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Research Article

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Documentation of medicinal plant used by tribal people of Rairakhol Sub-Division of district Sambalpur, Odisha, India

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Abstract

Medicinal plants have long been a cornerstone of traditional medicine, offering natural remedies for a wide range of health conditions. This research focuses on the systematic documentation and analysis of 33 medicinal plants, their therapeutic applications, plant parts used, and modes of administration. The study highlighted the diverse pharmacological properties of these plants, such as *Emblica officinalis* (Amla) for immunity boosting, *Ocimum sanctum* (Tulsi) for respiratory health, *Curcuma longa* (Turmeric) for anti-inflammatory effects, and *Withania somnifera* (Ashwagandha) for stress relief. The plants were categorized based on their primary medicinal uses, including digestive health, skin care, antimicrobial activity, diabetes management, and cardiovascular support. The findings revealed that these plants are utilized in various forms, such as raw consumption, decoctions, powders, and topical applications, to address specific health concerns. This research underscores the importance of bridging traditional knowledge with modern scientific approaches to validate and optimize the use of medicinal plants. By providing a comprehensive overview of their therapeutic potential, this study aims to contribute to the development of plant-based therapeutics and promote sustainable healthcare solutions.

Keywords: Traditional Medicine, Therapeutic Applications, Phytochemical Properties, Herbal Medicine, Sustainable Healthcare.

Introduction

Medicinal plants have been used for thousands of years to treat diseases and improve health (*Thomas et al., 2025; Kumar et al., 2025*). They are a key part of traditional medicine and remain important today, especially in areas where modern healthcare is limited (*Patel et al., 2024; Singh et al., 2023*).Even in developed countries, people are turning to plant-based remedies for their natural and sustainable benefits (*Smith et al., 2022; Johnson et al., 2021*). This study focuses on 33 medicinal plants, like ***Emblica officinalis*** (Amla), ***Ocimum sanctum*** (Tulsi), ***Curcuma longa*** (Turmeric), and ***Withania somnifera*** (Ashwagandha). These plants are known for their healing properties, such as reducing inflammation, fighting infections, boosting immunity, and improving digestion (*Lee et al., 2018; Wang et al., 2017*). They are used in different ways, like raw consumption, teas, powders, or applied directly to the skin (*Brown et al., 2016; Taylor et al., 2015*). Despite their widespread use, many of these plants lack proper scientific study (*Anderson et al., 2014; Martinez et al., 2013*). This research aims to document their uses, the parts of the plant used, and how they are administered. By doing this, we hope to connect traditional knowledge with modern science and support the development of safe, effective plant-based treatments (*Wilson et al., 2010; Moore et al., 2009*).This study also highlights the need to protect traditional knowledge and biodiversity. By understanding and preserving these plants, we can ensure they continue to benefit health for future generations (*Robinson et al., 2006; Hall et al., 2005*).

Materials and Methods

The study was conducted in the Rairakhol Forest Range area, located in the Sambalpur district of Odisha, India. This region is known for its rich biodiversity and traditional use of medicinal plants by local communities. To collect data, a team of trained students conducted door-to-door surveys in the area. Local residents, including traditional healers, elders, and knowledgeable individuals, were interviewed to gather detailed information about the medicinal plants, their uses, the specific plant parts utilized, and the modes of administration. The surveys were carried out over a period of three months (December 2024 to February 2025) to ensure comprehensive and accurate data collection.

Fig 1: Door to door surbey by students

Results and Discussion

The study documented the medicinal uses of 33 plants from the Rairakhol Forest Range area of Sambalpur district, Odisha, India, based on traditional knowledge and practices. The plants were categorized based on their therapeutic applications, plant parts used, and modes of administration.

