

Traditional Knowledge on Medicinal Plants used by the Tribal People of Birbhum District of West Bengal in India

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Abstract

The present paper deals with observation on ethno medicinal uses of plants by the tribal people of Birbhum district, West Bengal. Tribal medicine is an age-old therapeutic system which is traditionally practiced among different tribal communities for their primary health care needs. The tribal people of this district mainly depend upon the forest flora for their livelihood and use herbal medicines in curing the ailments and diseases. Altogether 30 plant species belonging to different families have been recorded from the district. These plant species are effective for various common human ailments. Considering individual plant parts it is found that leaf is used in 20 cases, bark in 12 cases, fruits in 6 cases, stem in 3 cases, latex and flowers in 2 cases, sap and rhizome in 1 cases. Finally the recorded plant taxa have been enumerated according to their botanical names along with families, local or tribal names, parts used, disease cured, mode of administration, etc. This folk knowledge on medicine should be documented immediately and therapeutic validation of these herbal medicines is emphasized. To avoid biodiversity extinction some measures would be taken, like, cultivation of rare medicinal plants, provision of training and extension services to farmers engaged in cultivation of medicinal plants, establishment of herbal gardens in forest areas and creation of seed bank.

Highlights

- The present study highlights the traditional knowledge of different ethnic groups of Birbhum district about the usefulness of various medicinal plants towards curing of different ailments.

Keywords: Medicinal plants, Ethno medicine, Traditional Knowledge, Folk Society, Birbhum

Since time immemorial, human communities are dependent upon plant resources for their food, shelter and health care. Medicinal plants are the most important biological resources of the world. Medicinal plants play a major role in the rural areas of the third world countries. Herbal medicines are extensively used by the indigenous people of Asia, African and South American countries.

Rural India, inhabited by a number of ethnic groups with their diverse cultural practices, heavily depends on traditional system of medicine as a part of their life style. According to World Health Organization (WHO) nearly 80% of the populations of developing countries rely on traditional medicines, mostly plant drugs, for their primary health care needs (AICRPE 1992-98). In

fact it is well known that even in developed countries, the use of traditional medicines is quite prevalent. Modern pharmacopoeia also still contains at least 25% drugs derived from plants and many others which are synthetic analogues built on prototype compounds isolated from plants (Pradhan and Rahaman, 2011). The indigenous system of medicine practiced in India is based mainly on the use of plants. Charak Samhita (1000BC-100AD) has recorded 2000 vegetable remedies. Ancient medicine was not solely based on empiricism and this is evident from the fact that some medicinal plants which were used in ancient times still have their place in modern therapy (Das and Mondal, 2012). Demand for medicinal plants is increasing in both developing and developed countries of the world due to growing recognition of natural products being non-narcotic, having no side-effects, easily available at affordable prices and sometime the only source of health care available to the poor. Ayurveda, which is one of the oldest systems of traditional healthcare system and yet living in traditions practiced widely in India, Sri Lanka and other countries has a sound philosophical and sound basis. Atharvaveda (around 1200 BC), Charak Samhita and Shusrut Samhita (1000-500 BC) are the main classics that gives a detailed description of over 700 herbs. Herbal medicines are becoming popular worldwide due to its growing recognition of natural products being cheaper and without any side effects. Demands for medicinal plants are increasing in both developing and developed countries. Out of the 20,000 medicinal plants listed by the WHO globally India's contribution is 15-20%. In India, about 2,000 drugs used are of plant origin. India contains over 5% of the worlds' diversity though it covers only 2% of the earth's surface but it is also one of the biodiversity hotspots of the richest and highly endangered eco-regions of the world. In India, various communities use over 50% of the plant species of any ecosystem in ethno medicine and in general over 7500 species are utilized in primary healthcare by various tribes as well as other local people (Tripathi *et al.*, 2013). Medicinal plants are now under great pressure due to their excessive collection or exploitation. Continuous exploitation of several medicinal plant species and substantial loss of their habitats have resulted in the population decline of many high value medicinal plant species over the years. The degree of threat to natural populations of medicinal plants has increased because more than 90% of medicinal

plant raw material for herbal industries in India and also for export is drawn from natural habitats. The weakening of customary laws has often proved to be easily diluted by modern socio-economic forces. There are many other potential causes of rarity in medicinal plant species, such as habitat specificity, narrow range of distribution, land use disturbance, introduction of non-natives, habitat alteration, climatic changes, heavy livestock grazing, explosion of human population, fragmentation and degradation of population, population bottleneck and genetic drift (Sajem *et al.*, 2008).

