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ETHNOBOTANICAL INSIGHTS INTO MEDICINAL PLANTS CULTIVATION BY THE INDIGENOUS PEOPLE OF ODISHA

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Abstract: The tribal communities of Odisha possess a rich ethnobotanical knowledge, particularly in the cultivation and use of medicinal plants. These indigenous practices, passed down through generations, form an integral part of their traditional healthcare system. This study explores the various medicinal plants cultivated by Odisha's tribal people and examines their significance in treating common ailments. It highlights the sustainable cultivation techniques used by these communities, which are often adapted to the region's unique agro-climatic conditions. Furthermore, the paper emphasizes the potential of these traditional practices in contributing to modern medicine and promoting biodiversity conservation. Understanding the ethnobotanical insights of Odisha's tribal groups not only preserves their cultural heritage but also offers valuable knowledge for scientific and pharmaceutical research.
Keywords: Ethnobotany, medicinal plants, Odisha tribes, traditional knowledge, sustainable cultivation**,** indigenous practices.

1. INTRODUCTION

Odisha, a state in eastern India, is home to a vast repository of traditional knowledge that intertwines agricultural practices with the use of medicinal plants. For centuries, the rural and tribal communities in Odisha have relied on their deep understanding of local biodiversity to cultivate crops and medicinal plants that play crucial roles in their livelihoods, health, and cultural practices[1]. These communities have honed agricultural techniques such as organic farming, crop rotation, and the cultivation of climate-resilient crop varieties, ensuring the sustainability of their ecosystems. At the same time, they possess rich ethnobotanical knowledge, which includes the identification and usage of various medicinal plants for healing and promoting health[2]. This connection between agriculture and ethnobotany creates a unique blend of traditional wisdom that is increasingly recognized for its importance in sustainable development and biodiversity conservation[3].

Forests support rural livelihoods and maintain natural equilibrium. In India, around 53 million tribal people live in 550 villages among 227 ethnic groupings. Approximately 60% of rural communities rely on forest resources for their daily needs[4]. Tribal families rely heavily on forest resources, accounting for half of their yearly income, 18% from agriculture, 13% from livestock, and 18% from other sources. Indigenous people have a strong connection to biodiversity-rich locations and are well-versed in their surroundings' floral diversity. Non-timber forest products (NTFP) encompass all forest-derived items, not only timber and fuel. NTFPs have a considerable impact on the rural economy by providing employment, income, and basic necessities. Indigenous societies have used NTFPs for centuries for a variety of uses, including edible, medicinal, and food production[5]. They are considered secondary production. In recent years, it has gained prominence in government policy measures due to its value as a life-sustaining ingredient for many forest populations. In recent years, human pressures such as encroachment, excessive harvesting, forest fires, and overgrazing have negatively impacted NTFPs[6]. NTFP provides economic advantages primarily to local

communities and forest inhabitants, unlike wood which benefits the government. Medicinal plants such as turmeric (Curcuma longa), neem (Azadirachta indica), and tulsi (Ocimum sanctum) have been integral to the health systems of rural communities in Odisha for generations. Each of these plants offers unique medicinal properties that support the well-being of the local population, while their cultivation plays a key role in traditional farming systems[7]. This study delves into the ethnobotanical insights of these plants, exploring their medicinal benefits, agricultural significance, and the traditional methods employed to cultivate and preserve them. Furthermore, it examines the agricultural practices of the traditional people of Odisha, focusing on organic farming, crop rotation, intercropping, and the use of traditional crop varieties[8]. These practices not only sustain soil fertility and ecosystem health but also represent a model of resilience in the face of climate change.

2. CULTIVATION PROCESS OF MEDICINAL PLANTS BY TRIBAL PEOPLE OF ODISHA

The tribal communities of Odisha have long relied on the biodiversity around them for health and well-being, particularly through the use of medicinal plants[9]. Their knowledge of these plants has been passed down for generations and is deeply intertwined with their cultural and spiritual practices[10]. Medicinal plants play a crucial role in treating common ailments, chronic conditions, and spiritual needs. Understanding the cultivation, medicinal value, and uses of these plants can provide insights into both traditional healthcare systems and modern herbal practices.

The cultivation and use of medicinal plants in Odisha are rooted in the close connection the tribal communities have with nature. These communities traditionally rely on the sustainable harvesting of wild plants rather than large-scale farming. Cultivation, where practiced, is often small-scale, organic, and closely aligned with natural ecosystems[11].

I. **Seed Selection and Propagation**: Seed selection is based on the season, climatic conditions, and the medicinal qualities of the plant. Tribal farmers usually collect seeds from wild or previously cultivated plants known to have potent medicinal properties[12]. Propagation can occur through seeds, cuttings, or root division, depending on the species.

II. **Soil and Water Management**: Tribal communities use forest soils, which are naturally rich in organic matter. They do not use synthetic fertilizers or chemicals, relying instead on organic manure from decomposed plant materials and animal waste. Rainwater and small hand-dug irrigation systems are often used for watering plants[13].

III. **Sustainable Harvesting Practices**: Many medicinal plants are harvested directly from forests or forest edges. Tribal communities employ sustainable methods, such as harvesting only the needed parts of the plant (e.g., leaves, roots, bark) while allowing the rest of the plant to regenerate. This ensures the plant population remains healthy and available for future use[14].

IV. **Biodiversity Conservation**: Tribal people practice mixed cropping, growing medicinal plants alongside other crops, which helps maintain soil fertility and reduces the risk of diseases. Forest ecosystems are also seen as sacred, and many tribal groups believe in preserving them to ensure a steady supply of medicinal resources[15].

