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Floristic Composition and Ethnobotanical Observation in Angul-Talcher Mining Area, Odisha, India

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Abstract: ***An exhaustive study on floristic composition and ethnobotanical survey was conducted to collect information about the occurrence of medicinal plants and their uses by different tribes in Angul-Talcher mining area of Odisha, India. More than 300 angiospermic medicinal plant species were collected and identified from various locations of the study area. Out of these, 46 species have been found to be used very often by the local tribes or rural native populace for the treatment of various diseases. The result of the present study indicate that the tribes population as well as the rural inhabitants of the Angul-Talcher mining areas largely depend on the native plant resource to meet their primary healthcare needs.***

Keyword: Angul, Diseases, Ethnobotanical medicinal plants, Odisha, Talcher, Tribes

1. Introduction

Floral diversity is the natural resource and wealth of a country and acquiring knowledge of it is of immense scientific and commercial importance. Plant community plays an important role in the sustainable management by maintaining biodiversity and conserving the environment. Plants are the basis of life on earth, supplying fresh oxygen and play an important role for people's livelihood. Worldwide, 422,000 seed plants are reported and more than 50,000 of them are used for medicinal purposes.[1] About 85% of traditional medicine practices used in primary healthcare is derived from plants and in India and China, medicinal plants have the richest arrays of registered and well known to mass.[2] India is one of the twelve mega biodiversity countries of the world having rich vegetation with various plants having medicinal value. About 43% of plants from Indian subcontinent (approximately 7,500 species) were reported to have medicinal utility.[3] In India, about 53.8 million tribal people reside in 5,000 villages with 427 different tribal communities and depend on medicinal plants for their primary health care and treatment of diseases.[4] the traditional knowledge of different tribes is one of the major source of herbalism and the over exploitation of some well known plants resulted in rapid decline of lesser known plants.[5] Odisha is enriched with dense forest with natural plant resources and good traditional knowledge-base.

The tribes residing deep inside the forest usually rely on these medicinal plants for their primary health care and treatment of diseases. Odisha states has 62 categories of tribes having good knowledge on medicinal uses of different plants and are completely dependent on the traditional ethno-medicine for their day-to-day primary health care.

In view of the meagre work undertaken on the medicinal plants and their uses from the Angul-Talcher region, the present study was undertaken with an objective to record in detail the status of medicinal plant species growing in and around the tribal settlements of this region to emphasize their medicinal uses.

2. Study Area

Angul, a centrally located state of Odisha covers a geographical area of 6232 square kilo metres and lies between 20° 31' N and 20° 40' N Latitude and 84° 15' E and 85° 23' E Longitude. The study area is located in Angul - Talcher forest division in the central part of Odisha.

3. Materials and Methods

Field studies were conducted from time to time during both winter and summer for the floristic survey on medicinal plants and to collect information about their uses by interacting with the tribes, local inhabitants, village medicine-men and Kavirajs (Vaidyas). They were interviewed to record the uses of various plants and their parts in primary healthcare system for various ailments. The collected species were identified following the available literature.[6][7] And the uses were verified from available works of different workers.[8]-[10] The voucher specimens were deposited in the Herbarium of Post Graduate Department of Botany, Utkal University, Bhubaneswar. The various uses of the medicinal plants were recorded.

