punden (Lodha); Badar, Sodal, Bandar lauri (Santhal) and Dhan-bahera (Bhumij) [Pl. 1F].

The fruit pulp is well known to use by the tribals and also as Ayurvedic medicine (Jain and De 1966, Panigrahi 1963) for dysentery, constipation. The use of bark paste, seed powder is also known. Presently it is informed that one spoon full root powder is mixed with a glass of water and is taken in empty stomach for the remedy of fever and is continued till remedy.

7. Ban Supli: *Oroxylum indicum* (L.) Vent; Family: Bignoniaceae; Tribal names: Ranganbanum, Somanauk (Lodha), Bans hatak, Pareri (Santhal), Sona (Bengali) [Pl. 1G].

Sona is well known for its medicinal use of stem bark for the remedy of rheumatism (Kirtikar and Basu 1954) in Ayurvedic system of medicine. New information is gathered for

the treatment of asthma. The roots and mature fruits are squashed and well mixed with a glass of water to form a mixture. This mixture is prescribed to take and to continue for 1-1/2 month once in each morning. Most of the tribals are with these practices for the remedy of asthma.

8. Barrohi: *Achyranthes aspera*. L. Family: Amaranthaceae. Tribal names: Rechari, Buridatrum (Lodhas), Chir-Chith (Oraon), Sitirkad (Santhal); Apang (Bengali), Chirehiti (Bhumij). [Pl. 1H].

Various uses are reported by Jain and De (1966), Pal and Jain (1998), and Maity and Manna (2000). Recent study reveals that Oraon community uses the stem pieces for recovery of jaundice as a magico-religious belief. Oraon has also used a small piece of stem hanged with thread from the waist of the patient and continued to apply until recovery.

9. Bel: *Aegle marmelos* (L.) Corr.; Family: Rutaceae. Tribal name: Sinja (Santhal); Bel, Bael (Bengali, Santhal) [Pl. 1I].

Harijan, Oraon and Mundas all use this plant during marriage ceremony. The uses of leaves, young fruits are noted by Tarafdar (1983), Jain and De (1966), Pal and Jain (1988), by the tribal communities and are well known in Ayurvedic system of medicine for the treatment of stomach trouble (Kirtikar and Basu 1954). The information is alike as reported earlier. However, as additional information leaves are also used along with Jamun (*Syzygium fruticosum*) leaves for the treatment of diabetes. Plant is with religions belief to all the communities and they never cut or fell these plants (Mahapatra 1967, Majumder 1950)

10. Buxiara : *Sida acuta* Burm.f.; Family: Malvaceae. Tribal names: Nelakutri, Carchijo (Lodha), Buriari (Oraon), Chickridal (Santhal)

[Pl. 1J].

Presently it is known that the leaves are used for the treatment of bone fracture. Leaf paste is mixed with cow milk to make a poultice and is used repeatedly in 3 consecutive days in the fracture area and the last application is retained for 7-10 days under a bandage.

Other uses of leaf decoction, leaf poultice, etc. were reported by Pal and Jain (1998).

11. Chhatni: *Alstonia scholaris* (L.) R. Br.; Family: Apocynaceae. Tribal name: Chhatni [Pl. 1K].

The use of stem bark is well known (Kirtikar and Basu 1954) as tonic, febrifuge and for the remedy of intestinal worms and also known to use by the tribal communities. Presently, the bark is used for the treatment of thoracic pain. The bark of 20-25 gms is squashed and finally mixed with a glass of water to form a mixture and is taken for 5 days, once or twice in a day, in empty stomach. Sometimes it is done until remedy.

12. Chirouta: *Nyctanthes arbor-tristis* L.; Family: Oleaceae. Tribal names: Chirata, Saporom (Lodha and Santhal), Seoli (Bengali) [Pl. 1L].

Pal and Jain (1998) had enlisted the uses of this plant thoroughly. The present report is to use the leaf squash for the remedy of diabetes and fever. Three to four leaves are smashed and mixed with water and is taken in empty stomach once in the morning and is continued till remedy.

