



Short Communication

Ethnobotanical study at Bacheli Iron Ore Mines of Dantewada, South Bastar, Chhattisgarh, India

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Abstract

Forests of Chhattisgarh is rich in biodiversity but are subjected to degradation due to several anthropogenic activities; one such activity is mining of iron ore. Although prevalence of biotic factors are noticed, the area rests with plenty full of plants in its vicinity where 64 plants in 32 families were identified with its ethnobotanical significance and immense medicinal values. 20 plants were recorded for economic importance in the study area while five species were recorded under Rare Endangered Extinct and Threatened (REET). In our study, dependencies of local people on forests were highly noticed and it's an opportunity to focus their traditional knowledge and culture that could play an essential role in forest resource management and biodiversity conservation through community participation. This would also provide scope for sustainable use of ethnobotanical plants to solve health problem.

Keywords: Ethnobotanical plants, traditional knowledge, medicinal values and tribal communities.

Introduction

Mega biodiversity rich country like India comprises quite large amount of floral species which is about 47000 in number that includes huge number of plants with high medicinal values. These medicinal plants are associated with several ethnic groups with their traditional knowledge base^{1,2}. In India, the only one state Chhattisgarh comprises of forest cover that contributes to about 44.2% (59772.2 ha) of the total area³. Within the state, 64% of the land is under forest cover at Dantewada district accompanied by tribal population of about 74%. Different tribal communities viz. Kols, Agaria, Korwa, Munda, Baiga, Nagasia, Bhirhor, Gonds, Bhuinhars, Cherva, Rajwars, Sahu, Ahir, Gwalas, Oraon, Gadaria, Koir, Bargah, Basods, Muslims, Kahars, Kunbi, Kewats, Guptas, Jaiswal, Agrawals, Jains and Panika are the inhabitants⁴⁻⁶. However, at Dantewada district, Maria, Muria, Dhurwa, Halba, Bhatra, and Gonds are noticed. The ethnic groups or communities have developed traditional medicine system that describes uses of plants by them and survival through oral communications.

Study of interrelationship between biodiversity with human culture is known as ethnobiology and of which ethnobotany is a part or branch. It deals with the direct relation of plants with man. Harshburger⁷ commended the term ethnobotany and defined as "the use of plants by aboriginal peoples"^{8,9}. Therefore, medicinal plants play a vital role in human society since prehistory. It is estimated that almost 80% of world's population depends upon traditional medicine.

Forests are the sources of such medicinal plants but with increased utilization of ethnobotanical plants, enhanced demand for medicinal plants have gradually caused depletion in its abundance. Many of the traditional medicinal valued plant species are now in verge of extinction which was usually collected from wild. Depletion is not only limited to activities of non-destructive harvest and over exploitation but due to certain developmental activities accelerates the process of habitat or forest fragmentation, degradation and loss of biodiversity. Certainly, these losses of biodiversity from wilderness exhibits reduction of several medicinal plants. Studies on medicinal plants and knowledge on ethnobotanical plants were made by several scientists¹⁰⁻¹⁸. Information and knowledge on medicinal plants in mining areas of Chhattisgarh is hardly documented. Present study would be useful for documenting medicinal plants related to use of different plant species by local people mostly for food, medicine, and other traditional uses, its distribution status and conserving the species as well as tribal communities' knowledge through people's participation.

Materials and methods

Study area: The study area is located on southern tip of Dantewada district in Chhattisgarh which is known as Bailadila range of hills. The range comprises of 14 iron ore deposits rising to a height of 1260 m above mean sea level. NMDC is presently operating three iron ore mines in its Bacheli Complex viz. Iron ore Deposit No 14, Iron Ore Deposit No 5 and Iron Ore Deposit No. 11 A. The buffer area of Bacheli is basically tribal

dominated. The area is inhabited by several tribal groups, including Maria, Muria, Dhurwa, Halba, Bhatra, and Gonds.