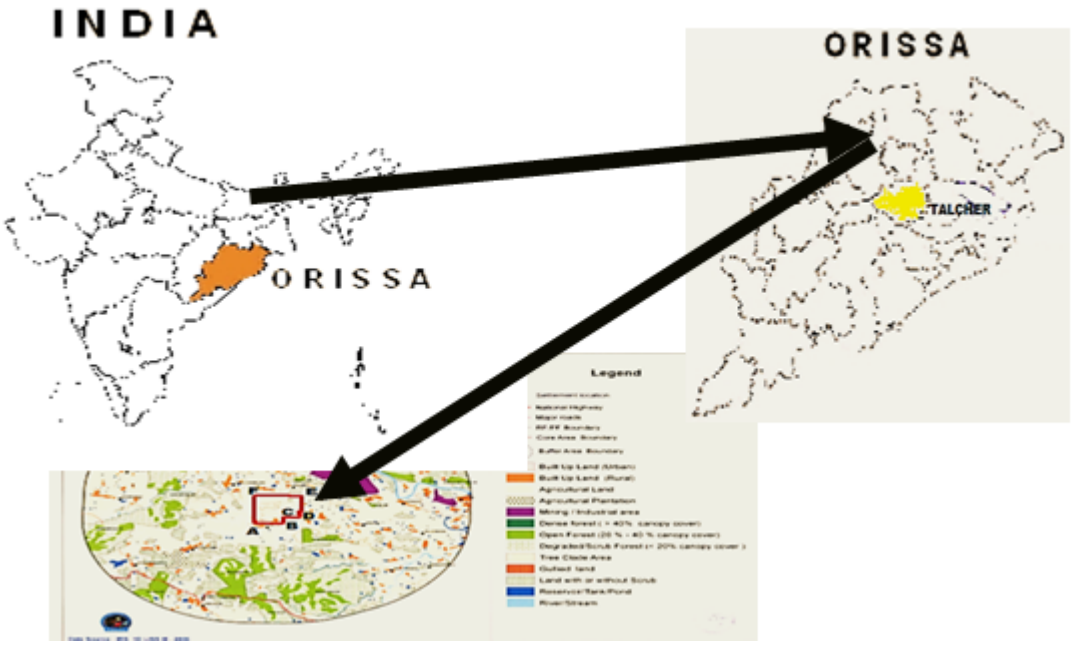

Figure 1: Angul-Talcher mining area under Survey for Medicinal plants diversity.

4. Result

A Total number of 46 medicinal plant species were recorded belonging to 28 families (Fig.2) and Fabaceae, Anacardiaceae, Mimosaceae, Moraceae, Apocynaceae, Caesalpiniaceae, Combretaceae and Verbenaceae were found to be the dominated families. *Ficus* was found to be the most dominant genus followed by *Terminalia* and *Acacia*. Among the medicinal plants *Shorea robusta* Gaertn.f., *Abrus pracatorius* L., *Achyranthes aspera* L., *Argemone mexicana* L, *Dalbergia sissoo* Roxb., *Terminalia bellirica* (Gaertn.) Roxb. etc. are high value species exploited for different therapeutic purposes. It was observed during the investigation that species such as *Acacia catechu* (L.f.) Willd., *Acacia nilotica* (L.) Delie., *Buchanania lanzan* Spreng., *Emblica officinalis* Gaertn., and *Woodfordia fruticosa* (L.) Kurz are rare at Angul-Talcher mining area; whereas, plants like *Gloriosa superba* Linn, *Abutilon indicum* (L.) Sweet, *Spondias pinnata* (L.f.) Kurz, *Acanthospermum hispidum* DC., *Rauwvolfia serpentina* Benth., *Andrographis paniculata* (Burm.f.) Wall. ex Nees; *Calotropis gigantea* R.Br., *Scoparia dulcis* L., *Wedelia chinensis* (Osbeck) Merr., *Leucas aspera* (Willd.) Link., *Desmodium gangeticum* (L.) DC., *Hemidesmus indicus* (L.) R.Br., *Streblus asper* Lour. are in threatened state in the said area. It was also evident that local users rely on subsistence agriculture with plants performing vital roles as crops, fodders, fruits and vegetables, fuel wood, building materials and medicines. Tribal people and others use plant parts such as bark, root, leaf, seed, flower, fruit or entire plant for medicinal purpose to cure different common ailments like stomachache, diarrhoea, bacillary dysentery, colic pain, constipation, digestion problem, gastric, rheumatic problems, respiratory problems such as cough, cold, bronchitis, asthma, tuberculosis, fever, skin diseases and bone fracture. (Table-1)

Table 1: Important ethno-medicinal plants of Angul-Talcher area mining area

Sl.No.	*Botanical Name*	*Family*	*Local Name*	*Parts Used*	*Medicinal Properties & uses*
1	*Abrus pracatorius* L.	Fabaceae	Kaincha	Root, leaves, seed	Leucoderma, skin diseases, asthma and fever.
2	*Acacia nilotica* (L.) Willd. ex Delile ssp. Indica	Mimosaceae	Babul	Bark, Gum	Haemostatic, antipyretic, asthma, diarrhoea
3	*Acacia catechu* (L.f.) Willd.	Mimosaceae	Khaira	Bark	Anti-dysenteric, haemostatic, leprosy, leucoderma
4	*Achyranthes aspera* L.	Amaranthaceae	Apama-ranga	Whole plant	Cough, asthma, bronchitis, colic and cardiac disorder.
5	*Aegle marmelos* (L.) Corr.	Rutaceae	Bela	Root, Leaves, fruits.	Diarrhoea & dysentery, Seminal weakness, gastric problem, diabetes and asthmatic complaints.
6	*Ageratum conyzoides* L.	Asteraceae	Pokasungha	Root, Leaves	Cough, wound infection and as eye infection.
7	*Alstonia scholaris* (L.) R.Br	Apocynaceae	Chhatiana	Root, Bark	Abdominal disorder, diarrhoea, dysentery and cardiopathy.
8	*Andrographis paniculata* (Burm.f.) Wall. ex Nees	Acanthaceae	Bhuinnimba	Whole plant	Wounds, ulcers, chronic fever, malaria, skin diseases, and intestinal worms.
9	*Argemone mexicana* L.	Papaveraceae	Ganghauda	Whole plant	Antipyretic, sedative, aphrodisiac, used in asthma, skin diseases, wounds, and ulcers, jaundice and malaria fever.
10	*Asparagus racemosus*	Liliaceae	Satabari	Root	Nervous disorder, diarrhoea, dysentery, throat

