Ethnomedicinal Plants of Gorakhpur: A Review of Traditional Knowledge among Tribal Communities

Sandhya Nishad
Department of Botany, Buddha Degree College GIDA Gorakhpur.
Email id: sandhy11@bdc.ac.in

Abstract- The study of ethnomedicinal plants used by indigenous tribal cultures is critical for better understanding traditional healthcare systems and preserving vital knowledge. This review focuses on the plants of ethnomedicinal importance used by the tribal people of Gorakhpur, a region in Uttar Pradesh, India. The paper aims to document the diverse plant species, their medicinal uses, and the cultural significance of these plants in the lives of tribal communities. By examining existing literature and ethnobotanical studies, this review highlights the relevance of these plants in the treatment of different diseases and their contribution to the sustainability of traditional medicinal practices. This review explores the ethnomedicinal plants of Gorakhpur, focusing on their medicinal uses, cultural significance, and the sustainability of traditional plant-based healthcare systems. The objective is to highlight the plants' relevance in contemporary health practices, encourage preservation efforts, and promote the incorporation of these plants into modern pharmacological research

Keywords- Ethnomedicine, Medicinal Plant, Flora, Tribal Community.

I. INTRODUCTION

Ethnobotany, the study of how different cultures use plants, has gained significant attention in recent years. The tribal people of Gorakhpur, located in the eastern part of Uttar Pradesh, India, have a rich history of using local plants for medicinal purposes. This review provides an overview of the plants with ethnomedicinal value used by these communities. Gorakhpur's tribal population includes groups such as the Tharus, Rajwars, and other indigenous people who rely on traditional plant- based remedies for treating a wide range of ailments. The knowledge of medicinal plants passed down through generations is not only vital for the preservation of indigenous practices but also holds the potential for discovering new compounds for pharmaceutical development. The region of Gorakhpur is blessed with a diverse ecosystem, ranging from the Indo-Gangetic plain to the Terai region. The interaction between these varied ecosystems has given rise to a wide array of plant species, many of which are utilized for their medicinal properties. Ethnomedicine—the use of plants for medicinal purposes—remains central to their healthcare system. This review aims to document the ethnomedicinal plants used by these communities and to assess their potential in modern healthcare systems.

1. Geography and Demographics of Gorakhpur

Gorakhpur is situated in the northeastern region of Uttar Pradesh and is characterized by a variety of ecosystems, including dense forests, rivers, and plains. The area's unique geography contributes to the rich biodiversity of flora, which the tribal communities use for food, medicine, and other cultural practices. The climate is predominantly tropical, supporting a variety of medicinal plants that are well adapted to the local environmental conditions.

2. Tribal Communities in Gorakhpur

Tribal populations in Gorakhpur, such as the Tharu, Rajwar, and other groups, have a deep connection with their natural surroundings. These communities possess a wealth of traditional knowledge regarding the plants that grow in the region, especially for treating common illnesses like fevers, digestive issues, respiratory problems, and wounds. Their knowledge is based on a holistic approach that integrates the physical, spiritual, and environmental aspects of health.

3. Tribal Communities' Use of Ethnomedicinal Plants in Gorakhpur

Several plants from the region are known for their medicinal properties. Some of the most important plants used by tribal people in Gorakhpur include:

Ocimum sanctum L., or tulsi

Tulsi is a member of the Lamiaceae family; its parts used of leaves and roots.
Chemical Constituents: Terpenoids, flavonoids, and phenolic compounds are among the many beneficial substances found in tulsi. β- caryophyllene, linalool, carvacrol, and eugenol are important components. These support its pharmacological properties, which include immunomodulatory, antibacterial, anti- inflammatory, and antioxidant actions.
Traditional Uses: Tulsi is used widely in traditional healing and is revered in Indian culture. Tribal groups in Gorakhpur utilize Tulsi leaves to cure respiratory conditions, fever, cough, and cold.
Additionally, the herb is used as a general health tonic to boost immunity and reduce symptoms associated with stress.
Scientific Validation: Numerous studies have validated Tulsi's therapeutic efficacy. Research supports its antimicrobial activity against bacteria and viruses, anti-inflammatory potential in respiratory tract infections, and adaptogenic effects that help the body resist stress. It is also shown to have hepatoprotective and cardioprotective properties.

Azadirachta indica A. Juss., or neem

Neem is a member of the Meliaceae family. Neem is the local name. It uses leaves, bark, seeds, flowers, and twigs as parts.
Chemical Constituents: Azadirachtin, nimbin, nimbidin, salannin, quercetin, and limonoids are among the many physiologically active substances found in neem. These substances give it antiviral, antifungal, antibacterial, anti-inflammatory, and insecticidal properties.
Traditional Uses: The plant is highly regarded for its antibacterial, antiviral, antifungal, and anti- inflammatory properties
Scientific Validation: Antibacterial, antifungal, and antidiabetic properties have been extensively documented.