13. Gulainch: *Tinospora cordifolia* (Willd.) Miers ex Hook. f. & Thom.; Family: Menispermaceae. Tribal names: Nim-gulancha (Lodha), Srasti Loor (Oraon), Latoglorj (Bhumij) [Pl. 1M].

Jain and De (1966), Pal and Jain (1998) had reported its uses by the tribal communities. The

leaves, stems and the roots are reported to use in Ayurvedic system of medicine (Kirtikar and Basu 1954). Now it is known that the *gulainch* and some grasses are mixed together and make a paste to apply for the relief of headache.

14. Haldi: *Curcuma domestica* Valetton; syn. *C. longa* L.; Family: Zingiberaceae. Tribal names: Haldi or Halud [Pl. 1N].

It is a well known spice as well as a dye yielding plant It has insecticidal property (Kirtikar and Basu 1954). Presently it is known to use in bone-fracture. Paste of rhizome is prepared and used as a poultice in the area of bone-fracture.

15. Harar: *Terminalia chebula* (Gaertn.f.) Retz.; Family: Combretaceae. Tribal names: Rola-daru, Hara (Lodha), Hora-dary, Rol (Santhal), Haritaki (Bhumij and Bengali) [Pl. 1O].

A well known plant from ancient time (Kirtikar and Basu 1954), and also reported for various uses of the fruits and stem barks by the tribal communities of India (Jain and De 1966, Pal and Jain 1998). The present report is the use of fruit pulp (mesocarp) to relief from cough and cold. The dust or powder or even the paste of fruit pulp is taken twice in a day in a dose of half tea - spoonful until recovery.

16. Jamun: *Syzygium fruticosum* (L.) Skeels; Family: Myrtaceae. Tribal names: Morong kuda (Lodha), Jamun (Santhal) [Pl. 2A].

Pal and Jain (1998) had summarized its various uses by the tribal communities of India. Addition information is given by Moti Oraon to use the leaf paste for the treatment of diabetes. Three to four leaves are added with 3-4 leaves of bel (*Aegle marmelos*) and make into a paste and is taken in the morning once in a day and is continued for one month.

17. Korayl: *Holarrhena pubescens* (Buch. -

Ham.) G. Don.; Syn. *H. antidysenterica* (Heyne ex Roth) DC.; Family: Apocynaceae; Tribal names: Padal, Kutichi (Lodha), Patadali (Munda), Hat, Kurchi (Santhal), Kurchi (Bengali) [Pl. 2B].

The use of stem bark as *kurchi* drug is well known for the treatment of dysentery (Kirtikar and Basu 1954). All the five communities of Patratu region use the stem bark for the remedy of blood dysentery or dysentery.

18. Neem: *Azadirachta indica* A. Juss; Family: Meliaceae. Tribal names: Nim-daru (Lodha), Bokom daru (Santhal) [Pl. 2C].

Pal and Jain (1998) had reported almost all the uses of this plant by the tribal communities of India. The same use is known from the present study as the leaves or the leaf juice is used for the purification of blood and for the remedy of skin-diseases by all the tribal communities.

19. Parash/Palash: *Butea monosperma* (O. Ktze.). Taub; Family: Papilionaceae. Tribal name: Palas baha (Lodha, Santhal, Oraon) [Pl. 2D].

Tribal communities use this plant in various purposes (Jain and De 1966, Pal and Jain 1998). Presently it is known that the powder of stem bark is applied to the wound or cut area for blood coagulation.

20. Phutkal: *Ficus virens* Ait.; Family: Moraceae. Tribal names: Phutkal daru (Lodha), Pakara (Santhal) [Pl. 2E].

The details of the uses of this plant were provided by Pal and Jain (1998). However, another new information of use of the young leaves in the recovery of dysentery is obtained from the present study. New or young leaves (5-10) are crushed and mixed with a glass of water and this mixture is taken once in empty stomach or twice daily until recovery. Two more

species of the *Ficus* as *F benghalensis* and *F. religiosa* are also used the tribal communities (Mitra 1920, Majumder 1950, Mahapatra 1967)

21. Rangani: *Datura metel* L.; Family: Solanaceae. Tribal names: Mamang tuncture, Tuntura ba (Lodha), Dhatpa (Santhal), Dhutro (Bengali) [Pl. 2F].