	Willd.				infections, tuberculosis and epilepsy, cardiac debility hypertension and abortion.
11	*Azadirachta indica* A. Juss.	Meliaceae	Neem	Bark, Leaves, Seed	Cough, skin diseases, eczema, leucoderma, malaria, bronchitis and diabetes.
12	*Bauhinia variegata* L.	Caesalpinaceae	Kanchana	Root, Bark	Useful in skin diseases, leprosy, intestinal worms, wounds and ulcers.
13	*Bombax ceiba* L.	Bombacaceae	Simuli	Root, Bark, Gum, Fruits	Skin eruptions, fruits useful in ulceration of bladder and kidney.
14	*Buchanania lanzan* Spreng.	Anacardiaceae	Chara	Root, Fruits	Skin diseases, seminal weakness, nervous debility and cardiac debility.
15	*Calotropis gigantea* R.Br.	Asclepiadaceae	Arakha	Whole plant.	Febrifuge and laxative; promotes gastric secretions; useful for asthma, paralysis.
16	*Cassia fistula* L.	Caesalpiniaceae	Sunari	Whole plant.	Skin diseases, tuberculosis, syphilis, diabetes, leprosy and ring worm.
17	*Clitoria ternatea* L.	Fabaceae	Aparajita	Root,Stem, Seed.	Leprosy and leucoderma
18	*Cuscuta reflexa* Roxb.	Convolvulaceae	Nirmuli	Whole plant	Jaundice, cough, bronchitis and paralysis.
19	*Cynodon dactylon* (L.) Pers.	Poaceae	Duba ghassa	Whole plant	Haemostatic, skin diseases, vomiting, diarrhoea, dysentery and abortion.
20	*Dalbergia sissoo* Roxb.	Fabaceae	Sissoo	Root, Leaves, Bark	Thermogenic, aphrodisiac and antipyretic; useful in the treatment of skin diseases, leucoderma, scabies, ulcers, syphilis, gastropathy and ophthalmopathy.
21	*Desmodium gangeticum* (L.) DC.	Fabaceae	Salaparni	Root	Febrifuge, thermogenic, nervine tonic, cardio tonic.
22	*Emblica officinalis* Gaertn.	Euphorbiaceae	Anla	Root, Leaves, Bark, Fruit	Aphrodisiac, antipyretic, digestive. Useful for diabetes, asthma, peptic ulcers, anaemia and emaciation.
23	*Ficus benghalensis* L.	Moraceae	Bara	Root, Bark, Leaves	Diarrhoea, dysentery, diabetes, ulcers, skin diseases, gonorrhoea, rheumatism
24	*Ficus racemosa* L.	Moraceae	Dimiri	Bark, Fruit	Ulcers, leucoderma, anaemia, jaundice and dysentery.
25	*Gloriosa superva* L.	Colchicaceae	Panjangulia	Root, Seed, Leaves	Kidney problems, typhus, cholera, smallpox
26	*Helicteres isora* L.	Sterculiaceae	Murmuri	Root, Bark, Fruit	Lactifuge, demulcent; useful in colic, scabies, diabetes and gastropathy
27	*Hemidesmus indicus* (L.) R.Br.	Asclepiadaceae	Anantamula	Root, Leaves, Stem	Aphrodisiac, demulcent, febrifuge; useful in asthma, bronchitis, leucoderma, leprosy, epileptic fits
28	*Lantana camara* auct. non L.	Verbenaceae	Naga Airi	Whole plant	Antispasmodic; useful in malaria, epilepsy and gastropathy.
29	*Leucas indica* (L.) R. Br ex Vatke	Lamiaceae	Gayasha	Leaves, Flower	Thermogenic, antipyretic; useful in eye infection.
30	*Mangifera indica* L.	Anacardiaceae	Amba	Root, Bark, Seed	Syphilis, wounds, ulcers, and rheumatism.
31	*Mimosa pudica* L.	Mimosaceae	Lajakuli	Root, Leaves	Antispasmodic, Febrifuge, useful in leucoderma, jaundice, asthma, small pox and uterus infection.
32	*Mucuna pruriens* (L.) DC	Fabaceae	Baidanka	Root, Leaves, Fruit	Thermogenic, stimulant, purgative; aphrodisiac; useful in gonorrhoea and sterility.
33	*Phoenix acaulis* Buch.-Ham. ex Roxb.	Arecaceae	Khajuri	Fruit	Cardio tonic and aphrodisiac; useful in seminal weakness and general debility.
34	*Rauvolfia serpentina* (L.) Benth. ex Kurz.	Apocynaceae	Patal garuda	Root, Leaves	Hypertension, insomnia, epilepsy
35	*Semecarpus anacardium* L.f.	Anacardiaceae	Bhalia	Fruit	Digestive, purgative, liver tonic stimulant, antiseptic, uterine stimulant; useful in cancer, diabetes and tumor.
36	*Sesbania grandiflora* (L.) Poir.	Fabaceae	Agasti	Root, Bark, Flower, Fruit	Febrifuge; useful for nasal infection.
37	*Shorea robusta* Gaertn.f.	Dipterocarpaceae	Sala	Bark, Fruit	Bacterial infection, tuberculosis, ulcers, seminal weakness and burning of eyes.
38	*Streblus asper* Lour.	Moraceae	Sahada	Root, Bark, Latex, Fruit	Cough, ulcers, bronchitis, throat infection.
39	*Tectona grandis* L.f.	Verbenaceae	Saguan	Whole plant	Hyper acidity, diabetes, leprosy, skin diseases.
40	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	Bahada	Bark, Fruit	Anaemia, leucoderma, narcotic, digestive, antipyretic.
41	*Smilax zeylanica* L.	Liliaceae	Muturi	Root	Spermatorrhoea, Leucorrhoea.
42	*Terminalia chebula* Retz.	Combretaceae	Harida	Fruit	Purgative, Digestive, Cardio tonic; useful in throat infection
43	*Vitex negundo* L.	Verbenaceae	Begunia	Whole plant	Antiseptic, antipyretic, ophthalmic, general debility, sprains and cardiac disorder.
44	*Vanda tessellata* (Roxb.) Hook ex G.	Orchidaceae	Rasana	Leaf	Ear pain
45	*Woodfordia fruticosa* (L.	Lythraceae	Dhataki	Root, Flower	Stimulant, antibacterial; corrective of urinary pigments,