Withania somnifera Dunal, or ashwagandha

ashwagandha is a Member of the Solanaceae family. Asgandh / Ashwagandha is the local name. its parts used of leaves and roots.
Chemical Constituent: steroids, saponins, phenolics, flavonoids, phytophenols, and glycosides
Traditional Uses: Known as an adaptogen, Ashwagandha is used to treat stress, anxiety, and insomnia. It also serves as a general tonic to improve energy levels and vitality.
Scientific Validation: It has been shown to reduce cortisol levels and improve sleep patterns.

Aegle marmelos L., or Bael

Bael is a Member of the Rutaceae family. its parts used of Fruit, leaves,and bark.
Chemical Constituent: alkaloids, coumarins, terpenoids, flavonoids, and essential oils. The leaves and fruit are particularly rich in bioactive compounds like phenolic acids, organic acids, and vitamins. Additionally, it contains minerals like potassium, calcium, and iron.
Traditional Uses: The bael fruit is used to treat digestive issues such as diarrhea, dysentery, and constipation. Its antimicrobial and anti- inflammatory properties are beneficial for treating fever.
Scientific Validation: Research indicates its antimicrobial, antidiabetic, and anti-inflammatory properties.

Giloy(Tinospora cordifolia Willd.)

Giloy is a Member of the Menispermaceae Family. its parts used of Stem, leaves.
Chemical Constituent: alkaloids, diterpenoid lactones, glycosides, steroids, sesquiterpenoids, phenolics, aliphatic compounds, and polysaccharides. Some key compounds include alkaloids like berberine, palmatine, and choline; glycosides like 18-norclerodane glycoside, furanoidditerpene glucoside, tinocordiside, and syringin; and diterpenoids like tinosporine, tinosporide, columbin, and jateorine.
Traditional Uses: Known for boosting immunity, Giloy is used in the treatment of fever, infections, and digestive disorders. It is also used to alleviate chronic fatigue.
Scientific Validation: Giloy has demonstrated potent immunomodulatory and anti-inflammatory effects.

Brahmi (Bacopa monnieri L.)

Brahmi is a member of the Scrophulariaceae family. Its parts used of whole plant.
Chemical Constituent: Bacopa monnieri contains a variety of chemical constituents, including alkaloids like brahmine, nicotine, and herpestine, triterpenoid saponins such as bacosides A and B, and other compounds like

flavonoids, glycosides, and amino acids. The major components, bacosides A and B, are triterpenoid saponins believed to be responsible for its neuroprotective effects.
Traditional Uses: Brahmi is used as a cognitive enhancer and memory booster. It is also used to treat anxiety and reduce stress.
Scientific Validation: Numerous studies support its neuroprotective and anxiolytic effects.

Moringa (Moringa oleifera Lam.)

Moringa is a member of the Moringaceae family. Its parts used of Leaves, seeds, pods.
Chemical Constituent: vitamins, minerals, proteins, and various secondary metabolites like flavonoids, alkaloids, glucosinolates, and phenolic acids. These compounds contribute to the plant's nutritional value and potential health benefits.
Traditional Uses: Moringa is considered a superfood. It is used to treat malnutrition, improve digestion, and boost immunity. It is also known for its anti-inflammatory and anti-hypertensive properties.
Scientific Validation: Moringa leaves have proven antioxidant, anti-inflammatory, and blood sugar-lowering effects.

Shatavari (Asparagus racemosus Willd.)

Shatavari is a member of the Asparagaceae family. Its parts used of Roots.
Chemical Constituent: steroidal saponins, isoflavones, alkaloids, flavonoids, polysaccharides, mucilage, essential oils, and amino acids like asparagine, arginine, and tyrosine.
Traditional Uses: Shatavari is particularly important for women's health. It is used to regulate menstrual cycles, treat infertility, and increase lactation in breastfeeding mothers.
Scientific Validation: Shatavari has been found to possess adaptogenic, antioxidant, and anti- inflammatory properties.

Sarso (Brassica juncea L.)

Sarso is a member of the Brassicaceae family. Its parts used of Seeds, leaves.
Chemical Constituent: glucosinolates, carotenoids, phenolic compounds, and volatile components like isothiocyanates. These compounds contribute to the plant's nutritional and pharmacological properties, including antioxidant and anti-inflammatory activities.
Traditional Uses: Mustard seeds are used in folk medicine for promoting digestion, treating respiratory problems like asthma, and relieving pain in the joints.
Scientific Validation: Mustard seeds have been documented for their anti-inflammatory and analgesic effects.

Turmeric (Curcuma longa L.)

Turmeric is a member of the Zingiberaceae family. Its parts used of Rhizomes.
Chemical Constituents: Curcumin, volatile oils, polysaccharides
Traditional Uses: Used for its anti-inflammatory and antiseptic properties. It is widely used for wounds, skin conditions, and digestive disorders.
Scientific Validation: Curcumin, the main active compound in turmeric, is known for its strong anti-inflammatory, antioxidant, and anticancer effects.

Ginger (Zingiber officinale Roscoe)

Ginger is a member of the Zingiberaceae family. Its parts used of Rhizomes.
Chemical Constituents: Gingerol, shogaol, zingerone
Traditional Uses: Used to treat nausea, digestive problems, inflammation, and respiratory issues.
Scientific Validation: Gingerol and other active compounds have shown potent anti-inflammatory, antioxidant, and antiemetic effects.