Tribals of different communities use this plant or plant parts in various ways particularly the leaves, fruits and the seeds (Jain and De 1966, Pal and Jain 1998).

Malahar community uses the seed dust to relief the toothache. The powder of dry seeds fried in mustard oil and the smoked vapor is taken at the open-mouth. This practice is done and applied with help of some handmade earthen pot. It is applied to the patient at the time of tooth pain.

22. Renta: *Helicteres isora* L.; Family: Sterculiaceae. Tribal names: Atmura, Ratandara (Lodha); Keheli (Munda) [Pl. 2G].

Ethnic communities use the fruits as a magico-religious belief (Bhowmik and Choudhary 1966) as well as for other medicinal purposes (Pal and Jain 1998). The same use is again seen and the fruits are used for the recovery of the disease like poliomyelitis showing deformed legs and foot.

23. Satabar/Satwar: *Asparagus racemosus* Willd.; Family: Asparagaceae. Tribal names: Gai-sira (Lodhas); Finagaperi (Munda, Santhal) [Pl. 2H].

The roots of this plant are of common uses as food and then for medicinal purpose (Jain and De 1966, Pal and Jain 1998). Further, it is noted that they use the roots in fever due to hot wind and sometimes for irritation and weakness. The dried root powder or dust is mixed with goat milk as ingredient and is taken once or twice in a day as of one cup or so.

24. Seuz : *Euphorbia neriifolia* L.; Family : Euphorbiaceae. Tribal names: Seuz (oran), siz (santhal), Mansa siz, Manasha siz (Bengali) [Pl. 2I].

The plant is considered as a sacred one and is worshipped by the tribal communities and often planted along with tulshi (*Ocimum tenniflorum* L.) also stated by Jain and De (1966) and Pal and Jain (1988). Presently it is informed that the bark of the stem is used for the treatment of pain and also the irritation in the palm and fingers. The latex is considered as poisonous.

25. Shahajiban boti: *Terminalia bellerica* (Gaertn.f.) Roxb.; Family: Combretaceae. Tribal names: Luptung daru (Lodha), Behra (Santhal, Bhumij, Bengali) [Pl. 2J].

A well known plant for the use of fruits as one of *triphala* in Indian system of medicine and also largely used by the different tribal communities for stomach trouble and cooling agent (Panigrahi 1963, Jain and De 1966, Pal and Jain 1998). Presently it is known that the roots (10-20 gms) are used as a mixture with a glass of water during abdominal pain.

26. Sidh/Sidha: *Lagerstroemia parviflora* Roxb.; Family: Lythraceae. Tribal names: Sidha (Bhumij) Sidh (Oraon), Sekrek (Santhal) [Pl. 2K].

Jain and De (1966) had reported this plant for the uses in agricultural implements, articles and as timber. Presently it is known to use by the Oraon for the treatment of cough and cold. The roots (10-20 gms) are smashed and mixed with water and this mixture is taken only once in a day in empty stomach for the remedy of cold and cough. However, Pal and Jain (1998) did not reported any medicinal use of this plant.

27. Sthal padma: *Hibiscus mutabilis* L.; Family: Malvaceae [Pl. 2L].

The flowers are used in pectoral and pulmonary complaints (Ambasta 1985). In the present study it is prescribed by Mundas that the smashed petals are mixed with milk used as a medicine for the cure of jaundice. The mixture is taken once in a day in the morning until complete recovery.

28. Supari: *Areca catechu* L.; Family: Palmae, Tribal names: Supri or Supari [Pl. 2M].

Areca nut is used extensively as a masticatory with the leaves of *Piper betel* (Ambastra 1985, Raghavaiah and Barua 1958). Dhena Shau of Harijan community had informed that the dust of fruit (supari) as 10-15 gms mixed with soda together is taken with a glass of hot water to relieve the patient from abdominal pain.