Ethnobotanical Survey: The procedure of gathering data, in general, was some as mentioned by Jain¹⁹⁻²². It included either interviews of the informants or witness of the uses during the period of work in the field. Information on plants associated with food, medicine, material culture and worship. The conservation aspects of the community, natural history, ethnology has been done by rapid ethnobotanical appraisal (REA) as suggested by Martin²³. REA is a method by which quick assessment of ecological knowledge and resource use can be studied and assessed. This technique is adopted from various disciplines to form a collaborative approach.

Informants were also requested to accompany the author in field, to detect the plants. However, in some cases, a plant is picked particularly and queries were made to understand the usefulness of that plant to the tribal communities. The reply was either description of the uses in details in all respects or a reply in negative.

Discussion on usefulness of plant is made one after the other and both male and female community members were involved during discussion as it is assumed that the women were supposed to know the foods, vegetables, medicine etc. and the men the materials in wood working, housing as well as medicine.

Information from secondary sources: Ethnobotanical information was also collected from i. Old literatures and ii. Oral history. Herbarium specimen and field notes on herbarium sheets also proved to be a good source of ethnobotanical information. In many cases the observation on plant are made by previous botanical explorers were noted on herbarium labels. This information were not published and remained unnoticed. Much useful information on plants associated with people of extent past has gone in written accounts of those items. Sometimes this information is scattered and exists in rather obsolete literature, such as, travel accounts, forest department reports, natural history, ethnologist, etc.

In the present study all the tools mentioned above have been taken as source of information. Information from secondary sources regarding regulations and guidelines of Biological Diversity Act (2002), Wildlife Protection Act (1972) and Forest Conservation Act (1980) were collected.

Results and discussion

Ethnobotanical Study: The study therefore shows a close dependence of the villagers cutting across their caste and creed on the forest. Lists of ethnomedicinal usage of 64 medicinal plant species are recorded (Table-1). Most of these items need detailed ethnopharmaceutical studies and therefore the knowledge needs also to be preserved. In most parts of forested

areas of Chhattisgarh measures have been taken to make in-situ as well as ex-situ conservation of NTFP species. Species like *Asparagus recemosus* (Satawari), *Hemidesmus indicus* (Anantmula) etc. needs special attention.

Species of Economic importance: The forest has good number of NTFP (Non Timber Forest Product species) which are of economic importance to the people. During the study 20 such species (Table-2) could be identified which are economically important to the people within the study area. Some of these species are also important to the Forest Department as they fetch good amount of money as these are nationalized items. These products (*tendu leaf*, *sal seed*) are sold to the Govt. recognized agencies only. These species also need to be preserved in *in situ* condition.

Species of High Conservation Significance (REET species): Though this landscape is quite rich in plant species diversity, it exhibits very low degree of endemism. This may be due to contiguity of landmass with adjacent phytogeographic regions. Nevertheless a large number of species in this tract are common between Western Ghats, Central Highlands, Chhotanagpur and North-East India which signify the past climatic conditions and corridor for floral migration. Plant species that needs special attention are namely *Mallotus philippensis*, *Plumbago zeylanica*, *Acacia concinna*, *Strychnos potatorum*, *Musa sp.*

Conclusion

As stated above the ethnobotanical study that has been carried out reveals the fact that this forest area is closely associated with the life of the villagers within the forest area. *Mallotus philippensis* though available in some parts of in India in wild condition are highly exploited for commercial purpose and therefore in the verge of being endangered. *Strychnos potatorum* being a tree of high medicinal importance is being planted for commercial extraction. But it needs *in-situ* conservation initiative due to its gradual exploitation from natural habitats. *Musa sp* which is a wild relative of present day banana like *Musa acuminata*, *Musa balbisiana* etc. are becoming rare in natural habitats. This study also sets a reference for ethnobotanist with knowledge to obtain significant data on medicinal plants in the mining areas. The study would also help forest managers, practitioners, ecologist to formulate appropriate conservation strategies for medicinal plants and traditional knowledge base of tribals.

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Table-1: List of Ethnomedicinal plants of Bachel Iron Ore Mines.