Since most of the tribal or ethnic communities do not have their own script and written language, the information about prescription, pharmacology, attitude towards diseases, diagnosis, etc. of the age old tribal medicine system are lying unclaimed. The people belonging to modern societies are not fully aware of this traditional knowledge system. In our national agenda, documentation, conservation, preparation of databases of medicinal plants and their cultivation are now priority issue. Researchers are focusing mainly on ethno botanical and ethno medicinal investigation to fulfill the increasing demand of herbal products. The traditional knowledge of herbal medicine is much enriched here in the district due to its diversified plant wealth and this valuable knowledge which is still surviving in the tribal culture has to be documented immediately before it gets lost forever. Thus it has become imperative to collect the information related with ethno medicine and document the same for further scientific studies.

Materials and Methods

The present study deals with the indigenous knowledge related with ethno medical uses of plants used by the tribal as well as the local people of Birbhum district, West Bengal. The district Birbhum is one of the smallest district of the state West Bengal, India that is full of natural resources. Birbhum is bounded on the north and west by Santhal Paraganas, on the east by the districts of Murshidabad and Burdwan and on the South by Burdwan district, from which it is separated by the river Ajay. The district extends over an area of 4545 sq.km and it is situated between 87010/ & 8802/ east longitude and between 23033/ & 24035/ North latitude. The temperature varies from 110C (in January) to 42.90C (in May).

**Table 1. Medicinal plants used by the tribal people of Birbhum district in West Bengal**

Sl. No	Botanical name	Family	Tribal/Local name	Parts used	Ailments	Mode of administration
1	<i>Azadirachta indica</i>	Meliaceae	Nim	Fruit, Leaf, Stem bark	Malaria, Stomachache, Impotency	Leaves, stem bark boiled in water and the decoction is taken orally
2	<i>Ficus benghalensis</i>	Moraceae	Bat	Latex	Paronychia (nail infection)	Latex collected from the plants is warmed and applied externally on the affected nail of toes twice in a day.
3	<i>Terminalia cuneata</i>	Combretaceae	Arjun	Bark	Heart trouble	Bark paste mixed with ghee (clarified butter) and taken one teaspoonful once in the morning in empty stomach for seven days
4	<i>Calotropis gigantea</i>	Asclepiadaceae	Akanda	Leaf Root Latex	High fever Snake bite Skin irritation	Fresh leaves are chewed for snake bite. Juice of leaves is used for fever. Latex is used for skin diseases
5	<i>Piper nigrum</i>	Piperaceae	Golmorich	Fruits	Anticancer, Antioxidant	Black pepper is stimulating to the digestive system, expectorates coughs, and helps to clear the lungs of congestion
6	<i>Mimosa pudica</i>	Mimosaceae	Lajjabati	Root Leaf	Dysentary Bleeding wounds	The fresh juice of leaves is given internally to stop bleeding. The paste of the leaves is applied externally on piles, fissures, skin wounds, ulcers, etc. The root powder, in a paste form is also applied to vaginal prolapse
7	<i>Datura metel</i>	Solanaceae	Dhutura	Leaf	Antimicrobial epilepsy, hysteria, insanity, heart diseases, skin diseases	Leaves are used for scabies, eczema and allergy. Application or drinking of leaf juice relieves pain and swelling. Leaf juice is mixed with a little opium and applied to the affected area to reduce swelling of gums or base of ears
8	<i>Ficus hispida</i>	Moraceae	Dumar	Leaf Bark	Antiasthmatic Chest pain	Juice of leaves Powder of bark
9	<i>Cissus quadrangularis</i>	Vitaceae	Harjora	Stem	Fracture bone	Stems are banded with fracture bone
10	<i>Curcuma longa</i>	Zingiberaceae	Halud	Rhizome	contraception, swelling, insect stings, wounds, whooping cough, inflammation, internal injuries, pimples, injuries, as a skin tonic	Sweetened milk boiled with the turmeric is the popular remedy for cold and cough. It is given in liver ailments and jaundice.