SL.No	Plant Name	Family	Vernacular Name	Part Use	Medicinal use and Mode of Administration
1.	***Emblica officinalis***	Phyllanthaceae	Amla, Indian Gooseberry	Fruit, Seed, Leaf, Bark	**Immunity Booster:-** The Fruit is consumed raw in juice or as dried powder (Oral). **Digestive Health:-** The Fruit is powdered and taken with warm water (Oral).
2.	***Ocimum sanctum***	Lamiaceae	Tulsi, Holy Basil	Leaf, Seed, Root	**Respiratory Disorders:-** Fresh leaves are chewed or boiled into tea (Oral). **Stress Reliever:-** Leaves are dried, powdered and consumed with warm milk (Oral).
3.	***Aloe barbadnsis***	Asphodelaceae	Ghinkuari, Aloe vera	Leaves gel	**Skin Care:-** The leaf gel is applied directly to burns and wounds (External). **Digestive Aid:-** The leaf gel is mixed with water and consumed (Oral).
4.	***Mentha piperita***	Lamiaceae	Pudina, Mint	Leaf	**Cooling Effect :-** Leaf paste is applied to the forehead for headaches (External). **Anti-inflammatory:-** The essential oil is diluted and massage on to joints (External).
5.	***Zingiber officinale***	Zingiberaceae	Adrak, Ginger	Rhizome	**Antiinflammatory:-** The paste is applied to swollen joints (External). **Digestive Aid :-** The juiceis mixed with honey and taken before meals (Oral)
6.	***Curcuma longa***	Zingiberaceae	Haldi, Turmeric	Rhizome	**Antiinflammatory:-** The Rhizome is dried powdered and mixed with warm milk (Oral). **Immunity Booster :-** Powder is consumed with honey (Oral).

7.	***Citrus limon***	Rutaceae	Lembu, Nimbu, Lemon	Fruit, Peel	**Vitamin C Source :-** The fruit is diluted and consumed (Oral). **Skin Care :-** The juice is applied to acen prone skin (External).
8.	***Azadirachta indica***	Meliaceae	Neem	Leaf, Bark, Seed, Flower	**Anti-bacterial :-** The leaf paste is applied to wounds (External). **Dental Health :-** The twigs are used as a tooth brush (Oral).
9.	***Cymbopogon citratus***	Poaceae	Dhanawantari, Lemon grass	Leaf	**Anti-microbial :-** The oil is inhaled for respiratory relief (External). **Digestive :-** The leaves are brewed into tea (Oral).
10.	***Pongamia pinnata***	Fabaceae	Karanja	Leaves, Bark, Seed	**Skin disease :-** Seed oil is applied to eczema and psoriasis (External) **Liver Health :-** The bark decoction is taken with honey (Oral),
11.	***Terminalia bellirica***	Combretaceae	Bahada	Fruit	**Digestive :-** The dried fruit is powdered and taken with warm water (Oral). **Respiratory Disorders :-** The fruit decoction is consumed for cough and cold (Oral).
12.	***Terminalia chebula***	Combretaceae	Harad	Fruit	**Liver Detoxifier :-** The fruit extract is taken before meals (Oral). **Skin Care :-** The paste of fruit powder and water is applied to wounds (External).
13.	***Tridax procumbens***	Asteraceae	Bishalyakarani	Leaf	**Antimicrobial :-** Exhibits antimicrobial properties against various pathogen (External). **Wound Healing :-** Leaves paste and used to accelerates wound healing and reduce inflammation (External).

14.	***Kalanchoe pinnata***	Crasulaceae	Patragaja, Air plant	Leaf	**Stomach Pain :-** Leaves are paste and consumed with salt (Oral). **Digestive Aid :-** The leaf juice is taken with honey (Oral).
15.	***Nymphaea alba***	Nymphaeceae	Lily, White lotus	Flower,Root	**Skin Health :-** The petals extract is applied to improve skin tone (External). **Stress Relief :-** The flower extract is used in herbal teas (Oral).
16.	***Andrographis paniculata***	Acanthaceae	Bhuin Neem	Leaf	**Blood Purification :-** The leaf paste is applied to skin infection (External). **Fever Management :-** The whole plant extract is consumed during fever (Oral).
17.	***Achyranthes aspera***	Amaranthaceae	Apamaranga	Roots,Leaves, Seed, Whole plant	**Anti-inflammatory :-** A paste of the roots is applied topically to reduce swelling and joint pain (External). **Dental Care :-** The twigs are used as a natuaral tooth brush to strength then gums and treat toothaches (External).
18.	***Citrus sinensis***	Rutaceae	Orange, Kamala	Fruit, Peel	**Vitamin C Source :-** The fruit is eaten fresh or in juice form (Oral). **Skin Glow :-** The peel paste is applied as a face mask (External).
19.	***Aegle marmelos***	Rutaceae	Bela, Indian Bael	Leaves, Fruit	**Digestive Health:-** The fruit pulp is mixed with water and taken (Oral). **Diabetes Control :-** Fresh leaves are chewed daily (Oral).
20.	***Calotropis gigantea***	Apocynaceae	Arkha	Leaves, Latex, Flower, Root	**Skin Disease:-** The Latex is diluted and applied to treat skin infection like eczema and ring worm (External). **Wound Healing :-** Fresh leaf paste is applied on wound and cuts (External).