29. Teju Malahar: *Cissampelos pareira* L.; Family: Menispermaceae. Tribal names : Tiju mala (Santhal), Ekleja (Bengali), Chot kipur (Bhumij) [Pl. 2N].

Jain and De (1966) had already reported the application of the roots and stems of this plant useful to stomach pain or abdominal pain. The same information is provided by the Santhal. However, the leaves are also made for the same.

30. Tulsi: *Ocimum tenuiflorum* L.; syn. *O. sanctum* L.; Family: Labiatae. Tribal names: Bir tulsi, Tunrusi (Lodha), Tulsi (Bengali) [Pl. 2O].

Plant is known as a religious belief as well as medicinal uses (Saha 1967, Bedi 1952, Kirtikar and Basu 1954 Pal and Jain 1998). Lodhas used the fresh leaf juice (4-5 leaves) mixed with a piece of ginger and a few drops of honey to form a mixture or tonic. This mixture is taken once in a day and usually continued for 5 days to relief or to cure from cough and cold.

The information is collected from the total number of 38 plants from local vaidyas or medicinemen. The total 30 plants are described

(Table 1) having their additional information of uses while 8 plants are not described. These are Bargad (*Ficus benghalensis*), Karam (*Adina cardifolia* or *Haldina cordifolia*), Koranch (*Pongamia pinnata* or *P. glabra*), Kend (*Diospyros melanoxylon*), Mahua (*Modhuca longifolia*), Makai (*Solanum nigrum*), Pipal (*Ficus religiosa*), Shakhua (*Shorea robusta*) due to their same uses as reported by many authors earlier. These plants although, are used by the 8 medicinemen but not all these plants are used by them. Sanjul Majhi, Dhena Shau and Panchu Malahar had provided information for 9 plants. Baijnath Purty, Naran Ekka and Guthal Munda had informed for 8 plants. Moti Oraon had provided for 12 plants while Kailash Munda had informed for 7 plants only.

A total number of 30 plants are used for different medicinal purpose by local vaidyas. There are 2 common plants which are used by all persons and these two plants are Chhatni (*Alstonia scholaris*) – used for thorasic pain and satabar (*Asparagus racemosus*)- used for fever. Chirotua (*Nyctanthes arbor-tristis*) is also used by 7 persons for different purposes.

Out of 30 plants, leaves of 8, roots of 7, fruits of 7, bark of 4, flowers of 3 along with whole plant, stem, rhizome, seed and the latex of one plant are generally used. Only one plant (Chirouta) is used as a whole plant.

Management practices of tribal communities of Patratu, Hazaribagh, Jharkhand:

The ethnic communities have the inheriting and traditional practices for sustainable utilization and conservation of natural resources (Schultes 1963, Sinha 1995, Vartak 1996, Gadgil 1993, 1998). The tribal communities as they inhabited in the forest, within the forest and between the forest they think more to the

Table 2. List of Medicinal plants used by the Tribal communities of Patratu, Jharkhand, India.