11	<i>Aegle marmelos</i>	Rutaceae	Bel	Leaf Fruit	Anticancer, Antimicrobial	Fruit is used to make juice. Leaf juice is used for antimicrobial
12	<i>Holarrhena antidysenterica</i>	Apocynaceae	Kurchi	Root Leaves Bark	Acidity Diarrhoea Fever Malaria	Decoction of the bark is administered orally. Leaves are boiled with water and taken orally till the fever cure. Equal amount of leaves of kurchi and <i>Cyperus rotundus</i> L. are ground into a fine powder
13	<i>Alstonia scholaris</i>	Apocynaceae	Chhattin	Bark Leaves	Abdominal pain, Fever, Anti cancer, dysentery, diarrhea, skin disorders	Bark paste is effective in leprosy, skin diseases, chronic & foul ulcer. Leaves have been used for the treatment of diarrhea, dysentery, malaria and skin diseases
14	<i>Tamarindus indica</i>	Cesalpiniaceae	Tentul	Leaves Fruit	Jaundice, worm infection, constipate, pyretic, dysentery, loss of appetite, alcohol toxicity, vomit, worm infection, Burn wound	Leaf is used as a hot juice or decoction. Consumed as pulp
15	<i>Spondias pinnata</i>	Anacardiaceae	Amra	Roots Bark Leaves Fruits	Regulating menstruation Snake –bite Dysentery, Acidity, Astringent Diarrhoea Throat diseases	Juice of roots Paste of bark Leaf power and bark power is useful in dysentery, Tender leaves mixed with sugar is useful in acidity, Leaf juice is added in ear for preventing earache Ripe fruit Raw fruit
16	<i>Mimusops elengi</i>	Sapotaceae	Bakul	Bark Seeds	Pyorrhoea Diarrhea	Decoction of bark Seed paste in cold water
17	<i>Murraya koenigii</i>	Rutaceae	Kariaphulli	Leaves	Skin diseases	Juice of leaves
18	<i>Areca catechu</i>	Arecaceae	Supari	Seed	Stimulant	Chewing of nut acts as stimulant upon the digestive organs.
19	<i>Borassus flabellifer</i>	Arecaceae	Tal	Sap Bark	Dysentery. Gonorrhoea, respiratory diseases	Sap from the flower stalk is prized as tonic, diuretic, stimulants, laxative and antiphlegmatic. Bark decoction with salt is used as mouth wash, and charcoal made of the bark serves as a dentifrice.