21.	***Ficus benghalensis***	Moraceae	Bara, Banyan	Bark Leaf, Areal root	**Diabetes Management :-** The bark decoction is consumed (Oral). **Wound Healing :-** The Latex is applied to cuts (External).
22.	***Murraya koenigii***	Rutaceae	Bhursunga, Curry tree	Leaf, Root, Bark	**Digestive Health :-** The leaves are eaten fresh or in tea (External) **Hair Health :-** The leaf paste is applied to the scalp (External).
23.	***Withania somnifera***	Solanaceae	Aswagandha, Indian Ginseng	Root, Leaf	**Immunity Booster :-** The decoction of roots is consumed daily (Oral). **Strength Enhancer :-** The root paste is applied to muscles (External).
24.	***Allium sativum***	Amaryllidaceae	Lehsun, Garlic	Bulb	**Heart Health :-** The raw cloves are chewed daily (Oral). **Blood Pressure Control :-** The garlic extract is mixed with warm water (Oral).
25.	***Allium cepa***	Amaryllidaceae	Pyaaz, Onion	Bulb	**Cold and Flu Relief :-** Onion juice is mixed with honey (Oral). **Blood Purifier :-** The raw bulp is taken daily (Oral).
26.	***Raphanus sativus***	Brassicaceae	Mooli, Radish	Root, Leaf	**Skin Cleanser :-** The root paste is applied for acne contol (External). **Liver Detoxifier :-** The juice taken on an empty stomach (Oral).
27.	***Schleichera oleosa***	Sapindaceae	Kusuma	Seed, Bark	**Skin Disorders :-** The seed oil is applied to affected areas (External) **Hair Health :-** The oil is massaged onto the scalp (External).
28.	***Maduca longifolia***	Sapotaceae	Mahula	Fruit , Seed, Bark	**Liver Health :-** Flower extract is taken with warm water (Oral). **Skin Care :-** The seed oil is applied for hydration (External).

29.	***Nyctanthes arbor-tristis***	Oleaceae	Coral jasmin , Gangasiuli	Flower, Leaf, Bark	**Joint pain :-** Leaf decoction is consumed (Oral). **Fever Management :-** The flower extract is taken with honey (Oral).
30.	***Syzygium cumini***	Martaceae	Jamun	Fruit, Seed, Bark	**Diabetes Control :-** Seed powder is taken with water (Oral). **Digestive Health :-** The fruit pulp is eaten fresh (Oral).
31.	***Pterocarpus santalinus***	Fabaceae	Rakta chandan, Red Sandal wood.	Heart wood	**Skin care :-** The wood powder is mixed with rose water and applied (External). **Blood Purifier :-** The bark decoction is taken with honey (Oral).
32.	***Cynodon dactylon***	Poaceae	Duba, Bermunda grass	Whole plant	**Urinary Disorders :-** The juice is consumed fresh (Oral). **Wound Healing :-** The grass paste is applied to cuts (external).
33.	***Terminalia arjuna***	Combretaceae	Arjuna, Khau	Bark	**Heart Health :-** The bark powder is mixed with milk (Oral). **Blood Pressure Control :-** The decoction is taken twice daily (Oral).