Botanical Name	Family	Parts used	Ethnobotanical/medicinal Use
<i>Abrus precatorius</i>	Fabaceae	Root, Seed	Swelling, Purgative, Permanent birth control, Analgesic, Anthelmintic, Urine-stimulant, Leucoderma
<i>Acacia catechu</i>	Fabaceae	Leaf	Toothache, Headache, Diarrhoea, Cough, Digestive, Skin disease
<i>Acacia concinna</i>	Fabaceae	Bark, Leaf, Pod	Skin disease, Baldness, Constipation, Pain, Jaundice
<i>Achyranthus aspera</i>	Amaranthaceae	Leaf, Root, Seed	Boils, Wound healing, Antidiabetic, Bleeding control, Scorpion-sting, Diuretic, Antidote, Antidiabetic, Toothache
<i>Aegaratum conyzoides</i>	Asteraceae	Leaf	Treatment of cuts and sores, Piles, Wound healing
<i>Aegle marmelos</i>	Myrtaceae	Tree	Stomachic, Piles, Cardiostonic, Laxative, Antiinflammatory, Jaundice, Urinary trouble, Diabetes, Dysentery
<i>Areva lanata</i>	Amaranthaceae	Leaf	Ear trouble, Fever, Stomach pain, Wounds
<i>Albizia leebek</i>	Fabaceae	Leaf, Seed	Antidote, Saponin for snake position, Skin disease, Asthma, Piles, Diarrhoea
<i>Alstonia scholaris</i>	Apocynaceae	Leaf	Asthma, Cardiopathy, Tumours
<i>Andrographis paniculata</i>	Acanthaceae	Seed	Diabetes, Jaundice, Fever, Digestion, Blood purification
<i>Annona squamosa</i>	Annonaceae	Fruit, Seed, Root, Leaf	Constipation, Vomiting, Cough, Purgative, Seed powder to kill lice
<i>Anthocephalous cadamba</i>	Rubiaceae	Bark, Fruit	Inflammation, Antibacterial, Diabetes, Cough, Fever, Asthma
<i>Asparagus recemosus</i>	Liliaceae	Root	Weakness, Lactation in women, Diuretic, Tonic, Alterative, Antidiarrhoeal, Galactogenesis, Bronchitis
<i>Azadirachtat indica</i>	Meliaceae	Brak, Leaves, Flower, Seed, Oil	Skin disease, Tooth ache, Antidote, Fever, Wound, Seed ulcer, Worms, Cough, Diabetes, Inflammation
<i>Barleria prionitis</i>	Acanthaceae	Leaf	Glandular swelling, Toothache, Cough, Asthma,
<i>Blumea lacera</i>	Asteraceae	Leaf	Bleeding control, Burning, Diuretic
<i>Bombax ceiba</i>	Bombaceae	Leaf, Flower, Bark, Seed, Gum	Dysentery, Antigonorrhoeic, Antidote, Laxative, Tonic, Antidiarrhoeal
<i>Butea monosperma</i>	Fabaceae	Bark, Leaves, Flower, Seed, Gum	Urinary disorder, Worms, Diabetes, Inflammation, Skin disease
<i>Calotropis procera</i>	Asclepiadaceae	Leaf, Root, Flower, Bark	Ringworm, Emetic, Laxative, Joint and Ear pain, Swelling
<i>Cassia fistula</i>	Fabaceae	Pulp, Seed, Bark	Purgative, Antiviral, Tonic, Boil, Ringworm
<i>Cassia tora</i>	Fabaceae	Leaf, Seed	Dermatosis, Cough and respiratory disease, Laxative, Carminative, Skin disease
<i>Cassia occidentalis</i>	Fabaceae	Root, Seed, Leaves	Bronchitis, Cough, Asthma, Wounds, Antidote, Skin disease, Fever, Allergy
<i>Curculigo orchoides</i>	Hypoxidaceae	Rhizome	Piles, Joint pain, Bronchitis, Jaundice, Asthma, Diarrhoea, Urinary problem
<i>Cuscuta reflexa</i>	Convolvulaceae	Stem, Seed	Antihelmintic, Carminative, Purgative
<i>Cynodon dactylon</i>	Poaceae	Leaf	Vomiting, Bleeding, Diuretic, Diarrhea, Ophthalmic
<i>Dalbergia sissoo</i>	Fabaceae	Leaf, Stem	Skin disease, Gonorrhoea, Dysentery, Itching
<i>Dendrocalamus strictus</i>	Poaceae	Stem, Root	Antifertility agent, Astringent