	Kurz.				and diabetes
46	*Ziziphus mauritiana* Lam.	Rhamnaceae	Barakoli	Whole plant	Aphrodisiac and invigorating; useful in the treatment of boils, wounds, syphilis, ulcers, typhoid fever

5. Discussion

The results of the present study revealed that most of the encountered plants were reported to have multiple local uses by the tribes. Some commercially important plant species such as *Achyranthes aspera* L., *Cassia fistula* L., *Streblus asper* Lour., *Smilax zeylanica* L., *Shorea robusta* Gaertn.f., *Terminalia bellirica* (Gaertn.) Roxb. etc. have also medicinal value. *Aegle marmelos* (L.) Corr., *Achyranthes aspera* L., *Calotropis gigantea* (L.) R.Br., *Ficus bengalensis* L., *Emblica officinalis* Gaertn., *Semecarpus anacardium* (L.) f. and *Mangifera indica* L. are regarded for religious purpose along with their medicinal value and other domestic uses, and found to be well conserved by the tribal people. It was observed that the plants such as *Ficus racemosa* L. is used to treat cancer, *Butea monosperma* (Lam.) Taub., and *Syzygium cumini* (L.) Skeels are used to treat kidney stones.

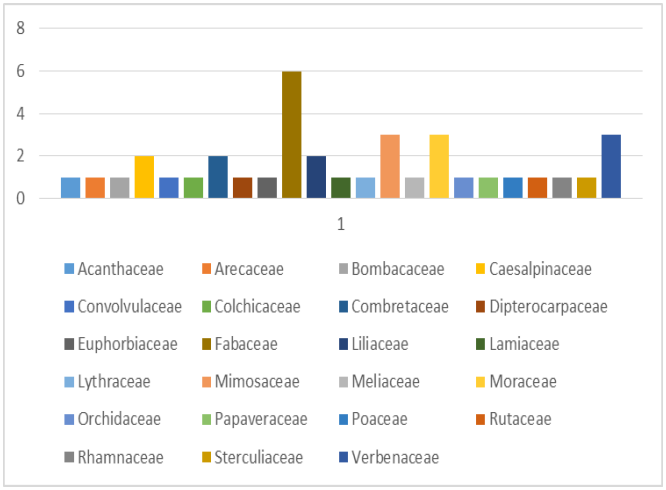

Figure 2: Family wise distribution of medicinal plants

6. Conclusion

The present study indicated that Angul-Talcher mining area harbours a rich diversity of useful plants but it is a matter of concern that the anthropogenic activities such as deforestation, habitat destruction, urbanization and mining activities cause a serious threat to the existence of valuable plant species. Therefore, it is essential to conserve such a wealth of information hidden among the local tribes and valuable plant species by ex-situ and in-situ means.

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