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Ethnobotanical practices and traditional knowledge: A study of medicinal plant use among tribes in Dongargarh and Rajnandgaon, Chhattisgarh India

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Abstract
The present paper documents traditional medicinal information from the tribal people of Dongargarh block of Rajnandgaon district, Chhattisgarh, India. A total of 87 informants from the Gond tribes (kanwar, kunjam, dhruw) inhabiting the five villages provided information. A sum of 54 medicinal plant species was reported and all were utilized for medicinal purposes. The study showed the older people are more knowledgeable, but the interest in younger generations repels. The predominant occupation was farming, and lack of health care lead to dependence on traditional medicine. The research emphasizes the immediate necessity of documenting indigenous knowledge systems through documentation and community participation in order to contribute to cultural preservation and biodiversity conservation.

Keywords: Ethnobotany, traditional medicine, tribal knowledge, Gond tribe

Introduction
A collection of empirical procedures ingrained in a social group's knowledge that is frequently passed down orally from generation to generation is known as traditional medicine or ethno medicine. In an effort to address health issues. It is a substitute for Western medicine and closely related to indigenous societies' religious activities and beliefs. Herbal medicine, or medicinal plant lore, is a significant part of traditional medicine (Bussmann and Sharon, 2006) [3]. Herbal medicines are used by almost 85% of people worldwide to prevent and treat illnesses, and both developed and developing nations are seeing an increase in demand for them. About 25% of medications contain substances derived from higher plants. Additionally, studies on the use of herbal medications made from plants to treat chronic illnesses including rheumatism, arthritis, and asthma, as well as AIDS, cancer, and malaria, have been documented. Worldwide, herbal medicines are becoming more and more well-liked. Only 10% of medicinal plant species are currently grown, with the vast majority remaining at risk from wild stands (Abera, B., 2014) [1].
Medicinal plants are plants that contain chemical compounds with therapeutic properties (Ralte *et al.*, 2024) [21]. And use these plants (parts, extract etc) in treating and preventing specific ailments and diseases that affect human beings, (Hingora and Sharma, 2017) [20]. The use of medicinal plants in india has been mentioned since ancient times (Sastri and Chaturvedi, 1996) [17]. Awareness about the therapeutic properties of plants is existing since few thousand years ago. Traditional medicines continue to be a part of our health system (Mahant *et al.*, 2016) [10]. Because they are essential to human survival (Mohamed Tariq and Md Rayees If ham, 2013) [11].
The tribal and rural people of various parts of India are highly depending on medicinal plant therapy for meeting their health care needs (Shanmugam *et al.*, 2012) [18]. The use of medicinal plants by tribal people is not only for improving health but is also their source of livelihood and income (World Health Organization, 2002) [19]. Medicinal plants are also reported to possess many other activities like antioxidant, anti-inflammatory, anti-insecticidal, anti-hemolytic properties etc, also used widely by the tribal people all over the world (Petrovska, 2012) [15]. In recent years, mass deforestation, and rural depopulation

accelerated loss of valuable traditional knowledge (Hazarika, 2012) [5]. In India, plant of therapeutic potential are widely used by all sections of people (Ravishankar and Shukla, 2007) [16]. Approximately 54 million indigenous people from diverse ethnic groups live in India, (Johan *et al.*, 2017) [9]. Since immemorial times the tribes in the state utilize a large number of plants species for curing various diseases (Parinitha *et al.*, 2005) [14]. India is a rich diversity centre of medicinal and aromatic plants. Effective documentation is crucial for the sustainable utilization and conservation of medicinal plants. As highlighted by (Patel, 2012) [13]. Assessing and recording plant diversity is a foundational step toward preserving these biological resources (Painkra *et al.*, 2015) [12].

This study quantitatively explores cultural relevance indices based on observational knowledge. Aim of these research is to utilize this robust historical data to analyze the significance of various cultural elements. Furthermore, the research seeks to identify new ethno medicinal plant species within the study area. With an aim to identify knowledgeable resource persons and document their knowledge of on the utilization of medicinal plants in. However, this knowledge orally passes on from one generation to the next; thus, have vulnerability to wiped out (Aziz *et al.*, 2018) [2].

