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Ethnomedicinal evaluation of the plants used for Cough and Cold by the native communities of Barapahad region of Western Odisha

Munilata Nayak
Department of Botany, Kalinga University, Naya Raipur, Chhattisgarh, India

Abstract

This review explores the ethnobotanical practices for treating colds and coughs in the Barapahad region of western Odisha, India, integrating perspectives from pharmacology, botany, anthropology, and archaeology. Through interviews with 80 participants, including traditional healers, the study identifies and documents medicinal plants and their preparation methods. Key plants such as *Ocimum basilicum* L. (Tulsi), *Zingiber officinale* Roscoe (Ginger), C*innamomum tamala* (Buch-Ham.) T.Nees & Eberm.a (Tej plant), and *Phyllanthus emblica* L. (Amla) were found to be significant in treating respiratory ailments. The preparation methods involve various plant parts like leaves, flowers, fruits, bulbs, roots, and seeds, utilized through oral consumption and inhalation. These findings emphasize the importance of traditional remedies and the diversity in their application, highlighting the critical need to preserve ethnobotanical knowledge and promote sustainable plant resource management to sustain these traditional medicinal practices. This review not only contributes to the understanding of indigenous medicinal knowledge but also supports its potential integration into modern healthcare systems.

Key Words – Ethnobotany, Traditional medicine, Respiratory ailments, Medicinal plants, Barapahad region

Introduction

Ethnobotany, a term first used in 1895 by American botanist John William Harshberger, involves the study of the interactions between humans and plants. Ethnobotanists, who often work with indigenous communities, document and preserve traditional plant-related knowledge. This interdisciplinary field combines aspects of botany, anthropology, ecology, and pharmacology to explore how different cultures have historically interacted with plants (Bartwal et al., 2011; Kamble et al., 2010).

Colds and coughs are prevalent respiratory ailments that can significantly affect daily activities, causing discomfort, disrupted sleep, and decreased productivity. While these conditions are

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typically managed with pharmacological treatments, such treatments can have side effects, and may not be suitable for everyone Rout & Panda, 2010. This has led to a growing interest in alternative treatments, particularly home remedies using medicinal herbs that have been part of traditional medicine for centuries (Sahu et al., 2013).

The rising demand for home remedies is influenced by several factors, including their natural composition, which usually results in fewer side effects, and the cultural and historical familiarity people have with these treatments (Sajan et al., 2017). Additionally, there is an increasing interest in sustainable and holistic health practices.

This paper focuses on evaluating the effectiveness and mechanisms of various medicinal plants in treating colds and coughs, highlighting the suitability and growing demand for these home remedies.

Study Area

Barapahad, located in the northeastern part of Bargarh district, spans approximately 776 square kilometers. Its highest peak, Debrigarh, rises to an elevation of 2267 feet. Near the peak lies Barabakhara, a stone-roofed structure providing shelter and an all-weather stream, capable of accommodating up to 500 individuals. A 48 km spur of the Barapahar hill separates the Bargarh plain from the Ambabhona-Lakhanpur plain. The terrain slopes down towards the northeastern River Mahanadi. The hills surrounding the Lakhanpur tract are covered in forests, making them suitable for agricultural farming. The Barapahar range comprises several reserve forests: Sareidamu-Budharaja (7683.040 hectares), Dechuan-Lakhanpur (6997.000 hectares), Phulsuri-Dungri Reserve Forest along the Mahanadi (880.964 hectares), Lohra Reserve Forest near Kamgaon (346.091 hectares), and Debrigarh Reserve Forest (2409 hectares).

Bargarh

Bargarh district, situated in the western region of Odisha, covers an area of 5,837 square kilometers. It is bordered by Sambalpur and Jharsuguda districts to the north, Subarnapur to the east, Balangir to the south, and the state of Chhattisgarh to the west. The district lies between latitudes 20°45' N and 21°45' N and longitudes 82°40' E and 83°50' E. The study areas includes

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Amlipali , Rujhenmal, Debrigarh, Rengali, Pahad sirgida, Attabira, Lahanda, Barahgoda, Bargarh, Ganthiapali.