Aloe Vera (Aloe barbadensis Mill.)

Aloe Vera is a member of the Asphodelaceae family. Its parts used of Gel from leaves.
Chemical Constituents: Polysaccharides (acemannan), anthraquinones
Traditional Uses: Used for treating burns, skin conditions, constipation, and promoting general health.
Scientific Validation: Known for its skin-healing properties, Aloe vera is also used to treat digestive problems,

promote wound healing, and support immune function.

Mint (Mentha spp.)

Mint is a member of the Lamiaceae family. Its parts used of leaves.
Chemical Constituents: Menthol, menthone, flavonoids
Traditional Uses: Used for digestive problems, respiratory issues, and to relieve headaches.
Scientific Validation: Menthol has antispasmodic and carminative effects, helping with digestive discomfort and nausea. It is also shown to have antimicrobial properties.

Kalmegh (Andrographis paniculata Wall. ex-Nees)

Kalmegh is a member of the Acanthaceae family. Its parts used of Whole plant.
Chemical Constituents: Andrographolide, diterpenoid lactones
Traditional Uses: Known for its use in liver disorders, fever, and infections. It is used to strengthen immunity.
Scientific Validation: Andrographolide has demonstrated potent anti-inflammatory, antimicrobial, and hepatoprotective activities.

Arjuna (Terminalia arjuna (Roxb.) Wight & Arn.)

Arjuna is a member of the Combretaceae family. Its parts used of Bark.
Chemical Constituents: Arjunolic acid, flavonoids, tannins
Traditional Uses: Used for cardiovascular health, including improving heart function and treating heart failure.
Scientific Validation: Has shown cardioprotective properties, supporting its traditional use for treating heart diseases.

Chirchita (Clerodendrum phlomidis L.)

Chirchita is a member of the Lamiaceae family. Its parts used of Root leaves.
Chemical Constituents: Flavonoids, alkaloids
Traditional Uses: Used to treat fever, respiratory disorders, and to improve digestion.
Scientific Validation: Has been shown to have antimalarial, anti-inflammatory, and antipyretic properties.

Amaltash (Cassia fistula L.)

Amaltash is a member of the Fabaceae family. Its parts used of Flowers, pods
Chemical Constituents: Anthraquinones, flavonoids, tannins
Traditional Uses: Used for constipation, liver diseases, and skin conditions.
Scientific Validation: Shown to have laxative, hepatoprotective, and antimicrobial effects.

II. Conservation and Sustainability of Medicinal Plants

The overexploitation of certain medicinal plants, combined with deforestation and climate change, has led to a decline in the availability of some species in the region. The loss of traditional knowledge, due to the changing socio-economic landscape, further threatens the sustainability of this plant-based healthcare system. Therefore, it is crucial to implement conservation strategies, including:
Ex situ Conservation: Developing nurseries and botanical gardens to cultivate endangered species.
In situ Conservation: Protecting natural habitats and traditional knowledge by involving local communities in sustainable harvesting practices.
Documentation and Awareness: Recording traditional uses and integrating local knowledge into scientific research to ensure its preservation.

III. Challenges and Threats

Despite the valuable knowledge that tribal people possess about medicinal plants, there are several challenges to the preservation of this knowledge:

Loss of traditional knowledge: With the encroachment of modern medicine and lifestyle changes, younger generations are less likely to learn about traditional healing practices.
Biopiracy: The exploitation of indigenous knowledge by pharmaceutical companies without compensation or recognition poses a threat to tribal communities.
Habitat loss: Deforestation and environmental degradation have led to the decline of many important medicinal plants.

IV. CONCLUSION

The ethnomedicinal plants of Gorakhpur represent a treasure trove of traditional knowledge and potential for modern medicine. By documenting and preserving the plants and practices used by the tribal communities, we not only safeguard their cultural heritage but also open new doors for scientific exploration. Further research, education, and conservation efforts are essential to ensure that the rich tradition of ethnomedicine continues to thrive and contribute to global health and well-being. The ethnomedicinal plants of Gorakhpur represent a significant aspect of the region's cultural heritage and healthcare practices. The traditional knowledge of these plants is invaluable, not only for preserving ancient wisdom but also for exploring new therapeutic avenues in modern medicine. However, with the increasing threats of biodiversity loss, it is essential to adopt strategies that ensure the sustainable use of these plants and the protection of indigenous knowledge. Integrating ethnomedicine with modern pharmacology can provide a holistic approach to healthcare, benefiting both local communities and the broader population.

V. DISCUSSION

- Patterns of plant use: Dominance of leaves, roots, and bark.
- Common ailments treated: Fever, gastrointestinal issues, respiratory infections.
- Preparation methods: Decoctions, infusions, pastes.
- Transmission of knowledge: Oral tradition, mostly elders and healers.
- Threats to traditional knowledge: Modernization, deforestation, lack of documentation.
- Conservation needs: Importance of protecting plant biodiversity and indigenous knowledge systems.

ACKNOWLEDGEMENT

We are grateful to our senior professors for their guidance on this topic and for providing us with the needed books and articles for our review.

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