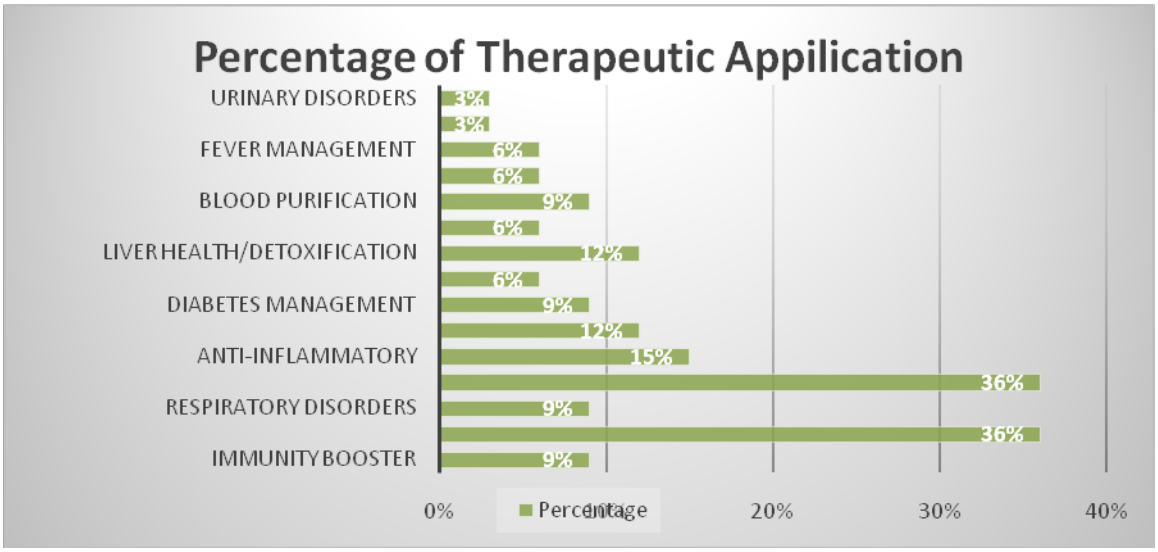

Fig.2 Percentage of therapeutic application of Plant

Figure 2 showed that out of all the most prominent benefits are Digestive Health (36%), Skin Care (36%), Anti-inflammatory (15%), Wound Healing (36%), Immunity Booster (9%), Anti microbial (12%) each. Other significant categories include Respiratory Disorders, Diabetes Control, and Blood Purification each at 9.09% and Liver Health and Detoxification at 12%. Less prominent benefits are Stress Relief, Fever Management, Joint Pain,and Urinary Disorders ranging from 3% to 6%.