Sl. No.	Plant	Reported Use
1.	<i>Mangifera indica</i> (Aam)	Bark, Jaundice [7].
2.	<i>Leonotis nepetifolia</i> (Agin kher)	Flower, Eczeima, itching [4] .
3.	<i>Calotropis gigantea</i> (Akhband)	Latex, Tooth ache [3], [4], [5], [6], [8].
4.	<i>Emblica officinalis</i> (Aonla)	Fruit, Caught and cold [1], [2], [3].
5.	<i>Smilax zeylanica</i> (Amra)	Fruit, Dysentery [6].
6.	<i>Cassia fistula</i> (Bandar Kenoa)	Root, Fever [8].
7.	<i>Oroxylum indicum</i> (Ban Supli)	Root and Fruit, Asthma[4].
8.	<i>Achyranthes aspera</i> (Bar- rohi)	Stem, Jaundice[4].
9.	<i>Aegle marmelos</i> (Bel)	Leaves, Diabetes [4].
10.	<i>Sida acuta</i> (Buriara)	Leaves, Bone fracture [2].
11.	<i>Alstonia scholaris</i> (Chhatni)	Bark, Thoracic pain [1],[2],[3],[4],[5],[6],[7],[8].
12.	<i>Nyctanthes arbor-tristis</i> (Chirouta)	Whole plant, Diabetes [1],[6]; Leaves, Fever [2],Whole plant, Fever [4],[5],[7]; Leaves, Diabetes [8].
13.	<i>Tinospora cordifolia</i> (Gulainch)	Flower, Headache [1],[3]; Root, Headache [8].
14.	<i>Curcuma domestica</i> (Haladi)	Rhizome, Bone fracture [8].
15.	<i>Terminalia chebula</i> (Harar)	Fruit, Cough and cold [7].
16.	<i>Syzygium fruticosum</i> (Jamun)	Leaves, Diabetes [4].
17.	<i>Holarrhena pubescens</i> (Korayl)	Bark, Blood dysentery [4]; Bark, Dysentery [5],[8].
18.	<i>Azadirachta indica</i> (Neem)	Leaves Blood purification [1],[2],[3],[5],[6]; Leaves, Diabetes [7].
19.	<i>Hibiscus mutabilis</i> (Sthal Padma)	Petal, Jaundice [3].
20.	<i>Butea monosperma</i> (Parash/ Palash)	Bark, Injury and wound [5]; Bark, Coagulate blood [6].

21.	<i>Ficus virens</i> (Phutkal)	New leaves, Dysentery [1],[2]; Leaves, Dysentery [3].
22.	<i>Datura metel</i> (Rangani)	Seed, Tooth pain [7].
23.	<i>Helicteris isora</i> (Renta)	Fruit, Poliomyelitis [2].
24	<i>Asparagus racemosus</i> (Satabar)	Root, Fever [1],[6]; Root, Fever due to hot wind [2],[3],[7],[8]; Root, Stomach irritation and weakness [4]; Root, Fever and abdominal Pain [5].
25.	<i>Euphorbia nerifoha</i> (Seuz)	Bark, Pain and irritation in palm and finger [4]
26.	<i>Terminalia bellirica</i> (Shahajiban Buti)	Root, Abdominal pain [7].
27.	<i>Lagerstroemia parviflora</i> (Sidh)	Root, Cough and cold [4]; Leaves, Cough and cold [5],[6].
28.	<i>Areca catechu</i> (Supari)	Fruit, Abdominal pain [7].
29.	<i>Cissampelos pareira</i> (Teju Malahar)	Root, Abdominal pain [6].
30.	<i>Ocimum tenuiflorum</i> (Tulsi)	Leaves, Cough and cold [8].

*The identity of the reporting medicine man is given inside the brackets as the serial number as described in the Table 1.

rational utilization of forest products for their long term uses from generation after generation.

Thus they protect forest use the forest and save the forest is the management practices are inherited to them throughout their life hood. The tribals have their specific guidelines for procuring the wild resources for their daily uses as medicinal plants, fuels, timbers, forest foods and other major or minor forest products (Ball 1867, Bhattacharyya 1950, 1958, Panigrahi 1963) and to some extent to maintain the socio-economic status. On the other hand to maintain the traditional practices they have adopted some functions or festivals or social fairs to worship

the forest plants growing in and around themselves (Schultes 1963, Agarwal 1981, Cunningham 1993, Arora 1996, 1997, Cotton 1996).

In the first instances for the procurement of medicinal plants there are some unwritten practices (Shey 1964) and that are also followed by the medicinemen of Patratu:

- a) Collect mature plant parts;
- b) Leave at least 30-40% population in nature for regeneration;
- c) Collect only desired parts of the plant for doing minimum harm to the mother plant;