Sambalpur

Sambalpur district covers an area of 6702 square kilometers and is located between latitudes 20°40' and 22°11' north and longitudes 82°39' and 85°15' east. It is bounded by the districts of Jharsuguda to the north, Deogarh and Angul to the east, Subarnapur to the south, Bargarh to the west, and the state of Chhattisgarh to the northwest. asinghari, Basantpur, Burla, Hirakud.

Methodology

In the Barapahad region, which includes villages in the Sambalpur and Bargarh districts of Western Odisha, India, ethnobotanical study was carried out. The Four study period ended in May of 2024. It focused on those who routinely utilized traditional medicine and were between the ages of 35 and 90. Amlipali, Rujhenmal, Pahad sirgida, Debrigarh, Rengali, Attabira, Basantpur, Lahanda, Badasinghari, Barahgoda, Bargarh, Ganthiapali, Burla, Hirakid were among the villages from which participants were chosen. 80 people in all were questioned, and their answers were relevant and thought-provoking. Of them, 5 were traditional healers and the remaining ones were conventional healers. For every participant, comprehensive records were kept that included their name, age, profession, community, degree of education, and residential location. Interviews were undertaken to obtain thorough information on the participants' use of traditional medicine. This included information about specific medicinal plants or plant components that were employed, as well as their local names, procurement sources, conservation strategies, and ethnomedical uses for those plants. Furthermore, detailed information was gathered on the preparation methods of the pharmaceutical formulations, suggested dosages, modes of administration, number of patients treated and cured, frequency of use, presence or absence of dietary restrictions, and any documented side effects. This methodology ensured a complete understanding of the ethnobotanical practices associated with the treatment of cold and cough with medicinal plants in the study area.

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Results

Demographic details of the Informants

Out of the total 80 informants surveyed, only a small subset of 6 individuals provided valuable insights into ethnomedicine practices for treating colds. These respondents hailed from various localities, including Amilipali, Attabira, Bargarh, Burla, and Lahanda. This group comprised 5 males and 1 female, all of whom were under the age of 55.

A closer look at their educational backgrounds revealed a diverse range of experiences. Three of these informants had no formal education, highlighting the reliance on traditional knowledge passed down through generations in their communities. One respondent had some schooling but did not complete high school, indicating an interruption in formal education. Another informant had successfully completed 10th grade, while the most educated among them had achieved a 12th grade education.

Despite their varying levels of formal education, these individuals possessed significant knowledge about traditional medicinal practices, underscoring the importance of preserving and valuing ethnobotanical wisdom within these communities. This insight is crucial for understanding the dynamics of traditional medicine in rural areas and the role it plays in local healthcare practices.

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Table no.1: showing demographic data

LOCATION	Details of the informants that consumed the plant											
	Male	Female	35-45	46-55	56-65	66-75	76-85	NE	<10	10	12	12+
Amlipali	1	0	1	0	0	0	0	0	0	0	1	0
Attabira	1	0	0	1	0	0	0	0	1	0	0	0
Bargarh	2	0	2	0	0	0	0	2	0	0	0	0
Burla	0	1	0	1	0	0	0	1	0	0	0	0
Lahanda	1	0	0	1	0	0	0	0	0	1	0	0

FLORISTIC ANALYSIS OF FAMILIES OF MEDICINAL PLANTS

The floristic analysis highlights the extensive diversity and the profound significance of medicinal plants across various botanical families and orders, shedding light on both their ecological roles and medicinal values. Key medicinal plants identified in this study are categorized meticulously to underscore their botanical affiliations and therapeutic importance.

Ocimum basilicum L., commonly known as Tulsi, is a prominent medicinal plant belonging to the Lamiaceae family and classified under the Lamiales order. This plant is renowned for its myriad therapeutic applications, particularly in treating respiratory ailments.

Zingiber officinale Roscoe, widely known as Ginger (Ada), is another significant medicinal plant that falls within the Zingiberaceae family and the Zingiberales order. Ginger's rhizomes are extensively used in traditional medicine for their anti-inflammatory and anti-microbial properties, making it a staple remedy for colds and coughs.

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Cinnamomum tamala (Buch-Ham.) T.Nees & Eberm.a, referred to as Tej, is part of the Lauraceae family and the Laurales order. This plant is valued for its aromatic leaves, which are utilized in various medicinal preparations to treat respiratory and digestive disorders.