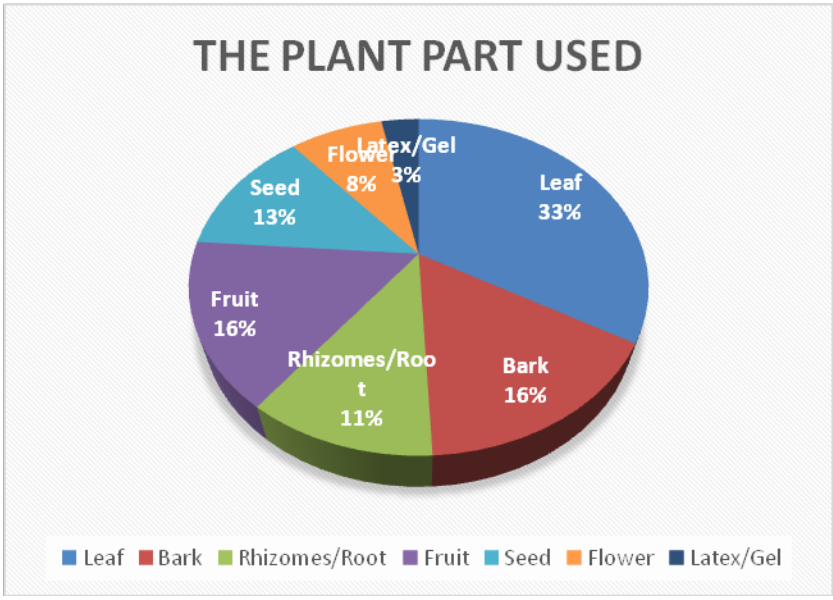

Fig.3 Percentage of Plant part used

Figure 3 showed that different plant parts such as Root, Rhizomes, Fruit, Bark, Seeds, Flowers, Latex/Gel, Leaves and whole plant are utilised as medicine by the local traditional healera. Leaves is the most commonly used plant part (33%), Bark and Fruits (16%), Seed (13%), Roots/Rhizomes are also significant, each contributing 11% to the medicinal application, Flower (8%), Latex/Gel are used to a lesser extent 3% . The plant are mostly used in the form of paste, decoction, plant part extract and seed oil.

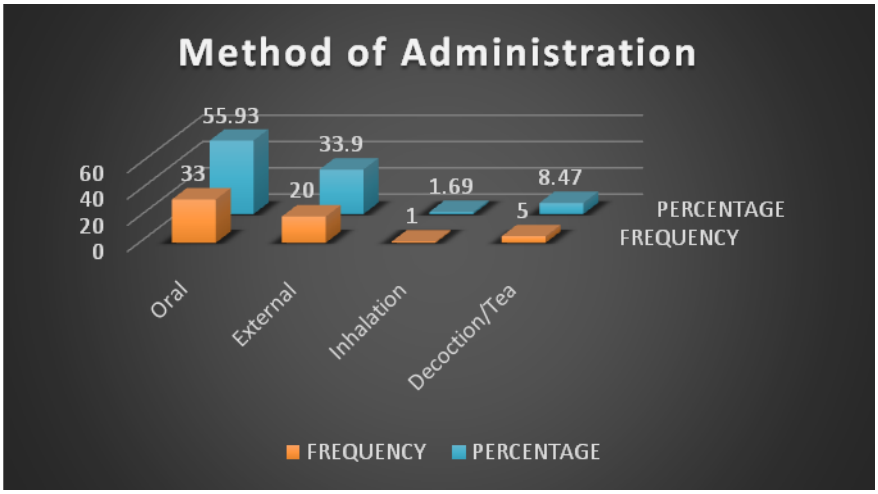

Fig.4 Method of Administration

Figure 4 showed that there are 33 medicinal plant species. Out of all 55.93% are orally, 33.9% are Externally, 1.69% are used as Inhalation and remaining 8.47% are used as Tea or Decoction.

The findings reveal a rich diversity of medicinal plants with significant potential for treating various ailments, ranging from digestive disorders and respiratory conditions to skin diseases and chronic illnesses.

Conclusion

This study highlights the immense therapeutic potential of 33 medicinal plants traditionally used in the Rairakhol Forest Range area of Sambalpur district, Odisha, India. The documented plants, such as ***Emblica officinalis*** (Amla), ***Ocimum sanctum*** (Tulsi), ***Curcuma longa*** (Turmeric), and ***Withania somnifera*** (Ashwagandha), demonstrate a wide range of medicinal applications, including immunity boosting, digestive health, respiratory relief, skin care, anti-inflammatory effects, antimicrobial activity, diabetes management, and cardiovascular support. The traditional knowledge of these plants, passed down through generations, aligns with modern scientific research, validating their pharmacological properties and therapeutic efficacy.

The study underscores the importance of integrating traditional knowledge with modern scientific research to harness the full potential of these medicinal plants. The documented uses and modes of administration provide a foundation for further research, including phytochemical analysis, pharmacological studies, and the development of standardized herbal formulations. Additionally, the study emphasizes the need to preserve biodiversity and traditional knowledge to ensure the sustainable use of these valuable resources.

In conclusion, the medicinal plants documented in this study represent a treasure trove of natural remedies with significant potential for improving healthcare outcomes. By bridging the gap between traditional and modern medicine, this research contributes to the development of plant-based therapeutics and promotes sustainable healthcare solutions for future generations.

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Conflict of Interest

There is no conflict of interest among the authors.

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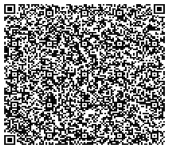	Website: www.ijarbs.com
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