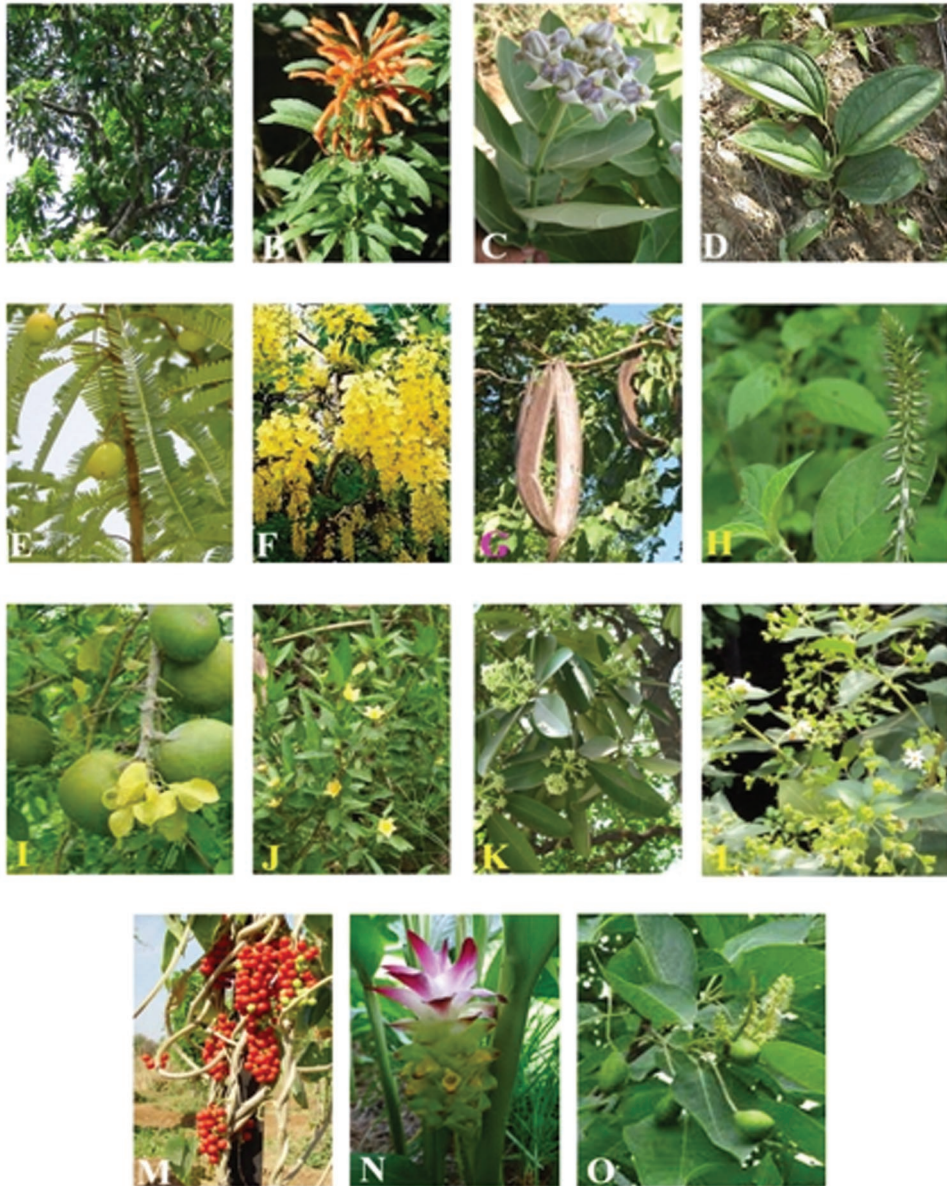


Plate 1: A- *Mangifera indica*, B- *Leonotis nepetifolia*, C- *Calotropis gigantea*, D- *Smilax zeylunica*, E- *Emblica officinalis*, F- *Cassia fistula*, G- *Oroxylum indicum*, H- *Achyranthes aspera*, I- *Aegle marmelos*, J- *Sida acuta*, K- *Alstonia scholaris*, L- *Nyctanthes arbor-tristis*, M- *Tinospora cordifolia*, N- *Curcuma domestica*, O- *Terminalia chebula*.