2. Materials and Methodology

2.1 Study area

The study was conducted in Rajnandgaon district of Chhattisgarh state during the month of March to June 2025. Chhattisgarh state has 33 district out of these, Rajnandgaon district was purposively selected and within a Rajnandgaon district the Dongargarh block is selected for this study, in Dongargarh block five villages are namely selected Piparkhar, Bacherabatha, Dhara, Barnara, and Kanhargao. The Dongargarh situated 318 meters above sea level at 21°11′20.15″ N, 80°45′16.52″ E.

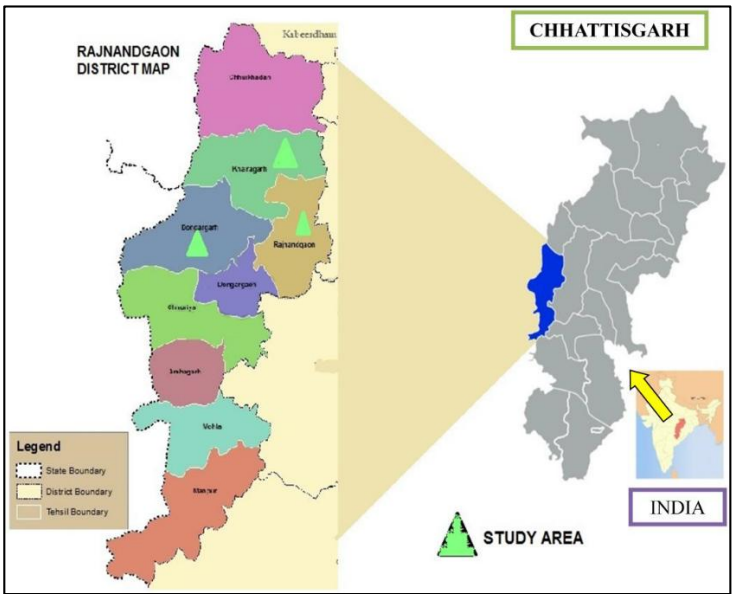

Fig 1: Map of Chhattisgarh (Survey area of Dongargarh, Rajnandgaon district)

2.2 Study design and sampling

The sample was collected in the Dongargarh block using multistage sampling. Five villages were randomly selected from the interior of block. This was followed by a purposive sample of knowledgeable indigenous people from different tribal communities from each selected village. A sample frame was carefully constructed to achieve a complete insight, which consisted of a list of 87 source persons. This frame recorded the key demographic and social profile information consistently for each participant (i.e., name, age, village of residence, sex, caste, and level of education) and thus provided a strong and reliable basis for the process of data collection and analysis (Painkra *et al.*, 2015) [12].

2.3 Data collection

The study employed a mixed-methods approach to comprehensively assess knowledge of medicinal plants. Data collection involved structured questionnaires to gather respondent demographics and specific plant knowledge (local names, parts, uses). This was complemented by semi-structured interviews for in-depth insights and participant observation, directly engaging with tribal members to witness plant gathering and application. Furthermore, guided field walks with resource persons were conducted to collect specimens and verify traditional therapeutic uses (Hooker, 1875; Painkra *et al.*, 2015) [7, 12].

3. Results and Discussion

3.1 Demographic overview and medicinal plants uses:

The socio-economic analysis of the participants indicated that a significant majority (89%) were primarily engaged in farming, highlighting the agricultural character of the region under study. A minor segment of respondents worked in government jobs (6%), while 5% participated in small-scale enterprises or retail. This demonstrates that agriculture continues to be the principal source of livelihood for the local community, with minimal expansion into alternative income-generating areas.