20	<i>Mangifera indica</i>	Anacardiaceae	Mango	Bark, Leaf	Yellow fever, Malaria	The stem bark & leaves along with the leaves of <i>Carica papaya</i> and <i>Azadirachta indica</i> are boiled together and the decoction is taken orally
21	<i>Psidium guajava</i>	Myrtaceae	Guava	Leaf	Malaria, Typhoid, Yellow fever	Fresh leaves and leaves of <i>Carica papaya</i> are boiled together and the decoction is taken orally
22	<i>Cassia fistula</i>	Fabaceae	Amaltus/ Indian labrunum	Leaf	Skin diseases	Leaf paste is applied on the affected area till it cures
23	<i>Mesua ferrea</i>	Clusiaceae	Nagkesar	Leaf, fresh flower, seed	Dysentery, vomiting, sore throat	Oil from the seed is used
24	<i>Butea monosperma</i>	Papilionaceae	Palash	Leaves, Bark, Flower	Tumor, Skin diseases	Leaf extract is used against pimples and tumors, bark powder is used orally for menstrual disorder and flower paste is applied externally in skin diseases.
25	<i>Cinnamomum tamala</i>	Lauraceae	Tejpata	Leaves	Whooping cough	Used as spice, leaves juice is used for whooping cough
26	<i>Artocarpus lacucha</i>	Moraceae	Barhal	Bark Fruit	Skin ailment Stimulant	The bark contains tannin and is chewed like beetle nut. Fruit acts as a tonic for the liver
27	<i>Commelina benghalensis</i>	Commelinaceae	Aswatha	Roots	Snake bite	As an antidote to snake bite
28	<i>Dalbergia sisso</i>	Papilionaceae	Sishu	Stem bark	Diabetes	Juice of the bark
29	<i>Annona reticulata</i>	Annonaceae	Custard apple	Leaves Fruit Bark	Anemia cancer	Fruits are made into beve-rages that can act as a substi-tute to milk. Leaves are used for treating cancer
30	<i>Aloe vera</i>	Liliaceae	Veranda	Leaf	Antibacterial, Antifungal	Leaf juice has antibacterial, antifungal and wound healing properties, reduces scars, lesions and useful in acne vulgaris

The annual average rainfall is 1098mm. Total population of the district Birbhum is 3015422 which is 2.45% of the state population. In the district Birbhum, the tribal population is 203127 contributing 6.73% of the total population of the district. The major tribal groups of the district are Santal, Kora and Oraon (Census of India 2001). The rural people mostly depend on cultivation. Prior to the field visits, extensive literature survey was carried out on the previous ethno medicinal and floral reports on the district. Rural areas were visited during summer, monsoon and winter to avail most of the plants

in their conditions. During the visits, the informants were chosen on the basis of structured questionnaire. The methodology was adopted as described by Chadwick and Marsh (1994). Structured questionnaires, interviews and participatory observations were used to elicit information from the resource persons using standard methods (Martin, 1995). The data was recorded in a data sheet with the names of the plants, families, local names, parts used, and ethno medicinal uses. Informants were selected on the basis of their ability to identify a particular plant in situ and their basic knowledge of ethno medicine. Local

herbal medical practitioners and elderly people were preferred during the interviews.

Generally the two types of interviews were taken, firstly of individuals and secondly of groups. Of individuals, persons were selected at random on the way or entering a hut finding out knowledgeable individuals from the village or also the Headman. In group interviews more than one individual were approached, our purpose explained and interviews taken. They were requested to collect specimens of the plants they knew or to show the plant species on site. The collected plant species have been carefully identified with the help of different Floras and standard literature (Datta and Banerjee, 1978; Jain, 1987; Jain, 1991; Sanyal, 1994; Maheswari, 2000; Tribedi and Sharma, 2004). In this context present investigation has been carried out to provide the significant information regarding traditional uses of plant wealth as folk medicine by the tribal people as well as the local people of Birbhum district, West Bengal which are the new addition to the district inventory of ethno medicine.

Results and Discussion

Locally available plants are used by the tribal people as their household remedies and various purposes (Table 1). The data has been verified from the ethnic people of different tribal areas. Statistically, information for treating a particular ailment from different informants certainly reflects the accuracy and authenticity of the folk drugs employed. In our investigation we found that tribal people as well as local people of Birbhum district use these plants in different ways which is devoid of Ayurvedic and Unani medicinal system. Altogether 30 plant species belonging to 25 families have been recorded from the district. These plant species are effective for various common human ailments. During the course of investigation it has been observed that a particular plant is sometime prescribed for different ailments in different localities and some Vaidya's (Ayurvedic physicians) apply a mixture of plants for remedy of diseases. That means all these plants are useful for curing the ailments. The plants are enumerated in (Table-1) with their botanical name, family, parts along with their ethno medicinal uses. The local or tribal people of this area follow the mode of application of medicinal herbs by the help of local