Botanical Name	Family	Parts used	Ethnobotanical/medicinal Use
<i>Desmodium trifolium</i>	Fabaceae	Leaf	Antidote, Diuretic, Carminative, Tonis, Diarrhea, Skin disease, Wounds
<i>Dioscorea bulbifera</i>	Dioscoreaceae	Tuber	Diabetes, Skin disease, Worm killer
<i>Eclipta prostrata</i>	Asteraceae	Leaf	Asthma, Hair shampoo, Hair tonic, Anthelminthic
<i>Embllica officinalis</i>	Euphorbiaceae	Fruit, Bark, Flower	Laxative, Diuretic, Carminative, Stomachic, Antidiarrhoeal, Jaundice, Eye problem, Digestive
<i>Euphorbia hirta</i>	Euphorbiaceae	Bark, Leaf, Root	Boil, Antiasthematic, Cough, Dysentery
<i>Evolvulus alsinoides</i>	Convolvulaceae	Leaf	Brain tonic, Antidysentric, Antiasthematic, Bronchitis
<i>Ficus bengalensis</i>	Moraceae	Milky latex	Asthma, Diabetes, for Pain Burn
<i>Ficus religiosa</i>	Moraceae	Milky latex	Diarrhea, Piles, Eye trouble, Mouth ulcer
<i>Ficus glomarrata</i>	Moraceae	Milky latex, Fruit	Asthma, Ulcer, Skin disease, leucoderma, Urinary problem
<i>Gmelina arborea</i>	Verbenaceae	Leaf, Root, Bark	Antidote, Anti-gonorrhea, Ulcer, Stomachic
<i>Gymnema sylvestris</i>	Asclepiadaceae	Leaf, Root	Diabetes, Stomach pain, Urine problem, Respiratory disorder, Swelling, Snake bite, Dysentery, Joint pain, Liver tonic
<i>Helicterus isora</i>	Sterculariaceae	Fruit, Root, Bark	Ulcers, Diabetes, Diarrhoea, Wounds
<i>Hemidesmus indicus</i>	Asclepiadaceae	Root	Skin disease, Bronchitis, Asthma, Dysentery, Arthritis, Burning, Leucoderma, Diarrhoea
<i>Hibiscus rosa-sinensis</i>	Malvaceae	Leaf, Flower	Alopecia, Burn
<i>Ipomoea aquatica</i>	Convolvulaceae	Leaf	Antidote, Gonorrhoea, Increases mother milk
<i>Jatropha curcus</i>	Euphorbiaceae	Leaf, Seed	Piles, Wound healing, Burn, Leucoderma
<i>Jatropha gossypifolia</i>	Euphorbiaceae	Leaf, Seed	Piles, Wound healing, Burn, Leucoderma
<i>Magnifera indica</i>	Anacardiaceae	Fruit	Dysentery, Digestive, Vitamin A, Tonic, Rheumatism
<i>Mallotus philippensis</i>	Euphorbiaceae	Hairs and glands covering fruit, Seed, Leaf	Rheumatism, Baldness, Cold, Intestinal parasites, Insect bite, Ulcer
<i>Mimosa pudica</i>	Fabaceae	Whole plant	Allergy, Asthma, Ulcer, Bleeding
<i>Musa sp</i>	Musaceae	Fruit, stem, Flower	Constipation, diarrhea, malnutrition, kidney, urinary bladder stone
<i>Nyctanthus arbortritis</i>	Nyctaginaceae	Leaf, Seed	Laxative, Diuretic, Bleeding, Piles
<i>Ocimum canum</i>	Lamiaceae	Leaf, Flower	Cold, Cough, Bronchitis, Destroying bacteria and insects, Stimulant, Skin disease, Burn, Ringworm
<i>Phyllanthus niruri</i>	Euphorbiaceae	Whole plant	Liver disorder, Diabetes, Skin disease, Urinary problem
<i>Pistia stratiotes</i>	Araceae	Leaf	Dysentery, Cough, Asthma, Ringworm
<i>Plumbago zeylanica</i>	Plumbaginaceae	Whole plant	Digestive weakness, Piles, Constipation, Cough, Muscular pains, Rheumatism
<i>Pongamia pinnata</i>	Fabaceae	Seed	Skin disease, Leucoderma, Carminative, Parasiticide, Bleeding
<i>Scoparia dulcis</i>	Scrophulariaceae	Whole plant	Swelling, Arthritis, Cough, Asthma, Skin disease
<i>Sida cordifolia</i>	Malvaceae	Leaf, Root	Ophthalmia, Diarrhoea, Leucorrhoea