Table 1: Socio-economic profile of respondents

Occupation	Percentage (%)
Farming	89%
Government Employees	6%
Business/ Shop keeper	5%
Total	100%

Further investigation of income sources confirmed these observations, highlighting that most households primarily rely on agriculture and farming for their livelihoods. Beyond agriculture, forest products serve as an additional means of income, particularly for tribal and rural communities. There was also evidence of temporary work through daily wage labor, though it was not identified as a significant source of income. Business and government jobs represented 5% and 6% respectively, suggesting a limited yet existing contribution to the economic support of some families.

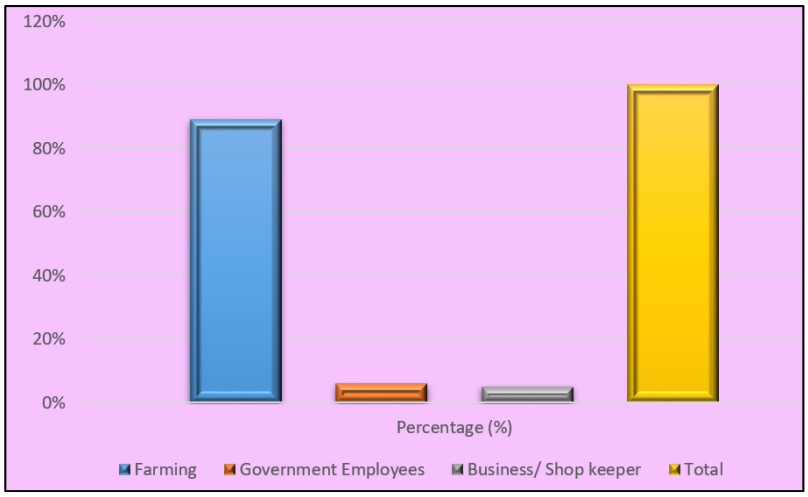

Fig 2: Distribution of Income Source of Respondents

3.2 Distribution and knowledge about medicinal plants of Respondents by Age Group

The research involved 87 key local participants, consisting of 51 men and 36 women from different age categories. An examination of the age distribution showed that 23% of the participants were in the young age bracket (25-40 years), 54% belonged to the middle age bracket (40-60 years), and 23% were classified as older adults (over 60 years). The results revealed that the older participants had greater knowledge of medicinal plants.

Table 2: Distribution and knowledge about medicinal plants of Respondents by Age Group

Age Group	Age Range (Years)	No. of Respondents	Percentage (%)	Knowledge about Medicinal Plants
Young	25-40	20	23%	Moderate
Middle-age	40-60	47	54%	Low
Elderly	Above 60	20	23%	High
Total	-	87	100%	-

Education level of respondents

The evaluation of the educational backgrounds of the respondents indicated that a considerable percentage, 52%, had completed their education at the primary to middle school level. Approximately 21% of those surveyed were illiterate, highlighting a significant part of the population lacking formal education. Additionally, 20% of respondents had reached the higher secondary level, while only 5% had finished their studies at the college level or higher. These results underscore a relatively low prevalence of higher education among the respondents, which may affect the ways in which knowledge is shared and understood regarding the use of medicinal plants in the region.