Plate 1: A- *Syzygium fruticosum*, B- *Holarrhena pubescens*, C- *Azadirachta indica*, D- *Butea monosperma*, E- *Ficus virens*, F- *Datura metel*, G- *Helicteres isora*, H- *Asparagus racemosus*, I- *Euphorbia neriifolia* J- *Terminalia bellerica*, K- *Lagerstroemia parviflora*, L- *Hibiscus mutabilis* M- *Areca catechu*, N- *Cissampelos pareira*, O- *Ocimum tenuiflorum*

d) Do not collect road-side herbs, from or near sewerage;

e) Do not cut branches or twigs unnecessarily;

f) Use proper equipments for digging, peeling which do not damage the mother plants;

Whenever they needs for the collection of underground parts or barks, etc. there also some specific guidelines as:

a) Collect underground parts only from fully matured mother plant and leave some portion of the part to facilitate regeneration;

b) Collect bark from one side of the main trunk;

c) Harvest only from mature plant, never from unhealthy or pest infected plants.

Secondly for the protection of the plants as wild and continuous resources, the tribal do some social traditional practices. This is probably the best way of management by them. In this regard they also have some indigenous technology for crop protection and the protection of some desirable plants (Majumdar 1950).

In this connection they adopted the plant conservation to restore the forest and forest products. These are several tribal customs (Pal and Jain 1998) for plant conservation and these are stated below:

Conservation of plants through totem

There are wide range of animistic conceptions associated with the vegetation, forests, groves, sacred groves, sacred tree or plant species and forest worship. They believe in a supernatural power of the big trees and thus the unique vegetation, unusual grove, forests of specific types of plants etc. Specify to have the dwelling places of ancestral souls or supernatural powers. This idea makes them to the religious beliefs in definite forms of totemism and fetishism (Pal and Biswas 1982).

So the plants are protected and not damaged by the tribals. They, moreover, consider these places as wedding place, or at domestic rites or in rituals and the plants are worshiped by them. The total impact on vegetation gives rise the local appeal that has largely changed and modified to restore the ecological and environmental diversity.

Conservation by restrictions

Useful plants are planted near or inside the campus by tribal villagers and these are protected. They never take off the whole plant and they impose some types of restriction every today for conservation of some plants. The best examples are the plants like *Ficus religiosa*, *Ficus benghalensis*, *Ocimum tenuiflorum*, *Euphorbia nerifolia*, etc. (Roy 1973).

Conservation through taboos

In the forest area there are some unusual as well as abnormal places which have meeting 3 to 5 paths crossing to each other. In these places or junctions the grown plants are usually protected. These places are mostly restored having many others useful herbs, shrubs, a good number of climbers and creepers and a few tall trees. These places are practically conserved by the tribals to maintain the vegetational surroundings. Thus it is an unique management system adopted by them (Shankara 1979).

Imposing restriction on premature plucking

Tribal vaidyas (medicinal practitioners) belief that before flowering and fruiting the annual herbs do not have any medicinal value. Thus the plants are allowed to regenerate. On the other hand they never uprooted the whole plant for collecting the medicinal roots, tubers, rhizomes etc., from a single population. The best example of this practice is maintained for *satawar* or *satabar* (*Asparagus racemosus*).

Imposing restriction on cutting and peeling of plants

In general the tribal people avoid peeling the bark from any single plant more than once in a year. They never cut the main trunk of the living plant. They never cut the living branches of Karma (*Haldina cordifolia*), Bargad (*Ficus benghalensis*), Kurchi (*Holarrhena pubesens*) Pipal (*Ficus religiosa*), Mahua (*Madhuca longifolia*), etc.

Restriction on lopping

Tribal people collect roots, twigs, etc. for their domestic use or as fodder. They maintain the practice or rather they impose restriction not to collect the leaves or twigs twice in a year from the same plant. This practice is adopted for the collection of leaves of *sal* (*Shakhua - Shorea robusta*), *kend* (*Kendu - Diospyros tomentosa*) and twigs of *Bauhinia vahlii*, *Combretum decandrum*, etc.

Restriction on tapping

Tribals are in practice to collect gum, resin, latex and sap etc. from the plants. Here they maintain the restriction not to collect their requirement from the young plants, secondly not to collect from the plant twice in a year. Moreover, they avoid tapping from more than twenty plants at a time (Pal and Jain 1998).