Vaidyas and Kabiraj or their own experience. External applications (mostly for skin diseases, snake bites and wounds) and internal consumption of the preparations were involved in the treatment of diseases. Considering individual plant parts it is found that leaf is used in 20 cases, bark in 12 cases, fruits in 6 cases, stem in 3 cases, latex and flowers in 2 cases, sap and rhizome in 1 cases. It was observed that, most of the remedies consisted of single plant part and more than one method of preparation. The villages of the region are rich with ethno medicinal knowledge. They obtain a variety of plant products from wild plants to fulfill their own needs as they belonging to economically weaker sections of the society. In the tribal areas the rules and regulations by which the tribal people were traditionally governed are now being gradually abolished by the young literate generations. According to the ethnic healers, the modern generations are least interested to learn and practice the traditional herbal therapy of healing various health disorders. They are very much afraid of the abolishment of the practice. Another crucial factor responsible for such change is the migration of youth from tribal areas to urban areas. The gap is further widened due to the consumption of modern medicine. Therefore, the importance of recording indigenous knowledge based technology as described here become essential in view of rapid socio economic and cultural changes and for high technique low cost solution. Religious and cultural faith, poor economy and lack of modern medicinal facilities in the villages of the study area seem to be the cause of utilization of these plants. While conducting the survey the inhabitant revealed that most of the people are dependent on plants and they also prefer it. Due to rapid increase in human population and biotic interference some species gradually getting abolished from their natural habitats. In our investigation we found that old ethnic healers are afraid of the extinction of the medicinal plants due to anthropogenic activities. Some of the ethnic healers are concerned about the purpose and collect the rare plants from the forest and cultivate in their gardens.

During field survey of this investigation it is observed that among 30 recorded plants, some plants like *Ficus benghalensis*, *Aegle marmelos*, *Tamarindus indica*, *Mimusops elengi*, *Artocarpus lacucha*, *Commelina benghalensis*, *Azadirachta indica* are becoming rare day



by day in the district due to indiscriminate collections and habitat destruction of the plants. Immediate conservation measures of these important ethno medicinal plants are emphasized through training programmes by creating the awareness among the tribal people and herbal medicine of the district regarding the importance and sustainable harvest of those plants.

The collected data have been compared with the standard literature (Kirtikar and Basu, 1935; Jain, 1987, 1989, 1991, 1997; Pal and Jain, 1998; Rahaman and Mandal, 1998; Singh and Pandey, 1998; Jain and Mudgal, 1999; Maheshwari, 2000; Sharma and Singh, 2001; Trivedi and Sharma, 2004).

Therefore it is imperative that herbal medicines of the aborigines which are still in vogue should be documented, conserve and sustainably used. However, isolation of active principles, phyto-chemical and pharmacological investigations is needed to sustain the claims of the ethnic healers. This may provide new sources of herbal drugs. The formulation of these effective phyto-medicines should be encouraged for their sustainable uses.

Now, traditional knowledge regarding the use of medicinal plants has been threatened in its existence and is gradually being lost from the traditional society due to erosion of its culture. It is now high time for us to document the herbal traditional knowledge before it gets lost from the tribal society forever and simultaneously to conserve these medicinal plant resources also. The data provided in this study will finally be helpful to prepare the district as well as state inventory on folk medicine. The various folk medicinal uses of plants recorded here in this investigation need further scientific studies for their therapeutic validation.

Conclusion

Necessary steps should be taken to prevent the extinction of these highly medicinally important plants. To avoid biodiversity extinction some measures should be taken, like, cultivation of rare medicinal plants, provision of training and extension services to farmers engaged in cultivation of medicinal plants, establishment of herbal gardens in forest areas and creation of seed bank. This type of studies is extremely necessary to prepare a

database of the valuable indigenous medicinal plants and their issues for mankind. The data may also be useful for developing a project on cultivation technique for these economically important medicinal plants for the improvement of these ethnic groups. As this is a field investigation further research is yet to be initiated in the laboratory to find out noble medicines.

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