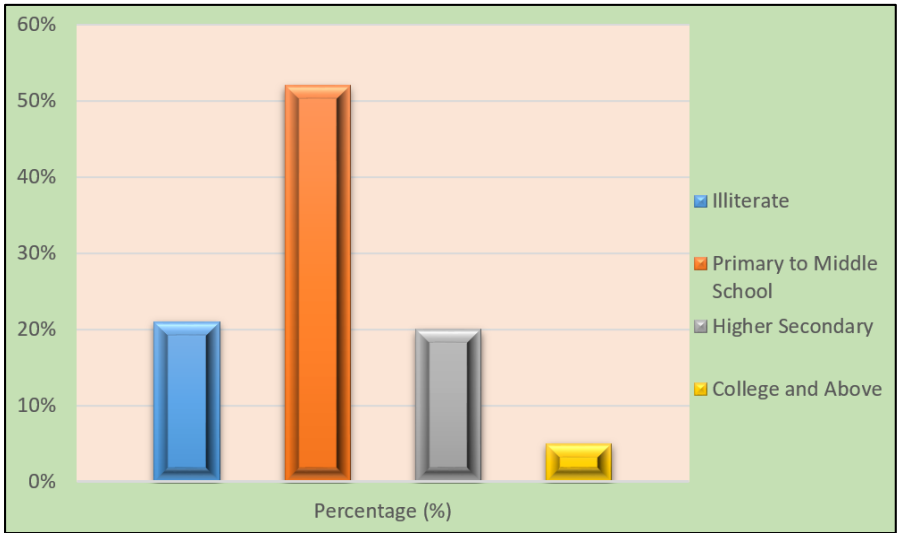

Fig 3: Education level of respondents

From the present study it was found that about the 54 plant species which are generally used by the tribes of Dongargarh that are listed in table no.3. From this survey it was found that the knowledge about medicinal plants is more prominent among tribal communities (Dhruw). This traditional knowledge has been passed down through generation and is deeply rooted in their culture and way of life. Elders and teaditional healers in this community play a vital role in presserving and sharing their wisdom.

Table 3: Knowledge of respondents about medicinal plants:

S.no	Botanical name	common name	Family	Habit	Part use	Disease
1.	*Zingiber officinale*	Adrak	Ziziberaceae	Herb	Rhizome	Cough & Cold
2.	*Acacia catechu (L.f.) Wild*	Khair	Fabaceae	Tree	Bark	Blood Dysentery
3.	*Achyranthus aspera*	Chirchita	Amaranthaceae	Herb	Seed	Asthama &T.B.
4.	*Aegle maemelos*	Bael	Rutaceae	Tree	Fruit pulp, Bark	Blood Dysentery, Diabetes
5.	*Albizia lebbeck*	Siris	Fabaceae	Tree	Seed	Asthama & T.B.
6.	*Aloe barbadensis*	Aloevera/Ghreet kumari	Liliaceae	Herb	Leaf	Hair Problem & Dandruff, Dryness
7	*Andrographis paniculata*	Bhuineem	Acanthaceae	Herb	Whole plant	Constipation
8.	*Andrographis paniculata*	Bhuineem	Acanthaceae	Herb	Whole plant	Cough, cold, Fever and Headache
9.	*Argemone mexicana* (L.)	Satyanashi	Papaveraceae	Herb	Leaf	Skin infection
10.	*Asparagus racemosus*	Satavar	Liliaceae	Herb	Root	Eye problem
12.	*Azadirachta indica*,	Neem	Meliaceae	Tree	Leaf	Eye problem, Dental problem and Diabetes
13.	*Blumea lacera*	Kukurmutta	Asteraceae	Herb	Whole plant	Digestive issues
14.	*Bryophyllum pinnatum*	Patharchatta	Crassulaceae	Herb	Leaf	Diarrhoea
15.	*Buchanania lanzan*	Char	Anacardiaceae	Tree	Leaf	Wound healing
16.	Butea monosperma	Pharsa	Fabaceae	Tree	Flower	Piles
17.	*Cassia fistula* L.	Amaltas	Fabaceae	Tree	Fruit	Constipation
18.	*Cassia tora*	Charota	Fabaceae	Herb	Seed	Asthama & T.B.
19.	*Catharanthus roseus*	Sadabahar	Apocynaceae	Herb	Leaf	Diabetes
20.	*Chloroxylon swietenia*	Bhirra	Rutacea	Tree	Bark	Diarrhea
21.	*Citrus limon*	citrus	Rutaceae	Shrub	Fruit	Digestive issues
22.	*Convolvulus arvensis*	Hirankhuri	Convolvulaceae	Climber	Leaf	Digestive aid
23.	*Cordia dichotom*	Bohar	Boraginaceae	Tree	Fruit	Constipation
24.	*Tinospora cordifolia*	Giloy/Guduchi	Menispermaceae	Climber	Stem	Diabetes
25.	*Coriandrum Sativum*	Dhaniya	Umbeliferae	Herb	Seed	Digestive issues
26.	*Cuminum cyminum*	Jeera	Umbeliferae	Herb	Seed	Urinary disorder
27.	*Curcuma longa* L.	Haldi	Zingeberaceae	Herb	Rhizome	Infectious disease
28.	*Cuscuta reflexa* (Roxb.)	Amarbel	Convolvulaceae	Climber	Whole plant	Bone fracture
29.	*Cynodon dactylon* (L.)	Doobghas	Poaceae	Herb	Whole Plant	Blood pressure
30.	*Dalbergia sissoo*	Sheesham	Fabaceae	Tree	Leaf	Stomach irritation
31.	*Dioscorea bulbifera*	Dangkanda	Dioscoreaceae	Climber	Leaf	Skin irritation
32.	*Diospyros melanoxylon* (Roxb.)	Tendu	Ebenaceae	Tree	Bark	Diarrhoea
33.	*Eclipta alba*	Bhringraj	Astaraceae	Herb	Leaf	Hair growth
34.	*Euphorbia hirta (Linn.)*	Dudhi	Euphorbiaceae	Herb	Leaf	Dog bite
35.	*Hibiscus rosa sinensis*	Hibiscus	Malvaceae	Herb	Flower	Hair problem
36.	*Jatropha curcas* (L.)	Ratanjot	Euphorbiaceae	Shrub	Seed and Leaf	Body and Muscular pain
37.	*Lantanas camara* (L.)	Jarayan	Verbenaceae	Shrub	Leaf	Cough and cold
38.	*Madhuca longifolia (J.Koing)*	Mahua	Sapotaceae	Tree	Bark	Animal bite (insecr, Snake)
39.	*Mangifera indica*	Aam	Anacardiaceae	Tree	Seed	Asthama
40.	*Moringa oleifera* (Lam.)	Munga	Moringaceae	Tree	Leaf	Blood pressure
41.	*Ocimum sanctum* (L.)	Van Tulsi	Lamiaceae	Herb	Root	Cough & cold Dental problem, Asthama & T.B.
42.	*Phyllanthus emblica* (L.)	Aonla	Phyllanthaceae	Tree	Seed	Asthama & T.B
43.	*Pongamia pinnata* (L.)	Karanj	Fabaceae	Tree	Stem	Dental and Oral problem
44.	*Pterocarpus marsupium* Roxb.	Bija	Fabaceae	Tree	Bark	Paralysis
45.	*Punica granatum*	Anar	Punicaceae	Tree	Leaf	Asthama & T.B.
46.	*Shorea robusta*	Sarai/Sal	Dipterocarpaceae	Tree	Bark	Blood Dysentery
47.	*Syzygium cumini*	Jamun	Myrtaceae	Tree	Seed	Diabetes, Diarrhoea
48.	*Terminalia arjuna* (Roxb.)	Kahuva/Arjun	Combretaceae	Tree	Bark	Blood Dysentery
49.	*Terminalia bellirica* (Gaertn.) Roxb.	Baheda	Combretaceae	Tree	Fruit	Cough and cold
50.	*Terminalia chebula*	Harra	Combretaceae	Tree	Fruit	Cough and cold
51.	*Zizyphus mauritiana*	Ber	Rhamnaceae	Tree	Root	Diarrhoea
52.	*Oxaliscorni culata* (L.)	Chauptiya	Oxalidaceae	Herb	Leaf	Jaundice
53.	*Peperomia peducida* (L.) Kunth	Panpatta	Piperaceae	Herb	Whole plant	Fever
54.	*Phyllanthus niruri* (L.)	Bhui-Amla	Phyllanthaceae	Herb	Leaf	jaundice