Botanical Name	Family	Parts used	Ethnobotanical/medicinal Use
<i>Strychnos potatorum</i>	Loganiaceae	Bark, Seed, Fruit, Root	Cough, Bronchitis, Chronic diarrhoea, Kidney and bladder stones, Diabetes and Eye diseases
<i>Tephrosia purpurea</i>	Fabaceae	Whole plant	Diarrhoea, Asthma, Ulcer, Laxative, Blood, Urinary problem, Stimulant, Intestinal worm
<i>Terminalia arjuna</i>	Combretaceae	Bark, Fruit	Antidysentric, Antiasthmatic, Cardiotonic, Diuretic, Ulcer, Leucoderma, Antidote
<i>Tridax procumbens</i>	Asteraceae	Leaf	Blood clotting, Boil, Wound treatment
<i>Typha angustifolia</i>	Typhaceae	Rhizome	Diuretic, Astringent
<i>Vitex negundo</i>	Verbenaceae	Leaf, stem	Tooth ache, swelling, digestive, tonic, asthma, stem cutting dysentery, rheumatism, skin disease
<i>Xanthium strumarium</i>	Asteraceae	Root, fruit	Skin disease, bleeding, insect bite, diuretic, urinary problem
<i>Zizyphus mauritiana</i>	Rhamnaceae	Leaf, fruit	Diarrhea, cough, bleeding, digestive

Table-2: Species of economic importance (Non Timber Forest Product).

Species	Local Name	Parts used	Usage
<i>Anogeissus latifolia</i>	Dhaora	Gum	Medicinal
<i>Azadirachta indica</i>	Neem	Bark, leaf and fruit	Medicinal
<i>Bombax ceiba</i>	Semal	Fruit, fiber and seed	Making cushion and Medicinal
<i>Boswellia serrata</i>	Salai	Gum	Medicinal
<i>Diospyros melanoxylon</i>	Kend	Leaf	Biri making
<i>Madhuca indica</i>	Mahua	Flower and fruit	Liquor and vegetable
<i>Mangifera indica</i>	Amm	Fruit	Food
<i>Terminalia chebula</i>	Kusum	Seed	Oil extraction
<i>Shorea robusta</i>	Sal	Leaf and fruit	Leaf plate and oil
<i>Terminalia chebula</i>	Harra	Fruit	Medicinal
<i>Terminalia bellerica</i>	Bahera	Fruit	Tanning and Medicinal
<i>Syzygium cumini</i>	Jamun	Fruit	Food
<i>Emblia officinalis</i>	Aonla	Fruit	Food and medicine
<i>Wrightia tinctora</i>	Dudhi	Seed	Medicine
<i>Vitex negundo</i>	Nirgundi	Leaves	Medicine
<i>Asparagus recemosus</i>	Satabar	Root	Medicine
<i>Thysanoleana maxima</i>	Phul bahari	Whole plant	Broom
<i>Holarrhena antidysenterica</i>	Dudhi	Whole plant	Medicine
<i>Smilax zeylanica</i>	Ramdatan	Whole plant	Medicine
<i>Eulaliopsis binata</i>	Sabai	Leave	Rope making

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