Phyllanthus emblica L., commonly known as Amla, belongs to the Phyllanthaceae family and is categorized under the Malpighiales order. Amla is particularly noted for its high vitamin C content and antioxidant properties, making it an effective remedy for boosting the immune system and combating respiratory infections.

Understanding the diverse floristic composition of these medicinal plants is essential for appreciating their ecological significance and the vital roles they play in traditional medicine. Each plant's unique properties and classifications contribute to a broader understanding of their applications and benefits, underscoring the importance of preserving this ethnobotanical knowledge for future generations.

(Table no. 2: Floristic analysis of medicinal plant)

Sr no.	**Name of the plant**	**Common name**	**Family Name**	**Order**
1	*Ocimum basilicum* L.	Tulsi	Lamiaceae	Lamiales
2	*Zingiber officinale* Roscoe	Ada	Zingiberaceae	Zingiberales
3	*Cinnamomum tamala* (Buch-Ham.) T.Nees & Eberm.a	Tej	Lauraceae	Laurales
4	*Phyllanthus emblica* L.	Amla	Phyllanthaceae	Malpighiales

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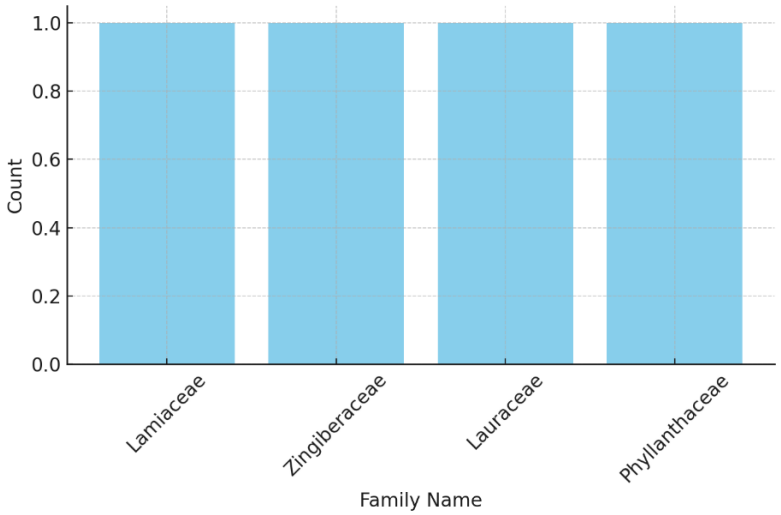
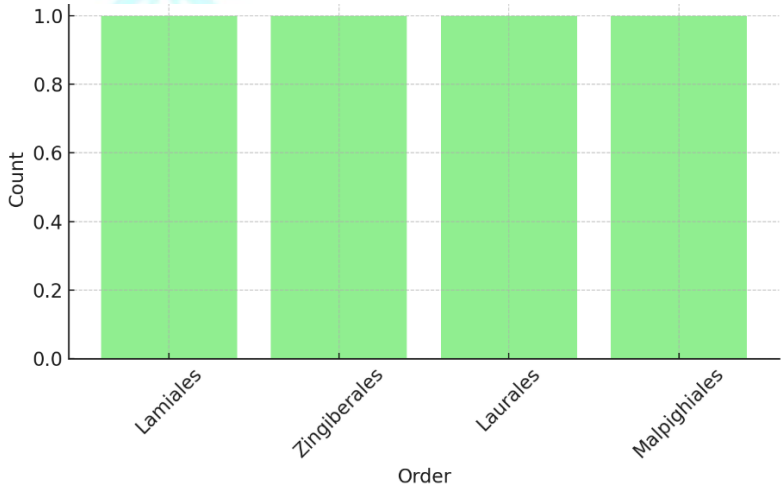


(Fig 1: Distribution of Family)



(Fig 2: Distribution of Order)

USE VALUE

The use value (UV) analysis provides a quantitative measure of the relative importance and frequency of use of various medicinal plants within the community. This analysis reveals that *Ocimum basilicum* L. (Tulsi) holds the highest use value (UV=1), with four distinct use reports.

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This high use value underscores Tulsi's crucial role and widespread application in traditional medicinal practices, reflecting its significant therapeutic relevance among the local populace.