3. MEDICINAL PLANTS AND THEIR MEDICINAL VALUE, USES, AND CULTIVATION

Below are ten medicinal plants commonly used by the tribal communities of Odisha[16], along with their medicinal values, uses, and cultivation practices:

3.1. Ashwagandha (Withania Somnifera)

Fig.1 Ashwagandha plant (Withania Somnifera)

3.1.1. Cultivation Process: Ashwagandha is a hardy plant that thrives in dry climates with well-drained soil. It can be propagated through seeds, sown at the beginning of the monsoon season. Tribal communities in Odisha often plant it in forest gardens or on small plots of land. They may also collect the wild variety from forest edges[17].

3.1.2. Medicinal Value: Ashwagandha is an adaptogen, meaning it helps the body cope with stress and boosts overall vitality. It has anti-inflammatory, antioxidant, and immune-boosting properties, making it effective for treating conditions such as arthritis, fatigue, and anxiety.

3.1.3. Uses:

- **Stress and anxiety**: Ashwagandha root powder is mixed with water or milk and consumed to reduce stress and promote relaxation.
- **Arthritis**: A paste of Ashwagandha root is applied to inflamed joints to alleviate pain.
- **General wellness**: Consuming Ashwagandha regularly is believed to boost immunity and increase energy levels.

3.2. Guduchi (Tinospora cordifolia)

Fig.6 Guduchi plant (Tinospora Cordifolia)

3.2.1. **Cultivation Process:** Guduchi is a hardy climber that grows well in tropical forests. It can be propagated through stem cuttings, which are planted near trees or support structures. It requires minimal care once established, as it grows vigorously in natural habitats[22].

3.2.2. **Medicinal Value:** Guduchi is an adaptogen that boosts the immune system and helps the body resist infections. It is used to treat fevers, digestive problems, and inflammatory conditions like arthritis.

3.2.3. **Uses:**

- **Fever**: A decoction made from Guduchi stems is consumed to reduce fever and boost immunity.
- **Arthritis**: Guduchi powder or extract is taken to alleviate joint pain and reduce inflammation.
- **Detoxification**: Guduchi juice is used to detoxify the body and improve liver function.

3.3. Kalmegh (Andrographis paniculata)

Fig.8 Kalmegh plant (Andrographis Paniculata)

3.3.1. **Cultivation Process:** Kalmegh is cultivated in well-drained soils with ample sunlight. It is propagated through seeds and requires regular watering, especially during the growing season. The plant grows quickly and can be harvested within a few months.

3.3.2. **Medicinal Value:** Kalmegh is known for its bitter taste and is widely used to treat liver disorders, fevers, and digestive problems. It also has antimicrobial properties, making it effective against infections[24].

3.3.3. **Uses:**

- **Liver health**: Kalmegh extract is consumed to treat liver disorders like jaundice and hepatitis.
- **Fever**: A decoction of Kalmegh leaves is taken to reduce fever and treat malaria.
- **Infections**: Kalmegh leaves are used to prepare a paste for treating skin infections and wounds.

3.4. Brahmi (Bacopa monnieri)

3.4.1. **Cultivation Process:** Brahmi thrives in moist, swampy areas and is often found growing along riverbanks or wetlands. It is propagated through cuttings and requires frequent watering. Tribal communities plant Brahmi near water sources for easy access[25].

3.4.2. **Medicinal Value:** Brahmi is known for its memory-enhancing and cognitive-boosting properties. It is used to treat neurological disorders, anxiety, and mental fatigue. It also has anti-inflammatory and antioxidant properties.

3.4.3. **Uses:**

- **Memory enhancement**: Brahmi leaves are consumed as a tea or in powdered form to improve memory and concentration.
- **Anxiety**: A decoction of Brahmi is taken to reduce anxiety and mental stress.
- **Inflammation**: Brahmi paste is applied externally to reduce inflammation and treat skin conditions.

3.5. Haritaki (Terminalia chebula)

Fig.10 Haritaki plant (Terminalia Chebula)

3.5.1. **Cultivation Process:** Haritaki trees grow best in tropical and subtropical climates. They prefer well-drained, fertile soils. Propagation is typically done through seeds or root cuttings, and the trees are often grown in agroforestry systems alongside other crops[26].

3.5.2. **Medicinal Value:** Haritaki is an important component of Ayurvedic medicine, known for its rejuvenating properties. It is used to treat digestive disorders, respiratory issues, and skin conditions. It also has antioxidant, anti-inflammatory, and antimicrobial properties.

3.5.3. **Uses:**

- **Digestive health**: Haritaki powder is consumed to improve digestion and treat constipation.
- **Respiratory issues**: Haritaki decoctions are used to treat coughs, colds, and bronchitis.
- **Skin care**: Haritaki paste is applied to wounds and skin infections for faster healing.

CONCLUSION

The tribal people of Odisha hold a wealth of ethnobotanical knowledge that has been cultivated over generations. Their deep connection with nature and reliance on medicinal plants for treating ailments demonstrates the significance of these resources in their everyday lives. This study underscores the importance of documenting and preserving these indigenous practices, which not only safeguard cultural heritage but also offer insights into sustainable agricultural methods and potential medical breakthroughs. The cultivation of medicinal plants by the tribes is not only ecologically adapted to Odisha's diverse climatic zones but also aligns with modern conservation efforts, contributing to the protection of regional biodiversity. As global interest in traditional and alternative medicines grows, there is a need to integrate these time-tested tribal practices with contemporary healthcare systems. Collaboration between tribal communities, researchers, and policymakers could pave the way for the sustainable development of medicinal plant resources while ensuring the protection of indigenous intellectual property. In conclusion, recognizing the contributions of Odisha's tribal people to ethnobotany can lead to advances in both healthcare and environmental sustainability, benefiting not only the region but also the global community.

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