Restriction on plucking

During collection of rhizome, roots, bulbs, corm and fruits, the tribal people also keep or left some reproductive parts for regenerations of the species. Collection of whole parts or organs is always avoided and they follow restriction of that type of collection. As they believe that violation of this restriction means the collected parts will be of no use. Violation of rules also signifies that both the purpose of collector and the collection will be useless and finally the collector violating the rules, means

that he will lose his power of application of medicine.

Preservation through worship

There are a number of forest plants which are worshipped by the tribal communities and even the Hindus. Special mention for the ethnic communities is that they worship the plants like *sidh/sidha* (*Lagersrtoemia parviflora*), *korma* (*Haldina cordifolia*), *shakua/sal* (*Shorea robusta*), *aonla/amla* (*Embllica officinalis*), etc. Thus they have the attitude to save the plants in their inhabitant places, villages and in forest (Mehra 1995, Mitra 1920).

Conservation through magico-religious belief

The tribal people believe that some plants which are with the characteristic shape to look at like *Streblus asper*, *Dillenia* and other abnormal sized trees have spirit so they never make any injury to these plants. It is further believed that if anybody does not maintain this practice he will suffer from incurable diseases which lead to death (Banerjee 1974, Bhowmik and Choudhury 1966).

DISCUSSION

The acquired unique knowledge system about the use of the biological resources among the various human communities living close to nature is very ancient in India (Anon 1994). This rich heritage of knowledge and age old wisdom of India might well be among the earliest in the world.

In this prospective the Indian communities represent one of the great ethnobotanical wealth. The diversified living ethnic groups possess still many of the special characteristic features in practical view point. The organized systematic study in ethnobotany can provide us many of the contents for future use. Of course,

these are the appearance of some study on the ethnic groups (Jain 1998, Pal and Jain 1998). Thus there is also the scope of bio-prospecting based on the indigenous knowledge of tribal communities.

The present study in this small area, it is seen that amongst the tribal groups there is still the practice to use medicines or drug from the nearby plants or forest products. Nearly 10 types of diseases are regularly cured by the local vaidyas (medicinal practitioners). In general, the tribal communities still use the living plants or the plant parts as a drug for their treatment. Many of these communities are living in the urban or suburban areas, not in the forest or near the forest, but they still believe this system of treatment. They believe to the instructions and to follow these guidelines throughout the lifelong period makes them simple and innocent.

Traditional practices to worship the plants is a very good way of conservation of plants. Similarly in social fairs or festivals they use some of the plant and plant parts for worshipping. The festival like the *Karma* or the *Sharhul* is of immense importance to their life. This is also a practice for the management of forest and forest wealth for future utilization.

As a whole in the study 30 plant species are reported by the 8 local vaidyas and from this study it is revealed that some of the plants are very commonly used by them. These are sidh, or sidha (*Lagerstroemia parviflora*), satabar or satauri (*Asparagus racemosus*), neem (*Azadirachta indica*), chhatvi (*Alstonia scholaris*), koraye (*Holarrhena pubescens*), gulainch (*Tinospora cordifolia*) for their medicinal uses.

At present it is blamed that reckless felling of forest trees causes deforestation. This blame is often coming to the tribal communities. But

practically urbanization, population pressure and industrialization, etc. are the major pressure to the tribal habitat. Tribals are forced to survive in an increasing monetarised economy in which they have few skills to sell. The availability of major forest products to the tribals has now decreased considerably. But still they are in their own system to maintain the plants, forest and vegetation through their beliefs and worship. It is no doubt the best inherited management practice of man.

Most of these tribal peoples are not enriched in literature and their economic condition is very poor. But they are the collectors of their traditional knowledge on medicine, food, shelter and judgment to restore the nature and natural resources. The management practices of the peoples are still these through rituals, legends, religious and ceremonies, tales, proverbs, riddles, etc.

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Ethnobotany and environmental management by the tribal communities of...

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