In contrast, *Zingiber officinale* Roscoe (Ada), commonly known as Ginger, has a use value of 0.5, supported by two use reports. This indicates a moderate level of importance and suggests that while Ginger is valued for its medicinal properties, it is utilized less frequently compared to Tulsi.

Cinnamomum tamala (Tej) and *Phyllanthus emblica* L. (Amla) each exhibit a use value of 0.25, with only one use report for each plant. This lower use value indicates that these plants are either more specialized in their application or less commonly used within the community. Despite their lower frequency of use, Tej and Amla are still recognized for their specific medicinal benefits, though their application might be limited to particular ailments or circumstances.

Overall, this use value analysis highlights the prominence of *Ocimum basilicum* L. (Tulsi) in traditional medicinal practices, marking it as a cornerstone of the local ethnomedicinal repertoire. The varying use values of the other plants, such as *Zingiber officinale* Roscoe, *Cinnamomum tamala*, and *Phyllanthus emblica* L., provide insights into their relative importance and specialized roles in the community's traditional healthcare system.

Table no.3: Use Value

Sr. No.	Name of the plant used for medicinal purpose	Use reports	UV
1	*Ocimum basilicum* L.	4	1
2	*Zingiber officinale* Roscoe	2	0.5
3	*Cinnamomum tamala* (Buch-Ham.) T.Nees & Eberm.a	1	0.25
4	*Phyllanthus emblica* L.	1	0.25

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LIFE FORM & PLANT PART

Table no.4: Life form and plant part

Sr. No	Plant name.	Life form	Plant Part
1	*Ocimum basilicum* L.	Herb	Flower, Seed, Leaf, Root
2	*Zingiber officinale* Roscoe	Herb	Bulb
3	*Cinnamomum tamala* (Buch-Ham.) T.Nees & Eberm.a	Tree	Leaf
4	*Phyllanthus emblica* L.	Tree	Fruit, Leaf

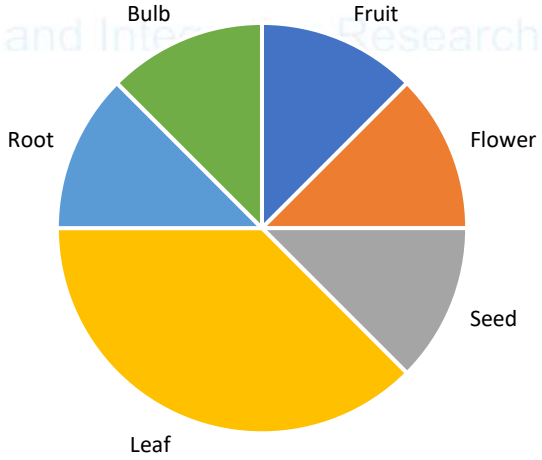

Fig1: Distribution of Plant Parts in medicinal plant

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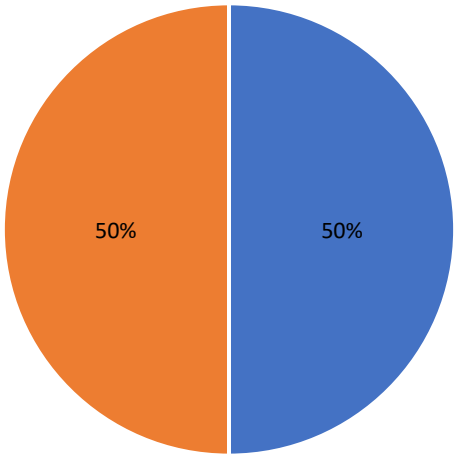

Fig 2: Distribution of life form of medicinal Plant

The range of plant species and their useful portions is highlighted by the examination of living organisms and plant parts employed in medical applications. To treat herbal remedies Fruits, Flowers, Seeds, Roots, and Bulbs are once each but leaves are used 3 times to treat Cold. Out of 4 medicinal plants that were used for treatment, 2 were herbs and 2 were trees. *Ocimum basilicum* L., often known as tulsi, is a herb with several uses, including the Flowers, Seed, Leaves, and Roots, demonstrating its extensive range of therapeutic uses. Another herb, *Zingiber officinale* Roscoe (Ada), is mostly used for therapeutic purposes in relation to its bulb. The main portion of the *Cinnamomum tamala (Buch-Ham.) T.Nees & Eberm.a* (Tej) tree that is used is the leaf. Amla, or *Phyllanthus emblica* L., is another tree whose leaves and fruit are utilized.