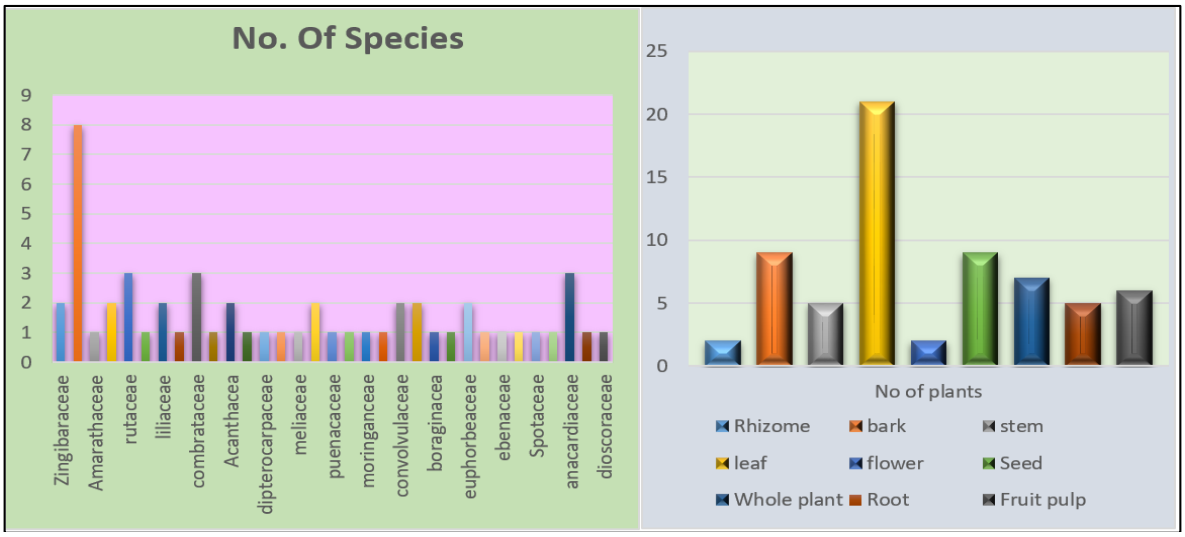

Fig 4: Distribution of family and plant part used for medicinal purpose

The medicinal value of 54 plants has been described in this study these plants belong to 33 families. The Fabaceae family was the most prevalent, accounting for 14.81% of all recorded medicinal plant species, according to the ethnobotanical survey. Families such as Zingiberaceae, Phyllanthaceae, Liliaceae, Acanthaceae, Asteraceae, Convolvulaceae, Umbelliferae, and Euphorbiaceae supplied 3.70% each, while other notable families were Rutaceae, Combretaceae, and Anacardiaceae, each contributing 5.56%. One species represented each of the other families. which include herb, tree, shrub and climber and talk about plant parts the most often used plant parts were the leaves (38%), followed by the Bark (16%), Seed (15%), Fruit pulp (11%), Stem (9%), Root (5%), or (3%) Rhizome used medicinally. The leaf is most commonly used for medicine, the reason being that it is easily available in the forest around them.

Conclusions

Healthcare systems of the tribal populations in Dongargarh, Chhattisgarh, traditional medicinal practices are essential, as this ethnobotanical study demonstrates. With the help of 87 informants from the Gond tribes, 54 species of medicinal plants were identified; and this plants are used to cure different diseases. The study discovered that older people know more about these plants, suggesting that if younger generations don't get involved, there is a chance that cultural and medical knowledge will be lost. The main source of income is still farming, and the lack of access to contemporary healthcare practices encourages reliance on conventional treatment, the results highlight the pressing need for systematic documentation and preservation of indigenous knowledge, which is in danger of disappearing as a result of ecological risks and modernity. Additionally, maintaining cultural heritage, fostering biodiversity, and advancing sustainable development all depend on the engaged community's involvement in conservation initiatives and knowledge sharing. In order to integrate historic knowledge with contemporary healthcare practices, this research lays the groundwork for future pharmacological studies and policy frameworks.

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