PREPARATION AND MODE OF ADMINISTRATION

Sr. No	**Name of the plant used for medicinal purpose**	**Common name**	**Disease**	**Preparation**	**Mode of Administration**
1	*1.Ocimum basilicum* L.	Tulsi, Ada	Cold and Cough	Take a few leaves of tulsi	Oral

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	2.Zingiber officinale Roscoe			and dry them for 2 days under the sun. now take those dried leaves and turn them into fine powder. mix this powder with honey and drink it with warm milk every night.	
2	*Cinnamomum tamala* (Buch-Ham.) T.Nees & Eberm.a	Tej	Cough and cold	5-6 leaves and boil it in 1ltr water. Inhale the vapor while it's boiling to get relief from of cold and cough.	Inhaling
3	*1.Phyllanthus emblica* L. *2. Zingiber officinale* Roscoe	Amla,Ada	Cough and Cold	Take few amla leaves and dry them and churn them into	Oral

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				powder. add this powder to a glass of boiling water along with ginger. drink it while it's warm.	
4	*Ocimum basilicum L.*	Tulsi	Cold and Cough	Take a few leaves of tulsi leaves, add a spoon of honey, and grind it.	Oral
5	*Ocimum basilicum* L.	Tulsi	Cold and Cough and to boost immunity	Take fresh roots, leaves, flowers, seeds and wash it clean. Now grind it with water and make it into a thick paste. take 500 ml water and add the paste to it. let	Oral

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				it boil till 1/4th of the water is left in the pot. now strain it into a bottle and use one drop in drinking water /tea/drinks.	
6	*Ocimum basilicum* L.	Tulsi	Cold	Take a few leaves of tulsi and dry them for 2 days under the sun. now take those dried leaves and turn them into fine powder. mix this powder with honey and drink it with warm milk every night.	Oral

(Table no.5: Preparation and mode of administration of herbal remedies)

In the realm of traditional medicine, plants such as Tulsi (Ocimum basilicum L.), Ginger (Zingiber officinale Roscoe), Tejpat (Cinnamomum tamala), and Amla (Phyllanthus emblica L.) play

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significant roles in treating cough, cold, and enhancing immunity. These plants are processed in various ways, including drying and powdering Tulsi leaves or boiling Tejpat leaves for inhalation. The efficacy of these remedies highlights the enduring value of herbal medicine in healthcare.

Discussion

The importance of using herbal treatments to cure coughs and colds is shown by the ethnobotanical study of the Barapahad area in Western Odisha). *Ocimum basilicum* L. (tulsi), *Zingiber officinale* Roscoe (ginger), *Cinnamomum tamala* (Buch-Ham.) T.Nees & Eberm.a (tejpat), and *Phyllanthus* emblica L. (amla) are among the important medicinal herbs recognized. Traditional medicine is highly sophisticated since these herbs are used in a variety of forms and preparations, including pastes, powders, and decoctions (Shiddamallayya, Yasmeen, & Gopakumar, 2010).

Several factors drive the use of herbal remedies in this region. Cultural heritage plays a significant role, as traditional knowledge passed down through generations forms the backbone of local healthcare practices (Vedavathy, Sudhakar, & Mrdula, 1997). Accessibility and affordability are also crucial, with medicinal plants being readily available and cost-effective, particularly in rural areas with limited access to modern medical facilities (Silja, Varma, & Mohanan, 2008). The natural composition of these remedies results in fewer side effects, and their efficacy, validated by generations of use, fosters community trust. The proven effectiveness of these remedies in treating common ailments reinforces their continued use (Upadhye, Vartak, & Kumbhojkar, 1994).

This paper emphasizes the importance of conserving cultural heritage and sustainable plant resource management, highlighting the potential of integrating traditional knowledge with modern scientific research for innovative healthcare solutions.

The study enhances ethnobotanical literature and serves as a foundation for research and therapeutic agent development, highlighting the potential of integrating traditional and modern healthcare practices for sustainable and effective health solutions for local and global communities.

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